ANNUAL

REPORT 2021

IDIBAPS

FUNDACIÓ CLÍNIC BARCELONA


IDIBAPS


FUNDACIÓ
CLÍNIC
BARCELONA

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ANNUAL SCIENTIFIC REPORT 2021

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ANNUAL **SCIENTIFIC REPORT** 2021

FOREWORD

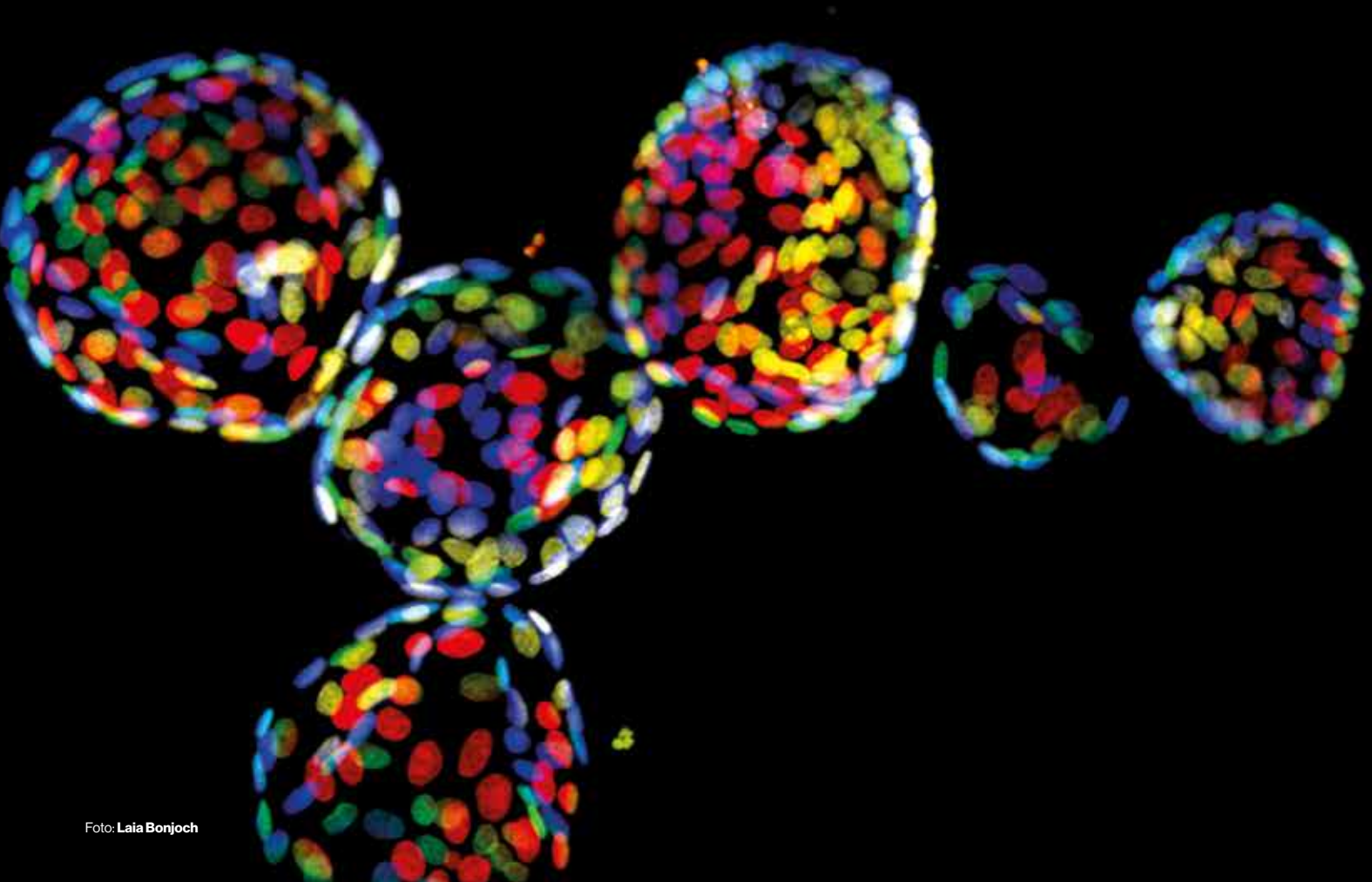


Foto: **Laia Bonjoch**

Foreword by the Director

In our previous annual report, I started my forward message reflecting on the extreme challenges citizens as well as scientists had to face because of the COVID-19 pandemic in 2020. We are now looking back at 2021, a year that was still difficult with new waves of infections but a year that also saw the roll-out of multiple vaccination campaigns, demonstrating the collective power of science and society to fight the pandemic. In 2021, we learnt to strengthen our resilience in personal and professional life, and this was also true in our institute. Our professionals, researchers, medical doctors, technicians, nurses, managers, and administrative staff endured the difficulties to continue contributing to great translational science, as we are now reviewing and humbly summarizing in this annual report.

Following the ambitious goals of our ongoing Strategic Plan, through a collaborative effort, we moved forward on multiple fronts, from science to technology, talent development, innovation, and outreach towards society.

We are proud of the promotion of two IDIBAPS researchers, doctors Jordi Gràcia-Sancho and Pau Sancho, to senior group leaders developing research lines on liver vascular biology, and cell plasticity and repair, respectively. In 2021, we proudly thanked for their work the senior researchers doctors Julian Panés, Ginés Escolar, Francisco Cervantes, Antoni Gual, Wladimiro Jiménez, Francesc Artigas, and Jordi Bruix, who passed on the leadership of their groups to doctors Azucena Salas, Maribel Díaz-Ricart, Jordi Esteve, Hugo López-Pelayo, Manuel Morales, Analía Bortolozzi and Maria Reig. They will build upon the previous achievements and open new relevant translational and clinical research lines in multiple diseases. We welcome these new leaders and are committed to supporting the nurturing of their groups and their science. It is reassuring to see we are advancing in the right direction to overcome the historic gender imbalance in our institution, a commitment in our Strategic Plan.

While promoting the new generations of scientists, more established researchers at our institute received prestigious recognitions. Once more this year, eight of our researchers, associated to Hospital Clínic and/or the University of Barcelona, are in fact among the top 1% of most cited researchers in the world (Clarivate, 2021), and more than fifty are the most influential in their field (Stanford University, 2021). Our contribution to knowledge and clinical practice is also reflected by the increasing number of publications, while maintaining their quality and increasing open access (from 62% to 69%) to share our discoveries as widely as possible. In previous years, to give a glimpse of IDIBAPS discoveries, we highlighted a few publications based on their impact factors.

Following the recommendations of our External Scientific Advisory Board and the new global movement to rethink and reform research assessment, as triggered by the DORA Declaration, this year the selection was made collectively by the different research areas based on the content and relevance of each publication, independently of their publishing venue. You will read about the latest discoveries in chimeric-antigen-receptor T-cells (CAR-Ts) and other immunotherapy strategies, chronic obstructive pulmonary disease (COPD) characterization, cardiovascular diseases, new autoimmune encephalitis, haematological tumours, and others, ranging from more fundamental research studies using state-of-the-art technologies to clinical trials and health care interventions, in this way reflecting the translational mission of our institute.

More than ever today, science depends on sophisticated technologies, and we continued strengthening our core facilities. Thanks also to the efforts of a new internal IDIBAPS committee whose role is to scout for new technologies, we were able to raise funds from the Carlos III Institute of Health (ISCIII) and the European Next Generation funds to acquire a new high-performance and high-resolution spectral flow cytometer. We are very satisfied to see the expansion and research impact of the COVID-19 biobank, a biorepository that we developed from the start of the pandemic, that has been enriched by over 50,000 samples and is constantly deployed for multiple in-house as well as external research projects.

Our responsibility towards talent development is reflected by our continuing commitment to the Human Resources Strategy for Researchers (HRS4R), an initiative promoted by the European Commission. To renew these efforts, we prepared a new Action Plan 2021-2024 in collaboration with various representatives of the professional profiles in our institution. New activities include the launch of a new seminar series – the Toolbox – to open debate on transversal emergent topics in science, such as Open Science, Open Data, and public-private partnerships.

In 2021, we continued to promote innovation spinning out of our research. We filed 12 new patent applications in diverse fields, such as diagnostics, therapeutics, advanced therapies and medical devices. A new spin-off was also launched, Athena Tech, to develop Artificial Intelligence (AI) tools for melanoma survival prediction, which was also awarded with one of the Innovation Prizes by Campus Clinic.

As part of our mission, we foster an active dialogue with citizens through multiple activities. Despite the still challenging situation due the pandemic, we were able to organize, once more this year, the successful "Generació Ciència" ("Science Generation") workshops, attended by 250 high-school students wearing white coats and carrying out hands-on experiments in the courtyard behind IDIBAPS.

Reflecting on the past always helps to move forward. We closed 2021 with a fruitful meeting with the members of our Scientific Advisory Board that celebrated the success of IDIBAPS, provided critical feedback and approved the launch of important new initiatives to start in 2022. To support our research groups and stimulate new translational research collaborations, we will launch new calls to incorporate assistant researchers into the groups and to create transversal multidisciplinary programmes to strengthen our ultimate mission – "from knowledge to cure".

This year saw a change in the direction of strategy at IDIBAPS. Dr. Marga Nadal left our institution to take over the direction of the Josep Trueta Institute of Biomedical Research of Girona (IDIBGI). Her contribution has left a deep imprint at the IDIBAPS, highlighted by her instrumental role in developing our current Strategic Plan. We want to thank her for her great dedication to our institution and congratulate on her new post. We warmly welcome and thank Dr. Michela Bertero for accepting the challenge of this Direction. She comes with long experience in research and management responsibilities and an enthusiastic portfolio of ideas and proposals to implement at IDIBAPS.

Our annual report provides an overview of our past activities to provide a tool for thought, improvement, and the generation of new ideas to enhance our impact on science and society. Our scientific work requires us to be rigorous, careful, prudent and critical with our observations and ideas. There is not space for emotive feelings. However, seeing all what we have done, it would be unfair not to convey our recognition and deep gratitude to all the people at IDIBAPS for their strong commitment in the difficult situations of all kinds we must confront. We also want to thank all the people and institutions who collaborate with us in this endeavour. This report on our activities is clear evidence that the efforts of all together are contributing to fulfilling our mission.

Elías Campo
Director



Foto: **Jose C. Pariente Zorrilla**

About us

The Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS) is a biomedical research institute of excellence. It combines clinical and basic research to accelerate the translation of the knowledge to the benefit of the patients. IDIBAPS is a CERCA (Research Centers of Catalonia) center and was first accredited as Instituto de Investigación Sanitaria (Instituto de Salud Carlos III) in 2009.

Founded in 1996, it is a public consortium formed by the Generalitat de Catalunya, Hospital Clínic de Barcelona, School of Medicine and Health Sciences of the University of Barcelona and, as an associated partner, the CSIC's Barcelona Biomedical Research Institute.

The IDIBAPS research community is composed of more than 2,000 people, grouped into 104 groups organized across 5 different areas of knowledge.

AREA 1
Biological aggression and response mechanisms

AREA 2
Respiratory, cardiovascular and renal pathobiology and bioengineering

AREA 3
Liver, digestive system and metabolism

AREA 4
Clinical and experimental neuroscience

AREA 5
Oncology and haematology

Additionally, 3 transversal groups perform research in Primary Care, Nursing, Pharmacology and Clinical Trials.

Institució CERCA
Centres de Recerca de Catalunya

HR EXCELLENCE IN RESEARCH

The Fundació Clínic per a la Recerca Biomèdica (FCRB) is a non-profit foundation set up in 1989 by the Hospital Clínic de Barcelona and the University of Barcelona. Its main mission is to provide administrative support to researchers at Hospital Clínic de Barcelona in the management, development and justification of their scientific activity.

It also works to attract resources for research and, through the Aula Clínic and Eixample Clínic platforms, to promote and disseminate continuous training in the health sciences.

Scientific breakthroughs are never the result of chance. They are the fruit of long-term commitments that involve not only researchers, but also society as a whole.

IDIBAPS - FCRB has made such a commitment, to encourage translational research, innovation and technological progress in the field of biomedicine, through different programmes addressing diseases with a high prevalence, morbidity and mortality in our society.

The data presented in this Annual Scientific Report details the ever-growing scientific achievements made by IDIBAPS-FCRB investigators and their capacity for attracting public and private funding. This enormous potential for capturing resources and their translation into applied results for clinical practice constitute the best guarantee for securing the future of the Institute and its impact on society.

Organisation chart

IDIBAPS-FCRB works to ensure efficiency and quality in the services offered to its research staff, in particular, in the areas of research project management and administration.

Elías Campo
Director of IDIBAPS and of FCRB

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Michela Bertero
Director of Strategy

Arantxa Fernández
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Daniel Arbós
Head of the Communication Office

Gemma Llaverias
Head of the Scientific Coordination Office

Teresa Lloret
Head of the Knowledge and Technology Transfer (KTT) Office

Gemma Pascual
Head of the Institutional Actions Office

Sandra Piquer
Head of IDIBAPS laboratories

Aina Rodríguez
Head of IDIBAPS Core Facilities and Biobank coordinator

Rosa Vilavella
General Manager

Laura Lopera
Secretary
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Juan Abolafia
Head of the Pre-Award Office for International Grants

Sergio Camacho
Head of Economic Planning and Management Control

Núria Castro
Head of Public Hiring

Ernest Costa
Head of the TIC Office

Marta Fernández
Head of the Human Resources Office

Judit Martínez
Head of the Post-award Grants Office

Guillem Masdeu
Head of the Legal Office

Sònia Meléndez
Head of the Finance Department

Cristina Navas
Head of the General Services Office

Sandra Pérez
Head of the Pre-Award Office for National Grants

Xavier Solé
Head of Aula Clínic

Núria Vilamajó
Head of Patronage

Governance and structure

Governance is exercised through the following boards and committees:

IDIBAPS BOARD OF GOVERNORS

Conformed by representatives of the different institutions of the consortium, it supervises IDIBAPS actions, budget and results. Its mission is to take scientific decisions in consultation with the Scientific Advisory Board, and to evaluate the implementation of the strategic plan.

CHAIRMAN
Joan Gómez Pallarés
General Director of Research. Departament d'Empresa i Coneixement. Generalitat de Catalunya

VICE-CHAIRMAN
Josep Maria Campistol
General Director of Hospital Clínic de Barcelona

BOARD MEMBERS
Aina Plaza
General Director of Health Planning Departament de Salut. Generalitat de Catalunya

Jordi García
Research Vice-Dean of Universitat de Barcelona

Lluís Calvo
Institutional Coordinator of Consejo Superior de Investigaciones Científicas (CSIC) in Catalonia

Antoni Trilla
Dean of the School of Medicine and Health Sciences. Universitat de Barcelona

Elías Campo
Director

Antoni Castells
Medical Director of Hospital Clínic de Barcelona

Roser Cortés
Director of Instituto de Investigaciones Biomédicas de Barcelona (IIBB-CSIC)

SECRETARY
Lluís Rovira
Director of CERCA

THE SCIENTIFIC ADVISORY BOARD

External leading scientists chosen by the Board of Governors, compose this board to advise IDIBAPS on all scientific issues. These leading scientists have in-depth knowledge of the Spanish, European and/or American R+D+I systems as they hold positions in prestigious research institutions.

CHAIRMAN
José María Mato
CIC bioGUNE, Bilbao

BOARD MEMBERS
Jesús Ávila
Centro de Biología Molecular Severo Ochoa (CBM), Madrid

Fernando Arenzana-Seisdedos
Institut Pasteur, Shangai, China

Amparo Cano
Instituto de Investigaciones Biomédicas "Alberto Sols", CSIC-UAM, Madrid

Francisco Fernández Avilés
Hospital Gregorio Marañón, Madrid

Ramon Gomis
IDIBAPS, Barcelona

José López Barneo
Instituto de Biomedicina de Sevilla (IBiS)

Carlos Macaya
Hospital Clínico San Carlos, Madrid

Óscar Marín
King's College London, UK

Federico Mayor
Centro de Biología Molecular Severo Ochoa, Madrid

Pura Muñoz
ICREA, Universitat Pompeu Fabra

Teresa Palomero
Columbia University

Angel Pellicer
NYU School of Medicine, New York, US

Francisco Sánchez-Madrid
Hospital La Princesa, Madrid

Eugenio Santos
Centro de Investigación del Cáncer (CIC), Salamanca

Antonio Vidal-Puig
Cambridge Phenomics Center, UK

THE STEERING COMMITTEE

It is responsible for the supervision of the progress achieved by the IDIBAPS research areas, the recruitment of new scientists within the framework of different research programmes, and the evaluation of IDIBAPS training programmes.

CHAIRMAN
Elías Campo
Director

MEMBERS
Neus Agell
Vice-Dean of School of Medicine and Health Sciences. Universitat de Barcelona
Signal transduction and cell cycle group leader

Cristina Fillat
Gene therapy and cancer group leader

Joan Carles García-Pagán
Research Deputy Director of Hospital Clínic de Barcelona
Hepatic hemodynamics and portal hypertension group leader

Josep Maria Llovet
Translational research in hepatic oncology group leader

Anna Planas
Coordinator of the IDIBAPS Research Area 4

Rosa Vilavella
General Manager

SECRETARY
Michela Bertero
Director of Strategy

THE INTERNAL ADVISORY COMMITTEE

IDIBAPS researchers representing all research areas advise the IDIBAPS director to implement the strategic decisions taken by the Board of Governors.

CHAIRMAN
Elías Campo
Director

STEERING COMMITTEE REPRESENTATIVES
Josep Maria Llovet
Translational research in hepatic oncology group leader

Joan Carles García-Pagán
Research Deputy Director of Hospital Clínic de Barcelona
Hepatic hemodynamics and portal hypertension group leader

Rosa Vilavella
General Manager

INSTITUTIONAL REPRESENTATIVES
Neus Agell
Vice-Dean of School of Medicine and Health Sciences. Universitat de Barcelona
Signal transduction and cell cycle group leader

Gisela Sugranyes
Physicians' Representatives of Hospital Clínic de Barcelona

Roser Cortés
Director of Instituto de investigaciones Biomédicas de Barcelona (IIBB-CSIC)

Guadalupe Mengod
Deputy Director of Instituto de Investigaciones Biomédicas de Barcelona (IIBB-CSIC)

AREA REPRESENTATIVES
AREA 1
Josep Maria Miró, Coordinator
Maria Cinta Cid, Representative

AREA 2
Ramón Farré, Coordinator
Joan Albert Barberà, Representative

AREA 3
Jordi Bruix, Coordinator
Francesc Balaguer, Representative

AREA 4
Anna Planas, Coordinator
Josep Dalmau, Representative

AREA 5
Dolors Colomer, Coordinator
Aleix Prat, Representative

GUEST MEMBERS
Montserrat Batlle
Works Committee President

Antoni Trilla
Dean of the School of Medicine and Health Sciences Universitat de Barcelona

Fàtima Crispi
Researcher of the Fetal and perinatal medicine group

Anna Novials
Pathogenesis and prevention of diabetes group leader

Carmen Peralta
Liver transplantation and graft viability group leader

Azucena Salas
Researcher of the Inflammatory bowel disease group

Antoni Sisó
CAPSBE Primary Care Research Coordinator

SECRETARY
Michela Bertero
Director of Strategy

OTHER COMMITTEES

The Drug Clinical Research Ethics Committee of the HCB
ceic@clinic.cat

The Animal Experimentation Ethics Committee of the UB
ceea@ccit.ub.edu

Biosafety Committee (CBS)
bioseguretat@idibaps.org

Mentoring Committee
coordinacio.cientifica@idibaps.org

Training Committee
stepping.stone@idibaps.org

Clinicians and Research Committee
direccio@idibaps.org

Ombuds Committee
ombudscommittee@idibaps.org

Works council
comite.empresa@idibaps.org
cefcrb@clinic.cat

FCRB BOARD OF GOVERNORS

Board of trustees

PRESIDENT
Joan Guàrdia
Dean of the Universitat de Barcelona

VICE-PRESIDENT
Josep M. Campistol
General Director of the Hospital Clínic de Barcelona

SECRETARY
Antoni Castells
Medical Director of the Hospital Clínic de Barcelona

Board members

Antoni Trilla
Dean of the School of Medicine and Health Sciences. Universitat de Barcelona

Josep Rodés
Research Director of the Hospital Clínic de Barcelona

Carles Ponsa
Independent member

Board of governors

PRESIDENT
Josep M. Campistol
General Director of the Hospital Clínic de Barcelona

Board members

Antoni Trilla
Dean of the School of Medicine and health Sciences. Universitat de Barcelona

Josep Rodés
Research Director of the Hospital Clínic de Barcelona

Elías Campo
Director

Antoni Castells
Medical Director of the Hospital Clínic de Barcelona

SECRETARY
Rosa Vilavella
General Manager

Research areas, teams and groups

AREA 1.
BIOLOGICAL AGRESSION AND RESPONSE MECHANISMS

1.1. Ocular inflammation clinical and experimental studies
1.2. Systemic autoimmune diseases
1.3. Systemic vasculitis
1.4. Molecular and cellular bases of inflammation. Structural and biological mass spectrometry
1.5. Immunogenetics and immunotherapy in autoinflammatory and immune responses
1.6. Immune receptors of the innate and adaptive system
1.7. AIDS and HIV infection
1.8. Endocarditis. Cardiovascular infections. Experimental model
1.9. Emergencies: processes and pathologies
1.10. Infections in solid-organ transplant recipients
1.11. Inflammatory joint diseases (IJDs)
1.12. Nosocomial infection

AREA 2.
RESPIRATORY, CARDIOVASCULAR AND RENAL PATHOBIOLOGY AND BIOENGINEERING

2.1. Inflammation and repair in respiratory diseases
2.2. Genetics and urological tumours
2.3. Physiopathological mechanisms of respiratory illnesses
2.4. Translational computing in cardiology
2.5. Translational research in pulmonary vascular diseases cell proliferation and apoptotic mechanisms in pulmonary arterial hypertension
2.6. Familial cardiomyopathies and sudden death syndrome
2.7. Nephro-urological diseases and kidney transplantation
2.8. Vascular cell biology
2.9. Cardiovascular risk nutrition and aging
2.10. Respiratory biophysics and bioengineering
2.11. Arrhythmias and physical activity
2.12. Atrial fibrillation biopathology and therapy
2.13. Breathing disturbances in sleep
2.14. Clinical and experimental respiratory immunoallergy
2.15. Translational research in post-transplant neoplasia
2.16. Atherosclerosis, coronary disease and heart failure
2.17. Cardiac imaging
2.18. Applied research in infectious respiratory diseases and critically ill patients

AREA 3.
LIVER, DIGESTIVE SYSTEM AND METABOLISM

3.1. Hepatic oncology (BCLC)
3.2. Translational colorectal cancer genomics
3.3. Gastrointestinal and pancreatic oncology
3.4. Genetic predisposition to gastrointestinal cancer
3.5. Neuronal control of metabolism (NeuCoMe)
3.6. Inflammation and liver disease
3.7. Angiogenesis in liver disease
3.8. Mitochondrial regulation of cell death and steatohepatitis
3.9. Gene therapy and cancer
3.10. Liver transplantation and graft viability
3.11. Viral toxic and metabolic hepatopathies
3.12. Regulation of liver microcirculation in cirrhosis and hepatic vascular diseases
3.13. Chronic liver diseases molecular mechanisms and clinical consequences
3.14. Liver vascular biology
3.15. Fetal and perinatal medicine
3.16. Metabolic bone disease
3.17. Endocrine disorders. Crosstalk between molecular, metabolic and therapeutic determinants
3.18. Translational research group in new therapeutic and diagnostic strategies in liver diseases
3.19. Gynecological endocrinology and human reproduction
3.20. Hepatocellular signaling and cancer
3.21. Translational research in diabetes lipids and obesity
3.22. Pathogenesis and prevention of diabetes
3.23. Cholestasis
3.24. Protective strategies against hepatic ischemia reperfusion injury
3.25. Inherited metabolic diseases
3.26. Inflammatory bowel disease
3.27. Liver cell plasticity and tissue repair
3.28. Pathogenesis and treatment of autoimmunity
3.29. Translational research in diabetes lipids and obesity

AREA 4.
CLINICAL AND EXPERIMENTAL NEUROSCIENCE

- **4.1.** Pathophysiology and treatment of neurodegenerative disorders
- **4.2.** Systems neuropharmacology
- **4.3.** Schizophrenia
- **4.4.** Child and adolescent psychiatry and psychology
- **4.5.** Brain ischemia clinical and experimental studies
- **4.6.** Theoretical neurobiology of cortical circuits
- **4.7.** Pathogenesis of autoimmune neuronal disorders
- **4.8.** Cortical circuit dynamics
- **4.9.** Neurophysiology
- **4.10.** Muscular research and mitochondrial function
- **4.11.** Clinical Neurophysiology
- **4.12.** Neurophysiology
- **4.13.** Advanced imaging in neuroimmunological diseases (ImaginEM)
- **4.14.** Clinical addictions
- **4.15.** Parkinson disease and other neurodegenerative movement disorders clinical and experimental research
- **4.16.** Molecular neuropharmacology
- **4.17.** Imaging of mood- and anxiety-related disorders (IMARD)
- **4.18.** Alzheimer's disease and other cognitive disorders
- **4.19.** Systems neuroscience
- **4.20.** Mechanisms of neurotoxicity and neurodegeneration
- **4.21.** Cellular neurobiology
- **4.22.** Multimodal neuroimaging in high risk and early psychosis
- **4.23.** Neurobiology
- **4.24.** Bipolar and depressive disorders

AREA 5.
ONCOLOGY AND HAEMATOLOGY

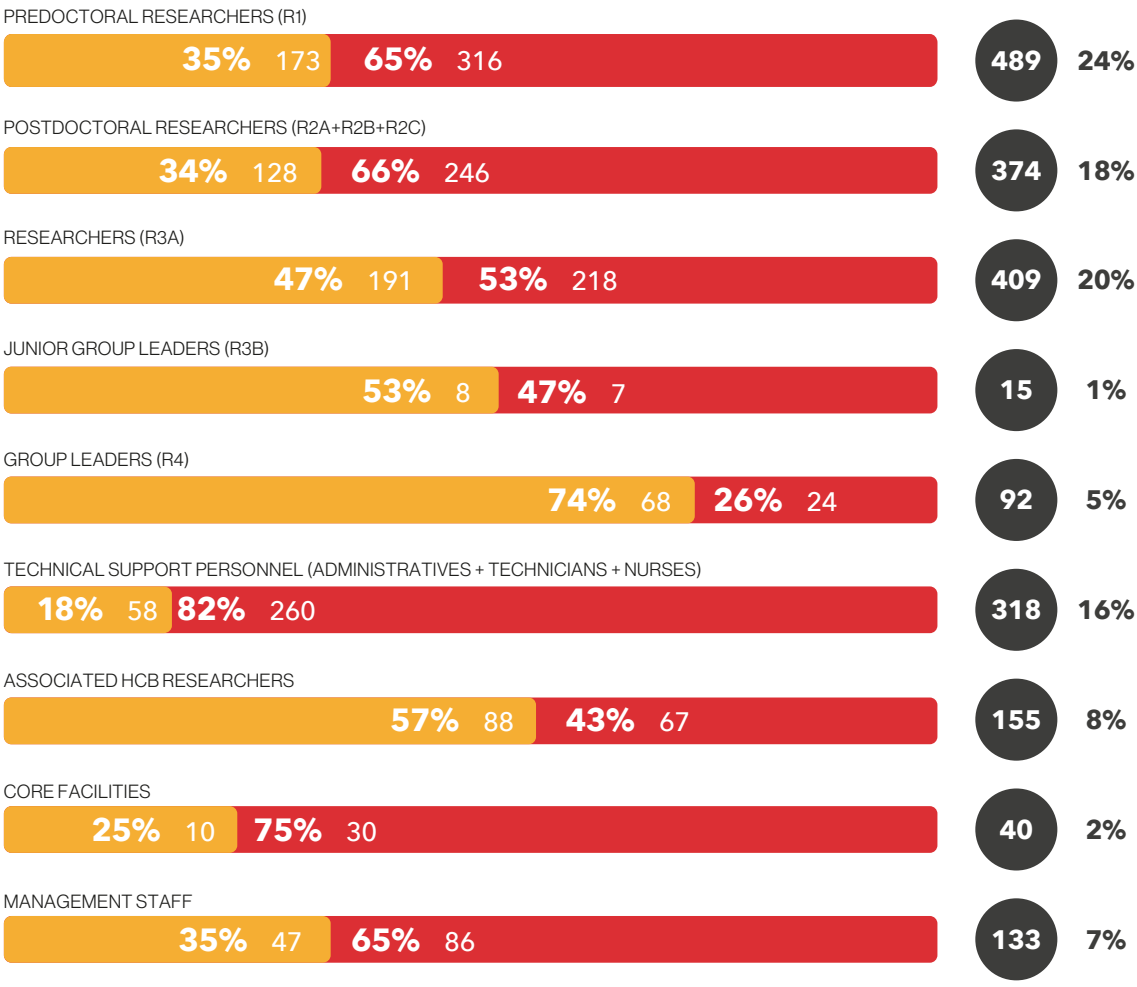
- **5.1.** Signal transduction and cell cycle
- **5.2.** Functional characterization of oncogenic mechanisms in lymphomagenesis
- **5.3.** Myeloma and other monoclonal gammopathies
- **5.4.** Molecular pathology of lymphoid neoplasmss
- **5.5.** Myeloid neoplasms
- **5.6.** Experimental therapies in lymphoid neoplasms
- **5.7.** Molecular pathology of inflammatory conditions and solid tumours
- **5.8.** Endocytosis and intracellular trafficking of proteins and colesterol
- **5.9.** Hemotherapy-hemostasis
- **5.10.** Mechanisms of progression in monoclonal gammopathies
- **5.11.** Lymphoid neoplasms
- **5.12.** Biomedical epigenomics
- **5.13.** Molecular biology of reproduction and development
- **5.14.** Microenvironment in lymphoma pathogenesis and therapy
- **5.15.** Lipid trafficking and disease
- **5.16.** Diagnosis and therapy in oncology
- **5.17.** Transcriptional regulation of gene expression
- **5.18.** Translational genomics and targeted therapies in solid tumours
- **5.19.** Melanoma imaging, genetics and immunology
- **5.20.** Molecular genetics of paediatric lymphomas
- **5.21.** Hematopoietic progenitor cell transplantation

TRANSVERSAL RESEARCH GROUPS

- **T.1.** Clinical pharmacology
- **T.2.** Primary healthcare transversal research group
- **T.3.** Research in nursing

Staff


771
38%
Men
TOTAL
2,025
Women
1,254
62%


PREDOCTORAL RESEARCHERS (R1)
35% 173
65% 316
489
24%
POSTDOCTORAL RESEARCHERS (R2A+R2B+R2C)
34% 128
66% 246
374
18%
RESEARCHERS (R3A)
47% 191
53% 218
409
20%
JUNIOR GROUP LEADERS (R3B)
53% 8
47% 7
15
1%
GROUP LEADERS (R4)
74% 68
26% 24
92
5%
TECHNICAL SUPPORT PERSONNEL (ADMINISTRATIVES + TECHNICIANS + NURSES)
18% 58
82% 260
318
16%
ASSOCIATED HCB RESEARCHERS
57% 88
43% 67
155
8%
CORE FACILITIES
25% 10
75% 30
40
2%
MANAGEMENT STAFF
35% 47
65% 86
133
7%

Recruitment and retention of talent programs

INSTITUCIÓ CATALANA DE RECERCA I ESTUDIS AVANÇATS (ICREA)

ICREA, the Catalan Institute for Research and Advanced Studies, is a foundation supported by the Catalan Government through the Catalan Ministry of Economy and Knowledge that aims to recruit top scientists for the Catalan R&D+I system. Currently IDIBAPS has 7 ICREA Research Professors and 2 ICREA Academy Professors:

Bart Bijnens
Translational computing in cardiology group leader

Josep Dalmau
Pathogenesis of autoimmune neuronal disorders group leader

Josep M. Llovet
Translational research in hepatic oncology group leader

José Ignacio Martín-Subero
Biomedical epigenomics group leader

Albert Pol
Lipid trafficking and disease group leader

Antonio Postigo
Transcriptional regulation of gene expression group leader

María Victoria Sánchez-Vives
Systems neuroscience group leader

Elías Campo (ICREA Academy)
Molecular pathology of lymphoid neoplasms group leader

Antoni Torres (ICREA Academy)
Applied research in infectious respiratory diseases and critically ill patients

IDIBAPS 80/20 PROGRAMME

With the final mission to strengthen translational clinical research, IDIBAPS launched this program in 2013. The 80/20 researchers are consolidated clinician scientists from Hospital Clinic and IDIBAPS with strategic research projects to develop. The beneficiaries of this program release 30 hours of their weekly care activities (80% of a full-time dedication) to dedicate them to research. It is a 3-year position extendable for 2 additional years prior positive evaluation.

Josep M. Miró
Endocarditis. Cardiovascular infections. Experimental model group

IDIBAPS 50/50 PROGRAMME

With the final mission to strengthen translational clinical research, IDIBAPS and Hospital Clínic de Barcelona started in 2012 this pioneering program designed to facilitate the combination of research and clinical activity. The 50/50 researchers are young medical staff specialists (MD) with a strong research career (PhD) built up, at least in part, in the most prestigious foreign research centers. These junior clinician scientists are called to be the future translational research group leaders that this institution will need.

Felicia Alexandra Hanzu
Endocrine disorders: crosstalk between molecular and metabolic determinants group leader

Ignacio Revuelta
Translational research in posttransplant neoplasia group leader

Isabel Blanco
Translational research in pulmonary vascular diseases: cell proliferation and apoptotic mechanisms in pulmonary arterial hypertension group leader

Gisela Sugranyes
Multimodal neuroimaging in high risk and early psychosis group leader

Carlos Fernández de Larrea
Mechanisms of progression in monoclonal gammopathies group leader

Eduard Guasch
Arrhythmias and physical activity group leader

Sara Llufriu
Advanced imaging in neuroimmunological diseases group leader

Georgina Espígol
Systemic vasculitis group

Rosa M. Muñoz
Clinical and experimental respiratory immunoallergy group

PHD4MD PROGRAMME

The health system requires an increasing number of clinician-scientists with a deep understanding of research and medicine to ensure that discoveries in fundamental research can reach clinical practice. The objective of the PhD4MD programme is to provide medical doctors with advanced hands-on training on the cutting-edge fields and technologies. Ultimately, the medical professionals enrolled in the program will obtain their PhD degree from one of the associated Universities.

Medical professionals who enrol in the PhD4MD programme carry out a project in translational research jointly coordinated by a basic and a clinical research investigators, belonging to one of the four participating institutions: the CRG (Centre for Genomic Regulation), the IRB Barcelona, the IDIBAPS and the VHIR (Vall d'Hebron Research Institute).

The PhD4MD programme was launched for the first time in 2015. During this year, 4 awardees of the programme have been working at IDIBAPS.

Irene López

PROJECT

Splicing factor mutations in hematological malignancies.

PRINCIPAL INVESTIGATORS

Dolors Colomer (IDIBAPS) and Juan Valcárcel (CRG)

Alexandra Pérez

PROJECT

Multiple system atrophy: synuclein regulation and biomarkers discovery.

PRINCIPAL INVESTIGATORS

M José Martí (IDIBAPS) and Gian Tartaglia (CRG)

Francisco Aya

PROJECT

Targeting of BRAF mutant mRNA alternative splicing in melanoma.

PRINCIPAL INVESTIGATORS

Ana Arance (IDIBAPS) and Juan Valcárcel (CRG)

Fernanda Inés Hernández

PROJECT

Cellular senescense in fibrosing interstitial lung diseases

PRINCIPAL INVESTIGATORS

Jacobo Sellarés (IDIBAPS) and Manuel Serrano (IRB)

BITRECS PROGRAMME

Bitrecs

Biomedicine international training research programme for excellent clinician-scientists

Obra Social Fundación "la Caixa"

WEB

www.bitrecs.idibaps.org

BITRECS, Biomedicine international training research programme for excellent clinician-scientists, aims to recruit excellent and highly motivated postdoctoral clinician-scientists to help them become clinician-scientist leaders in the future.

This project that started in 2017 has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 754550 and from "La Caixa" Foundation (ID 100010434), under the agreement LCF/PR/GN18/50310006.

BITRECS fellows perform their own research projects and focus on their training and career development guided by an IDIBAPS Principal investigator and, in some cases, also by one co-Principal investigator from another institution. They can follow an incoming scheme (36-month fellowship at IDIBAPS) or an outgoing scheme (12-18 month outgoing stay in other worldwide research institutions that has to be followed by a 18-24 month period at IDIBAPS).

Marco Antonio Alba

PROJECT

Development of a 3D model of granulomatous vasculitis: a research tool for investigating immunopathogenic mechanisms of granulomatosis with polyangiitis.

PRINCIPAL INVESTIGATOR/S

Maria Cinta Cid (IDIBAPS)

Helena Ariño

PROJECT

Phenotyping encephalitis through electronic health records (EHR): a computational approach.

PRINCIPAL INVESTIGATOR/S

Josep Dalmau (IDIBAPS)
Robert Stewart (King's College London, United Kingdom)

Lorna Leal

PROJECT

Preparedness for the implementation of preventive and therapeutic vaccine clinical trials: from a specialized immunology laboratory to the planning of clinical trial structures in Africa.

PRINCIPAL INVESTIGATOR/S

Felipe Garcia (IDIBAPS)
Sheena McComack (Imperial College of London and University College London, the United Kingdom)

Gianluigi Li Bassi

PROJECT

The Covid-19 Critical Care Consortium Observational Study and New frontiers in Acute Respiratory Distress Syndrome from Translational Pre-clinical Studies.

PRINCIPAL INVESTIGATOR/S

Antoni Torres (IDIBAPS)
John Fraser (The Prince Charles Hospital, Australia)

Luis Gerardo Rodríguez

PROJECT

BCMA and SLAMF3 (CD229) chimeric antigen receptor T-cell immunotherapy in multiple myeloma.

PRINCIPAL INVESTIGATOR/S

Carlos Ferández de Larrea (IDIBAPS)
Michael Hudecek (University of Würzburg, Germany)

Isabel Valli

PROJECT

Neurodevelopmental influences in youth at high risk for psychosis: a multimodal diagnostic and prognostic model integrating genetic, environmental and neuroimaging data.

PRINCIPAL INVESTIGATOR/S

Gisela Sugranyes (IDIBAPS)

Norma Verdolini

PROJECT

Prodromes and predictors of bipolar disorder: a longitudinal evaluation of patients presenting a first manic episode.

PRINCIPAL INVESTIGATOR/S

Eduard Vieta (IDIBAPS)

Research and innovation outputs

Scientific publications

Publication output and indicators.

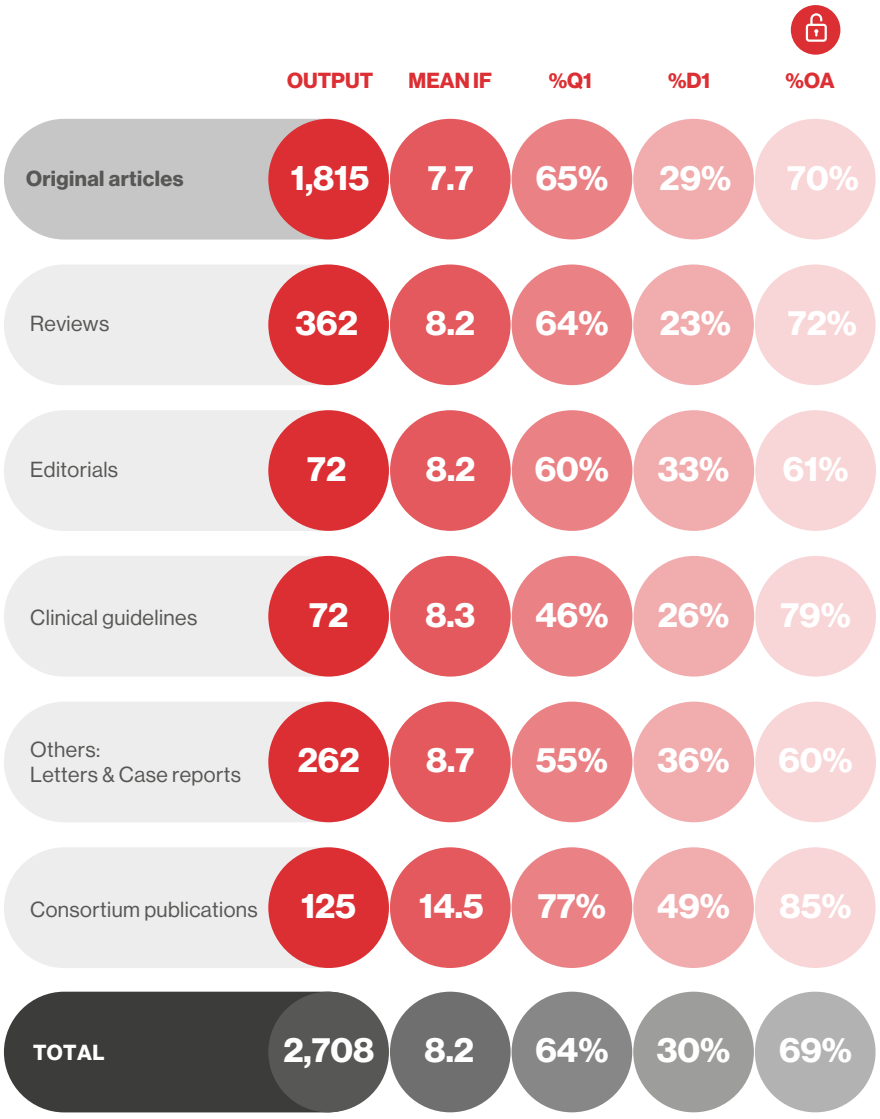


FIGURE LEGEND

Output
Total number of documents published in scholarly journals indexed in the ISI Web of Science.

Mean IF
Mean impact factor (2020 Journal Citation Reports).

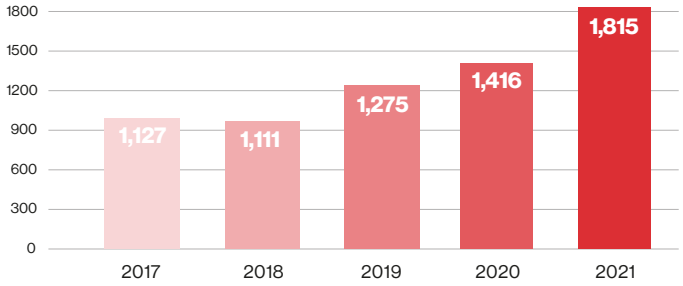
% Q1
% of publications published in journals ranked in the first quartile (top 25%) of their category as ordered by the 2020 Journal Citation Reports.

% D1
% of publications published in journals ranked in the first decile (top 10%) of their category as ordered by the 2020Journal Citation Reports.

% OA
% of publications in Open Access considering gold, green, hybrid and bronze route publications. Results have been obtained in September 2022 by means of the Unpaywall - Simple Query Tool.

Evolution of the total number of original articles (A) and the total number of original articles per area (B).

A) Number of original articles



B) Number of original articles per area

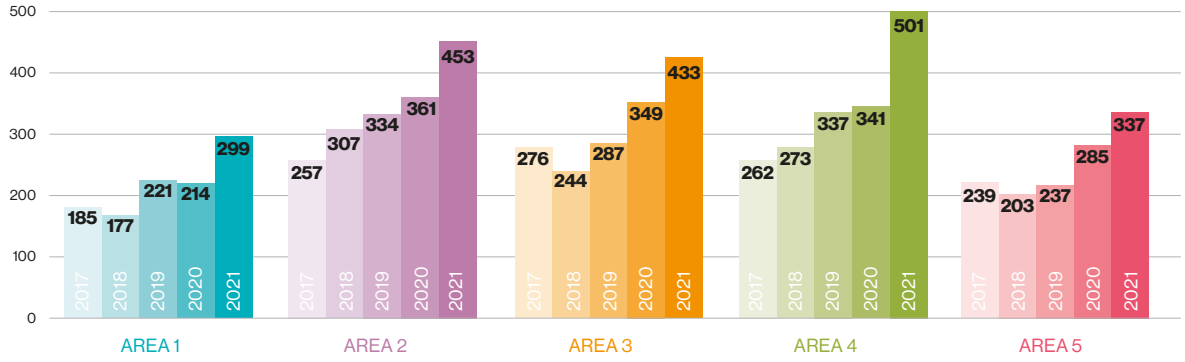
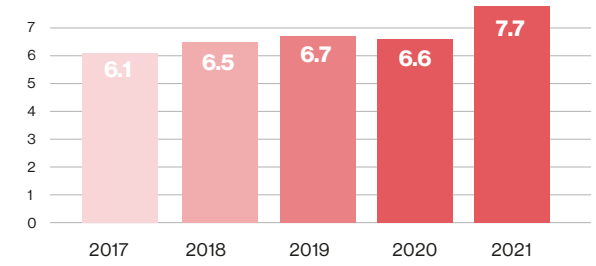


FIGURE LEGEND

Only original articles were taken into consideration. Publications resulting from collaboration between teams from different areas have been counted once for each area, so the sum of the articles per area is higher than the total.

Evolution of the mean IF (A) and % Q1 (B).

A) Mean IF



B) % Q1

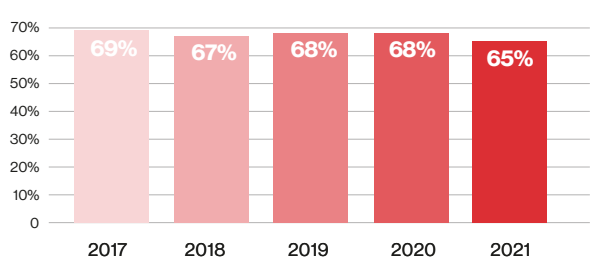


FIGURE LEGEND

Only original articles were taken into consideration. **%Q1**: % of publications published in journals ranked in the first quartile (top 25%) of their category as ordered by the 2020 Journal Citation Reports.

Featured publications

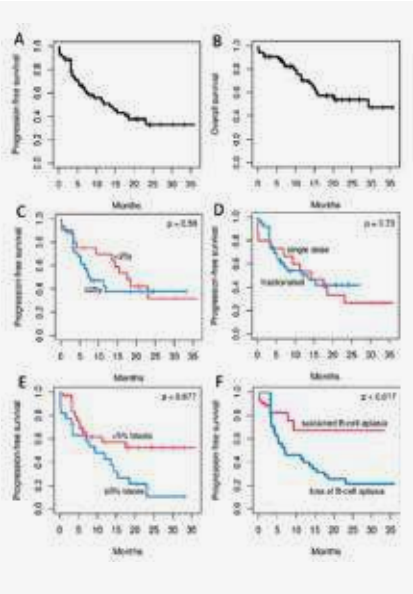
Below is a selection of the most notable publications leaded by IDIBAPS' researchers in 2021.

Factors associated with the clinical outcome of patients with relapsed/refractory CD19+ acute lymphoblastic leukemia treated with ARI-0001 CART19-cell therapy.

Ortiz-Maldonado V, Rives S, Español-Rego M, Alonso-Saladrigues A, Montoro M, Magnano L, Giné E, Pascal M, Díaz-Beyá M, ... , Fernández de Larrea C, Benitez-Ribas D, Trias E, Varea S, Calvo G, Esteve J, Urbano-Ispizua A, **Juan M*, Delgado J***.
J Immunother Cancer, 2021

The article analyzes 53 R/R Acute Lymphoblastic Leukemia patients treated with ARI0001 cells (CAR T-cells anti-CD19 developed in Hospital Clínic-IDIBAPS). Lower incidence and severity of main adverse events (AEs) were associated with fractionated administration of ARI0001, a unique feature of our product.

Cytokine Release Syndrome (CRS) was reported in 56.6% of patients (grade ≥3 only in 11.3%), while efficacy results were similar to other CART19 products: Complete (residual disease-negative) responses were 88.6% at day +28 and 79.2% at day +100, with 50.9% PFS at 1-year and 53.9% OS at 2-y.



Infective Endocarditis in Patients on Chronic Hemodialysis.

Pericàs JM, Llopis J, Jiménez-Exposito MJ, Kourany WM, Almirante B, Carosi G, Durante-Mangoni E, Fortes CQ, Giannitsioti E, Lerakis S, Montagna-Mella R, Ambrosioni J, Tan RS, Mestres CA, Wray D, Pachirat O, Moreno A, Chu VH, de Lazzari E, Fowler VG Jr, **Miró JM**; ICE Investigators.
J Am Coll Cardiol, 2021

The article by Pericàs et al was published in JACC, one of the world's leading journals on cardiovascular medicine, with an accompanying editorial by Dr Sodha. Using data from the International Collaboration on Endocarditis encompassing 7715 infective endocarditis (IE) episodes from 28 countries of which 553 in patients undergoing HD, this study is the most comprehensive picture of IE in this subpopulation as of to date. Remarkably, both the prevalence of IE amongst HD patients and its associated mortality were higher than that described in the prior literature.

In addition, the study confirmed that enterococci are emergent chief causative agents in HD patients. Charlson comorbidity score, emboli, persistent bacteremia, and acute onset heart failure were identified as risk factors for mortality. Finally, this article was used for continuing medical education (CME) in Cardiology.

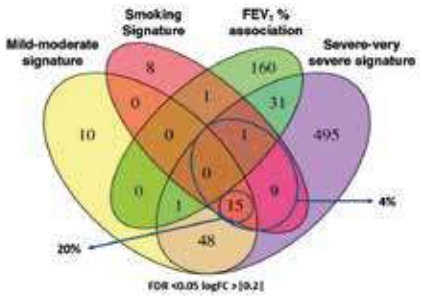


Lung DNA Methylation in Chronic Obstructive Pulmonary Disease: Relationship with Smoking Status and Airflow Limitation Severity.

Casas-Recasens S, Noell G, Mendoza N, Lopez-Giraldo A, Garcia T, Guirao A, Agusti A, **Faner R**.
Am J Respir Crit Care Med, 2021

Chronic obstructive pulmonary disease (COPD) is a major public health problem because of its high prevalence and associated morbi-mortality. We investigated for the first time, the relationship between severity of the disease and methylation and transcriptomic changes in lung tissue of 189 COPD patients.

Results showed that: patients with mild-moderate disease present a larger number of smoking-associated differential methylation positions (DMPs) than patients with severe-very severe disease, that in turn present more DMPs. Some of these DMPs translate into specific gene-expression changes.



10-Year Follow-Up of Patients With Everolimus-Eluting Versus Bare-Metal Stents After ST-Segment Elevation Myocardial Infarction.

Brugaletta S, Gomez-Lara J, Ortega-Paz L, Jimenez-Diaz V, Jimenez M, Jiménez-Quevedo P, Diletti R, Mainar V, ... , Biscaglia S, Rodriguez-Arias JJ, Al-Shaibani S, Arevalos V, Romaguera R, Gomez-Hospital JA, Serruys PW, **Sabaté M**.
J Am Coll Cardiol, 2021

This study reports 10-year follow-up of acute myocardial infarction patients who required emergent stent implantation. The study concluded that use of everolimus-eluting stents was associated with a reduction in cardiovascular events compared to bare metal stents.

This benefit was built during the first 5 years with significant reduction in thrombosis and restenosis, with no further divergence between 5 and 10 years. The results of this trial are included in current Clinical Practice Guidelines and lay foundation for future evaluation of treatments in myocardial infarction patients.

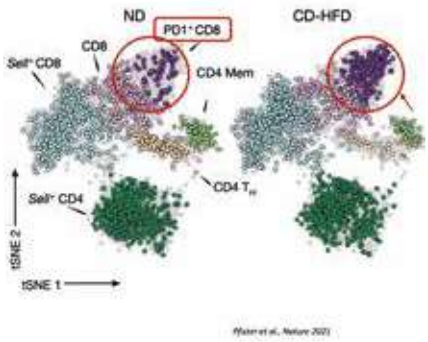


NASH limits anti-tumour surveillance in immunotherapy-treated HCC.

Pfister D, Gonzalo Núñez N, Pinyol R, Govaere O, Pinter M, Szydlowska M, Gupta R, Qiu M, ... , Macek Jilkova Z, Claassen M, Anstee QM, Amit I, Knolle P, Becher P, **Llovet JM***, Heikenwalder M*.
Nature, 2021

Hepatocellular carcinoma (HCC) is the 4th leading cause of cancer-related death and its incidence related to non-alcoholic steatohepatitis (NASH) is on the rise. Immunotherapy (atezolizumab plus bevacizumab) is the standard of care for advanced HCC.

We identified a dysfunctional resident T cells (activated CD8+PD1+CxCR6 T cells) as a primary mechanism of resistance to immunotherapies in murine models of NASH-HCC and in human NASH. Through a meta-analysis of 3 RCT we showed that immunotherapies are more effective in viral-related HCC compared to non-viral (ie NASH/alcohol) etiologies.



Effects of Mediterranean Diet or Mindfulness-Based Stress Reduction on Prevention of Small for-Gestational Age Birth Weights in Newborns Born to At-Risk Pregnant Individuals The IMPACT BCN Randomized Clinical Trial.

Crovetto F, Crispi F, Casas R, Martín-Asuero A, Borràs R, Vieta E, Estruch R, **Gratacós E**; for the IMPACT BCN Trial Investigators.
JAMA, 2021

Being born small for gestational age (SGA) is a leading cause of morbidity and mortality. There is currently no prevention or therapy for SGA. This randomized trial (n=1221) in high-risk pregnancies provides first evidence that structured lifestyle interventions based on Mediterranean Diet or Mindfulness-Based Stress Reduction programs reduced SGA and other adverse pregnancy outcomes by ~30-35%.

The findings open research and clinical opportunities for traditionally not contemplated strategies based on lifestyle to reduce adverse pregnancy outcomes.

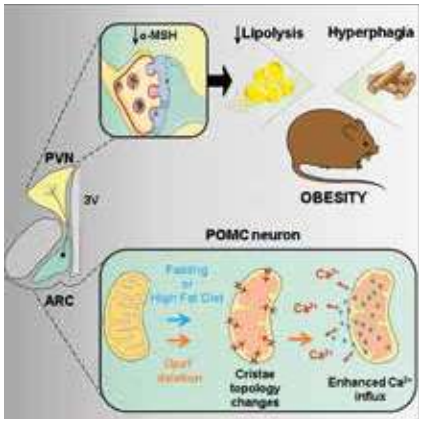


Mitochondrial cristae-remodeling protein OPA1 in POMC neurons couples Ca2+ homeostasis with adipose tissue lipolysis.

Gómez-Valadés AG, Pozo M, Varela L, Boutagouga Boudjadja M, Ramirez S, Chivite I, Eyre E, Haddad-Tóvolli R, Obri A, ... , Alonso MT, Gomis R, Zorzano A, D'Agostino G, Alvarez CV, Nogueiras R, Garcia-Roves PM, Horvath TL, **Claret M**.
Cell Metab, 2021

This study demonstrates that mitochondrial cristae morphology, and the expression of the principal cristae-shaping player Opa1, in POMC neurons, is influenced by energy availability. Defective expression of OPA1 in POMC neurons leads to excessive mitochondrial Ca2+ influx, resulting in impaired melanocortinergic tone thus causing hyperphagia, attenuated sympathetic fasting-induced lipolysis and obesity.

Our results unveiled a novel axis connecting OPA1 in POMC neurons with mitochondrial cristae, Ca2+ homeostasis, and WAT lipolysis in the regulation of energy balance.

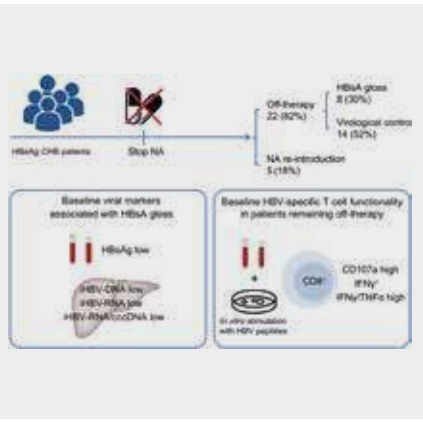


Viral and immune factors associated with successful treatment withdrawal in HBeAg-negative chronic hepatitis B patients.

García-López M, Lens S, Pallett LJ, Testoni B, Rodríguez-Tajes S, Mariño Z, Bartres C, García-Pras E, Leonel T, Perpiñán E, Lozano JJ, Rodríguez-Frías F, Koutsoudakis G, Zoulim F, Maini MK, **Forns X**, **Pérez-Del-Pulgar S**.
J Hepatol, 2021

Antiviral therapy with nucleos(t)ide analogs can be discontinued in some patients with chronic hepatitis B (CHB) without cirrhosis (EASL guidelines 2017). We have shown that decreased cccDNA transcription and low HBsAg levels are associated with functional cure (HBsAg loss) upon therapy discontinuation in HBeAg-negative CHB patients.

In this setting, the strength of HBV-specific T cell responses may contribute to successful viral control. Our comprehensive study provides, for the first time, in-depth data on viral and immune factors than can help guide individualized therapy in CHB patients.

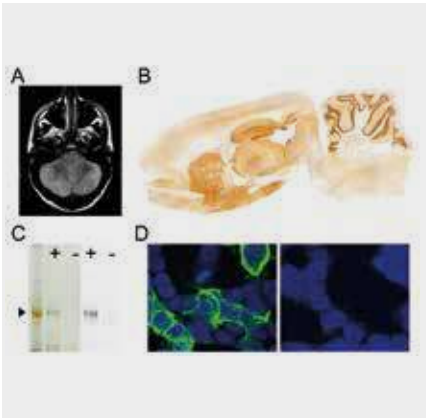


Encephalitis with Autoantibodies against the Glutamate Kainate Receptors GluK2.

Landa J, Guasp M, Míguez-Cabello F, Guimaraes J, Mishima T, Oda F, Zipp F, Krajinovic V, Fuhr P, Honnorat J, Titulaer M, Simabukuro M, Planagumà J, Martínez-Hernandez E, Armangué T, Saiz A, Gasull X, Soto D, Graus F, Sabater L, **Dalmau J**.
Ann Neurol, 2021

Our study describes a novel autoimmune encephalitis mediated by autoantibodies against the GluK2 subunit of the kainate receptors. Patients develop prominent cerebellar symptoms that if promptly diagnosed are treatable with immunotherapy.

The autoantibodies cause a transient decrease of the GluK2 subunit of the kainate receptors in neurons along with a reduction of GluK2-mediated currents. The study represents the discovery of a novel autoimmune synaptopathy.

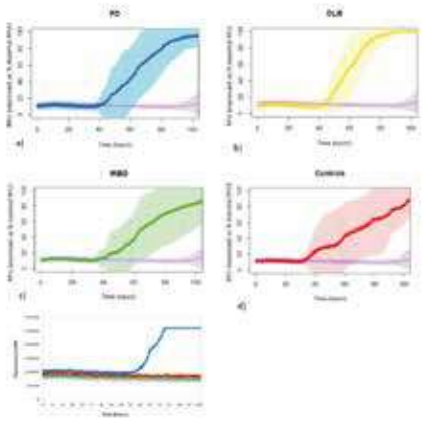


Detection of α-synuclein in CSF by RT-QuIC in patients with isolated rapid-eye-movement sleep behaviour disorder: a longitudinal observational study.

Iranzo A, Fairfoul G, Ayudhaya ACN, Serradell M, Gelpi E, Vilaseca I, Sánchez-Valle R, Gaig C, Santamaria J, Tolosa E, Riha RL, Green AJE.
Lancet Neurol, 2021

We found that the RT-QuIC assay had a sensitivity of 90% and a specificity of 90% for detecting α-synuclein in the cerebrospinal fluid (CSF) of REM sleep behavior disorder patients. Patients who had positivity for synuclein in the CSF had a higher risk of developing a synucleinopathy than patients who had α-synuclein negativity.

We concluded that detection of synuclein by RT-QuIC in CSF represents a prodromal marker of Parkinson disease and dementia with Lewy bodies. This finding will serve to select patients with RBD at neuroprotective trials to eliminate synuclein.

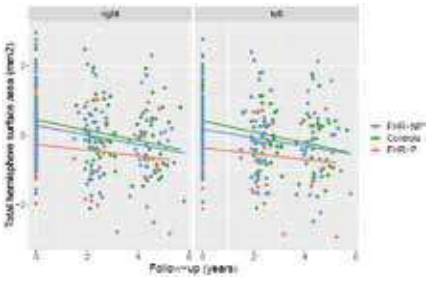


Brain structural trajectories in youth at familial risk for schizophrenia or bipolar disorder according to development of psychosis spectrum symptoms.

Sugranyes G, de la Serna E, Ilzarbe D, Pariente JC, Borras R, Romero S, Rosa M, Baeza I, Moreno MD, Bernardo M, Vieta E, Castro-Fornieles J.
J Child Psychol Psychiatry, 2021

In this sample we found that youth with familial high risk for schizophrenia or bipolar disorder who developed psychotic symptoms over a 4 year follow-up period experienced greater thinning of their frontal and occipital cortices over time than those who did not.

At baseline, they also exhibited smaller cortical surface area in the temporal and parietal cortices. This opens the possibility that brain scans obtained using magnetic resonance imaging can help predict clinical course at an early age in children and adolescents at increased risk for psychiatric disease.

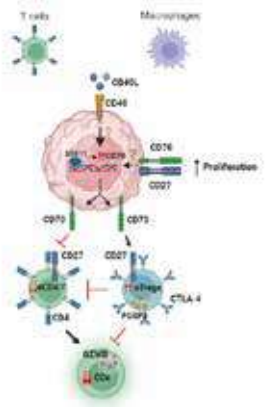


SOX11, CD70, and Treg cells configure the tumor-immune microenvironment of aggressive mantle cell lymphoma.

Balsas P, Veloza L, Clot G, Sureda-Gómez M, Rodríguez ML, Masaoutis C, Frigola G, Navarro A, Beà S, Nadeu F, Giné E, López-Guillermo A, Martínez A, Ribera-Cortada I, Engel P, Quintanilla-Martínez L, Klapper W, Campo E, **Amador V**.
Blood, 2021

SOX11 oncogenic expression contributes to the aggressiveness of Mantle cell lymphoma (MCL) by different mechanisms. In this paper, we demonstrated that SOX11 expression in MCL is associated with an immunosuppressive microenvironment characterized by CD70 overexpression in tumor cells.

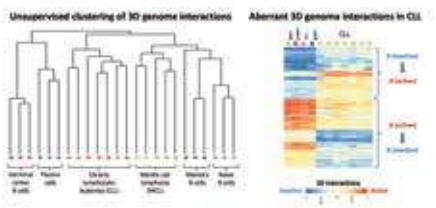
CD70 overexpression significantly associated with a higher regulatory T-cells (Treg) intratumor infiltration, tumor proliferation, aggressive clinical behavior, and worse outcome. Together, our results suggest that CD70/Treg axis represents a novel target for immunotherapy strategies in patients with MCL.



Dynamics of genome architecture and chromatin function during human B cell differentiation and neoplastic transformation.

Vilarrasa-Blasi R, Soler-Vila P, Verdaguer-Dot N, Russiñol N, Di Stefano M, Chapaprieta V, Clot G, Farabella I, Cuscó P, Kulis M, Agirre X, Prosper F, Beekman R, Beà S, Colomer D, Stunnenberg HG, Gut I, Campo E, Marti-Renom MA*, **Martin-Subero JI***.
Nat Commun, 2021

In this study, we investigated the 3D genome architecture during normal B cell differentiation and in two different mature B-cell neoplasms. By integrating 3D genome interactions with other epigenomic marks, this study revealed: **i)** the presence of a novel intermediate or transitional 3D structure characterized by polycomb-repressed chromatin, **ii)** that the 3D genome structure is highly dynamic during normal B cell maturation, and **iii)** that B cell neoplasms show extensive tumor-specific 3D genome changes, including large chromatin blocks spanning key disease-specific genes.

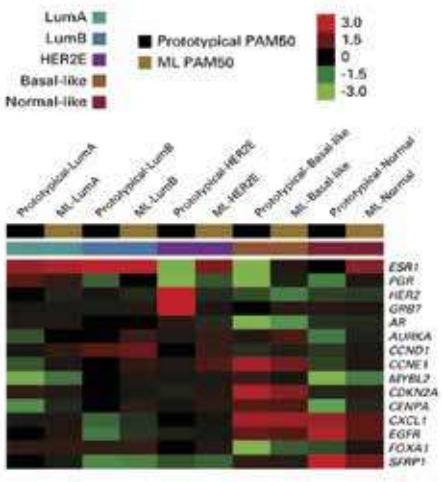


Correlative Biomarker Analysis of Intrinsic Subtypes and Efficacy Across the MONALEESA Phase III Studies.

Prat A, Chaudhury A, Solovieff N, Paré L, Martinez D, Chic N, Martínez-Sáez O, Brasó-Maristany F, Lteif A, Taran T, Babbar N, Su F.
J Clin Oncol, 2021

Hormone receptor-positive (HR+)/HER2-negative (HER2-) breast cancer is a clinically and molecularly heterogeneous. Here we demonstrated that the intrinsic molecular subtypes (luminal A and B, HER2-enriched, and basal-like) are strongly associated with progression-free survival in patients with HR+/HER2- advanced breast cancer treated with endocrine-based therapy.

In addition, a consistent benefit with ribociclib was observed across all subtypes, except for basal-like. Our results highlight the importance of tissue sample collection in the setting of large randomized trials.



Experiences of nursing students as Healthcare Aid during the Covid-19 pandemic in Spain.

Casafont C, Fabrellas N, Rivera P, Olivé-Ferrer MC, Querol E, Venturas M, Prats J, Cuzco C, Frías CE, Pérez-Ortega S, **Zabalegui A**.
Nurse Educ Today, 2021

The aim of this study was to explore the experience of nursing students' roles as healthcare aid in responding to the COVID-19 crisis. A qualitative phenomenology design was used.

Seven main themes emerged: Learning, ambivalent emotions and adaptation were classified at a personal level; teamwork, patient communication, and unclear care processes were categorized under hospital structure; and coping mechanisms were part of external factors. Orientation, follow-up, and emotional support in crisis situations are key to unexperienced healthcare workers overcoming stressful emotions.



Translation of knowledge and innovation

IDIBAPS–FCRB researchers have a final goal to benefit our society by getting new innovative products and services to market that without industrial partners would be unable to find the resources to reach the patients. Several collaboration agreements are signed every year between our scientists and Industry partners.

In this sense, several activities are a good proxy to analyse the translation of our research to the society: clinical guidelines, clinical trials and technology transfer agreements, including license agreements and creation of spin-offs.

CLINICAL GUIDELINES

Every year our researchers participate in the elaboration of international clinical guides that have a remarkable impact in patients' care and medical practice.

TOTAL NUMBER **72**

63% % International

19% % Leaded*

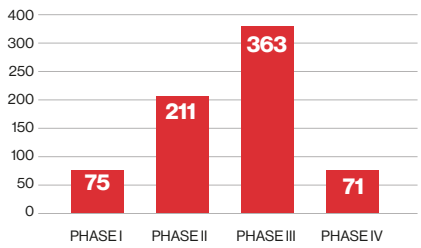
*Leaded: the 1rst, last or corresponding author is an IDIBAPS researcher.

CLINICAL TRIALS

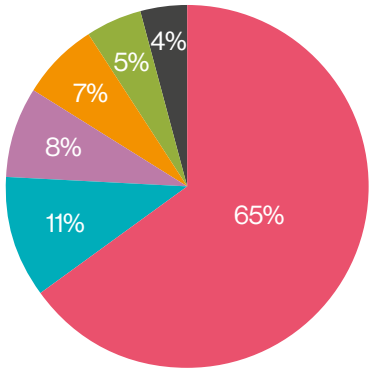
The IDIBAPS–FCRB Clinical Trials Unit constitutes the ideal setting for completing a number of the crucial steps in the development of new medical products. Basic biomedical research and applied clinical research, together with specialized healthcare practice, are aspects of IDIBAPS–FCRB that may be very useful for the development of drugs.

The figures below summarize the number of active clinical trials in 2021.
238 new clinical trials were opened an overall, there were 720 active clinical trials. Most of these clinical trials correspond to phase III (50,4%).

Active clinical trials by phase in 2021:



Trials performed by scientific areas.

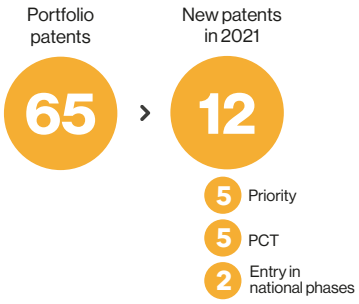


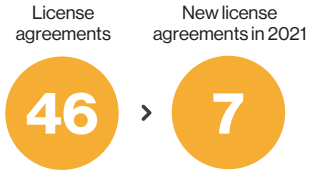
- AREA 1 Biological aggression and response mechanisms
- AREA 2 Respiratory, cardiovascular and renal pathobiology and bioengineering
- AREA 3 Liver, digestive system and metabolism
- AREA 4 Clinical and experimental neuroscience
- AREA 5 Oncology and haematology
- OTHERS

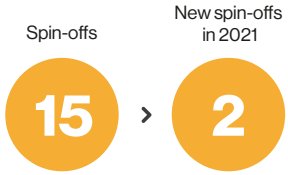
PATENTS AND LICENSE AGREEMENTS

The IDIBAPS-FCRB currently manages 65 patent families and 11 proprietary software. Besides, 46 license agreements that have been signed with several industry partners are currently active.

During 2021, 12 new patent applications were filed: 5 priority patents, 5 PCTs, and 2 patent entered into National Phases in several countries. Besides, 7 new license agreements were signed with national and international companies.







PORTFOLIO OF SPIN-OFFS

The activity of researchers gave rise to 2 new companies based on the knowledge from IDIBAPS – FRCB: Health Circuit, project led by Dr. Isaac Cano and Athena Tech, led by Dr. Josep Malvehy.

IDIBAPS researchers have founded **19** spin-offs since 2008, **15** of which are active companies that together employ more than 50 people. Below there is a list of all these spin-offs.

Spin-offs from IDIBAPS researchers where IDIBAPS or FCRB participate as shareholders:

OWL METABOLOMICS (2008)
http://www.owlmetabolomics.com/
Dr. Joan Caballeria

OWL is a biotechnology company in the field of Metabolomics with pioneering diagnostics products and unique R&D services for the scientific community. The OWLiver Test is the first in vitro test for determining steatosis and NASH.

VIRTUAL BODYWORKS (2015)
https://virtualbodyworks.com/
Dr. Maria Victoria Sanchez-Vives

Virtual Bodyworks is changing the the future of social, medical and psychological rehabilitation. They are developing several tools such as: i-Cortex (a tool that facilitates the neurological and physical rehabilitation of individuals who have experienced a wide range of traumas ranging from chronic pain management to stroke) and VRespect.Me (a powerful virtual reality experience designed to rehabilitate men with a history of domestic violence, the only scientifically proven product of its kind in the market).

ESTIMTRACK (2016)
http://www.estimtrack.com/
Dr. Jaume Balust

Estimtrack provides an intelligent set of tools to schedule, track and orchestrate all involved personnel in surgical procedures and operating rooms based on Machine Learning (ML), which improves the efficiency of operating room tracks in healthcare organizations by 31%.

BARCELONA LIVER BIOSERVICES (2017)
http://liver.barcelona/
Dr. Jordi Gracia-Sancho

BLB is a contract research organization that offers cutting-edge research services and consultancy in the field of liver diseases. Its first product ExoLiver, allows co-culture of healthy or diseased hepatic cells, unravels key biological data obtained in a human-like system, therefore representing the ultimate pre-clinical step in any development pipeline.

BIOMARKERS CLINICAL DIAGNOSIS AND APPLICATIONS (2018)
Dr. Rafael Molina

The aim of this company is the development of tumour markers for clinical application through the creation of computer algorithms for the evaluation and detection of cancer.

AIS CHANNEL (2019)
https://aischannel.com/about-ais-channel/
Dr. Antonio M. Lacy

AIS Channel is an online platform that provides a new approach to the communication of advances in cutting-edge surgical expertise, provided by leading surgeons.

IWENDO SOLUTIONS (2019)
https://www.miwendo.com/
Dr. Glòria Fernàndez- Esparrach

MiWEndo Solutions SL is a low-cost and safe (non-ionizing) electromagnetic device designed to be attached at the tip of a conventional colonoscope. MiWEndo automatizes polyp detection emitting an alarm when a polyp is sensed, increases the field of view to 360º and provides quantitative differentiation between malignant and benign polyps without changing the current clinical practice.

PREDICTHEON (2019)
Dr. Pedro Gambús
http://www.linkedin.com/company/predictheon/about/

Predictheon SL develops mathematical models, based on artificial intelligence, to optimize the monitoring systems for patients undergoing sedation or general anesthesia processes, anticipating side effects and therefore increasing the safety of the patient subjected to these processes.

SURG SOLUTIONS (2019)
https://www.vessconnect.com/
Dr. Joan Fontdevila and Dr. Jordi Descarrega

Surg Solution SL develops innovative devices and solutions in the field of vascular and microvascular anastomosis. Its first product, VessConnect, simplifies vascular anastomosis, especially in microvascular procedures providing an easier, faster and safer way to perform these procedures using the memory-shape properties of some advanced materials.

CREATSENS, S.L, (2020)
Dr. Josep Mª Campistol

Technology healthcare platform for the personalized management of chronic renal failure.

GYALA THERAPEUTICS, S.L (2020)
Dr. Manel Juan

The aim of this company is the development of new CAR-T therapies for the treatment of hematological malignancies.

REVEAL GENOMICS, S.L (2020)
https://www.reveal-genomics.com
Dr. Aleix Prat

The aim of this company is the development of diagnostic tools based on complex genomic data for patients with advanced breast cancer.

PSICOTERAPIA VR, S.L (2020)
Dr. Oscar García-Algar
https://mentalxr.com/

The aim of this company is the development of artificial intelligence tools for the diagnosis and treatment of neurocognitive disorders using virtual reality.

Spin-offs from IDIBAPS researchers where IDIBAPS or FCRB do not participate as shareholders:

TRANSMURAL BIOTECH (2009)
www.transmuralbiotech.com
Dr. Eduard Gratacós

Transmural Biotech is developing innovative products and services in the perinatal field by applying image analysis technologies that facilitate a better diagnosis in a non-invasive way and representing a saving for the health system.

AELIX THERAPEUTICS (2015)
www.aelixtherapeutics.com
Dr. Josep M. Gatell

AELIX Therapeutics is a clinical stage biotechnology company focused on the development of a therapeutic HIV vaccine to be used in cure/eradication strategies. The HIV Vaccine program is based on an innovative T cell vaccine immunogen design that directs the body's immune defence to the most vulnerable parts of HIV.

FREEOX BIOTECH (2017)
www.freeoxbiotech.com
Dr. Ángel Chamorro

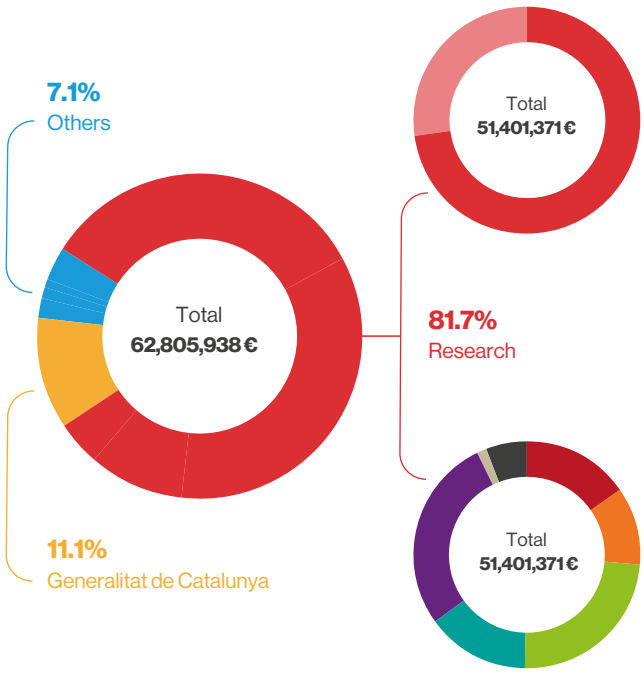
Freeox Biotech is an innovative company born to discover and develop medicines addressed to reduce the effects of the oxidative stress in the organism, and especially those related to the neurological and cardiovascular system. The company is focused mainly in Stroke, a condition characterized by the interruption of blood flow to the brain which is a leading cause of death and disability worldwide.

Funding

From a financial and managerial perspective, IDIBAPS and FCRB are managed in a global and consolidated manner.

Funding sources

1	Competitive funding	20,918,034 €	33.3%
2	Private funding	21,700,472 €	34.5%
3	Donations	5,990,516 €	9.5%
4	Knowledge dissemination	2,792,348 €	4.4%
5	Generalitat de Catalunya	7,003,179 €	11.1%
6	Core facilities	1,139,117 €	1.8%
7	Rental income	783,026 €	1.2%
8	Intercompany services	420,809 €	0.7%
9	Financial income	11,752 €	0.1%
10	Capital grant	2,046,683 €	3.3%
	Total	**62,805,938 €**	



Executed funds by source

National	37,502,695 €	73%
International	13,898,677 €	27%

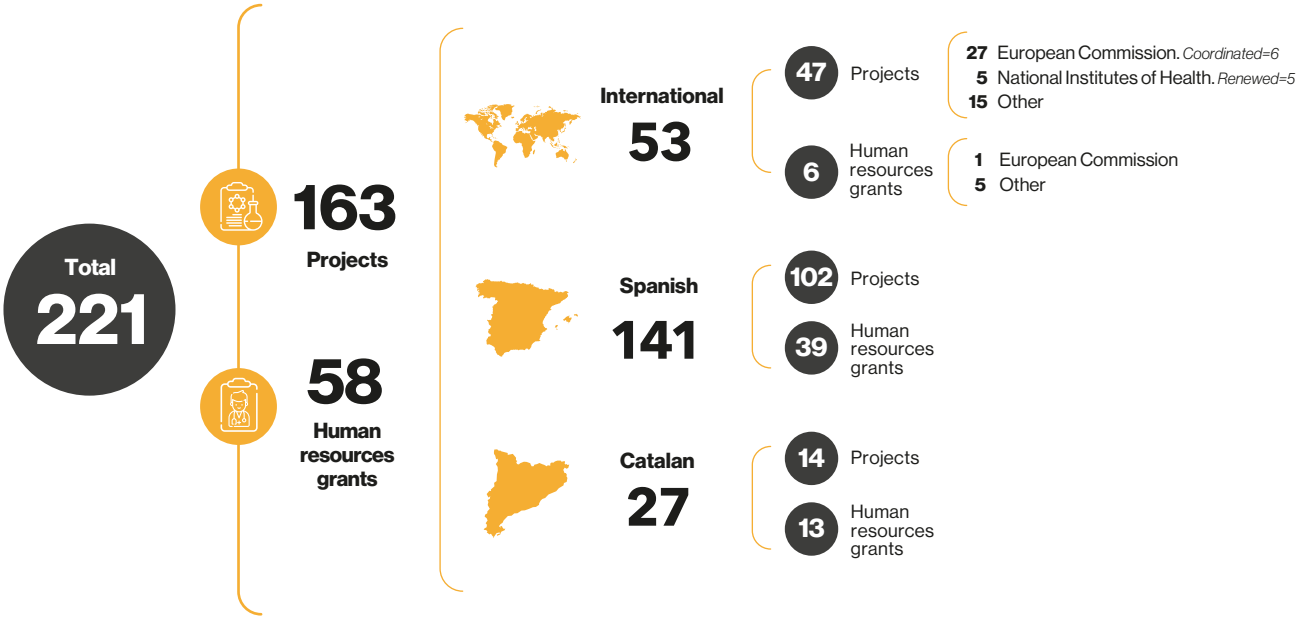
Executed funds by research area

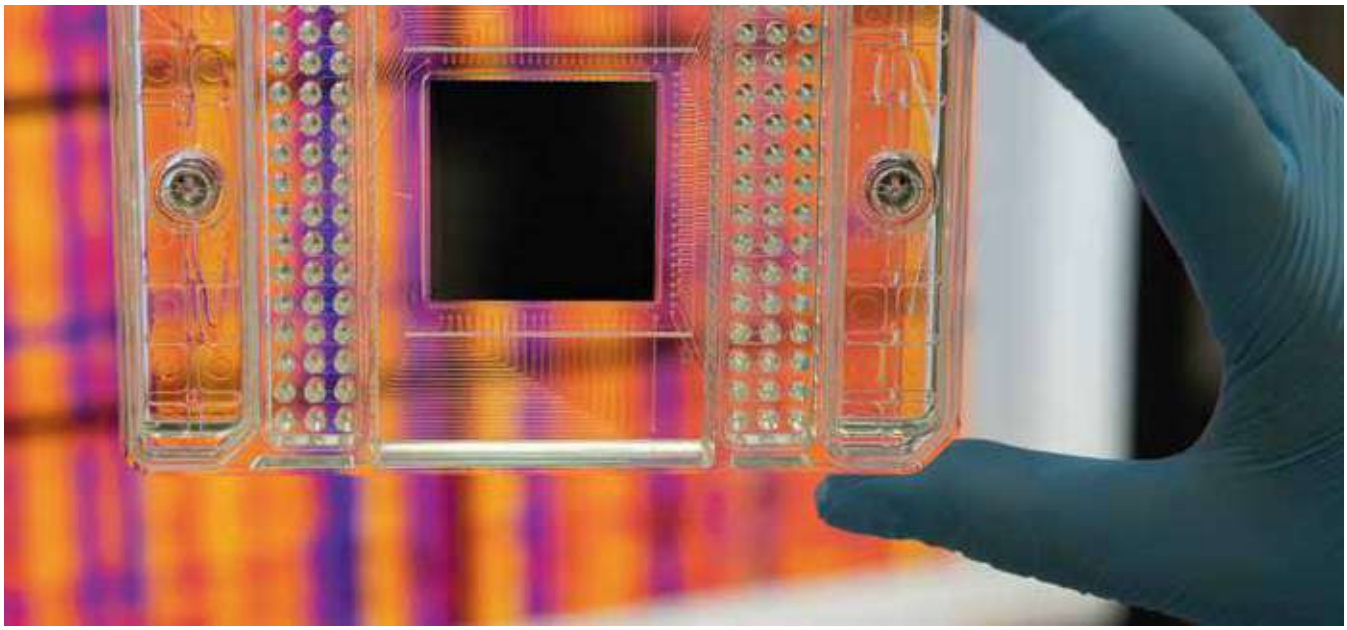
Area 1	7,923,897 €	15.4%
Area 2	5,674,465 €	11%
Area 3	12,349,561 €	24%
Area 4	7,538,115 €	14.6%
Area 5	14,339,910 €	28%
Transversal	598,352 €	1.2%
Other research	2,977,071 €	5.8%

New competitive projects

Staff of IDIBAPS research groups and other members of the Clínic Campus have actively participated in different International, Spanish and Catalan competitive calls.

As a result, 221 competitive projects have been granted to IDIBAPS – FCRB in 2021.





The following table classifies the **221** new competitive projects being granted in the Clínic Campus per funding agency.

The funding institutions listed below are grouped in two sections, public and private:

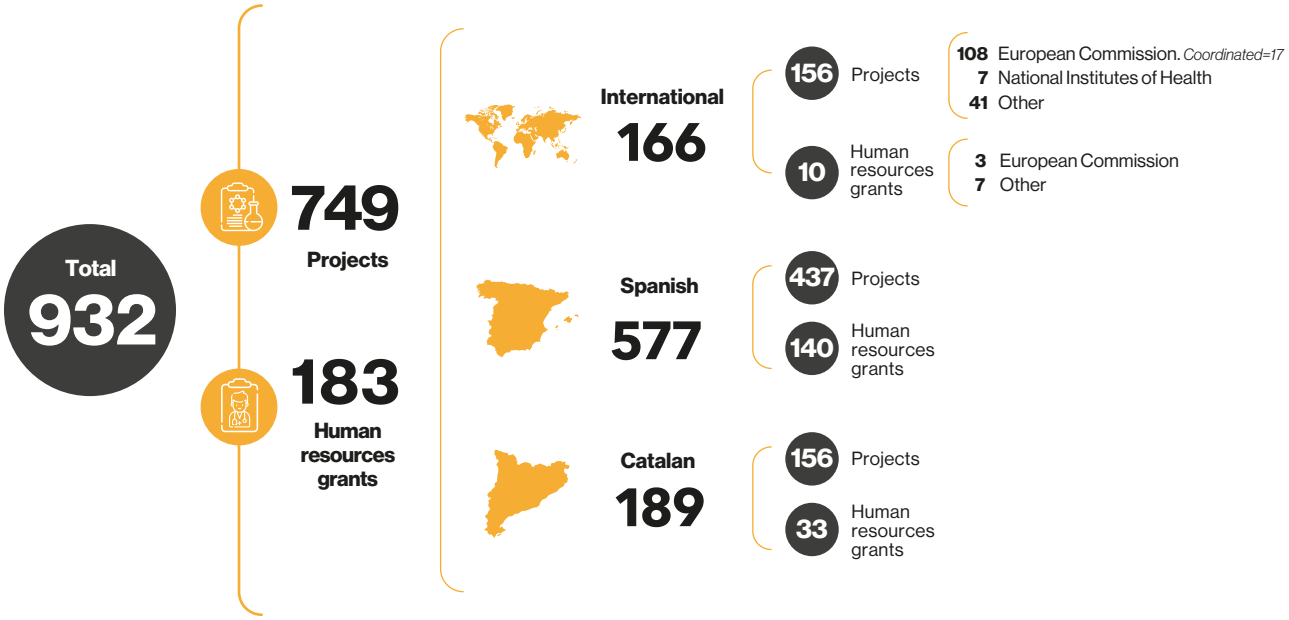
COMPETITIVE PUBLIC FUNDING	NUMBER OF PROJECTS
TOTAL	**157**
Catalan institutions	**17**
Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR)	8
Ajuntament de Barcelona	1
Generalitat de Catalunya	8
Spanish institutions	**107**
Agencia Estatal de Investigación (AEI)	16
Instituto de Salud Carlos III (ISCIII)	89
Ministerio de Universidades	1
Ministerio de Sanidad, Consumo y Bienestar social	1
International institutions	**33**
European Commission	28
National Institute of Health (NIH)	5

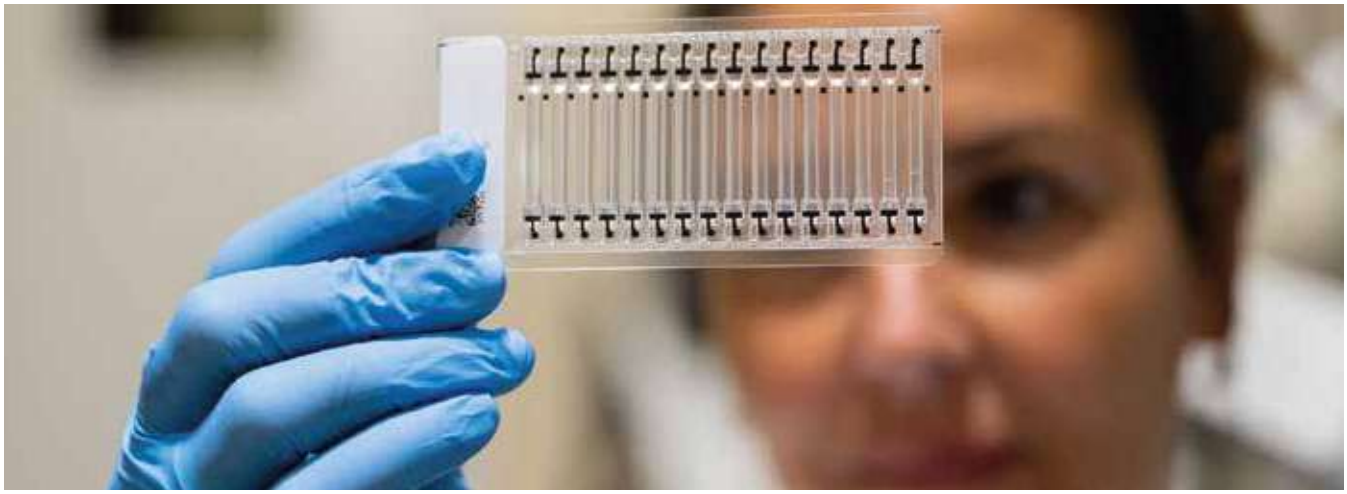
COMPETITIVE PRIVATE FUNDING	NUMBER OF PROJECTS
TOTAL	**64**
Catalan institutions	**10**
Col·legi de Fisioterapeutes de Catalunya	2
Fundació Acadèmia de Ciències Mèdiques i de la Salut de Catalunya i Balears	3
Fundació Catalana del Transplantament (FCT)	1
Fundació La Marató de TV3	4
Spanish institutions	**34**
Asociación Española de Afectados de Cáncer de Pulmón	1
Asociación Española Contra el Cáncer (AECC)	6
Asociación Española de Gastroenterología (AEG)	1
Asociación Española para el Estudio del Hígado (AEEH)	1
Asociación para la Investigación del Cáncer de Pulmón en Mujeres (ICAPEM)	1
Fundación Española de Hematología y Hemoterapia (FEEH)	1
Fundación Española de Pediatría	1
Fundación Española para la Ciencia y la Tecnologia (FECYT)	1
Fundación Alicia Koplowitz	1
Fundación Bancaria "La Caixa"	5
Fundación de Investigación Médica Mutua Madrileña	1
Fundación FERO	2
Fundación Investigación en Urología (FIU)	1
Fundación Merck Salud	1
Fundación Sociedad Española de Endocrinología y Nutrición (SEEN)	2
Fundación Sociedad Española de Cirugía Ortopédica y Traumatología (SECOT)	1
Fundación Sociedad Española de Oncología Médica (SEOM)	1
GILEAD Sciences	2
Sociedad Española de Diagnóstico por Imagen del Abdomen (SEDIA)	1
Sociedad Española de Hematología y Oncologia Pediátricas (SEHOP)	1
Sociedad Española de Medicina Nuclear Imagen Molecular (SEMNIM)	1
Sociedad Española del Sueño	1
International institutions	**20**
Alzheimer's Association	1
American Association for Cancer Research	1
AO Trauma	2
Association Française de l'Étude du Foie	1
Autoimmune Encephalities Alliance	1
Bill and Melinda Gates Foundation	1
European Association for the Study of the Liver (EASL)	2
European Committee for Treatment and Research in Multiple Sclerosis (ECTRIMS)	1
European Hematology Association	1
European Mantle Cell Lymphoma (MCL) Network	1
Lady Tata Memorial Trust	1
Michael J. Fox Foundation for Parkinson	3
Milken Institute	2
Novartis farmacéutica	1
Sociedade Portuguesa de Transplantação	1

Active competitive projects

In 2021, there have been 932 IDIBAPS–FCRB active competitive projects (being alive or in closure during the year). The raised funds have allowed to support research projects and human resources grants.

Some of these initiatives have also provided the Institute with new scientific equipments or facilities. Many of these competitive projects have been co-funded by the European Regional Development Fund (ERDF).





Leadership in European Union's funded projects

IDIBAPS has a strong background both participating and leading competitive projects supported by the European Commission:

NEW COMPETITIVE PROJECTS

The led IDIBAPS-FCRB grants raised along 2021 are listed below:

MARIE SŁODOWSKA CURIE ACTIONS' MONOCONTRACTOR GRANTS

EBAP
Evidence-Based Assessment in Psychotherapy (EBAP) Study
2021-2022
Fellow: **Alberto Stefana**
Mentor: **Eduard Vieta**
Call: CE_H2020-MSCA-IF-20
Official code: 101030608

COORDINATED COLLABORATIVE PROJECTS

ANDRONET
European andrology network research coordination, education and public awareness
2021 – 2025
Rafael Oliva
Call: CE_H2020_COST20nov
Official code: CA20119

WAVE
Workforce in Addictions - Valorisation in Europe
2022 – 2024
Silvia Matrai
Call: CE_JUST-2020-AG-DRU
Official code: 101045870

MULTI-FACT
Multi-centric study of Fetal Abnormal Cortical Trajectory with standardised and privacy-preserving method on fetal MRI
2022 – 2025
Elisenda Eixarch
Call: CE_ERAnet_NEURON_21
Official code: NEURON_NDD-155

TRAP-MEDD
Translational Platform for MSA: Elucidation of Disease-mechanisms and Drug discovery
2022 – 2025
Yaroslau Compta
Call: CE_FLAG-ERA_21
Official code: FLAG-ERA-21-01

4-DBR
4-Deep Brain Reconstruction
2022 – 2025
Josep Maria Canals
Call: CE_HE_PathOPEN_21
Official code: 101047099

Scientific leadership

SAVE-COR
Stratification of Atrial and Ventricular Arrhythmias based on Electrocardiographic Imaging
2022 – 2024
Josep Lluís Mont
Call: 220385
Official code: CE_EIT_Inn_22_24marz

ACTIVE COMPETITIVE PROJECTS

In 2021, the IDIBAPS-FCRB European projects implemented to be highlighted are listed in this section:

GRANTS FUNDED BY THE EUROPEAN RESEARCH COUNCIL

European Research Council

PRIORS
Neural circuit dynamics underlying expectation and their impact on the variability of perceptual choices
Jaime de la Rocha
2015 – 2021
Call: CE_H2020-ERC-2015_Consolidator grant
Official code: 683209

MITOSENSING
Decoding mitochondrial nutrient-sensing programs in POMC neurons as key determinants of metabolic health
Marc Claret
2017 – 2022
Call: CE_H2020-ERC-2016_Consolidator grant
Official code: 725004

BCLLatlas
Single-cell genomics to comprehensively understand healthy B-cell maturation and transformation to chronic lymphocytic leukemia
Elías Campo and Iñaki Martín Subero *(participating as independent Principal Investigators)*
2019 – 2024
Call: CE_H2020-ERC-2018_Synergy grants
Official code: 810287

MARIE SŁODOWSKA CURIE ACTIONS' MONOCONTRACTOR GRANTS

BITRECS
Biomedicine international training research programme for excellent clinician-scientists
Elías Campo
2017 – 2023
Call: CE_H2020-MSCA-COFUND-16
Official code: 754550

PDX-PC
Elucidation of tumour cell plasticity mechanisms associated to treatment in metastatic prostate cancer
Fellow: **Mercedes Marín**
Mentors: **Aleix Prat and Begoña Mellado**
2019 – 2021
Call: CE_H2020-MSCA-IF-18
Official code: 841121

NEUROPREG
Eating patterns in pregnancy: unravelling the underlying neurocircuits and its deleterious metabolic consequences
2021 – 2023
Fellow: **Roberta Haddad**
Mentor: **Marc Claret**
Call: CE_H2020-MSCA-IF-19
Official code: 891247

COORDINATED COLLABORATIVE PROJECTS

HIVACAR
Evaluating a Combination of Immune-based Therapies to Achieve a Functional Cure of HIV Infection
Felipe Garcia
2017 – 2021
Call: H2020-SC1-2016-RTD
Official code: 731626

LIVERHOPE
Simvastatin and rifaximin as new therapy for patients with decompensated cirrhosis
Pere Ginès
2017 – 2022
Call: H2020-SC1-2016-RTD
Official code: 731875

IMLINFO
Red Transfronteriza de Immunoterapias Personalizadas para Linfomas no-Hodgkin
Patricia Pérez Galán
2018 – 2021
Call: CE_Interreg-16_POCTEFA
Official code: EFA281/16

DEEP SEAS
Developing and Extending Evidence and Practice from the Standard European Alcohol Survey
Antoni Gual
2018 – 2021
Call: CE_TED_Chafea17_01
Official code: 20177113

TRANSCOLONCAN
Identifying Biomarkers Through Translational Research for Prevention and Stratification of Colorectal Cancer
Sergi Castellví
2018 – 2022
Call: CE_H2020-COST17
Official code: CA17118

FAR SEAS
Piloting Brief interventions to reduce risk of FAS/FASD, following 1st and 2nd standarised European Alcohol Survey and providing support to Member States to strengthen their capacity to tackle alcohol related harm
Antoni Gual
2019 – 2022
Official code: 20187106
Call: CE_TED_Chafea18_10

VR Per GENERE
Virtual Reality Prevention of Gender-Violence in Europe based on Neuroscience of Embodiment, peRspective and Empathy
Maria Victoria Sánchez-Vives
2020 – 2022
Call: CE_REC_2019
Official code: 881712

ULISES
Immunological incompatibility as a basis for cancer curing and vaccination
Cristina Fillat
2020 – 2023
Call: CE_H2020-FETOPN19-2
Official code: 899708

LIVERSCREEN
Screening for liver fibrosis - population-based study across European countries
Pere Ginès
2020 – 2024
Call: CE-H2020-SC1_2019_2s
Official code: 847989

INTER-GLAM
Intercontinental Perspectives on Global Addictions and Drug Markets
2021 – 2023
Antoni Gual
Call: CE_JUST-2019-AG-DRU
Official code: 957776

Institutional projects

GO EUROPE PROGRAMME

(Strategic plan for health research and innovation, PERIS - Catalan Government)

An IDIBAPS-FCRB project funded by the Health Department of the Catalan Government has been implemented (2019-2021) with the following objectives:

1) The research and innovation needs, resources or objectives of more than 150 Principal investigators have been compiled and used to identify the specific calls best-fitting to their activities.

2) More than 200 new international calls have been identified and disseminated.

3) Close to 70 proposals enjoyed a significant support from the European Projects Office.

4) The leading role of Hospital Clínic de Barcelona in the EIT Health network has been consolidated at European level.

5) 11 Young Principal Investigators have been involved in international funding.

6) More than 200 contacts with other entities have lead to the participation in 29 proposals.

7) A total of 124 projects have been funded through the project.

8) More than 30 lobby actions were promoted in order to influence European Union policies.

9) 13 institutional events have been organized towards the internationalization of the institution.

Supported by the Health Department (SLT008/18/00199)

Generalitat de Catalunya
Departament de Salut

HRS4R

Human Resources Strategy for Researchers.

WEB

www.clinicbarcelona.org/en/idibaps/working-idibaps/hrs4r

IDIBAPS is awarded with the logo "HR Excellence in research" since 2015 due to it has acquired a commitment to implement the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers (Charter and Code) in their policies and practices. Overall, IDIBAPS has its own HRS4R strategy to prioritize the working environment of the researchers in terms of professionalism, recruitment, conditions as well as supervision.

In 2021, all the HRS4R activity developed since 2015 has been reported to the European Commission with the intention to show the progress achieved in the framework of this initiative. Additionally, a new Action Plan (2021-2024) has been approved and launched to continue getting closer to the statements of the European Charter and Code. All those aspects were part of the renewal phase of the logo that has to be completed in 2022 with a site visit involving three external auditors.

HR EXCELLENCE IN RESEARCH

REDACT

Europa Redes y Gestores – Europa Centros Tecnológicos 2020, Spanish Research Agency (AEI)

The REDACT project (2021-2022) is supported by the Spanish Research Agency (AEI) from the Spanish Ministry of Science and Innovation. Its objective is to increase the capacities of European Projects Office for drafting and reviewing proposals to be submitted to the Horizon Europe 2021-2027 Framework Programme. The initiative will particularly focus on:

1) Establishing a repository with support information to optimize the preparation of proposals.

2) Identifying and supporting in proposal writing to the members of the research community with the greatest potential for participation and leadership in Research and Innovation proposals.

3) Identifying and supporting in proposal writing to the research community with the greatest potential to participate in Innovation activities, thus increasing the institutional positioning in the European Innovation Council funding programmes of the Horizon Europe.

Grant reference ECT2020-000811 financed by MCIN/AEI/10.13039/501100011033/ and by the European Union "NextGenerationEU"/PRTR.

MINISTERIO DE CIENCIA E INNOVACIÓN
Financiado por la Unión Europea NextGenerationEU
Plan de Recuperación, Transformación y Resiliencia
AGENCIA ESTATAL DE INVESTIGACIÓN

Spanish Biomedical Networks

ISCIII Networks

The Instituto de Salud Carlos III, ISCIII, from the Spanish Ministry of Science and Innovation promotes the consolidation of several Spanish networks with the participation of IDIBAPS that are detailed below:

RESEARCH NETWORKS

The Networked Biomedical Research Centres (Centros de Investigacion Biomédica en Red, CIBERs and also CIBERNED) and the Cooperative Research Topic Networks (Redes Temáticas de Investigación Cooperativa en Salud, RETICs) represent a cooperative way of understanding biomedical research to achieve excellent results.

In 2021, IDIBAPS has been related to most of the existing research networks as it is described below:

CIBERS

ciber
Centro de Investigación Biomédica en Red

To sum up, 29 top IDIBAPS researchers are group leaders within CIBER networks and CIBERNED in those proportions:

CIBERCV Cardiovascular	1
CIBERDEM Diabetes and associated metabolic disorders	2
CIBEREHD Hepatic and digestive diseases	8
CIBERER Rare diseases	6
CIBERES Respiratory diseases	5
CIBERNED Neurodegenerative diseases	1
CIBEROBN Obesity and nutrition	2
CIBERONC Oncology	2
CIBERSAM Mental health	2

One IDIBAPS researcher is the Scientific Director in his corresponding CIBERs as leader of his field of research:

Dr. Eduard Vieta
Scientific Director at CIBER for Mental health (CIBERSAM).
www.cibersam.es

The mission of this network is to provide answers and solutions to treat mental illnesses and thus improve the quality of life of citizens.

RETICS

13 IDIBAPS high-level researchers are also group leaders within RETICs networks. According to their field of work they are distributed in the following structures:

INVICTUS Cerebral Vascular Diseases	1
OFTARED Prevention, early detection, treatment and rehabilitation of ocular pathologies	2
REDINREN Renal Research	1
REDRIS Research in Aids	1
REEM Multiple Sclerosis	3
RIER Research in Inflammation and Rheumatic Diseases	1
RIRAAF Adverse Reactions to Allergens and Drugs	1
RTA Addictive Disorders	1
SAMID Maternal and Child Health and Development Research Network	1
TERCEL Cell Therapy Network	1

ITEMAS NETWORK
www.itemas.org

IDIBAPS KTT Office is part of the Medical Technology Innovation Platform (ITEMAS). The Platform for Dynamization and Innovation of the industrial capacities of the National Health System and its effective transfer to the productive sector (ITEMAS) is one of the platforms of the Carlos III Health Institute (ISCIII) to support R&D&i in Biomedicine and Health Sciences.

Its objective is to effectively boost the industrial capacity generated from the National Health System and the real transfer of the results of research carried out within the National Health System to the productive fabric. The core of the ITEMAS comprises the innovation units of 18 large hospitals belonging to the Spanish National Health System, in addition to the Ministry of Health, Social Services and Equality and the National Center for Cardiovascular Research (CNIC).

itemas isciii

SPANISH NETWORK OF BIOBANKS PLATFORM

HCB-IDIBAPS Biobank is part of the ISCIII Biobanks and Biomodels Platform, an initiative of the Carlos III Health Institute. Its members are biobanks of hospitals, autonomic networks, virtual biobanks, biobanks of the main research centers linked to healthcare institutions, between others.
The Platform's structure have been organised into four scientific-technological HUBS, which include: Biobanks, Organoids, Animal Models and 3D Printing. This structure makes it possible to manage and supply biological samples and associated clinical data. In the interest of promoting and incrementing scientific-technological resources in biomedical research, the PISCIIIBB's services include organoids, animal models and 3D printing.
HCB-IDIBAPS has been joined as a unit participating in the Biobank HUB and in the Organoids Hub.

Red Biobancos
PLATAFORMA ISCIII BIOBANCOS Y BIOMODELOS

European Biomedical Networks

SPANISH CLINICAL RESEARCH NETWORK, SCReN

IDIBAPS Principal Investigators are supported by the Clinical Trial Unit from FCRB and also by the IDIBAPS Core Facility of Medical Statistics while performing their clinical research and also their clinical trials. It is for this purpose that the SCReN network has as members both FCRB and IDIBAPS.

This ISCIII platform is responsible for grouping 34 Units of Clinical Research and Clinical trials. Its objective is to achieve high quality standards in all clinical research procedures, from the design to the final dissemination of the results.

The network is organized into 11 working groups: Methodology; Regulation, ethics and data protection; Monitoring and quality; Pharmacovigilance; Data management; Statistics; Training; Early studies; Pediatrics and special populations; Observational studies; and, International studies.

EUROPEAN ANIMAL RESEARCH ASSOCIATION, EARA

IDIBAPS is member of the European Animal Research Association (EARA). EARA's mission is to inform society about the continued need for, and the benefits of, the humane use of animals in scientific research by providing accurate and evidence-based information.

EUROPEAN CLINICAL RESEARCH INFRASTRUCTURE NETWOR, ECRIN

FCRB is the Spanish National Scientific Partner of ECRIN, a 'distributed research infrastructure (RI)' that connects research facilities at multiple sites in countries across Europe and provides services for top-level clinical research.

ECRIN supports the conduct of multinational clinical research in Europe. By managing and supporting clinical trials across borders, connecting networks, and advising and implementing policy, ECRIN advances knowledge flow, competitiveness, and integration in European clinical research.

This network has the legal status of European Research Infrastructure Consortium (ERIC) given by the European Commission. It is also listed on the European Strategy Forum on Research Infrastructures (ESFRI) roadmap, strategic instrument to focus on optimal use and development of research infrastructures.

EUROPEAN INFRASTRUCTURE FOR TRANSLATIONAL MEDICINE, EATRIS

EATRIS is the European Infrastructure for Translational Medicine. It is one of the existing European Research Infrastructure Consortiums (ERICs) that expects to improve the productivity of the translational research and development pipeline by providing high quality research services to public and private research entities. IDIBAPS together with many other European entities bring together resources and services for research communities to translate scientific discoveries into benefits for patients.

EUROPEAN INSTITUTE OF INNOVATION AND TECHNOLOGY, EIT HEALTH

EIT HEALTH is a "Knowledge and Innovation Community" (KIC) of the European Institute of Innovation and Technology (EIT) focused on health and aging. EIT HEALTH is the largest healthcare innovation network in Europe and helps building and growing businesses to create products and services that progress healthcare in Europe, while strengthening our economy.

It is composed by close to 150 EIT Heath partner organisations from the worlds of business, research education and healthcare delivery. In 2020, Hospital Clínic of Barcelona became Core Partner of EIT HEALTH together with IDIBAPS and FCRB as linked institutions.

Other Networks

TRANSPARENCY AGREEMENT ABOUT THE USE OF SCIENTIFIC EXPERIMENTAL ANIMALS IN SPAIN

The Confederation of Scientific Societies of Spain (COSCE) supports the statement that the use of animals for experimentation is key to ensure the medicine advance. For that reason, COSCE has promoted a transparency agreement regarding the use of those animals for scientific purposes in Spain in which IDIBAPS has adhered.

The main intention is to promote communication between research community and society, share transparent data or information and objectively justify the need to use of animals for that purpose.

NETWORK OF CLINICAL RESEARCH MANAGEMENT ENTITIES, REGIC

REGIC is the first association of clinical research management entities created in Spain at the request of professionals.

Its main aim is to share experiences and create a space for interaction and training in health research, development and innovation management. FCRB is member of this network and actively participates in some of its working groups.

NETWORK OF TUMOR BANKS OF CATALONIA, XBTC

The Network of Tumor Banks of Catalonia (XBTC) is composed by 10 tumour banks and 2 observers, linked to the main hospitals of Catalonia. The coordinator node is the HCB-IDIBAPS Biobank.

The XBTC was set up in 2009 through the "Pla Director d'Oncologia" (PDO), managed by the Catalan Oncology Institute. The aim was to create a network to provide researchers with tumoral and non tumoral tissue surplus from surgeries performed in the different hospitals in order to assist in a broad range of research projects.

Scientific facilities

CEK, Esther Koplowitz Research Center

Inaugurated by the end of 2010 and with space for more than 350 researchers, the CEK building receives international scientists, fostering the exchange of experience and professional synergies.

The building has a laboratory area of 4,860 m2 on the ground. In the basement one underground floor offers a total area of 2,565 m2, including space for scientific core facilities, a category 2 radioactive non-encapsulated sources type facility (IRA-3029), and a BSL-3 laboratory GMO notified (A/ES/13/I-11).

The CEK building was made possible thanks to the contribution of several public and private institutions, the Generalitat de Catalunya, the Ministerio de Economía y Competitividad, and the Instituto de Salud Carlos III, as well as from the support of other donors such as the Fundación Esther Koplowitz, Fundació Privada Cellex, Acció Sardà Farriol para la Investigación en Diabetes and Laboratorios Esteve.

CELLEX, Biomedical Research Center

Since 2013, CELLEX center is a space with four floors located in the UB School of Medicine. Thanks to the collaboration between the public and private sectors 2,290 m2 of laboratories, scientific and technological services and other spaces are available to the research developed at IDIBAPS and the University of Barcelona.

The renovation and adaptation of these areas is mainly the result of a donation from the CELLEX Foundation. Part of the contribution of the IDIBAPS has been funded with ERDF funds from the Generalitat de Catalunya and the rest comes from specific calls by the Instituto de Salud Carlos III. These IDIBAPS facilities home over 200 researchers.



Core facilities

Excellent biomedical research requires the use of highly specialised techniques and equipment. IDIBAPS has five core facilities to provide all researchers with big infrastructures and high quality technical expertise:

Functional Genomics
NGS
Transcriptomics

Flow cytometry and cell sorting
Flow cytometry
Cell sorting

Biobank
Neurological tissue bank
Tumor and tissue bank
Biologic fluids bank

Medical Statistics
Statistics
Data management
Information technology

Magnetic Resonance Imaging
3T
7T
Image lab

On the other hand, IDIBAPS has an agreement with its consortium partners to optimise investments in infrastructures so duplicities are avoided and a wider spectrum of scientific services can be offered to the community.

Universitat de Barcelona at the Clínic Campus, provides researchers with some complementary infrastructures such as microscopy, animal facility, library and proteomics.

	Services			Research	
	New internal users	New external users	Total attended users	Publications	Acknowledged publications
Biobank of Hospital Clínic - Idibaps	28	45	210	8	32
Flow cytometry and cell sorting	5	2	79	1	6
Functional genomics	20	8	185	6	6
Magnetic resonance imaging	18	4	68	14	5
Medical statistics	0	3	191	70	0

HCB-IDIBAPS biobank

FOR FURTHER INFORMATION
www.clinicbiobanc.org
biobanc@idibaps.org

Joan Carles García Pagán (HCB)
Scientific director

Aina Rodríguez
Head of core facility

The **Biobank** coordinates the collection, processing, storage and transfer of human biological samples to promote biomedical research of the highest standard. In compliance with the legal and ethical framework, the Biobank only provides samples to projects that have been approved by the ethical and scientific committees. With the aim of optimizing the human resources and equipment in the Biobank, this facility offers a wide range of services for the processing and analysis of the samples gathered by the research groups. All the procedures performed at the Biobank are carried out under ISO 9001:2015 certification.

The HCB-IDIBAPS Biobank's catalogue of samples is formed by the samples collected by three large banks, all of which have extensive experience in research with human samples:

Neurological Tissue Bank
A nervous tissue repository (brain and spinal cord) created from donations from deceased donors with or without neurological disorders.

Tumour and Tissue Bank
A repository of tumoural and non-tumoural frozen tissue samples from around 12.000 cancer patients. Additionally, the Anatomical Pathology collection consists of para nembedded tissue samples from all kind of adult diseases, which gathers more than 1.6 million tissue blocks. All these samples are surplus to diagnostic requirements from the Department of Anatomical Pathology in the Hospital Clínic.

Biological Fluids Bank
It houses a large variety of samples: primarily whole blood, serum, plasma urine and DNA isolated from body fluid samples, among others. This repository is composed by samples of patients with diverse clinical diagnosis, collected in clinical laboratories and medical interventions and surgeries for Biobank donation.

Flow cytometry and cell sorting

FOR FURTHER INFORMATION
idicitom@idibaps.org

Isabel Crespo
Head of core facility

The **Flow Cytometry** core facility provides high quality state-of-the-art multiparametric flow cytometry and cell sorting instrumentation as well as associated expertise and services to all investigators at IDIBAPS and other outside customers.

Skilled staff provide help with experimental design, sample acquisition, data analysis, sorting and help with interpreting the data and producing figures for publication.

The Flow Cytometry core facility will soon acquire a state-of-the-art spectral cytometer: 5 LASER, 64 fluorescence channels and autosampler option, thanks to the Next Generation funds granted in the 2021 call. A unique combination of innovative technologies that takes flow cytometry to the next level of performance and flexibility from simple to high-complexity applications.

Functional genomics

FOR FURTHER INFORMATION
genomica.idibaps@idibaps.org

Pedro Jares
Scientific director

Magda Pinyol
Head of core facility

The **Functional Genomics** core facility provides access to different high throughput genomic technologies to the researchers. The facility manages samples for genomic analysis including transcriptional profiling, low density and large-scale genotyping, gene copy number analysis and gene-panel sequencing using different technological platforms such as real-time PCR, digital quantification, microarrays and next-generation sequencing.

The core facility has a new next-generation sequencer, NextSeq2000 which will allow the implementation of new sequencing protocols such as RNASeq or EXOMES. In addition, the facility offers advice on experimental design and application of genomic technologies.

Other facilities

Magnetic resonance imaging

FOR FURTHER INFORMATION
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Núria Bargalló (HCB)
until July 2021
Head of core facility

since July 2021
Scientific Director

Emma Muñoz
since july 2021
Head of core facility

The Magnetic Resonance Imaging (MRI) core facility is equipped with a 7 Tesla Bruker magnet for small animal imaging and a PRISMA 3 Tesla magnet for humans (thanks to own funds and resources obtained from the Spanish Ministry of Economy and Competitiveness, MINECO and the European Regional Development Fund, ERDF).

The facility provides services related to medical imaging techniques for researchers from IDIBAPS and other institutions, and to industries connected with health, as well as performs first-rate basic and clinical research into medical imaging using structural and functional magnetic resonance imaging, magnetic resonance spectroscopy, molecular imaging, other types of medical imaging and image processing.

The facility also takes care of the training of the users and keeping the state of art in MRI techniques to enable researchers conducting experimental and clinical studies, thereby allowing them to explore the advantages of translational research.

There is also a Laboratory of Image Analysis dedicated to MRI image processing and analysis. It owns different workstations available to use with the most common softwares used in the MR field installed.

Medical statistics

FOR FURTHER INFORMATION
bioestadistica@idibaps.org

Ferran Torres
until september 2021

José Ríos
since September 2021
Head of core facility

The Medical Statistics core facility provides methodological and statistical support for IDIBAPS research projects and those of allied institutions. The main objective is to promote clinical research excellence and facilitate resources to achieve this.

The platform's tasks are conducted in compliance with the International Conference of Harmonisation guidelines, European and local laws, as well as with the regulatory recommendations. Standard Operating Procedures (SOPs) are in place to fulfil those standards.

High Performance Computing

At the Institute there are resources able to process big data, especially focused on omic data and image processing, thanks to the incorporation of a new platform divided into 2 sites, one on the Barcelona Super Computing Centre (BSC) dedicated to big processing and another on IDIBAPS for small projects.

This has been possible thanks to the own funds and the resources obtained from the Ministry of Science, Innovation and Universities, MCIU and the European Regional Development Fund, ERDF.

BSC has nine nodes with a total of 360 cores, 2.88 Tb of RAM and 800 Tb of disk. IDIBAPS has 3 nodes with a total of 48 cores, 2.1Tb of RAM and 240Tb of disk. This facility provides resources for the development of projects with large processing needs, and for small projects and systems dedicated to research at IDIBAPS.

Training

Doctoral theses

121 Doctoral theses defended in 2021

18 Theses with European mention

THESIS AUTHOR	TITLE	THESIS DIRECTORS
Laura Boldú Nebot	Automatic recognition of different types of acute leukaemia using peripheral blood cell images	Merino A, Rodellar J.
Alessandra Camassa	Spatiotemporal dynamics of the cerebral cortex: from unconscious brain states towards consciousness	Sánchez-Vives MV, Mattia M.
Sergi Casadó Llombart	Expression and variation of lymphocyte scavenger receptors in inflammatory diseases and cancer	Lozano F.
Blanca Domenech Ximenos	Extended remodeling of the right ventricle and pulmonary circulation in endurance athletes: insights from cardiac magnetic resonance	Sitges M, Sanz de La Garza M.
Jaime Hernández Ojeda	Clinical, electrocardiographic and electrophysiological characterization in Brugada Syndrome	Brugada J, Arbelo E.
Daniel Ilzarbe Simorte	Brain functional correlates of theory of mind in neurodevelopmental disorders	Castro-Fornieles J, Sugranyes G.
Anna Inguanzo Pons	Subtypes in Parkinson's disease and Dementia with Lewy bodies: MRI and neuropsychological profiles	Junqué C, Segura B.
Tania Johnston	Assessment, prevention and rehabilitation of intimate partner violence through immersion in virtual reality	Sánchez-Vives MV.
Filip Loncaric	Phenotyping of Left Ventricular Hypertrophy using Etiology-Discriminative Deformation Imaging and Data Integration	Sitges M, Bijnens B.
Iria Méndez Blanco	Psychotic symptoms in genetic-at-risk and bipolar disorder samples: prevalence and related variables	Castro-Fornieles J, Birmaher B.
Talita Micheletti Helfer	Development of a sealing system for preventing iatrogenic preterm prelabor rupture of membrane after endoscopic fetal surgery	Eixarch E, Deprest J.
Iuliia Naumova	Psychological characteristics, sexual function and quality of life in infertile women with polycystic ovary syndrome	Castelo-Branco C.
Tiffany Oña Jodar	When Working Memory fails: mechanisms underlying memory accuracy and errors	de la Rocha J, Compte A.
Marti Ortega Ribera	Sinusoidal mechanobiology in advanced chronic liver disease	Gracia-Sancho J, Villa R.
Laura Pla Codina	Diagnosis and perinatal therapies in an animal model of intrauterine growth restriction	Illa M, Eixarch E.
Joan Enric Ramis Zaldívar	Decoding the genetic landscape of pediatric and young adult germinal center-derived B-cell non-Hodgkin lymphoma	Salaverria I.
Estela Salagre Muñoz	Intervención precoz de precisión en primeros episodios psicóticos: uso de modelos estadísticos avanzados para predecir el diagnóstico, la evolución funcional y el riesgo suicida tras un primer episodio psicótico	Vieta, EGrande I.
Cristina Varo Martin	La cognición social y emocional en el trastorno bipolar y la depresión: aspectos sociodemográficos, clínicos, neurocognitivos y de funcionamiento	Vieta, EMartínez-Arán A,
Sira Aguiló Mir	Medida de estrés en cuidadores principales de enfermos crónicos: En busca de una herramienta de medida	Aguiló J, López Barbeito B.
Anton Albajes Eizaguirre	Development, implementation and validation of a new method for meta-analysis of voxel-based neuroimage studies	Raduà J, Pomarol-Clotet E.
Ana Maria Alcalde Dominguez	Impacto de la adenomiosis y endometriosis profunda en la calidad de vida, calidad de vida sexual y salud mental	Martínez-Zamora MA, Carmona F.
Victoria Alcaraz Serrano	Les aguditzacions com a element crucial en el maneig no farmacològic de les bronquièctasis	Torres A, Gimeno-Santos E.

Martina Angeles Fité	Evaluación del ganglio centinela obtenido mediante la técnica de inyección miometrial de radiotrazador guiada por ecografía transvaginal en pacientes con cáncer de endometrio de riesgo intermedio y alto	**del Pino M, Paredes P.**
Sònia Anglès Acedo	Actividad y función sexual de las mujeres con prolapso de órganos pélvicos. Impacto del tratamiento quirúrgico	**Espuña M, Ros C.**
Marina Barraso Rodrigo	Evaluación del flujo vascular en la red capilar perifoveal mediante angiografía de tomografía de coherencia óptica en la diabetes mellitus tipo 1	**Adán A, Zarranz J.**
Carolina Bernal Morales	Manejo de la afaquia: análisis retrospectivo de implante de lentes retropupilares (Artisan® - Verisyse®) ancladas a iris en pacientes con cirugía complicada de catarata o luxación de lente intraocular y vitrectomía pars plana asociada	**Zarranz J, Adán A.**
Josep M. Blasco Pelicano	Implicación de la fase terminal del complemento en las microangiopatías trombóticas	**Campistol JM, Palomo M.**
Sergi Borrego Ecija	Determinantes genéticos del fenotipo clínico y neuropatológico en el espectro demencia frontotemporal - esclerosis lateral amiotrófica	**Sanchez-Valle, RGelpi E.**
Pol Bruguera Soler	Prevenció dels problemes relacionats amb el consum d'alcohol a urgències	**Vieta, EGual A.**
Pablo Burbano Santos	Investigación científica en Medicina de Urgencias y Emergencias en España: análisis bibliométrico y de redes de colaboración	**Miró Ò, Martin FJ.**
Juana Cajiao Nieto	La vivencia emocional del padre en el Servicio de neonatología	**Torres A, Botet F.**
Albert Carrion Puig	Identificación de biomarcadores pronósticos de agresividad en cáncer de próstata	**Mengual L, Ribal MJ.**
Rocio Casas Saucedo	Efecto modulador del cofactor sobre la gravedad en la anafilaxia alimentaria por alergia a la proteína de transferencia de lípidos (LTP): estudio del papel del metabolismo de los eicosanoides	**Muñoz-Cano R, Pascal M.**
Carlos Castaño Perez	Exosomal miRNAs in the development and treatment of glucose intolerance and type 2 diabetes	**Novials A, Parrizas M.**
Raul A. Castellanos Moreira	Anticuerpos frente a péptidos carbamilados en la artritis reumatoide: Papel en el reumatismo palindrómico, la enfermedad pulmonar intersticial y la respuesta terapéutica	**Sanmarti R, Haro I.**
Cristina Català Osete	Study of scavenger receptor CD6: its role in immune response to infection and sepsis	**Lozano F.**
Pedro Luis Cepas Guillen	Evolución temporal e impacto clínico de procedimientos percutáneos de cardiología intervencionista en pacientes nonagenarios	**Freixa X, Sabaté M.**
Maria J. Climent Esteller	Diferències histopatològiques entre els limfomes cutanis primaris i secundaris: una anàlisi dels limfomes fol·liculars i T/NK	**Servitje O, Cid J.**
Josep Corominas	Role of lymphocyte populations along the treatment of advanced hepatocellular carcinoma patients with antiangiogenic agents and immune checkpoint inhibitors	**Boix L.**
Montserrat Cubo Abert	Utilidad de la ecografía ginecológica en dos y tres dimensiones en la estadificación prequirúrgica del cáncer de endometrio	**Diaz-Feijoo B.**
Blanca Cucarull Martínez	Regulation of the microenvironment and chemoresistance in liver therapy	**Morales A, Mari M.**
Sandra Cuerpo Cardeñosa	Manejo de las complicaciones clínicas de las enfermedades pulmonares intersticiales difusas (EPID): insuficiencia respiratoria crónica y exacerbaciones agudas	**Agustí A, Sellarés J.**
Andrea Mireya Cuervo	Biomarcadores sinoviales para la clasificación diagnóstica de las artritis indiferenciadas	**Cañete JD.**
Cristina de Dios Conde	Disturbances in cholesterol homeostasis and mitochondrial oxidative stress as causal mechanisms of Alzheimer's disease	**Colell A.**
Borja de Lacy Oliver	Transanal total mesorectal excision for rectal cancer	**Castells A, Lacy A.**
Daniela Josefa Diaz Catalán	Bace2 as a new therapeutic target in the treatment of type 2 diabetes and obesity	**Novials A, Servitja JM.**
Fco Javier Escalada Roig	Medicina de Urgencias y Emergencias en Cataluña: Análisis detallado de las estructuras físicas y su organización, así como de los recursos humanos y su formación	**Miró Ò.**
Aranzazu Fernandez	How to identify patients with high-risk HRpositive/ HER2-negative breast cancer in the absence of gene expression platforms	**Prat A, Vidal M.**

José A. Ferrusquía Acosta	Hipertensión portal: Avances en su diagnóstico e impacto en el riesgo quirúrgico	**Garcia-Pagan JC, Hernández-Gea V.**
Eduardo J. Flores Umanzor	Beneficio de la revascularización vs el tratamiento médico óptimo de las oclusiones crónicas coronarias totales. Importancia del género, de la edad avanzada y de la diabetes	**Sabaté M, Freixa X.**
Helena Flórez Enrich	Osteoporosis inducida por el tratamiento crónico por glucocorticoides	**Peris P.**
Cindy Frías Torres	Evaluación de una intervención formativa y de apoyo social INFOSA-DEM dirigida a cuidadores informales de personas con demencia en relación con la sobrecarga y el bienestar emocional	**Zabalegui A.**
Irene Fuertes de Vega	Manejo de patología anal y rectal secundaria a infecciones de transmisión sexual en hombres que tienen sexo con hombres infectados por el virus de la inmunodeficiencia humana	**Blanco JL, Alsina MM.**
Mattia Gallizioli	Identity and functions of dendritic cell subsets in ischaemia-induced neuroinflammation	**Planas AM, Miró F.**
Sergio Garcia Garcia	Estudio de la integridad de sustancia blanca mediante tractografía por tensor de difusión: simulación, diagnóstico y pronóstico	**Enseñat J, González-Sánchez JJ.**
Anna Garcia Serra	Investigations in animal models of anti-NMDAR encephalitis	**Dalmau J.**
Elisa García Lara	Implicación de la proteína C reactiva monomérica en el desarrollo de demencia de tipo Alzheimer: modelo experimental y posibles terapias	**Sanfeliu C.**
Sònia Gelis Caparros	Utilidad de la provocación nasal con alérgeno, y de la determinación del perfil de sensibilización, como técnicas diagnósticas en el estudio de la alergia al marisco	**Bartra J, Valero A.**
Miguel Á. Giménez Lajara	Adecuación a un sistema de prescripción informatizada para enfermeras de la Unidad de Cuidados Intensivos	**Zabalegui A.**
Miquel Gomez Umbert	Análisis multidisciplinar de la eficiencia depurativa en la hemodiafiltración en línea post-dilucional	**Maduell F, Bañón E.**
Jose M. Gonzalez de Aledo	Implementación del análisis del ADN libre circulante en plasma en el diagnóstico de pacientes con cáncer de pulmón de células no pequeñas	**Puig JA.**
Rosario Hernández Ibáñez	Estudio de la esteatosis hepática, estimada mediante cap (control attenuation parameter) en personas con factores de riesgo metabólico, atendidas en atención primária. Estudio poblacional	**Fabrellas N.**
Paola A. Hurtado Restrepo	Análisis de la aplicabilidad de los dispositivos supraglóticos (mascarilla laríngea) en procedimientos neuroanestésicos	**Valero R, Fábregas MN.**
M. Mercedes Ingelmo Torres	Estudio de marcadores moleculares para el diagnóstico no invasivo del cáncer de vejiga	**Mengual L, Izquierdo L.**
Naroa Insausti Urkia	Alcoholic liver disease: contribution of hypoxia signaling and transiational relevance in a humanized liver mouse model	**Fernández-Checa JC, García Ruiz C.**
Mireya Jimeno Ramiro	Estudio de concordancia en el diagnóstico histológico de lesiones premalignas colorrectales	**Cuatrecasas M, Pellisé M.**
Roshanak Kakvan	Translation and validation of the clinical learning enviroment and Nurse teacher scale (CLES+T) in Persian Language	**Fabrellas N.**
Mari Kinoshita	Intrauterine growth restriction—experimental and clinical strategies to improve outcome	**Zamora M, Marsál K.**
Cristobal Langdon Montero	Impacto del traumatismo cerebral agudo sobre el sentido del olfato: papel del entrenamiento olfativo y de la neuroprotección en la recuperación postraumática del olfato	**Marín MC, Mullol J.**
Carlos Laredo Gregorio	Advanced neuroimaging techniques in acute ischemic stroke: tissue viability, blood-brain barrier status and clinical outcome prediction	**Amaro S, Chamorro Á.**
Andrea Larisa Turcu	Antagonistas de receptores ionotrópicos como potenciales terapias en la enfermedad de alzheimer	**Soto D, Vázquez Cruz S.**
Eduardo Lehrer Coriat	Tratamiento de la hiperhidrosis craneofacial y el rubor mediante el bloqueo del ganglio esfenopalatino por vía endoscópica trasnasal	**Mullol J, Alobid I.**
Markus Linhart	Utilidad de la caracterización de la cicatriz miocárdica basada en realce tardío con gadolinio en el tratamiento de arritmias cardiacas: Valor pronóstico e impacto en la práctica clínica	**Berruezo A, Doltra A.**
Ana Isabel Lopez Lazcano	Detección del riesgo psicosocial y de uso de drogas en poblaciones vulnerables. Validación de instrumentos en salud	**Pintor L, Gual A.**

Nicolo Mancardi	Papel de la comunicación intercelular hepática en la fisiopatología y el desarrollo de nuevos biomarcadores en la cirrosis	**Gracia-Sancho J.**
Maria Carmen Martinez	Role of ZEB factors in macrophages in atherosclerosis and ovarian cancer	**Postigo A, Cortes M.**
Olga Martinez Saez	Predicción de Beneficio Terapéutico en Cáncer de Mama Avanzado Receptor Hormonal Positivo y HER2 Negativo	**Prat A.**
Aida Mayorgas	Human Primary Organoid-Derived Epithelial Monolayers as a Novel Strategy for the Study of Adherent Invasive Escherichia coli pathogenicity and the effects of Postbiotics on Intestinal Epithelial Function	**Salas A, Dotti I.**
Ana T. Menjívar Hernández	Aspectos psicosociales de la donación renal en vida	**Manyalich M, Revuelta I.**
Federico J. Miguez Cabello	New insights into ionotropic glutamate receptors in physiological and pathological conditions	**Soto D, Altafaj X.**
Amanda C. Miñana Moll	Estudio de validación de los parámetros dinámicos de respuesta a fluidos, variación de volumen sistólico (VVS) y variación de presión de pulso (VPP) durante la cirugía de resección pulmonar	**Belda FJ, Ferrando C.**
Pablo J. Mozas Fernandez	Factores clínicos, analíticos y genómicos para refinar el pronóstico de los pacientes con linfoma folicular	**López-Guillermo A.**
Aida Orois Añon	Búsqueda de genes implicados en el cáncer de tiroides no medular familiar (FNMTC) no sindrómico	**Mora M.**
Marina Parra Robert	Evaluación de nanomateriales basados en óxido de cerio como nueva estrategia terapéutica frente las alteraciones metabólicas asociadas a la obesidad	**Casals G.**
Roque Pastor Ibáñez	La Microbiota Intestinal en Individuos Infectados por el Virus de la Inmunodeficiencia Humana Tipo-1	**Sánchez-Palomino MS, Garcia F.**
Alexandra Pérez Soriano	Multiple System Atrophy: A clinical characterization and biomarker discovery study	**Martí MJ, Gaetano G.**
Estela Pineda Losada	Mecanismos de resistencia a quimioterapia y a bevacizumab en cáncer colorectal metastásico	**Maurel J.**
Gastón Julio Piñeiro	Rechazo mediado por anticuerpos en el trasplante renal, respuesta a diferentes estrategias de tratamiento y factores pronósticos	**Rovira J, Diekmann F.**
Valeria Pistorio	Unravelling CtsD-cell-specific role in macrophages during tissue remodelling in kidney disease	**Moles A.**
Miguel A. Plasín Rodríguez	Haplotipos del receptor endotelial de la proteína C (EPCR) y acción sobre la hemostasia de las micropartículas circulantes en el síndrome antifosfolipídico y en el lupus eritematoso sistémico: Relación con la arteriosclerosis y la trombosis	**Espinosa G, Tassies D.**
Federico Ponente	Enhanced recording paradigms and advanced analyses of peripheral nerve fibers	**Gasull X.**
Elisa Pose Mendez	Investigación de nuevos tratamientos para la cirrosis descompensada: evaluación preclínica del tratamiento con anti PD-L1 y estudio clínico de la seguridad de la combinación de estatinas y rifaximina	**Ginès P, Coll M.**
Luís Quintairos Domènech	Population Pharmacokinetic-Pharmacodynamic Modelling in Solid Organ Transplantation: Basis of Personalized immunosupression	**Brunet M, Colom H.**
Anna Reig Garcia	Avaluació dels nous anticossos antihexocinasa 1 i anti-proteïna kelch-like 12 pel diagnòstic i pronòstic de la colangitis biliar primària	**Parés A.**
Irene Ribera Casellas	Estudi dels factors prenatals predictius d'anomalies del neurodesenvolupament en cardiopaties congènites	**Carreras E, Eixarch W, Llurba E.**
Paula Ribo Gonzalez	Estudio de los factores que influyen en el control del asma: papel de la educación sanitaria, tratamiento adecuado y las preferencias de los pacientes	**Bartra J, Valero A.**
David Robles Sanchez	Stard1 y esteatohepatitis	**Fernández-Checa JC, García Ruiz C.**
Vicente Roca Agujetas	Cholesterol contribution to Aβ defective clearance in Alzheimer's Disease	**Colell A.**
Gema Rodriguez Trigo	El vertido del petrolero 'prestige' y sus efectos respiratorios y genotóxicos en los marineros de la costa gallega	**Barberà JA, Zock JP.**
Sergio Rodríguez Tajes	Evolución de los patrones epidemiológicos de las hepatitis virales en Cataluña	**Forns X, Lens S.**

Alejandro Roset Rigat	Papel de la troponina en el pronóstico de la insuficiencia cardíaca aguda	**Miró Ò, Rodríguez JJ.**
Noelia Sabater Cruz	Biosustitutos para el tratamiento de la patología de la córnea y la superficie ocular: epidemiología, aplicaciones clínicas y controles microbiológicos	**Casaroli-Marano RP.**
Cristina Salado Manzano	The Development of a Combined Cell Therapy for Huntington's Disease	**Canals JM, Sanders P.**
Rodolfo Valentí San Antonio	Nuevas técnicas de estimulación cardíaca: avances en la optimización de dispositivos de resincronización cardíaca y en la estimulación sin cables	**Lluis Mont L, Tolosana JM.**
Raul Sancho Agredano	Estudio cuasiexperimental sobre la eficacia de una intervención a domicilio por parte de enfermería a pacientes crónicos complejos ancianos	**Fabrellas N.**
Ana Santos Gómez	NMDA receptor mutations associated with neurodevelopmental disorders: pathophysiological impact and personalized pharmacotherapy	**Soto D, Altafaj X.**
Maria C. Sebastia Cerqueda	Eficàcia de la hidratació oral com a mesura preventiva de la lesió renal aguda postcontrast iodat	**Nicolau C, Oleaga L.**
Lidia Segura García	Millora de la identifiació precoç i la intervenció breu en el consum de risc d'alcohol a l'atenció primària de salut de Catalunya	**Gutiérrez T, Mora MS, Gual A.**
Maria Sepulveda Gazquez	Caracterización clínica y biológica de la neuromielitis óptica, e identificación de factores pronósticos	**Saiz A, Graus F.**
Nuria Sola Valls	Aplicaciones de telemedicina en el seguimiento clínico de pacientes con enfermedades autoinmunes del sistema nervioso central	**Saiz A, Blanco Y.**
Ada Soler Ventura	Nous paradigmes de la contribució paterna al desenvolupament embrionari primerenc mitjançant l'anàlisi de l'espermatozoide humà amb tècniques d'alt rendiment	**Oliva R, Jodar M.**
Roser Solernou Soler	Efectos de la androgenización exógena durante la estimulación ovárica en pacientes con baja reserva folicular	**Fabregues-Gasol FJ**
Estel Solsona i Vilarrasa	Cholesterol and stard1: a common nexus in alcoholic liver injury and niemann-pick type C disease-associated mitochondrial stress	**Fernández-Checa JC, García Ruiz C.**
Iris Soveral Rodrigues	Evaluation of left-sided congenital heart defects by advanced fetal echocardiography and cord blood biomarkers	**Gómez del Rincón O, Crispi F.**
Sergi Torramadé Moix	Lesión endotelial como factor común en enfermedades con riesgo cardiovascular asociado. Reversión mediante estrategias terapéuticas	**Diaz-Ricart M, Palomo M.**
Adrià Tort Merino	Detección precoz de cambios cognitivos sutiles en el envejecimiento y en la fase preclínica del continuo Alzheimer	**Rodriguez A, Rami L.**
Fanny Turón Masferrer	Factors de risc de trombosi portal no tumoral en la cirrosi	**García-Pagán JC, Hernández-Gea V.**
Olatz Ugarteburu	Identificación y caracterización de nuevos defectos del metabolismo energético mitocondrial asociados a aciduria 3-metilglutacónica	**Ribes A, Tort F.**
Elia Valls Roig	Efectes d'un programa Integrador de Teràpia Cognitiva Basada en Mindfulness (MBCT), Psicoeducació i Rehabilitació Funcional adaptat al Trastorn Bipolar	**Martínez-Arán A, Vieta, E**
Júlia Vallverdú Ginès	Generació de cèl·lules estrellades hepàtiques derivades de iPSC i la seva utilització com a model per l'estudi de la fibrosi hepàtica	**Ginès P, Sancho-Bru P.**
Víctor Vicens Soler	Brain correlates of delusional disorder using magnetic resonance imaging	**Raduà J, Pomarol-Clotet E.**

Seminars



2 Idibaps Seminars

1 In-House Seminars

9 Liver Seminar

3 Gastrointestinal and Pancreatic Oncology

Stepping-stone training programme

It is a training programme that seeks to provide predoctoral (R1) and postdoctoral (R2) researchers at IDIBAPS with non-scientific tools and skills which are key for the development of their careers.

Every year a new edition is implemented. This initiative started in 2016 as part of the IDIBAPS Human Resources Strategy for Researchers (HRS4R).

2 Plenary sessions in 2021

6 Workshops in 2021

ATTENDEES

145 Plenary sessions in 2021

92 Workshops in 2021



Toolbox, IDIBAPS Talks Series

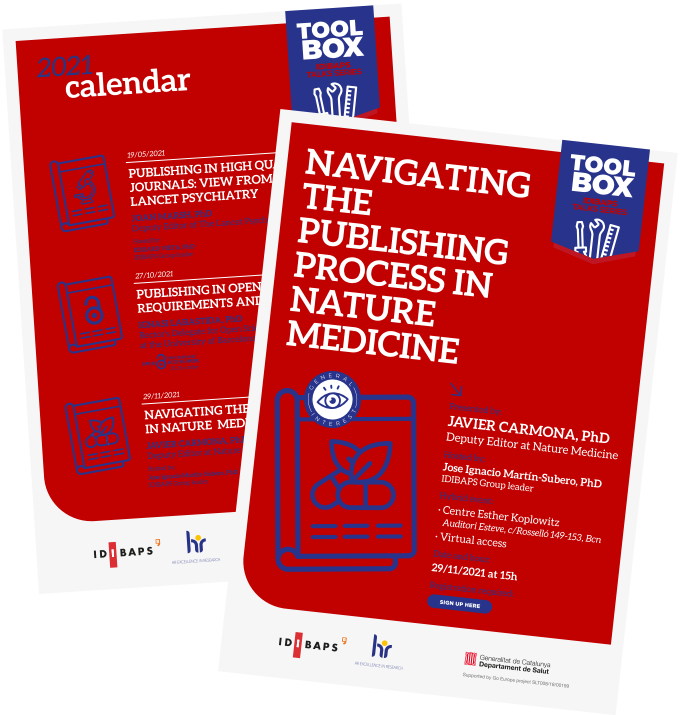
It is a cycle of talks that focuses on different topics of general interest for all IDIBAPS-FCRB research community.

On each occasion and for each specific topic, a speaker of reference is invited to provide everyone at the Institute with updated information regarding the topic of the talk.

In 2021, the Toolbox has been initiated in the framework of the IDIBAPS Human Resources Strategy for Researchers (HRS4R). Experts in the field of scientific publications have participated in the three sessions organised.

3 **Talks in 2021**

201 **Attendees in 2021**



Aula Clínic

Aula Clínic is dedicated to the promotion and dissemination of continuing education in Health Science.

It also develops, plans and provides logistical support to the training initiatives of the professionals of the Hospital Clínic de Barcelona through the design of courses, providing advice, administration, management and marketing support and disseminating the teaching activities.

In 2021, 100 professionals from the Clinic campus entrust the organization of their continuing education activity to Aula Clínic.

Among others, Aula Clínic, organised:

- *V Edition of the CLINIC Barcelona Summer School*
- *V National conference on HIV*
- *UROFORUM 2021*

Patronage

The IDIBAPS-FCRB has the support of companies, entities and people who, through financial contributions or organizing fundraising activities, help to finance research projects.

They also contribute to the dissemination and social awareness of their activity.

In 2021, the Fundació Clínic received a total of **€ 7,195,191** from patronage activities.

The Foundation would like to thank all the individuals, organizations and entities that have collaborated with the institution in 2021.

Communication and public engagement

MEDIA RELATIONS

39 Press releases

3,151 Media Appearances

PUBLIC RELATIONS

12 Events organised

WEB

150 Pieces of news published

SOCIAL MEDIA

Facebook
3,058 page likes*

Twitter
13,741 followers*

Linkedin
9,204 followers*

*at december 31th

PUBLIC ENGAGEMENT

48 Activities organised
(8 different categories of activities)

855 Audience Reached

ACTIVITIES
Primary school students

80 Summer Camp Assistants

ACTIVITIES
Secondary school students

25 Bojos per la Medicina Participants

250 Generació Ciència Assistants

500 #100tífiques Assistants

Institutional news

APRIL

In one year, IDIBAPS-Hospital Clínic collects over 40,000 samples from COVID-19 patients for research purposes. *(Photo 1)*

MAY

IDIBAPS incorporates the 'Translational genomics of colorectal cancer' research group. *(Photo 2)*

OCTOBER

IDIBAPS signs the transparency agreement on the use of animals in scientific experimentation in Spain.

NOVEMBER

Eight researchers at Hospital Clínic-IDIBAPS and Universitat de Barcelona in the ranking of the best in the world. *(Photo 3)*

More than 50 IDIBAPS Clinic researchers on Stanford University's list of most influential scientists.

Nearly 250 students take part in the IDIBAPS science workshops for Science Week. *(Photo 4)*



1



2



3

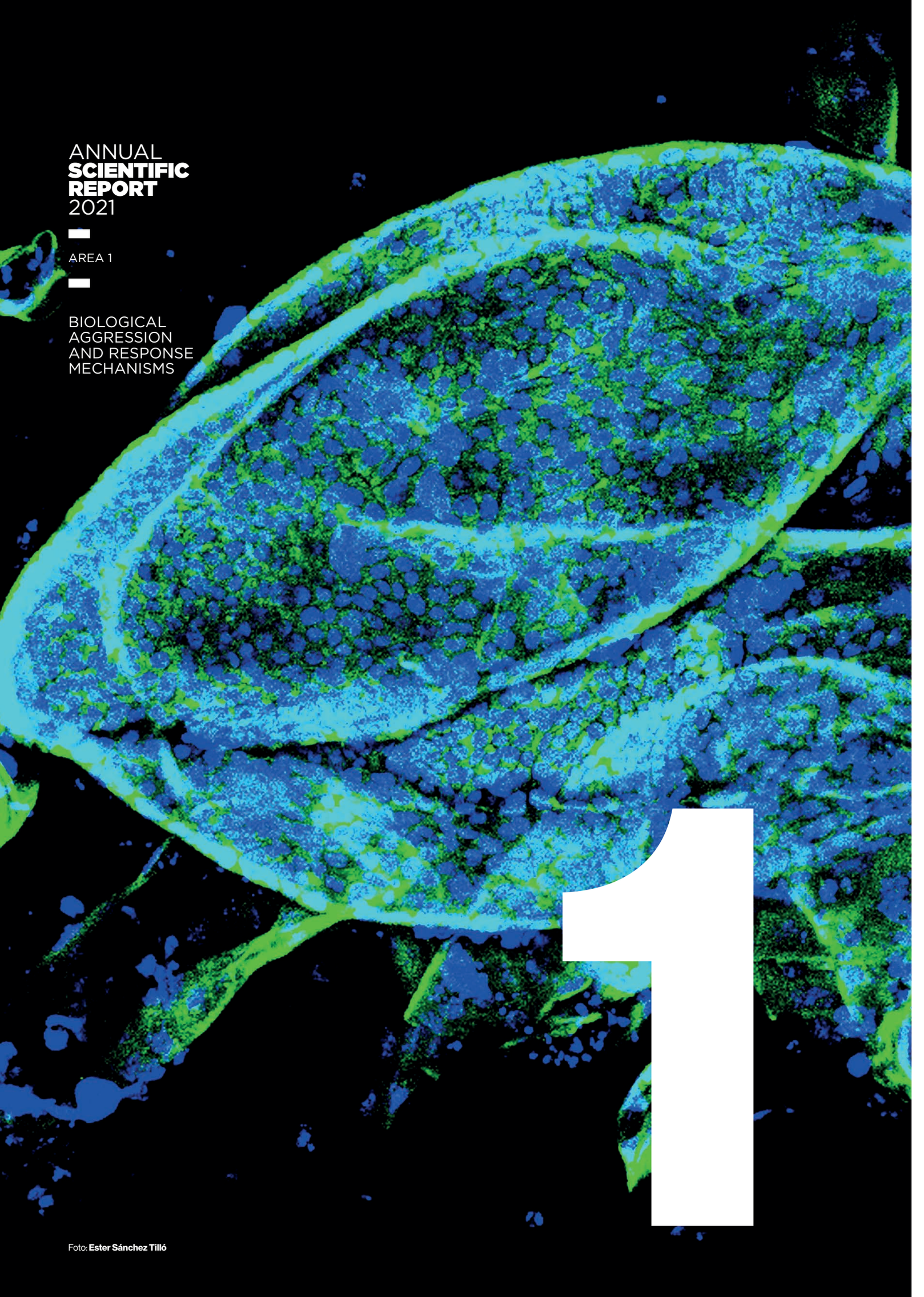


4

ANNUAL SCIENTIFIC REPORT 2021

AREA 1

BIOLOGICAL AGGRESSION AND RESPONSE MECHANISMS



1

Foto: **Ester Sánchez Tilló**

AREA 1

BIOLOGICAL AGGRESSION AND RESPONSE MECHANISMS

1.1 **Ocular inflammation: clinical and experimental studies**
Alfredo Adán

1.2 **Systemic autoimmune diseases**
Ricard Cervera

1.3 **Systemic vasculitis**
Maria Cinta Cid

1.4 **Molecular and cellular bases of inflammation. Structural and biological mass spectrometry**
Daniel Closa

1.5 **Immunogenetics and immunotherapy in autoinflammatory and immune responses**
Manel Juan

1.6 **Immune receptors of the innate and adaptive system**
Francisco Lozano

1.7 **AIDS and HIV infection**
Josep Mallolas

1.8 **Emergencies: processes and pathologies**
Oscar Miró

1.9 **Endocarditis. Cardiovascular infections. Experimental model**
Josep Maria Miró

1.10 **Infections in solid-organ transplant recipients**
Asunción Moreno

1.11 **Inflammatory joint diseases (IJDs)**
Raimon Sanmarti

1.12 **Nosocomial infection**
Alex Soriano

1.1 Ocular inflammation: clinical and experimental studies

LOCATION
Maternitat building

KEYWORDS
1. **Ocular immunopathology**
2. **Retinal imaging**
3. **Biomarkers**
4. **Biological therapies**
5. **Artificial intelligence**

RELATED DISEASES
1. **Uveitis**
2. **Diabetic retinopathy**
3. **Age-related macular degeneration**
4. **Glaucoma**

GROUP INVOLVED IN
AGAUR_SGR17:00701
OFTARED (RETIC)

Original publications

TOTAL	32
Mean IF	**3,76**
Q1	**34%**
D1	**6%**
MA	**47%**
OA	**44%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Ocular inflammation is the underlying cause of many highly prevalent eye diseases with a major socioeconomic burden, such as diabetic retinopathy (DR), age-related macular degeneration (AMD), uveitis, scleritis, and even glaucoma. These diseases often cause irreversible loss of sight.

APPROACH

The group has a multidisciplinary profile and is made up of ophthalmologists, optometrists, biomedical researchers, engineers etc. to tackle this problem from a translational perspective: i.e., in the laboratory, it studies the pathophysiologic mechanisms involved in ocular inflammation and the immune response, and develops new tools that it applies in patients.

There is considerable interaction between basic and clinical research, and clinical practice. The cycle of patient-problem-research-therapy feeds back on itself to provide patients with a better diagnosis and the most appropriate treatments.

On the other hand, advanced retinal imaging techniques based in artificial intelligence are used to investigate the role of potential novel biomarkers of disease, linked to clinical databases of interest in DR and AMD.

IMPACT

The principal objective of the group is to promote research on inflammatory ocular diseases, especially the pathophysiologic mechanisms, the immune response and the development of new therapies, as well as to develop novel retinal imaging techniques to investigate novel biomarkers of disease linked to clinical data.

The group has taken part in the creation of new biological therapies for treating uveitis and aims to transfer this experience to other inflammatory eye diseases.

RESEARCH LINES

- Macular pathology in diabetic patients.

- Molecular basis of the inflammatory component of age-related macular degeneration (AMD) pathobiology.

- New biologic therapies for the treatment of non-infectious uveitis.

- Prognostic factors in patients with macular edema associated with non-infectious uveitis.

- Tuberculosis-related uveitis.

- Glaucoma.

- Retinal imaging, artificial intelligence and clinical databases.

PUBLICATIONS

Originals

1. Suhler EB, Jaffe GJ, Fortin E, Lim LL, Merrill PT, Dick AD, Brezin AP, Nguyen QD, Thorne JE, Van Calster J, Cimino L, Adan A, Goto H, Kaburaki T, Kramer M, Vitale AT, Kron M, Song AP, Liu J, Pathai S, Douglas KM, Schlaen A, Muccioli C, Van Velthoven MEJ, Zierhut M, Rosenbaum JT. **Long-Term Safety and Efficacy of Adalimumab in Patients With Noninfectious Intermediate Uveitis, Posterior Uveitis, or Panuveitis.** *Ophthalmology*. 128(6):899-909. D1

2. Maloca, Peter M.; Mueller, Philipp L.; Lee, Aaron Y.; Tufail, Adnan; Balaskas, Konstantinos; Niklaus, Stephanie; Kaiser, Pascal; Suter, Susanne; Zarranz-Ventura, Javier; Egan, Catherine; Scholl, Hendrik P. N.; Schnitzer, Tobias K.; Singer, Thomas; Hasler, Pascal W.; Denk, Nora. **Unraveling the deep learning gearbox in optical coherence tomography image segmentation towards explainable artificial intelligence.** *Commun Biol.* 4(1). D1

3. Sarmiento-Monroy JC, Espinosa G, Londoño MC, Meira F, Caballol B, Llufriu S, Carrasco JL, Moll-Udina A, Quintana LF, Giavedoni P, Ramírez J, Inciarte-Mundo J, Solana E, Blanco Y, Martinez-Hernandez E, Sepúlveda M, Llorenç V, Prieto-González S, Espigol-Frigolé G, Milisenda JC, Cid MC, Mascaró JM, Blanco I, Barberá JA, Sibila O, Gratacos-Ginès J, Adán A, Agustí A, Sanmartí R, Panés J, Cervera R, Vila J, Soriano A, Gómez-Puerta JA, Immunocovid Clinic. **A multidisciplinary registry of patients with autoimmune and immune-mediated diseases with symptomatic COVID-19 from a single center.** *Journal Of Autoimmunity*. 117:102580. Q1

4. García-Otero X, Mondelo-García C, González F, Perez-Fernandez R, Avila L, Antúnez-López JR, González-Barcia M, Adan A, Aguiar P, Otero-Espinar FJ, Bermúdez MA, Fernández-Ferreiro A. **Anti-Inflammatory Effect of Tacrolimus/Hydroxypropyl-β-Cyclodextrin Eye Drops in an Endotoxin-Induced Uveitis Model.** *Pharmaceutics*. 13(10):1737. Q1

5. Gonzalez-Zamora, Jorge; Bilbao-Malave, Valentina; Gandara, Elsa; Casablanca-Pinera, Anna; Boquera-Ventosa, Claudia; Landecho, Manuel F.; Zarranz-Ventura, Javier; Garcia-Layana, Alfredo. **Retinal Microvascular Impairment in COVID-19 Bilateral Pneumonia Assessed by Optical Coherence Tomography Angiography.** *Biomedicines*. 9(3):247. Q1

6. Bilbao-Malavé V; González-Zamora J; De Viteri MS; De La Puente M; Gándara E; Casablanca-Piñera A; Boquera-Ventosa C; Zarranz-Ventura J; Landecho MF; García-Layana A. **Persistent retinal microvascular impairment in covid-19 bilateral pneumonia at 6-months follow-up assessed by optical coherence tomography angiography.** *Biomedicines*. 9(5):502. Q1

7. Pazos, Marta; Biarnes, Marc; Blasco-Alberto, Andres; Dyrda, Agnieszka; Angel Luque-Fernandez, Miguel; Gomez, Alicia; Mora, Clara; Milla, Elena; Jesus Muniesa, Ma; Anton, Alfonso; Tinguaro Diaz-Aleman, Valentin. **SD-OCT peripapillary nerve fibre layer and ganglion cell complex parameters in glaucoma: principal component analysis.** *British Journal Of Ophthalmology*. 105(4):496-501. Q1

8. Hunt AR; Nguyen V; Creuzot-Garcher CP; Alforja S; Gabrielle PH; Zarranz-Ventura J; Guillemin M; Fraser-Bell S; Casaroli Marano RP; Arnold J; McAllister IL; O'Toole L; Gillies MC; Barthelmes D; Mehta H. **Twelve-month outcomes of ranibizumab versus aflibercept for macular oedema in branch retinal vein occlusion: Data from the FRB! registry.** *British Journal Of Ophthalmology*. Q1

9. Sainz de La Maza M, Hernanz I, Moll-Udina A, Mesquida M, Adan A, Martinez JA, Espinosa G, Llorenç V . **Presumed tuberculosis-related scleritis.** *British Journal Of Ophthalmology*. :bjophthalmol. Q1

10. Bernal-Morales C, Hernández-Martínez A, Navarro-Angulo MJ, Ruiz-Miguel M, Rodriguez-Maqueda M, Velazquez-Villoria D, Cubero-Parra JM, Marticorena J, Ruiz-Casas D, Adan A, Zarranz-Ventura J, Writing Committee on behalf of the Spanish Multicenter Iris-claw IOL study group. **Retropupillary iris-claw intraocular lens and pars plana vitrectomy in aphakia management: A national multicenter audit.** *Retina-The Journal Of Retinal And Vitreous Diseases*. 41(10):2048-2058. Q1

11. Llorenç V; Serrano AR; Mesquida M; Lin P; Esquinas C; Sainz-de-la-Maza M; Metea C; Bosch A; Calvo M; Balter A; Nakamura Y; Molins B; Alba C; Suhler E; Adán A. **Swept- source optical coherence tomography objective composite activity score for uveitis.** *Acta Ophthalmologica*. 99(7):756-764. Q1

12. Martín-Varillas JL, Atienza-Mateo B, Calvo-Rio V, Beltrán E, Sánchez-Bursón J, Adán A, Hernández-Garfella M, Valls-Pascual E, Sellas-Fernández A, Ortego N, Maíz O, Torre I, Fernández-Espartero C, Jovani V, Peiteado D, Valle DD, Aurrecoechea E, Caracuel MA, García-González AJ, Álvarez ER, Vegas-Revenga N, Demetrio-Pablo R, Castañeda S, González-Gay MA, Hernández JL, Blanco R, Ricardo Blanco on behalf of the Spanish Collaborative Group of Refractory Behçet's Disease. **Long Term Follow-up and Optimization of Infliximab in Refractory Uveitis Due to Behçet's Disease.** *Journal Of Rheumatology*. 48(5):741-750. Q2

13. Prieto-Peña D, Calderón-Goercke M, Adán A, Chamorro-López L, Maíz-Alonso O, De Dios-Jiménez Aberásturi JR, Veroz R, Blanco S, Martín-Santos JM, Navarro F, Gallego A, González-Suárez S, Conesa A, García-Valle A, Cordero-Coma M, Pardiñas-Barón N, Demetrio R, Calvo-Río V, Martínez-Taboada VM, Castañeda S, Hernández JL, González-Gay MA, Blanco R . Efficacy and safety of certolizumab pegol in pregnant women with uveitis. **Recommendations on the management with immunosuppressive and biologic therapies in uveitis during pregnancy.** *Clinical And Experimental Rheumatology*. 39(1):105-114. Q2

14. Bernal-Morales C; Alé-Chilet A; Martín-Pinardel R; Barraso M; Hernández T; Oliva C; Vinagre I; Ortega E; Figueras-Roca M;

Sala-Puigdollers A; Gimenez M; Esmatjes E; Adán A; Zarranz-Ventura J. **Optical coherence tomography angiography in type 1 diabetes mellitus. Report 4: Glycated haemoglobin.** *Diagnostics.* 11(9):1537. Q2

15. Jesus Muniesa, Maria; Benitez, Ivan; Ezpeleta, Juan; Sanchez de la Torre, Manuel; Pazos, Marta; Milla, Elena; Barbe, Ferran. **Effect of CPAP Therapy on 24-Hour Intraocular Pressure-Related Pattern From Contact Lens Sensors in Obstructive Sleep Apnea Syndrome.** *Translational Vision Science & Technology.* 10(4):10. Q2

16. Zapata MA, Martín R, Garcia-Arumí C, Fonollosa A, Flores-Moreno I, Gallego-Pinazo R, Gutiérrez E, Abraldes M, Zarranz-Ventura J, On behalf Optretina Reading Group. **Remote screening of retinal and optic disc diseases using handheld nonmydriatic cameras in programmed routine occupational health checkups onsite at work centers**. *Graefes Archive For Clinical And Experimental Ophthalmology.* 259(3):575-583. Q2

17. Figueras-Roca M; Parrado-Carrillo A; Nguyen V; Casaroli-Marano RP; Moll-Udina A; Gillies MC; Barthelmes D; Zarranz-Ventura J. **Treat-and-extend versus fixed bimonthly treatment regimens for treatment-naive neovascular age–related macular degeneration: real world data from the Fight Retinal Blindness registry.** *Graefes Archive For Clinical And Experimental Ophthalmology.* 259(6):1463-1470. Q2

18. Figueras-Roca M; Matas J; Llorens V; Sala-Puigdollers A; Navarro M; Zarranz-Ventura J; Adán A; Molins B. **Systemic contribution of inflammatory mediators to the severity of diabetic and uveitic macular edema.** *Graefes Archive For Clinical And Experimental Ophthalmology.* 259(9):2695-2705. Q2

19. Hernanz I; Moll-Udina A; Llorenç BV; Adan CA. **Ocular Toxocariasis: Beyond Typical Patterns through the New Imaging Technologies.** *Ocular Immunology And Inflammation.* 29(7-8):1252-1258. Q2

20. Miguel-Escuder L, Rocha-de-Lossada C, Sabater-Cruz N, Sánchez-González JM, Spencer F, Marín-Martínez S, Batlle-Ferrando S, Carreras Castañer X, Torras J, Peraza-Nieves J. **Use of Nicergoline as Adjunctive Treatment of Neurotrophic Keratitis in Routine Clinical Practice: A Case Series.** *Ocular Immunology And Inflammation.* :1-5. Q2

21. Cedro, Luca; Hasler, Pascal W.; Meier, Christoph; Povazay, Boris; Burri, Christian; Mooser, Matthias; Kaiser, Pascal; Rothenbuehler, Simon P.; Muller, Philipp L.; Zarranz-Ventura, Javier; Egan, Catherine; Tufail, Adnan; Scholl, Hendrik P. N.; Maloca, Peter M. **Feasibility and Safety of a Coaxial Dual-Wavelength Optical Coherence Tomography Apparatus.** *Ophthalmic Research.* 64(1):55-61. Q2

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24. Miguel-Escuder L, Olate-Pérez Á, Sala-Puigdoners A, Moll-Udina A, Figueras-Roca M, Navarro-Angulo MJ, Adán A, Pelegrín L. **Intravitreal fluocinolone acetonide implant for the treatment of persistent post-surgical cystoid macular edema in vitrectomized eyes.** *European Journal Of Ophthalmology.* (11206721211046718): 11206721211046718. Q3

25. Shah, Jay V.; Albors, Gabriel O.; Williams, Jack; Yuan, Quan; Milla, Elena; Firestone, Murray I.; Simon, Gabriel; Irazoqui, Pedro P. **Clinical Study of the IOPTx (TM) System-an Electroceutical Wearable to Lower Intraocular Pressure.** *Current Eye Research.* 46(10):1531-1538. Q3

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27. Moll-Udina A, Figueras-Roca M, Oliveres J, Sala-Puigdollers A, Esquinas C, Alba-Linero C, Llorenç V, Adán A. **Uveitic macular edema response to intravitreal dexamethasone implant is independent of optical coherence tomography findings.** *International Ophthalmology.* 41(3):787-796. Q3

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29. Sainz-de-la-Maza, Maite; Adan, Alfredo; Ruiz, Iona; Beltran, Emma; Yago, Ines; Jimenez, Rosa; Gomez, Angela; Martin, Ana; Trilla, Antoni;Soc Espanola Inflamacion Ocular. **Quality standards for Comprehensive Care Units for patients with uveitis of the Spanish Society of Ocular Inflammation (SEIOC).** *Medicina Clinica.* 156(2):76-80. Q3

30. Fanlo P; Espinosa G; Adan A; Fonollosa A; Segura A; Heras H; Ruiz-Arruza I; Diestefano L; Solanich X; García O; Artaraz J; de Ramón-Garrido E; Jódar-Márquez M; Rodriguez-Carballeira M; Mousavi K; López-Dupla M; Porras-Ledantes JA; Sole-Forteza E; Rosello-Silvestre N; Añón-Roig MS; Fernandez-Matilla M; Chaques V; Arroyo C; Madroñero-Vuelta AB; Jimenez-Lasanta L; Martín-Armada M; Bueno C; Elejalde I; Echeverria M; Compains E; Solanich-Moreno X; Garcia-Garcia O; Garcia-Bru P; Carrillo-Alascio PL; Ruiz-Nicolás C; Llorenç V; Mesquida M; Eguiluz S; Anaut P; Larrauri A; Fanlo P; Espinosa G; Adan A; Fonollosa A; Segura A; Heras H; Ruiz-Arruza I; Diestefano L; Solanich X; García O; Artaraz J; de Ramón-Garrido E; Jódar-Márquez M; Rodriguez-Carballeira M; Mousavi K; López-Dupla M; Porras-Ledantes JA; Sole-Forteza E; Rosello-Silvestre N; Añón-Roig MS; Fernandez-Matilla M; Chaques V; Arroyo C; Madroñero-Vuelta AB; Jimenez-Lasanta L. **Multidisciplinary care and units for uveitis in the internal medicine departments in Spain: Survey of the Systemic Autoimmune Diseases Group.** *Rev Clin Esp.* 221(4):221-225. Q3

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32. Bernal-Morales C, Dotti-Boada M, Olate-Perez A, Navarro-Angulo MJ, Pelegrín L, Figueras-Roca M. **Simultaneous pars plana vitrectomy, panretinal photocoagulation, cryotherapy, and Ahmed valve implantation for neovascular glaucoma.** *International Journal Of Ophthalmology.* 14(9):1396-1401. Q4

Review

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Editorial

1. Cunningham ET, Adán A, Nguyen QD, Zierhut M . **Tocilizumab for the Treatment of Ocular Inflammatory Disease.** *Ocular Immunology And Inflammation.* 29(1):2-5. Q2

Case Reports

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GRANTS FOR RESEARCH IN PROGRESS

Adán A. **Grup de recerca de malalties inflamatòries oculars.**
Sponsored by: Gerenalitat de Catalunya.
AGAUR_SGR17_701
Duration: 01/01/2017- 30/09/2021

Adán A. **Red Temática de Investigación Cooperativa en Salud - Enfermedades oculares.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_RD16/0008/0013
Duration: 01/01/2017-31/12/2021

Adán A, Llorens V. **Diseño y validación de un índice de actividad objetivo compuesto para la uveítis basado en la tomografía de coherencia óptica Swept-Source.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00316
Duration: 01/01/2018-31/12/2021

Millá E. **Estudio de factores clínicos y biomarcadores en humor acuoso asociados al glaucoma secundario a uveitis.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00407
Duration: 01/01/2020-31/12/2022

Molins B. **Proteína C-reactiva monomérica como Biomarcador y Diana Terapéutica de la Degeneración Macular Asociada a la Edad.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00265
Duration: 01/01/2020-31/12/2022

Sainz de la Maza MT. **Efecto de las estatinas orales en la secreción de las glándulas de meibomio mediante análisis por lipidómica de meibum y de la película lagrimal.**
Sponsored by: Societat Catalana Oftalmologia. SCOFT_BEQUES18_01
Duration: 01/10/2019-30/09/2021

Sánchez-Dalmau B, Villoslada P. **Análisis del daño axonal y desmielinización en la Neuritis Óptica Aguda como modelo de ensayo.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/01236
Duration: 01/01/2021-31/12/2023

Villoslada P. **Multiple manifestations of genetic and non-genetic factors in Multiple Sclerosis disentangled with a multi-omics approach to accelerate personalised medicine.**
Sponsored by: European Commission.
CE_H2020-SC1_16_1s
Duration: 01/01/2017-31/12/2022

Zarranz J. **Impacto de los factores sistémicos en la red capilar perifoveal evaluada con angiografía por tomografía de coherencia óptica en diabetes mellitus tipo 1.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00518
Duration: 01/01/2019-31/12/2022

DOCTORAL THESES

Adán A, Zarranz J. **Evaluación del flujo vascular en la red capilar perifoveal mediante angiografía de tomografía de coherencia óptica en la diabetes mellitus tipo 1.**
PhD student: Marina Barraso Rodrigo

Zarranz J, Adán A. **Manejo de la afaquia: análisis retrospectivo de implante de lentes retropupilares (Artisan® - Verisyse®) ancladas a iris en pacientes con cirugía complicada de catarata o luxación de lente intraocular y vitrectomía pars plana asociada.**
PhD student: Carolina Bernal Morales

1.2 Systemic autoimmune diseases

LOCATION
HCB building
CELLEX building, floor 4B

KEYWORDS
1. **Systemic autoimmune diseases**
2. **Systemic lupus erythematosus**
3. **Antiphospholipid syndrome**
4. **Sjögren's syndrome**
5. **Systemic sclerosis**

RELATED DISEASES
1. **Systemic autoimmune diseases**

GROUP INVOLVED IN
AGAUR_SGR17: 00819, 01413
RETIC: RICORS

Original publications

TOTAL	48
Mean IF	4,99
Q1	35%
D1	8%
MA	50%
OA	58%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Autoimmune diseases are a group of disorders whose exact cause is unknown and in which the immune system attacks one or more organs in the body. More than 110 diseases of this type are currently known, and epidemiological studies estimate that over 10% of the population suffer from one or more of them.

In around forty of these diseases, a generalized attack against the entire body may occur; these are known as systemic autoimmune diseases. They feature highly varied clinical symptoms as a result of the simultaneous or successive involvement of different organs and systems, and they feature different antibodies as biological markers.

The clinical complexity of the diseases makes their diagnosis and control difficult. Current treatments do not yet offer a cure, as well as presenting many side effects.

APPROACH

The group promotes basic, clinical and translational research on systemic autoimmune diseases using a multidisciplinary approach and with the participation of members from different departments of Hospital Clínic, Barcelona.

It also cooperates with different international working groups, for which its team members are national or international coordinators, including: the European Working Party on Systemic Lupus Erythematosus, the European Forum on Antiphospholipid Antibodies, the Catastrophic Antiphospholipid Syndrome (CAPS) Registry Project Group, and Systemic Lupus International Collaborating Clinics (SLICC).

IMPACT

Its study of over 600 patients with systemic lupus erythematosus (SLE) has made it possible to individualize and define different clinical subgroups, such as late-onset SLE, subacute cutaneous lupus erythematosus, silent lupus nephritis, etc.

Another very important aspect of the group's work is its description of antiphospholipid syndrome (APS). This has included the original description both primary APS and catastrophic APS. Similarly, its study of large cohorts of patients with systemic sclerosis, Sjögren's syndrome and mixed cryoglobulinaemia has led to a better clinical description of these diseases.This experience has allowed the group to create and lead various European working groups to study these diseases (European Working Party on Systemic Lupus Erythematosus, European Forum on European Forum on Antiphospholipid Antibodies, etc.).

With our group conducting broad multidisciplinary, multi-centre studies, making use of the extensive clinical cases available will make it possible to improve the clinical and pathogenic description of these diseases and to improve their treatment.

RESEARCH LINES

- Sjögren's syndrome, autoimmune manifestations of hepatitis c virus infection and biological therapies.

- Systemic lupus erythematosus, antiphospholipid syndrome and systemic sclerosis.

PUBLICATIONS

Originals

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GRANTS FOR RESEARCH IN PROGRESS

Cervera R, Panés J. **Taxonomy, treatment, targets and remission-Identification of the molecular mechanisms of non-response to treatments, relapses and remission in autoimmune, inflammatory, and allergic conditions (3TR).**
Sponsored by: European Comission.
CE_IMI2-2018-14
Duration: 01/10/2019-31/09/2026

Espinosa G. **Estudio multimodal de imagen para el diagnóstico y pronóstico de los pacientes con lupus eritematoso sistémico.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/01104
Duration: 01/01/2021-31/12/2023

Ramos-Casals M. **New Clinical Endpoints in primary Sjögren#s Syndrome: an Interventional Trial based on stratifYing patients.**
Sponsored by: European Commission.
CE_IMI2_2017_12th
Duration: 01/01/2019-31/12/2024

DOCTORAL THESES

Espinosa G, Tassies D. **Haplotipos del receptor endotelial de la proteína C (EPCR) y acción sobre la hemostasia de las micropartículas circulantes en el síndrome antifosfolipídico y en el lupus eritematoso sistémico: Relación con la arteriosclerosis y la trombosis.**
PhD student: Miguel Angel Plasín Rodríguez

Casaroli-Marano RP. **Biosustitutos para el tratamiento de la patología de la córnea y la superficie ocular: epidemiología, aplicaciones clínicas y controles microbiológicos.**
PhD student: Noelia Sabater Cruz

1.3 Systemic vasculitis

LOCATION
CELLEX building, floor 4B

KEYWORDS
1. **Vascular inflammation**
2. **Autoimmunity**
3. **Vascular remodelling and fibrosis**
4. **Biomarkers**
5. **Therapeutic targets**
6. **Innovative therapies**

RELATED DISEASES
1. **Systemic vasculitis**
2. **Autoimmune diseases**
3. **Autoinflammatory diseases**

GROUP INVOLVED IN
AGAUR_SGR17: 01592

Original publications

TOTAL	16
Mean IF	**9,74**
Q1	**69%**
D1	**6%**
MA	**0%**
OA	**94%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The systemic vasculitides encompass an heterogenous grup of rare diseases characterised by chronic inflammation of blood vessels. The inflammatory process leads to the occlusion, dilatation or rupture of the involved vasculature with the potential of severe complications.

Vasculitis are categorized according to the size of the vessels involved, since this may impact diagnostic approach and may lead to specific clinical findings and complications. Vasculitis may involve large arteries (giant-cell arteritis, Takayasu arteritis), medium arteries (polyarteritis nodosa, Kawasaki disease) and small vessel vasculitis (ANCA-associated vasculitis [Granulomatosis with polyangiitis, eosinophilic granulomatosis with polyangiitis and microscopic polyangiitis], and immune-complex mediated vasculitis [IgA vasculitis, cryoglobulinemic vasculitis, hypocomplementemic vasculitis])

The vasculitides are relapsing disases and irreversible damage derived from the disease activity or treatments cumulate over the years with a deep impact on quality of life. 5-year mortality is still 15-20%.

APPROACH

The group's research focuses on a) Investigating mechanisms involved in vascular inflammation and remodeling, b) Accurate characterization of clinical cohorts with prospectively recorded data, c) Identifiying biomarkers clinically useful for diagnosis, prognosis, assessment of disease activity and prediction of reponse to conventional and new therapies, d) Development of functional models and pre-clinical testing of targeted therapies, e) Design and performance of innovative clinical trials. The group studies pathogenic pathways related to the development of inflammation and vascular remodelling in samples (blood, tissue and primary cultures) from patients with vasculitis, using biochemical, cellular and molecular biology techniques, in vitro functional models (adhesion, migration, chemotaxis, angiogenesis) and ex-vivo tissue cultures. Both candidate molecule approach and omics are used for biomarker studies which are applied to carefully characterized prospective patient cohorts with defined clinical and imaging outcomes. The group has developed a wide network of national and international collaborations, essential for studies on rare diseases.

IMPACT

The group has contributed to:

- Improvement of the diagnostic accuracy of systemic vaculitis by identifying histopathologic and imaging findings with diagnostic potential

-Identification of clinical, biologic and immunopathologic (blood and tissue) biomarkers predictors of vascular complications or relapsing disease

- Contribution to large-scale genetic studies characterizing the genetic background of giant-cell arteritis and eosinophilic granulomatosis with polyangiitis.

- Development of original functional models (primary cells, co-cultures and ex-vivo 3D tissue culture). These have attracted the interest of companies leading to research agreements and are currently used by other reearchers.

- Identification of potential therapeutic targets ad pre-clinical testing of targeted therapies.

-Participation in the design and performance of innovative clinical trials leading to the approval of new treatments.

- Contribution of the group have impacted national and international guidelines for the management of systemic vasculitis. Reflected in the most important national and international clinical guidelines.

RESEARCH LINES

SYSTEMIC VASCULITIS. MECHANISMS INVOLVED IN INFLAMMATION AND VASCULAR REMODELING AS A SOURCE OF BIOMARKERS OF CLINICAL UTILITY AND THERAPEUTIC TARGETS

- Accurate characterization of patient cohorts (systemic vasculitis and autoinflammatory diseases) according to relevant outcomes (disease extent, relapses, complications derived from vascular occlusion or dilatation, or reparative fibrosis, treatment toxicity) according to international consensus.

- Identification of biomarkers associated with specific phenotypes, prognosis or response to therapies (clinical or imaging data, genetic, epigenetic, immunopathological or molecular biomarkers in biologic fluids or tissues) through candidate biomarker approach or through multi-omic approaches, locally or through multi-centre collaboration.

- Funtional testing of candidate molecules/pathways in in vitro models including primary cell cultures and co-cultures, biologic models (adhesion, migration, angiogenesis), 3D-models, ex-vivo explants.

- Generation of pre-clinical data with targeted therapies in these models.

- Participation in the design and performance of innovative clinical trials with targeted therapies in patients with systemic vasculitis.

Originals

1. Valero JG, Matas-Céspedes A, Arenas F, Rodriguez V, Carreras J, Serrat N, Guerrero-Hernández M, Yahiaoui A, Balagué O, Martin S, Capdevila C, Hernández L, Magnano L, Rivas-Delgado A, Tannheimer S, Cid MC, Campo E, López-Guillermo A, Colomer D, Pérez-Galán P . **The receptor of the colony-stimulating factor-1 (CSF-1R) is a novel prognostic factor and therapeutic target in follicular lymphoma.** *Leukemia*. 35(9):2635-2649. D1

2. Stone JH; Han J; Aringer M; Blockmans D; Brouwer E; Cid MC; Dasgupta B; Rech J; Salvarani C; Spiera R; Unizony SH; Bao M; GiACTA investigators. **Long-term effect of tocilizumab in patients with giant cell arteritis: open-label extension phase of the Giant Cell Arteritis Actemra (GiACTA) trial.** *The Lancet Rheumatology*. 3(5):e328-e336. Q1

3. Fernandez-Codina, Andreu; Pinilla, Blanca; Pinal-Fernandez, Iago; Carballo, Iago; Feijoo-Masso, Carlos; Toledano-Macias, Maria; De Miguel-Campo, Borja; Fonseca-Aizpuru, Eva; Saez-Comet, Luis; Lopez-Dupla, Miguel; Hernandez-Rodriguez, Jose; Martinez-Valle, Fernando. **Performance of the 2019 ACR/EULAR classification criteria for IgG4-related disease and clinical phenotypes in a Spanish multicentre registry (REERIGG4).** *Rheumatology*. 60(1):217-223. Q1

4. Stone JH; Spotswood H; Unizony SH; Aringer M; Blockmans D; Brouwer E; Cid MC; Dasgupta B; Rech J; Salvarani C; Spiera R; Bao M. **New-onset versus relapsing giant cell arteritis treated with tocilizumab: 3-year results from a randomized controlled trial and extension**. *Rheumatology*. 2021(00):1-8. Q1

5. Sota J; Rigante D; Cimaz R; Cattalini M; Frassi M; Manna R; Sicignano LL; Verrecchia E; Aragona E; Maggio MC; Lopalco G; Emmi G; Parronchi P; Cauli A; Wiesik-Szewczyk E; Hernández-Rodríguez J; Gaggiano C; Tarsia M; Mourabi M; Ragab G; Vitale A; Fabiani C; Frediani B; Lamacchia V; Renieri A; Cantarini L; Autoinflammatory Diseases Alliance (AIDA) and the Autoinflammatory Diseases Working Group of the Italian Society of Rheumatology (SIR). **Drug survival of anakinra and canakinumab in monogenic autoinflammatory diseases: observational study from the International AIDA Registry.** *Rheumatology*. 60(12):5705-5712. Q1

6. Sarmiento-Monroy JC, Espinosa G, Londoño MC, Meira F, Caballol B, Llufriu S, Carrasco JL, Moll-Udina A, Quintana LF, Giavedoni P, Ramírez J, Inciarte-Mundo J, Solana E, Blanco Y, Martinez-Hernandez E, Sepúlveda M, Llorenç V, Prieto-González S, Espígol-Frigolé G, Milisenda JC, Cid MC, Mascaró JM, Blanco I, Barberá JA, Sibila O, Gratacos-Ginès J, Adán A, Agustí A, Sanmartí R, Panés J, Cervera R, Vila J, Soriano A, Gómez-Puerta JA, Immunocovid Clinic. **A multidisciplinary registry of patients with autoimmune and immune-mediated diseases with symptomatic COVID-19 from a single center.** *Journal Of Autoimmunity*. 117:102580. Q1

7. Garcia-Vidal C, Alonso R, Camon AM, Cardozo C, Albiach L, Agüero D, Marcos MA, Ambrosioni J, Bodro M, Chumbita M, de la Mora L, Garcia-Pouton N, Dueñas G, Hernandez-Meneses M, Inciarte A, Cuesta G, Meira F, Morata L, Puerta-Alcalde P, Herrera S, Tuset M, Castro P, Prieto-Gonzalez S, Almuedo-Riera A, Mensa J, Martínez JA, Sanjuan G, Nicolas JM, Del Rio A, Muñoz J, Vila J, Garcia F, Soriano A, Hospital Clinic of Barcelona COVID-19 Research Group. **Impact of remdesivir according to the pre-admission symptom duration in patients with COVID-19.** *Journal Of Antimicrobial Chemotherapy*. 76(12):3296-3302. Q1

8. Gaggiano C; Rigante D; Hernández-Rodríguez J; Vitale A; Tarsia M; Soriano A; Lopalco G; Iannone F; Abdel Jaber M; Giacomelli R; Wi sik-Szewczyk E; Cattalini M; Frassi M; Piga M; Ragab G; Sota J; Zunica F; Floris A; Sabato V; Hegazy MT; Araújo O; Pelegrín L; Fabbiani A; Renieri A; Grosso S; Fabiani C; Frediani B; Cantarini L. **Anakinra and canakinumab for patients with R92Q-associated autoinflammatory syndrome: a multicenter observational study from the AIDA Network.** *Therapeutic Advances In Musculoskeletal Disease*. 13:1759720X211037178. Q1

9. Laurent C; Prieto-González S; Belnou P; Carrat F; Fain O; Dellal A; Cid MC; Hernández-Rodríguez J; Mekinian A. **Prevalence of cardiovascular risk factors, the use of statins and of aspirin in Takayasu Arteritis.** *Scientific Reports*. 11(1):14404. Q1

10. Picado C; Ortiz de Landazuri I; Vlagea A; Bobolea I; Arismendi E; Amaro R; Sellarés J; Bartra J; Sanmarti R; Hernandez-rodriguez J; Mascaró JM; Colmenero J; Vaquero EC; Pascal M. **Spectrum of disease manifestations in patients with selective immunoglo-**

bulin E deficiency. *Journal Of Clinical Medicine.* 10(18):4160. Q1

11. Remuzgo-Martínez S; Atienza-Mateo B; Ocejo-Vinyals JG; Genre F; Pulito-Cueto V; Mora-Cuesta VM; Iturbe-Fernández D; Lera-Gómez L; Pérez-Fernández R; Prieto-Peña D; Irure J; Romero-Bueno F; Sanchez-Pernaute O; Alonso-Moralejo R; Nuño L; Bonilla G; Vicente-Rabaneda EF; Grafia I; Prieto-González S; Narvaez J; Trallero-Araguas E; Selva-O'Callaghan A; Spanish Biomarkers of Antisynthetase Syndrome Consortium; Spanish Biomarkers of Interstitial Lung Disease Consortium; Gualillo O; Cavagna L; Cifrián JM; Renzoni EA; Castañeda S; López-Mejías R; González-Gay MA Spanish Biomarkers of Antisynthetase Syndrome Consortium; Spanish Biomarkers of Interstitial Lung Disease Consortium. **Role of MUC1 rs4072037 polymorphism and serum KL-6 levels in patients with antisynthetase syndrome.** *Scientific Reports.* 11(1):22574. Q1

12. Samson M, Greigert H, Ciudad M, Gerard C, Ghesquière T, Trad M, Corbera-Bellalta M, Genet C, Ouandji S, Cladière C, Thebault M, Ly KH, Liozon E, Maurier F, Bienvenu B, Terrier B, Guillevin L, Charles P, Quipourt V, Devilliers H, Gabrielle PH, Creuzot-Garcher C, Tarris G, Martin L, Saas P, Audia S, Cid MC, Bonnotte B . **Improvement of Treg immune response after treatment with tocilizumab in giant cell arteritis.** *Clin Transl Immunology.* 10(9):e1332. Q2

13. Remuzgo-Martínez S, Atienza-Mateo B, Ocejo-Vinyals JG, Pulito-Cueto V, Prieto-Peña D, Genre F, Marquez A, Llorca J, Mora Cuesta VM, Fernández DI, Riesco L, Ortego-Centeno N, Gómez NP, Mera A, Martínez-Barrio J, López-Longo FJ, Lera-Gómez L, Moriano C, Díez E, Tomero E, Calvo-Alén J, Romero-Bueno F, Sanchez-Pernaute O, Nuño L, Bonilla G, Grafia I, Prieto-González S, Narvaez J, Trallero-Araguas E, Selva-O'Callaghan A, Gualillo O, Martín J, Cavagna L, Castañeda S, Cifrian JM, Renzoni EA, López-Mejías R, González-Gay MA. **HLA association with the susceptibility to anti-synthetase syndrome.** *Revue Du Rhumatisme.* 88(3):105115. Q2

14. Espinosa, Gerard; Prieto-Gonzalez, Sergio; Llevadot, Mireia; Marco-Hernandez, Javier; Martinez-Artuna, Antonio; Perez-Isidro, Albert; Rife, Elia; Cervera, Ricard. **The impact of SARS-CoV-2 coronavirus infection in patients with systemic lupus erythematosus from a single center in Catalonia.** *Clinical Rheumatology.* 40(5):2057-2063. Q3

15. Capdevila-Reniu A, Pellice M, Prieto-González S, Ventosa H, Ladino A, Naval J, Rodriguez-Nuñez O, César Milisenda J, Moreno-Lozano PJ, Soriano A, Bosch X, López-Soto A, Hospital Clínic COVID-19 Research Group. **Clinical characteristics and outcome of patients aged over 80 years with covid-19.** *Medicine.* 100(8):e24750. Q3

16. Lopes, ED; Balbi, GGM; Tektonidou, MG; Pengo, V; Sciascia, S; Ugarte, A; Belmont, HM; Gerosa, M; Fortin, PR; Lopez-Pedrera, C; Ji, LL; Cohen, H; de Jesus, GR; Branch, DW; Nalli, C; Petri, M; Rodriguez, E; Kello, N; Rios-Garces, R; Knight, JS; Atsumi, T; Willis, R; Bertolaccini, ML; Erkan, D; Andrade, D. **Clinical and laboratory characteristics of Brazilian versus non-Brazilian primary antiphospholipid syndrome patients in AntiPhospholipid Syndrome Alliance for Clinical Trials and InternatiOnal Networking (APS ACTION) clinical database and repository**. *Advances In Rheumatology.* 61(1):64. Q4

17. Serrano M, Espinosa G, Lalueza A, Bravo-Gallego LY, Diaz-Simón R, Garcinuño S, Gil-Etayo J, Moises J, Naranjo L, Prieto-González S, Ruiz-Ortiz E, Sánchez B, Moreno-Castaño AB, Díaz-Pedroche C, Viñas-Gomis O, Cervera R, Serrano A; APS-COVID 19 Study Group/European Forum on Antiphospholipid Antibodies. **Beta-2-Glycoprotein-I Deficiency Could Precipitate an Antiphospholipid Syndrome-like Prothrombotic Situation in Patients With Coronavirus Disease.** *ACR Open Rheumatol. 3(4):267-276.*

Review

1. Kronbichler A; Geetha D; Smith RM; Egan AC; Bajema IM; Schönermarck U; Mahr A; Anders HJ; Bruchfeld A; Cid MC; Jayne DRW. **The COVID-19 pandemic and ANCA-associated vasculitis - reports from the EUVAS meeting and EUVAS education forum.** *Autoimmunity Reviews.* 20(12):102986. D1

2. Atzeni F, Masala IF, Rodríguez-Carrio J, Ríos-Garcés R, Gerratana E, La Corte L, Giallanza M, Nucera V, Riva A, Espinosa G, Cervera R . **The Rheumatology Drugs for COVID-19 Management: Which and When?** *Journal Of Clinical Medicine.* 10(4):783. Q1

3. Dominguez-Quintana, Maricruz; Alba, Marco A.; Hinojosa-Azaola, Andrea. **Classification of ANCA-associated vasculitis: differences based on ANCA specificity and clinicopathologic phenotype.** *Rheumatology International.* 41(10):1717-1728. Q4

Editorial

1. Cid MC; Espígol-Frigolé G. **Risks and benefits of tocilizumab monotherapy in giant cell arteritis.** *The Lancet Rheumatology.* 3(9):e606. Q1

2. Ríos-Garcés R, Cervera R . **Anti Ro52 antibodies: One step further, but still not there yet.** *European Journal Of Internal Medicine.* 91(91):31-32. Q1

Case Reports

1. Espígol-Frigolé G, Prieto-González S, Grau JM, Cid MC. **An 80-year-old man with headache, orbital pain and elevated ESR: challenges in the diagnosis of a patient with suspected giant cell arteritis.** *Rheumatology.* 60(3):12-14. Q1

2. Aldea-Pares, A; Alves, A S; Vasconcelo Barros, C; Boncoraglio, M T; Redondo-Urda, M J; Sanfeliu, E; Prieto-Gonzalez, S; Espinosa, G. **Unilateral granulomatous mastitis in a pregnant woman as a first manifestation of sarcoidosis.** *Scandinavian Journal Of Rheumatology.* 50(5):406-408. Q3

Consortium Publications

1. Jayne DRW; Merkel PA; Schall TJ; Bekker P; ADVOCATE Study Group ADVOCATE Study Group. **Avacopan for the Treatment of ANCA-Associated Vasculitis.** *New England Journal Of Medicine.* 384(7):599-609. D1

2. Gleich GJ; Roufosse F; Chupp G; Faguer S; Walz B; Reiter A; Yancey SW; Bentley JH; Steinfeld J; HES Mepolizumab Study Group HES Mepolizumab Study Group. **Safety and Efficacy of Mepolizumab in Hypereosinophilic Syndrome: An Open-Label Extension Study.** *Journal Of Allergy And Clinical Immunology-In Practice.* 9(12):4431-4440.e1. Q1

3. Monti S; Craven A; Klersy C; Montecucco C; Caporali R; Watts R; Merkel PA; DCVAS Collaborators. **Association between age at disease onset of anti-neutrophil cytoplasmic antibody-associated vasculitis and clinical presentation and short-term outcomes.** *Rheumatology.* 60(2):617-628. Q1

GRANTS FOR RESEARCH IN PROGRESS

Cid MC, Pérez-Galán P. **Interacciones multi-celulares en la progresión de las enfermedades inflamatorias crónicas y síndromes linfoproliferativos: modelos 3D para investigar inmunoterapias dirigidas.**
Sponsored by: Ministerio de Economía y Competitividad. MINECO_SAF2017-88275-R
Duration: 01/01/2018-30/06/2021

Cid MC. **Impacto inmunopatológico de las terapias dirigidas en explantes y organoides. Hacia una medicina personalizada para pacientes con arteritis de células gigantes.**
Sponsored by: Agencia Estatal de Investigación. AEI_PE20
Duration: 01/09/2021-31/08/2024

Cid MC. **HEalth data LInkage for ClinicAL benefit.**
Sponsored by: European Commission. CE_H2020-MSCA-ITN-18
Duration: 01/01/2019-31/12/2022

Cid MC. **Effects of blocking IL-6 receptor with tocilizumab on ex-vivo cultured arteries from patients with giant-cell arteritis. Searching for predictors of response.**
Sponsored by: Vasculitis Foundation. INT_VASCFOUND_RG_18_01
Duration: 01/06/2019-30/03/2022

Espigol-Frigolé G. **Vasculitis de pequeño vaso rodeando a una arteria temporal preservada: significado clínico y búsqueda de biomarcadores de utilidad diagnóstica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI15/00092
Duration: 01/01/2016-30/11/2021

Espigol-Frigolé G. **Perfil de expresión génica en linfocitos T CD4 + de pacientes con Granulomatosis Eosinofilica con Eosinofílica con Poliangeitis o Síndrome de Churg-Strauss.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00461
Duration: 01/01/2019-30/09/2022

1.4 Molecular and cellular bases of inflammation. Structural and biological mass spectrometry

LOCATION
IIBB-CSIC labs

KEYWORDS
1. **Inflammation**
2. **Fibrosis**
3. **Proteomics**
4. **Cell therapy**
5. **Exosomes**
6. **Wastewater epidemiology**

RELATED DISEASES
1. **Pancreatitis**
2. **Lung fibrosis**
3. **Pancreatic cancer**

GROUP INVOLVED IN
AGAUR_SGR17: 01228

Original publications

TOTAL	5
Mean IF	7,74
Q1	100%
D1	20%
MA	20%
OA	100%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Many diseases involve alterations of the body's defence mechanisms and tissue-repair mechanisms. This leads to inflammatory modifications and fibrous tissue that sometimes becomes the disease's main problem.

This group researches inflammatory and fibrotic processes in respiratory and digestive diseases, such as idiopathic pulmonary fibrosis, pancreatic cancer, and acute pancreatitis.

APPROACH

The group studies intercellular signalling mechanisms based on the exchange of soluble molecules and on those transported by extracellular vesicles, the interaction cell/cell, the phenotypic changes associated with these diseases, and the alteration of different markers at the molecular level.

It also develops techniques for analysing biomolecules using mass spectrometry , including envirommental proteomics directed to the characterization of human protein biomarkers in sewage.

IMPACT

The group aims to discover innovative strategies that, by altering the communication between cells, will make it possible to develop new therapeutic applications for different diseases.

The group has already developed a new therapy for treating idiopathic pulmonary fibrosis, based on the transplantation of alveolar cells. It was also a pioneer in describing the role of exosomes (groups of proteins) in the progression of inflammation in different tissues during the course of pancreatitis.

Finally, it has published the first database of phosphorylation sites for the human lymphocyte, with over 2,000 modification sites.

RESEARCH LINES

- Molecular and cellular bases of inflammation and remodeling.

- Structural, biological and environmental mass spectrometry.

PUBLICATIONS

Originals

1. Barrachina MN, Hermida-Nogueira L, Moran LA, Casas V, Hicks SM, Sueiro AM, Di Y, Andrews RK, Watson SP, Gardiner EE, Abian J, Carrascal M, Pardo M, García Á. **Phosphoproteomic Analysis of Platelets in Severe Obesity Uncovers Platelet Reactivity and Signaling Pathways Alterations.** *Arteriosclerosis Thrombosis And Vascular Biology.* 41(1):478-490. D1

2. Chauvigné F, Ducat C, Ferré A, Hansen T, Carrascal M, Abián J, Finn RN, Cerdà J. **A multiplier peroxiporin signal transduction pathway powers piscine spermatozoa.** *Proceedings Of The National Academy Of*

Sciences Of The United States Of America. 118(10):e2019346118. Q1

3. Fraunhoffer NA, Closa D, Folch-Puy E, Abuelafia AM, Calvo EL, Chuluyan E, Iovanna J. **Targeting REG3β limits pancreatic ductal adenocarcinoma progression through CTGF downregulation**. *Cancer Letters.* 521:64-70. Q1

4. Perez-Lopez C; Ginebreda A; Carrascal M; Barcelò D; Abian J; Tauler R. **Non-target protein analysis of samples from wastewater treatment plants using the regions of interest-multivariate curve resolution (ROIMCR) chemometrics method.** *Journal Of Environmental Chemical Engineering.* 9(4). Q1

5. Lopez-Rodriguez, Elena; Gay-Jordi, Gemma; Knudsen, Lars; Ochs, Matthias; Serrano-Mollar, Anna. **Improved Alveolar Dynamics and Structure After Alveolar Epithelial Type II Cell Transplantation in Bleomycin Induced Lung Fibrosis.** *Frontiers Of Medicine.* 8(640020):640020. Q2

Case Reports

1. Aran, A; Peg, V; Rabanal, RM; Bernado, C; Zamora, E; Molina, E; Arribas, YA; Arribas, J; Perez, J; Roura-Mir, C; Carrascal, M; Cortes, J; Marti, M. **Epstein-Barr Virus plus B Cells in Breast Cancer Immune Response: A Case Report.** *Frontiers In Immunology.* 12(761798):761798. Q1

GRANTS FOR RESEARCH IN PROGRESS

Closa D. **Importancia de los microRNAs transportados por exosomas en la progresión de la inflamación sistémica durante la pancreatitis aguda.**
Sponsored by: Asociación Española de Gastro Enterología (AEG). AEG_BECAGONMIÑO_01
Duration: 01/03/2017-

1.5 Immunogenetics and immunotherapy in autoinflammatory and immune responses

LOCATION
CEK building, floor 1

KEYWORDS
1. **Autoinflammation**
2. **Immunogenetics**
3. **Inflammasome**
4. **Cell Immunotherapy**
5. **Immunodeficiencies**
6. **CAR-T and gene modified T-cells**

RELATED DISEASES
1. **Autoinflammatory diseases**
2. **Cancer**
3. **Immunodeficiencies**
4. **Transplantation**
5. **Autoimmunity**

GROUP INVOLVED IN
AGAUR_SGR17: 01539

AWARDS
Premios BiC 2021 (Best in Class) - Mejor Unidad de Referencia en Terapias celulares CART-T
Institution: Gaceta Médica
Awardee/s: Unidad de Terapias CAR-T del Hospital Clínic – Dr. Manel Juan

Original publications

TOTAL	20
Mean IF	7,05
Q1	75%
D1	40%
MA	20%
OA	60%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Genes define the immune system as any biological cell system and, consequently, most human diseases. Therefore, immunogenetics is the basis for different diagnostic tools and treatments that are valid for many diseases, from autoinflammatory disorders to cancer.

The group uses immunogenetics to better understand and diagnose immune-mediated diseases, and particularly to generate its own cellular drugs in order to treat many of these diseases, starting with cancer using dendritic cells, TILs and CAR T cells, and in addition, to detect and obtain purposeful T-cells that can act as a measure of immune status and potential therapy against infections such as SARS-CoV2.

APPROACH

The group's research involves defining the molecular bases of certain diseases (especially problems at the genetic level), proposing a better diagnosis, and developing cellular immunotherapy strategies (the use of cells as treatment) in order to solve the abnormal functioning of patients' immune systems.

In infectious diseases, the focus is on the therapeutic options of the cellular response, coming to have tools to manipulate samples of individuals to detect and develop anti-pathogen and suppressor T-cells as a plausible therapy, now in the field of SARS-CoV2 infection.

In the case of cancer, the immunotherapy developed by the group aims to restore the patients' antitumor response, which makes it possible to control and even cure certain tumours. Some of our proposals use gene therapy to improve the function of these cancer cell therapies, being CAR T-cells the main example.

IMPACT

After thousands of patients with genetic diseases have been diagnosed and hundreds treated with cellular immunotherapy, the aim of the group is to provide the hospital with therapeutic tools for patients who have no other options.

Specifically, the group develops and presents clinical trials based on cell therapy to the Spanish Agency for Medicine and Medical Devices (AEMPS), which has approved CAR-T ARI-0001, as an advanced therapy drug of non-industrial production for its use in patients over 25 years of age with lymphoblastic leukaemia that is resistant to conventional treatments. This authorization usually named "Hospital Exemption" is now under additional evaluation by European Medicine Agency (EMA) after PRIME (Priority Medicine) designation, becoming the first academic product to deserve this designation focused on centralized approval.

RESEARCH LINES

- Cellular and genetic immunotherapy for the treatment of cancer and other immune-mediated diseases.

- Genetic and epigenetic diagnosis of autoinflammatory disease.

- Molecular determination of the T-cell specific immune response.

PUBLICATIONS

Originals

1. Esteve-Sole A, Anton J, Pino-Ramírez RM, Sanchez-Manubens J, Fumadó V, Fortuny C, Rios-Barnes M, Sanchez-de-Toledo J, Girona-Alarcón M, Mosquera JM, Ricart S, Launes C, de Sevilla MF, Jou C, Muñoz-Almagro C, González-Roca E, Vergara A, Carrillo J, Juan M, Cuadras D, Noguera-Julian A, Jordan I, Alsina L. **Similarities and differences between the immunopathogenesis of COVID-19-related pediatric inflammatory multisystem syndrome and Kawasaki disease.** *Journal Of Clinical Investigation.* 131(6):144554. D1

2. Bachiller M, Perez-Amill L, Battram AM, Carné SC, Najjar A, Verhoeyen E, Juan M, Urbano-Ispizua A, Martin-Antonio B. **NK cells enhance CAR-T cell antitumor efficacy by enhancing immune/tumor cells cluster formation and improving CAR-T cell fitness.** *Journal For Immunotherapy Of Cancer.* 9(8):e002866. D1

3. Sanchez-Martinez D, Gutierrez-Aguera F, Romecin P, Vinyoles M, Palomo M, Tirado N, Zanetti SR, Juan M, Carlet M, Jeremias I, Menendez P. **Enforced sialyl-Lewis-X (sLeX) display in E-selectin ligands by exofucosylation is dispensable for CD19-CAR T-cell activity and bone marrow homing.** *Clinical And Translational Medicine.* 11(2):e280. D1

4. Ortíz-Maldonado V, Rives S, Castellà M, Alonso-Saladrigues A, Benítez-Ribas D, Caballero-Baños M, Baumann T, Cid J, Garcia-Rey E, Llanos C, Torrebadell M, Villamor N, Giné E, Díaz-Beyá M, Guardia L, Montoro M, Català A, Faura A, González EA, Español-Rego M, Klein-González N, Alsina L, Castro P, Jordan I, Fernández S, Ramos F, Suñé G, Perpiñá U, Canals JM, Lozano M, Trias E, Scalise A, Varea S, Sáez-Peñataro J, Torres F, Calvo G, Esteve J, Urbano-Ispizua Á, Juan M, Delgado J. **CART19-BE-01: A Multicenter Trial of ARI-0001 Cell Therapy in Patients with CD19+ Relapsed/Refractory Malignancies.** *Molecular Therapy.* 29(2):636-644. D1

5. Cabo M, Santana-Hernández S, Costa-Garcia M, Rea A, Lozano-Rodríguez R, Ataya M, Balaguer F, Juan M, Ochoa MC, Menéndez S, Comerma L, Rovira A, Berraondo P, Albanell J, Melero I, López-Botet M, Muntasell A. **CD137 Costimulation Counteracts TGFβ Inhibition of NK-cell Antitumor Function**. *Cancer Immunology Research.* 9(12):1476-1490. D1

6. Sharma A, Naidu G, Sharma V, Jha S, Dhooria A, Dhir V, Bhatia P, Bhattad S, Chengappa KG, Gupta V, Misra DP, Chavan PP, Malaviya S, Dudam R, Sharma B, Kumar S, Bhojwani R, Gupta P, Agarwal V, Sharma K, Singhal M, Rathi M, Nada R, Minz RW, Chaturvedi V, Aggarwal A, Handa R, Grossi A, Gattorno M, Huang Z, Wang J, Jois R, Negi VS, Khubchandani R, Jain S, Arostegui JI, Chambers EP, Hershfield MS, Aksentijevich I, Zhou Q, Lee PY. **Deficiency of adenosine deaminase 2 (DADA2) in Adults and Children: Experience from India.** *Arthritis & Rheumatology.* 73(2):276-285. D1

7. Cucchiari D, Egri N, Bodro M, Herrera S, Del Risco-Zevallos J, Casals-Urquiza J, Cofan F, Moreno A, Rovira J, Banon-Maneus E, Ramirez-Bajo MJ, Ventura-Aguiar P, Pérez-Olmos A, Garcia-Pascual M, Pascal M, Vilella A, Trilla A, Ríos J, Palou E, Juan M, Bayés B, Diekmann F. **Cellular and humoral response after mRNA-1273 SARS-CoV-2 vaccine in kidney transplant recipients.** *American Journal Of Transplantation.* 21(8):2727-2739. D1

8. Herrera S, Colmenero J, Pascal M, Escobedo M, Castel MA, Sole-González E, Palou E, Egri N, Ruiz P, Mosquera M, Moreno A, Juan M, Vilella A, Soriano A, Farrero M, Bodro M . **Cellular and humoral immune response after mRNA-1273 SARS-CoV-2 vaccine in liver and heart transplant recipients.** *American Journal Of Transplantation.* 21(12):3971-3979. D1

9. Perez-Amill L, Suñe G, Antoñana-Vildosola A, Castella M, Najjar A, Bonet J, Fernández-Fuentes N, Inogés S, López A, Bueno C, Juan M, Urbano-Ispizua A, Martín-Antonio B . **Preclinical development of a humanized chimeric antigen receptor against B cell maturation antigen for multiple myeloma.** *Haematologica.* 106(1):173-184. Q1

10. Mozas P, Rivero A, Rivas-Delgado A, Fabregat A, Piñeyroa JA, Correa JG, Nadeu F, Oliver A, Bataller A, Giné E, Delgado J, Villamor N, Cibeira MT, Fernández de Larrea C, Rosiñol L, Campo E, Aróstegui JI, Bladé J, Magnano L, López-Guillermo A. **Baseline correlations and prognostic impact of serum monoclonal proteins in follicular lymphoma.** *British Journal Of Haematology.* 193(2):299-306. Q1

11. Juan M, Delgado J, Calvo G, Trias E, Urbano-Ispizua A. **Is Hospital Exemption an alternative or a bridge to EMA for developing Academic CAR-T in Europe? Our experience with ARI0001.** *Human Gene Therapy.* 32(19-20):1004-1007. Q1

12. Deyà-Martínez A, Alonso-Saladrigues A, García AP, Faura A, Torrebadell M, Vlagea A, Català A, Esteve-Solé A, Juan M, Rives S, Alsina L. **Kinetics of humoral deficiency in CART19-treated children and young adults with acute lymphoblastic leukaemia**. *Bone Marrow Transplantation.* 56(2):376-386. Q1

13. Gonzalez-Manso A, Agut-Busquet E, Romani J, Vilarrasa E, Bittencourt F, Mensa A, Canto E, Arostegui JI, Vidal S. **Hidradenitis Suppurativa: Proposal of Classification in Two Endotypes with Two-Step Cluster Analysis.** *Dermatology.* 237(3):365-371. Q1

14. Solís-Moruno M, Mensa-Vilaró A, Batlle-Masó L, Lobón I, Bonet N, Marquès-Bonet T, Aróstegui JI, Casals F. **Assessment of the gene mosaicism burden in blood and its implications for immune disorders.** *Scientific Reports.* 11(1):12940. Q1

15. Picado C, Ortiz de Landazuri I, Vlagea A, Bobolea I, Arismendi E, Amaro R, Sellarés J,

Bartra J, Sanmarti R, Hernandez-Rodriguez J, Mascaró JM, Colmenero J, Vaquero EC, Pascal M. **Spectrum of disease manifestations in patients with selective immunoglobulin E deficiency.** *Journal Of Clinical Medicine.* 10(18):4160. Q1

16. Cuervo A, Sanmartí R, Ramírez J, Castellanos-Moreira R, Inciarte-Mundo J, Aróstegui JI, McGonagle D, Cañete JD. **Palindromic rheumatism: Evidence of four subtypes of palindromic-like arthritis based in either MEFV or RF/ACPA status.** *Joint Bone Spine.* 88(6):105235. Q2

17. Cerda Reyes E, González-Navarro EA, Magaz M, Muñoz-Sánchez G, Diaz A, Silva-Junior G, Triguero A, Lafoz E, Campreciós G, Orts L, Perez-Campuzano V, Seijo S, Rubio L, Turon F, Baiges A, Hernández-Gea V, Álvarez-Larran A, Juan M, Garcia-Pagan JC. **Autoimmune Biomarkers in Porto-Sinusoidal Vascular Disease**. *Liver International.* 41(9):2171-2178. Q2

18. Isola I, Moreno DF, Moga E, Mena MP, Tovar N, Rodríguez-Lobato LG, Oliver-Caldés A, Salgado MC, Brasó-Maristany F, Yagüe J, Cibeira MT, Prat A, Rosiñol L, Bladé J, Fernández de Larrea C. **Immunoparesis defined by heavy/light chain pair suppression in smoldering multiple myeloma shows initial isotype specificity and involves other isotypes in advanced disease.** *Annals Of Hematology.* 100(12):2997-3005. Q2

19. Deyà-Martínez A; García-García A; Gonzalez-Navarro EA; Yiyi L; Vlagea A; Jordan I; Fumadó V; Fortuny C; Español M; Launes C; Esteve-Solé A; Juan M; Pascal M; Alsina L. **COVID-19 in children and young adults with moderate/severe inborn errors of immunity in a high burden area in pre-vaccine era.** *Clinical Immunology.* 230(108821):108821. Q3

20. Rodrigues F G, Petrushkin H, Webster AR, Bickerstaff M, Moraitis, E, Rowczenio D, Arostegui JI; Westcott M. **A Novel Pathogenic NOD2 Variant in a Mother and Daughter with Blau Syndrome**. *Ophthalmic Genetics.* 42(6):753-764. Q4.

Review

1. Bartoló-Ibars A; Uribe-Herranz M; Muñoz-Sánchez G; Arnaldos-Pérez C; Ortiz-Maldonado V; Urbano-Ispizua Á; Pascal M; Juan M. **Car-t after stem cell transplantation in b-cell lymphoproliferative disorders: Are they really autologous or allogenic cell therapies?** *Cancers.* 13(18):4664. Q1

2. Herrera L, Santos S, Vesga MA, Carrascosa T, Garcia-Ruiz JC, Pérez-Martínez A, Juan M, Eguizabal C . **The Race of CAR Therapies: CAR-NK Cells for Fighting B-Cell Hematological Cancers.** *Cancers.* 13(21):5418. Q1

3. Uribe-Herranz M, Klein-González N, Rodríguez-Lobato LG, Juan M, de Larrea CF. **Gut Microbiota Influence in Hematological Malignancies: From Genesis to Cure.** *International Journal Of Molecular Sciences.* 22(3):1026. Q1

4. Bayó C, Jung G, Español-Rego M, Balaguer F, Benitez-Ribas D. **Vaccines for Non-Viral Cancer Prevention.** *International Journal Of Molecular Sciences.* 22(20):10900. Q1

5. Nicolini F, Bravaccini S, Mazza M, Gruszka AM, Tazzari M, Martín-Antonio B, Juan M, Ibrahim T, Maltoni R, Martinelli G, Cerchione C. **CAR T cells targeting options in the fight against multiple myeloma.** *Panminerva Medica.* 63(1):37-45. Q1

6. Egri N, Esteve-Solé A, Deyà-Martínez À, Ortiz de Landazuri I, Vlagea A, García AP, Cardozo C, Garcia-Vidal C, Bartolomé CS, Español-Rego M, Yiyi L, Bosch-Amate X, Ferrando J, Yagüe J, Juan M, Alsina L. **Primary immunodeficiency and chronic mucocutaneous candidiasis: pathophysiological, diagnostic, and therapeutic approaches.** *Allergologia Et Immunopathologia.* 49(1):118-127. Q4.

Letters

1. Ortiz-Maldonado V, Rives S, Español-Rego M, Alonso-Saladrigues A, Montoro M, Magnano L, Giné E, Pascal M, Díaz-Beyá M, Castella M, Català A, Faura A, Rodríguez-Lobato LG, Oliver-Caldes A, Martínez-Roca A, Rovira M, González-Navarro EA, Ortega JR, Cid J, Lozano M, Garcia-Rey E, Fernández S, Castro P, Jordan I, Villamor N, Aymerich M, Torrebadell M, Deyà À, Fernández de Larrea C, Benitez-Ribas D, Trias E, Varea S, Calvo G, Esteve J, Urbano-Ispizua A, Juan M, Delgado J. **Factors associated with the clinical outcome of patients with relapsed/refractory CD19+ acute lymphoblastic leukemia treated with ARI-0001 CART19-cell therapy.** *Journal For Immunotherapy Of Cancer.* 9(12):e003644. D1

2. Mozas P, Pineyroa JA, Nadeu F, Magnano L, Rivero A, Rivas-Delgado A, Bataller A, Fabregat A, Gine E, Baumann T, Villamor N, Arostegui JI, Aymerich M, Lopez-Guillermo A, Campo E, Delgado J. **Serum monoclonal component in chronic lymphocytic leukemia: baseline correlations and prognostic impact.** *Haematologica.* 106(6):1754-1757. Q1

Case Reports

1. Oliver-Caldes A, Jimenez R, Espanol-Rego M, Cibeira, MT, Ortiz-Maldonado V, Quintana LF, Castillo P, Guijarro F, Tovar N, Montoro M, Benitez-Ribas D, Bataller A; Gonzalez-Navarro EA, Cid J, Lozano M, Perez-Amill L; Martin-Antonio B, Mena MP, Moreno DF, Rodriguez-Lobato LG, Campistol JM, Calvo G, Blade J, Rosinol L, Juan M, Pascal M, Urbano-Ispizua A, de Larrea CF. **First report of CART treatment in AL amyloidosis and relapsed/refractory multiple myeloma.** *Journal For Immunotherapy Of Cancer.* 9(12):e003783. D1

2. López-Sánchez C; Falla LM; Roé-Crespo E; Arostegui JI; Mozos A; Bernal S; Iznardo H; Baselga-Torres E. **Excellent response to secukinumab in an infant with severe generalized pustular psoriasis.** *Journal Of Dermatology.* 48(6):907-910. Q2

3. Papagoras C; Lampropoulou V; Mavraki E; Chrysanthopoulou A; Deftereos S; Aróstegui JI; Skendros P; Ritis K. **Multiple sclerosis in a patient with cryopyrin-associated autoinflammatory syndrome: Evidence that autoinflammation is the common link.** *Clinical Immunology*. 227:108750. Q3

Consortium Publications

1. Crovetto F, Crispi F, Llurba E, Pascal R, Larroya M, Trilla C, Camacho M, Medina C, Dobaño C, Gomez-Roig MD, Figueras F, Gratacos E, KidsCorona Pregnancy COVID-19 Group. **Impact of SARS-CoV-2 Infection on Pregnancy Outcomes: A Population-Based Study.** *Clinical Infectious Diseases.* 73(10):1768-1775. D1

GRANTS FOR RESEARCH IN PROGRESS

Aróstegui J. **Identificación de nuevos mecanismos moleculares en enfermedades autoinflamatorias.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_R-TI2018-096824-B-C21
Duration: 01/01/2019-30/09/2022

Benitez D. **Inmunoterapia de cáncer de colon mediante la combinación de anticuerpos bloqueantes de la vía inhibidora PD-1-PD-L1 y células dendríticas autólogas.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00732
Duration: 01/01/2018-30/06/2022

Benítez D. **Role of IVIG administration in the generation of anti-CAR antibodies in CART cell-treated leukem patients.**
Sponsored by: Grifols Shared Services. INT_GRIFOLSISR19_01
Duration: 03/12/2020-22/07/2022

Juan M. **Immunoteràpia cel·lular específica com a estratègia general en front de les pandèmies i en concret per a l'actual de COVID19.**
Sponsored by: Generalitat de Catalunya. AGAUR_PANDE20_00079
Duration: 14/05/2021-13/11/2022

Juan M. **Inmunoterapia y terapia génica del cáncer.**
Sponsored by: Research la Caixa Foundation. 3922-19
Duration: 01/01/2018-31/12/2022

Juan M. **Cellular immunological response to SARS-CoV2 decisions on the immunization of t-cells and their use in potential therapy.**
Sponsored by: CELLNEX. 5234_20
Duration: 01/06/2020-01/06/2022

Juan M. **Desarrollo de mejoras de la eficacia en nuestra propuesta académica de CART19 propio para síndromes linfoproliferativos B: modificaciones imprescindibles para mejorar resultados.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00775
Duration: 01/01/2019-31/12/2021

Juan M. **Chimeric Antigen Receptor T cells for the treatment of breast cancer HER2+.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_MV20/00012
Duration: 01/08/2021-31/12/2022

Juan M. **Cationic Gold nanoparticles mediated mRNA cytoplasmatic-targeted delivery for production of CAR-T lymphocytes for Chronic Lymphoid Leukemia immunotherapy.**
Sponsored by: European Commission and Instituto de Salud Carlos III (ISCIII). CE_ERA-Net_Nanomed18 and AC18/00072
Duration: 01/01/2019-31/12/2021

Juan M. **Artificial Intelligence-driven, Decentralized Production for Advanced Therapies in the Hospital.**
Sponsored by: European Commission. CE_H2020-ICT-20_1s17
Duration: 01/01/2021-31/12/2024

Mensa A. **Diagnóstico y seguimiento de las enfermedades autoinflamatorias no filiadas mediante la aplicación de técnicas transcriptómicas y genómicas avanzadas.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/01567
Duration: 01/01/2020-31/12/2022

Palou E. **Histocompatibilidad del Laboratorio a la Clínica 2021.**
Sponsored by: Ministerio de Sanidad, Consumo y Bienestar Social. MSCBS_ONT20
Duration: 01/01/2020-30/06/2021

Palou E, Diekmann F. **Inmunoterapia para el control del rechazo del riñón trasplantado: uso de células T modificadas genéticamente con receptores quiméricos del antígeno.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00078
Duration: 01/01/2018-31/12/2021

Palou E, Diekmann F. **Inmunoterapia celular adoptiva para el control del rechazo mediado por anticuerpos tras el trasplante renal: uso de las células NK modificadas genéticamente con receptores quiméricos de antígeno.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00227
Duration: 01/01/2021-31/12/2023

1.6 Immune receptors of the innate and adaptive system

LOCATION
CEK building, floor 4

KEYWORDS
1. **Innate and adaptive immune response**
2. **Immune receptor-lig and interactions**
3. **Immunomodulation and immunotherapy**
4. **Host-pathogen interaction**
5. **Immunevasion**

RELATED DISEASES
1. **Systemic lupus erythematosus**
2. **Sjögren's syndrome**
3. **Chronic lymphocytic leukemia**
4. **Sepsis**
5. **Solid tumor cancer**
6. **Cytomegalovirus infection**

GROUP INVOLVED IN
AGAUR_SGR17:1582
Infect-ERA

Original publications

TOTAL	7
Mean IF	**9,40**
Q1	**100%**
D1	**57%**
MA	**71%**
OA	**86%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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Judit Pelegrín (UB)
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Manuel Sáez (UB)

TECHNICIANS
Javier Fernández (FCRB)

PROBLEM

The malfunctioning of the immune system is a factor in a wide number of incurable diseases such as autoimmune disorders, cancer, and certain serious infection processes, which pose a huge challenge for public health.

The development of novel immunotherapeutic strategies to treat these diseases requires a precise knowledge of the immune receptors that regulate innate and adaptive immune responses.

APPROACH

We aim to identify and understand the function of the molecules that regulate immune responses in health and disease.

We particularly focus on the molecular interactions involved in the intercommunication and coordination of immune cells during physiological and pathological processes.

This approach will allow the development of new approaches and biological tools (recombinant proteins and monoclonal antibodies) for the treatment of immune-mediated disorders (e.g., systemic autoimmune and infectious diseases, graft rejection, allergy, or cancer).

IMPACT

We aim to develop novel therapeutic strategies, disseminate our results in high-impact international journals and transfer the knowledge generated to biomedical companies.

Over the last 5 years, we have published over 50 research papers, created a new spin-off company, and filed 2 patents.

RESEARCH LINES

- Study of citomegalovirus (CMV) modulation of the immune response and viral immune evasion strategies.

- Study of the structure and function of scavenger-like receptors and their role as Inmunomodulators in infection, autoimmunity and cancer.

- Study of the structure and function of the slam leukocyte molecules and their role in autoimmunity and cancer.

PUBLICATIONS

Originals

1. Pose E, Coll M, Martínez-Sánchez C, Zeng Z, Surewaard BGJ, Català C, Velasco-de Andrés M, Lozano JJ, Ariño S, Fuster D, Niñerola-Bazán A, Graupera I, Muñoz É, Lozano F, Sancho-Bru P, Kubes P, Ginès P .

PD-L1 is overexpressed in liver macrophages in chronic liver diseases and its blockade improves the antibacterial activity against infections. *Hepatology*. 74(1):296-311. D1

2. Ortega N, Ribes M, Vidal M, Rubio R, Aguilar R, Williams S, Barrios D, Alonso S, Hernández-Luis P, Mitchell RA, Jairoce C, Cruz A, Jimenez A, Santano R, Méndez S, Lamoglia M, Rosell N, Llupià A, Puyol L, Chi J, Melero NR, Parras D, Serra P, Pradenas E, Trinité B, Blanco J, Mayor A, Barroso S, Varela P, Vilella A, Trilla A, Santamaria P, Carolis C, Tortajada M, Izquierdo L, Angulo A, Engel P, García-Basteiro AL, Moncunill G, Dobaño C. **Seven-month kinetics of SARS-CoV-2 antibodies and role of pre-existing antibodies to human coronaviruses**. *Nature Communications*. 12(1):4740. D1

3. Velasco-de-Andrés M; Català C; Casadó-Llombart S; Simões I; Zaragoza O; Carreras E; Lozano F. **The lymphocyte scavenger receptor CD5 plays a nonredundant role in fungal infection.** *Cellular & Molecular Immunology*. 18(2):498-500. D1

4. Angulo G, Zeleznjak J, Martínez-Vicente P, Puñet-Ortiz J, Hengel H, Messerle M, Oxenius A, Jonjic S, Krmpotić A, Engel P, Angulo A. **Cytomegalovirus restricts ICOSL expression on antigen-presenting cells disabling T cell co-stimulation and contributing to immune evasion.** *Elife*. 10(e59350). D1

5. Sáez Moya M, Gutiérrez-Cózar R, Puñet-Ortiz J, Rodríguez de la Concepción ML, Blanco J, Carrillo J, Engel P. **Autoimmune B Cell Repertoire in a Mouse Model of Sjögren's Syndrome.** *Frontiers In Immunology*. 12:666545. Q1

6. Velasco-de Andrés M, Català C, Casadó-Llombart S, Martínez-Florensa M, Simões I, García-Luna J, Mourglia-Ettlin G, Zaragoza Ó, Carreras E, Lozano F . **The lymphocytic scavenger receptor CD5 shows therapeutic potential in mouse models of fungal infection.** *Antimicrobial Agents And Chemotherapy*. 65(1):e01103. Q1

7. Munoz-Sanchez, Guillermo; Gonzalez-Navarro, Europa A.; Fabregat, Virginia; Serra-Pages, Carles. **Identification of a novel HLA-B null allele, HLA-B*27:225N.** *HLA*. 97(3):232-233. Q1

Review

1. Casadó-Llombart S; Andrés MVD; Català C; Leyton-Pereira A; Lozano F; Bosch E. **Contribution of evolutionary selected immune gene polymorphism to immune-related disorders: The case of lymphocyte scavenger receptors cd5 and cd6**. *International Journal Of Molecular Sciences*. 22(10). Q1

Consortium Publications

1. Nakanishi T, Pigazzini S, Degenhardt F, Cordioli M, Butler-Laporte G, Maya-Miles D, Bujanda L, Bouysran Y, Niemi ME, Palom A, Ellinghaus D, Khan A, Martínez-Bueno M, Rolker S, Amitrano S, Roade Tato L, Fava F,, Spinner CD, Prati D, Bernardo D, Garcia F, Darcis G, Fernández-Cadenas I, Holter JC, Banales JM, Frithiof R, Kiryluk K, Duga S, Asselta R, Pereira AC, Romero-Gómez M, Nafría-Jiménez B, Hov JR, Migeotte I, Renieri A, Planas AM, Ludwig KU, Buti M, Rahmouni S, Alarcón-Riquelme ME, Schulte EC, Franke A, Karlsen TH, Valenti L, Zeberg H, Richards JB, Ganna A FinnGen, COVID-19 Host Genetics Initiative (HGI). **Age-dependent impact of the major common genetic risk factor for COVID-19 on severity and mortality.** *Journal Of Clinical Investigation*. 131(23):e152386. D1

GRANTS FOR RESEARCH IN PROGRESS

Ángulo A. **Manipulación de inmuno receptores de la superficie celular por citomegalovirus.**
Sponsored by: Ministerio de Economía y Competitividad. SAF2017-87688-R
Duration:01/01/2018- 31/08/2021

Angulo A. **Nuevos mecanismos de inmunoevasión utilizados por herpesvirus.**
Sponsored by: Ministerio de Ciencia e Innovación. PID 2020-116918RB-100
Duration: 01/01/2021-31/12/2023

Engel P. **Repertorio, immunopatología y terapia dirigida a los linfocitos B en la enferemdad.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_R-TI2018-094440-B-I00.
Duration: 01/01/2019-31/12/2021

Lozano F. **Receptores linfocitarios scavenger como dianas de inmunomodulación en respuesta a agresión microbiana.**
Sponsored by: Agencia Estatal de Investigación. AEI_PID2019
Duration: 01/01/2020-31/12/2022

Lozano F. **Receptores linfocitarios scavanger como dianas de inmunomodulación en respuesta a agresión microbiana.**
Sponsored by: Agencia Estatal de Investigación. AEI_FPI20
Duration: 01/09/2021-31/08/2025

DOCTORAL THESES

Lozano F. **Expression and variation of lymphocyte scavenger receptors in inflammatory diseases and cancer.**
PhD student: Sergi Casadó Llombart

Lozano F. **Study of scavenger receptor CD6: its role in immune response to infection and sepsis.**
PhD student: Cristina Català Osete

1.7 AIDS and HIV infection

LOCATION
CELLEX building, floor 4A

KEYWORDS
1. **HIV infection**
2. **AIDS**
3. **Antiretroviral treatment**
4. **PrEP-PEP**
5. **Co-infection**
6. **Chemsex**

RELATED DISEASES
1. **VHC**
2. **VPH**
3. **STD**

GROUP INVOLVED IN
AGAUR_SGR17: 00615
ERANET
RIS
CIBERINFEC

Original publications

TOTAL	52
Mean IF	**7,58**
Q1	**56%**
D1	**21%**
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PROBLEM

HIV infection and AIDS are among the most important avoidable causes of death in the world. In Spain, there are some 140,000 infected individuals, of whom 100,000 are receiving antiretroviral treatment. Every year, some 3,000 new infections are diagnosed, 800 of which are in Catalonia.

To stop this epidemic, it is necessary to address our efforts at all aspects of the infection: clinical (ageing of those infected and new comorbidities), diagnosis (early identification), therapeutics (search for new treatments), prevention (PrEP) and research (studies of the immunopathology of infection and development of vaccines). Only by optimising all of this research can there be any real control of the disease.

APPROACH

The HIV-AIDS unit serves 6.000 people infected with HIV, most of whom receive antiretroviral treatment. The group also conducts a wide range of research activities, divided into two parts: firstly, clinical research focusing on antiretroviral efficacy and tolerance, resistance mechanisms, and opportunistic infections and coinfection. Secondly, it performs basic research in Retrovirology and Viral Immunopathology, which includes the development of vaccines.

IMPACT

Our research has played a key role in the development of strategies for the treatment and prevention of HIV and opportunistic infections and coinfection, both nationally and internationally.

The impact of our research activity in the last years can be quantified through over 600 international publications in peer-review journals with an impact factor of over 4,000, approximately 20,000 citations and over 50 manuscripts cited more than 50 times.

RESEARCH LINES

- Basic and translational research.
- Clinical and diagnostic aspects.
- Epidemiological research and public health.
- Therapeutic aspects.

PUBLICATIONS

Originals

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Review

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3. D'haese S, Lacroix C, Garcia F, Plana M, Ruta S, Vanham G, Verrier B, Aerts JL. **Off the beaten path: Novel mRNA-nanoformulations for therapeutic vaccination against HIV.** *Journal Of Controlled Release*. 330:1016-1033. D1

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6. Esteban, Ignasi; Pastor-Quinones, Carmen; Usero, Lorena; Plana, Montserrat; Garcia, Felipe; Leal, Lorna. **In the Era of mRNA Vaccines, Is There Any Hope for HIV Functional Cure?** *Viruses-Basel*. 13(3):501. Q2

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Letters

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Editorial

1. Ainoa Ugarte Ramos; Josep Mallolas Masferrer. **Detection of unknown cases of human immunodeficiency virus infection in emergency departments: a utopian ideal?** *Emergencias: Revista De La Sociedad Española De Medicina De Urgencias Y Emergencias*. 33(4):249-250. Q1

Case Reports

1. Diaz NA, Ambrosioni J, Tuset M, Brunet M, Cofan F, Crespo G, Ruiz P, Redondo-Pachón D, Crespo M, Marín-Casino M, Moreno A, Miró JM, Hospital Clinic and Hospital del Mar SOT in HIV Investigators. **Tacrolimus, Sirolimus and Everolimus Doses in HIV-Infected Solid-Organ Recipients, Requiring a Cobicistat-Based Antiretroviral Regimen: Report of Three Cases and Review.** *Infectious Diseases And Therapy*. 10(2):1055-1064. Q1

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3. Ugarte, A; De la Mora, L; Martinez-Rebollar, M; Mallolas, J; Laguno, M. **An unexpected adverse effect: Elvitegravir/cobicistat/emtricitabine/tenofovir alafenamide-induced cholestasis.** *Antiviral Therapy*. 26(1-2):9-12. Q3

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5. Rabadán Pejenaute E; Marcos MA; Mallolas J; Ambrosioni J. **Guillain-Barré-like syndrome as a rare presentation of severe primary HIV-infection [Sindrome de Guillain-Barré como rara forma de presentación de primoinfección grave por HIV].** *Enfermedades Infecciosas Y Microbiologia Clinica.* 39(10):533-534. Q4

Consortium Publications

1. WHO Solidarity Trial Consortium. **Repurposed Antiviral Drugs for Covid-19-Interim WHO Solidarity Trial Results.** *New England Journal Of Medicine.* 384(6):497-511. D1

2. Gutiérrez-Gutiérrez B, Del Toro MD, Borobia AM, Carcas A, Jarrín I, Yllescas M, Ryan P, Pachón J, Carratalà J, Berenguer J, Arribas JR, Rodríguez-Baño J, REIPI-SEIMC COVID-19 group and COVID@HULP groups. **Identification and validation of clinical phenotypes with prognostic implications in patients admitted to hospital with COVID-19: a multicentre cohort study.** *Lancet Infectious Diseases.* 21(6):783-792. D1

3. Torres A, Motos A, Riera J, Fernández-Barat L, Ceccato A, Pérez-Arnal R, García-Gasulla D, Peñuelas O, Lorente JA, Rodriguez A, de Gonzalo-Calvo D, Almansa R, Gabarrús A, Menéndez R, Bermejo-Martin JF, Ferrer R, Amaya Villar R, Añón JM, Barberà C, Barberán J, Blandino Ortiz A, Bustamante-Munguira E, Caballero J, Carbajales C, Carbonell N, Catalán-González M, Galbán C, Gumucio-Sanguino VD, de la Torre MDC, Díaz E, Estella Á, Gallego E, García Garmendia JL, Garnacho-Montero J, Gómez JM, Huerta A, Jorge García RN, Loza-Vázquez A, Marin-Corral J, Martínez de la Gándara A, Martínez Varela I, López Messa J, M Albaiceta G, Novo MA, Peñasco Y, Pozo-Laderas JC, Ricart P, Salvador-Adell I, Sánchez-Miralles A, Sancho Chinesta S, Socias L, Solé-Violan J, Suares Sipmann F, Tamayo Lomas L, Trenado J, Barbé F, CIBERESUCICOVID Project (COV20/00110, ISCIII). **The evolution of the ventilatory ratio is a prognostic factor in mechanically ventilated COVID-19 ARDS patients.** *Critical Care.* 25(1):331. Q1

4. Cillóniz C, Torres A, Garcia-Vidal C, Moreno-Garcia E, Amaro R, Soler N, Marcos MA, Rico V, Gabarrús A, Nicolás JM, Soriano A, COVID19-Researchers. **The Value of C-Reactive Protein-to-Lymphocyte Ratio in Predicting the Severity of SARS-CoV-2 Pneumonia.** *Archivos De Bronconeumologia.* 57:79-82. Q2

5. RESPOND Study Grp. **The interrelationship of smoking CD4(+) cell count viral load and cancer in persons living with HIV.** *Aids.* 35(5):747-757. Q2

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GRANTS FOR RESEARCH IN PROGRESS

Blanco JL. **Papel de la determinación de resistencias en PMBC mediante secuenciación masica del DNA proviral integrado en sujetos VIH+ con fracaso virológico con viremias bajas (50-200 copias/mL).**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/01562
Duration: 01/01/2018-30/06/2022

De la Mora L. **Diagnosis of HIV and other sexually transmitted diseases (STDs) in high-risk population (men who have sex with men ChemSex users).**
Sponsored by: Gilead Sciences (SLU).
GLD19_DiagnostVIH
Duration: 01/09/2020-31/08/2021

García F, Leal L. **Development of innovative coformulated mRNA vaccine against SARS-CoV2 (Cova-RNA).**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_ICI20/00067
Duration: 01/01/2021-31/12/2024

García F, Miró JM. **Impact of a supplemented Mediterranean diet on the microbial translocation, intestinal microbiota, immune activation and HIV reservoirs in successful treated HIV infected patients.**
Sponsored by: Gilead Sciences (SLU).
GLD18_Fellowship
Duration: 01/03/2019-28/02/2021

Garcia F, Plana M. **Preclinical development of innovative mRNA/MVA vaccines against SARS-CoV2.**
Sponsored by:Instituto de Salud Carlos III (ISCIII). FIS_COV20/00214
Duration: 30/04/2020-29/04/2021

Garcia F. **Red Temática de Investigación Cooperativa en Salud - SIDA.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_RD16/0025/0002
Duration: 01/01/2017-31/12/2022

García F. **Utilización de medicina de sistemas para la predicción de la inmunogenicidad y eficacia de vacunas terapéuticas frente a VIH.**
Sponsored by: Ministerio de Economia y Competitividad (MINECO).
SAF2015-66193-R
Duration: 01/01/2016-17/07/2021

Garcia F. **Desarrollo preclínico de una innovadora vacuna ARNm contra el VIH.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_R-TI2018-096309-B-I00.
Duration: 01/01/2019-30/06/2022

Garcia F. **European HIV Vaccine Alliance (EHVA): a EU platform for the discovery and evaluation of novel prophylactic and therapeutic vaccine candidates.**
Sponsored by: European Commission.
CE_H2020-PHCRTD-15
Duration: 01/01/2016-30/06/2023

Garcia F. **Evaluating a Combination of Immune-based Therapies to Achieve a Functional Cure of HIV Infection.**
Sponsored by: European Commission.
CE_H2020-SC1_16abr1s
Duration: 01/01/2017-30/06/2022

Garcia F. **Joint Action on integrating prevention, testing and linkage to care strategies acros HIV, viral hepatitis, TB and STIs in Europe.**
Sponsored by: European Commission.
CE_HP-JA-2016
Duration: 01/09/2017-31/05/2021

Laguno M. **Micro-eliminación de la infección por el VHC en el colectivo de HSH/VIH+ en Barcelona.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00583
Duration: 01/01/2019-31/12/2021

Mallolas J. **Grup de Recerca VIH/SIDA. Sponsored by: Generalitat de Catalunya.**
AGAUR_SGR17_00615
Duration: 01/01/2017-30/09/2021

Mallolas J. **Evaluación clínica y de consumo sanitario del seguimiento telemático de una cohorte de pacientes infectados por el VIH.**

Sponsored by:Instituto de Salud Carlos III (ISCIII). FIS_PI17/00726
Duration: 01/01/2018-30/06/2021

Martínez EJ. **Predictive Metabolomics biomarkers for cardiovascular disease risk in ART-HIV+ population.**
Sponsored by: Gilead Sciences (SLU). GLD16/00104
Duration: 14/12/2016-

Martínez EJ. **Seguridad, tolerabilidad y eficacia de dos estrategias de simplificación basadas en dolutegravir en pacientes infectados por VIH con supresión virológica sostenida.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/01085
Duration: 01/01/2017-30/06/2021

Martínez-Chamorro E. **Seguridad, tolerabilidad y eficacia de una estrategia de reducción de dosis basada en bictegravir/emtricitabina/ tenofovir alafenamida en adultos infectados por el VIH con suspresión viral.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00869
Duration: 01/01/2021-31/12/2023

Miró JM. **Seguridad, tolerancia y actividad antirretroviral de dasatinib: estudio clínico piloto en pacientes con infección reciente por el VIH-1 (Proyecto DASAHIVCURE).**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_ICI20/00103
Duration: 01/01/2021-31/12/2024

Ambrosioni J, Miró JM. **Intensified tuberculosis treatment to reduce the high mortality of tuberculous.**
Sponsored by: European Commission. CE_EDCTP_17T
Duration: 01/01/2019-31/12/2023

Miró JM. **Microbiome-based stratification of individuals at risk of HIV-1 acquisition, chronic clinical complications,antimicrobial drug resistance,and unresponsiveness to therapeutic HIV-1 vaccination.**
Sponsored by: European Commission. CE_H2020-SC1_2019_2s
Duration: 01/01/2020-31/12/2024

Plana M. **Desarrollo de una vacuna terapéutica frente al VIH basada en una nueva formulación de mRNA con nanopartículas.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI15/00480
Duration: 01/01/2016-30/11/2021

Plana M. **Diseño de vacunas frente a la gripe humana mediante micelas multifuncionales capaces de utilizar la inmunidad innata.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_AC16/00051
Duration: 01/01/2017-30/06/2022

Plana M. **Estudio preclínico de la eficacia de una nueva vacuna terapéutica frente al VIH-1 basada en mRNA.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00699
Duration: 01/01/2019-30/06/2022

Plana M. **RBD Dimer recombinant protein vaccine against SARSCoV2.**
Sponsored by: European Commission. CE_HE_CH_C19_1s_RIA
Duration: 01/12/2021-31/05/2024

Sánchez-Palomino S. **Mecanismos inmunopatogénicos favorecedores del cáncer en pacientes infectados por VIH-1. Influencia del estrés inmune, del reservorio VIH y de los sitios de integración del VIH.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00676
Duration: 01/01/2021-31/12/2023

DOCTORAL THESES

Blanco JL, Alsina MM. **Manejo de patología anal y rectal secundaria a infecciones de transmisión sexual en hombres que tienen sexo con hombres infectados por el virus de la inmunodeficiencia humana.**
PhD student: Irene Fuertes de Vega

Sánchez-Palomino MS, Garcia F. **La Microbiota Intestinal en Individuos Infectados por el Virus de la Inmunodeficiencia Humana Tipo-1.**
PhD student: Roque Pastor Ibáñez

1.8 Emergencies: processes and pathologies

LOCATION
HCB building

KEYWORDS
1. **Emergency department**
2. **Organization**
3. **Toxicology**
4. **Chest pain**
5. **Arrhythmia**
6. **Acute heart failure**

RELATED DISEASES
1. **Quality**
2. **Drug consumption and emergencies**
3. **Atrial fibrillation**
4. **Ischaemic cariomyopathy**
5. **Cardiopulmonar ressuscitation**
6. **Risk scores**

GROUP INVOLVED IN
AGAUR_SGR17:01424

Original publications

TOTAL	62
Mean IF	**6,58**
Q1	**48%**
D1	**15%**
MA	**40%**
OA	**71%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Emergency medicine has the principal mission of acting on any health condition during the acute phase. This initial care is uniquely and exclusively provided by emergency care professionals and has important implications in terms of patient survival and prognosis, especially in time-dependent conditions such as sepsis, acute myocardial infarctions, stroke, and heart failure, among others. Improved knowledge about emergency care processes is leading to continuous progress, which has a major care and organisational impact on the health system in both the short and long term.

APPROACH

The continuous cross-disciplinary nature of disease mean that the emergency services sequentially share care with other specialist areas. In other words, after the initial emergency care, the patient is referred to each of the different hospital specialist areas, depending on their illness.

Consolidating research (basically clinical research) in emergency processes (particularly the most prevalent ones) makes it possible to improve our knowledge of them and generate new research lines. This improves patient care and promotes the optimisation and the continuity of the medical process.

IMPACT

In recent years, the group has exponentially increased its research activity, with its global impact factor rising from 37.46 in 2016, to 235.95 in 2017. This upwards trend has continued during the past year.

As a result of this research work, modifications have been made in certain areas of care practice such as heart failure, chest pain, and intoxicated patient care. Furthermore, the group has promoted the creation of national and international work networks, which are especially relevant in a world where multidisciplinary working and teamwork are of fundamental importance.

RESEARCH LINES

- Acute heart failure.

- Attention to infectious diseases in emergency departments.

- Clinical aspects of intoxicated patients and medical care for problems caused by drug abuse.

- Diffusion of the teaching of cardiopulmonary resuscitation maneuvers among the general population.

- Dynamics of teaching and research in emergency medicine.

- Evaluation of chest pain in the emergency department.

- Functional aspects of the hospital emergency departments.

PUBLICATIONS

Originals

1. Jiménez D, Agustí A, Tabernero E, Jara-Palomares L, Hernando A, Ruiz-Artacho P, Pérez-Peñate G, Rivas-Guerrero A, Rodríguez-Nieto MJ, Ballaz A, Agüero R, Jiménez S, Calle-Rubio M, López-Reyes R, Marcos-Rodríguez P, Barrios D, Rodríguez C, Muriel A, Bertoletti L, Couturaud F, Huisman M, Lobo JL, Yusen RD, Bikdeli B, Monreal M, Otero R, SLICE Trial Group. **Effect of a Pulmonary Embolism Diagnostic Strategy on Clinical Outcomes in Patients Hospitalized for COPD Exacerbation: A Randomized Clinical Trial.** *JAMA-Journal Of The American Medical Association.* 326(13):1277-1285. D1

2. Freund Y, Chauvin A, Jimenez S, Philippon AL, Curac S, Fémy F, Gorlicki J, Chouihed T, Goulet H, Montassier E, Dumont M, Lozano Polo L, Le Borgne P, Khellaf M, Bouzid D, Raynal PA, Abdessaied N, Laribi S, Guenezan J, Ganansia O, Bloom B, Miró O, Cachanado M, Simon T. **Effect of a Diagnostic Strategy Using an Elevated and Age-Adjusted D-Dimer Threshold on Thromboembolic Events in Emergency Department Patients With Suspected Pulmonary Embolism: A Randomized Clinical Trial.** *JAMA-Journal Of The American Medical Association.* 326(21):2141-2149. D1

3. Miró Ò, Jiménez S, Mebazaa A, Freund Y, Burillo-Putze G, Martín A, Martín-Sánchez FJ, García-Lamberechts EJ, Alquézar-Arbé A, Jacob J, Llorens P, Piñera P, Gil V, Guardiola J, Cardozo C, Mòdol Deltell JM, Tost J, Aguirre Tejedo A, Palau-Vendrell A, LLauger García L, Adroher Muñoz M, Del Arco Galán C, Agudo Villa T, López-Laguna N, López Díez MP, Beddar Chaib F, Quero Motto E, González Tejera M, Ponce MC, González Del Castillo J, Spanish Investigators on Emergency Situations TeAm (SIESTA) network. **Pulmonary embolism in patients with COVID-19: incidence, risk factors, clinical characteristics, and outcome.** *European Heart Journal.* 42(33):3127-3142. D1

4. Lopez-Ayala P, Nestelberger T, Boeddinghaus J, Koechlin L, Ratmann PD, Strebel I, Gehrke J, Meier S, Walter J, Rubini Gimenez M, Mutschler E, Miró Ò, López-Barbeito B, Martín-Sánchez FJ, Rodríguez-Adrada E, Keller DI, Newby LK, Twerenbold R, Giannitsis E, Lindahl B, Mueller C, APACE and TRAPID-AMI Investigators†. **Novel Criteria for the Observe-Zone of the ESC 0/1h-hs-cTnT Algorithm.** *Circulation.* 144(10):773-787. D1

5. Nestelberger T, Boeddinghaus J, Lopez-Ayala P, Kaier TE, Marber M, Gysin V, Koechlin L, Sanchez AY, Giménez MR, Wussler D, Walter JE, Strebel I, Zimmermann T, Glarner N, Miró Ò, Martin-Sanchez FJ, Zehnder T, Twerenbold R, Keller DI, Mueller C, APACE Investigators. **Cardiovascular Biomarkers in the Early Discrimination of Type 2 Myocardial Infarction.** *JAMA Cardiology.* 6(7):771-780. D1

6. Fragiel M, Miró Ò, Llorens P, Jiménez S, Piñera P, Burillo G, Martín A, Martín-Sánchez FJ, García-Lamberechts EJ, Jacob J, Alquézar-Arbé A, Juárez R, Jiménez B, Del Rio R, Mateo Roca M, García AH, López Laguna N, Lopez Diez MP, Pedraza García J, Fernández de Simón Almela A, Lopez Diaz JJ, Eiroa Hernández P, Ruiz de Lobera N, Porta-Etessam J, Fernández Pérez C, Calvo E, González Del Castillo J, SIESTA (Spanish Investigators in Emergency Situations Team) network. **Incidence, clinical characteristics, risk factors and outcomes of Guillain-Barré syndrome in patients with Covid-19.** *Annals Of Neurology.* 89(3):598-603. D1

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55. Ramos-Pachon, A; Garcia-Tornel, A; Millan, M; Ribo, M; Amaro, S; Cardona, P; Marti-Fabregas, J; Roquer, J; Silva, Y; Ustrell, X; Purroy, F; Gomez-Choco, M; Zaragoza-Brunet, J; Canovas, D; Krupinski, J; Sala, NM; Palomeras, E; Cocho, D; Redondo, L; Repullo, C; Sanjurjo, E; Carrion, D; Lopez, M; Almendros, MC; Barcelo, M; Monedero, J; Catena, E; Rybyeba, M; Diaz, G; Jimenez-Fabrega, X; Sola, S; Hidalgo, V; Pueyo, MJ; de la Ossa, NP; Urra, X. **Bottlenecks in the Acute Stroke Care System during the COVID-19 Pandemic in Catalonia.** *Cerebrovascular Diseases.* 50(5):551-559. Q3

56. Miró Ò, Alquézar-Arbé A, Llorens P, Martín-Sánchez FJ, Jiménez S, Martín A, Burillo-Putze G, Jacob J, García-Lamberechts EJ, Piñera P, Del Castillo JG, en representación de la red de investigación SIESTA. **Comparison of the demographic characteristics and comorbidities of patients with COVID-19 who died in Spanish hospitals based on whether they were or were not admitted to an intensive care unit.** *Medicina Intensiva.* 45(1):14-26. Q3

57. Mir AS, Nogué Xarau S, Alcaraz Peñarrocha RM, Morán Chorro I, Montero Clavero FJ, Palomar Martínez M, Grupo de trabajo de Toxicología de la SEMICYUC y participantes en EMPIUCI 13-14. **Evolution of poisoned patients admitted to Spanish intensive care units: Comparing two periods.** *Medicina Intensiva.* S0210-5691(20):30185-6-E6. Q3

58. Vallecillo G; Perelló R; Güerri R; Fonseca F; Torrens M. **Clinical impact of COVID-19 on people with substance use disorders.** *Journal Of Public Health.* 43(1):9-12. Q3

59. Miró Ò, López Díez MP, Llorens P, Mir M, López Grima ML, Alonso H, Gil V, Herrero-Puente P, Jacob J, Martín-Sánchez FJ, en representación del grupo ICA-SEMES. **Frequency, profile and results of patients with acute heart failure transferred directly to home hospitalisation from emergency departments.** *Rev Clin Esp.* S0014-2565(20):30141-7-8. Q3

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61. Miró Ò; Miró E; García-Lamberechts EJ; Villamor Ordozgoiti A; González Del Castillo J. **Map of sexually transmitted disease care in spanish emergency departments.** *Revista Española De Quimioterapia.* 34(4):353-364. Q4

62. Adrián Valls Carbó; Juan González del Castillo; Óscar Miró Andreu; Pedro López Ayala; Sonia Jimenez; Javier Jacob Rodríguez; C Bibiano Guillén; Francisco Javier Martín Sánchez. **Increased severity in SARS-CoV-2 infection of minorities in Spain.** *Revista Española De Quimioterapia.* 34(6):664-667. Q4

Review

1. Radu, RI; Ben Gal, T; Abdelhamid, M; Antohi, EL; Adamo, M; Ambrosy, AP; Geavlete, O; Lopatin, Y; Lyon, A; Miro, O; Metra, M; Parissis, J; Collins, SP; Anker, SD; Chioncel, O. **Antithrombotic and anticoagulation therapies in cardiogenic shock: a critical review of the published literature.** *ESC Heart Failure.* 8(6):4717-4736. Q2

Letters

1. González Del Castillo J, Porta-Etessam J, Miró Ò, Spanish Investigators on Emergency Situations TeAm (SIESTA) network. **Currently available data regarding the potential association between COVID-19 and Guillain-Barre syndrome.** *Brain.* 144(5):e46. D1

2. Miró Ò, Porta-Etessam J, González Del Castillo J, Spanish Investigators on Emergency Situations TeAm (SIESTA) network. **Reply to: "COVID-19 and the Risk of GBS".** *Annals Of Neurology.* 89(4):846-847. D1

3. Miro, Oscar; Gonzalez del Castillo, Juan;. **Response.** *Chest.* 160(1):e89-E89. D1

4. Glarner N, Lopez-Ayala P, Cakal H, Grossenbacher M, Miró Ò. **Applying High-Sensitivity Cardiac Troponin T.** *Journal Of The American College Of Cardiology.* 78(18):e147. D1

5. Fernandez-Guerrero, IM; Allende, AMR; TudurP, CM; Briones, LC; Martin-Sanchez, FJ; Miro, O. **Authors' reply.** *Emergencias: Revista De La Sociedad Española De Medicina De Urgencias Y Emergencias.* 33(4):327. Q1

6. García-Martínez A, López-Barbeito B, Martínez-Nadal G, Miró Ò. **Cardiac risk factors and the probability of acute myocardial infarction in the emergency department.** *European Journal Of Emergency Medicine.* 28(5):407-408. Q2

7. Ibrahim-Achia D, Galicia M, López-Hernández MA. **Drugs of abuse as a cause of admission to intensive care units in Spain.** *Medicina Intensiva.* Q3

Editorial

1. Miro, O. **EMERGENCIAS: a new publisher - without missing a step.** *Emergencias: Revista De La Sociedad Española De Medicina De Urgencias Y Emergencias.* 33(1):1-2. Q1

2. Jimenez Hernandez, Sonia. **Impact of the COVID-19 pandemic on hospital emergency departments' quality-of-care indicators.** *Emergencias: Revista De La Sociedad Española De Medicina De Urgencias Y Emergencias.* 33(5):333-334. Q1

3. Miro, Oscar. **From Spain with love.** European Journal Of Emergency Medicine. 28(4):247-248. Q2

Clinical Guidelines

1. Riera-Mestre A, Jara-Palomares L, Lecumberri R, Trujillo-Santos J, Grau E, Blanco-Molina A, Piera Carbonell A, Jiménez S, Frías Vargas M, Fuset MP, Bellmunt-Montoya S, Monreal M, Jiménez D, On Behalf Of The Covilax Project. **PICO Questions and DELPHI Methodology for the Management**

of Venous Thromboembolism Associated with COVID-19. *Viruses-Basel.* 13(11):2128. Q2

2. Delgado JF; Cepeda JM; Llorens P; Jacob J; Comín J; Montero M; Miró O; López de Sá E; Manzano L; Martín-Sánchez FJ; Formiga F; Masip J; Pérez-Calvo JI; Herrero-Puente P; Manito N. **Consensus on improving the comprehensive care of patients with acute heart failure.** *Rev Clin Esp.* 221(3):163-168. Q3

Consortium Publications

1. WHO Solidarity Trial Consortium, Pan H, Peto R, Henao-Restrepo AM, Preziosi MP, Sathiyamoorthy V, Abdool Karim Q, Alejandria MM, Hernández García C, Kieny MP, Malekzadeh R, Murthy S, Reddy KS, Roses Periago M, Abi Hanna P, Ader F, Al-Bader AM, Alhasawi A, Allum E, Alotaibi A, Alvarez-Moreno CA, Appadoo S, Asiri A, Aukrust P, Barratt-Due A, Bellani S, Branca M, Cappel-Porter HBC, Cerrato N, Chow TS, Como N, Eustace J, García PJ, Godbole S, Gotuzzo E, Griskevicius L, Hamra R, Hassan M, Hassany M, Hutton D, Irmansyah I, Jancoriene L, Kirwan J, Kumar S, Lennon P, Lopardo G, Lydon P, Magrini N, Maguire T, Manevska S, Manuel O, McGinty S, Medina MT, Mesa Rubio ML, Miranda-Montoya MC, Nel J, Nunes EP, Perola M, Portolés A, Rasmin MR, Raza A, Rees H, Reges PPS, Rogers CA, Salami K, Salvadori MI, Sinani N, Sterne JAC, Stevanovikj M, Tacconelli E, Tikkinen KAO, Trelle S, Zaid H, Røttingen JA, Swaminathan S. **Repurposed Antiviral Drugs for Covid-19-Interim WHO Solidarity Trial Results.** *New England Journal Of Medicine.* 384(6):497-511. D1

2. Mellado-Artigas R, Ferreyro BL, Angriman F, Hernández-Sanz M, Arruti E, Torres A, Villar J, Brochard L, Ferrando C, COVID-19 Spanish ICU Network. **High-flow nasal oxygen in patients with COVID-19-associated acute respiratory failure.** *Critical Care.* 25(1):58. Q1

3. Nestelberger T; Boeddinghaus J; Lopez Ayala P; Gehrke J; Twerenbold R; Cullen L; Mueller C; APACE; ADAPT; TRAPID-AMI Investigators. **Utility of Echocardiography in Patients With Suspected Acute Myocardial Infarction and Left Bundle-Branch Block.** *Journal Of The American Heart Association.* 10(18):e021262-e021262. Q1

4. Noseda R, Schmid Y, Scholz I, Liakoni E, Liechti ME, Dargan PI, Wood DM, Dines AM, Yates C, Heyerdahl F, Hovda KE, Giraudon I, Ceschi A, Euro-DEN Research Group. **MDMA-related presentations to the emergency departments of the European Drug Emergencies Network plus (Euro-DEN Plus) over the four-year period 2014-2017.** *Clinical Toxicology.* 59(2):131-137. Q2

5. Layne KA; Dargan PI; Dines AM; Leaper C; Yates C; Hovda KE; Heyerdahl F; Archer JRH; Giraudon I; Wood DM; Euro-DEN Plus Research Group Euro-DEN Plus Research Group. **Acute toxicity related to misuse (nonmedical use) of tramadol: Experience of the European Drug Emergencies Network Plus**. *British Journal Of Clinical Pharmacology.* 87(4):1668-1675. Q2

6. Mellado-Artigas R, Mujica LE, Ruiz ML, Ferreyro BL, Angriman F, Arruti E, Torres A, Barbeta E, Villar J, Ferrando C, COVID-19 Spanish ICU Network. **Predictors of failure with high-flow nasal oxygen therapy in COVID-19 patients with acute respiratory failure: a multicenter observational study.** *Journal Of Intensive Care.* 9(1):23. Q2

7. Piñeiro GJ, Molina-Andújar A, Hermida E, Blasco M, Quintana LF, Rojas GM, Mercadal J, Castro P, Sandoval E, Andrea R, Fernández J, Badia JR, Soriano A, Poch E, Hospital Clínic Critical Care COVID-19 working group (CCCC). **Severe acute kidney injury in critically ill COVID-19 patients.** *Journal Of Nephrology.* 34(2):285-293. Q2

GRANTS FOR RESEARCH IN PROGRESS

Aguiló S, Pomar J. **Detección precoz de vulnerabilidad al trastorno de estrés postraumático en poblaciones altamanente expuestas al COVID-19.**
Sponsored by: Universitat Autònoma de Barcelona (UAB). SANTANDER_CO-VID20_02
Duration: 01/07/2020-30/06/2021

Alonso JR. **International impact of TALK©: a simple and practical approach to multi-professional structured feedback and debriefing, to be used after unplanned learning events in clinical environments.**
Sponsored by: European Commission. CE_H2020_MSCA_RISE16
Duration: 01/06/2017-28/02/2022

Miró O. **Evaluación de la capacidad de la escala MEESSI-AHF para mejorar la toma de decisión y el pronóstico en pacientes diagnosticados de insuficiencia cardíaca aguda en urgencias: Estudio observacional, cuasiexperimental y ensayo clínico.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00393
Duration: 01/01/2019-30/06/2023

DOCTORAL THESES

Aguiló J, López Barbeito B. **Medida de estrés en cuidadores principales de enfermos crónicos: En busca de una herramienta de medida.**
PhD student: Sira Aguiló Mir

Miró Ò,Martin FJ. **Investigación científica en Medicina de Urgencias y Emergencias en España: análisis bibliométrico y de redes de colaboración.**
PhD student: Pablo Burbano Santos

Miró Ò. **Medicina de Urgencias y Emergencias en Cataluña: Análisis detallado de las estructuras físicas y su organización, así como de los recursos humanos y su formación.**
PhD student: Fco Javier Escalada Roig

Miró Ò, Jacob Rodríguez J. **Papel de la troponina en el pronóstico de la insuficiencia cardíaca aguda.**
PhD student: Alejandro Roset Rigat

1.9 Endocarditis. Cardiovascular infections. Experimental model

LOCATION
CELLEX building, floor 4A

KEYWORDS
1. **Endocarditis**
2. **Native valve endocarditis**
3. **Prosthetic valve endocarditis**
4. **Cardiac Implantable Electronic Device (CIED) infection**
5. **Vascular infections**
6. **Experimental endocarditis**

RELATED DISEASES
1. **Bacteremia**
2. **Sepsis**
3. **Heart failure**
4. **Stroke**
5. **Bone and joint infections**
6. **Cardiac surgery**
7. **Cardiac implantable electronic devices**

GROUP INVOLVED IN
REIPI

Original publications

TOTAL	10
Mean IF	**7,91**
Q1	**70%**
D1	**40%**
MA	**70%**
OA	**80%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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VISITING SCIENTISTS
Anders Dahl

PROBLEM

Cardiovascular infections in general and infective endocarditis (IE) in particular are diseases that have severe effects on patients quality of life. They have high morbidity and mortality rates, as it affects the heart and the vessels as well as other organs such as the brain. Surgical treatment is necessary in more than fifty per cent of cases.

APPROACH

Our principal objective is to transfer basic scientific knowledge to daily clinical practice.

Making progress in the study of IE requires an interdisciplinary and translational approach, from basic *in vitro* and *in vivo* laboratory research in an experimental endocarditis model to clinical studies. This is achieved by a close collaboration between experts in infectious disease, microbiology, cardiology, cardiac and electrophysiological imaging, heart surgery, nuclear medicine, neurology and anatomical pathology.

The aspects of IE addressed covered all the clinical spectrum of IE: prevention strategies; optimising drug monitoring; improving clinical imaging and laboratory diagnostic techniques; developing new, effective treatment strategies; and studying improved surgical approaches.

IMPACT

The results of our studies can have an important impact on society, as they can lead to: earlier diagnosis of these diseases; the identification of new antibiotics, antibiotic combinations and therapeutic strategies that are effective for treating cardiovascular infections; better determination of the best time for heart surgery in diseases involving cardiovascular infections; and the prevention of post-operative cardiovascular infections and those that develop in patients with heart disease. The conclusions of the studies that we have conducted may be incorporated into national and international clinical guidelines.

RESEARCH LINES

- Clinical research.
- Translational research.
- Experimental endocarditis studies.

PUBLICATIONS

Originals

1. Pericàs JM; Llopis J; Athan E; Hernández-Meneses M; Hannan MM; Murdoch DR; Kanafani Z; Freiberger T; Strahilevitz J; Fernández-Hidalgo N; Lamas C; Durante-Mangoni E; Tattevin P; Nacinovich F; Chu VH; Miró JM; International Collaboration on Endocarditis (ICE) Investigators.

Prospective Cohort Study of Infective Endocarditis in People Who Inject Drugs. *Journal Of The American College Of Cardiology.* 77(5):544-555. D1

2. Pericàs JM, Llopis J, Jiménez-Exposito MJ, Kourany WM, Almirante B, Carosi G, Durante-Mangoni E, Fortes CQ, Giannitsioti E, Lerakis S, Montagna-Mella R, Ambrosioni J, Tan RS, Mestres CA, Wray D, Pachirat O, Moreno A, Chu VH, de Lazzari E, Fowler VG, Miró JM, ICE Investigators. **Infective Endocarditis in Patients on Chronic Hemodialysis.** *Journal Of The American College Of Cardiology.* 77(13):1629-1640. D1

3. Pujol M, Miró JM, Shaw E, Aguado JM, San-Juan R, Puig-Asensio M, Pigrau C, Calbo E, Montejo M, Rodriguez-Álvarez R, Garcia-Pais MJ, Pintado V, Escudero-Sánchez R, Lopez-Contreras J, Morata L, Montero M, Andrés M, Pasquau J, Arenas MD, Padilla B, Murillas J, Jover-Sáenz A, López-Cortes LE, García-Pardo G, Gasch O, Videla S, Hereu P, Tebé C, Pallarès N, Sanllorente M, Domínguez MÁ, Càmara J, Ferrer A, Padullés A, Cuervo G, Carratalà J, MRSA Bacteremia (BACSARM) Trial Investigators. **Daptomycin plus Fosfomycin versus Daptomycin Alone for Methicillin-Resistant *Staphylococcus aureus* Bacteremia and Endocarditis.** *Clinical Infectious Diseases.* 72(9):1517-1525. D1

4. Pericàs JM, Hernández-Meneses M, Muñoz P, Martínez-Sellés M, Álvarez-Uria A, de Alarcón A, Gutiérrez-Carretero E, Goenaga MA, Zarauza MJ, Falces C, Rodríguez-Esteban MÁ, Hidalgo-Tenorio C, Hernández-Cabrera M, Miró JM, Spanish Collaboration on Endocarditis—Grupo de Apoyo al Manejo de la Endocarditis Infecciosa en España (GAMES). **Characteristics and outcome of acute heart failure in infective endocarditis: focus on cardiogenic shock.** *Clinical Infectious Diseases.* 73(5):765-774. D1

5. Pericàs JM, Ambrosioni J, Muñoz P, de Alarcón A, Kestler M, Mari-Hualde A, Moreno A, Goenaga MÁ, Fariñas MC, Rodríguez-Álvarez R, Ojeda-Burgos G, Gálvez-Acebal J, Hidalgo-Tenorio C, Noureddine M, Miró JM, GAMES Investigators. **Prevalence of Colorectal Neoplasms Among Patients With *Enterococcus faecalis* Endocarditis in the GAMES Cohort (2008-2017)**. *Mayo Clinic Proceedings.* 96(1):132-146. Q1

6. Castaneda, X; Garcia-De-la-Maria, C; Gasch, O; Pericas, JM; Soy, D; Canas-Pacheco, MA; Falces, C; Garcia-Gonzalez, J; Hernandez-Meneses, M; Vidal, B; Almela, M; Quintana, E; Tolosana, JM; Fuster, D; Llopis, J; Dahl, A; Moreno, A; Marco, F; Miro, JM; Hospital Clinic Endocarditis Study Group. **Effectiveness of vancomycin plus cloxacillin compared with vancomycin, cloxacillin and daptomycin single therapies in the treatment of methicillin-resistant and methicillin-susceptible *Staphylococcus aureus* in a rabbit model of experimental endocarditis.** *Journal Of Antimicrobial Chemotherapy.* 76(6):1539-1546. Q1

7. Cañas MA, Téllez A, García de la Mària C, Dahl A, García-González J, Hernández-Meneses M, Almela M, Ambrosioni J, Falces C, Quintana E, Vidal B, Perissinotti A, Tolosana JM, Sandoval E, Pericàs JM, Moreno A, Miró JM, Hospital Clínic Endocarditis Team Investigators. **Development of High-Level Daptomycin Resistance in *Abiotrophia* and *Granulicatella* Species Isolates from Patients with Infective Endocarditis.** *Antimicrobial Agents And Chemotherapy.* 65(10):e0252220. Q1

8. Escrihuela-Vidal F, López-Cortés LE, Escolà-Vergé L, De Alarcón González A, Cuervo G, Sánchez-Porto A, Fernández-Hidalgo N, Luque R, Montejo M, Miró JM, Goenaga MÁ, Muñoz P, Valerio M, Ripa M, Sousa-Regueiro D, Gurguí M, Fariñas-Alvarez MC, Mateu L, García Vázquez E, Gálvez-Acebal J, Carratalà J, Grupo de Apoyo al Manejo de la Endocarditis Infecciosa en España (GAMES) Cohort Investigators and the Barcelona Endocarditis Study Team (BEST). **Clinical Features and Outcomes of *Streptococcus anginosus* Group Infective Endocarditis: A Multicenter Matched Cohort Study.** *Open Forum Infectious Diseases.* 8(6):ofab163. Q2

9. Pericàs JM, Hernández-Meneses M, Muñoz P, Álvarez-Uría A, Pinilla-Llorente B, de Alarcón A, Reviejo K, Fariñas MC, Falces C, Goikoetxea-Agirre J, Gálvez-Acebal J, Hidalgo-Tenorio C, Gómez-Nebreda E, Miro JM. **Outcomes and Risk Factors of Septic Shock in Patients With Infective Endocarditis: A Prospective Cohort Study.** *Open Forum Infectious Diseases.* 8(6):ofab119. Q2

10. Grillo S, Cuervo G, Carratala J, San-Juan R, Aguado JM, Morata L, Gomez-Zorrilla S, López-Contreras J, Gasch O, Gomila-Grange A, Iftimie S, Garcia-Pardo G, Calbo E, Boix-Palop L, Oriol I, Jover-Sáenz A, López-Cortés LE, Euba G, Aguirregabiria M, Garcia-Pais MJ, Gioia F, Paño JR, Pedro-Botet ML, Benítez RM, Pérez-Rodríguez MT, Meije Y, Loeches-Yagüe MB, Horna G, Berbel D, Domínguez MÁ, Padullés A, Cobo S, Hereu P, Videla S, Tebe C, Pallarés N, Miro JM, Pujol M, SAFO study group and the Spanish Network for Research in Infectious Diseases (REIPI). **Multicentre, randomised, open-label, phase IV-III study to evaluate the efficacy of cloxacillin plus fosfomycin versus cloxacillin alone in adult patients with methicillin-susceptible *Staphylococcus aureus* bacteraemia: study protocol for the SAFO trial.** *BMJ Open.* 11(8):e051208. Q2

Review

1. Dahl A, Hernandez-Meneses M, Perissinotti A, Vidal B, Quintana E, Miro JM, on behalf Hospital Clinic Endocarditis team investigators. **Echocardiography and FDG-PET/CT scan in Gram-negative bacteremia and cardiovascular infections.** *Current Opinion In Infectious Diseases.* 34(6):728-736. Q2

Letters

1. Corredoira J, Romay E, Pericàs JM, Miró JM. **Associating enterococcal endocarditis and colorectal neoplasia: is colonoscopy mandatory?** *European Journal Of Internal Medicine.* 85:112-113. Q1

Case Reports

1. Bodro M, Hernández-Meneses M, Ambrosioni J, Linares L, Moreno A, Sandoval E, Olivas P, Hernández-Tejero M, Miró JM, Marco F, Soriano A. **Salvage Treatment with Cefiderocol Regimens in Two Intravascular Foreign Body Infections by MDR Gram-Negative Pathogens, Involving Non-Removable Devices.** *Infectious Diseases And Therapy.* 10(1):575-581. Q1

2. Hernández-Meneses M, González-Martin J, Agüero D, Tolosana JM, Sandoval E, Falces C, San Antonio R, Vidal B, Moreno A, Ambrosioni J, Miró JM, Hospital Clínic of Barcelona Infectious Endocarditis Team. ***Mycobacterium wolinskyi*: A New Non-Tuberculous Mycobacterium Associated with Cardiovascular Infections?** *Infectious Diseases And Therapy.* 10(2):1073-1080. Q1

Clinical Guidelines

1. Wilson WR; Gewitz M; Lockhart PB; Bolger AF; DeSimone DC; Kazi DS; Couper DJ; Beaton A; Kilmartin C; Miro JM; Sable C; Jackson MA; Baddour LM; American Heart Association Young Hearts Rheumatic Fever; Endocarditis and Kawasaki Disease Committee of the Council on Lifelong Congenital Heart Disease and Heart Health in the Young; Council on Cardiovascular and Stroke Nursing; and the Council on Quality of Care and Outcomes Research American Heart Association Young Hearts Rheumatic Fever; Endocarditis and Kawasaki Disease Committee of the Council on Lifelong Congenital Heart Disease and Heart Health in the Young; Council on Cardiovascular and Stroke Nursing; and the Council on Quality of Care and Outcomes Research. **Prevention of Viridans Group Streptococcal Infective Endocarditis: A Scientific Statement From the American Heart Association.** *Circulation.* 143(20):e963-e978. D1

2. Bouza E, de Alarcón A, Fariñas MC, Gálvez J, Goenaga MA, Gutiérrez-Díez F, Hortal J, Lasso J, Mestres CA, Miró JM, Navas E, Nieto M, Parra A, Pérez de la Sota E, Rodríguez-Abella H, Rodríguez-Créixems M, Rodríguez-Roda J, Sánchez-Espín G, Sousa D, Velasco García de Sierra C, Muñoz P, Kestler M. **Prevention, diagnosis and management of post-surgical mediastinitis in adults consensus guidelines of the spanish society of cardiovascular infections (Seicav), the spanish society of thoracic and cardiovascular surgery (sectcv) and the biomedical research centre network for respiratory diseases (ciberes).** *Journal Of Clinical Medicine.* 10(23):5566. Q1

3. Wilson WR; Gewitz M; Lockhart PB; Bolger AF; DeSimone DC; Kazi DS; Couper DJ; Beaton A; Kilmartin C; Miro JM; Sable C; Jackson MA; Baddour LM; American Heart Association Young Hearts Rheumatic Fever; Endocarditis and Kawasaki Disease Committee of the Council on Lifelong Congenital Heart Disease and Heart Health in the Young; Council on Cardiovascular and Stroke Nursing; and the Council on Quality of Care and Outcomes Research American Heart Association Young Hearts Rheumatic Fever; Endocarditis and Kawasaki Disease Committee of the Council on Lifelong Congenital Heart Disease and Heart Health in the Young; Council on Cardiovascular and Stroke Nursing; and the Council on Quality of Care and Outcomes Research. **Adapted from: Prevention of Viridans Group Streptococcal Infective Endocarditis: A Scientific Statement From the American Heart Association.** *Journal Of The American Dental Association.* 152(11):886-902.e2. Q1

Consortium Publications

1. Escolà-Vergé L, Cuervo G, de Alarcón A, Sousa D, Barca LV, Fernández-Hidalgo N, IE COVID-19 investigators. **Impact of the COVID-19 pandemic on the diagnosis, management and prognosis of infective endocarditis.** *Clinical Microbiology And Infection.* 27(4):660-664. D1

2. Varela Barca L, Vidal-Bonnet L, Fariñas MC, Muñoz P, Valerio Minero M, de Alarcón A, Gutiérrez Carretero E, Gutiérrez Cuadra M, Moreno Camacho A, Kortajarena Urkola X, Goikoetxea Agirre J, Ojeda Burgos G, López-Cortés LE, Porres Azpiroz JC, Lopez-Menendez J, GAMES Investigators. **Analysis of sex differences in the clinical presentation, management and prognosis of infective endocarditis in Spain.** *Heart.* 107(21):1717-1724. Q1

3. Gutierrez-Villanueva, A; Munoz, P; Delgado-Montero, A; Olmedo-Samperio, M; de Alarcon, A; Gutierrez-Carretero, E; Zarauza, J; Pares, DGI; Goenaga, MA; Ojeda-Burgos, G; Goikoetxea-Agirre, AJ; Reguera-Iglesias, JM; Ramos, A; Fernandez-Cruz, A. **Mural Endocarditis: The GAMES Registry Series and Review of the Literature.** *Infectious Diseases And Therapy.* 10(4):2749-2764. Q1

GRANTS FOR RESEARCH IN PROGRESS

Ambrosioni J. **Tratamiento antimicrobiano oral vs. parenteral ambulatorio para la endocarditis infecciosa (Ensayo clínico OraPAT-EI GAMES).**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00861
Duration: 01/01/2019-31/12/2022

Garcia de la Maria C. **Prevention of vascular catheter-related infections by the FUNctionalization of CATHeters with thermically activated hydrogels with antimicrobial agents of broad spectrum.**
Sponsored by: Fundació La Marató de TV3. Infeccioses_18
Duration: 21/06/2019-20/06/2022

Miró JM, García dela María C. **Eficacia de nuevas pautas de tratamiento antibiótico de la endocarditis enterocòcica evaluadas *in vitro* y en el modelo de endocarditis experimental.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/01251
Duration: 01/01/2018-30/06/2022

Miró JM, García dela María C. **Estudio in vitro y en el modelo de endocarditis experimental de la eficacia de nuevas combinaciones orales y parenterales de antibióticos para el tratamiento domiciliario de la endocarditis infecciosa.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00830
Duration: 01/01/2021-31/12/2023

Miró JM. **Eficàcia de noves pautes antibiòtiques al tractament de la endocarditis enterocòcica per *Enterococcus faecalis* avaluades *in vitro* i al model d'endocarditis experimental.**
Sponsored by: Generalitat de Catalunya. PERIS_SLT017/20/000163
Duration: 01/07/2021-31/12/2024

Miró JM. **Intensified tuberculosis treatment to reduce the high mortality of tuberculous.**
Sponsored by: European Commission. CE_EDCTP_17T
Duration: 01/01/2019-31/12/2023

Miró JM. **Microbiome-based stratification of individuals at risk of HIV-1 acquisition, chronic clinical.**
Sponsored by: European Commission. CE_H2020-SC1_2019_2s
Duration: 01/01/2020-30/06/2025

Pericàs JM. **Estudio prospectivo multicéntrico para explorar la relación entre las infecciones del torrente sanguíneo por Enterococcus faecalis y la neoplasia colorrectal (Proyecto EnteroColonus-GAMES).**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/01898
Duration: 13/01/2020-31/12/2022

1.10 Infections in solid-organ transplant recipients

LOCATION
HCB building

KEYWORDS
1. **HIV**
2. **AIDS**
3. **Endocarditis**
4. **Nosocomial infections**
5. **Immune suppressed patients**

RELATED DISEASES
1. **Infections in transplant patients**
2. **Donor-to-recipient transmitted infections**
3. **Recipient antibiotic prophylaxis**
4. **Preventive measures**
5. **Innate and adaptive immunity**
6. **Epidemiology of infections**

GROUP INVOLVED IN
REIPI
RIS

Original publications

TOTAL	25
Mean IF	**5,40**
Q1	**60%**
D1	**20%**
MA	**16%**
OA	**84%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PRE-DOCTORAL RESEARCHERS
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PROBLEM

Transplant patients require immunosuppressive treatment to prevent graft rejection. However, this causes immunodepression (lowering of defences), which makes the patient more prone to infections.

For this reason, it is very important to be familiar with the most common infections and prevent them using antimicrobial and other prophylactic measures.

Infections differ over time, and so specialists must know how to request the pertinent tests and apply the most appropriate treatment in order to reduce patient morbidity and mortality.

APPROACH

The group is made up of specialists in infectious diseases, microbiology, immunology, as well as experts in diverse organ specialities (nephrology, gastroenterology, cardiology, endocrinology and surgery, among others) and in transplant coordination.

Almost fifty per cent of transplant patients will develop an infection during the postoperative phase.

The group's objective is to reduce the number of infections and minimise their severity, and to achieve this they develop and apply prophylactic, diagnostic and antimicrobial therapy protocols.

IMPACT

These preventive, diagnostic and therapeutic measures have a positive effect on the solid-organ transplant population and on immunosuppressed patients. Antimicrobial prophylaxis and other prevention measures are applied and developed (vaccines, colonisation by multi-drug resistant bacteria, etc.).

Protocols are applied for the study and early detection of diverse infections, as are highly effective antimicrobial treatment guidelines for use in opportunistic and nosocomial (hospital-acquired) infections. In addition, isolation measures are applied in cases when the micro-organism detected makes this necessary.

Many of the results of the studies published by the group in biomedical journals have been included in national and international clinical practice guidelines.

RESEARCH LINES

- Epidemiological evolution of pulmonary infections in immunosuppressed patients (SOT, HIV, others).

- Evolution of the epidemiology of infection in SOT (including HIV-infected patients and donors) and role of the immunosuppressors. Evaluation of the sensitivity and specificity of diagnostic techniques and biological markers and prognostic factors of oppor.

- Multicenter research projects within the reipi. Clinical trials in the area of infections in SOT recipients.

- Role of innate and adaptive immunity (including genetic markers) in the risk of infections in SOT.

PUBLICATIONS

Originals

1. Pericàs JM, Llopis J, Jiménez-Exposito MJ, Kourany WM, Almirante B, Carosi G, Durante-Mangoni E, Fortes CQ, Giannitsioti E, Lerakis S, Montagna-Mella R, Ambrosioni J, Tan RS, Mestres CA, Wray D, Pachirat O, Moreno A, Chu VH, de Lazzari E, Fowler VG, Miró JM, ICE Investigators. **Infective Endocarditis in Patients on Chronic Hemodialysis.** *Journal Of The American College Of Cardiology.* 77(13):1629-1640. D1

2. Revuelta I, Santos-Arteaga FJ, Montagud-Marrahi E, Ventura-Aguiar P, Di Caprio D, Cofan F, Cucchiari D, Torregrosa V, Piñeiro GJ, Esforzado N, Bodro M, Ugalde-Altamirano J, Moreno A, Campistol JM, Alcaraz A, Bayès B, Poch E, Oppenheimer F, Diekmann F . **A hybrid data envelopment analysis-artificial neural network prediction model for COVID-19 severity in transplant recipients.** *Artificial Intelligence Review.* 1(32):1-4684. D1

3. Cucchiari D, Egri N, Bodro M, Herrera S, Del Risco-Zevallos J, Casals-Urquiza J, Cofan F, Moreno A, Rovira J, Banon-Maneus E, Ramirez-Bajo MJ, Ventura-Aguiar P, Pérez-Olmos A, Garcia-Pascual M, Pascal M, Vilella A, Trilla A, Ríos J, Palou E, Juan M, Bayés B, Diekmann F . **Cellular and humoral response after mRNA-1273 SARS-CoV-2 vaccine in kidney transplant recipients.** *American Journal Of Transplantation.* 21(8):2727-2739. D1

4. Herrera S, Colmenero J, Pascal M, Escobedo M, Castel MA, Sole-González E, Palou E, Egri N, Ruiz P, Mosquera M, Moreno A, Juan M, Vilella A, Soriano A, Farrero M, Bodro M. **Cellular and humoral immune response after mRNA-1273 SARS-CoV-2 vaccine in liver and heart transplant recipients.** *American Journal Of Transplantation.* 21(12):3971-3979. D1

5. Fariñas MC, González-Rico C, Fernández-Martínez M, Fortún J, Escudero-Sanchez R, Moreno A, Bodro M, Muñoz P, Valerio M, Montejo M, Nieto J, Ruiz-San Millan JC, Casafont-Morencos F, Martinez-Martínez L, Fariñas-Álvarez C, ENTHERE Study Group, the Group for Study of Infection in Transplantation of the Spanish Society of Infectious Diseases and Clinical Microbiology (GESITRA-SEIMC) and the Spanish Network for Research in Infectious Diseases (REIPI). **Oral decontamination with colistin plus neomycin in solid organ transplant recipients colonized by multidrug-resistant Enterobacterales: a multicenter, randomized, controlled, open-label, parallel-group clinical trial.** *Clinical Microbiology And Infection.* 27(6):856-863. D1

6. Pericàs JM, Ambrosioni J, Muñoz P, de Alarcón A, Kestler M, Mari-Hualde A, Moreno A, Goenaga MÁ, Fariñas MC, Rodríguez-Álvarez R, Ojeda-Burgos G, Gálvez-Acebal J, Hidalgo-Tenorio C, Noureddine M, Miró JM, GAMES Investigators. **Prevalence of Colorectal Neoplasms Among Patients With Enterococcus faecalis Endocarditis in the GAMES Cohort (2008-2017).** *Mayo Clinic Proceedings.* 96(1):132-146. Q1

7. Varela Barca L, Vidal-Bonnet L, Fariñas MC, Muñoz P, Valerio Minero M, de Alarcón A, Gutiérrez Carretero E, Gutiérrez Cuadra M, Moreno Camacho A, Kortajarena Urkola X, Goikoetxea Agirre J, Ojeda Burgos G, López-Cortés LE, Porres Azpiroz JC, Lopez-Menendez J, GAMES Investigators. **Analysis of sex differences in the clinical presentation, management and prognosis of infective endocarditis in Spain.** *Heart.* 107(21):1717-1724. Q1

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11. Gutiérrez-Gutiérrez B, Pérez-Nadales E, Pérez-Galera S, Fernández-Ruiz M, Carratalà J, Oriol I, Cordero E, Lepe JA, Tan BH, Corbella L, Paul M, Natera AM, David MD, Montejo M, Iyer RN, Pierrotti LC, Merino E, Steinke SM, Rana MM, Muñoz P, Mularoni A, van Delden C, Grossi PA, Seminari EM, Gunseren F, Lease ED, Roilides E, Fortún J, Arslan H, Coussement J, Tufan ZK, Pilmis B, Rizzi M, Loeches B, Eriksson BM, Abdala E, Soldani F, Lowman W, Clemente WT, Bodro M, Fariñas MC, Kazak E, Martínez-Martínez L, Aguado JM, Torre-Cisneros J, Pascual Á, Rodríguez-Baño J, Investigators from the REIPI/ESGICH/ESGBIS/INCREMENT-SOT Group. **Propensity Score and Desirability of Outcome Ranking Analysis of Ertapenem for Treatment of Nonsevere Bacteremic Urinary Tract Infections Due to Extended-Spectrum-Beta-Lactamase-Producing Enterobacterales in Kidney Transplant Recipients.** *Antimicrobial Agents And Chemotherapy.* 65(11):e0110221. Q1

12. Ventura-Aguiar P, Ramirez-Bajo MJ, Kaur N, Demko Z, Rovira J, Bañón-Maneus E, Hierro N, Lazo M, Cucchiari D, Esforzado N, Revuelta I, Piñeiro G, Torregrosa V, Cofan F, Fondevila C, Billings P, Tabriziani H, Diekmann F . **406.2: Utility of Donor-derived Cell-free DNA in Assessing Simultaneous Pancreas-Kidney Transplantation Rejection.** *Transplantation.* 105(12 Suppl 2):S31. Q1

13. Gioia F, Filigheddu E, Corbella L, Fernández-Ruiz M, López-Medrano F, Pérez-Ayala A, Aguado JM, Fariñas MC, Arnaiz F, Calvo J, Cifrian JM, Gonzalez-Rico C, Vidal E, Torre-Cisneros J, Ras MM, Pérez S, Sabe N, López-Soria LM, Rodríguez-Alvarez RJ, Montejo JM, Valerio M, Machado M, Muñoz P, Linares L, Bodro M, Moreno A, Fernández-Cruz A, Cantón R, Moreno S, Martin-Davila P, Fortún J. **Invasive aspergillosis in solid organ transplantation: Diagnostic challenges and differences in outcome in a**

Spanish national cohort (Diaspersot Study). *Mycoses.* 64(11):1334-1345. Q1

14. Bodro M, Cofan F, Ríos J, Herrera S, Linares L, Marcos MA, Soriano A, Moreno A, Diekmann F. **Use of Anti-Cytokine Therapy in Kidney Transplant Recipients with COVID-19.** *Journal Of Clinical Medicine.* 10(8):1551. Q1

15. Herrera S; Bernal-Maurandi J; Cofan F; Ventura P; Marcos MA; Linares L; Cuesta G; Diekmann F; Moreno A; Bodro M. **BK virus and cytomegalovirus coinfections in kidney transplantation and their impact on allograft loss.** *Journal Of Clinical Medicine.* 10(17):3779. Q1

16. Montagud-Marrahi E, Molina-Andújar A, Rovira J, Revuelta I, Ventura-Aguiar P, Piñeiro G, Ugalde-Altamirano J, Perna F, Torregrosa JV, Oppenheimer F, Esforzado N, Cofán F, Campistol JM, Herrera-Garcia A, Ríos J, Diekmann F, Cucchiari D . **The impact of functional delayed graft function in the modern era of kidney transplantation.** Transplant International. 34(1):175-184. Q1

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18. Torres B, Alcubilla P, González-Cordón A, Inciarte A, Chumbita M, Cardozo C, Meira F, Giménez M, de Hollanda A, Soriano A, COVID19 Hospital Clínic Infectious Diseases research group. **Impact of low serum calcium at hospital admission on SARS-CoV-2 infection outcome.** *International Journal Of Infectious Diseases.* 104(104):164-168. Q2

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20. Cucchiari D, Guillén E, Cofan F, Torregrosa JV, Esforzado N, Revuelta I, Ventura-Aguiar P, Oppenheimer F, Bayés B, Marcos MÁ, Morgado-Carrasco D, López JM, Creus P, Hernández C, Coloma E, Bodro M, Diekmann F, Pericàs JM, Nicolás D, Hospital Clínic 4H Team (Hospital at Home-Health Hotel). **Taking care of kidney transplant recipients during the COVID-19 pandemic: experience from a medicalized hotel.** *Clinical Transplantation.* 35(1):e14132. Q2

21. Inciarte A, Cardozo C, Chumbita M, Alcubilla P, Torres B, González Cordón A, Rico V, Aguero D, García-Pouton N, Hernández-Meneses M, Albiach L, Meira F, De la Mora L, Linares L, Puerta-Alcalde P, Macaya I, Mensa J, Laguno M, Ambrosioni J, Ramos A, Morata L, Bodro M, Moreno-García E, Moreno A, Sola M, Rojas J, Leal L, Torres M, Garcia-Vidal C, Martínez JA, Alobid I, Soriano A, Garcia F. **Gustatory and olfactory dysfunctions in hospitalised patients with COVID-19 pneumonia: a prospective study.** *BMJ Open.* 11(8):e040775. Q2

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23. Moreno-García E, Rico E, Albiach L, Agüero D, Ambrosioni J, Bodro M, Cardozo C, Chumbita M, De la Mora M, García-Pouton N, Garcia-Vidal C, González-Cordón A, Hernández-Meneses M, Inciarte A, Laguno M, Leal L, Linares L, Macay I, Meira F, Mensa J, Moreno A, Morata L, Puerta-Alcalde P, Rojas J, Solá M, Torres B, Torres M, Tomé A, Tuset M, Castro P, Fernández S, Nicolás JM, Almuedo-Riera A, Muñoz J, Fernandez-Pittol M, Marcos MA, Soy D, Martínez JA, García F, Soriano A. **Tocilizumab reduces the risk of ICU admission and mortality in patients with SARS-CoV-2 infection.** *Revista Española De Quimioterapia.* 34(3):238-244. Q4

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Review

1. Herrera S, Bodro M, Soriano A. **Predictors of multidrug resistant Pseudomonas aeruginosa involvement in bloodstream infections**. *Current Opinion In Infectious Diseases.* 34(6):686-692. Q2

Letters

1. Montagud-Marrahi E, Cucchiari D, Cuadrado-Payán E, Cofan F, Torregrosa JV, Ventura-Aguiar P, Revuelta I, Bodro M, Piñeiro GJ, Esforzado N, Campistol JM, Oppenheimer F, Marcos MÁ, Bayés B, Moreno A, Diekmann F. **SARS-CoV-2 Infection After Full Vaccination in Kidney Transplant Recipients.** *Transplantation.* 105(12):e278-e279. Q1

Case Reports

1. Molina-Andújar A, Tovar N, Cuadrado E, Castrejón de Anta N, Revuelta I, Cucchiari D, Cofan F, Esforzado N, Cibeira MT, Rosiñol L, Bladé J, Diekmann F, Fernández de Larrea C, Quintana LF. **Kidney Transplantation in Monoclonal Immunoglobulin Deposition Disease: A Report of 6 Cases.** *American Journal Of Kidney Diseases.* 78(5):755-759. D1

2. Bodro M, Hernández-Meneses M, Ambrosioni J, Linares L, Moreno A, Sandoval E, Olivas P, Hernández-Tejero M, Miró JM, Marco F, Soriano A . **Salvage Treatment with Cefiderocol Regimens in Two Intravascular Foreign Body Infections by MDR Gram-Negative Pathogens, Involving Non-Removable Devices.** *Infectious Diseases And Therapy.* 10(1):575-581. Q1

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4. Diaz NA, Ambrosioni J, Tuset M, Brunet M, Cofan F, Crespo G, Ruiz P, Redondo-Pachón D, Crespo M, Marín-Casino M, Moreno A, Miró JM, Hospital Clinic and Hospital del Mar SOT in HIV Investigators. **Tacrolimus, Sirolimus and Everolimus Doses in HIV-Infected Solid-Organ Recipients, Requiring a Cobicistat-Based Antiretroviral Regimen: Report of Three Cases and Review.** *Infectious Diseases And Therapy.* 10(2):1055-1064. Q1

5. Marques, JS; Bodro, M; Torres, B; Garcia, F; Martinez, JA; Leal, L. **Pulmonary Infection Caused by Mycobacterium malmoense in a Chronic HIV-Infected Individual Participating in a Therapeutic Vaccine Trial.** *Vaccines.* 9(10):1103. Q2

6. Arana C, Cuevas Ramírez RE, Xipell M, Casals J, Moreno A, Herrera S, Bodro M, Cofan F, Diekmann F, Esforzado N. **Mucormycosis associated with covid19 in two kidney transplant patients.** *Transplant Infectious Disease.* 23(4):e13652. Q3

Consortium Publications

1. Gutierrez-Villanueva, A; Munoz, P; Delgado-Montero, A; Olmedo-Samperio, M; de Alarcon, A; Gutierrez-Carretero, E; Zarauza, J; Pares, DGI; Goenaga, MA; Ojeda-Burgos, G; Goikoetxea-Agirre, AJ; Reguera-Iglesias, JM; Ramos, A; Fernandez-Cruz, A. **Mural Endocarditis: The GAMES Registry Series and Review of the Literature.** *Infectious Diseases And Therapy.* 10(4):2749-2764. Q1

2. Fernández-Martínez M, González-Rico C, Gozalo-Margüello M, Marco F, Gracia-Ahufinger I, Aranzamendi M, Sánchez-Díaz AM, Vicente-Rangel T, Chaves F, Calvo Montes J, Martínez-Martínez L, Fariñas MC, ENTHERE Study Group, the Group for Study of Infection in Transplantation of the Spanish Society of Infectious Diseases and Clinical Microbiology (GESITRA-SEIMC) and the Spanish Network for Research in Infectious Diseases (REIPI). **Molecular characterization of multidrug resistant Enterobacterales strains isolated from liver and kidney transplant recipients in Spain.** *Scientific Reports.* 11(1):11875. Q1

3. Escrihuela-Vidal F, López-Cortés LE, Escolà-Vergé L, De Alarcón González A, Cuervo G, Sánchez-Porto A, Fernández-Hidalgo N, Luque R, Montejo M, Miró JM, Goenaga MÁ, Muñoz P, Valerio M, Ripa M, Sousa-Regueiro D, Gurguí M, Fariñas-Alvarez MC, Mateu L, García Vázquez E, Gálvez-Acebal J, Carratalà J, Grupo de Apoyo al Manejo de la Endocarditis Infecciosa en España (GAMES) Cohort Investigators and the Barcelona Endocarditis Study Team (BEST). **Clinical Features and Outcomes of Streptococcus anginosus Group Infective Endocarditis: A Multicenter Matched Cohort Study.** *Open Forum Infectious Diseases.* 8(6):ofab163. Q2

GRANTS FOR RESEARCH IN PROGRESS

Bodro M. **Seguretat i immunogenicitat de la vacuna ARNm SARS-Cov-2 en receptors de transplantament d'organ sòlid: Estudi Multicèntric.**
Sponsored by: Fundació la Marató de TV3.
TV3_COVID19_21
Duration: 10/09/2021-09/09/2023

Bodro M. **Utilidad de la prueba elispot-bkv para predecir el riesgo de desarrollar nefropatía por virus bk en receptores de riñón. Estudio multicéntrico.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00608
Duration: 01/01/2020-31/12/2022

1.11 Inflammatory joint diseases (IJDs)

LOCATION
HCB building

KEYWORDS
1. **Rheumatoid arthritis**
2. **Psoriatic arthritis**
3. **Pathogenesis**
4. **Biomarkers**
5. **Targeted therapies**
6. **Synovial immunopathology**

RELATED DISEASES
1. **Rheumatoid arthritis**
2. **Psoriatic arthritis**
3. **Spondyloarthritis**
4. **Palindromic rheumatism**

GROUP INVOLVED IN
RIER

Original publications

TOTAL	18
Mean IF	**9,24**
Q1	**56%**
D1	**33%**
MA	**33%**
OA	**61%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PRE-DOCTORAL RESEARCHERS
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PROBLEM

The various forms of chronic arthritis (rheumatoid arthritis, psoriatic arthritis and, spondylarthritis) affect nearly 2% of the population. They have a major social and health impact, due to the incapacity and loss of quality of life that they can cause.

Although there are currently no effective treatments that cure them, in recent years the mechanisms that cause inflammation and the destruction of the joints have become better known, and new drugs and therapeutic targets have been developed.

However, not all patients respond favourably, so the challenge remains: new treatments and new biomarkers need to be developed to be able to treat each person with the most appropriate therapy.

APPROACH

This research group aims to increase its knowledge of the different prognostic factors that can determine a better evolution of arthritis and which treatment can be most effective for each patient.

It studies biomarkers present in the blood of patients with arthritis at the initial stages of the disease (especially autoantibodies) and is a pioneer in the field of immunopathological study of the synovial membrane in different forms of arthritis, including those that do not have an initial diagnosis, in order to improve the diagnostic and prognostic process. The group also participates in strategic studies working towards the advancement of personalised medicine.

IMPACT

The group's objectives are to improve the diagnosis of rheumatoid arthritis, gain insight into the immune mechanisms involved, and identify biomarkers that could help to obtain a personalised therapy.

To do this, research is carried out in collaboration with other European groups. It is making advances in identifying individuals at risk of rheumatoid arthritis with a view to conducting clinical trials for therapies that regulate the adaptive immune response and thus prevent the onset of the disease.

RESEARCH LINES

- Clinical and sonographic characterization of clinical remission.

- Immunopathology of synovitis in chronic arthritis.

-Autoantibodies in rheumatois arthritis.

-Arthritis induced by immunotherapy.

-Arthritis in systemic autoimmune diseases.

- Pharmacogenomics of chronic arthritis.

- Prognostic factors in early arthritis.

- The gut-joint axis in rheumatoid arthritis patients: role of microbiota-induced intestinal t follicular helper cells and innate immune cells in the pathogenesis of the disease.

PUBLICATIONS

Originals

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2. Andreev D, Liu M, Kachler K, Llerins Perez M, Kirchner P, Kölle J, Gießl A, Rauber S, Song R, Aust O, Grüneboom A, Kleyer A, Cañete JD, Ekici A, Ramming A, Finotto S, Schett G, Bozec A. **Regulatory eosinophils induce the resolution of experimental arthritis and appear in remission state of human rheumatoid arthritis.** *Annals Of The Rheumatic Diseases.* 80(4):451-468. D1

3. De la Calle-Fabregat C, Niemantsverdriet E, Cañete JD, Li T, van der Helm-van Mil AHM, Rodríguez-Ubreva J, Ballestar E . **The DNA methylation Profile of Undifferentiated Arthritis Patients Anticipates their Subsequent Differentiation to Rheumatoid Arthritis.** *Arthritis & Rheumatology.* 73(12):2229-2239. D1

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7. Fuentelsaz-Romero S; Cuervo A; Estrada-Capetillo L; Celis R; García-Campos R; Ramírez J; Sastre S; Samaniego R; Puig-Kröger A; Cañete JD. **GM-CSF Expression and Macrophage Polarization in Joints of Undifferentiated Arthritis Patients Evolving to Rheumatoid Arthritis or Psoriatic Arthritis.** *Frontiers In Immunology.* 11:613975. Q1

8. Sarmiento-Monroy JC, Espinosa G, Londoño MC, Meira F, Caballol B, Llufriu S, Carrasco JL, Moll-Udina A, Quintana LF, Giavedoni P, Ramírez J, Inciarte-Mundo J, Solana E, Blanco Y, Martinez-Hernandez E, Sepúlveda M, Llorenç V, Prieto-González S, Espígol-Frigolé G, Milisenda JC, Cid MC, Mascaró JM, Blanco I, Barberá JA, Sibila O, Gratacos-Ginès J, Adán A, Agustí A, Sanmartí R, Panés J, Cervera R, Vila J, Soriano A, Gómez-Puerta JA, Immunocovid Clinic. **A multidisciplinary registry of patients with autoimmune and immune-mediated diseases with symptomatic COVID-19 from a single center.** *Journal Of Autoimmunity.* 117:102580. Q1

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11. Morlà RM; Li T; Castrejon I; Luta G; Pincus T. **Multidimensional Health Assessment Questionnaire as an Effective Tool to Screen for Depression in Routine Rheumatology Care.** *Arthritis Care & Research.* 73(1):120-129. Q2

12. Cuervo A, Celis R, Julià A, Usategui A, Faré R, Ramírez J, Azuaga AB, Lorenzo A, Sanmartí R, Pablos JL, Cañete JD. **Synovial Immunohistological Biomarkers of the Classification of Undifferentiated Arthritis Evolving to Rheumatoid or Psoriatic Arthritis.** *Frontiers Of Medicine.* 8:656667. Q2

13. Julià A, Martínez-Mateu SH, Domènech E, Cañete JD, Ferrándiz C, Tornero J, Gisbert JP, Fernández-Nebro A, Daudén E, Barreiro-de Acosta M, Pérez C, Queiró R, López-Longo FJ, Carazo JLS, Mendoza JL, Alpéri M, Montilla C, Venegas JJP, Muñoz F, Castañeda S, Aterido A, Lasanta ML, Marsal S, IMID Consortium. **Food groups associated with immune-mediated inflammatory diseases: a Mendelian randomization and disease severity study.** *European Journal Of Clinical Nutrition.* 75(9):1368-1382. Q2

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15. Ramírez J; Inciarte-Mundo J; Cuervo A; Celis R; Ruiz-Esquide V; Castellanos-Moreira R; Ponce A; Gómez-Puerta JA; Sanmartí R; Cañete JD. **Comparable long-term outcomes between DAS28-ESR remission criteria and ACR/EULAR definitions in patients with established rheumatoid arthritis.** *Clinical Rheumatology.* 40(7):2665-2672. Q3

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Tomas; Ocampo, Vanessa; Armando Bautista-Molano, Wilson; Medina, Yimy F.; Josefina Fuentes-Silva, Yurilis; Soriano, Enrique R. **Design of an algorithm for the diagnostic approach of patients with joint pain.** *Clincal Rheumatology.* 40(4):1581-1591. Q3

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1. Sanmartí R, Frade-Sosa B, Morlà R, Castellanos-Moreira R, Cabrera-Villalba S, Ramirez J, Salvador G, Haro I, Cañete JD. **Palindromic Rheumatism: Just a Pre-rheumatoid Stage or Something Else?** *Frontiers Of Medicine.* 8:657983. Q2

2. Ramirez, J; Azuaga-Pinango, AB; Celis, R; Canete, JD. **Update on Cardiovascular Risk and Obesity in Psoriatic Arthritis.** *Frontiers Of Medicine.* 8:742713. Q2

3. Sanmartí R, Haro I, Cañete JD. **Palindromic rheumatism: a unique and enigmatic entity with a complex relationship with rheumatoid arthritis.** *Expert Review Of Clinical Immunology*. 17(4):375-384. Q2

Letters

1. Gómez-Puerta JA, Peris P. **Expanding diagnostic approach in patients with osteonecrosis**. *Arthritis Research & Therapy.* 23(1):150. Q2

2. Castellanos-Moreira R; Gomez A; Haro I; Ruiz-Esquide V; Marsal S; Sanmarti R. **Anti-carbamylated protein antibodies are associated with early abatacept response in rheumatoid arthritis Comment on: Anti-carbamylated protein antibodies as a clinical response predictor in rheumatoid arthritis patients treated with abatacept.** *Clinical And Experimental Rheumatology.* 39(5):1142-1143. Q2

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1. Tomas X; Atilano L; Cañete JD; Pomes J; del Amo M; Macias N. **Delayed soft tissue emphysema of the leg following arthroscopy of the knee.** Medicina Clinica. 156(9):476-476. Q3

Clinical Guidelines

1. Mankia K; Siddle HJ; Kerschbaumer A; Rodriguez DA; Catrina AI; Canete JD; Cope AP; Daien CI; Deane KD; Gabalawy HE; Finckh A; Holers VM; Koloumas M; Ometto F; Raza K; Zabalan C; van der Helm-Van Mil A; van Schaardenburg D; Aletaha D; Emery P. **EULAR points to consider for conducting clinical trials and observational studies in individuals at risk of rheumatoid arthritis.** *Annals Of The Rheumatic Diseases.* 80(10):1286-1298. D1

Consortium Publications

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GRANTS FOR RESEARCH IN PROGRESS

Cañete JD, Sanmartí R. **Biomarcadores sinoviales y séricos de mal pronóstico en Artritis Indeferenciadas de inicio. Un estudio longitudinal, prospectivo, de 18 meses de seguimiento.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00993
Duration: 01/01/2018-31/12/2021

Cañete JD. **Red Temática de Investigación Cooperativa en Salud - Inflamación y enfermedades reumáticas.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_RD16/0012/0010
Duration: 01/01/2017-31/12/2022

Cañete JD. **3TR: Taxonomy, treatment, targets and remission-Identification of the molecular mechanisms of non-response to treatments, relapses and remission in autoimmune, inflammatory, and allergic conditions.**
Sponsored by: European Comission. CE_IMI2-2018-14
Duration: 01/10/2019-31/09/2026

Cañete JD. **Promoting Early Identification and Improving Outcomes in Psoriatic Arthritis.**
Sponsored by: European Commission. CE_IMI2_20th_2stg
Duration: 01/07/2021-30/06/2026

Castellanos RA. **Estudi dels autoanticossos en malaltia pulmonar intersticial difusa associada a artritis reumatoide.**
Sponsored by: Societat Catalana de Reumatologia. SCR_19_01
Duration: 07/06/2019-06/06/2021

DOCTORAL THESIS

Sanmarti R, Haro I. **Anticuerpos frente a péptidos carbamilados en la artritis reumatoide: Papel en el reumatismo palindrómico, la enfermedad pulmonar intersticial y la respuesta terapéutica.**
PhD student: Raul Antonio Castellanos Moreira

Cañete JD. **Biomarcadores sinoviales para la clasificación diagnóstica de las artritis indiferenciadas.**
PhD student: Andrea Mireya Cuervo Aguilera

1.12 Nosocomial infection

LOCATION
HCB

KEYWORDS
1. **Nosocomial infection**
2. **Bacteremia**
3. **Inmunosuppresed patients**
4. **Bone and joint infection**

RELATED DISEASES
1. **Infectious diseases**

GROUP INVOLVED IN
AGAUR_SGR17: 01432, 01067
REIPI

Original publications

TOTAL	48
Mean IF	6,32
Q1	50%
D1	15%
MA	42%
OA	81%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Eight per cent of patients admitted have a nosocomial infection (infection acquired in the hospital) and approximately 20-30% of cases are due to multi-drug resistant organisms.

This has direct consequences for the health of patients, prolonging their stay in hospital and can lead to death.

APPROACH

This group is a multidisciplinary team in which doctors specialising in infectious diseases, microbiology and preventive medicine along with pharmacists cooperate in the study of the causes of nosocomial infections, in order to prevent them or treat them when they appear.

IMPACT

The research carried out by the group may help to reduce the number of healthcare-associated infections, promote the rational use of antibiotics and reduce the rate of multi-drug resistant organisms.

RESEARCH LINES

- Bacteremia.
- Bone and joint infections.
- Immunocompromised patients.
- Intestinal microbiota.

PUBLICATIONS

Originals

1. López MG, Chiner-Oms Á, García de Viedma D, Ruiz-Rodriguez P, Bracho MA, Cancino-Muñoz I, D'Auria G, de Marco G, García-González N, Goig GA, Gómez-Navarro I, Jiménez-Serrano S, Martinez-Priego L, Ruiz-Hueso P, Ruiz-Roldán L, Torres-Puente M, Alberola J, Albert E, Aranzamendi Zaldumbide M, Bea-Escudero MP, Boga JA, Bordoy AE, Canut-Blasco A, Carvajal A, Cilla Eguiluz G, Cordón Rodríguez ML, Costa-Alcalde JJ, de Toro M, de Toro Peinado I, Del Pozo JL, Duchêne S, Fernández-Pinero J, Fuster Escrivá B, Gimeno Cardona C, González Galán V, Gonzalo Jiménez N, Hernáez Crespo S, Herranz M, Lepe JA, López-Causapé C, López-Hontangas JL, Martín V, Martró E, Milagro Beamonte A, Montes Ros M, Moreno-Muñoz R, Navarro D, Navarro-Marí JM, Not A, Oliver A, Palop-Borrás B, Parra Grande M, Pedrosa-Corral I, Pérez González MC, Pérez-Lago L, Pérez-Ruiz M, Piñeiro Vázquez L, Rabella N, Rezusta A, Robles Fonseca L, Rodríguez-Villodres Á, Sanbonmatsu-Gámez S, Sicilia J, Soriano A, Tirado Balaguer MD, Torres I, Tristancho A, Marimón JM,, Coscolla M,

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14. García-Vidal C; Vázquez L; Jarque I. **[Relevance of liposomal amphotericin B in the treatment of invasive fungal infections in patients with hematologic malignancies].** *Revista Iberoamericana De Micologia.* 38(2):61-67. Q4

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Editorial

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Recommendations for antibiotic selection for severe nosocomial infections. *Revista Española De Quimioterapia.* 34(5):511-524. Q4

Consortium Publications

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4. Mellado-Artigas R, Ferreyro BL, Angriman F, Hernández-Sanz M, Arruti E, Torres A, Villar J, Brochard L, Ferrando C, COVID-19 Spanish ICU Network. **High-flow nasal oxygen in patients with COVID-19-associated acute respiratory failure**. *Critical Care.* 25(1):58. Q1

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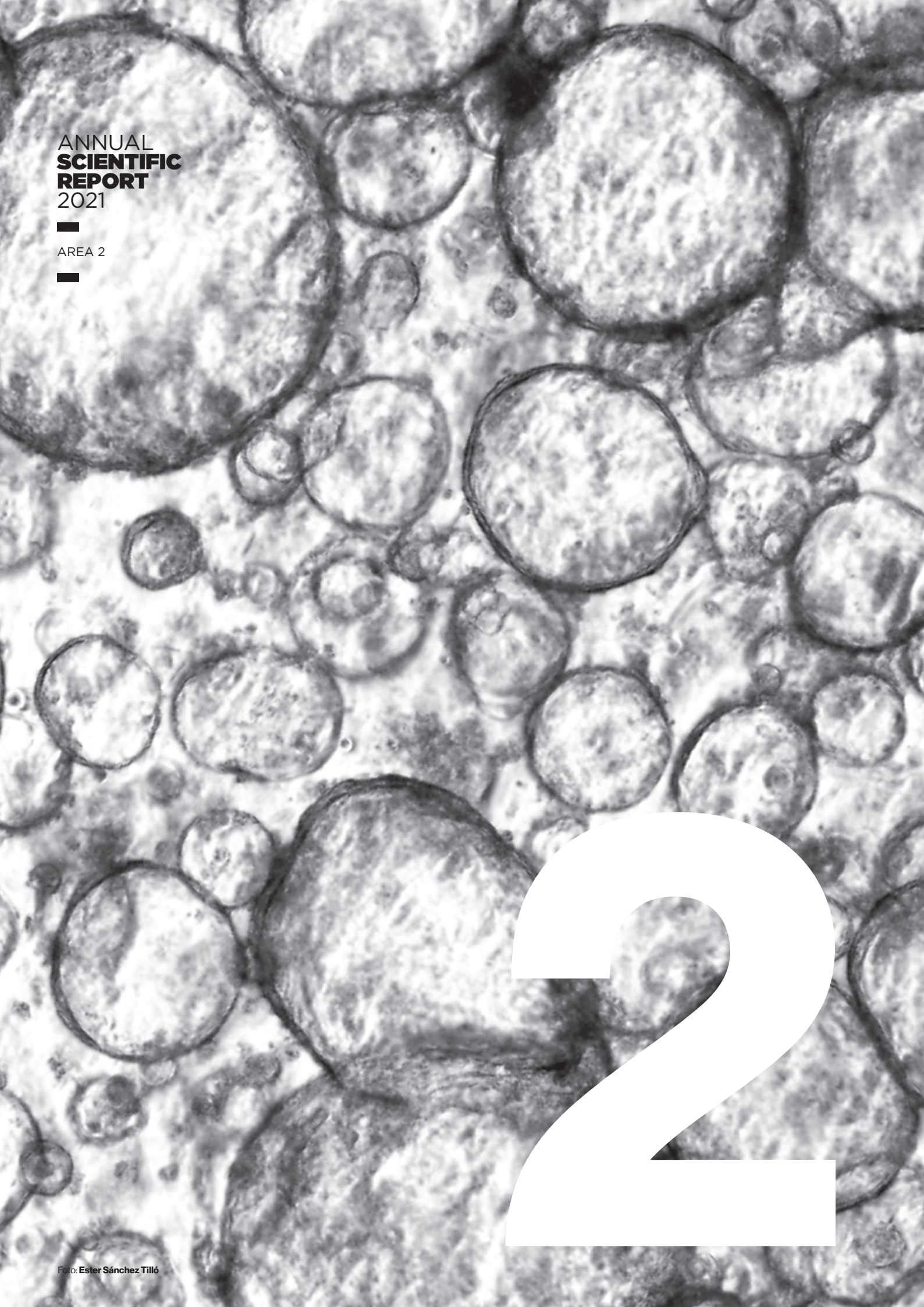
GRANTS FOR RESEARCH IN PROGRESS

del Río A, Martinez JA. **Ensayo clínico randomizado para comparar la eficacia de la combinación de antibióticos no absorbibles seguidos de un probiótico o de trasplante de flora fecal (FMT) en la descolonización rectal por MDRO.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00842
Duration: 01/01/2020-31/12/2022

García-Vidal C. **Uso del aprendizaje automático (machine learning) y la inteligencia artificial para mejorar el tratamiento antibiótico empírico de los pacientes hematológicos con neutropenia febril.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/01061
Duration: 01/01/2019-31/07/2022

Soriano A. **Estudio de estabilidad y viabilidad de la microbiota intestinal liofilizada y su utilidad en el tratamiento de la infección por Clostridium difficile.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/01023
Duration: 01/01/2017-30/06/2021

Soriano A. **Eficacia del PET-TC precoz en la detección de metástasis sépticas en pacientes con bacteremia por S. aureus de alto riesgo. Estudio piloto empleando el 2-[18F]F-PABA-PET/TC como marcador de S. aureus.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/01116
Duration: 01/01/2020-31/12/2022



ANNUAL
SCIENTIFIC REPORT
2021

AREA 2

2

Foto: **Ester Sánchez Tilló**

AREA 2

RESPIRATORY, CARDIOVASCULAR AND RENAL PATHOBIOLOGY AND BIOENGINEERING

2.1 **Inflammation and repair in respiratory diseases**
Alvar Agustí

2.2 **Genetics and urological tumours**
Antonio Alcaraz

2.3 **Physiopathological mechanisms of respiratory illnesses**
Joan Albert Barberà

2.4 **Translational computing in cardiology**
Bart Bijnens

2.5 **Translational research in pulmonary vascular diseases: cell proliferation and apoptotic mechanisms in pulmonary arterial hypertension**
Isabel Blanco

2.6 **Familial cardiomyopathies and sudden death syndromes**
Josep Brugada

2.7 **Nephro-urological diseases and kidney transplantation**
Fritz Diekmann

2.8 **Vascular cell biology**
Gustavo Egea

2.9 **Cardiovascular risk, nutrition and aging**
Ramon Estruch

2.10 **Respiratory biophysics and bioengineering**
Ramon Farré

2.11 **Arrhythmias and physical activity**
Eduard Guasch

2.12 **Biopathology and treatment of cardiac arrhythmias**
Lluís Mont

2.13 **Breathing disturbances in sleep**
Josep Maria Montserrat

2.14 **Clinical and experimental respiratory immunoallergy**
Joaquim Mullol

2.15 **Translational research in post-transplant neoplasia**
Ignacio Revuelta

2.16 **Atherosclerosis, coronary disease and heart failure**
Manel Sabaté

2.17 **Cardiac imaging**
Marta Sitges

2.18 **Applied research in infectious respiratory diseases and critically ill patients**
Antoni Torres

2.1 Inflammation and repair in respiratory diseases

LOCATION
CELLEX building, floor 2A

KEYWORDS
1. **Inflammation**
2. **Repair**
3. **Development**
4. **Ageing**
5. **Network analysis**
6. **Systems biology**

RELATED DISEASES
1. **COPD**
2. **Emphysema**
3. **Lung cancer**
4. **Interstitial lung diseases**
5. **Bronchiectasis**
6. **COVID-19 lung sequelae**

GROUP INVOLVED IN
CIBERES

Original publications

TOTAL	29
Mean IF	**12,51**
Q1	**66%**
D1	**21%**
MA	**31%**
OA	**72%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Chronic obstructive pulmonary disease (COPD) – also known as pulmonary emphysema or chronic bronchitis – pulmonary fibrosis, bronchiectasis, and lung cancer, are common and potentially serious respiratory diseases.

All of them are the result of interactions between environmental factors and genetic factors through the lifetime. We have very recently proposed the term GETomics to describe this temporal interactions (Agusti, Faner, Lancet Respiratory Medicine 2022 (on line).

Our research focuses on the study of those GETomic interactions and their potential translation to clinical practice, with the aim of improving the diagnosis and treatment of patients who suffer these diseases.

APPROACH

To meet these goals, the group uses a multi-disciplinary translational research strategy that includes clinical information and knowledge; pulmonary function variables; quantitative thoracic imaging techniques; cellular and molecular analysis of biological samples; and analysis of the composition of exhaled air. This information is ultimately integrated using advanced bioinformatic methods (systems biology, network analysis and artificial intelligence).

IMPACT

We have shown that about 4-12% of young individuals in the general population do not develop their lungs (and likely other organs) correctly, and that this is associated with a higher prevalence, about a decade earlier incidence of comorbid disesease, as well as with premature death (Agusti, Faner, Lancet Respiratory Medicine 2017).

These observations open up new possibilities for prevention, early diagnosis and treatment. The group has also found ways of improving the diagnosis of lung cancer based on tumour markers in blood and trained dogs that can be used that identify aected patients by their breath.

Finally, thanks to its research, it has found that an abnormal immune response is a key mechanism in many respiratory diseases.

RESEARCH LINES

- Lung development and ageing as key pathogenic determinants of adulthood respiratory diseases.

- Bronchiectasis endotyping.

- Interstitial lung diseases phenotyping.

- Early lung cancer (LC) diagnosis.

PUBLICATIONS

Originals

1. Jiménez D, Agustí A, Tabernero E, Jara-Palomares L, Hernando A, Ruiz-Artacho P, Pérez-Peñate G, Rivas-Guerrero A, Rodríguez-Nieto MJ, Ballaz A, Agüero R, Jiménez S, Calle-Rubio M, López-Reyes R, Marcos-Rodríguez P, Barrios D, Rodríguez C, Muriel A, Bertoletti L, Couturaud F, Huisman M, Lobo JL, Yusen RD, Bikdeli B, Monreal M, Otero R, SLICE Trial Group. **Effect of a Pulmonary Embolism Diagnostic Strategy on Clinical Outcomes in Patients Hospitalized for COPD Exacerbation: A Randomized Clinical Trial.** *JAMA-Journal Of The American Medical Association.* 326(13):1277-1285. D1

2. Keir HR, Shoemark A, Dicker AJ, Perea L, Pollock J, Giam YH, Suarez-Cuartin G, Crichton ML, Lonergan M, Oriano M, Cant E, Einarsson GG, Furrie E, Elborn JS, Fong CJ, Finch S, Rogers GB, Blasi F, Sibila O, Aliberti S, Simpson JL, Huang JTJ, Chalmers JD. **Neutrophil extracellular traps, disease severity, and antibiotic response in bronchiectasis: an international, observational, multicohort study.** *Lancet Respiratory Medicine.* 9(8):873-884. D1

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6. Martinez-Garcia MA, de la Rosa-Carrillo D, Soler-Cataluña JJ, Catalan-Serra P, Ballester M, Roca Vanaclocha Y, Agramunt M, Ballestin J, Garcia-Ortega A, Oscullo G, Navarro-Soriano C, Agusti A . **Bronchial Infection and Temporal Evolution of Bronchiectasis in Patients With Chronic Obstructive Pulmonary Disease.** *Clinical Infectious Diseases.* 72(3):403-410. D1

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8. Hiles SA; Gibson PG; Agusti A; McDonald VM. **Treatable Traits That Predict Health Status and Treatment Response in Airway Disease.** *Journal Of Allergy And Clinical Immunology-In Practice.* 9(3):1255-1264.e2. Q1

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11. Martín J, Castellano JJ, Marrades RM, Canals J, Viñolas N, Díaz T, Molins L, Martinez D, Han B, Moisés J, He Y, Monzó M, Navarro A . **Role of the epithelial-mesenchymal transition-related circular RNA, circ-10720, in non-small-cell lung cancer.** *Translational Lung Cancer Research.* 10(4):1804-1818. Q1

12. Shull JG, Pay MT, Lara Compte C, Olid M, Bermudo G, Portillo K, Sellarés J, Balcells E, Vicens-Zygmunt V, Planas-Cerezales L, Badenes-Bonet D, Blavia R, Rivera-Ortega P, Moreno A, Sans J, Perich D, Barril S, Esteban L, Garcia-Bellmunt L, Esplugas J, Suarez-Cuartin G, Bordas-Martinez J, Castillo D, Jolis R, Salvador I, Eizaguirre Anton S, Villar A, Robles-Perez A, Cardona MJ, Barbeta E, Silveira MG, Guevara C, Dorca J, Rosell A, Luburich P, Llatjós R, Jorba O, Molina-Molina M. **Mapping IPF helps identify geographic regions at higher risk for disease development and potential triggers.** *Respirology.* 26(4):352-359. Q1

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15. Li X; Noell G; Tabib T; Gregory AD; Trejo Bittar HE; Vats R; Kaminski TW; Sembrat J; Snyder ME; Chandra D; Chen K; Zou C; Zhang Y; Sundd P; McDyer JF; Sciurba F; Rojas M; Lafyatis R; Shapiro SD; Faner R; Nyunoya T. **Single cell RNA sequencing identifies IGFBP5 and QKI as ciliated epithelial cell genes associated with severe COPD.** *Respiratory Research.* 22(1):100. Q1

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MG, Portal JAR, Torres JS, Narvaez J, Molina-Molina M. **Diagnostic delay of associated interstitial lung disease increases mortality in rheumatoid arthritis.** *Scientific Reports.* 11(1):9184. Q1

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20. Sibila O, Albacar N, Perea L, Faner R, Torralba Y, Hernandez-Gonzalez F, Moisés J, Sanchez-Ruano N, Sequeira-Aymar E, Badia JR, Agusti A, Barberà JA, Sellares J. **Lung Function sequelae in COVID-19 Patients 3 Months After Hospital Discharge.** *Archivos De Bronconeumologia.* 57:59-61. Q2

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7. Agusti A, Fabbri LM, Baraldi E, Celli B, Corradi M, Faner R, Martinez FD, Melén E, Papi A. **Spirometry: A practical lifespan predictor of global health and chronic respiratory and non-respiratory diseases.** *European Journal Of Internal Medicine.* 89(89):3-9. Q1

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Letters

1. Fernando M; Agusti A; Dharmage S; Lodge C. **Are women with asthma at increased risk for severe COVID-19?** *Lancet Respiratory Medicine.* 9(2):125-126. D1

2. Agusti A, Torres F, Faner R. **Early treatment with inhaled budesonide to prevent clinical deterioration in patients with COVID-19.** *Lancet Respiratory Medicine.* 9(7):682-683. D1

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Editorial

1. Sibila O. **Reducing Pseudomonas sputum density in bronchiectasis.** *European Respiratory Journal.* 57(1):2003390. D1

2. Agusti A; Breyer-Kohansal R; Faner R. **Transitioning from infancy to adulthood: A black box full of opportunities.** *European Respiratory Journal.* 57(3):2003997. D1

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Consortium Publications

1. Mellado-Artigas R, Ferreyro BL, Angriman F, Hernández-Sanz M, Arruti E, Torres A, Villar J, Brochard L, Ferrando C, COVID-19 Spanish ICU Network. **High-flow nasal oxygen in patients with COVID-19-associated acute respiratory failure.** *Critical Care.* 25(1):58. Q1

2. Torres A, Motos A, Riera J, Fernández-Barat L, Ceccato A, Pérez-Arnal R, García-Gasulla D, Peñuelas O, Lorente JA, Rodriguez A, de Gonzalo-Calvo D, Almansa R, Gabarrús A, Menéndez R, Bermejo-Martin JF, Ferrer R, Amaya Villar R, Añón JM, Barberà C, Barberán J, Blandino Ortiz A, Bustamante-Munguira E, Caballero J, Carbajales C, Carbonell N, Catalán-González M, Galbán C, Gumucio-Sanguino VD, de la Torre MDC, Díaz E, Estella Á, Gallego E, García Garmendia JL, Garnacho-Montero J, Gómez JM, Huerta A, Jorge García RN, Loza-Vázquez A, Marin-Corral J, Martínez de la Gándara A, Martínez Varela I, López Messa J, M Albaiceta G, Novo MA, Peñasco Y, Pozo-Laderas JC, Ricart P, Salvador-Adell I, Sánchez-Miralles A, Sancho Chinesta S, Socias L, Solé-Violan J, Suares Sipmann F, Tamayo Lomas L, Trenado J, Barbé F, CIBERESUCICOVID Project (COV20/00110, ISCIII). **The evolution of the ventilatory ratio is a prognostic factor in mechanically ventilated COVID-19 ARDS patients.** *Critical Care.* 25(1):331. Q1

3. Mellado-Artigas R, Mujica LE, Ruiz ML, Ferreyro BL, Angriman F, Arruti E, Torres A, Barbeta E, Villar J, Ferrando C, COVID-19 Spanish ICU Network. **Predictors of failure with high-flow nasal oxygen therapy in COVID-19 patients with acute respiratory failure: a multicenter observational study.** *Journal Of Intensive Care.* 9(1):23. Q2

GRANTS FOR RESEARCH IN PROGRESS

Agustí A. **Determinantes genético-ambientales del desarrollo de la función pulmonar en la infancia y adolescencia: CATCH-UP.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/01008
Duration: 01/01/2019-31/12/2022

Agusti A, Faner R. **3TR: Identification of the molecular mechanisms of non-response to treatments, relapses and remission in autoimmune, inflammatory, and allergic conditions.**
Sponsored by: European Comission. CE_H2020-831434
Duration: 01/09/2019-03/08/2026

Faner R. **Desarrollo pulmonar anormal vs. envejecimiento acelerado en la EPOC: una aproximación a partir del análisis de redes multinivel.**
Sponsored by: Respira. Fundación Española del Pulmón (SEPAR). SEPAR_BecaSepar19
Duration: 14/07/2020-30/06/2022

Sellarés J. **Estudio de la fibrosis pulmonar mediante el "radio-transcriptoma": una nueva forma de evaluación de las enfemedades pulmonares intersticiales fibrosantes.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/01152
Duration: 01/01/2020-31/12/2022

Sellarés J. **Impacto de un programa de deshabituación en tabaquismo en el pronóstico de las enfermedades pulmonares intersticiales difusas.**
Sponsored by: Fundació Catalana de Pneumologia (FUCAP).
Duration: 01/01/2020-01/01/2023

Sellarés J. **Caracterización clínica y radiotranscriptómica de la sarcoidosis pulmonar en España.**

Sponsored by: Sociedad Española de Neumología y Cirugía Torácica (SEPAR).
792/2018
Duration: 01/01/2019-30/06/2022

Sellarés J. **Neumonitis persistente en la infección por COVID19: estudio de los factores de riesgo genéticos y ambientales, mecanismos inmunológicos y desarrollo de fibrosis pulmonar a largo plazo.**
Sponsored by: Beca mecenazgo COVID19_Hospital Clínic de Barcelona.
Convocatoria 2020
Duration: 01/01/2020-31/12/2021

Sibila O. **Predictores Inmunológicos de infección Bronquial en Enfermedades Respiratorias Crónicas.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00311
Duration: 10/02/2020-31/12/2021

Sibila O. **Predictores Inmunológicos de infección Bronquial en Enfermedades Respiratorias Crónicas.**
Sponsored by: Respira. Fundación Española del Pulmón (SEPAR). SEPAR_BecaSepar18
Duration: 14/07/2020-30/06/2021

Sibila O. **Estudio de las secuelas post-COVID19; factores de riesgo clínicos y biológicos.**
Sponsored by: Sociedad Española de Neumología y Cirugía Torácica (SEPAR). 1083/2020
Duration: 01/01/2021-30/12/2023

Hernández González F. **Estudi de la fibrosi pulmonar mitjançant el "ràdio-transcriptoma": una nova forma de avaluació de les malalties pulmonars intersticials fibrosants.**
Sponsored by: Societat Catalana de Pneumologia (SOCAP). SOCAP_TLLIURE21
Duration: 01/01/2021-01/01/2024

DOCTORAL THESES

Agustí A, Sellarés J. **Manejo de las complicaciones clínicas de las enfermedades pulmonares intersticiales difusas (EPID): insuficiencia respiratoria crónica y exacerbaciones agudas.**
PhD student: Sandra Cuerpo Cardeñosa

2.2 Genetics and urological tumours

LOCATION
CELLEX building, floor 2B

KEYWORDS
1. **Urothelial carcinoma**
2. **Prostate neoplasia**
3. **Renal tumors**
4. **Biomarkers for diagnosis, prognosis and treatment response**
5. **Gene expression profiles**
6. **DNA methylation**
7. **DNA variants**
8. **Liquid biopsy**
9. **Radiogenomics**

RELATED DISEASES
1. **Bladder cancer**
2. **Kidney cancer**
3. **Prostate cancer**
4. **Upper tract urothelial carcinoma**

GROUP INVOLVED IN
AGAUR_SGR17: 01801

Original publications

TOTAL	24
Mean IF	5,73
Q1	63%
D1	8%
MA	46%
OA	50%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Prostate, bladder and kidney cancers are the three most common urological tumours suffered by society today. Existing diagnostic techniques are invasive, and non-sensitive and/or non-specific enough.

In addition, current prognostic factors make no distinction between patients with tumour recurrence and those cured by surgery who require no adjuvant therapy.

Therefore, if the group is able to identify non-invasive biomarkers with high diagnostic precision that can also predict disease outcome and treatment response, this would be a great step forward in clinical practice.

APPROACH

Technological breakthroughs in molecular . biology over the last twenty years and the development of bioinformatics tools have enabled the group to make progress in the study of the genetic changes that take place in diverse urological cancers. The group uses these new approaches to identify changes in the genetic material of bladder, prostate and kidney tumours and thus develop the diagnostic, prognostic and treatment-response biomarkers required to improve current urological clinical practice.

IMPACT

The group has identified various biomarkers in urine to monitor patients with bladder cancer, thus avoiding (or lengthening the time between) invasive diagnostic techniques such as cystoscopies.
In relation to this disease, the group has also identified tumour dissemination in blood, using non-invasive sampling techniques very useful for monitoring tumour relapse an predict the response to therapies.

In prostate cancer, this group has identified diagnostic biomarkers in urine that might make it unnecessary to perform a prostatic biopsy and procnostic biomarkers of biochemical recurrence. Lastly, in renal carcinoma, the group is working on the identification of biomarkers to predict the evolution of the disease after tumour removal.

RESEARCH LINES

- Non-invasive diagnostic and prognostic tools for bladder tumors.

- Genomic heterogeneity in muscle-invasive bladder cancer.

- Liquid biopsy in muscle-invasive bladder cancer and upper tract urothelial carcinoma for early metastatic relapse detection and treatment response.

- Biomarkers for predicting biochemical recurrence in localized prostate cancer patients .

- Radiogenomics in localized prostate cancer.

- Prognostic biomarkers in clear-cell renal carcinoma.

PUBLICATIONS

Originals

1. Revuelta I, Santos-Arteaga FJ, Montagud-Marrahi E, Ventura-Aguiar P, Di Caprio D, Cofan F, Cucchiari D, Torregrosa V, Piñeiro GJ, Esforzado N, Bodro M, Ugalde-Altamirano J, Moreno A, Campistol JM, Alcaraz A, Bayès B, Poch E, Oppenheimer F, Diekmann F. **A hybrid data envelopment analysis-artificial neural network prediction model for COVID-19 severity in transplant recipients.** *Artificial Intelligence Review.* 1(32):1-4684. D1

2. Marchioni M; Kriegmair M; Heck M; Amiel T; Porpiglia F; Ceccucci E; Campi R; Minervini A; Mari A; Van Bruwaene S; Linares E; Hevia V; Musquera M; D'Anna M; Derweesh I; Bradshaw A; Autorino R; Guruli G; Veccia A; Roussel E; Albersen M; Pavan N; Claps F; Antonelli A; Palumbo C; Klatte T; Erdem S; Mir MC; EAU-Young Academic Urologist Kidney Cancer Group EAU-Young Academic Urologist Kidney Cancer Group. **Development of a Novel Risk Score to Select the Optimal Candidate for Cytoreductive Nephrectomy Among Patients with Metastatic Renal Cell Carcinoma.** *Eur Urol Oncol.* 4(2):256-263. D1

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4. Armstrong AJ; Shore ND; Szmulewitz RZ; Petrylak DP; Holzbeierlein J; Villers A; Azad A; Alcaraz A; Alekseev B; Iguchi T; Gomez-Veiga F; Rosbrook B; Lee HJ; Haas GP; Stenzl A. **Efficacy of Enzalutamide plus Androgen Deprivation Therapy in Metastatic Hormone-Sensitive Prostate Cancer by Pattern of Metastatic Spread: ARCHES Post Hoc Analyses.** *Journal Of Urology.* 205(5):1361-1370. Q1

5. Torné A; Pahisa J; Ordi J; Fusté P; Díaz-feijóo B; Glickman A; Paredes P; Rovirosa A; Gaba L; Saco A; Nicolau C; Carreras N; Agustí N; Vidal-sicart S; Gil-ibáñez B; Del Pino M. **Oncological results of laparoscopically assisted radical vaginal hysterectomy in early-stage cervical cancer: Should we really abandon minimally invasive surgery?** *Cancers.* 13(4):846. Q1

6. Roldán FL, Lozano JJ, Ingelmo-Torres M, Carrasco R, Díaz E, Ramirez-Backhaus M, Rubio J, Reig O, Alcaraz A, Mengual L, Izquierdo L. **Clinicopathological and Molecular Prognostic Classifier for Intermediate/High-Risk Clear Cell Renal Cell Carcinoma.** *Cancers.* 13(24):6338. Q1

7. Amor AJ, Casas A, Pané A, Ruiz S, Montagud-Marrahi E, Molina-Andújar A, Ruiz M, Mayordomo R, Musquera M, Ferrer-Fàbrega J, Fondevila C, Diekmann F, Ventura-Aguiar P, Esmatjes E . **Weight gain following pancreas transplantation in type 1 diabetes is associated with a worse glycemic profile: a retrospective cohort study.** *Diabetes Research And Clinical Practice.* 179:109026. Q1

8. Montagud-Marrahi E, Amor AJ, Molina-Andujar A, Cucchiari D, Revuelta I, Esforzado N, Cofan F, Oppenheimer F, Torregrosa V, Casals J, Ferrer J, Esmatjes E, Ramírez-Bajo MJ, Musquera M, Bayes B, Campistol JM, Diekmann F, Ventura-Aguiar P . **Impact of insulin therapy before donation on graft outcomes in pancreas transplantation: An analysis of the OPTN/UNOS database.** *Diabetes Research And Clinical Practice.* 182(109120). Q1

9. Musquera M, Peri L, Ajami T, Campi R, Tugcu V, Decaestecker K, Stockle M, Fornara P, Doumerc N, Vigues F, Barod R, Desender L, Territo A, Serni S, Vignolini G, Sahin S, Zeuschner P, Banga N, Breda A, Alcaraz A . **Robot-assisted kidney transplantation: update from the European Robotic Urology Section (ERUS) series.** *BJU International.* 127(2):222-228. Q1

10. Carrasco R, Izquierdo L, van der Heijden AG, Lozano JJ, Franco M, Ingelmo-Torres M, Roldan FL, Llorens M, Ribal MJ, Mengual L, Alcaraz A. **Differential gene expression profile between progressive and de novo muscle invasive bladder cancer and its prognostic implication.** *Scientific Reports.* 11(1):6132. Q1

11. Alcaraz A, Rodríguez-Antolín A, Carballido-Rodríguez J, Castro-Díaz D, Medina-Polo J, Fernández-Gómez JM, Ficarra V, Palou J, Ponce de León Roca J, Angulo JC, Esteban-Fuertes M, Cózar-Olmo JM, Pérez-León N, Molero-García JM, Fernández-Pro Ledesma A, Brenes-Bermúdez FJ, Manasanch J. **Efficacy and tolerability of the hexanic extract of Serenoa repens compared to tamsulosin in moderate-severe LUTS-BPH patients**. *Scientific Reports.* *11*(1):19401. Q1

12. Prudhomme T, Beauval JB, Lesourd M, Roumiguié M, Decaestecker K, Vignolini G, Campi R, Serni S, Territo A, Gausa L, Tugcu V, Sahin S, Alcaraz A, Musquera M, Stockle M, Janssen M, Fornara P, Mohammed N, Del Bello A, Kamar N, Sallusto F, Breda A, Doumerc N . **Robotic-assisted kidney transplantation in obese recipients compared to non-obese recipients: the European experience.** *World Journal Of Urology.* 39(4):1287-1298. Q1

13. Moris L; Gandaglia G; Vilaseca A; Van den Broeck T; Briers E; De Santis M; Gillessen S; Grivas N; O'Hanlon S; Henry A; Lam TB; Lardas M; Mason M; Oprea-Lager D; Ploussard G; Rouviere O; Schoots IG; van der Poel H; Wiegel T; Willemse PP; Yuan CY; Grummet JP; Tilki D; van den Bergh RCN; Cornford P; Mottet N. **Evaluation of Oncological Outcomes and Data Quality in Studies Assessing Nerve-sparing Versus Non-Nerve-sparing Radical Prostatectomy in Nonmetastatic Prostate Cancer: A Systematic Review.** *European Urology Focus.* S2405-4569(21):S2405-4569. Q1

14. Musquera M, Sierra A, Diekmann F, Perez M, Mercader C, Peri L, Esforzado N, Paredes D, Alcaraz A. **Increasing kidney grafts for transplantation**. *World Journal Of Urology.* 39(7):2795-2800. Q1

15. De Nunzio, Cosimo; Ghahhari, Jamil; Lombardo, Riccardo; Russo, Giorgio Ivan; Albano, Ana; Franco, Antonio; Baldassarri, Valeria; Nacchia, Antonio; Lopez, Juan; Luque, Pilar; Ribal, Maria Jose; Alcaraz, Antonio; Tubaro, Andrea. **Development of a nomogram predicting the probability of stone free rate in patients with ureteral stones eligible for semi-rigid primary laser uretero-litothripsy.** *World Journal Of Urology.* 39(11):4267-4274. Q1

16. Cucchiari D, Tubita V, Rovira J, Ramirez-Bajo MJ, Banon-Maneus E, Lazo-Rodriguez M, Hierro-Garcia N, Borràs FE, Ventura-Aguiar P, Piñeiro GJ, Martorell J, Peri L, Musquera M, Hertig A, Oppenheimer F, Campistol JM, Diekmann F, Revuelta I . **B Cell-Derived Extracellular Vesicles**

Reveal Residual B Cell Activity in Kidney Graft Recipients Undergoing Pre-Transplant Desensitization. *Frontiers Of Medicine.* 8:781239. Q2

17. Sebastià C, Páez-Carpio A, Guillen E, Paño B, Garcia-Cinca D, Poch E, Oleaga L, Nicolau C. **Oral hydration compared to intravenous hydration in the prevention of post-contrast acute kidney injury in patients with chronic kidney disease stage IIIb: A phase III non-inferiority study (NICIR study).** *European Journal Of Radiology.*136:109509. Q2

18. Carrion A, Ingelmo-Torres M, Lozano JJ, Montalbo R, D'Anna M, Mercader C, Velez E, Ribal MJ, Alcaraz A, Mengual L . **Prognostic classifier for predicting biochemical recurrence in localized prostate cancer patients after radical prostatectomy.** *Urologic Oncology-Seminars And Original Investigations.* 39(8):493.e17-493.e25. Q2

19. Ajami T, Sebastia C, Corominas D, Ribal MJ, Nicolau C, Alcaraz A, Musquera M. **Clinical and radiological findings for small renal masses under active surveillance.** *Urologic Oncology-Seminars And Original Investigations.* 39(8):499.e9-499.e14. Q2

20. Salvador, R; Sebastia, M; Cardenas, G; Paez-Carpio, A; Pano, B; Sole, M; Nicolau, C. **CT differentiation of fat-poor angiomyolipomas from papillary renal cell carcinomas: development of a predictive model.** *Abdominal Radiology.* 46(7):3280-3287. Q2

21. Antunes N, Vas D, Sebastia C, Salvador R, Ribal MJ, Nicolau C. **Susceptibility artifacts and PIRADS 3 lesions in prostatic MRI: how often is the dynamic contrast-enhance sequence necessary?** *Abdominal Radiology.* 46(7):3401-3409. Q2

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1. Cucchiari D, Guillén E, Cofan F, Torregrosa JV, Esforzado N, Revuelta I, Ventura-Aguiar P, Oppenheimer F, Bayés B, Marcos MÁ, Morgado-Carrasco D, López JM, Creus P, Hernández C, Coloma E, Bodro M, Diekmann F, Pericàs JM, Nicolás D, Hospital Clínic 4H Team (Hospital at Home-Health Hotel). **Taking care of kidney transplant recipients during the COVID-19 pandemic: experience from a medicalized hotel.** *Clinical Transplantation.* 35(1):e14132. Q2

GRANTS FOR RESEARCH IN PROGRESS

Alcaraz A. **A multimodal AI-based toolbox and an interoperable health imaging repository for the empowerment of imaging analysis related to the diagnosis, prediction and follow-up of cancer.**
Sponsored by: European Commission.
CE_H2020_SC1_20_1s13
Duration: 01/10/2020-31/03/2024

Izquierdo L. **Identification of Kidney Cancer progression targets and biomarkers through CRISPRengineered organoids and xenograft mouse models.**
Sponsored by: Fundació La Marató de TV3.
Cancer_19
Duration: 30/07/2020-29/07/2023

Mengual L, Izquierdo L. **Identificación de biomarcadores pronósticos del tumor vesical músculo invasivo y su inferencia en la biopsia líquida.**
Sponsored by: Istituto de Salud Carlos III (ISCIII). FIS_PI17/01343
Duration: 01/01/2018-30/06/2021

Mengual L, Izquierdo L. **Monitorización de la progresión tumoral y la respuesta terapéutica en pacientes con cáncer de vejiga músculo-invasivo mediante biopsia líquida.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00409
Duration: 01/01/2021-31/12/2023

Quintana LF, Nicolau C. **Papel de la patología digital y la Resonancia nuclear magnética en la detección precoz de la fibrosis intersticial en la enfermedad renal crónica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00080
Duration: 01/01/2018-30/06/2022

DOCTORAL THESIS

Mengual L, Ribal MJ. **Identificación de biomarcadores pronósticos de agresividad en cáncer de próstata.**
PhD student: Albert Carrion Puig

Mengual L, Izquierdo L. **Estudio de marcadores moleculares para el diagnóstico no invasivo del cáncer de vejiga.**
PhD student: M. Mercedes Ingelmo Torres

Nicolau C, Oleaga L. **Eficàcia de la hidratació oral com a mesura preventiva de la lesió renal aguda postcontrast iodat.**
PhD student: Maria Carmen Sebastià Cerqueda

2.3 Physiopathological mechanisms of respiratory illnesses

LOCATION
CELLEX building, floor 2A

KEYWORDS
1. **Pulmonary hypertension**
2. **COPD**
3. **Systems medicine**
4. **Endothelium**
5. **Stem cells**

RELATED DISEASES
1. **Pulmonary hypertension**
2. **Chronic thromboembolic pulmonary hypertension**

GROUP INVOLVED IN
CIBERES
RETIC Biobancos
AGAUR_SGR17: 00617
AGAUR_XARDI18: 00016

Original publications

TOTAL	48
Mean IF	6,47
Q1	50%
D1	25%
MA	15%
OA	75%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The group's research focuses on three major areas: alterations of pulmonary circulation in respiratory diseases, complications associated with surgical interventions, and the development and evaluation of integrated patient-care systems for the follow-up and treatment of patients with respiratory diseases.

APPROACH

The group's research on pulmonary circulation disorders in respiratory diseases uses a translational approach, i.e., it works closely with advances in the laboratory and in clinical practice. The goal is to identify the mechanisms that affect the development of pulmonary hypertension and to identify potential therapeutic targets to treat it.

Its research on perioperative medicine evaluates prehabilitation as a preoperative intervention aimed at reducing complications. With regard to the postoperative period, it evaluates strategies for minimizing complications derived from mechanical ventilation and other therapeutic interventions.

Its research area on the development and evaluation of integrated patient-care systems for the follow-up and treatment of patients with respiratory diseases uses an approach based on digital health and systems medicine.

IMPACT

Abnormal pulmonary circulation is highly prevalent in chronic respiratory diseases and affects survival and the clinical course of the disease.

The group's research focuses on the mechanisms that cause these abnormalities in pulmonary circulation and will make it possible to identify potential diagnostic markers and therapeutic targets.

Prehabilitation, the improvement of a patient's physical condition before surgery, is a preventive strategy that reduces postoperative complications, such as the use of ventilator support, which will contribute to improving the treatment of postoperative complications.

Information and communication technologies (ICT) provide a useful tool for implementing integrated healthcare systems that prevent discontinuity in the care process of patients with chronic respiratory disease and facilitate patient access to the healthcare system.

RESEARCH LINES

- Deep phenotyping of pulmonary hypertension in chronic respiratory diseases.

- Metabolic profiling of pulmonary vascular cells in chronic thromboembolic pulmonary hypertension.

- Assessing prehabilitation as preventive intervention to reduce postoperative complications.

- Evaluating modalities of perioperative ventilatory support.

- Implementation of integrated care services with a digital health and systems medicine approach.

PUBLICATIONS

Originals

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42. Nathan SD, Barnett SD, King CS, Provencher S, Barbera JA, Pastre J, Shlobin OA, Seeger W. **Impact of the new definition for pulmonary hypertension in patients with lung disease: an analysis of the United Network for Organ Sharing database.** *Pulmonary Circulation.* 11(1):2045894021999960. Q3

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45. Lazaro Salvador M, Quezada Loaiza CA, Rodríguez Padial L, Barberá JA, López-Meseguer M, López-Reyes R, Sala- Llinas E, Alcolea S, Blanco I, Escribano- Subías P, REHAP Investigators. **Portopulmonary hypertension: prognosis and management in the current treatment era.** *Internal Medicine Journal.* 51(3):355-365. Q3

46. Cares-Marambio K, Montenegro-Jiménez Y, Torres-Castro R, Vera-Uribe R, Torralba Y, Alsina-Restoy X, Vasconcello-Castillo L, Vilaró J. **Prevalence of potential respiratory symptoms in survivors of hospital admission after coronavirus disease 2019 (COVID-19): A systematic review and meta-analysis.** *Chronic Respiratory Disease.* 18:14799731211002240. Q4

47. Ojeda A, Calvo A, Cuñat T, Artigas RM, Comino-Trinidad O, Aliaga J, Arias M, Ahuir M, Ferrando C, Dürsteler C. **Rationale and study design of an early care, therapeutic education, and psychological intervention program for the management of post-intensive care syndrome and chronic pain after COVID-19 infection (PAIN-COVID): study protocol for a randomized controlled trial.** *Trials.* 22(1):486. Q4

48. Suarez-de-la-Rica A, Serrano P, De-la-Oliva R, Sánchez-Díaz P, Molinero P, Falces-Romero I, Ferrando C, Rello J, Maseda E. **Secondary infections in mechanically ventilated patients with COVID-19: An overlooked matter?** *Revista Española De Quimioterapia.* 34(4):330-336. Q4

Review

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2. Gredic M, Blanco I, Kovacs G, Helyes Z, Ferdinandy P, Olschewski H, Barberà JA, Weissmann N. **Pulmonary hypertension in chronic obstructive pulmonary disease.** *British Journal Of Pharmacology.* 178(1):132-151. D1

3. Rodríguez C, Luque N, Blanco I, Sebastian L, Barberà JA, Peinado VI, Tura-Ceide O . **Pulmonary Endothelial Dysfunction and Thrombotic Complications in COVID-19 Patients.** *American Journal Of Respiratory Cell And Molecular Biology.* 64(4):407-415. Q1

4. Kurakula K, Smolders VFED, Tura-Ceide O, Jukema JW, Quax PHA, Goumans MJ . **Endothelial Dysfunction in Pulmonary**

Hypertension: Cause or Consequence? *Biomedicines*. 9(1):57. Q1

5. Villar, J; Ferrando, C; Tusman, G; Berra, L; Rodriguez-Suarez, P; Suarez-Sipmann, F. **Unsuccessful and Successful Clinical Trials in Acute Respiratory Distress Syndrome: Addressing Physiology-Based Gaps.** *Frontiers In Physiology*. 12(774025):774025. Q1

6. Suárez-Sipmann F, Villar J, Ferrando C, Sánchez-Giralt JA, Tusman G. **Monitoring Expired CO 2 Kinetics to Individualize Lung-Protective Ventilation in Patients With the Acute Respiratory Distress Syndrome.** *Frontiers In Physiology*. 12:785014. Q1

7. Cuzco C, Torres-Castro R, Torralba Y, Manzanares I, Muñoz-Rey P, Romero-García M, Martínez-Momblan MA, Martínez-Estalella G, Delgado-Hito P, Castro P. **Nursing Interventions for Patient Empowerment during Intensive Care Unit Discharge: A Systematic Review**. *International Journal Of Environmental Research And Public Health*. 18(21):11049. Q1

8. Barberan-Garcia A, Cano I, Bongers BC, Seyfried S, Ganslandt T, Herrle F, Martinez-Palli G. **Digital Support to Multimodal Community-Based Prehabilitation: Looking for Optimization of Health Value Generation.** *Frontiers In Oncology*. 11:662013. Q2

9. Ashrafian H, Sounderajah V, Glen R, Ebbels T, Blaise BJ, Kalra D, Kultima K, Spjuth O, Tenori L, Salek RM, Kale N, Haug K, Schober D, Rocca-Serra P, O'Donovan C, Steinbeck C, Cano I, de Atauri P, Cascante M . **Metabolomics - the stethoscope for the 21st century.** *Medical Principles And Practice*. 30(4):301-310. Q3

Letters

1. Rodríguez C, Luque N, Blanco I, Sebastian L, Barberà JA, Peinado VI, Tura-Ceide O. **Reply to: COVID-19 and Coagulopathy.** *American Journal Of Respiratory Cell And Molecular Biology. 64(6):764-766. Q1*

Clinical Guidelines

1. McCormack MC, Bascom R, Brandt M, Burgos F, Butler S, Caggiano C, Dimmock AEF, Fineberg A, Goldstein J, Guzman FC, Halldin CN, Johnson JD, Kerby GS, Krishnan JA, Kurth L, Morgan G, Mularski RA, Pasquale CB, Ryu J, Sinclair T, Stachowicz NF, Taite A, Tilles J, Truta JR, Weissman DN, Wu TD, Yawn BP, Drummond MB. **Electronic Health Records and Pulmonary Function Data: Developing an Interoperability Roadmap. An Official American Thoracic Society Workshop Report.** *Annals Of The American Thoracic Society*. 18(1):1-11. Q1

Consortium Publications

1. Humbert M; McLaughlin V; Gibbs JSR; Gomberg-Maitland M; Hoeper MM; Preston IR; Souza R; Waxman A; Escribano Subias P; Feldman J; Meyer G; Montani D; Olsson KM; Manimaran S; Barnes J; Linde PG; de Oliveira Pena J; Badesch DB; PULSAR Trial Investigators PULSAR Trial Investigators. **Sotatercept for the Treatment of Pulmonary Arterial Hypertension.** *New England Journal Of Medicine*. 384(13):1204-1215. D1

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3. PRISM trial group. **Postoperative continuous positive airway pressure to prevent pneumonia, re-intubation, and death after major abdominal surgery (PRISM): a multicentre, open-label, randomised, phase 3 trial**. *Lancet Respiratory Medicine*. 9(11):1221-1230. D1

4. COVID-19 Host Genetics Initiative. **Mapping the human genetic architecture of COVID-19.** *Nature*. 600(7889):472-477. D1

5. Zorrilla-Vaca A; Stone AB; Ripolles-Melchor J; Abad-Motos A; Ramirez-Rodriguez JM; Galan-Menendez P; Mena GE; Grant MC; Power Investigators Group (including all Researchers participating in POWER Study). **Institutional factors associated with adherence to enhanced recovery protocols for colorectal surgery: Secondary analysis of a multicenter study**. *Journal Of Clinical Anesthesia*. 74:110378. D1

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7. Blondon M, Jimenez D, Robert-Ebadi H, Del Toro J, Lopez-Jimenez L, Falga C, Skride A, Font L, Vazquez FJ, Bounameaux H, Monreal M, RIETE investigators. **Comparative clinical prognosis of massive and non-massive pulmonary embolism: A registry-based cohort study.** *Journal Of Thrombosis And Haemostasis*. 19(2):408-416. Q1

8. Bikdeli B, Jiménez D, Del Toro J, Piazza G, Rivas A, Fernández-Reyes JL, Sampériz Á, Otero R, Suriñach JM, Siniscalchi C, Martín-Guerra JM, Castro J, Muriel A, Lip GYH, Goldhaber SZ, Monreal M, RIETE Investigators †. **Association Between Preexisting Versus Newly Identified Atrial Fibrillation and Outcomes of Patients With Acute Pulmonary Embolism.** *Journal Of The American Heart Association*. 10(17):e021467. Q1

9. Piñeiro GJ, Molina-Andújar A, Hermida E, Blasco M, Quintana LF, Rojas GM, Mercadal J, Castro P, Sandoval E, Andrea R, Fernández J, Badia JR, Soriano A, Poch E, Hospital Clínic Critical Care COVID-19 working group (CCCC). **Severe acute kidney injury in critically ill COVID-19 patients.** *Journal Of Nephrology*. 34(2):285-293. Q2

10. Expósito-Ruiz M, Arcelus JI, Caprini JA, López-Espada C, Bura-Riviere A, Amado C, Loring M, Mastroiacovo D, Monreal M, RIETE Investigators. **Timing and characteristics of venous thromboembolism after noncancer surgery.** *Journal Of Vascular Surgery-Venous And Lymphatic Disorders.* 9(4):859-867.e2. Q2

11. Nijbroek SG, Hol L, Swart P, Hemmes SNT, Serpa Neto A, Binnekade JM, Hedenstierna G, Jaber S, Hiesmayr M, Hollmann MW, Mills GH, Vidal Melo MF, Putensen C, Schmid W, Severgnini P, Wrigge H, Gama de Abreu M, Pelosi P, Schultz MJ, LAS VEGAS study investigators, PROVE Network and the Clinical Trial Network of the European Society of Anaesthesiology. **Sex difference and intra-operative tidal volume: Insights from the LAS VEGAS study.** *European Journal Of Anaesthesiology.* 38(10):1034-1041. Q2

12. Serrano AB; DÍaz-Cambronero Ó; Melchor-RipollÉs J; Abad-Gurumeta A; Ramirez-Rodriguez JM; MartÍnez-Ubieto J; SÁnchez-Merchante M; Rodriguez R; JordÁ L; Gil-Trujillo S; Cabellos-Olivares M; Bordonaba-Bosque D; Aldecoa C; POWER Group POWER Group. **Neuromuscular blockade management and postoperative outcomes in enhanced recovery colorectal surgery: secondary analysis of POWER trial.** *Minerva Anestesiologica.* 87(1):13-25. Q3

13. Mazzinari G, Serpa Neto A, Hemmes SNT, Hedenstierna G, Jaber S, Hiesmayr M, Hollmann MW, Mills GH, Vidal Melo MF, Pearse RM, Putensen C, Schmid W, Severgnini P, Wrigge H, Cambronero OD, Ball L, de Abreu MG, Pelosi P, Schultz MJ, LAS VEGAS study–investigators, PROtective VEntilation NETwork, Clinical Trial Network of the European Society of Anaesthesiology. **The Association of Intraoperative driving pressure with postoperative pulmonary complications in open versus closed abdominal surgery patients - a posthoc propensity score-weighted cohort analysis of the LAS VEGAS study**. *BMC Anesthesiology.* 21(1):84. Q4

GRANTS FOR RESEARCH IN PROGRESS

Barberà JA. **Recerca traslacional en malalties pulmonars.**
Sponsored by: Generalitat de Catalunya.
AGAUR_SGR17_00617
Duration: 01/01/2017-30/09/2021

Barberà JA. **Caracterización fenotípica de la hipertensión pulmonar en las enfermedades respiratorias.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00383
Duration: 01/01/2019-31/12/2022

Barberán A. **Cost-efectivitat d'un programa de prehabilitació multimodal en pacients d'alt risc candidats a cirurgia de resecció de parènquima pulmonar: Assaig clínic aleatoritzat.**
Sponsored by: Fundació Catalana de Pneumologia (FUCAP). FUCAP_MARIARA-VA19_01
Duration: 05/04/2019-04/04/2022

Barberàn A. **Coste-efectividad de un programa de prehabilitación multimodal en pacientes de alto riesgo candidatos a cirugía de resección de parénquima pulmonar: Ensayo controlado aleatorizado.**
Sponsored by: Sociedad Española de Neumología y Cirugía Torácica (SEPAR). 791/2018
Duration: 01/01/2018-31/12/2021

Ferrando C. **Reducción de complicaciones postoperatorias pulmonares mediante una estrategia ventilatoria perioperatoria de apertura pulmonar individualizada en pacientes intervenidos de cirugía torácica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/01611
Duration: 21/05/2019-31/12/2022

Ferrando C. **Simulation Approach For Education and Training in emergency.**
Sponsored by: European Commission.
CE_ERASMUS+_20
Duration: 01/11/2020-31/10/2023

Martínez-Palli G, Arguis MJ. **Implementación de un programa de prehabilitación trimodal como estrategia de optimización prequirúrgica en cirugía cardíaca.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00852
Duration: 01/01/2018-31/12/2021

Martinez-Palli G, Ausania F. **Evaluación de la prehabilitación como estrategia para minimizar el riesgo quirúrgico en cirugía pancreática: eficacia y factores determinantes.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00835
Duration: 01/01/2021-31/12/2023

Peinado VI. **Tratamiento de la hipertensión pulmonar en enfermedades pulmonares crónicas: caracterización y validación de biomarcadores pronósticos e identificación de posibles estrategias terapéuticas en el eje sGC-PKG.**
Sponsored by: Sociedad Española de Neumología y Cirugía Torácica (SEPAR). 888/2019
Duration: 01/01/2019-01/01/2022

Roca J. **Atenció personalitzada del malalt crònic en un marc de salut digital.**
Sponsored by: Fundació Eurecat. ACCIO_-COMRDI15-1-0016-08
Duration: 15/10/2016-15/01/2021

Roca J. **Temporal disease map based stratification of depression-related multimorbidities: towards quantitative investigations of patient trajectories and predictions of multi-target drug candida.**
Sponsored by: European Commission and Generalitat de Catalunya.
CE_ERA_PerMed_19 and SLD003/19/00001
Duration: 01/03/2020-31/12/2022

Roca J. **Smart PITeS: modelos predictivos para el soporte a la gestión de casos en un marco de salud digital.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00841
Duration: 01/01/2019-31/12/2022

Roca J. **Patient empowerment for major surgery preparation @home.**
Sponsored by: European Commission.
CE_EIT_1stI19
Duration: 01/01/2019-31/12/2021

Roca J. **Joint Action on implementation of digitally enabled integrated person-centred care.**
Sponsored by: European Commission.
CE_HP-JA-03-2019
Duration: 01/10/2020-30/09/2023

Tura O. **Estudio del metabolismo y de la función endotelial en pacientes con hipertensión pulmonar tromboembólica: efecto de la estimulación de Riociguat.**

Sponsored by: Fundació Acadèmia de les Ciències Mèdiques. SOCAP_TLLIURE19_01
Duration: 05/04/2019-04/04/2021

Tura O. **Estudio del metabolismo y de la función endotelial en pacientes con hipertensión pulmonar tromboembólica: efecto de la estimulación de Riociguat.**
Sponsored by: Sociedad Española de Neumología y Cirugía Torácica (SEPAR). 907/2019
Duration: 01/01/2019-30/04/2021

Tura O. **Estudio del metabolismo y de la función endotelial en pacientes con hipertensión pulmonar tromboembólica: efecto de la estimulación de Riociguat.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00960
Duration: 01/01/2019-31/12/2021

DOCTORAL THESIS

Barberà JA, Zock JP. **El vertido del petrolero 'prestige' y sus efectos respiratorios y genotóxicos en los marineros de la costa gallega.**
PhD student: Gema Rodriguez Trigo

Belda FJ, Ferrando C. **Estudio de validación de los parámetros dinámicos de respuesta a fluidos, variación de volumen sistólico (VVS) y variación de presión de pulso (VPP) durante la cirugía de resección pulmonar.**
PhD student: Amanda Cristina Miñana Moll

2.4 Translational computing in cardiology

KEYWORDS

1. **Cardiovascular pathophysiology**
2. **Machine learning**
3. **Artificial intelligence**
4. **Computational modelling**
5. **Cardiac imaging**
6. **Image processing**

RELATED DISEASES

1. **Cardiovascular diseases**

Original publications

TOTAL	7
Mean IF	**6,16**
Q1	**86%**
D1	**43%**
MA	**29%**
OA	**86%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PRE-DOCTORAL RESEARCHERS
Guillermo Jiménez (IDIBAPS)
Pablo-Miki Martí Castellote (IDIBAPS)

TECHNICIANS
Ainhoa Marina Aguado (IDIBAPS)
Josa Prats (IDIBAPS)

PROBLEM

Cardiovascular diseases remain a major cause of death and loss of quality of life. While current prevention and treatment strategies have delayed symptoms and improved life expectancy, this has resulted in an increasing number of patients now requiring careful follow-up and subsequent therapy.

To optimally treat these chronic patients, a detailed assessment and a thorough understanding of how their heart is working is essential. Imaging is often used for this, but the images have to be analysed and summarised into relevant information to enable personal decision-making.

Given the wealth of available imaging and other diagnostic data, computational tools such as image processing, computational modelling and machine learning are required to enable processing of all the information for the treating clinician.

APPROACH

The group aims at developing and investigating computing for understanding each individual heart, in order to improve diagnosis, prognosis and therapy. We work in an interdisciplinary way combining biomedical engineering, physics, and mathematics with basic research, as well as clinical expertise, in order to link technological and theoretical science with physiological and clinical knowledge.

We combine medical imaging with computer models representing all relevant details of the working heart as well as with knowledge about therapies. Additionally, the wealth of information available from any single individual and groups of patients from routine practice and clinical trials can be integrated in an understandable way by using the latest machine learning and artificial intelligence methods.

IMPACT

Modern cardiology relies on the detailed (imaging) assessment of the function and structure of the heart for selecting targeted prevention and drug, device or surgical therapies. A wealth of data is available in clinical practice but integrating it into a consistent representation of an individuals' heart is highly challenging. However, this is crucial in order to choose the best personalised care and is also needed to improve our understanding of cardiovascular diseases and their impact in different groups of individuals.

We aim at providing computing approaches to help this data integration as well as interpretation for both individuals and populations alike. These methods include image analysis and interpretation and machine learning for data integration and decision-making, as well as tools for better and more targeted data acquisition.

RESEARCH LINES

- Cloud-based tools for data integration and analysis.

- Computational modelling of the cardiovascular system.

- Deformation and function analysis in different cardiovascular diseases.

- Machine learning for clinical diagnosis and decision making.

- Quantification of structural and shape remodelling of the heart.

- Synchrotron-based x-ray phase-contrast imaging.

PUBLICATIONS

Originals

1. Crispi F, Rodríguez-López M, Bernardino G, Sepúlveda-Martínez Á, Prat-González S, Pajuelo C, Perea RJ, Caralt MT, Casu G, Vellvé K, Crovetto F, Burgos F, De Craene M, Butakoff C, González Ballester MÁ, Blanco I, Sitges M, Bijnens B, Gratacós E. **Exercise Capacity in Young Adults Born Small for Gestational Age.** *JAMA Cardiology.* 6(11):1308-1316. D1

2. Bernardino G; Hodzic A; Langet H; Legallois D; De Craene M; González Ballester MÁ; Saloux É; Bijnens B. **Volumetric parcellation of the cardiac right ventricle for regional geometric and functional assessment.** *Medical Image Analysis.* 71:102044. D1

3. Soveral I, Crispi F, Guirado L, García-Otero L, Torres X, Bennasar M, Sepúlveda-Martínez Á, Nogué L, Gratacós E, Martínez JM, Bijnens B, Friedberg M, Gómez O. **Cardiac filling and ejection time fractions by pulsed Doppler: fetal nomograms and potential clinical application.** *Ultrasound In Obstetrics & Gynecology.* 58(1):83-91. D1

4. Loncaric F, Garcia-Canadilla P, Garcia-Alvarez A, Sanchis L, Prat S, Doltra A, Quintana E, Pereda D, Dejea H, Bonnin A, Sitges M, Bijnens B. **Etiology-Discriminative Multimodal Imaging of Left Ventricular Hypertrophy and Synchrotron-Based Assessment of Microstructural Tissue Remodeling.** *Front Cardiovasc Med.* 8:670734. Q1

5. Planinc I, Garcia-Canadilla P, Dejea H, Ilic I, Guasch E, Zamora M, Crispi F, Stampanoni M, Milicic D, Bijnens B, Bonnin A, Cikes M. **Comprehensive assessment of myocardial remodeling in ischemic heart disease by synchrotron propagation based X-ray phase contrast imaging.** *Scientific Reports.* 11(1):14020. Q1

6. Mas-Stachurska A, Egea G, de Bruin-Bon R, Rudenick P, Sanchis L, Bouma BJ, Mulder BJ, Bijnens B, Sitges M. **Postsystolic thickening is a potential new clinical sign of injured myocardium in marfan syndrome.** *Scientific Reports.* 11(1):15790. Q1

7. Loncaric F, Marciniak M, Nunno L, Mimbrero M, Fernandes JF, Fabijanovic D, Sanchis L, Doltra A, Montserrat S, Cikes M, Lamata P, Bijnens B, Sitges M. **Distribution of myocardial work in arterial hypertension: insights from non-invasive left ventricular pressure-strain relations.** *International Journal Of Cardiovascular Imaging.* 37(1):145-154. Q3

Review

1. Loncaric F; Camara O; Piella G; Bijnens B. **Integration of artificial intelligence into clinical patient management: focus on cardiac imaging.** *Rev Esp Cardiol.* 74(1):72-80. Q2

Letters

1. Fraser AG; Bijnens BH; Friedberg MK. **Understanding right ventricular dyssynchrony: Its myriad determinants and clinical relevance.** *Experimental Physiology.* 106(4):797-800. Q2

GRANTS FOR RESEARCH IN PROGRESS

Bijnens B. **CoALeS: Improving long term outcome in infants with coarctation through machine learnig for data integration from fetus to childhood.**
Sponsored by: Fundació la Marató de TV3.
TV3_Minoritaries_20
Duration: 20/04/2021 - 19/04/2024

Bijnens B. **Fenotipado tisular y funcional de la miocardiopatía hipertrófica con imagen multimodal: caracterización integral y multiescalar no invasiva.**
Sponsored by: Fundación Casa del Corazón (FEC). SEC_FEC-INV-CLI20/028
Duration: 29/10/2020-28/10/2021

Bijnens B. **Fetal doppler for antenatal risk stratification.**
Sponsored by: Aga Khan University.
INT_INV-021528
Duration: 01/01/2021- 31/12/2024

Bijnens B. **Incorporating Machine Learnig approaches to optimize the clinical workflow and throughput in pediatric echocardiology.** Hitachi Healtcare. 5870-20
Duration: 01/09/2020-28/02/2022

DOCTORAL THESES

Sitges M, Bijnens B. **Phenotyping of Left Ventricular Hypertrophy using Etiology- Discriminative Deformation Imaging and Data Integration.**
PhD student: Filip Loncaric

2.5 Translational research in pulmonary vascular diseases: cell proliferation and apoptotic mechanisms in pulmonary arterial hypertension

LOCATION
CELLEX building, floor 2A

KEYWORDS
1. **Pulmonary hypertension**
2. **Proliferation-apoptosis pathway**
3. **Hypoxia**
4. **Animal models**

RELATED DISEASES
1. **Pulmonary arterial hypertension**
2. **Connective tissue diseases**
3. **Congenital heart diseases**
4. **Cronich thromboembolic pulmonary hypertension**

GROUP INVOLVED IN
CIBERES
AGAUR_SGR17: 617

Original publications

TOTAL	28
Mean IF	6,36
Q1	50%
D1	18%
MA	18%
OA	64%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Pulmonary hypertension (PH) is a disease in which the blood pressure of the pulmonary arteries is abnormally high. It usually develops in association with pulmonary artery diseases, and also as a complication in more common lung and heart diseases. The most significant clinical repercussion of PH is that it gives rise to an overload in the right ventricle, causing this to fail and resulting in death.

It is important to correctly diagnose and describe the mechanism that produces PH, as its treatment varies, depending on the type of hypertension.

Today, different drugs are available that offer enormous benefits to patients with pulmonary hypertension, but it is not yet possible to say that a cure exists for this disease. The group's goal is to gain deeper knowledge of the mechanisms responsible for PH and to find new activity biomarkers of the disease and new therapeutic lines to correct the underlying problem.

APPROACH

Pulmonary arterial hypertension is a disease of the small pulmonary arteries in which blood vessel diameter is gradually reduced due to an increase in the thickness of the vessel walls (vasoconstriction). This leads to an increase in pulmonary vascular resistance (PVR) which causes right ventricular failure and death.

Recent therapeutic advances have managed to increase survival and improve the quality of life of patients with PH, but the drugs available today are unable to alter the progression of the disease and the structural lesions of the pulmonary arteries, acting simply as vasodilators.

In the group's opinion, in addition to vasodilators, it is necessary to find new signalling pathways that could be more appropriate therapeutic targets. In this respect, it is proposed to not only work in the laboratory with animal and cell models, but also to work with blood and tissue samples from patients undergoing lung transplants.
The group's line of research consists of evaluating potential therapeutic targets and biomarkers of disease activity and progression, aimed at reversing the proliferative remodelling phenotype in PH.

IMPACT

Molecular study and clinical repercussions of pulmonary arterial hypertension and chronic pulmonary thromboembolic disease.

A pulmonary artery hypertension model has been set up in rodents consisting of exposure to hypoxia related to the administration of a VEGF inhibitor. This model reproduces the disease and identifies new potential therapeutic targets, in order to reverse the pro-proliferative and anti-apoptotic phenotype.

Various members of the group belong to the functional pulmonary hypertension unit at the Hospital Clínic, the most active unit in Catalonia and the second most active in Spain. The unit is accredited as an Expert Referral Unit by the Catalan Health Service (CatSalut), as a CSUR (referral centres, services and units) by the Spanish Ministry of Health and as a healthcare provider of the European Reference Network on Rare Lung Diseases (ERN-LUNG), established by the European Commission, thus increasing its capacity to take on translational research projects and participate in international clinical trials.

RESEARCH LINES

- Clinical research in pulmonary hypertension.

- Interventions on lifestyle: exercise and other non-pharmacological actions to improve ph.

- Proliferation and apoptosis in pulmonary arterial hypertension: biomarkers and new therapies.

PUBLICATIONS

Originals

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8. Sarmiento-Monroy JC, Espinosa G, Londoño MC, Meira F, Caballol B, Llufriu S, Carrasco JL, Moll-Udina A, Quintana LF, Giavedoni P, Ramírez J, Inciarte-Mundo J, Solana E, Blanco Y, Martinez-Hernandez E, Sepúlveda M, Llorenç V, Prieto-González S, Espígol-Frigolé G, Milisenda JC, Cid MC, Mascaró JM, Blanco I, Barberá JA, Sibila O, Gratacos-Ginès J, Adán A, Agustí A, Sanmartí R, Panés J, Cervera R, Vila J, Soriano A, Gómez-Puerta JA, Immunocovid Clinic. **A multidisciplinary registry of patients with autoimmune and immune-mediated diseases with symptomatic COVID-19 from a single center.** *Journal Of Autoimmunity.* 117:102580. Q1

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11. Nukala SB; Tura-Ceide O; Aldini G; Smolders VFED; Blanco I; Peinado VI; Castellà M; Barberà JA; Altomare A; Baron G; Carini M; Cascante M; D'Amato A. **Protein network analyses of pulmonary endothelial cells in chronic thromboembolic pulmonary hypertension**. *Scientific Reports.* 11(1):5583. Q1

12. Crispi F, Crovetto F, Larroya M, Camacho M, Tortajada M, Sibila O, Badia JR, López M, Vellvé K, Garcia F, Trilla A, Faner R, Blanco I, Borràs R, Agustí A, Gratacós E . **Low birth weight as a potential risk factor for severe COVID-19 in adults.** *Scientific Reports.* 11(1):2909. Q1

13. Tura-Ceide O; Smolders VFED; Aventin N; Morén C; Guitart-Mampel M; Blanco I; Piccari L; Osorio J; Rodríguez C; Rigol M; Solanes N; Malandrino A; Kurakula K; Goumans MJ; Quax PHA; Peinado VI; Castellà M; Barberà JA. **Derivation and characterisation of endothelial cells from patients with chronic thromboembolic pulmonary hypertension.** *Scientific Reports.* 11(1):18797. Q1

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15. Tura-Ceide O, Blanco I, Garcia-Lucio J, del Pozo R, Roberto García A, Ferrer E, Crespo I, Rodríguez-Chiaradia DA, Simeon-Aznar CP, López-Meseguer M, Martín-Ontiyuelo C, Peinado VI, Barberà JA. **Circulating Cell**

Biomarkers in Pulmonary Arterial Hypertension: Relationship with Clinical Heterogeneity and Therapeutic Response. *Cells*. 10(7):1688. Q2

16. Koreny M, Demeyer H, Benet M, Arbillaga-Etxarri A, Balcells E, Barberan-Garcia A, Gimeno-Santos E, Hopkinson NS, De Jong C, Karlsson N, Louvaris Z, Polkey MI, Puhan MA, Rabinovich RA, Rodríguez-Roisin R, Vall-Casas P, Vogiatzis I, Troosters T, Garcia-Aymerich J, Urban Training Study Group and PROactive Consortium members, Urban Training Study Group, PROactive Consortium members. **Patterns of Physical Activity Progression in Patients With COPD.** *Archivos De Bronconeumologia.* 57(3):214-223. Q2

17. Puente-Maestú L; Ortega F; Pedro JGd; Rodríguez-Nieto MJ; Gómez-Seco J; Gáldiz B; Ojanguren I; Muñoz X; Blanco I; Burgos F; Rodríguez-Chiaradía DA; Gea J; García-Rio F. **Prediction Equations for Maximal Aerobic Capacity on Cycle Ergometer for the Spanish Adult Population.** *Archivos De Bronconeumologia.* 57(7):471-478. Q2

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19. Isus Olivé G, Páez Carpio A, Martínez D, Vollmer I. **Role of Contrast-Enhanced Ultrasound in the Differentiation Between Pneumonia and Neoplasia Within a Lung Consolidation.** *Archivos De Bronconeumologia.* 57(9):605-607. Q2

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22. Jimenez Trinidad FR, Arrieta Ruiz M, Solanes Batlló N, Vea Badenes À, Bobi Gibert J, Valera Cañellas A, Roqué Moreno M, Freixa Rofastes X, Sabaté Tenas M, Dantas AP, Tura-Ceide O, Rigol Muxart M. **Linking In Vitro Models of Endothelial Dysfunction with Cell Senescence.** *Life*. 11(12):1323. Q2

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25. Salvador, R; Sebastia, M; Cardenas, G; Paez-Carpio, A; Pano, B; Sole, M; Nicolau, C. **CT differentiation of fat-poor angiomyolipomas from papillary renal cell carcinomas: development of a predictive model.** *Abdominal Radiology*. 46(7):3280-3287. Q2

26. Zarco, F; Macias, N; Delgado, F; Rosati, S; Gonzalez, A; Jimenez, E; Moreu, M; Ortega, J; Macho, J; Lopez-Rueda, A. **Multicenter Retrospective Registry of Anterior Communicating Artery Aneurysms with Endovascular Therapy (MACAARET): safety and efficacy study according to morphological considerations and spatial orientations.** *Clinical Radiology*. 76(10):786.e1-786.e8. Q3

27. Lazaro Salvador M, Quezada Loaiza CA, Rodríguez Padial L, Barberá JA, López-Meseguer M, López-Reyes R, Sala-Llinas E, Alcolea S, Blanco I, Escribano-Subías P, REHAP Investigators. **Portopulmonary hypertension: prognosis and management in the current treatment era.** *Internal Medicine Journal*. 51(3):355-365. Q3

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Review

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3. Páez-Carpio A, Gómez FM, Isus Olivé G, Paredes P, Baetens T, Carrero E, Sánchez M, Vollmer I. **Image-guided percutaneous ablation for the treatment of lung malignancies: current state of the art.** *Insights Into Imaging*. 12(1):57. Q1

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Letters

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Editorial

1. Vollmer, I; Domenech-Ximenos, B; Sanchez, M. **Contrast-Enhanced Lung Ultrasound: A New Horizon.** *Archivos De Bronconeumologia.* 57(6):385-386. Q2

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2. Cabedo-Esteve, L; Vollmer, CPSEI. **Migrating Pleuropericardial Cyst: A Case Report .** *Archivos De Bronconeumologia.* 57(10):648. Q2

Consortium Publications

1. Blondon M; Jimenez D; Robert-Ebadi H; Del Toro J; Lopez-Jimenez L; Falga C; Skride A; Font L; Vazquez FJ; Bounameaux H; Monreal M; RIETE investigators RIETE investigators. **Comparative clinical prognosis of massive and non-massive pulmonary embolism: A registry-based cohort study.** *Journal Of Thrombosis And Haemostasis.* 19(2):408-416. Q1

2. Bikdeli B; Jiménez D; Del Toro J; Piazza G; Rivas A; Fernández-Reyes JL; Sampériz Á; Otero R; Suriñach JM; Siniscalchi C; Martín-Guerra JM; Castro J; Muriel A; Lip GYH; Goldhaber SZ; Monreal M; RIETE Investigators † RIETE Investigators †. **Association Between Preexisting Versus Newly Identified Atrial Fibrillation and Outcomes of Patients With Acute Pulmonary Embolism.** *Journal Of The American Heart Association.* 10(17):e021467. Q1

3. Hoeper MM, Gomez Sanchez MA, Humbert M, Pittrow D, Simonneau G, Gall H, Grünig E, Klose H, Halank M, Langleben D, Snijder RJ, Escribano Subias P, Mielniczuk LM, Lange TJ, Vachiéry JL, Wirtz H, Helmersen DS, Tsangaris I, Barberà JA, Pepke-Zaba J, Boonstra A, Rosenkranz S, Ulrich S, Steringer-Mascherbauer R, Delcroix M, Jansa P, Šimková I, Giannakoulas G, Klotsche J, Williams E, Meier C, Ghofrani HA, Collaborators list. **Riociguat treatment in patients with pulmonary arterial hypertension: Final safety data from the EXPERT registry.** *Respiratory Medicine.* 177(106241):106241. Q2

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GRANTS FOR RESEARCH IN PROGRESS

Blanco I. **Efectos del entrenamiento físico sobre la función vascular como diana terapéutica en la hipertensión pulmonar.**
Sponsored by: Fundació Acadèmia de les Ciències Mèdiques. SOCAP_TLLIURE18_01
Duration: 19/06/2018-

Blanco I. **Efectos del entrenamiento físico sobre la función vascular como diana terapéutica en la hipertensión pulmonar.**
Sponsored by: Sociedad Española de Neumología y Cirugía Torácica (SEPAR). 672/2018
Duration: 01/06/2018-30/06/2021

Blanco I. **Efectos del entrenamiento físico sobre la función vascular como diana terapéutica en la hipertensión pulmonar.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/01515
Duration: 01/01/2018-30/06/2021

Blanco I. **Evaluación de la vasculatura pulmonar periférica mediante Tomografía Computadorizada de Doble Energía en pacientes COVID-19: Implicaciones clínicas y pronósticas.**
Sponsored by: Beca mecenazgo COVID19_Hospital Clínic de Barcelona.
Convocatoria 2020
Duration: 01/06/2020-30/06/2021

Gimeno-Santos E. **Ensayo clínico aleatorizado y controlado sobre los efectos de la electroestimulación neuromuscular en la capacidad de ejercicio en pacientes con patología respiratoria ingresados en la unidad de cuidados intensivos.**
Sponsored by: Fundació Acadèmia de les Ciències Mèdiques. SOCAP_PROJECTE01
Duration: 16/03/2017-

Ramirez, A. **Propuesta de mejora en la consulta de enfermería para pacientes con hipertensión pulmonar: implantación de una consulta telemática de enfermería.**
Sponsored by: Sociedad Española de Neumología y Cirugía Torácica (SEPAR). 1113
Duration: 30/06/2021-30/06/2022

DOCTORAL THESIS

Torres A, Gimeno-Santos E. **Les aguditzacions com a element crucial en el maneig no farmacològic de les bronquièctasis.**
PhD student: Victoria Alcaraz Serrano

2.6 Familial cardiomyopathies and sudden death syndromes

LOCATION
HCB building

KEYWORDS
1. **Cardiogenetics**
2. **Familial cardiopmyopathy**
3. **Channelopathy**
4. **Sudden death**
5. **Brugada syndrome**
6. **Long QT syndrome**
7. **Short QT syndrome**
8. **Catecholaminergic polymorphic ventricular tachycardia**
9. **Early repolarisation syndrome**
10. **Idiopathic ventricular fibrillation**
11. **Arrhythmogenic cardiomyopathy**
12. **Hypertrophic cardiomyopathy**
13. **Dilated cardiomyopathy**
14. **Non-compacted cardiomyopathy**
15. **Atrial fibrillation**
16. **Genetic testing**
17. **Implantable cardiac defibrillator**

RELATED DISEASES
1. **Brugada syndrome**
2. **Long QT syndrome**
3. **Short QT syndrome**
4. **Catecholaminergic polymorphic ventricular tachycardia**
5. **Early repolarisation syndrome**
6. **Idiopathic ventricular fibrillation**
7. **Arrhythmogenic cardiomyopathy**
8. **Hypertrophic cardiomyopathy**
9. **Dilated cardiomyopathy**
10. **Non-compacted cardiomyopathy**
11. **Familial atrial fibrillation**

GROUP INVOLVED IN
CIBERCV
RIC

Original publications

TOTAL	19
Mean IF	5,95
Q1	42%
D1	5%
MA	32%
OA	63%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Cardiac arrhythmias are responsible for nearly a million deaths each year in the West. They can lead to sudden death, which normally occurs without any prior symptoms and can affect men and women of all ethnicities and age groups, including babies. In people over the age of 50 years, sudden death is usually caused by coronary or ischemic diseases. In the population under the age of 50 years, familial cardiopathies caused by genetic abnormalities are the main cause of these fatal episodes.

In recent years, thanks to technological advances in the field of molecular biology, it has been possible to identify numerous genetic abnormalities responsible for diseases associated with sudden cardiac death. Modern gene-sequencing technology makes it possible to analyse a large number of genes (even exomes or genomes) in a cost-effective way and in a short time. In cases where familial disease is suspected, a thorough genetic study is carried out to identify the causes of the disease.

Once this has been identified, a family genetic study is carried out to identify those members of the family who are at risk of suffering from the disease.

Genetics contributes to improving our understanding of the pathophysiological mechanisms of arrhythmias and this has made it possible to improve diagnosis and risk stratification of patients, and to focus on personalized treatment.

APPROACH

The group studies the clinical, electrical, structural, and genetic variables involved in the appearance, natural history and prognosis of these diseases, with the aim of identifying risk indicators for sudden death and preventing it. In the case of diseases that affect cardiac function, it works to prevent their progression.

The research group has a multidisciplinary team of IDIBAPS-HCB specialists and works closely with different centres in Catalonia that are pioneers at the national and international level. This makes it possible to provide a joint response for families affected by arrhythmogenic diseases associated with sudden death. Finally, the group also works in partnership with other centres around the world towards establishing an accurate diagnosis that makes it possible to adopt personalized measures in both the prevention and treatment of familial sudden death.

IMPACT

The group's scientific contributions in recent years have been based on clinical diagnosis, adopting personalized preventive measures, and research into the genetic causes of heart disease.

The group is now a gold standard centre in sudden cardiac death at national level and is a key actor at international level in the field of familial heart disease.

Over the past 15 years, it has taken part in over 50 research projects on sudden death, has participated in over 200 scientific publications focusing on familiar cardiomyopathies, and has been invited to over 300 lectures at congresses and courses on familiar cardiomyopathies and sudden death. It has been, and continues to be, a member of national and international networks in the field of malignant arrhythmias and sudden death.

As a result of the group's work, new diseases associated with sudden death in healthy people have been identified (for example Brugada syndrome or Short QT syndrome) and many genetic and clinical findings have been described that make it possible to adopt the most suitable treatment measures in each case.

RESEARCH LINES

- Clinical, electrical and genetic characteristics of brugada syndrome.

- Clinical, electrical and genetic characteristics of arrhythmogenic cardiomyopathy.

- Sudden cardiac death without an apparent cause: post-mortem genetic study.

- International collaboration for genome-wide association studies in brugada and long qt syndrome

PUBLICATIONS

Originals

1. Walsh R; Lahrouchi N; Tadros R; Kyndt F; Glinge C; Postema PG; Amin AS; Nannenberg EA; Ware JS; Whiffin N; Mazzarotto F; Škorić-Milosavljević D; Krijger C; Arbelo E; Babuty D; Barajas-Martinez H; Beckmann BM; Bézieau S; Bos JM; Breckpot J; Campuzano O; Castelletti S; Celen C; Clauss S; Corveleyn A; Crotti L; Dagradi F; de Asmundis C; Denjoy I; Dittmann S; Ellinor PT; Ortuño CG; Giustetto C; Gourraud JB; Hazeki D; Horie M; Ishikawa T; Itoh H; Kaneko Y; Kanters JK; Kimoto H; Kotta MC; Krapels IPC; Kurabayashi M; Lazarte J; Leenhardt A; Loeys BL; Lundin C; Makiyama T; Mansourati J; Martins RP; Mazzanti A; Mörner S; Napolitano C; Ohkubo K; Papadakis M; Rudic B; Molina MS; Sacher F; Sahin H; Sarquella-Brugada G; Sebastiano R; Sharma S; Sheppard MN; Shimamoto K; Shoemaker MB; Stallmeyer B; Steinfurt J; Tanaka Y; Tester DJ; Usuda K; van der Zwaag PA; Van Dooren S; Van Laer L; Winbo A; Winkel BG; Yamagata K; Zumhagen S; Volders PGA; Lubitz SA; Antzelevitch C; Platonov PG; Odening KE; Roden DM; Roberts JD; Skinner JR; Tfelt-Hansen J; van den Berg MP; Olesen MS; Lambiase PD; Borggrefe M; Hayashi K; Rydberg A; Nakajima T; Yoshinaga M; Saenen JB; Kääb S; Brugada P; Robyns T; Giachino DF; Ackerman MJ; Brugada R; Brugada J; Gimeno JR; Hasdemir C; Guicheney P; Priori SG; Schulze-Bahr E; Makita N; Schwartz PJ; Shimizu W; Aiba T; Schott JJ; Redon R; Ohno S; Probst V; Nantes Referral Center for inherited cardiac arrhythmia; Behr ER; Barc J; Bezzina CR. **Enhancing rare variant interpretation in inherited arrhythmias through quantitative analysis of consortium disease cohorts and population controls.** *Genetics In Medicine.* 23(1):47-58. D1

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3. Quinto L, Sanchez-Somonte P, Alarcón F, Garre P, Castillo À, San Antonio R, Borras R, Guasch E, Arbelo E, Tolosana JM, Berruezo A, Mont L, Roca-Luque I . **Ventricular tachycardia burden reduction after substrate ablation: predictors of recurrence**. *Heart Rhythm.* 18(6):896-904. Q1

4. Sánchez-Somonte P, Quinto L, Garre P, Zaraket F, Alarcón F, Borràs R, Caixal G, Vázquez S, Prat S, Ortiz-Perez JT, Perea RJ, Guasch E, Tolosana JM, Berruezo A, Arbelo E, Sitges M, Mont L, Roca-Luque I . **Scar channels in cardiac magnetic resonance to predict appropriate therapies in primary prevention.** *Heart Rhythm.* 18(8):1336-1343. Q1

5. Rodríguez-Mañero M; Jordá P; Hernandez J; Muñoz C; Grima EZ; García-Fernández A; Cañadas-Godoy MV; Jiménez-Ramos V; Oloriz T; Basterra N; Calvo D; Pérez-Álvarez L; Arias MA; Expósito V; Alemán A; Díaz-Infante E; Guerra-Ramos JM; Fernández-Armenta J; Arce-Leon Á; Sanchez-Gómez JM; Sousa P; García-Bolao I; Baluja A; Campuzano O; Sarquella-Brugada G; Martinez-Sande JL; González-Juanatey JR; Gimeno JR; Brugada J; Arbelo E. **Long-term prognosis of women with Brugada syndrome and electrophysiological study**. *Heart Rhythm.* 18(5):664-671. Q1

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7. Vallverdu-Prats M, Alcalde M, Sarquella-Brugada G, Cesar S, Arbelo E, Fernandez-Falgueras A, Coll M, Perez-Serra A, Puigmule M, Iglesias A, Fiol V, Ferrer-Costa C, del Olmo B, Pico F, Lopez L, Jorda P, Garcia-Alvarez A, de Llano CT, Toro R, Grassi S, Oliva A, Brugada J, Brugada R, Campuzano O. **Rare Variants Associated with Arrhythmogenic Cardiomyopathy: Reclassification Five Years Later.** *J Pers Med.* 11(3):162. Q1

8. Sarquella-Brugada G; García-Algar O; Zambrano MD; Fernández-Falgueres A; Sailer S; Cesar S; Sebastiani G; Martí-Almor J; Aurensanz E; Cruzalegui JC; Merchan EF; Coll M; Pérez-Serra A; Olmo Bd; Fiol V; Iglesias A; Ferrer-Costa C; Puigmulé M; Lopez L; Pico F; Arbelo E; Jordà P; Brugada J; Brugada R; Campuzano O. **Early Identification of Prolonged QT Interval for Prevention of Sudden Infant Death.** *Frontiers In Pediatrics.* 9:704580. Q1

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10. Vassilikos VP, Pagourelias ED, Laroche C, Blomström-Lundqvist C, Kautzner J, Maggioni AP, Tavazzi L, Dagres N, Brugada J, Stühlinger M, Arbelo E, AFA LT registry investigators group. **Impact of centre volume on atrial fibrillation ablation outcomes in Europe: a report from the ESC EHRA EORP Atrial Fibrillation Ablation Long-Term (AFA LT) Registry.** *Europace.* 23(1):49-58. Q2

11. Caixal G, Alarcón F, Althoff TF, Nuñez-Garcia M, Benito EM, Borràs R, Perea RJ,

Prat-González S, Garre P, Soto-Iglesias D, Gunturitz C, Cozzari J, Linhart M, Tolosana JM, Arbelo E, Roca-Luque I, Sitges M, Guasch E, Mont L . **Accuracy of left atrial fibrosis detection with cardiac magnetic resonance: correlation of late gadolinium enhancement with endocardial voltage and conduction velocity.** *Europace.* 23(3):380-388. Q2

12. Arbelo E, Angera I, Trucco E, Rivas-Gándara N, Guerra JM, Bisbal F, Jáuregui-Abularach M, Vallés E, Martin G, Sbraga F, Tolosana JM, Linhart M, Francisco-Pascual J, Montiel-Serrano J, Pereferrer D, Menéndez-Ramírez D, Jiménez J, Elamrani A, Borrás R, Dallaglio PD, Benito E, Santos-Ortega A, Rodríguez-Font E, Sarrias A, González-Matos CE, Martí-Almor J, Cabrera S, Mont L . **Reduction in new cardiac electronic device implantations in Catalonia during COVID-19.** *Europace.* 23(3):456-463. Q2

13. Caixal G, Althoff T, Garre P, Alarcón F, NuñezGarcia M, Benito EM, Borras R, Perea RJ, Prat-González S, Gunturiz C, Sanchez P, Olivas D, Tolosana JM, Arbelo E, Roca-Luque I, Brugada J, Sitges M, Guasch E, Mont L . **Proximity to the descending aorta predicts regional fibrosis in the adjacent left atrial wall: aetiopathogenic and prognostic implications.** *Europace.* 23(10):1559-1567. Q2

14. Quinto L, Sanchez P, Alarcón F, Garre P, Zaraket F, Prat-Gonzalez S, Ortiz-Perez JT, JesúsPerea R, Guasch E, Tolosana JM, San Antonio R, Arbelo E, Sitges M, Brugada J, Berruezo A, Mont L, Roca-Luque I . **Cardiac magnetic resonance to predict recurrences after ventricular tachycardia ablation: septal involvement, transmural channels, and left ventricular mass.** *Europace.* 23(9):1437-1445. Q2

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18. San Antonio R, Guasch E, González-Ascaso A, Jiménez-Arjona R, Climent AM, Pujol-López M, Doltra A, Alarcón F, Garre P, Liberos A, Trotta O, Quinto L, Borràs R, Arbelo E, Roca-Luque I, Atienza F, Brugada J, Fernández-Avilés F, Guillem MS, Sitges M, Tolosana JM, Mont L. **Optimized single-point left ventricular pacing leads to improved resynchronization compared with multipoint pacing.** *PACE-Pacing And Clinical Electrophysiology.* 44(3):519-527. Q4

19. van Rosmalen, F; Delhaas, T; Dagres, N; Arbelo, E; Blomstrom-Lundqvist, C; Crijns, Harry J. G. M.; Da Costa, A; Pytkowski, M; Sharikov, N; Laroche, C; Tavazzi, L; Brugada, J; Pison, L; ESC-EHRA Atrial Fibrillation Ablat. **Adenosine usage during AF ablation in Europe and selected long-term findings from the ESC-EHRA EORP Atrial Fibrillation Ablation Long-Term registry.** *Journal Of Interventional Cardiac Electrophysiology.* 60(3):395-406. Q4

Review

1. Crijns, Harry J G M; Prinzen, Frits; Lambiase, Pier D; Sanders, Prashanthan; Brugada, Josep. **The year in cardiovascular medicine 2020: arrhythmias.** *European Heart Journal.* 42(5):499-507. D1

2. Grassi, S; Campuzano, O; Coll, M; Cazzato, F; Sarquella-Brugada, G; Rossi, R; Arena, V; Brugada, J; Brugada, R; Oliva, A. **Update on the Diagnostic Pitfalls of Autopsy and Post-Mortem Genetic Testing in Cardiomyopathies.** *International Journal Of Molecular Sciences.* 22(8):4124. Q1

3. Jordà P; Toro R; Diez C; Salazar-Mendiguchía J; Fernandez-Falgueras A; Perez-Serra A; Coll M; Puigmulé M; Arbelo E; García-Álvarez A; Sarquella-Brugada G; Cesar S; Tiron C; Iglesias A; Brugada J; Brugada R; Campuzano O. **Malignant arrhythmogenic role associated with rbm20: A comprehensive interpretation focused on a personalized approach.** *J Pers Med.* 11(2):130. Q1

4. Sarquella-Brugada G, Fernandez-Falgueras A, Cesar S, Arbelo E, Jorda P, Garcia-Alvarez A, Cruzalegui JC, Merchan EF, Fiol V, Brugada J, Brugada R, Campuzano O. **Pediatric Malignant Arrhythmias Caused by Rare Homozygous Genetic Variants in TRDN: A Comprehensive Interpretation.** *Frontiers In Pediatrics.* 8:601708. Q1

5. Mascia G, Olivotto I, Brugada J, Arbelo E, Di Donna P, Della Bona R, Canepa M, Porto I. **Sport practice in hypertrophic cardiomyopathy: Running to stand still?** *International Journal Of Cardiology.* 345:77-82. Q2

Letters

1. Rodríguez-Mañero M, Arbelo E, Brugada J . **Reply to the Editor-Electrophysiologic study in women with Brugada Syndrome .** *Heart Rhythm.* 18(6):1039-1040. Q1

Editorial

1. Roca-Luque I; Tolosana JM; Brugada J. **Atrial fibrillation ablation after the CABANA study: beyond statistical dogma.** *Rev Esp Cardiol.* 74(2):129-130. Q2

Clinical Guidelines

1. Heidbuchel H, Arbelo E, D'Ascenzi F, Borjesson M, Boveda S, Castelletti S, Miljoen H, Mont L, Niebauer J, Papadakis M, Pelliccia A, Saenen J, Sanz de la Garza M, Schwartz PJ, Sharma S, Zeppenfeld K, Corrado D. **Recommendations for participation in leisure-time physical activity and competitive sports of patients with arrhythmias and potentially arrhythmogenic conditions.** *Europace.* 23(1):147-148. Q2

2. Varma N, Marrouche NF, Aguinaga L, Albert CM, Arbelo E, Choi JI, Chung MK, Conte G, Dagher L, Epstein LM, Ghanbari H, Han JK, Heidbuchel H, Huang H, Lakkireddy DR, Ngarmukos T, Russo AM, Saad EB, Saenz Morales LC, Sandau KE, Sridhar ARM, Stecker EC, Varosy PD . **HRS/EHRA/APHR-**

S/LAHRS/ACC/AHA worldwide practice update for telehealth and arrhythmia monitoring during and after a pandemic. *Europace.* 23(2):313. Q2

3. Arbelo E,, Aktaa S, Bollmann A, D'Avila A, Drossart I, Dwight J, Hills MT, Hindricks G, Kusumoto FM, Lane DA, Lau DH, Lettino M, Lip GYH, Lobban T, Pak HN, Potpara T, Saenz LC, Van Gelder IC, Varosy P, Gale CP, Dagres N, Boveda S, Deneke T, Defaye P, Conte G, Lenarczyk R, Providencia R, Guerra JM, Takahashi Y, Pisani C, Nava S, Sarkozy A, Glotzer TV, Martins Oliveira M (Chair), (Co-chair), Reviewers, (review coordinator). **Quality indicators for the care and outcomes of adults with atrial fibrillation.** *Europace.* 23(4):494-495. Q2

4. Hindricks G, Potpara T, Dagres N, Arbelo E, Bax JJ, Blomstrom-Lundqvist C, Boriani G, Castella M, Dan GA, Dilaveris PE, Fauchier L, Filippatos G, Kalman JM, La Meir M, Lane DA, Lebeau JP, Lettino M, Lip GYH, Pinto FJ, Thomas GN, Valgimigli M, Van Gelder IC, Isabelle C, Van Putte BP, Watkins, CL. **Guía ESC 2020 sobre el diagnóstico y tratamiento de la fibrilación auricular, desarrollada en colaboración de la European Association of Cardio-Thoracic Surgery (EACTS): Guía de práctica clínica.** *Rev Esp Cardiol.* 74(5):437. Q2

GRANTS FOR RESEARCH IN PROGRESS

Arbelo E. **Characterization and risk stratification in Brugada Syndrome through the developement and validation of novel artificial intelligence model-based approaches for precision medicine.**
Sponsored by: Fundació la Marató de TV3. TV3_Minoritaries_20
Duration: 30/03/2021 - 29/03/2024

Jordà P, Arbelo E. **Caracterización del sustrato fisiopatológico y el impacto clínico de la fibrilación auricular en pacientes con miocardiopatía arritmogénica.**
Sponsored by: Fundación Casa del Corazón (FEC). SEC_CLINICA_01
Duration: 18/10/2019-31/12/2023

DOCTORAL THESIS

Brugada J, Arbelo E. **Clinical, electrocardiographic and electrophysiological characterization in Brugada Syndrome.**
PhD student: Jaime Hernández Ojeda

2.7 Nephro-urological diseases and kidney transplantation

LOCATION
CELLEX building 2B

KEYWORDS
1. **Renal transplantation**
2. **Dialysis**
3. **Transplant immunology**
4. **Cell therapy**
5. **Renal regeneration**
6. **Pancreas transplantation**
7. **Transplant registries**

RELATED DISEASES
1. **Acute kidney injury**
2. **Chronic kidney disease**
3. **Glomerular diseases**
4. **Hereditary kidney diseases (polycycstic kidney disease; amyloidosis; hemolytic uremic syndrome; fabry; alport)**
5. **Renal transplantation**
6. **Pancreas transplantation**
7. **Hemodialysis**

GROUP INVOLVED IN
REDinREN
AGAUR_SGR17: 01331

Original publications

TOTAL	60
Mean IF	5,19
Q1	52%
D1	12%
MA	43%
OA	58%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Terminal organ failure is a severe health problem often leading to a reduced quality of life or even death. Renal replacement therapy has become a routine procedure, however, still is associated with major complications and in many cases reduced life expectancy. To the same extent absence of insulin production as in diabetes type 1 is associated with a reduced quality of life and life expectancy.

Therefore, research is needed to improve these therapies and ultimately avoid them.

APPROACH

LENIT (Laboratori Experimental de Nefrologia i Trasplantament) performs translational research of renal diseases. Our focus is pathophysiology of kidney diseases and optimization of renal replacement therapy (RT) (dialysis or transplantation) as well as pancreas transplantation; therefore, we do research on RT optimization; but we also focus on regenerative treatment in order to avoid or optimize RT.

IMPACT

Chronic kidney failure and diabetes mellitus type 1 are a major health problem and lead to important expenses un health care budgets. In addition, transplant organs are a scarce resource and unfortunalely not available in sufficient numbers.

Thus, improvements in this field will lead not only to higher quality of life and life expectancy, but also to better and more sustainable utilization of resources.

RESEARCH LINES

- Biomarkers, transplant immunology and cell therapy in renal and pancreatic transplantation.

- New technologies and biomarkers in dialysis.

- Pathophisiology and innovative therapies in acute and chronic kidney disease.

PUBLICATIONS

Originals

1. Ventura-Aguiar P, Ferrer J, Paredes D, Rodriguez-Villar C, Ruiz A, Fuster J, Fondevila C, Garcia-Valdecasas JC, Esmatjes E, Adália R, Oppenheimer F, Campistol JM, Diekmann F, Ricart MJ . **Outcomes From Brain Death Donors With Previous Cardiac Arrest Accepted for Pancreas Transplantation: A Single-center Retrospective Analysis.** *Annals Of Surgery*. 273(6):e230-e238. D1

2. Pappaccogli M, Di Monaco S, Warchol-Celińska E, Lorthioir A, Amar L, Aparicio LS, Beauloye C, Bruno RM, Chenu P, de Leeuw P, De Backer T, Delmotte P, Dika Z, Gordin D, Heuten H, Iwashima Y, Krzesinski JM, Kroon AA, Mazzolai L, Poch E, Sarafidis P, Seinturier C, Spiering W, Toubiana L, Van der Niepen P, van Twist D, Visonà A, Wautrecht JC, Witowicz H, Xu J, Prejbisz A, Januszewicz A, Azizi M, Persu A, European/International FMD Registry and Initiative (FEIRI), and the Working Group 'Hypertension and the Kidney' of the European Society of Hypertension (ESH). **The European/International Fibromuscular Dysplasia Registry and Initiative (FEIRI)-clinical phenotypes and their predictors based on a cohort of 1000 patients.** *Cardiovascular Research*. 117(3):950-959. D1

3. Caravaca-Fontán F, Trujillo H, Alonso M, Díaz-Encarnación M, Cabello V, Ariceta G, Quintana LF, Marco H, Barros X, Ramos N, Rodríguez-Mendiola N, Cruz S, Fernández-Juárez G, Rodríguez E, de la Cerda F, Pérez de José A, López I, Fernández L, Pérez Gómez V, Ávila A, Bravo L, Lumbreras J, Allende N, Sanchez de la Nieta MD, Olea T, Melgosa M, Huerta A, Miquel R, Mon C, Fraga G, de Lorenzo A, Draibe J, González F, Shabaka A, Illescas ML, Calvo C, Oviedo V, Da Silva I, Goicoechea de Jorge E, Caravaca F, Praga M, C3G Study Group of the Spanish Group for the Study of Glomerular Diseases (GLOSEN). **Validation of a Histologic Scoring Index for C3 Glomerulopathy.** *American Journal Of Kidney Diseases*. 77(5):684-695.e1. D1

4. Au EH, Wong G, Howard K, Chapman JR, Castells A, Roger SD, Bourke MJ, Macaskill P, Turner R, Lim WH, Lok CE, Diekmann F, Cross N, Sen S, Allen RD, Chadban SJ, Pollock CA, Tong A, Teixeira-Pinto A, Yang JY, Kieu A, James L, Craig JC . **Factors Associated With Advanced Colorectal Neoplasia in Patients With CKD.** *American Journal Of Kidney Diseases*. S0272-6386(21):00823-4. D1

5. Broseta JJ; Rodríguez-Espinosa D; Rodríguez N; Mosquera MDM; Marcos MÁ; Egri N; Pascal M; Soruco E; Bedini JL; Bayés B; Maduell F. **Humoral and Cellular Responses to mRNA-1273 and BNT162b2 SARS-CoV-2 Vaccines Administered to Hemodialysis Patients.** *American Journal Of Kidney Diseases*. 78(4):571-581. D1

6. Revuelta I, Santos-Arteaga FJ, Montagud-Marrahi E, Ventura-Aguiar P, Di Caprio D, Cofan F, Cucchiari D, Torregrosa V, Piñeiro GJ, Esforzado N, Bodro M, Ugalde-Altamirano J, Moreno A, Campistol JM, Alcaraz A, Bayès B, Poch E, Oppenheimer F, Diekmann F. **A hybrid data envelopment analysis-artificial neural network prediction model for COVID-19 severity in transplant recipients.** *Artificial Intelligence Review*. 1(32):1-4684. D1

7. Cucchiari D, Egri N, Bodro M, Herrera S, Del Risco-Zevallos J, Casals-Urquiza J, Cofan F, Moreno A, Rovira J, Banon-Maneus E, Ramirez-Bajo MJ, Ventura-Aguiar P, Pérez-Olmos A, Garcia-Pascual M, Pascal M, Vilella A, Trilla A, Ríos J, Palou E, Juan M, Bayés B, Diekmann F. **Cellular and humoral response after mRNA-1273 SARS-CoV-2 vaccine in kidney transplant recipients.** *American Journal Of Transplantation*. 21(8):2727-2739. D1

8. Sarmiento-Monroy JC, Espinosa G, Londoño MC, Meira F, Caballol B, Llufriu S, Carrasco JL, Moll-Udina A, Quintana LF, Giavedoni P, Ramírez J, Inciarte-Mundo J, Solana E, Blanco Y, Martinez-Hernandez E, Sepúlveda M, Llorenç V, Prieto-González S, Espígol-Frigolé G, Milisenda JC, Cid MC, Mascaró JM, Blanco I, Barberá JA, Sibila O, Gratacos-Ginès J, Adán A, Agustí A, Sanmartí R, Panés J, Cervera R, Vila J, Soriano A, Gómez-Puerta JA, Immunocovid Clinic. **A multidisciplinary registry of patients with autoimmune and immune-mediated diseases with symptomatic COVID-19 from a single center.** *Journal Of Autoimmunity*. 117:102580. Q1

9. Blasco M; Martínez-Roca A; Rodríguez-Lobato LG; Garcia-Herrera A; Rosiñol L; Castro P; Fernández S; Quintana LF; Cibeira MT; Bladé J; Fernández de Larrea C; Tovar N; Jimenez R; Poch E; Guillen E; Campistol JM; Carreras E; Diaz-Ricart M; Palomo M. **Complement as the enabler of carfilzomib-induced thrombotic microangiopathy.** *British Journal Of Haematology*. 193(1):181-187. Q1

10. Helve J, Kramer A, Abad Diez JM, Aresté-Fosalba N, Arici M, Cases A, Collart F, Heaf J, De Meester J, Nordio M, Palsson R, Pobes A, Rydell H, Reisæter AV, Massy ZA, Jager KJ, Finne P. **Effect of comorbidities on survival in patients >80 years at onset of renal replacement therapy: data from the ERA-EDTA Registry.** *Nephrology Dialysis Transplantation*. 36(4):688-694. Q1

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4. Arana C, Cuevas Ramírez RE, Xipell M, Casals J, Moreno A, Herrera S, Bodro M, Cofan F, Diekmann F, Esforzado N . **Mucormycosis associated with covid19 in two kidney transplant patients.** *Transplant Infectious Disease.* 23(4):e13652. Q3

5. Rodriguez-Espinosa, Diana; Rodas, Lida; Cuadrado, Elena; Hermida, Evelyn; Pineiro, Gaston Julio; Molina, Alicia; Broseta, Jose Jesus; Fontsere, Nestor; Maduell, Francisco. **Acute hepatitis post arteriovenous graft thrombectomy of hemodialysis vascular access.** *Journal Of Vascular Access.* Q4

Consortium Publications

1. Soler MJ; Noordzij M; Abramowicz D; de Arriba G; Basile C; van Buren M; Covic A; Crespo M; Duivenvoorden R; Massy ZA; Ortiz A; Sanchez JE; Petridou E; Stevens K; White C; Vart P; Gansevoort RT; ERACODA Collaborators ERACODA Collaborators. **Renin-Angiotensin System Blockers and the Risk of COVID-19-Related Mortality in Patients with Kidney Failure.** *Clinical Journal Of The American Society Of Nephrology.* 16(7):1061-1072. D1

2. Mellado-Artigas R, Ferreyro BL, Angriman F, Hernández-Sanz M, Arruti E, Torres A, Villar J, Brochard L, Ferrando C, COVID-19 Spanish ICU Network. **High-flow nasal oxygen in patients with COVID-19-associated acute respiratory failure.** *Critical Care.* 25(1):58. Q1

3. Goffin E; Candellier A; Vart P; Noordzij M; Arnol M; Covic A; Lentini P; Malik S; Reichert LJ; Sever MS; Watschinger B; Jager KJ; Gansevoort RT; ERACODA Collaborators ERACODA Collaborators. **COVID-19-related mortality in kidney transplant and haemodialysis patients: a comparative, prospective registry-based study.** *Nephrology Dialysis Transplantation.* 36(11):2094-2105. Q1

4. García-Martínez A; López-Barbeito B; Coll-Vinent B; Placer A; Font C; Vargas CR; Sánchez C; Piñango D; Gómez-Angelats E; Curtelin D; Salgado E; Aya F; Martínez-Nadal G; Alonso JR; García-Gozalbes J; Fresco L; Galicia M; Perea M; Carbó M; Iniesta N; Escoda O; Perelló R; Cuerpo S; Flores V; Alemany X; Miró Ò; Ortega MdM; Antolín A; Moll C; Jiménez S; Bragulat E; Sánchez M; Escoda R; Gil V; Aguiló S; Osorio G; López-Sobrino T; Paglialunga PL; Xipell M; Reinoso J; Zapatero MJ; Boswell L; Bataller A; Tornero E; Renau M; Vives M; García-Morillo M; Gasch B; Carpio A; Caprini A; Sabater M; Pané A; Domenech M; López-Batet N; Gaytan JM; Guijarro F; Xipell C; Doi AL; Comice P; Garibaldi G; Fernández-Codina A; Álvarez-Larrán A; Obregón NH; Martínez-Torroba M; Santos M; Mihaylov M; Florez H; De Caneva F; Mestre J; Fernández Á; da Fieno AM; Casanova GS; Piñeyroa JA; Fibla A; Morcos R; Mayor MI; Castrillo LC; Ayala B; Mariaca KM; Ji MQY; del Risco J; Pérez V; Gutiérrez F; Alamón F; Martí I; Bosch X; Rizo D; Morancho A; Ventosa H; Cardozo C. **Mortality in patients treated for COVID-19 in the emergency department of a tertiary care hospital during the first phase of the pandemic: Derivation of a risk model for emergency departments.** *Emergencias: Revista De La Sociedad Española De Medicina De Urgencias Y Emergencias.* 33(4):273-281. Q1

5. Mellado-Artigas R, Mujica LE, Ruiz ML, Ferreyro BL, Angriman F, Arruti E, Torres A, Barbeta E, Villar J, Ferrando C, COVID-19 Spanish ICU Network. **Predictors of failure with high-flow nasal oxygen therapy in COVID-19 patients with acute respiratory failure: a multicenter observational study.** *Journal Of Intensive Care.* 9(1):23. Q2

GRANTS FOR RESEARCH IN PROGRESS

Blasco M. **Evaluación de la sobreactivación del complemento en la patogénesis de las ANCA-vasculitis.**
Sponsored by: Fundación Senefro.
SENEFRO_PROY_20_02
Duration: 23/12/2020-22/12/2022

Campistol JM. **Metabolismo del hierro en los receptores de aloinjerto de riñón añoso.**
Sponsored by: Fundación Senefro.
SENEFRO19_001
Duration: 04/12/2019-03/12/2021

Diekmann F. **Laboratori Experimental de Nefrologia i Trasplantament Renal (LENIT).**
Sponsored by: Generalitat de Catalunya.
AGAUR_SGR17_01331
Duration: 01/01/2017-30/09/2021

Diekmann F. **Red Temática de Investigación Cooperativa en Salud - Enfermedades renales.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_RD16/0009/0023
Duration: 01/01/2017-31/12/2021

Diekmann F, Palou E. **Inmunoterapia para el control del rechazo del riñon trasplantado: uso de células T modificadas genéticamente con receptores quiméricos del antígeno.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00078
Duration: 01/01/2018-31/12/2021

Diekmann F, Palou E. **Inmunoterapia celular adoptiva para el control del rechazo mediado por anticuerpos tras el trasplante renal: uso de las células NK modificadas genéticamente con receptores quiméricos de antígeno.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00227
Duration: 01/01/2021-31/12/2023

Maduell F. **Dosis convectiva y adsorción de toxinas urémicas en tratamientos de hemodiafiltración en línea post-dilucional.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00108
Duration: 01/01/2018-31/12/2021

Revuelta I, Oppenheimer F. P**apel de los exosomas de células inmunes de memoria (InmEx) en la activación del endotelio y desarrollo precoz del rechazo mediado por anticuerpos en el trasplante renal.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/00115
Duration: 01/01/2017-30/06/2021

Revuelta I, Oppenheimer F. **Exosomas como nuevo mecanismo de rechazo mediado por anticuerpos en receptores de trasplante renal de alto riesgo inmunológico caracterizados con tecnología de Big Data e Inteligencia.** Artificial. Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00797
Duration: 01/01/2020-31/12/2022

Ricart MJ, Garcia-Criado MA. **Trasplante de páncreas – monitorización de poblaciones linfociatarias y aplicación de ecografía con contraste y elastografia como preditores de rechazo y sobrevida.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16-00167
Duration: 01/01/2017-30/06/2021

Quintana LF, Nicolau C. **Papel de la patología digital y la Resonancia nuclear magnética en la detección precoz de la fibrosis intersticial en la enfermedad renal crónica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00080
Duration: 01/01/2018-30/06/2022

Quintana LF. **Caracterización fenotípica y funcional de linfocitos, monocitos y macrófagos mediante citometría de flujo del sedimento urinario en pacientes con nefritis lúpica para la predicción de enfermedad renal crónica.**
Sponsored by: Fundación Senefro.
SENEFRO_GLOM_20_01
Duration: 23/12/2020-22/12/2022

Ventura P. **Effect of strict glycaemic control after transplantation of pancreas on endothelial dysfunction: role of extracellular vesicles.**
Sponsored by: Sociedade Portuguesa de Nefrologia (Spnefro). INT_SPNefro_2019
Duration: 01/02/2020-31/12/2021

Ventura P, Campistol JM. **CD4+ T-cell immunoreactivity in pancreas transplantation – influence of allo- and auto-immunity on pancreas graft outcomes and their transcriptomic signature.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00230
Duration: 01/01/2021-31/12/2023

Ventura P. **Impact of autologous tolerogenic dendritic cells (TolDC) on full mismatch kidney transplantation rat model.**
Sponsored by: Sociedade Portuguesa de Transplantaçao (SPT). Bolsa Antonio Morais Sarmento 2019
Duration: 01/10/2021-31/09/2022

Hotter G. **Papel del CPT1a en la nefritis lúpica.**
Sponsored by: Instituto de Salud CarlosIII(ISCIII). FIS_PI20/00900
Duration: 01/01/2020-31/12/2023

Hotter G. **Desarrollo preclínico de una nueva terapia celular para el tratamiento del fallo renal.**
Sponsored by: Ministerio de Ciencia e innovación. Retos colaboración_RTC2019-007191-1
Duration: 01/01/2020-31/12/2023

DOCTORAL THESES

Campistol JM, Palomo M. **Implicación de la fase terminal del complemento en las microangiopatías trombóticas.**
PhD student: Josep Miquel Blasco Pelicano

Maduell F, Bañón E. **Análisis multidisciplinar de la eficiencia depurativa en la hemodiafiltración en línea post-dilucional.**
PhD student: Miquel Gomez Umbert

Manyalich M, Revuelta I. **Aspectos psicosociales de la donación renal en vida.**
PhD student: Ana Teresa Menjívar Hernández

Rovira J, Diekmann F. **Rechazo mediado por anticuerpos en el trasplante renal, respuesta a diferentes estrategias de tratamiento y factores pronósticos.**
PhD student: Gastón Julio Piñeiro

2.8 Vascular cell biology

LOCATION
UB School of Medicine

KEYWORDS
1. **Aortic aneurysm**
2. **TGF-β**
3. **Oxidative stress**
4. **Rare diseases**
5. **Connective tissue**
6. **Extracellular matrix**

RELATED DISEASES
1. **Marfan syndrome**
2. **Loeys-Dietz syndrome**
3. **Williams-Beuren syndrome**
4. **Weill-Mrchesani syndrome**
5. **Ehlers-Danlos syndrome**
6. **Stenosis Aortica Supravalvular SVAS)**

GROUP INVOLVED IN
AGAUR_SGR18: 00188
AGAUR_SGR17: 01794
CIBERER_U735

Original publications

TOTAL	3
Mean IF	6,17
Q1	100%
D1	33%
MA	67%
OA	100%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The aorta is the main artery where blood circulates. In Marfan syndrome (MFS) or Loeys-Dietz (LDS) syndrome, patients develops aortic dilation (aneurysm) with the subsequent risk of its dissection and rupture, and therefore a of sudden death.

Marfan syndrome is a genetic disease severely affecting the connective tissue, which acts as a glue of other tissues and organs of the body. Undiagnosed patients affected with MFS have a reduced of life and life expectancy. MFS affects 1:5,000 people.

There are no effective pharmacological therapies that prevent or significantly delay the aortic damage, although there are promising results from studies being conducted in an attempt to reduce patients needing the operating theatre. At the moment, the only effective solution is surgery before the vessel breaks down.

APPROACH

The group uses samples from Marfan patients who have undergone aortic repair surgery and genetically modified Marfan mice that present various clinical features of the disease.

In the laboratory, we use morphological techniques such as echocardiography and histology to observe structural changes of the aorta, and biochemistry and molecular biology to identify the molecules that are directly involved in the pathogenesis of this aortopathy.

We also uses different drugs and gene therapy tools against these molecules to interfere with the formation and/or progression of aorta dilatation.

IMPACT

The group wants to stop or at least mitigate the progressive dilatation of the aorta (aneurysm) and, therefore, the risk of dissection and rupture. The final aim is to avoid the aorta reparatory surgery in patients and thus improve their quality of life.

It is important to point out that the progress the group achieves can be also applied to other diseases affecting the aorta (Loeys-Dietz syndrome, Ehlers-Danlos syndrome, Williams-Beuren syndrome) since they share many common molecular mechanisms that lead to the aortopathy.

RESEARCH LINES

- New pharmacological approaches to interfere in the Marfan syndrome-associated TGF-β hypersignaling.

- Redox stress in aortic aneurysm formation and progression in Marfan syndrome.

- New pharmacological approaches and Redox stress in cardiovascular alterations in WBS.

PUBLICATIONS

Originals

1. Arce C; Rodríguez-Rovira I; De Rycke K; Durán K; Campuzano V; Fabregat I; Jiménez-Altayó F; Berraondo P; Egea G. **Anti-TGFβ (Transforming Growth Factor β) Therapy with Betaglycan-Derived P144 Peptide Gene Delivery Prevents the Formation of Aortic Aneurysm in a Mouse Model of Marfan Syndrome.** *Arteriosclerosis Thrombosis And Vascular Biology.* 41(9):e440-e452. D1

2. Ortiz-Romero P; González-Simón A; Egea G; Pérez-Jurado LA; Campuzano V. **Co-Treatment With Verapamil and Curcumin Attenuates the Behavioral Alterations Observed in Williams–Beuren Syndrome Mice by Regulation of MAPK Pathway and Microglia Overexpression.** *Frontiers In Pharmacology.* 12:670785. Q1

3. Mas-Stachurska A, Egea G, de Bruin-Bon R, Rudenick P, Sanchis L, Bouma BJ, Mulder BJ, Bijnens B, Sitges M. **Postsystolic thickening is a potential new clinical sign of injured myocardium in marfan syndrome.** *Scientific Reports.* 11(1):15790. Q1

Review

1. Costa TJ, Barros PR, Arce C, Santos JD, da Silva-Neto J, Egea G, Dantas AP, Tostes RC, Jiménez-Altayó F . **The homeostatic role of hydrogen peroxide, superoxide anion and nitric oxide in the vasculature.** *Free Radical Biology And Medicine.* 162(162):615-635. Q1

GRANTS FOR RESEARCH IN PROGRESS

Campuzano V. **Studying the mitochondrial health of cardiomyocytes and vascular smooth muscle cells in Williams Syndrome.**
Sponsored by: Fundation Autour des Williams (France). CONV_18925
Duration: 05/06/2019-04/10/2022

Egea G. **Redox stress in Marfan syndrome.**
Sponsored by: MInisterio de Ciencia e Innovación. PID2020113634RB-C2
Duration: 01/09/2021-31/08/2024

2.9 Cardiovascular risk, nutrition and aging

LOCATION
CELLEX building, floor 4B

KEYWORDS
1. **Nutrition**
2. **Mediterranean diet**
3. **Cardiovascular disease**
4. **Cardiovascular risk factors**
5. **Cognition**

RELATED DISEASES
1. **Cardiovascular disease**
2. **Cancer**
3. **Hypertension**
4. **Dyslypdidemia**
5. **Type 2 diabetes**
6. **Neurodegenerative disease**

GROUP INVOLVED IN
AGAUR_SGR17: 01717
CIBEROBN

AWARDS

Acadèmic Corresponent
Institution: Reial Acadèmia de Medicina de Catalunya
Awardee/s: Ramon Estruch

Top 1% most cited researcher globally
Institution: Clarivate Analytics
Awardee/s: Ramon Estruch & Emili Ros

Mejor artículo publicado en la revista Española de Cardiología
Institution: Sociedad Española de Cardiología
Awardee/s: Ramon Estruch

Premio QV Extra!
Institution: Asociación Aceites QV Extra
Awardee/s: Ramon Estruch

Original publications

TOTAL	61
Mean IF	7,41
Q1	70%
D1	26%
MA	26%
OA	70%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The leading cause of premature death in industrialized countries is cardiovascular disease, which accounts for 30% of all deaths around the world (17.3 million deaths/year) and is considered a public-health priority.

Evidence exists that indicates that lifestyle, and more specifically a healthy diet such as the Mediterranean diet, may play a key role in the prevention of this disease and in the management of associated risk factors, such as diabetes, obesity, hypertension and dyslipidemia.

APPROACH

To meet this 21st-century challenge, the group is conducting different clinical studies, such as PREDIMED (prevention with the Mediterranean diet), PREDIMED-PLUS (intervention with a hypocaloric Mediterranean diet, physical activity and behavioral therapy), MEDCARS (~14,000 employees at the SEAT factory), SI! (~1200 adolescents) and IMPACT (~1200 pregnant women with fetal growth restriction).

The aim of these studies is to find tools to prevent the onset of cardiovascular disease and its associated risk factors, such as diabetes, dyslipidemia, hypertension and obesity.

IMPACT

The results obtained in the studies conducted by the group make it possible to extrapolate nutritional recommendations for the whole of society because the group works with the highest standards of scientific evidence.

This has been shown by the PREDIMED study, which enabled the Mediterranean diet to be included in American and European nutritional guidelines because it is considered to be an effective and healthy diet for preventing chronic, non-communicable diseases such as cardiovascular disease, neurodegenerative diseases, and even some types of cancer.

RESEARCH LINES

- Protective effects of Mediterranean diet.

- Protective effects of alcohol (beer or wine).

- Effects of other diet components on healthy.

- Assessment on cardiovascular risk factors on primary prevention.

- Evaluation of the intima-media thickness (IMT) of the carotid artery and ultrasound plaque.

- Aging.

- Thrombosis.

PUBLICATIONS

Originals

1. Crovetto F, Crispi F, Casas R, Martín-Asuero A, Borràs R, Vieta E, Estruch R, Gratacós E, IMPACT BCN Trial Investigators. **Effects of Mediterranean Diet or Mindfulness-Based Stress Reduction on Prevention of Small-for-Gestational Age Birth Weights in Newborns Born to At-Risk Pregnant Individuals: The IMPACT BCN Randomized Clinical Trial.** *JAMA-Journal Of The American Medical Association.* 326(21):2150-2160. D1

2. Rajaram S, Cofán M, Sala-Vila A, Haddad E, Serra-Mir M, Bitok E, Roth I, Freitas-Simoes TM, Kaur A, Valls-Pedret C, Doménech M, Oda K, Corella D, Sabaté J, Ros E . **Effects of Walnut Consumption for 2 Years on Lipoprotein Subclasses Among Healthy Elders: Findings From the WAHA Randomized Controlled Trial.** *Circulation.* 144(13):1083-1085. D1

3. Munguía-Realpozo P; Mendoza-Pinto C; García-Carrasco M; Berra-Romani R; Sierra-Benito C; Méndez-Martínez S; Cervera R. **The impact of antimalarial agents on traditional and non-traditional subclinical atherosclerosis biomarkers in systemic lupus erythematosus: A systematic review and meta-analysis**. *Autoimmunity Reviews.* 20(9):102887. D1

4. Galmes-Panades AM, Konieczna J, Varela-Mato V, Abete I, Babio N, Fiol M, Antonio de Paz J, Casas R, Olbeyra R, Ruiz-Canela M, Palau-Galindo A, Castañer O, Martín-García A, Estruch R, Vidal J, Buil-Cosiales P, Wärnberg J, Salas-Salvadó J, Martínez JA, Romaguera D, PREDIMED-Plus investigators. **Targeting body composition in an older population: do changes in movement behaviours matter? Longitudinal analyses in the PREDIMED-Plus trial.** *BMC Medicine.* 19(1):3. D1

5. Bulló M, Papandreou C, García-Gavilán J, Ruiz-Canela M, Li J, Guasch-Ferré M, Toledo E, Clish C, Corella D, Estruch R, Ros E, Fitó M, Lee CH, Pierce K, Razquin C, Arós F, Serra-Majem L, Liang L, Martínez-González MA, Hu FB, Salas-Salvadó J. **Tricarboxylic acid cycle related-metabolites and risk of atrial fibrillation and heart failure.** *Metabolism-Clinical And Experimental.* 125:154915. D1

6. Papandreou C, Bulló M, Hernández-Alonso P, Ruiz-Canela M, Li J, Guasch-Ferré M, Toledo E, Clish C, Corella D, Estruch R, Ros E, Fitó M, Alonso-Gómez A, Fiol M, Santos-Lozano JM, Serra-Majem L, Liang L, Martínez-González MA, Hu FB, Salas-Salvadó J. **Choline Metabolism and Risk of Atrial Fibrillation and Heart Failure in the PREDIMED Study.** *Clinical Chemistry.* 67(1):288-297. D1

7. Gutierrez-Bedmar M, Olmedo P, Gil F, Ruiz-Canela M, Martínez-González MA, Salas-Salvadó J, Babio N, Fito M, Del Val JL, Corella D, Sorli JV, Ros E, Fiol M, Estruch R, Lapetra J, Arós F, Serra-Majem L, Pintó X, Gomez-Gracia E. **Low serum iron levels and risk of cardiovascular disease in high risk elderly population: Nested case-control study in the PREvención con Dieta MEDiterránea (PREDIMED) trial.** *Clinical Nutrition.* 40(2):496-504. D1

8. Konieczna J, Morey M, Abete I, Bes-Rastrollo M, Ruiz-Canela M, Vioque J, Gonzalez-Palacios S, Daimiel L, Salas-Salvadó J, Fiol M, Martín V, Estruch R, Vidal J, Martínez-González MA, Canudas S, Jover AJ, Fernández-Villa T, Casas R, Olbeyra R, Buil-Cosiales P, Babio N, Schröder H, Martínez JA, Romaguera D, PREDIMED-Plus investigators. **Contribution of ultra-processed foods in visceral fat deposition and other adiposity indicators: Prospective analysis nested in the PREDIMED-Plus trial.** *Clinical Nutrition.* 40(6):4290-4300. D1

9. López-González L, Becerra-Tomás N, Babio N, Martínez-González MÁ, Díaz-López A, Corella D, Goday A, Romaguera D, Vioque J, Alonso-Gómez ÁM, Wärnberg J, Martínez JA, Serra-Majem L, Estruch R, Tinahones F, Lapetra J, Pintó X, Tur JA, López-Miranda J, Bueno-Cavanillas A, Delgado-Rodríguez M, Matía-Martín P, Daimiel L, Álvarez-Álvarez L, Vidal J, Vázquez C, Ros E, Vázquez-Ruiz Z, Canudas S, Carrión RF, Castañer O, Zulet MÁ, Sierra LT, Ajejas Bazán MJ, López García CM, Martín M, García-Ríos A, Casas R, Gómez-Pérez AM, Santos-Lozano JM, Goñi E, Guillem-Saiz P, Lassale C, Abete I, Lete IS, Eguaras S, Schröder H, Salas-Salvadó J, PREDIMED-Plus Investigators. **Variety in fruits and vegetables, diet quality and lifestyle in an older adult mediterranean population.** *Clinical Nutrition.* 40(4):1510-1518. D1

10. Glenn AJ, Hernández-Alonso P, Kendall CWC, Martínez-González MÁ, Corella D, Fitó M, Martínez JA, Alonso-Gómez ÁM, Wärnberg J, Vioque J, Romaguera D, López-Miranda J, Estruch R, Tinahones FJ, Lapetra J, Serra-Majem JL, Bueno-Cavanillas A, Tur JA, Celada SR, Pintó X, Delgado-Rodríguez M, Matía-Martín P, Vidal J, Mas-Fontao S, Daimiel L, Ros E, Jenkins DJA, Toledo E, Sorlí JV, Castañer O, Abete I, Rodriguez AM, Barceló OF, Oncina-Canovas A, Konieczna J, Garcia-Rios A, Casas R, Gómez-Pérez AM, Santos-Lozano JM, Vazquez-Ruiz Z, Portolés O, Schröder H, Zulet MA, Eguaras S, Lete IS, Zomeño MD, Sievenpiper JL, Salas-Salvadó J . **Longitudinal changes in adherence to the portfolio and DASH dietary patterns and cardiometabolic risk factors in the PREDIMED-Plus study.** *Clinical Nutrition.* 40(5):2825-2836. D1

11. Schröder H, Zomeño MD, Martínez-González MA, Salas-Salvadó J, Corella D, Vioque J, Romaguera D, Martínez JA, Tinahones FJ, Miranda JL, Estruch R, Bueno-Cavanillas A, Alonso Gómez AM, Tur JA, Warnberg J, Serra-Majem L, Martín V, Vázquez C, Lapetra J, Pintó X, Vidal J, Daimiel L, Gaforio JJ, Matía-Martín P, Ros E, Lassale C, Ruiz-Canela M, Babio N, Sorlí JV, García-Arellano A, Díaz-López A, Fitó M, Castañer O, PREDIMED-Plus investigators. **Validity of the energy-restricted Mediterranean Diet Adherence Screener.** *Clinical Nutrition.* 40(8):4971-4979. D1

12. Laguna JC, Alegret M, Cofán M, Sánchez-Tainta A, Díaz-López A, Martínez-González MA, Sorlí JV, Salas-Salvadó J, Fitó M, Alonso-Gómez ÁM, Serra-Majem L, Lapetra J, Fiol M, Gómez-Gracia E, Pintó X, Muñoz MA, Castañer O, Ramírez-Sabio JB, Portu JJ, Estruch R, Ros E . **Simple sugar intake and cancer incidence, cancer**

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53. Gallardo-Alfaro L, Bibiloni MDM, Bouzas C, Mascaró CM, Martínez-González MÁ, Salas-Salvadó J, Corella D, Schröder H, Martínez JA, Alonso-Gómez ÁM, Wärnberg J, Vioque J, Romaguera D, Lopez-Miranda J, Estruch R, Tinahones FJ, Lapetra J, Serra-Majem L, Bueno-Cavanillas A, Micó RM, Pintó X, Gaforio JJ, Ortíz-Ramos M, Altés-Boronat A, Luca BL, Daimiel L, Ros E, Sayon-Orea C, Becerra-Tomás N, Gimenez-Alba IM, Castañer O, Abete I, Tojal-Sierra L, Pérez-López J, Torres-Collado L, Colom A, Garcia-Rios A, Castro-Barquero S, Bernal R, Santos-Lozano JM, Fernandez-Lazaro CI, Hernández-Alonso P, Saiz C, Zomeño MD, Zulet MA, Belló-Mora MC, Basterra-Gortari FJ, Canudas S, Goday A, Tur JA, PREDIMED-Plus investigators. **Physical activity and metabolic syndrome severity among older adults at cardiovascular risk: 1-Year trends.** *Nutrition Metabolism and Cardiovascular Diseases.* 31(10):2870-2886. Q2

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55. Díaz-López A, Becerra-Tomás N, Ruiz V, Toledo E, Babio N, Corella D, Fitó M, Romaguera D, Vioque J, Alonso-Gómez ÁM, Wärnberg J, Martínez JA, Serra-Majem L, Estruch R, Tinahones FJ, Lapetra J, Pintó X, Tur JA, López-Miranda J, Cano Ibañez N, Delgado-Rodríguez M, Matía-Martín P, Daimiel L, de Paz JA, Vidal J, Vázquez C, Ruiz-Canela M, Bulló M, Sorlí JV, Goday A, Fiol M, García-de-la-Hera M, Tojal Sierra L, Pérez-Farinós N, Zulet MÁ, Sánchez-Villegas A, Sacanella E, Fernández-García JC, Santos-Lozano JM, Gimenez-Gracia M, Del Mar Bibiloni M, Diez-Espino J, Ortega-Azorin C, Castañer O, Morey M, Torres-Collado L, Sorto Sanchez C, Muñoz MÁ, Ros E, Martinez-Gonzalez MA, Salas-Salvadó J, PREDIMED-Plus Investigators. **Effect of an Intensive Weight-Loss Lifestyle Intervention on Kidney Function: A Randomized Controlled Trial.** *American Journal of Nephrology.* 52(1):45-58. Q2

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(Improving Mothers for a better PrenAtal Care Trial BarCeloNa): a study protocol for a randomized controlled trial. *Trials*. 22(1):362. Q4

Review

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2. Marcos A; Serra-Majem L; Pérez-Jiménez FJ; Pascual V; Tinahones FJ; Estruch R. **Moderate consumption of beer and its effects on cardiovascular and metabolic health: An updated review of recent scientific evidence.** *Nutrients*. 13(3):879. Q1

3. Vancells Lujan, Pau; Vinas Esmel, Esther; Sacanella Meseguer, Emilio. **Overview of Non-Alcoholic Fatty Liver Disease (NAFLD) and the Role of Sugary Food Consumption and Other Dietary Components in Its Development.** *Nutrients.* 13(5):1442. Q1

4. Ros E; Singh A; O'keefe JH. **Nuts: Natural pleiotropic nutraceuticals**. *Nutrients*. 13(9):3269. Q1

5. Ros E. **Can specific nutrients, foods, or dietary patterns modulate cognitive function in (older) adults? Latest evidence from randomized controlled trials.** *Current Opinion in Clinical Nutrition and Metabolic Care.* 24(6):511-520. Q2

6. Capdevila-Reniu A; Navarro-López M; López-Soto A. **Osteoporotic vertebral fractures: A diagnostic challenge in the 21ST century**. *Rev Clin Esp.* 221(2):118-124. Q3

Editorial

1. Estruch R, Sacanella E, Ros E . **Should we all go pesco-vegetarian?** *European Heart Journal.* 42(12):1144-1146. D1

2. Castro-Barquero, Sara; Estruch, Ramon. **Ultra-processed food consumption and disease: the jury is still out.** *European Heart Journal.* D1

3. Angelidi AM; Kokkinos A; Katechaki E; Ros E; Mantzoros CS. **Mediterranean diet as a nutritional approach for COVID-19.** *Metabolism-Clinical And Experimental.* 114:154407. D1

4. Casas R . **Moving towards a Healthier Dietary Pattern Free of Ultra-Processed Foods.** *Nutrients*. 14(1):118. Q1

5. Ramón Estruch; Emilio Sacanella. **Is a picture worth a thousand words in cardiovascular risk assessment?** *Rev Esp Cardiol.* 74(12):1007-1008. Q2

Clinical Guidelines

1. Averna M, Banach M, Bruckert E, Drexel H, Farnier M, Gaita D, Magni P, März W, Masana L, Mello E Silva A, Reiner Z, Ros E, Vrablik M, Zambon A, Zamorano JL, Stock JK, Tokgö-zo?lu LS, Catapano AL. **Practical guidance for combination lipid-modifying therapy in high- and very-high-risk patients: A statement from a European Atherosclerosis Society Task Force.** *Atherosclerosis.* 325:99-109. Q1

2. Scuteri A, Benetos A, Sierra C, Coca A, Chicherio C, Frisoni GB, Gasecki D, Hering D, Lovic D, Manios E, Petrovic M, Qiu C, Shenkin S, Tzourio C, Ungar A, Vicario A, Zaninelli A, Cunha PG . **Routine assessment of cognitive function in older patients with hypertension seen by primary care physicians: why and how-a decision-making support from the working group on 'hypertension and the brain' of the European Society of Hypertension and from the European Geriatric Medicine Society.** *Journal of Hypertension.* 39(1):90-100. Q2

3. Kasiakogias, A; Rosei, EA; Camafort, M; Ehret, G; Faconti, L; Ferreira, JP; Brguljan, J; Januszewicz, A; Kahan, T; Manolis, A; Tsioufis, K; Weber, T; von Lueder, TG; Smiseth, OA; Wachtell, K; Kjeldsen, SE; Zannad, F; Mancia, G; Kreutz, R. **Hypertension and heart failure with preserved ejection fraction: position paper by the European Society of Hypertension.** *Journal of Hypertension.* 39(8):1522-1545. Q2

4. Camafort M; Alcocer L; Coca A; Lopez-Lopez JP; López-Jaramillo P; Ponte-Negretti CI; Sebba-Barroso W; Valdéz O; Wyss F. **Latin-American Ambulatory Blood Pressure Registry (MAPA-LATAM): An urgent need.** *Rev Clin Esp.* 221(9):547-552. Q3

Consortium Publications

1. Garcia-Vidal C, Alonso R, Camon AM, Cardozo C, Albiach L, Agüero D, Marcos MA, Ambrosioni J, Bodro M, Chumbita M, de la Mora L, Garcia-Pouton N, Dueñas G, Hernandez-Meneses M, Inciarte A, Cuesta G, Meira F, Morata L, Puerta-Alcalde P, Herrera S, Tuset M, Castro P, Prieto-Gonzalez S, Almuedo-Riera A, Mensa J, Martínez JA, Sanjuan G, Nicolas JM, Del Rio A, Muñoz J, Vila J, Garcia F, Soriano A, Hospital Clinic of Barcelona COVID-19 Research Group. **Impact of remdesivir according to the pre-admission symptom duration in patients with COVID-19.** *Journal of Antimicrobial Chemotherapy.* 76(12):3296-3302. Q1

2. Pericas, Juan M.; Cucchiari, David; Torrallardona-Murphy, Orla; Calvo, Julia; Serralabos, Julia; Alves, Elisenda; Agelet, Aleix; Hidalgo, Judit; Alves, Eduarda; Castells, Eva; Seijas, Nuria; Hernandez, Carme; Bodro, Marta; Cardozo, Celia; Coloma, Emmanuel; Nicolas, David;Hosp Clinic 4H Team Hosp Home-Hlth. **Hospital at home for the management of COVID-19: preliminary experience with 63 patients.** *Infection.* 49(2):327-332. Q2

3. Cucchiari D, Guillén E, Cofan F, Torregrosa JV, Esforzado N, Revuelta I, Ventura-Aguiar P, Oppenheimer F, Bayés B, Marcos MÁ, Morgado-Carrasco D, López JM, Creus P, Hernández C, Coloma E, Bodro M, Diekmann F, Pericàs JM, Nicolás D, Hospital Clínic 4H Team (Hospital at Home-Health Hotel). **Taking care of kidney transplant recipients during the COVID-19 pandemic: experience from a medicalized hotel.** *Clinical Transplantation.* 35(1):e14132. Q2

GRANTS FOR RESEARCH IN PROGRESS

Estruch R. **Cardiovascular, Nutrition and Aging Group.**
Sponsored by: Generalitat de Catalunya.
AGAUR_SGR17_01717
Duration: 01/01/2017-30/09/2021

Estruch R. **Efecto de una intervención intensiva de pérdida de peso con dieta mediterránea hipocalórica, actividad física y tratamiento conductual sobre la prevención primaria cardiovascular: ensayo PREDIMED-Plus.**

Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/01226
Duration: 01/01/2020-31/12/2022

Estruch R. **Los fitoquímicos de los alimentos son importantes para la salud cadiometabólica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_AC19/00100
Duration: 01/01/2020-31/12/2022

Estruch R. **Food phytochemicals matter for cardiometabolic health.**
Sponsored by: European Commission and Instituto de Salud Carlos III (ISCIII). CE_ERA_HDHL_19 and AC19/00100
Duration: 02/04/2019-02/04/2022

Martínez-González MA, Salas-Salvadí J, Estruch R. **Metabolomics and long-term effects of the Mediterranean diet on CVD.**
Sponsered by: National Institutes of Health (NIH)_1U10AA025286-01, USA
Duration: 01/07/2017- 30/06/2021

2.10 Respiratory biophysics and bioengineering

LOCATION
UB School of Medicine

KEYWORDS
1. **Respiratory mechanics**
2. **Lung bioengineering**

RELATED DISEASES
1. **Chronic obstructive pulmonary disease (COPD)**
2. **Obstructive sleep apnea**
3. **Acute respiratory failure**

GROUP INVOLVED IN
CIBERES
CIBER-BBN

Original publications

TOTAL	14
Mean IF	**7,14**
Q1	**86%**
D1	**14%**
MA	**36%**
OA	**93%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The application of advanced biophysical techniques is essential for improving diagnostic tools (especially those used for medical imaging), as well as to optimise therapeutic devices for respiratory diseases.

APPROACH

The group studies the biophysical mechanisms that determine respiratory function. It also develops models and methods for the processing of images and biomedical signals.

IMPACT

The group has provided some keys for a better understanding of certain respiratory diseases linked to hypoxia, and to advance in lung tissue engineerring and regenerative medicine. It is also improving our therapeutic (respiratory support) tools, such as systems for evaluating the quality of devices used to treat obstructive sleep apnoea and mechanical ventilation.

RESEARCH LINES

- Molecular and cellular nanomechanics.
- Respiratory mechanics.

PUBLICATIONS

Originals

1. López-Alonso I, López-Martínez C, Martín-Vicente P, Amado-Rodríguez L, González-López A, Mayordomo-Colunga J, Del Busto C, Bernal M, Crespo I, Astudillo A, Arias-Guillén M, Fueyo A, Almendros I, Otero J, Sanz-Fraile H, Farré R, Albaiceta GM . **Mechanical ventilation promotes lung tumor spread by modulation of cholesterol cell content.** *European Respiratory Journal.* :2101470. D1

2. Andreu I, Falcones B, Hurst S, Chahare N, Quiroga X, Le Roux AL, Kechagia Z, Beedle AEM, Elosegui-Artola A, Trepat X, Farré R, Betz T, Almendros I, Roca-Cusachs P . **The force loading rate drives cell mechanosensing through both reinforcement and cytoskeletal softening.** *Nature Communications.* 12(1):4229. D1

3. Khalyfa A; Ericsson A; Qiao Z; Almendros I; Farré R; Gozal D. **Circulating exosomes and gut microbiome induced insulin resistance in mice exposed to intermittent hypoxia: Effects of physical activity.** *Ebiomedicine.* 64:103208. Q1

4. Khalyfa A; Trzepizur W; Gileles-Hillel A; Qiao Z; Sanz-Rubio D; Marin JM; Martinez-Garcia MA; Campos-Rodriguez F; Almendros I; Farre R; Sanchez-De-la-torre M; García-Río F; Gozal D. **Heterogeneity of melanoma cell responses to sleep apnea-derived plasma exosomes and to intermittent hypoxia.** *Cancers.* 13(19):4781. Q1

5. Narciso M; Otero J; Navajas D; Farré R; Almendros I; Gavara N. **Image-based method to quantify decellularization of tissue sections.** *International Journal Of Molecular Sciences.* 22(16):8399. Q1

6. Júnior C; Narciso M; Marhuenda E; Almendros I; Farré R; Navajas D; Otero J; Gavara N. **Baseline stiffness modulates the non-linear response to stretch of the extracellular matrix in pulmonary fibrosis.** *International Journal Of Molecular Sciences.* 22(23):12928. Q1

7. Castro-Grattoni AL, Suarez-Giron M, Benitez I, Tecchia L, Torres M, Almendros I, Farre R, Targa A, Montserrat JM, Dalmases M, Barbé F, Gozal D, Sánchez-de-la-Torre M . **The effect of chronic intermittent hypoxia in cardiovascular gene expression is modulated by age in a mice model of sleep apnea.** *Sleep.* 44(6):zsaa293. Q1

8. Aymerich C; Rodríguez-Lázaro M; Solana G; Farré R; Otero J. **Low-Cost Open-Source Device to Measure Maximal Inspiratory and Expiratory Pressures.** *Frontiers In Physiology.* 12:719372. Q1

9. Falcones, Bryan; Sanz-Fraile, Hector; Marhuenda, Esther; Mendizabal, Irene; Cabrera-Aguilera, Ignacio; Malandain, Nanthilde; Uriarte, Juan J; Almendros, Isaac; Navajas, Daniel; Weiss, Daniel J; Farre, Ramon; Otero, Jorge. **Bioprintable Lung Extracellular Matrix Hydrogel Scaffolds for 3D Culture of Mesenchymal Stromal Cells.** *Polymers.* 13(14):2350. Q1

10. Farré R, Gozal D, Montserrat JM. **Alternative Procedure to Individual Nasal Pressure Titration for Sleep Apnea.** *Journal Of Clinical Medicine.* 10(7):1453. Q1

11. Garmendia O; Farré R; Ruiz C; Suarez-Girón M; Torres M; Cebrian R; Saura L; Monasterio C; Negrín MA; Montserrat JM. **Telemedicine strategy to rescue cpap therapy in sleep apnea patients with low treatment adherence: a pilot study.** *Journal Of Clinical Medicine.* 10(18):4123. Q1

12. Farré R, Rodríguez-Lázaro MA, Dinh-Xuan AT, Pons-Odena M, Navajas D, Gozal D . **A Low-Cost, Easy-to-Assemble Device to Prevent Infant Hyperthermia under Conditions of High Thermal Stress.** *International Journal Of Environmental Research And Public Health.* 18(24):13382. Q1

13. Khannous-Lleiffe, Olfat; Willis, Jesse R.; Saus, Ester; Cabrera-Aguilera, Ignacio; Almendros, Isaac; Farre, Ramon; Gozal, David; Farre, Nuria; Gabaldon, Toni. **A Mouse Model Suggests That Heart Failure and Its Common Comorbidity Sleep Fragmentation Have No Synergistic Impacts on the Gut Microbiome.** *Microorganisms.* 9(3):641. Q2

14. Osuna, Ana; Ulldemolins, Anna; Sanz-Fraile, Hector; Otero, Jorge; Farre, Nuria; Farre, Ramon; Almendros, Isaac. **Experimental Setting for Applying Mechanical Stimuli to Study the Endothelial Response of Ex Vivo Vessels under Realistic Pathophysiological Environments.** *Life.* 11(7):671. Q2

Review

1. Otero J, Ulldemolins A, Farré R, Almendros I . **Oxygen Biosensors and Control in 3D Physiomimetic Experimental Models.** *Antioxidants.* 10(8):1165. D1

2. Fàbregues F; Ferreri J; Méndez M; Calafell JM; Otero J; Farré R. **In Vitro Follicular Activation and Stem Cell Therapy as a Novel Treatment Strategies in Diminished Ovarian Reserve and Primary Ovarian Insufficiency.** *Frontiers In Endocrinology.* 11(617704):617704. Q1

Editorial

1. Farré R; Gozal D; Almendros I. **Human experimental models: Seeking to enhance multiscale research in sleep apnoea.** *European Respiratory Journal.* 58(4):2101169. D1

GRANTS FOR RESEARCH IN PROGRESS

Almendros I. **Hidrogeles de matriz extracelular pulmonar para preacondicionamiento e instilación de células madre mesenquimales en el tratamiento de enfermedades respiratorias severas.**
Sponsored by Ministerio de Ciencia e Innovación y Universidades.
MCIU_PID2019-108958RB-I00
Duration: 01/09/2020-31/08/2023

Farré R. **Condicionamiento biofisico de celulas madre/estromales mesenquimales para la terapia del sindrome de distres respiratorio agudo.**
Sponsored by Ministerio de Ciencia e Innovación y Universidades. MCIU_PID2020-113910RB-I00
Duration: 01/09/2021-31/08/2024

2.11 Arrhythmias and physical activity

LOCATION
CELLEX building, floor 2 A
HCB building

KEYWORDS
1. **Atrial fibrillation**
2. **Endurance exercise**
3. **Animal models**

RELATED DISEASES
1. **Atrial fibrillation**
2. **Vascular disease**

GROUP INVOLVED IN
CIBERCV CB16/11/00354
AGAUR_SGR17: 1548

Original publications

TOTAL	10
Mean IF	**7,28**
Q1	**60%**
D1	**10%**
MA	**30%**
OA	**50%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Our increasingly sedentary lifestyles and lack of physical activity constitute one of the major problems for Western societies. While moderate physical activity is essential for maintaining optimal cardiovascular health, increasing numbers of people are taking part in very high-intensity activities, such as marathons and triathlons.

Recent studies carried out at Hospital Clínic-IDIBAPS have shown that this type of exercise may increase the risk of certain cardiac diseases, especially atrial fibrillation and right ventricular arrhythmia.

APPROACH

The group uses a multidisciplinary approach in order to identify and understand the causes of exercise-induced disorders. It uses animal models, in which it attempts to reproduce the effects of very-high intensity physical exercise and of arrhythmias, and it also conducts studies in patients and healthy volunteers.

In order to analyse these, it uses in vitro techniques (such as tissue staining and the study of RNA and protein expression), ex vivo studies (study of the function of isolated cells or organs) and in vivo studies (studies in live animals).

IMPACT

The results obtained to date have made it possible to confirm that exercise increases the risk of arrhythmias in the atria and ventricles, possibly due to the appearance of scar tissue (fibrosis) in the heart and changes in the autonomic nervous system.

Cardiac scar tissue and other disorders of heart structure and function only appear when the exercise is of very high intensity and prolonged over time, whereas moderate exercise appears to be safe and even beneficial.

The group's research is currently aimed at identifying these consequences of very high-intensity physical exercise and, particularly, at understanding why they occur and how they can be prevented.

This information should make it possible to design more efficient diagnostic and therapeutic strategies targeting the initial causes.

RESEARCH LINES

- Characterization of the pathophysiology of cardiac arrhythmias.

- Extra-cardiac consequences of very high-intensity physical activity.

- Mechanisms of cardiac arrhythmias in high-level athletes.

PUBLICATIONS

Originals

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8. Caixal G, Althoff T, Garre P, Alarcón F, NuñezGarcia M, Benito EM, Borras R, Perea RJ, Prat-González S, Gunturiz C, Sanchez P, Olivas D, Tolosana JM, Arbelo E, Roca-Luque I, Brugada J, Sitges M, Guasch E, Mont L. **Proximity to the descending aorta predicts regional fibrosis in the adjacent left atrial wall: aetiopathogenic and prognostic implications**. *Europace.* 23(10):1559-1567. Q2

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1. Quinto L; Mont L; Guasch E. **Is cardiac magnetic resonance imaging a game changer in re-ablation of atrial fibrillation?-Authors' reply.** *Europace.* 23(9):1508-1509. Q2

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2. Guasch E. **Natriuretic peptides in atrial fibrillation: evidence is here, but are we ready to go one step beyond?** *Heart.* 107(9):688-689. Q1

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Consortium Publications

1. Mellado-Artigas R, Ferreyro BL, Angriman F, Hernández-Sanz M, Arruti E, Torres A, Villar J, Brochard L, Ferrando C, COVID-19 Spanish ICU Network. **High-flow nasal oxygen in patients with COVID-19-associated acute respiratory failure.** Critical Care. 25(1):58. Q1

2. Mellado-Artigas R, Mujica LE, Ruiz ML, Ferreyro BL, Angriman F, Arruti E, Torres A, Barbeta E, Villar J, Ferrando C, COVID-19 Spanish ICU Network. **Predictors of failure with high-flow nasal oxygen therapy in COVID-19 patients with acute respiratory failure: a multicenter observational study.** *Journal Of Intensive Care.* 9(1):23. Q2

3. Piñeiro GJ, Molina-Andújar A, Hermida E, Blasco M, Quintana LF, Rojas GM, Mercadal J, Castro P, Sandoval E, Andrea R, Fernández J, Badia JR, Soriano A, Poch E, Hospital Clínic Critical Care COVID-19 working group (CCCC). **Severe acute kidney injury in critically ill COVID-19 patients.** *Journal Of Nephrology.* 34(2):285-293. Q2

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GRANTS FOR RESEARCH IN PROGRESS

Batlle M. **Acidosis asociada al ejercicio extremo y su efecto en la función mitocondrial vascular.**
Sponsored by: Fundación Casa del Corazón (FEC). SEC_BASICA_02
Duration: 26/10/2017-

Guasch E, Batlle M. **Profundización y validación de las consecuencias adversas cardiovasculares inducidas por el ejercicio de alta intensidad: de la poyata a los atletas y viceversa.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00443
Duration: 01/01/2020-31/12/2022

Guasch E. **Caracterización del remodelado a dosis crecientes de ejercicio físico como sustrato para el desarrollo de patología inducida por ejercicio.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/00703
Duration: 01/01/2017 -30/06/2021

Mont L, Guasch E. **Personalized Therapies for Atrial Fibrillation. A Translational Approach.**
Sponsored by: European Commission. CE_H2020-MSCA-ITN-19
Duration: 01/02/2020-31/01/2024

2.12 Biopathology and treatment of cardiac arrhythmias

LOCATION
HCB building

KEYWORDS
1. **Arrhythmia**
2. **Ablation**
3. **MRI guided ablation**
4. **ECG Imaging**
5. **Physiological stimulation**

RELATED DISEASES
1. **Cardiac Arrhythmias**
2. **Atrial Fibrillation**
3. **Ventricular Arrhythmias**
4. **Cardiac Stimulation**

GROUP INVOLVED IN
CIBERCV
AGAUR_SGR17: 01548

Original publications

TOTAL	29
Mean IF	8,61
Q1	55%
D1	24%
MA	0%
OA	69%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The diagnosis and treatment of cardiac arrhythmias has become a specialized area within cardiology. The complexity and high technological demand mean that very sophisticated techniques are required, together with lengthy training in order to apply them.

Our group aims to perfect the techniques used in diagnosis and treatment, in order to simplify the process and make it accessible to a larger number of patients, and to collaborate with other companies to develop new products that exceed current limitations.

APPROACH

Our research takes place in a multidisciplinary setting, in collaboration with other areas of knowledge, such as cardiac imaging techniques.

We also include nurses and engineers in the group, who can interact in different areas of knowledge.

Finally, we have established collaborations with businesses in the sector and with start-ups to create new software and hardware products that contribute to responding to current diagnostic and treatment challenges.

IMPACT

We hope to improve the diagnosis of the arrhythmic substrate with cardiac magnetic resonance imaging. And we also aim to use noninvasive tools to map the heart, such as ECG imaging, which makes it possible to document arrhythmias without the need to insert catheters.

In the field of cardiac stimulation, we want to study new stimulation techniques, such as left bundle branch stimulation, and evaluate new technologies, such as wireless cardiac stimulation.

We also want to study the utility of new catheters and new forms of energy applicable in ablation of tachycardia.

RESEARCH LINES

- Utility of cardiac magnetic resonance in the diagnosis and treatment of arrhythmias.

- Utility of ECG imaging in locating abnormal conduction zones and in mapping arrhythmias.

- Role of stimulation of the conduction system in cardiac stimulation.

- Study of the utility of new mapping tools in ablation of ventricular tachycardia.

PUBLICATIONS

Originals

1. Crovetto F, Crispi F, Casas R, Martín-Asuero A, Borràs R, Vieta E, Estruch R, Gratacós E, IMPACT BCN Trial Investigators. **Effects of Mediterranean Diet or Mindfulness-Based Stress Reduction on Prevention of Small-for-Gestational Age Birth Weights in Newborns Born to At-Risk Pregnant Individuals: The IMPACT BCN Randomized Clinical Trial.** *JAMA-Journal Of The American Medical Association.* 326(21):2150-2160. D1

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3. Turon F, Driever EG, Baiges A, Cerda E, García-Criado Á, Gilabert R, Bru C, Berzigotti A, Nuñez I, Orts L, Reverter JC, Magaz M, Camprecios G, Olivas P, Betancourt-Sanchez F, Perez-Campuzano V, Blasi A, Seijo S, Reverter E, Bosch J, Borràs R, Hernandez-Gea V, Lisman T, Garcia-Pagan JC. **Predicting portal thrombosis in cirrhosis: A prospective study of clinical, ultrasonographic and hemostatic factors.** *Journal Of Hepatology.* 75(6):1367-1376. D1

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19. Hohnloser SH; Camm AJ; Cappato R; Diener HC; Heidbüchel H; Mont L; Morillo CA; Lanz HJ; Rauer H; Reimitz PE; Smolnik R; Kautzner J. **Periprocedural anticoagulation in the uninterrupted edoxaban vs.** *Europace.* 23(1):65-72. Q2

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Letters

1. Quinto L; Mont L; Guasch E. **Is cardiac magnetic resonance imaging a game changer in re-ablation of atrial fibrillation?-Authors' reply.** *Europace.* 23(9):1508-1509. Q2

2. Althoff TF; Mont L. **Prediction of stroke risk based on left atrial appendage morphology: from pareidolia to artificial intelligence.** *International Journal Of Cardiovascular Imaging.* 37(8):2529-2531. Q3

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1. Roca-Luque I; Tolosana JM; Brugada J. **Atrial fibrillation ablation after the CABANA study: beyond statistical dogma.** *Rev Esp Cardiol.* 74(2):129-130. Q2

2. San Antonio R, Tolosana JM, Mont L . **Is multipoint pacing superior to optimized single-point pacing?** *Journal Of Cardiovascular Electrophysiology*. 32(12):3279. Q3

Case Reports

1. Sanchis L; Farrero M; Martinez D; Castel MA; Sandoval E; Alcocer J; Regueiro A; Flores-Umanzor E; Cepas-Guillen P; Sabaté M; Sitges M; Freixa X. **Anatomical Fusion of MitraClip Device With Native Mitral Apparatus: Insights From an Explanted Human Heart.** *JACC-Cardiovascular Interventions*. 14(11):1257-1258. D1

2. Hernández-Meneses M, González-Martin J, Agüero D, Tolosana JM, Sandoval E, Falces C, San Antonio R, Vidal B, Moreno A, Ambrosioni J, Miró JM, Hospital Clínic of Barcelona Infectious Endocarditis Team. **Mycobacterium Wolinskyi: A New Non-Tuberculous Mycobacterium Associated with Cardiovascular Infections?** *Infectious Diseases And Therapy*. 10(2):1073-1080. Q1

3. Pujol-López M, Tolosana JM, Mont L. **The plus and pure left bundle branch pacing.** *Europace*. 23(8):1325. Q2

4. Flores-Umanzor E, Pujol-Lopez M, Cepas P, Caldentey G, Freixa X, Martin-Yuste V, Farrero M, Perea RJ, Scuarcia M, Masotti M . **A rare cause of non-infectious sialadenitis: Iodide-induced sialadenitis associated with coronary angiography.** *Revista Portuguesa De Cardiologia*. 40(5):395-397. Q4

Clinical Guidelines

1. Glikson M, Nielsen JC, Kronborg MB, Michowitz Y, Auricchio A, Barbash IM, Barrabés JA, Boriani G, Braunschweig F, Brignole M, Burri H, Coats AJS, Deharo JC, Delgado V, Diller GP, Israel CW, Keren A, Knops RE, Kotecha D, Leclercq C, Merkely B, Starck C, Thylén I, Tolosana JM, ESC Scientific Document Group. **2021 ESC Guidelines on cardiac pacing and cardiac resynchronization therapy**. *European Heart Journal*. 42(35):3427-3520. D1

2. Heidbuchel H, Arbelo E, D'Ascenzi F, Borjesson M, Boveda S, Castelletti S, Miljoen H, Mont L, Niebauer J, Papadakis M, Pelliccia A, Saenen J, Sanz de la Garza M, Schwartz PJ, Sharma S, Zeppenfeld K, Corrado D . **Recommendations for participation in leisure-time physical activity and competitive sports of patients with arrhythmias and potentially arrhythmogenic conditions.** *Europace*. 23(1):147-148. Q2

3. Fabritz L; Crijns HJGM; Guasch E; Goette A; Häusler KG; Kotecha D; Lewalter T; Meyer C; Potpara TS; Rienstra M; Schnabel RB; Willems S; Breithardt G; Camm AJ; Chan A; Chua W; de Melis M; Dimopoulou C; Dobrev D; Easter C; Eckardt L; Haase D; Hatem S; Healey JS; Heijman J; Hohnloser SH; Huebner T; Ilyas BS; Isaacs A; Kutschka I; Leclercq C; Lip GYH; Marinelli EA; Merino JL; Mont L; Nabauer M; Oldgren J; Pürerfellner H; Ravens U; Savelieva I; Sinner MF; Sitch A; Smolnik R; Steffel J; Stein K; Stoll M; Svennberg E; Thomas D; Van Gelder IC; Vardar B; Wakili R; Wieloch M; Zeemering S; Ziegler PD; Heidbuchel H; Hindricks G; Schotten U; Kirchhof P. **Dynamic risk assessment to improve quality of care in patients with atrial fibrillation: the 7th AFNET/EHRA Consensus Conference.** *Europace*. 23(3):329-344. Q2

Consortium Publications

1. Pelliccia A; Sharma S; Gati S; Bäck M; Börjesson M; Caselli S; Collet JP; Corrado D; Drezner JA; Halle M; Hansen D; Heidbuchel H; Myers J; Niebauer J; Papadakis M; Piepoli MF; Prescott E; Roos-Hesselink JW; Graham Stuart A; Taylor RS; Thompson PD; Tiberi M; Vanhees L; Wilhelm M; Guazzi M; La Gerche A; Aboyans V; Adami PE; Backs J; Baggish A; Basso C; Biffi A; Bucciarelli-Ducci C; John Camm A; Claessen G; Delgado V; Elliott PM; Galderisi M; Gale CP; Gray B. **2020 ESC Guidelines on sports cardiology and exercise in patients with cardiovascular disease.** *European Heart Journal*. 42(1):17-96. D1

2. Pericàs JM, Llopis J, Jiménez-Exposito MJ, Kourany WM, Almirante B, Carosi G, Durante-Mangoni E, Fortes CQ, Giannitsioti E, Lerakis S, Montagna-Mella R, Ambrosioni J, Tan RS, Mestres CA, Wray D, Pachirat O, Moreno A, Chu VH, de Lazzari E, Fowler VG, Miró JM, ICE Investigators. **Infective Endocarditis in Patients on Chronic Hemodialysis.** *Journal Of The American College Of Cardiology*. 77(13):1629-1640. D1

3. Pericàs JM, Ambrosioni J, Muñoz P, de Alarcón A, Kestler M, Mari-Hualde A, Moreno A, Goenaga MÁ, Fariñas MC, Rodríguez-Álvarez R, Ojeda-Burgos G, Gálvez-Acebal J, Hidalgo-Tenorio C, Noureddine M, Miró JM, GAMES Investigators. **Prevalence of Colorectal Neoplasms Among Patients With Enterococcus faecalis Endocarditis in the GAMES Cohort (2008-2017).** *Mayo Clinic Proceedings*. 96(1):132-146. Q1

4. Gutierrez-Villanueva, A; Munoz, P; Delgado-Montero, A; Olmedo-Samperio, M; de Alarcon, A; Gutierrez-Carretero, E; Zarauza, J; Pares, DGI; Goenaga, MA; Ojeda-Burgos, G; Goikoetxea-Agirre, AJ; Reguera-Iglesias, JM; Ramos, A; Fernandez-Cruz, A. **Mural Endocarditis: The GAMES Registry Series and Review of the Literature.** *Infectious Diseases And Therapy*. 10(4):2749-2764. Q1

5. Escrihuela-Vidal F, López-Cortés LE, Escolà-Vergé L, De Alarcón González A, Cuervo G, Sánchez-Porto A, Fernández-Hidalgo N, Luque R, Montejo M, Miró JM, Goenaga MÁ, Muñoz P, Valerio M, Ripa M, Sousa-Regueiro D, Gurguí M, Fariñas-Alvarez MC, Mateu L, García Vázquez E, Gálvez-Acebal J, Carratalà J, Grupo de Apoyo al Manejo de la Endocarditis Infecciosa en España (GAMES) Cohort Investigators and the Barcelona Endocarditis Study Team (BEST) . **Clinical Features and Outcomes of Streptococcus anginosus Group Infective Endocarditis: A Multicenter Matched Cohort Study.** *Open Forum Infectious Diseases*. 8(6):ofab163. Q2

6. Pericas JM, Cucchiari D, Torrallardona-Murphy O, Calvo J, Serralabos J, Alves E, Agetet A, Hidalgo J, Alves E, Catells E, Seijas N, Hernandez C, Bodro M, Cardozo C, Coloma E, Nicolas D; Hosp Clinic 4H. **Hospital at home for the management of COVID-19: preliminary experience with 63 patients.** *Infection*. 49(2):327-332. Q2

7. Cucchiari D, Guillén E, Cofan F, Torregrosa JV, Esforzado N, Revuelta I, Ventura-Aguiar P, Oppenheimer F, Bayés B, Marcos MÁ, Morgado-Carrasco D, López JM, Creus P, Hernández C, Coloma E, Bodro M, Diekmann F, Pericàs JM, Nicolás D, Hospital Clínic 4H Team.**Taking care of kidney transplant recipients during the COVID-19 pandemic: experience from a medicalized hotel**. *Clinical Transplantation*. 35(1):e14132. Q2

GRANTS FOR RESEARCH IN PROGRESS

Mont L. **Arítmies, Resincronització i imatge cardíaques.**

Sponsored by: Generalitat de Catalunya.
AGAUR_SGR17_01548
Duration: 01/01/2017- 30/09/2021

Mont L. **Caracterización de la fibrosis auricular con RMC-RT: mejora de la metodología y el conocimiento de la fisiopatología de la fibrilación auricular.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00573
Duration: 01/01/2020 - 31/12/2022

Mont L. **Gemelos digitales cardíacos personalizados para mejorar el desarrollo de dispositivos médicos y tratamientos antiarrítmicos cardíacos (DIDIMO).**
Sponsored by: Agencia Estatal de Investigación. AEI_LinEstrateg21
Duration:01/10/2021- 30/09/2024

Mont L, Guasch E. **Personalized Therapies for Atrial Fibrillation. A Translational Approach.**
Sponsored by: European Commission.
CE_H2020-MSCA-ITN-19
Duration: 01/02/2020 - 31/01/2024

Pujol M . **Resincronització cardíaca amb estimulació hisiana: valoració de l'escurçament del QRS i del patró d'activació amb electrocardiographic imaging.**
Sponsored by: Fundació Acadèmia de les Ciències Mèdiques. SCC_PROJECTES_01
Duration: 07/06/2019 - 06/06/2022

Pujol M. **Estudi Aleatoritzat d'Estimulació Fisiolóagica versus Teràpia de resincronització biventricular: Valoració de l'escurçament del temps d'activació amb electrocardiographic imaging.**
Sponsored by: Fundació Acadèmia de les Ciències Mèdiques. SCC_PROJECTES_20_01
Duration: 01/11/2020 - 31/10/2021

Pujol M. **Estudio aleatorizado de estimulación fisiológica versus terapia de resincronización biventricular: valoración de la reducción del tiempo de activación con electrocardiographic imaging.**
Sponsored by: Fundación Casa del Corazón (SEC). SEC_EstimCardiaca20
Duration: 24/09/2020 - 23/03/2021

Roca I. **Papel de la RM y nuevas herramientas de mapeo en taquicardias ventriculares (TV). Estratificación de riesgo de TV, mapeo de alta densidad y señales omnipolares y mapas de duración de electrogramas.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00693
Duration: 01/01/2021- 31/12/2023

DOCTORAL THESIS

Lluis Mont L, Tolosana JM. **Nuevas técnicas de estimulación cardíaca: avances en la optimización de dispositivos de resincronización cardíaca y en la estimulación sin cables.**
PhD student: Rodolfo Valentí San Antonio Dharandas

2.13 Breathing disturbances in sleep

LOCATION
HCB building

KEYWORDS
1. **Sleep apnea**
2. **CPAP treatment**
3. **Telemedicine**

RELATED DISEASES
1. **Sleep disorders**
2. **SAOS-Sleep apnea**

GROUP INVOLVED IN
CIBERES

Original publications

TOTAL	8
Mean IF	5,46
Q1	75%
D1	0%
MA	50%
OA	88%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access

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PROBLEM

Sleep-related breathing disorders lack a cost-effective diagnostic method that is accessible to most patients. This makes it difficult to define a treatment that is both preventive and effective.

APPROACH

The group concentrates on three lines of work to optimise the management of sleep-related breathing disorders: basic experiments that enable us to understand these disorders; clinical experiments in patients to ascertain effects on them, and multicentre experiments designed to transfer knowledge gained from research to the healthcare system.

IMPACT

The group's research in mice has made it possible to demonstrate that sleep apnoea is dangerous.

In addition, it has shown that telemedicine is a valid and cost-effective system for treating sleep-related breathing disorders, and that it is useful to treat them with CPAP, an appliance providing continuous positive airway pressure throughout the respiratory cycle.

PUBLICATIONS

Originals

1. Castro-Grattoni AL, Suarez-Giron M, Benitez I, Tecchia L, Torres M, Almendros I, Farre R, Targa A, Montserrat JM, Dalmases M, Barbé F, Gozal D, Sánchez-de-la-Torre M . **The effect of chronic intermittent hypoxia in cardiovascular gene expression is modulated by age in a mice model of sleep apnea.** *Sleep*. 44(6):zsaa293. Q1

2. Martinez-Nicolas A, Guaita M, Santamaría J, Montserrat JM, Madrid JA, Rol MA . **Ambulatory circadian monitoring in sleep disordered breathing patients and CPAP treatment.** *Scientific Reports*. 11(1):14711. Q1

3. Farré R, Gozal D, Montserrat JM. **Alternative Procedure to Individual Nasal Pressure Titration for Sleep Apnea.** *Journal Of Clinical Medicine*. 10(7):1453. Q1

4. Garmendia O; Farré R; Ruiz C; Suarez-Girón M; Torres M; Cebrian R; Saura L; Monasterio C; Negrín MA; Montserrat JM. **Telemedicine strategy to rescue cpap therapy in sleep apnea patients with low treatment adherence: a pilot study.** *Journal Of Clinical Medicine*. 10(18):4123. Q1

5. Ferrer-Lluis, Ignasi; Castillo-Escario, Yolanda; Montserrat, Josep Maria; Jane, Raimon. **Enhanced Monitoring of Sleep Position in Sleep Apnea Patients: Smartphone Triaxial Accelerometry Compared with Video-Validated Position from Polysomnography.** *Sensors*. 21(11). Q1

6. Ferrer-Lluis, Ignasi; Castillo-Escario, Yolanda; Montserrat, Josep Maria; Jane, Raimon. **SleepPos App: An Automated Smartphone Application for Angle Based High Resolution Sleep Position Monitoring and Treatment.** *Sensors*. 21(13):4531. Q1

7. Navarro-Soriano C, Martínez-García MA, Torres G, Barbé F, Sánchez-de-la-Torre M,

Caballero-Eraso C, Lloberes P, Cambriles TD, Somoza M, Masa JF, González M, Mañas E, de la Peña M, García-Río F, Montserrat JM, Muriel A, Oscullo G, García-Ortega A, Posadas T, Campos-Rodríguez F, on behalf the Spanish Sleep Network. **Long-term Effect of CPAP Treatment on Cardiovascular Events in Patients With Resistant Hypertension and Sleep Apnea. Data From the HIPARCO-2 Study.** *Archivos De Bronconeumologia.* 57(3):165-171. Q2

8. Navarro-Soriano C, Torres G, Barbé F, Sánchez-de-la-Torre M, Mañas P, Lloberes P, Cambriles TD, Somoza M, Masa JF, González M, Mañas E, de la Peña M, García-Río F, Montserrat JM, Muriel A, Oscullo G, García-Ortega A, Posadas T, Campos-Rodríguez F, Martínez-García MÁ, on behalf the Spanish Sleep Network. **The HIPARCO-2 study: long-term effect of continuous positive airway pressure on blood pressure in patients with resistant hypertension: a multicenter prospective study.** *Journal Of Hypertension.* 39(2):302-309. Q2

Letters

1. Garmendia O, Monasterio C, Guzmán J, Saura L, Ruiz C, Salord N, Negrín MÁ, Izquierdo Sanchez C, Suarez-Giron M, Montserrat JM, Torres M . **Telemedicine Strategy for CPAP Titration and Early Follow-up for Sleep Apnea During COVID-19 and Post-Pandemic Future.** *Archivos De Bronconeumologia.* 57:56-58. Q2

Clinical Guidelines

1. Schiza S, Simonds A, Randerath W, Fanfulla F, Testelmans D, Grote L, Montserrat JM, Pepin JL, Verbraecken J, Ersu R, Bonsignore MR . **Sleep Laboratories Reopening and COVID-19: A European Perspective.** *European Respiratory Journal.* 57(3):2002722. D1

2. Montserrat Canal JM; Suárez-Girón M; Egea C; Embid C; Matute-Villacís M; de Manuel Martínez L; Orteu Á; González-Cappa J; Tato Cerdeiras M; Mediano O. **Spanish Society of Pulmonology and Thoracic Surgery positioning on the use of telemedine in sleep-disordered breathing and mechanical ventilation.** *Archivos De Bronconeumologia.* 57(4):281-290. Q2

Consortium Publications

1. Riha RL, Kotoulas SC, Pataka A, Kvamme JA, Joppa P, Hedner J, ESADA collaborators. **Obstructive sleep apnoea in adult patients post-tonsillectomy.** *Sleep Medicine.* 78:189-192. Q2

GRANTS FOR RESEARCH IN PROGRESS

Montserrat JM. **Telemedicina en pacientes con "sleep APNEA" que no cumplen adecuadamente el tratamiento con CPAP. Cumplidores mínimos vs cumplidores óptimos.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/01068
Duration: 01/01/2018-30/09/2021

2.14 Clinical and experimental respiratory immunoallergy

LOCATION
CELLEX building, floor 2B

KEYWORDS
1. **Chronic rhinosinusitis and nasal polyps**
2. **Aspirin sensitive asthma**
3. **Drug & food allergy**
4. **Olfactory disorders**
5. **Urticaria and mast cells**
6. **Endoscopic & skull base surgery**
7. **Anaphylaxis**

RELATED DISEASES
1. **Rhinosinusitis (acute, COVID-19, chronic, nasal polyps)**
2. **Asthma (allergic, non-allergic, eosinophilic, N-ERD)**
3. **Rhinitis (allergic, non-allergic)**
4. **Smell and taste disorders**
5. **Drug-induced allergies**
6. **Food-induced allergies**
7. **Atopic dermatitis and urticaria**
8. **Sinus and skull base tumors**
9. **Anaphylaxis**

GROUP INVOLVED IN
AGAUR_SGR17: 01090
CIBER_CIBERES
RETIC_RIRAAF
RETIC_ARADYAL

Original publications

TOTAL	55
Mean IF	6,67
Q1	60%
D1	38%
MA	47%
OA	67%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Respiratory and food allergies, chronic rhinosinusitis, and asthma are chronic inflammatory diseases with a very high prevalence: they affect more than a third of the general population, have a major impact on patients' sense of smell, reduce their quality of life, and have an enormous cost in terms of long-term health care resources.

Identifying the mechanisms of action responsible for these disorders may improve the efficacy of current treatments, allow for the development of new therapeutic strategies, and also facilitate the identification of biological markers (biomarkers) for diagnosis and for monitoring therapeutic response, within a context of personalized and precision medicine.

APPROACH

The group forms part of a multidisciplinary team of physicians and researchers who are studying the mechanisms involved in certain chronic and allergic food and respiratory diseases, including anaphylaxis, and in the problem of olfactory dysfunction.

Its translational research aims to find answers in the laboratory to questions that arise in clinical practice and to integrate the results of clinical studies and patient samples with those of animal experiments and cell models.

Analysis of specific metabolites and biomarkers using cellular and molecular biology

techniques and bioinformatics to process the data are helping the group to obtain improved knowledge of the mechanisms involved in these disorders and to answer some of the questions.

IMPACT

One of the most group's most highly pursued goals is the identification of diagnostic biomarkers that may even predict treatment efficacy in inflammatory and allergic disorders and in diseases that lead to loss of the sense of smell. By means of studies in humans and the use of in vivo (animals) and in vitro models, the group is able to evaluate the anti-inflammatory potency of new drugs, and determine the pathophysiology of certain clinical problems (asthma, chronic rhinosinusitis, food allergies, urticaria, intolerance to NSAID, anaphylaxis) as well as the mechanism of action of existing drugs (corticosteroids, biological drugs) and of new therapies (post-traumatic olfactory training and cell therapy).

RESEARCH LINES

- Inflammation of the upper and lower respiratory mucosa.

- Sense of smell in health and disease.

- Food and drug allergy.

- Anaphylaxis.

- Glucocorticoid resistance.

- Aspirin and non-steroidal anti-inflammatory drug (NSAID) intolerance.

- Pathophysiology of eosinophils, mast cells, and basophils.

- Skull base tumours.

PUBLICATIONS

Originals

1. Eguiluz-Gracia I, Testera-Montes A, Salas M, Perez-Sanchez N, Ariza A, Bogas G, Bartra J, Torres MJ, Rondon C . **Comparison of diagnostic accuracy of acoustic rhinometry and symptoms score for nasal allergen challenge monitoring.** *Allergy*. 76(1):371-375. D1

2. Sánchez-López J, Araujo G, Cardona V, García-Moral A, Casas-Saucedo R, Guilarte M, Torres MJ, Doña I, Picado C, Pascal M, Muñoz-Cano R, Bartra J . **Food-dependent NSAID-induced hypersensitivity reactions (FDNIH): unraveling the clinical features and risk factors.** *Allergy*. 76(5):1480-1492. D1

3. Jimenez-Rodriguez TW, Berges-Gimeno MP, Barranco R, Bartra J, Diéguez MDC, Doña I, Fernández-Rivas M, Gandolfo-Cano MDM, Gastaminza-Lasarte G, González-Mancebo E, de la Hoz Caballer B, Sánchez-Morillas L, Torres MJ, Vega A, Muñoz-Cano R . **Management of hypersensitivity reactions to chemotherapy and biologic agents: A survey of ARADyAL (Asthma, Allergic and Adverse Reactions Network) Spanish Allergy Services.** *Allergy*. 76(7):2249-2253. D1

4. Palomares F, Gómez F, Bogas G, Maggi L, Cosmi L, Annunziato F, Núñez R, Pérez N, Muñoz-Cano R, Torres MJ, Mayorga C . **Innate lymphoid cells type 2 in LTP-allergic patients and their modulation during sublingual immunotherapy.** *Allergy*. 76(7):2253-2256. D1

5. Hagemann J, Onorato GL, Jutel M, Akdis CA, Agache I, Zuberbier T, Czarlewski W, Mullol J, Bedbrook A, Bachert C, Bennoor KS, Bergmann KC, Braido F, Camargos P, Caraballo L, Cardona V, Casale T, Cecchi L, Chivato T, Chu DK, Cingi C, Correia-de-Sousa J, Del Giacco S, Dokic D, Dykewicz M, Ebisawa M, El-Gamal Y, Emuzyte R, Fauquert JL, Fiocchi A, Fokkens WJ, Fonseca JA, Gemicioglu B, Gomez RM, Gotua M, Haahtela T, Hamelmann E, Iinuma T, Ivancevich JC, Jassem E, Kalayci O, Kardas P, Khaitov M, Kuna P, Kvedariene V, Larenas-Linnemann DE, Lipworth B, Makris M, Maspero JF, Miculinic N, Mihaltan F, Mohammad Y, Montefort S, Morais-Almeida M, Mösges R, Naclerio R, Neffen H, Niedoszytko M, O'Hehir RE, Ohta K, Okamoto Y, Okubo K, Panzner P, Papadopoulos NG, Passalacqua G, Patella V, Pereira A, Pfaar O, Plavec D, Popov TA, Prokopakis EP, Puggioni F, Raciborski F, Reijula J, Regateiro FS, Reitsma S, Romano A, Rosario N, Rottem M, Ryan D, Samolinski B, Sastre J, Solé D, Sova M, Stellato C, Suppli-Ulrik C, Tsiligianni I, Valero A, Valiulis A, Valovirta E, Vasankari T, Ventura MT, Wallace D, Wang Y, Williams S, Yorgancioglu A, Yusuf OM, Zernotti M, Bousquet J, Klimek L. **Differentiation of COVID-19 signs and symptoms from allergic rhinitis and common cold: An ARIA-EAACI-GA 2 LEN consensus.** *Allergy*. 76(8):2354-2366. D1

6. Marin C, Tubita V, Langdon C, Fuentes M, Rojas-Lechuga MJ, Valero A, Alobid I, Mullol J. **ACE2 downregulation in olfactory mucosa: eosinophilic rhinosinusitis as COVID-19 protective factor?** *Allergy*. 76(9):2904-2907. D1

7. Urbano A, Plaza J, Turon S, Pujol A, Costa-Farré C, Marco A, Picado C, Torres R, de Mora F . **Transgenic mice overexpressing the PGE 2 receptor EP 2 on mast cells exhibit a protective phenotype in a model of allergic asthma.** *Allergy*. 76(10):3196-3199. D1

8. Pfeiffer S, Sandler P, Raith M, Pascal M, Munoz-Cano RM, San Bartolome C, Nöbauer K, Quirce S, Razzazi-Fazeli E, Focke-Tejkl M, Sterflinger K, Swoboda I . **Identification of Ulocladium chartarum as an important indoor allergen source.** *Allergy*. 76(10):3202-3206. D1

9. Pfeiffer S, Raith M, Pascal M, Munoz-Cano RM, San Bartolome C, Nöbauer K, Quirce S, Razzazi-Fazeli E, Focke-Tejkl M, Sterflinger K, Swoboda I . **The emerging pathogen Paecilomyces variotii - a novel and important fungal allergen source.** *Allergy*. 77(3):1045-1048. D1

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Letters

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Editorial

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Clinical Guidelines

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Consortium Publications

1. Bousquet J, Antó JM, Czarlewski W, Haahtela T, Fonseca SC, Iaccarino G, Blain H, Vidal A, Sheikh A, Akdis CA, Zuberbier T; ARIA group. **Cabbage and fermented vegetables: From death rate heterogeneity in countries to candidates for mitigation strategies of severe COVID-19.** *Allergy*. 76(3):735-750. D1

GRANTS FOR RESEARCH IN PROGRESS

Alobid I. **Heterogeneidad de la disfunción olfativa en fenotipos inflamatorios, postvíricos y neurodegenerativos: Estudio de biomarcadores genómicos específicos relacionados con el olfato.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00806
Duration: 01/01/2020-31/12/2022

Araujo G, Muñoz-Cano R. **El papel de la prueba de provocación nasal alérgeno específica con Pru p3 para el diagnóstico de alergia a alimentos por proteína de transferencia de lípidos del melocotón.**
Sponsored by: Fundació Acadèmia de les Ciències Mèdiques. SCAIC_17_01
Duration: 16/05/2018-

Bartra J. **Red Temática de Investigación Cooperativa en Salud - Reacciones adversas a alérgenos y fármacos.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_RD16/0006/0007
Duration: 01/01/2017-31/12/2021

Bartra J. **Mecanismos y predicción de reacciones adversas medicamentosas y enfermedad alérgica.**
Sponsored by: Fundación SEAIC. FSEAIC_AYUDAS_18-01
Duration: 25/06/2018-

Bartra J. **Utilidad del test de activación de mastocitos en el estudio del metabolismo de los eicosanoides en la aparición de anafilaxia por alergia a alimentos en un modelo in vivo e in vitro.**
Sponsored by: Fundación SEAIC. FSEAIC_AYUDAS_19_02
Duration: 01/02/2021-31/01/2024

Bartra J. **Estudio del metabolismo de los eicosanoides en la aparición de anafilaxia por alergia a alimentos en un modelo in vivo e in vitro.**
Sponsored by: Fundación Merck Salud. FSalud_20-AL-007
Duration: 26/11/2020-27/11/2022

Casas R, Muñoz-Cano R. **Análisis de la sensibilidad y reactividad de los basófilos en la alergia a alimentos inducida o no por cofactor y del efecto protector de PGE2 a través de sus receptores.**
Sponsored by: Fundació Acadèmia de les Ciències Mèdiques. BECA_SCAIC2019_01
Duration: 15/09/2019-14/09/2021

Enseñat J. **Minimally invasive neurosurgery for complex brain tumors. Creation of novel endoscopic anatomic models and direct clinical application.**
Sponsored by: Fundació La Marató de TV3. TV3_Cancer_19
Duration: 30/07/2020-29/07/2023

Enseñat J. **Estudio de los abordajes endoscópicos multiportales mínimamente invasivos para el tratamiento de tumores cerebrales complejos. Diseño de nuevos modelos anatómicos y traslación clínica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00592
Duration: 01/01/2020-31/12/2022

Martin Andorrà M. **Estudios de nuevos mecanismos en la activación mastocitaria y la supervivencia celular. Implicaciones en patologías con KIT oncogénico y en reacciones anafilácticas.**
Sponsored by: Ministry of Science, Innovation, and Universities. RTI2018-096915-B-100
Duration: 01/01/2019-31/12/2021

Mullol J. **Papel de los microRNA en la modulación in vitro de la diferenciación mucociliar e inflamación del epitelio nasosinusal en la poliposis nasal.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00469
Duration: 01/01/2019-31/12/2022

Muñoz-Cano R. **Estudios de los mecanismos patogénicos en la anafilaxia inducida por alimentos y exacerbada por antiinflamatorios no esteroideos (AINEs).**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/00696
Duration: 01/01/2017-30/06/2021

Muñoz-Cano R. **Estudio del papel del metabolismo de los eicosanoides en la aparición de anafilaxia por alergia a alimentos en un modelo in vivo e in vitro.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/01861
Duration: 01/01/2020-31/12/2022

Pascal M, Bartra J. **Síndrome LTP: identificación y caracterización clínica de los epítopos inmunodominantes B y T y su presentación antigénica HLA.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/00344
Duration: 01/01/2017-30/06/2021

Pascal M, Bartra J. **Estratificación del riesgo de gravedad y patrón de reconocimiento en el Síndrome LTP: papel de la afinidad, clonalidad BCR/TCR y la presentación facilitada de antígeno.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00710
Duration: 01/01/2020-31/12/2022

DOCTORAL THESES

Muñoz-Cano R, Pascal M. **Efecto moduladador del cofactor sobre la gravedad en la anafilaxia alimentaria por alergia a la proteína de transferencia de lípidos (LTP): estudio del papel del metabolismo de los eicosanoides.**
PhD student: Rocío Casas Saucedo

Enseñat J, González-Sánchez JJ. **Estudio de la integridad de sustancia blanca mediante tractografía por tensor de difusión: simulación, diagnóstico y pronóstico.**
PhD student: Sergio García García

Bartra J, Valero A. **Utilidad de la provocación nasal con alérgeno, y de la determinación del perfil de sensibilización, como técnicas diagnósticas en el estudio de la alergia al marisco.**
PhD student: Sònia Gelis Caparrós

Marín MC, Mullol J. **Impacto del traumatismo cerebral agudo sobre el sentido del olfato: papel del entrenamiento olfativo y de la neuroprotección en la recuperación postraumática del olfato.**
PhD student: Cristóbal Langdon Montero

Mullol J, Alobid I. **Tratamiento de la hiperhidrosis craneofacial y el rubor mediante el bloqueo del ganglio esfenopalatino por vía endoscópica trasnasal.**
PhD student: Eduardo Lehrer Coriat

Bartra J, Valero A. **Estudio de los factores que influyen en el control del asma: papel de la educación sanitaria, tratamiento adecuado y las preferencias de los pacientes.**
PhD student: Paula Ribó Gonzalez

2.15 Translational research in post-transplant neoplasia

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Original publications

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PROBLEM

A kidney transplant is the best and often, the only treatment available to terminal chronic kidney patients. Advances in medicine have made it possible to lengthen the useful life of many organs, but this is often accompanied by risks for patients. Despite being a minor problem, the rejection of an organ is the cause of most transplant deaths in the long term.

Chronic treatment with immunosuppressant drugs alters the immune system, exposing the patient to infections and tumours. To prevent this, it is necessary to have early diagnostic and therapeutic tools that are effective and with low toxicity levels.

APPROACH

There is a need to establish a distinction between and describe transplant patients from the clinical and from the molecular standpoint, due to the enormous heterogeneity of this group.

Immunological, histological (of the tissues) and biochemical monitoring is not sufficient, and we need to find new markers and new technologies.

Studying the possibilities of nanomedicine as a diagnostic and therapeutic tool could provide a response in many areas. Moreover, the addition of add big data and artificial intelligence represents a great step forward in the future of organ transplants.

IMPACT

The establishment of a clinical and molecular definition of patients in relation to their risks in terms of immunology, infection and neoplasms makes it possible to apply personalised medicine to organ transplants.

The group has experience with patients who have rejected a kidney transport and have then developed colon and skin cancer or Kaposi's sarcoma. However, apart from medication, these patients require diagnostic algorithms based on big data and artificial intelligence to attack the tumours while they remain immunodepressed. The possibility of adding nanomedicine as a biomarker and therapeutic arsenal, as demonstrated in post-transplant cancer, could lead to the use of new therapeutic strategies in these patients.

RESEARCH LINES

- Artificial intelligent and big data in nephrology and kidney transplant world.

- Immune exosomes and antibody mediated rejection and graft loss.

- Incidence, behaviour, risk factors, and therapeutic approach of cancer in kidney transplant patients.

- Molecular characterization of posttransplant malignancies.

- Role of cancer exosomes in tumor progression and metastasis in posttransplant malignancies under different immunousppressive therapy.

PUBLICATIONS

Originals

1. Revuelta I, Santos-Arteaga FJ, Montagud-Marrahi E, Ventura-Aguiar P, Di Caprio D, Cofan F, Cucchiari D, Torregrosa V, Piñeiro GJ, Esforzado N, Bodro M, Ugalde-Altamirano J, Moreno A, Campistol JM, Alcaraz A, Bayès B, Poch E, Oppenheimer F, Diekmann F . **A hybrid data envelopment analysis-artificial neural network prediction model for COVID-19 severity in transplant recipients.** *Artificial Intelligence Review.* 1(32):1-4684. D1

2. Montagud-Marrahi E, Amor AJ, Molina-Andujar A, Cucchiari D, Revuelta I, Esforzado N, Cofan F, Oppenheimer F, Torregrosa V, Casals J, Ferrer J, Esmatjes E, Ramírez-Bajo MJ, Musquera M, Bayes B, Campistol JM, Diekmann F, Ventura-Aguiar P . **Impact of insulin therapy before donation on graft outcomes in pancreas transplantation: An analysis of the OPTN/UNOS database.** *Diabetes Research And Clinical Practice.* 182:109120. Q1

3. Montagud-Marrahi E, Molina-Andújar A, Rovira J, Revuelta I, Ventura-Aguiar P, Piñeiro G, Ugalde-Altamirano J, Perna F, Torregrosa JV, Oppenheimer F, Esforzado N, Cofán F, Campistol JM, Herrera-Garcia A, Ríos J, Diekmann F, Cucchiari D . **The impact of functional delayed graft functon in the modern era of kidney transplantation.** *Transplant International.* 34(1):175-184. Q1

4. Montero N, Toapanta N, Pallarès N, Crespo M, Diekmann F, Guirado L, Esteban R, Codina S, Melilli E, Buxeda A, Velis G, Torres IB, Revuelta I, Molina Andujar A, Facundo C, Bardají B, Riera L, Fiol M, Cruzado JM, Comas J, Giral M, Naesens M, Åsberg A, Moreso F, Bestard O . **Deciphering Transplant Outcomes of Expanded Kidney Allografts donated after controlled Circulatory Death in the Current Transplant Era.** *Transplant International.* 34(12):2494-2506. Q1

5. Pineiro, GJ; Montagud-Marrahi, E; Rios, J; Ventura-Aguiar, P; Cucchiari, D; Revuelta, I; Lozano, M; Cid, J; Cofan, F; Esforzado, N; Palou, E; Oppenheimer, F; Campistol, JM; Bayes-Genis, B; Rovira, J; Diekmann, F. **Influence of Persistent Inflammation in Follow-Up Biopsies After Antibody-Mediated Rejection in Kidney Transplantation.** *Frontiers Of Medicine.* 8:761919. Q2

6. Cucchiari D, Tubita V, Rovira J, Ramirez-Bajo MJ, Banon-Maneus E, Lazo-Rodriguez M, Hierro-Garcia N, Borràs FE, Ventura-Aguiar P, Piñeiro GJ, Martorell J, Peri L, Musquera M, Hertig A, Oppenheimer F, Campistol JM, Diekmann F, Revuelta I . **B Cell-Derived Extracellular Vesicles Reveal Residual B Cell Activity in Kidney Graft Recipients Undergoing Pre-Transplant Desensitization.** *Frontiers Of Medicine.* 8:781239. Q2

7. Carreras-Planella L; Cucchiari D; Cañas L; Juega J; Franquesa M; Bonet J; Revuelta I; Diekmann F; Taco O; Lauzurica R; Borràs FE. **Urinary vitronectin identifies patients with high levels of fibrosis in kidney grafts.** *Journal Of Nephrology.* 34(3):861-874. Q2

8. Santos Arteaga FJ, Di Caprio D, Cucchiari D, Campistol JM, Oppenheimer F, Diekmann F, Revuelta I. **Modeling patients as decision making units: evaluating the efficiency of kidney transplantation through data envelopment analysis.** *Health Care Management Science.* 24(1):55-71. Q2

9. Melilli E, Cestone G, Revuelta I, Meneghini M, Lladó L, Montero N, Manonelles A, Diaz M, Coloma A, Torregrosa V, Baliellas C, Cruzado JM, Diekmann F, Grinyó J, Bestard O. **Adoption of a novel smart mobile-health application technology to track chronic immunosuppression adherence in solid organ transplantation: Results of a prospective, observational, multicentre, pilot study.** *Clinical Transplantation.* 35(5):e14278. Q2

Letters

1. Montagud-Marrahi E, Cucchiari D, Cuadrado-Payán E, Cofan F, Torregrosa JV, Ventura-Aguiar P, Revuelta I, Bodro M, Piñeiro GJ, Esforzado N, Campistol JM, Oppenheimer F, Marcos MÁ, Bayés B, Moreno A, Diekmann F . **SARS-CoV-2 Infection After Full Vaccination in Kidney Transplant Recipients.** *Transplantation.* 105(12):e278-e279. Q1

2. Cucchiari D, Guillén E, Cofan F, Torregrosa JV, Esforzado N, Revuelta I, Ventura-Aguiar P, Oppenheimer F, Bayés B, Marcos MÁ, Morgado-Carrasco D, López JM, Creus P, Hernández C, Coloma E, Bodro M, Diekmann F, Pericàs JM, Nicolás D, Hospital Clínic 4H Team (Hospital at Home-Health Hotel). **Taking care of kidney transplant recipients during the COVID-19 pandemic: experience from a medicalized hotel.** *Clinical Transplantation.* 35(1):e14132. Q2

Case Reports

1. Molina-Andújar A, Tovar N, Cuadrado E, Castrejón de Anta N, Revuelta I, Cucchiari D, Cofan F, Esforzado N, Cibeira MT, Rosiñol L, Bladé J, Diekmann F, Fernández de Larrea C, Quintana LF. **Kidney Transplantation in Monoclonal Immunoglobulin Deposition Disease: A Report of 6 Cases.** *American Journal Of Kidney Diseases.* 78(5):755-759. D1

Consortium Publications

1. Linares L, Cofan F, Diekmann F, Herrera S, Marcos MA, Castel MA, Farrero M, Colmenero J, Ruiz P, Crespo G, Llopis J, Garcia-Vidal C, Soriano À, Moreno A, Bodro M, Hospital Clínic COVID-19 research group. **A propensity score-matched analysis of mortality in solid organ transplant patients with COVID-19 compared to non-solid organ transplant patients**. *Plos One.* 16(3):e0247251. Q2

GRANTS FOR RESEARCH IN PROGRESS

Revuelta I, Oppenheimer F. **Papel de los exosomas de células inmunes de memoria (InmEx) en la activación del endotelio y desarrollo precoz del rechazo mediado por anticuerpos en el trasplante renal.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/00115
Duration: 01/01/2017-30/06/2021

Revuelta I, Oppenheimer F. **Exosomas como nuevo mecanismo de rechazo mediado por anticuerpos en receptores de trasplante renal de alto riesgo inmunológico caracterizados con tecnología de Big Data e Inteligencia Artificial.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00797
Duration: 01/01/2020-31/12/2022

Revuelta I. **Modelo hibrido predictivo de optimización y mejora del matching donante-receptor en donación en asistolia controlada con criterios expandidos como incremento del pool de donantes de órganos.** Ayudas Fundación Mutua Madrileña en Salud.
Sponsored by: Mutua Madrileña_MM AP176572021
Duration: 01/12/2021-31/12/2024

DOCTORAL THESES

Manyalich M, Revuelta I. **Aspectos psicosociales de la donación renal en vida.**
PhD student: Ana Teresa Menjívar Hernández

2.16 Atherosclerosis, coronary disease and heart failure

LOCATION
CELLEX building, floor 2A

KEYWORDS
1. **Acute myocardial infarction**
2. **Percutaneous coronary intervention.**
3. **Stent**
4. **Biodegradable device**
5. **Therapeutic hypothermia**
6. **Stem cell therapy**
7. **Heart failure**
8. **Structural heart disease**

RELATED DISEASES
1. **Coronary artery disease**
2. **Structural heart disease**
3. **Acute coronary syndrome**
4. **Congestive heart failure**
5. **Pulmonary hypertension**

GROUP INVOLVED IN
AGAUR_SGR17: 01525

Original publications

TOTAL	87
Mean IF	6,73
Q1	48%
D1	17%
MA	28%
OA	59%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Cardiovascular diseases are the most frequent cause of death in the western world, causing more than 4 million deaths every year in Europe, and 45% of all deaths in Catalonia, being the leading cause of death in women and the second in men.

Population ageing causes these diseases to appear increasingly in more complex patients. In addition, today's lifestyles do not favour prevention. Research in this context must be at all levels: diagnosis, prevention, regenerative and therapeutic.

APPROACH

The group's vocation is to conduct research on the diagnosis and mechanisms that cause diseases of the heart's arteries using sophisticated imaging techniques and experimental models.

Another important aspect of its research is the evaluation of advanced therapies (with stem cells) and of new devices for the treatment of the most prevalent cardiovascular diseases (myocardial infarction, valvopathies, pulmonary hypertension, congenital illnesses).

The group does research with translational, multidisciplinary, collaborative vocation between different centres and groups and Pan-European countries.

IMPACT

IIn basic research, the group identifies mechanisms for the regulation of stem cell therapy for the regeneration and improvement of blood circulation to the heart muscle.

In addition, it studies the mechanisms of cellular ageing and inflammatory response after an infarct or a therapeutic procedure.

From a clinical point of view, it evaluates new devices (such as biodegradable stents or percutaneous valves) using different imaging and vascular physiology techniques, as well as new strategies for the treatment of myocardial

infarction, cardiogenic shock, heart failure and pulmonary hypertension. The results of these studies have been published in high-impact clinical journals and are part of European clinical practice guidelines.

RESEARCH LINES

- To design experimental and clinical studies to evaluate the performance of novel devices and strategies to treat coronary artery disease, including chronic and acute coronary syndromes, cardiogenic shock and cardiac arrest.

- To determine the safety, efficacy and efficiency of new transcatheter and minimally invasive devices to treat structural and congenital heart disease and the role of imaging techniques.

- To evaluate neurohormonal activation, fibrotic process, genetic and environmental factors associated with ventricular remodeling in dilated cardiomyopathy.

- To evaluate new pharmacological and invasive treatments for pulmonary hypertension.

- To evaluate the influence of hormonal factors, gender and aging in ischemic heart disease.

- To perform experimental models of neointimal hyperplasia, endothelialization, vascular inflammation and thrombosis.

- To study the regulatory mechanisms and efficacy of stem cell therapy in experimental models and in clinical contexts.

PUBLICATIONS

Originals

1. Lansky AJ, Kereiakes DJ, Baumbach A, Windecker S, Hussain Y, Pietras C, Dressler O, Issever O, Curtis M, Bertolet B, Zidar JP, Smits PC, Alfonso Jiménez Díaz V, McLaurin B, Hofma S, Cequier Á, Dib N, Benit E, Mathur A, Brogno D, Berland J, Wykrzykowska J, Piegari G, Brugaletta S, Saito S, Leon MB, PIONEER III Trial Investigators. **Novel Supreme Drug-Eluting Stents With Early Synchronized Antiproliferative Drug Delivery to Inhibit Smooth Muscle Cell Proliferation After Drug-Eluting Stents Implantation in Coronary Artery Disease: Results of the PIONEER III Randomized Clinical Trial.** *Circulation*. 143(22):2143-2154. D1

2. Brugaletta S; Gomez-Lara J; Ortega-Paz L; Jimenez-Diaz V; Jimenez M; Jiménez-Quevedo P; Diletti R; Mainar V; Campo G; Silvestro A; Maristany J; Flores X; Oyarzabal L; De Miguel-Castro A; Iñiguez A; Serra A; Nombela-Franco L; Ielasi A; Tespili M; Lenzen M; Gonzalo N; Bordes P; Tebaldi M; Biscaglia S; Rodriguez-Arias JJ; Al-Shaibani S; Arevalos V; Romaguera R; Gomez-Hospital JA; Serruys PW; Sabaté M. **10-Year Follow-Up of Patients With Everolimus-Eluting Versus Bare-Metal Stents After ST-Segment Elevation Myocardial Infarction.** *Journal Of The American College Of Cardiology*. 77(9):1165-1178. D1

3. Kite TA; Ludman PF; Gale CP; Wu J; Caixeta A; Mansourati J; Sabate M; Jimenez-Quevedo P; Candilio L; Sadeghipour P; Iniesta AM; Hoole SP; Palmer N; Ariza-Solé A; Namitokov A; Escutia-Cuevas HH; Vincent F; Tica O; Ngunga M; Meray I; Morrow A; Arefin MM; Lindsay S; Kazamel G; Sharma V; Saad A; Sinagra G; Sanchez FA; Roik M; Savonitto S; Vavlukis M; Sangaraju S; Malik IS; Kean S; Curzen N; Berry C; Stone GW; Gersh BJ; Gershlick AH. **International Prospective Registry of Acute Coronary Syndromes in Patients With COVID-19**. *Journal Of The American College Of Cardiology*. 77(20):2466-2476. D1

4. Simard, Trevor; Jung, Richard G; Lehenbauer, Kyle; Piayda, Kerstin; Pracon, Radoslaw; Jackson, Gregory G; Flores-Umanzor, Eduardo; Faroux, Laurent; Korsholm, Kasper; Chun, Julian K R; Chen, Shaojie; Maarse, Moniek; Montrella, Kristi; Chaker, Zakeih; Spoon, Jocelyn N; Pastormerlo, Luigi E; Meincke, Felix; Sawant, Abhishek C; Moldovan, Carmen M; Qintar, Mohammed; Aktas, Mehmet K; Branca, Luca; Radinovic, Andrea; Ram, Pradhum; El-Zein, Rayan S; Flautt, Thomas; Ding, Wern Yew; Sayegh, Bassel; Benito-Gonzalez, Tomas; Lee, Oh-Hyun; Badejoko, Solomon O; Paitazoglou, Christina; Karim, Nabeela; Zaghloul, Ahmed M; Agrawal, Himanshu; Kaplan, Rachel M; Alli, Oluseun; Ahmed, Aamir; Suradi, Hussam S; Knight, Bradley P; Alla, Venkata M; Panaich, Sidakpal S; Wong, Tom; Bergmann, Martin W; Chothia, Rashaad; Kim, Jung-Sun; Prado, Armando Perez de; Bazaz, Raveen; Gupta, Dhiraj; Valderrabano, Miguel; Sanchez, Carlos E; Chami, Mikhael F El; Mazzone, Patrizio; Adamo, Marianna; Ling, Fred; Wang, Dee Dee; O'Neill, William; Wojakowski, Wojtek; Pershad, Ashish; Berti, Sergio; Spoon, Daniel; Kawsara, Akram; Jabbour, George; Boersma, Lucas V A; Schmidt, Boris; Nielsen-Kudsk, Jens Erik; Rodes-Cabau, Josep; Freixa, Xavier; Ellis, Christopher R; Fauchier, Laurent; Demkow, Marcin; Sievert, Horst; Main, Michael L; Hibbert, Benjamin; Holmes, David R; Alkhouli, Mohamad. **Predictors of Device-Related Thrombus Following Percutaneous Left Atrial Appendage Occlusion.** *Journal Of The American College Of Cardiology*. 78(4):297-313. D1

5. del Val, D; Abdel-Wahab, M; Mangner, N; Durand, E; Ihlemann, N; Urena, M; Pellegrini, C; Giannini, F; Gasior, T; Wojakowski, W; Landt, M; Auffret, V; Sinning, JM; Cheema, AN; Nombela-Franco, L; Chamandi, C; Campelo-Parada, F; Munoz-Garcia, E; Herrmann, HC; Testa, L; Won-Keun, K; Castillo, JC; Alperi, A; Tchetche, D; Bartorelli, AL; Kapadia, S; Stortecky, S; Amat-Santos, I; Wijeysundera, HC; Lisko, J; Gutierrez-Ibanes, E; Serra, V; Salido, L; Alkhodair, A; Livi, U; Chakravarty, T; Lerakis, S; Vilalta, V; Regueiro, A; Romaguera, R; Kappert, U; Barbanti, M; Masson, JB; Maes, F; Fiorina, C; Miceli, A; Kodali, S; Ribeiro, HB; Mangione, JA; de Brito, FS; Dato, GMA; Rosato, F; Ferreira, MC; de Lima, VC; Colafranceschi, AS; Abizaid, A; Marino, MA; Esteves, V; Andrea, J; Godinho, RR; Alfonso, F; Eltchaninoff, H; Sondergaard, L; Himbert, D; Husser, O; Latib, A; Le Breton, H; Servoz, C; Pascual, I; Siddiqui, S; Olivares, P; Hernandez-Antolin, R; Webb, JG; Sponga, S; Makkar, R; Kini, AS; Boukhris, M; Gervais, P; Linke, A; Crusius, L; Holzhey, D; Rodes-Cabau, J. **Stroke Complicating Infective Endocarditis After Transcatheter Aortic Valve Replacement.** *Journal Of The American College Of Cardiology*. 77(18):2276-2287. D1

6. Escobar-Lopez, L; Ochoa, JP; Mirelis, JG; Espinosa, MA; Navarro, M; Gallego-Delgado, M; Barriales-Villa, R; Robles-Mezcua, A; Basurte-Elorz, MT; Garcia-Moreno, LG; Climent, V; Jimenez-Jaimez, J; Mogollon-Jimenez, MV; Lopez, J; Pena-Pena, ML; Garcia-Alvarez, A; Brion, M; Ripoll-Vera, T; Palomino-Doza, J; Tiron, C; Idiazabal, U; Brogger, MN; Garcia-Hernandez, S; Restrepo-Cordoba, MA; Gonzalez-Lopez, E; Mendez, I; Sabater, M; Villacorta, E; Larranaga-Moreira, JM; Abecia, A; Fernandez, AI; Garcia-Pinilla, JM; Rodriguez-Palomares, JF; Gimeno-Blanes, JR; Bayes-Genis, A; Lara-Pezzi, E; Dominguez, F; Garcia-Pavia, P. **Association of Genetic Variants With Outcomes in Patients With Nonischemic Dilated Cardiomyopathy.** *Journal Of The American College Of Cardiology*. 78(17):1682-1699. D1

7. Amaro R, Li Bassi G, Motos A, Fernandez-Barat L, Aguilera Xiol E, Rigol M, Frigola G, Travierso C, Bobi J, Pagliara F, Carbonara M, Comaru T, Chiurazzi C, Yang M, Yang H, Arrieta M, Marti JD, De Rosa F, Saco MA, Rinaudo M, Terraneo S, Schultz MJ, Nicolau DP, Artigas A, Ramirez J, Torres A . **Development and characterization of a new swine model of invasive pneumococcal pneumonia.** *Lab Animal.* 50(11):327-335. D1

8. Alperi A, Mohammadi S, Campelo-Parada F, Munoz-Garcia E, Nombela-Franco L, Faroux L, Veiga G, Serra V, Fischer Q, Pascual I, Asmarats L, Gutiérrez E, Regueiro A, Vilalta V, Ribeiro HB, Matta A, Munoz-Garcia A, Armijo G, Metz D, De la Torre Hernandez JM, Rodenas-Alesina E, Urena M, Moris C, Arzamendi D, Perez-Fuentes P, Fernandez-Nofrerias E, Campanha-Borges DC, Mesnier J, Voisine P, Dumont E, Kalavrouziotis D, Rodés-Cabau J . **Transcatheter Versus Surgical Aortic Valve Replacement in Patients With Complex Coronary Artery Disease.** *JACC-Cardiovascular Interventions.* 14(22):2490-2499. D1

9. Pericàs JM, Hernández-Meneses M, Muñoz P, Martínez-Sellés M, Álvarez-Uria A, de Alarcón A, Gutiérrez-Carretero E, Goenaga MA, Zarauza MJ, Falces C, Rodríguez-Esteban MÁ, Hidalgo-Tenorio C, Hernández-Cabrera M, Miró JM, Spanish Collaboration on Endocarditis—Grupo de Apoyo al Manejo de la Endocarditis Infecciosa en España (GAMES). **Characteristics and outcome of acute heart failure in infective endocarditis: focus on cardiogenic shock.** *Clinical Infectious Diseases.* 73(5):765-774. D1

10. Del Val D, Abdel-Wahab M, Linke A, Durand E, Ihlemann N, Urena M, Pellegrini C, Giannini F, Landt M, Auffret V, Sinning JM, Cheema A, Nombela-Franco L, Chamandi C, Campelo-Parada F, Munoz-Garcia A, Herrmann HC, Testa L, Won-Keun K, Castillo JC, Alperi A, Tchetche D, Bartorelli A, Kapadia S, Stortecky S, Amat-Santos I, Wijeysundera HC, Lisko J, Gutiérrez-Ibanes E, Serra V, Salido L, Alkhodair A, Livi U, Chakravarty T, Lerakis S, Vilalta V, Regueiro A, Romaguera R, Barbanti M, Masson JB, Maes F, Fiorina C, Miceli A, Kodali S, Ribeiro HB, Mangione JA, de Brito FS, Actis Dato GM, Rosato F, Ferreira MC, Lima VC, Colafranceschi AS, Abizaid A, Marino MA, Esteves V, Andrea J, Godinho RR, Eltchaninoff H, Søndergaard L, Himbert D, Husser O, Latib A, Le Breton H, Servoz C, Pascual I, Siddiqui S, Olivares P, Hernandez-Antolin R, Webb JG, Sponga S, Makkar R, Kini AS, Boukhris M, Mangner N, Crusius L, Holzhey D, Rodés-Cabau J. **Temporal Trends, Characteristics, and Outcomes of Infective Endocarditis After Transcatheter Aortic Valve Replacement.** *Clinical Infectious Diseases.* 73(11):e3750-e3758. D1

11. Panagides V, Del Val D, Abdel-Wahab M, Mangner N, Durand E, Ihlemann N, Urena M, Pellegrini C, Giannini F, Gasior T, Wojakowski W, Landt M, Auffret V, Sinning JM, Cheema AN, Nombela-Franco L, Chamandi C, Campelo-Parada F, Munoz-Garcia E, Herrmann HC, Testa L, Won-Keun K, Castillo JC, Alperi A, Tchetche D, Bartorelli AL, Kapadia S, Stortecky S, Amat-Santos I, Wijeysundera HC, Lisko J, Gutiérrez-Ibanes E, Serra V, Salido L, Alkhodair A, Livi U, Chakravarty T, Lerakis S, Vilalta V, Regueiro A, Romaguera R, Kappert U, Barbanti M, Masson JB, Maes F, Fiorina C, Miceli A, Kodali S, Ribeiro HB, Mangione JA, Sandoli de Brito F, Actis Dato GM, Rosato F, Ferreira MC, Correia de Lima V, Colafranceschi AS, Abizaid A, Marino MA, Esteves V, Andrea J, Godinho RR, Alfonso F, Eltchaninoff H, Søndergaard L, Himbert D, Husser O, Latib A, Le Breton H, Servoz C, Pascual I, Siddiqui S, Olivares P, Hernandez-Antolin R, Webb JG, Sponga S, Makkar R, Kini AS, Boukhris M, Gervais P, Linke A, Crusius L, Holzhey D, Rodés-Cabau J. **Perivalvular Extension of Infective Endocarditis after Transcatheter Aortic Valve Replacement.** *Clinical Infectious Diseases.* D1

12. Restrepo-Cordoba MA; Wahbi K; Florian AR; Jiménez-Jáimez J; Politano L; Arad M; Climent Paya V; Garcia-Alvarez A; Hansen RB; Larrañaga-Moreira JM; Kubanek M; Lopes LR; Ros A; Jurcut R; Rasmussen TB; Ruiz-Guerrero L; Pribe-Wolferts R; Palomino-Doza J; Bilinska Z; Rodríguez-Palomares JF; Van Loon RL; Basurte Elorz MT; Quarta G; Robledo Iñarritu M; Verdonschot JAJ; Stojkovic T; Shomanova Z; Bermudez-Jimenez F; Palladino A; Freimark D; García-Álvarez MI; Jorda P; Dominguez F; Ochoa JP; Girolami F; Brugada R; Meder B; Barriales-Villa R; Mogensen J; Laforêt P; Yilmaz A; Elliott P; Garcia-Pavia P; European genetic cardiomyopathies initiative investigators. **Prevalence and Clinical Outcomes of Dystrophin associated Dilated Cardiomyopathy without severe skeletal myopathy.** *European Journal Of Heart Failure.* 23(8):1276-1286. D1

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GRANTS FOR RESEARCH IN PROGRESS

Brugaletta S. **Efecto a corto, mediano y largo plazo de la enfermedad por Coronavirus 2019 en el sistema cardiovascular.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_COV20/00040
Duration: 30/04/2020-29/04/2021

Dantas AP, Brugaletta S. **Impacto de nuevas TeRapias para reducir los lípidos y la inflamación en el fenotipo y perfil funcional de las células progenitoras ENDoteliales en la enfermedad coronaria: estudio TREND.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00264
Duration: 01/01/2020-31/12/2022

Dantas AP. **Potential of EXosomes derived from Progenitor endothelial cells to improve REvascularization in murine model of myocardial infraction: EXPloRE Study.**
Sponsored by: Fundación Casa del Corazón (FEC). SEC_FEC-INV-BAS20/012
Duration: 29/10/2020-28/10/2021

García-Álvarez A. **Estudio de los mecanismos fisiopatológicos que conducen a la hipertrofia maladaptativa del ventrículo derecho en la hipertensión pulmonar crónica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00995
Duration: 01/01/2018-30/06/2022

García-Álvarez A. **Fenotipado integrando clínica, imagen y ómicas de la interacción del ventrículo derecho y circulación pulmonar en la hipertensión pulmonar: avanzando hacia la identificación de dianas terapéuticas.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00742
Duration: 01/01/2021-31/12/2023

Pomar J, Aguiló S. **Detección precoz de vulnerabilidad al trastorno de estrés postraumático en poblaciones altamanente expuestas al COVID-19.**
Sponsored by: Universitat Autònoma de Barcelona (UAB). SANTANDER_COVID20_02
Duration: 01/07/2020-30/06/2021

Rigol M, Sabaté M. **Terapia combinada con células progenitoras endoteliales y mesenquimales autólogas para maximizar su potencial terapéutico en la cardiopatía isquémica crónica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00277
Duration: 01/01/2019-31/12/2022

Rigol M. **Estrategias para optimizar el potencial terapéutico de las células progenitoras endoteliales: terapia combinada y rejuvenecimiento.**
Sponsored by: Fundación Casa del Corazón (FEC). SEC_BASICA_01
Duration: 26/10/2017-

Sabaté M. **Aterosclerosi, malaltia coronària i insuficiència cardíaca.**
Sponsored by: Generalitat de Catalunya. AGAUR_SGR17_01525
Duration: 01/01/2017-30/09/2021

Sabaté M. **Assessment of up-front use of Mechanical Support Device in Cardiogenic Shock: The EURO SHOCK 2020 Research Consortium Study.**
Sponsored by: European Commission. CE_H2020-SC1_17_2s
Duration: 01/01/2018-31/12/2022

DOCTORAL THESES

Freixa X, Sabaté M. **Evolución temporal e impacto clínico de procedimientos percutáneos de cardiología intervencionista en pacientes nonagenarios.**
PhD student: Pedro Luis Cepas Guillen

Sabaté M, Freixa X. **Beneficio de la revascularización vs el tratamiento médico óptimo de las oclusiones crónicas coronarias totales. Importancia del género, de la edad avanzada y de la diabetes.**
PhD student: Eduardo Josué Flores Umanzor

2.17 Cardiac imaging

LOCATION
HCB building

KEYWORDS
1. **Cardiac imaging**
2. **Echocardiography**
3. **Cardiac magnetic resonance**

RELATED DISEASES
1. **Heart valve disease**
2. **Athlete's heart**
3. **Arrhythmia**
4. **Acute coronary syndromme**
5. **Myocardial infarction**

GROUP INVOLVED IN
CIBERCV

Original publications

TOTAL	37
Mean IF	**7,32**
Q1	**54%**
D1	**14%**
MA	**27%**
OA	**59%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Many cardiac diseases present with a common syndrome: heart failure or arrhythmia. There are several therapeutic options for treating these diseases, which can sometimes be very expensive or involve a certain risk for the patient.

The group's research focuses on non-invasive identification, using imaging techniques and cardiac biomarkers, of the myocardial and electrical pathophysiological substrate in order to be able to select the best therapeutic option for each patient, as well as identify those patients with the highest risks.

This level of description and identification, which we can achieve with imaging techniques, also allows us to evaluate the impact of new therapies.

APPROACH

This is a multidisciplinary group and includes professionals who are experts in the various aspects of non-invasive heart imaging. It performs research on cardiac mechanics in various cardiovascular conditions, such as arrhythmias, heart valve diseases and heart failure, as well as heart adaptation to physical training.

Based on clinical observations, the group applies cardiac imaging techniques to evaluate the functioning of the heart. In this way, we can identify patients at risk of heart disease or complications. Through this research, the benefits or impact of some therapies on the heart can also be analyzed.

IMPACT

The group's goal is to improve the tools that enable the identification of patients at risk of suffering from heart disease, as well as those who may respond better to a specific treatment. Therefore, its hope is to obtain results in both prevention and the achievement of a more accurate diagnosis.

Its research is also helping to improve the treatment of heart failure, valvular disease and heart rhythm disorders. As a whole, its work is also leading to better survival rates and a better quality of life for patients with cardiovascular diseases, as well as a more efficient use of health resources.

RESEARCH LINES

- Characterization of cardiac mechanics in heart failure.

- Characterization of hypertrophic hearts (INDEPTH-HCM).

- Identification of athletes at risk of sudden death.

- Identification of candidates for and impact of percutaneous therapies for heart valve diseases.

- Identification of patients at risk of sudden death and heart failure after myocardial infarction.

- Non invasive characterization of arrhythmia substrate.

- Prediction of atrial fibrillation in patients at risk (PREDICTAF study).

- Usefulness of non-invasive cardiac imaging in the identification of acute coronary syndromes.

PUBLICATIONS

Originals

1. Lurz P; Stephan von Bardeleben R; Weber M; Sitges M; Sorajja P; Hausleiter J; Denti P; Trochu JN; Nabauer M; Tang GHL; Biaggi P; Ying SW; Trusty PM; Dahou A; Hahn RT; Nickenig G; TRILUMINATE Investigators. **Transcatheter Edge-to-Edge Repair for Treatment of Tricuspid Regurgitation.** *Journal Of The American College Of Cardiology.* 77(3):229-239. D1

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8. Sánchez-Somonte P, Quinto L, Garre P, Zaraket F, Alarcón F, Borràs R, Caixal G, Vázquez S, Prat S, Ortiz-Perez JT, Perea RJ, Guasch E, Tolosana JM, Berruezo A, Arbelo E, Sitges M, Mont L, Roca-Luque I . **Scar channels in cardiac magnetic resonance to predict appropriate therapies in primary prevention.** *Heart Rhythm.* 18(8):1336-1343. Q1

9. Loncaric, Filip; Garcia-Canadilla, Patricia; Garcia-Alvarez, Ana; Sanchis, Laura; Prat, Susana; Doltra, Adelina; Quintana, Eduard; Pereda, Daniel; Dejea, Hector; Bonnin, Anne; Sitges, Marta; Bijnens, Bart. **Etiology-Discriminative Multimodal Imaging of Left Ventricular Hypertrophy and Synchrotron-Based Assessment of Microstructural Tissue Remodeling.** *Front Cardiovasc Med.* 8:670734. Q1

10. Martinez, V; Sanz-De la Garza, M; Domenech-Ximenos, B; Fernandez, C; Garcia-Alvarez, A; Prat-Gonzalez, S; Yanguas, C; Sitges, M. **Cardiac and Pulmonary Vascular Remodeling in Endurance Open Water Swimmers Assessed by Cardiac Magnetic Resonance: Impact of Sex and Sport Discipline.** *Front Cardiovasc Med.* 8:719113. Q1

11. Castaneda, X; Garcia-De-la-Maria, C; Gasch, O; Pericas, JM; Soy, D; Canas-Pacheco, MA; Falces, C; Garcia-Gonzalez, J; Hernandez-Meneses, M; Vidal, B; Almela, M; Quintana, E; Tolosana, JM; Fuster, D; Llopis, J; Dahl, A; Moreno, A; Marco, F; Miro, JM. **Effectiveness of vancomycin plus cloxacillin compared with vancomycin, cloxacillin and daptomycin single therapies in the treatment of methicillin-resistant and methicillin-susceptible Staphylococcus aureus in a rabbit model of experimental endocarditis**. *Journal Of Antimicrobial Chemotherapy.* 76(6):1539-1546. Q1

12. Domenech-Ximenos B, Sanz-de la Garza M, Sepulveda-Martinez Á, Lorenzatti D, Simard F, Crispi F, Perea RJ, Prat-Gonzalez S, Sitges M . **Assessment of myocardial deformation with CMR: a comparison with ultrasound speckle tracking.** *European Radiology.* 31(10):7242-7250. Q1

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Cruz-González I, Andraka L, Goicolea J, Ruíz-Quevedo V, Díez JL, Berenguer A, Baz JA, Pan M, Benito-González T, Briales JHA, Li CH, Sanchis L, Serrador A, Jiménez-Quevedo P, Avanzas P, Salido L, Fernández-Vázquez F, Hernández-García JM, Arzamendi D. **Percutaneous Mitral Valve Repair: Outcome Improvement with Operator Experience and a Second-Generation Device.** *Journal Of Clinical Medicine.* 10(4):734. Q1

17. Trejo-Velasco, Blanca; Estevez-Loureiro, Rodrigo; Carrasco-Chinchilla, Fernando; Fernandez-Vazquez, Felipe; Arzamendi, Dabit; Pan, Manuel; Pascual, Isaac; Nombela-Franco, Luis; Amat-Santos, Ignacio J.; Freixa, Xavier; Hernandez-Antolin, Rosa Ana; Trillo-Nouche, Ramiro; Andraka Ikazuriaga, Leire; Lopez-Minguez, Jose R.; Sanmiguel Cervera, Dario; Sanchis, Juan; Diez-Gil, Jose Luis; Ruiz-Quevedo, Valeriano; Urbano-Carrillo, Cristobal; Becerra-Munoz, Victor Manuel; Benito-Gonzalez, Tomas; Li, Chi Hion; Mesa, Dolores; Avanzas, Pablo; Armijo, German; Serrador-Frutos, Ana Maria; Sanchis, Laura; Loban, Covadonga Fernandez-Golfin; Cid-Alvarez, Belen; Hernandez-Garcia, Jose Maria; Garrote-Coloma, Carmen; Fernandez-Peregrina, Estefania; Romero, Miguel; Leon Arguero, Victor; Cruz-Gonzalez, Ignacio. **Prognostic Role of TAPSE to PASP Ratio in Patients Undergoing MitraClip Procedure.** *Journal Of Clinical Medicine.* 10(5):1006. Q1

18. Cepas-Guillen PL; Mancera JCdlF; Bofarull JG; Farrero M; Regueiro A; Brugaletta S; Ibañez C; Sanchis L; Sitges M; Sabate M; Freixa X. **Initial results after the implementation of an edge-to-edge transcatheter tricuspid valve repair program.** *Journal Of Clinical Medicine.* 10(18):4252. Q1

19. Martinez V, Sanz de la Garza M, Grazioli G, Roca E, Brotons D, Sitges M. **Cardiac adaptation to endurance exercise training: differential impact of swimming and running.** *European Journal Of Sport Science.* 21(6):844-853. Q1

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23. Loncaric F, Marti Castellote PM, Sanchez-Martinez S, Fabijanovic D, Nunno L, Mimbrero M, Sanchis L, Doltra A, Montserrat S, Cikes M, Crispi F, Piella G, Sitges M, Bijnens B. **Automated Pattern Recognition in Whole-Cardiac Cycle Echocardiographic Data - Capturing Functional Phenotypes with Machine Learning.** *Journal Of The American Society Of Echocardiography.* 34(11):1170-1183. Q2

24. Jáuregui B, Soto-Iglesias D, Zucchelli G, Penela D, Ordóñez A, Terés C, Chauca A, Acosta J, Fernández-Armenta J, Linhart M, Perea RJ, Prat-González S, Bosch X, Ortiz-Pérez JT, Mont L, Berruezo A. **Arrhythmogenic substrate detection in chronic ischaemic patients undergoing ventricular tachycardia ablation using multidetector cardiac computed tomography: compared evaluation with cardiac magnetic resonance.** *Europace.* 23(1):82-90. Q2

25. Caixal G, Alarcón F, Althoff TF, Nuñez-Garcia M, Benito EM, Borràs R, Perea RJ, Prat-González S, Garre P, Soto-Iglesias D, Gunturitz C, Cozzari J, Linhart M, Tolosana JM, Arbelo E, Roca-Luque I, Sitges M, Guasch E, Mont L. **Accuracy of left atrial fibrosis detection with cardiac magnetic resonance: correlation of late gadolinium enhancement with endocardial voltage and conduction velocity.** *Europace.* 23(3):380-388. Q2

26. Caixal G, Althoff T, Garre P, Alarcón F, NuñezGarcia M, Benito EM, Borras R, Perea RJ, Prat-González S, Gunturiz C, Sanchez P, Olivas D, Tolosana JM, Arbelo E, Roca-Luque I, Brugada J, Sitges M, Guasch E, Mont L. **Proximity to the descending aorta predicts regional fibrosis in the adjacent left atrial wall: aetiopathogenic and prognostic implications.** *Europace.* 23(10):1559-1567. Q2

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Editorial

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1. Sanchis L, Cepas PL, Pérez Fuentes PR, Carramiñana A, Flores EJ, Farrero M, Regueiro A, Sabaté M, Sitges M, Freixa X. **Amplatzer Vascular Plug III and Interclip Mitral Regurgitation: A Good Alternative When Another Clip Doesn't Fit.** *JACC-Cardiovascular Interventions.* 14(1):e9-e10. D1

2. Sanchis L; Farrero M; Martinez D; Castel MA; Sandoval E; Alcocer J; Regueiro A; Flores-Umanzor E; Cepas-Guillen P; Sabaté M; Sitges M; Freixa X. **Anatomical Fusion of MitraClip Device With Native Mitral Apparatus: Insights From an Explanted Human Heart.** *JACC-Cardiovascular Interventions.* 14(11):1257-1258. D1

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K; Lancellotti, P; Borger, MA; Forrest, JK; Webb, J; Milewicz, DM; Makkar, R; Leon, MB; Sanders, SP; Markl, M; Ferrari, VA; Roberts, WC; Song, JK; Blanke, P; White, CS; Siu, S; Svensson, LG; Braverman, AC; Bavaria, J; Sundt, TM; El Khoury, G; De Paulis, R; Enriquez-Sarano, M; Bax, JJ; Otto, CM; Schafers, HJ. **International Consensus Statement on Nomenclature and Classification of the Congenital Bicuspid Aortic Valve and Its Aortopathy, for Clinical, Surgical, Interventional and Research Purposes.** *Annals Of Thoracic Surgery.* 112(3):e203-e235. Q1

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Consortium Publications

1. Visseren FLJ; Mach F; Smulders YM; Carballo D; Koskinas KC; Bäck M; Benetos A; Biffi A; Boavida JM; Capodanno D; Cosyns B; Crawford C; Davos CH; Desormais I; Di Angelantonio E; Franco OH; Halvorsen S; Hobbs FDR; Hollander M; Jankowska EA; Michal M; Sacco S; Sattar N; Tokgozoglu L; Tonstad S; Tsioufis KP; van Dis I; van Gelder IC; Wanner C; Williams B; ESC National Cardiac Societies; ESC Scientific Document Group ESC National Cardiac Societies; ESC Scientific Document Group. **2021 ESC Guidelines on cardiovascular disease prevention in clinical practice**. *European Heart Journal.* 42(34):3227-3337. D1

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8. Gutierrez-Villanueva, A; Munoz, P; Delgado-Montero, A; Olmedo-Samperio, M; de Alarcon, A; Gutierrez-Carretero, E; Zarauza, J; Pares, DGI; Goenaga, MA; Ojeda-Burgos, G; Goikoetxea-Agirre, AJ; Reguera-Iglesias, JM; Ramos, A; Fernandez-Cruz, A. **Mural Endocarditis: The GAMES Registry Series and Review of the Literature.** *Infectious Diseases And Therapy.* 10(4):2749-2764. Q1

9. Vahanian A; Beyersdorf F; Praz F; Milojevic M; Baldus S; Bauersachs J; Capodanno D; Conradi L; De Bonis M; De Paulis R; Delgado V; Freemantle N; Gilard M; Haugaa KH; Jeppsson A; Jüni P; Pierard L; Prendergast BD; Sádaba JR; Tribouilloy C; Wojakowski W; ESC/EACTS Scientific Document Group ESC/EACTS Scientific Document Group. **2021 ESC/EACTS Guidelines for the management of valvular heart disease.** *European Journal Of Cardio-Thoracic Surgery.* 60(4):727-800. Q1

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12. Escrihuela-Vidal F, López-Cortés LE, Escolà-Vergé L, De Alarcón González A, Cuervo G, Sánchez-Porto A, Fernández-Hidalgo N, Luque R, Montejo M, Miró JM, Goenaga MÁ, Muñoz P, Valerio M, Ripa M, Sousa-Regueiro D, Gurguí M, Fariñas-Alvarez MC, Mateu L, García Vázquez E, Gálvez-Acebal J, Carratalà J, Grupo de Apoyo al Manejo de la Endocarditis Infecciosa en España (GAMES) Cohort Investigators and the Barcelona Endocarditis Study Team (BEST) . **Clinical Features and Outcomes of Streptococcus anginosus Group**

Infective Endocarditis: A Multicenter Matched Cohort Study. Open Forum Infectious Diseases. 8(6):ofab163. Q2

GRANTS FOR RESEARCH IN PROGRESS

Doltra A. **Cooperación clínico-técnica para la predicción precoz de fibrilación auricular: hacia un abordaje personalizado integral.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/01131
Duration: 01/01/2018-30/06/2022

Ortíz-Pérez JT. **Therapeutic targeting of the neutrophil clock in cardiovascular disease.**
Sponsored by: Fundació Bancaria "La Caixa". HealthRes17-00527
Duration: 05/11/2018-04/11/2022

Ortiz-Pérez JT. **La interacció entre els sistemes ACE2 i AXL per predir la gravetat i els resultats de la malaltia COVID-19.**
Sponsored by: Fundació la Marató de TV3. TV3_COVID19_21
Duration: 23/09/2021-22/09/2024

Sitges M. **Personalized In-Silico Cardiology.**
Sponsored by: European Commission. CE_H2020-MSCA-ITN-17
Duration: 01/09/2017-28/02/2022

DOCTORAL THESIS

Sitges M, Sanz de La Garza M. **Extended remodeling of the right ventricle and pulmonary circulation in endurance athletes: insights from cardiac magnetic resonance.**
PhD student: Blanca Domenech Ximenos

Sitges M, Bijnens B. **Phenotyping of Left Ventricular Hypertrophy using Etiology-Discriminative Deformation Imaging and Data Integration.**
PhD student: Filip Loncaric

Berruezo A, Doltra A. **Utilidad de la caracterización de la cicatriz miocárdica basada en realce tardío con gadolinio en el tratamiento de arritmias cardiacas: Valor pronóstico e impacto en la práctica clínica.**
PhD student: Markus Linhart

2.18 Applied research in infectious respiratory diseases and critically ill patients

LOCATION
CELLEX building, floor 2B

KEYWORDS
1. **Respiratory infections**
2. **Mechanical ventilation**
3. **Pneumonia**
4. **COVID 19**
5. **COPD, bronchiectasis**
6. **Breathing disturbances in sleep**

RELATED DISEASES
1. **Pulmonary infections, respiratory infections**
2. **Community-acquired pneumònia**
3. **Ventilator-associated pneumonia**
4. **COPD: Chronic Obstructive Pulmonary Diseases**
5. **Bronchiectasis**
6. **Lower respiratory tract infection**
7. **Acute respiratory distress syndrome**

GROUP INVOLVED IN
CIBERES
AGAUR_SGR17: 00787

AWARDS
ICREA Academy
Awardee/s: Antoni Torres

Original publications

TOTAL	45
Mean IF	8,99
Q1	69%
D1	22%
MA	47%
OA	78%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The group focuses its research on the causes, diseased tissue, diagnosis and treatment of respiratory infections in the community and in intensive care, and especially in patients receiving mechanical ventilation. In the 2020 we have included COVID-19 pneumonia and ARDS.

In the 2020 we have included COVID-19 pneumonia and ARDS.

APPROACH

The group's approach is completely translational: it studies respiratory infections based on cell and molecular responses to obtain clinical results, which include pig models.

The group has coordinated and taken part in international guidelines and clinical trials with EMBARC (the European Bronchiectasis Registry). It has also conducted systematic reviews and meta-analyses to improve the evidence-based medical knowledge of respiratory diseases.

This has included COVID-19 management recommendations.

IMPACT

The group has described measures for preventing nosocomial pneumonia and criteria for admitting patients with community-acquired pneumonia to the intensive care unit (ICU) that have been universally adopted.

Furthermore, the research conducted has made it possible to put into practice new therapeutic approaches using advanced genetic bioengineering techniques, in collaboration with the Centre for Genomic Regulation (GRC).

In addition to that we have investigated extensively COVID-19 ICU admitted patients, thanks to an important grants from Generalitat de Catalunya (BIOCAT) and ISCIII (CiberEs).

RESEARCH LINES

- Epidemiology, prevention and new treatments of pneumonias associated with artificial ventilation and new methods of fast diagnosis.

- Epidemiology and diagnosis of community-acquired pneumonia.

- Etiopathogenesis, bronchial infection and inflammation in the patient with chronic obstructive pulmonary disease (COPD).

- Chronic pulmonary infections.

- Infectious lung complications in immune depressed patients.

- Invasive and noninvasive mechanical ventilation.

- Porcine model of acute pulmonary damage due to methicillinresistant P. Aeruginosa, S. Aureus and S. pneumoniae.

- Translational research laboratory for the microbiology diagnosis and pathogen-host response in respiratory infections.

- Covid-19 Pneumonia and ARDS: Risk and prognostic factors using a multicentre approach. Inflammatory and genetics pathways.

- Chronic sleep apnea.

PUBLICATIONS

Originals

1. Rouze A, Martin-Loeches I, Povoa P, Metzelard M, Du Cheyron D, Lambiotte F, Tamion F, Labruyere M, Boulle Geronimi C, Nieszkowska A, Nyunga M, Pouly O, Thille AW, Megarbane B, Saade A, Diaz E, Magira E, Llitjos JF, Cilloniz C, Ioannidou I, Pierre A, Reignier J, Garot D, Kreitmann L, Baudel JL, Fartoukh M, Plantefeve G, Beurton A, Asfar P, Boyer A, Mekontso-Dessap A, Makris D, Vinsonneau C, Floch PE, Weiss N, Ceccato A, Artigas A, Bouchereau M, Duhamel A, Labreuche J, Nseir S, coVAPid study group. **Early Bacterial Identification Among Intubated Patients with COVID-19 or Influenza Pneumonia: A European Multicenter Comparative Cohort Study.** *American Journal Of Respiratory And Critical Care Medicine.* 204(5):546-556. D1

2. Rouzé A, Martin-Loeches I, Povoa P, Makris D, Artigas A, Bouchereau M, Lambiotte F, Metzelard M, Cuchet P, Boulle Geronimi C, Labruyere M, Tamion F, Nyunga M, Luyt CE, Labreuche J, Pouly O, Bardin J, Saade A, Asfar P, Baudel JL, Beurton A, Garot D, Ioannidou I, Kreitmann L, Llitjos JF, Magira E, Mégarbane B, Meguerditchian D, Moglia E, Mekontso-Dessap A, Reignier J, Turpin M, Pierre A, Plantefeve G, Vinsonneau C, Floch PE, Weiss N, Ceccato A, Torres A, Duhamel A, Nseir S, coVAPid study Group. **Relationship between SARS-CoV-2 infection and the incidence of ventilator-associated lower respiratory tract infections: a European multicenter cohort study**. *Intensive Care Medicine.* 47(2):188-198. D1

3. Motos A, López-Gavín A, Riera J, Ceccato A, Fernández-Barat L, Bermejo-Martin JF, Ferrer R, de Gonzalo-Calvo D, Menéndez R, Pérez-Arnal R, García-Gasulla D, Rodriguez A, Peñuelas O, Lorente JÁ, Almansa R, Gabarrus A, Marin-Corral J, Ricart P, Roche-Campo F, Sancho Chinesta S, Socias L, Barbé F, Torres A, CIBERESUCICOVID Project (COV20/00110, ISCIII). **Higher frequency of comorbidities in fully vaccinated patients admitted to ICU due to severe COVID-19: a prospective, multicenter, observational study.** *European Respiratory Journal.* 59(2):2102275. D1

4. Amaro R, Li Bassi G, Motos A, Fernandez-Barat L, Aguilera Xiol E, Rigol M, Frigola G, Travierso C, Bobi J, Pagliara F, Carbonara M, Comaru T, Chiurazzi C, Yang M, Yang H, Arrieta M, Marti JD, De Rosa F, Saco MA, Rinaudo M, Terraneo S, Schultz MJ, Nicolau DP, Artigas A, Ramirez J, Torres A. **Development and characterization of a new swine model of invasive pneumococcal pneumonia.** *Lab Animal.* 50(11):327-335. D1

5. González J, Benítez ID, Carmona P, Santisteve S, Monge A, Moncusí-Moix A, Gort-Paniello C, Pinilla L, Carratalá A, Zuil M, Ferrer R, Ceccato A, Fernández L, Motos A, Riera J, Menéndez R, Garcia-Gasulla D, Peñuelas O, Bermejo-Martin JF, Labarca G, Caballero J, Torres G, de Gonzalo-Calvo D, Torres A, Barbé F, CIBERESUCICOVID Project (COV20/00110, ISCIII). **Pulmonary Function and Radiologic Features in Survivors of Critical COVID-19: A 3-Month Prospective Cohort.** *Chest.* 160(1):187-198. D1

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Consortium Publications

1. Ambrosioni J, Blanco JL, Reyes-Urueña JM, Davies MA, Sued O, Marcos MA, Martínez E, Bertagnolio S, Alcamí J, Miro JM, COVID-19 in HIV Investigators. **Overview of SARS-CoV-2 infection in adults living with HIV.** *Lancet HIV.* 8(5):e294-e305. D1

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3. Garcia-Vidal C, Sanjuan G, Moreno-García E, Puerta-Alcalde P, Garcia-Pouton N, Chumbita M, Fernandez-Pittol M, Pitart C, Inciarte A, Bodro M, Morata L, Ambrosioni J, Grafia I, Meira F, Macaya I, Cardozo C, Casals C, Tellez A, Castro P, Marco F, García F, Mensa J, Martínez JA, Soriano A, COVID-19 Researchers Group. **Incidence of co-infections and superinfections in hospitalised patients with COVID-19: a retrospective cohort study.** *Clinical Microbiology And Infection.* 27(1):83-88. D1

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GRANTS FOR RESEARCH IN PROGRESS

Cillóniz C, Soler N. **Fenotipos relacionados con la evolución clínica a corto y largo plazo en la neumonía adquirida en la comunidad.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00207
Duration: 01/01/2020-31/12/2022

Ferrer M. **Driving Pressure e Inflamación en el Síndrome de Distress Respiratorio Agudo.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00974
Duration: 01/01/2019-31/12/2022

Soler N. **Dinámica del microbioma pulmonar en la agudización neumónica y no neumónica de la EPOC y uso como potencial diana terapéutica: estudio discriminativo con TAC torácica de baja radiación.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/00803
Duration: 01/01/2017-30/06/2021

Torres A. **Fisiopatologia i tractament de les malalties respiratòries.**
Sponsored by: Generalitat de Catalunya. AGAUR_SGR17_00787
Duration: 01/01/2017-30/09/2021

Torres A. **Pulmonary and cardiac injury caused by severe pneumococcal pneumonia: appraisal of the benefits of corticosteroids and macrolides.**
Sponsored by: Fundació La Marató de TV3. Infeccioses_18
Duration: 29/03/2019-28/03/2022

Torres A. **Bacterial lung chassis for treating human lung infectious diseases.**
Sponsored by: Fundació Bancaria "La Caixa". HealthRes18-00058
Duration: 15/09/2019-14/09/2022

Torres A, Fernández-Barat L. **Importancia de las biopelículas de Pseudomonas aeruginosa en las agudizaciones en pacientes con bronquiectasias con y sin enfermedad pulmonar obstructiva crónica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00145
Duration: 01/01/2019-30/06/2023

Torres A. **Factores de riesgo, pronóstico personalizado y seguimiento de los enfermos ingresados en las unidades de Cuidados Intensivos Españolas infectados por el virus SARS-CoV2; CIBERESUCICOVID-PLUS.**
Sponsored by: : Instituto de Salud Carlos III (ISCIII)_UNESPA
Duration: 01/01/2021-31/12/2024

Torres A. **Academic Partners of COMBACTE.**
Sponsored by: European Commission. CE_IMI12_8th_2stg
Duration: 01/01/2013-31/10/2023

Torres A. **Combatting Bacterial Resistance in Europe - Molecules Against Gram Negative Infections.**
Sponsored by: European Commission. CE_IMI13_11th_2stg

Duration: 01/01/2015-31/12/2022
Torres A. **Host-targeted Approaches for the Prevention and the treatment of Hospital-Acquired Pneumonia.**
Sponsored by: European Commission.
CE_H2020-SC1_2019_2s
Duration: 01/01/2020-31/12/2024

DOCTORAL THESES

Torres A, Gimeno-Santos E. **Les aguditzacions com a element crucial en el maneig no farmacològic de les bronquièctasis.**
PhD student: Victoria Alcaraz Serrano



ANNUAL
SCIENTIFIC REPORT
2021

AREA 3

LIVER, DIGESTIVE SYSTEM AND METABOLISM

3

Foto: **Verónica Pablo Fontecha**

AREA 3

LIVER, DIGESTIVE SYSTEM AND METABOLISM

3.1 **Hepatic oncology (BCLC)**
Jordi Bruix

3.2 **Translational colorectal cancer genomics**
Jordi Camps

3.3 **Gastrointestinal and pancreatic oncology**
Antoni Castells

3.4 **Genetic predisposition to gastrointestinal cancer**
Sergi Castellví

3.5 **Neuronal control of metabolism (NeuCoMe)**
Marc Claret

3.6 **Inflammation and liver disease**
Joan Clària

3.7 **Translational control in liver disease and cancer**
Mercedes Fernández Lobato

3.8 **Mitochondrial regulation of cell death and steatohepatitis**
José Carlos Fernández-Checa

3.9 **Gene therapy and cancer**
Cristina Fillat

3.10 **Liver transplantation and graft viability**
Constantino Fondevila

3.11 **Viral toxic and metabolic hepatopathies**
Xavi Forns

3.12 **Regulation of liver microcirculation in cirrhosis and hepatic vascular diseases**
Joan Carles García Pagán

3.13 **Chronic liver diseases molecular mechanisms and clinical consequences**
Pere Ginès

3.14 **Liver vascular biology**
Jordi Gràcia

3.15 **Fetal and perinatal medicine**
Eduard Gratacós

3.16 **Metabolic bone disease**
Núria Guañabens

3.17 **Endocrine disorders: crosstalk between molecular, metabolic and therapeutic determinants**
Felicia Hanzu

3.18 **Translational research in hepatic oncology**
Josep Maria Llovet

3.19 **Gynecological endocrinology and human reproduction**
Mª Angels Martinez

3.20 **Hepatocellular signaling and cancer**
Albert Morales

3.21 **Translational research group in new therapeutic and diagnostic strategies in liver diseases**
Manuel Morales

3.22 **Pathogenesis and prevention of diabetes**
Anna Novials

3.23 **Cholestasis**
Albert Parés

3.24 **Protective strategies against hepatic ischemia reperfusion injury**
Carmen Peralta

3.25 **Inherited metabolic diseases**
Antonia Ribes

3.26 **Inflammatory bowel disease**
Azucena Salas

3.27 **Liver cell plasticity and tissue repair**
Pau Sancho

3.28 **Pathogenesis and treatment of autoimmunity**
Pere Santamaria

3.29 **Translational research in diabetes lipids and obesity**
Josep Vidal

3.1 Hepatic oncology (BCLC)

LOCATION
CEK building, floor 3
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KEYWORDS
1. **Hepatocellular carcinoma**
2. **Cholangiocarcinoma**
3. **Rare hepatic tumors**
4. **Biomarkers**
5. **Outcome research**

RELATED DISEASES
1. **Chronic liver disease**

GROUP INVOLVED IN
AGAUR_SGR17: 01465
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AWARDS
Top 1% most cited researcher globally
Institution: Clarivate Analytics
Awardee/s: Jordi Bruix

Original publications

TOTAL	23
Mean IF	**11,76**
Q1	**70%**
D1	**48%**
MA	**48%**
OA	**61%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Liver cancer normally affects patients who already have chronic liver disease. Among this risk population, the development of liver cancer is the leading cause of death. This group studies the epidemiological, molecular, diagnostic and therapeutic aspects of this disease.

In our region, liver cancer represents 10 new cases per 100,000 inhabitants per year whereas in global terms, this type of tumour is the second leading cause of death by cancer.

Depending on the approach area (risk factors, diagnosis, treatment), it is necessary to involve a combination of the diverse specialists who form part of the group (hepatologists, surgeons, radiologists, pathologists, oncologists and nurses) and implement the technologies that fall within their expertise.

APPROACH

The group is developing tools to predict which patients may develop cancer and to improve early detection plans, as well as investigating the mechanisms of action of new treatments and their efficiency in reducing the risk of recurrence after cancer treatment and in increasing the patient's survival rate at advanced stages. All of the above is combined with education designed to empower patients.

The group leads international studies that involve centres from all over the world. This makes it possible to generate evidence, within the contexts of research and real life alike.

IMPACT

The group has established non-invasive diagnostic criteria, but it is necessary to improve their sensitivity to tumours of less than 2 cm in size. Imaging tools must be developed to establish the molecular profile of the tumours and their prognosis, without the need for biopsies. And educational tools are needed to ensure that patients are fully integrated into the entire process.

The group has led national and international studies to evaluate new treatment options and define the best candidates. It is necessary to continue investigating new agents that can reduce the risk of postoperative recurrence and new alternatives for increasing patient survival at advanced stages, by conducting clinical trials.

RESEARCH LINES

- Epidemiology and risk factors for liver cancer
- Diagnosis and staging
- Surgery for liver cancer
- Locoregional therapy
- Adjuvant therapy
- Systemic therapy
- Intrahepatic colangiocarcinoma
- Rare hepatic tumors
- Research in nursing

PUBLICATIONS

Originals

1. Kelley RK; Sangro B; Harris W; Ikeda M; Okusaka T; Kang YK; Qin S; Tai DW; Lim HY; Yau T; Yong WP; Cheng AL; Gasbarrini A; Damian S; Bruix J; Borad M; Bendell J; Kim TY; Standifer N; He P; Makowsky M; Negro A; Kudo M; Abou-Alfa GK. **Safety, Efficacy, and Pharmacodynamics of Tremelimumab Plus Durvalumab for Patients With Unresectable Hepatocellular Carcinoma: Randomized Expansion of a Phase I/II Study.** *Journal of Clinical Oncology.* 39(27):2991-3001. D1

2. Conde de la Rosa L, Garcia-Ruiz C, Vallejo C, Baulies A, Nuñez S, Monte MJ, Marin JJG, Baila-Rueda L, Cenarro A, Civeira F, Fuster J, Garcia-Valdecasas JC, Ferrer J, Karin M, Ribas V, Fernandez-Checa JC. **STARD1 promotes NASH-driven HCC by sustaining the generation of bile acids through the alternative mitochondrial pathway.** *Journal of Hepatology.* 74(6):1429-1441. D1

3. Kudo M, Matilla A, Santoro A, Melero I, Gracián AC, Acosta-Rivera M, Choo SP, El-Khoueiry AB, Kuromatsu R, El-Rayes B, Numata K, Itoh Y, Di Costanzo F, Crysler O, Reig M, Shen Y, Neely J, Tschaika M, Wisniewski T, Sangro B. **CheckMate 040 Cohort 5: A phase I/II study of nivolumab in patients with advanced hepatocellular carcinoma and Child-Pugh B cirrhosis.** *Journal of Hepatology.* 75(3):600-609. D1

4. Ferrer-Fàbrega J, Sampson-Dávila J, Forner A, Sapena V, Díaz A, Vilana R, Navasa M, Fondevila C, Miquel R, Ayuso C, García-Valdecasas JC, Bruix J, Reig M, Fuster J. **Limited tumor progression beyond Milan criteria while on the waiting list does not result in unacceptable impairment of survival.** *Journal of Hepatology.* 75(5):1154-1163. D1

5. Sanduzzi-Zamparelli M, Mariño Z, Lens S, Sapena V, Iserte G, Pla A, Granel N, Bartres C, Llarch N, Vilana R, Nuñez I, Darnell A, Belmonte E, García-Criado A, Díaz A, Muñoz-Martinez S, Ayuso C, Bianchi L, Fuster-Anglada C, Rimola J, Forner A, Torres F, Bruix J, Forns X, Reig M. **Liver cancer risk after HCV cure in patients with advanced liver disease without non-characterized nodules.** *Journal of Hepatology.* S0168-8278(21):02228-5. D1

6. Lamarca A; Santos-Laso A; Utpatel K; la Casta A; Stock S; Forner A; Adeva J; Folseraas T; Fabris L; Macias R; Krawczyk M; Krawczyk M; Cardinale V; Braconi C; Alvaro D; Evert M; Banales JM; Valle JW; Grp Behalf European Network Study. **Liver Metastases of Intrahepatic Cholangiocarcinoma: Implications for an Updated Staging System.** *Hepatology.* 73(6):2311-2325. D1

7. Pinato DJ, Murray SM, Forner A, Kaneko T, Fessas P, Toniutto P, Mínguez B, Cacciato V, Avellini C, Diaz A, Boyton RJ, Altmann DM, Goldin RD, Akarca AU, Marafioti T, Mauri FA, Casagrande E, Grillo F, Giannini E, Bhoori S, Mazzaferro V. **Trans-arterial chemoembolization as a loco-regional inducer of immunogenic cell death in hepatocellular carcinoma: implications for immunotherapy.** *Journal for Immunotherapy of Cancer.* 9(9):e003311. D1

8. Ventura-Aguiar P, Ferrer J, Paredes D, Rodriguez-Villar C, Ruiz A, Fuster J, Fondevila C, Garcia-Valdecasas JC, Esmatjes E, Adália R, Oppenheimer F, Campistol JM, Diekmann F, Ricart MJ. **Outcomes From Brain Death Donors With Previous Cardiac Arrest Accepted for Pancreas Transplantation: A Single-center Retrospective Analysis.** *Annals of Surgery.* 273(6):e230-e238. D1

9. Bossuyt, P; Dreesen, E; Rimola, J; Devuysere, S; De Bruecker, Y; Vanslembrouck, R; Laurent, V; Zappa, M; Savoye-Collet, C; Pariente, B; Filippi, J; Baert, F; D'Haens, G; Laharie, D; Peyrin-Biroulet, L; Vermeire, S. **Infliximab Exposure Associates With Radiologic Evidence of Healing in Patients With Crohn's Disease**. *Clinical Gastroenterology and Hepatology.* 19(5):947- 954.e2. D1

10. Cucarull B, Tutusaus A, Hernáez-Alsina T, García de Frutos P, Reig M, Colell A, Marí M, Morales A. **Antioxidants Threaten Multikinase Inhibitor Efficacy against Liver Cancer by Blocking Mitochondrial Reactive Oxygen Species.** *Antioxidants.* 10(9):1336. D1

11. Iavarone M, Invernizzi F, Ivanics T, Mazza S, Zavaglia C, Sanduzzi-Zamparelli M, Fraile-López M, Czauderna C, Di Costanzo G, Bhoori S, Pinter M, Manini MA, Amaddeo G, Yunquera AF, Piñero F, Blanco Rodríguez MJ, Anders M, Aballay Soteras G, Villadsen GE, Yoon PD, Cesarini L, Díaz-González Á, González-Diéguez ML, Tortora R, Weinmann A, Mazzaferro V, Romero Cristóbal M, Crespo G, Regnault H, De Giorgio M, Varela M, Prince R, Scudeller L, Donato MF, Wörns MA, Bruix J, Sapisochin G, Lampertico P, Reig M. **Regorafenib efficacy after sorafenib in patients with recurrent HCC after liver transplantation: a retrospective study.** *Liver Transplantation.* 27(12):1767-1778. D1

12. Fernández-Tussy P, Rodríguez-Agudo R, Fernández-Ramos D, Barbier-Torres L, Zubiete-Franco I, Davalillo SL, Herraez E, Goikoetxea-Usandizaga N, Lachiondo-Ortega S, Simón J, Lopitz-Otsoa F, Juan VG, McCain MV, Perugorria MJ, Mabe J, Navasa N, Rodrigues CMP, Fabregat I, Boix L, Sapena V, Anguita J, Lu SC, Mato JM, Banales JM, Villa E, Reeves HL, Bruix J, Reig M, Marin JJG, Delgado TC, Martínez-Chantar ML. **Anti-miR-518d-5p overcomes liver tumor cell death resistance through mitochondrial activity.** *Cell Death & Disease.* 12(6):555. Q1

13. Corominas J, Sapena V, Sanduzzi-Zamparelli M, Millán C, Samper E, Llarch N, Iserte G, Torres F, Da Fonseca LG, Muñoz-Martínez S, Forner A, Bruix J, Boix L, Reig M. **Activated Lymphocytes and Increased Risk of Dermatologic Adverse Events during Sorafenib Therapy for Hepatocellular Carcinoma.** *Cancers.* 13(3):426. Q1

14. Osorio-Conles Ó; Vega-Beyhart A; Ibarzabal A; Balibrea JM; Graupera I; Rimola J; Vidal J; de Hollanda A. **A distinctive NAFLD signature in adipose tissue from women with severe obesity.** *International Journal of Molecular Sciences.* 22(19):10541. Q1

15. Darnell A, Rimola J, Belmonte E, Ripoll E, Garcia-Criado Á, Caparroz C, Díaz-González Á, Vilana R, Reig M, Ayuso C, Bruix J, Forner A. **Evaluation of LI-RADS 3 category by magnetic resonance in US-detected nodules ≤ 2 cm in cirrhotic patients.** *European Radiology.* 31(7):4794-4803. Q1

16. Ferrer-Fàbrega J, Cano-Vargas B, Ventura-Aguiar P, Cárdenas G, García-Criado Á, López-Boado MA, Rull R, García R, Cuatrecasas M, Esmatjes E, Diekmann F, Fondevila C, Ricart MJ, Fernández-Cruz L,

Fuster J, García-Valdecasas JC. **Early intestinal complications following pancreas transplantation: Lessons learned from over 300 cases.** *Transplant International.* 34(1):139-152. Q1

17. Reig M, Galle PR, Kudo M, Finn R, Llovet JM, Metti AL, Schelman WR, Liang K, Wang C, Widau RC, Abada P, Zhu AX. **Pattern of progression in advanced hepatocellular carcinoma treated with ramucirumab.** *Liver International.* 41(3):598-607. Q2

18. Díaz-González Á, Sapena V, Boix L, Torres F, Sanduzzi-Zamparelli M, Da Fonseca LG, LLarch N, Iserte G, Guedes C, Muñoz-Martínez S, Darnell A, Belmonte E, Rimola J, Forner A, Ayuso C, Bruix J, Reig M. **Early diarrhoea under sorafenib as a marker to consider the early migration to second-line drugs**. *United European Gastroenterology Journal.* 9(6):655-661. Q2

19. Rimola J, Da Fonseca LG, Sapena V, Perelló C, Guerrero A, Simó MT, Pons M, De La Torre-Aláez M, Márquez L, Calleja JL, Lledó JL, Varela M, Mínguez B, Sangro B, Matilla A, Torres F, Ayuso C, Bruix J, Reig M. **Radiological response to nivolumab in patients with hepatocellular carcinoma: A multicenter analysis of real-life practice.** *European Journal of Radiology.* 135(109484):109484. Q2

20. Bilreiro C, Soler JC, Ayuso JR, Caseiro-Alves F, Ayuso C. **Diagnostic value of morphological enhancement patterns in the hepatobiliary phase of gadoxetic acid-enhanced MRI to distinguish focal nodular hyperplasia from hepatocellular adenoma.** *Radiología Médica.* 126(11):1379-1387. Q2

21. Ausania F, Sanchez-Cabus S, Senra Del Rio P, Borin A, Ayuso JR, Bodenlle P, Espinoza S, Cuatrecasas M, Conill C, Saurí T, Ferrer J, Fuster J, García-Valdecasas JC, Melendez R, Fondevila C. **Clinical impact of preoperative tumour contact with superior mesenteric-portal vein in patients with resectable pancreatic head cancer.** *Langenbecks Archives of Surgery*. 406(5):1443-1452. Q2

22. Hofheinz RD; Bruix J; Demetri GD; Grothey A; Marian M; Bartsch J; Odom D.**Effect of Regorafenib in Delaying Definitive Deterioration in Health-Related Quality of Life in Patients with Advanced Cancer of Three Different Tumor Types.** *Cancer Management and Research.* 13(13):5523-5533. Q3

23. Díaz-González Á, Belmonte E, Sapena V, Sanduzzi-Zamparelli M, Darnell A, Díaz A, Gomes da Fonseca L, Llarch N, Iserte G, Ayuso C, Forner A, Feu F, Bruix J, Rimola J, Reig M. **Pancreatic Insufficiency in Patients Under Sorafenib Treatment for Hepatocellular Carcinoma.** *Journal of Clinical Gastroenterology.* 55(3):263-270. Q3

Review

1. Bruix J. **End-points in clinical trials for liver cancer and their value in evidence based clinical decision making: an unresolved Gordian knot.** *Journal of Hepatology.* 74(6):1483-1488. D1

2. Reig M, Cabibbo G. **Antiviral therapy in the palliative setting of HCC (BCLC B and C).** *Journal of Hepatology.* 74(5):1225-1233. D1

3. Bruix J; Chan SL; Galle PR; Rimassa L; Sangro B. **Systemic treatment of hepatocellular carcinoma**. *Journal of Hepatology.* 75(4):960-974. D1

4. Kloeckner R; Galle PR; Bruix J. **Local and Regional Therapies for Hepatocellular Carcinoma.** *Hepatology*. 73:137-149. D1

5. Gonzalez-Sanchez E; Vaquero J; Férnandez-Barrena MG; Lasarte JJ; Avila MA; Sarobe P; Reig M; Calvo M; Fabregat I. **The tgf-β pathway: A pharmacological target in hepatocellular carcinoma?** *Cancers.* 13(13):3248. Q1

6. Muñoz-Martínez S, Iserte G, Sanduzzi-Zamparelli M, Llarch N, Reig M. **Current pharmacological treatment of hepatocellular carcinoma.** *Current Opinion in Pharmacology.* 60(60):141-148. Q1

7. Jauregui-Amezaga, A; Rimola, J. **Role of Intestinal Ultrasound in the Management of Patients with Inflammatory Bowel Disease.** *Life.* 11(7):603. Q2

8. Ramírez-Maldonado E, García-Pérez R, Ferrer-Fàbrega J, Sapena V, Fuster J, García-Valdecasas JC. **Missing colorectal liver metastases: the surgical challenge.** *Langenbecks Archives of Surgery.* 406(7):2163-2175. Q2

9. Wege H, Schulze K, von Felden J, Calderaro J, Reig M, rare liver tumors working group of the European Reference Network on Hepatological Diseases (ERN RARE-LIVER). **Rare variants of primary liver cancer: Fibrolamellar, combined, and sarcomatoid hepatocellular carcinomas.** *European Journal of Medical Genetics.* 64(11):104313. Q3

Letters

1. Lamarca, A; Santos-Laso, A; Utpatel, K; La Casta, A; Stock, S; Forner, A; Adeva, J; Folseraas, T; Fabris, L; Macias, RIR; Krawczyk, M; Krawczyk, M; Cardinale, V; Braconi, C; Alvaro, D; Evert, M; Banales, JM; Valle, JW. **Reply.** *Hepatology*. 74(2):1129-1131. D1

2. Lamarca, A; Santos-Laso, A; Utpatel, K; La Casta, A; Stock, S; Forner, A; Adeva, J; Folseraas, T; Fabris, L; Macias, RIR; Krawczyk, M; Krawczyk, M; Cardinale, V; Braconi, C; Alvaro, D; Evert, M; Banales, JM; Valle, JW. **Reply.** *Hepatology*. 74(4):2319-2321. D1

Editorial

1. Da Fonseca LG; Forner A. **Editorial: aspirin and NSAID for chemoprevention of hepatocellular carcinoma—ready for their use?** *Alimentary Pharmacology & Therapeutics.* 54(6):850-851. D1

2. Muñoz-Martínez S, Forner A. **The tireless search to improve the prognostic assessment of intrahepatic cholangiocarcinoma: An urgent need.** *Liver International.* 41(2):252-254. Q2

3. Rimola J, Forner A. **Hepatobiliary contrast agents in MR: Where we stand and future perspectives.** *Liver International.* 41(5):888-890. Q2

4. Mauro E; Forner A. **Hepatocellular adenoma in men: Is it time for a precision approach?** *Liver International.* 41(10):2246-2248. Q2

Clinical Guidelines

1. Reig M, Forner A, Ávila MA, Ayuso C, Mínguez B, Varela M, Bilbao I, Bilbao JI, Burrel M, Bustamante J, Ferrer J, Gómez MÁ, Llovet JM, De la Mata M, Matilla A, Pardo F, Pastrana MA, Rodríguez-Perálvarez M, Tabernero J, Urbano J, Vera R, Sangro B, Bruix J. **Diagnosis and treatment of hepatocellular carcinoma.** *Medicina Clínica.* 156(9):463.e1-463.e30. Q3

Consortium Publications

1. Solà E, Pose E, Campion D, Piano S, Roux O, Simon-Talero M, Uschner F, de Wit K, Zaccherini G, Alessandria C, Beuers U, Caraceni P, Francoz C, Mookerjee RP, Trebicka J, Vargas V, Serra M, Torres F, Montagnese S, Krag A, Hernaez R, Korenjak M, Watson H, Abraldes JG, Kamath PS, Ginès P, LiverHope Consortium Investigators. **Endpoints and design of clinical trials in patients with decompensated cirrhosis: Position paper of the LiverHope Consortium.** *Journal of Hepatology*. 74(1):200-219. D1

GRANTS FOR RESEARCH IN PROGRESS

Bruix J, Boix L. **The inhibition of miR122 as an early event in the development of hepatocellular carcinoma in patients infected by the hepatitis C Virus. Role of miR122 in the immune system.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00768
Duration: 01/01/2019-31/12/2022

Díaz-Lorca MA, Colmenero J. **Molecular and histological characterization of alloimmune damage against graft after liver transplantation: identification of predictive factors of por prognosis and therapeutic targets.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/01125
Duration: 01/01/2019-30/06/2022

Ferrer-Fàbrega J. **Graft optimization in páncreas transplant: Analysis of histomorphological and functional factors of discarded organs in a multicenter study.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00161
Duration: 01/01/2019-31/12/2022

Forner A. **MRI performance of MRI with gadoxetic acid for the diagnosis and staging of hepatocellular carcinoma. Radiologica-Pathological correlation.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00542
Duration: 01/01/2019-30/06/2023

Reig M. **Importance of the inflammasome in the sensitivity or resistance to tyrosine kinase inhibitors in patients with liver cancer.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00358
Duration: 01/01/2019-31/12/2022

Rimola J. **Measurement of therapeutic response with functional magnetic resonance imaging in Chrohn's disease.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/00721
Duration: 01/01/2017-30/06/2021

Rimola J, Reig M. **Epithelioid Hemangioendothelioma International Network.**
Sponsored by: European Association for the Study of the Liver. INT_EASL_RG_21_01
Duration: 01/09/2021-31/08/2026

Rimola J. **EUCAN Image. A european cáncer image platform linked to biological and health data for next-generation artificial intelligence and precision medicine in oncology.**
Sponsored by: European Union in the Framework of the Public Health Programme. INT_EUCAN
Duration: 01/10/2020-31/10/2024

DOCTORAL THESES

Boix L. **Role of lymphocyte populations along the treatment of advanced hepatocellular carcinoma patients with antiangiogenic agents and immune checkpoint inhibitors.**
PhD Student: Josep Corominas Argente del Castillo

3.2 Translational colorectal cancer genomics

LOCATION
CEK building, floor 4

KEYWORDS
1. **Colorectal cancer**
2. **Cancer Genomics**
3. **Copy-Number Alterations**
4. **Mutational Profiling**
5. **Intratumor Heterogeneity**
6. **Metastasis**
7. **Next-Generation Sequencing**
8. **Machine Learning**

RELATED DISEASES
1. **Colorectal cancer**
2. **Digestive cancer**

GROUP INVOLVED IN
AGAUR_SGR17: 01035

Original publications

TOTAL	3
Mean IF	6,65
Q1	33%
D1	33%
MA	0%
OA	100%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Most tumor cells are characterized by high levels of abnormalities in genes and chromosomes, which favor uncontrolled and invasive cell growth, and can lead to the appearance of metastases.

The goal of our group is to understand the mechanisms of genomic instability and tumor heterogeneity, and to use the genetic information to discover molecular markers that allow us to improve the prognosis and prediction of response to treatments in colorectal cancer.

APPROACH

Currently, genome analysis benefits from the development and application of multi-omics techniques aimed at detecting anything from chromosomal rearrangements to individual changes to nucleotides, and the impact of these on the cell's gene expression.

By using these techniques, we can characterize the genomic profiles of primary colorectal cancers and identify cellular pathways and molecular targets and then model the functional mechanisms involved in the carcinogenesis of colorectal cancer.

IMPACT

The study of genomic alterations and gene expression has allowed the identification of cellular and molecular markers to stratify patients with colorectal cancer according to the probability of developing metastasis, and to determine which patients are less likely to respond to treatment with chemo- and radio-therapy.

These molecular tools will help clinicians to make decisions regarding the course and treatment of patients with this cancer.

RESEARCH LINES

- Clinical applicability of genomic copy-number alterations and aneuploidy.

- Intratumor heterogeneity as a novel biomarker in colorectal cancer.

- Functional consequences of whole-genome doubling and its impact on disease outcome.

PUBLICATIONS

Originals

1. Patkar S; Heselmeyer-Haddad K; Auslander N; Hirsch D; Camps J; Bronder D; Brown M; Chen WD; Lokanga R; Wangsa D; Wangsa D; Hu Y; Lischka A; Braun R; Emons G; Ghadimi BM; Gaedcke J; Grade M; Montagna C; Lazebnik Y; Difilippantonio MJ; Habermann JK; Auer G; Ruppin E; Ried T. **Hard wiring of normal tissue-specific chromosome-wide gene expression levels is an additional factor driving cancer type-specific aneuploidies.** *Genome Medicine.* 13(1):93. D1

2. Archilla I, Díaz-Mercedes S, Aguirre JJ, Tarragona J, Machado I, Rodrigo MT, Lopez-Prades S, Gorostiaga I, Landolfi S, Alén BO, Balaguer F, Castells A, Camps J, Cuatrecasas M. **Lymph Node Tumor Burden Correlates With Tumor Budding and Poorly Differentiated Clusters: A New Prognostic Factor in Colorectal Carcinoma?** *Clinical and Translational Gastroenterology.* 12(3):e00303. Q2

3. Guerrero JA; Pérez-Anker J; Fernández-Esparrach G; Archilla I; Diaz A; Lopez-Prades S; Rodrigo-Calvo M; Lahoz S; Camps J;

Puig S; Malvehy J; Cuatrecasas M. **Ex vivo Fusion Confocal Microscopy of Colorectal Polyps: A Fast Turnaround Time of Pathological Diagnosis.** *Pathobiology*. 88(6):392-399. Q2

GRANTS FOR RESEARCH IN PROGRESS

Camps J. **Genòmica traslacional del càncer colorectal.**
Sponsored by: Generalitat de Catalunya. AGAUR_SGR17_01035
Duration: 01/01/2017-30/09/2021

Camps J, Cuatrecasas M. **Nuevas estrategias para la estratificación del riesgo de recidiva en pacientes con cáncer de colon en estadio II: Integración de perfiles genómicos y carga tumoral ganglionar.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/01304
Duration: 01/01/2018-30/06/2022

Camps J, Cuatrecasas M. **Distribución espacial de alteraciones genómicas en "tumor buds" y grupos de células pobremente diferenciadas en el cáncer colorrectal y su implicación en la evasión inmune y la metástasis.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00863
Duration: 01/01/2021-31/12/2023

Camps J. **Identificación de una firma inmunogénica asociada a la respuesta al tratamiento neoadyuvante del cáncer de recto localizado.**
Sponsored by: Grupo Español Multidisciplinar en Cáncer Digestivo. GEMCAD_18_001
Duration: 10/05/2019-09/05/2021

3.3 Gastrointestinal and pancreatic oncology

LOCATION
CEK building, floor 4

KEYWORDS
1. **Colorectal cancer**
2. **Pancreatic cancer**
3. **Genetics**
4. **Inherited disorders**

RELATED DISEASES
1. **Colorectal cancer**
2. **Pancreatic cancer**
3. **Gastric cancer**

GROUP INVOLVED IN
AGAUR_SGR17: 01035, 00653
CIBEREHD
CIBERER

Original publications

TOTAL	44
Mean IF	8,08
Q1	64%
D1	31%
MA	22%
OA	68%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Gastrointestinal and pancreatic neoplasms are among the most common cancers in the western world, and among those that cause the highest number of deaths. Paradoxically, some of them, for instance, colorectal cancer, can easily be prevented as they are usually preceded by premalignant lesions that can be removed, thus preventing their progression to cancer.
Meanwhile, in a small but significant number of cases, the tumour is the result of a hereditary disease and the genes responsible for them are known.

APPROACH

Prevention of colorectal cancer considers several approaches, depending on personal and/or family-related factors that condition its development. Establishing screening programmes among the general public is the most cost-effective measure.

In hereditary forms, genetic counselling and performing genetic studies, where appropriate, make it possible to identify individuals who are carriers of mutations. Lastly, advanced endoscopic techniques promote the detection and eventual removal of the first lesions.

IMPACT

Studies performed by the group have made it possible to ascertain the efficacy of diverse colorectal and pancreatic cancer screening strategies and identify biomarkers derived from tumour molecular alterations. It has also established the best approach for the detection of Lynch syndrome, the main form of hereditary colorectal cancer.

Lastly, many clinical studies have contributed to defining the indications and outcomes of different endoscopic and surgical techniques for the diagnosis and treatment of these neoplasms.

RESEARCH LINES

- Colorectal cancer screening and surveillance.

- Genetics and epigenetics of gastrointestinal and pancreatic cancer.

- Physiopathology of colorectal and pancreatic cancer.

- Research and innovation in endoscopy.

- Research and innovation in surgery.

PUBLICATIONS

Originals

1. Van Hattem WA; Shahidi N; Vosko S; Hartley I; Britto K; Sidhu M; Bar-Yishay I; Schoeman S; Tate DJ; Byth K; Hewett DG; Pellisé M; Hourigan LF; Moss A; Tutticci N; Bourke MJ. **Piecemeal cold snare polypectomy versus conventional endoscopic mucosal resection for large sessile serrated lesions: a retrospective comparison across two successive periods.** *Gut*. 70(9):1691-1697. D1

2. Huyghe JR, Harrison TA, Bien SA, Hampel H, Figueiredo JC, Schmit SL, Conti DV, Chen S, Qu C, Lin Y, Barfield R, Baron JA, Cross AJ, Diergaarde B, Duggan D, Harlid S, Imaz L, Kang HM, Levine DM, Perduca V, Perez-Cornago A, Sakoda LC, Schumacher FR, Slattery ML, Toland AE, van Duijnhoven FJB, Van Guelpen B, Agudo A, Albanes D, Alonso MH, Anderson K, Arnau-Collell C, Arndt V, Banbury BL, Bassik MC, Berndt SI, Bézieau S, Bishop DT, Boehm J, Boeing H, Boutron-Ruault MC, Brenner H, Brezina S, Buch S, Buchanan DD, Burnett-Hartman A, Caan BJ, Campbell PT, Carr PR, Castells A, Castellví-Bel S, Chan AT, Chang-Claude J, Chanock SJ, Curtis KR, de la Chapelle A, Easton DF, English DR, Feskens EJM, Gala M, Gallinger SJ, Gauderman WJ, Giles GG, Goodman PJ, Grady WM, Grove JS, Gsur A, Gunter MJ, Haile RW, Hampe J, Hoffmeister M, Hopper JL, Hsu WL, Huang WY, Hudson TJ, Jenab M, Jenkins MA, Joshi AD, Keku TO, Kooperberg C, Kühn T, Küry S, Le Marchand L, Lejbkowicz F, Li CI, Li L, Lieb W, Lindblom A, Lindor NM, Männistö S, Markowitz SD, Milne RL, Moreno L, Murphy N, Nassir R, Offit K, Ogino S, Panico S, Parfrey PS, Pearlman R, Pharoah PDP, Phipps AI, Platz EA, Potter JD, Prentice RL, Qi L, Raskin L, Rennert G, Rennert HS, Riboli E, Schafmayer C, Schoen RE, Seminara D, Song M, Su YR, Tangen CM, Thibodeau SN, Thomas DC, Trichopoulou A, Ulrich CM, Visvanathan K, Vodicka P, Vodickova L, Vymetalkova V, Weigl K, Weinstein SJ, White E, Wolk A, Woods MO, Wu AH, Abecasis GR, Nickerson DA, Scacheri PC, Kundaje A, Casey G, Gruber SB, Hsu L, Moreno V, Hayes RB, Newcomb PA, Peters U. **Genetic architectures of proximal and distal colorectal cancer are partly distinct**. *Gut*. 70(7):1325-1334. D1

3. Vennelaganti S, Cuatrecasas M, Vennelaganti P, Kennedy KF, Srinivasan S, Patil DT, Plesec T, Lanas A, Hörndler C, Andraws N, Cherian R, Mathur S, Hassan C, Repici A, Klotz D, Musulen E, Risio M, Castells A, Gupta N, Sharma P. **Moderate Inter-Observer Agreement Among Pathologists in Differentiation of Sessile Serrated From Hyperplastic Polyps.** Gastroenterology. 160(1):452-504. D1

4. Wada Y, Shimada M, Murano T, Takamaru H, Morine Y, Ikemoto T, Saito Y, Balaguer F, Bujanda L, Pellise M, Kato K, Ikematsu H, Goel A. **A Liquid Biopsy Assay for Noninvasive Identification of Lymph Node Metastases in T1 Colorectal Cancer**. *Gastroenterology*. 161(1):151-162.e1. D1

5. Crinò SF, Di Mitri R, Nguyen NQ, Tarantino I, de Nucci G, Deprez PH, Carrara S, Kitano M, Shami VM, Fernández-Esparrach G, Poley JW, Baldaque-Silva F, Itoi T, Manfrin E, Bernardoni L, Gabbrielli A, Conte E, Unti E, Naidu J, Ruszkiewicz A, Amata M, Liotta R, Manes G, Di Nuovo F, Borbath I, Komuta M, Lamonaca L, Rahal D, Hatamaru K, Itonaga M, Rizzatti G, Costamagna G, Inzani F, Curatolo M, Strand DS, Wang AY, Ginès À, Sendino O, Signoretti M, van Driel LMJW, Dolapcsiev K, Matsunami Y, van der Merwe S, van Malenstein H, Locatelli F, Correale L, Scarpa A, Larghi A. **Endoscopic Ultrasound-guided Fine-needle Biopsy With or Without Rapid On-site Evaluation for Diagnosis of Solid Pancreatic Lesions: A Randomized Controlled Non-Inferiority Trial.** *Gastroenterology*. 161(3):899-909.e5. D1

6. Kandimalla R, Xu J, Link A, Matsuyama T, Yamamura K, Parker MI, Uetake H, Balaguer F, Borazanci E, Tsai S, Evans D, Meltzer SJ, Baba H, Brand R, Von Hoff D, Li W, Goel A. **EpiPanGI Dx: A Cell-free DNA Methylation Fingerprint for the Early Detection of Gastrointestinal Cancers.** *Clinical Cancer Research*. 27(22):6135-6144. D1

7. Duran-Sanchon S, Moreno L, Gómez-Matas J, Augé JM, Serra-Burriel M, Cuatrecasas M, Moreira L, Serradesanferm A, Pozo À, Grau J, Pellisé M, Gironella M, Castells A. **Fecal MicroRNA-Based Algorithm Increases Effectiveness of Fecal Immunochemical Test-based Screening for Colorectal Cancer.** *Clinical Gastroenterology and Hepatology*. 19(2):323-330.e1. D1

8. Rodríguez de Santiago E, Hernández-Tejero M, Rivero-Sánchez L, Ortiz O, García de la Filia-Molina I, Foruny-Olcina JR, Prieto HMM, García-Prada M, González-Cotorruelo A, De Jorge Turrión MA, Jiménez-Jurado A, Rodríguez-Escaja C, Castaño-García A, Outomuro AG, Ferre-Aracil C, de-Frutos-Rosa D, Pellisé M, Endoscopy Group of the Spanish Gastroenterology Association. **Management and Outcomes of Bleeding Within 30 Days of Colonic Polypectomy in a Large, Real-life Multicenter Cohort Study.** *Clinical Gastroenterology and Hepatology*. 19(4):732-742.e6. D1

9. Medina-Prado L, Hassan C, Dekker E, Bisschops R, Alfieri S, Bhandari P, Bourke MJ, Bravo R, Bustamante-Balen M, Dominitz J, Ferlitsch M, Fockens P, van Leerdam M, Lieberman D, Herráiz M, Kahi C, Kaminski M, Matsuda T, Moss A, Pellisé M, Pohl H, Rees C, Rex DK, Romero-Simó M, Rutter MD, Sharma P, Shaukat A, Thomas-Gibson S, Valori R, Jover R. **When and How To Use Endoscopic Tattooing in the Colon: An International Delphi Agreement.** *Clinical Gastroenterology and Hepatology*. 19(5):1038-1050. D1

10. Cabo M, Santana-Hernández S, Costa-Garcia M, Rea A, Lozano-Rodríguez R, Ataya M, Balaguer F, Juan M, Ochoa MC, Menéndez S, Comerma L, Rovira A, Berraondo P, Albanell J, Melero I, López-Botet M, Muntasell A. **CD137 Costimulation Counteracts TGFβ Inhibition of NK-cell Antitumor Function.** *Cancer Immunology Research*. 9(12):1476-1490. D1

11. Houwen BBSL, Mostafavi N, Vleugels JLA, Hüneburg R, Lamberti C, Rivero-Sánchez L, Pellisé M, Stoffel EM, Syngal S, Haanstra JF, Koornstra JJ, Dekker E, Hazewinkel Y. **Dye-Based Chromoendoscopy in Patients With Lynch Syndrome: An Individual Patient Data Meta-Analysis of Randomized Trials.** *American Journal of Gastroenterology*. 116(4):825-828. D1

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F, von Renteln D, Crockett SD, Rastogi A, Gill JA, Law R, Wallace MB, Elias PA, MacKenzie TA, Pohl H, Pellisé M. **Factors associated with complete clip closure after endoscopic mucosal resection of large colorectal polyps.** *Endoscopy*. 53(11):1150-1159. D1

13. Au EH, Wong G, Howard K, Chapman JR, Castells A, Roger SD, Bourke MJ, Macaskill P, Turner R, Lim WH, Lok CE, Diekmann F, Cross N, Sen S, Allen RD, Chadban SJ, Pollock CA, Tong A, Teixeira-Pinto A, Yang JY, Kieu A, James L, Craig JC. **Factors Associated With Advanced Colorectal Neoplasia in Patients With CKD.** *American Journal of Kidney Diseases*. S0272-6386(21):00823-4. D1

14. Keys MT, Serra-Burriel M, Martínez-Lizaga N, Pellisé M, Balaguer F, Sánchez A, Bernal-Delgado E, Castells A. **Population-based organized screening by faecal immunochemical testing and colorectal cancer mortality: a natural experiment.** *International Journal of Epidemiology*. 50(1):143-155. D1

15. Boces-Pascual, C; Mata-Ventosa, A; Martin-Satue, M; Boix, L; Gironella, M; Pastor-Anglada, M; Perez-Torras, S. **OncomiRs miR-106a and miR-17 negatively regulate the nucleoside-derived drug transporter hCNT1.** Cellular and Molecular Life Sciences. 78(23):7505-7518. Q1

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18. Gomez A; Pato ML; Bujanda L; Sala N; Companioni O; Cosme A; Tufano M; Hanly DJ; Garcia N; Sanz-Anquela JM; Gisbert JP; Lopez C; Elizalde JI; Cuatrecasas M; Andreu V; Paules MJ; Martin-Arranz MD; Ortega L; Poves E; Barrio J; Torres MA; Munoz G; Ferrandez A; Ramirez-Lazaro MJ; Lario S; Gonzalez CA; Esteller M; Berdasco M. **Follow-Up Study Confirms the Presence of Gastric Cancer DNA Methylation Hallmarks in High-Risk Precursor Lesions**. *Cancers*. 13(11):2760. Q1

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20. da Costa-Seixas JP, López-Cerón M, Arnau A, Rosiñol Ò, Cuatrecasas M, Herreros-de-Tejada A, Ferrández Á, Serra-Burriel M, Nogales Ó, de Castro L, López-Vicente J, Vega P, Álvarez-González MA, González-Santiago JM, Hernández-Conde M, Diez-Redondo P, Rivero-Sánchez L, Gimeno-García AZ, Burgos A, García-Alonso FJ, Bustamante-Balén M, Martínez-Bauer E, Peñas B, Rodríguez-Alcalde D, Pellisé M, Puig I. **Compound Endoscopic Morphological Features for Identifying Non-Pedunculated Lesions ≥20 mm with Intramucosal Neoplasia.** *Cancers*. 13(21):5302. Q1

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22. Golubicki, M; Diaz-Gay, M; Bonjoch, L; Franch-Exposito, S; Munoz, J; Cuatrecasas, M; Ocana, T; Iseas, S; Mendez, G; Carballido, M; Robbio, J; Cisterna, D; Roca, E; Castells, A; Balaguer, F; Castellvi-Bel, S; Antelo, M. **Comprehensive Genomic Characterization of Fifteen Early-Onset Lynch-Like Syndrome Colorectal Cancers.** *Cancers*. 13(6):1259. Q1

23. Herrera-Pariente C, Capó-García R, Díaz-Gay M, Carballal S, Muñoz J, Llach J, Sánchez A, Bonjoch L, Arnau-Collell C, Soares de Lima Y, Golubicki M, Jung G, Lozano JJ, Castells A, Balaguer F, Bujanda L, Castellví-Bel S, Moreira L. **Identification of New Genes Involved in Germline Predisposition to Early-Onset Gastric Cancer.** *International Journal of Molecular Sciences*. 22(3):1310. Q1

24. Araujo-Castro M, Garcia Centeno R, López-García MC, Lamas C, Álvarez-Escolá C, Calatayud Gutiérrez M, Blanco-Carrera C, de Miguel Novoa P, Valdés N, Gracia Gimeno P, Fernández-Ladreda MT, Mínguez Ojeda C, Percovich Hualpa JC, Mora M, Vidal Ó, Serrano Romero A, Hanzu FA, Gómez Dos Santos V. **Risk factors for intraoperative complications in pheochromocytomas.** *Endocrine-Related Cancer*. 28(11):695-703. Q1

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27. Fernández-Rozadilla C, Álvarez-Barona M, Quintana I, López-Novo A, Amigo J, Cameselle-Teijeiro JM, Roman E, Gonzalez D, Llor X, Bujanda L, Bessa X, Jover R, Balaguer F, Castells A, Castellví-Bel S, Capellá G, Carracedo A, Valle L, Ruiz-Ponte C. **Exome sequencing of early-onset patients supports genetic heterogeneity in colorectal cancer.** *Scientific Reports*. 11(1):11135. Q1

28. Dominguez-Valentin M, Plazzer JP, Sampson JR, Engel C, Aretz S, Jenkins MA, Sunde L, Bernstein I, Capella G, Balaguer F, Macrae F, Winship IM, Thomas H, Evans DG, Burn J, Greenblatt M, de Vos Tot Nederveen Cappel WH, Sijmons RH, Nielsen M, Bertario L, Bonanni B, Tibiletti MG, Cavestro GM, Lindblom A, Valle AD, Lopez-Kostner F, Alvarez K, Gluck N, Katz L, Heinimann K, Vaccaro CA, Nakken S, Hovig E, Green K, Lalloo F, Hill J, Vasen HFA, Perne C, Büttner R, Görgens H, Holinski-Feder E, Morak M, Holzapfel S, Hüneburg R, von Knebel Doeberitz M, Loeffler M, Rahner N, Weitz J, Steinke-Lange V, Schmiegel W, Vangala D, Crosbie EJ, Pineda M, Navarro M, Brunet J, Moreira L, Sánchez A, Serra-Burriel M, Mints M, Kariv R, Rosner G, Piñero TA, Pavicic WH, Kalfayan P, Broeke SWT, Mecklin JP, Pylvänäinen K, Renkonen-Sinisalo L, Lepistö

A, Peltomäki P, Hopper JL, Win AK, Buchanan DD, Lindor NM, Gallinger S, Marchand LL, Newcomb PA, Figueiredo JC, Thibodeau SN, Therkildsen C, Hansen TVO, Lindberg L, Rødland EA, Neffa F, Esperon P, Tjandra D, Möslein G, Seppälä TT, Møller P. **No Difference in Penetrance between Truncating and Missense/Aberrant Splicing Pathogenic Variants in MLH1 and MSH2: A Prospective Lynch Syndrome Database Study.** *Journal of Clinical Medicine.* 10(13):2856. Q1

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Letters

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Editorial

1. Pellise M, Rodríguez-Sánchez J. **Testing polyp resection techniques: Are we asking the clinically relevant questions?** *Gastrointestinal Endoscopy.* 94(3):483-485. Q1

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1. Saez de Gordoa K, Guerrero J, Bishop R, Archilla I, Rodrigo M, Sendino O, Momblan D, Sauri T, Jares P, Cuatrecasas M. Submucosal gland adenocarcinoma of the esophagus. **A rare non-Barrett's associated tumor.** *Gastroenterología y Hepatología.* 44(5):367-369. Q4

Clinical Guidelines

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Consortium Publications

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GRANTS FOR RESEARCH IN PROGRESS

Balaguer F. **Nous gens de càncer gàstric hereditari: seqüenciació de nova generació i avaluació functional.**
Sponsored by: Generalitat de Catalunya.
PERIS_SLT008/18/00153
Duration: 10/07/2019-31/12/2021

Balaguer F. **Vacunas con células dendríticas para la prevención del cáncer: neopéptidos derivados de la vía de inestabilidad de microsatélites para inmunoterapia en el síndrome de Lynch.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/01867
Duration: 01/01/2020-31/12/2022

Balaguer F. **Identificación de neoantígenos para desarrollar una inmunoterapia eficaz para la prevención del cáncer en el síndrome de Lynch.**
Sponsored by: Asociación Española de Gastro Enterología. AEG_BECAGRUPOONCO_01
Duration: 01/04/2018-

Balaguer F. **Development of microRNA Biomarkers For Noninvasive Detection of Colorectal Cancer.**
Sponsored by: National Institutes of Health.
INT_NIH_R01CA184792-05
Duration: 01/07/2019-30/06/2021

Castells A. **Grup de recerca en Oncologia Gastrointestinal i Pancreàtica.**
Sponsored by: Generalitat de Catalunya.
AGAUR_SGR17_00653
Duration: 01/01/2017-30/09/2021

Castells A. **Identification and validation of microRNA profiles in fecal samples for detection of colorectal cancer.**
Sponsored by: Fundació Institució Centres de Recerca de Catalunya.CERCA_Ginjol18
Duration: 06/03/2020-05/03/2025

Castells A. **Organización de la cromatina durante la transición de adenoma a carcinoma en el cáncer colorrectal y su papel en la resistencia al tratamiento.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_MV19/00046
Duration: 28/12/2020-25/03/2021

Castells A. **Papel de la microbiota intestinal en la patología digestiva.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_BA20/00006
Duration: 15/06/2021-14/12/2021

Castells A. **Randomized controlled trial of colonoscopy versus fecal immunochemical testing in colorectal cancer screening. The COLONPREV study.**
Sponsored by: Fundación científica asociación española contra el cáncer. AECC_EstClinicos21
Duration: 01/11/2021-31/10/2026

de Lacy AM. **Ensayo clínico aleatorizado controlado sobre la Invaginación Lateral de la Anastomosis Colorrectal mediante Doble Grapado (ILAC trial).**
Sponsored by: Fundación Cirugía Española. AEC_ProyInv19
Duration: 21/12/2020-20/12/2022

Fernández-Esparrach G, Cordova-Guevara H. **Validación clínica del primer sistema in-vivo de predicción histológica automática de los pólopis de colon integrando la visión del endoscopista con la visión por computador (HISINVIA).**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00894
Duration: 01/01/2018-30/06/2022

Gironella M. **Estudi funcional de microRNAs candidats en el cancer de pancrees. Evaluacio de la seva capacitat com a biomarcadors pronostics i com a noves dianes terapeutiques.**
Sponsored by: Generalitat de Catalunya. AGAUR_FI19_B00926
Duration: 01/04/2019-31/08/2022

Ortiz O. **LCI vs Endoscopia con luz blanca de alta definición para la evaluación de las escaras postpolipectomia de pólipos no pediculados. Estudio aleatorizado, controlado y cruzado. LCI Scar study.**
Sponsored by: Asociación Española de Gastro Enterología. AEG_BecaGrupoJov_20
Duration: 01/06/2021-31/05/2022

Pellisé M. **Improving the management of T1 colorectal cancer.**
Sponsored by: Fundació la Marató de TV3. Cancer_19
Duration: 20/07/2020-19/07/2023

Pellisé M. **Endoscopia versus cirugía para el tratamiento de los cánceres colorectales pT1: Estudio de cohortes de base poblacional - EpiT1.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/01050
Duration: 01/01/2020-31/12/2022

Pellisé M. **Utilidad de la Imagen de Color Vinculada (Linked Color Imaging; LCI) en la vigilancia del Síndrome de Poliposis Serrada: Ensayo clínico Aleatorizado, Controlado, Paralelo y Multicéntrico.**
Sponsored by: Fundación Sociedad Española de Endoscopia Digestiva. FSEED_18_001
Duration: 21/12/2018-

Pellisé M. **Evaluation of artificial Intelligemce System (Gi-Genius) for adenoma detection in Lynch Syndrome. A randomized, parallel, multicenter, controlled trial.**
Sponsored by: Asociación Española de Gastro Enterología. AEG_BecaGrupoOnco_21
Duration: 15/09/2021-14/09/2023

Rivero-Sánchez L. **Usefulness of Linked Color Imaging for surveillance of Serrated Polyposis Syndrome: A Randomized, Controlled and Parallel Trial.**
Sponsored by: European Society of Gastrointestinal Endoscopy. INT_ESGE_GA_2018
Duration: 01/06/2020-14/06/2022

Sánchez-Tillo E. **La ligasa E3 de ubiquitina GRAIL/RNF128 en los subtipos de cáncer de colon con mutaciones en KRAS, BRAF y APC.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00244
Duration: 01/01/2019-30/06/2022

Sendino O. **Ensayo prospectivo multicéntrico aleatorizado de uso de stents Vs terapia de vacío endoscópica en el tratamiento de dehiscencia de sutura anastomótica en el tracto digestivo superior.**
Sponsored by: Fundación Sociedad Española de Endoscopia Digestiva. FSEED_19_001
Duration: 19/12/2019-18/12/2021

Vaquero EC. **Intervención farmacológica sobre el patrón fibroinflamatorio asociado al desarrollo de cáncer de páncreas.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00842
Duration: 01/01/2019-30/06/2023

Vaquero EC. **Farmacotipificación de pacientes con cáncer de páncreas mediante organoides autogénicos.**
Sponsored by: Fundación de investigación medica mutua madrileña. FundMM_AP172132019
Duration: 30/09/2019-29/09/2022

Vaquero EC. **Intervención farmacológica sobre el patrón fibroinflamatorio asociado al desarrollo de cáncer de páncreas.**
Sponsored by: Asociación Española de Pancreatología. AESPANC_19_002
Duration: 25/11/2019-24/09/2022

DOCTORAL THESES

Castells A, Lacy A. **Transanal total mesorectal excision for rectal cáncer.**
PhD student: Borja de Lacy Oliver

Cuatrecasas M, Pellisé M. **Estudio de concordancia en el diagnóstico histológico de lesiones premalignas colorrectales.**
PhD student: Mireya Jimeno Ramiro

3.4 Genetic predisposition to gastrointestinal cancer

LOCATION
CEK building, floor 4

KEYWORDS
1. **Gastrointestinal cancer**
2. **Hereditary predisposition**
3. **Genetic association studies**
4. **Next generation sequencing**
5. **Gene editing**
6. **Intestinal organoids**

RELATED DISEASES
1. **Colorectal cancer**
2. **Gastric cancer**
3. **Serrated polyposis syndrome**
4. **Pancreatic cancer**

GROUP INVOLVED IN
AGAUR_SGR17: 00021
CIBEREHD

Original publications

TOTAL	20
Mean IF	7,53
Q1	75%
D1	25%
MA	25%
OA	95%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Cancer is the second leading cause of death worldwide. Gastrointestinal neoplasms, such as colorectal cancer and gastric cancer, are common tumours. An important number of these cancers are due to alterations of genes, which will be transmitted down generation after generation within the same family.

It is necessary to determine what these genes are, how they work, and whether their alteration predisposes people to cancer. This will improve knowledge of these diseases, permit the identification of people at risk and enable strategies to be designed for personalised prevention and treatment.

APPROACH

The group works to identify alterations of the human genome that are relevant to hereditary predisposition towards suffering gastrointestinal neoplasms.

To determine them, we use genetic association studies, in which the group compares the genomes of patients and those of healthy controls, along with mass sequencing studies to decode the genome.

To verify the effect of genetic alterations, it uses molecular and cellular biology tools such as gene editing using the CRISPR system and the growth of organoids, three-dimensional structures that allow it to recreate gastrointestinal tissue in the laboratory.

IMPACT

The group's research identifies new genes and genetic variants involved in hereditary predisposition to gastrointestinal cancer. It has been able to identify new variants thanks to the results obtained in genetic association studies and in international collaboration.

Sequencing studies have identified significant candidates, and the group is applying functional studies to corroborate their implications for predisposition towards cancer. The group wants to use these new genetic variants to improve the clinical management of patients and to develop customised follow-up and treatment.

RESEARCH LINES

- Clinical relevance of new hereditary genes for gastrointestinal cancer.

- Genetic association studies in colorectal cancer and advanced adenomas.

- New hereditary genes for colorectal cancer.

- New hereditary genes for gastric cancer.

- State-of-the-art functional studies of candidate genes.

PUBLICATIONS

Originals

1. Huyghe JR, Harrison TA, Bien SA, Hampel H, Figueiredo JC, Schmit SL, Conti DV, Chen S, Qu C, Lin Y, Barfield R, Baron JA, Cross AJ, Diergaarde B, Duggan D, Harlid S, Imaz L, Kang HM, Levine DM, Perduca V, Perez-Cornago A, Sakoda LC, Schumacher FR, Slattery ML, Toland AE, van Duijnhoven FJB, Van Guelpen B, Agudo A, Albanes D, Alonso MH, Anderson K, Arnau-Collell C, Arndt V, Banbury BL, Bassik MC, Berndt SI, Bézieau S, Bishop DT, Boehm J, Boeing H, Boutron-Ruault MC, Brenner H, Brezina S, Buch S, Buchanan DD, Burnett-Hartman A, Caan BJ, Campbell PT, Carr PR, Castells A, Castellví-Bel S, Chan AT, Chang-Claude J, Chanock SJ, Curtis KR, de la Chapelle A, Easton DF, English DR, Feskens EJM, Gala M, Gallinger SJ, Gauderman WJ, Giles GG, Goodman PJ, Grady WM, Grove JS, Gsur A, Gunter MJ, Haile RW, Hampe J, Hoffmeister M, Hopper JL, Hsu WL, Huang WY, Hudson TJ, Jenab M, Jenkins MA, Joshi AD, Keku TO, Kooperberg C, Kühn T, Küry S, Le Marchand L, Lejbkowicz F, Li CI, Li L, Lieb W, Lindblom A, Lindor NM, Männistö S, Markowitz SD, Milne RL, Moreno L, Murphy N, Nassir R, Offit K, Ogino S, Panico S, Parfrey PS, Pearlman R, Pharoah PDP, Phipps AI, Platz EA, Potter JD, Prentice RL, Qi L, Raskin L, Rennert G, Rennert HS, Riboli E, Schafmayer C, Schoen RE, Seminara D, Song M, Su YR, Tangen CM, Thibodeau SN, Thomas DC, Trichopoulou A, Ulrich CM, Visvanathan K, Vodicka P, Vodickova L, Vymetalkova V, Weigl K, Weinstein SJ, White E, Wolk A, Woods MO, Wu AH, Abecasis GR, Nickerson DA, Scacheri PC, Kundaje A, Casey G, Gruber SB, Hsu L, Moreno V, Hayes RB, Newcomb PA, Peters U. **Genetic architectures of proximal and distal colorectal cancer are partly distinct.** *Gut*. 70(7):1325-1334. D1

2. Guo X, Lin W, Wen W, Huyghe J, Bien S, Cai Q, Harrison T, Chen Z, Qu C, Bao J, Long J, Yuan Y, Wang F, Bai M, Abecasis GR, Albanes D, Berndt SI, Bézieau S, Bishop DT, Brenner H, Buch S, Burnett-Hartman A, Campbell PT, Castellví-Bel S, Chan AT, Chang-Claude J, Chanock SJ, Cho SH, Conti DV, Chapelle A, Feskens EJM, Gallinger SJ, Giles GG, Goodman PJ, Gsur A, Guinter M, Gunter MJ, Hampe J, Hampel H, Hayes RB, Hoffmeister M, Kampman E, Kang HM, Keku TO, Kim HR, Le Marchand L, Lee SC, Li CI, Li L, Lindblom A, Lindor N, Milne RL, Moreno V, Murphy N, Newcomb PA, Nickerson DA, Offit K, Pearlman R, Pharoah PDP, Platz EA, Potter JD, Rennert G, Sakoda LC, Schafmayer C, Schmit SL, Schoen RE, Schumacher FR, Slattery ML, Su YR, Tangen CM, Ulrich CM, van Duijnhoven FJB, Van Guelpen B, Visvanathan K, Vodicka P, Vodickova L, Vymetalkova V, Wang X, White E, Wolk A, Woods MO, Casey G, Hsu L, Jenkins MA, Gruber SB, Peters U, Zheng W. **Identifying novel susceptibility genes for colorectal cancer risk from a transcriptome-wide association study of 125,478 subjects.** *Gastroenterology*. 160(4):1164-1178.e6. D1

3. Duran-Sanchon S, Moreno L, Gómez-Matas J, Augé JM, Serra-Burriel M, Cuatrecasas M, Moreira L, Serradesanferm A, Pozo À, Grau J, Pellisé M, Gironella M, Castells A. **Fecal MicroRNA-Based Algorithm Increases Effectiveness of Fecal Immunochemical Test-based Screening for Colorectal Cancer.** *Clinical Gastroenterology and Hepatology*. 19(2):323-330.e1. D1

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Review

1. Vuletic, A; Martinovic, KM; Miletic, NT; Zoidakis, J; Castellvi-Bel, S; Cavic, M. **Cross-Talk Between Tumor Cells Undergoing Epithelial to Mesenchymal Transition and Natural Killer Cells in Tumor Microenvironment in Colorectal Cancer.** *Frontiers in Cell and Developmental Biology*. 9:750022. Q1

2. Herrera-Pariente C, Montori S, Llach J, Bofill A, Albeniz E, Moreira L. **Biomarkers for Gastric Cancer Screening and Early Diagnosis.** *Biomedicines*. 9(10):1448. Q1

Letters

1. Thomas M, Sakoda LC, Hoffmeister M, Rosenthal EA, Lee JK, van Duijnhoven FJB, Platz EA, Wu AH, Dampier CH, de la Chapelle A, Wolk A, Joshi AD, Burnett-Hartman A, Gsur A, Lindblom A, Castells A, Win AK, Namjou B, Van Guelpen B, Tangen CM, He Q, Li CI, Schafmayer C, Joshu CE, Ulrich CM, Bishop DT, Buchanan DD, Schaid D, Drew DA, Muller DC, Duggan D, Crosslin DR, Albanes D, Giovannucci EL, Larson E, Qu F, Mentch F, Giles GG, Hakonarson H, Hampel H, Stanaway IB, Figueiredo JC, Huyghe JR, Minnier J, Chang-Claude J, Hampe J, Harley JB, Visvanathan K, Curtis KR, Offit K, Li L, Le Marchand L, Vodickova L, Gunter MJ, Jenkins MA, Slattery ML, Lemire M, Woods MO, Song M, Murphy N, Lindor NM, Dikilitas O, Pharoah

PDP, Campbell PT, Newcomb PA, Milne RL, MacInnis RJ, Castellví-Bel S, Ogino S, Berndt SI, Bézieau S, Thibodeau SN, Gallinger SJ, Zaidi SH, Harrison TA, Keku TO, Hudson TJ, Vymetalkova V, Moreno V, Martín V, Arndt V, Wei WQ, Chung W, Su YR, Hayes RB, White E, Vodicka P, Casey G, Gruber SB, Schoen RE, Chan AT, Potter JD, Brenner H, Jarvik GP, Corley DA, Peters U, Hsu L. **Response to Li and Hopper.** *American Journal of Human Genetics.* 108(3):527-529. D1

Clinical Guidelines

1. Cubiella J; Pérez Aisa Á; Cuatrecasas M; Díez Redondo P; Fernández Esparrach G; Marín-Gabriel JC; Moreira L; Núñez H; Pardo López ML; Rodríguez de Santiago E; Rosón P; Sanz Anquela JM; Calvet X. **Gastric cancer screening in low incidence populations: Position statement of AEG, SEED and SEAP.** *Gastroenterología y Hepatología.* 44(1):67-86. Q4

2. Fernández-Esparrach G, Marín-Gabriel JC, Díez Redondo P, Núñez H, Rodríguez de Santiago E, Rosón P, Calvet X, Cuatrecasas M, Cubiella J, Moreira L, Pardo López ML, Pérez Aisa Á, Sanz Anquela JM, en representación de la Asociación Española de Gastroenterología, la Sociedad Española de Endoscopia Digestiva y la Sociedad Española de Anatomía Patológica. **Quality in diagnostic upper gastrointestinal endoscopy for the detection and surveillance of gastric cancer precursor lesions: Position paper of AEG, SEED and SEAP.** *Gastroenterología y Hepatología.* 44(6):448-464. Q4

GRANTS FOR RESEARCH IN PROGRESS

Castellví-Bel S. **INPhINIT - Doctorate in Spanish Research Centres of Excellence. Position: Searching for predisposition genes in colorectal cancer: Serrated polyposis syndrome in the spotlight.**
Sponsored by: Fundació Bancaria "La Caixa". INPhINIT18
Duration: 07/01/2019-06/03/2022

Castellví-Bel S. **Germline predisposition to serrated polyposis syndrome: Functional characterization of candidate genes by CRISPR-CAS and organoid modeling.**
Sponsored by: Fundació la Marató de TV3. Minoritaries_20
Duration: 30/03/2021-29/03/2024

Castellví-Bel S. **Caracterización funcional de variantes en nuevos genes candidatos en la predisposición germinal al cáncer colorrectal y el síndrome de poliposis serrada (FUNCTION4GENE).**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00878
Duration: 01/01/2018-30/06/2022

Castellví-Bel S. **Predisposición germinal a cáncer colorrectal: caracterización funcional de nuevos genes mediante CRISP/CAS y modelos organoides (PARAGON).**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00113
Duration: 01/01/2021-31/12/2023

Castellví-Bel S. **Cáncer colorrectal en adolescentes y adultos jóvenes: identificación de factores de predisposición germinal e insultos mediante una caracterización completa multiómica.**
Sponsored by: Fundación científica Asociación Española Contra el Cáncer. AECC_Proyectos21
Duration: 01/12/2021-30/11/2024

Castellví-Bel S. **Identifying biomarkers through translational research for prevention and stratification of colorectal cáncer.**
Sponsored by: European Commission. CE_H2020-COST17sept
Duration: 01/11/2018-30/09/2022

Moreira L. **EPIGASTRIC: Primer registro multicéntrico nacional de cáncer gástrico.**
Sponsored by: Asociación Española de Gastroenterología. AEG_BecaGonMiño_20
Duration: 01/01/2021-31/12/2022

3.5 Neuronal control of metabolism (NeuCoMe)

LOCATION
CEK building, floor 5

KEYWORDS
1. **Hypothalamus**
2. **Neurons**
3. **Mitochondria**
4. **Metabolism**

RELATED DISEASES
1. **Obesity**
2. **Diabetes**

GROUP INVOLVED IN
CIBERdem

Original publications

TOTAL	3
Mean IF	15,50
Q1	100%
D1	67%
MA	33%
OA	100%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Humans are the result of evolution within an environment of scarcity, where physical activity and caloric restriction were common.

But today's lifestyles, characterised by sedentarism and a dietary excess of fats and carbohydrates, have caused an epidemic of diabetes and obesity.

Unfortunately, non-invasive therapeutic tools are scarce and inefficient. Therefore, it is essential to understand the mechanisms that regulate metabolism and body weight in order to design safe and powerful drugs.

APPROACH

The central nervous system controls many physiological functions, including appetite and body weight.

The group aims to understand the molecular mechanisms through which specific neuronal circuits, and especially hypothalamic ones, regulate food intake, body weight and metabolism. It also investigates the relationship between food and emotional behavior.

IMPACT

The group has established that maintaining the shape of the mitochondria (the part of the cells responsible for providing energy), and therefore their function, within a specific population of neurons, is essential to respond adequately to certain hormones and nutrients. Whenever there are defects in these processes, diabetes and obesity appear.

It is currently investigating, from various perspectives, the role played by mitochondria with respect to appetite and body weight in different neuronal populations. It is also developing paradigms to study in depth the relationships between appetite, cognitive function and emotions.

RESEARCH LINES

- Cell-type specific epigenetics and obesity.

- Eating patterns during pregnancy and hypothalamic programming.

- Endothelial cells: new players in metabolic disorders.

- Feeding behavior and emotions.

- The multifaceted mitochondria: obesity, diabetes and beyond.

PUBLICATIONS

Originals

1. Gómez-Valadés AG, Pozo M, Varela L, Boudjadja MB, Ramírez S, Chivite I, Eyre E, Haddad-Tóvolli R, Obri A, Milà-Guasch M, Altirriba J, Schneeberger M, Imbernón M, Garcia-Rendueles AR, Gama-Perez P, Rojo-Ruiz J, Rácz B, Alonso MT, Gomis R, Zorzano A, D'Agostino G, Alvarez CV, Nogueiras R, Garcia-Roves PM, Horvath TL, Claret M. **Mitochondrial cristae-remodeling protein OPA1 in POMC neurons couples Ca 2+ homeostasis with adipose tissue lipolysis**. *Cell Metabolism*. 33(9):1820-1835.e9. D1

2. Quiñones M; Hernández-Bautista R; Beiroa D; Heras V; Torres-Leal FL; Lam BYH; Senra A; Fernø J; Gómez-Valadés AG; Schwaninger M; Prevot V; Yeo G; Claret M; López M; Diéguez C; Al-Massadi O; Nogueiras R. **Sirt3 in POMC neurons controls energy balance in a sex- and diet-dependent manner.** *Redox Biology*. 41:101945. D1

3. Díaz-Catalán D, Alcarraz-Vizán G, Castaño C, de Pablo S, Rodríguez-Comas J, Fernández-Pérez A, Vallejo M, Ramírez S, Claret M, Parrizas M, Novials A, Servitja JM. **BACE2 suppression in mice aggravates the adverse metabolic consequences of an obesogenic diet.** *Molecular Metabolism*. 53:101251. Q1

Review

1. Quarta C; Claret M; Zeltser LM; Williams KW; Yeo GSH; Tschöp MH; Diano S; Brüning JC; Cota D. **POMC neuronal heterogeneity in energy balance and beyond: an integrated view**. *Nature Metabolism*. 3(3):299-308. D1

Letters

1. Haddad-Tóvolli R, Claret M. **Cooperative tanycytes fuel the neuronal tank.** *Journal of Clinical Investigation*. 131(18):e153279. D1

GRANTS FOR RESEARCH IN PROGRESS

Claret M. **Hypothalamic control of gut function and microbiota composition: implications for energy balance regulation.**
Sponsored by: Fundació Bancaria "La Caixa". HealthRes18-00100
Duration: 01/11/2019-31/10/2022

Claret M. **Hypothalamic control of gut function and microbiota composition: implications for energy balance regulation.**
Sponsored by: Generalitat de Catalunya. AGAUR_BP18_00032
Duration: 01/02/2020-31/05/2024

Claret M. **Study of the epigenetic mechanism in AgRP- and POMC-neurons of the hypothalamus.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_CP19/00083
Duration: 01/01/2020-31/12/2024

Claret M. **Investigando las firmas epigenéticas de neuronas POMC en el contexto de la obesidad.**
Sponsored by: Agencia Estatal de Investigación. AEI_PID2019-108175RB-I00
Duration: 01/06/2020-31/05/2023

Claret M. **Investigando las firmas epigeneticas de neuronas POMC en el contexto de la obesidad.**
Sponsored by: Agencia Estatal de Investigación. AEI_FPI20
Duration: 01/09/2021-31/08/2025

Claret M. **Decoding mitochondrial nutrient-sensing programs in POMC neurons as key determinants of metabolic health.**
Sponsored by: European Commission. CE_H2020-ERC-2016_Co
Duration: 01/04/2017-30/09/2022

Claret M. **Eating patterns in pregnancy: unraveling the underlying neurocircuits and its deleterious metabolic consequences.**
Sponsored by: European Commission. CE_H2020-MSCA-IF-19
Duration: 01/03/2021-28/02/2023

Claret M. **Mitochondrial fusion in endothelial cells: impact on systemic energy and glucose homeostasis.**
Sponsored by: European Foundation for the Study of Diabetes. INT_EFSD/NOVO_17_01
Duration: 15/02/2018-31/03/2022

Obri A. **Estudio del código epigenético del esperma que determina la predisposición a la obesidad.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00732
Duration: 01/01/2021-31/12/2023

3.6 Inflammation and liver disease

LOCATION
CEK building, floor 3

KEYWORDS
1. **Inflammation**
2. **Innate immune cells**
3. **Lipid mediators**
4. **Omics technologies**

RELATED DISEASES
1. **Chronic liver diseases**
2. **Acute on chronic liver failure**
3. **Systemic inflammation**
4. **Organ failure**

GROUP INVOLVED IN
AGAUR_SGR17: 01449

Original publications

TOTAL	8
Mean IF	**14,79**
Q1	**75%**
D1	**50%**
MA	**50%**
OA	**75%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Chronic liver disease is, among all non-transmissible diseases, the most prevalent in our environment. This is becoming increasingly evident with the growing prevalence of liver disorders associated with the global obesity pandemic.

Within this context, inflammatory injury of the liver parenchyma plays a key role in the early stages of the disease whereas systemic inflammation driving to extra-hepatic organ failures is of utmost importance in the most advanced phases, in this case associated with a high mortality rate.

APPROACH

The group is interested in the study of the molecular and cellular mechanisms of the inflammatory response in liver diseases, especially in the study of the so-called lipid inflammatory lipid mediators.

Within these, we pay special attention to the recently identified pro-resolving lipid mediators, endogenous molecules with intrinsic ability to temper inflammation.

IMPACT

The group has identified new lipid mediators derived from polyunsaturated fatty acids that slow the activation of the innate immune system and promote the resolution of inflammation. One of its great challenges is to transfer these results to the prevention and treatment of liver complications.

RESEARCH LINES

- Cellular mechanisms of inflammation in chronic liver disease.

- Genetic determinants of inflammation in chronic liver disease.

- Molecular mechanisms of inflammation in chronic liver disease.

PUBLICATIONS

Originals

1. Trebicka J, Fernandez J, Papp M, Caraceni P, Laleman W, Gambino C, Giovo I, Uschner FE, Jansen C, Jimenez C, Mookerjee R, Gustot T, Albillos A, Bañares R, Jarcuska P, Steib C, Reiberger T, Acevedo J, Gatti P, Shawcross DL, Zeuzem S, Zipprich A, Piano S, Berg T, Bruns T, Danielsen KV, Coenraad M, Merli M, Stauber R, Zoller H, Ramos JP, Solé C, Soriano G, de Gottardi A, Gronbaek H, Saliba F, Trautwein C, Kani HT, Francque S, Ryder S, Nahon P, Romero-Gomez M, Van Vlierberghe H, Francoz C, Manns M, Garcia-Lopez E, Tufoni M, Amoros A, Pavesi M, Sanchez C, Praktiknjo M, Curto A, Pitarch C, Putignano A, Moreno E, Bernal W, Aguilar F, Clària J, Ponzo P, Vitalis Z, Zaccherini G, Balogh B, Gerbes A,

Vargas V, Alessandria C, Bernardi M, Ginès P, Moreau R, Angeli P, Jalan R, Arroyo V, PREDICT STUDY group of the EASL-CLIF CONSORTIUM. **PREDICT identifies precipitating events associated with the clinical course of acutely decompensated cirrhosis.** *Journal of Hepatology.* 74(5):1097-1108. D1

2. Zaccherini G, Aguilar F, Caraceni P, Clària J, Lozano JJ, Fenaille F, Castelli F, Junot C, Curto A, Formentin C, Weiss E, Bernardi M, Jalan R, Angeli P, Moreau R, Arroyo V. **Assessing the role of amino acids in systemic inflammation and organ failure in patients with ACLF.** *Journal of Hepatology.* 74(5):1117-1131. D1

3. Clària J, Curto A, Moreau R, Colsch B, López-Vicario C, Lozano JJ, Aguilar F, Castelli FA, Fenaille F, Junot C, Zhang I, Vinaixa M, Yanes O, Caraceni P, Trebicka J, Fernández J, Angeli P, Jalan R, Arroyo V. **Untargeted lipidomics uncovers lipid signatures distinguishing severe versus moderate forms of acutely decompensated cirrhosis.** *Journal of Hepatology.* 75(5):1116-1127. D1

4. Monteiro S, Grandt J, Uschner FE, Kimer N, Madsen JL, Schierwagen R, Klein S, Welsch C, Schäfer L, Jansen C, Claria J, Alcaraz-Quiles J, Arroyo V, Moreau R, Fernandez J, Bendtsen F, Mehta G, Gluud LL, Møller S, Praktiknjo M, Trebicka J. **Differential inflammasome activation predisposes to acute-on-chronic liver failure in human and experimental cirrhosis with and without previous decompensation**. *Gut.* 70(2):379-387. D1

5. Weiss E; de la Grange P; Defaye M; Lozano JJ; Aguilar F; Hegde P; Jolly A; Moga L; Sukriti S; Agarwal B; Gurm H; Tanguy M; Poisson J; Claria J; Abback PS; Perianin A; Mehta G; Jalan R; Francoz C; Rautou PE; Lotersztajn S; Arroyo V; Durand F; Moreau R. **Characterization of Blood Immune Cells in Patients With Decompensated Cirrhosis Including ACLF.** *Frontiers in Immunology.* 11:619039. Q1

6. Duran-Güell M, Flores-Costa R, Casulleras M, López-Vicario C, Titos E, Díaz A, Alcaraz-Quiles J, Horrillo R, Costa M, Fernández J, Arroyo V, Clària J. **Albumin protects the liver from tumor necrosis factor α-induced immunopathology.** *Faseb Journal.* 35(2):e21365. Q1

7. Kalveram L; Schunck WH; Rothe M; Rudolph B; Loddenkemper C; Holzhütter HG; Henning S; Bufler P; Schulz M; Meierhofer D; Zhang IW; Weylandt KH; Wiegand S; Hudert CA. **Regulation of the cytochrome P450 epoxyeicosanoid pathway is associated with distinct histologic features in pediatric non-alcoholic fatty liver disease.** *Prostaglandins Leukotrienes and Essential Fatty Acids.* 164:102229. Q2

8. Villanueva-Cañas JL, Gonzalez-Roca E, Gastaminza Unanue A, Titos E, Martínez Yoldi MJ, Vergara Gómez A, Puig-Butillé JA. **Implementation of an open-source robotic platform for SARS-CoV-2 testing by real-time RT-PCR.** *Plos One.* 16(7):e0252509. Q2

Review

1. Arroyo V, Angeli P, Moreau R, Jalan R, Clària J, Trebicka J, Fernández J, Gustot T, Caraceni P, Bernardi M, investigators from the EASL-CLIF Consortium, Grifols Chair and European Foundation for the Study of Chronic Liver Failure (EF-Clif). **The Systemic Inflammation Hypothesis: Towards a New Paradigm of Acute Decompensation and Multiorgan Failure in Cirrhosis.** *Journal of Hepatology.* 74(3):670-685. D1

2. Engelmann C, Clària J, Szabo G, Bosch J, Bernardi M. **Pathophysiology of decompensated cirrhosis: Portal hypertension, circulatory dysfunction, inflammation, metabolism and mitochondrial dysfunction.** *Journal of Hepatology.* 75:S49-S66. D1

3. Clària J, Flores-Costa R, Duran-Güell M, López-Vicario C. **Proresolving lipid mediators and liver disease.** *Biochimica et Biophysica Acta-Molecular and Cell Biology of Lipids.* 1866(11):159023. Q1

4. Zhang IW, López-Vicario C, Duran-Güell M, Clària J. **Mitochondrial Dysfunction in Advanced Liver Disease: Emerging Concepts.** *Frontiers in Molecular Biosciences.* 8:772174. Q2

Letters

1. Praktiknjo M, Schierwagen R, Monteiro S, Ortiz C, Uschner FE, Jansen C, Claria J, **Trebicka J. Hepatic inflammasome activation as origin of Interleukin-1α and Interleukin-1β in liver cirrhosis.** *Gut.* 70(9):1799-1800. D1

GRANTS FOR RESEARCH IN PROGRESS

Clària J. **Investigació hepàtica: recerca bàsica i experimental.**
Sponsored by: Generalitat de Catalunya.
AGAUR_SGR17_01449
Duration: 01/01/2017-30/09/2021

Clària J. **Mecanismos responsables de una respuesta inflamatoria inadecuada y de fallo orgánico múltiple en pacientes con enfermedad hepática avanzada: Papel de los mediadores lipídicos.**
Sponsored by: Agencia Estatal de Investigación. AEI_PID2019-105240RB-I00
Duration: 01/06/2020-31/05/2023

Clària J, Ginés P. **MICROBiome-based biomarkers to PREDICT decompensation of liver cirrhosis and treatment response.**
Sponsored by: European Commission.
CE_H2020-SC1_18_1s
Duration: 01/01/2019-31/03/2025

Clària J. **Decompensated cirrhosis: identification of new combinatorial therapies based on system approaches.**
Sponsored by: European Commission.
CE_H2020-SC1_2019_2s
Duration: 01/04/2020-30/09/2025

Clària J. **Acute-on-chronic liver failure: Evaluation of the role of mitochondria in disease etiology and experimental treatment of mitochondrial dysfunction.**
Sponsored by: European association for the study of the liver. INT_EASL_SS_2018_01
Duration: 20/05/2019-19/11/2021

Titos E. **Pan-European Network in Lipidomics and EpiLipidomics.**
Sponsored by: European Commission.
COST_ACTION_CA19105
Duration: 01/12/2020-01/12/2024

3.7 Translational control in liver disease and cancer

LOCATION
CEK building, floor 2

KEYWORDS
1. **Liver cancer**
2. **Translational control**
3. **Fibrosis**
4. **Steatosis**
5. **Obesity**

RELATED DISEASES
1. **Liver cirrhosis**
2. **Liver steatosis**
3. **Liver cancer**

Original publications

TOTAL	2
Mean IF	8,42
Q1	100%
D1	0%
MA	50%
OA	100%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Chronic liver diseases, including liver steatosis, cirrhosis and cancer, affect millions of human beings and are leading causes of death and liver transplantation worldwide. They are therefore grave public health problems and consequently a field of considerable pharmaceutical interest. Worryingly, the incidence of liver disease is dramatically rising due to the global epidemics of obesity/overweight that has become a major socioeconomic challenge, affecting both adults and children.

In our group, we aim to dissect the mechanisms underpinning chronic liver disease and the link obesity-liver disease, with a particular interests in unraveling how dysregulated posttranscriptional reprogramming (leading to aberrant protein expression) facilitates disease progression and aggravation. The ultimate goal is to identify novel therapeutic targets that help design new and more effective treatments.

APPROACH

We use a combination of mouse models and cell-based models (human and mouse), knockout mice, high-throughput genomic approaches, and basic molecular and cellular biology.

IMPACT

Our group has made key contributions to the understanding of chronic liver disease:

- Posttranscriptional reprogramming of metabolism is a driver of hepatic stellate cell activation in liver fibrosis (Gastroenterology 2020).

- Adaptive translational response to ER stress mediated by CPEB4 counteracts hepatic steatosis (Nature Cell Biology 2017).

- Targeted siRNA therapeutics are novel treatment tools for liver disease (Scientific Reports 2017).

- Vascular stem cells mediate a new mechanism responsible for formation of abnormal vessels in chronic liver disease (Gut 2017).

- CPEB proteins are critical for pathologic angiogenesis in chronic liver disease (Gastroenterology 2016).

- Endogenous angiogenesis inhibitors have potent antiangiogenic and antifibrogenic therapeutic activity in chronic liver disease (Gut 2015; Hepatology 2014).

- Angiogenesis is a critical hallmark of chronic liver disease with therapeutic potential (Gastroenterology 2004; Journal Hepatology 2005; Journal Hepatology 2006; Gut 2007; Hepatology 2007; Journal Hepatology 2009; Hepatology 2009; Journal of Hepatology 2010; among others).

RESEARCH LINES

- Which is the role of translational control of gene expression in liver disease and cancer?

- What is the significance and underlying mechanisms linking obesity with liver disease and cancer?

- How does deregulation of pathways that control angiogenesis contribute to progression of liver disease and cancer?

PUBLICATIONS

Originals

1. Riechert E; Kmietczyk V; Stein F; Schwarzl T; Sekaran T; Jürgensen L; Kamuf-Schenk V; Varma E; Hofmann C; Rettel M; Gür K; Ölschläger J; Kühl F; Martin J; Ramirez-Pedraza M; Fernandez M; Doroudgar S; Méndez R; Katus HA; Hentze MW; Völkers M. **Identification of dynamic RNA-binding proteins uncovers a Cpeb4-controlled regulatory cascade during pathological cell growth of cardiomyocytes**. *Cell Reports*. 35(6):109100. Q1

2. Pell N, Garcia-Pras E, Gallego J, Naranjo-Suarez S, Balvey A, Suñer C, Fernandez-Alfara M, Chanes V, Carbo J, Ramirez-Pedraza M, Reina O, Thingholm L, Bang C, Rühlemann M, Franke A, Schierwagen R, Rheinwalt KP, Trebicka J, Mendez R, Fernandez M. **Targeting the cytoplasmic polyadenylation element-binding protein CPEB4 protects against diet-induced obesity and microbiome dysbiosis.** *Molecular Metabolism*. 54:101388. Q1

Review

1. Balvey A; Fernandez M. **Translational Control in Liver Disease.** *Frontiers in Physiology*. 12:795298. Q1

2. Delgado ME, Cárdenas BI, Farran N, Fernandez M. **Metabolic Reprogramming of Liver Fibrosis.** *Cells*. 10(12):3604. Q2

GRANTS FOR RESEARCH IN PROGRESS

Fernández-Lobato M. **Metabolic reprogramming in obesity-driven liver cancer: mechanisms, functions and therapeutic opportunities.**
Sponsored by: Fundació la Marató de TV3.
Cancer_19
Duration: 20/07/2020-19/07/2023

Fernández-Lobato M. **Identifying new therapeutic targets for liver cancer treatment.**
Sponsored by: Generalitat de Catalunya.
AGAUR_BP19_00040
Duration: 01/01/2021-31/12/2023

Fernández-Lobato M. **Papel y potencial terapéutico de la respuesta a proteinas desplegadas en el cáncer de hígado asociado a la obesidad.**
Sponsored by: Ministerio de Economía y Competitividad. MINECO_SAF2017-87988-R
Duration: 01/01/2018-30/06/2021

Fernández-Lobato M. **Papel y potencial terapeutico de la respuesta a proteinas desplegadas en el cancer de higado asociado a la obesidad.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades.
MCIU_PRE18-083718
Duration: 01/08/2019-31/07/2023

Fernández-Lobato M. **Apuntando al Control Traduccional como Terapia del Cáncer de Hígado.**
Sponsored by: Agencia Estatal de Investigación. AEI_PE20
Duration: 01/09/2021-31/08/2024

Fernández-Lobato M. **Identifying New Therapeutic Targets in Obesity-Driven Liver Cancer.**
Sponsored by: Institut Recerca Biomèdica Barcelona (IRB). World Cancer Research Fund International. INT_WCRFI_RG_19
Duration: 01/01/2021-31/12/2024

3.8 Mitochondrial regulation of cell death and steatohepatitis

LOCATION
CEK building, floor 4

KEYWORDS
1. **Cholesterol/sphingolipids**
2. **Mitochondrial death**
3. **Oxidative stress**
4. **Alcoholic and non-alcoholic steatohepatitis (ASH/NASH)**
5. **Lipid therapies**

RELATED DISEASES
1. **Alcoholic (ASH) and non alcoholic steatohepatitis (NASH)**
2. **Hepatocellular carcinoma (HCC)**
3. **Lysosomal storage diseases (LSD)**
4. **Alzheimer disease**

GROUP INVOLVED IN
AGAUR_SGR17: 00225, 01112
CIBEREHD
REDES DE INVESTIGACIÓN

Original publications

TOTAL	16
Mean IF	11,60
Q1	88%
D1	63%
MA	38%
OA	81%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The group focuses on the study of the role of lipids, such as cholesterol, in regulating the function of the organelles that supply energy to cells, i.e., the mitochondria.

Good mitochondrial function is essential for cell survival. That is why the laboratory investigates how variations in mitochondrial function affect the development of liver diseases, such as steatohepatitis and its progression towards liver cancer, and neurodegenerative diseases such as Alzheimer's. Better knowledge of the biological mechanisms that control these diseases will allow the team to design better and more specific drugs.

APPROACH

The laboratory uses mice to investigate the cellular and molecular bases related to the progression of liver disease and Alzheimer's disease. And it applies therapeutic interventions to improve the final outcome of the disorder.

It is equipped with genetically modified mice that allow it to study what role different proteins play in specific liver cells. In addition, through an innovative mouse model with a liver repopulated with human cells, it can corroborate its results within a scenario that is more similar to that of the patient.

IMPACT

The group's research explores the knowledge of the biological mechanisms that modulate mitochondrial function and how this modulation affects the progression of liver diseases and Alzheimer's disease.

One of the group's most important discoveries has been how mitochondrial cholesterol influences the development of diseases of the liver and neuronal function. The various lines of research in the laboratory will allow it to better understand the biology of these conditions, in order to design new drugs or to reuse existing ones for treatment.

RESEARCH LINES

- Contribution of sphingolipids and cholesterol in acute liver failure.

- ER stress-mitochondrial cholesterol axis in obesity-associated insulin resistance and comorbidities.

- Lysosomal proteases role during tissue remodeling and regeneration in liver and kidney injury.

- Mechanisms responsible for cholesterol transport to the mitochondria and role in

NASH, hepatocellular carcinoma and Alzheimer's disease.

- Mitochondrial cholesterol and glycosphingolipids in liver fibrosis. Reciprocal regulation between HIF1a and StARD1 in steatohepatitis and hepatocellular carcinoma.

- Sphingolipid and mitochondrial oxidative-stress regulation of cell death.

- Translational research in nonalcoholic steatohepatitis (NASH): development of NASH in a humanized mouse model to identify potential targets in human NASH.

- Identification of galectin-1 as a new target for cancer diagnosis and therapy.

- Study of new mechanisms for regulating gene expression in cancer (and other pathologies) through the control of mRNA translation.

PUBLICATIONS

Originals

1. Conde de la Rosa L, Garcia-Ruiz C, Vallejo C, Baulies A, Nuñez S, Monte MJ, Marin JJG, Baila-Rueda L, Cenarro A, Civeira F, Fuster J, Garcia-Valdecasas JC, Ferrer J, Karin M, Ribas V, Fernandez-Checa JC. **STARD1 promotes NASH-driven HCC by sustaining the generation of bile acids through the alternative mitochondrial pathway.** *Journal of Hepatology.* 74(6):1429-1441. D1

2. Koh EH, Yoon JE, Ko MS, Leem J, Yun JY, Hong CH, Cho YK, Lee SE, Jang JE, Baek JY, Yoo HJ, Kim SJ, Sung CO, Lim JS, Jeong WI, Back SH, Baek IJ, Torres S, Solsona-Vilarrasa E, Conde de la Rosa L, Garcia-Ruiz C, Feldstein AE, Fernandez-Checa JC, Lee KU. **Sphingomyelin synthase 1 mediates hepatocyte pyroptosis to trigger non-alcoholic steatohepatitis.** *Gut.* 70(10):1954-1964. D1

3. Massey V, Parrish A, Argemi J, Moreno M, Mello A, García-Rocha M, Altamirano J, Odena G, Dubuquoy L, Louvet A, Martinez C, Adrover A, Affò S, Morales-Ibanez O, Sancho-Bru P, Millán C, Alvarado-Tapias E, Morales-Arraez D, Caballería J, Mann J, Cao S, Sun Z, Shah V, Cameron A, Mathurin P, Snider N, Villanueva C, Morgan TR, Guinovart J, Vadigepalli R, Bataller R. **Integrated Multiomics Reveals Glucose Use Reprogramming and Identifies a Novel Hexokinase in Alcoholic Hepatitis.** *Gastroenterology.* 160(5):1725-1740.e2. D1

4. Pico, S; Parras, A; Santos-Galindo, M; Pose-Utrilla, J; Castro, M; Fraga, E; Hernandez, IH; Elorza, A; Anta, H; Wang, N; Marti-Sanchez, L; Belloc, E; Garcia-Esparcia, P; Garrido, JJ; Ferrer, I; Macias-Garcia, D; Mir, P; Artuch, R; Perez, B; Hernandez, F; Navarro, P; Lopez-Sendon, JL; Iglesias, T; Yang, XW; Mendez, R; Lucas, JJ. **CPEB alteration and aberrant transcriptome-polyadenylation lead to a treatable SLC19A3 deficiency in Huntington's disease.** *Science Translational Medicine.* 13(613):eabe7104. D1

5. Gárate-Rascón M; Recalde M; Jimenez M; Elizalde M; Azkona M; Uriarte I; Latasa MU; Urtasun R; Bilbao I; Sangro B; Garcia-Ruiz C; Fernandez-Checa JC; Corrales FJ; Esquivel A; Pineda-Lucena A; Fernández-Barrena MG; Ávila MA; Arechederra M; Berasain C. **SLU7 prevents oxidative stress-mediated HNF4 α degradation preserving hepatic differentiation and protecting from liver damage.** *Hepatology.* 74(5):2791-2807. D1

6. Torres S, Solsona-Vilarrasa E, Nuñez S, Matías N, Insausti-Urkia N, Castro F, Casasempere M, Fabriás G, Casas J, Enrich C, Fernández-Checa JC, Garcia-Ruiz C. **Acid ceramidase improves mitochondrial function and oxidative stress in Niemann-Pick type C disease by repressing STARD1 expression and mitochondrial cholesterol accumulation.** *Redox Biology.* 45:102052. D1

7. Alari-Pahissa, E; Ataya, M; Moraitis, I; Campos-Ruiz, M; Altadill, M; Muntasell, A; Moles, A; Lopez-Botet, M. **NK cells eliminate Epstein-Barr virus bound to B cells through a specific antibody-mediated uptake.** *Plos Pathogens.* 17(8):e1009868. D1

8. Hernandez S, Simoni-Nieves A, Gerardo-Ramírez M, Torres S, Fucho R, Gonzalez J, Castellanos-Tapia L, Hernández-Pando R, Tejero-Barrera E, Bucio L, Souza V, Miranda-Labra R, Fernández-Checa JC, Marquardt JU, Gomez-Quiroz LE, García-Ruiz C, Gutiérrez-Ruiz MC. **GDF11 restricts aberrant lipogenesis and changes in mitochondrial structure and function in human hepatocellular carcinoma cells.** *Journal of Cellular Physiology.* 236(5):4076-4090. D1

9. Ribera J, Portolés I, Córdoba-Jover B, Rodríguez-Vita J, Casals G, González-de la Presa B, Graupera M, Solsona-Vilarrasa E, Garcia-Ruiz C, Fernández-Checa JC, Soria G, Tudela R, Esteve-Codina A, Espadas G, Sabidó E, Jiménez W, Sessa WC, Morales-Ruiz M. **The loss of DHX15 impairs endothelial energy metabolism, lymphatic drainage and tumor metastasis in mice.** *Communications Biology.* 4(1):1192. D1

10. Musto JA, Eickhoff J, Ventura-Cots M, Abraldes JG, Bosques-Padilla F, Verna EC, Brown RS, Vargas V, Altamirano J, Caballería J, Shawcross D, Louvet A, Mathurin P, Garcia-Tsao G, Schnabl B, Bataller R, Lucey MR. **The Level of Alcohol Consumption in the Prior Year Does Not Impact Clinical Outcomes in Patients With Alcohol-Associated Hepatitis.** *Liver Transplantation.* 27(10):1382-1391. D1

11. Blaya D, Pose E, Coll M, Lozano JJ, Graupera I, Schierwagen R, Jansen C, Castro P, Fernandez S, Sidorova J, Vasa-Nicotera M, Solà E, Caballería J, Trebicka J, Ginès P, Sancho-Bru P. **Profiling circulating microRNAs in patients with cirrhosis and acute-on-chronic liver failure.** *JHEP Reports.* 3(2):100233. Q1

12. Miyata T, Wu X, Fan X, Huang E, Sanz-Garcia C, Ross CKC, Roychowdhury S, Bellar A, McMullen MR, Dasarathy J, Allende DS, Caballeria J, Sancho-Bru P, McClain CJ, Mitchell M, McCullough AJ, Radaeva S, Barton B, Szabo G, Dasarathy S, Nagy LE. **Differential role of MLKL in alcohol-associated and non-alcohol-associated fatty liver diseases in mice and humans.** *JCI Insight.* 6(4):e140180. Q1

13. Ribas V; de la Rosa LC; Robles D; Núñez S; Segalés P; Insausti-urkia N; Solsona-vilarrasa E; Fernández-checa JC; García-ruiz C. **Dietary and genetic cholesterol loading rather than steatosis promotes liver tumorigenesis and nash-driven hcc.** *Cancers.* 13(16):4091. Q1

14. Torrente-Rodriguez RM; Munoz-San Martin C; Gamella M; Pedrero M; Martinez-Bosch N; Navarro P; Garcia de Frutos P; Pingarron JM; Campuzano S.**Electrochemical Immunosensing of ST2: A Checkpoint Target in Cancer Diseases.** *Biosensors.* 11(6):202. Q1

15. Blaya D; Rubio-Tomas T; Rodrigo-Torres D; Lozano JJ; Coll M; Argemi JM; Altamirano J; A-o S; Morales-Ibanez O; Gratacos-Gines J; Pose E; Tanguy M; Issoufaly T; Rautou PE; Bataller R; Caballeria J; Sancho-Bru P. **Endothelial dysfunction markers predict short-term mortality in patients with**

severe alcoholic hepatitis. *Hepatology International.* 15(4):1006-1017. Q2

16. Ampuero J, Aller R, Gallego-Durán R, Crespo J, Abad J, González-Rodríguez Á, Gómez-Camarero J, Caballería J, Lo Iacono O, Ibañez L, García-Samaniego J, Martín-Mateos R, Francés R, Fernández-Rodríguez C, Diago M, Soriano G, Andrade RJ, Latorre R, Jorquera F, Morillas RM, Escudero D, Estévez P, Hernández-Guerra M, Augustín S, Pareja-Megia MJ, Banales JM, Aspichueta P, Benlloch S, Rosales JM, Salmerón J, Turnes J, Romero-Gómez M, HEPAmet Registry. **Definite and indeterminate NASH share similar clinical features and prognosis: a longitudinal study of 1893 biopsy-proven NAFLD subjects.** *Liver International.* 41(9):2076-2086. Q2

Review

1. Fernandez-Checa JC, Bagnaninchi P, Ye H, Sancho-Bru P, Falcon-Perez JM, Royo F, Garcia-Ruiz C, Konu O, Miranda J, Lunov O, Dejneka A, Elfick A, McDonald A, Sullivan GJ, Aithal GP, Lucena MI, Andrade RJ, Fromenty B, Kranendonk M, Cubero FJ, Nelson LJ. **Advanced preclinical models for evaluation of drug-induced liver injury - consensus statement by the European Drug-Induced Liver Injury Network [PRO-EURO-DILI-NET].** *Journal of Hepatology.* 75(4):935-959. D1

2. Ruiz-Blázquez P, Pistorio V, Fernández-Fernández M, Moles A. **The multifaceted role of cathepsins in liver disease.** *Journal of Hepatology.* 75(5):1192-1202. D1

3. Garcia-Ruiz C, Conde de la Rosa L, Ribas V, Fernandez-Checa JC. **Mitochondrial Cholesterol and Cancer.** *Seminars in Cancer Biology.* 73:76-85. D1

Clinical Guidelines

1. Klionsky, DJ; Abdel-Aziz, AK; Abdelfatah, S; ... ; Fernandez-Checa, JC; ... ; Garcia-Ruiz, C; ... ; Moles, A; ... ; Xu, WW; Xu, XL; Xue, Y; Yakhine-Diop, SMS. **Guidelines for the use and interpretation of assays for monitoring autophagy (4th edition).** *Autophagy.* 17(1):1-382. D1

GRANTS FOR RESEARCH IN PROGRESS

Fernández-Checa JC. **Contribution of Mitochondrial metabolism of oxysterols and bile acids to liver carcinogenesis.**
Sponsored by: Fundació la Marató de TV3. Cancer_19
Duration: 01/12/2019-30/11/2022

Fernández-Checa JC. **Metabolic Diseases and Cancer.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_RED2018-102799-T
Duration: 01/01/2020-31/12/2021

Fernández-Checa JC. **STARD1 and SAB in human alcoholic liver disease: validation in a murine model with humanized liver.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_PID2019-111669RB
Duration: 01/09/2020-31/08/2023

Fernández-Checa JC. **ER stress-mitochondrial cholesterol axis in obesity-associated insulin resistance and comorbidities.**
Sponsored by: BBVA Foundation
Duration: 01/01/2019-31/12/2021

Fernández-Checa JC. **Zonal distribution of the SARS CoV-2 receptor ACE2 and its partner TMPRSS2 in chronic liver disease.**
Sponsored by: Spanish Association for the Study of the Liver. AEEH_COVID2020
Duration: 01/09/2020 -30/11/2022

Fernández-Checa JC. **Therapeutic Potential of SAMe in NPC Disease.**
Sponsored by: Together Strong NPC Foundation-USA. TSNPC2020
Duration: 31/12/2020 -30/12/2021

Fernández-Checa JC. **Hepatic Liver Diseases: Role of lipids and sphingolipids.**
Sponsored by: Biomedical research Networking Center in Hepatic and Digestive Diseases (CIBERehd)
Duration: 01/01/2021-31/12/2021

Garcia-Ruiz C. **Interplay of mitochondrial proteins StARD1 and SAB in the development and progression of non-alcoholic fatty liver disease: influence by gender.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_PID2020-115055RB-I00
Duration: 10/01/2021-31/09/2024

Garcia-Ruiz C. **Gender specificity in the development of NASH.**
Sponsored by: Spanish National Research Council. CSIC_2020AEP145
Duration: 01/01/2021-31/09/2021

Moles A. **Identification of new therapeutic targets for the treatment of hepatocellular carcinoma: analysis of the role of cathepsin D in the inflammation-fibrosis-cancer axis.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_R-TI2018-097475-A-I00
Duration: 01/01/2019-31/12/2021

Navarro P. **New tumor target-driven strategies: clinical opportunities for pancreatic cancer.**
Sponsored by: Ministerio de Sanidad, Consumo y Bienestar Social. MSCBS_PI20_00625
Duration: 01/01/2021-31/12/2023

DOCTORAL THESES

Fernández-Checa JC, García-Ruiz C. **Stard1 y esteatohepatitis.**
PhD Student: David Robles Sanchez

Fernández-Checa JC, García-Ruiz C. **Cholesterol and stard1: a common nexus in alcoholic liver injury and niemann-pick type C disease-associated mitochondrial stress.**
PhD Student: Estel Solsona i Vilarrasa

Fernández-Checa JC, García-Ruiz C. **Alcoholic liver disease: contribution of hypoxia signaling and transiational relevance in a humanized liver mouse model.**
PhD Student: Naroa Insausti Urkia

Moles A. **Unravelling CtsD-cell-specific role in macrophages during tissue remodelling in kidney disease.**
Phd Student: Valeria Pistorio

3.9 Gene therapy and cancer

LOCATION
CEK building, floor 2

KEYWORDS
1. **Cancer**
2. **Oncolytic adenovirus**
3. **Organoids**
4. **Gene therapy**

RELATED DISEASES
1. **Pancreatic cancer**
2. **Glutaric aciduria**

GROUP INVOLVED IN
AGAUR_SGR17: 00861
CIBERER
RED TERAPIAS AVANZADAS

Original publications

TOTAL	6
Mean IF	**4,74**
Q1	**25%**
D1	**0%**
MA	**50%**
OA	**67%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Changes in the genome of cells often cause disorders such as cancer or hereditary genetic diseases. A precise knowledge of these changes and their impact on pathophysiology helps us to better understand these diseases.

In addition, a knowledge of genetic alterations is very valuable for therapeutics, because it enables innovative, often sophisticated but highly specific therapies that seek maximum efficacy to be developed.

APPROACH

The group studies the molecular and cellular bases of pancreatic cancer, taking advantage of this knowledge to design new therapies based on the use of oncolytic adenoviruses.

These viruses are capable of replicating, amplifying and disintegrating cancer cells selectively and activating a response from the immune system to attack the tumour.
The group also investigates new therapeutic strategies based on gene therapy and/or gene editing, for the treatment of hereditary metabolic diseases.

IMPACT

Pancreatic cancer is a disease with a very poor prognosis: five years after diagnosis, only 7% of patients have survived. The research the group conducts allows it to advance in its knowledge of this tumour, in order to design and test new treatments to improve its progress.

In recent years, advances in gene therapy have provided new treatments for diseases that to date were incurable. In this sense, the group believes that the new gene therapy designs that it is developing will contribute towards responding to some of the hereditary metabolic diseases.

RESEARCH LINES

- Oncolytic virotherapies against pancreatic cancer.

- Preclinical gene therapy/genome editing studies for metabolic rare diseases.

- Understanding pancreatic carcinogenesis.

PUBLICATIONS

Originals

1. Raimondi G; Gea-Sorlí S; Otero-Mateo M; Fillat C. **Inhibition of mir-222 by oncolytic adenovirus-encoded mirna sponges promotes viral oncolysis and elicits antitumor effects in pancreatic cancer models.** *Cancers*. 13(13):3233. Q1

2. Acosta J, Pérez E, Sánchez-Murcia PA, Fillat C, Fernández-Lucas J. **Molecular Basis of NDT-Mediated Activation of Nucleoside-Based Prodrugs and Application in Suicide Gene Therapy.** *Biomolecules*. 11(1):120. Q2

3. Ausania F; Martínez-Pérez A; Senza del Rio P; Borin A; Melendez R; Casal-Nuñez JE. **Multifactorial mitigation strategy to reduce clinically relevant pancreatic fistula in high-risk pancreatojejunostomy following pancreaticoduodenectomy**. *Pancreatology*. 21(2):466-472. Q2

4. Ausania F, Sanchez-Cabus S, Senra Del Rio P, Borin A, Ayuso JR, Bodenlle P, Espinoza S, Cuatrecasas M, Conill C, Saurí T, Ferrer J, Fuster J, García-Valdecasas JC, Melendez R, Fondevila C. **Clinical impact of preoperative tumour contact with superior mesenteric-portal vein in patients with resectable pancreatic head cancer.** *Langenbecks Archives of Surgery*. 406(5):1443-1452. Q2

5. Núñez-Manchón E, Farrera-Sal M, Otero-Mateo M, Castellano G, Moreno R, Medel D, Alemany R, Villanueva E, Fillat C. **Transgene codon usage drives viral fitness and therapeutic efficacy in oncolytic adenoviruses.** *NAR Cancer*. 3(2):zcab015

6. Pascual-Sabater S, Raimondi G, Mato-Berciano A, Vaquero EC, Ausania F, Fillat C. **Preclinical testing of oncolytic adenovirus sensitivity in patient-derived tumor organoids.** *STAR Protocols*. 2(4):101017

Review

1. Giménez-Roig J, Núñez-Manchón E, Alemany R, Villanueva E, Fillat C. **Codon Usage and Adenovirus Fitness: Implications for Vaccine Development.** *Frontiers in Microbiology*. 12:633946. Q1

GRANTS FOR RESEARCH IN PROGRESS

Ausania F, Martínez-Palli G. **Evaluación de la prehabilitación como estrategia para minimizar el riesgo quirúrgico en cirugía pancreática: eficacia y factores determinantes.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00835
Duration: 01/01/2021-31/12/2023

Fillat C. **DYRK1A inhibition to remodel tumor stroma and sensitize immune checkpoint blockade therapies in pancreatic cancer.**
Sponsored by: Fundació la Marató de TV3. Cancer_19
Duration: 30/07/2020-29/07/2023

Fillat C. **Adenovirus oncolíticos protegidos frente anticuerpos neutralizantes y optimizados para la expresión de transgenes y reprogramación del estroma de tumores pancreáticos.**
Sponsored by: Ministerio de Economía y Competitividad. MINECO_-BIO2017-89754-C2-2-R
Duration: 01/01/2018-30/09/2021

Fillat C. **Adeno-associated viral gene therapy with AAV9-GCDH to correct glutaric aciduria type I in Gcdh -/- mice.**
Sponsored by: Fundación Ramón Areces. CIVP19S8539
Duration: 03/04/2019-02/10/2022

Fillat C, Ausania F, Vaquero EC. **Farmacotipificación de pacientes con cáncer de páncreas mediante organoides autogénicos.**
Sponsored by: Fundación Mutua Madrileña.
Duration: 30/09/2019-29/09/2022

Fillat C. **Adenovirus oncolíticos que expresan el sistema PDT/prodroga y un inhibidor de LIF para inducir muerte celular inmunogénica y bloquear la inmunosupresión en cáncer de páncreas.**
Sponsored by: Agencia Estatal de Investigación.AEI_PE20_ PID2020-119692RB-C222018-2021
Duration: 01/09/2021-31/08/2024

Fillat C. **Combining engineered mistranslation and viral therapy for the treatment of pancreatic cancer.**
Sponsored by: Fundación científica asociación española contra el cáncer. AECC_idea Semilla
Duration: 01/12/2021-30/11/2023

Fillat C. **Immunological incompatibility as a basis for cancer curing and vaccination.**
Sponsored by: European Commission. CE_H2020-FETOPN19-2
Duration: 01/10/2020-30/09/2023

3.10 Liver transplantation and graft viability

LOCATION
CEK building, floor 5

KEYWORDS
1. **Liver transplantation**
2. **Graft viability**
3. **Immunosuppression**
4. **Allograft tolerance**
5. **Hepatic ischemia-reperfusion injury**

RELATED DISEASES
1. **Liver metastasis from colorectal cancer**
2. **Cholangiocarcinoma**
3. **Hepatocellular carcinoma**
4. **Biliary complications**
5. **Portal hypertension and abdominal vascular diseases**
6. **Thrombosis and haemostasis**
7. **Neoplasia de novo and cardiovascular complications**

GROUP INVOLVED IN
CIBEREHD

Original publications

TOTAL	49
Mean IF	**9,10**
Q1	**67%**
D1	**41%**
MA	**39%**
OA	**61%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Liver transplantation is the only treatment available for end-stage liver disease and some forms of liver tumors. The success of liver transplantation hinges in the short term on having an adequate supply of good-quality livers to transplant and in the long(er) term on preventing allograft rejection while simultaneously minimizing the risk for chronic diseases due to the use of immunosupression.

APPROACH

This group focuses on optimizing the number of organs available for transplantation by improving techniques of procurement and preservation as well as improving the survival and quality of life of transplanted patients. In order to achieve these aims, this group has lines of research in basic science/experimental research, translational/pre-clinical models, and clinical investigation.

This is a multidisciplinary group comprised of surgeons, hepatologists, anesthesiologists, immunologists, and biologists, with the common goal of improving scientific understanding and above all the lives of the patients we come into contact with each day.

IMPACT

Being an interdisciplinary research group give us a key vision to continue advancing into liver transplantation process research.

In relation to ischemia and graft preservation, important contributions have been made in terms of the preservation solution used to maintain the grafts after its procurement and related to the development of advanced forms of in-situ and ex-situ liver perfusion, allowing recover and transplant safely suboptimal livers, such as the ones from donors that suffer cardiac arrest.

The group has also established which patients have operational tolerance, i.e., those who require no immunosuppression, and it has defined immunosuppression status markers to help personalize the administration of immunosuppressant drugs. Another area of research has aimed to identify the cardiovascular risk factors that significantly impact on the prognosis after liver transplantations, which makes necessary to personalize immunosuppression.

Furthermore, in relation to hemostasis and coagulation, we have defined some independent risk factors for post-transplant venous thrombotic events that facilitates the management of these serious complications depending on the associated risk factors.

Biliary complicatios represents the most important source of morbidity after liver transplantation. Our group has been focused on optimizing the diagnosis and management of these detrimental complications that importantly affect the quality of life of liver transplant patients. Thus, we have been able to refine our guidelines to determine the best optimal strategy for our patients.

RESEARCH LINES

- Ischemia-reperfusion injury and expanding criteria for liver graft acceptance.

- Endoscopic management of biliary complications following liver transplantation.

- Expanding indications for liver transplantation in relation to pre-existing portal vein thrombosis and portal hypertension.

- Expanding indications for transplantation for malignant tumors – hilar cholangiocarcinoma and colorectal cancer liver metastases.

- Alloimmune response, complications associated with immunosupression, and operational tolerance.

- Prevention and treatment of cardiovascular risk factors following liver transplantation.

PUBLICATIONS

Originals

1. Colmenero J, Rodríguez-Perálvarez M, Salcedo M, Arias-Milla A, Muñoz-Serrano A, Graus J, Nuño J, Gastaca M, Bustamante-Schneider J, Cachero A, Lladó L, Caballero A, Fernández-Yunquera A, Loinaz C, Fernández I, Fondevila C, Navasa M, Iñarrairaegui M, Castells L, Pascual S, Ramírez P, Vinaixa C, González-Dieguez ML, González-Grande R, Hierro L, Nogueras F, Otero A, Álamo JM, Blanco-Fernández G, Fábrega E, García-Pajares F, Montero JL, Tomé S, De la Rosa G, Pons JA. **Epidemiological pattern, incidence and outcomes of COVID-19 in liver transplant patients.** *Journal of Hepatology.* 74(1):148-155. D1

2. Conde de la Rosa L, Garcia-Ruiz C, Vallejo C, Baulies A, Nuñez S, Monte MJ, Marin JJG, Baila-Rueda L, Cenarro A, Civeira F, Fuster J, Garcia-Valdecasas JC, Ferrer J, Karin M, Ribas V, Fernandez-Checa JC. **STARD1 promotes NASH-driven HCC by sustaining the generation of bile acids through the alternative mitochondrial pathway.** *Journal of Hepatology.* 74(6):1429-1441. D1

3. Pose E, Torrents A, Reverter E, Perez-Campuzano V, Campos-Varela I, Avitabile E, Gratacós-Ginès J, Castellote J, Castells L, Colmenero J, Tort J, Ginès P, Crespo G. **A notable proportion of liver transplant candidates with alcohol-related cirrhosis can be delisted because of clinical improvement.** *Journal of Hepatology.* 75(2):275-283. D1

4. Belli LS, Duvoux C, Artzner T, Bernal W, Conti S, Cortesi PA, Sacleux SC, Pageaux GP, Radenne S, Trebicka J, Fernandez J, Perricone G, Piano S, Nadalin S, Morelli MC, Martini S, Polak WG, Zieniewicz K, Toso C, Berenguer M, Iegri C, Invernizzi F, Volpes R, Karam V, Adam R, Faitot F, Rabinovich L, Saliba F, Meunier L, Lesurtel M, Uschner FE, Fondevila C, Michard B, Coilly A, Meszaros M, Poinsot D, Schnitzbauer A, De Carlis LG, Fumagalli R, Angeli P, Arroyo V, Jalan R, ELITA/EF-CLIF working group. **Liver transplantation for patients with acute-on-chronic liver failure (ACLF) in Europe: results of the ELITA/EF-CLIF collaborative study (ECLIS).** *Journal of Hepatology.* 75(3):610-622. D1

5. Ferrer-Fàbrega J, Sampson-Dávila J, Forner A, Sapena V, Díaz A, Vilana R, Navasa M, Fondevila C, Miquel R, Ayuso C, García-Valdecasas JC, Bruix J, Reig M, Fuster J. **Limited tumor progression beyond Milan criteria while on the waiting list does not result in unacceptable impairment of survival.** *Journal of Hepatology.* 75(5):1154-1163. D1

6. Turon F, Driever EG, Baiges A, Cerda E, García-Criado Á, Gilabert R, Bru C, Berzigotti A, Nuñez I, Orts L, Reverter JC, Magaz M, Camprecios G, Olivas P, Betancourt-Sanchez F, Perez-Campuzano V, Blasi A, Seijo S, Reverter E, Bosch J, Borràs R, Hernandez-Gea V, Lisman T, Garcia-Pagan JC. **Predicting portal thrombosis in cirrhosis: A prospective study of clinical, ultrasonographic and hemostatic factors.** *Journal of Hepatology.* 75(6):1367-1376. D1

7. Belli LS; Duvoux C; Cortesi PA; Facchetti R; Iacob S; Perricone G; Radenne S; Conti S; Patrono D; Berlakovich G; Hann A; Pasulo L; Castells L; Faitot F; Detry O; Invernizzi F; Magini G; De Simone P; Kounis I; Morelli MC; Díaz Fontenla F; Ericzon BG; Loinaz C; Johnston C; Gheorghe L; Lesurtel M; Romagnoli R; Kollmann D; Perera MTP; Fagiuoli S; Mirza D; Coilly A; Toso C; Zieniewicz K; Elkrief L; Karam V; Adam R; den Hoed C; Merli M; Puoti M; De Carlis L; Oniscu GC; Piano S; Angeli P; Fondevila C; Polak WG; for all the centres contributing to the ELITA-ELTR COVID-19 Registry. **COVID-19 in liver transplant candidates: pretransplant and post-transplant outcomes - an ELITA/ELTR multicentre cohort study.** *Gut.* 70(10):1914-1924. D1

8. Belli LS, Fondevila C, Cortesi PA, Conti S, Karam V, Adam R, Coilly A, Ericzon BG, Loinaz C, Cuervas-Mons V, Zambelli M, Llado L, Diaz-Fontenla F, Invernizzi F, Patrono D, Faitot F, Bhooori S, Pirenne J, Perricone G, Magini G, Castells L, Detry O, Cruchaga PM, Colmenero J, Berrevoet F, Rodriguez G, Ysebaert D, Radenne S, Metselaar H, Morelli C, De Carlis LG, Polak WG, Duvoux C, ELITA-ELTR COVID-19 Registry. **Protective role of tacrolimus, deleterious role of age and comorbidities in liver transplant recipients with Covid-19: results from the ELITA/ELTR multi-center European study.** *Gastroenterology.* 160(4):1151-1163.e3. D1

9. Domínguez-Gil B; Ascher N; Capron AM; Gardiner D; Manara AR; Bernat JL; Miñambres E; Singh JM; Porte RJ; Markmann JF; Dhital K; Ledoux D; Fondevila C; Hosgood S; Van Raemdonck D; Keshavjee S; Dubois J; McGee A; Henderson GV; Glazier AK; Tullius SG; Shemie SD; Delmonico FL. **Expanding controlled donation after the circulatory determination of death: statement from an international collaborative.** *Intensive Care Medicine.* 47(3):265-281. D1

10. Ventura-Aguiar P, Ferrer J, Paredes D, Rodriguez-Villar C, Ruiz A, Fuster J, Fondevila C, Garcia-Valdecasas JC, Esmatjes E, Adália R, Oppenheimer F, Campistol JM, Diekmann F, Ricart MJ. **Outcomes From Brain Death Donors With Previous Cardiac Arrest Accepted for Pancreas Transplantation: A Single-center Retrospective Analysis.** *Annals of Surgery.* 273(6):e230-e238. D1

11. Ramírez-Maldonado E, López Gordo S, Pueyo EM, Sánchez-García A, Mayol S, González S, Elvira J, Memba R, Fondevila C, Jorba R. **Immediate Oral Refeeding in Patients With Mild and Moderate Acute Pancreatitis: A Multicenter, Randomized Controlled Trial (PADI trial).** *Annals of Surgery.* 274(2):255-263. D1

12. Mueller M, Breuer E, Mizuno T, Bartsch F, Ratti F, Benzing C, Ammar-Khodja N, Sugiura T, Takayashiki T, Hessheimer A, Kim HS, Ruzzenente A, Ahn KS, Wong T, Bednarsch J, D'Silva M, Koerkamp BG, Jeddou H, López-López V, de Ponthaud C, Yonkus JA, Ismail W, Nooijen LE, Hidalgo-Salinas C, Kontis E, Wagner KC, Gunasekaran G, Higuchi R, Gleisner A, Shwaartz C, Sapisochin G, Schulick RD, Yamamoto M, Noji T, Hirano S, Schwartz M, Oldhafer KJ, Prachalias A, Fusai GK, Erdmann JI, Line PD, Smoot RL, Soubrane O, Robles-Campos R, Boudjema K, Polak WG, Han HS, Neumann UP, Lo CM, Kang KJ, Guglielmi A, Park JS, Fondevila C, Ohtsuka M, Uesaka K, Adam R, Pratschke J, Aldrighetti L, De Oliveira ML, Gores GJ, Lang H, Nagino M, Clavien PA. **Perihilar Cholangiocarcinoma-Novel Benchmark Values for Surgical and Oncological Outcomes From 24 Expert Centers.** *Annals of Surgery.* 274(5):780-788. D1

13. Hessheimer AJ, Vargas-Martinez AM, Trapero-Bertran M, Navasa M, Fondevila C. **Post-Transplant Hepatocellular Carcinoma Surveillance: A Cost-Effectiveness and Cost-Utility Analysis.** *Annals of Surgery*. D1

14. Grassano M; Calvo A; Moglia C; Brunetti M; Barberis M; Sbaiz L; Canosa A; Manera U; Vasta R; Corrado L; D'Alfonso S; Mazzini L; Scholz SW; Dalgard C; Ding J; Gibbs RJ; Chia R; Traynor BJ; Chio A; Amer Genomic Ctr. **Mutational Analysis of Known ALS Genes in an Italian Population-Based Cohort.** *Neurology*. 96(4):E600-E609. D1

15. Shekhtman L, Navasa M, Sansone N, Crespo G, Subramanya G, Chung TL, Cardozo-Ojeda EF, Pérez-Del-Pulgar S, Perelson AS, Cotler SJ, Forns X, Uprichard SL, Dahari H. **Modeling hepatitis C virus kinetics during liver transplantation reveals the role of the liver in virus clearance.** *Elife*. 10:e65297. D1

16. Caballero-Marcos A, Salcedo M, Alonso-Fernández R, Rodríguez-Perálvarez M, Olmedo M, Graus Morales J, Cuervas-Mons V, Cachero A, Loinaz-Segurola C, Iñarrairaegui M, Castells L, Pascual S, Vinaixa-Aunés C, González-Grande R, Otero A, Tomé S, Tejedor-Tejada J, Álamo-Martínez JM, González-Diéguez L, Nogueras-Lopez F, Blanco-Fernández G, Muñoz-Bartolo G, Bustamante FJ, Fábrega E, Romero-Cristóbal M, Martin-Mateos R, Del Rio-Izquierdo J, Arias-Milla A, Calatayud L, Marcacuzco-Quinto AA, Fernández-Alonso V, Gómez-Gavara C, Colmenero J, Muñoz P, Pons JA, Spanish Society of Liver Transplantation (SETH). **Changes in Humoral Immune Response after SARS-CoV-2 Infection in Liver Transplant Recipients Compared to Immunocompetent Patients.** *American Journal of Transplantation.* 21(8):2876-2884. D1

17. Herrera S, Colmenero J, Pascal M, Escobedo M, Castel MA, Sole-González E, Palou E, Egri N, Ruiz P, Mosquera M, Moreno A, Juan M, Vilella A, Soriano A, Farrero M, Bodro M. **Cellular and humoral immune response after mRNA-1273 SARS-CoV-2 vaccine in liver and heart transplant recipients.** *American Journal of Transplantation.* 21(12):3971-3979. D1

18. Viguera L, Blasi A, Reverter E, Arjona B, Caballero M, Chocron I, García-López JA, Gutierrez R, Martin MJ, Pérez-Peña J, Pitera J, Zarragoikoetxea I, Sabaté A, Sociedad Española de Transplante Hepatico (SETH) Study Group. **Liver transplant with controlled donors after circulatory death with normothermic regional perfusion and brain dead donors: A multicenter cohort study of transfusion, one-year graft survival and mortality.** *International Journal of Surgery*. 96:106169. D1

19. Lissing M, Nowak G, Adam R, Karam V, Boyd A, Gouya L, Meersseman W, Melum E, Ołdakowska-Jedynak U, Reiter FP, Colmenero J, Sanchez R, Herden U, Langendonk J, Ventura P, Isoniemi H, Boillot O, Braun F, Perrodin S, Mowlem E, Wahlin S, European Liver and Intestine Transplant Association. **Liver Transplantation for Acute Intermittent Porphyria.** *Liver Transplantation.* 27(4):491-501. D1

20. Iavarone M, Invernizzi F, Ivanics T, Mazza S, Zavaglia C, Sanduzzi-Zamparelli M, Fraile-López M, Czauderna C, Di Costanzo G, Bhoori S, Pinter M, Manini MA, Amaddeo G, Yunquera AF, Piñero F, Blanco Rodríguez MJ, Anders M, Aballay Soteras G, Villadsen GE, Yoon PD, Cesarini L, Díaz-González Á, González-Diéguez ML, Tortora R, Weinmann A, Mazzaferro V, Romero Cristóbal M, Crespo G, Regnault H, De Giorgio M, Varela M, Prince R, Scudeller L, Donato MF, Wörns MA, Bruix J, Sapisochin G, Lampertico P, Reig M. **Regorafenib efficacy after sorafenib in patients with recurrent HCC after liver transplantation: a retrospective study.** *Liver Transplantation.* 27(12):1767-1778. D1

21. Vidal L, Victoria I, Gaba L, Martín MG, Brunet M, Colom H, Cortal M, Gómez-Ferrería M, Yeste-Velasco M, Perez A, Rodon J, Sohal DPS, Lizcano JM, Domènech C, Alfón J, Gascón P. **A first-in-human phase I/Ib dose-escalation clinical trial of the autophagy inducer ABTL0812 in patients with advanced solid tumours.** *European Journal of Cancer*. 146:87-94. Q1

22. Fraunhoffer NA, Closa D, Folch-Puy E, Abuelafia AM, Calvo EL, Chuluyan E, Iovanna J. **Targeting REG3β limits pancreatic ductal adenocarcinoma progression through CTGF downregulation.** *Cancer Letters*. 521:64-70. Q1

23. Manicardi N; Fernández-Iglesias A; Abad-Jordà L; Royo F; Azkargorta M; Ortega-Ribera M; Sanfeliu-Redondo D; Martínez-Alcocer A; Elortza F; Hessheimer AJ; Fondevila C; Lozano JJ; García-Pagán JC; Bosch J; Cubero FJ; Albillos A; Vaquero J; Falcón-Pérez JM; Gracia-Sancho J. **Transcriptomic profiling of the liver sinusoidal endothelium during cirrhosis reveals stage-specific secretory signature.** *Cancers*. 13(11):2688. Q1

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GRANTS FOR RESEARCH IN PROGRESS

Blasi A, Reverter JC. **Desarrollo de un modelo mecanístico computacional de complejidad reducida de la hemostasia portal a partir de parámetros en sangre periférica, y evaluación de su capacidad predictiva de aparición de trombosis portal en la cirrosis.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00076
Duration: 01/01/2020-31/12/2022

Brunet M, Millán O. **Análisis de la expresión de un panel de miRNAs y Quimiocinas como biomarcadores pronóstico precoces del riesgo de rechazo mediado por células T y subclínico post-trasplante hepático.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00378
Duration: 01/01/2020-31/12/2022

Cárdenas A. **Nuevas estrategias para identificar dianas terapéuticas de la fibrosis de la estenosis de la anastomosis biliar en receptores de trasplante hepático.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00752
Duration: 01/01/2020-31/12/2022

Colmenero J, Díaz-Lorca MA. **Caracterización molecular e histológicas del daño aloinmune contra el injerto tras el trasplante hepático: identificación de factores predictivos de mal pronóstico y dianas terapéuticas.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/01125
Duration: 01/01/2019-30/06/2023

Crespo G. **Caracterización del papel de la respuesta inmunológica en la progresión de la cirrosis hepática mediante inmunología de sistemas: evaluación de nuevas estrategias terapéuticas.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00727
Duration: 01/01/2019-31/12/2021

Fondevila C, Hessheimer AJ. **Precondicionamiento portal en injertos hepáticos pequeños mediante perfusión normotérmica ex situ en un modelo porcino.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00894
Duration: 01/01/2019-31/12/2021

DOCTORAL THESES

Brunet M, Colom H. **Population Pharmacokinetic-Pharmacodynamic Modelling in Solid Organ Transplantation: Basis of Personalized immunosupression.**
Phd Student: Luís Quintairos Domènech

3.11 Viral, toxic and metabolic hepatopathies

LOCATION
CEK building, floor 4

KEYWORDS
1. **Viral hepatitis, clinical outcomes and treatment**
2. **Immune responses in liver diseases**
3. **Cupper metabolism**

RELATED DISEASES
1. **Acute hepatitis**
2. **Chronic hepatitis B and D**
3. **Autoimmune hepatitis**
4. **Wilson's disease**
5. **Cholestatic diseases**
6. **Hepatitis C**
7. **Drug-induced liver injury (DILI)**

GROUP INVOLVED IN
AGAUR_SGR17: 01753
CIBEREHD

AWARDS
Rising Star
Institution: United European Gastroenterology (UEG)
Awardee/s: Sabela Lens

Original publications

TOTAL	17
Mean IF	7,72
Q1	65%
D1	41%
MA	24%
OA	76%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Our group has two main focuses of clinical and translational research: viral hepatitis and autoimmune liver diseases. Viral hepatitis, mainly hepatitis C and B, are relevant causes of cirrhosis, hepatocellular carcinoma, and liver-related mortality worldwide.

In the case of hepatitis B virus infection (HBV, with or without HDV), there is no curative treatment, so conducting research in this area is a challenge. We also work on clinical and translational aspects of autoimmune hepatitis and cholestatic liver diseases.

In both cases, a better knowledge on the pathophysiology (particularly the adaptive immune responses) will be crucial to advance in future therapies.

Finally, our team has two other focuses of clinical research: **1)** metabolic diseases caused by copper (Wilson's disease) or iron (hemochromatosis) accumulation, which can evolve into cirrhosis if not diagnosed and treated early and **2)** Drug-induced liver injury (DILI), which has an increasing incidence due to the wide use of drugs in the general population.

APPROACH

In the field of viral hepatitis, advances in the knowledge of the interactions between the virus and the immune responses are key to understanding the natural history of the disease and the development of new therapeutic targets. This is particularly relevant in chronic hepatitis B, where an immune exhaustion of T cells may explain the persistence of HBV.

Our group is actively working on exploring the mechanisms that explain dysfunctional T and B cells during hepatitis B infection (in the different phases of the disease), by characterizing certain intrahepatic lymphocyte populations, as well as assessing viral replication activity in hepatocytes. Regarding autoimmune hepatitis (AIH), we are working on characterizing peripheral and intrahepatic immune cell populations in newly diagnosed patients and in those who present a flare after withdrawing immunosuppression as a model to better understand the pathogenesis of the disease and the immunological factors that predict treatment response.

In the case of metabolic and drug-induced liver disease, epidemiological studies and the search for factors (genetic or environmental) that are involved in diseases' outcomes are expanding fields.

IMPACT

The group has made significant contributions to the study of the impact of curing hepatitis C, especially on the treatment (with direct acting antivirals) in patients with advanced liver diseases and associated extrahepatic manifestations.

Currently, we are focused on: **1)** analyzing virological and immunological factors involved in the evolution of hepatitis B and their potential use to predict response to therapy, and **2)** studying transcriptomic and immunological factors that predict treatment response in patients with AIH to subsequently design an individualized treatment approach with more aggressive immunosuppression being administered to patients with lower changes of response to standard therapy with corticoids and azathioprine.

RESEARCH LINES

- Interplay between HBV, HDV and host factors: impact on liver disease progression.

- Molecular mechanisms and clinical relevance of the persistence of cccDNA in chronic HBV infection.

- Natural history of chronic HBV infection in different clinical situations.

- Clinical, virological and immunological predictors of response after antiviral treatment interruption in chronic hepatitis B.

- Characterization of humoral and intrahepatic HBV immune responses and the effect of antiviral therapy.

- Strategies of hepatitis C microelimination in our geographical area, focused in People Who Inject Drugs (PWID).

- Long-term impact of Hepatitis C cure in patients with advanced liver disease.

- Evolution of AIH in special populations (pregnancy, compensated and decompensated cirrhosis).

- Identification of biomarkers of success of immunosuppression withdrawal and treatment response in AIH.

- Natural history of modern primary biliary cholangitis (PBC).

- Predictive factors of portal hypertension in patients in non-cirrhotic patients with PBC.

- Impact of exercise programs in the treatment PBC-associated fatigue.

- Clinical and biological characterization of patients with Wilson's disease.

- Epidemiology of drug-induced liver disease.

PUBLICATIONS

Originals

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2. Álvarez EG, Demeulemeester J, Otero P, Jolly C, García-Souto D, Pequeño-Valtierra A, Zamora J, Tojo M, Temes J, Baez-Ortega A, Rodriguez-Martin B, Oitaben A, Bruzos AL, Martínez-Fernández M, Haase K, Zumalave S, Abal R, Rodríguez-Castro J, Rodriguez-Casanova A, Diaz-Lagares A, Li Y, Raine KM, Butler AP, Otero I, Ono A, Aikata H, Chayama K, Ueno M, Hayami S, Yamaue H, Maejima K, Blanco MG, Forns X, Rivas C, Ruiz-Bañobre J, Pérez-Del-Pulgar S, Torres-Ruiz R, Rodriguez-Perales S, Garaigorta U, Campbell PJ, Nakagawa H, Van Loo P, Tubio JMC. **Aberrant integration of Hepatitis B virus DNA promotes major restructuring of human hepatocellular carcinoma genome architecture.** *Nature Communications.* 12(1):6910. D1

3. Bassegoda O, Olivas P, Turco L, Mandorfer M, Serra-Burriel M, Tellez L, Kwanten W, Laroyenne A, Farcau O, Alvarado E, Moga L, Vuille-Lessard E, Fortea JI, Ibañez L, Tosetti G, Vanwolleghem T, Larrue H, Burgos-Santamaría D, Stefanescu H, Paternostro R, Cippitelli A, Lens S, Augustin S, Llop E, Laleman W, Trebicka J, Chang J, Masnou H, Zipprich A, Miceli F, Semmler G, Forns X, Primignani M, Bañares R, Puente A, Berzigotti A, Rautou PE, Villanueva C, Ginès P, Garcia-Pagan JC, Procopet B, Bureau C, Albillos A, Francque S, Reiberger T, Schepis F, Graupera I, Hernandez-Gea V. **Decompensation in advanced non-alcoholic fatty liver disease may occur at lower hepatic venous pressure gradient levels that in patients with viral disease.** *Clinical Gastroenterology and Hepatology.* S1542-3565(21):01136-8. D1

4. Palom A, Sopena S, Riveiro-Barciela M, Carvalho-Gomes A, Madejón A, Rodriguez-Tajes S, Roade L, García-Eliz M, García-Samaniego J, Lens S, Berenguer-Hayme M, Rodríguez-Frías F, Hernandez-Évole H, Isabel Gil-García A, Barreira A, Esteban R, Buti M. **One-quarter of chronic hepatitis D patients reach HDV-RNA decline or undetectability during the natural course of the disease.** *Alimentary Pharmacology & Therapeutics.* 54(4):462-469. D1

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6. Mastoridis S, Londoño MC, Kurt A, Kodela E, Crespo E, Mason J, Bestard O, Martínez-Llordella M, Sánchez-Fueyo A. **Impact of donor extracellular vesicle release on recipient cell "cross-dressing" following clinical liver and kidney transplantation.** *American Journal of Transplantation.* 21(7):2387-2398. D1

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Impact of Sexualized Substance Use and Other Risk Practices on HCV Microelimination in gbMSM Living with HIV: Urgent Need for Targeted Strategies. *Infectious Diseases and Therapy.* 10(3):1253-1266. Q1

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12. Mandorfer M, Turon F, Lens S, Baiges A, García-Criado Á, Darnell A, Belmonte E, Ferrusquía-Acosta J, Magaz M, Perez-Campuzano V, Olivas P, Bauer D, Casanovas G, Torres F, Mariño Z, Forns X, Hernández-Gea V, García-Pagán JC. **Risk of non-tumoral portal vein thrombosis in patients with HCV-induced cirrhosis after sustained virological response.** *Liver International.* 41(12):2954-2964. Q2

13. Broquetas T; Herruzo-Pino P; Mariño Z; Naranjo D; Vergara M; Morillas RM; Forns X; Carrión JA. **Elastography is unable to exclude cirrhosis after sustained virological response in HCV-infected patients with advanced chronic liver disease.** *Liver International.* 41(11):2733-2746. Q2

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15. Rodríguez-Tajes S, Miralpeix A, Costa J, López-Suñé E, Laguno M, Pocurull A, Lens S, Mariño Z, Forns X. **Low risk of hepatitis b reactivation in patients with severe COVID-19 who receive immunosuppressive therapy.** *Journal of Viral Hepatitis.* 28(1):89-94. Q2

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17. Ferre-Aracil C, Riveiro-Barciela M, Trapero-Marugán M, Rodríguez-Perálvarez M, Llovet LP, Téllez L, Sánchez-Torrijos Y, Díaz-Fontenla F, Salcedo-Plaza M, Álvarez-López P, de la Mata M, Londoño MC, Bañares-Cañizares R, Calleja JL. **Tacrolimus as an Effective and Durable Second-Line Treatment for Chronic Autoimmune Hepatitis: A Multicentric Study.** *Digestive Diseases and Sciences.* 66(8):2826-2832. Q3

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1. García-Pras E, Fernández-Iglesias A, Gracia-Sancho J, Pérez del Pulgar, S. **Cell Death in Hepatocellular Carcinoma: Pathogenesis and Therapeutic Opportunities.** *Cancers.* 14(1):48. Q1

2. Olivas I, Cobreros M, Londoño MC, Díaz-González Á. **Budesonide in the first line treatment of patients with autoimmune hepatitis.** *Gastroenterología y Hepatología.* S0210-5705(21):00319-8. Q4

Letters

1. Londoño MC, Gratacós-Ginès J, Sáez-Peñataro J. **Another case of autoimmune hepatitis after SARS-CoV-2 vaccination. Still casualty?** *Journal of Hepatology.* 75(5):1248-1249. D1

2. Rodríguez-Tajes S, Lens S, Forns X. **Reply to: Optimal hepatitis B vaccination schedule for cirrhotic patients: a still unanswered question.** *Journal of Viral Hepatitis.* 28(9):1331-1332. Q2

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1. Bartres C, Soy G, Forns X. **Hepatitis C therapy and anticonvulsants.** *Gastroenterología y Hepatología.* 44(7):536-536. Q4

2. Soy G; Forns X. **Red yeast rice extract: The risky trend of natural products. Gastroenterología y Hepatología.** 44(4):293-294. Q4

GRANTS FOR RESEARCH IN PROGRESS

Forns X. **Hepatopaties víriques, tòxiques i metabòliques.**
Sponsored by: Generalitat de Catalunya. AGAUR_SGR17_01753
Duration: 01/01/2017-30/09/2021

Forns X. **Estudio de la disfunción de la respuesta inmune adaptativa periférica e intrahepática en las diferentes fases de la infección crónica por el virus de la hepatitis B.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00079
Duration: 01/01/2019-31/03/2022

Forns X. **Programa de formación para la interpretación de biopsias hepáticas dirigida a Hepatólogos.**
Sponsored by: Gilead Sciences (SLU). GLD18_0128
Duration: 01/02/2019-15/11/2021

Forns X. **Evaluación prospectiva de un modelo externalizado de consulta especializada con intervención educacional para reducir la reinfección por el virus de la hepatitis C en un centro de reducción de daños.**
Sponsored by: Ministerio de Sanidad, Consumo y Bienestar Social. MSCBS_P-NSD20
Duration: 01/01/2021-31/12/2022

Forns X, Lens S. **Thervacb: A therapeutic vaccine to cure hepatitis B.**
Sponsored by: European Commission. CE_H2020-848223
Duration: 01/01/2020-31/12/2024

Lens S. **Defining the best strategy for global HCV screening, linkage-to-care education and prevention in PWID population and validation of a new diagnostic dried blood spot test.**
Sponsored by: Gilead Sciences (SLU). INT_GILEAD_IRS_18
Duration: 01/12/2018-18/05/2022

Lens S. **Caracterización de la respuesta inmune mediada por linfocitos B específicos contra el virus de la Hepatitis B en diferentes fases de la enfermedad e impacto del tratamiento antiviral.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00609
Duration: 01/01/2021-31/12/2023

Londoño MC. **Identificación de biomarcadores para predecir el éxito de la retirada de la inmunosupresión en pacientes con hepatitis autoinmune.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00955
Duration: 01/01/2018-31/03/2022

Mariño Z. **Brain metabolic and functional connectivity dysfunction in patients with chronic hepatitis C and reversibility after viral eradication with direct acting antivirals.**
Sponsored by: Gilead Sciences (SLU). GLD17/00273
Duration: 01/02/2018-17/02/2022

Mariño Z. **Proyecto de microeliminación del virus de la hepatitis C (VHC) entre la población con trastorno mental grave en la Unidad de agudos del Hospital Clinic y el CSMA-EE de Barcelona (Estudio PSIQUI-Clinic).**
Sponsored by: Gilead Sciences (SLU). GLD20_PSIQUI-Clinic
Duration: 01/05/2021-30/04/2023

Pérez del Pulgar S. **Interplay between HBV, HDV and host factors: impact on liver disease progression.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00036
Duration: 01/01/2020-31/12/2022

DOCTORAL THESES

Forns X, Lens S. **Evolución de los patrones epidemiológicos de las hepatitis virales en Cataluña.**
PhD student: Sergio Rodríguez Tajes

3.12 Regulation of liver microcirculation in cirrhosis and hepatic vascular diseases

LOCATION
CEK building, floor 4

KEYWORDS
1. **Portal hypertension**
2. **Cirrhosis**
3. **Variceal bleeding**
4. **Idiopathic**
5. **Portal vein thrombosis**
6. **Tips**

RELATED DISEASES
1. **Portal hypertension**
2. **Hepatic vascular diseases**
3. **Idiopathic portal hypertension**
4. **Non-cirrhotic portal vein thrombosis**
5. **Budd-Chiari syndrome**

AWARDS
XV Premio Francisco Cobos
Institution: Fundación Francisco Cobos
Awardee/s: Juan Carlos García-Pagán

GROUP INVOLVED IN
AGAUR_SGR17: 00517
CIBEREHD

Original publications

TOTAL	26
Mean IF	12,43
Q1	81%
D1	50%
MA	42%
OA	50%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The group's research focuses on the etiology, pathophysiology, diagnosis, staging and treatment of all portal hypertension (PHT) causes, which is defined by an increased pressure in the portal vein (the vein that carries blood to the liver), and is the most serious complication common to all liver diseases.

The development of PHT leads to variceal bleeding, development of ascites or hepatic encephalopathy, all of them life threatening complications.

Although the most frequent cause of PHT is cirrhosis, many other diseases such as Budd Chiari syndrome, idiopathic portal hypertension or portal vein thrombosis (known as non-cirrhotic portal hypertension or hepatic vascular diseases) can also evolve with portal hypertension. These diseases, that are considered rare minority diseases, usually affect young patients and, if not treated properly, can markedly reduce their survival.

APPROACH

The group approaches portal hypertension from different angles: improvement of PHT knowledge with molecular-cellular studies, studies in preclinical models of the diseases as well as human interventional studies and clinical trials.

Molecular-cellular studies and preclinical models focus on reproducing the disease and the mechanisms that regulate the liver cells, evaluating which components are responsible for the increase in PHT and the appearance of complications so that new therapeutic targets and treatments can be developed. From the clinical point of view, the group is pioneer in the application of new diagnostic methods among patients with PHT. The group has actively participated in the development of non – invasive methods that facilitate the diagnosis of PHT, especially useful in the outpatient clinic evaluation.

Regarding invasive methods such as performance of transjugular liver biopsies, hepatic pressures measurement, placing of TIPS and recanalization of the portal vein in patients with extensive thromboses our group works as a referral center both in Catalunya and in Europe. This versatile and dynamic approach enables our group to further improve our knowledge in the prognosis, diagnosis techniques and treatment options for these patients.

IMPACT

The ultimate goal of the research performed in our group is to understand how PHT

develops at different levels. We seek to clarify the mechanisms responsible for its appearance in order to find new therapeutic targets easy to apply in clinical practice.

From a more clinical point of view, the group also focuses on improving diagnostic methods and the identification of patients at risk of developing complications, as well as implementing management, treatment and follow-up strategies that significantly reduce the incidence of complications from these diseases, therefore increasing patient survival.

RESEARCH LINES

- Pre-clinical models for disease studies.

- Role of liver sinusoidal endothelial cells in the regulation of liver fibrosis and liver regeneration.

- Physiopathology, natural history, prognosis and management for portal hypertension.

- Precision medicine in the management of decompensated cirrhosis.

- Hepatic vascular diseases (Budd-Chiari syndrome, portal vein thrombosis; Idiopathic non-cirrhotic portal hypertension): physiopathology, prognosis and management.

- Discovery of diagnostic bio-markers for idiopathic portal hypertension and for risk-stratification.

- Management of post-TIPS encephalopathy.

- Mechanisms in liver inflammation and fibrosis.

PUBLICATIONS

Originals

1. Ferrusquía-Acosta J, Bassegoda O, Turco L, Reverter E, Pellone M, Bianchini M, Pérez-Campuzano V, Ripoll E, García-Criado Á, Graupera I, García-Pagán JC, Schepis F, Senzolo M, Hernández-Gea V. **Agreement between wedged hepatic venous pressure and portal pressure in non-alcoholic steatohepatitis-related cirrhosis.** *Journal of Hepatology.* 74(4):811-818. D1

2. Pose E, Torrents A, Reverter E, Perez-Campuzano V, Campos-Varela I, Avitabile E, Gratacós-Ginès J, Castellote J, Castells L, Colmenero J, Tort J, Ginès P, Crespo G. **A notable proportion of liver transplant candidates with alcohol-related cirrhosis can be delisted because of clinical improvement.** *Journal of Hepatology.* 75(2):275-283. D1

3. Martínez J, Hernández-Gea V, Rodríguez-de-Santiago E, Téllez L, Procopet B, Giráldez Á, Amitrano L, Villanueva C, Thabut D, Ibañez-Samaniego L, Silva-Junior G, Genescà J, Bureau C, Trebicka J, Bañares R, Krag A, Llop E, Laleman W, Palazon JM, Castellote J, Rodrigues S, Gluud LL, Noronha-Ferreira C, Cañete N, Rodríguez M, Ferlitsch A, Schwarzer R, Mundi JL, Gronbaek H, Hernández-Guerra M, Sassatelli R, Dell'Era A, Senzolo M, Abraldes JG, Romero-Gomez M, Zipprich A, Casas M, Masnou H, Primignani M, Nevens F, Calleja JL, Jansen C, Robic MA, Conejo I, Catalina MV, Rudler M, Alvarado E, Perez-Campuzano V, Guardascione MA, Fischer P, Bosch J, García-Pagán JC, Albillos A, International Variceal Bleeding Observational Study Group and Baveno Cooperation. **Bacterial infections in patients with acute variceal bleeding in the era of antibiotic prophylaxis.** *Journal of Hepatology.* 75(2):342-350. D1

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5. Hernández-Gea V, Campreciós G, Betancourt F, Pérez-Campuzano V, Seijo S, Díaz A, Gallego-Durán R, Olivas P, Orts L, Magaz M, Baiges A, Turon F, Sidorova J, Romero-Gómez M, Lozano JJ, García-Pagán JC. **Coexpression gene network analysis reveals novel regulatory pathways involved in porto-sinusoidal vascular disease.** *Journal of Hepatology.* 75(4):924-934. D1

6. Turon F, Driever EG, Baiges A, Cerda E, García-Criado Á, Gilabert R, Bru C, Berzigotti A, Nuñez I, Orts L, Reverter JC, Magaz M, Camprecios G, Olivas P, Betancourt-Sanchez F, Perez-Campuzano V, Blasi A, Seijo S, Reverter E, Bosch J, Borràs R, Hernandez-Gea V, Lisman T, Garcia-Pagan JC. **Predicting portal thrombosis in cirrhosis: A prospective study of clinical, ultrasonographic and hemostatic factors.** *Journal of Hepatology.* 75(6):1367-1376. D1

7. Nicoară-Farcău O, Han G, Rudler M, Angrisani D, Monescillo A, Torres F, Casanovas G, Bosch J, Lv Y, Thabut D, Fan D, Hernández-Gea V, García-Pagán JC, Preemptive TIPS Individual Data Metanalysis, International Variceal Bleeding Study and Baveno Cooperation Study groups. **Effects of Early Placement of Transjugular Portosystemic Shunts in Patients With High-Risk Acute Variceal Bleeding: a Meta-analysis of Individual Patient Data.** *Gastroenterology.* 160(1):193-205. D1

8. Elkrief L; Lazareth M; Chevret S; Paradis V; Magaz M; Blaise L; Rubbia-Brandt L; Moga L; Durand F; Payancé A; Plessier A; Chaffaut C; Valla D; Malphettes M; Diaz A; Nault JC; Nahon P; Audureau E; Ratziu V; Castera L; Garcia Pagan JC; Ganne-Carrie N; Rautou PE; ANRS CO12 CirVir group. **Liver stiffness by transient elastography to detect porto-sinusoidal vascular liver disease with portal hypertension**. *Hepatology*. 74(1):364-378. D1

9. Luo X; Xiang T; Wu J; Wang X; Zhu Y; Xi X; Yan Y; Yang J; García-Pagán JC; Yang L. **Endoscopic Cyanoacrylate Injection vs BRTO for Prevention of Gastric Variceal Bleeding: A Randomized Controlled Trial.** *Hepatology*. 74(4):2074-2084. D1

10. Walter A, Rudler M, Olivas P, Moga L, Trépo E, Robic MA, Ollivier-Hourmand I, Baiges A, Sutter O, Bouzbib C, Peron JM, Le Pennec V, Ganne-Carrié N, Garcia-Pagán JC, Mallet M, Larrue H, Dao T, Thabut D, Hernández-Gea V, Nault JC, Bureau C, Allaire M, Salvage TIPS Group. **Combination of MELD and lactate predicts death in patients treated with salvage TIPS for refractory variceal bleeding.** *Hepatology*. 74(4):2085-2101. D1

11. Knight GM; Clark J; Boike JR; Maddur H; Ganger DR; Talwar A; Riaz A; Desai K; Mouli S; Hohlastos E; Garcia Pagan JC; Gabr A; Stein B; Lewandowski R; Thornburg B; Salem R. **TIPS for Noncirrhotic Adults with Chronic Mesenteric Venous Thrombosis and EHPVO Refractory to Standard of Care Therapy.** *Hepatology*. 74(5):2735-2744. D1

12. Bassegoda O, Olivas P, Turco L, Mandorfer M, Serra-Burriel M, Tellez L,

Kwanten W, Laroyenne A, Farcau O, Alvarado E, Moga L, Vuille-Lessard E, Fortea JI, Ibañez L, Tosetti G, Vanwolleghem T, Larrue H, Burgos-Santamaría D, Stefanescu H, Paternostro R, Cippitelli A, Lens S, Augustin S, Llop E, Laleman W, Trebicka J, Chang J, Masnou H, Zipprich A, Miceli F, Semmler G, Forns X, Primignani M, Bañares R, Puente A, Berzigotti A, Rautou PE, Villanueva C, Ginès P, Garcia-Pagan JC, Procopet B, Bureau C, Albillos A, Francque S, Reiberger T, Schepis F, Graupera I, Hernandez-Gea V. **Decompensation in advanced non-alcoholic fatty liver disease may occur at lower hepatic venous pressure gradient levels that in patients with viral disease.** *Clinical Gastroenterology and Hepatology.* S1542-3565(21):01136-8. D1

13. Viguera L, Blasi A, Reverter E, Arjona B, Caballero M, Chocron I, García-López JA, Gutierrez R, Martin MJ, Pérez-Peña J, Pitera J, Zarragoikoetxea I, Sabaté A, Sociedad Española de Transplante Hepatico (SETH) Study Group. **Liver transplant with controlled donors after circulatory death with normothermic regional perfusion and brain dead donors: A multicenter cohort study of transfusion, one-year graft survival and mortality.** *International Journal of Surgery.* 96:106169. D1

14. Manicardi N; Fernández-Iglesias A; Abad-Jordà L; Royo F; Azkargorta M; Ortega-Ribera M; Sanfeliu-Redondo D; Martínez-Alcocer A; Elortza F; Hessheimer AJ; Fondevila C; Lozano JJ; García-Pagán JC; Bosch J; Cubero FJ; Albillos A; Vaquero J; Falcón-Pérez JM; Gracia-Sancho J. **Transcriptomic profiling of the liver sinusoidal endothelium during cirrhosis reveals stage-specific secretory signature.** *Cancers.* 13(11):2688. Q1

15. Martín-Grau C, Deulofeu R, Serrat Orus N, Arija V, On Behalf Of The Eclipses Study Group. **Trimester-Specific Reference Ranges for Saturated, Monounsaturated and Polyunsaturated Fatty Acids in Serum of Pregnant Women: A Cohort Study from the ECLIPSES Group.** *Nutrients.* 13(11):4037. Q1

16. Campreciós G, Ruart M, Anton A, Suárez-Herrera N, Montironi C, Martínez C, Jiménez N, Lafoz E, García-Calderó H, Vilaseca M, Magaz M, Coll M, Graupera I, Friedman SL, García-Pagán JC, Hernández-Gea V. **Spermidine Supplementation Protects the Liver Endothelium from Liver Damage in Mice.** *Nutrients.* 13(11):3700. Q1

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Review

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2. Garcia-Pagan JC; Francoz C; Montagnese S; Senzolo M; Mookerjee RP. **Management of the major complications of cirrhosis: Beyond guidelines.** *Journal of Hepatology.* 75:S135-S146. D1

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4. Northup PG; García-Pagán JC; Garcia-Tsao G; Intagliata NM; Superina RA; Roberts LN; Lisman T; Valla DC. **Vascular Liver Disorders, Portal Vein Thrombosis, and Procedural Bleeding in Patients With Liver Disease: 2020 Practice Guidance by the American Association for the Study of Liver Diseases.** *Hepatology*. 73(1):366-413. D1

5. Baiges A, Magaz M, Turon F, Hernández-Gea V, García-Pagán JC. **Treatment of Acute Variceal Bleeding in 2021-When to Use Transjugular Intrahepatic Portosystemic Shunts?** *Clinics in Liver Disease.* 25(2):345-356. Q1

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Letters

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Editorial

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Case Reports

1. Caporali C; Turco L; Prampolini F; Quaretti P; Bianchini M; Saltini D; Miceli F; Casari F; Felaco D; Garcia-Pagan JC; Trebicka J; Senzolo M; Guerrini GP; Di Benedetto F; Torricelli P; Villa E; Schepis F. **Proximal splenic artery embolization to treat refractory ascites in a cirrhotic patient.** *Hepatology*. 74(6):3534-3538. D1

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Clinical Guidelines

1. Klionsky, DJ; Abdel-Aziz, AK; Abdelfatah, S; ... ; Hernandez-Gea, V; ... ; Xu, XL; Xue, Y; Yakhine-Diop, SMS. **Guidelines for the use and interpretation of assays for monitoring autophagy (4th edition).** *Autophagy.* 17(1):1-382. D1

2. Spaander MCW; van der Bogt RD; Baron TH; Albers D; Blero D; de Ceglie A; Conio M; Czako L; Everett S; Garcia-Pagan JC; Gines A; Jovani M; Repici A; Rodrigues-Pinto E; Siersema PD; Fuccio L; van Hooft JE. **Esophageal stenting for benign and malignant disease: European Society of Gastrointestinal Endoscopy (ESGE) Guideline - Update 2021.** *Endoscopy.* 53(7):751-762. D1

3. Lisman, T; Hernandez-Gea, V; Magnusson, M; Roberts, L; Stanworth, S; Thachil, J; Tripodi, A. **The concept of rebalanced hemostasis in patients with liver disease: Communication from the ISTH SSC working group on hemostatic management of patients with liver disease.** *Journal of Thrombosis and Haemostasis.* 19(4):1116-1122. Q1

Consortium Publications

1. Mellado-Artigas R, Ferreyro BL, Angriman F, Hernández-Sanz M, Arruti E, Torres A, Villar J, Brochard L, Ferrando C, COVID-19 Spanish ICU Network. **High-flow nasal oxygen in patients with COVID-19-associated acute respiratory failure.** *Critical Care.* 25(1):58. Q1

2. Mellado-Artigas R, Mujica LE, Ruiz ML, Ferreyro BL, Angriman F, Arruti E, Torres A, Barbeta E, Villar J, Ferrando C, COVID-19 Spanish ICU Network. **Predictors of failure with high-flow nasal oxygen therapy in COVID-19 patients with acute respiratory failure: a multicenter observational study.** *Journal of Intensive Care.* 9(1):23. Q2

GRANTS FOR RESEARCH IN PROGRESS

García-Pagán JC. **Hemodinàmica hepàtica i hipertensió portal.**
Sponsored by: Generalitat de Catalunya.
AGAUR_SGR17_00517
Duration: 01/01/2017-30/09/2021

García-Pagán JC. **Plataforma Red Nacional de Biobancos.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PT17/0015/0016
Duration: 01/01/2018-31/07/2021

García-Pagán JC. **Caracterización de la cirrosis de regresión. Identificación de vías moleculares clave y nuevas estrategias terapéuticas para su potenciación.**

Sponsored by: Agencia Estatal de Investigación. AEI_PID2019-105148RB-I00
Duration: 01/06/2020-31/05/2023

García-Pagán JC. **Caracterización de la cirrosis en regresión. Identificación de vías moleculares clave y nuevas estrategias terapéuticas para su potenciación.**
Sponsored by: Agencia Estatal de Investigación. AEI_FPI20
Duration: 01/08/2021-31/07/2025

García-Pagán JC. **European Registry of patients treated with TIPS following a standardized, state of the art, pre, peri and post procedural approach: The EUROTIPS project.**
Sponsored by: European association for the study of the liver. INT_EASL_RG_19
Duration: 20/07/2020-19/07/2024

Hernández-Gea V. **Precision medicine in portal vein thrombosis: Identification of new therapeutic targets and development of a unique theranostic approach.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00569
Duration: 01/01/2021-31/12/2023

Reverter E. **Caracterización hemodinámica del paciente cirrótico crítico: fiabilidad de la monitorización invasiva y ecográfica y valor pronóstico de las variables de congestión sistémica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/01214
Duration: 01/01/2018-30/06/2022

DOCTORAL THESES

García-Pagán JC, Hernández-Gea V. **Hipertensión portal: Avances en su diagnóstico e impacto en el riesgo quirúrgico.**
PhD student: José Alberto Ferrusquía Acosta

García-Pagán JC, Hernández-Gea V. **Factors de risc de trombosi portal no tumoral en la cirrosi.**
PhD student: Fanny Turón Masferrer

3.13 Chronic liver diseases: molecular mechanisms and clinical consequences

LOCATION
CEK building, floor 3

KEYWORDS
1. **Chronic liver diseases**
2. **Alcohol**
3. **NAFLD**
4. **Cirrhosis**
5. **Inflammation**
6. **Screening**
7. **Fibrosis**

RELATED DISEASES
1. **Cirrhosis and associated complications; ascites, hepatic encephalopathy, bacterial infections**
2. **Non-alcoholic fatty liver disease and non-alcoholic steatohepatitis**
3. **Alcoholic liver disease**
4. **Hepatorenal syndrome**
5. **Acute-on-Chronic Liver Failure**

GROUP INVOLVED IN
AGAUR_SGR17: 01281

Original publications

TOTAL	24
Mean IF	**14,67**
Q1	**79%**
D1	**58%**
MA	**29%**
OA	**71%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Cirrhosis is a common disease with high morbidity and mortality rates. The only definitive treatment is a liver transplant.

The disease evolves from a compensated phase, in which the patient shows no symptoms and presents a good prognosis, to patients who present complications and a poor outcome. Multiorgan failure with a high mortality rate may also occur in certain patients.

It is therefore very important to research the pathophysiological mechanisms that explain the disease's progression in order to find therapeutic targets and stop its course.

APPROACH

The main research interests of the group are the pathophysiologic mechanisms that explain the disease progression. It starts with the intestinal microbiome and analyses the hepatic transcriptome and systemic and hepatic inflammation.

It studies different biomarkers to determine the prognosis of patients with cirrhosis and its complications, such as renal failure. It trials new treatments, such as albumin or statins, for patients with complications of cirrhosis and conducts therapeutic studies to try to prevent the progression of the disease.

The research field of the group encompasses also the investigation of the pathogenesis, natural history, and new treatments for patients with alcohol-related and non-alcoholic fatty liver disease, which are currently the two most important etiologies of chronic liver disease in Europe.

An important research interest of the group is the evaluation of methods for screening for liver fibrosis in the general population and also in subjects with risk factors of liver disease as those with alcohol risk consumption.

IMPACT

Patients with cirrhosis present an abnormal intestinal microbiome and hepatic transcriptome, with increased expression of proinflammatory genes and increased systemic inflammation.

In one of the projects, the patients receive anti-inflammatory treatment (statins) and treatment for the alterations in the microbiome (rifaximin) and the number of complications these patients present is expected to decline, along with the incidence of acute –on-chronic liver failure.

The group is also involved in multicenter studies for the development of new therapies in patients with non-alcoholic fatty liver disease. Also studies on pathophysiology, natural history and regression of alcohol-related liver disease are developed in the group.

Furthermore, using transient elastography, a research line of the group is aimed at identifying patients at early stages of the disease in order to provide them with early treatment.

RESEARCH LINES

- Analyze different biomarkers to predict patients' outcomes and prognosis.

- Characterization of systemic and hepatic inflammation and gut microbiome in patients with cirrhosis, encompassing all stages of the disease.

- Screening for liver fibrosis. A population-based study in european countries. The 'LiverScreen' project.

- Studying different treatment strategies to halt disease progression. The ´LiverHope´ project.

- Investigating natural history and new treatments for patients with non-alcoholic fatty liver disease.

- Studying pathophysiology of natural history and regression of alcohol-related liver disease.

PUBLICATIONS

Originals

1. Wong F, Piano S, Singh V, Bartoletti M, Maiwall R, Alessandria C, Fernandez J, Soares EC, Kim DJ, Kim SE, Marino M, Vorobioff J, Barea RCR, Merli M, Elkrief L, Vargas V, Krag A, Singh SP, Lesmana LA, Toledo C, Marciano S, Verhelst X, Intagliata N, Rabinowich L, Colombato L, Kim SG, Gerbes A, Durand F, Roblero JP, Bruns T, Yoon EL, Girala M, Pyrsopoulos NT, Kim TH, Yim SY, Juanola A, Gadano A, Angeli P, International Club of Ascites Global Study Group. **Clinical features and evolution of bacterial infection-related acute-on-chronic liver failure.** *Journal of Hepatology.* 74(2):330-339. D1

2. Solà E, Pose E, Campion D, Piano S, Roux O, Simon-Talero M, Uschner F, de Wit K, Zaccherini G, Alessandria C, Beuers U, Caraceni P, Francoz C, Mookerjee RP, Trebicka J, Vargas V, Serra M, Torres F, Montagnese S, Krag A, Hernaez R, Korenjak M, Watson H, Abraldes JG, Kamath PS, Ginès P, LiverHope Consortium Investigators. **Endpoints and design of clinical trials in patients with decompensated cirrhosis: Position paper of the LiverHope Consortium.** *Journal of Hepatology.* 74(1):200-219. D1

3. Ferrusquía-Acosta J, Bassegoda O, Turco L, Reverter E, Pellone M, Bianchini M, Pérez-Campuzano V, Ripoll E, García-Criado Á, Graupera I, García-Pagán JC, Schepis F, Senzolo M, Hernández-Gea V. **Agreement between wedged hepatic venous pressure and portal pressure in non-alcoholic steatohepatitis-related cirrhosis.** *Journal of Hepatology.* 74(4):811-818. D1

4. Marjot T, Moon AM, Cook JA, Abd-Elsalam S, Aloman C, Armstrong MJ, Pose E, Brenner EJ, Cargill T, Catana MA, Dhanasekaran R, Eshraghian A, García-Juárez I, Gill US, Jones PD, Kennedy J, Marshall A, Matthews C, Mells G, Mercer C, Perumalswami PV, Avitabile E, Qi X, Su F, Ufere NN, Wong YJ, Zheng MH, Barnes E, Barritt AS, Webb GJ. **Outcomes following SARS-CoV-2 infection in patients with chronic liver disease: an international registry study.** *Journal of Hepatology.* 74(3):567-577. D1

5. Trebicka J, Fernandez J, Papp M, Caraceni P, Laleman W, Gambino C, Giovo I, Uschner FE, Jansen C, Jimenez C, Mookerjee R, Gustot T, Albillos A, Bañares R, Jarcuska P, Steib C, Reiberger T, Acevedo J, Gatti P, Shawcross DL, Zeuzem S, Zipprich A, Piano S, Berg T, Bruns T, Danielsen KV, Coenraad M, Merli M, Stauber R, Zoller H, Ramos JP, Solé C, Soriano G, de Gottardi A, Gronbaek H, Saliba F, Trautwein C, Kani HT, Francque S, Ryder S, Nahon P, Romero-Gomez M, Van Vlierberghe H, Francoz C, Manns M, Garcia-Lopez E, Tufoni M, Amoros A, Pavesi M, Sanchez C, Praktiknjo M, Curto A, Pitarch C, Putignano A, Moreno E, Bernal W, Aguilar F, Clària J, Ponzo P, Vitalis Z, Zaccherini G, Balogh B, Gerbes A, Vargas V, Alessandria C, Bernardi M, Ginès P, Moreau R, Angeli P, Jalan R, Arroyo V, PREDICT STUDY group of the EASL-CLIF CONSORTIUM. **PREDICT identifies precipitating events associated with the clinical course of acutely decompensated cirrhosis.** *Journal of Hepatology.* 74(5):1097-1108. D1

6. Pose E, Torrents A, Reverter E, Perez-Campuzano V, Campos-Varela I, Avitabile E, Gratacós-Ginès J, Castellote J, Castells L, Colmenero J, Tort J, Ginès P, Crespo G. **A notable proportion of liver transplant candidates with alcohol-related cirrhosis can be delisted because of clinical improvement.** *Journal of Hepatology.* 75(2):275-283. D1

7. Belli LS, Duvoux C, Artzner T, Bernal W, Conti S, Cortesi PA, Sacleux SC, Pageaux GP, Radenne S, Trebicka J, Fernandez J, Perricone G, Piano S, Nadalin S, Morelli MC, Martini S, Polak WG, Zieniewicz K, Toso C, Berenguer M, Iegri C, Invernizzi F, Volpes R, Karam V, Adam R, Faitot F, Rabinovich L, Saliba F, Meunier L, Lesurtel M, Uschner FE, Fondevila C, Michard B, Coilly A, Meszaros M, Poinsot D, Schnitzbauer A, De Carlis LG, Fumagalli R, Angeli P, Arroyo V, Jalan R, ELITA/EF-CLIF working group. **Liver transplantation for patients with acute-on-chronic liver failure (ACLF) in Europe: results of the ELITA/EF-CLIF collaborative study (ECLIS).** *Journal of Hepatology.* 75(3):610-622. D1

8. Clària J, Curto A, Moreau R, Colsch B, López-Vicario C, Lozano JJ, Aguilar F, Castelli FA, Fenaille F, Junot C, Zhang I, Vinaixa M, Yanes O, Caraceni P, Trebicka J, Fernández J, Angeli P, Jalan R, Arroyo V. **Untargeted lipidomics uncovers lipid signatures distinguishing severe versus moderate forms of acutely decompensated cirrhosis.** *Journal of Hepatology.* 75(5):1116-1127. D1

9. Solé C, Guilly S, Da Silva K, Llopis M, Le-Chatelier E, Huelin P, Carol M, Moreira R, Fabrellas N, De Prada G, Napoleone L, Graupera I, Pose E, Juanola A, Borruel N, Berland M, Toapanta D, Casellas F, Guarner F, Doré J, Solà E, Ehrlich SD, Ginès P. **Alterations in Gut Microbiome in Cirrhosis as Assessed by Quantitative Metagenomics:**

Relationship With Acute-on-Chronic Liver Failure and Prognosis. *Gastroenterology*. 160(1):206-218.e13. D1

10. Sehrawat TS, Arab JP, Liu M, Amrollahi P, Wan M, Fan J, Nakao Y, Pose E, Navarro-Corcuera A, Dasgupta D, Liao CY, He L, Mauer AS, Avitabile E, Ventura-Cots M, Bataller RA, Sanyal AJ, Chalasani NP, Heimbach JK, Watt KD, Gores GJ, Gines P, Kamath PS, Simonetto DA, Hu TY, Shah VH, Malhi H. **Circulating extracellular vesicles carrying sphingolipid cargo for the diagnosis and dynamic risk profiling of alcoholic hepatitis**. *Hepatology*. 73(2):571-585. D1

11. Pose E, Coll M, Martínez-Sánchez C, Zeng Z, Surewaard BGJ, Català C, Velasco-de Andrés M, Lozano JJ, Ariño S, Fuster D, Niñerola-Bazán A, Graupera I, Muñoz É, Lozano F, Sancho-Bru P, Kubes P, Ginès P. **PD-L1 is overexpressed in liver macrophages in chronic liver diseases and its blockade improves the antibacterial activity against infections.** *Hepatology*. 74(1):296-311. D1

12. Vallverdú J, Martínez García de la Torre RA, Mannaerts I, Verhulst S, Smout A, Coll M, Ariño S, Rubio-Tomás T, Aguilar-Bravo B, Martínez-Sánchez C, Blaya D, Verfaillie CM, van Grunsven LA, Sancho-Bru P. **Directed differentiation of human induced pluripotent stem cells to hepatic stellate cells.** *Nature Protocols*. 16(5):2542-2563. D1

13. Bassegoda O, Olivas P, Turco L, Mandorfer M, Serra-Burriel M, Tellez L, Kwanten W, Laroyenne A, Farcau O, Alvarado E, Moga L, Vuille-Lessard E, Fortea JI, Ibañez L, Tosetti G, Vanwolleghem T, Larrue H, Burgos-Santamaría D, Stefanescu H, Paternostro R, Cippitelli A, Lens S, Augustin S, Llop E, Laleman W, Trebicka J, Chang J, Masnou H, Zipprich A, Miceli F, Semmler G, Forns X, Primignani M, Bañares R, Puente A, Berzigotti A, Rautou PE, Villanueva C, Ginès P, Garcia-Pagan JC, Procopet B, Bureau C, Albillos A, Francque S, Reiberger T, Schepis F, Graupera I, Hernandez-Gea V. **Decompensation in advanced non-alcoholic fatty liver disease may occur at lower hepatic venous pressure gradient levels that in patients with viral disease.** *Clinical Gastroenterology and Hepatology*. S1542-3565(21):01136-8. D1

14. Graupera I, Thiele M, Serra-Burriel M, Caballeria L, Roulot D, Wong GL, Fabrellas N, Guha IN, Arslanow A, Expósito C, Hernández R, Aithal GP, Galle PR, Pera G, Wong VW, Lammert F, Ginès P, Castera L, Krag A, Investigators of the LiverScreen Consortium. **Low accuracy of FIB-4 and NAFLD fibrosis scores for screening for liver fibrosis in the population.** *Clinical Gastroenterology and Hepatology*. S1542-3565(21):01358-6. D1

15. Blaya D, Pose E, Coll M, Lozano JJ, Graupera I, Schierwagen R, Jansen C, Castro P, Fernandez S, Sidorova J, Vasa-Nicotera M, Solà E, Caballería J, Trebicka J, Ginès P, Sancho-Bru P. **Profiling circulating microRNAs in patients with cirrhosis and acute-on-chronic liver failure.** *JHEP Reports*. 3(2):100233. Q1

16. Osorio-Conles Ó; Vega-Beyhart A; Ibarzabal A; Balibrea JM; Graupera I; Rimola J; Vidal J; de Hollanda A. **A distinctive NAFLD signature in adipose tissue from women with severe obesity.** *International Journal of Molecular Sciences*. 22(19):10541. Q1

17. Campreciós G, Ruart M, Anton A, Suárez-Herrera N, Montironi C, Martínez C, Jiménez N, Lafoz E, García-Calderó H, Vilaseca M, Magaz M, Coll M, Graupera I, Friedman SL, García-Pagán JC, Hernández-Gea V. **Spermidine Supplementation Protects the Liver Endothelium from Liver Damage in Mice.** *Nutrients*. 13(11):3700. Q1

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Review

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Letters

1. Arroyo V, Fernández J, Moreau R. **Systemic inflammation, coagulation disorders and the AD-ACLF syndrome.** *Journal of Hepatology.* 74(5):1265-1265. D1

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4. Bassegoda O, Olivas P, Graupera I, Hernández-Gea V. **Reply to "Decompensation in patients with advanced NAFLD - more questions that need answering".** *Clinical Gastroenterology and Hepatology.* S1542-3565(21):01275-1. D1

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Editorial

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1. Biggins SW; Angeli P; Garcia-Tsao G; Ginès P; Ling S; Nadim MK; Wong F; Kim WR. **Diagnosis, evaluation, and management of ascites and hepatorenal syndrome.** *Hepatology.* 74(2):1014-1048. D1

Consortium Publications

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2. Mellado-Artigas R, Ferreyro BL, Angriman F, Hernández-Sanz M, Arruti E, Torres A, Villar J, Brochard L, Ferrando C, COVID-19 Spanish ICU Network. **High-flow nasal oxygen in patients with COVID-19-associated acute respiratory failure.** *Critical Care.* 25(1):58. Q1

3. Torres A, Motos A, Riera J, Fernández-Barat L, Ceccato A, Pérez-Arnal R, García-Gasulla D, Peñuelas O, Lorente JA, Rodriguez A, de Gonzalo-Calvo D, Almansa R, Gabarrús A, Menéndez R, Bermejo-Martin JF, Ferrer R, Amaya Villar R, Añón JM, Barberà C, Barberán J, Blandino Ortiz A, Bustamante-Munguira E, Caballero J, Carbajales C, Carbonell N, Catalán-González M, Galbán C, Gumucio-Sanguino VD, de la Torre MDC, Díaz E, Estella Á, Gallego E, García Garmendia JL, Garnacho-Montero J, Gómez JM, Huerta A, Jorge García RN, Loza-Vázquez A, Marin-Corral J, Martínez de la Gándara A, Martínez Varela I, López Messa J, M Albaiceta G, Novo MA, Peñasco Y, Pozo-Laderas JC, Ricart P, Salvador-Adell I, Sánchez-Miralles A, Sancho Chinesta S, Socias L, Solé-Violan J, Suares Sipmann F, Tamayo Lomas L, Trenado J, Barbé F, CIBERESUCICOVID Project (COV20/00110, ISCIII). **The evolution of the ventilatory ratio is a prognostic factor in mechanically ventilated COVID-19 ARDS patients.** *Critical Care.* 25(1):331. Q1

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GRANTS FOR RESEARCH IN PROGRESS

Fabrellas N. **Cribado poblacional de fibrosis hepática con elastografía transitoria en personas con factores de riesgo de enfermedad hepática e índice de grasa hepática elevado. Estudio de validación.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/01330
Duration: 01/01/2019-31/12/2022

Fernández-Gómez J. **Impacto clinico y coste/eficacia de estrategias de vigilancia epidemiológica y de optimización farmacoterapéutica antibiótica en la cirrosis descompensada.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/00885
Duration: 01/01/2017-30/06/2021

Ginès P. **Grup de Hepatologia Recerca Clínica.**
Sponsored by: Generalitat de Catalunya. AGAUR_SGR17_01281
Duration: 01/01/2017-30/09/2021

Ginès P. **A screening algorithm for non-invasive assessment of NAFLD in patients with type-2 diabetes mellitus in primary care.**
Sponsored by: Gilead Sciences (SLU). GLD19/00125
Duration: 21/01/2020-20/01/2022

Ginès P. **Enfermedad hepática por consumo de alcohol: mecanismos patogénicos, relación con inflamación y síndrome metabólico, efectos de la abstinencia y evaluación de nuevos métodos terapéuticos.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00579
Duration: 01/01/2021-31/12/2023

Coll M, Graupera I. **Evaluación del papel de la inflamación del tejido adiposo en el**

desarrollo y progresión de la enfermedad por hígado graso no alcohólico. El NRF1 macrofágico como potencial regulador de la inflamación.
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_BA20/00016
Duration: 04/07/2021-31/12/2021

Ginès P. **Clinical evaluation of carbons of controlled porosity as a new therapeutic for the treatment of liver.**
Sponsored by: European Commission. CE_H2020-PHC-2014-2s
Duration: 01/05/2015-31/01/2021

Ginès P. **Simvastatin and rifaximin as new therapy for patients with decompensated cirrosis.(LIVERHOPE)**
Sponsored by: European Commission. CE_H2020-SC1_16abr1s
Duration: 01/01/2017-30/06/2022

Ginès P, Clària J. **MICROBiome-based biomarkers to PREDICT decompensation of liver cirrhosis and treatment response.**
Sponsored by: European Commission. CE_H2020-SC1_18_1s
Duration: 01/01/2019-31/03/2025

Ginès P. **FiSPlat.**
Sponsored by: European Commission. CE_EIT_Inn20
Duration: 01/01/2020-31/12/2022

Ginès P. **Screening for liver fibrosis - population-based study across European countries. (LIVERSCREEN)**
Sponsored by: European Commission. CE_H2020-SC1_2019_2s
Duration: 01/01/2020-30/06/2025

Graupera I, Coll M. **Caracterización del eje tejido adiposo-hígado en la enfermedad hepática por hígado graso no alcohólico. Macrófagos infiltrantes del tejido adiposo como diana terapéutica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00862
Duration: 01/01/2019-31/12/2022

DOCTORAL THESES

Fabrellas N. **Estudio de la esteatosis hepática, estimada mediante cap (control attenuation parameter) en personas con factores de riesgo metabólico, atendidas en atención primária. Estudio poblacional.**
PhD student: Rosario Hernández Ibáñez

Fabrellas N. **Translation and validation of the clinical learning enviroment and Nurse teacher scale (CLES+T) in Persian Language.**
PhD student: Roshanak Kakvan

Fabrellas N. **Estudio cuasiexperimental sobre la eficacia de una intervención a domicilio por parte de enfermería a pacientes crónicos complejos ancianos.**
PhD student: Raul Sancho Agredano

Ginès P, Coll M. **Investigación de nuevos tratamientos para la cirrosis descompensada: evaluación preclínica del tratamiento con anti PD-L1 y estudio clínico de la seguridad de la combinación de estatinas y rifaximina.**
PhD student: Elisa Pose Mendez

Ginès P, Sancho-Bru P. **Generació de cèl·lules estrellades hepàtiques derivades de iPSC i la seva utilització com a model per l'estudi de la fibrosi hepàtica.**
PhD student: Júlia Vallverdú Ginès

3.14 Liver vascular biology

LOCATION
CEK building, floor 4

KEYWORDS
1. **Chronic liver diseases**
2. **Portal hypertension**
3. **Liver microcirculation**
4. **Liver fibrosis**
5. **Liver sinusoidal endothelial cells**
6. **Liver cells secretome**
7. **Aging**
8. **Liver mechanobiology**

RELATED DISEASES
1. **Cirrhosis of the liver**
2. **Advanced chronic liver diseases**
3. **Fatty liver disease**
4. **Non-alcoholic steatohepatitis**

GROUP INVOLVED IN
CIBEREHD

Original publications

TOTAL	14
Mean IF	**13,26**
Q1	**86%**
D1	**57%**
MA	**29%**
OA	**71%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Liver diseases represent a serious social problem, with a health prevalence comparable to that of respiratory diseases. By way of example, over the last ten years, chronic liver disease, also known as cirrhosis, has led to the death of more than 35,000 men and 10,000 women in Spain.

The cells that are part of the liver's blood vessels, mainly sinusoidal endothelial cells, stellate cells and resident macrophages, play a key role in the development and progression of liver disease.

Therefore, they can be therapeutic targets to be taken into account for the treatment and improvement of patients with liver damage.

APPROACH

The group studies the molecular and biomechanical processes that regulate the status and function of these sinusoidal cells, as well as hepatic intercellular communication mechanisms in health situations, in response to acute liver damage, in chronic liver disease (cirrhosis and steatohepatitis) and in ageing. The results obtained are applied to discover new therapeutic targets and to develop new therapies that improve microcirculation, fibrosis and liver function.

To achieve this, the group uses a wide range of experimental methods, which include tissues and primary cells (humans or rodents), models of liver disease in vivo and in vitro, cellular culture through liver-on-a-chip technology, and massive analysis of omics data, among others.

IMPACT

The group has discovered the KLF2 autophagy pathway as a key mechanism in the regulation of liver cell health. It is a finding that proposes the use of statins, which activate this pathway, as components for the treatment of cirrhosis, both in the early and very advanced stages.

In the field of ageing, it has described the changes suffered by liver microcirculation in situations of old age, both in health and acute liver damage as well as during chronic liver disease. These advances have shown that the protective agent, simvastatin, would be useful in the subpopulation of older patients. In the field of new technologies, it has developed the first human liver-on-a-chip. This innovation has already been transferred to a company and, therefore, has been placed at the service of society.

Latest research discovered the role of liver stiffness regulating liver cells phenotype in cirrhosis, thus playing a key role in its pathophysiology & treatment. In addition, we demonstrated the potential of using regenerative medicine for the amelioration of portal hypertension.

RESEARCH LINES

- Aging & liver diseases.

- Role of sinusoidal cells in the progression and regression of liver diseases.

- Sinusoidal communications in liver disease.

- Sinusoidal mechanobiology in liver diseases.

PUBLICATIONS

Originals

1. Magaz M, Alvarez-Larrán A, Colomer D, López-Guerra M, García-Criado MÁ, Mezzano G, Belmonte E, Olivas P, Soy G, Cervantes F, Darnell A, Ferrusquía-Acosta J, Baiges A, Turon F, Hernández-Gea V, García-Pagán JC. **Next generation sequencing in the diagnosis of non-cirrhotic splanchnic vein thrombosis.** *Journal of Hepatology.* 74(1):89-95. D1

2. Boyer-Diaz Z, Aristu-Zabalza P, Andrés-Rozas M, Robert C, Ortega-Ribera M, Fernández-Iglesias A, Broqua P, Junien JL, Wettstein G, Bosch J, Gracia-Sancho J. **Pan-PPAR agonist lanifibranor improves portal hypertension and hepatic fibrosis in experimental advanced chronic liver disease.** *Journal of Hepatology.* 74(5):1188-1199. D1

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4. Villanueva C, Albillos A, Genescà J, Garcia-Pagan JC, Brujats A, Calleja JL, Aracil C, Bañares R, Morillas RM, Poca M, Peñas B, Augustin S, Abraldes JG, Alvarado E, Torres F, Bosch J, PreDesCI Study Investigators. **Bacterial infections adversely influence the risk of decompensation and survival in compensated cirrhosis**. *Journal of Hepatology.* 75(3):589-599. D1

5. Nicoară-Farcău O, Han G, Rudler M, Angrisani D, Monescillo A, Torres F, Casanovas G, Bosch J, Lv Y, Thabut D, Fan D, Hernández-Gea V, García-Pagán JC, Preemptive TIPS Individual Data Metanalysis, International Variceal Bleeding Study and Baveno Cooperation Study groups. **Effects of Early Placement of Transjugular Portosystemic Shunts in Patients With High-Risk Acute Variceal Bleeding: a Meta-analysis of Individual Patient Data.** *Gastroenterology.* 160(1):193-205. D1

6. Bosch J, Chung C, Carrasco-Zevallos OM, Harrison SA, Abdelmalek MF, Shiffman ML, Rockey DC, Shanis Z, Juyal D, Pokkalla H, Le QH, Resnick M, Montalto M, Beck AH, Wapinski I, Han L, Jia C, Goodman Z, Afdhal N, Myers RP, Sanyal AJ. **A Machine Learning Approach to Liver Histological Evaluation Predicts Clinically Significant Portal Hypertension in NASH Cirrhosis.** *Hepatology.* 74(6):3146-3160. D1

7. Pons M, Augustin S, Scheiner B, Guillaume M, Rosselli M, Rodrigues SG, Stefanescu H, Ma MM, Mandorfer M, Mergeay-Fabre M, Procopet B, Schwabl P, Ferlitsch A, Semmler G, Berzigotti A, Tsochatzis E, Bureau C, Reiberger T, Bosch J, Abraldes JG, Genescà J. **Noninvasive Diagnosis of Portal Hypertension in Patients With Compensated Advanced Chronic Liver Disease.** *American Journal of Gastroenterology.* 116(4):723-732. D1

8. Turaga RC, Satyanarayana G, Sharma M, Yang JJ, Wang S, Liu C, Li S, Yang H, Grossniklaus H, Farris AB, Gracia-Sancho J, Liu ZR. **Targeting integrin αvβ3 by a rationally designed protein for chronic liver disease treatment.** *Communications Biology.* 4(1):1087. D1

9. Manicardi N; Fernández-Iglesias A; Abad-Jordà L; Royo F; Azkargorta M; Ortega-Ribera M; Sanfeliu-Redondo D; Martínez-Alcocer A; Elortza F; Hessheimer AJ; Fondevila C; Lozano JJ; García-Pagán JC; Bosch J; Cubero FJ; Albillos A; Vaquero J; Falcón-Pérez JM; Gracia-Sancho J. **Transcriptomic profiling of the liver sinusoidal endothelium during cirrhosis reveals stage-specific secretory signature.** *Cancers.* 13(11):2688. Q1

10. de Souza Basso B, Haute GV, Ortega-Ribera M, Luft C, Antunes GL, Bastos MS, Carlessi LP, Levorse VG, Cassel E, Donadio MVF, Santarém ER, Gracia-Sancho J, Rodrigues de Oliveira J. **Methoxyeugenol deactivates hepatic stellate cells and attenuates liver fibrosis and inflammation through a PPAR-γ and NF-kB mechanism.** *Journal of Ethnopharmacology.* 280:114433. Q1

11. Benede-Ubieto R; Estevez-Vazquez O; Flores-Perojo V; Macias-Rodriguez RU; Ruiz-Margain A; Martinez-Naves E; Regueiro JR; Avila MA; Trautwein C; Banares R; Bosch J; Cubero FJ; Nevzorova YA. **Abnormal Liver Function Test in Patients Infected with Coronavirus (SARS-CoV-2): A Retrospective Single-Center Study from Spain.** *Journal of Clinical Medicine.* 10(5):1039. Q1

12. Lafoz E, Campreciós G, García-Calderó H, Anton A, Vilaseca M, Ruart M, Guasch E, Garrabou G, Delgado TC, Martínez-Chantar ML, García-Martínez R, Gracia-Sancho J, Hernández-Gea V, García-Pagán JC. **Impact of lifestyle interventions targeting physical exercise and caloric intake on cirrhosis regression in rats.** *American Journal of Physiology-Gastrointestinal and Liver Physiology.* 321(6):G603-G616. Q1

13. Garcia Garcia de Paredes A, Manicardi N, Tellez L, Ibañez L, Royo F, Bermejo J, Blanco C, Fondevila C, Fernandez Lanza V, Garcia-Bermejo L, Falcon-Perez JM, Bañares R, Gracia-Sancho J, Albillos A. **Molecular Profiling of Decompensated Cirrhosis by a Novel MicroRNA Signature.** *Hepatology Communications.* 5(2):309-322. Q2

14. Felli E; Al-Taher M; Collins T; Nkusi R; Felli E; Baiocchini A; Lindner V; Vincent C; Barberio M; Geny B; Ettorre GM; Hostettler A; Mutter D; Gioux S; Schuster C; Marescaux J; Gracia-Sancho J; Diana M. **Automatic liver viability scoring with deep learning and hyperspectral imaging.** *Diagnostics.* 11(9):1527. Q2

Review

1. Gracia-Sancho J, Caparrós E, Fernández-Iglesias A, Francés R. **Role of liver**

sinusoidal endothelial cells in liver diseases. *Nature Reviews Gastroenterology & Hepatology.* 18(6):411-431. D1

2. Bosch J. **Small diameter TIPS should lead to safely expanding the use of TIPS.** *Journal of Hepatology.* 74(1):230-234. D1

3. Engelmann C, Clària J, Szabo G, Bosch J, Bernardi M. **Pathophysiology of decompensated cirrhosis: Portal hypertension, circulatory dysfunction, inflammation, metabolism and mitochondrial dysfunction.** *Journal of Hepatology.* 75:S49-S66. D1

4. Azparren-Angulo M, Royo F, Gonzalez E, Liebana M, Brotons B, Berganza J, Goñi-de-Cerio F, Manicardi N, Abad-Jordà L, Gracia-Sancho J, Falcon-Perez JM. **Extracellular vesicles in hepatology: Physiological role, involvement in pathogenesis, and therapeutic opportunities.** *Pharmacology & Therapeutics.* 218:107683. D1

5. Gibert-Ramos A, Sanfeliu-Redondo D, Aristu-Zabalza P, Martínez-Alcocer A, Gracia-Sancho J, Guixé-Muntet S, Fernández-Iglesias A. **The Hepatic Sinusoid in Chronic Liver Disease: The Optimal Milieu for Cancer.** *Cancers.* 13(22):5719. Q1

6. Álvarez-Mercado AI; Caballeria-Casals A; Rojano-Alfonso C; Chávez-Reyes J; Micó-Carnero M; Sanchez-Gonzalez A; Casillas-Ramírez A; Gracia-Sancho J; Peralta C. **Insights into growth factors in liver carcinogenesis and regeneration: An ongoing debate on minimizing cancer recurrence after liver resection.** *Biomedicines.* 9(9):1158. Q1

7. Jin C, Kumar P, Gracia-Sancho J, Dufour JF. **Calcium transfer between endoplasmic reticulum and mitochondria in liver diseases.** *FEBS Letters.* 595(10):1411-1421. Q1

8. Caballeria-Casals A, Micó-Carnero M, Rojano-Alfonso C, Maroto-Serrat C, Casillas-Ramírez A, Álvarez-Mercado AI, Gracia-Sancho J, Peralta C. **Role of FGF15 in Hepatic Surgery in the Presence of Tumorigenesis: Dr. Jekyll or Mr. Hyde?** *Cells.* 10(6):1421. Q2

9. Selicean S, Wang C, Guixé-Muntet S, Stefanescu H, Kawada N, Gracia-Sancho J. **Regression of portal hypertension: underlying mechanisms and therapeutic strategies.** *Hepatology International.* 15(1):36-50. Q2

10. Baiocchi L; Glaser S; Francis H; Kennedy L; Felli E; Alpini G; Gracia-Sancho J. **Impact of Aging on Liver Cells and Liver Disease: Focus on the Biliary and Vascular Compartments.** *Hepatology Communications.* 5(7):1125-1137. Q2

Letters

1. Bosch J, García Tsao G. **In Memoriam: Roberto J.** *Journal of Hepatology.* 74(5):1009-1010. D1

2. Bosch J. **Reply to: "Achieving an effective pressure reduction after TIPS: The need for a new target".** *Journal of Hepatology.* 75(1):248-249. D1

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GRANTS FOR RESEARCH IN PROGRESS

Gracia-Sancho J. **Desenvolupament de teràpies per a la disfunció microcirculatòria hepàtica i fibrosi en la malaltia hepàtica crònica.**
Sponsored by: Generalitat de Catalunya.
AGAUR_DI21_0024
Duration: 01/09/2021-30/08/2024

Gracia-Sancho J. **Impacto de la presión sinusoidal hepática en la fisiopatología de las enfermedades del hígado.**
Sponsored by: Ministerio de Universidades.
MCIU_FPU19/03098
Duration: 31/10/2020-30/10/2024

Gracia-Sancho J. **Impacto del aumento de presión sinusoidal hepática en la fisiopatología de las enfermedades del hígado: descubrimiento de nuevos mecanismos y dianas terapéuticas.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00220
Duration: 01/01/2021-31/12/2023

Gracia-Sancho J. **Seminarios internacionales de investigación en hepatología. 4a edición.**
Sponsored by: Gilead Sciences (SLU).
GLD19_EdMedica
Duration: 01/09/2021-30/06/2022

DOCTORAL THESES

Gracia-Sancho J, Villa R. **Sinusoidal mechanobiology in advanced chronic liver disease.**
PhD student: Marti Ortega Ribera

Gracia-Sancho J. **Papel de la comunicación intercelular hepática en la fisiopatología y el desarrollo de nuevos biomarcadores en la cirrosis.**
PhD student: Nicolo Mancardi

3.15 Fetal and perinatal medicine

LOCATION
Maternitat building

KEYWORDS
1. **Prenatal diseases**
2. **Intrauterine growth restriction**
3. **Fetal programming**
4. **Fetal brain damage**
5. **Prematurity**
6. **Congenital heart disease**

RELATED DISEASES
1. **Preeclampsia**
2. **Intrauterine growth restriction**
3. **Congenital diaphragmatic hernia**
4. **Twin-to-twin transfusion syndrome**
5. **Spina bifida**
6. **Preterm delivery**
7. **Preterm rupture of membranes**
8. **Chorioamnionitis**
9. **Congenital heart disease**
10. **Fetal alcohol syndrome**
11. **AIDS (acquired immunodeficiency syndrome)**
12. **Congenital cytomegalovirus infection**
13. **Assisted reproductive technogies**

GROUP INVOLVED IN
AGAUR_SGR17: 01531, 01734
CIBERER

Original publications

TOTAL	76
Mean IF	**8,17**
Q1	**63%**
D1	**32%**
MA	**59%**
OA	**68%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The group views the fetus as a patient. Therefore, while it is in the uterus, certain diseases can be diagnosed and treated so that, in the future, any sequelae will be minimal or will completely disappear.

The group's research focuses particularly on the heart and the brain because fetal programming is key during the development of these organs. The group is also developing new intrauterine treatments that can revert or mitigate certain fetal disorders.

APPROACH

The group is made up of more than 80 people from different nationalities, trained in different scientific disciplines. The research areas are fetal cardiac programming, prematurity, fetal neurodevelopment, inflammation in preterm birth, fetal therapy and surgery, placental diseases and the influence of the environment during pregnancy.

To ensure the correct development of these areas, the group has created a structure with the following four platforms: biobank, animal platform, participants' follow-up (post-natal) platform and management.

IMPACT

The results obtained in the research areas show that it is very important to perform careful, specialized follow-up of the pregnancy.

This makes it possible to detect possible deficiencies in the creation of the fetus's vital organs.

RESEARCH LINES

- Environment and pregnancy complications.
- Fetal brain development.
- Fetal programming.
- Fetal therapy & surgery.
- Inflammation in preterm birth.
- Placental disease.
- Prematurity.

PUBLICATIONS

Originals

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54. Pauta M; Badenas C; Rodriguez-Revenga L; Soler A; Grande M; Sabrià J; Illanes C; Borobio V; Borrell A. **A New Stepwise Molecular Work-Up After Chorionic Villi Sampling in Women With an Early Pregnancy Loss.** *Frontiers in Genetics.* 11:561720. Q2

55. Benítez L; Pauta M; Badenas C; Madrigal I; Nadal A; Marimon E; Borrell A. **The contribution of qf-pcr and pathology studies in the diagnosis of diandric triploidy/partial mole.** *Diagnostics.* 11(10):1811. Q2

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using non-invasive saliva samples. *International Journal of Infectious Diseases.* 110:363-370. Q2

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60. Peng S, Bhatt S, Borrell A, Yaron Y. **Economic impact of using maternal plasma cell-free DNA testing to guide further workup in recurrent pregnancy loss.** *Prenatal Diagnosis.* 41(10):1215-1221. Q2

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68. Cobo T, Aldecoa V, Holeckova M, Andrys C, Filella X, Jacobsson B, Kacerovsky M. **A Rapid Amniotic Fluid Interleukin-6 Assessment for the Identification of Intra-Amniotic Inflammation in Women with Preterm Labor and Intact Membranes.** *Fetal Diagnosis and Therapy.* 48(5):327-332. Q3

69. Micheletti T, Eixarch E, Bennasar M, Torres X, Martinez-Crespo JM, Deprest J, Gratacos E. **Risk Factors Associated with Preterm Prelabor Rupture of Membranes after Cord Occlusion in Monochorionic Diamniotic Twins.** *Fetal Diagnosis and Therapy.* 48(6):457-463. Q3

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72. Wijngaard R, Casals E, Mercadé I, Laguna J, Madrigal I, Badenas C, Borrell A, Rodriguez-Revenga L. **Significance of Low Maternal Serum Β-hCG Levels in the Assessment of the Risk of Atypical Chromosomal Abnormalities.** *Fetal Diagnosis and Therapy.* 48(11-12):849-856. Q3

73. Nedopekina E; Escura S; Cobo T; Hansson SR; Martinez JM; Figueras F; López M. **Conservative treatment in non-tubal ectopic pregnancy and predictors of treatment failure.** *European Journal of Obstetrics & Gynecology and Reproductive Biology.* 257:6-10. Q3

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Review

1. Navarro-Tapia, E; Almeida-Toledano, L; Sebastiani, G; Serra-Delgado, M; Garcia-Algar, O; Andreu-Fernandez, V. **Effects of Microbiota Imbalance in Anxiety and Eating Disorders: Probiotics as Novel Therapeutic Approaches.** *International Journal of Molecular Sciences.* 22(5):2351. Q1

2. Sebastiani G; Almeida-Toledano L; Serra-Delgado M; Navarro-Tapia E; Sailer S; Valverde O; Garcia-Algar O; Andreu-Fernández V. **Therapeutic effects of catechins in less common neurological and neurodegenerative disorders.** *Nutrients.* 13(7):2232. Q1

3. Perez-Serrano, C; Bartolome, A; Bargallo, N; Sebastia, C; Nadal, A; Gomez, O; Oleaga, L. **Perinatal post-mortem magnetic resonance imaging (MRI) of the central nervous system (CNS): a pictorial review.** *Insights Into Imaging.* 12(1):104. Q1

4. Diz OM; Toro R; Cesar S; Gomez O; Sarquella-Brugada G; Campuzano O. **Personalized genetic diagnosis of congenital heart defects in newborns.** *Journal of Personalized Medicine.* 11(6):562. Q1

5. Pauta M, Martinez-Portilla RJ, Borrell A. **Prenatal Exome Sequencing in Recurrent Fetal Structural Anomalies: Systematic Review and Meta-Analysis**. *Journal of Clinical Medicine.* 10(20):4739. Q1

6. Meler E, Martínez J, Boada D, Mazarico E, Figueras F. **Doppler studies of placental function.** *Placenta.* 108:91-96. Q2

7. Marbán-Castro E, Goncé A, Fumadó V, Romero-Acevedo L, Bardají A. **Zika virus infection in pregnant women and their children: A review.** *European Journal of Obstetrics & Gynecology and Reproductive Biology.* 265:162-168. Q3

8. Maya-Enero S, Ramis-Fernández SM, Astals-Vizcaino M, García-Algar Ó. **Neurocognitive and behavioral profile of fetal alcohol spectrum disorder.** *Anales de Pediatría.* 95(3):208.e1-208.e9. Q4

Letters

1. Yaron Y, Borrell A. **Reply: cfDNA testing in recurrent pregnancy loss: a new step in the right way but still raw for the clinical area.** *Human Reproduction.* 36(3):829-830. D1

Editorial

1. Shah, JS; Vaughan, DA; Leung, A; Korkidakis, A; Figueras, F; Garcia, D; Penzias, AS; Sakkas, D. **Perinatal Outcomes in Singleton Pregnancies After In Vitro Fertilization Cycles Over 24 Years.** *Obstetrical & Gynecological Survey.* 76(10):610-611. Q3

2. Deprest, JA; Nicolaides, KH; Benachi, A; Gratacos, E; Ryan, G; Persico, N; Sago, H; Johnson, A; Wielgos, M; Berg, C; Van Calster, B; Russo, FM. **Randomized Trial of Fetal Surgery for Severe Left Diaphragmatic Hernia COMMENT.** *Obstetrical & Gynecological Survey.* 76(12):724-725. Q3

Case Reports

1. Frigola G; Del Rincón OG; Florián VB; Fita AV; Campos B; Pauta M; Puimedon MS; Oliva R; Borrell A; Nadal A. **Histopathology of recurrent Steel syndrome in fetuses caused by novel variants of COL27A1 gene.** *Virchows Archiv.* 479(2):413-418. Q2

GRANTS FOR RESEARCH IN PROGRESS

Borrell A. **Secuenciación del exoma completo (SEC) en fetos con anomalías fetales estructurales.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/01153
Duration: 01/01/2018-31/12/2021

Cobo T. **Desarrollo y validación de una herramienta diagnóstica no-invasiva de infección/inflamación intra-amniótica en flujo vaginal basada en la integración de metabolómica y microbioma.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00580
Duration: 01/01/2020-31/12/2022

Crsipi F. **A personalised medicine approach for the assessment and treatment of pulmonary hypertension in congenital heart disease to reduce brain damage and heart failure in neonates.**
Sponsored by: Generalitat de Catalunya. AGAUR_BP18_00201
Duration: 01/01/2020-31/05/2023

Crispi F. **Impacto de las técnicas de reproducción asistida en la programación cardiovascular fetal, resultado perinatal y epigenética fetal.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00675
Duration: 01/01/2018-31/12/2021

Crsipi F. **Impacto del crecimiento intrauterino restringido sobre el desarrollo pulmonar.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00246
Duration: 01/01/2021-31/12/2023

Eixarch E. **Desarrollo de herramientas predictivas para a identificación precoz de las alteraciones del neurodesarrollo de origen prenatal basadas en el estudio del desarrollo cortical fetal.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/00861
Duration: 01/01/2017-30/06/2021

Eixarch E. **FetalBrainCare: Tratamiento para la mejora del neurodesarrollo en el crecimiento intrauterino restringido.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/01872
Duration: 01/01/2020-31/12/2022

Eixarch E. **Estudio multicéntrico del proceso de desarollo cortical fetal anormal aplicando métodos estandarizados y protegidos de resonancia magnética fetal.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_AC21_2/00016
Duration: 15/12/2021-14/12/2024

Figueras F. **Desarrollo del modelo multiparamétrico de predicción de diabetes gestacional en el primer trimestre del embarazo.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00402
Duration: 01/01/2021-31/12/2023

García-Algar O. **Red de Salud Materno-Infantil y del desarrollo.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_RD16/0022/0002
Duration: 04/01/2017-31/12/2022

García-Algar O. **Alteraciones epigenéticas generadas por exposición prenatal al alcohol en pacientes con SAF (síndrome alcohol fetal). Antioxidante epigalocatequina (EGCG) como herramienta terapéutica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/00566
Duration: 17/03/2017-30/06/2021

García-Algar O. **App VisualTEAF: una nova eina diagnòstica del TEAF (Trastorn de l'Espectre Alcohòlic Fetal).**
Sponsored by: Barcelona Mobile Ventures. MWCapital_COLLIDER19_002
Duration: 01/09/2019-30/07/2021

García-Algar O. **Estudio epigenómico, metabolómico y metagenómico de una cohorte de niños con Síndrome Alcohólico Fetal: modelo diagnóstico y nuevas dianas terapéuticas.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/01853
Duration: 01/01/2020-31/12/2022

Goncé A. **Develop a multi-disciplinary approach for a personalized prenatal diagnostics and care for twin pregnancies.**
Sponsored by: Generalitat de Catalunya. GENCAT_ERAPERMED19
Duration: 01/03/2020-31/12/2022

Goncé A. **Develop a multi-disciplinary approach for a personalized prenatal diagnostics and care for twin pregnancies.**
Sponsored by: European Commission and Generalitat de Catalunya. CE_ERA_PerMed_19 and SLD001/19/000002
Duration: 05/03/2019-05/03/2022

Gratacós E. **Grup de medicina Meternofetal i Reproductiva mixta Hospital Clínic de Barcelona i Hospital Sant Joan de Déu.**
Sponsored by: Generalitat de Catalunya. AGAUR_SGR17_01531
Duration: 01/01/2017-31/10/2021

Gratacós E. **Artificial Placenta.**
Sponsored by: La Caixa Foundation. 6049-20 FCRB
Duration: 01/01/2020-31/12/2024

Gratacós E. **Validació d'un algoritme de predicció d'infecció/inflamació intraamniòtica basat en marcadors metabolòmics vaginals en gestants amb amenaça de part prematur. Influència de la microbiota.**
Sponsored by: Generalitat de Catalunya. PERIS_SLT008/18/00126
Duration: 25/06/2019-31/12/2021

Gratacós E. **Desenvolupament d'eines predictives per a la identificacio precoç de les alteracions del neurodesenvolupament d'origen prenatal.**
Sponsored by: Generalitat de Catalunya. PERIS_SLT008/18/00156
Duration: 25/06/2019-31/12/2021

Gratacós E. **Caracterización fenotípica para una nueva clasificación clínica de la restricción de crecimiento fetal.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00073
Duration: 01/01/2019-30/06/2023

Gratacós E. **Impacto del ambiente y estilo de vida materno en la susceptibilidad a lesiones genéticas (pre)leucémicas fetales: estudio de viabilidad y prueba de concepto**.
Sponsored by: Fundación científica asociación española contra el cáncer. AECC_ClinicoJunior21
Duration: 01/12/2021-30/11/2023

Gratacós E. **FetalMed-PhD - A joint doctorate in Fetal Medicine.**
Sponsored by: European Commission. FPA 2013-0040
Duration: 01/08/2013-31/10/2022

López-Rojano M. **Seguimiento ecográfico en gestantes con infección por COVID-19. Riesgos asociados a la infección severa y al trimestre del embarazo.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_COV20/00310
Duration: 30/04/2020-29/10/2021

Zamora M. **La restricción de crecimiento fetal predispone en vida adulta a una respuesta a estrés cardíaco defectuosa: papel de la cardioquiina FGF21.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00167
Duration: 01/01/2020-31/12/2022

DOCTORAL THESES

Eixarch E, Deprest J. **Development of a sealing system for preventing iatrogenic preterm prelabor rupture of membrane after endoscopic fetal surgery.**
PhD student: Talita Micheletti Helfer

Illa M, Eixarch E. **Diagnosis and perinatal therapies in an animal model of intrauterine growth restriction.**
PhD student: Laura Pla Codina

Carreras E, Eixarch E, Llurba E. **Estudi de factors predicitus d'anomalies del neurodesenvolupament en caridiopaties congenties.**
PhD student: Irene Ribera Casellas

Gómez del Rincón O, Crispi F. **Evaluation of left-sided congenital heart defects by advanced fetal echocardiography and cord blood biomarkers.**
PhD student: Iris Soveral Rodrigues Da Silva Dias

Zamora M, Marsál K. **Intrauterine growth restriction-experimental and clinical strategies to improve outcome.**
PhD student: Mari Kinoshita

3.16 Metabolic bone disease

LOCATION
HCB building, floor 4B

KEYWORDS
1. **Osteoporosis**
2. **Paget's disease of bone**
3. **Bone turnover markers**
4. **Hepatic osteodystrophy**

RELATED DISEASES
1. **Osteoporosis**
2. **Paget's disease of bone**
3. **Bone disease associated with chronic cholestasis**
4. **Glucocorticoid-induced osteoporosis**

AWARDS

Best poster in basic science in the XXV SEIOMM congress "Efecto de la bilirrubina sobre la viabilidad de los osteoclastos y los microRNAs potenciadores de la osteoclastogénesis"
Institution: Sociedad Española de Investigación Ósea y Metabolismo Mineral (SEIOMM)
Awardee/s: Pilar Peris & Núria Guañabens

Best published paper in metabolic bone diseases in the XLVII SER congress " Vertebral fracture risk in glucocorticoid-induced osteoporosis: the role of hypogonadism and corticosteroid boluses"
Institution: Sociedad Española de Reumatología (SER)
Awardee/s: Helena Florez, Xavier Filella, Ana Monegal, Núria Guañabens & Pilar Peris

Original publications

TOTAL	4
Mean IF	3,52
Q1	25%
D1	0%
MA	25%
OA	50%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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POST-DOCTORAL RESEARCHERS
Helena Florez (HCB)

PROBLEM

Metabolic bone diseases, particularly osteoporosis, have important health implications, since they are often behind many fractures. Despite their relevance, metabolic bone diseases form a poorly studied health issue.

APPROACH

The group has studied the effects of cholestasis on bone tissue, both at the clinical and experimental levels. The group also has a deep experience in the study of osteoporosis in patients with end-stage liver disease and following a liver transplant.

Study of the interactions between the liver and bones has allowed it to identify the risk factors and cellular mechanisms involved, as well as to analyse various treatment options.

Our group has also analyzed the usefulness of the biochemical markers of bone turnover in the evaluation of metabolic bone disorders. With this, we have expanded the knowledge in the biochemical approach not only of osteoporosis, but also of other metabolic bone diseases such as Paget's disease of bone.

IMPACT

The group has shown that patients with cholestatic liver disease have a high prevalence of osteoporosis. It has also been identified the risk factors for developing fractures in this context.

In the experimental field the group has described how substances retained in cholestasis produce a damaging effect on osteoblasts, the bone-forming cells, which explains the deficit in bone formation (the main mechanism of osteoporosis associated with cholestasis). More recently, we have analyzed their effects on osteocytic cell lines and the group is currently studying the effects of the products retained in cholestasis on osteoclasts, the cells responsible for bone resorption.

RESEARCH LINES

- Pathogenesis of osteoporosis and fracture development in primary biliary cholangitis and other chronic cholestatic disorders.

- Osteoporosis in liver transplantation.

- Osteoporosis in premenopausal women and in males. Clinical characteristics and mechanisms involved in the development of the disorder.

- Evaluation of bone remodelling regulators in the pathogenesis of osteoporosis.

- Biomarkers in Paget disease.

PUBLICATIONS

Originals

1. Tsourdi E; Zillikens MC; Meier C; Body JJ; Gonzalez-Rodriguez E; Anastasilakis AD; Abrahamsen B; McCloskey E; Hofbauer LC; Guañabens N; Obermayer-Pietsch B; Ralston SH; Eastell R; Pepe J; Palermo A; Langdahl B. **Fracture Risk and Management of Discontinuation of Denosumab Therapy: A Systematic Review and Position Statement by ECTS.** *Journal of Clinical Endocrinology & Metabolism.* 106(1):264-281. Q1

2. Guañabens N, Olmos JM, Hernández JL, Cerdà D, Hidalgo Calleja C, Martinez López JA, Arboleya L, Aguilar Del Rey FJ, Martinez Pardo S, Ros Vilamajó I, Suris Armangué X, Grados D, Beltrán Audera C, Suero-Rosario E, Gómez Gracia I, Salmoral Chamizo A, Martín-Esteve I, Florez H, Naranjo A, Castañeda S, Ojeda Bruno S, García Carazo S, García Vadillo A, López Vives L, Martínez-Ferrer À, Borrell Paños H, Aguado Acín P, Castellanos-Moreira R, Tebé C, Gómez-Vaquero C, OsteoResSer Working Group of the Spanish Society of Rheumatology. **Vertebral fractures are increased in rheumatoid arthritis despite recent therapeutic advances: a case-control study.** *Osteoporosis International.* 32(7):1333-1342. Q2

3. Cobo T, Aldecoa V, Holeckova M, Andrys C, Filella X, Jacobsson B, Kacerovsky M. **A Rapid Amniotic Fluid Interleukin-6 Assessment for the Identification of Intra-Amniotic Inflammation in Women with Preterm Labor and Intact Membranes.** *Fetal Diagnosis and Therapy.* 48(5):327-332. Q3

4. Jimenez-Hernandez M; Soriano A; Filella X; Calvo M; Coll E; Rebled JM; Poch E; Graterol F; Compte, MT; Maduell F; Fontsere N. **Impact of locking solutions on conditioning biofilm formation in tunnelled haemodialysis catheters and inflammatory response activation.** *Journal of Vascular Access.* 22(3):370-379. Q4

Review

1. Peris P, Monegal A, Guañabens N. **Bisphosphonates in inflammatory rheumatic diseases.** *Bone.* 146:115887. Q2

Letters

1. Kanterewicz E; Puigoriol E; Peris P. **Grade 1 vertebral fractures, bone mineral density, and the risk of fractures.** *Journal of Bone and Mineral Research.* 36(11):2275-2276. Q1

2. Gómez-Puerta JA, Peris P. **Expanding diagnostic approach in patients with osteonecrosis.** *Arthritis Research & Therapy.* 23(1):150. Q2

Case Reports

1. Cajiao K; Setoain FJ; Peris P. **Multifocal Osteonecrosis The Usefulness of Bone Scintigraphy.** *JCR-Journal of Clinical Rheumatology.* 27(5):E196-E197. Q3

2. Gumucio R; Azuaga AB; Isern-Kebschull J; Ramirez J; Frade-Sosa B; Guañabens N. **A Case Report of Exuberant Chondrocalcinosis of the Ankle An Unusual Presentation.** *JCR-Journal of Clinical Rheumatology.* 27(1):E30-E31. Q3

GRANTS FOR RESEARCH IN PROGRESS

Guañabens N. **Efectos de la bilirrubina y ácidos biliares sobre osteoclastos humanos in vitro y sobre el patrón de expresión de MicroRNAs implicados en la osteoclastogénesis.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00444
Duration: 01/01/2018-30/06/2022

DOCTORAL THESES

Peris P. **Osteoporosis inducida por el tratamiento crónico por glucocorticoides.**
PhD student: Helena Flórez Enrich

3.17 Endocrine disorders: crosstalk between molecular, metabolic and therapeutic determinants

LOCATION
CEK building, floor 5

KEYWORDS
1. **Endocrine tumours**
2. **Steroids**

Original publications

TOTAL	9
Mean IF	**5,05**
Q1	**67%**
D1	**0%**
MA	**22%**
OA	**67%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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Mattia Squarcia (HCB)

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Arturo Vega (IDIBAPS)

PROBLEM

The group studies molecular, metabolic and therapeutic aspects of complex endocrine disorders within the context of research on endocrine tumours and on steroids.

APPROACH

The group's research work is organized into two programmes: the steroids programme and the endocrine tumours programme. The former studies the molecular and epigenetic mechanisms that cause severe and persistent damage to the target tissues of steroidal hormones.

The endocrine tumours programme researches genetic and molecular factors, biomarkers and new diagnostic and therapeutic strategies.

The basic goal of the group's research is translation of the knowledge derived from basic research to clinical practice.

IMPACT

As a result of the research carried out to date, the group has provided evidence, in a translational ex vivo-in vitro model, of endothelial activation and inflammation on the action of circulating factors that remain after endogenous tumour hypercortisolism.

In parallel, a new animal model of reversible exogenous Cushing syndrome has shown the persistence of the harmful metabolic effects that result from excess steroids.

In terms of technological innovation, work is being carried out on the differential diagnosis and minimally invasive percutaneous treatment of benign and malignant thyroid nodules.

RESEARCH LINES

- Molecular and epigenetic mechanisms responsible for the persistent deleterious effects in target tissue exposed to steroidal hormones.

- Translational approach in humans and animal models.

PUBLICATIONS

Originals

1. Díaz-Catalán D, Alcarraz-Vizán G, Castaño C, de Pablo S, Rodríguez-Comas J, Fernández-Pérez A, Vallejo M, Ramírez S, Claret M, Parrizas M, Novials A, Servitja JM. **BACE2 suppression in mice aggravates the adverse metabolic consequences of an obesogenic diet.** *Molecular Metabolism.* 53:101251. Q1.

2. Osorio-Conles Ó; Vega-Beyhart A; Ibarzabal A; Balibrea JM; Graupera I; Rimola J; Vidal J; de Hollanda A. **A distinctive NAFLD signature in adipose tissue from women with severe obesity.** *International Journal of Molecular Sciences.* 22(19):10541. Q1

3. Araujo-Castro M, Garcia Centeno R, López-García MC, Lamas C, Álvarez-Escolá C, Calatayud Gutiérrez M, Blanco-Carrera C, de Miguel Novoa P, Valdés N, Gracia Gimeno P, Fernández-Ladreda MT, Mínguez Ojeda C, Percovich Hualpa JC, Mora M, Vidal Ó, Serrano Romero A, Hanzu FA, Gómez Dos Santos V. **Risk factors for intraoperative**

complications in pheochromocytomas. *Endocrine-Related Cancer.* 28(11):695-703. Q1

4. de Pablo S, Rodríguez-Comas J, Díaz-Catalán D, Alcarraz-Vizán G, Castaño C, Moreno-Vedia J, Montane J, Parrizas M, Servitja JM, Novials A. **4-Phenylbutyrate (PBA) treatment reduces hyperglycemia and islet amyloid in a mouse model of type 2 diabetes and obesity.** *Scientific Reports.* 11(1):11878. Q1

5. Borrás A; Manau MD; Fabregues F; Casals G; Saco A; Halperin I; Mora M; Goday A; Barral Y; Carmona F. **Endocrinological and ovarian histological investigations in assigned female at birth transgender people undergoing testosterone therapy.** *Reproductive Biomedicine Online.* 43(2):289-297. Q1

6. Cortese L; Io Presti G; Zanoletti M; Aranda G; Buttafava M; Contini D; Dalla-Mora A; Dehghani H; di Sieno L; de Fraguier S; Hanzu FA; Mora-Porta M; Nguyen-Dinh A; Renna M; Rosinski B; Squarcia M; Tosi A; Weigel UM; Wojtkiewicz S; Durduran T. **The LUCA device: a multi-modal platform combining diffuse optics and ultrasound imaging for thyroid cancer screening.** *Biomedical Optics Express.* 12(6):3392-3409. Q1

7. Squarcia M, Mora M, Aranda G, Carrero E, Martínez D, Jerez R, Valero R, Berenguer J, Halperin I, Hanzu FA. **Long-Term Follow-Up of Single-Fiber Multiple Low-Intensity Energy Laser Ablation Technique of Benign Thyroid Nodules.** *Frontiers in Oncology.* 11:584265. Q2

8. Vega-Beyhart A; Iruarrizaga M; Pané A; García-Eguren G; Giró O; Boswell L; Aranda G; Flores V; Casals G; Alonso C; Mora M; Halperin I; Carmona F; Enseñat J; Vidal O; Hu T; Rojo G; Gomis R; Hanzu FA. **Endogenous cortisol excess confers a unique lipid signature and metabolic network.** *Journal of Molecular Medicine-JMM.* 99(8):1085-1099. Q2

9. Araujo-Castro M; García Centero R; López-García MC; Álvarez Escolá C; Calatayud Gutiérrez M; Blanco Carrera C; De Miguel Novoa P; Valdés Gallego N; Hanzu FA; Gracia Gimeno P; Fernández-Ladreda MT; Percovich Hualpa JC; Mora Porta M; Lorca Álvaro J; Pian H; Caracuel IR; Sanjuanbenito Dehesa A; Gómez Dos Santos V; Serrano Romero A; Oliveira CL. **Surgical outcomes in the pheochromocytoma surgery. Results from the PHEO-RISK STUDY.** *Endocrine.* 74(3):676-684. Q3

Review

1. Aranda G, Halperin I, Gomez-Gil E, Hanzu FA, Seguí N, Guillamon A, Mora M. **Cardiovascular Risk Associated With Gender Affirming Hormone Therapy in Transgender Population.** *Frontiers in Endocrinology.* 12:718200. Q1

2. Araujo-Castro M; Valderrábano P; Escobar-Morreale HF; Hanzu FA; Casals G. **Urine steroid profile as a new promising tool for the evaluation of adrenal tumors. Literature review**. *Endocrine.* 72(1):40-48. Q3

3. Orois A, Mora M, Halperin I, Oriola J. **Familial non medullary thyroid carcinoma: Beyond the syndromic forms.** *Endocrinología, Diabetes y Nutrición.* 68(4):260-269. Q4

Letters

1. Garcia-Carbonero R; Matute Teresa F; Mercader-Cidoncha E; Mitjavila-Casanovas M; Robledo M; Tena I; Alvarez-Escola C; Arístegui M; Bella-Cueto MR; Ferrer-Albiach C; Hanzu FA. **Multidisciplinary practice guidelines for the diagnosis, genetic counseling and treatment of pheochromocytomas and paragangliomas.** *Clinical & Translational Oncology.* 23(10):1995-2019. Q3

Case Reports

1. Boswell L, Casals G, Blanco J, Jiménez A, Aya F, de Hollanda A, Halperin I, Arance AM, Mora M, Hanzu FA. **Onset of fulminant type 1 diabetes mellitus following hypophysitis after discontinuation of combined immunotherapy.** *Journal of Diabetes Investigation.* 12(12):2263-2266. Q2

GRANTS FOR RESEARCH IN PROGRESS

Hanzu F. **Assessment of senescence as a novel target in the management of Cushing's syndrome comorbidities.**
Sponsored by: Fundació la Marató de TV3.
Minoritaries_20
Duration: 30/06/2021-29/06/2024

Hanzu F. **Papel del factor de crecimiento de fibroblastos 21 en la disfunción metabólica durante el Síndrome de Cushing en activo y tras curación. Estudio en humanos y modelo animal.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00581
Duration: 01/01/2020-31/12/2022

Mora M. **Laser and Ultrasound Co-Analyzer for thyroid nodules.**
Sponsored by: European Commission.
CE_H2020-ICT-2015_IA
Duration: 01/02/2016-31/05/2021

DOCTORAL THESES

Mora M. **Búsqueda de genes implicados en el cáncer de tiroides no medular familiar (FNMTC) no sindrómico.**
PhD student: Aida Orois Añon

3.18 Translational research in hepatic oncology

LOCATION
CEK building, floor 3

KEYWORDS
1. **Hepatocellular carcinoma (HCC)**
2. **Intrahepatic cholangiocarcinoma (iCCA)**
3. **Molecular targeted therapies in liver cancer**
4. **Immunotherapies in liver cancer**
5. **Molecular and immune classification of HCC and iCCA**
6. **Cancer drivers and signalling pathways**
7. **Biomarkers predictors of response and primary resistance to molecular therapies in HCC**
8. **Pathogenesis and treatment of NASH-HCC**
9. **Liver Cancer microbiome**

RELATED DISEASES
1. **Liver cancer**
2. **Hepatocellular carcinoma (HCC)**
3. **Intrahepatic cholangiocarcinoma (iCCA)**
4. **Other primary liver and biliary tree tumors**

GROUP INVOLVED IN
AGAUR_SGR17: 01358
HEP-CAR
HUNTER
ICGC
International HCC Genomic Consortium

AWARDS
Top 1% most cited researcher globally
Institution: Clarivate Analytics
Awardee/s: Josep M. Llovet

Recognition as one of the best worldwide researchers
Institution: Stanford University
Awardee/s: Josep M. Llovet

Original publications

TOTAL	17
Mean IF	**17,24**
Q1	**88%**
D1	**76%**
MA	**18%**
OA	**71%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Liver cancer is a major public health issue, with an estimated incidence of one million cases from 2025. Surgery and local-regional treatments cure the disease in a small number of cases, but most patients progress to advanced stages, in which molecular therapies obtain survival rates of up to two years.

Molecular and genomic studies have defined the molecular and immunological classification of the tumour and the main therapeutic targets. However, such knowledge has not yet given rise to any clinical application that could prove beneficial to patients, and thus this remains as an unmet medical need that our team is currently addressing.

APPROACH

The group has defined the molecular and immunological classification of hepatocellular carcinoma and has characterised certain therapeutic targets.

The most pressing challenges to improve the treatment of patients with hepatocellular carcinoma and cholangiocarcinoma are: a) identification of molecular markers – with tissue and liquid biopsy – for early diagnosis; b) identification of the pro-carcinogenic microenvironment as the therapeutic target in patients with cirrhosis of the liver; c) examination of genomic alterations to detect the presence of new genotoxic agents; d) identification of the biomarkers denoting response or primary resistance to therapies involving immunological treatments in first and second line management of advanced hepatocellular carcinoma through single-cell data and spatial transcriptomics; e) identification of new therapeutic targets by methylation deregulation; f) identification of drugs which, when combined, have synergistic effects;
g) improving knowledge about the mechanisms involved in the origin, progression and dissemination of NASH-HCC; h) exploring the role of liver microbiome in the pathogenesis of HCC.

IMPACT

The long-term objective is to improve survival rates and quality of life in patients with liver cancer, as well as to improve prevention. Secondary objectives include increasing knowledge on the understanding of tumor development, molecular alterations and treatment of these tumours.

The impact of the group's studies may help improve the prevention and treatment of liver cancer by identifying the biomarkers that predict the response to immunological therapies, and those that predict resistance. This will also make it possible to identify the best therapeutic combinations for use in clinical trials and to identify new treatment paradigms.

For this purpose, the group will use cutting-edge technology, such as next generation sequencing and single cell sequencing.

RESEARCH LINES

- Establishment of molecular and immune classification of HCC.

- Translational research in liver cancer.

- Identification of drivers of oncogenesis as targets for therapies in HCC and iCCA.

- Identification of biomarkers predicting response to molecular and immune therapies in HCC.

- Establishment of chemoembolization, sorafenib, regorafenib and ramucirumab as standard of care in HCC patients.

PUBLICATIONS

Originals

1. Pfister D; Nuñez NG; Pinyol R; Govaere O; Pinter M; Szydlowska M; Gupta R; Qiu M; Deczkowska A; Weiner A; Mueller F; Sinha A; Friebel E; Engleitner T; Lenggenhager D; Moncsek A; Heide D; Stirm K; Kosla J; Kotsiliti E; Leone V; Dudek M; Yousuf S; Inverso D; Singh I; Teijeiro A; Castet F; Montironi C; Haber PK; Tiniakos D; Bedossa P; Cockell S; Younes R; Vacca M; Marra F; Schattenberg JM; Allison M; Bugianesi E; Ratziu V; Pressiani T; D'Alessio A; Personeni N; Rimassa L; Daly AK; Scheiner B; Pomej K; Kirstein MM; Vogel A; Peck-Radosavljevic M; Hucke F; Finkelmeier F; Waidmann O; Trojan J; Schulze K; Wege H; Koch S; Weinmann A; Bueter M; Rossler F; Siebenhuner A; de Dosso S; Mallm JP; Umansky V; Jugold M; Luedde T; Schietinger A; Schirmacher P; Emu B; Augustin HG; Billeter A; Mueller-Stich B; Kikuchi H; Duda DG; Kutting F; Waldschmidt DT; Ebert MP; Rahbari N; Mei HE; Schulz AR; Ringelhan M; Malek N; Spahn S; Bitzer M; Ruiz de Galarreta M; Lujambio A; Dufour JF; Marron TU; Kaseb A; Kudo M; Huang YH; Djouder N; Wolter K; Zender L; Marche PN; Decaens T; Pinato DJ; Rad R; Mertens JC; Weber A; Unger K; Meissner F; Roth S; Jilkova ZM; Claassen M; Anstee QM; Amit I; Knolle P; Becher B; Llovet JM; Heikenwalder M. **NASH limits anti-tumour surveillance in immunotherapy-treated HCC.** *Nature.* 592(7854):450-456. D1

2. Affo S, Nair A, Brundu F, Ravichandra A, Bhattacharjee S, Matsuda M, Chin L, Filliol A, Wen W, Song X, Decker A, Worley J, Caviglia JM, Yu L, Yin D, Saito Y, Savage T, Wells RG, Mack M, Zender L, Arpaia N, Remotti HE, Rabadan R, Sims P, Leblond AL, Weber A, Riener MO, Stockwell BR, Gaublomme J, Llovet JM, Kalluri R, Michalopoulos GK, Seki E, Sia D, Chen X, Califano A, Schwabe RF. **Promotion of cholangiocarcinoma growth by diverse cancer-associated fibroblast subpopulations.** *Cancer Cell.* 39(6):866-882.e11. D1

3. Pinyol R, Torrecilla S, Wang H, Montironi C, Piqué-Gili M, Torres-Martin M, Wei-Qiang L, Willoughby CE, Ramadori P, Andreu-Oller C, Taik P, Lee YA, Moeini A, Peix J, Faure-Dupuy S, Riedl T, Schuehle S, Oliveira CP, Alves VA, Boffetta P, Lachenmayer A, Roessler S, Minguez B, Schirmacher P, Dufour JF, Thung SN, Reeves HL, Carrilho FJ, Chang C, Uzilov AV, Heikenwalder M, Sanyal A, Friedman SL, Sia D, Llovet JM. **Molecular characterization of hepatocellular carcinoma in patients with non-alcoholic steatohepatitis.** *Journal of Hepatology.* 75(4):865-878. D1

4. Von Felden J; Garcia-Lezana T; Dogra N; Gonzalez-Kozlova E; Ahsen ME; Craig A; Gifford S; Wunsch B; Smith JT; Kim S; Diaz JEL; Chen X; Labgaa I; Haber P; Olsen R; Han D; Restrepo P; D'Avola D; Hernandez-Meza G; Allette K; Sebra R; Saberi B; Tabrizian P; Asgharpour A; Dieterich D; Llovet JM; Cordon-Cardo C; Tewari A; Schwartz M; Stolovitzky G; Losic B; Villanueva A. **Unannotated small RNA clusters associated with circulating extracellular vesicles detect early stage liver cancer.** *Gut.* 325036. D1

5. Singal AG; Hoshida Y; Pinato DJ; Marrero J; Nault JC; Paradis V; Tayob N; Sherman M; Lim YS; Feng Z; Lok AS; Rinaudo JA; Srivastava S; Llovet J; Villanueva A. **International Liver Cancer Association (ILCA) White Paper on Biomarker Development for Hepatocellular Carcinoma.** *Gastroenterology.* 160(7):2572-2584. D1

6. Hernandez-Meza G, von Felden J, Gonzalez-Kozlova EE, Garcia-Lezana T, Peix J, Portela A, Craig AJ, Sayols S, Schwartz M, Losic B, Mazzaferro V, Esteller M, Llovet JM, Villanueva A. **DNA methylation profiling of human hepatocarcinogenesis.** *Hepatology.* 74(1):183-199. D1

7. Bernardo-Seisdedos G, Bilbao J, Fernández-Ramos D, Lopitz-Otsoa F, Gutierrez de Juan V, Bizkarguenaga M, Mateos B, Fondevila MF, Abril-Fornaguera J, Diercks T, Lu SC, Nogueiras R, Mato JM, Millet O. **Metabolic landscape of the mouse liver by quantitative 31 P-NMR analysis of the phosphorome.** *Hepatology.* 74(1):148-163. D1

8. Meunier L; Hirsch TZ; Caruso S; Imbeaud S; Bayard Q; Roehrig A; Couchy G; Nault JC; Llovet JM; Blanc JF; Calderaro J; Zucman-Rossi J; Letouzé E. **DNA Methylation Signatures Reveal the Diversity of Processes Remodeling Hepatocellular Carcinoma Methylomes.** *Hepatology.* 74(2):816-834. D1

9. Torrens L, Montironi C, Puigvehí M, Mesropian A, Leslie J, Haber PK, Maeda M, Balaseviciute U, Willoughby CE, Abril-Fornaguera J, Piqué-Gili M, Torres-Martín M, Peix J, Geh D, Ramon-Gil E, Saberi B, Friedman SL, Mann DA, Sia D, Llovet JM. **Immunomodulatory effects of lenvatinib plus anti-PD1 in mice and rationale for patient enrichment in hepatocellular carcinoma.** *Hepatology.* 74(5):2652-2669. D1

10. Kudo M; Montal R; Finn RS; Castet F; Ueshima K; Nishida N; Haber PK; Hu Y; Chiba Y; Schwartz M; Meyer T; Lencioni R; Llovet JM. **Objective Response Predicts Survival in Advanced Hepatocellular Carcinoma treated with Systemic Therapies.** *Clinical Cancer Research.* D1

11. Kudo M; Finn RS; Morimoto M; Rau KM; Ikeda M; Yen CJ; Galle PR; Llovet JM; Daniele B; Lim HY; McIlwain DW; Yoshikawa R; Nakamura K; Liang K; Wang C; Abada P; Widau RC; Zhu AX. **Ramucirumab for Patients with Intermediate-Stage Hepatocellular Carcinoma and Elevated Alpha-Fetoprotein: Pooled Results from Two Phase 3 Studies (REACH and REACH-2)**. *Liver Cancer.* 10(5):451-460. D1

12. Dalwadi DA; Torrens L; Abril-Fornaguera J; Pinyol R; Willoughby C; Posey J; Llovet JM; Lanciault C; Russell DW; Grompe M; Naugler WE. **Liver Injury Increases the Incidence of HCC following AAV Gene Therapy in Mice.** *Molecular Therapy.* 29(2):680-690. D1

13. von Felden J; Craig AJ; Garcia-Lezana T; Labgaa I; Haber PK; D'Avola D; Asgharpour A; Dieterich D; Bonaccorso A; Torres-Martin M; Sia D; Sung MW; Tabrizian P; Schwartz M; Llovet JM; Villanueva A. **Mutations in circulating tumor DNA predict primary resistance to systemic therapies in advanced hepatocellular carcinoma.** *Oncogene.* 40(1):140-151. D1

14. Zhu AX; Finn RS; Kang YK; Yen CJ; Galle PR; Llovet JM; Assenat E; Brandi G; Motomura K; Ohno I; Daniele B; Vogel A; Yamashita T; Hsu CH; Gerken G; Bilbruck J; Hsu Y; Liang K; Widau RC; Wang C; Abada P; Kudo M. **Serum alpha-fetoprotein and clinical outcomes in patients with advanced hepatocellular carcinoma treated with ramucirumab.** *British Journal of Cancer.* 124(8):1388-1397. Q1

15. Craig AJ; Garcia-Lezana T; de Galarreta MR; Villacorta-Martin C; Kozlova EG; Martins-Filho SN; Felden Jv; Ahsen ME; Bresnahan E; Hernandez-Meza G; Labgaa I; D'Avola D; Schwartz M; Llovet JM; Sia D; Thung S; Losic B; Lujambio A; Villanueva A. **Transcriptomic characterization of cancer-testis antigens identifies MAGEA3 as a driver of tumor progression in hepatocellular carcinoma.** *Plos Genetics.* 17(6):e1009589. Q1

16. Reig M, Galle PR, Kudo M, Finn R, Llovet JM, Metti AL, Schelman WR, Liang K, Wang C, Widau RC, Abada P, Zhu AX. **Pattern of progression in advanced hepatocellular carcinoma treated with ramucirumab.** *Liver International.* 41(3):598-607. Q2

17. Galle PR; Kudo M; Llovet JM; Finn RS; Karwal M; Pezet D; Kim TY; Yang TS; Lonardi S; Tomasek J; Phelip JM; Touchefeu Y; Koh SJ; Stirnimann G; Liang K; Ogburn KD; Wang C; Abada P; Widau RC; Zhu AX. **Ramucirumab in patients with previously treated advanced hepatocellular carcinoma: Impact of liver disease aetiology.** *Liver International.* 41(11):2759-2767. Q2

Review

1. Llovet JM; Kelley RK; Villanueva A; Singal AG; Pikarsky E; Roayaie S; Lencioni R; Koike K; Zucman-Rossi J; Finn RS. **Hepatocellular carcinoma.** *Nature Reviews Disease Primers.* 7(1). D1

2. Llovet JM; De Baere T; Kulik L; Haber PK; Greten TF; Meyer T; Lencioni R. **Locoregional therapies in the era of molecular and immune treatments for hepatocellular carcinoma.** *Nature Reviews Gastroenterology & Hepatology.* 18(5):293-313. D1

3. Haber, PK; Puigvehi, M; Castet, F; Lourdusamy, V; Montal, R; Tabrizian, P; Buckstein, M; Kim, E; Villanueva, A; Schwartz, M; Llovet, JM. **Evidence-Based Management of Hepatocellular Carcinoma: Systematic Review and Meta-analysis of Randomized Controlled Trials (2002-2020).** *Gastroenterology.* 161(3):879-898. D1

4. Llovet JM, Villanueva A, Marrero JA, Schwartz M, Meyer T, Galle PR, Lencioni R, Greten TF, Kudo M, Mandrekar SJ, Zhu AX, Finn RS, Roberts LR, AASLD Panel of Experts on Trial Design in HCC. **Trial Design and Endpoints in hepatocellular carcinoma: AASLD Consensus Conference.** *Hepatology.* 73(73):158-191. D1

5. Castet F, Willoughby CE, Haber PK, Llovet JM. **Atezolizumab plus bevacizumab: a novel breakthrough in hepatocellular carcinoma.** *Clinical Cancer Research.* 27(7):1827-1829. D1

6. El-Khoueiry AB; Hanna DL; Llovet JM; Kelley RK. **Cabozantinib: An evolving therapy for hepatocellular carcinoma.** *Cancer Treatment Reviews.* 98:102221. D1

Clinical Guidelines

1. Reig M, Forner A, Ávila MA, Ayuso C, Mínguez B, Varela M, Bilbao I, Bilbao JI, Burrel M, Bustamante J, Ferrer J, Gómez MÁ, Llovet JM, De la Mata M, Matilla A, Pardo F, Pastrana MA, Rodríguez-Perálvarez M, Tabernero J, Urbano J, Vera R, Sangro B, Bruix J. **Diagnosis and treatment of hepatocellular carcinoma.** *Medicina Clinica.* 156(9):463.e1-463.e30. Q3

GRANTS FOR RESEARCH IN PROGRESS

Llovet JM. **Laboratori de Recerca Translacional en Oncología Hepàtica.**
Sponsored by: Generalitat de Catalunya.
AGAUR_SGR17_01358
Duration: 01/01/2017-30/09/2021

Llovet JM. **Descobriment de biomarcadores predictors de resposta i/o resistència a inhibidors de punts de control immunitari anti-PD1 en carcinoma hepatocel·lular avançat.**
Sponsored by: Fundació Acadèmia Ciències Mèdiques. BECA_ACADEMIA21_001
Duration: 31/05/2021-30/05/2023

Llovet JM. **Mecanismos de resistencia adquirida a Sorafenib en el carcinoma hepatocellular.**
Sponsored by: Ministerio de Economía y Competitividad. MINECO_BES-2017-081286
Duration: 01/08/2018-31/07/2022

Llovet JM. **Caracterización molecular del carcinoma hepatocelular relacionado con obesidad/diabetes/EHNA.**
Sponsored by: Agencia Estatal de Investigación. PID2019-105378RB-I00.
Duration: 01/06/2020-31/05/2023

Llovet JM. **Caracterización molecular del carcinoma hepatocelular relacionado con Obesidad/Diabetes/EHNA.**
Sponsored by: Agencia Estatal de Investigación. AEI_FPI20
Duration: 01/08/2021-31/07/2025

Llovet JM. **HUNTER: Hepatocellular Carcinoma Expediter Network.**
Sponsored by: Cancer Research UK and Fundación científica asociación española contra el cáncer. INT_AA_17 and AccAward17
Duration: 01/11/2018-30/11/2023

Llovet JM. **Molecular characterization of obesity/diabetes/NASH-related hepatocellular carcinoma.**
Sponsored by: European association for the study of the liver. INT_EASL_JR_12_20
Duration: 01/05/2021-30/04/2024

3.19 Gynecological endocrinology and human reproduction

LOCATION
HCB building

KEYWORDS
1. **Human papillomavirus**
2. **Endometrial cancer**
3. **Assisted reproductive technologies**
4. **Recurrent miscarriage**
5. **Gynecological laparoscopy**
6. **Endometriosis**

AWARDS

Academic numerari de la Reial Acadèmia Europea de Doctors
Institution: Reial Acadèmia Europea de Doctors
Awardee/s: Castelo-Branco A

Premi AEPCC-Investiga. Ácido tricloroacético vs Imiquimod en el tratamiento de mujeres con lesiones anales HSIL/AIN: efectividad y tolerancia
Institution: Asociación Española de Patología Cervical y Colposocopia
Awardee/s: Torné A & del Pino M

Original publications

TOTAL	34
Mean IF	**4,28**
Q1	**59%**
D1	**21%**
MA	**74%**
OA	**35%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

There are still many unknown aspects of gynecological pathology, both benign and malignant On the one hand, it is necessary to obtain early diagnostic tools, improve treatments and optimize follow-up to ensure the safety of our patients.

But it is also necessary to integrate into this knowledge the improvement of quality of life and to encourage our patients to be involved in decision-making. On the other hand, it is essential to deepen our knowledge of the etiopathogenesis and treatment of different gynecological processes, including reproductive failure.

APPROACH

Our group carries out clinical and translational research. The members of the team are part of the Gynecology Service of the Hospital Clínic, a third level reference center for complex gynecological pathology, which allows us to develop our research in direct contact with patients and their pathology.

The main health issues that focus our research are endometriosis and adenomyosis, sterility and reproductive failure, cervical pathology and human papillomavirus, endocrine disorders and sexual dysfunctions, as well as oncological gynecological pathology.

IMPACT

We have made advances in the diagnosis, molecular basis and treatment of endometriosis and adenomyosis. We have also deepened in the impact of gynecological diseases, quality of life and sexual quality, as well as the effect of hormonal treatments. Likewise, we have performed the first uterine transplant at the national level, and we have progressed in the implementation of robotic surgery in gynecological pathology.

We have improved our knowledge of gynecological malignant tumors and their surgical approach, as well as the study of premalignant lesions and vaccines against human papillomavirus, too. Finally, we have progressed in the knowledge of reproductive failure and fertility preservation.

RESEARCH LINES

- Optimization of the surgical, medical management and follow up of diseases of the reproductive apparatus.

- Etiopathogenesis in endometriosis and adenomyosis.

- Preservation and improvement of fertility.

- Reproductive failure markers.

- Human papillomavirus infection and vaccination.

- Robotic surgery and uterine transplantation.

PUBLICATIONS

Originals

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2. Ros C, Rius M, Abrao MS, deGuirior C, Martínez-Zamora MÁ, Gracia M, Carmona F. **Bowel preparation prior to transvaginal ultrasound improves the detection and visualization of rectosigmoid deep infiltrating endometriosis.** *Ultrasound in Obstetrics & Gynecology*. 57(2):335-341. D1

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8. Torné A; Pahisa J; Ordi J; Fusté P; Díaz-feijóo B; Glickman A; Paredes P; Rovirosa A; Gaba L; Saco A; Nicolau C; Carreras N; Agustí N; Vidal-sicart S; Gil-ibáñez B; Del Pino M. **Oncological results of laparoscopically assisted radical vaginal hysterectomy in early-stage cervical cancer: Should we really abandon minimally invasive surgery?** *Cancers*. 13(4):846. Q1

9. Del Pino M; Angeles MA; Martí C; Henere C; Munmany M; Marimon L; Saco A; Rakislova N; Ordi J; Torné A. **Colposcopic impression has a key role in the estimation of the risk of hsil/cin3.** *Cancers*. 13(6):1224. Q1

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13. Angeles MA, Migliorelli F, Vidal-Sicart S, Saco A, Ordi J, Ros C, Fusté P, Munmany M, Escura S, Carreras N, Sánchez-Izquierdo N, Pahisa J, Torné A, Paredes P, Del Pino M. **Paraaortic sentinel lymph node detection in intermediate and high-risk endometrial cancer by transvaginal ultrasound-guided myometrial injection of radiotracer (TUMIR).** *Journal of Gynecologic Oncology*. 32(4):e52. Q1

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18. Borrás A; Manau MD; Fabregues F; Casals G; Saco A; Halperin I; Mora M; Goday A; Barral Y; Carmona F. **Endocrinological and ovarian histological investigations in assigned female at birth transgender people undergoing testosterone therapy.** *Reproductive Biomedicine Online*. 43(2):289-297. Q1

19. Ramírez M, de la Fuente J, Andía D, José Hernández J, Fiol G, Torné A. **"HPV vaccination coverage in women between 15-55 years in Spain.** *International Journal of Gynecology & Obstetrics*. Q1

20. Alcalde AM, Martínez-Zamora MÁ, Gracia M, Ros C, Rius M, Nicolás I, Carmona F.

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21. Vega-Beyhart A; Iruarrizaga M; Pané A; García-Eguren G; Giró O; Boswell L; Aranda G; Flores V; Casals G; Alonso C; Mora M; Halperin I; Carmona F; Enseñat J; Vidal O; Hu T; Rojo G; Gomis R; Hanzu FA. **Endogenous cortisol excess confers a unique lipid signature and metabolic network.** *Journal of Molecular Medicine-JMM* 99(8):1085-1099. Q2

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26. Naumova I; Castelo-Branco C; Casals G. **Psychological Issues and Sexual Function in Women with Different Infertility Causes: Focus on Polycystic Ovary Syndrome.** *Reproductive Sciences*. 28(10):2830-2838. Q2

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29. Castelo-Branco C, RiberaTorres L, Gómez-Gil E, Uribe C, Cañizares S. **Psychopathological symptoms in Spanish subjects with gender dysphoria.** *Gynecological Endocrinology*. 37(6):534-540. Q3

30. Matos O, Ruthes EMP, Junior ABA, Lenardt BCC, Petroski CA, Lass AD, Castelo-Branco C. **Effects of anthropometric parameters on bone mineral density in women: from perimenopause to old age.** *Gynecological Endocrinology*. 37(10):902-905. Q3

31. Nicolás I; Martínez-Zamora MÁ; Gracia M; Carrion A; Feixas G; Bernal L; Quintas L; Rius M; Castelo-Branco C; Carmona F. **Management of symptomatic uterine fibroids after ulipristal acetate suspension and identification of high risk patients for surgery at 6-months of follow-up.** *Gynecological Endocrinology*. 37(9):831-835. Q3

32. Alcalde AM, Martínez-Zamora MÁ, Gracia M, Ros C, Rius M, Carmona F. **Assessment of quality of sexual life in women with adenomyosis.** *Women & Health*. 61(6):520-526. Q3

33. Rius M, Fusté P, Ros C, Martínez-Zamora Á, deGuirior C, Gracia M, Mension E, Carmona F. **HE4 might be a more useful tumor biomarker to detect malignancy in patients with ovarian endometrioma when malignancy is suspected.** *Journal of International Medical Research*. 49(9):300605211047701. Q4

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Review

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5. Casals G, Carrera M, Domínguez JA, Abrão MS, Carmona F. **Impact of Surgery of Deep Infiltrative Endometriosis Before In Vitro Fertilization: a Systematic Review and Meta-analysis.** *Journal of Minimally Invasive Gynecology*. 28(7):1303-1312.e5. Q1

6. Carreras, N; de Guirior, C; Munmany, M; Rius, M; Nonell, R; Carmona, F; Castelo-Branco, C. **Diagnosis and Surgical Treatment of Uterine Isthmus Atresia: A Case Report and Review of the Literature.** *Journal of Minimally Invasive Gynecology*. 28(1):137-141. Q1

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8. Bouza, E; Jimenez, MM; Alemany, L; Arribas, J; Banares, R; Barragan, MB; Bouza, JME; Felip, E; Fernandez-Capetillo, O; Gracia, D; Lopez-Velez, R; Mollar, JB; Munoz, P; Paz-Ares, L; Torne, A; Tovar, J; Valencia, E; Palomo, E. **Overview of virus and cancer relationships. Position paper.** *Revista Española de Quimioterapia*. 34(6):525-555. Q4

Letters

1. Díaz-Feijoo B, Rius M, Gracia M, Agusti N, Carmona F. **Pelvic anatomy for gynecologic oncologists: autonomic bladder plexus.** *International Journal of Gynecological Cancer.* 31(6):936-937. Q2

2. Castelo-Branco C, Mension E. **Are we assessing genitourinary syndrome of menopause properly?** *Climacteric.* 24(6):529-530. Q2

Editorial

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Case Reports

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2. Carmona F, Rius M, Díaz-Feijoo B, Musquera M, Tort J, Alcaraz A. **Uterine transplantation. First viable case in Southern Europe.** *Medicina Clinica.* 156(6):297-300. Q3

Consortium Publications

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2. COVIDSurg Collaborative. **Effect of COVID-19 pandemic lockdowns on planned cancer surgery for 15 tumour types in 61 countries: an international, prospective, cohort study.** *Lancet Oncology.* 22(11):1507-1517. D1

3. COVIDSurg Collaborative and GlobalSurg Collaborative. **SARS-CoV-2 vaccination modelling for safe surgery to save lives: data from an international prospective cohort study.** *British Journal of Surgery.* 108(9):1056-1063. D1

4. COVIDSurg Collaborative. **Preoperative nasopharyngeal swab testing and postoperative pulmonary complications in patients undergoing elective surgery during the SARS-CoV-2 pandemic.** *British Journal of Surgery.* 108(1):88-96. D1

5. STARSurg Collaborative and COVIDSurg Collaborative. **Death following pulmonary complications of surgery before and during the SARS-CoV-2 pandemic.** *British Journal of Surgery.* 108(12):1448-1464. D1

6. COVIDSurg Collaborative and GlobalSurg Collaborative. **Timing of surgery following SARS-CoV-2 infection: an international prospective cohort study.** *Anaesthesia.* 76(6):748-758. Q1

7. COVIDSurg Collaborative and GlobalSurg Collaborative. **Effects of pre-operative isolation on postoperative pulmonary complications after elective surgery: an international prospective cohort study.** *Anaesthesia.* 76(11):1454-1464. Q1

GRANTS FOR RESEARCH IN PROGRESS

del Pino M, Torné A. **Valor de la detección del ARNm de los biomarcadores CDKN2A, MKi67, TOP2A en la prevención secundaria del cáncer de cuello de útero.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00772
Duration: 01/01/2018-30/06/2022

Manau D. **Evaluacion del efecto de la expansion del gen FMR1 sobre la reserva ovarica en mujeres jovenes portadoras de premutacion.**
Sponsored by: Fundación Merck Salud. FSalud_19Serono
Duration: 01/07/2019-30/06/2022

Martínez-Zamora MA, Carmona F. **Evaluación de la eficacia de dos regímenes de tratamiento hormonal en la endometriosis e investigación de nuevos marcadores de la hemostasia.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00651
Duration: 01/01/2021-31/12/2023

DOCTORAL THESES

Castelo-Branco C. **Psychological characteristics, sexual function and quality of life in infertile women with polycystic ovary syndrome.**
PhD student: Iuliia Naumova

del Pino M, Paredes P. **Evaluación del ganglio centinela obtenido mediante la técnica de inyección miometrial de radiotrazador guiada por ecografía transvaginal en pacientes con cáncer de endometrio de riesgo intermedio y alto.**
PhD student: Martina Angeles Fité

Diaz-Feijoo B. **Utilidad de la ecografía ginecológica en dos y tres dimensiones en la estadificación prequirúrgica del cáncer de endometrio.**
PhD student: Montserrat Cubo Abert

Espuña M, Ros C. **Actividad y función sexual de las mujeres con prolapso de órganos pélvicos. Impacto del tratamiento quirúrgico.**
PhD student: Sònia Anglès Acedo

Fabregues-Gasol FJ. **Efectos de la androgenización exógena durante la estimulación ovárica en pacientes con baja reserva folicular.**
PhD student: Roser Solernou Soler

Martínez-Zamora MA, Carmona F. **Impacto de la adenomiosis y endometriosis profunda en la calidad de vida, calidad de vida sexual y salud mental.**
PhD student: Ana Maria Alcalde Dominguez

3.20 Hepatocellular signaling and cancer

LOCATION
IIBB-CSIC lab#631

KEYWORDS
1. **Liver microenvironment**
2. **Chemotherapy**
3. **Mitochondria**
4. **Antioxidants**
5. **Cell death**
6. **Autophagy**
7. **Inflammasome**

RELATED DISEASES
1. **Hepatocellular carcinoma**
2. **NAFLD**
3. **Liver fibrosis**
4. **Liver metastasis**
5. **COVID-19**

GROUP INVOLVED IN
AGAUR_SGR17: 00177
CIBEREHD

Original publications

TOTAL	5
Mean IF	8,36
Q1	100%
D1	60%
MA	20%
OA	100%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The introduction of molecular therapy is a great step forward in medicine that is not properly applied in the treatment of liver cancers, due to its complexity. The poor efficiency of chemotherapy and development of resistance to treatment often lead to therapeutic failure.

Changes in the hepatic microenvironment during chronic liver disease promote the growth of primary liver tumours and the implantation of metastasis from other organs. For this reason, it is necessary to test pharmacological therapies that combat resistance to treatment and attack metastasis in order to subsequently introduce them into clinical practice. Moreover, we are also interested in understanding the immune component, particularly the role of NKT cells, responsible for the gender variations that prevail in common liver diseases such as NAFLD, autoimmune hepatitis, and liver cancer.

APPROACH

Chemotherapy promotes the development of cell alterations that give rise to resistance to treatment. Once identified, these can be treated with specific drugs.

In cell models and animals, the group identifies specific targets that condition the efficacy of treatment and make it possible to select the disease that best responds to chemotherapy. There are therapies that combat the tumour microenvironment or immunotherapies that increase the efficacy of current chemotherapy on the liver tumour.

Experimental animal models of chronic liver disease in male and female NKT-deficient mouse are used to characterize the immune response in these settings.

IMPACT

The group's objectives are to identify markers that can anticipate the efficacy of the different treatments available for patients with liver tumours, and develop new therapies targeted at tumour microenvironment proteins and immunotherapy as an alternative to, or in combination with, current chemotherapy.

In addition, by uncovering potential gender differences in prevalent chronic liver disease we aim to offer novel therapeutic approaches and improve the current ones.

RESEARCH LINES

- Identification of specific signatures in blood to categorize HCC patients for each specific therapy.

- Microenvironment-directed therapies to block the development of HCC and liver metastasis.

- Molecular therapies to improve HCC management, and help to overcome sorafenib resistance.

- Role of NKT cells in chronic liver diseases, by using experimental models in CD1d-KO mice with a gender approach.

PUBLICATIONS

Originals

1. Roca-Agujetas V; Barbero-Camps E; de Dios C; Podlesniy P; Abadin X; Morales A; Marí M; Trullàs R; Colell A. **Cholesterol alters mitophagy by impairing optineurin recruitment and lysosomal clearance in Alzheimer's disease.** *Molecular Neurodegeneration.* 16(1):15. D1

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3. Cucarull B, Tutusaus A, Hernáez-Alsina T, García de Frutos P, Reig M, Colell A, Marí M, Morales A. **Antioxidants Threaten Multikinase Inhibitor Efficacy against Liver Cancer by Blocking Mitochondrial Reactive Oxygen Species.** *Antioxidants.* 10(9):1336. D1

4. Morales A, Rojo Rello S, Cristóbal H, Fiz-López A, Arribas E, Marí M, Tutusaus A, de la Cal-Sabater P, Nicolaes GAF, Ortiz-Pérez JT, Bernardo D, García de Frutos P. **Growth Arrest-Specific Factor 6 (GAS6) Is Increased in COVID-19 Patients and Predicts Clinical Outcome.** *Biomedicines.* 9(4):335. Q1

5. Huckriede J, Anderberg SB, Morales A, de Vries F, Hultström M, Bergqvist A, Ortiz-Pérez JT, Sels JW, Wichapong K, Lipcsey M, van de Poll M, Larsson A, Luther T, Reutelingsperger C, de Frutos PG, Frithiof R, Nicolaes GAF. **Evolution of NETosis markers and DAMPs have prognostic value in critically ill COVID-19 patients.** *Scientific Reports.* 11(1):15701. Q1

Editorial

1. Marí M; Colell A. **Mitochondrial oxidative and nitrosative stress as a therapeutic target in diseases.** *Antioxidants.* 10(2):314. D1

GRANTS FOR RESEARCH IN PROGRESS

Marí M. **Gender-specific role of NKT cells and Senescence marker protein-30 in chronic liver diseases.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/01410
Duration: 01/01/2020-31/12/2022

Morales A. **The interaction between the ACE2 and AXL systems to predict the severity and the outcomes of the COVID-19 disease.**
Sponsored by: Fundació la Marató de TV3. COVID19
Duration: 23/09/2021- 23/09/2024

Morales A. **Targeting the Microenvironment in Fibrosis and Cancer: Molecular Therapies.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_RTI2018-095672-B-I00
Duration: 01/01/2019-31/12/2021

DOCTORAL THESES

Morales A, Mari M. **Regulation of the microenvironment and chemoresistance in liver therapy.**
PhD student: Blanca Cucarull Martínez

3.21 Translational research group in new therapeutic and diagnostic strategies in liver diseases

LOCATION
CEK building, floor 3

KEYWORDS
1. **Liver fibrosis**
2. **Cirrhosis**
3. **Nanomedicine**
4. **Liver regeneration**
5. **Sinusoidal endothelial cells**
6. **Inflammation**
7. **Macrophages**
8. **Laboratory medicine**

RELATED DISEASES
1. **Cirrhosis**
2. **MAFLD**
3. **Metabolic syndrome**
4. **Hepatocellular carcinoma**
5. **Heart failure**

GROUP INVOLVED IN
AGAUR_SGR17: 00858
CIBEREHD: CB06/04/0020

Original publications

TOTAL	8
Mean IF	7,26
Q1	63%
D1	25%
MA	75%
OA	25%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Liver diseases are a serious health problem globaly, especially in Europe. These are very prevalent disorders and they come with high social and economic costs.The main causes are chronic infections for hepatitis B or C, alcoholism and MAFLD, all of which are rising worldwide.

Chronic liver damage involves the development of liver fibrosis and portal hypertension, complications that can lead to more severe disorders such as cirrhosis, hepatocellular carcinoma, hyponatremia and ascites.

In spite of the advances in the understanding of the cellular and molecular mechanisms that govern liver disease, there are still no effective therapies that slow down its progression.

APPROACH

The group is addressing this problem from a multifactorial perspective, especially based on the use of gene therapy or new materials such as nanoparticles.

Its main objective is to design complementary therapies with biocompatible nanomaterials that can be applied as a treatment for liver disease in humans.

IMPACT

The basic treatment for a person with acute or chronic liver failure is a liver transplant, a solution som e limitations due to the shortage of organ donors for this type of patients.

Therefore, it is necessary to identify new therapeutic tools capable of stopping or reversing the progression of the phenomena that promote fibrosis in liver disease.

The group's research is highly translational, because it is opening up new therapeutic pathways for liver disease.

RESEARCH LINES

- Establish new therapies for the normalisation of the intrahepatic vasculature in cirrhotic livers.

- Evaluation of new strategies to modify the activity of specific Akt targets that have a therapeutic potential to stimulate functional liver regeneration in cirrhotic livers.

- Evaluation of the therapeutic potential of cerium oxide nanoparticles in experimental models of hepatocellular carcinoma and liver steatosis.

- Evaluation of the utility of collagen matrix implants containing endothelial cells as a cell therapy to stimulate the regenerative layer of cirrhotic livers.

- Identification of non-invasive biomarkers of liver injury and new signalling pathways of liver fibroproliferative processes.

- Modulation of macrophages to liver damage, regeneration and cancer through functionalised nanoparticles and gene therapy.

PUBLICATIONS

Originals

1. Ribera J, Vilches C, Sanz V, de Miguel I, Portolés I, Córdoba-Jover B, Prat E, Nunes V, Jiménez W, Quidant R, Morales-Ruiz M. **Treatment of Hepatic Fibrosis in Mice Based on Targeted Plasmonic Hyperthermia.** *ACS Nano.* 15(4):7547-7562. D1

2. Ribera J, Portolés I, Córdoba-Jover B, Rodríguez-Vita J, Casals G, González-de la Presa B, Graupera M, Solsona-Vilarrasa E, Garcia-Ruiz C, Fernández-Checa JC, Soria G, Tudela R, Esteve-Codina A, Espadas G, Sabidó E, Jiménez W, Sessa WC, Morales-Ruiz M. **The loss of DHX15 impairs endothelial energy metabolism, lymphatic drainage and tumor metastasis in mice.** *Communications Biology.* 4(1):1192. D1

3. Parra-Robert M; Zeng M; Shu Y; Fernandez-Varo G; Perramon M; Desai D; Chen J; Guo D; Zhang X; Morales-Ruiz M; Rosenholm JM; Jimenez W; Puntes V; Casals E; Casals G. **Mesoporous silica coated CeO2 nanozymes with combined lipid-lowering and antioxidant activity induce long-term improvement of the metabolic profile in obese Zucker rats.** *Nanoscale.* 13(18):8452-8466. Q1

4. Zeng M, Shu Y, Parra-Robert M, Desai D, Zhou H, Li Q, Rong Z, Karaman D?, Yang H, Peng J, Fernandez-Varo G, Jiménez W, Casals G, Puntes V, Rosenholm JM, Casals E. **Scalable synthesis of multicomponent multifunctional inorganic core@mesoporous silica shell nanocomposites.** *Materials Science & Engineering C-Materials for Biological Applications.* 128:112272. Q1

5. Wijngaard R, Perramón M, Parra-Robert M, Hidalgo S, Butrico G, Morales-Ruiz M, Zeng M, Casals E, Jiménez W, Fernández-Varo G, Shulman GI, Cline GW, Casals G. **Validation of a Gas Chromatography-Mass Spectrometry Method for the Measurement of the Redox State Metabolic Ratios Lactate/Pyruvate and β-Hydroxybutyrate/Acetoacetate in Biological Samples.** *International Journal of Molecular Sciences.* 22(9):4752. Q1

6. Solé C, Ma AT, Solà E, Carol M, Fabrellas N, Juanola A, Napoleone L, Gratacós-Ginès J, Bassegoda O, Cervera M, Pérez M, Rubio AB, Avitabile E, Morales-Ruiz M, Graupera I, Pose E, Kamath PS, Ginès P. **Sequential Changes In Urinary Biomarker Levels In Patients With Cirrhosis And Severe Hepatorenal Syndrome.** *Liver International.* 41(11):2729-2732. Q2

7. Vega-Beyhart A; Iruarrizaga M; Pané A; García-Eguren G; Giró O; Boswell L; Aranda G; Flores V; Casals G; Alonso C; Mora M; Halperin I; Carmona F; Enseñat J; Vidal O; Hu T; Rojo G; Gomis R; Hanzu FA. **Endogenous cortisol excess confers a unique lipid signature and metabolic network.** *Journal of Molecular Medicine-JMM.* 99(8):1085-1099. Q2

8. Wijngaard R; Parra-Robert M; Mares L; Escalante A; Salgado E; Gonzalez-de-la-Presa B; To-Figueras J; Brunet M. **Tetracaine from urethral ointment causes false positive amphetamine results by immunoassay.** *Clinical Toxicology.* 59(6):500-505. Q2

Review

1. Casals G, Perramón M, Casals E, Portolés I, Fernández-Varo G, Morales-Ruiz M, Puntes V, Jiménez W. **Cerium Oxide Nanoparticles: A New Therapeutic Tool in Liver Diseases.** *Antioxidants.* 10(5):660. D1

2. Medrano-Bosch M; Moreno-Lanceta A; Melgar-Lesmes P. **Nanoparticles to target and treat macrophages: The ockham's concept?** *Pharmaceutics.* 13(9):1340. Q1

3. Araujo-Castro M; Valderrábano P; Escobar-Morreale HF; Hanzu FA; Casals G. **Urine steroid profile as a new promising tool for the evaluation of adrenal tumors. Literature review.** *Endocrine.* 72(1):40-48. Q3

Case Reports

1. Boswell L, Casals G, Blanco J, Jiménez A, Aya F, de Hollanda A, Halperin I, Arance AM, Mora M, Hanzu FA. **Onset of fulminant type 1 diabetes mellitus following hypophysitis after discontinuation of combined immunotherapy.** *Journal of Diabetes Investigation.* 12(12):2263-2266. Q2

GRANTS FOR RESEARCH IN PROGRESS

Casals G, Fernández-Varo G. **Determinación del uso terapéutico en enfermedades hepáticas de conjugados antioxidantes avanzados basados en nanopartículas de óxido de cerio.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00774
Duration: 01/01/2020-31/12/2022

Casals G. **Incorporación de la espectrometría de masas en las pruebas de endocrinología y nutrición.**
Sponsored by: Fundación SEEN. SEEN_INVESTCLIN21_01
Duration: 14/10/2021-13/10/2022

Jiménez W. **Desenvolupament i aplicació de nanopartícules de ceri en el tractament del carcinoma hepatocel.lular.**
Sponsored by: Generalitat de Catalunya. 2018_PROD_00187
Duration: 01/05/2019-31/01/2021

Jiménez W, Melgar P. **Utilidad terapéutica y de nuevos tratamientos para las enfermedades hepáticas: RNA de interferencia para PTTG1, nanopartículas de carbono grafito y donadores de óxido nítrico.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_R-TI2018-094734-B-C21
Duration: 01/01/2019-30/09/2022

Jiménez W. **Utilidad terapéutica y de nuevos tratamientos para las enfermedades hepáticas: RNA de interferencia para PTTG1, nanopartículas de carbono grafito y donadores de óxido nítrico.**
Sponsored by: Agencia Estatal de Investigación. AEI_FPI19
Duration: 01/10/2020-30/09/2024

Morales-Ruíz M. **Nuevos mecanismos moleculares y nuevas estrategias terapéuticas aplicables a la conservación de la función hepática y a la mejora de la enfermedad hepática crónica.**
Sponsored by: Agencia Estatal de Investigación. AEI_PID2019-105502RB-I00
Duration: 01/01/2020-31/12/2022

Morales-Ruíz M. **Estimulación de la regeneración funcional de hígados cirróticos mediante la normalización vascular intrahepática y la modulación de dianas de Akt.**
Sponsored by: Ministerio de Economía y Competitividad. MINECO_BES-2017-080823
Duration: 01/07/2018-30/06/2022

DOCTORAL THESES

Casals G. **Evaluación de nanomateriales basados en óxido de cerio como nueva estrategia terapéutica frente las alteraciones metabólicas asociadas a la obesidad.**
PhD student: Marina Parra Robert

3.22 Pathogenesis and prevention of diabetes

LOCATION
CEK building, floor 5

KEYWORDS
1. **Islet amyloid polypeptide (IAPP)/amylin**
2. **Beta-cell dysfunction**
3. **MicroRNAs**
4. **Exosomes/Extracellular vesicles**
5. **Exercise and nutrition**
6. **Organ-on-chip**

RELATED DISEASES
1. **Diabetes**
2. **Obesity**

GROUP INVOLVED IN
AGAUR_SGR17: 01390
CIBERDEM

Original publications

TOTAL	6
Mean IF	7,89
Q1	83%
D1	33%
MA	67%
OA	83%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Diabetes is a disease characterised by chronic hyperglycaemia (high levels of glucose in the blood), due to a defect in the secretion and/or the action of insulin.

Today it is a serious global health problem due to its prevalence (more than 425 million people are affected), its economic cost and the number of deaths it causes due to the complications that arise. Similarly, there is an increase in the number of young people suffering from it.

Therefore, it is necessary to know the mechanisms that trigger it and to establish new strategies for prevention and treatment.

APPROACH

Combining clinical and basic research, the group conducts studies in animal models and in humans to better understand diabetes and to create innovative methods of treatment and prevention.

Its lines of research focus on preventing and controlling diabetes with lifestyle interventions; the search for markers to predict the development of diabetes and the complications that arise from it; the study of endothelial dysfunction related to diabetes and vascular complications and the molecular mechanisms of deterioration of b-pancreatic cells during the disease's progression; as well as the search for therapeutic targets.

IMPACT

The group has identified molecules, called microRNAs, that appear altered in the blood of prediabetic patients. In this context, the researchers have reported that a type of vesicles known as exosomes transporting microRNAs mediate the cross-talk between organs in prediabetic settings.

The group has also identified microRNAs expressed under stress conditions that induce pancreatic beta-cell dysfunction. Current research on microRNAs and exosomes is being performed in order to advance in treatments that prevent and revert diabetes.

Other studies of the group have demonstrated that anti-inflammatory molecules and inhibitors of endoplasmic-reticulum stress protect pancreatic beta-cells in mouse models of type 2 diabetes, opening the door to their use for the treatment of diabetes.

The group has also tracked the eating and physical exercise patterns of patients with type 1 diabetes to help them improve control over the disease and, therefore, their quality of life.

RESEARCH LINES

- Circulating microRNAs as potential biomarkers and therapeutic targets in type 2 diabetes.

- Exosomes as mediators of organ cross-talk.

- Impact of lifestyle on diabetes.

- Bace2, a new therapeutic target for the treatment of type 2 diabetes and obesity.

- ER stress inhibitors and anti-inflammatory molecules as therapeutic agents against type 2 diabetes.

- Development of bioengineered organs to study real time metabolism.

PUBLICATIONS

Originals

1. Eckstein ML, Farinha JB, McCarthy O, West DJ, Yardley JE, Bally L, Zueger T, Stettler C, Boff W, Reischak-Oliveira A, Riddell MC, Zaharieva DP, Pieber TR, Müller A, Birnbaumer P, Aziz F, Brugnara L, Haahr H, Zijlstra E, Heise T, Sourij H, Roden M, Hofmann P, Bracken RM, Pesta D, Moser O. **Differences in Physiological Responses to Cardiopulmonary Exercise Testing in Adults With and Without Type 1 Diabetes: A Pooled Analysis.** *Diabetes Care.* 44(1):240-247. D1

2. Prattichizzo F, De Nigris V, Sabbatinelli J, Giuliani A, Castaño C, Párrizas M, Crespo I, Grimaldi A, Baranzini N, Spiga R, Mancuso E, Rippo MR, Procopio AD, Novials A, Bonfigli AR, Garavelli S, La Sala L, Matarese G, de Candia P, Olivieri F, Ceriello A. **CD31 Positive-Extracellular Vesicles from Patients with Type 2 Diabetes Shuttle a miRNA Signature Associated with Cardiovascular Complications.** *Diabetes.* 70(1):240-254. D1

3. Díaz-Catalán D, Alcarraz-Vizán G, Castaño C, de Pablo S, Rodríguez-Comas J, Fernández-Pérez A, Vallejo M, Ramírez S, Claret M, Parrizas M, Novials A, Servitja JM. **BACE2 suppression in mice aggravates the adverse metabolic consequences of an obesogenic diet.** *Molecular Metabolism.* 53:101251. Q1

4. Ortega MA, Rodríguez-Comas J, Yavas O, Velasco-Mallorquí F, Balaguer-Trias J, Parra V, Novials A, Servitja JM, Quidant R, Ramón-Azcón J. **In Situ LSPR Sensing of Secreted Insulin in Organ-on-Chip.** *Biosensors.* 11(5):138. Q1

5. De Pablo S, Rodríguez-Comas J, Díaz-Catalán D, Alcarraz-Vizán G, Castaño C, Moreno-Vedia J, Montane J, Parrizas M, Servitja JM, Novials A. **4-Phenylbutyrate (PBA) treatment reduces hyperglycemia and islet amyloid in a mouse model of type 2 diabetes and obesity.** *Scientific Reports.* 11(1):11878. Q1

6. Gómez-Peralta F; Menéndez E; Conde S; Conget I; Novials A; investigators of the studies SED and SED1. **Clinical characteristics and management of type 1 diabetes in Spain.** *Endocrinología Diabetes y Nutrición.* 68(9):642-653. Q4

GRANTS FOR RESEARCH IN PROGRESS

Castaño C. **Administración de exo-miRNAs como tratamiento para la DM2 en ratones.**
Sponsored by: Sociedad Española de Diabetes. SED_PROY_20_001
Duration: 10/09/2020-31/03/2022

Servitja JM, Novials A. **Comunicación entre órganos y diabetes tipo 2: efectos de exosomas circulantes sobre los islotes pancreáticos.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00658
Duration: 01/01/2021-31/12/2023

Servitja JM. **Benchtop NMR for lab-on-chip.**
Sponsored by: European Commission. CE_H2020-FETOPN19
Duration: 01/01/2020-31/12/2022

Párrizas M. **Experimental modulation of exosomal miRNA targets for the treatment of diabetes.**
Sponsored by: European Foundation for the Study of Diabetes. INT_EFSD
Duration: 01/07/2020-30/11/2021

DOCTORAL THESES

Novials A, Parrizas M. **Exosomal miRNAs in the development and treatment of glucose intolerance and type 2 diabetes.**
PhD student: Carlos Castaño Perez

Novials A, Servitja JM. **Bace2 as a new therapeutic target in the treatment of type 2 diabetes and obesity.**
PhD student: Daniela Josefa Diaz Catalán

3.23 Cholestasis

LOCATION
HCB building, floor 4B

KEYWORDS
1. **Primary biliary cholangitis**
2. **Primary sclerosing cholangitis**
3. **Autoimmune hepatitis**
4. **Cholestasis**
5. **Metabolic bone disease**
6. **Pruritus**

RELATED DISEASES
1. **Primary biliary cholangitis**
2. **Primary sclerosing cholangitis**
3. **Autoimmune hepatitis**

GROUP INVOLVED IN
CIBERehd
ERN-Rare Liver
Global-PBC
IAIHSG
IPSCSG

Original publications

TOTAL	8
Mean IF	**10,87**
Q1	**88%**
D1	**88%**
MA	**25%**
OA	**63%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The autoimmune cholestasis diseases, which include primary biliary cholangitis, primary sclerosing cholangitis and autoimmune hepatitis, are rare, but their prevalence is growing. Their development, presentation, course, prognosis and treatment are still little known.

The group's goal is to improve knowledge of all these aspects, and to address new therapeutic strategies. The group also emphasises better knowledge regarding the origin, development and treatment of manifestations associated with autoimmune cholestasis diseases, such as pruritus and osteoporosis.

APPROACH

The group analyses the clinical characteristics and the prognostic indicators of these diseases to delimit the subgroup of patients that requires innovative therapies. To find out about the origin and development of pruritus, it conducts metabolomic studies in patients who receive different known treatments or those under evaluation, such as fibrates.

Knowledge of the metabolic pathology of the bone is partially addressed, through experimental procedures with specific bone cell lines.

From the clinical point of view, new first- and second-line treatment options are being evaluated to prevent the loss of bone mass and relieve pruritus.

IMPACT

The group has defined criteria for therapeutic response to ursodeoxycholic acid in primary biliary cholangitis and has described which patients need a second-line treatment (second option).

The group has demonstrated the efficacy of fibrates and their role in pruritus associated with cholestasis. For primary sclerosing cholangitis it has defined several phenotypes and prognostic factors, and for autoimmune hepatitis the group is analysing which patients can stop taking immunomodulators (agents that act on the mechanisms of the immune response).

As regards osteoporosis related to cholestasis, the group has shown that, basically, it depends on impaired bone formation.

RESEARCH LINES

- Course and prognosis in primary sclerosing cholangitis.

- Development of new prognostic scores in primary biliary cholangitis.

- Epidemiology and natural history of chronic cholestatic disorders in adults.

- Evaluation of the factors of treatment response, and new treatment regimens in patients with suboptimal response to ursodeoxycholic acid.

- Presentation, course and prognosis of autoimmune hepatitis.

- Pruritus in chronic cholestasis: pathogenesis and treatment.

PUBLICATIONS

Originals

1. Hirschfield GM, Beuers U, Kupcinskas L, Ott P, Bergquist A, Färkkilä M, Manns MP, Parés A, Spengler U, Stiess M, Greinwald R, Pröls M, Wendum D, Drebber U, Poupon R. **A placebo-controlled randomised trial of budesonide for primary biliary cholangitis following an insufficient response to UDCA.** *Journal of Hepatology.* 74(2):321-329. D1

2. Schattenberg JM, Pares A, Kowdley KV, Heneghan MA, Caldwell S, Pratt D, Bonder A, Hirschfield GM, Levy C, Vierling J, Jones D, Tailleux A, Staels B, Megnien S, Hanf R, Magrez D, Birman P, Luketic V. **A randomized placebo-controlled trial of elafibranor in patients with primary biliary cholangitis and incomplete response to UDCA.** *Journal of Hepatology.* 74(6):1344-1354. D1

3. de Vries E, Bolier R, Goet J, Parés A, Verbeek J, de Vree M, Drenth J, van Erpecum K, van Nieuwkerk K, van der Heide F, Mostafavi N, Helder J, Ponsioen C, Oude Elferink R, van Buuren H, Beuers U, Netherlands Association for the Study of the Liver-Cholestasis Working Group. **Fibrates for itch (FITCH) in fibrosing cholangiopathies: a double blind, randomized, placebo-controlled trial.** *Gastroenterology.* 160(3):734-743.e6. D1

4. Gerussi A, Bernasconi DP, O'Donnell SE, Lammers WJ, Van Buuren H, Hirschfield G, Janssen H, Corpechot C, Reig A, Pares A, Battezzati PM, Zuin MG, Cazzagon N, Floreani A, Nevens F, Gatselis N, Dalekos G, Mayo MJ, Thorburn D, Bruns T, Mason AL, Verhelst X, Kowdley K, van der Meer A, Niro GA, Beretta-Piccoli BT, Marzioni M, Belli LS, Marra F, Valsecchi MG, Lindor KD, Invernizzi P, Hansen BE, Carbone M, Italian PBC Study Group and the GLOBAL PBC Study Group. **Measurement of Gamma Glutamyl Transferase to Determine Risk of Liver Transplantation or Death in Patients With Primary Biliary Cholangitis.** *Clinical Gastroenterology and Hepatology.* 19(8):1688-1697. D1

5. Goet JC, Murillo Perez CF, Harms MH, Floreani A, Cazzagon N, Bruns T, Prechter F, Dalekos GN, Verhelst X, Gatselis NK, Lindor KD, Lammers WJ, Gulamhusein A, Reig A, Carbone M, Nevens F, Hirschfield GM, van der Meer AJ, van Buuren HR, Hansen BE, Parés A, GLOBAL PBC Study Group. **A Comparison of Prognostic Scores (Mayo, UK-PBC, and GLOBE) in Primary Biliary Cholangitis.** *American Journal of Gastroenterology.* 116(7):1514-1522. D1

6. Reig A, Álvarez-Navascués C, Vergara M, Gómez-Domínguez E, Gallego-Moya A, Pérez-Medrano IM, Fábrega E, Hernández-Guerra M, Berenguer M, Estevez P, Arencibia A, Morillas RM, Horta D, Albillos A, Casado M, De la Cruz G, Fernandez-Bonilla E, Molina E, Hijona L, Diago M, Fernández-Rodriguez CM, González-Santiago JM, Sala M, Gómez-Camarero J, Romero-Gomez M, Suárez F, Vargas V, Ferre-Aracil C, Andrade RJ, Chahri N, Parés A. **Obeticholic Acid and Fibrates in Primary Biliary Cholangitis: Comparative Effects in a Multicentric Observational Study.** *American Journal of Gastroenterology.* 116(11):2250-2257. D1

7. Soret PA; Lam L; Carrat F; Smets L; Berg T; Carbone M; Invernizzi P; Leroy V; Trivedi P; Cazzagon N; Weiler-Normann C; Alric L; Rosa-Hezode I; Heurgue A; Cervoni JP; Dumortier J; Potier P; Roux O; Silvain C; Bureau C; Anty R; Larrey D; Levy C; Pares A; Schramm C; Nevens F; Chazouilleres O; Corpechot C. **Combination of fibrates with obeticholic acid is able to normalise biochemical liver tests in patients with difficult-to-treat primary biliary cholangitis.** *Alimentary Pharmacology & Therapeutics.* 53(10):1138-1146. D1

8. Murillo Perez CF, Gulamhusein A, Carbone M, Trivedi PJ, van der Meer AJ, Corpechot C, Battezzati PM, Lammers WJ, Cazzagon N, Floreani A, Parés A, Nevens F, Lleo A, Mayo MJ, Kowdley KV, Ponsioen CY, Dalekos GN, Gatselis NK, Thorburn D, Mason AL, Janssen H, Verhelst X, Bruns T, Lindor KD, Chazouillères O, Invernizzi P, Hansen BE, Hirschfield GM, GLOBAL PBC Study Group. **Simplified care-pathway selection for nonspecialist practice: the GLOBAL Primary Biliary Cholangitis Study Group Age, Bilirubin, Alkaline phosphatase risk assessment tool.** *European Journal of Gastroenterology & Hepatology.* 33(1):e266-e273. Q4

Letters

1. Reig A, Norman GL, Parés A. **Surrogate Markers for Antimitochondrial Antibody Negative Primary Biliary Cholangitis.** *American Journal of Gastroenterology.* 116(1):217-217. D1

GRANTS FOR RESEARCH IN PROGRESS

Parés A. **Efecto del bezafibrato sobre el prurito de la colestasis. Mecanismos patogénicos.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI15/00797
Duration: 01/01/2016-30/11/2021

DOCTORAL THESES

Parés A. **Avaluació dels nous anticossos antihexocinasa 1 i anti-proteïna kelch-like 12 pel diagnòstic i pronòstic de la colangitis biliar primària.**
PhD student: Anna Reig Garcia

3.24 Protective strategies against hepatic ischemia reperfusion injury

LOCATION
CEK building, floor 3

KEYWORDS
1. **Ischemia-reperfusion**
2. **Liver transplantation**
3. **Organ, tissue and cell preservation**
4. **Hepatic resections**
5. **Steatosis**
6. **NAFLD**
7. **NASH**
8. **Preservation solutions**
9. **BD donors**
10. **LRLT**
11. **DCD donors**

RELATED DISEASES
1. **Liver transplantation from standard and extended donors**
2. **Organ , tissue and cell preservation**
3. **Hepatic resections associated with tumours**
4. **Diseases related with diabetes and metabolic syndrome**
5. **Nafld/nash and liver surgery**
6. **Preclinical experimental models in different liver diseases**
7. **Pharmacological modulation and different surgical strategies in different liver diseases**

GROUP INVOLVED IN
AGAUR_SGR17: 00551

Original publications

TOTAL	1
Mean IF	5,72
Q1	100%
D1	0%
MA	100%
OA	100%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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Marc Micó (IDIBAPS)
Carlos Rojano (IDIBAPS)

PROBLEM

Organs available for transplant are insufficient to meet demand and many patients die while waiting. The majority of organs for a transplant come from deceased donors but, given the shortage of donors, the criteria have been expanded and steatosis (fatty liver and donors from acardiac arrest) is also now accepted.

Both brain death, cardiac arrest and steatosis negatively affect graft quality, as well as post-transplant results. In addition, many organs are rejected precisely due to steatosis, which increases the problem of donor liver shortages.

Liver diseases, including the use of livers such as liver from diabetic, NAFLD/NASH and other liver diseases shows more vulnerability to heptic ischemia-reperfusion injury and to regenerative failure when such livers are submitted to liver surgery.

APPROACH

The group's research focuses on the investigations aimed at evaluating pharmacological, technological and surgical strategies in different liver diesases (livers with NAFLD/NASH, cirrhosis among other diseases) with or without liver sugery (transplantation and hepatic resections) to protect such livers against damage, the progession of liver disease, and regenerative failure.

The knowledge of the different liver pathologies in preclinical models that mimic as soon as possible the clinical conditions (with or without liver surgery) will provide new target of potential therapeutic action as well as the establishment of pharmacological, surgical and technological strategies useful in the clinical practice.

IMPACT

The group's goal is to transfer to clinical practice the most effective and least invasive therapies for people who need a liver, improve the post-operative outcomes in patients that are submitted to hepatic resections of tumours-which show poor regenerative response and exacerbated ischemia-reperfusion injury-, as well as to improve the life quality of patients with different liver pathologies (NAFLD/NASH, cirrhosis, liver diseases related with diabetes, among others) using preclinical models that mimic as soon as possible the clinical conditions.

The application of its results may solve a problem of social and clinical significance: improving the survival and quality of life of those patients with the mentioned pathologies, as well reduce the ischemia-reperfusion injury and improve liver regeneration in patients submitted to liver surgery of hepatic resections associated with tumour as well as liver transplantation, therefore, reducing waiting lists.

RESEARCH LINES

- A new medical device for transporting abdominal organs in clinical practice.

- Innovations for organ preservation during long times.

- New preservation solutions in liver transplantation.

- Pharmacological, technological and surgical strategies in liver transplantation and surgery

PUBLICATIONS

Originals

1. Micó-Carnero M; Casillas-Ramírez A; Caballeria-Casals A; Rojano-Alfonso C; Sánchez-González A; Peralta C. **Role of dietary nutritional treatment on hepatic and intestinal damage in transplantation with steatotic and non-steatotic liver grafts from brain dead donors.** *Nutrients*. 13(8):2554. Q1

Review

1. Alvarez-Mercado AI; Rojano-Alfonso C; Mico-Carnero M; Caballeria-Casals A; Peralta C; Casillas-Ramirez A. **New Insights Into the Role of Autophagy in Liver Surgery in the Setting of Metabolic Syndrome and Related Diseases.** *Frontiers in Cell and Developmental Biology*. 9:670273. Q1

2. Álvarez-Mercado AI; Caballeria-Casals A; Rojano-Alfonso C; Chávez-Reyes J; Micó-Carnero M; Sanchez-Gonzalez A; Casillas-Ramírez A; Gracia-Sancho J; Peralta C. **Insights into growth factors in liver carcinogenesis and regeneration: An ongoing debate on minimizing cancer recurrence after liver resection.** *Biomedicines*. 9(9):1158. Q1

3. Caballeria-Casals A, Micó-Carnero M, Rojano-Alfonso C, Maroto-Serrat C, Casillas-Ramírez A, Álvarez-Mercado AI, Gracia-Sancho J, Peralta C. **Role of FGF15 in Hepatic Surgery in the Presence of Tumorigenesis: Dr. Jekyll or Mr. Hyde?** *Cells*. 10(6):1421. Q2

GRANTS FOR RESEARCH IN PROGRESS

Peralta C. **Preservació del l'empelt hepatic (Hepatic graft perseveration).**
Sponsored by: Generalitat de Catalunya. AGAUR_SGR17_00551
Duration: 01/01/2017-30/09/2021

Peralta C. **La GH en el trasplante de hígados grasos con esteatohepatitis alcohólica procedentes de donantes con muerte cerebral.**
Sponsored by: Fundació Catalana de Trasplantament. FCT21_MICO
Duration: 01/01/2021-31/12/2021

Peralta C. **Protección en el transplante hepático procedente de donantes con criterios extendidos.**
Sponsored by: Generalitat de Catalunya. PERIS_SLT017/20/000211
Duration: 01/07/2021-31/12/2024

Peralta C. **Nuevas estrategias en el trasplante de injertos hepáticos esteatósicos y no esteatósicos procedentes de donantes con muerte cerebral.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_RTI2018-095114-B-I00
Duration: 01/01/2019-30/06/2022

3.25 Inherited metabolic diseases

LOCATION
HCB-Maternitat building

KEYWORDS
1. **Mitochondrial diseases**
2. **Lysosomal diseases**
3. **Inherited metabolic diseases**
4. **RNAseq**
5. **Functional Genomics**

RELATED DISEASES
1. **Diseases of the mitochondrial energy metabolism**
2. **Lysosomal diseases**
3. **Congenital disorders of glycosilation (CDG)**
4. **Glutaric aciduria type I**

GROUP INVOLVED IN
AGAUR_SGR17: 01428
CIBERER

Original publications

TOTAL	7
Mean IF	5,47
Q1	71%
D1	14%
MA	14%
OA	43%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

According to the latest data, fifty per cent of people who suffer from inherited genetic diseases are not diagnosed.

The main reason lies in the clinical diversity of their symptoms: not all genetic alterations can be easily detected and although it is now possible to perform genomic studies on each person, the pathological significance of many of the genetic variants identified is not known and this makes it difficult to obtain a conclusive diagnosis.

Inherited diseases generally require personalised therapies that cannot be offered without a conclusive diagnosis, and the absence of a clear diagnosis makes it difficult to access treatment and adequate genetic counselling.

APPROACH

The group's strategy to improve the diagnosis and treatment of inherited genetic diseases consists of the combined use of modern, innovative techniques (genomics, transcriptomics, proteomics and metabolomics) with traditional biochemical studies and cell biology.

It has implemented methods that make it possible to determine whether or not the genetic variants identified cause a particular disorder, so that a conclusive diagnosis can be established. These studies are conducted using samples obtained directly from patients and cell generated identified in the laboratory.

IMPACT

The group has identified new genes associated with different diseases. Its objective is to continue to identify new genes to improve the diagnosis of inherited metabolic diseases.

It will also continue its research and development of drugs that improve the quality of life of patients and their families. In some cases, new therapeutic options may become available, and in others, adequate genetic counselling.

RESEARCH LINES

- Identification of genes responsible for Mendelian disorders.

- Physiopathology of the identified inherited genetic diseases.

- Therapeutic approaches in inherited metabolic diseases.

PUBLICATIONS

Originals

1. Wilson MP, Garanto A, Pinto E Vairo F, Ng BG, Ranatunga WK, Ventouratou M, Baerenfaenger M, Huijben K, Thiel C, Ashikov A, Keldermans L, Souche E, Vuillaumier-Barrot S, Dupré T, Michelakakis H, Fiumara A, Pitt J, White SM, Lim SC, Gallacher L, Peters

H, Rymen D, Witters P, Ribes A, Morales-Romero B, Rodríguez-Palmero A, Ballhausen D, de Lonlay P, Barone R, Janssen MCH, Jaeken J, Freeze HH, Matthijs G, Morava E, Lefeber DJ. **Active site variants in STT3A cause a dominant type I congenital disorder of glycosylation with neuromusculoskeletal findings.** *American Journal of Human Genetics.* 108(11):2130-2144. D1

2. Marti-Sanchez L, Baide-Mairena H, Marcé-Grau A, Pons R, Skouma A, López-Laso E, Sigatullina M, Rizzo C, Semeraro M, Martinelli D, Carrozzo R, Dionisi-Vici C, González-Gutiérrez-Solana L, Correa-Vela M, Ortigoza-Escobar JD, Sánchez-Montañez Á, Vazquez É, Delgado I, Aguilera-Albesa S, Yoldi ME, Ribes A, Tort F, Pollini L, Galosi S, Leuzzi V, Tolve M, Pérez-Gay L, Aldamiz-Echevarría L, Del Toro M, Arranz A, Roelens F, Urreizti R, Artuch R, Macaya A, Pérez-Dueñas B. **Delineating the neurological phenotype in children with defects in the ECHS1 or HIBCH gene.** *Journal of Inherited Metabolic Disease.* 44(2):401-414. Q1

3. To-Figueras J, Wijngaard R, García-Villoria J, Aarsand AK, Aguilera P, Deulofeu R, Brunet M, Gómez-Gómez À, Pozo OJ, Sandberg S. **Dysregulation of homocysteine homeostasis in acute intermittent porphyria patients receiving heme arginate or givosiran.** *Journal of Inherited Metabolic Disease.* 44(4):961-971. Q1

4. Fogh S, Dipace G, Bie A, Veiga-da-Cunha M, Hansen J, Kjeldsen M, Mosegaard S, Ribes A, Gregersen N, Aagaard L, Van Schaftingen E, Olsen RKJ. **Variants in the Ethylmalonyl-CoA Decarboxylase (ECHDC1) Gene; a Novel Player in Ethylmalonic Aciduria?** *Journal of Inherited Metabolic Disease.* 44(5):1215-1225. Q1

5. Darling A; Irún P; Giraldo P; Armstrong J; Gort L; Díaz-Conradi Á; Yubero D; De Oryazábal Sanz AL; Ormazábal A; Artuch R; García-Cazorla À; O'Callaghan M. **Pediatric Gaucher disease with intermediate type 2–3 phenotype associated with parkinsonian features and levodopa responsiveness.** *Parkinsonism & Related Disorders.* 91:19-22. Q1

6. Pajares S, Arranz JA, Ormazabal A, Del Toro M, García-Cazorla Á, Navarro-Sastre A, López RM, Meavilla SM, de Los Santos MM, García-Volpe C, de Aledo-Castillo JMG, Argudo A, Marín JL, Carnicer C, Artuch R, Tort F, Gort L, Fernández R, García-Villoria J, Ribes A. **Implementation of second-tier tests in newborn screening for the detection of vitamin B 12 related acquired and genetic disorders: results on 258,637 newborns.** *Orphanet Journal of Rare Diseases.* 16(1):195. Q2

7. Guiñón L; García-Villoria J; Ribes A; Gort L; Molina A; Soler A; Sahuquillo Á; Alvarez L. **External quality assessment in the absence of proficiency testing: A split-sample testing program experience.** *Clinical Biochemistry.* 97:78-81. Q2

Clinical Guidelines

1. Altassan R; Radenkovic S; Edmondson AC; Barone R; Brasil S; Cechova A; Coman D; Donoghue S; Falkenstein K; Ferreira V; Ferreira C; Fiumara A; Francisco R; Freeze H; Grunewald S; Honzik T; Jaeken J; Krasnewich D; Lam C; Lee J; Lefeber D; Marques-da-Silva D; Pascoal C; Quelhas D; Raymond KM; Rymen D; Seroczynska M; Serrano M; Sykut-Cegielska J; Thiel C; Tort F; Vals MA; Videira P; Voermans N; Witters P; Morava E. **International consensus guidelines for phosphoglucomutase 1 deficiency (PGM1-CDG): diagnosis, follow-up and management.** *Journal of Inherited Metabolic Disease.* 44(1):148-163. Q1

Consortium Publications

1. Peña-Chilet M; Roldán G; Perez-Florido J; Ortuño FM; Carmona R; Aquino V; Lopez-Lopez D; Loucera C; Fernandez- Rueda JL; Gallego A; García-Garcia F; González-Neira A; Pita G; Núñez-Torres R; Santoyo-López J; Ayuso C; Minguez P; Avila-Fernandez A; Corton M; Moreno-Pelayo MÁ; Morin M; Gallego-Martinez A; Lopez-Escamez JA; Borrego S; Antiñolo G; Amigo J; Salgado-Garrido J; Pasalodos- Sanchez S; Morte B; Spanish Exome Crowdsourcing Consortium; Carracedo Á; Alonso Á; Dopazo J Spanish Exome Crowdsourcing Consortium. **CSVS, a crowdsourcing database of the Spanish population genetic variability.** *Nucleic Acids Research.* 49(D1):D1130-D1137. D1

2. Bellusci M; Paredes-Fuentes AJ; Ruiz-Pesini E; Gomez B; MITOSPAIN Working Group; Martin MA; Montoya J; Artuch R. **The Genetic Landscape of Mitochondrial Diseases in Spain: A Nationwide Call.** *Genes.* 12(10):1590. Q2

GRANTS FOR RESEARCH IN PROGRESS

García-Villoria J. **Desarrollo de una aproximación de medicina personalizada para la aciduria glutárica tipo I basada en el tratamiento con chaperonas farmacológicas.**
Sponsored by: Fundación Merck Salud. Merck_Inv20
Duration: 01/07/2021-30/06/2023

Ribes A, Gort L. **Desarrollo de una plataforma para demostrar patogenicidad de variantes de significado incierto y nuevos genes causantes de enfermedad en pacientes con trastornos del metabolismo energético mitocondrial.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/01310
Duration: 01/01/2020-31/12/2022

DOCTORAL THESES

Ribes A, Tort F. **Identificación y caracterización de nuevos defectos del metabolismo energético mitocondrial asociados a aciduria 3-metilglutacónica.**
PhD student: Olatz Ugarteburu

3.26 Inflammatory bowel disease

LOCATION
CEK building, floor 3

KEYWORDS
1. **Inflammatory bowel diseases**
2. **Cell therapy**
3. **Cross-sectional imaging**
4. **Biomarkers**

RELATED DISEASES
1. **Ulcerative colitis**
2. **Crohn's disease**
3. **Lympmocythic colitis**
4. **Colagenous colitis**

GROUP INVOLVED IN
AGAUR_SGR17: 00992
CIBEREHD

Original publications

TOTAL	25
Mean IF	**6,57**
Q1	**56%**
D1	**12%**
MA	**40%**
OA	**64%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Crohn's disease and ulcerative colitis are diseases that begin in childhood and youth and become chronic. They cause a marked impairment in quality of life in all spheres.

The fact that patients present few specific symptoms (diarrhoea or abdominal pain) leads to a significant delay in establishing a diagnosis and also hinders monitoring. In recent years, new treatments are being developed, but they are only effective for a certain percentage of patients, and there are no tools able to predict the response.

APPROACH

The group has developed the methodology to accurately assess the activity, extent and severity of Crohn's disease by means of magnetic resonance, as an alternative to colonoscopy. The laboratory is an international reference point in translational research aimed at finding out the molecular and cellular mechanisms involved in the development and course of Crohn's disease and ulcerative colitis.

It uses techniques such as transcriptional analysis in human samples (determining the genes that are being regulated at all times), analysis of immune cells and their responses to different stimuli or therapies, and the culture of stem cells from the intestinal epithelium. These cultures provide a tool to study the impact of the disease on epithelial function, including immune responses and bacterial sensing. In addition, the group has pioneered the development of highly effective cell therapies for refractory disease such as the use of mesenchymal cells for the treatment of perianal fistulas, and the transplantation of hematopoietic progenitor cells in patients with severe Crohn's disease who cannot undergo surgery.

IMPACT

The magnetic resonance index for the evaluation of Crohn's disease developed by the group is currently the most commonly used, in both clinical trials and in regular clinical practice. The group has identified biomarkers linked to disease remission and alternative therapeutic targets for patients who do not respond to current treatments. In Crohn's disease, the group has discovered the presence of immune responses directed against components of the intestinal microbiota. The group has revealed the deregulation of the epithelial barrier in ulcerative colitis using patient-derived epithelial cultures.

The group has improved many aspects of the safety of transplantation of hematopoietic progenitors making this procedure more acceptable and generalizable.

RESEARCH LINES

- Cross-sectional imaging for assessment of inflammatory bowel disease.

- Therapeutic targets and biomarkers in inflammatory bowel disease.

- Cell therapies in refractory inflammatory bowel disease.

- siRNA delivery to the gut using lipid nanoparticles as carriers.

- Mechanisms of disease heterogeneity using single-cell RNA sequencing.

PUBLICATIONS

Originals

1. Laharie D, Bourreille A, Branche J, Allez M, Bouhnik Y, Filippi J, Zerbib F, Savoye G, Vuitton L, Moreau J, Amiot A, Beaugerie L, Ricart E, Dewit O, Lopez-Sanroman A, Fumery M, Carbonnel F, Buisson A, Coffin B, Roblin X, van Assche G, Esteve M, Farkkila M, Gisbert JP, Marteau P, Nahon S, de Vos M, Peyrin-Biroulet L, Mary JY. **Evolution of endoscopic lesions in steroid-refractory acute severe ulcerative colitis responding to infliximab or cyclosporine.** *Clinical Gastroenterology and Hepatology.* 19(6):1180-1188.e4. D1

2. D'Haens G; Panés J; Louis E; Lacerda A; Zhou Q; Liu J; Loftus EV. **Upadacitinib Was Efficacious and Well Tolerated Over 30 Months in Patients with Crohn's Disease in the CELEST Extension Study.** *Clinical Gastroenterology and Hepatology.* S1542-3565(21):01354-9. D1

3. Reiter S; Dunkel A; Metwaly A; Panes J; Salas A; Haller D; Hofmann T. **Development of a Highly Sensitive Ultra-High-Performance Liquid Chromatography Coupled to Electrospray Ionization Tandem Mass Spectrometry Quantitation Method for Fecal Bile Acids and Application on Crohn's Disease Studies.** *Journal of Agricultural and Food Chemistry.* 69(17):5238-5251. D1

4. Veny M, Garrido-Trigo A, Corraliza AM, Masamunt MC, Bassolas-Molina H, Esteller M, Arroyes M, Tristán E, Fernández-Clotet A, Ordás I, Ricart E, Esteve M, Panés J, Salas A. **Dissecting common and unique effects of anti-α4β7 and anti-tumor necrosis factor treatment in ulcerative colitis.** *Journal of Crohns & Colitis.* 15(3):441-452. Q1

5. Vermeire S; Su C; Lawendy N; Kobayashi T; Sandborn WJ; Rubin DT; Modesto I; Gardiner S; Kulisek N; Zhang H; Wang W; Panés J. **Outcomes of Tofacitinib Dose Reduction in Patients with Ulcerative Colitis in Stable Remission from the Randomized RIVETING Trial.** *Journal of Crohns & Colitis.* 15(7):1130-1141. Q1

6. Vermeire S; Chiorean M; Panés J; Peyrin-Biroulet L; Zhang J; Sands BE; Lazin K; Klassen P; Naik SU; Cabell CH; Sandborn WJ. **Long-term Safety and Efficacy of Etrasimod for Ulcerative Colitis: Results from the Open-label Extension of the OASIS Study.** *Journal of Crohns & Colitis.* 15(6):950-959. Q1

7. Chaparro M, Garre A, Iborra M, Sierra-Ausín M, Barreiro-de Acosta M, Fernández-Clotet A, de Castro L, Boscá-Watts M, Casanova MJ, López-García A, Lorente R, Rodríguez C, Carbajo AY, Arroyo MT, Gutiérrez A, Hinojosa J, Martínez-Pérez T, Villoria A, Bermejo F, Busquets D, Camps B, Cañete F, Manceñido N, Monfort D, Navarro-Llavat M, Pérez-Calle JL, Ramos L, Rivero M, Angueira T, Camo Monterde P, Carpio D, García-de-la-Filia I, González-Muñoza C, Hernández L, Huguet JM, Morales VJ, Sicilia B, Vega P, Vera I, Zabana Y, Nos P, Suárez Álvarez P, Calviño-Suárez C, Ricart E, Hernández V, Mínguez M, Márquez L, Hervías Cruz D, Rubio Iturria S, Barrio J, Gargallo-Puyuelo C, Francés R, Hinojosa E, Del Moral M, Calvet X, Algaba A, Aldeguer X, Guardiola J, Mañosa M, Pajares R, Piqueras M, García-Bosch O, López Serrano P, Castro B, Lucendo AJ, Montoro M, Castro Ortiz E, Mesonero F, García-Planella E, Fuentes DA, Bort I, Delgado-Guillena P, Arias L, Iglesias A, Calvo M, Esteve M, Domènech E, Gisbert JP. **Effectiveness and safety of ustekinumab in ulcerative colitis: Real-world evidence from the ENEIDA registry.** *Journal of Crohns & Colitis.* 15(11):1846-1851. Q1

8. Panés J; Vermeire S; Dubinsky MC; Loftus EV; Lawendy N; Wang W; Salese L; Su C; Modesto I; Guo X; Colombel J. **Efficacy and Safety of Tofacitinib Retreatment for Ulcerative Colitis After Treatment Interruption: Results From the OCTAVE Clinical Trials.** *Journal of Crohns & Colitis.* 15(11):1852-1863. Q1

9. Ghosh S; Sanchez Gonzalez Y; Zhou W; Clark R; Xie W; Louis E; Loftus EV; Panes J; Danese S. **Upadacitinib Treatment Improves Symptoms of Bowel Urgency and Abdominal Pain, and Correlates With Quality of Life Improvements in Patients With Moderate to Severe Ulcerative Colitis.** *Journal of Crohns & Colitis.* 15(12):2022-2030. Q1

10. Ferrante M; Feagan BG; Panés J; Baert F; Louis E; Dewit O; Kaser A; Duan WR; Pang Y; Lee WJ; Gustafson D; Liao X; Wallace K; Kalabic J; D'Haens GR. **Long-Term Safety and Efficacy of Risankizumab Treatment in Patients with Crohn's Disease: Results from the Phase 2 Open-Label Extension Study.** *Journal of Crohns & Colitis.* 15(12):2001-2010. Q1

11. Calafat M, Mañosa M, Ricart E, Nos P, Iglesias-Flores E, Vera I, López-SanRomán A, Guardiola J, Taxonera C, Mínguez M, Martín-Arranz MD, de Castro L, de Francisco R, Rivero M, Garcia-Planella E, Calvet X, García-López S, Márquez L, Gomollón F, Barrio J, Esteve M, Muñoz F, Gisbert JP, Gutiérrez A, Hinojosa J, Argüelles-Arias F, Busquets D, Bujanda L, Pérez-Calle JL, Sicilia B, Merino O, Martínez P, Bermejo F, Lorente R, Barreiro-de Acosta M, Rodríguez C, García-Sepulcre MF, Monfort D, Cañete F, Domènech E, ENEIDA Study Group of GETECCU. **Risk of immunomediated adverse events and loss of response to infliximab in elderly patients with inflammatory bowel disease.** *Journal of Crohns & Colitis.* ijab213. Q1

12. Mayorgas A, Dotti I, Martínez-Picola M, Esteller M, Bonet-Rossinyol Q, Ricart E, Salas A, Martínez-Medina M. **A Novel Strategy to Study the Invasive Capability of Adherent-Invasive Escherichia coli by Using Human Primary Organoid-Derived Epithelial Monolayers.** *Frontiers in Immunology.* 12:646906. Q1

13. Sarmiento-Monroy JC, Espinosa G, Londoño MC, Meira F, Caballol B, Llufriu S, Carrasco JL, Moll-Udina A, Quintana LF, Giavedoni P, Ramírez J, Inciarte-Mundo J, Solana E, Blanco Y, Martinez-Hernandez E, Sepúlveda M, Llorenç V, Prieto-González S,

Espígol-Frigolé G, Milisenda JC, Cid MC, Mascaró JM, Blanco I, Barberá JA, Sibila O, Gratacos-Ginès J, Adán A, Agustí A, Sanmartí R, Panés J, Cervera R, Vila J, Soriano A, Gómez-Puerta JA, Immunocovid Clinic. **A multidisciplinary registry of patients with autoimmune and immune-mediated diseases with symptomatic COVID-19 from a single center.** *Journal of Autoimmunity.* 117:102580. Q1

14. Linggi B; Jairath V; Zou G; Shackelton LM; McGovern DPB; Salas A; Verstockt B; Silverberg MS; Nayeri S; Feagan BG; Vande Casteele N. **Meta-analysis of gene expression disease signatures in colonic biopsy tissue from patients with ulcerative colitis.** *Scientific Reports.* 11(1):18243. Q1

15. Lichtenstein GR; Rogler G; Ciorba MA; Su C; Chan G; Pedersen RD; Lawendy N; Quirk D; Nduaka CI; Thorpe AJ; Panés J. **Tofacitinib, an Oral Janus Kinase Inhibitor: Analysis of Malignancy (Excluding Nonmelanoma Skin Cancer) Events Across the Ulcerative Colitis Clinical Program.** *Inflammatory Bowel Diseases.* 27(6):816-825. Q2

16. Dubinsky MC; DiBonaventura M; Fan H; Bushmakin AG; Cappelleri JC; Maller E; Thorpe AJ; Salese L; Panés J. **Tofacitinib in Patients with Ulcerative Colitis: Inflammatory Bowel Disease Questionnaire Items in Phase 3 Randomized Controlled Induction Studies.** *Inflammatory Bowel Diseases.* 27(7):983-993. Q2

17. Panés J; Lindsay JO; Teich N; Lindgren S; Colombel JF; Flynn HA; Huyck S; Yao R; Philip G; Reinisch W. **Colectomy Incidence Rates in Five-Year Data From the Observational Postmarketing Ulcerative Colitis Study of Originator Infliximab.** *Inflammatory Bowel Diseases.* 27(12):1963-1967. Q2

18. Aguilar D, Revilla L, Garrido-Trigo A, Panés J, Lozano JJ, Planell N, Esteller M, Lacerda AP, Guay H, Butler J, Davis JW, Salas A. **Randomized Controlled Trial Substudy of Cell-specific Mechanisms of Janus Kinase 1 Inhibition With Upadacitinib in the Crohn's Disease Intestinal Mucosa: Analysis From the CELEST Study.** *Inflammatory Bowel Diseases.* 27(12):1999-2009. Q2

19. Hanzel J; Jairath V; De Cruz P; Guizzetti L; Shackelton LM; Bossuyt P; Duijvestein M; Dulai PS; Grossmann J; Hirten RP; Khanna R; Panes J; Peyrin-Biroulet L; Regueiro M; Rubin DT; Singh S; Stidham RW; Sandborn WJ; Feagan BG; D'Haens GR; Ma C. **Recommendations for Standardizing Clinical Trial Design and Endoscopic Assessment in Postoperative Crohn's Disease.** *Inflammatory Bowel Diseases.* izab259. Q2

20. Barreiro-de Acosta M; Gutiérrez A; Zabana Y; Beltrán B; Calvet X; Chaparro M; Domènech E; Esteve M; Panés J; Gisbert JP; Nos P; on behalf GETECCU. **Inflammatory bowel disease integral care units: Evaluation of a nationwide quality certification programme. The GETECCU experience.** *United European Gastroenterology Journal.* 9(7):766-772. Q2

21. Revilla L, Mayorgas A, Corraliza AM, Masamunt MC, Metwaly A, Haller D, Tristán E, Carrasco A, Esteve M, Panés J, Ricart E, Lozano JJ, Salas A. **Multi-omic modelling of inflammatory bowel disease with regularized canonical correlation analysis.** *Plos One.* 16(2):e0246367. Q2

22. Algaba A; Guerra I; Ricart E; Iglesias E; Manosa M; Gisbert JP; Guardiola J; Minguez M; Castro B; de Francisco R; Nos P; Bertoletti F; Mesonero F; Barrio J; Dolores Martin-Arranz M; Calvet X; Garcia-Lopez S; Sicilia B; Alcain G; Esteve M; Marquez L; Piqueras M; Jimenez L; Perez-Calle JL; Bujanda L; Garcia-Sepulcre M; Fernandez A; Moraleja I; Humberto Lorente R; Garcia-Bosch O; Lamban A; Blazquez I; Rodriguez E; Huguet JM; Lucendo AJ; Almela P; Busquets D; Ramirez de la Piscina P; Perez M; Domenech E; Bermejo F; Spanish GETECCU Grp; ENEIDA Project. **Extraintestinal Manifestations in Patients with Inflammatory Bowel Disease: Study Based on the ENEIDA Registry.** *Digestive Diseases and Sciences.* 66(6):2014-2023. Q3

23. Díaz-González Á, Belmonte E, Sapena V, Sanduzzi-Zamparelli M, Darnell A, Díaz A, Gomes da Fonseca L, Llarch N, Iserte G, Ayuso C, Forner A, Feu F, Bruix J, Rimola J, Reig M. **Pancreatic Insufficiency in Patients Under Sorafenib Treatment for Hepatocellular Carcinoma.** *Journal of Clinical Gastroenterology.* 55(3):263-270. Q3

24. Giordano A, González AE, Ceballos FS, Carretero-Ribón C, Aicart-Ramos M, Valenzuela JE, Alonso-Lázaro N, Martín-Lorente JL, Gálvez-Castillo C, Pons-Beltrán V, Fernández-Urién I, González-Suárez B, SEED Group of Capsule Endoscopy and Enteroscopy. **Oral ingestion versus endoscopic delivery of endoscopic capsule in patients with previous gastrointestinal surgery (ORENCES study): A Spanish multicentre observational study.** *Gastroenterología y Hepatología.* 44(10):680-686. Q4

25. Aira A; Rubio E; Fehér C; González-Suárez B; Casals-Pascual C; Soriano Á. **Stool donor recruitment - A one-year experience.** *Enfermedades Infecciosas y Microbiología Clínica.* S0213-005X(21):00044-6. Q4

Review

1. Caballol B; Gudiño V; Panes J; Salas A. **Ulcerative colitis: shedding light on emerging agents and strategies in preclinical and early clinical development.** *Expert Opinion on Investigational Drugs.* 30(9):931-946. Q1

2. Mayorgas A, Dotti I, Salas A. **Microbial Metabolites, Postbiotics and Intestinal Epithelial Function.** *Molecular Nutrition & Food Research.* 65(5):e2000188. Q1

3. Greco R, Alexander T, Burman J, Del Papa N, de Vries-Bouwstra J, Farge D, Henes J, Kazmi M, Kirgizov K, Muraro PA, Ricart E, Rovira M, Saccardi R, Sharrack B, Snarski E, Withers B, Jessop H, Boglione C, Kramer E, Badoglio M, Labopin M, Orchard K, Corbacioglu S, Ljungman P, Mikulska M, De la Camara R, Snowden JA, European Society for Blood and Marrow Transplantation (EBMT) Autoimmune Diseases Working Party (ADWP), Infectious Diseases Working Party (IDWP), Pediatric Working Party (PWP), Joint Accreditation Committee of the International Society for Cellular Therapy (ISCT) and EBMT (JACIE), EBMT Nurses Group and Patient Advocacy Committee. **Hematopoietic stem cell transplantation for autoimmune diseases in the time of COVID-19: EBMT guidelines and recommendations**. *Bone Marrow Transplantation.* 56(7):1493-1508. Q1

4. Shen B, Kochhar GS, Navaneethan U, Cross RK, Farraye FA, Iacucci M, Schwartz DA, Gonzalez-Lama Y, Schairer J, Kiran RP, Kotze PG, Kobayashi T, Bortlik M, Liu X, Levy AN, González Suárez B, Tang SJ, Coelho-Prabhu N, Lukas M, Bruining DH, El-Hachem S, Charles RJ, Chen Y, Sood A, Mao R, Loras C, Dulai PS, Picoraro JA, Chiorean M, Shergill A, Silverberg MS, Sandborn WJ, Bernstein CN. **Endoscopic evaluation of surgically altered bowel in inflammatory bowel disease: a consensus**

guideline from the Global Interventional Inflammatory Bowel Disease Group. *Annals of Hepato-Biliary-Pancreatic Surgery.* 6(6):482-497. Q1

5. Alexander T; Snowden JA; Burman J; Chang HD; Del Papa N; Farge D; Lindsay JO; Malard F; Muraro PA; Nitti R; Salas A; Sharrack B; Mohty M; Greco R. **Intestinal Microbiome in Hematopoietic Stem Cell Transplantation For Autoimmune Diseases: Considerations and Perspectives on Behalf of Autoimmune Diseases Working Party (ADWP) of the EBMT.** *Frontiers in Oncology.* 11:722436. Q2

6. Aguilera-Chuchuca MJ, Sánchez-Luna SA, González Suárez B, Ernest-Suárez K, Gelrud A, Berzin TM. **The emerging role of artificial intelligence in gastrointestinal endoscopy: A review.** *Gastroenterología y Hepatología.* S0210-5705(21):00309-5. Q4

Letters

1. Aguilar-Toalá JE; Arioli S; Behare P; Belzer C; Berni Canani R; Chatel JM; D'Auria E; de Freitas MQ; Elinav E; Esmerino EA; García HS; da Cruz AG; González-Córdova AF; Guglielmetti S; de Toledo Guimarães J; Hernández-Mendoza A; Langella P; Liceaga AM; Magnani M; Martin R; Mohamad Lal MT; Mora D; Moradi M; Morelli L; Mosca F; Nazzaro F; Pimentel TC; Ran C; Ranadheera CS; Rescigno M; Salas A; Sant'Ana AS; Sivieri K; Sokol H; Taverniti V; Vallejo-Cordoba B; Zelenka J; Zhou Z. **Postbiotics - when simplification fails to clarify.** *Nature Reviews Gastroenterology & Hepatology.* 18(11):825-826. D1

2. Rimola J; Panes J; Ordas I. **Accuracy of magnetic resonance index of activity score to predict response to biologics in Crohn's disease-authors' reply**. *Alimentary Pharmacology & Therapeutics.* 53(1):207-208. D1

Editorial

1. Panés J. **Integrin Inhibitors in Inflammatory Bowel Disease: From Therapeutic Antibodies to Small-Molecule Drugs.** *Gastroenterology*. 161(6):1791-1793. D1

2. Gudiño V, Salas A. **Promise of Mesenchymal Stem Cell Lysates in IBD Therapy: Are the Parts Greater than the Whole**? *Digestive Diseases and Sciences.* 66(4):932-934. Q3

Case Reports

1. Aira A; Rubio E; Vergara Gómez A; Fehér C; Casals-Pascual C; González B; Morata L; Rico V; Soriano A. **rUTI Resolution After FMT for Clostridioides difficile Infection: A Case Report.** *Infectious Diseases and Therapy.* 10(2):1065-1071. Q1

Clinical Guidelines

1. Aràjol C, Aira Gómez A, González-Suárez B, Casals-Pascual C, Martí Martí S, Domínguez Luzón MÁ, Soriano A, Guardiola Capón J, en representación del Grupo Catalán para el Estudio y Desarrollo de la Transferencia de Microbiota Fecal. **Donor selection for faecal microbiota transplantation. Consensus document of the Catalan Society of Gastroenterology and the Catalan Society of Infectious Diseases and Clinical Microbiology.** Gastroenterología y Hepatología. 44(2):175-180. Q4

2. González-Suárez B. Donor selection for faecal microbiota trasplantation. **Consensus document of the Catalan Society of Gastroenterology and the Catalan Society of Infectious Diseases and Clinical Microbiology.** *Gastroenterología y Hepatología.* 44(2):175-180. Q4

Consortium Publications

1. Julià A, Martínez-Mateu SH, Domènech E, Cañete JD, Ferrándiz C, Tornero J, Gisbert JP, Fernández-Nebro A, Daudén E, Barreiro-de Acosta M, Pérez C, Queiró R, López-Longo FJ, Carazo JLS, Mendoza JL, Alpéri M, Montilla C, Venegas JJP, Muñoz F, Castañeda S, Aterido A, Lasanta ML, Marsal S, IMID Consortium. **Food groups associated with immune-mediated inflammatory diseases: a Mendelian randomization and disease severity study.** *European Journal of Clinical Nutrition.* 75(9):1368-1382. Q2

GRANTS FOR RESEARCH IN PROGRESS

Panés J, Cervera R. **Taxonomy, Treatment, Targets and Remission. Identification of the Molecular Mechanisms of non-response to Treatments, Relapses and Remission in Autoimmune, Inflammatory, and Allergic Conditions.**
Sponsored by: European Commission.
CE_IMI2-2018-14
Duration: 01/09/2019-31/08/2026

Ricart E, Marin PJ. **Eficacia y seguridad del trasplante autólogo de progenitores hematopoyéticos para la enfermedad de Crohn refractaria tras movilización libre de ciclofosfamida.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00513
Duration: 01/01/2018-30/06/2022

Salas A. **Mecanismes cel·lulars i moleculars de la malaltia inflamatòria intestinal.**
Sponsored by: Generalitat de Catalunya. AGAUR_SGR17_00992
Duration: 01/01/2017-30/09/2021

Salas A, Panés J. **Caracterización de la base celular de la enfermedad inflamatoria intestinal mediante secuenciación de células individuales.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_R-TI2018-096946-B-I00
Duration: 01/01/2019-31/12/2021

Salas A. **New siRNA Nanotherapy for Inflammatory Bowel Diseases, targeting Janus kinase 3.**
Sponsored by: European Commission. CE_H2020_NMBP16_17
Duration: 01/01/2017-30/09/2021

Salas A, Panés J. **Early detection of perianal fistulizing disease- Pathophysiology and Imaging.**
Sponsored by: The Leona M & Harry B Helmsley Charitable Trust. INT_HelmselyCT_19
Duration: 25/11/2019-24/11/2022

DOCTORAL THESES

Salas A, Dotti I. **Human Primary Organoid-Derived Epithelial Monolayers as a Novel Strategy for the Study of Adherent Invasive Escherichia coli pathogenicity and the effects of Postbiotics on Intestinal Epithelial Function.**
PhD student: Aida Mayorgas

3.27 Liver cell plasticity and tissue repair

LOCATION
CEK building, floor 3

KEYWORDS
1. **Chronic liver disease**
2. **Cell plasticity**
3. **In vitro liver modelling**
4. **Stem cells**
5. **Organoids**

RELATED DISEASES
1. **Liver disease**

GROUP INVOLVED IN
AGAUR_SGR17: 01456

Original publications

TOTAL	7
Mean IF	**14,71**
Q1	**86%**
D1	**57%**
MA	**43%**
OA	**86%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

In advanced liver diseases, the mechanisms for tissue repair and liver regeneration are compromised, resulting in organ dysfunction and, ultimately, in liver failure.

Which factors compromise hepatic repair? How is liver regeneration regulated? What do the cells do to maintain their characteristics and function?

These are some of the questions that the group wants to answer in order to be able to develop new therapeutic strategies enabling improved regeneration and liver function in chronic liver disease.

APPROACH

Based on human samples, experimental models of liver disease, and in vitro systems with primary cells and stem cells, the group seeks to identify the factors responsible for impaired regeneration of the liver and the mechanisms that alter tissue repair.

Within this context, it is particularly interested in studying cellular plasticity and maintaining the identity of liver cells in response to damage and disease, as well as in the mechanisms and factors that promote inflammation and hepatic fibrosis.

IMPACT

The group has described key mechanisms involved in the progression of chronic liver disease and identified potential new therapeutic targets.

One of the main findings of the group has been the association of impaired liver regeneration and proliferation of immature cells with an increase in liver inflammation and a poor outcome of the patients. In addition, the group has described the methodology to obtain hepatic stellate cells from pluripotent stem cells and showed their potential for disease modelling.

RESEARCH LINES

- In vitro disease modeling.

- Liver cell plasticity.

- Mechanisms of liver inflammation and fibrosis.

PUBLICATIONS

Originals

1. Bou Saleh M, Louvet A, Ntandja-Wandji LC, Boleslawski E, Gnemmi V, Lassailly G, Truant S, Maggiotto F, Ningarhari M, Artru F, Anglo E, Sancho-Bru P, Corlu A, Argemi J, Dubois-Chevalier J, Dharancy S, Eeckhoute J, Bataller R, Mathurin P, Dubuquoy L. **Loss of hepatocyte identity following aberrant YAP activation: a key mechanism in alcoholic hepatitis.** *Journal of Hepatology*. 75(4):912-923. D1

2. Massey V, Parrish A, Argemi J, Moreno M, Mello A, García-Rocha M, Altamirano J, Odena G, Dubuquoy L, Louvet A, Martinez C, Adrover A, Affò S, Morales-Ibanez O, Sancho-Bru P, Millán C, Alvarado-Tapias E, Morales-Arraez D, Caballería J, Mann J, Cao S, Sun Z, Shah V, Cameron A, Mathurin P, Snider N, Villanueva C, Morgan TR, Guinovart J, Vadigepalli R, Bataller R. **Integrated Multiomics Reveals Glucose Use Reprogramming and Identifies a Novel Hexokinase in Alcoholic Hepatitis.** *Gastroenterology.* 160(5):1725-1740.e2. D1

3. Pose E, Coll M, Martínez-Sánchez C, Zeng Z, Surewaard BGJ, Català C, Velasco-de Andrés M, Lozano JJ, Ariño S, Fuster D, Niñerola-Bazán A, Graupera I, Muñoz É, Lozano F, Sancho-Bru P, Kubes P, Ginès P. **PD-L1 is overexpressed in liver macrophages in chronic liver diseases and its blockade improves the antibacterial activity against infections.** *Hepatology.* 74(1):296-311. D1

4. Vallverdú J, Martínez García de la Torre RA, Mannaerts I, Verhulst S, Smout A, Coll M, Ariño S, Rubio-Tomás T, Aguilar-Bravo B, Martínez-Sánchez C, Blaya D, Verfaillie CM, van Grunsven LA, Sancho-Bru P. **Directed differentiation of human induced pluripotent stem cells to hepatic stellate cells.** *Nature Protocols.* 16(5):2542-2563. D1

5. Blaya D, Pose E, Coll M, Lozano JJ, Graupera I, Schierwagen R, Jansen C, Castro P, Fernandez S, Sidorova J, Vasa-Nicotera M, Solà E, Caballería J, Trebicka J, Ginès P, Sancho-Bru P. **Profiling circulating microRNAs in patients with cirrhosis and acute-on-chronic liver failure.** *JHEP Reports.* 3(2):100233. Q1

6. Miyata T, Wu X, Fan X, Huang E, Sanz-Garcia C, Ross CKC, Roychowdhury S, Bellar A, McMullen MR, Dasarathy J, Allende DS, Caballeria J, Sancho-Bru P, McClain CJ, Mitchell M, McCullough AJ, Radaeva S, Barton B, Szabo G, Dasarathy S, Nagy LE. **Differential role of MLKL in alcohol-associated and non-alcohol-associated fatty liver diseases in mice and humans.** *JCI Insight.* 6(4):e140180. Q1

7. Blaya D; Rubio-Tomas T; Rodrigo-Torres D; Lozano JJ; Coll M; Argemi JM; Altamirano J; A-o S; Morales-Ibanez O; Gratacos-Gines J; Pose E; Tanguy M; Issoufaly T; Rautou PE; Bataller R; Caballeria J; Sancho-Bru P. **Endothelial dysfunction markers predict short-term mortality in patients with severe alcoholic hepatitis.** *Hepatology International.* 15(4):1006-1017. Q2

Review

1. Fernandez-Checa JC, Bagnaninchi P, Ye H, Sancho-Bru P, Falcon-Perez JM, Royo F, Garcia-Ruiz C, Konu O, Miranda J, Lunov O, Dejneka A, Elfick A, McDonald A, Sullivan GJ, Aithal GP, Lucena MI, Andrade RJ, Fromenty B, Kranendonk M, Cubero FJ, Nelson LJ. **Advanced preclinical models for evaluation of drug-induced liver injury - consensus statement by the European Drug-Induced Liver Injury Network [PRO-EURO-DILI-NET].** *Journal of Hepatology.* 75(4):935-959. D1

GRANTS FOR RESEARCH IN PROGRESS

Sancho-Bru P. **Cèl·lules hepàtiques estrellades per aplicacions biomèdiques i tecnològiques.**
Sponsored by: Generalitat de Catalunya. 2019_PROD_00055
Duration: 23/07/2020-22/01/2022

Sancho-Bru P. **Mecanismos implicados en la deficiente reparación tisular del hígado en enfermedades crónicas hepáticas. Nuevas dianas terapéuticas.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00673
Duration: 01/01/2018-31/12/2021

Sancho-Bru P. **Papel de los neutrófilos en el daño crónico del hígado.**
Sponsored by: Ministerio de Educación Cultura y Deporte. MECD_FPU17
Duration: 01/10/2018-30/09/2022

Sancho-Bru P. **Desarrollo de una herramienta de cribado de nuevos fármacos para el tratamiento de la enfermedad hepática crónica a partir de un sistema in vitro hepático organotípico derivado de iPSC.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_DTS18/00088
Duration: 01/01/2019-31/12/2021

Sancho-Bru P. **Understanding hepatoblastoma to design new personalized treatments.**
Sponsored by: Fundación científica asociación española contra el cáncer. AECC_Proyectos19
Duration: 01/12/2019-30/11/2022

Sancho-Bru P. **Mecanismos implicados en la deficiente regeneración del hígado en la hepatitis alcohólica: Mediadores y dianas terapéuticas.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00765
Duration: 01/01/2021-31/12/2023

Sancho-Bru P. **Liver-enriched Transcription Factors as Prognostic Markers and Therapeutic Targets in Alcoholic Hepatitis.**
Sponsored by: National Institutes of Health. INT_NIH_AA-18-003
Duration: 22/09/2018-30/06/2022

DOCTORAL THESES

Ginès P, Sancho-Bru P. **Generació de cèl·lules estrellades hepàtiques derivades de iPSC i la seva utilització com a model per l'estudi de la fibrosi hepàtica.**
PhD student: Júlia Vallverdú Ginès

3.28 Pathogenesis and treatment of autoimmunity

LOCATION
CEK building, floor 5

KEYWORDS
1. **Autoimmunity**
2. **Diabetes**
3. **Nanoparticle**
4. **Tolerance**
5. **T-cell development**
6. **T-cell re-programming**
7. **Epigenetics**

RELATED DISEASES
1. **Diabetes**
2. **Multiple sclerosis**
3. **Inflammatory bowel disease**
4. **Obesity**
5. **Systemic lupus erythematosus**
6. **Rheumatoid arthritis**
7. **Psoriasis**
8. **Uveitis**
9. **Sjogren's disease**

GROUP INVOLVED IN
AGAUR_SGR17: 00338
RETIC RD16/0015/0020

Original publications

TOTAL	7
Mean IF	9,66
Q1	100%
D1	43%
MA	43%
OA	100%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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ADMINISTRATIVE STAFF
Mireia Ortega (IDIBAPS)

PROBLEM

Autoimmune diseases such as type 1 diabetes (T1D), multiple sclerosis (MS) and many others result from chronic autoimmune responses involving T- and B-cells recognizing numerous antigenic epitopes on incompletely defined lists of autoantigens.

Eliminating or suppressing all polyclonal autoreactive T-cell specificities (known and unknown) in each individual autoimmune disorder without compromising systemic immunity is not currently possible.

Our group focusses on a new class of drugs, based on nanomedicine, that can comprehensively blunt several experimental autoimmune diseases without compromising normal immunity to infections and cancer.

We investigate the underlying mechanisms, in particular the molecular changes that result in the conversion of pathogenic T-cells into disease-suppressing progeny, with a major focus on mice humanized with peripheral blood mononuclear cells or hematopoietic stem cells. In addition, we enumerate the presence of, and clone autoantigen-specific T-cell specificities in patients with various autoimmune diseases.

APPROACH

We employ peptide-major histocompatibility complex-based nanomedicines to elicit the formation of disease-specific immunoregulatory cell networks in vivo, both in experimental animal models of autoimmune disease as well as in humanized mice.

In addition, we study the developmental biology of diabetogenic T cell specificities in transgenic mice in the presence/absence of genetic modifications of the antigen-presenting machinery in both thymic and peripheral antigen-presenting cells.

We use a variety of approaches to identify target epitope specificities of both murine and human autoreactive T-cells.

IMPACT

Our approach offers a new class of drugs potentially capable of treating many autoimmune diseases without impairing normal immunity. In addition, these drugs re-program cognate autoreactive T-cells into regulatory cells followed by the formation of multi-cellular regulatory cell networks.

Studies of this process at the transcriptional and epigenetic level provides clues about these new cellular lineages and the underlying mechanisms. A major focus is on translational aspects of these processes, using humanized mice as a tool.

RESEARCH LINES

- Advancing antigen-specific nanomedicines for the treatment of organ-specific and systemic autoimmune diseases.

- Engineering of recombinant peptide-major histocompatibility complexes suitable for eliciting autoreactive T-regulatory type 1 cells in vivo.

- Lineage-specification of pMHC-NP-induced antigen-specific T-regulatory type 1 (TR1) cells.

- Phenotypic, transcriptional and epigenetic make up of pMHC-NP-induced human autoantigen-specific TR1 cells in humanized mouse models.

- Role of autophagy in autoantigen presentation during T-cell ontogeny and autoimmunity.

PUBLICATIONS

Originals

1. Ortega N, Ribes M, Vidal M, Rubio R, Aguilar R, Williams S, Barrios D, Alonso S, Hernández-Luis P, Mitchell RA, Jairoce C, Cruz A, Jimenez A, Santano R, Méndez S, Lamoglia M, Rosell N, Llupià A, Puyol L, Chi J, Melero NR, Parras D, Serra P, Pradenas E, Trinité B, Blanco J, Mayor A, Barroso S, Varela P, Vilella A, Trilla A, Santamaria P, Carolis C, Tortajada M, Izquierdo L, Angulo A, Engel P, García-Basteiro AL, Moncunill G, Dobaño C. **Seven-month kinetics of SARS-CoV-2 antibodies and role of pre-existing antibodies to human coronaviruses**. *Nature Communications*. 12(1):4740. D1

2. Yang Y, Ellestad KK, Singha S, Uddin MM, Clarke R, Mondal D, Garabatos N, Solé P, Fandos C, Serra P, Santamaria P. **Extremely short bioavailability and fast pharmacodynamic effects of pMHC-based nanomedicines.** *Journal of Controlled Release*. 338:557-570. D1

3. Dobaño C, Ramírez-Morros A, Alonso S, Vidal-Alaball J, Ruiz-Olalla G, Vidal M, Rubio R, Cascant E, Parras D, Rodrigo Melero N, Serra P, Carolis C, Santamaria P, Forcada A, Mendioroz J, Aguilar R, Moncunill G, Ruiz-Comellas A. **Persistence and baseline determinants of seropositivity and reinfection rates in health care workers up to 12.** *BMC Medicine*. 19(1):155. D1

4. Foray AP; Candon S; Hildebrand S; Marquet C; Valette F; Pecquet C; Lemoine S; Langa-Vives F; Dumas M; Hu P; Santamaria P; You S; Lyon S; Scott L; Bu CH; Wang T; Xu D; Moresco EMY; Scazzocchio C; Bach JF; Beutler B; Chatenoud L. **De novo germline mutation in the dual specificity phosphatase 10 gene accelerates autoimmune diabetes.** *Proceedings of the National Academy of Sciences of the United States of America*. 118(47):e2112032118. Q1

5. Umeshappa CS; Solé P; Surewaard BGJ; Yamanouchi J; Mohapatra S; Uddin MM; Clarke R; Ortega M; Singha S; Mondal D; Yang Y; Vignali DAA; Serra P; Kubes P; Santamaria P. **Liver-specific T regulatory type-1 cells program local neutrophils to suppress hepatic autoimmunity via CRAMP.** *Cell Reports*. 34(13):108919. Q1

6. Parras D; Solé P; Delong T; Santamaría P; Serra P. **Recognition of Multiple Hybrid Insulin Peptides by a Single Highly Diabetogenic T-Cell Receptor.** *Frontiers in Immunology*. 12:737428. Q1

7. Dobaño C, Vidal M, Santano R, Jiménez A, Chi J, Barrios D, Ruiz-Olalla G, Rodrigo Melero N, Carolis C, Parras D, Serra P, Martínez de Aguirre P, Carmona-Torre F, Reina G, Santamaria P, Mayor A, García-Basteiro AL, Izquierdo L, Aguilar R, Moncunill G. **Highly sensitive and specific multiplex antibody assays to quantify immunoglobulins M, A and G against SARS-CoV-2 antigens.** *Journal of Clinical Microbiology*. 59(2):e01731-20. Q1

Review

1. Yang Y; Santamaria P. **Evolution of nanomedicines for the treatment of autoimmune disease: From vehicles for drug delivery to inducers of bystander immunoregulation.** *Advanced Drug Delivery Reviews*. 176:113898. D1

2. Montaño J; Garnica J; Santamaria P. **Immunomodulatory and immunoregulatory nanomedicines for autoimmunity.** *Seminars in Immunology*. 56(101535):101535. D1

3. Serra P; Santamaria P. **Peptide-MHC-Based Nanomedicines for the Treatment of Autoimmunity: Engineering, Mechanisms, and Diseases.** *Frontiers in Immunology*. 11:621774. Q1

4. Solé P, Santamaria P. **Re-Programming Autoreactive T Cells Into T-Regulatory Type 1 Cells for the Treatment of Autoimmunity.** *Frontiers in Immunology*. 12:684240. Q1

GRANTS FOR RESEARCH IN PROGRESS

Santamaria P. **Grup de Recerca en autoimmunitat.**
Sponsored by: Generalitat de Catalunya. AGAUR_SGR17_00338
Duration: 01/01/2017-30/09/2021

Santamaria P. **Red Temática de Investigación Cooperativa en Salud - Esclerosis múltiple.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_RD16/0015/0020
Duration: 01/01/2017-31/12/2021

Santamaria P. **El papel de la autofagia celular en la tolerancia central y activación periférica de células TCD4+ diabetogénicas.**
Sponsored by: Ministerio de Economía y Competitividad. MINECO_-BES-2016-077990
Duration: 10/05/2017-31/12/2021

Santamaria P. **Advancing human antigen-specific T-regulatory cell expanding nanomedicines for autoimmune disease: Translational studies in humanized mice.** Integrated Project of Excellence (MINECO).
Sponsored by: Ministerio de Educación Cultura y Deporte. MECD_FPU16
Duration: 30/10/2017-29/03/2022

Santamaria P. **Papel de la autofagia en la tolerancia central y periférica en la diabetes tipo I.**
Sponsored by: Ministerio de Educación Cultura y Deporte. MECD_FPU17
Duration: 22/10/2018-21/10/2022

Santamaria P, Serra P. **The role of autophagy in central tolerance and peripheral activation of diabetogenic T-cells.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_R-TI2018-093964-B-I00
Duration: 01/01/2019-30/09/2022

Santamaria P. **pMHC-based nanomedicines for the treatment of progressive multiple sclerosis.**
Sponsored by: Asociación Esclerosis Múltiple España. FCRB_5401-20
Duration: 01/07/2020-30/06/2022

Santamaria P. **Decision on optimal combinatorial therapies in imids using systems approaches.**
Sponsored by: European Commission. CE_H2020-SC1_2019_2s
Duration: 01/01/2020-31/12/2025

DOCTORAL THESES

Santamaria P, Serra P. **Transcriptional and epigenetic re-programming of autoantigen-specific CD4+ T-cells by pMHC class II-based nanomedicines.**
PhD student: Patricia Solé Sánchez

3.29 Translational research in diabetes, lipids and obesity

LOCATION
CEK building, floor 5

KEYWORDS
1. **Type 1 diabetes**
2. **Type 2 diabetes**
3. **Obesity**
4. **Dyslipidaemia**
5. **Nutrition**
6. **Bariatric surgery**

RELATED DISEASES
1. **Type 1 diabetes**
2. **Type 2 diabetes**
3. **Obesity**
4. **Dyslipidaemia**

GROUP INVOLVED IN
AGAUR_SGR17: 01166
CIBERDEM

Original publications

TOTAL	53
Mean IF	5,76
Q1	75%
D1	23%
MA	28%
OA	62%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Metabolic diseases constitute one of the main health problems in our society. Diabetes, dyslipidaemia and obesity are highly prevalent diseases that are also risk factors for cardiovascular disease, cognitive deterioration and certain types of cancer.

Characterizing these diseases correctly, understanding why they can lead to other severe diseases, and designing better treatments for them, are priorities.

APPROACH

The group carries out research on diabetes (type 1, type 2 and other forms), obesity and dyslipidaemia from the perspective of epidemiology, clinical research and laboratory research. In studies in humans, it uses a broad range of clinical and metabolic characterization techniques, vascular ultrasound, neuroimaging, molecular techniques and computational techniques.

It integrates this information to provide a better description of the diseases in their field of research, with the understanding that thorough knowledge of the diseases is the basis for effective, personalized medicine. The group also uses this information to improve currently available treatments. Finally, it seeks new therapeutic alternatives based on cell-biology studies and studies in animal models. The group's goal is to translate this knowledge obtained in the laboratory into clinical practice in the near future.

The group consists of a multidisciplinary research team of biologists, physicians, nutritionists and nurses, and creates ad hoc teams based on the questions to be answered at any given moment. It also works in collaboration with other IDIBAPS groups and with groups from other universities around the country.

IMPACT

Improving knowledge of diseases with a high prevalence is a priority for the group if we want the healthcare system to be sustainable.

RESEARCH LINES

- Nutrition, obesity, diabetes, and cardiovascular disease: from epidemiology to mechanistic studies.

- Detection of atherosclerosis: a road to personalized medicine in dyslipidemia and diabetes.

- Monogenic forms of diabetes.

- Impact of bariatric surgery on health.

- Advanced therapies for type 1 diabetes. The artificial pancreas concept.

- Hypoglycemia and its consequences in patients with diabetes.

- Regenerative medicine strategies to treat beta cell deficiency in diabetes.

- Advancing antigen-specific nanomedicines for the treatment of type 1 diabetes.

PUBLICATIONS

Originals

1. Gómez-Valadés AG, Pozo M, Varela L, Boudjadja MB, Ramírez S, Chivite I, Eyre E, Haddad-Tóvolli R, Obri A, Milà-Guasch M, Altirriba J, Schneeberger M, Imbernón M, Garcia-Rendueles AR, Gama-Perez P, Rojo-Ruiz J, Rácz B, Alonso MT, Gomis R, Zorzano A, D'Agostino G, Alvarez CV, Nogueiras R, Garcia-Roves PM, Horvath TL, Claret M . **Mitochondrial cristae-remodeling protein OPA1 in POMC neurons couples Ca 2+ homeostasis with adipose tissue lipolysis.** *Cell Metabolism.* 33(9):1820-1835.e9. D1

2. Ventura-Aguiar P, Ferrer J, Paredes D, Rodriguez-Villar C, Ruiz A, Fuster J, Fondevila C, Garcia-Valdecasas JC, Esmatjes E, Adália R, Oppenheimer F, Campistol JM, Diekmann F, Ricart MJ. **Outcomes From Brain Death Donors With Previous Cardiac Arrest Accepted for Pancreas Transplantation: A Single-center Retrospective Analysis.** *Annals of Surgery.* 273(6):e230-e238. D1

3. Real J; Vlacho B; Ortega E; Valles JA; Mata-Cases M; Castelblanco E; Wittbrodt ET; Fenici P; Kosiborod M; Mauricio D; Franch-Nadal J. **Cardiovascular and mortality benefits of sodium-glucose co-transporter-2 inhibitors in patients with type 2 diabetes mellitus: CVD-Real Catalonia.** *Cardiovascular Diabetology.* 20(1):139. D1

4. Galmes-Panades AM, Konieczna J, Varela-Mato V, Abete I, Babio N, Fiol M, Antonio de Paz J, Casas R, Olbeyra R, Ruiz-Canela M, Palau-Galindo A, Castañer O, Martín-García A, Estruch R, Vidal J, Buil-Cosiales P, Wärnberg J, Salas-Salvadó J, Martínez JA, Romaguera D, PREDIMED-Plus investigators. **Targeting body composition in an older population: do changes in movement behaviours matter? Longitudinal analyses in the PREDIMED-Plus trial.** *BMC Medicine.* 19(1):3. D1

5. Lázaro I, Cofán M, Amor AJ, Ortega E, Freitas-Simoes TM, Llull L, Amaro S, Mestres G, Yugueros X, Harris WS, Riambau V, Sala-Vila A. **Linoleic Acid Status in Cell Membranes Inversely Relates to the Prevalence of Symptomatic Carotid Artery Disease.** *Stroke.* 52(2):703-706. D1

6. Díaz-Rizzolo DA; Serra A; Colungo C; Sala-Vila A; Sisó-Almirall A; Gomis R. **Type 2 diabetes preventive effects with a 12-months sardine-enriched diet in elderly population with prediabetes: An interventional, randomized and controlled trial.** *Clinical Nutrition.* 40(5):2587-2598. D1

7. Schröder H, Zomeño MD, Martínez-González MA, Salas-Salvadó J, Corella D, Vioque J, Romaguera D, Martínez JA, Tinahones FJ, Miranda JL, Estruch R, Bueno-Cavanillas A, Alonso Gómez AM, Tur JA, Warnberg J, Serra-Majem L, Martín V, Vázquez C, Lapetra J, Pintó X, Vidal J, Daimiel L, Gaforio JJ, Matía-Martín P, Ros E, Lassale C, Ruiz-Canela M, Babio N, Sorlí JV, García-Arellano A, Díaz-López A, Fitó M, Castañer O, PREDIMED-Plus investigators. **Validity of the energy-restricted Mediterranean Diet Adherence Screener.** *Clinical Nutrition.* 40(8):4971-4979. D1

8. Chiva-Blanch G; Bratseth V; Laake K; Arnesen H; Solheim S; Schmidt EB; Badimon L; Seljeflot I. **One year of omega 3 polyunsaturated fatty acid supplementation does not reduce circulating prothrombotic microvesicles in elderly subjects after suffering a myocardial infarction.** *Clinical Nutrition.* 40(12):5674-5677. D1

9. Chiva-Blanch G, Peña E, Cubedo J, García-Arguinzonis M, Pane A, Gil PA, Perez A, Ortega E, Padró T, Badimon L. **Molecular mapping of platelet hyperreactivity in diabetes: The stress proteins complex HSPA8/Hsp90/CSK2α and platelet aggregation in diabetic and normal platelets.** *Translational Research.* 235:1-14. D1

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11. Cárdenas-Fuentes G, Lassale C, Martínez-González MÁ, Grau M, Salas-Salvadó J, Corella D, Serra-Majem L, Warnberg J, Konieczna J, Estruch R, Pintó X, Martínez JA, Vázquez C, Vidal J, Tur JA, Díaz-López A, Lancova H, Fito M, Schröder H. **Anthropometric variables as mediators of the association of changes in diet and physical activity with inflammatory profile.** *Journals of Gerontology Series A-Biological Sciences and Medical Sciences.* 76(11):2021-2029. D1

12. Ahmad S; Ramkissoon CM; Beneyto A; Conget I; Giménez M; Vehi J. **Generation of virtual patient populations that represent real type 1 diabetes cohorts**. *Mathematics.* 9(11):1200. D1

13. Serra-Navarro B, Fernandez-Ruiz R, García-Alamán A, Pradas-Juni M, Fernandez-Rebollo E, Esteban Y, Mir-Coll J, Mathieu J, Dalle S, Hahn M, Ahlgren U, Weinstein LS, Vidal J, Gomis R, Gasa R. **Gs α-dependent signaling is required for postnatal establishment of a functional β-cell mass.** *Molecular Metabolism.* 53:101264. Q1

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15. Viñals C, Beneyto A, Martín-SanJosé JF, Furió-Novejarque C, Bertachi A, Bondia J, Vehi J, Conget I, Giménez M. **Artificial pancreas with carbohydrate suggestion performance for unannounced and announced exercise in Type 1 Diabetes.** *Journal of Clinical Endocrinology & Metabolism.* 106(1):55-63. Q1

16. George JJ; Martin-Diaz L; Ojanen MJT; Gasa R; Pesu M; Viiri K. **Prc2 regulated atoh8 is a regulator of intestinal microfold cell (M cell) differentiation.** *International Journal of Molecular Sciences.* 22(17):9355. Q1

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18. Muñoz-Garach A, Cornejo-Pareja I, Martínez-González MÁ, Bulló M, Corella D, Castañer O, Romaguera D, Vioque J, Alonso-Gómez ÁM, Wärnberg J, Martínez JA, Serra-Majem L, Estruch R, Bernal-López MR, Lapetra J, Pintó X, Tur JA, López-Miranda J, Bueno-Cavanillas A, Delgado-Rodríguez M, Matía-Martín P, Daimiel L, Sánchez VM, Vidal J, Prieto L, Ros E, Fernández-Aranda F, Camacho-Barcia L, Ortega-Azorin C, Soria M, Fiol M, Compañ-Gabucio L, Goicolea-Güemez L, Pérez-López J, Goñi N, Pérez-Cabrera J, Sacanella E, Fernández-García JC, Miró-Moriano L, Gimenez-Gracia M, Razquin C, Paz-Graniel I, Guillem P, Zomeño MD, Moñino M, Oncina-Canovas A, Salaverria-Lete I, Toledo E, Salas-Salvadó J, Schröder H, Tinahones FJ, Predimed-Plus Investigators. **Milk and Dairy Products Intake is Related to Cognitive Impairment at Baseline in Predimed Plus Trial.** *Molecular Nutrition & Food Research.* 65(7):e2000728. Q1

19. Domínguez-López I, Marhuenda-Muñoz M, Tresserra-Rimbau A, Hernáez Á, Moreno JJ, Martínez-González MÁ, Salas-Salvadó J, Corella D, Fitó M, Martínez JA, Alonso-Gómez ÁM, Wärnberg J, Vioque J, Romaguera D, López-Miranda J, Bernal-Lopez MR, Lapetra J, Serra-Majem JL, Bueno-Cavanillas A, Tur JA, Martín-Sánchez V, Pintó X, Delgado-Rodríguez M, Matía-Martín P, Vidal J, Vázquez C, Daimiel L, Serra-Mir M, Vázquez-Ruiz Z, Nishi SK, Sorli JV, Castañer O, Abete I, Luna JV, Carabaño-Moral R, Asencio A, Prohens L, Garcia-Rios A, Casas R, Gomez-Perez AM, Santos-Lozano JM, Razquin C, Martínez MÁ, Saiz C, Robledo-Pastor V, Zulet MA, Salaverria I, Eguaras S, Babio N, Malcampo M, Ros E, Estruch R, López-Sabater MC, Lamuela-Raventós RM. **Fruit and Vegetable Consumption is Inversely Associated with Plasma Saturated Fatty Acids at Baseline in Predimed Plus Trial.** *Molecular Nutrition & Food Research.* 65(17):e2100363. Q1

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21. Martinez-Perez C, San-Cristobal R, Guallar-Castillon P, Martínez-González MÁ, Salas-Salvadó J, Corella D, Castañer O, Martinez JA, Alonso-Gómez ÁM, Wärnberg J, Vioque J, Romaguera D, López-Miranda J, Estruch R, Tinahones FJ, Lapetra J, Serra-Majem L, Bueno-Cavanillas A, Tur JA, Sánchez VM, Pintó X, Gaforio JJ, Matía-Martín P, Vidal J, Vázquez C, Ros E, Bes-Rastrollo M, Babio N, Sorlí JV, Lassale C, Pérez-Sanz B, Vaquero-Luna J, Bazán MJA, Barceló-Iglesias MC, Konieczna J, Ríos AG, Bernal-López MR, Santos-Lozano JM, Toledo E, Becerra-Tomás N, Portoles O, Zomeño MD, Abete I, Moreno-Rodriguez A, Lecea-Juarez O, Nishi SK, Muñoz-Martínez J, Ordovás JM, Daimiel L. **Use of Different Food Classification Systems to Assess the Association between Ultra-Processed Food Consumption and Cardiometabolic Health in an Elderly Population with Metabolic Syndrome (PREDIMED-Plus Cohort).** *Nutrients.* 13(7):2471. Q1

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Letters

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Clinical Guidelines

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GRANTS FOR RESEARCH IN PROGRESS

de Hollanda AM. **Efecte d'una dieta mediterrània complementada amb oli d#oliva extra verge o fruits secs sobre la funció del teixit adipós en persones amb obesitat greu.**
Sponsored by: Fundació Acadèmia de les Ciències Mèdiques. ACD_PROJECTES18_02
Duration: 06/04/2018-

Flores L. **Mecanismo de recompensa cerebral en la recuperación ponderal y el mantenimiento del peso perdido tras la gastrectomía tubular. Un estudio mutimodal con resonancia magnética funcional.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/01138
Duration: 01/01/2020-31/12/2022

Gasa R, Gomis R. **Fibroblastos humanos como fuente de células productoras de insulina.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00896
Duration: 01/01/2020-31/12/2022

Giménez-Álvarez M. **Sistema de pàncrees artificial intermitent per a pacients amb diabetis tipus 1 en tractament amb múltiples dosis d'insulina amb un sistema de monitorització contínua de la glucosa a temps real.**
Sponsored by: Fundació Acadèmia Ciències Mèdiques. ACD_GLLOVERAS21_01
Duration: 15/06/2021-14/06/2023

Giménez-Álvarez M. **Personalización de un sistema de páncreas artificial en pacientes con diabetes tipo 1 y alto riesgo cardiovascular.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/01865
Duration: 01/01/2020-31/12/2022

Jiménez-Pineda A. **Pre-clinical Alzheimer's disease and Type 2 diabetes and obesity. Effects of bariatric surgery: a multimodal study.**
Sponsored by: Fundació la Marató de TV3. Diabet_16
Duration: 10/03/2017-31/12/2021

Jiménez-Pineda A. **Inflamación hipotalámica en obesidad., Papel de la dieta y efectos de la cirugía bariátrica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00279
Duration: 01/01/2018-30/06/2022

Jiménez-Pineda A. **Walnuts as a means to reverse the metabolic alterations caused by the western type diet: The Akt-FOXO pathway in liver and adipose tissue.**
Sponsored by: Fundación SEEN. SEEN_JOVINV_18_01
Duration: 01/02/2019-31/01/2021

Jiménez-Pineda A. **Vesículas extracelulares y otros biomarcadores en la exploración del la fisiopatología del sistema melanocortina en personas con obesidad. Un estudio longitudinal.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00424
Duration: 01/01/2021-31/12/2023

Ortega E. **Cambios en la microcirculación retiniana y carotidea tras restauración de normoglicemia en pacientes con diabetes tipo 2: angiografia retiniana mediante tomografía de coherencia óptica y ultrasonido carotideo con contraste.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/01479
Duration: 01/01/2018-30/06/2022

Vidal J. **Diabetis: xarxes metabòliques i moleculars.**
Sponsored by: Generalitat de Catalunya. AGAUR_SGR17_01166
Duration: 01/01/2017-30/09/2021

Vidal J. **Inflamación hipotalámica y obesidad: papel de la dieta y efectos de la cirugía bariátrica. Pre-clinical Alzheimer's disease and Type 2 diabetes and obesity. Effects of bariatric surgery: a multimodal study.**
Sponsored by: Generalitat de Catalunya. PERIS_SLT008/18/00127
Duration: 22/06/2019-25/02/2022

Vidal J. **Importància de la intervenció nutricional en la relació entre funció del teixit adipòs i malalties metabòliques.**
Sponsored by: Generalitat de Catalunya. PERIS_SLT008/18/00187
Duration: 26/06/2019-28/03/2021

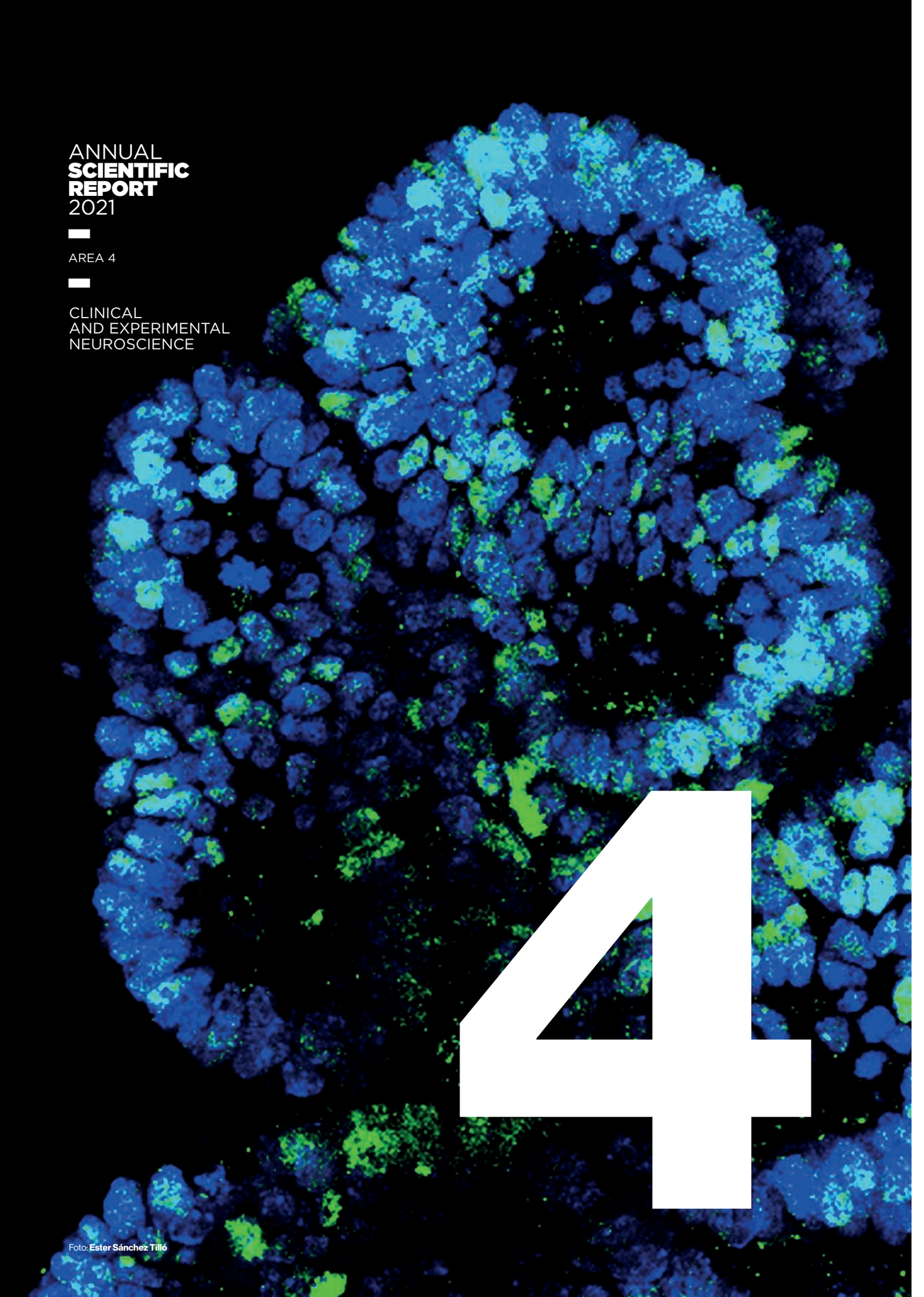
Vidal J. **PREDIMED+DM: Efecto de una pérdida de peso con dieta mediterránea hipocalórica y promoción de la actividad física en la prevención de diabetes tipo 2 en personas con síndrome metabólico.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00215
Duration: 01/01/2018-30/06/2022

Vidal J. **PREDIMED+DM: Efecto de una pérdida de peso con dieta mediterránea hipocalórica y promoción de la actividad física en la prevención de diabetes tipo 2 en personas con síndrome metabólico.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00339
Duration: 01/01/2021-31/12/2023

ANNUAL
SCIENTIFIC REPORT
2021

AREA 4

CLINICAL AND EXPERIMENTAL NEUROSCIENCE



4

Foto: **Ester Sánchez Tilló**

AREA 4

CLINICAL AND EXPERIMENTAL NEUROSCIENCE

4.1 **Pathophysiology and treatment of neurodegenerative disorders**
Jordi Alberch

4.2 **Systems neuropharmacology**
Francesc Artigas

4.3 **Schizophrenia**
Miquel Bernardo

4.4 **Child and adolescent psychiatry and psychology**
Josefina Castro

4.5 **Brain ischemia: clinical and experimental studies**
Ángel Chamorro

4.6 **Theoretical neurobiology of cortical circuits**
Albert Compte

4.7 **Pathogenesis of autoimmune neuronal disorders**
Josep Dalmau

4.8 **Cortical circuit dynamics**
Jaime de la Rocha

4.9 **Neurophysiology**
Xavier Gasull

4.10 **Muscular research and mitochondrial function**
Josep Maria Grau

4.11 **Clinical neurophysiology**
Alejandro Iranzo

4.12 **Neuropsychology**
Carme Junqué

4.13 **Advanced imaging in neuroimmunological diseases (ImaginEM)**
Sara Llufriu

4.14 **Clinical addictions**
Hugo López-Pelayo

4.15 **Parkinson disease and other neurodegenerative movement disorders: clinical and experimental research**
M Josep Martí

4.16 **Molecular neuropharmacology**
Guadalupe Mengod

4.17 **Imaging of mood - and anxiety - related disorders (IMARD)**
Joaquim Raduà

4.18 **Alzheimer's disease and other cognitive disorders**
Raquel Sánchez-Valle

4.19 **Systems neuroscience**
Maria Victoria Sanchez Vives

4.20 **Mechanisms of neurotoxicity and neurodegeneration**
Coral Sanfeliu

4.21 **Cellular neurobiology**
Josep Saura

4.22 **Multimodal neuroimaging in high risk and early psychosis**
Gisela Sugranyes

4.23 **Neurobiology**
Ramon Trullàs

4.24 **Bipolar and depressive disorders**
Eduard Vieta

4.1 Pathophysiology and treatment of neurodegenerative disorders

LOCATION
CELLEX building, floor 3B
UB School of Medicine

KEYWORDS
1. **Huntington's disease**
2. **Motor and cognitive function**
3. **Psychiatric disturbances**
4. **Neuroprotection**
5. **Trophic factors**
6. **Neuron-glia crosstalk**
7. **Neurodevelopment**
8. **Regenerative medicine**

RELATED DISEASES
1. **Huntington's disease**
2. **Schizophrenia**
3. **Chorea acanthocytosis**
4. **Stroke**

GROUP INVOLVED IN
AGAUR_SGR17: 01408, 01095
CIBERNED
HD-iPSCs Consortium
RETICS-Terapia Celular
Unit of Excellence María de Maeztu

Original publications

TOTAL	15
Mean IF	**8,05**
Q1	**73%**
D1	**40%**
MA	**40%**
OA	**100%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The incidence of nervous system disorders has considerably increased in recent years owing to the higher life expectancy. These diseases not only cause suffering to patients and their families but also have a major social and economic impact. Unfortunately, there is currently no treatment for halting neurodegenerative processes.

APPROACH

The group studies the pathophysiologic mechanisms involved in neuronal dysfunction and neurodegeneration in different brain areas, which cause impairment in motor activity and/or cognitive functions. Using new and innovative technology, these studies make it possible to design new gene, cell and drug therapies. The group is using a multidisciplinary and translational approach to develop new treatments to halt or slow neurodegenerative processes in diseases such as Huntington´s disease, chorea acanthocytosis or stroke, and also to recover neuronal network activity in schizophrenia. The group essentially uses two strategies to achieve this: neuroprotective therapies and neuro-regenerative therapies.

The former are based on the study of the mechanisms that regulate neuronal plasticity, which maintain the connectivity of the neuron networks in different areas of the brain and neuronal function and survival to understand the cell-specific vulnerability in different neurodegenerative processes. Neuro-regenerative therapies focus on the differentiation of human pluripotent stem cells and somatic stem cells in neurons with the same profile as those affected in Huntington disease.
It is thus possible to perform transplants that replace the dead neurons and recover motor function.

IMPACT

The group has determined several intracellular pathways involved in neuronal function and plasticity within the basal ganglia and the hippocampus, which are abnormal in Huntington disease (BDNF/TrkB/p75, Cdk5, STEP, etc.). This has allowed the group to identify new therapeutic targets and to develop new treatments that have been tested in preclinical studies in cellular and animals models. Some have already been used in international clinical trials. Cell-therapy studies in Huntington disease have also advanced with the differentiation of human neurons with the structural and physiological characteristics of the neurons of the putamen/caudate nucleus, which can be transplanted to recover motor function.

RESEARCH LINES

- Neuronal connectivity in Huntington's disease and other basal ganglia disorders.
PI: Dr. Jordi Alberch

- Epitranscriptomic regulation in brain disorders. *PI: Dr Veronica Brito*

- Stem cells and regenerative medicine.
PI: Dr. Josep M Canals

- In vivo reprogramming during cortex development. *PI: Daniel del Toro*

- Glia-neuron crosstalk in Huntington's disease.
PI: Dr. Silvia Ginés

- Neural plasticity in neurological and neuropsychiatric disorders. *PI: Albert Giralt*

- Modulation of neuronal circuitry in brain disorders. *PI: Dr. Mercè Masana*

- Kinases and phosphatases in neuronal function and dysfunction.
PI: Dr. Esther Pérez-Navarro

- Neural Stem Cells and Brain Damage.
PI: Dr. Daniel Tornero

PUBLICATIONS

Originals

1. Creus-Muncunill J; Guisado-Corcoll A; Venturi V; Pantano L; Escaramís G; García de Herreros M; Solaguren-Beascoa M; Gámez-Valero A; Navarrete C; Masana M; Llorens F; Diaz-Lucena D; Pérez-Navarro E; Martí E. **Huntington's disease brain-derived small RNAs recapitulate associated neuropathology in mice.** *Acta Neuropathologica.* 141(4):565-584. D1

2. Alcalá-Vida R; Garcia-Forn M; Castany-Pladevall C; Creus-Muncunill J; Ito Y; Blanco E; Golbano A; Crespí-Vázquez K; Parry A; Slater G; Samarajiwa S; Peiró S; Di Croce L; Narita M; Pérez-Navarro E. **Neuron type-specific increase in lamin B1 contributes to nuclear dysfunction in Huntington's disease.** *EMBO Molecular Medicine.* 13(2):e12105. D1

3. Rejc L; Gómez-Vallejo V; Joya A; Moreno O; Egimendia A; Castellnou P; Ríos-Anglada X; Cossío U; Baz Z; Passannante R; Tobalina-Larrea I; Ramos-Cabrer P; Giralt A; Sastre M; Capetillo-Zarate E; Košak U; Knez D; Gobec S; Marder M; Martin A; Llop J. **Longitudinal evaluation of a novel BChE PET tracer as an early in vivo biomarker in the brain of a mouse model for Alzheimer disease.** *Theranostics.* 11(13):6542-6559. D1

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6. Fissolo N; Matute-Blanch C; Osman M; Costa C; Pinteac R; Miro B; Sanchez A; Brito V; Dujmovic I; Voortman M; Khalil M; Borras E; Sabido E; Issazadeh-Navikas S; Montalban X; Comabella-Lopez M. **CSF SERPINA3 Levels Are Elevated in Patients With Progressive MS.** *Neurology-Neuroimmunology & Neuroinflammation.* 8(2):e941. D1

7. Pérez-Sisqués L, Sancho-Balsells A, Solana-Balaguer J, Campoy-Campos G, Vives-Isern M, Soler-Palazón F, Anglada-Huguet M, López-Toledano MÁ, Mandelkow EM, Alberch J, Giralt A, Malagelada C. **RTP801/REDD1 contributes to neuroinflammation severity and memory impairments in Alzheimer's disease.** *Cell Death & Disease.* 12(6):616. Q1

8. Senís E, Esgleas M, Najas S, Jiménez-Sábado V, Bertani C, Giménez-Alejandre M, Escriche A, Ruiz-Orera J, Hergueta-Redondo M, Jiménez M, Giralt A, Nuciforo P, Albà MM, Peinado H, Del Toro D, Hove-Madsen L, Götz M, Abad M. **TUNAR lncRNA Encodes a Microprotein that Regulates Neural Differentiation and Neurite Formation by Modulating Calcium Dynamics.** *Frontiers in Cell and Developmental Biology.* 9:747667. Q1

9. Costas-Insua C, Moreno E, Maroto IB, Ruiz-Calvo A, Bajo-Grañeras R, Martín-Gutiérrez D, Diez-Alarcia R, Vilaró MT, Cortés R, García-Font N, Martín R, Espina M, Botta J, Ginés S, McCormick PJ, Sánchez-Prieto J, Galve-Roperh I, Mengod G, Urigüen L, Marsicano G, Bellocchio L, Canela EI, Casadó V, Rodríguez-Crespo I, Guzmán M. **Identification of BiP as a CB1 receptor-interacting protein that fine-tunes cannabinoid signaling in the mouse brain.** *Journal of Neuroscience.* 41(38):7924-7941. Q1

10. García-García E, Chaparro-Cabanillas N, Coll-Manzano A, Carreras-Caballé M, Giralt A, del Toro D, Alberch J, Masana M, Rodríguez MJ. **Unraveling the spatiotemporal distribution of VPS13A in the mouse brain.** *International Journal of Molecular Sciences.* 22(23):13018. Q1

11. Ruff T; Peters C; Matsumoto A; Ihle SJ; Morales PA; Gaitanos L; Yonehara K; del Toro D; Klein R. **FLRT3 Marks Direction-Selective Retinal Ganglion Cells That Project to the Medial Terminal Nucleus.** *Frontiers in Molecular Neuroscience.* 14:790466. Q1

12. Pérez-Sisqués L; Martín-Flores N; Masana M; Solana-Balaguer J; Llobet A; Romaní-Aumedes J; Canal M; Campoy-Campos G; García-García E; Sánchez-Fernández N; Fernández-García S; Gilbert JP; Rodríguez MJ; Man HY; Feinstein E; Williamson DL; Soto D; Gasull X; Alberch J; Malagelada C. **RTP801 regulates motor cortex synaptic transmission and learning.** *Experimental Neurology.* 342:113755. Q2

13. Pérez-Sisqués L, Solana-Balaguer J, Campoy-Campos G, Martín-Flores N,

Sancho-Balsells A, Vives-Isern M, Soler-Palazón F, Garcia-Forn M, Masana M, Alberch J, Pérez-Navarro E, Giralt A, Malagelada C. **RTP801/REDD1 Is Involved in Neuroinflammation and Modulates Cognitive Dysfunction in Huntington's Disease.** *Biomolecules*. 12(1):34. Q2

14. Meneses-Salas E, Garcia-Forn M, Castany-Pladevall C, Lu A, Fajardo A, Jose J, Wahba M, Bosch M, Pol A, Tebar F, Klein AD, Zanlungo S, Pérez-Navarro E, Grewal T, Enrich C, Rentero C. **Lack of Annexin A6 exacerbates liver dysfunction and reduces lifespan of NPC1-deficient mice.** *American Journal of Pathology. 1*91(3):475-486. Q2

15. Nurm K, Sepp M, Castany-Pladevall C, Creus-Muncunill J, Tuvikene J, Sirp A, Vihma H, Blake DJ, Perez-Navarro E, Timmusk T. **Isoform-specific reduction of the basic helix-loop-helix transcription factor TCF4 levels in Huntington's disease.** *eNeuro*. 8(5):ENEURO.0197-21.2021. Q2

Review

1. Palma-Tortosa S; Coll-San, B; Kokaia Z; Tornero D. **Neuronal Replacement in Stem Cell Therapy for Stroke: Filling the Gap.** *Frontiers in Cell and Developmental Biology*. 9:662636. Q1

2. de Pins B, Mendes T, Giralt A, Girault JA. **The Non-receptor Tyrosine Kinase Pyk2 in Brain Function and Neurological and Psychiatric Diseases.** *Frontiers in Synaptic Neuroscience*. 13:749001. Q2

Letters

1. Rosser AE, Busse M, Aron Badin R, Canals JM, Wheelock V, Perrier AL, Gray W, Thompson L, Goldman S. **Cell Therapy for Huntington's Disease: Learning from Failure.** *Movement Disorders*. 36(3):787-788. D1

GRANTS FOR RESEARCH IN PROGRESS

Alberch J, Rodriguez-Allue M. **To identify the convergent mechanisms activated by mutant huntingtin and the lack of VPS13A responsible for the selective neurodegeneration of striatal neurons to develop neuroprotective approaches.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades.
MCIU_PID2020-119386RB-I00
Duration: 01/09/2021-31/08/2024

Brito V. **Deciphering the role of m6A RNA methylation as a new layer of gene expresión regulation in Huntington´s disease pathology (MetHD).**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades.
MCIU_PID2020-116474RB-I00
Duration: 01/09/2021-31/08/2024

Brito V. **Exploring the role of RNA editing on the generation of pathogenic huntingtin fragments.**
Sponsored by: Hereditary Disease Foundation
Duration: 14/01/2021-30/07/2022

Canals JM. **Red temática de investigación cooperativa en salud - terapia celular.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_RD16/0011/0012
Duration: 01/01/2017-31/12/2022

Canals JM. **Study of the role of neurodevelopment alterations in Huntington's disease.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_R-TI2018-099001-B-I00
Duration: 01/01/2019-31/12/2021

Canals JM. **Modelización de enfermedades neurodegenerativas.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades.
AEI_EIN2020-112381
Duration: 01/11/2020-31/10/2022

del Toro D. **Novel mechanism of neuronal migration leading to cortex folding.**
Sponsored: Ministerio de Economía y Competitividad. MINECO_R-TI2018-095580-A-100
Duration: 01/01/2019-31/12/2021

Gines S. **Gliotransmitters and cannabinoid receptors at the hub of cognitive and synaptic plasticity impairments in Huntington's disease.**
Sponsored by: Fundació la Marató de TV3.
Duration: 10/03/2021-10/03/2023

Gines S. **Transmitophagy between astrocytes and neurons: A new step of neuroglia crosstalk in Huntington´s disease.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_R-TI2018-094374-B-I00
Duration: 01/01/2019-31/12/2021

Gines S. **Astrocytes at the hub of neuronal dysfunction in Huntington´s disease: Dissecting the role of ARMS/kidins 220 on astrocyte secretome.**
Sponsored by: European Huntington´s Disease Network (EHDN/CHDI)
Duration: 01/01/2021-31/12/2021

Giralt A. **Defining the role of the ikaros family in schizophrenia (DISC).**
Sponsored: Ministerio de Economía y Competitividad. MINECO_R-TI2018-094678-A-100
Duration: 01/01/2019-31/12/2021

Masana M. **Non-invasive dynamic neural control by laser-based technology (NEUROPA).**
Sponsored by: European Commission. CE_H2020_Fet Open
Duration: 01/01/2020-31/12/2023

Pérez-Navarro E. **La enfermedad de Huntington como una laminopatía: Interacción entre el cerebro y la periferia.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades.
MCIU_PID2019-106447RB-100
Duration: 01/06/2020-31/05/2023

Tornero D. **Mejora de la integración funcional de progenitores neurales derivados de hiPSC trasplantados tras ictus cerebral.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades.
MCIU_PID2020_118120RB-I00
Duration: 01/09/2021-31/08/2024

Tornero D, Soriano J. **Neuronal networks from Cortical human iPSCs for Machine Learning Processing (NEU-ChiP).**
Sponsored by: European Commission. CE_HORIZON 2020_Fet Open
Duration: 01/09/2021-31/08/2024

DOCTORAL THESES

Canals JM, Sanders P. **The Development of a Combined Cell Therapy for Huntington's Disease.**
PhD student: Cristina Salado Manzano

4.2 Systems neuropharmacology

LOCATION
IIBB-CSIC labs

KEYWORDS
1. **Neuropsychiatric disorders**
2. **Parkinson's disease**
3. **Brain circuits**
4. **Neuropsychopharmacology**
5. **Oligonucleotide therapeutics**
6. **Animal models**

RELATED DISEASES
1. **Major depressive disorder**
2. **Schizophrenia**
3. **Parkinson's disease**

GROUP INVOLVED IN
AGAUR_SGR17: 00717
CIBERSAM

AWARDS
Leandre Cevera
Institution: Societat Catalana de Biologia
Awardee/s: Francesc Artigas

World's top 2% Scientific
Institution: University of Stanford, CA, USA
Awardee/s: Francesc Artigas

Original publications

TOTAL	4
Mean IF	**5,31**
Q1	**75%**
D1	**0%**
MA	**50%**
OA	**75%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Depression and schizophrenia are very likely the two mental illnesses with the greatest socioeconomic and personal impact. Current treatments, based on the same pharmacological principles that first generation drugs are slow-acting and ineffective, which reduces the quality of life of patients and increases the risk of suicide among those who fail to respond.

Likewise, psychiatric and cognitive disturbances in Parkinson's disease lack appropriate treatment.

Hence, one of the great challenges of translational neuroscience in the 21st century is to understand the alterations of the neural circuits responsible for such diseases and design new therapies that are more efficient.

APPROACH

The group studies brain circuits and the synaptic processes involved in the pathophysiology and treatment of severe mental illnesses and also analyses the psychiatric and cognitive aspects of Parkinson's disease.

To achieve this, the group uses a wide array of experimental strategies in animal models, including molecular, cellular, electrophysiological, neurochemical, and behavioural approaches, which makes it possible to obtain a detailed vision of how brain circuits function at different levels of complexity. The main aim of our research is to identify new molecular targets for therapeutic intervention and biomarkers for diagnosis and early detection or response to treatment.

IMPACT

Over the years, the group has consolidated as an international reference in the field of Neuropsychopharmacology, with a special relevance on their studies on the role of serotonin receptors in the mechanism of action of antidepressant drugs.

These studies have led to the development of new drugs by pharmaceutical companies. The group has also developed new animal models to identify potential antipsychotic drugs. More recent accomplishments include the development and use of translational oligonucleotide strategies in Major Depressive Disorder and Parkinson's disease.

RESEARCH LINES

- Neurobiological bases of severe mental disorders such as schizophrenia and depression: synaptic function, neurotransmitters, receptors and brain circuits involved.

- Identification of biomarkers and new targets for therapeutic action. Mechanism of action of fast-acting antidepressant drugs: glutamatergic agents, inhibitory oligonucleotides, microRNAs.

- Role of synucleins in the control of monoaminergic neurotransmission: Implication in cognitive and psychiatric symptoms of Parkinson's disease.

- Development of new animal models of depression and Parkinson's disease based on astrocyte-neuron communication and on gene over-expression using adeno-associated viral vectors.

- Neurochemistry and neuropharmacology of brain neurotransmission systems.

PUBLICATIONS

Originals

1. Vila-Merkle H, González-Martínez A, Campos-Jiménez R, Martínez-Ricós J, Teruel-Martí V, Blasco-Serra A, Lloret A, Celada P, Cervera-Ferri A. **The Oscillatory Profile Induced by the Anxiogenic Drug FG-7142 in the Amygdala-Hippocampal Network Is Reversed by Infralimbic Deep Brain Stimulation: Relevance for Mood Disorders**. *Biomedicines*. 9(7):783. Q1

2. Pavia-Collado R; Cóppola-Segovia V; Miquel-Rio L; Alarcón-Aris D; Rodríguez-Aller R; Torres-López M; Paz V; Ruiz-Bronchal E; Campa L; Artigas F; Montefeltro A; Revilla R; Bortolozzi A. **Intracerebral administration of a ligand-aso conjugate selectively reduces α-synuclein accumulation in monoamine neurons of double mutant human a30p*A53t*α-synuclein transgenic mice**. *International Journal of Molecular Sciences*. 22(6):2939. Q1

3. Garro-Martínez E; Fullana MN; Florensa-Zanuy E; Senserrich J; Paz V; Ruiz-Bronchal E; Adell A; Castro E; Díaz Á; Pazos Á; Bortolozzi A; Pilar-Cuéllar F. **mTOR knockdown in the infralimbic cortex evokes a depressive-like state in mouse.** *International Journal of Molecular Sciences*. 22(16):8671. Q1

4. Fullana MN; Paz V; Artigas F; Bortolozzi A. **Ketamine triggers rapid antidepressant effects by modulating synaptic plasticity in a new depressive-like mouse model based on astrocyte glutamate transporter GLT-1 knockdown in infralimbic cortex.** *Revista de Psiquiatría y Salud Mental*. Q2

Review

1. Bortolozzi A; Manashirov S; Chen A; Artigas F. **Oligonucleotides as therapeutic tools for brain disorders: Focus on major depressive disorder and Parkinson's disease.** *Pharmacology & Therapeutics*. 227:107873. D1

Letters

1. Artigas F. **Brain circuitry in major depressive disorder: The critical role of ventral anterior cingulate cortex.** *European Neuropsychopharmacology*. 51:134-137. Q2

GRANTS FOR RESEARCH IN PROGRESS

Bortolozzi A. **Linking between endoplasmic reticulum stress and alpha-synucleinopathy in brain disorders.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades.
MCIU_PID2019-105136RB-I00
Duration: 01/06/2020-31/05/2023

Bortolozzi A. **Gliotransmitters and cannabinoid receptors at the hub of cognitive and synaptic plasticity impairments in Huntington's disease.**
Sponsored by: Fundació la Marató de TV3.
Infeccioses_30/C/2020
Duration: 01/12/2020-31/11/2023

4.3 Schizophrenia

LOCATION
HCB building
Mallorca 183 building

KEYWORDS
1. **Schizophrenia**
2. **First episode psychosis**
3. **Psychosis**

RELATED DISEASES
1. **Psychosis**

GROUP INVOLVED IN
AGAUR_SGR17: 01355, 01562
AGAUR_XARDI18: 00010
CIBERSAM

Original publications

TOTAL	42
Mean IF	**5,99**
Q1	**79%**
D1	**31%**
MA	**38%**
OA	**74%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The group considers schizophrenia as a complex, heterogeneous disorder resulting from the interaction between genetic variables and environmental variants with important social determinants.

As a disease, schizophrenia raises some health needs that are not covered from the patient care angle, and which the group is attempting to tackle from a clinical research position.

The group does this by researching and generating scientific evidence on new, more valid and effective procedures and treatments, as the prognosis of this disease depends, largely, on early and effective intervention.

APPROACH

The group is developing longitudinal follow-up studies of initial psychotic episodes and defining the factors involved and the determinants of their evolution.

This is a task that it carries out while analysing the clinical, neurocognitive, neurobiological, neuroimaging and environmental correlates that condition the therapeutic response and the risk of relapse.

It also puts into practice techniques and procedures to analyse genetic and neurobiological variants, especially related with inflammatory balance and oxidative stress, in order to look for biomarkers and predictive models that enable identification of new therapeutic targets.

IMPACT

The identification of biochemical, genetic, neuroimaging or neuropsychological biomarkers contributes to more effective and efficient treatment and rehabilitation. The group's research in the field of schizophrenia has allowed it to validate strategies that have been incorporated into clinical guides, improving prognoses and reducing burden.

In patient care in practice, reducing the period for the implementation of the proven results obtained in the research, as well as early intervention, have shown clear benefits that have enabled a reduction in the individual, family and social burden of the disease.

RESEARCH LINES

- First episodes and second schizophrenia episodes.
- Molecular neurobiology of schizophrenia.
- Neuropsychology.
- Phisical health.
- Animal model.

PUBLICATIONS

Originals

1. Velthorst E, Mollon J, Murray RM, de Haan L, Germeys IM, Glahn DC, Arango C, van der Ven E, Di Forti M, Bernardo M, Guloksuz S, Delespaul P, Mezquida G, Amoretti S, Bobes J, Saiz PA, García-Portilla MP, Santos JL, Jiménez-López E, Sanjuan J, Aguilar EJ, Arrojo M, Carracedo A, López G, González-Peñas J, Parellada M, Atbaşoğlu C, Saka MC, Üçok A, Alptekin K, Akdede B, Binbay T, Altınyazar V, Ulaş H, Yalınçetin B, Gümüş-Akay G, Beyaz BC, Soygür H, Cankurtaran EŞ, Kaymak SU, Maric NP, Mihaljevic MM, Petrovic SA, Mirjanic T, Del-Ben CM, Ferraro L, Gayer-Anderson C, Jones PB, Jongsma HE, Kirkbride JB, La Cascia C, Lasalvia A, Tosato S, Llorca PM, Menezes PR, Morgan C, Quattrone D, Menchetti M, Selten JP, Szöke A, Tarricone I, Tortelli A, McGuire P, Valmaggia L, Kempton MJ, van der Gaag M, Riecher-Rössler A, Bressan RA, Barrantes-Vidal N, Nelson B, McGorry P, Pantelis C, Krebs MO, Ruhrmann S, Sachs G, Rutten BPF, van Os J, Alizadeh BZ, van Amelsvoort T, Bartels-Velthuis AA, Bruggeman R, van Beveren NJ, Luykx JJ, Cahn W, Simons CJP, Kahn RS, Schirmbeck F, van Winkel R, Reichenberg A, EU-GEI High Risk Study. **Cognitive functioning throughout adulthood and illness stages in individuals with psychotic disorders and their unaffected siblings.** *Molecular Psychiatry.* 26(8):4529-4543. D1

2. Guasp M, Giné-Servén E, Maudes E, Rosa-Justicia M, Martínez-Hernández E, Boix-Quintana E, Bioque M, Casado V, Módena-Ouarzi Y, Guanyabens N, Muriana D, Sugranyes G, Pacchiarotti I, Davi-Loscos E, Torres-Rivas C, Ríos J, Sabater L, Saiz A, Graus F, Castro-Fornieles J, Parellada E, Dalmau J. **Clinical, Neuroimmunologic, and CSF Investigations in First Episode Psychosis.** *Neurology*. 97(1):E61-E75. D1

3. Ajnakina O, Rodriguez V, Quattrone D, di Forti M, Vassos E, Arango C, Berardi D, Bernardo M, Bobes J, de Haan L, Del-Ben CM, Gayer-Anderson C, Jongsma HE, Lasalvia A, Tosato S, Llorca PM, Menezes PR, Rutten BP, Santos JL, Sanjuán J, Selten JP, Szöke A, Tarricone I, D'Andrea G, Richards A, Tortelli A, Velthorst E, Jones PB, Arrojo Romero M, La Cascia C, Kirkbride JB, van Os J, O'Donovan M, Murray RM, EU-GEI WP2 Group. **Duration of Untreated Psychosis in First-Episode Psychosis is not Associated With Common Genetic Variants for Major Psychiatric Conditions: Results From the Multi-Center EU-GEI Study.** *Schizophrenia Bulletin.* 47(6):1653-1662. D1

4. Pignon B, Lajnef M, Kirkbride JB, Peyre H, Ferchiou A, Richard JR, Baudin G, Tosato S, Jongsma H, de Haan L, Tarricone I, Bernardo M, Velthorst E, Braca M, Arango C, Arrojo M, Bobes J, Del-Ben CM, Di Forti M, Gayer-Anderson C, Jones PB, La Cascia C, Lasalvia A, Menezes PR, Quattrone D, Sanjuán J, Selten JP, Tortelli A, Llorca PM, van Os J, Rutten BPF, Murray RM, Morgan C, Leboyer M, Szöke A, Schürhoff F. **The Independent Effects of Psychosocial Stressors on Subclinical Psychosis: Findings From the Multinational EU-GEI Study.** *Schizophrenia Bulletin.* 47(6):1674-1684. D1

5. Sugranyes G; de la Serna E; Ilzarbe D; Pariente JC; Borras R; Romero S; Rosa M; Baeza I; Moreno MD; Bernardo M; Vieta E; Castro-Fornieles J. **Brain structural trajectories in youth at familial risk for schizophrenia or bipolar disorder according to development of psychosis spectrum symptoms.** *Journal of Child Psychology and Psychiatry.* 62(6):780-789. D1

6. Quattrone D, Ferraro L, Tripoli G, La Cascia C, Quigley H, Quattrone A, Jongsma HE, Del Peschio S, Gatto G, Gayer-Anderson C, Jones PB, Kirkbride JB, La Barbera D, Tarricone I, Berardi D, Tosato S, Lasalvia A, Szöke A, Arango C, Bernardo M, Bobes J, Del Ben CM, Menezes PR, Llorca PM, Santos JL, Sanjuán J, Tortelli A, Velthorst E, de Haan L, Rutten BPF, Lynskey MT, Freeman TP, Sham PC, Cardno AG, Vassos E, van Os J, Morgan C, Reininghaus U, Lewis CM, Murray RM, Di Forti M EU-GEI group. **Daily use of high-potency cannabis is associated with more positive symptoms in first-episode psychosis patients: The EU-GEI case-control study.** *Psychological Medicine.* 51(8):1329-1337. D1

7. Tripoli G, Quattrone D, Ferraro L, Gayer-Anderson C, Rodriguez V, La Cascia C, La Barbera D, Sartorio C, Seminerio F, Tarricone I, Berardi D, Szöke A, Arango C, Tortelli A, Llorca PM, de Haan L, Velthorst E, Bobes J, Bernardo M, Sanjuán J, Santos JL, Arrojo M, Del-Ben CM, Menezes PR, Selten JP, Jones PB, Jongsma HE, Kirkbride JB, Lasalvia A, Tosato S, Richards A, O'Donovan M, Rutten BP, Os JV, Morgan C, Sham PC, Murray RM, Murray GK, Di Forti M EU-GEI WP2 Group. **Jumping to conclusions, general intelligence, and psychosis liability: Findings from the multi-centre EU-GEI case-control study.** *Psychological Medicine.* 51(4):623-633. D1

8. Sami M; Quattrone D; Ferraro L; Tripoli G; Cascia E; Gayer-Anderson C; Selten JP; Arango C; Bernardo M; Tarricone I; Tortelli A; Gatto G; Del Peschio S; Del-Ben CM; Rutten BP; Jones PB; van Os J; de Haan L; Morgan C; Lewis C; Bhattacharyya S; Freeman TP; Lynskey M; Murray RM; Forti MD. **Association of extent of cannabis use and psychotic like intoxication experiences in a multi-national sample of first episode psychosis patients and controls.** *Psychological Medicine.* 51(12):2074-2082. D1

9. Jongsma HE, Gayer-Anderson C, Tarricone I, Velthorst E, van der Ven E, Quattrone D, di Forti M, Menezes PR, Del-Ben CM, Arango C, Lasalvia A, Berardi D, La Cascia C, Bobes J, Bernardo M, Sanjuán J, Santos JL, Arrojo M, de Haan L, Tortelli A, Szöke A, Murray RM, Rutten BP, van Os J, Morgan C, Jones PB, Kirkbride JB EU-GEI WP2 Group. **Social disadvantage, linguistic distance, ethnic minority status and first-episode psychosis: results from the EU-GEI case-control study.** *Psychological Medicine.* 51(9):1536-1548. D1

10. Tarricone I, D'Andrea G, Jongsma HE, Tosato S, Gayer-Anderson C, Stilo SA, Suprani F, Iyegbe C, van der Ven E, Quattrone D, di Forti M, Velthorst E, Rossi Menezes P, Arango C, Parellada M, Lasalvia A, La Cascia C, Ferraro L, Bobes J, Bernardo M, Sanjuán I, Santos JL, Arrojo M, Del-Ben CM, Tripoli G, Llorca PM, de Haan L, Selten JP, Tortelli A, Szöke A, Muratori R, Rutten BP, van Os J, Jones PB, Kirkbride JB, Berardi D, Murray RM, Morgan C. **Migration history and risk of psychosis: results from the multinational EU-GEI study.** *Psychological Medicine.* 1-13. D1

11. Misra S, Gelaye B, Williams DR, Koenen KC, Borba CPC, Quattrone D, Di Forti M, Tripoli G, La Cascia C, La Barbera D, Ferraro L, Tarricone I, Berardi D, Lasalvia A, Tosato S, Szöke A, Llorca PM, Arango C, Tortelli A, de Haan L, Velthorst E, Bobes J, Bernardo M, Sanjuán J, Santos JL, Arrojo M, Del-Ben CM, Menezes PR, Selten JP, Jones PB, Jongsma HE, Kirkbride JB, Rutten BPF, van Os J, Murray RM, Gayer-Anderson C, Morgan C. **Perceived major experiences of discrimination, ethnic group, and risk of psychosis in a six-country case-control study.** *Psychological Medicine.* 1-9. D1

12. Aas M; Alameda L; Di Forti M; Quattrone D; Dazzan P; Trotta A; Ferraro L; Rodriguez V; Vassos E; Sham P; Tripoli G; Cascia CL; Barbera DL; Tarricone I; Muratori R; Berardi D; Lasalvia A; Tosato S; Szöke A; Llorca PM; Arango C; Tortelli A; De Haan L; Velthorst E; Bobes J; Bernardo M; Sanjuán J; Santos JL; Arrojo M; Del-Ben CM; Menezes PR; Selten JP; Jones PB; Jongsma HE; Kirkbride JB; Rutten BPF; Van Os J; Gayer-Anderson C; Murray RM; Morgan C. **Synergistic effects of childhood adversity and polygenic risk in first-episode psychosis: The EU-GEI study.** *Psychological Medicine.* D1

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Review

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Letters

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Case Reports

1. Imaz ML; Soy D; Torra M; Garcia-Esteve LI; Soler C; Martin-Santos R. **Case Report: Clinical and Pharmacokinetic Profile of Lithium Monotherapy in Exclusive Breastfeeding. A Follow-Up Case Series.** *Frontiers in Pharmacology.* 12:647414. Q1

2. Sagué-Vilavella M, Gil-Badenes J, Baldaquí Baeza N, Madero Gómez S, Pacchiarotti I, Pons Cabrera MT, Valentí Ribas M, Bioque M. **The Other Victims of COVID-19: The Value of Electroconvulsive Therapy.** *Journal of ECT.* 37(1):E1-E2. Q1

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GRANTS FOR RESEARCH IN PROGRESS

Bernardo M. **Identificación y caracterización del valor predictivo de la reserva cognitiva en el curso evolutivo y respuesta en terapéutica en personas con un primer episodio psicótico.**
Sponsored by: Generalitat de Catalunya. PERIS_SLT006/17/00345
Duration: 17/02/2018-31/12/2021

Bioque M, Bernardo M. **Biomarcadores de pérdida sináptica, daño neuronal e inflamación en líquido cefalorraquídeo y sangre periférica en pacientes con un primer episodio psicótico.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/01066
Duration: 01/01/2021-31/12/2023

Catalán R. **Diferencias de género en la respuesta a antipsicóticos: analizando el rol de la menopausia, los cambios epigenéticos en los receptores de estrógenos y los niveles de hormonas sexuales.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/01029
Duration: 01/01/2017-30/06/2021

García-Rizo C. **El efecto de los eventos perinatales en los primeros episodios psicóticos.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00661
Duration: 01/01/2021-31/12/2023

Lafuente A, Arnaiz JA. **Mecanismos moleculares implicados en la Farmacogenética del síndrome metabólico inducido por antipsicóticos.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/01222
Duration: 01/01/2017-30/06/2021

Mas S, Lafuente A. **Estudio de genómica funcional convergente de la esquizofrenia resistente al tratamiento.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00574
Duration: 01/01/2021-31/12/2023

Parellada E. **Cellular, molecular, genetic and cognitive-behavioural characterization of the antiapoptotic effect of clozapine and glutamate inhibitors in a postnatal ketamine animal model of schizophrenia.**
Sponsored by: Fundació Clínic per a la Recerca Biomèdica. FCRB_PB2_2018
Duration: 25/04/2018-

Parellada E, Gassó P. **Estudio convergente en modelo celular, animal y humano del efecto y mecanismos de acción de la clozapina e inhibidores de glutamato en los síntomas negativos-cognitivos de la esquizofrenia.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/01005
Duration: 01/01/2019-30/06/2023

Penadés R. **Rehabilitación cognitiva en la esquizofrenia: variación genética en los genes BDNF (Val66Met) y COMT (Val158-Met) como posible modulador de la respuesta al tratamiento.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00872
Duration: 01/01/2018-30/06/2022

4.4 Child and adolescent psychiatry and psychology

LOCATION
HCB building

KEYWORDS
1. **Children**
2. **Adolescents**
3. **Psychopathology**
4. **Neuroimaging, genetics**
5. **Neuropsychology**

RELATED DISEASES
1. **Psychotic and affective disorders**
2. **Anorexia nervosa and other eating disorders**
3. **Obsessive-compulsive disorder**
4. **Tourette syndrome**
5. **Autism spectrum disorder**

GROUP INVOLVED IN
AGAUR_SGR17: 00287, 00881
CIBERSAM

Original publications

TOTAL	53
Mean IF	**5,77**
Q1	**62%**
D1	**38%**
MA	**36%**
OA	**57%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The presence of psychiatric and psychological disorders with varying degrees of severity is observed in approximately 15% of children and adolescents.

This means that 15 out of every 100 minors experience psychiatric and psychological difficulties at a time of vital importance, when the psychological traits and functional bases of the future adult are in the process of being formed.

Studying the characteristics of disorders at these ages and their possible treatments is of primordial importance in early diagnosis and intervention in order to improve their prognosis.

APPROACH

The group investigates the most common psychiatric and psychological diseases among children and adolescents: disorders related to eating, obsessive-compulsive, depression, anxiety, emotional upsets, attention deficit and hyperactivity, autistic disorders, and psychotic disorders, among others.

The studies include children and adolescents with a very high risk of developing mental disorders. This enables the group to study disorders before they develop and above all, to detect their symptoms in advance and take preventive action

The group's objectives also include the study of genetic bases and of clinical, cognitive, and neuroimaging characteristics.

IMPACT

In recent years the research group has made important progress in researching risk markers related to the development of psychotic disorders, in the characteristics and prognosis of minors with psychotic symptoms.

RESEARCH LINES

- Anorexia and other eating disorders.

- Autism spectrum disorders (ASD).

- Obsessive-compulsive disorder (OCD) and tourette syndrome.

- Psychotic and affective disorders in children and adolescents.

PUBLICATIONS

Originals

1. Writing Committee for the Attention-Deficit/Hyperactivity Disorder; Autism Spectrum

Disorder; Bipolar Disorder; Major Depressive Disorder; Obsessive-Compulsive Disorder; and Schizophrenia ENIGMA Working Groups; Yash Patel, Patel Y, Parker N, Shin J, ... , Calvo R, ... , Lazaro L, ... , Puig O, ... , Pausova Z, Thompson PM, Paus T. **Virtual Histology of Cortical Thickness and Shared Neurobiology in 6 Psychiatric Disorders.** *JAMA Psychiatry.* 78(1):47-63. D1

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53. Forcadell, E; Garcia-Delgar, B; Medrano, L; Garcia, C; Orgiles, M; Lazaro, L; Lera-Miguel, S. **Spanish Validation of the Parent Version of the Spence Children's Anxiety Scale (Scas-P) in a Clinical Sample1.** *Behavioral Psychology-Psicología Conductual.* 29(2):365-381. Q4

Review

1. Fortea A, Batalla A, Radua J, van Eijndhoven P, Baeza I, Albajes-Eizagirre A, Fusar-Poli P, Castro-Fornieles J, De la Serna E, Luna LP, Carvalho AF, Vieta E, Sugranyes G. **Cortical gray matter reduction precedes transition to psychosis in individuals at clinical high-risk for psychosis: A voxel-based meta-analysis.** *Schizophrenia Research.* 232:98-106. Q1

Letters

1. Sagué-Vilavella M; Berge D; Bioque M; Coromina M; Labad X; Mane A; Montalvo I; Sanchez-Gistau V; Usall J; Baeza I; García Rizo C; PEPCat Group. **Psychiatrists' attitudes towards the treatment of people with a first episode of psychosis in Catalonia.** *Revista de Psiquiatría y Salud Mental.* Q2

Consortium Publications

1. Halvorsen M; Szatkiewicz J; Mudgal P; Yu D; Psychiatric Genomics Consortium TS/OCD Working Group; Nordsletten AE; Mataix-Cols D; Mathews CA; Scharf JM; Mattheisen M; Robertson MM; McQuillin A; Crowley JJ. **Elevated common variant genetic risk for tourette syndrome in a densely-affected pedigree.** *Molecular Psychiatry.* 26(12):7522-7529. D1

2. Bond M; Moll N; Rosello A; Bond R; Schnell J; Burger B; Hoekstra PJ; Dietrich A; Schrag A; Kocovska E; Martino D; Mueller N; Schwarz M; Meier UC; EMTICS Collaborative Group. **Vitamin D levels in children and adolescents with chronic tic disorders: a multicentre study.** *European Child & Adolescent Psychiatry*. D1

3. Pericàs JM, Ambrosioni J, Muñoz P, de Alarcón A, Kestler M, Mari-Hualde A, Moreno A, Goenaga MÁ, Fariñas MC, Rodríguez-Álvarez R, Ojeda-Burgos G, Gálvez-Acebal J, Hidalgo-Tenorio C, Noureddine M, Miró JM, GAMES Investigators. **Prevalence of Colorectal Neoplasms Among Patients With Enterococcus faecalis Endocarditis in the GAMES Cohort (2008-2017).** *Mayo Clinic Proceedings.* 96(1):132-146. Q1

4. Zhang-James Y, Helminen EC, Liu J,, Franke B, Hoogman M, Faraone SV ENIGMA-ADHD Working Group. **Evidence for similar structural brain anomalies in youth and adult attention-deficit/hyperactivity disorder: a machine learning analysis.** *Translational Psychiatry.* 11(1):82. Q1

5. Gutierrez-Villanueva, A; Munoz, P; Delgado-Montero, A; Olmedo-Samperio, M; de Alarcon, A; Gutierrez-Carretero, E; Zarauza, J; Pares, DGI; Goenaga, MA; Ojeda-Burgos, G; Goikoetxea-Agirre, AJ; Reguera-Iglesias, JM; Ramos, A; Fernandez-Cruz, A; Spanish Collaboration on Endocarditis-Grupo de Apoyo al Manejo de la Endocarditis infecciosa en España (GAMES).. **Mural Endocarditis: The GAMES Registry Series and Review of the Literature.** *Infectious Diseases and Therapy.* 10(4):2749-2764. Q1

6. Arnaiz JA, Rodrigues-Silva C, Mezquida G, Amoretti S, Cuesta MJ, Fraguas D, Lobo A, González-Pinto A, Díaz-Caneja MC, Corripio I, Vieta E, Baeza I, Mané A, García-Rizo C, Bioque M, Saiz J, Bernardo M, Mas S, PEPs group. **The usefulness of Olanzapine plasma concentrations in monitoring treatment efficacy and metabolic disturbances in first-episode psychosis.** *Psychopharmacology.* 238(3):665-676. Q2

7. Haas M; Jakubovski E; Fremer C; Dietrich A; Hoekstra PJ; Jäger B; Müller-Vahl KR; EMTICS Collaborative Group. **Yale Global Tic Severity Scale (YGTSS): Psychometric Quality of the Gold Standard for Tic Assessment Based on the Large-Scale EMTICS Study.** *Frontiers in Psychiatry.* 12:626459. Q2

8. Escrihuela-Vidal F, López-Cortés LE, Escolà-Vergé L, De Alarcón González A, Cuervo G, Sánchez-Porto A, Fernández-Hidalgo N, Luque R, Montejo M, Miró JM, Goenaga MÁ, Muñoz P, Valerio M, Ripa M, Sousa-Regueiro D, Gurguí M, Fariñas-Alvarez MC, Mateu L, García Vázquez E, Gálvez-Acebal J, Carratalà J, Grupo de Apoyo al Manejo de la Endocarditis Infecciosa en España (GAMES) Cohort Investigators and the Barcelona Endocarditis Study Team (BEST). **Clinical Features and Outcomes of Streptococcus anginosus Group Infective Endocarditis: A Multicenter Matched Cohort Study.** *Open Forum Infectious Diseases.* 8(6):ofab163. Q2

GRANTS FOR RESEARCH IN PROGRESS

Baeza I. **Estudio longitudinal sobre marcadores nutricionales y de estrés en niños y adolescentes con síndrome de riesgo de psicosis y su capacidad predictiva de la transición a psicosis.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00242
Duration: 01/01/2019-30/06/2023

Calvo R. **Autism Innovative Medicine Studies 2 Trials.**
Sponsored by: European Commission.
CE_IMI2_10th_2stg
Duration: 01/06/2018-31/05/2023

Castro-Fornieles J. **Grup de recerca en Psiquiatria i Psicologia Infantil Clínic (GRUPPIC).**
Sponsored by: Generalitat de Catalunya.
AGAUR_SGR17_00881
Duration: 01/01/2017-30/09/2021

Castro-Fornieles J. **Detecció del risc per esquizofrènia mitjançant PGRS en nens i adolescents fills de pacients amb esquizofrènia o trastorn bipolar.**
Sponsored by: Generalitat de Catalunya.
PERIS_SLT006/17/00346
Duration: 17/02/2018-31/03/2022

Castro-Fornieles J. **Early intervention to improve cognitive reserve in subjects at risk and early stages of phychosis.**
Sponsored by: Fundació Clínic per a la Recerca Biomèdica. FCRB_PB2_2020
Duration: 04/05/2020-03/05/2022

Castro-Fornieles J, Compte A, Dalmau J, de la Rocha J, Graus F, Santamaria J. **Inmune-mediated diseases of the synapse: symptoms, brain networks, and the link to human memory.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PIE16/00014
Duration: 01/01/2017-30/06/2021

Castro-Fornieles J. **Características comunes y diferenciales en hijos de pacientes con esquizofrenia diagnosticados de TDAH, hijos de padres sanos diagnosticados de TDAH y controles.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00696
Duration: 01/01/2019-30/06/2023

de la Serna E. **Estudio sobre la eficacia de la potenciación de reserva cognitiva en niños, adolescentes y adultos jóvenes de alto riesgo genético para esquizofrenia o trastorno bipolar.**
Sponsored: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00741
Duration:01/01/2018-30/06/2022

de la Serna E. **Estudio longitudinal de una cohorte representativa: superando la heterogeneidad clínica y biológica en primeros episodios psicóticos.**
Sponsored: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00654
Duration:01/01/2021-31/12/2023

de la Serna E. **Interacción genética y ambiente en hijos de pacientes con esquizofrenia.**
Sponsored by: Fundación Alicia Koplowitz
Duration: 01/11/2021-31/10/2023

Lázaro L. **Caracterització mitjançant neuroimatge de predictors i mecanismes de resposta a la teràpia cognitiu-conductual en el trastorn obsessivocompulsiu.**
Sponsored by: Generalitat de Catalunya.
PERIS_SLT006/17/00249
Duration: 17/02/2018-31/12/2021

Lázaro L. **Microbiota i Factors (EPI) genetics en els trastorns del Neurodesenvolupament: TDAH i Autisme al Llarg de la vida a Catalunya (MENTAL-Cat).**
Sponsored by: Generalitat de Catalunya.
PERIS_SLT006/17/00287
Duration:17/02/2018-09/04/2021

Lázaro L. **Fenomenología y vias neuroinmunes de los comportamientos repetitivos y restrictivos.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/01122
Duration: 01/01/2020-31/12/2022

Morer A. **Influencia de las vacunas, biomarcadores infecciosos e inmunológicos y análisis de las redes transcriptoma-interactoma en el curso de los trastornos de tics: un estudio longitudinal (COURSE-CAT).**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/01056
Duration: 01/01/2021-31/12/2023

Morer A. **1/7-Collaborative Genomics Studies of Tourette Disorder.**
Sponsored by: National Institutes of Health.
INT_NIH_PAR-17-256
Duration: 15/06/2018-31/03/2023

Romero S. **Función del eje HHA y modificaciones epigenéticas como predictores del curso clínico en menores con psicopatología expuestos a maltrato infantil e investigada en la transición puberal-adolescente.**
Sponsored by: Fundación Alicia Koplowitz.
AKOPLOWITZ21_07
Duration: 01/11/2021-31/10/2023

DOCTORAL THESES

Castro-Fornieles J, Sugranyes G. **Brain functional correlates of theory of mind in neurodevelopmental disorders.**
PhD student: Daniel Ilzarbe Simorte

Castro-Fornieles J, Birmaher B.
Psychotic symptoms in genetic-at-risk and bipolar disorder samples: prevalence and related variables.
PhD student: Iria Méndez Blanco

4.5 Brain ischemia: clinical and experimental studies

LOCATION
CELLEX building, floor 3B

KEYWORDS
1. **Brain**
2. **Stroke**
3. **Cerebrovascular diseases**
4. **Neuroinflammation**
5. **Oxidative stress**

RELATED DISEASES
1. **Cerebrovascular diseases**
2. **Subarachnoid hemorrhage**
3. **Intraparenchymal hemorrhage**
4. **Ischemic stroke**
5. **Vascular cognitive impairment**
6. **Small vessel disease**

GROUP INVOLVED IN
AGAUR_SGR17: 00645, 01704
AGAUR_XARDI18: 00016
RED INVICTUSPLUS

Original publications

TOTAL	44
Mean IF	**5,71**
Q1	**70%**
D1	**30%**
MA	**36%**
OA	**61%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Strokes are caused by a sudden interruption of brain blood flow due to the obstruction or rupture of a cerebral artery. They represent the leading cause of permanent disability in adults, the second leading cause of mortality among people aged over 60, the leading cause of death among Spanish women and between 3% -7% of national health expenditure.

Despite the great progress in our ability to reopen obstructed arteries, we need to discover new strategies that protect poorly irrigated cells and allow us to minimise this serious health problem.

APPROACH

The group brings together clinical and basic researchers who plan a joint approach to learn about the problems of patients with cerebral vascular disorders. It studies, both in the laboratory and at the patient's bedside, the underlying basic mechanisms and the strategies for obtaining a better diagnosis and treatment.

Its interest focuses, in particular, on a more in-depth knowledge of the bi-directional relationship between the nervous system and the immune system, as well as on the search for new neuroprotective treatments.

IMPACT

The group's studies reveal the existence of a sophisticated interaction between an injured nervous system due to an alteration in blood supply and the immune system. They also show the great relevance of oxidative and nitrosative mechanisms in the pathogenesis of brain damage.

The group hypothesizes a role of immune cells in stroke progression. Moreover, the group identified antioxidant treatments sand provided robust experimental and clinical evidence supportive of beneficial effect that may have significant social health consequences.

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RESEARCH LINES

- Blood-brain barrier disruption in cerebrovascular diseases.

- Brain-gut cross-talk in stroke: targeting gut barrier dysfunction and immune responses to improve stroke outcome.

- Inflammatory and immune responses to stroke.

- The chemical optimization of cerebral embolectomy.

- Therapeutic use of uric acid as peroxynitrite scavenger in acute ischemic stroke.

- Vascular changes with aging and in animal models of vascular dementia.

PUBLICATIONS

Originals

1. Bastard P, Gervais A, Le Voyer T, ... Planas AM, ... , HGID Lab; COVID Clinicians; COVID-STORM Clinicians; NIAID Immune Response to COVID Group; NH-COVAIR Study Group; Danish CHGE; Danish Blood Donor Study; St. James's Hospital; SARS CoV2 Interest group; French COVID Cohort Study Group; Imagine COVID-Group; Milieu Intérieur Consortium; CoV-Contact Cohort; Amsterdam UMC Covid-19; Biobank Investigators; COVID Human Genetic Effort; CONSTANCES cohort; 3C-Dijon Study; Cerba Health-Care; Etablissement du Sang study group, ... , Cobat A, Abel L, Casanova JL.**Autoantibodies neutralizing type I IFNs are present in ~ 4% of uninfected individuals over 70 years old and account for ~ 20% of COVID-19 deaths.** *Science Immunology*. 6(62):eabl4340. D1

2. Rubio-Perez C; Planas-Rigol E; Trincado JL; Bonfill-Teixidor E; Arias A; Marchese D; Moutinho C; Serna G; Pedrosa L; Iurlaro R; Martínez-Ricarte F; Escudero L; Cordero E; Cicuendez M; Ruiz S; Parra G; Nuciforo P; Gonzalez J; Pineda E; Sahuquillo J; Tabernero J; Heyn H; Seoane J. **Immune cell profiling of the cerebrospinal fluid enables the characterization of the brain metastasis microenvironment.** *Nature Communications*. 12(1):1503. D1

3. Nakanishi T, Pigazzini S, Degenhardt F, Cordioli M, Butler-Laporte G, Maya-Miles D, Bujanda L, Bouysran Y, Niemi ME, Palom A, Ellinghaus D, Khan A, Martínez-Bueno M, Rolker S, Amitrano S, Roade Tato L, Fava F, Spinner CD, Prati D, Bernardo D, Garcia F, Darcis G, Fernández-Cadenas I, Holter JC, Banales JM, Frithiof R, Kiryluk K, Duga S, Asselta R, Pereira AC, Romero-Gómez M, Nafría-Jiménez B, Hov JR, Migeotte I, Renieri A, Planas AM, Ludwig KU, Buti M, Rahmouni S, Alarcón-Riquelme ME, Schulte EC, Franke A, Karlsen TH, Valenti L, Zeberg H, Richards JB, Ganna A FinnGen, COVID-19 Host Genetics Initiative (HGI). **Age-dependent impact of the major common genetic risk factor for COVID-19 on severity and mortality.** *Journal of Clinical Investigation*. 131(23):e152386. D1

4. Lázaro I, Cofán M, Amor AJ, Ortega E, Freitas-Simoes TM, Llull L, Amaro S, Mestres G, Yugueros X, Harris WS, Riambau V, Sala-Vila A. **Linoleic Acid Status in Cell Membranes Inversely Relates to the Prevalence of Symptomatic Carotid Artery Disease.** *Stroke*. 52(2):703-706. D1

5. Cagnazzo F, Piotin M, Escalard S, Maier B, Ribo M, Requena M, Pop R, Hasiu A, Gasparotti R, Mardighian D, Piano M, Cervo A, Eker OF, Durous V, Sourour NA, Elhorany M, Zini A, Simonetti L, Marcheselli S, Paolo NN, Houdart E, Guédon A, Ligot N, Mine B, Consoli A, Lapergue B, Cordona Portela P, Urra X, Rodriguez A, Bolognini F, Lebedinsky PA, Pasco-Papon A, Godard S, Marnat G, Sibon I, Limbucci N, Nencini P, Nappini S, Saia V, Caldiera V, Romano D, Frauenfelder G, Gallesio I, Gola G, Menozzi R, Genovese A, Terrana A, Giorgianni A, Cappellari M, Augelli R, Invernizzi P, Pavia M, Lafe E, Cavallini A, Giossi A, Besana M, Valvassori L, Macera A, Castellan L, Salsano G, Di Caterino F, Biondi A, Arquizan C, Lebreuche J, Galvano G, Cannella A, Cosottini M, Lazzarotti G, Guizzardi G, Stecco A, Tassi R, Bracco S, Bianchini E, Micieli C, Pascarella R, Napoli M, Causin F, Desal H, Cotton F, Costalat V, ET-COVID-19 Study Group. **European Multicenter Study of ET-COVID-19**. *Stroke*. 52(1):31-39. D1

6. Scheldeman L; Wouters A; Dupont P; Christensen S; Boutitie F; Cheng B; Ebinger M; Endres M; Fiebach JB; Gerloff C; Muir KW; Nighoghossian N; Pedraza S; Simonsen CZ; Ringelstein EB; Chamorro A; Grond M; Laage R; Schneider A; Thomalla G; Thijs V; Lemmens R. **Reversible Edema in the Penumbra Correlates With Severity of Hypoperfusion.** *Stroke*. 52(7):2338-2346. D1

7. Martí-Fàbregas J, Guisado-Alonso D, Delgado-Mederos R, Martínez-Domeño A, Prats-Sánchez L, Guasch-Jiménez M, Cardona P, Núñez-Guillén A, Requena M, Rubiera M, Olivé M, Bustamante A, Gomis M, Amaro S, Llull L, Ustrell X, Castilho de Oliveira G, Seró L, Gomez-Choco M, Mena L, Serena J, Bashir Viturro S, Purroy F, Vicente M, Rodríguez-Campello A, Ois A, Catena E, Carmen Garcia-Carreira M, Barrachina O, Palomeras E, Krupinski J, Almeria M, Zaragoza J, Esteve P, Cocho D, Moreira A, van Eendenburg C, Emilio Codas J, Pérez de la Ossa N, Salvat M, Camps-Renom P, COVICTUS Collaborators. **Impact of COVID-19 Infection on the Outcome of Patients With Ischemic Stroke**. *Stroke*. 52(12):3908-3917. D1

8. Guisado-Alonso D, Martínez-Domeño A, Prats-Sánchez L, Delgado-Mederos R, Camps-Renom P, Abilleira S, de la Ossa NP, Ramos-Pachón A, Cardona P, Rodríguez-Campello A, Molina CA, Rudilosso S, Martí-Fàbregas J, Catalan Stroke Code and Reperfusion Consortium (Cat-SCR). **Reasons for Not Performing Mechanical Thrombectomy: A Population-Based Study of Stroke Codes.** *Stroke*. 52(9):2746-2753. D1

9. Rudilosso S; Laredo C; Amaro S; Renú A; Llull L; Obach V; Moreno J; Ribó M; Abilleira S; Cardona P; Martí-Fàbregas J; Pérez de la Ossa N; Ramos A; Roquer J; Serena J; Purroy F; Urra X; Chamorro Á. **Clinical improvement within 24 hours from mechanical thrombectomy as a predictor of long-term functional outcome in a multicenter population-based cohort of patients with ischemic stroke.** *Journal of Neurointerventional Surgery*. 13(2):119-123. D1

10. Blasco J; Puig J; Daunis-I-Estadella P; González E; Fondevila Monso JJ; Manso X; Oteros R; Jimenez-Gomez E; Bravo Rey I; Vega P; Murias E; Jimenez JM; López-Rueda

A; Renú A; Aixut S; Chirife Chaparro O; Rosati S; Moreu M; Remollo S; Aguilar Tejedor Y; Terceño M; Mosqueira A; Nogueira RG; San Roman L. **Balloon guide catheter improvements in thrombectomy outcomespersist despite advances in intracranial aspiration technology.** *Journal of Neurointerventional Surgery*. 13(9):773-778. D1

11. Blasco J, Puig J, López-Rueda A, Daunis-I-Estadella P, Llull L, Zarco F, Macias N, Macho J, González E, Labayen I, Vega P, Murias E, Jimenez-Gomez E, Bravo Rey I, Moreu M, Pérez-García C, Chirife Chaparro O, Aixut S, Terceño M, Werner M, Pumar JM, Aguilar Tejedor Y, Mendez JC, Moliner S, Nogueira RG, San Roman L, ROSSETTI Group. **Addition of intracranial aspiration to balloon guide catheter does not improve outcomes in large vessel occlusion anterior circulation stent retriever based thrombectomy for acute stroke**. *Journal of Neurointerventional Surgery*. D1

12. Mosteiro A, Pedrosa L, Torne R, Rodríguez-Hernández A, Amaro S, Reyes LA, Hoyos JA, San Roman L, de Riva N, Domínguez CJ, Enseñat J. **Venous tortuosity as a novel biomarker of rupture risk in arteriovenous malformations: ARI score.** *Journal of Neurointerventional Surgery*. Neurintsurg. D1

13. Topczewski TE, Di Somma A, Culebras D, Reyes L, Torales J, Tercero A, Langdon C, Alobid I, Torne R, Roldan P, Prats-Galino A, Ensenat J. **Endoscopic endonasal surgery to treat intrinsic brainstem lesions: correlation between anatomy and surgery.** *Rhinology*. 59(2):191-204. D1

14. Castro de Moura M, Davalos V, Planas-Serra L, Alvarez-Errico D, Arribas C, Ruiz M, Aguilera-Albesa S, Troya J, Valencia-Ramos J, Vélez-Santamaria V, Rodríguez-Palmero A, Villar-Garcia J, Horcajada JP, Albu S, Casasnovas C, Rull A, Reverte L, Dietl B, Dalmau D, Arranz MJ, Llucià-Carol L, Planas AM, Pérez-Tur J, Fernandez-Cadenas I, Villares P, Tenorio J, Colobran R, Martin-Nalda A, Soler-Palacin P, Vidal F, Pujol A, Esteller M. **Epigenome-wide association study of COVID-19 severity with respiratory failure.** *Ebiomedicine*. 66:103339. Q1

15. Rudilosso S, Ríos J, Rodríguez A, Gomis M, Vera V, Gómez-Choco M, Renú A, Matos N, Llull L, Purroy F, Amaro S, Terceño M, Obach V, Serena J, Martí-Fàbregas J, Cardona P, Molina C, Rodríguez-Campello A, Cánovas D, Krupinski J, Ustrell X, Torres F, Román LS, Salvat-Plana M, Jiménez-Fàbrega FX, Palomeras E, Catena E, Colom C, Cocho D, Baiges J, Aragones JM, Diaz G, Costa X, Almendros MC, Rybyeba M, Barceló M, Carrión D, Lòpez MN, Sanjurjo E, de la Ossa NP, Urra X, Chamorro Á, Catalan Stroke Code and Reperfusion (Cat-SCR) Consortium. **Effectiveness of Thrombectomy in Stroke According to Baseline Prognostic Factors: Inverse Probability of Treatment Weighting Analysis of a Population-Based Registry.** *Journal of Stroke*. 23(3):401-410. Q1

16. Stanzani E; Pedrosa L; Bourmeau G; Anezo O; Noguera-Castells A; Esteve-Codina A; Passoni L; Matteoli M; de la Iglesia N; Seano G; Martínez-Soler F; Tortosa A. **Dual role of integrin alpha-6 in glioblastoma: Supporting stemness in proneural stem-like cells while inducing radioresistance in mesenchymal stem-like cells.** *Cancers*. 13(12):3055. Q1

17. Llull L, Mayà G, Torné R, Mellado-Artigas R, Renú A, López-Rueda A, Laredo C, Culebras D, Ferrando C, Blasco J, Amaro S, Chamorro Á. **Stroke Units could be a valid alternative to Intensive Care Units for low-grade aneurysmal subarachnoid haemorrhage patients.** *European Journal of Neurology*. 28(2):500-508. Q1

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GRANTS FOR RESEARCH IN PROGRESS

Amaro S. **Blood brain barrier disruption after subarachnoid hemorrhage: clinical relevance, role of hyperglycemia and effect of potentiating endogenous antioxidant mechanisms. A translational study.**
Sponsored by: Fundació la Marató de TV3.
Ictus_17
Duration: 10/07/2018-31/01/2022

Amaro S. **Daño de la pared arterial en el ictus isquémico agudo: detección con RM avanzada, mecanismos subyacentes y valor pronostico.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/00711
Duration: 01/01/2017-30/06/2021

Chamorro A. **The Chemical Optimization of Cerebral Embolectomy (CHOICE) Trial.**
Sponsored by: Fundació la Marató de TV3.
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Duration: 01/03/2018-31/08/2022

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Duration: 15/11/2017-14/11/2022

Planas AM. **Grup d'Investigació Cerebrovascular (GICV).**
Sponsored by: Generalitat de Catalunya.
AGAUR_SGR17_00645
Duration: 01/01/2017-30/09/2021

Planas AM. **Respuesta inmune y puntos de control inmunitario en microglia y leucocitos infiltrantes como diana s terapéuticas en el ictus y efecto del envejecimiento.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades.
MCIU_PID2020-113202RB-I00
Duration: 01/09/2021-31/08/2024

Planas AM. **Endothelial Macrophage Alliance in Neuroinflammation (ENTRAIN).**
Sponsored by: European Commission.
CE_H2020-ITN-2018
Duration: 01/05/2019 -30/04/2023

Planas AM. **Anti-inflammatory miRNA nanoshuttles as therapeutic strategy for stroke Acronym.**
Sponsored by: European Commission.
CE_ERA-Net_Nanomed20 & Instituto de Salud Carlos III (ISCIII). FIS_AC20/00052
Duration: 01/01/2021-31/12/2023

Renú A. **Estado glucémico evaluado con monitorización continua en el ictus isquémico agudo tratado con terapias de reperfusión cerebral: correlato clínico-radiológico y relevancia fisiopatológica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00901
Duration: 01/01/2021-31/12/2023

Torné R. **Blood-brain barrier dysfunction and oxidative stress modulation in brain arteriovenous malformations: a translactional study of secondary injury after surgical resection.**
Sponsored by: Fundació la Marató de TV3.
Minoritaries_20
Duration: 30/04/2021-29/04/2024

Torné R, Amaro S. **Daño isquémico cerebral en la hemorragia subaracnoidea aneurismática: un estudio multimodal del papel de la microtrobosis y del estrés oxidativo.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00936
Duration: 01/01/2020-31/12/2022

Urra X. **Brain-gut cross-talk in stroke: targeting gut barrier dysfunction and immune responses to improve stroke outcome.**
Sponsored by: Fundació la Marató de TV3.
Ictus_17
Duration: 10/07/2018-31/12/2021

Valero R. **Delirio postoperatorio en neurocirugía, profundidad anestésica y manejo individualizado de la presión arterial para optimizar la autorregulación cerebral.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/01207
Duration: 01/01/2021-31/12/2023

DOCTORAL THESES

Amaro S, Chamorro Á. **Advanced neuroimaging techniques in acute ischemic stroke: tissue viability, blood-brain barrier status and clinical outcome prediction.**
PhD student: Carlos Laredo Gregorio

Enseñat J, González-Sánchez JJ. **Estudio de la integridad de sustancia blanca mediante tractografía por tensor de difusión: simulación, diagnóstico y pronóstico.**
PhD student: Sergio Garcia Garcia

Planas AM, Miró F. **Identity and functions of dendritic cell subsets in ischaemia-induced neuroinflammation.**
PhD student: Mattia Gallizioli

Valero R, Fábregas MN. **Análisis de la aplicabilidad de los dispositivos supraglóticos (mascarilla laríngea) en procedimientos neuroanestésicos.**
PhD student: Paola Andrea Hurtado Restrepo

4.6 Theoretical neurobiology of cortical circuits

LOCATION
Edifici Rostower
C/ Urgell 204

KEYWORDS
1. **Working memory**
2. **Prefrontal cortex**
3. **Neural network**
4. **NMDA receptor**
5. **Sleep**

RELATED DISEASES
1. **Autoimmune encephalitis**
2. **Schizophrenia**
3. **Depression**

GROUP INVOLVED IN
AGAUR_SGR17: 01565

Original publications

TOTAL	4
Mean IF	**6,80**
Q1	**75%**
D1	**50%**
MA	**75%**
OA	**100%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Many neurological and psychiatric disorders that affect the activity of the brain eventually end up causing alterations in the cognitive functions of the prefrontal cortex.

These alterations are subtle and difficult to treat but can have extremely incapacitating effects on normal life.

Of all the cognitive functions affected, short-term memory (or working memory) is one of the most interesting to study, and requires understanding of the neural circuits in order to try and improve patient well-being.

APPROACH

The group studies cognitive function in patients with autoimmune encephalitis and in patients with schizophrenia based on computer-based behavioural testing, EEG recordings and fMRI.

These tests on humans are combined with the analysis of electrophysiological data recorded in the cerebral cortex of animals while they perform working memory tasks.

The ultimate objective is to formulate computational models in silico that link neural activity with the human cognitive function and serve as a mechanistic model with the predictive power to understand brain diseases.

IMPACT

The group has made important contributions to defining a mechanistic spatial working-memory model based on computational simulations.

They have validated this model with electrophysiological and behavioural data in non-human primates and demonstrated the way in which the model makes behavioural predictions for validation in behavioural experiments in humans.

In experiments with patients, highly specific alterations were detected in spatial working-memory behavioural parameters that could be useful in diagnosing or monitoring these diseases.

RESEARCH LINES

- Network mechanisms of working memory in the prefrontal cortex.

- The NMDAR hypothesis of schizophrenia.

- The role of NMDARs in slow-wave sleep.

- The role of NMDARs in working memory.

PUBLICATIONS

Originals

1. Barbosa J, Lozano-Soldevilla D, Compte A. **Pinging the brain with visual impulses reveals electrically active, not activity-silent, working memories.** *Plos Biology*. 19(10):e3001436. D1

2. Marin-Campos R; Dalmau J; Compte A; Linares D. **StimuliApp: Psychophysical tests on mobile devices.** *Behavior Research Methods*. 53(3):1301-1307. D1

3. Qi XL; Liu R; Singh B; Bestue D; Compte A; Vazdarjanova AI; Blake DT; Constantinidis C. **Nucleus basalis stimulation enhances working memory by stabilizing stimulus representations in primate prefrontal cortical activity.** *Cell Reports*. 36(5):109469. Q1

4. Barbosa J; Babushkin V; Temudo A; Sreenivasan KK; Compte A. **Across-Area Synchronization Supports Feature Integration in a Biophysical Network Model of Working Memory.** *Frontiers in Neural Circuits*. 15:716965. Q3

Review

1. Stein H, Barbosa J, Compte A. **Towards biologically constrained attractor models of schizophrenia.** *Current Opinion in Neurobiology*. 70(70):171-181. Q1

2. Yang GR; Molano-Mazón M. **Towards the next generation of recurrent network models for cognitive neuroscience.** Current Opinion in Neurobiology. 70:182-192. Q1

GRANTS FOR RESEARCH IN PROGRESS

Compte A. **Dynamics in neuronal networks.**
Sponsored by: Generalitat de Catalunya. AGAUR_SGR17_01565
Duration: 01/01/2017-30/09/2021

Castro-Fornieles J, Compte A, Dalmau J, de la Rocha J, Graus F, Santamaria J. **Inmune-mediated diseases of the synapse: symptoms, brain networks, and the link to human memory.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PIE16/00014
Duration: 01/01/2017-30/06/2021

Compte A. **Mecanismos sinápticos y de red de interferencias en memoria de trabajo.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_R-TI2018-094190-B-I00
Duration: 01/01/2019-30/09/2022

Compte A. **Neural mechanisms underlying unconscious working memory.**
Sponsored by: Fundação BIAL. INT_BIAL_18
Duration: 01/05/2019-30/04/2021

Compte A. **CRCNS US-Spain Research Proposal: Serial dependence in working memory.**
Sponsored by: National Science Foundation (NSF, USA). INT_CRCNS_18 & Instituto de Salud Carlos III (ISCIII). FIS_AC20/00071
Duration: 01/01/2021-31/12/2023

DOCTORAL THESES

de la Rocha J, Compte A. **When Working Memory fails: mechanisms underlying memory accuracy and errors.**
PhD student: Tiffany Oña Jodar

4.7 Pathogenesis of autoimmune neuronal disorders

LOCATION
CELLEX building, floor 3A

KEYWORDS
1. **Autoantibodies**
2. **Encephalitis**
3. **Autoimmunity**
4. **Paraneoplastic**
5. **Multiple sclerosis**
6. **Demyelinating disorders**

RELATED DISEASES
1. **Autoimmune encephalitis**
2. **Paraneoplastic neurologic disorders**
3. **Multiple sclerosis and related demyelinating diseases**
4. **Cancer including brain tumors**

GROUP INVOLVED IN
AGAUR_SGR17: 00266
CIBERER
REEM

AWARDS
Premio Esclerosis Múltiple 2020
Institution: Sociedad Española de Neurología
Awardee/s: Albert Saiz

Top 1% most cited researcher globally
Institution: Clarivate Analytics
Awardee/s: Josep Dalmau & Francesc Graus

Original publications

TOTAL	42
Mean IF	**9,65**
Q1	**93%**
D1	**62%**
MA	**31%**
OA	**79%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The principal objective of the group is the study of autoimmune/inflammatory brain diseases including multiple sclerosis, autoimmune encephalitis and paraneoplastic neurologic disorders among others.We aim to identify novel biologic, genetic, immunologic, and neuroimaging biomarkers that will allow for early and accurate disease diagnoses and have prognostic value.

Studies are also aimed at elucidating the underlying immunopathogenic disease mechanisms through studies that link immunological processes to abnormal neuronal function.

APPROACH

The group aims to discover the mechanisms of these diseases through studies examining how autoimmunity alters the structure and function of neurons and brain circuits and result in symptoms that include changes in behavior, memory, movements and seizures or progressive disability.

The research is carried out in the clinic with the participation of patients and in the laboratory. Clinical studies include neuropsychological, psychophysical, and sleep evaluations. Laboratory studies use advanced neuroimaging, molecular, immunological and electrophysiological techniques, and computational modeling.

IMPACT

The group has discovered novel autoimmune brain diseases, developed guidelines for diagnosis and treatment and has identified diagnostic and prognostic markers that enable faster diagnosis and initiation of treatment that improve patient outcomes. The group has uncovered the basic mechanisms of these diseases and produced animal models that are being used to further optimize treatment approaches.

RESEARCH LINES

- Syndromes and mechanisms of paraneoplastic and autoimmune encephalitis.

- Multiple sclerosis and other demyelinating syndromes.

- Pediatric neuroimmunologic diseases.

PUBLICATIONS

Originals

1. Jercog D, Winke N, Sung K, Fernandez MM, Francioni C, Rajot D, Courtin J, Chaudun F, Jercog PE, Valerio S, Herry C. **Dynamical prefrontal population coding during defensive behaviours.** *Nature.* 595(7869):690-694. D1

2. Li, XT; Ostropolets, A; Makadia, R; Shoaibi, A; Rao, G; Sena, AG; Martinez-Hernandez, E; Delmestri, A; Verhamme, K; Rijnbeek, PR; Duarte-Salles, T; Suchard, MA; Ryan, PB; Hripcsak, G; Prieto-Alhambra, D. **Characterising the background incidence rates of adverse events of special interest for covid-19 vaccines in eight countries: multinational network cohort study.** *BMJ-British Medical Journal.* 373. D1

3. Nosadini M; Eyre M; Molteni E; Thomas T; Irani SR; Dalmau J; Dale RC; Lim M; International NMDAR Antibody Encephalitis Consensus Group; Anlar B; Armangue T; Benseler S; Cellucci T; Deiva K; Gallentine W; Gombolay G; Gorman MP; Hacohen Y; Jiang Y; Lim BC; Muscal E; Ndondo A; Neuteboom R; Rostásy K; Sakuma H; Sartori S; Sharma S; Tenembaum SN; Van Mater HA; Wells E; Wickstrom R; Yeshokumar AK. **Use and Safety of Immunotherapeutic Management of N-Methyl-d-Aspartate Receptor Antibody Encephalitis: A Meta-analysis.** *JAMA Neurology.* 78(11):1333-1344. D1

4. Luijten LWG, Leonhard SE, van der Eijk AA, Doets AY, Appeltshauser L, Arends S, Attarian S, Benedetti L, Briani C, Casasnovas C, Castellani F, Dardiotis E, Echaniz-Laguna A, Garssen MPJ, Harbo T, Huizinga R, Humm AM, Jellema K, van der Kooi AJ, Kuitwaard K, Kuntzer T, Kusunoki S, Lascano AM, Martinez-Hernandez E, Rinaldi S, Samijn JPA, Scheidegger O, Tsouni P, Vicino A, Visser LH, Walgaard C, Wang Y, Wirtz PW, Ripellino P, Jacobs BC, IGOS consortium. **Guillain-Barré syndrome after SARS-CoV-2 infection in an international prospective cohort study.** *Brain.* 144(11):3392-3404. D1

5. de Bruijn MAAM, Bastiaansen AEM, Mojzisova H, van Sonderen A, Thijs RD, Majoie MJM, Rouhl RPW, van Coevorden-Hameete MH, de Vries JM, Muñoz Lopetegi A, Roozenbeek B, Schreurs MWJ, Sillevis Smitt PAE, Titulaer MJ, ACES Study Group. **The Antibodies Contributing to focal Epilepsy Signs and symptoms (ACES) score.** *Annals of Neurology.* 89(4):698-710. D1

6. Zrzavy T, Endmayr V, Bauer J, Macher S, Mossaheb N, Schwaiger C, Ricken G, Winklehner M, Glatter S, Breu M, Wimmer I, Kovacs GG, Risser DU, Klupp N, Simonitsch-Klupp I, Roetzer T, Rommer P, Berger T, Gelpi E, Lassmann H, Graus F, Dalmau J, Höftberger R. **Neuropathological variability within a spectrum of NMDAR-encephalitis.** *Annals of Neurology.* 90(5):725-737. D1

7. Landa, J; Guasp, M; Miguez-Cabello, F; Guimaraes, J; Mishima, T; Oda, F; Zipp, F; Krajinovic, V; Fuhr, P; Honnorat, J; Titulaer, M; Simabukuro, M; Planaguma, J; Martinez-Hernandez, E; Armangue, T; Saiz, A; Gasull, X; Soto, D; Graus, F; Sabater, L; Dalmau, J. **Encephalitis with Autoantibodies against the Glutamate Kainate Receptors GluK2.** *Annals of Neurology.* 90(1):101-117. D1

8. Martín-Aguilar L; Camps-Renom P; Lleixà C; Pascual-Goñi E; Díaz-Manera J; Rojas-García R; De Luna N; Gallardo E; Cortés-Vicente E; Muñoz L; Alcolea D; Lleó A; Casasnovas C; Homedes C; Gutiérrez-Gutiérrez G; Jimeno-Montero MC; Berciano J; Sedano-Tous MJ; García-Sobrino T; Pardo-Fernández J; Márquez-Infante C; Rojas-Marcos I; Jericó-Pascual I; Martínez-Hernández E; Morís De La Tassa G; Domínguez-González C; Illa I; Querol L. **Serum neurofilament light chain predicts long-term prognosis in Guillain-Barré syndrome patients.** *Journal of Neurology Neurosurgery and Psychiatry.* 92(1):70-77. D1

9. Petit-Pedrol M, Guasp M, Armangue T, Lavarino C, Morales La Madrid A, Saiz A, Graus F, Dalmau J. **Absence of GluD2 Antibodies in Patients With Opsoclonus-Myoclonus Syndrome.** *Neurology.* 96(7):E1082-E1087. D1

10. Yeh WZ, Widyastuti PA, Van der Walt A, Stankovich J, Havrdova E, Horakova D, Vodehnalova K, Ozakbas S, Eichau S, Duquette P, Kalincik T, Patti F, Boz C, Terzi M, Yamout BI, Lechner-Scott J, Sola P, Skibina OG, Barnett M, Onofrj M, Sá MJ, McCombe PA, Grammond P, Ampapa R, Grand'Maison F, Bergamaschi R, Spitaleri DLA, Van Pesch V, Cartechini E, Hodgkinson S, Soysal A, Saiz A, Gresle M, Uher T, Maimone D, Turkoglu R, Hupperts RM, Amato MP, Granella F, Oreja-Guevara C, Altintas A, Macdonell RA, Castillo-Trivino T, Butzkueven H, Alroughani R, Jokubaitis VG, MSBase Study Group. **Natalizumab, Fingolimod and Dimethyl Fumarate Use and Pregnancy-Related Relapse and Disability in Women With Multiple Sclerosis.** *Neurology.* 96(24):E2989-E3002. D1

11. Guasp M, Giné-Servén E, Maudes E, Rosa-Justicia M, Martínez-Hernández E, Boix-Quintana E, Bioque M, Casado V, Módena-Ouarzi Y, Guanyabens N, Muriana D, Sugranyes G, Pacchiarotti I, Davi-Loscos E, Torres-Rivas C, Ríos J, Sabater L, Saiz A, Graus F, Castro-Fornieles J, Parellada E, Dalmau J. **Clinical, Neuroimmunologic, and CSF Investigations in First Episode Psychosis.** *Neurology.* 97(1):E61-E75. D1

12. Herrero San Martin A, Amarante Cuadrado C, Gonzalez Arbizu M, Rábano-Suárez P, Ostos-Moliz F, Naranjo L, Sabater L, Martinez Hernandez E, Ruiz Garcia R, Toledo Alfocea D. **Autoimmune Septin-5 Disease Presenting as Spinocerebellar Ataxia and Nystagmus.** *Neurology.* 97(6):291-292. D1

13. Gaig C, Compta Y, Heidbreder A, Marti MJ, Titulaer MJ, Crijnen Y, Högl B, Lewerenz J, Erro ME, Garcia-Monco JC, Nigro P, Tambasco N, Patalong-Ogiewa M, Erdler M, Macher S, Berger-Sieczkowski E, Höftberger R, Geis C, Hutterer M, Milán-Tomás A, Martin-Bastida A, Manzanares LL, Quintas S, Höglinger GU, Möhn N, Schoeberl F, Thaler FS, Asioli GM, Provini F, Plazzi G, Berganzo K, Blaabjerg M, Brüggemann N, Farias T, Ng CF, Giordana C, Herrero-San Martín A, Huebra L, Kotschet K, Liendl H, Montojo T, Morata C, Perez JP, Puertas I, Seifert-Held T, Seitz C, Simabukuro MM, Tellez N, Villacieros-Álvarez J, Willekens B, Sabater L, Iranzo A, Cano JS, Dalmau J, Graus F. **Frequency and Characterization of Movement Disorders in Anti-IgLON5 Disease.** *Neurology.* 97(14):E1367-E1381. D1

14. García-Serra A, Radosevic M, Pupak A, Brito V, Ríos J, Aguilar E, Maudes E, Ariño H, Spatola M, Mannara F, Pedreño M, Joubert B, Ginés S, Planagumà J, Dalmau J. **Placental**

transfer of NMDAR antibodies causes reversible alterations in mice. *Neurology-Neuroimmunology & Neuroinflammation.* 8(1):e915. D1

15. Fernández-Velasco JI, Kuhle J, Monreal E, Meca-Lallana V, Meca-Lallana J, Izquierdo G, Gascón-Giménez F, Sainz de la Maza S, Walo-Delgado PE, Maceski A, Rodríguez-Martín E, Roldán E, Villarrubia N, Saiz A, Blanco Y, Sánchez P, Carreón-Guarnizo E, Aladro Y, Brieva L, Íñiguez C, González-Suárez I, Rodríguez de Antonio LA, Masjuan J, Costa-Frossard L, Villar LM. **Effect of Ocrelizumab in Blood Leukocytes of Patients With Primary Progressive MS.** *Neurology-Neuroimmunology & Neuroinflammation.* 8(2):e940. D1

16. Sepúlveda M, Llufriu S, Martínez-Hernández E, Català M, Artola M, Hernando A, Montejo C, Pulido-Valdeolivas I, Martínez-Heras E, Guasp M, Solana E, Llansó L, Escudero D, Aldea M, Prats C, Graus F, Blanco Y, Saiz A. **Incidence and Impact of COVID-19 in MS: A Survey From a Barcelona MS Unit.** *Neurology-Neuroimmunology & Neuroinflammation.* 8(2):e954. D1

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19. Landa, J; Guasp, M; Petit-Pedrol, M; Martinez-Hernandez, E; Planaguma, J; Saiz, A; Ruiz-Garcia, R; Garcia-Fernandez, L; Verschuuren, J; Saunders-Pullman, R; Ramirez-Gomez, L; Geschwind, MD; Dalmau, J; Sabater, L; Graus, F. **Seizure-related 6 homolog like 2 autoimmunity Neurologic syndrome and antibody effects.** *Neurology-Neuroimmunology & Neuroinflammation.* 8(1):e916. D1

20. Garcia-Serra, A; Radosevic, M; Rios, J; Aguilar, E; Maudes, E; Landa, J; Sabater, L; Martinez-Hernandez, E; Planaguma, J; Dalmau, J. **Blocking Placental Class G Immunoglobulin Transfer Prevents NMDA Receptor Antibody Effects in Newborn Mice.** *Neurology-Neuroimmunology & Neuroinflammation.* 8(6):e1061. D1

21. Guasp, M; Landa, J; Martinez-Hernandez, E; Sabater, L; Iizuka, T; Simabukuro, M; Nakamura, M; Kinoshita, M; Kurihara, M; Kaida, K; Bruna, J; Kapetanovic, S; Sanchez, P; Ruiz-Garcia, R; Naranjo, L; Planaguma, J; Munoz-Lopetegi, A; Bataller, L; Saiz, A; Dalmau, J; Graus, F. **Thymoma and Autoimmune Encephalitis Clinical Manifestations and Antibodies.** *Neurology-Neuroimmunology & Neuroinflammation.* 8(5):e1053. D1

22. Nosadini, M; Thomas, T; Eyre, M; Anlar, B; Armangue, T; Benseler, SM; Cellucci, T; Deiva, K; Gallentine, W; Gombolay, G; Gorman, MP; Hacohen, Y; Jiang, YW; Lim, BC; Muscal, E; Ndondo, A; Neuteboom, R; Rostasy, K; Sakuma, H; Sharma, S; Tenembaum, SN; Van Mater, HA; Wells, E; Wickstrom, R; Yeshokumar, AK; Irani, SR; Dalmau, J; Lim, M; Dale, RC. **International Consensus Recommendations for the Treatment of Pediatric NMDAR Antibody Encephalitis.** *Neurology-Neuroimmunology & Neuroinflammation.* 8(5):e1052. D1

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26. Marin-Campos R; Dalmau J; Compte A; Linares D. **StimuliApp: Psychophysical tests on mobile devices.** *Behavior Research Methods.* 53(3):1301-1307. D1

27. Ruiz-Garcia, R; Munoz-Sanchez, G; Naranjo, L; Guasp, M; Sabater, L; Saiz, A; Dalmau, J; Graus, F; Martinez-Hernandez, E. **Limitations of a Commercial Assay as Diagnostic Test of Autoimmune Encephalitis.** *Frontiers in Immunology.* 12:691536. Q1

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31. Capuano R, Zubizarreta I, Alba-Arbalat S, Sepulveda M, Sola-Valls N, Pulido-Valdeolivas I, Andorra M, Martinez-Heras E, Solana E,

Lopez-Soley E, Montejo C, Blanco Y, Fernández-Velasco JI, Gallo A, Bisecco A, Villoslada P, Saiz A, Llufriu S, Villar LM, Martinez-Lapiscina EH. **Oligoclonal IgM bands in the cerebrospinal fluid of patients with relapsing MS to inform long-term MS disability.** *Multiple Sclerosis Journal.* 27(11):1706-1716. Q1

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33. Silva C, Iranzo A, Maya G, Serradell M, Muñoz-Lopetegi A, Marrero-González P, Gaig C, Santamaría J, Vilaseca I. **Stridor during sleep: description of 81 consecutive cases diagnosed in a tertiary sleep disorders center.** *Sleep.* 44(3):zsaa191. Q1

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35. Guasp M, Molina-Porcel L, Painous C, Caballol N, Camara A, Perez-Soriano A, Sánchez-Gómez A, Garrido A, Muñoz E, Marti MJ, Valldeoriola F, Grau O, Gelpi E, Respondek G, Höglinger GH, Compta Y. **Association of PSP phenotypes with survival: A brain-bank study.** *Parkinsonism & Related Disorders.* 84:77-81. Q1

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37. Conde-Blanco E, Pascual-Diaz S, Carreño M, Muñoz-Moreno E, Pariente JC, Boget T, Manzanares I, Donaire A, Centeno M, Graus F, Bargalló N. **Volumetric and shape analysis of the hippocampus in temporal lobe epilepsy with GAD65 antibodies compared with non-immune epilepsy.** *Scientific Reports.* 11(1):10199. Q1

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39. Fàbregas N, Valencia JF, Belda I, Tercero A, Hervias A, Villafuerte S, Gambús PL, Carreño M, Valero R. **Bilateral Bispectral Index Monitoring Performance in the Detection of Seizures in Nonanesthetized Epileptic Patients: An Observational Study.** *Journal of Neurosurgical Anesthesiology.* Q1

40. Roura E, Maclair G, Andorrà M, Juanals F, Pulido-Valdeolivas I, Saiz A, Blanco Y, Sepulveda M, Llufriu S, Martínez-Heras E, Solana E, Martinez-Lapiscina EH, Villoslada P. **Cortical fractal dimension predicts disability worsening in Multiple Sclerosis patients.** *Neuroimage-Clinical.* 30:102653. Q2

41. Solanes, A; Laredo, C; Guasp, M; Fullana, MA; Fortea, L; Garcia-Olive, I; Solmi, M; Shin, JI; Urra, X; Radua, J. **No Effects of Meteorological Factors on the SARS-CoV-2 Infection Fatality Rate.** *Biomedical and Environmental Sciences.* 34(11):871-880. Q2

42. Vide S, Castro A, Correia R, Cabral T, Lima D, Nunes CS, Gambús P, Amorim P. **Foreseeing postoperative pain in neurosurgical patients: pupillometry predicts postoperative pain ratings-an observational study.** *Journal of Clinical Monitoring and Computing.* 35(5):1111-1118. Q3

Review

1. Fadda G; Armangue T; Hacohen Y; Chitnis T; Banwell B. **Paediatric multiple sclerosis and antibody-associated demyelination: clinical, imaging, and biological considerations for diagnosis and care.** *Lancet Neurology.* 20(2):136-149. D1

2. Papp V, Magyari M, Aktas O, Berger T, Broadley SA, Cabre P, Jacob A, Kira JI, Leite MI, Marignier R, Miyamoto K, Palace J, Saiz A, Sepulveda M, Sveinsson O, Illes Z. **Worldwide incidence and prevalence of NMO: A systematic review.** *Neurology.* 96(2):59-77. D1

3. Sneyd JR; Gambus PL; Rigby-Jones AE. **Current status of perioperative hypnotics, role of benzodiazepines, and the case for remimazolam: a narrative review.** *British Journal of Anaesthesia.* 127(1):41-55. D1

4. Giné Servén E; Boix Quintana E; Martínez Ramírez M; Guanyabens Buscà N; Muriana Batiste D; Guasp M; Torres Rivas C; Davi Loscos E; Casado Ruiz V. **Cycloid psychosis as a psychiatric expression of anti-NMDAR encephalitis. A systematic review of case reports accomplished with the authors' cooperation.** *Brain and Behavior.* 11(2):e01980. Q3

5. Hutchinson ML; Yeshokumar AK; Armangue T. **Antibody-Mediated Encephalitis in Children: Focus on Diagnostic Clues and Acute Symptom Management.** *Seminars in Pediatric Neurology.* 37:100873. Q3

Letters

1. Balint B, Bhatia KP, Dalmau J. **"Antibody of Unknown Significance" (AUS): The Issue of Interpreting Antibody Test Results.** *Movement Disorders.* 36(7):1543-1547. D1

2. Balint B, Bhatia KP, Dalmau J. **Reply to: Comparing VUS and AUS: Parallels and Differences in Neurogenetics and Neuroimmunology.** *Movement Disorders.* 36(10):2454-2456. D1

3. Dalmau, J; Guasp, M; Graus, F. **Author Response: Clinical, Neuroimmunologic, and CSF Investigations in First Episode Psychosis.** *Neurology.* 97(21):1010. D1

4.Graus F; Dalmau J. **Autoimmune encephalitis or autoimmune psychosis?** *European Neuropsychopharmacology.* 50:112-114. Q2

5.Baldaquí N, Anmella G, Gómez-Ramiro M, Guasp M, Mesa A, Parellada E. **Thyrotoxic Psychosis Associated With Amiodarone.** *Journal of Clinical Psychopharmacology.* 41(3):342-344. Q3

Editorial

1. Graus F. **Towards a better recognition of paraneoplastic brainstem encephalitis.** *Journal of Neurology Neurosurgery and Psychiatry.* 92(11):1141. D1

2. Dalmau J, Dalakas MC, Kolson DL, Paul F, Zamvil SS . **N2 year in review.** *Neurology-Neuroimmunology & Neuroinflammation.* 8(1):e925. D1

Case Reports

1. Munoz-Lopetegi, A; Pujol, M; Gimenez, M; Gaig, C; Brieva, L; Santamaria, J. **Abnormal sleep behavior caused by hypoglycemia.** *Sleep Medicine.* 85:268-270. Q2

GRANTS FOR RESEARCH IN PROGRESS

Armangué T. **Factores predictores y patogénicos de las encefalopatías autoinmunes post-encefalitis herpética.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00486
Duration: 01/01/2019-30/06/2023

Armangué T. **Nuevos biomarcadores y anticuerpos involucrados en enfermedades desmielinizantes en la edad pediátrica.**
Sponsored by: Fundación Española de Pediatría. AEP_PROYECTOS21_01
Duration: 15/11/2021-14/11/2023

Armangué T. **Opsoclonus myoclonus syndrome: a novel approach to antigen identification and disease modeling.**
Sponsored by: Pablove Foundation. INT_PabloveF_19
Duration: 01/08/2020-31/07/2021

Castro-Fornieles J, Compte A, Dalmau J, de la Rocha J, Graus F, Santamaria J. **Inmune-mediated diseases of the synapse: symptoms, brain networks, and the link to human memory.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PIE16/00014
Duration: 01/01/2017-30/06/2021

Dalmau J. **Clinical and Experimental Neuroimmunology Group.**
Sponsored by: Generalitat de Catalunya. AGAUR_SGR17_00266
Duration: 01/01/2017-30/09/2021

Dalmau J. **Alteracions de la memòria espacial en ratolins mitjançant immunoablació de circuits d'hipocamp dependents del receptor NMDA.**
Sponsored by: Generalitat de Catalunya. AGAUR_FI18_B00620
Duration: 01/06/2018-31/10/2021

Dalmau J. **A Translational Model of Antibody-mediated Synaptic Disease: Symptoms, Neuronal Circuits, and the Mechanisms of Memory Loss and Recovery.**
Sponsored by: Fundació Bancaria "La Caixa". HealthRes17-00149
Duration: 31/12/2018-31/12/2022

Dalmau J. **Investigaciones en la encefalitis anti-NMDAR: nuevo test diagnóstico, papel de la inflamación en un modelo animal, y modulación alostérica de NMDAR como estrategia terapéutica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00197
Duration: 01/01/2021-31/12/2023

Dalmau J. **Multi-scale exploration of autoantibodies against synaptic receptors.**
Sponsored by: European Commission and Instituto de Salud Carlos III (ISCIII). CE_ERA-Net_NEURON_18 and AC18/00009
Duration: 01/01/2019-30/06/2023

Dalmau J. **Subclinical activity in anti-LGI1 encephalitis: diagnostic test and prognostic implications.**
Sponsored by: Autoimmune Encephalitis Alliance. INT_AEA_CSG_20_01
Duration: 01/07/2021-30/06/2022

Gambús P. **Sistema de monitorización basado en modelos predictivos como estrategia para el control óptimo e individualizado de la sedación en pacientes.**
Sponsored by: Universidad de San Buenaventura Cali. INT_COLCIENCIAS_18
Duration: 31/01/2019-31/01/2022

Jercog P. **Decodificando la representación neuronal de la memoria de reglas en condiciones normales y de amnesia.**
Sponsored by: Agencia Estatal de Investigación. AEI_PID2019-110427RB-I00
Duration: 01/06/2020-31/05/2023

Martínez-Hernández E. **Un nuevo modelo in vitro para estudiar las encefalitis autoinmunes.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00820
Duration: 01/01/2021-31/12/2023

Planagumà J. **Investigaciones sobre la transferencia transplacental de anticuerpos en sinaptopatías autoinmunes.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00280
Duration: 01/01/2021-31/12/2023

Sabater L, Gaig C. **Estudio de la enfermedad por anticuerpos IgLON5 e implicación en los mecanismos de neurodegeneración.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00067
Duration: 01/01/2019-21/12/2021

Saiz A. **Eficàcia i efectes adversos neurològics de la vacunació contra la COVID-19 en pacients immunodeprimits per l'esclerosi múltiple.**
Sponsored by: Fundació la Marató de TV3. COVID19_21
Duration: 23/09/2021-22/09/2023

Saiz A. **Red Temática de Investigación Cooperativa en Salud - Esclerosis múltiple.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_RD16/0015/0002
Duration: 01/01/2017-31/12/2021

Saiz A, Llufriu S. **Rehabilitación cognitiva y plasticidad cerebral en la Esclerosis Múltiple: en búsqueda de la evidencia.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/01030
Duration: 01/01/2019-31/12/2021

DOCTORAL THESES

Dalmau J. **Investigations in animal models of anti-NMDAR encephalitis.**
PhD student: Anna Garcia Serra

Saiz A, Blanco Y. **Aplicaciones de telemedicina en el seguimiento clínico de pacientes con enfermedades autoinmunes del sistema nervioso central.**
PhD student: Nuria Sola Valls

Saiz A, Graus F. **Caracterización clínica y biológica de la neuromielitis óptica, e identificación de factores pronósticos.**
PhD student: Maria Sepulveda Gazquez

4.8 Cortical circuit dynamics

LOCATION
Edifici Rostower
C/ Urgell 204

KEYWORDS
1. **Decision-making**
2. **Working memory**

RELATED DISEASES
1. **Anti-NMDAR encephalitis**
2. **Schizophrenia**

Original publications

TOTAL	4
Mean IF	**11,73**
Q1	**100%**
D1	**100%**
MA	**50%**
OA	**75%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Cognitive deficits are common in mental disorders. Nonetheless, there is no cognitive test sensitive enough to establish a precise classification and quantification of such deficits, which would make it possible to obtain an effective diagnosis.

The vast majority of the neural bases of these deficits are still unknown, mainly because the underlying neural mechanisms of most of the cognitive functions of the healthy brain are not properly understood. For this reason, it is essential to design new behavioural assays for use in both animal models and patients, to investigate the underlying neural mechanisms and develop efficient therapies.

APPROACH

The group studies the way in which cognitive functions such as perception, working memory, and decision-making emerge from different neural circuits. To do this, we performed controlled behavioural experiments with rodents in which we record and manipulate their electrophysiological brain activity.

In addition, the group uses a wide range of analytical and computational techniques, including behavioural and network models, and applies this approach to characterise the underlying mechanisms of those cognitive deficits normally present in neurological disorders, such as anti-NMDAR encephalitis and schizophrenia.

IMPACT

In recent years, the group has conducted diverse behavioural studies on rodents to investigate the mechanisms underlying perceptual decisions decisions based on ambiguous sensory information and previous experience, including a description of the role of the different areas of the brain in performing the computations inherent to this task.

Furthermore, the group investigates the neural bases of working memory in mice during automated behavioural tasks combined with monitoring neural activity, and applies such tasks in animal models of different mental disorders.

RESEARCH LINES

- The dynamics of sensory evidence integration during perceptual decision making.

- The neural circuitry of Working Memory (WM): memory interference and disease-mediated deficits.

- The neural circuitry of expectation during decision making tasks.

PUBLICATIONS

Originals

1. Prat-Ortega G; Wimmer K; Roxin A; de la Rocha J. **Flexible categorization in perceptual decision making.** *Nature Communications.* 12(1):1283. D1

2. Hernández-Navarro L, Hermoso-Mendizabal A, Duque D, de la Rocha J, Hyafil A. **Proactive and reactive accumulation-to-bound processes compete during perceptual decisions.** *Nature Communications.* 12(1):7148. D1

3. Andraka K; Kondrakiewicz K; Rojek-Sito K; Ziegart-Sadowska K; Meyza K; Nikolaev T; Hamed A; Kursa M; Wójcik M; Danielewski K; Wiatrowska M; Kublik E; Bekisz M; Lebitko T; Duque D; Jaworski T; Madej H; Konopka W; Boguszewski PM; Knapska E. **Distinct circuits in rat central amygdala for defensive behaviors evoked by socially signaled imminent versus remote danger.** *Current Biology.* 31(11):2347-2358.e6. D1

4. Marin-Campos R; Dalmau J; Compte A; Linares D. **StimuliApp: Psychophysical tests on mobile devices.** *Behavior Research Methods.* 53(3):1301-1307. D1

Review

1. Yang GR; Molano-Mazón M. **Towards the next generation of recurrent network models for cognitive neuroscience.** *Current Opinion In Neurobiology.* 70:182-192. Q1

GRANTS FOR RESEARCH IN PROGRESS

Castro-Fornieles J, Compte A, Dalmau J, de la Rocha J, Graus F, Santamaria J. **Inmune-mediated diseases of the synapse: symptoms, brain networks, and the link to human memory.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PIE16/00014
Duration: 01/01/2017-30/06/2021

De la Rocha J. **La dinámica de los circuitos neuronales durante la toma de decisiones perceptuales.**
Sponsored by: Ministerio de Economía y Competitividad. MINECO_BES-2016-078021
Duration: 30/05/2017-08/07/2023

De la Rocha J. **Los mecanismos neuronales responsables de la generación de sesgos en decisiones pereptuales y basadas en la memoria.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_R-TI2018-099750-B-I00
Duration: 01/01/2019-30/06/2022

De la Rocha J. **Un ensayo de biomarcadores neurocomputacionales para la esquizofrenia basados en el desbalance E/I.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_AC19/00147
Duration: 01/01/2020-31/12/2022

De la Rocha J. **Neural circuit dynamics underlying expectation and their impact on the variability of perceptual choices.**
Sponsored by: European Commission. CE_H2020-ERC-2015_Co
Duration: 01/09/2016-28/02/2022

De la Rocha J. **A neurocomputational biomarker assay for schizophrenia based on E/I-balance.**
Sponsored by: European Commission and Instituto de Salud Carlos III (ISCIII). CE_ERA-Net_NEURON_19 and AC19/00147
Duration: 11/03/2019-11/03/2022

DOCTORAL THESES

De la Rocha J, Compte A. **When Working Memory fails: mechanisms underlying memory accuracy and errors.**
PhD student: Tiffany Oña Jodar

4.9 Neurophysiology

LOCATION
UB Medical School

KEYWORDS
1. **Pain**
2. **Itch**
3. **Sensory neurons**
4. **Ion channels**
5. **Glutamate receptors**
6. **GRINpathies**
7. **Ocular pain**
8. **Microglia**

RELATED DISEASES
1. **Chronic pain**
2. **Itch**
3. **Neurodegenerative diseases**
4. **Mental retardation**
5. **Ocular diseases**
6. **Alzheimer's disease**
7. **Channelopathies**
8. **Developmental encephalopathies**

GROUP INVOLVED IN
AGAUR_SGR17: 00737
RETIC Oftared

Original publications

TOTAL	9
Mean IF	**7,01**
Q1	**89%**
D1	**22%**
MA	**44%**
OA	**89%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Chronic or genetic diseases alter the role of neurons and glial cells, including alterations in their excitability and connectivity, which contribute to chronic pain and itch, mental retardation or other neurological disorders, including neurodegenerative diseases. However, most of the underlying mechanisms remain unknown. In order to develop the most appropriate and effective drugs and treatments, it is necessary to unravel the molecular and functional basis of such alterations and identify the specific proteins and signalling pathways that may be the most adequate therapeutic targets.

APPROACH

The group is interested in understanding the molecular and functional bases of neuronal excitability, neuron-glia crosstalk and communication between neurons in normal and pathological conditions.

In sensory neurons, we study which ion channels and receptors participate in the detection of painful and itchy stimuli, and how they are regulated during chronic pain and itch. In glutamatergic neurotransmission, we study the glutamate receptors and their regulatory proteins, as well as the functional consequences of de novo mutations altering ionotropic glutamate receptors.

Finally, another research line of our group is studying the role of neuron-microglia crosstalk in synaptic and neuronal deficits in neurodegenerative diseases and other neurological disorders.

IMPACT

Our several ongoing projects investigate the molecular mechanisms underlying the alterations of membrane receptors or ion channels and their contribution to neurologic diseases, from migraine pain to chronic itch and not just neurotransmitter receptors, from developmental encephalopathies (e.g. GRIN-related disorders) to neurodegeneration.
As part of this quest, we have:

- Identified a family of potassium channels in sensory neurons that regulate electrical activity and whose alteration is associated with neuropathic or migraine pain.

- Identified different factors that regulate microglial phagocytosis of neurons and synapses in neurodegeneration.

- Comprehensively delineated GRIN-related disorders, and developed pioneer personalised treatments (i.e. preclinical and clinical trial) for this rare developmental encephalopathy.

Besides understanding the molecular mechanisms involved in the different neurological disorders abovementioned, our goal is to identify and validate specific molecular targets and develop new specific drugs that could open new therapeutic avenues for the treatment of different neurological disorders.

RESEARCH LINES

- Glutamatergic signalling: functional interaction between AMPARs, auxiliary subunits and novel interacting proteins.

- Pathophysiology of the NMDAR receptor and personalised medicine for GRIN-related disorders.

- Ocular physiology: dry eye physiopathology and sensory neurons on the ocular surface. Pathophysiology of the drainage of aqueous humour and the physiopathology of glaucoma.

- Physiology and pathophysiology of pain and chronic itch. Study of the ion channels involved in neuronal excitability in the sensory nervous system.

- Traffic and regulation of K+ and Cl- channels in cell physiology. Interaction with proteins and membrane lipids.

- Microglia-neuron crosstalk in health and disease.

- N-glycosilation channelopathies and synaptic function.

PUBLICATIONS

Originals

1. Landa, J; Guasp, M; Miguez-Cabello, F; Guimaraes, J; Mishima, T; Oda, F; Zipp, F; Krajinovic, V; Fuhr, P; Honnorat, J; Titulaer, M; Simabukuro, M; Planaguma, J; Martinez-Hernandez, E; Armangue, T; Saiz, A; Gasull, X; Soto, D; Graus, F; Sabater, L; Dalmau, J. **Encephalitis with Autoantibodies against the Glutamate Kainate Receptors GluK2.** *Annals of Neurology.* 90(1):101-117. D1

2. Nalpas, N; Hoyles, L; Anselm, V; Ganief, T; Martinez-Gili, L; Grau, C; Droste-Borel, I; Davidovic, L; Altafaj, X; Dumas, ME; Macek, B. **An integrated workflow for enhanced taxonomic and functional coverage of the mouse fecal metaproteome.** *Gut Microbes.* 13(1):1994836. D1

3. Puigdellívol M; Milde S; Vilalta A; Cockram TOJ; Allendorf DH; Lee JY; Dundee JM; Pampuščenko K; Borutaite V; Nuthall HN; Brelstaff JH; Spillantini MG; Brown GC. **The microglial P2Y6 receptor mediates neuronal loss and memory deficits in neurodegeneration.** *Cell Reports.* 37(13):110148. Q1

4. Santos-Gómez A, Miguez-Cabello F, García-Recio A, Locubiche-Serra S, García-Díaz R, Soto-Insuga V, Guerrero-López R, Juliá-Palacios N, Ciruela F, García-Cazorla À, Soto D, Olivella M, Altafaj X. **Disease-associated GRIN protein truncating variants trigger NMDA receptor loss-of-function.** *Human Molecular Genetics.* 29(24):3859-3871. Q1

5. Alonso-Gardón M, Elorza-Vidal X, Castellanos A, La Sala G, Armand-Ugon M, Gilbert A, Di Pietro C, Pla-Casillanis A, Ciruela F, Gasull X, Nunes V, Martínez A, Schulte U, Cohen-Salmon M, Marazziti D, Estévez R. **Identification of the GlialCAM interactome: The G protein-coupled receptors GPRC5B and GPR37L1 modulate Megalencephalic leukoencephalopathy proteins**. *Human Molecular Genetics.* 30(17):1649-1665. Q1

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GRANTS FOR RESEARCH IN PROGRESS

Altafaj X. **Comprehensive delineation and personalised medicine of GRIN-related neurodevelopmental disorders, a rare paediatric encephalopathy.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00348
Duration: 28/10/2020-31/12/2022

Altafaj X. **Mutaciones de los receptores NMDA asociadas a trastornos del neurodesarrollo: impacto patofisiológico y farmacoterapia personalizada.**
Sponsored by: Fundación Tatiana Pérez de Guzmán el Bueno. FUNDTATPG_BEC17_01
Duration: 01/12/2020-26/11/2022

Gasull X. **Red Temática de Investigación Cooperativa en Salud - Enfermedades oculares.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_RD16/0008/0014
Duration: 01/01/2017-31/12/2021

Gasull X. **Bases neurofisiológicas del picor y dolor crónico: canales iónicos en neuronas sensoriales implicados en enfermedades inflamatorias y oculares.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00296
Duration: 01/01/2018-31/12/2021

Gasull X, Comes N. **Neuronas sensoriales no peptidérgicas en la percepción de modalidades somatosensoriales específicas: mecanismos del dolor por el fríoy el picor ocular.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades.
MCIU_PID2020-119305RB-I00
Duration: 01/09/2021-31/08/2024

Gasull X. **DATAETHICS. Strategic Partnership for Higher Education.**
Sponsored by: European Commission.
CE_ERASMUS+_20
Duration: 01/01/2020-31/12/2022

Gasull X. **Innovative Training Network (ITN)-EU. Molecule-to-man pain network (PAIN-Net).**
Sponsored by: European Commission.
H2020-MSCA-ITN-2016
Duration: 29/06/2020-31/07/2021

Soto D. **Fisiologia de interactores de receptores AMPA (TARPs y CPT1C) en neuronas y glía.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades.
MCIU_PID2020-119932GB-I00
Duration: 01/09/2021-31/08/2025

DOCTORAL THESES

Gasull X. **Enhanced recording paradigms and advanced analyses of peripheral nerve fibers.**
PhD student: Federico Ponente

Soto D, Vázquez Cruz S. **Antagonistas de receptores ionotrópicos como potenciales terapias en la enfermedad de alzheimer.**
PhD student: Andrea Larisa Turcu

Soto D, Altafaj X. **New insights into ionotropic glutamate receptors in physiological and pathological conditions.**
PhD student: Federico Javier Miguez Cabello

Soto D, Altafaj X. **NMDA receptor mutations associated with neurodevelopmental disorders: pathophysiological impact and personalized pharmacotherapy.**
PhD student: Ana Santos Gómez

4.10 Muscular research and mitochondrial function

LOCATION

CELLEX building, floor 4B
University of Barcelona,
School of Medicine and Health Sciences

KEYWORDS

1. **Muscle**
2. **Mitochondria**
3. **Cardiomyopathy**
4. **Chronic fatigue syndrome**
5. **Septic shock**

RELATED DISEASES

1. **Myositis**
2. **Mitochondrial disorders**
3. **Cardiomyopathies**
4. **Central sensitization syndrome**
5. **Sepsis**

GROUP INVOLVED IN

AGAUR_SGR17: 00893
AGAUR_XARDI18: 00011
CARDIONET
CIBERER
CIBEROBN
METNET
XUEC

Original publications

TOTAL	50
Mean IF	**6,14**
Q1	**72%**
D1	**38%**
MA	**12%**
OA	**70%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Muscles and mitochondria (cell organelles that supply energy to cells), are involved in the appearance and development of relatively common illnesses but also numerous rare disorders.

Especially prevalent are adult muscle diseases, mitochondrial dysfunctions (responsible for many syndromes), cardiomyopathy in chronic alcoholic patients, chronic fatigue syndrome or fibromyalgia (of growing prevalence) and septic shock, which is an important cause of death in intensive care units.

APPROACH

The group works, above all, with muscle diseases and mitochondrial dysfunctions. In relation to muscle pathology, we attend patients from other hospitals and primary care centres, we also develop diagnostic protocols (beta-oxidation, dried blood spot, antibodies, imaging, muscular biopsies, biochemistry and genetic testing, among others) and we collaborate with other centres (such as the Vall d'Hebron hospital, Sant Joan de Deu and the Johns Hopkins University) in the development of collaborative databases or registries, therapeutic strategies, and the identification of biomarkers.

In relation to mitochondrial pathology, we study bioenergetics in depth (respiration, genetic studies, oxidative stress etc.) and identify patients and groups with mitochondrial dysfunction.

We also perform the diagnosis of primary mitochondrial diseases to the Hospital Clinic of Barcelona and participate in the assistance of these and other adult patients with inherited metabolic diseases from the XUEC we coordinate with the paediatric Hospital Sant Joan de Deu.

Parallel interests are focused in the research of the etiologic base, biomarkers and therapeutic targets for the onset and progression of cardiomyopathy, chronic fatigue syndrome and sepsis.

IMPACT

The lines of research we promote have allowed the group to develop an accurate protocol to diagnose, treat and monitor adult patients with muscle and metabolic diseases.

It has also been able to describe the biochemistry and genetics of primary and secondary mitochondrial dysfunction problems in patients and in terms of research; to unequivocally demonstrate the mechanisms responsible for the toxicity of chronic alcohol consumption on the heart, the bases for chronic fatigue or fibromyalgia diagnosis and

management and to identify prognostic factors in sepsis, as well as to design a treatment algorithm.

RESEARCH LINES

- Adult myopathies.

- Mitochondrial and metabolic diseases, either primary (rare diseases) or secondary (usually more prevalent).

- Alcohol consumption and cardiomyopathy.

- Chronic fatigue syndrome risk factors.

- Septic shock anb multiorgan dysfunction.

PUBLICATIONS

Originals

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Letters

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Case Reports

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3. Martínez-Vila C, Laguna JC, Segui E, Ruiz G, Aya Moreno F, Fernandez-Morales LM, Giner Joaquim J, Padrosa J, Fernandez L, Gaba L, Victoria I, Arance Fernandez AM. **Encephalitis Associated With Immune Checkpoint Inhibitor Treatment in Patients With Melanoma.** *Journal of Immunotherapy.* 44(5):204-207. Q2

Consortium Publications

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8. Castaneda, X; Garcia-De-la-Maria, C; Gasch, O; Pericas, JM; Soy, D; Canas-Pacheco, MA; Falces, C; Garcia-Gonzalez, J; Hernandez-Meneses, M; Vidal, B; Almela, M; Quintana, E; Tolosana, JM; Fuster, D; Llopis, J; Dahl, A; Moreno, A; Marco, F; Miro, JM; Hospital Clínic Endocarditis Study Group. **Effectiveness of vancomycin plus cloxacillin compared with vancomycin, cloxacillin and daptomycin single therapies in the treatment of methicillin-resistant and methicillin-susceptible Staphylococcus aureus in a rabbit model of experimental endocarditis.** *Journal of Antimicrobial Chemotherapy.* 76(6):1539-1546. Q1

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11. Mellado-Artigas R, Mujica LE, Ruiz ML, Ferreyro BL, Angriman F, Arruti E, Torres A, Barbeta E, Villar J, Ferrando C, COVID-19 Spanish ICU Network. **Predictors of failure with high-flow nasal oxygen therapy in COVID-19 patients with acute respiratory failure: a multicenter observational study.** *Journal of Intensive Care.* 9(1):23. Q2

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13. Pericas JM; Cucchiari D; Torrallardona-Murphy O; Calvo J; Serralabos J; Alves E; Agelet A; Hidalgo J; Alves E; Castells E; Seijas N; Hernandez C; Bodro M; Cardozo C; Coloma E; Nicolas D; Hosp Clinic

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15. Cobo T, Aldecoa V, Bartha JL, Bugatto F, Paz Carrillo-Badillo M, Comas C, Diago-Almeda V, Ferrero S, Goya M, Herraiz I, Martí-Malgosa L, Olivella A, Paulés C, Vives À, Figueras F, Palacio M, Gratacós E, OPTIM-PTL group. **Assessment of an intervention to optimise antenatal management of women admitted with preterm labour and intact membranes using amniocentesis-based predictive risk models: study protocol for a randomised controlled trial (OPTIM-PTL Study).** *BMJ Open*. 11(9):e054711. Q2

GRANTS FOR RESEARCH IN PROGRESS

Cardellach F. **Biomarcadores de utilidad pronóstica y terapéutica en el crecimiento intrauterino restringido y el remodelado cardiovascular fetal asociado.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00451
Duration: 01/01/2019-30/06/2023

Cuzco C. **Impacto de una intervención enfermera centrada en el empoderamiento del paciente crítico al alta de la unidad de cuidados intensivos.**
Sponsored by: Fundació Infermeria i Societat. COIB_PR-248/17
Duration: 01/01/2018-31/12/2021

Garrabou G, Grau JM. **Miositis por cuerpos de inclusión esporádica: desarrollo de nuevos modelos celulares para la identificación de biomarcadores y estrategias terapéuticas.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00498
Duration: 01/01/2019- 30/06/2023

Grau JM. **Phenylketonuria: from chilhood to adults through brain functonal conectomics, cardiovascular changes, metabolomic and intestinal microbiota characteristics.**
Sponsored by: Fundació la Marató de TV3. Minoritaries_20
Duration: 20/05/2021-19/05/2024

4.11 Clinical neurophysiology

LOCATION
HCB building

KEYWORDS
1. **Neurophysiology**
2. **Sleep**
3. **Neuropathic pain**
4. **Motor control and sensorimotor integration**
5. **Epilepsy**

RELATED DISEASES
1. **Sleep disorders**
2. **Epilepsy**
3. **Neuropathic pain**
4. **Dysautonomia**
5. **Coma**
6. **ANTI-IGLON5 disease**
7. **Neuromuscular disorders**

GROUP INVOLVED IN
CIBERNED

Original publications

TOTAL	39
Mean IF	**5,86**
Q1	**59%**
D1	**15%**
MA	**44%**
OA	**67%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Very little is known about the physiological bases of the functioning of the nervous system and the pathophysiology of its diseases, such as sleep disorders, coma, epilepsy, neuropathic pain or dysautonomia (the abnormal functioning of the autonomous nervous system).

This makes it difficult for patients with diseases of the nervous system to find drugs or other therapeutic alternatives that will cure them or significantly improve their quality of life. Although we have a considerable amount of clinical, neurophysiological and basic knowledge of the nervous system and its diseases at our disposal, it continues to be insufficient.

APPROACH

The group evaluates the neurophysiological study of nervous system disorders, from the most basic level to clinical practice, including sleep disorders, epilepsy, chronic pain, coma and dysautonomic alterations.

Patients are studied with electrophysiological techniques such as EEG, overnight polysomnography, multiple audio latencies, somatosensory and nociceptive-evoked potentials, electromyogram, autonomic and trunk reflexes and the startle reaction (the body's response to being startled).

IMPACT

The group's research has led to the discovery of a new nervous system disorder (anti-IgLON5 disease), characterised by a triad consisting of a complex sleep disorder, cerebral protein antibodies and tauopathy (accumulation of Tau proteins) in the brain.

This has made it possible to: demonstrate that REM phase sleep disorder is a predictor for Parkinson's disease, provide surgical and pharmacological solutions for epilepsy, describe the pathophysiological bases of neuropathic pain and demonstrate that the subcortical motor systems participate in the execution of movements and position.

RESEARCH LINES

- Epilepsy.
- Motor control.
- Neuropathic pain.
- Sleep and sleep disorders.

PUBLICATIONS

Originals

1. Iranzo A, Fairfoul G, Ayudhaya ACN, Serradell M, Gelpi E, Vilaseca I, Sanchez-Valle R, Gaig C, Santamaria J, Tolosa E, Riha RL, Green AJE. **Detection of α-synuclein in CSF by RT-QuIC in patients with isolated rapid-eye-movement sleep behaviour disorder: a longitudinal observational study.** *Lancet Neurology.* 20(3):203-212. D1

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23. Oltra J, Campabadal A, Segura B, Uribe C, Marti MJ, Compta Y, Valldeoriola F, Bargallo N, Iranzo A, Junque C. **Disrupted functional connectivity in PD with probable RBD and its cognitive correlates.** *Scientific Reports.* 11(1):24351. Q1

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26. Villanueva V; Sánchez-Álvarez JC; Carreño M; Salas-Puig J; Caballero-Martínez F; Gil-Nagel A. **Initiating antiepilepsy treatment: An update of expert consensus in Spain.** *Epilepsy & Behavior.* 114(A):107540. Q2

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31. Sanchez-Larsen A; Conde-Blanco E; Viloria-Alebesque A; Sánchez-Vizcaíno Buendía C; Espinosa Oltra T; Alvarez-Noval A; Aledo-Serrano A; Martin-Garcia R; Ramos-Araque ME; Campos D; Valle-Peñacoba G; Sierra-Gómez A; De Ceballos-Cerrajería P; Agundez-Sarasola M; Khawaja M; Hampel KG; Serra-Martínez M; Arbós-Barber C; Gómez-Ibáñez A; Villino-Boquete R; Cabezudo-García P; Rodríguez-Lavado I; Principe A; Sopelana-Garay D. **COVID-19 prevalence and mortality in people with epilepsy: A nation-wide multicenter study.** *Epilepsy & Behavior.* 125:108379. Q2

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Review

1. Campabadal A, Segura B, Junque C, Iranzo A. **Structural and functional magnetic resonance imaging in isolated REM sleep behavior disorder: A systematic review of studies using neuroimaging software.** *Sleep Medicine Reviews.* 59:101495. D1

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Letters

1. Cámara A, Compta Y, Pérez-Soriano A, Montagut N, Baixauli M, Maragall L, Ludeña E, Lopez de Los Reyes JC, Peri-Cusi L, Fernández N, Villote S, Ahuir M, Grau A, Caballol N, Buongiorno M, Pont-Sunyer C, Puente V, Giraldo DM, de Fabregues O, Garrido A, Navarro-Otano J, Painous C, Sánchez-Gómez A, Muñoz E, Zaro I, Obiang D, Valldeoriola F, Lombraña M, Martí MJ. **Effects of COVID -19 pandemic and lockdown on people with multiple system atrophy participating in a therapeutic education program.** *Parkinsonism & Related Disorders.* 86:78-80. Q1

2. Kumru H, Kofler M, Valls-Sole J. **Modulation of brainstem reflexes induced by non-invasive brain stimulation: is there a future?** *Neural Regeneration Research.* 16(10):2004-2005. Q2

3. Iranzo A. **REM sleep behavior disorder, a parasomnia that predicts Parkinson disease and dementia with Lewy bodies.** *European Neuropsychopharmacology.* 46:52-53. Q2

4. Iranzo A, Santamaría J. **Did inspector Kurt Wallander develop dementia with Lewy bodies?** *Sleep Medicine.* 78:36-37. Q2

Editorial

1. Arnold AC; Navarro-Otano J. **Orthostatic leg pain in neuropathic postural tachycardia syndrome: what does muscle excitability have to do with it?** *Clinical Autonomic Research.* 31(6):651-653. Q2

2. Valls-Sole J. **Prepulse inhibition on the spot.** *Clinical Neurophysiology.* 132(10):2679-2680. Q2

Case Reports

1. Villacieros-Álvarez J, Ordás CM, Torres-Gaona G, Díez-Barrio A, Prieto-Jurczynska C, Gaig C. **Teaching Video NeuroImages: Anti-IgLON5 Disease: A Long-Course Presentation With a Response to Immunotherapy.** *Neurology.* 96(23):E2901-E2902. D1

2. Munoz-Lopetegi, A; Pujol, M; Gimenez, M; Gaig, C; Brieva, L; Santamaria, J. **Abnormal sleep behavior caused by hypoglycemia.** *Sleep Medicine.* 85:268-270. Q2

3. Sarto J; Semerano A; Moreno J; Mayà-Casalprim G; Blasco J; Urra X. **Spinal cord hemodynamic infarction after vertebral artery endovascular trapping despite preserved flow in the anterior spinal artery.** *Journal of Spinal Cord Medicine.* 44(6):1001-1004. Q4

Clinical Guidelines

1. Bassetti, CLA; Kallweit, U; Vignatelli, L; Plazzi, G; Lecendreux, M; Baldin, E; Dolenc-Groselj, L; Jennum, P; Khatami, R; Manconi, M; Mayer, G; Partinen, M; Pollmacher, T; Reading, P; Santamaria, J; Sonka, K; Dauvilliers, Y; Lammers, GJ. **European guideline and expert statements on the management of narcolepsy in adults and children.** *European Journal of Neurology.* 28(9):2815-2830. Q1

2. Bassetti, CLA; Kallweit, U; Vignatelli, L; Plazzi, G; Lecendreux, M; Baldin, E; Dolenc-Groselj, L; Jennum, P; Khatami, R; Manconi, M; Mayer, G; Partinen, M; Pollmacher, T; Reading, P; Santamaria, J; Sonka, K; Dauvilliers, Y; Lammers, GJ. **European guideline and expert statements on the management of narcolepsy in adults and children.** *Journal of Sleep Research.* 30(6):e13387. Q2

Consortium Publications

1. Pérez-Soriano A, Giraldo DM, Ríos J, Muñoz E, Compta Y, Martí MJ, Catalán MSA Registry (CMSAR). **Progression of Motor and Non-Motor Symptoms in Multiple System Atrophy: A Prospective Study from the Catalan-MSA Registry.** *Journal of Parkinsons Disease.* 11(2):685-694. Q1

GRANTS FOR RESEARCH IN PROGRESS

Casanova J. **Caracterización del daño axonal en la neuropatía por quimioterapia: perfil temporal de la degeneración y regeneración axonal y su repercusión en los diferentes sistemas funcionales.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/00984
Duration: 01/01/2017-30/06/2021

Castro-Fornieles J, Compte A, Dalmau J, de la Rocha J, Graus F, Santamaria J. **Inmune-mediated diseases of the synapse: symptoms, brain networks, and the link to human memory.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PIE16/00014
Duration: 01/01/2017-30/06/2021

Enseñat J, Prats A. **Estudio de los abordajes endoscópicos multiportales mínimamente invasivos para el tratamiento de tumores cerebrales complejos. Diseño de nuevos modelos anatómicos y traslación clínica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00592
Duration: 01/01/2020-31/12/2022

Gaig C, Sabater L. **Estudio de la enfermedad por anticuerpos IgLON5 e implicación en**

los mecanismos de neurodegeneración.
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00067
Duration: 01/01/2019-31/12/2022

Iranzo A, Aldecoa I. **Detección de alfa-sinucleína en biopsias y resecciones quirúrgicas de órganos periféricos en el trastorno de conducta del sueño REM, como modelo premotor de la enfermedad de Parkinson.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00764
Duration: 01/01/2021-31/12/2023

Iranzo A. **Behaviours in REM sleep: personalised Automatic 3D Video Analysis as novel tool to detect alphasynucleinopathies.**
Sponsored by: European Commission. CE_ERA_PerMed_21
Duration: 04/03/2021-03/03/2024

Santamaria J. **Vía visual aferente: innovación para trastorno del Sueño REM y Parkinson.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/01228
Duration: 01/01/2018-30/06/2022

4.12 Neuropsychology

LOCATION
UB School of Medicine

KEYWORDS
1. **Magnetic resonance imaging**
2. **Structural and functional connectivity**
3. **Aging and degenerative illness**
4. **Non-invasive brain stimulation**
5. **Brain plasticity**

RELATED DISEASES
1. **Parkinson's disease**
2. **Multisystem atrophy**
3. **Supranuclear palsy**
4. **Idiopathic rem sleep behavior disorder**
5. **Epilepsy**
6. **Fibromialgya**

GROUP INVOLVED IN
AGAUR_SGR17: 00748

Original publications

TOTAL	40
Mean IF	**5,09**
Q1	**58%**
D1	**15%**
MA	**30%**
OA	**80%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

In an ever-ageing society, it is important to understand the risk factors, protective factors and cerebral mechanisms related to preservation of the cognitive function and mental health over time.

Ageing and the neurodegenerative disorders that come with it lead to significant cognitive and behavioural alterations in the daily lives of people who are affected and their families.

We need to gain an understanding of the brain networks involved in these alterations, their possible modification and responses to pharmacological and behavioural interventions.

APPROACH

The group studies the brain networks involved in cognitive and behavioural deficits related to ageing and neurodegenerative conditions. To achieve this objective, it uses multimodal magnetic resonance imaging and transcranial magnetic and electric stimulation techniques.

IMPACT

The group's research is targeted at improving and solving problems related to what is known as 'Health, ageing and disease'.
In recent years, the group has applied multimodal approaches that have enabled team members to increase their knowledge regarding changes in the structure and functional connectivity of the brain in relation with diverse phases of ageing and neurodegenerative diseases.

Maintaining the sound structure and function of the neural networks during our lifetime is essential for ageing well and depends largely on our habits and lifestyles.

RESEARCH LINES

- Ageing and brain health.
- Cerebral plasticity.
- Neuropsychology and neuroimaging in Parkinson's disease.

PUBLICATIONS

Originals

1. Writing Committee for the Attention-Deficit/Hyperactivity Disorder; Autism Spectrum Disorder; Bipolar Disorder; Major Depressive Disorder; Obsessive-Compulsive Disorder; and Schizophrenia ENIGMA Working Groups; Yash Patel, Patel Y, Parker N, Shin J, ... , Bargalló N, ... , Pausova

Z, Thompson PM, Paus T. **Virtual Histology of Cortical Thickness and Shared Neurobiology in 6 Psychiatric Disorders.** *JAMA Psychiatry.* 78(1):47-63. D1

2. Fjell AM, Grydeland H, Wang Y, Amlien IK, Bartres-Faz D, Brandmaier AM, Düzel S, Elman J, Franz CE, Håberg AK, Kietzmann TC, Kievit RA, Kremen WS, Krogsrud SK, Kühn S, Lindenberger U, Macía D, Mowinckel AM, Nyberg L, Panizzon MS, Solé-Padullés C, Sørensen Ø, Westerhausen R, Walhovd KB. **The genetic organization of longitudinal subcortical volumetric change is stable throughout the lifespan.** *Elife.* 10:e66466. D1

3. Vidal-Pineiro D; Wang Y; Krogsrud SK; Amlien IK; Baaré WFC; Bartres-Faz D; Bertram L; Brandmaier AM; Drevon CA; Düzel S; Ebmeier K; Henson RN; Junqué C; Kievit RA; Kühn S; Leonardsen E; Lindenberger U; Madsen KS; Magnussen F; Mowinckel AM; Nyberg L; Roe JM; Segura B; Smith SM; Sørensen Ø; Suri S; Westerhausen R; Zalesky A; Zsoldos E; Walhovd KB; Fjell A. **Individual variations in 'brain age' relate to early-life factors more than to longitudinal brain change.** *Elife.* 10:e69995. D1

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for Loneliness Comparable to Health Status and Social Connectedness. *Frontiers in Psychology.* 12:627547. Q2

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Review

1. Campabadal A, Segura B, Junque C, Iranzo A. **Structural and functional magnetic resonance imaging in isolated REM sleep behavior disorder: A systematic review of studies using neuroimaging software.** *Sleep Medicine Reviews.* 59:101495. D1

2. Pascual-Leone A; Bartres-Faz D. **Human Brain Resilience: A Call to Action.** *Annals of Neurology.* 90(3):336-349. D1

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Editorial

1. Pascual-Leone A; Cattaneo G; Macia D; Solana J; Tormos JM; Bartres-Faz D. **Beware of Optimism Bias in the Context of the COVID-19 Pandemic.** *Annals of Neurology.* 89(3):423-425. D1

Consortium Publications

1. Tsvetanov KA, Gazzina S, Jones PS, van Swieten J, Borroni B, Sanchez-Valle R, Moreno F, Laforce R, Graff C, Synofzik M, Galimberti D, Masellis M, Tartaglia MC, Finger E, Vandenberghe R, de Mendonça A, Tagliavini F, Santana I, Ducharme S, Butler C, Gerhard A, Danek A, Levin J, Otto M, Frisoni G, Ghidoni R, Sorbi S, Rohrer JD, Rowe JB, Genetic FTD Initiative, GENFI. **Brain functional network integrity sustains cognitive function despite atrophy in presymptomatic genetic frontotemporal dementia.** *Alzheimers & Dementia.* 17(3):500-514. D1

2. Manera AL, Dadar M, Van Swieten JC, Borroni B, Sanchez-Valle R, Moreno F, Laforce R, Graff C, Synofzik M, Galimberti D, Rowe JB, Masellis M, Tartaglia MC, Finger E, Vandenberghe R, de Mendonca A, Tagliavini F, Santana I, Butler CR, Gerhard A, Danek A, Levin J, Otto M, Frisoni G, Ghidoni R, Sorbi S, Rohrer JD, Ducharme S, Collins DL, FTLDNI investigators, GENFI Consortium. **MRI data-driven algorithm for the diagnosis of behavioural variant frontotemporal dementia.** *Journal of Neurology Neurosurgery and Psychiatry.* 92(6):608-616. D1

GRANTS FOR RESEARCH IN PROGRESS

Bargalló N. **Validación de la resonancia funcional en reposo y tractografia para la lateralización del lenguaje en pacientes epilepticos.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/01211
Duration: 01/01/2018-30/06/2021

Bartres D. **Barcelona Brain Health Initiative.**
Sponsored by: Obra social La Caixa. Fundació Abertis
Duration: 01/07/2016-31/12/2022

Bartrés D. **Estudio de los cambios cerebrales inducidos por estimulación cerebral no invasiva como predictores del estado de salud cerebral futuro en personas de edad avanzada.**
Sponsored by: Ministerio de Ciencia, Innovación y Universidades.
MICIUN_RTI2018-095181-B-C21

Bartres D. **Healthy minds from 0-100 years: Optimising the use of European brain imaging cohorts (Lifebrain).**
Sponsored by: European Commission.
CE_H2020
Duration: 01/01/2017-31/12/2021

Junqué C. **Phenylketonuria: from childhood to asults throught braon functional connectomics, cardiovascular changes, metabolomic and intestinal microbiota characteristics.**
Sponsored by: Fundació la Marató de TV3.
18/C/2020
Duration: 01/04/2021-01/04 2024

Junqué C. **CoviD-19 and brain: Cognition and mental health (DIANA).**
Sponsored by: Generalitat de Catalunya.
AGAUR_122038
Duration: 13/05/2021- 12/11/2022

López-Solà M. **Identifying neural pathophysiology in juvenile fibromyalgia.**
Sponsored by: National Institutes of Health.
INT_NIH_ R01AR074795
Duration: 01/01/2019-31/12/2023

López-Solà M. **SPRINT: Signature for Pain Recovery IN Teens.**
Sponsored by: National Institutes of Health.
INT_NIH_ R61NS114926
Duration: 01/01/2019-31/12/2023

Segura-Fabregas B, Uribe C. **Multimodal imaging in parkinsonisms: from the molecular synaptic pruning to the whole-brain connectomics (SYNPARK).**
Sponsored by: European Commission.
CE_H2020
Duration: 20/09/2020-31/08/2023

Segura B, Junqué C**. Patrones cerebrales estructurales y funcionales asociados con diferentes fenotipos cognitivos y su progresión en trastornos de la conducta del sueño REM.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades.
MCIU_PID2020-114640GB-100
Duration: 01/09/2021-01/09/2024

Soria G. **Efecto de la intervención cognitiva pre y post amiloide en la conectividad estructural y funcional en un modelo de rata transgénico de Alzheimer.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00893
Duration: 01/01/2019-31/12/2022

DOCTORAL THESES

Junqué C, Segura B. **Subtypes in Parkinson's disease and Dementia with Lewy bodies: MRI and neuropsychological profiles.**
PhD student: Anna Inguanzo Pons

4.13 Advanced imaging in neuroimmunological diseases (ImaginEM)

LOCATION
CEK building, floor -1

KEYWORDS
1. **Multiple sclerosis**
2. **Neuroimage**

RELATED DISEASES
1. **Multiple sclerosis**
2. **Neuromyelitis optica**
3. **Mog diseases**
4. **Autoimmune encephalitis**

GROUP INVOLVED IN
RETIC

Original publications

TOTAL	18
Mean IF	**5,86**
Q1	**83%**
D1	**22%**
MA	**33%**
OA	**89%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Multiple sclerosis and other neuroimmune diseases are a relevant cause of disability in young adults. Despite the significant advances that have been made in their treatment, there are still many unknowns to solve.

Advanced magnetic resonance techniques can help to strengthen our knowledge of the bases of neurological dysfunction and the functioning of the human brain.

APPROACH

This research group combines technological development with the clinical application of new techniques in advanced magnetic resonance imaging in patients with neurological diseases. These tools are allowing it to identify new biomarkers that can predict the evolution of multiple sclerosis and other disorders and, therefore, to customise treatment to each individual patient.

They can also provide very valuable information about the functioning of the neural networks and their ability to recover, both in a healthy brain and an unhealthy one.

IMPACT

The group's research has been able to quantify the impact of the damage of neurons and glia and to identify the severity of damage inside the brain lesions on patients with multiple sclerosis using advanced magnetic resonance biomarkers. The group also evaluated the clinical efficacy and neuroprotection of treatment with mesenchymal stem cells (adult stem cells that can be converted into various skeletal tissues). It has identified the neuronal networks that support the cognitive performance and pathological changes that patients suffer during the progression of multiple sclerosis.
In this sense, the group is leading a multicentre project within the MAGNIMS group that aims to describe the changes that occur in patients' brain networks over time, as well as the consequences of the collapse of these networks. The group is conducting a clinical trial on cognitive rehabilitation to understand the efficacy of cognitive training and the mechanisms of brain plasticity induced by the treatment in multiple sclerosis. The group also applies machine learning techniques to generate models that can help to predict disease evolution.

RESEARCH LINES

- Cognitive rehabilitation and brain plasticity in multiple sclerosis.

- MRI and genetic markers of multiple sclerosis long-term progression.

- Structural connectivity in multiple sclerosis.

PUBLICATIONS

Originals

1. Cohen-Adad J; Alonso-Ortiz E; Abramovic M; Arneitz C; Atcheson N; Barlow L; Barry RL; Barth M; Battiston M; Büchel C; Budde M; Callot V; Combes AJE; De Leener B; Descoteaux M; de Sousa PL; Dostál M; Doyon J; Dvorak A; Eippert F; Epperson KR; Epperson KS; Freund P; Finsterbusch J; Foias A; Fratini M; Fukunaga I; Wheeler-Kingshott CAMG; Germani G; Gilbert G; Giove F; Gros C; Grussu F; Hagiwara A; Henry PG; Horák T; Hori M; Joers J; Kamiya K; Karbasforoushan H; Keřkovský M; Khatibi A; Kim JW; Kinany N; Kitzler H; Kolind S; Kong Y; Kudlička P; Kuntke P; Kurniawan ND; Kusmia S; Labounek R; Laganà MM; Laule C; Law CS; Lenglet C; Leutritz T; Liu Y; Llufriu S; Mackey S; Martinez-Heras E; Mattera L; Nestrasil I; O'Grady KP; Papinutto N; Papp D; Pareto D; Parrish TB; Pichiecchio A; Prados F; Rovira À; Ruitenberg MJ; Samson RS; Savini G; Seif M; Seifert AC; Smith AK; Smith SA; Smith ZA; Solana E; Suzuki Y; Tackley G; Tinnermann A; Valošek J; Van De Ville D; Yiannakas MC; Weber KA; Weiskopf N; Wise RG; Wyss PO; Xu J. **Generic acquisition protocol for quantitative MRI of the spinal cord.** *Nature Protocols.* 16(10):4611-4632. D1

2. Fernández-Velasco JI, Kuhle J, Monreal E, Meca-Lallana V, Meca-Lallana J, Izquierdo G, Gascón-Giménez F, Sainz de la Maza S, Walo-Delgado PE, Maceski A, Rodríguez-Martín E, Roldán E, Villarrubia N, Saiz A, Blanco Y, Sánchez P, Carreón-Guarnizo E, Aladro Y, Brieva L, Íñiguez C, González-Suárez I, Rodríguez de Antonio LA, Masjuan J, Costa-Frossard L, Villar LM. **Effect of Ocrelizumab in Blood Leukocytes of Patients With Primary Progressive MS.** *Neurology-Neuroimmunology & Neuroinflammation.* 8(2):e940. D1

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4. Comabella M, Sastre-Garriga J, Borras E, Villar LM, Saiz A, Martínez-Yélamos S, García-Merino JA, Pinteac R, Fissolo N, Sánchez López AJ, Costa-Frossard L, Blanco Y, Llufriu S, Vidal-Jordana A, Sabidó E, Montalban X. **CSF Chitinase 3-Like 2 Is Associated With Long-term Disability Progression in Patients With Progressive Multiple Sclerosis.** *Neurology-Neuroimmunology & Neuroinflammation.* 8(6):e1082. D1

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8. Reid LB, Martínez-Heras E, Manjón JV, Jeffree RL, Alexander H, Trinder J, Solana E, Llufriu S, Rose S, Prior M, Fripp J. **Fully automated delineation of the optic radiation for surgical planning using clinically feasible sequences.** *Human Brain Mapping.* 42(18):5911-5926. Q1

9. Lopez-Soley E, Martinez-Heras E, Andorra M, Solanes A, Radua J, Montejo C, Alba-Arbalat S, Sola-Valls N, Pulido-Valdeolivas I, Sepulveda M, Romero-Pinel L, Munteis E, Martínez-Rodríguez JE, Blanco Y, Martinez-Lapiscina EH, Villoslada P, Saiz A, Solana E, Llufriu S. **Dynamics and Predictors of Cognitive Impairment along the Disease Course in Multiple Sclerosis.** *Journal of Personalized Medicine.* 11(11):1107. Q1

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11. Alba-Arbalat S, Andorra M, Sanchez-Dalmau B, Camos-Carreras A, Dotti-Boada M, Pulido-Valdeolivas I, Llufriu S, Blanco Y, Sepulveda M, Saiz A, Batet O, Bilbao I, Torre I, Amat-Roldan I, Martinez-Lapiscina EH, Villoslada P. **In Vivo Molecular Changes in the Retina of Patients With Multiple Sclerosis.** *Investigative Ophthalmology & Visual Science.* 62(6):11. Q1

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14. Ramos-Casals M, Pérez-Alvarez R, Kostov B, Gómez-de-la-Torre R, Feijoo-Massó C, Chara-Cervantes J, Pinilla B, González-García A, Garcia-Morillo JS, López-Dupla M, De-Escalante B, Rascón J, Perez-Guerrero P, Bonet M, Cruz-Caparrós G, Alguacil A, Callejas JL, Calvo E, Soler C, Robles A, de Miguel-Campo B, Oliva-Nacarino P, Estela-Herrero J, Pallarés L, Brito-Zerón P, Blanco Y, SarcoGEAS-SEMI Registry. **Clinical characterization and outcomes of 85 patients with neurosarcoidosis.** *Scientific Reports.* 11(1):13735. Q1

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16. Roura E, Maclair G, Andorrà M, Juanals F, Pulido-Valdeolivas I, Saiz A, Blanco Y, Sepulveda M, Llufriu S, Martínez-Heras E, Solana E, Martinez-Lapiscina EH, Villoslada P. **Cortical fractal dimension predicts disability worsening in Multiple Sclerosis patients.** *Neuroimage-Clinical.* 30:102653. Q2

17. Montejo C, Laredo C, Llull L, Martínez-Heras E, López-Rueda A, Torné R, Garrido C, Bargallo N, Llufriu S, Amaro S. **Synthetic MRI in subarachnoid haemorrhage.** *Clinical Radiology.* 76(10):785.e17-785.e23. Q3

18. Hermann I, Golla AK, Martínez-Heras E, Schmidt R, Solana E, Llufriu S, Gass A, Schad LR, Zöllner FG. **Lesion probability mapping in MS patients using a regression network on MR fingerprinting.** *BMC Medical Imaging.* 21(1):107. Q3

Review

1. Martinez-Heras E; Grussu F; Prados F; Solana E; Llufriu S. **Diffusion-Weighted Imaging: Recent Advances and Applications.** *Seminars in Ultrasound CT and MRI.* 42(5):490-506. Q4

Clinical Guidelines

1. Otero-Romero S, Rodríguez-García J, Vilella A, Ara JR, Brieva L, Calles C, Carmona O, Casanova V, Costa-Frossard L, Eichau S, García-Merino JA, Garcia-Vidal C, González-Platas M, Llaneza M, Martínez-Ginés M, Meca-Lallana JE, Prieto JM, Rodríguez-Antigüedad A, Tintoré M, Blanco Y, Moral E, en nombre del Grupo de enfermedades desmielizantes de la SEN. **Recommendations for vaccination in patients with multiple sclerosis who are eligible for immunosuppressive therapies: Spanish consensus statement.** *Neurologia.* 36(1):50-60. Q3

2. Llufriu S, Agüera E, Costa-Frossard L, Galán V, Landete L, Lourido D, Meca-Lallana JE, Moral E, Bravo-Rodríguez F, Koren L, Labiano A, León A, Martín P, Monedero MD, Requeni L, Zubizarreta I, Rovira À. **Recommendations for the coordination of Neurology and Neuroradiology Departments in the management of patients with multiple sclerosis.** *Neurologia.* S0213-4853(21):00029-3. Q3

Consortium Publications

1. Nicolás D, Camós-Carreras A, Spencer F, Arenas A, Butori E, Maymó P, Anmella G, Torrallardona-Murphy O, Alves E, García L, Pereta I, Castells E, Seijas N, Ibáñez B, Grané C, Bodro M, Cardozo C, Barroso S, Olive V, Tortajada M, Hernández C, Cucchiari D, Coloma E, Pericàs JM, Hospital Clinic Hospital at Home Team. **A Prospective Cohort of SARS-CoV-2-Infected Health Care Workers: Clinical Characteristics, Outcomes, and Follow-up Strategy.** *Open Forum Infectious Diseases.* 8(1):ofaa592. Q2

2. Cucchiari D, Guillén E, Cofan F, Torregrosa JV, Esforzado N, Revuelta I, Ventura-Aguiar P, Oppenheimer F, Bayés B, Marcos MÁ, Morgado-Carrasco D, López JM, Creus P, Hernández C, Coloma E, Bodro M, Diekmann F, Pericàs JM, Nicolás D, Hospital Clínic 4H Team (Hospital at Home-Health Hotel). **Taking care of kidney transplant recipients during the COVID-19 pandemic: experience from a medicalized hotel.** *Clinical Transplantation.* 35(1):e14132. Q2

GRANTS FOR RESEARCH IN PROGRESS

Blanco Y. **Terapia con células dendríticas asociada a tratamiento inmunomodulador en la esclerosis múltiple.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_ICI19/00034
Duration: 01/01/2020-31/12/2023

Llufriu S. **Red Temática de Investigación Cooperativa en Salud - Esclerosis múltiple.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_RD16/0015/0003
Duration: 01/01/2017-31/12/2022

Llufriu S, Saiz A. **Rehabilitación cognitiva y plasticidad cerebral en la Esclerosis Múltiple: en búsqueda de la evidencia.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/01030
Duration: 01/01/2019-31/12/2021

Llufriu S. **Rehabilitación cognitiva y plasticidad cerebral en la Esclerosis Múltiple: evaluación a través de un ensayo clínico aleatorizado y controlado.**
Sponsored by: Fundación Merck Salud. FSalud_17-EM-010
Duration: 01/06/2017-30/06/2021

DOCTORAL THESES

Saiz A, Blanco Y. **Aplicaciones de telemedicina en el seguimiento clínico de pacientes con enfermedades autoinmunes del sistema nervioso central.**
PhD student: Nuria Sola Valls

4.14 Clinical addictions

LOCATION
HCB building
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KEYWORDS
1. **Alcohol**
2. **Cannabis**
3. **Tobacco**
4. **Benzodiazepines**
5. **Opiates**
6. **Drugs**

RELATED DISEASES
1. **Alcohol use disorder**
2. **Cannabis use disorder**
3. **Substance use disorder**
4. **Opioid use disorder**
5. **Tobacco use disorder**

GROUP INVOLVED IN
AGAUR_SGR17: 01460
RETICS-Trastornos Adictivos

Original publications

TOTAL	24
Mean IF	3,56
Q1	25%
D1	4%
MA	33%
OA	83%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Most citizens consume drugs (alcohol, tobacco, cannabis, cocaine), often without being aware of them. The drug business (legal and illegal) causes a few to enrich themselves, many suffer directly or indirectly and we all end up paying the related high social and health costs.

The research of this group, therefore, develops within a broad framework, ranging from the molecular mechanisms of addiction to the study of socioeconomic costs or causes of stigmatisation suffered by people with addiction.

APPROACH

The group aims to understand why a person goes from consuming drugs to an addiction, what role the family and society play and how they can be part of the recovery. It does this by promoting quality care based on scientific evidence, adopting a broad perspective: psychological, social and medical.

New technologies are a reality in today's lifestyle and, therefore, they are also an essential part of our day-to-day endeavours.

IMPACT

The group will provide new preventive measures to reduce the number of people using drugs. For those who still decide to use drugs, the group adopts a harm-reduction principle, promoting informed choices, and up-to-date, accurate information; resulting in the least possible damage to health and well-being and, therefore, lower costs to the individual and society.

It has developed standardised units of measurement, such as the Standard Beverage Unit or the Standard Cannabis Unit, which facilitate the study of risks of consumption to health. Thus, the group's main goal is to create and validate useful treatments that allow the person to have more control over their life, their decisions and their health. Its objective is to

provide tools that allow more people to be treated and to achieve their own goals; one such tool being Nalmefene (a drug that has been proven effective against alcoholism). The overarching priority is to eliminate stigma.

RESEARCH LINES

- Epidemiology, prevention and health care costs.

- New assesment and therapeutic tools for addictive disorders.

- Treatment approach for addictive patients with organic complications.

PUBLICATIONS

Originals

1. Kilian C, Rehm J, Allebeck P, Braddick F, Gual A, Barták M, Bloomfield K, Gil A, Neufeld M, O'Donnell A, Petruželka B, Rogalewicz V, Schulte B, Manthey J, European Study Group on Alcohol Use and COVID-19. **Alcohol consumption during the COVID-19 pandemic in Europe: a large-scale cross-sectional study in 21 countries.** *Addiction*. 116(12):3369-3380. D1

2. Anderson P, Manthey J, Llopis EJ, Rey GN, Bustamante IV, Piazza M, Aguilar PSM, Mejía-Trujillo J, Pérez-Gómez A, Rowlands G, Lopez-Pelayo H, Mercken L, Kokole D, O'Donnell A, Solovei A, Kaner E, Schulte B, de Vries H, Schmidt C, Gual A, Rehm J. **Impact of Training and Municipal Support on Primary Health Care-Based Measurement of Alcohol Consumption in Three Latin American Countries: 5-Month Outcome Results of the Quasi-experimental Randomized SCALA Trial.** *Journal of General Internal Medicine*. 36(9):2663-2671. Q1

3. Blithikioti C, Nuño L, Paniello B, Gual A, Miquel L. **Impact of COVID-19 lockdown on individuals under treatment for substance use disorders: Risk factors for adverse mental health outcomes.** *Journal of Psychiatric Research*. 139:47-53. Q1

4. Caballeria E, López-Pelayo H, Segura L, Wallace P, Oliveras C, Díaz E, Manthey J, Baena B, Colom J, Gual A, EFAR group. **A randomized controlled non-inferiority trial of primary care-based facilitated access to an alcohol reduction website (EFAR Spain).** *Internet Interventions*. 26:100446. Q1

5. Hernández-Serrano O, Ghiță A, Fernández-Ruiz J, Monràs M, Gual A, Gacto M, Porras-García B, Ferrer-García M, Gutiérrez-Maldonado J. **Determinants of Cue-Elicited Alcohol Craving and Perceived Realism in Virtual Reality Environments among Patients with Alcohol Use Disorder.** *Journal of Clinical Medicine*. 10(11):2241. Q1

6. Rossow I; Bartak M; Bloomfield K; Braddick F; Bye EK; Kilian C; López-Pelayo H; Mäkelä P; Moan IS; Moskalewicz J; Petruzelka B; Rogalewicz V; Manthey J. **Changes in alcohol consumption during the covid-19 pandemic are dependent on initial consumption level: Findings from eight european countries.** *International Journal of Environmental Research and Public Health*. 18(19):10547. Q1

7. Guiraud J, Addolorato G, Aubin HJ, Batel P, de Bejczy A, Caputo F, Goudriaan AE, Gual A, Lesch O, Maremmani I, Perney P, Poulnais R, Raffaillac Q, Soderpalm B, Spanagel R, Walter H, van den Brink W, SMO032 study group. **Treating alcohol dependence with an abuse and misuse deterrent formulation of sodium oxybate: Results of a randomised, double-blind, placebo-controlled study.** *European Neuropsychopharmacology*. 52:18-30. Q2

8. López-Pelayo H; Matrai S; Balcells-Olivero M; Campeny E; Braddick F; Bossong MG; Cruz OS; Deluca P; Dom G; Feingold D; Freeman TP; Guzman P; Hindocha C; Kelly BC; Liebregts N; Lorenzetti V; Manthey J; Matias J; Oliveras C; Pons MT; Rehm J; Rosenkranz M; Swithenbank Z; van Deurse L; Vicente J; Vuolo M; Wojnar M; Gual A. **Supporting Future Cannabis Policy – Developing a Standard Joint Unit: A Brief Back-Casting Exercise.** *Frontiers in Psychiatry*. 12:675033. Q2

9. López-Pelayo H, Campeny E, Oliveras C, Rehm J, Manthey J, Gual A, Balcells-Olivero MLM. **Early, Chronic, and Acute Cannabis Exposure and Their Relationship With Cognitive and Behavioral Harms.** *Frontiers in Psychiatry*. 12:643556. Q2

10. Kilian C; Rehm J; Allebeck P; Bartak M; Braddick F; Gual A; Matrai S; Petruzelka B; Rogalewicz V; Rossow I; Schulte B; Stelemekas M; Manthey J. **Conducting a multi-country online alcohol survey in the time of the COVID-19 pandemic: Opportunities and challenges.** *International Journal of Methods in Psychiatric Research*. 30(3):e1875. Q2

11. Kokole D, Jané-Llopis E, Mercken L, Piazza M, Bustamante I, Natera Rey G, Medina P, Pérez-Gómez A, Mejía-Trujillo J, O'Donnell A, Kaner E, Gual A, Schmidt CS, Schulte B, Candel MJJM, de Vries H, Anderson P. **Factors associated with primary health care providers' alcohol screening behavior in Colombia, Mexico and Peru.** *Substance Abuse*. 42(4):1007-1015. Q2

12. Sanvisens A, Zuluaga P, Short A, Rubio G, Gual A, Torrens M, Fuster D, Bolao F, Rodríguez de Fonseca F, Muga R, CohRTA study. **Sex-specific Associations of Alcohol Withdrawal in Patients Admitted for the Treatment of Alcohol Use Disorder.** *Journal of Addiction Medicine*. 15(1):68-73. Q2

13. O'Donnell A; Schulte B; Manthey J; Schmidt CS; Piazza M; Chavez IB; Natera G; Aguilar NB; Hernández GYS; Mejía-Trujillo J; Pérez-Gómez A; Gual A; de Vries H; Solovei A; Kokole D; Kaner E; Kilian C; Rehm J; Anderson P; Jané-Llopis E. **Primary care-based screening and management of depression amongst heavy drinking patients: Interim secondary outcomes of a three-country quasiexperimental study in Latin America.** *Plos One*. 16(8):e0255594. Q2

14. Freiburghaus T; Raffing R; Ballbe M; Gual A; Tonnesen H. **The right to smoke and the right to smoke-free surroundings: international comparison of smoke-free psychiatric clinic implementation experiences**. *BJPsych Open*. 7(3):e81. Q2

15. Bruguera P, Barrio P, Manthey J, Oliveras C, López-Pelayo H, Nuño L, Miquel L, López-Lazcano A, Blithikioti C, Caballeria E, Matrai S, Rehm J, Vieta E, Gual A. **Mid and long-term effects of a SBIRT program for at-risk drinkers attending to an emergency department.** *European Journal of Emergency Medicine*. 28(5):373-379. Q2

16. Solovei A, Mercken L, Jané-Llopis E, Bustamante I, Evers S, Gual A, Medina P, Mejía-Trujillo J, Natera-Rey G, O'Donnell A, Pérez-Gómez A, Piazza M, de Vries H, Anderson P. **Development of community strategies supporting brief alcohol advice in three Latin American countries: a**

protocol. *Health Promotion International.* daab192. Q2

17. Barrio P; Baldaquí N; Andreu M; Kilian C; Rehm J; Gual A; Manthey J. **Abstinence Among Alcohol Use Disorder Patients During the COVID-19 Pandemic: Insights From Spain.** *Alcoholism-Clinical and Experimental Research.* 45(4):802-807. Q3

18. Casajuana Kögel C, López-Pelayo H, Oliveras C, Colom J, Gual A, Balcells-Oliveró MM. **The relationship between motivations for cannabis consumption and problematic use.** *Adicciones.* 33(1):31-41. Q3

19. López-Lazcano AI; López-Pelayo H; Balcells-Oliveró M; Segura L; Gual Solé A. **Validation of the Alcohol Smoking and Substance Involvement Screening Test (ASSIST) in acute psychiatric inpatients.** *Adicciones.* 0(0):1496. Q3

20. Arbelo N; López-Pelayo H; Sagué M; Madero S; Pinzón-Espinosa J; Gomes-da-Costa S; Ilzarbe L; Anmella G; Llach CD; Imaz ML; Cámara MM; Pintor L. **Psychiatric Clinical Profiles and Pharmacological Interactions in COVID-19 Inpatients Referred to a Consultation Liaison Psychiatry Unit: a Cross-Sectional Study.** *Psychiatric Quarterly.* 92(3):1021-1033. Q3

21. Caballeria E, Maier M, Balcells-Oliveró M, López-Pelayo H, Oliveras C, Rubio Ballester B, Verschure PFMJ, Gual A. **Rehabilitation Gaming System for Alcohol-Related Cognitive Impairment: A Pilot Usability Study.** *Alcohol and Alcoholism.* agab043. Q3

22. Manthey J, Kilian C, Carr S, Bartak M, Bloomfield K, Braddick F, Gual A, Neufeld M, O'Donnell A, Petruzelka B, Rogalewicz V, Rossow I, Schulte B, Rehm J. **Use of alcohol, tobacco, cannabis, and other substances during the first wave of the SARS-CoV-2 pandemic in Europe: a survey on 36,000 European substance users.** *Substance Abuse Treatment Prevention and Policy.* 16(1):36. Q3

23. Balcells-Olivero MM; Nuno L; Freixa N; Dominguez I; Pons I; Alcover E; Gual, A. **Shared Reflection to Maximize Resources and Minimize Costs: The Reflecting Team Applied to a Hospital Environment.** *Community Mental Health Journal.* 57(4):746-752. Q3

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2. Andreu-Mondon, M; Barrio-Gimenez, P; Mondon-Vehils, S. **COVID-19 and restrictions on tobacco use.** *Medicina Clinica.* 156(2):93. Q3

Editorial

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2. Córdoba-García R; Sureda X; Sordo L; Gual A. **Paradigm shift in the relationship between alcohol and health: The less, the better.** *Adicciones.* 33(1):3-5. Q3

3. Andreu, M; Pons, MT; Navarro, L; Barrio, P. **Inpatient group psychotherapy for addiction patients in times of COVID-19.** *Adicciones.* 33(4):295-298. Q3

Case Reports

1. Sagué-Vilavella M, Gil-Badenes J, Baldaquí Baeza N, Madero Gómez S, Pacchiarotti I, Pons Cabrera MT, Valentí Ribas M, Bioque M. **The Other Victims of COVID-19: The Value of Electroconvulsive Therapy.** *The Journal of ECT.* 37(1):E1-E2. Q1

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GRANTS FOR RESEARCH IN PROGRESS

Gual A. **Red Temática de Investigación Cooperativa en Salud - Trastornos adictivos.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_RD16/0017/0009
Duration: 01/01/2017-30/06/2022

Gual A, Balcells M. **La TRV como biomarcador de alteraciones cerebrales en el consumo crónico de cánnabis (TRV-CAN).**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00874
Duration: 01/01/2018-31/12/2022

Gual A. **Definición del patrón de consumo de riesgo de cannabis: implicaciones para la detección y la intervención precoz.**
Sponsored by: Ministerio de Sanidad, Consumo y Bienestar Social. MSSSI_PNSD17
Duration: 01/01/2018-30/06/2021

Gual A. **Scale-up of Prevention and Management of Alcohol Use Disorders and Comorbid Depression in Latin America.**
Sponsored by: European Commission. CE_H2020-SC1_17_1
Duration: 01/12/2017-30/11/2021

Gual A. **Developing and Extending Evidence and Practice from the Standard European Alcohol Survey.**
Sponsored by: European Commission. CE_TED_Chafea17_01
Duration: 18/12/2018-

Gual A. **Piloting Brief interventions to reduce risk of FAS/FASD, following 1st and 2nd standarised European Alcohol Survey and providing support to Member States to strengthen their capacity to tackle alcohol related harm.**
Sponsored by: European Commission. CE_TED_Chafea18_10
Duration: 08/07/2019-

Gual A. **Alcohol Harm - Measuring and Building Capacity for Policy Response and Action.**
Sponsored by: European Commission. CE_TED_Chafea19_05
Duration: 01/09/2020-

Gual A. **Intercontinental Perspectives on Global Addictions and Drug Markets.**
Sponsored by: European Commission. CE_JUST-2019-AG-DRU
Duration: 01/07/2021-30/06/2023

López-Pelayo H. **IBM-ABJ: Intervención Breve Motivacional combinada con Aprendizaje Basado en el Juego para mejorar la retención en tratamiento de pacientes con daño hepático relacionado con el alcohol.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00760
Duration: 01/01/2021-31/12/2023

López-Pelayo H. **Identificación del patrón de uso de cannabis, tabaco y alcohol en función del género y las comorbilidades psiquiátricas que predice un mayor uso de recursos hospitalarios.**
Sponsored by: Ministerio de Sanidad, Consumo y Bienestar Social. MSCBS_P-NSD20
Duration: 01/01/2021-31/12/2023

Miquel L. **¿Qué funciona y por qué? Desensibilización y reprocesamiento por los movimientos oculares como tratamiento para los trastornos por uso de sustancias.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00506
Duration: 01/01/2021-31/12/2023

DOCTORAL THESES

Gutiérrez T, Mora MS, Gual A. **Millora de la identifiació precoç i la intervenció breu en el consum de risc d'alcohol a l'atenció primària de salut de Catalunya.**
PhD student: Lidia Segura García

Pintor L, Gual A. **Detección del riesgo psicosocial y de uso de drogas en poblaciones vulnerables. Validación de instrumentos en salud.**
PhD student: Ana Isabel Lopez Lazcano

Vieta E, Gual A. **Prevenció dels problemes relacionats amb el consum d'alcohol a urgències.**
PhD student: Pol Bruguera Soler

4.15 Parkinson disease and other neurodegenerative movement disorders: clinical and experimental research

LOCATION
CELLEX building, floor 3B

KEYWORDS
1. **Parkinson disease**
2. **Movement disorders**
3. **Degenerative neurological diseases**

RELATED DISEASES
1. **Parkinson disease**
2. **Progressive supranuclear palsy**
3. **Multiple system atrophy**
4. **Huntington's disease**
5. **Dystonia**

GROUP INVOLVED IN
AGAUR_SGR17: 01502
CIBERNED

Original publications

TOTAL	40
Mean IF	**7,44**
Q1	**70%**
D1	**35%**
MA	**23%**
OA	**75%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Parkinson's disease is a common disorder and its incidence is expected to increase in coming years. Although its causes are not yet known, it has been established that genetic and environmental factors intervene and, in some cases, it is difficult to diagnose with precision.

At present, no curative treatments exist, only measures for stabilizing and controlling the symptoms.
One of the main problems, however, is that by the time that the most characteristic motor symptoms become apparent, the death of most of the dopaminergic neurons in the brain, which are essential for motor function, has already occurred.

This pre-symptomatic and prodromic phase is common to all neurodegenerative diseases, so it is important to extend research in order to apply treatments that will restore or modify the progression of these pathologies.

APPROACH

The group conducts in-depth clinical studies, develops clinical trials and engages in neuroimaging, genetic, genomic and biomarker studies related to Parkinson's disease, atypical parkinsonism, and other movement disorders, such as Huntington's disease and dystonia.

In addition, it conducts research on the initial stage of Parkinson's disease and in subjects at risk of developing this condition, when its motor symptoms have not yet appeared and neuroprotective therapies are still possible.

IMPACT

The group's research has made it possible to create complete biorepositories of biological samples from patients with Parkinson's disease and other neurodegenerative parkinsonism (blood, cerebrospinal fluid, urine, DNA, RNA and cells) for use in future research projects.

Using these biorepositories, the group aims to investigate the presence and applicability of biomarkers that are useful in the correct diagnosis and prognosis of Parkinson's disease and atypical Parkinsonian disorders.

Through the use of cell models, it strives to obtain information about the basic molecular processes associated with Parkinson's and other neurodegenerative diseases, as well as genetic associations among the population, to locate risk genes.

RESEARCH LINES

- Molecular basis in Parkinson's disease.

- Neurodegenerative movement disorders: diagnose and treatment.

- Parkinson's disease prodromal phase.

- Subjects at risk for Parkinson's disease.

PUBLICATIONS

Originals

1. Iranzo A, Fairfoul G, Ayudhaya ACN, Serradell M, Gelpi E, Vilaseca I, Sanchez-Valle R, Gaig C, Santamaria J, Tolosa E, Riha RL, Green AJE . **Detection of α-synuclein in CSF by RT-QuIC in patients with isolated rapid-eye-movement sleep behaviour disorder: a longitudinal observational study.** *Lancet Neurology*. 20(3):203-212. D1

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6. Klopstock T; Videnovic A; Bischoff AT; Bonnet C; Cif L; Comella C; Correa-Vela M; Escolar ML; Fraser JL; Gonzalez V; Hermanowicz N; Jech R; Jinnah HA; Kmiec T; Lang A; Marti MJ; Mercimek-Andrews S; Monduy M; Nimmo GAM; Perez-Duenas B; Pfeiffer HCV; Planellas LI; Roze E; Thakur N; Tochen L; Vanegas-Arroyave N; Zorzi G; Burns C; Greblikas F. **Fosmetpantotenate Randomized Controlled Trial in Pantothenate Kinase-Associated Neurodegeneration.** *Movement Disorders*. 36(6):1342-1352. D1

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Review

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Letters

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Clinical Guidelines

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Consortium Publications

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6. Gialluisi A; Reccia MG; Modugno N; Nutile T; Lombardi A; Di Giovannantonio LG; Pietracupa S; Ruggiero D; Scala S; Gambardella S; International Parkinson's Disease Genomics Consortium (IPDGC); Iacoviello L; Gianfrancesco F; Acampora D; D'Esposito M; Simeone A; Ciullo M; Esposito T International Parkinson's Disease Genomics Consortium (IPDGC). **Identification of sixteen novel candidate genes for late onset Parkinson's disease.** *Molecular Neurodegeneration.* 16(1):35. D1

7. Ambrosioni J, Blanco JL, Reyes-Urueña JM, Davies MA, Sued O, Marcos MA, Martínez E, Bertagnolio S, Alcamí J, Miro JM, COVID-19 in HIV Investigators. **Overview of SARS-CoV-2 infection in adults living with HIV.** *Lancet HIV.* 8(5):e294-e305. D1

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11. Mellado-Artigas R, Ferreyro BL, Angriman F, Hernández-Sanz M, Arruti E, Torres A, Villar J, Brochard L, Ferrando C, COVID-19 Spanish ICU Network. **High-flow nasal oxygen in patients with COVID-19-associated acute respiratory failure.** *Critical Care.* 25(1):58. Q1

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13. Mellado-Artigas R, Mujica LE, Ruiz ML, Ferreyro BL, Angriman F, Arruti E, Torres A, Barbeta E, Villar J, Ferrando C, COVID-19 Spanish ICU Network. **Predictors of failure with high-flow nasal oxygen therapy in COVID-19 patients with acute respiratory failure: a multicenter observational study.** *Journal of Intensive Care.* 9(1):23. Q2

14. Piñeiro GJ, Molina-Andújar A, Hermida E, Blasco M, Quintana LF, Rojas GM, Mercadal J, Castro P, Sandoval E, Andrea R, Fernández J, Badia JR, Soriano A, Poch E, Hospital Clínic Critical Care COVID-19 working group (CCCC). **Severe acute kidney injury in critically ill COVID-19 patients.** *Journal of Nephrology.* 34(2):285-293. Q2

GRANTS FOR RESEARCH IN PROGRESS

Cámara A. **Programa d'educació terapèutica per pacients amb atròfia multisistèmica (AMS) i els seus cuidadors.**
Sponsored by: Generalitat de Catalunya.
PERIS_SLT008/18/00191
Duration: 25/06/2019-02/03/2021

Compta Y. **PSP REGISTRY: Clinical cohort study with biomarkers study of prediagnostic cases and health education program in established disease.**
Sponsored by: Fundació la Marató de TV3.
Minoritaries_20
Duration: 30/03/2021-29/03/2024

Compta Y, Martí MJ. **Amplificación de autoagregación de alfa-sinucleina y 4R-tau en tejido cerebral y liquido cerebroespinal mediante RTQuIC como biomarcador diferencial de parkinsonismos degenerativos.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00096
Duration: 01/01/2018-30/06/2021

Compta Y. **Conservative iron chelation as a disease-modifying strategy in Parkinsons disease: a multicentric parallel-group,placebo-controlled, randomized clinical trial of deferiprone.**
Sponsored by: European Commission.
CE_H2020-PHC-2014-2s
Duration: 01/05/2015-31/10/2021

Compta Y. **Plataforma Traslacional para la AMS: Descubriendo mecanismos patológicos y nuevas dianas terapéuticas: PTra-ADPT.**
Sponsored by: European Commission.
CE_FLAG-ERA: JTC2021 Call & Instituto de Salud Carlos III (ISCIII). FIS_AC21_2/00018
Duration: 15/12/2021-14/12/2024

Ezquerra M. **Análisis Ómicos de cultivos de fibroblastos de enfermos de Parkinson con mutaciones en el gen LRRK2.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00259
Duration: 01/01/2021-31/12/2023

Fernandez-Santiago R. **Tackling prodomal Parkinson's disease (PD): from early pathophysiology to disease biomarkers.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_CP19/00048
Duration: 01/01/2020-31/12/2024

Fernández-Santiago R. **Regulación epigenética de a-sinucleina en la enfermedad del Parkinson.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00659
Duration: 01/01/2021-31/12/2023

Fernández-Santiago R, Ezquerra M. **Phospho-proteome analysis of PBMCs in LRRK2 mutations carriers: expansion & validation of findings of the Barcelona LRRK2 Biorepository.**
Sponsored by: Michael J. Fox Foundation for Parkinson. INT_MJFF-000858
Duration: 01/08/2021-31/07/2023

Martí MJ. **Parkinson and other Neurodegenerative Movement Disorders: Clinical and Experimental Research.**
Sponsored by: Generalitat de Catalunya.
AGAUR_SGR17_01502
Duration: 01/01/2017-30/09/2021

Marti MJ. **The Parkinson's Progression Markers Initiative (PPMI).**
Sponsored by: Michael J. Fox Foundation for Parkinson. INT_MJFF_041396
Duration: 06/11/2013-31/12/2023

Martí MJ. **Fox Trial Finder Spain.**
Sponsored by: Michael J. Fox Foundation for Parkinson. INT_MJFF_2018
Duration: 01/01/2019-30/06/2021

Martí MJ. **Collection, cryopreservation and shipment of PBMC from G2019S MC, NMCs, Controls and iPD subjects.**
Sponsored by: Michael J. Fox Foundation for Parkinson. INT_MJFF_2020_StaffD
Duration: 24/08/2020-23/08/2022

Martí MJ. **CSF RT-QuIC alpha-synuclein amplification in LRRK2-Parkinsons disease.**
Sponsored by: Michael J. Fox Foundation for Parkinson. INT_MJFF_UPDB_spg_20
Duration: 15/10/2020-01/02/2022

Marti MJ. **The Parkinson's Progression Markers Initiative (PPMI 2.0).**
Sponsored by: Michael J. Fox Foundation for Parkinson. INT_MJFF_041396
Duration: 01/01/2020-31/12/2033

Valldeoriola F. **Vía visual aferente: innovación para trastorno del Sueño REM y Parkinson.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/01228
Duration: 01/01/2018-30/06/2022

DOCTORAL THESES

Martí MJ, Gaetano G. **Multiple System Atrophy: A clinical characterization and biomarker discovery study.**
PhD student: Alexandra Pérez Soriano

4.16 Molecular neuropharmacology

LOCATION
IIBB-CSIC labs

KEYWORDS
1. **Neurodegeneration**
2. **Neuroinflammation**

RELATED DISEASES
1. **Multiple sclerosis**
2. **Experimental autoimmune encephalomyelitis**
3. **Huntington's disease**

GROUP INVOLVED IN
CIBERNED
AGAUR_SGR717: 00717

Original publications

TOTAL	1
Mean IF	**6,17**
Q1	**100%**
D1	**0%**
MA	**0%**
OA	**100%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Multiple sclerosis is a degenerative disease of the central nervous system that mainly affects young adults, especially women causing significant health burdens, both individually and in the family and community.

It is a chronic inflammatory disease characterized by damage to the axons (the branches of neurons) and a loss of myelin from neurons in the brain and spinal cord. This occurs as a result of infiltration by white blood cells (lymphocytes and macrophages) and results in the loss of neurological functions.

To find new therapies, researchers must understand how this inflammation works.

APPROACH

The group focuses its work on the analysis of phosphodiesterases, enzymes involved in neuroinflammation. We use cell lines and primary cultures of macrophages, as well as a multiple sclerosis model in mice to find new therapeutic targets to treat this disease.

Greater knowledge of the metabolic pathways involved and their alterations will help us identify new drugs capable of modifying the disease's progression.

IMPACT

The group has seen that some phosphodiesterases (involved in neuroinflammation) are expressed differently according to the sex of the animals.

We observed a significant reduction of clinical symptoms when mice with experimental autoimmune encephalomyelitis are treated chronically with a phosphodiesterase 7 inhibitor, specific to the cAMP.

In the spinal cord of these treated mice changes in the messenger RNA levels of some phosphodiesterases were observed, suggesting a potential treatment for this disease.

RESEARCH LINES

The molecular neuropharmacology group studies the involvement of the cAMP cascade in the polarization of microglia and macrophages toward anti- or pro-inflammatory phenotypes both in cell culture -cell lines and primary cultures- and in the CNS of EAE (experimental autoimmune encephalomyelitis) mice, a multiple sclerosis animal model.

We are also studying, in a collaborative CIBERNED project, the interaction of GRP78 (Glucose Regulated Protein-78) and the cannabinoid receptor CB1R as a new regulatory mechanism for the neuroprotective activity of cannabinoids, in the control mouse brain and in a Huntington's disease mouse mouse model.

PUBLICATIONS

Originals

1. Costas-Insua C, Moreno E, Maroto IB, Ruiz-Calvo A, Bajo-Grañeras R, Martín-Gutiérrez D, Diez-Alarcia R, Vilaró MT, Cortés R, García-Font N, Martín R, Espina M, Botta J, Ginés S, McCormick PJ, Sánchez-Prieto J, Galve-Roperh I, Mengod G, Urigüen L, Marsicano G, Bellocchio L, Canela EI, Casadó V, Rodríguez-Crespo I, Guzmán M. **Identification of BiP as a CB 1 Receptor-Interacting Protein That Fine-Tunes Cannabinoid Signaling in the Mouse Brain.** *Journal of Neuroscience.* 41(38):7924-7941. Q1

4.17 Imaging of mood - and anxiety - related disorders (IMARD)

LOCATION
CEK building, floor -1

KEYWORDS
1. **Brain imaging**
2. **Machine learning**
3. **Mental health**
4. **Meta-analysis**
5. **Personalized medicine**
6. **Prevention**

RELATED DISEASES
1. **Anxiety disorders**
2. **Bipolar disorders**
3. **Depression**
4. **Obsessive-compulsive disorder**
5. **Psychosis**

GROUP INVOLVED IN
CIBERSAM
ENIGMA

AWARDS
Top 1% most cited researcher globally
Institution: Clarivate Analytics
Awardee/s: Joaquim Raduà

Original publications

TOTAL	32
Mean IF	7,63
Q1	75%
D1	31%
MA	25%
OA	69%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Mood and anxiety disorders are among the leading causes of disability. Approximately one out of four people will suffer from one of these disorders during their lifetime.

And, unfortunately, the treatments available today only help half of sufferers, and it is often necessary to resort to trial and error to find the right treatment.

We need reliable, objective, valid indicators that allow us to predict from the outset the body's response to a treatment. Only by doing this will we be able to recommend the right treatment to each patient.

APPROACH

The group's research has two goals: to identify the changes in the brain involved in mood and anxiety disorders, and to determine the brain mechanisms that predict who will respond better or worse to different treatments.

To achieve these goals, the group uses different neuroimaging techniques (such as magnetic resonance imaging of the brain), which are often combined with artificial-intelligence techniques.

IMPACT

The group has published many studies on the brain changes observed in different mood and anxiety disorders, as well as in other mental health disorders (such as psychotic disorders).

It has also developed clinical tools that could potentially help clinicians to make more accurate predictions regarding the course of patients with mental health disorders, thanks to the information obtained from magnetic resonance imaging.

RESEARCH LINES

- Development of neuroimaging-based diagnostic and treatment prediction tools.

- Evidence-based syntheses in mental health.

- Neural correlates of mood- and anxiety-related disorders.

PUBLICATIONS

Originals

1. Writing Committee for the Attention-Deficit/Hyperactivity Disorder; Autism Spectrum Disorder; Bipolar Disorder; Major Depressive Disorder; Obsessive-Compulsive Disorder; and Schizophrenia ENIGMA Working Groups; Patel Y, Parker N, Shin J, ... , Raduà J, ... , Pausova Z, Thompson PM, Paus T. **Virtual Histology of Cortical Thickness and Shared Neurobiology in 6 Psychiatric Disorders.** *JAMA Psychiatry.* 78(1):47-63. D1

2. Catalan A; Salazar de Pablo G; Aymerich C; Damiani S; Sordi V; Radua J; Oliver D; McGuire P; Giuliano AJ; Stone WS; Fusar-Poli P. **Neurocognitive Functioning in Individuals at Clinical High Risk for Psychosis: A Systematic Review and Meta-analysis.** *JAMA Psychiatry.* 78(8):859-867. D1

3. de Pablo GS; Radua J; Pereira J; Bonoldi I; Arienti V; Besana F; Soardo L; Cabras A; Fortea L; Catalan A; Vaquerizo-Serrano J; Coronelli F; Kaur S; Da Silva J; Shin JI; Solmi M; Brondino N; Politi P; McGuire P; Fusar-Poli P. **Probability of Transition to Psychosis in Individuals at Clinical High Risk An Updated Meta-analysis.** *JAMA Psychiatry.* 78(9):970-978. D1

4. Schurz M; Radua J; Tholen MG; Maliske L; Margulies DS; Mars RB; Sallet J; Kanske P. **Toward a hierarchical model of social cognition: A neuroimaging meta-analysis and integrative review of empathy and theory of mind.** *Psychological Bulletin.* 147(3):293-327. D1

5. Han LKM, Dinga R, Hahn T, Ching CRK, Eyler LT, Aftanas L, Aghajani M, Aleman A, Baune BT, Berger K, Brak I, Filho GB, Carballedo A, Connolly CG, Couvy-Duchesne B, Cullen KR, Dannlowski U, Davey CG, Dima D, Duran FLS, Enneking V, Filimonova E, Frenzel S, Frodl T, Fu CHY, Godlewska BR, Gotlib IH, Grabe HJ, Groenewold NA, Grotegerd D, Gruber O, Hall GB, Harrison BJ, Hatton SN, Hermesdorf M, Hickie IB, Ho TC, Hosten N, Jansen A, Kähler C, Kircher T, Klimes-Dougan B, Krämer B, Krug A, Lagopoulos J, Leenings R, MacMaster FP, MacQueen G, McIntosh A, McLellan Q, McMahon KL, Medland SE, Mueller BA, Mwangi B, Osipov E, Portella MJ, Pozzi E, Reneman L, Repple J, Rosa PGP, Sacchet MD, Sämann PG, Schnell K, Schrantee A, Simulionyte E, Soares JC, Sommer J, Stein DJ, Steinsträter O, Strike LT, Thomopoulos SI, van Tol MJ, Veer IM, Vermeiren RRJM, Walter H, van der Wee NJA, van der Werff SJA, Whalley H, Winter NR, Wittfeld K, Wright MJ, Wu MJ, Völzke H, Yang TT, Zannias V, de Zubicaray GI, Zunta-Soares GB, Abé C, Alda M, Andreassen OA, Bøen E, Bonnin CM, Canales-Rodriguez EJ, Cannon D, Caseras X, Chaim-Avancini TM, Elvsåshagen T, Favre P, Foley SF, Fullerton JM, Goikolea JM, Haarman BCM, Hajek T, Henry C, Houenou J, Howells FM, Ingvar M, Kuplicki R, Lafer B, Landén M, Machado-Vieira R, Malt UF, McDonald C, Mitchell PB, Nabulsi L, Otaduy MCG, Overs BJ, Polosan M, Pomarol-Clotet E, Radua J, Rive MM, Roberts G, Ruhe HG, Salvador R, Sarró S, Satterthwaite TD, Savitz J, Schene AH, Schofield PR, Serpa MH, Sim K, Soeiro-de-Souza MG, Sutherland AN, Temmingh HS, Timmons GM, Uhlmann A, Vieta E, Wolf DH, Zanetti MV, Jahanshad N, Thompson PM, Veltman DJ, Penninx BWJH, Marquand AF, Cole JH, Schmaal L. **Brain aging in major depressive disorder: results from the ENIGMA major depressive disorder working group.** *Molecular Psychiatry.* 26(9):5124-5139. D1

6. McWhinney SR; Abé C; Alda M; Benedetti F; Bøen E; Del Mar Bonnin C; Borgers T; Brosch K; Canales-Rodríguez EJ; Cannon DM; Dannlowski U; Díaz-Zuluaga AM; Elvsåshagen T; Eyler LT; Fullerton JM; Goikolea JM; Goltermann J; Grotegerd D; Haarman BCM; Hahn T; Howells FM; Ingvar M; Kircher TTJ; Krug A; Kuplicki RT; Landén M; Lemke H; Liberg B; Lopez-Jaramillo C; Malt UF; Martyn FM; Mazza E; McDonald C; McPhilemy G; Meier S; Meinert S; Meller T; Melloni EMT; Mitchell PB; Nabulsi L; Nenadic I; Opel N; Ophoff RA; Overs BJ; Pfarr JK; Pineda-Zapata JA; Pomarol-Clotet E; Raduà J; Repple J; Richter M; Ringwald KG; Roberts G; Salvador R; Savitz J; Schmitt S; Schofield PR; Sim K; Stein DJ; Stein F; Temmingh HS; Thiel K; van Haren NEM; Gestel HV; Vargas C; Vieta E; Vreeker A; Waltemate L; Yatham LN; Ching CRK; Andreassen O; Thompson PM; Hajek T; ENIGMA Bipolar Disorders Working Group. **Association between body mass index and subcortical brain volumes in bipolar disorders-ENIGMA study in 2735 individuals.** *Molecular Psychiatry.* 26(11):6806-6819. D1

7. Solmi M; Civardi S; Corti R; Anil J; Demurtas J; Lange S; Radua J; Dragioti E; Fusar-Poli P; Carvalho AF. **Risk and protective factors for alcohol and tobacco related disorders: an umbrella review of observational studies.** *Neuroscience and Biobehavioral Reviews.* 121:20-28. D1

8. Madre M; Fuentes-Claramonte P; Palau P; Sáez N; Moro N; Blanch C; Verdolini N; Garcia-Leon MA; Feria I; Munuera J; Sarró S; Raduà J; McKenna P; Salvador R; Pomarol-Clotet E. **Brain correlates of impaired goal management in bipolar mania.** *Psychological Medicine.* D1

9. Lee S; Lee KH; Park KM; Park SJ; Kim WJ; Lee J; Kronbichler A; Smith L; Solmi M; Stubbs B; Koyanagi A; Jacob L; Stickley A; Thompson T; Dragioti E; Oh H; Brunoni AR; Carvalho AF; Radua J; An SK; Namkoong K; Lee E; Shin JI; Fusar-Poli P. **Impact of data extraction errors in meta-analyses on the association between depression and peripheral inflammatory biomarkers: an umbrella review.** *Psychological Medicine.* 1-14. D1

10. Canales-Rodríguez EJ; Pizzolato M; Yu T; Piredda GF; Hilbert T; Radua J; Kober T; Thiran JP. **Revisiting the T2 Spectrum Imaging Inverse Problem: Bayesian Regularized Non-Negative Least Squares.** *Neuroimage.* 244:118582. D1

11. McWhinney SR; Abé C; Alda M; Benedetti F; Bøen E; Del Mar Bonnin C; Borgers T; Brosch K; Canales-Rodríguez EJ; Cannon DM; Dannlowski U; Diaz-Zuluaga AM; Dietze L; Elvsåshagen T; Eyler LT; Fullerton JM; Goikolea JM; Goltermann J; Grotegerd D; Haarman BCM; Hahn T; Howells FM; Ingvar M; Kircher TTJ; Krug A; Kuplicki RT; Landén M; Lemke H; Liberg B; Lopez-Jaramillo C; Malt UF; Martyn FM; Mazza E; McDonald C; McPhilemy G; Meier S; Meinert S; Meller T; Melloni EMT; Mitchell PB; Nabulsi L; Nenadic I; Opel N; Ophoff RA; Overs BJ; Pfarr JK; Pineda-Zapata JA; Pomarol-Clotet E; Raduà J; Repple J; Richter M; Ringwald KG; Roberts G; Ross A; Salvador R; Savitz J; Schmitt S; Schofield PR; Sim K; Stein DJ; Stein F; Temmingh HS; Thiel K; Thomopoulos SI; van Haren NEM; Van Gestel H; Vargas C; Vieta E; Vreeker A; Waltemate L; Yatham LN; Ching CRK; Andreassen O; Thompson PM; Hajek T; ENIGMA Bipolar Disorders Working Group. **Diagnosis of bipolar disorders and body mass index predict clustering based on similarities in cortical thickness - ENIGMA study in 2 436 individuals**. *Bipolar Disorders.* Q1

12. Hauke DJ; Schmidt A; Studerus E; Andreou C; Riecher-Rössler A; Radua J; Kambeitz J; Ruef A; Dwyer DB; Kambeitz-Ilankovic L; Lichtenstein T; Sanfelici R; Penzel N; Haas SS; Antonucci LA; Lalousis PA; Chisholm K; Schultze-Lutter F; Ruhrmann S; Hietala J; Brambilla P; Koutsouleris N; Meisenzahl E; Pantelis C; Rosen M; Salokangas RKR; Upthegrove R; Wood SJ; Borgwardt S. **Multimodal prognosis of negative symptom severity in individuals at increased risk of developing psychosis.** *Translational Psychiatry.* 11(1):312. Q1

13. Westwood SJ; Radua J; Rubia K. **Noninvasive brain stimulation in children and adults with attention-deficit/hyperactivity disorder: a systematic review and meta-analysis.** *Journal of Psychiatry & Neuroscience.* 46(1):E14-E33. Q1

14. Sheng L; Zhao P; Ma H; Radua J; Yi Z; Shi Y; Zhong J; Dai Z; Pan P. **Cortical thickness in Parkinson's disease: a coordinate-based meta-analysis.** *Aging-US.* 13(3):4007-4023. Q1

15. Gharehgazlou A; Freitas C; Ameis SH; Taylor MJ; Lerch JP; Radua J; Anagnostou E. **Cortical Gyrification Morphology in Individuals with ASD and ADHD across the Lifespan: A Systematic Review and Meta-Analysis.** *Cerebral Cortex.* 31(5):2653-2669. Q1

16. Lopez-Soley E, Martinez-Heras E, Andorra M, Solanes A, Radua J, Montejo C, Alba-Arbalat S, Sola-Valls N, Pulido-Valdeolivas I, Sepulveda M, Romero-Pinel L, Munteis E, Martínez-Rodríguez JE, Blanco Y, Martinez-Lapiscina EH, Villoslada P, Saiz A, Solana E, Llufriu S. **Dynamics and Predictors of Cognitive Impairment along the Disease Course in Multiple Sclerosis.** *Journal of Personalized Medicine.* 11(11):1107. Q1

17. Radua J; Davies C; Fusar-Poli P. **Evaluation of variability in individual response to treatments in the clinical high-risk state for psychosis: A meta-analysis.** *Schizophrenia Research.* 227:20-27. Q1

18. Verdolini N, Amoretti S, Montejo L, García-Rizo C, Hogg B, Mezquida G, Rabelo-da-Ponte FD, Vallespir C, Radua J, Martinez-Aran A, Pacchiarotti I, Rosa AR, Bernardo M, Vieta E, Torrent C, Solé B. **Resilience and mental health during the COVID-19 pandemic.** *Journal of Affective Disorders.* 283:156-164. Q1

19. Fortea L, Tortella-Feliu M, Juaneda-Seguí A, De la Peña-Arteaga V, Chavarría-Elizondo P, Prat-Torres L, Soriano-Mas C, Lane SP, Radua J, Fullana MA. **Development and Validation of a Smartphone-Based App for the Longitudinal Assessment of Anxiety in Daily Life.** *Assessment.* 10731911211065166. Q1

20. Laing PAF; Vervliet B; Fullana MA; Savage HS; Davey CG; Felmingham KL; Harrison BJ. **Characterizing human safety learning via Pavlovian conditioned inhibition**. *Behaviour Research and Therapy.* 137:103800. Q1

21. Cano M; Martínez-Zalacaín I; Giménez M; Torrents-Rodas D; Real E; Alonso P; Segalàs C; Munuera J; Menchón JM; Cardoner N; Soriano-Mas C; Fullana MA. **Neural correlates of fear conditioning and fear extinction and its association with cognitive-behavioral therapy outcome in adults with obsessive-compulsive disorder.** *Behaviour Research and Therapy.* 144:103927. Q1

22. Moreno-Alcázar A; Ramos-Quiroga JA; Ribases M; Sánchez-Mora C; Palomar G; Bosch R; Salavert J; Fortea L; Monté-Rubio GC; Canales-Rodríguez EJ; Milham MP; Castellanos FX; Casas M; Pomarol-Clotet E; Radua J. **Brain structural and functional substrates of ADGRL3 (latrophilin 3) haplotype in attention-deficit/hyperactivity disorder.** *Scientific Reports.* 11(1):2373. Q1

23. Solana E; Martinez-Heras E; Montal V; Vilaplana E; Lopez-Soley E; Radua J; Sola-Valls N; Montejo C; Blanco Y; Pulido-Valdeolivas I; Sepúlveda M; Andorra M; Berenguer J; Villoslada P; Martinez-Lapiscina EH; Prados F; Saiz A; Fortea J; Llufriu S. **Regional grey matter microstructural changes and volume loss according to disease duration in multiple sclerosis patients.** *Scientific Reports.* 11(1):16805. Q1

24. Santo-Angles A; Fuentes-Claramonte P; Argila-Plaza I; Guardiola-Ripoll M; Almodóvar-Payá C; Munuera J; McKenna PJ; Pomarol-Clotet E; Radua J. **Reward and fictive prediction error signals in ventral striatum: asymmetry between factual and counterfactual processing.** *Brain Structure & Function.* 226(5):1553-1569. Q1

25. Garcia-Leon, MA; Fuentes-Claramonte, P; Valiente-Gomez, A; Natividad, C; Salgado-Pineda, P; Gomar, JJ; Guerrero-Pedraza, A; Portillo, F; Ortiz-Gil, J; Alonso-Lana, S; Maristany, T; Radua, J; Salvador, R; Sarro, S; Pomarol-Clotet, E. **Altered brain responses to specific negative emotions in schizophrenia.** *Neuroimage-Clinical.* 32:102894. Q2

26. Montejo L, Solé B, Verdolini N, Martínez-Arán A, Bonnín CDM, Radua J, Martín-Villalba I, Williams E, García-Rizo C, Mezquida G, Bernardo M, Vieta E, Torrent C, Amoretti S, BRIS-MHC research group. **Self-reported neurocognitive symptoms during COVID-19 lockdown and its associated factors in a sample of psychiatric patients.** *European Neuropsychopharmacology.* 53:7-18. Q2

27. Fortea L, Solanes A, Pomarol-Clotet E, Garcia-Leon MA, Fortea A, Torrent C, Varo C, Bonnin CM, Montejo L, Alonso J, Carmona S, Soldevila-Matías P, Alustiza I, Arbós D, Hidalgo-Mazzei D, Grande I, Vieta E, Fullana MÀ, Radua J. **Study Protocol-Coping With the Pandemics: What Works Best to Reduce Anxiety and Depressive Symptoms.** *Frontiers in Psychiatry.* 12:642763. Q2

28. Anmella G, Primé-Tous M, Segú X, Solanes A, Ruíz V, Martín-Villalba I, Morilla I, Also-Fontanet A, Sant E, Murgui S, Sans-Corrales M, Murru A, Zahn R, Young AH, Vicens V, Viñas-Bardolet C, Martínez-Cerdá JF, Blanch J, Radua J, Fullana MÀ, Cavero M, Vieta E, Hidalgo-Mazzei D. **PRimary carE digital Support ToOl in mental health (PRESTO): design, development and study protocols**. *Revista de Psiquiatría y Salud Mental.* S1888-9891(21):00051-3. Q2

29. Jauhar S, Fortea L, Solanes A, Albajes-Eizagirre A, McKenna PJ, Radua J. **Brain activations associated with anticipation and delivery of monetary reward: A systematic review and meta-analysis of fMRI studies.** *Plos One.* 16(8):e0255292. Q2

30. Solanes, A; Laredo, C; Guasp, M; Fullana, MA; Fortea, L; Garcia-Olive, I; Solmi, M; Shin, JI; Urra, X; Radua, J. **No Effects of Meteorological Factors on the SARS-CoV-2 Infection Fatality Rate.** *Biomedical and Environmental Sciences.* 34(11):871-880. Q2

31. Solanes A, Palau P, Fortea L, Salvador R, González-Navarro L, Llach CD, Valentí M, Vieta E, Radua J. **Biased accuracy in multisite machine-learning studies due to incomplete removal of the effects of the site.** *Psychiatry Research-Neuroimaging.* 314:111313. Q3

32. Gardoki-Souto I; Martín de la Torre O; Hogg B; Redolar-Ripoll D; Valiente-Gómez A; Martínez Sadurní L; Blanch JM; Lupo W; Pérez V; Radua J; Amann BL; Moreno-Alcázar A. **Augmentation of EMDR with multifocal transcranial current stimulation (MtCS) in the treatment of fibromyalgia: study protocol of a double-blind randomized controlled exploratory and pragmatic trial.** *Trials.* 22(1):104. Q4

Review

1. Han YJ; Lee KH; Yoon S; Nam SW; Ryu S; Seong D; Kim JS; Lee JY; Yang JW; Lee J; Koyanagi A; Hong SH; Dragioti E; Radua J; Smith L; Oh H; Ghayda RA; Kronbichler A; Effenberger M; Kresse D; Denicolò S; Kang W; Jacob L; Shin H; Shin JI. **Treatment of severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), and coronavirus disease 2019 (COVID-19): a systematic review of in vitro, in vivo, and clinical trials.** *Theranostics.* 11(3):1207-1231. D1

2. Solmi M; Dragioti E; Arango C; Radua J; Ostinelli E; Kilic O; Yilmaz UE; Yalcinay-İnan M; Soares FC; Mariano L; Mosillo P; Cortese S; Correll CU; Carvalho AF; Shin JI; Fusar-Poli P. **Risk and protective factors for mental disorders with onset in childhood/adolescence: An umbrella review of published meta-analyses of observational longitudinal studies.** *Neuroscience and Biobehavioral Reviews.* 120:565-573. D1

3. Solmi M; Dragioti E; Croatto G; Radua J; Borgwardt S; Carvalho AF; Demurtas J; Mosina A; Kurotschka PK; Shin JI; Fusar-Poli P. **Risk and protective factors for cannabis, cocaine, and opioid use disorders: an umbrella review of meta-analyses of observational studies.** *Neuroscience and Biobehavioral Reviews.* 126:243-251. D1

4. Anmella G, Fico G, Lotfaliany M, Hidalgo-Mazzei D, Soto-Angona Ó, Giménez-Palomo A, Amoretti S, Murru A, Radua J, Solanes A, Pacchiarotti I, Verdolini N, Cowdery S, Dodd S, Williams LJ, Mohebbi M, Carvalho AF, Kessing LV, Vieta E, Berk M. **Risk of cancer in bipolar disorder and the potential role of lithium: international collaborative systematic review and meta-analyses.** *Neuroscience and Biobehavioral Reviews.* 126:529-541. D1

5. Del Fabro L, Schmidt A, Fortea L, Delvecchio G, D'Agostino A, Radua J, Borgwardt S, Brambilla P. **Functional brain network dysfunctions in subjects at high-risk for psychosis: A meta-analysis of resting-state functional connectivity.** *Neuroscience and Biobehavioral Reviews.* 128:90-101. D1

6. Pezzoli S, Sánchez-Valle R, Solanes A, Kempton MJ, Bandmann O, Shin JI, Cagnin A, Goldman JG, Merkitch D, Firbank MJ, Taylor JP, Pagonabarraga J, Kulisevsky J, Blanc F, Verdolini N, Venneri A, Radua J. **Neuroanatomical and cognitive correlates of visual hallucinations in Parkinson's disease and dementia with Lewy bodies: Voxel-based morphometry and neuropsychological meta-analysis.** *Neuroscience And Biobehavioral Reviews.* 128:367-382. D1

7. Webler RD; Berg H; Fhong K; Tuominen L; Holt DJ; Morey RA; Lange I; Burton PC; Fullana MA; Radua J; Lissek S. **The neurobiology of human fear generalization: meta-analysis and working neural model.** *Neuroscience and Biobehavioral Reviews.* 128:421-436. D1

8. Serra-Blasco M, Radua J, Soriano-Mas C, Gómez-Benlloch A, Porta-Casteràs D, Carulla-Roig M, Albajes-Eizagirre A, Arnone D, Klauser P, Canales-Rodríguez EJ, Hilbert K, Wise T, Cheng Y, Kandilarova S, Mataix-Cols D, Vieta E, Via E, Cardoner N. **Structural Brain Correlates in Major Depression, Anxiety Disorders and Post-traumatic Stress Disorder: A Voxel-Based Morphometry Meta-analysis.** *Neuroscience and Biobehavioral Reviews.* 129:269-281. D1

9. Bellato A; Norman L; Idrees I; Ogawa CY; Waitt A; Zuccolo PF; Tye C; Radua J; Groom MJ; Shephard E. **A systematic review and meta-analysis of altered electrophysiological markers of performance monitoring in Obsessive-Compulsive Disorder (OCD), Gilles de la Tourette Syndrome (GTS), Attention-Deficit/Hyperactivity Disorder (ADHD) and Autism.** *Neuroscience and Biobehavioral Reviews.* 131:964-987. D1

10. de Pablo GS; Davies C; de Diego H; Solmi M; Shin JI; Carvalho AF; Radua J; Fusar-Poli P. **Transition to psychosis in randomised clinical trials of individuals at clinical high risk of psychosis compared to observational cohorts: a systematic review and meta-analysis.** *European Psychiatry.* 64(1):e51. Q1

11. Fortea A, Batalla A, Radua J, van Eijndhoven P, Baeza I, Albajes-Eizagirre A, Fusar-Poli P, Castro-Fornieles J, De la Serna E, Luna LP, Carvalho AF, Vieta E, Sugranyes G. **Cortical gray matter reduction precedes transition to psychosis in individuals at clinical high-risk for psychosis: A voxel-based meta-analysis.** *Schizophrenia Research.* 232:98-106. Q1

12. Salazar de Pablo G; Solmi M; Vaquerizo-Serrano J; Radua J; Passina A; Morsillo P; Correll CU; Borgwardt S; Galderisi S; Bechdolf A; Pfennig A; Bauer M; Kessing LV; van Amelsvoort T; Nieman DH; Domschke K; Krebs MO; Sand M; Vieta E; McGuire P; Arango C; Shin JI; Fusar-Poli P. **Primary prevention of depression: An umbrella review of controlled interventions.** *Journal of Affective Disorders.* 294:957-970. Q1

13. Solmi M; Dragioti E; Croatto G; Radua J; Borgwardt S; Carvalho AF; Demurtas J; Mosina A; Kurotschka P; Thompson T; Cortese S; Shin JI; Fusar-Poli P. **Risk and Protective Factors for Personality Disorders: An Umbrella Review of Published Meta-Analyses of Case-Control and Cohort Studies.** *Frontiers in Psychiatry.* 12:679379. Q2

14. Garcés MS; Alústiza I; Albajes-Eizagirre A; Goena J; Molero P; Radua J; Ortuño F. **An fMRI Study Using a Combined Task of Interval Discrimination and Oddball Could Reveal Common Brain Circuits of Cognitive Change.** *Frontiers in Psychiatry.* 12:786113. Q2

15. Salazar de Pablo G; De Micheli A; Solmi M; Oliver D; Catalan A; Verdino V; Di Maggio L; Bonoldi I; Radua J; Baccaredda Boy O; Provenzani U; Ruzzi F; Calorio F; Nosari G; Di Marco B; Famularo I; Montealegre I; Signorini L; Molteni S; Filosi E; Mensi M; Balottin U; Politi P; Shin JI; Correll CU; Arango C; Fusar-Poli P. **Universal and Selective Interventions to Prevent Poor Mental Health Outcomes in Young People: Systematic Review and Meta-analysis.** *Harvard Review of Psychiatry.* 29(3):196-215. Q2

16. Choi, MJ; Yang, JW; Lee, S; Kim, JY; Oh, JW; Lee, J; Stubbs, B; Lee, KH; Koyanagi, A; Hong, SH; Ghayda, RA; Hwang, J; Dragioti, E; Jacob, L; Carvalho, AF; Radua, J; Thompson, T; Smith, L; Fornaro, M; Stickley, A; Bettac, EL; Han, YJ; Kronbichler, A; Yon, DK; Lee, SW; Shin, JI; Lee, E; Solmi, M. **Suicide associated with COVID-19 infection: an immunological point of view.** *European Review for Medical and Pharmacological Sciences.* 25(20):6397-6407. Q2

17. Lee, HJ; Jeong, GH; Li, H; Kim, MS; Kim, JS; Park, SJ; Han, YJ; Lee, KH; Kronbichler, A; Hong, SH; Ghayda, RA; Luchini, C; Nottegar, A; Koyanagi, A; Smith, L; Jacob, L; Dragioti, E; Radua, J; Cargnin, S; Terrazzino, S; Thompson, T; Yon, DK; Lee, SW; Yang, JM; Wasuwanich, P; Shin, JI; Gamerith, G. **Efficacy and safety of epidermal growth factor receptor-tyrosine kinase inhibitor (EGFR-TKI) monotherapy for advanced EGFR-mutated non-small cell lung cancer: systematic review and meta-analysis.** *European Review for Medical and Pharmacological Sciences.* 25(20):6232-6244. Q2

18. Solanes A, Albajes-Eizagirre A, Fullana MA, Fortea L, Fusar-Poli P, Torrent C, Solé B, Bonnín CM, Shin JI, Vieta E, Radua J. **Can we increase the subjective well-being of the general population? An umbrella review of the evidence.** *Revista de Psiquiatría y Salud Mental.* 14(1):50-64. Q2

19. Soldevila-Matías P, Schoretsanitis G,

Tordesillas-Gutierrez D, Cuesta MJ, de Filippis R, Ayesa-Arriola R, González-Vivas C, Setién-Suero E, Verdolini N, Sanjuán J, Radua J, Crespo-Facorro B. **Neuroimaging correlates of insight in non-affective psychosis: A systematic review and meta-analysis.** *Revista de Psiquiatría y Salud Mental.* S1888-9891(21):00067-7. Q2

20. Solanes A; Albajes-Eizagirre A; Fullana MA; Fortea L; Fusar-Poli P; Torrent C; Solé B; Bonnín CM; Shin JI; Vieta E; Radua J. **Can we increase the subjective well-being of the general population? An umbrella review of the evidence.** *Revista de Psiquiatría y Salud Mental.* 14(1):50-64. Q2

21. Solmi M; Radua J; Stubbs B; Ricca V; Moretti D; Busatta D; Carvalho AF; Dragioti E; Favaro A; Monteleone AM; Shin JI; Fusar-Poli P; Castellini G. **Risk factors for eating disorders: an umbrella review of published meta-analyses.** *Revista Brasileira de Psiquiatria.* 43(3):314-323. Q2

Letters

1. Fusar-Poli P; Radua J; Jauhar S. **Lack of robust meta-analytic evidence to favour cognitive behavioural therapy for prevention of psychosis**. *World Psychiatry.* 20(3):443-444. D1

2. Radua J. **PRISMA 2020 - An updated checklist for systematic reviews and meta-analyses.** *Neuroscience and Biobehavioral Reviews.* 124:324-325. D1

3. Radua J. **What is the actual accuracy of clinical prediction models? The case of transition to psychosis.** *Neuroscience and Biobehavioral Reviews.* 127:502-503. D1

4. Fullana MA; Soriano-Mas C. **Doing the Math in Exposure Therapy.** *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging.* 6(11):1040-1041. Q1

5. Fullana MA; Littarelli SA. **Covid-19, anxiety, and anxiety-related disorders.** *European Neuropsychopharmacology.* 51:87-89. Q2

6. Radua J; Carvalho AF. **Route map for machine learning in psychiatry: Absence of bias, reproducibility, and utility.** *European Neuropsychopharmacology.* 50:115-117. Q2

7. Radua J, Fortea L, Pomarol-Clotet E, Vieta E, Fullana MÀ, Solanes A. **Following a healthy/balanced diet predicts lower anxiety and depression during the COVID-19 pandemic.** *Revista de Psiquiatría y Salud Mental.* Q2

Editorial

1. Lai CH; Kim YK; Radua J. **Editorial: Neuroimaging Biomarkers in Mood and Anxiety Disorders**. *Frontiers in Psychiatry.* 12:773034. Q2

GRANTS FOR RESEARCH IN PROGRESS

Fullana MA. **El modelo de incertidumbre-anticipación: uso de la neuroimagen funcional para predecir la trayectoria de los síntomas de ansiedad y caracterizar las alteraciones cerebrales relacionadas.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/00144
Duration: 14/12/2017-30/06/2021

Fullana MA. **Aprendizaje de estados en la corteza orbitofrontal: un estudio combinado de neuroimagen y psiquiatria computacional en el trastorno obsesivo-compulsivo.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00272
Duration: 01/01/2020-31/12/2022

Fullana MA. **¿Por qué el/la niño/a no puede dejar de lavarse? Aprendizaje de hábitos en el TOC infantil.**
Sponsored by: Fundación Alicia Koplowitz. AKOPLOWITZ18_002
Duration: 01/11/2018-31/12/-

Raduà J. **Hacia biomarcadores robustos en salud mental: Creación de un atlas de los trastornos mentales basado en la resonancia magnética, y validación inicial de una herramienta asociada de ayuda diagnóstica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00394
Duration: 01/01/2020-31/12/2022

Raduà J. **Anxiety, depression and coping behaviors during the COVID-19 pandemic and lockdown.**
Sponsored by: AXA Research Fund. INT_AXA-COVID-19_1
Duration: 01/09/2020-31/08/2022

DOCTORAL THESES

Raduà J, Pomarol-Clotet E. **Development, implementation and validation of a new method for meta-analysis of voxel-based neuroimage studies.**
PhD student: Anton Albajes Eizaguirre

Raduà J, Pomarol-Clotet E. **Brain correlates of delusional disorder using magnetic resonance imaging.**
PhD student: Víctor Vicens Soler

4.18 Alzheimer's disease and other cognitive disorders

LOCATION
CELLEX building, floor 3B
HCB building, E8P4

KEYWORDS
1. **Alzheimer disease**
2. **Degenerative neurological diseases**

RELATED DISEASES
1. **Alzheimer's disease**
2. **Frontotemporal dementia**
3. **Primary progressive aphasia**
4. **Dementia with lewy bodies**
5. **Prion diseases**

GROUP INVOLVED IN
AGAUR_SGR17: 01507

Original publications

TOTAL	43
Mean IF	**11,36**
Q1	**72%**
D1	**49%**
MA	**19%**
OA	**84%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Neurodegenerative dementias are one of the main causes of disability, dependency and death worldwide. Around 50 million people have dementia, and there are nearly 10 million new cases every year.
Alzheimer's disease is the most common neurodegenerative dementia, although there are many others, such as frontotemporal dementia, progressive aphasias, dementia with Lewy bodies, and prion diseases. The cause of these diseases in most patients are still unknown. An accurate diagnosis in the early phases of the disease is key for the optimal management of the disease.

APPROACH

The Alzheimer's disease and other cognitive disorders (ADCD) group is a multidisplinary team composed by neurologists, neuropsychologists, biologists, nurses, speech therapist, physicist and lab technicians. The group works to better understand the causes of different forms of neurodegenerative dementias and to characterize the preclinical and early phases and the progression of these diseases with the general aim to establish an accurate early diagnosis and an accurate prognosis.

The group participates in international interventional clinical trials of modifying treatments for Alzheimer's disease, both sporadic and genetic forms of the disease and frontotemporal lobar degeneration .

IMPACT

In recent years, the group has analysed the usefulness of different diagnostic and prognostic biomarkers in Alzheimer's disease, frontotemporal dementia and dementia with Lewy bodies; characterized the initial phases of autosomal dominant Alzheimer's disease and genetic frotontemporal dementia; investigated new genetic causes and evaluated the impact of new diagnostic criteria in the clinical-neuropathological correlations.

The results have been presented in top-of their-field international conferences, and resulted in more than 100 scientific publications and several doctoral theses.

RESEARCH LINES

- Diagnostic and prognostic biomarkers of early-onset sporadic Alzheimer's disease.

- Healthy aging - Alzheimer's disease continuum.

- Neuropathology of neurodegenerative diseases.

- Rare neurodegenerative dementias: Frontotemporal lobar degeneration and prion diseases.

- Study of genetically determined dementias.

PUBLICATIONS

Originals

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32. Ahmad F; Jing Y; Llado A; Liu P. **Chemical Stimulation of Rodent and Human Cortical Synaptosomes: Implications in Neurodegeneration.** *Cells*. 10(5):1174. Q2

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35. Contador J, Pérez-Millán A, Tort-Merino A, Balasa M, Falgàs N, Olives J, Castellví M, Borrego-Écija S, Bosch B, Fernández-Villullas G, Ramos-Campoy O, Antonell A, Bargalló N, Sanchez-Valle R, Sala-Llonch R, Lladó A, Alzheimer's Disease Neuroimaging Initiative. **Longitudinal brain atrophy and CSF biomarkers in early-onset Alzheimer's disease.** *Neuroimage-Clinical*. 32:102804. Q2

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37. van der Ende EL; Morenas-Rodriguez E; McMillan C; Grossman M; Irwin D; Sanchez-Valle R; Graff C; Vandenberghe R; Pijnenburg YAL; Laforce R; Ber IL; Lleo A; Haass C; Suarez-Calvet M; van Swieten JC; Seelaar H. **CSF sTREM2 is elevated in a subset in GRN-related frontotemporal dementia.** *Neurobiology of Aging*. 103:158.e1-158.e5. Q2

38. Premi E; Giunta M; Iraji A; Rachakonda S; Calhoun VD; Gazzina S; Benussi A; Gasparotti R; Archetti S; Bocchetta M; Cash D; Todd E; Peakman G; Convery R; van Swieten JC; Jiskoot L; Sanchez-Valle R; Moreno F; Laforce R; Graff C; Synofzik M; Galimberti D; Rowe JB; Masellis M; Tartaglia C; Finger E; Vandenberghe R; de Mendonça A; Tagliavini F; Butler CR; Santana I; Gerhard A; Le Ber I; Pasquier F; Ducharme S; Levin J; Danek A; Sorbi S; Otto M; Rohrer JD; Borroni B; Genetic Frontotemporal dementia Initiative (GENFI). **Dissemination in time and space in presymptomatic granulin mutation carriers: a GENFI spatial chronnectome study.** *Neurobiology of Aging.* 108:155-167. Q2

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40. Bergström S; Remnestål J; Yousef J; Olofsson J; Markaki I; Carvalho S; Corvol JC; Kultima K; Kilander L; Löwenmark M; Ingelsson M; Blennow K; Zetterberg H; Nellgård B; Brosseron F; Heneka MT; Bosch B; Sanchez-Valle R; Månberg A; Svenningsson P; Nilsson P. **Multi-cohort profiling reveals elevated CSF levels of brain-enriched proteins in Alzheimer's disease.** *Annals of Clinical and Translational Neurology.* 8(7):1456-1470. Q2

41. Montagut N, Borrego-Écija S, Castellví M, Rico I, Reñé R, Balasa M, Lladó A, Sánchez-Valle R. **Errorless Learning Therapy in Semantic Variant of Primary Progressive Aphasia.** *Journal of Alzheimers Disease.* 79(1):415-422. Q2

42. Falgas, N; Illan-Gala, I; Allen, IE; Mumford, P; Essanaa, YM; Le, MM; You, M; Grinberg, LT; Rosen, HJ; Neylan, TC; Kramer, JH; Walsh, CM. **Specific cortical and subcortical grey matter regions are associated with insomnia severity.** *Plos One.* 16(5):e0252076. Q2

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Review

1. Benussi A; Alberici A; Samra K; Russell LL; Greaves CV; Bocchetta M; Ducharme S; Finger E; Fumagalli G; Galimberti D; Jiskoot LC; Le Ber I; Masellis M; Nacmias B; Rowe JB; Sanchez-Valle R; Seelaar H; Synofzik M; GENFI Consortium; Rohrer JD; Borroni B. **Conceptual framework for the definition of preclinical and prodromal frontotemporal dementia.** *Alzheimers & Dementia.* D1

2. Pezzoli S, Sánchez-Valle R, Solanes A, Kempton MJ, Bandmann O, Shin JI, Cagnin A, Goldman JG, Merkitch D, Firbank MJ, Taylor JP, Pagonabarraga J, Kulisevsky J, Blanc F, Verdolini N, Venneri A, Radua J. **Neuroanatomical and cognitive correlates of visual hallucinations in Parkinson's disease and dementia with Lewy bodies: Voxel-based morphometry and neuropsychological meta-analysis.** *Neuroscience and Biobehavioral Reviews.* 128:367-382. D1

3. Forno G, Lladó A, Hornberger M. **Going round in circles - the Papez Circuit in Alzheimer's Disease.** *European Journal of Neuroscience.* 54(10):7668-7687. Q3

Letters

1. Sanchez-Valle R. **Pioglitazone for prevention of cognitive impairment: results and lessons.** *Lancet Neurology.* 20(7):500-502. D1

2. Falgàs N, Walsh CM, Neylan TC, Grinberg LT. **Deepen into sleep and wake patterns across Alzheimer's disease phenotypes.** *Alzheimers & Dementia.* 17(8):1403-1406. D1

3. Hernandez I, Gelpi E, Molina-Porcel L, Bernal S, Rodríguez-Santiago B, Dols-Icardo O, Ruiz A, Alcolea D, Boada M, Lleó A, Clarimón J. **Heterozygous APOE Christchurch in familial Alzheimer's disease without mutations in other Mendelian genes.** *Neuropathology and Applied Neurobiology.* 47(4):579-582. D1

4. Gelpi E, Aldecoa I, Lopez-Villegas D, Abellan-Vidal MT, Mercadel-Fañanas P, Fortea J, Ribosa R, Morenas E, Gomez-Anson B, Molina-Porcel L, Ximelis T, Borrego S, Antonell A, Rovelet-Lecrux A, Klotz S, Andres-Benito P, Sanchez-Valle R, Ferrer I. **Atypical astroglial pTDP-43 pathology in astroglial predominant tauopathy.** *Neuropathology and Applied Neurobiology.* 47(7):1109-1113. D1

Consortium Publications

1. Dewan R, Chia R, Ding J, Hickman RA, Stein TD, Abramzon Y, Ahmed S, Sabir MS, Portley MK, Tucci A, Ibáñez K, Shankaracharya FNU, Keagle P, Rossi G, Caroppo P, Tagliavini F, Waldo ML, Johansson PM, Nilsson CF, Rowe JB, Benussi L, Binetti G, Ghidoni R, Jabbari E, Viollet C, Glass JD, Singleton AB, Silani V, Ross OA, Ryten M, Torkamani A, Tanaka T, Ferrucci L, Resnick SM, Pickering-Brown S, Brady CB, Kowal N, Hardy JA, Van Deerlin V, Vonsattel JP, Harms MB, Morris HR, Ferrari R, Landers JE, Chiò A, Gibbs JR, Dalgard CL, Scholz SW, Traynor BJ, American Genome Center (TAGC), FALS Sequencing Consortium, Genomics England Research Consortium, International ALS/FTD Genomics Consortium (iAFGC), International FTD Genetics Consortium (IFGC), International LBD Genomics Consortium (iLBDGC), NYGC ALS Consortium, PROSPECT Consortium. **Pathogenic Huntingtin Repeat Expansions in Patients with Frontotemporal Dementia and Amyotrophic Lateral Sclerosis.** *Neuron.* 109(3):448-460. D1

GRANTS FOR RESEARCH IN PROGRESS

Antonell A. **Estudio comparativo de portadores de mutaciones determinantes de enfermedad de Alzheimer y demencia frontotemporal genéticas en un modelo de línea celular linfoblastoide y cerebro.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00670
Duration: 01/01/2018-30/06/2022

Balasa M. **Neurofilamentos en plasma para el diagnóstico del deterioro cognitivo en una cohorte de práctica clínica habitual:co-**

rrelación con cognición,neuroimagen y otros marcadores bioquímicos.
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00198
Duration: 01/01/2019-31/12/2022

Balasa M. **Dementia-friendly Hospital Design – MOOC.**
Sponsored by: European Institute of Innovation & Technology (EIT) Health
Duration: 01/01/2021-31/12/2021

Balasa M. **Digitally-enhanced personalized medicine: accurate selection of subjective cognitive decline.**
Sponsored by: Altoida. INT_ADDF_2019_01
Duration: 01/08/2021-31/07/2023

Falgàs N, Sánchez-Valle R. **Understanding sleep-wake alterations in Alzheimer's Disease.**
Sponsored by: Alzheimer's Association. INT_AlzAs_PilotAw_19
Duration: 01/02/2021-31/01/2023

Falgàs N, Sánchez-Valle R. **Novel biomarkers related to sleep-wake alterations in Alzheimer's disease.**
Sponsored by: Alzheimer's Association. INT_ALZASSOC_CSF_21_01
Duration: 01/11/2021-31/10/2025

Lladó A. **Progresión clínica y biomarcadores pronósticos en la Enfermedad de Alzheimer.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00449
Duration: 01/01/2020-31/12/2022

Rami L. **Detección precoz de disfunción cognitiva en sujetos con enfermedad de Alzheimer preclínica: asociación de una nueva batería cognitiva, resonancia magnética y biomarcadores en LCR.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00745
Duration: 01/01/2020-31/12/2022

Sánchez-Valle R. **Study of genetic frontotemporal dementia in preclinical and early stages of the disease: cognitive performance, structural and functional neuroimaging and biochemical markers.**
Sponsored by: Fundació la Marató de TV3. Neuro_14
Duration: 12/05/2015-15/11/2021

Sánchez-Valle R. **Utilitat clínica i estudi cost-benefici dels actuals biomarcadors diagnòstics inous biomarcadors pronòstics en les demències d'inici primerenc.**
Sponsored by: Generalitat de Catalunya. PERIS_SLT008/18/00061
Duration: 02/09/2019-31/12/2021

Sánchez-Valle R. **Demencias genéticamente determinadas (enf. De Alzheimer y enf. Priónicas genéticas) en fases preclínica y sintomática precoz: cognición, neuroimagen y marcadores bioquímicos.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/00235
Duration: 01/01/2017-30/06/2021

Sánchez-Valle R. **Demencias genéticas (enfermedad de Alzheimer, demencia frontotemporal y enfermedades priónicas genéticas): cambios longitudinales y diferencias en expresión y epigenéticas con formas esporádicas.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00448
Duration: 01/01/2021-31/12/2023

Sánchez-Valle R. **Diagnóstico precoz de la enfermedad de Alzheimer mediante el perfil de linfocitos citotóxicos y caracterización de alteraciones del sueño.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_AC21_2/00007
Duration: 15/12/2021-14/12/2024

Sánchez-Valle R. **Investigating the impact of meditation training on mental health and wellbeing in the ageing population.**
Sponsored by: European Commission. CE_H2020-PHC-2015-2s
Duration: 01/01/2016-31/03/2022

Sánchez-Valle R. **DIAN-TU: Next generation prevention trial.**
Sponsored by: National Institutes of Health. INT_NIH_PA-16-160_3
Duration: 01/07/2018-31/05/2022

Sánchez-Valle R. **Dominantly Inherited Alzheimer Network (DIAN).**
Sponsored by: National Institutes of Health. INT_NIH_PAR-13-147
Duration: 24/06/2019-23/06/2022

DOCTORAL THESES

Rodriguez A, Rami L. **Detección precoz de cambios cognitivos sutiles en el envejecimiento y en la fase preclínica del continuo Alzheimer.**
PhD student: Adrià Tort Merino

Sanchez-Valle R, Gelpi E. **Determinantes genéticos del fenotipo clínico y neuropatológico en el espectro demencia frontotemporal - esclerosis lateral amiotrófica.**
PhD student: Sergi Borrego Ecija

4.19 Systems neuroscience

LOCATION
Còrsega 176

KEYWORDS
1. **Cerebral cortex**
2. **Brain states**
3. **Neural networks**
4. **Brain rhythms**
5. **Cortical models**
6. **Oscillations**
7. **Virtual reality**
8. **Body representation**

RELATED DISEASES
1. **Disorders of consciousness**
2. **Epilepsy**

GROUP INVOLVED IN
AGAUR_SGR17: 01296

Original publications

TOTAL	10
Mean IF	**6,99**
Q1	**80%**
D1	**30%**
MA	**70%**
OA	**100%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

How are the emergent activity patterns of the brain generated in different brain states, both physiological and pathological? What are the cellular and network underlying mechanisms? These are questions of basic research in neurosciences that are critical to the design of strategies for exogenous modulation of brain activity in pathological states.

Our group has also a focus on neurotechnology, and the design and testing of novel brain interfaces. Finally, the understanding of the impact of embodiment in immersive virtual reality and its applications on rehabilitation is one of our objectives.

APPROACH

We use a combination of experimental and computational approaches. We use different electrophysiological techniques (from cellular to global brain approaches), novel neurotechnological tools that currently are mostly focused around graphene-based interfaces, brain stimulation, and photopharmacology in collaboration with the group of Dr. Gorostiza (IBEC). But we consider that the technology employed must be determined by the questions to be answered, therefore we also use other tools like brain imaging (fMRI) or calcium imaging or collaborate with other groups. Immersive virtual reality and embodiment techniques are also our expertise, and are being employed in laboratory and clinical settings.

IMPACT

Our group has found that the slow oscillatory pattern of the brain is the default activity of the cerebral cortex, and is generated in situations of physical or functional isolation of the cortical network.

Further, the alterations of this emergent pattern in conditions of early ageing, Alzheimer's disease, Williams syndrome, and Down syndrome, provide information about the underlying network alterations. Our objectives are to investigate exogenous interventions for neuromodulation based on data-driven models to be applied in cortical dysfunction. In the field of a virtual reality applications, we investigate how modifying a virtual body modulates pain and brain plasticity.

RESEARCH LINES

- Cortical network dynamics.
- Brain states.
- Neurotechnology.
- Virtual embodiment.

PUBLICATIONS

Originals

1. Barbero-Castillo A; Riefolo F; Matera C; Caldas-Martinez S; Mateos-Aparicio P; Weinert JF; Garrido-Charles A; Claro E; Sanchez-Vives MV; Gorostiza P. **Control of Brain State Transitions with a Photoswitchable Muscarinic Agonist.** *Advanced Science.* 8(14):e2005027. D1

2. Rebollo B; Telenczuk B; Navarro-Guzman A; Destexhe A; Sanchez-Vives MV. **Modulation of intercolumnar synchronization by endogenous electric fields in cerebral cortex.** *Science Advances.* 7(10):eabc7772. D1

3. Dasilva M, Camassa A, Navarro-Guzman A, Pazienti A, Perez-Mendez L, Zamora-López G, Mattia M, Sanchez-Vives MV. **Modulation of cortical slow oscillations and complexity across anesthesia levels.** *Neuroimage.* 224:117415. D1

4. Tort-Colet N; Capone C; Sanchez-Vives MV; Mattia M. **Attractor competition enriches cortical dynamics during awakening from anesthesia.** *Cell Reports.* 35(12):109270. Q1

5. Barbero-Castillo A; Mateos-Aparicio P; Dalla-Porta L; Camassa A; Perez-Mendez L; Sanchez-Vives MV. **Impact of GABA(A) and GABA(B) Inhibition on Cortical Dynamics and Perturbational Complexity during Synchronous and Desynchronized States.** *Journal of Neuroscience.* 41(23):5029-5044. Q1

6. Nierula B; Spanlang B; Martini M; Borrell M; Nikulin V; Sanchez-Vives M. **Agency and responsibility over virtual movements controlled through different paradigms of brain–computer interface.** *Journal of Physiology-London.* 599(9):2419-2434. Q1

7. Seinfeld S; Zhan M; Poyo-Solanas M; Barsuola G; Vaessen M; Slater M; Sanchez-Vives MV; de Gelder B. **Being the victim of virtual abuse changes default mode network responses to emotional expressions.** *Cortex.* 135:268-284. Q1

8. Dalla Porta, L; Castro, DM; Copelli, M; Carelli, PV; Matias, FS. **Feedforward and feedback influences through distinct frequency bands between two spiking-neuron networks.** *Physical Review E.* 104(5-1):054404. Q1

9. Torao-Angosto M; Manasanch A; Mattia M; Sanchez-Vives MV. **Up and Down States During Slow Oscillations in Slow-Wave Sleep and Different Levels of Anesthesia.** *Frontiers in Systems Neuroscience.* 15:609645. Q3

10. Świdrak J; Pochwatko G; Insabato A. **Does an agent's touch always matter? Study on virtual Midas touch, masculinity, social status, and compliance in Polish men.** *Journal on Multimodal User Interfaces.* 15(2):163-174. Q3

Review

1. Sanchez-Vives MV; Barbero-Castillo A; Perez-Zabalza M; Reig R. **GABA(B) receptors: modulation of thalamocortical dynamics and synaptic plasticity.** *Neuroscience.* 456:131-142. Q3

GRANTS FOR RESEARCH IN PROGRESS

Sánchez-Vives MV. **Neurovirtual.**
Sponsored by: Generalitat de Catalunya.
AGAUR_SGR17_01296
Duration: 01/01/2017-30/09/2021

Sánchez-Vives MV. **GraphCAT: comunidad emergente de grafeno de Catalunya.**
Sponsored by: Generalitat de Catalunya.
GENCAT_TecEmergent18
Duration: 01/07/2018-30/06/2022

Sánchez-Vives MV. **Cluster Emergente del Cerebro Humano (CECH).**
Sponsored by: Generalitat de Catalunya.
GENCAT_TecEmergent18
Duration: 01/01/2019-31/12/2022

Sánchez-Vives MV. **Traslacortex: Desde el estudio de la fisiología cortical a la comprensión y tratamiento de las patologías que la afectan.**
Sponsored by: Ministerio de Economía y Competitividad. MINECO_B-FU2017-85048-R
Duration: 01/01/2018-30/06/2021

Sánchez-Vives MV. **Translacortex: desde el estudio de la fisiologia cortical a la comprension y tratamiento de las patologias que la afectan.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades.
MCIU_PRE18-086203
Duration: 01/09/2019-31/08/2023

Sánchez-Vives MV. **Rehabilitación domiciliaria de la rodilla inmovilizada mediante realidad virtual inmersiva.**
Sponsored by: Fundación de investigación médica mutua madrileña. FundM-M_AP171552019
Duration: 24/09/2019-23/09/2022

Sánchez-Vives MV. **CORTICOMOD: Neuromodulación cortical endógena y exógena por campos eléctricos y neurotransmisores.**
Sponsored by: Agencia Estatal de Investigación. AEI_PE20
Duration: 01/09/2021-31/08/2024

Sánchez-Vives MV. **European School of Network Neuroscience.**
Sponsored by: European Commission.
CE_H2020-MSCA-ITN-19
Duration: 01/10/2019-30/09/2023

Sánchez-Vives MV, García-Esteve L. **Virtual Reality Prevention of Gender-Violence in Europe based on Neuroscience of Embodiment, peRspective and Empathy.**
Sponsored by: European Commission.
CE_REC_2019
Duration: 01/03/2020-31/08/2022

Sánchez-Vives MV. **Graphene Flagship Core Project 3.**
Sponsored by: European Commission.
CE_H2020-FLAG-GRA-19
Duration: 01/04/2020-31/03/2023

Sánchez-Vives MV. **Human Brain Project Specific Grant Agreement 3.**
Sponsored by: European Commission.
CE_H2020-FLAG-HBP-19
Duration: 01/04/2020-30/03/2023

DOCTORAL THESES

Sánchez-Vives MV. **Assessment, prevention and rehabilitation of intimate partner violence through immersion in virtual reality.**
PhD student: Tania Johnston

Sánchez-Vives MV, Mattia M. **Spatio-temporal dynamics of the cerebral cortex: from unconscious brain states towards consciousness.**
PhD student: Alessandra Camassa

4.20 Mechanisms of neurotoxicity and neurodegeneration

LOCATION
IIBB-CSIC labs

KEYWORDS
1. **Brain aging**
2. **Environment**
3. **Lifestyle**
4. **Cognitive loss**
5. **Neuroprotection**

RELATED DISEASES
1. **Alzheimer's disease**

GROUP INVOLVED IN
AGAUR_SGR17: 000106

Original publications

TOTAL	5
Mean IF	6,24
Q1	100%
D1	20%
MA	60%
OA	100%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The social and health improvements of recent decades have led to a significant increase in the life expectancy of the population, and these advances have been accompanied by an important rise in the incidence of diseases associated with age.

Lifestyle can also lead to unhealthy habits and environments. Most neurons in the brain age with us and, over time, memory and dementia issues may appear. In view of this scenario, new therapies are needed to prevent or decrease the onset of neurodegenerative changes.

APPROACH

The group uses animal models, cell cultures, and samples of human tissue to investigate neuroprotection and prevention therapies in the face of neurological lesions and cognitive loss. Studying the mechanisms of neurotoxicity and neurodegeneration of Alzheimer's disease has allowed the group to define targets in the prevention of pathological brain ageing: some of these targets are changes in the brain such as the accumulation of abnormal proteins, inflammation, oxidative stress and decreased neurotrophic factors.

The strategy is to strengthen the cellular mechanisms of defence against these processes with new drugs or therapies.

IMPACT

The group has obtained neuroprotection by activating mechanisms against the accumulation of anomalous proteins that causes Alzheimer's. In doing so, it has observed cognitive improvement in Alzheimer's disease model mice. It is interesting to confirm that these mechanisms were also activated in healthy mice.

Therefore, it might be possible to achieve a preventive effect and brain resilience. The group wants to define the most powerful therapies that activate these molecular resilience pathways and, also, the influence of the environment and of lifestyle in neurodegenerative diseases.

RESEARCH LINES

- Increase of brain resilience by activation of SIRT1-SIRT3 axis.

- Neuronal effects of environmental chemicals.

- Neuroprotection by novel inhibitors of the soluble Epoxide hydrolase.

PUBLICATIONS

Originals

1. Codony S, Calvó-Tusell C, Valverde E, Osuna S, Morisseau C, Loza MI, Brea J, Pérez C, Rodríguez-Franco MI, Pizarro-Delgado J, Corpas R, Griñán-Ferré C, Pallàs M, Sanfeliu C, Vázquez-Carrera M, Hammock BD, Feixas F, Vázquez S. **From the Design to the In Vivo Evaluation of Benzohomoadamantane-Derived Soluble Epoxide Hydrolase Inhibitors for the Treatment of Acute Pancreatitis.** *Journal of Medicinal Chemistry.* 64(9):5429-5446. D1

2. Garcia-Lara E; Aguirre S; Clotet N; Sawkulycz X; Bartra C; Almenara-Fuentes L; Suñol C; Corpas R; Olah P; Tripon F; Crauciuc A; Slevin M; Sanfeliu C. **Antibody Protection against Long-Term Memory Loss Induced by Monomeric C-Reactive Protein in a Mouse Model of Dementia.** *Biomedicines*. 9(7):828. Q1

3. Sarroca S, Gatius A, Rodríguez-Farré E, Vilchez D, Pallàs M, Griñán-Ferré C, Sanfeliu C, Corpas R. **Resveratrol confers neuroprotection against high-fat diet in a mouse model of Alzheimer's disease via modulation of proteolytic mechanisms.** *Journal of Nutritional Biochemistry*. 89:108569. Q1

4. Martín-López J, Codony S, Bartra C, Morisseau C, Loza MI, Sanfeliu C, Hammock BD, Brea J, Vázquez S. **2-(Piperidin-4-yl)acetamides as Potent Inhibitors of Soluble Epoxide Hydrolase with Anti-Inflammatory Activity.** *Pharmaceuticals*. 14(12):1323. Q1

5. Molina-Martínez P, Corpas R, García-Lara E, Cosín-Tomás M, Cristòfol R, Kaliman P, Solà C, Molinuevo JL, Sánchez-Valle R, Antonell A, Lladó A, Sanfeliu C. **Microglial Hyperreactivity Evolved to Immunosuppression in the Hippocampus of a Mouse Model of Accelerated Aging and Alzheimer's Disease Traits.** *Frontiers in Aging Neuroscience*. 12:622360. Q1.

Review

1. Griñán-Ferré C, Bellver-Sanchis A, Izquierdo V, Corpas R, Roig-Soriano J, Chillón M, Andres-Lacueva C, Somogyvári M, Sőti C, Sanfeliu C, Pallàs M. **The pleiotropic neuroprotective effects of resveratrol in cognitive decline and Alzheimer's disease pathology: from antioxidant to epigenetic therapy.** *Ageing Research Reviews*. 67:101271. D1

2. Arrifano GP; Augusto-Oliveira M; Souza-Monteiro JR; de Matos-Macchi B; Rodrigues-Lima R; Suñol C; Martins-do Nascimento JL; Crespo-Lopez ME. **Revisiting Astrocytic Roles in Methylmercury Intoxication.** *Molecular Neurobiology*. 58(9):4293-4308. Q1

GRANTS FOR RESEARCH IN PROGRESS

Sanfeliu C. **Soluble Epoxide hydrolase modulation in brain and peripheral tissues: Involvement in early neuroinflammation.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MICINN_ PID2019-106285RB-C22
Duration: 01/06/2020-31/05/2023

Sanfeliu C. **Validation first in class candidate of soluble epoxide hydrolase inhibitor for the treatment of Alzheimer's disease. Biochemical and molecular evaluation.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MICINN_ PDC2021-121096-C22
Duration: 01/12/2021-30/11/2023

DOCTORAL THESES

Sanfeliu C. **Implicación de la proteína C reactiva monomérica en el desarrollo de demencia de tipo Alzheimer: modelo experimental y posibles terapias.**
PhD student: Elisa García Lara

4.21 Cellular neurobiology

LOCATION
UB School of Medicine
IIBB-CSIC labs

KEYWORDS
1. **Neuroinflammation**
2. **Microglia**
3. **CD200**
4. **CD200R**
5. **C/EBPs**
6. **Neurodegenerative diseases**

RELATED DISEASES
1. **Parkinson's disease**
2. **Amytrophic lateral sclerosis**
3. **Multiple sclerosis**
4. **Alzheimer's disease**
5. **Huntington's disease**

GROUP INVOLVED IN
AGAUR_SGR17: 00939

Original publications

TOTAL	2
Mean IF	**7,04**
Q1	**100%**
D1	**50%**
MA	**50%**
OA	**100%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Glial cells are essential for the proper functioning of neurons. When there is some type of alteration in the nervous system, glial cells organise a coordinated response to try to solve or minimise the problem.

This response is very similar to inflammatory reactions (neuroinflammation). Although essentially a protective solution, if it is too intense or too prolonged in time it can cause damage to the nervous tissue. There is a wealth of scientific evidence demonstrating that neuroinflammation is involved in the progression of most neurological diseases.

APPROACH

The group's main objective is to contribute to the discovery of strategies to reduce the harmful effects of neuroinflammation in human diseases.

To achieve this, the group is working on: the development of new tools to study neuroinflammation; the identification of the elements of the neuro-inflammatory response responsible for its harmful effects; and the discovery of therapeutic strategies that inhibit harmful elements of the neuro-inflammatory response or enhance beneficial ones.

IMPACT

The group has developed new methods to cultivate the main cell types in neuroinflammation (microglia and astrocytes) and new methods to co-activate neurons with microglia that allow it to study, in culture, the neurotoxic role of the neuro-inflammatory response.

It is working to determine the role played by various microglia cell proteins (the C/EBPs and the CD200/CD200R1 system) in the neuro-inflammatory response. That is why it is designing experiments that enable it to establish whether these proteins can serve as therapeutic targets for new drugs that are capable of inhibiting the neuro-inflammatory response.

RESEARCH LINES

- Characterization and optimization of protocols for primary glial cultures.

- The PPARgamma agonist MIN-102 as potential therapeutic agent in neurological disorders.

- The microglial inhibitory receptor CD200R1 in the control of neuroinflammation.

- The transcription factors C/EBPδ and C/EBPβ in neuroinflammation.

PUBLICATIONS

Originals

1. Rabaneda-Lombarte N; Serratosa J; Bové J; Vila M; Saura J; Solà C. **The CD200R1 microglial inhibitory receptor as a therapeutic target in the MPTP model of Parkinson's disease.** *Journal of Neuroinflammation.* 18(1):88. D1

2. Molina-Martínez P, Corpas R, García-Lara E, Cosín-Tomás M, Cristòfol R, Kaliman P, Solà C, Molinuevo JL, Sánchez-Valle R, Antonell A, Lladó A, Sanfeliu C. **Microglial Hyperreactivity Evolved to Immunosuppression in the Hippocampus of a Mouse Model of Accelerated Aging and Alzheimer's Disease Traits.** *Frontiers in Aging Neuroscience.* 12:622360. Q1

4.22 Multimodal neuroimaging in high risk and early psychosis

LOCATION
CEK building, floor -1

KEYWORDS
1. **Psychotic disorders**
2. **Adolescence**
3. **Brain development**
4. **Brain imaging**

RELATED DISEASES
1. **Psychotic disorders**
2. **Schizophrenia**
3. **Bipolar disorders**
4. **Neurodevelopmental disorders**
5. **Nmda receptor encefalitis**

GROUP INVOLVED IN
CIBERSAM_G04

AWARDS

Premio al Investigador Acreditado de la Sociedad Española de Psiquiatría Biológica
Institution: Sociedad Española de Psiquiatría Biológica
Awardee/s: Gisela Sugranyes

Premio Santiago Reig
Institution: CIBERSAM
Awardee/s: Gisela Sugranyes

Original publications

TOTAL	11
Mean IF	**6,99**
Q1	**73%**
D1	**64%**
MA	**27%**
OA	**36%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Psychotic disorders are one of the first causes of disability among young people. One of the strongest determinants of long-term outcome is early detection of the disorder. However, at present, diagnosis still relies on clinical interview.

It is possible that some of the changes that occur in the brain of patients with psychotic disorders begin years before clinical symptoms emerge. Therefore, the group has set out to identify brain markers with the potential to inform of the risk of disease before clinical onset of the disorder.

APPROACH

The group studies children and adolescents through clinical interviews, neuropsychological tests, brain magnetic resonance imaging, and blood or saliva samples, which are repeated over follow-up.

It evaluates both typically developing individuals and young people at different stages of psychosis risk, either because they have mild or non-specific symptoms, or because they have a family history of the disorder. It also evaluates young people with a recent diagnosis of psychotic disorder or with a specific type of autoimmune encephalitis, which is an illness that in some cases has similar manifestations to psychosis.

IMPACT

So far, the group has demonstrated that young people with an increased risk of psychosis show changes in brain structure, and specifically, that a more accentuated loss of cortical thickness is associated with the development of psychosis symptoms.

It has also found that young people with psychotic disorders have poorer connectivity in the frontal area of the brain, which could be related to some of the social difficulties that they often present. The next step includes combining magnetic resonance data with other biological measures, to try to predict the development of psychotic disorders in high-risk population.

RESEARCH LINES

- Characterisation of neural substrates of vulnerability to psychosis, and relationship with clinical manifestations, in youth in the early stages of psychosis.

- Multimodal prediction of psychosis in high risk youth.

- New treatment options for youth with emerging psychosis.

- Understanding trajectories of change in brain structure / function leading to health and disease during youth.

PUBLICATIONS

Originals

1. Jalbrzikowski M, Hayes RA, Wood SJ, Nordholm D, Zhou JH, Fusar-Poli P, Uhlhaas PJ, Takahashi T, Sugranyes G, Kwak YB,

Mathalon DH, Katagiri N, Hooker CI, Smigielski L, Colibazzi T, Via E, Tang J, Koike S, Rasser PE, Michel C, Lebedeva I, Hegelstad WTV, de la Fuente-Sandoval C, Waltz JA, Mizrahi R, Corcoran CM, Resch F, Tamnes CK, Haas SS, Lemmers-Jansen ILJ, Agartz I, Allen P, Amminger GP, Andreassen OA, Atkinson K, Bachman P, Baeza I, Baldwin H, Bartholomeusz CF, Borgwardt S, Catalano S, Chee MWL, Chen X, Cho KIK, Cooper RE, Cropley VL, Dolz M, Ebdrup BH, Fortea A, Glenthøj LB, Glenthøj BY, de Haan L, Hamilton HK, Harris MA, Haut KM, He Y, Heekeren K, Heinz A, Hubl D, Hwang WJ, Kaess M, Kasai K, Kim M, Kindler J, Klaunig MJ, Koppel A, Kristensen TD, Kwon JS, Lawrie SM, Lee J, León-Ortiz P, Lin A, Loewy RL, Ma X, McGorry P, McGuire P, Mizuno M, Møller P, Moncada-Habib T, Muñoz-Samons D, Nelson B, Nemoto T, Nordentoft M, Omelchenko MA, Oppedal K, Ouyang L, Pantelis C, Pariente JC, Raghava JM, Reyes-Madrigal F, Roach BJ, Røssberg JI, Rössler W, Salisbury DF, Sasabayashi D, Schall U, Schiffman J, Schlagenhauf F, Schmidt A, Sørensen ME, Suzuki M, Theodoridou A, Tomyshev AS, Tor J, Værnes TG, Velakoulis D, Venegoni GD, Vinogradov S, Wenneberg C, Westlye LT, Yamasue H, Yuan L, Yung AR, van Amelsvoort TAMJ, Turner JA, van Erp TGM, Thompson PM, Hernaus D ENIGMA Clinical High Risk for Psychosis Working Group. **Association of Structural Magnetic Resonance Imaging Measures With Psychosis Onset in Individuals at Clinical High Risk for Developing Psychosis: An ENIGMA Working Group Mega-analysis.** *JAMA Psychiatry.* 78(7):753-766. D1

2. Guasp M, Giné-Servén E, Maudes E, Rosa-Justicia M, Martínez-Hernández E, Boix-Quintana E, Bioque M, Casado V, Módena-Ouarzi Y, Guanyabens N, Muriana D, Sugranyes G, Pacchiarotti I, Davi-Loscos E, Torres-Rivas C, Ríos J, Sabater L, Saiz A, Graus F, Castro-Fornieles J, Parellada E, Dalmau J. **Clinical, Neuroimmunologic, and CSF Investigations in First Episode Psychosis.** *Neurology*. 97(1):E61-E75. D1

3. Sugranyes G; de la Serna E; Ilzarbe D; Pariente JC; Borras R; Romero S; Rosa M; Baeza I; Moreno MD; Bernardo M; Vieta E; Castro-Fornieles J. **Brain structural trajectories in youth at familial risk for schizophrenia or bipolar disorder according to development of psychosis spectrum symptoms.** *Journal of Child Psychology and Psychiatry*. 62(6):780-789. D1

4. Ilzarbe D; Baeza I; de la Serna E; Fortea A; Valli I; Puig O; Masias M; Borras R; Pariente JC; Dolz M; Castro-Fornieles J; Sugranyes G. **Theory of mind performance and prefrontal connectivity in adolescents at clinical high risk for psychosis.** *Developmental Cognitive Neuroscience.* 48:100940. D1

5. De la Serna E, Ilzarbe D, Sugranyes G, Baeza I, Moreno D, Rodríguez-Toscano E, Espliego A, Ayora M, Romero S, Sánchez-Gistau V, Castro-Fornieles J. **Lifetime psychopathology in child and adolescent offspring of parents diagnosed with schizophrenia or bipolar disorder: a 2-year follow-up study.** *European Child & Adolescent Psychiatry*. 30(1):117-129. D1

6. Camprodon-Boadas P, de la Serna E, Baeza I, Puig O, Ilzarbe D, Sugranyes G, Borras R, Castro-Fornieles J. **Cognitive reserve in patients with first-episode psychosis as outcome predictor at 5-year follow-up.** *European Child & Adolescent Psychiatry*. 30(12):1959-1967. D1

7. Rodríguez-Pascual M, Álvarez-Subiela X, Tor J, Pardo M, de la Serna E, Sugranyes G, Puig O, Baeza I, Dolz M. **Major depressive disorder and attenuated negative symptoms in a child and adolescent sample with psychosis risk syndrome: the CAPRIS study.** *European Child & Adolescent Psychiatry.* D1

8. Valli, I; De La Serna, E; Borras, R; Ilzarbe, D; Baeza, I; Picouto, MD; Baltasar, I; Moreno, D; Bernardo, M; Young, AH; Vieta, E; Sugranyes, G; Castro-Fornieles, J. **Cognitive heterogeneity in the offspring of patients with schizophrenia or bipolar disorder: a cluster analysis across family risk.** *Journal of Affective Disorders.* 282:757-765. Q1

9. Fortea L, Solanes A, Pomarol-Clotet E, Garcia-Leon MA, Fortea A, Torrent C, Varo C, Bonnin CM, Montejo L, Alonso J, Carmona S, Soldevila-Matías P, Alustiza I, Arbós D, Hidalgo-Mazzei D, Grande I, Vieta E, Fullana MÀ, Radua J. **Study Protocol-Coping With the Pandemics: What Works Best to Reduce Anxiety and Depressive Symptoms.** *Frontiers in Psychiatry.* 12:642763. Q2

10. de la Serna E, Montejo L, Solé B, Castro-Fornieles J, Camprodon-Boadas P, Sugranyes G, Rosa-Justicia M, Martinez-Aran A, Vieta E, Vicent-Gil M, Serra-Blasco M, Cardoner N, Torrent C. **Effectiveness of enhancing cognitive reserve in children, adolescents and young adults at genetic risk for psychosis: study protocol for a randomized controlled trial.** *Revista de Psiquiatría y Salud Mental.* S1888-9891(21):00029-X. Q2

11. Muñoz-Samons D, Tor J, Rodríguez-Pascual M, Álvarez-Subiela X, Sugranyes G, de la Serna E, Puig O, Dolz M, Baeza I. **Recent stressful life events and stress sensitivity in children and adolescents at clinical risk for psychosis.** *Psychiatry Research.* 303:114017. Q2

Review

1. Fortea A, Batalla A, Radua J, van Eijndhoven P, Baeza I, Albajes-Eizagirre A, Fusar-Poli P, Castro-Fornieles J, De la Serna E, Luna LP, Carvalho AF, Vieta E, Sugranyes G. **Cortical gray matter reduction precedes transition to psychosis in individuals at clinical high-risk for psychosis: A voxel-based meta-analysis.** *Schizophrenia Research.* 232:98-106. Q1

Letters

1. Sugranyes G, Serna E. **Offspring studies: Predicting conversion to psychosis.** *European Neuropsychopharmacology.* 52:15-17. Q2

2. Solerdelcoll M, Arango C, Sugranyes G. **Calling for the integration of children's mental health and protection into COVID-19 responses.** *Revista de Psiquiatria y Salud Mental.* 14(2):113-116. Q2

Consortium Publications

1. De la Serna E, Puig O, Mezquida G, Moreno-Izco L, Merchan-Naranjo J, Amoretti S, Ruiz P, Gonzalez-Pinto A, Molina-García M, Corripio I, Vieta E, Baeza I, Berge D, Penadés R, Sanchez-Torres A, Cuesta MJ, Bernardo M, Castro-Fornieles J, PEP's Group. **Relationship between cognition and age at onset of first-episode psychosis: comparative study between adolescents, young adults, and adults.** *European Child & Adolescent Psychiatry*. D1

GRANTS FOR RESEARCH IN PROGRESS

Sugranyes G. **Estudio del procesamiento perceptual temprano en adolescentes con esquizofrenia de debut reciente y pacientes con encefalitis anti-NMDAR para evaluar la hipótesis glutamatérgica de la esquizofrenia.**
Sponsored by: Generalitat de Catalunya. PERIS_SLT006/17/00362
Duration: 17/02/2018-31/12/2021

Sugranyes G. **Construction of a multimodal model with diagnostic and prognostic potential in youth at high risk for psychosis: integration of genetic, environmental and neuroimaging factors.**
Sponsored by: Fundació Clínic per a la Recerca Biomèdica. FCRB_PB1_2018
Duration: 25/04/2018-31/12/-

Sugranyes G. **Construcción de un modelo multimodal con capacidad diagnóstica y pronóstica de adolescentes con alto riesgo de psicosis: integración de factores genéticos, ambientales y de neuroimagen.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00976
Duration: 01/01/2019-30/06/2023

Sugranyes G. **Marcadores de disfunción glutamatérgica en adolescentes con alto riesgo de psicosis: relación con estructura cerebral, sintomatología y metabolismo oxidativo.**
Sponsored by: Fundación Alicia Koplowitz. AKOPLOWITZ20_004
Duration: 01/11/2020-31/10/2022

Sugranyes G. **From the synapse to brain structure and function: a comparative study between youth with early stage psychosis and patients with NMDA Receptro Encephalitis.**
Sponsored by: Brain & Behavior Research Foundation. INT_NARSAD17_YIG_02B
Duration: 15/02/2018-14/07/2021

DOCTORAL THESES

Castro-Fornieles J, Sugranyes G. **Brain functional correlates of theory of mind in neurodevelopmental disorders.**
PhD student: Daniel Ilzarbe Simorte

4.23 Neurobiology

LOCATION
IIBB-CSIC labs
UB School of Medicine

KEYWORDS
1. **Neurodegeneration**
2. **Alzheimer's disease**
3. **Mitochondrial DNA**
4. **Microglia**
5. **Neuronal pentraxin**
6. **Neuronal death**
7. **Mitochondrial dynamics**

RELATED DISEASES
1. **Alzheimer**
2. **Parkinson**

GROUP INVOLVED IN
CIBERNED
AGAUR_SGR17: 00737

Original publications

TOTAL	6
Mean IF	**6,57**
Q1	**67%**
D1	**33%**
MA	**67%**
OA	**100%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

At present, there are no effective treatments to combat the causes of neurodegenerative diseases such as Alzheimer's and Parkinson's diseases, due to a lack of knowledge of the mechanisms directly responsible for the death of the neurons.

The group is working on identifying these molecular mechanisms that are essential for the neurodegenerative process to take place, and on finding the necessary tools to prevent this.

APPROACH

One of the molecular mechanisms that is essential for the survival of neurons is the production of energy, a process in which the mitochondria participate. These organelles also intervene in certain types of cell death (apoptosis), in the degradation of macromolecules (autophagy) and in inflammation.

The group has based its research on the hypothesis that neurodegeneration leads to alteration of the mitochondrial function.

Studying the mitochondrial function, identifying the causes of its alteration and determining how it triggers neurodegeneration are the group's main objectives.

IMPACT

Mitochondria have their own DNA which regulates the energy they produce. The group has discovered that a reduction in mitochondrial DNA content precedes the development of Alzheimer's disease.

It is now investigating the role of mitochondrial DNA transcription and replication in neurodegenerative diseases, and how mitochondrial oxidative stress and changes in glutathione levels (an enzyme) regulate cell processes such as autophagy and contribute to cytotoxicity induced by beta-amyloid peptides, which play a crucial role in Alzheimer's disease.

RESEARCH LINES

- Study the role of mitochondrial function in neuroinflammation and amyloid beta (Aβ) - induced cell death.

- To investigate the role of mitochondrial DNA in synapse elimination and neurodegeneration in genetic models of neurodegenerative diseases.

- To study the mechanisms that alter amyloid beta (Aβ) clearance and disposal of dysfunctional mitochondria.

PUBLICATIONS

Originals

1. Roca-Agujetas V; Barbero-Camps E; de Dios C; Podlesniy P; Abadin X; Morales A; Marí M; Trullàs R; Colell A. **Cholesterol alters mitophagy by impairing optineurin recruitment and lysosomal clearance in Alzheimer's disease.** *Molecular Neurodegeneration.* 16(1):15. D1

2. Cucarull B, Tutusaus A, Hernáez-Alsina T, García de Frutos P, Reig M, Colell A, Marí M, Morales A. **Antioxidants Threaten Multikinase Inhibitor Efficacy against Liver Cancer by Blocking Mitochondrial Reactive Oxygen Species.** *Antioxidants.* 10(9):1336. D1

3. García-García E, Chaparro-Cabanillas N, Coll-Manzano A, Carreras-Caballé M, Giralt A, del Toro D, Alberch J, Masana M, Rodríguez MJ. **Unraveling the spatiotemporal distribution of VPS13A in the mouse brain.** *International Journal of Molecular Sciences.* 22(23):13018. Q1

4. Munoz-Violant, S; Violant-Holz, V; Gallego-Jimenez, MG; Anguera, MT; Rodriguez, MJ. **Coping strategies patterns to buffer the psychological impact of the State of Emergency in Spain during the COVID-19 pandemic's early months.** *Scientific Reports.* 11(1):24400. Q1

5. Pérez-Sisqués L; Martín-Flores N; Masana M; Solana-Balaguer J; Llobet A; Romaní-Aumedes J; Canal M; Campoy-Campos G; García-García E; Sánchez-Fernández N; Fernández-García S; Gilbert JP; Rodríguez MJ; Man HY; Feinstein E; Williamson DL; Soto D; Gasull X; Alberch J; Malagelada C. **RTP801 regulates motor cortex synaptic transmission and learning.** *Experimental Neurology.* 342:113755. Q2

6. Violant-Holz, V; Rodriguez-Silva, C; Carol, M; Rodriguez, MJ. **Impact of cocreation training capsules for preschool teachers on children's healthy habits: a pilot study conducted in Barcelona, Spain.** *BMC Public Health.* 21(1):2089. Q2

Letters

1. Roca-Agujetas V, de Dios C, Abadin X, Colell A. **Upregulation of brain cholesterol levels inhibits mitophagy in Alzheimer disease.** Autophagy. 17(6):1555-1557. D1

Editorial

1. Marí M; Colell A. **Mitochondrial oxidative and nitrosative stress as a therapeutic target in diseases.** *Antioxidants.* 10(2):314. D1

Clinical Guidelines

1. Klionsky, DJ; Abdel-Aziz, AK; Abdelfatah, S; ... ; Colell, A; ... ; Xu, XL; Xue, Y; Yakhine-Diop; SMS. **Guidelines for the use and interpretation of assays for monitoring autophagy (4th edition).** Autophagy. 17(1):1-382. D1

GRANTS FOR RESEARCH IN PROGRESS

Colell A. **Papel de la necroptosis en la enfermedad de Alzheimer.**
Sponsored by: Generalitat de Catalunya.
AGAUR_FI21_B00627
Duration: 01/05/2021-30/04/2024

Colell A. **Autophagy-inflammasome interplay as a therapeutic target for Alzheimer's disease.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_R-TI2018-095572
Duration: 01/01/2019-31/12/2022

Trullas R. **Mitochondrial DNA in familial Alzheimer's Disease.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades.
MCIU_PID2020-115091RB-I00
Duration: 01/01/2021-31/12/2023

Trullas R. **Mitochondrial DNA in prodromal Parkinson's Disease.**
Sponsored by: Michael J. Fox Foundation for Parkinson. INT_MJFF-001111
Duration 01/3/2021-15/2/2023

DOCTORAL THESES

Colell A. **Cholesterol contribution to Aβ defective clearance in Alzheimer's Disease.**
PhD student: Vicente Roca Agujetas

Colell A. **Disturbances in cholesterol homeostasis and mitochondrial oxidative stress as causal mechanisms of Alzheimer's disease.**
PhD student: Cristina de Dios Conde

4.24 Bipolar and depressive disorders

LOCATION
HCB building
Mallorca 183 building

KEYWORDS
1. **Bipolar disorder**
2. **Depression**
3. **Cognition**

RELATED DISEASES
1. **Bipolar disorder**
2. **Depressive disorder**
3. **Addictions**
4. **Postnatal depression**

GROUP INVOLVED IN
AGAUR_SGR17: 01365, 01798
CIBERSAM

AWARDS
Premi Josep Trueta 2021
Institution: Acadèmia de Ciències Mèdiques i de la Salut de Catalunya i de Balears
Awardee/s: Eduard Vieta

Top 1% most cited researcher globally
Institution: Clarivate Analytics
Awardee/s: Eduard Vieta

Original publications

TOTAL	102
Mean IF	5,99
Q1	53%
D1	16%
MA	37%
OA	65%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Bipolar and depressive disorders are serious mental health conditions that affect almost 10% of the population at some point in their lives.

Our group takes an expert approach to bipolar disorder and depressive disorders, these being prevalent and complex pathologies that require in-depth knowledge of psychopharmacology and psychotherapy.

APPROACH

The group's research is highly translational. That is to say, it is geared towards a better understanding of bipolar and depressive disorders and corresponding improvements in clinical practice.

It employs a multidisciplinary approach, both to patient care and to teaching and research, and it investigates the neurobiological and anatomical-functional mechanisms that are involved in the clinical development and progression of these conditions, comorbidity (co-occurrence with other conditions), intervening neurocognitive mechanisms and the quest for new pharmacological, biophysical and psychosocial treatments.

IMPACT

The group has contributed to increasing the availability of new drugs for bipolar and depressive disorders, by designing and conducting clinical trials that have facilitated the introduction of new approaches to the pharmacological treatment of these diseases.

It has demonstrated the efficacy of psychoeducation combined with medications as the standard treatment for bipolar disorder, as recognised by international therapeutic guides.

It has also contributed to the identification of patterns of neurocognitive deterioration and their neuroimaging correlates in depression and bipolar disorder.

RESEARCH LINES

- Clinical trials and innovation in psychopharmacology of bipolar and depressive disorders.

- Endophenotypes, genetics and biomarkers of affective disorders.

- Epidemiology and disability associated with bipolar and unipolar disorders.

- First affective and psychotic episodes.

- Innovative psychological interventions for bipolar disorder and depression.

- Neurocognition and neuroimaging of bipolar and unipolar disorders.

- Observational studies in affective disorders.

- Psychometrics of mental disorders.

PUBLICATIONS

Originals

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GRANTS FOR RESEARCH IN PROGRESS

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Duration: 01/01/2018-31/12/2021

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Duration: 02/07/2021-31/12/2022

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Duration: 01/01/2019-30/06/2023

Vieta E. **Recovery with MIND/COVID-19: Development, feasibility and effectiveness of a smartphone application (PRESTOapp) for mental health problems in health workers during the COVID-19 pandemic.**
Sponsored by: Fundación Española de Psiquiatría y Salud Mental. FEPSM_COVID19_20_1
Duration: 02/12/2020-31/12/2022

Vieta E. **Optimizing response to Li treatment through personalized evaluation of individuals with bipolar I disorder: the R-LiNK initiative.**
Sponsored by: European Commission. CE_H2020-SC1_17_2s
Duration: 01/01/2018-31/12/2022

Vieta E. **A New Intervention for Implementation of Pharmacogenetics in Psychiatry.**
Sponsored by: European Commission. CE_H2020-SC1_20_2s04
Duration: 01/03/2021-28/02/2026

Vieta E**. Evidence-Based Assessment in Psychotherapy (EBAP) Study.**
Sponsored by: European Commission. CE_H2020-MSCA-IF-20
Duration: 08/10/2021-07/10/2024

DOCTORAL THESES

Vieta E, Grande I. **Intervención precoz de precisión en primeros episodios psicóticos: uso de modelos estadísticos avanzados para predecir el diagnóstico, la evolución funcional y el riesgo suicida tras un primer episodio psicótico.**
PhD student: Estela Salagre Muñoz

Vieta E, Martínez-Arán A. **La cognición social y emocional en el trastorno bipolar y la depresión: aspectos sociodemográficos, clínicos, neurocognitivos y de funcionamiento.**
PhD student: Cristina Varo Martin

Martínez-Arán A, Vieta E. **Efectes d'un programa Integrador de Teràpia Cognitiva Basada en Mindfulness (MBCT), Psicoeducació i Rehabilitació Funcional adaptat al Trastorn Bipolar.**
PhD student: Elia Valls Roig

Pintor L, Gual A. **Detección del riesgo psicosocial y de uso de drogas en poblaciones vulnerables. Validación de instrumentos en salud.**
PhD student: Ana Isabel Lopez Lazcano

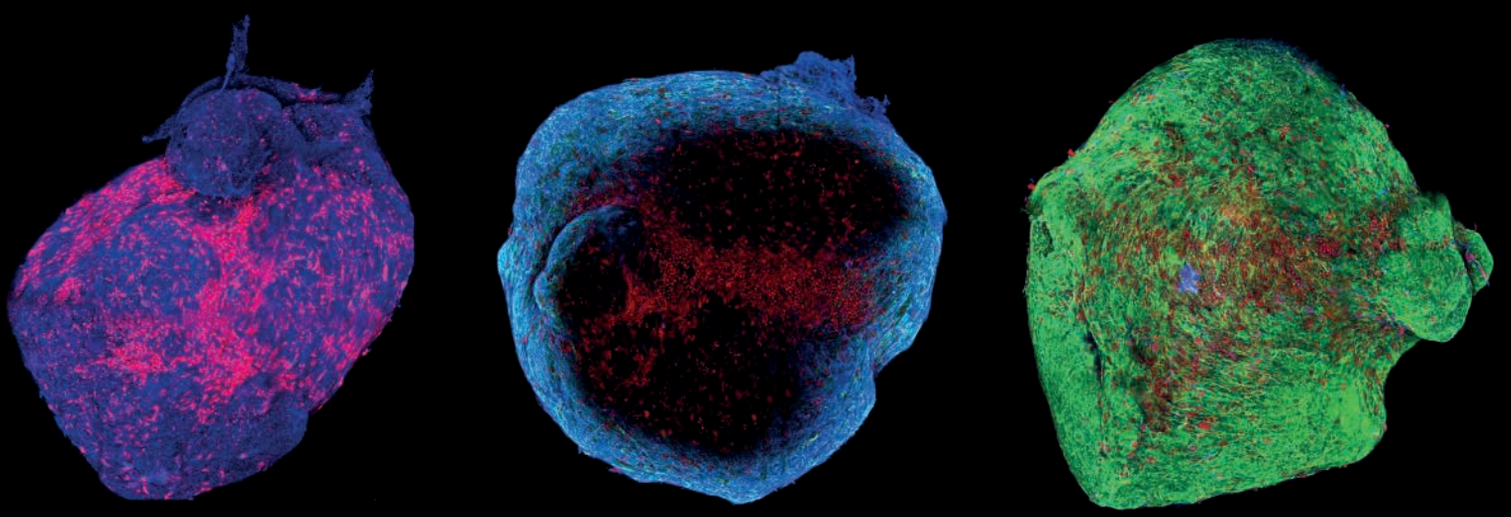
Torres A, Botet F. **La vivencia emocional del padre en el Servicio de neonatología.**
PhD student: Juana Cajiao Nieto

Vieta E, Gual A. **Prevenció dels problemes relacionats amb el consum d'alcohol a urgències.**
PhD student: Pol Bruguera Soler

ANNUAL SCIENTIFIC REPORT 2021

AREA 5

ONCOLOGY
AND HAEMATOLOGY



5

Foto: **Rubén Giménez**

AREA 5

ONCOLOGY AND HAEMATOLOGY

5.1 **Signal transduction and cell cycle**
Neus Agell

5.2 **Functional characterization of oncogenic mechanisms in lymphomagenesis**
Virginia Amador

5.3 **Myeloma and other monoclonal gammopathies**
Joan Bladé

5.4 **Molecular pathology of lymphoid neoplasms**
Elias Campo

5.5 **Experimental therapies in lymphoid neoplasms**
Dolors Colomer

5.6 **Molecular pathology of inflammatory conditions and solid tumours**
Miriam Cuatrecasas

5.7 **Hemotherapy-hemostasis**
Maribel Díaz Ricart

5.8 **Endocytosis and intracellular trafficking of proteins and cholesterol**
Carles Enrich

5.9 **Myeloid neoplasms**
Jordi Esteve

5.10 **Mechanisms of progression in monoclonal gammopathies**
Carlos Fernández de Larrea

5.11 **Lymphoid neoplasms**
Armando López Guillermo

5.12 **Biomedical epigenomics**
Iñaki Martín Subero

5.13 **Molecular biology of reproduction and development**
Rafael Oliva

5.14 **Microenvironment in lymphoma pathogenesis and therapy**
Patricia Pérez Galán

5.15 **Lipid trafficking and disease**
Albert Pol

5.16 **Diagnosis and therapy in oncology**
Francesca Pons

5.17 **Gene regulation in stem cells, cell plasticity, differentiation, and cancer**
Antonio Postigo

5.18 **Translational genomics and targeted therapies in solid tumours**
Aleix Prat

5.19 **Melanoma: imaging, genetics and immunology**
Susana Puig

5.20 **Molecular genetics of paediatric lymphomas**
Itziar Salaverria

5.21 **Hematopoietic progenitor cell transplantation**
Álvaro Urbano-Ispizua

5.1 Signal transduction and cell cycle

LOCATION
CELLEX building, floor 1A
UB School of Medicine

KEYWORDS
1. **RAS**
2. **RAC**
3. **Replication stress**
4. **Cell cycle checkpoints**

RELATED DISEASES
1. **Cancer**

GROUP INVOLVED IN
AGAUR_SGR17: 01225

Original publications

TOTAL	3
Mean IF	**6,85**
Q1	**67%**
D1	**67%**
MA	**33%**
OA	**67%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Cancer is one of the most prevalent diseases in developed countries. Although great progress has been made in early detection and treatment, no effective strategies exist as yet in the majority of cases.

The cells that are resistant to treatment continue to proliferate, forming new tumours, even in tissues far from the initial tumour site, thus generating metastasis, the main cause of death in patients.

APPROACH

The objective of the group's studies is to improve cancer therapies to prevent the appearance, migration and proliferation of tumour cells.

One of the characteristics of tumour cells is their uncontrolled proliferation and migration. In other words, they act regardless of the internal and external signals they receive.

The study of the basic mechanisms that regulate such processes in normal cells and the way in which they are altered in cancer cells allows us to understand the development of tumours and thus know their weaknesses, in order to design new therapies.

IMPACT

The group's studies are focused on firstly understanding the DNA replication control mechanisms and secondly, the functioning of Ras family proteins, which appear mutated in many human tumours.

The group aims to find new strategies to suppress the genes that provoke tumours (oncogenes) and halt cell proliferation and migration, as well as inducing replication stress in tumour cells and causing their death.

RESEARCH LINES

- New strategies to inhibit oncogenic K-Ras.

- Replicative stress: response of untransformed cells versus tumor cells.

- Signaling, cytoskeleton and cellular migration.

PUBLICATIONS

Originals

1. Abdelli F, Jellali K, Anguita E, González-Muñoz M, Villalobo E, Madroñal I, Alcalde J, Ben Ali M, Elloumi-Mseddi J, Jemel I, Tebar F, Enrich C, Aifa S, Villalobo A. **The role of the calmodulin-binding and calmodulin-like domains of the epidermal growth factor receptor in tyrosine kinase activation.** *Journal Of Cellular Physiology.* 236(7):4997-5011. D1

2. Cabot D, Brun S, Paco N, Ginesta MM, Gendrau-Sanclemente N, Abuasaker B, Ruiz-Fariña T, Barceló C, Cuatrecasas M, Bosch M, Rentero C, Pons G, Estanyol JM, Capellà G, Jaumot M, Agell N. **KRAS phosphorylation regulates cell polarization and tumorigenic properties in colorectal cancer.** *Oncogene.* 40(38):5730-5740. D1

3. Meneses-Salas E, Garcia-Forn M, Castany-Pladevall C, Lu A, Fajardo A, Jose J, Wahba M, Bosch M, Pol A, Tebar F, Klein AD, Zanlungo S, Pérez-Navarro E, Grewal T, Enrich C, Rentero C. **Lack of Annexin A6 exacerbates liver dysfunction and reduces lifespan of NPC1-deficient mice.** *American Journal Of Pathology*. 191(3):475-486. Q2

GRANTS FOR RESEARCH IN PROGRESS

Agell N. **Nuevas interacciones de KRAS relevantes para su actividad oncogénica y efecto del estrés de replicación en la actividad transcripcional.**
Sponsored by: Ministerio de Ciencia, Innovación y Universidades. MCIU_PID2019-105483RB-I00
Duration: 01/06/2020-31/05/2023

Agell N. **Peptidomiméticos inhibidores de KRAS como terapia dirigida para el cáncer de Páncreas.**
Sponsored by: Ministerio de Ciencia, Innovación y Universidades. MCIU_P-DC2021-121119-I00
Duration: 01/12/2021-30/11/2023

5.2 Functional characterization of oncogenic mechanisms in lymphomagenesis

LOCATION
CEK building, floor 2

KEYWORDS
1. **Lymphoma**
2. **Mantle cell lymphoma**
3. **SOX11**
4. **Tumor immune microenvironment**
5. **Immunecheckpoints**
6. **Cancer stem cells**

RELATED DISEASES
1. **Lymphoma**
2. **Mantle cell lymphoma**

GROUP INVOLVED IN
AGAUR_SGR17: 1482

Original publications

TOTAL	2
Mean IF	**23,63**
Q1	**100%**
D1	**100%**
MA	**50%**
OA	**100%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Personalised therapies have great potential for the treatment of various types of cancer, such as lymphomas. However, resistance (to drugs) remains a problem that must be resolved. Normal cells within the tumour's micro-environment provide factors that help cancer cells to grow and survive despite the presence of drugs.

The identification and description of new signalling networks and factors responsible for cancer emergence, progression and resistance to drugs, in both cancer cells and normal cells in the tumour micro-environment, will be essential for the design of new therapeutic strategies for aggressive cancers with relapse, such as lymphomas.

APPROACH

The group identifies and describes the molecular mechanisms and the clinical impact of new oncogenic factors and the signalling pathways of aggressive lymphomas using innovative screening tools in primary patient samples, molecular and cellular biology tools and mimicking the tumour microenvironment in 3D cocultures. It also conducts translational research, in which it generates lymphoma in murine models to test the treatments in vivo.

In this way it can better understand the disease and it can find new targets in order to develop specific therapies that benefit patients with aggressive relapsing lymphomas, many of them incurable to date.

IMPACT

The results of the group have helped to show that, as with solid tumours, the tumour micro-environment and the immune system play an important role in aggressive behaviour and response to current treatments against mantle cell lymphoma.

Its ultimate goal is to transfer the best experimental therapies to patients with aggressive lymphomas, to improve their response to treatments and their quality of life. Its experimental approaches will also allow the establishment of new biomarkers to stratify patients, which will result in a more accurate allocation of these new treatments.

RESEARCH LINES

Functional characterization of oncogenic mechanisms in lymphomagenesis.

The objective of the group is to identify and characterize the functional role of new candidates and signaling pathways, in both cancerous and normal cells of the tumor microenvironment, responsible for the appearance, maintenance and aggressive behavior of lymphomas, for a better understanding of the pathogenesis and to find potential candidates for tailored therapies.

PUBLICATIONS

Originals

1. Domostegui A, Peddigari S, Mercer CA, Iannizzotto F, Rodriguez ML, Garcia-Cajide M, Amador V, Diepstraten ST, Kelly GL, Salazar R, Kozma SC, Kusnadi EP, Kang J, Gentilella A, Pearson RB, Thomas G, Pelletier J. **Impaired ribosome biogenesis checkpoint activation induces p53-dependent MCL-1 degradation and MYC-driven lymphoma death.** *Blood*. 137(24):3351-3364. D1

2. Balsas P, Veloza L, Clot G, Sureda-Gómez M, Rodriguez ML, Masaoutis C, Frigola G, Navarro A, Beà S, Nadeu F, Gine E, López-Guillermo A, Martinez A, Ribera-Cortada I, Engel P, Quintanilla-Martinez L, Klapper W, Campo E, Amador V. **SOX11, CD70 and Treg cells configure the tumor immune microenvironment of aggressive mantle cell lymphoma.** *Blood*. 138(22):2202-2215. D1

GRANTS FOR RESEARCH IN PROGRESS

Amador V. **Tumor-immune microenvironment in mantle cell lymphoma.**
Sponsored by: Fundació La Marató de TV3.
Cancer_19
Duration: 30/07/2020-29/07/2023

Amador V. **Identifying immune system evasion mechanisms in aggressive Mantle Cell lymphoma (MCL).**
Sponsored by: Fundación científica asociación española contra el cáncer. AECC_Investigador18
Duration: 01/11/2018-

Amador V. **El microambiente inmune tumoral en la progresión y control de los linfomas de células del manto: caracterización de críticos factores inmunes y desafíos para la terapia.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_RTI2018-099793-B-I00
Duration: 01/01/2019-30/09/2022

5.3 Myeloma and other monoclonal gammopathies

LOCATION
HCB building

KEYWORDS
1. **Multiple myeloma**
2. **Amyloidosis**
3. **Monoclonal gammopathy**
4. **Waldenstrom's macroglobulinemia**

RELATED DISEASES
1. **Multiple myeloma**
2. **Amyloidosis**
3. **Monoclonal gammopathy of undetermined significance**
4. **Waldenstrom's macroglobulinemia**

GROUP INVOLVED IN
AGAUR_SGR17: 00792

Original publications

TOTAL	19
Mean IF	**17,88**
Q1	**79%**
D1	**37%**
MA	**11%**
OA	**53%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Multiple myeloma (MM) accounts for 15% of malignant disease. It consists of the proliferation in the bone marrow of plasma cells that produce an abnormal protein. MM manifests with bone involvement, abnormal kidney function, anaemia, increased calcium levels, infections and tumours of the plasma cells (extramedullary disease).

Although the mean survival rate for patients has increased from 3 to 6 years, only 3% of cases are cured. Preventing the disease and improving treatment results are therefore the healthcare problems to be solved.

APPROACH

The group studies mechanisms of progression in people with monoclonal gammopathy of undetermined significance and in patients with MM who respond to treatment.

It studies the efficacy of new models (phase-I and phase-II clinical trials) and of drug combinations (phase-III trials) to increase survival and the proportion of patients cured.

It also participates as the principal national investigator in clinical trials by the Spanish Myeloma Group, in trials by the pharmaceutical industry, and it will shortly begin a project with a phase-I clinical trial with anti-BCMA CAR-T-cell therapy (first-in-human).

IMPACT

The work carried out to date has enabled the group to develop international criteria for responding to MM (Bladé BJH 1998), describe evolving smouldering MM, provide a response to extramedullary involvement with new drugs, and obtain approval from the EMEA for pre-transplant induction treatment with VTD.

The group leader is among the top 1% of most cited researchers in the world, according to the Thompson&Reuters ranking agency.

RESEARCH LINES

- Cardiac involvement in al amyloidosis.

- Clinical trials.

- Extramedullary involvement in multiple myeloma.

- Mechanisms of progression in monoclonal gammopathies.

- Real life data.

PUBLICATIONS

Originals

1. Kastritis E, Palladini G, Minnema MC, Wechalekar AD, Jaccard A, Lee HC, Sanchorawala V, Gibbs S, Mollee P, Venner CP, Lu J, Schönland S, Gatt ME, Suzuki K, Kim K, Cibeira MT, Beksac M, Libby E, Valent J, Hungria V, Wong SW, Rosenzweig M, Bumma N, Huart A, Dimopoulos MA, Bhutani D, Waxman AJ, Goodman SA, Zonder JA, Lam S, Song K, Hansen T, Manier S, Roeloffzen W, Jamroziak K, Kwok F, Shimazaki C, Kim JS, Crusoe E, Ahmadi T, Tran N, Qin X, Vasey SY, Tromp B, Schecter JM, Weiss BM, Zhuang SH, Vermeulen J, Merlini G, Comenzo RL, ANDROMEDA Trial Investigators. **Daratumumab-Based Treatment for Immunoglo-**

bulin Light-Chain Amyloidosis. *New England Journal Of Medicine.* 385(1):46-58. D1

2. Usmani SZ; Garfall AL; van de Donk NWCJ; Nahi H; San-Miguel JF; Oriol A; Rosinol L; Chari A; Bhutani M; Karlin L; Benboubker L; Pei L; Verona R; Girgis S; Stephenson T; Elsayed Y; Infante J; Goldberg JD; Banerjee A; Mateos MV; Krishnan A. **Teclistamab, a B-cell maturation antigen × CD3 bispecific antibody, in patients with relapsed or refractory multiple myeloma (MajesTEC-1): a multicentre, open-label, single-arm, phase 1 study.** *Lancet.* 398(10301):665-674. D1

3. Richardson PG; Oriol A; Larocca A; Bladé J; Cavo M; Rodriguez-Otero P; Leleu X; Nadeem O; Hiemenz JW; Hassoun H; Touzeau C; Alegre A; Paner A; Maisel C; Mazumder A; Raptis A; Moreb JS; Anderson KC; Laubach JP; Thuresson S; Thuresson M; Byrne C; Harmenberg J; Bakker NA; Mateos MV; HORIZON (OP-106) Investigators. **Melflufen and Dexamethasone in Heavily Pretreated Relapsed and Refractory Multiple Myeloma.** *Journal Of Clinical Oncology.* 39(7):757-767. D1

4. Laubach JP, Schjesvold F, Mariz M, Dimopoulos MA, Lech-Maranda E, Spicka I, Hungria VTM, Shelekhova T, Abdo A, Jacobasch L, Polprasert C, Hájek R, Illés Á, Wróbel T, Sureda A, Beksac M, Gonçalves IZ, Bladé J, Rajkumar SV, Chari A, Lonial S, Spencer A, Maison-Blanche P, Moreau P, San-Miguel JF, Richardson PG . **Efficacy and safety of oral panobinostat plus subcutaneous bortezomib and oral dexamethasone in patients with relapsed or relapsed and refractory multiple myeloma (PANORAMA 3): an open-label, randomised, phase 2 study.** *Lancet Oncology.* 22(1):142-154. D1

5. Goicoechea I, Puig N, Cedena MT, Burgos L, Cordón L, Vidriales MB, Flores-Montero J, Gutierrez NC, Calasanz MJ, Ramos MM, Lara-Astiaso D, Vilas-Zornoza A, Alignani D, Rodriguez I, Sarvide S, Alameda D, Garcés JJ, Rodriguez S, Fresquet V, Celay J, Garcia-Sanz R, Martinez-Lopez J, Oriol A, Rios R, Martin-Sanchez J, Martinez-Martinez R, Sarra J, Hernandez MT, de la Rubia J, Krsnik I, Moraleda JM, Palomera L, Bargay J, Martinez-Climent JA, Orfao A, Rosiñol L, Mateos MV, Lahuerta JJ, Blade J, San Miguel J, Paiva B. **Deep MRD profiling defines outcome and unveils different modes of treatment resistance in standard and high risk myeloma.** *Blood.* 137(1):49-60. D1

6. Puig N, Hernández MT, Rosiñol L, González E, de Arriba F, Oriol A, González-Calle V, Escalante F, de la Rubia J, Gironella M, Ríos R, García-Sánchez R, Arguiñano JM, Alegre A, Martín J, Gutiérrez NC, Calasanz MJ, Martín ML, Couto MDC, Casanova M, Arnao M, Pérez-Persona E, Garzón S, González MS, Martín-Sánchez G, Ocio EM, Coleman M, Encinas C, Vale AM, Teruel AI, Cortés-Rodríguez M, Paiva B, Cedena MT, San-Miguel JF, Lahuerta JJ, Bladé J, Niesvizky R, Mateos MV. **Lenalidomide and dexamethasone with or without clarithromycin in patients with multiple myeloma ineligible for autologous transplant: a randomized trial.** *Blood Cancer Journal.* 11(5):101. D1

7. Fernández de Larrea C, Kyle R, Rosiñol L, Paiva B, Engelhardt M, Usmani S, Caers J, Gonsalves W, Schjesvold F, Merlini G, Lentzch S, Ocio E, Garderet L, Moreau P, Sonneveld P, Badros A, Gahrton G, Goldschmidt H, Tuchman S, Einsele H, Durie B, Wirk B, Musto P, Hayden P, Kaiser M, Miguel JS, Bladé J, Rajkumar SV, Mateos MV. **Primary plasma cell leukemia: consensus definition by the International Myeloma Working Group according to peripheral blood plasma cell percentage.** *Blood Cancer Journal.* 11(12):192. D1

8. Isola I, Brasó-Maristany F, Moreno DF, Mena MP, Oliver-Calders A, Paré L, Rodríguez-Lobato LG, Martin-Antonio B, Cibeira MT, Bladé J, Rosiñol L, Prat A, Lozano E, Fernández de Larrea C. **Gene Expression Analysis of the Bone Marrow Microenvironment Reveals Distinct Immunotypes in Smoldering Multiple Myeloma Associated to Progression to Symptomatic Disease.** *Frontiers In Immunology.* 12:792609. Q1

9. Blasco M; Martínez-Roca A; Rodríguez-Lobato LG; Garcia-Herrera A; Rosiñol L; Castro P; Fernández S; Quintana LF; Cibeira MT; Bladé J; Fernández de Larrea C; Tovar N; Jimenez R; Poch E; Guillen E; Campistol JM; Carreras E; Diaz-Ricart M; Palomo M. **Complement as the enabler of carfilzomib-induced thrombotic microangiopathy.** *British Journal Of Haematology.* 193(1):181-187. Q1

10. Ocio EM; Motlló C; Rodríguez-Otero P; Martínez-López J; Martínez-López J; Cejalvo MJ; Martín-Sánchez J; Bladé J; García-Malo MD; Dourdil MV; García-Mateo A; de Arriba F; García-Sanz R; de la Rubia J; Oriol A; Lahuerta JJ; San-Miguel JF; Mateos MV. **Filanesib in combination with pomalidomide and dexamethasone in refractory MM patients: safety and efficacy, and association with alpha 1-acid glycoprotein (AAG) levels. Phase Ib/II Pomdefil clinical trial conducted by the Spanish MM group.** *British Journal Of Haematology.* 192(3):522-530. Q1

11. Mozas P, Rivero A, Rivas-Delgado A, Fabregat A, Piñeyroa JA, Correa JG, Nadeu F, Oliver A, Bataller A, Giné E, Delgado J, Villamor N, Cibeira MT, Fernández de Larrea C, Rosiñol L, Campo E, Aróstegui JI, Bladé J, Magnano L, López-Guillermo A. **Baseline correlations and prognostic impact of serum monoclonal proteins in follicular lymphoma.** *British Journal Of Haematology.* 193(2):299-306. Q1

12. Moreno DF, Pereira A, Tovar N, Cibeira MT, Magnano L, Rozman M, López-Guerra M, Colomer D, Martín-Antonio B, Jiménez-Segura R, Isola I, Rodríguez-Lobato LG, Oliver-Caldés A, Mena MP, Rosiñol L, Bladé J, Fernández de Larrea C. **Defining an Ultra-Low Risk Group in Asymptomatic IgM Monoclonal Gammopathy.** *Cancers.* 13(9):2055. Q1

13. Puig N; Flores-Montero J; Burgos L; Cedena MT; Cordón L; Pérez JJ; Sanoja-Flores L; Manrique I; Rodríguez-Otero P; Rosiñol L; Martínez-López J; Mateos MV; Lahuerta JJ; Bladé J; San Miguel JF; Orfao A; Paiva B. **Reference values to assess hemodilution and warn of potential false-negative minimal residual disease results in myeloma.** *Cancers.* 13(19):4924. Q1

14. Granell M; Senín A; Barata A; Cibeira MT; Gironella M; López-Pardo J; Motlló C; Garcia-Guiñón A; Ben-Azaiz R; Abella E; Soler A; Canet M; Martí JM; Martino R; Sierra J; de Larrea CF; Oriol A; Rosiñol L; Group for the Study of Myeloma and Amyloidosis of Catalonia (GEMMAC). **Predictors of return to work after autologous stem cell transplantation in patients with multiple myeloma.** *Bone Marrow Transplantation.* 56(12):2904-2910. Q1

15. Giavedoni, Priscila; Martinez, Carmen; Podlipnik, Sebastian; Suarez-Lleido, Maria; Marti-Marti, Ignasi; Morgado-Carrasco, Daniel; Rovira, Montserrat; Fernandez-Aviles, Francesc; Gutierrez, Gonzalo; Rosinol, Laura; Cid, Joan; Lozano, Miquel; Mascaro Jr, Jose Manuel. **Assessment of Sclerodermoid Chronic Graft-versus-host Disease with Colour Doppler Ultrasound.** *Acta Dermato-Venereologica.* 101:adv00395. Q1

16. Isola I, Moreno DF, Moga E, Mena MP, Tovar N, Rodríguez-Lobato LG, Oliver-Caldés

A, Salgado MC, Brasó-Maristany F, Yagüe J, Cibeira MT, Prat A, Rosiñol L, Bladé J, Fernández de Larrea C. **Immunoparesis defined by heavy/light chain pair suppression in smoldering multiple myeloma shows initial isotype specificity and involves other isotypes in advanced disease.** *Annals Of Hematology.* 100(12):2997-3005. Q2

17. Oriol, Albert; Ibarra, Gladys; Abella, Eugenia; Motllo, Cristina; Cibeira, Maria-Teresa; Garcia, Antoni; Escoda, Lourdes; Granell, Miquel; Ben-Azaiz, Randa; Cervera, Marta; Cabezudo, Elena; Fernandez, Carlos; Rosinol, Laura;GEMMAC Study Grp. **Impact of response to treatment in health-related quality of life patient-reported outcomes in elderly patients with relapsed multiple myeloma.** *Leukemia & Lymphoma.* 62(1):125-135. Q3

18. Rodriguez-Otero P, Sirvent M, González-Rodríguez AP, Lavilla E, de Coca AG, Arguiñano JM, Martí JM, Cabañas V, Motlló C, de Cabo E, Encinas C, Murillo I, Hernández-Rivas JÁ, Pérez-Persona E, Casado F, Sampol A, García R, Blanchard MJ, Anguita M, Lafuente AP, Iñigo B, López A, Ribas P, Arnao M, Maldonado R, Bladé J, Mateos MV, Lahuerta JJ, San Miguel JF . **Pomalidomide, Cyclophosphamide, and Dexamethasone for the Treatment of Relapsed/Refractory Multiple Myeloma: Real-World Analysis of the Pethema-GEM Experience.** *Clinical Lymphoma Myeloma & Leukemia.* 21(6):413-420. Q3

19. Mateos MV; Dimopoulos MA; Cavo M; Suzuki K; Knop S; Doyen C; Lucio P; Nagy Z; Pour L; Grosicki S; Crepaldi A; Liberati AM; Campbell P; Yoon SS; Iosava G; Fujisaki T; Garg M; Iida S; Bladé J; Ukropec J; Pei H; Van Rampelbergh R; Kudva A; Qi M; San-Miguel J. **Daratumumab Plus Bortezomib, Melphalan, and Prednisone Versus Bortezomib, Melphalan, and Prednisone in Transplant-Ineligible Newly Diagnosed Multiple Myeloma: Frailty Subgroup Analysis of ALCYONE.** *Clinical Lymphoma Myeloma & Leukemia.* 21(11):785-798. Q3

Review

1. Moreno DF, Rosiñol L, Cibeira MT, Bladé J, Fernández de Larrea C. **Treatment of Patients with Monoclonal Gammopathy of Clinical Significance.** *Cancers.* 13(20):5131. Q1

2. Richter J; Ramasamy K; Rasche L; Bladé J; Zweegman S; Faith Davies; Dimopoulos M. **The management of patients with difficult-to-treat multiple myeloma.** *Future Oncology.* 17(16):2089-2105. Q3

Letters

1. Jiménez-Ubieto A, Paiva B, Puig N, Cedena MT, Martínez-López J, Oriol A, Blanchard MJ, Ríos R, Martin J, Martínez R, Sureda A, Hernández MT, de la Rubia J, Krnisk I, Cabañas V, Palomera L, Sánchez-Pina JM, Bargay J, Mateos MV, Rosiñol L, Blade J, San Miguel J, Lahuerta JJ, GEM (Grupo Español de Mieloma)/PETHEMA (Programa Español de Tratamientos en Hematología) Cooperative Study Group. **Validation of the IMWG standard response criteria in the PETHEMA/GEM2012MENOS65 study: are these times of change?** *Blood.* 138(19):1901-1905. D1

2. Lahuerta JJ; Paiva B; Jiménez de Ubieto A; Sánchez-Pina J; Mateos MV; Bladé J; San-Miguel JF. **Early detection of treatment failure and early rescue intervention in multiple myeloma: time for new approaches.** *Blood Advances.* 5(5):1340-1343. Q1

Case Reports

1. Oliver-Caldes, A; Jimenez, R; Espanol-Rego, M; Cibeira, MT; Ortiz-Maldonado, V; Quintana, LF; Castillo, P; Guijarro, F; Tovar, N; Montoro, M; Benitez-Ribas, D; Bataller, A; Gonzalez-Navarro, EA; Cid, J; Lozano, M; Perez-Amill, L; Martin-Antonio, B; Mena, MP; Moreno, DF; Rodriguez-Lobato, LG; Campistol, JM; Calvo, G; Blade, J; Rosinol, L; Juan, M; Pascal, M; Urbano-Ispizua, A; de Larrea, CF. **First report of CART treatment in AL amyloidosis and relapsed/refractory multiple myeloma.** *Journal For Immunotherapy Of Cancer.* 9(12):e003783. D1

2. Molina-Andújar A, Tovar N, Cuadrado E, Castrejón de Anta N, Revuelta I, Cucchiari D, Cofan F, Esforzado N, Cibeira MT, Rosiñol L, Bladé J, Diekmann F, Fernández de Larrea C, Quintana LF. **Kidney Transplantation in Monoclonal Immunoglobulin Deposition Disease: A Report of 6 Cases.** *American Journal Of Kidney Diseases.* 78(5):755-759. D1

Clinical Guidelines

1. Moreau P; Kumar SK; San Miguel J; Davies F; Zamagni E; Bahlis N; Ludwig H; Mikhael J; Terpos E; Schjesvold F; Martin T; Yong K; Durie BGM; Facon T; Jurczyszyn A; Sidana S; Raje N; van de Donk N; Lonial S; Cavo M; Kristinsson SY; Lentzsch S; Hajek R; Anderson KC; João C; Einsele H; Sonneveld P; Engelhardt M; Fonseca R; Vangsted A; Weisel K; Baz R; Hungria V; Berdeja JG; Leal da Costa F; Maiolino A; Waage A; Vesole DH; Ocio EM; Quach H; Driessen C; Bladé J; Leleu X; Riva E; Bergsagel PL; Hou J; Chng WJ; Mellqvist UH; Dytfeld D; Harousseau JL; Goldschmidt H; Laubach J; Munshi NC; Gay F; Beksac M; Costa LJ; Kaiser M; Hari P; Boccadoro M; Usmani SZ; Zweegman S; Holstein S; Sezer O; Harrison S; Nahi H; Cook G; Mateos MV; Rajkumar SV; Dimopoulos MA; Richardson PG. **Treatment of relapsed and refractory multiple myeloma: recommendations from the International Myeloma Working Group.** *Lancet Oncology.* 22(3):e105-e118. D1

2. Rosiñol L; Beksac M; Zamagni E; Van de Donk NWCJ; Anderson KC; Badros A; Caers J; Cavo M; Dimopoulos MA; Dispenzieri A; Einsele H; Engelhardt M; Fernández de Larrea C; Gahrton G; Gay F; Hájek R; Hungria V; Jurczyszyn A; Kröger N; Kyle RA; Leal da Costa F; Leleu X; Lentzsch S; Mateos MV; Merlini G; Mohty M; Moreau P; Rasche L; Reece D; Sezer O; Sonneveld P; Usmani SZ; Vanderkerken K; Vesole DH; Waage A; Zweegman S; Richardson PG; Bladé J. **Expert review on soft-tissue plasmacytomas in multiple myeloma: definition, disease assessment and treatment considerations.** *British Journal Of Haematology.* 194(3):496-507. Q1

GRANTS FOR RESEARCH IN PROGRESS

Bladé J. **Towards new efficacy paradigms in newly diagnosed multiple myeloma (NDMM) patients: a phase III GEM/PETHEMA trial comparing the current international standard VRD [VRS (X 6) + plus transplant and consolidation (VDRx2)] vs. an extended VRD (x18 cycles).**
Sponsored by: Asociación Española Contra el Cáncer. AECC_GruposCoord20
Duration: 01/01/2021-31/12/2025

Rosiñol L, Lozano E. **Identificación de los mecanismos inmunológicos que controlan la progresión a mieloma en los pacientes con mieloma quiescente "non-evolving" y "evolving" para el diseño de nuevas estrategias terapéuticas.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00436
Duration: 01/01/2021-31/12/2023

5.4 Molecular pathology of lymphoid neoplasms

LOCATION
CEK building, floor 2

KEYWORDS
1. **Lymphoid neoplasms**
2. **Genomic alterations**
3. **Epigenome**
4. **Transcriptional regulation**
5. **Molecular pathology**

RELATED DISEASES
1. **Lymphoid neoplasms**

GROUP INVOLVED IN
AGAUR_SGR17: 00709, 01142
CIBERONC
Int. Cancer Genome Consortium (ICGC)
Leukemia Lymphoma Molecular Profiling Project (LLMPP)
European Mantle Cell Lymphoma Network

AWARDS
ICREA Academy
Awardee/s: Elías Campo

Karl Lennert Medal
Institution: European Association for Haemophathology (EAHP)
Awardee/s: Elías Campo

José Carreras Award
Institution: European Haematology Association (EHA)
Awardee/s: Elías Campo

Fred W. Stewart Award
Institution: Memorial Sloan Kettering Cancer Center (MSKCC)
Awardee/s: Elías Campo

Original publications

TOTAL	25
Mean IF	12
Q1	88%
D1	56%
MA	20%
OA	84%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The group is striving to understand the molecular mechanisms involved in the development and progression of lymphoid neoplasms, a group of extremely heterogeneous cancers that are relatively common and affect the blood, lymph nodes and other organs in the form of leukaemia or lymphomas.

Our aim is to discover the mechanisms that transform lymphoid cells to improve the diagnosis of these tumours, predict their evolution and identify the most effective treatments.

APPROACH

To understand the complexity of lymphoid neoplasms, the group approaches the study of these tumors from a multidisciplinary perspective, using advanced microscopy, DNA and RNA sequencing with next-generation sequencing technologies, single cell analysis, biochips and bioinformatics studies.

These studies use tissues and cells that the patients themselves have donated to research. The group also uses animal models and cell cultures that reproduce in the laboratory the diseases to be studied.

All the experimental data that we obtain are combined with clinical observations of patients, and we use these results to design novel diagnostic tools, models to predict evolution of these disease and orient new treatments.

IMPACT

The group has identified and characterized several lymphoid neoplasms about which very little was known. We have defined the way in which two oncogenes, which are involved in the development of mantle cell lymphoma (cyclin D1 and SOX11) function, and have described the whole genome sequence and epigenomic alterations of chronic lymphatic leukaemia and mantle cell lymphoma that have change our view of these neoplasms. We have also designed new bioinformatics tools to analyze regions of interest in lymphoid neoplasms from genome sequences.

This information has help to designed novel treatments, improve the diagnosis of diverse lymphomas and identified new mechanisms that could be used as targets for treatment.

RESEARCH LINES

- Genetic and molecular mechanisms involved in the pathogenesis of lymphoid neoplasms.

- Genomic alterations of chronic lymphocytic leukemia and mantle cell lymphoma.

- Identification of biomarkers for more precise diagnosis, prognosis and prediction for therapy.

PUBLICATIONS

Originals

1. Hanna BS, Llaó-Cid L, Iskar M, Roessner PM, Klett LC, Wong JKL, Paul Y, Ioannou N, Öztürk S, Mack N, Kalter V, Colomer D, Campo E, Bloehdorn J, Stilgenbauer S, Dietrich S, Schmidt M, Gabriel R, Rippe K, Feuerer M, Ramsay AG, Lichter P, Zapatka M, Seiffert M. **Interleukin-10 receptor signaling promotes the maintenance of a PD-1 int TCF-1 + CD8 + T cell population that sustains anti-tumor immunity.** Immunity. 54(12):2825. D1

2. Agathangelidis A, Chatzidimitriou A, Gemenetzi K, Giudicelli V, Karypidou M, Plevova K, Davis Z, Yan XJ, Jeromin S, Schneider C, Pedersen LB, Tschumper RC, Sutton LA, Baliakas P, Scarfò L, van Gastel EJ, Armand M, Tausch E, Biderman B, Baer C, Bagnara D, Navarro A, Langlois de Septenville A, Guido V, Mitterbauer-Hohendanner G, Dimovski A, Brieghel C, Lawless S, Meggendorfer M, Brazdilova K, Ritgen M, Facco M, Tresoldi C, Visentin A, Patriarca A, Catherwood M, Bonello L, Sudarikov A, Vanura K, Roumelioti M, Skuhrova Francova H, Moysiadis T, Veronese S, Giannopoulos K, Mansouri L, Karan-Djurasevic T, Sandalt-zopoulos R, Bödör C, Fais F, Kater AP, Panovska I, Rossi D, Alshemmari S, Panagiotidis P, Costeas P, Espinet B, Antic D, Foroni L, Montillo M, Trentin L, Stavroyianni N, Gaidano G, Francia di Celle P, Niemann C, Campo E, Anagnostopoulos A, Pott C, Fischer K, Hallek M, Oscier D, Stilgenbauer S, Haferlach C, Jelinek D, Chiorazzi N, Pospisilova S, Lefranc MP, Kossida S, Langerak AW, Belessi C, Davi F, Rosenquist R, Ghia P, Stamatopoulos K. **Higher-order connections between stereotyped subsets: implications for improved patient classification in CLL.** *Blood.* 137(10):1365-1376. D1

3. Klintman J, Appleby N, Stamatopoulos B, Ridout K, Eyre TA, Robbe P, Pascua LL, Knight SJL, Dreau H, Cabes M, Popitsch N, Ehinger M, Martín-Subero JI, Campo E, Månsson R, Rossi D, Taylor JC, Vavoulis DV, Schuh A. **Genomic and transcriptomic correlates of Richter's transformation in Chronic Lymphocytic Leukemia.** *Blood.* 137(20):2800-2816. D1

4. Nadeu F, Royo R, Clot G, Duran-Ferrer M, Navarro A, Martín S, Lu J, Zenz T, Baumann T, Jares P, Puente XS, Martín-Subero JI, Delgado J, Campo E. **IGLV3-21R110 identifies an aggressive biological subtype of chronic lymphocytic leukemia with intermediate epigenetics.** *Blood.* 137(21):2935-2946. D1

5. Balsas P, Veloza L, Clot G, Sureda-Gómez M, Rodriguez ML, Masaoutis C, Frigola G, Navarro A, Beà S, Nadeu F, Gine E, López-Guillermo A, Martinez A, Ribera-Cortada I, Engel P, Quintanilla-Martinez L, Klapper W, Campo E, Amador V. **SOX11, CD70 and Treg cells configure the tumor immune microenvironment of aggressive mantle cell lymphoma.** *Blood.* 138(22):2202-2215. D1

6. Meier-Abt F, Lu J, Cannizzaro E, Pohly MF, Kummer S, Pfammatter S, Kunz L, Collins BC, Nadeu F, Lee KS, Xue P, Gwerder M, Roiss M, Hüllein J, Scheinost S, Dietrich S, Campo E, Huber W, Aebersold R, Zenz T. **The Protein Landscape of Chronic Lymphocytic Leukemia (CLL).** *Blood.* 138(24):2514-2525. D1

7. Moon CS, Reglero C, Cortes JR, Quinn SA, Alvarez S, Zhao J, Lin WHW, Cooke AJ, Abate F, Soderquist CR, Fiñana C, Inghirami G, Campo E, Bhagat G, Rabadan R, Palomero T, Ferrando AA. **FYN–TRAF3IP2 induces NF-κB signaling-driven peripheral T-cell lymphoma.** *Nature Cancer.* 2(1):98-113. D1

8. Lu J, Cannizzaro E, Meier-Abt F, Scheinost S, Bruch PM, Giles HAr, Lutge A, Huellein J, Wagner L, Giacopelli B, Nadeu F, Delgado J, Campo E, Mangolini M, Ringshausen I, Bottcher M, Mougiakakos D, Jacobs A, Bodenmiller B, Dietrich S, Oakes CC, Zenz T, Huber W. **Multi-omics reveals clinically relevant proliferative drive associated with mTOR-MYC-OXPHOS activity in chronic lymphocytic leukemia.** *Nature Cancer.* 2(8):853-864. D1

9. Vilarrasa-Blasi R, Soler-Vila P, Verdaguer-Dot N, Russiñol N, Di Stefano M, Chapaprieta V, Clot G, Farabella I, Cuscó P, Kulis M, Agirre X, Prosper F, Beekman R, Beà S, Colomer D, Stunnenberg HG, Gut I, Campo E, Marti-Renom MA, Martin-Subero JI. **Dynamics of genome architecture and chromatin function during human B cell differentiation and neoplastic transformation.** *Nature Communications.* 12(1):651. D1

10. Demajo S, Albero R, Clot G, Castellano G, Navarro A, Capdevila C, Enjuanes A, Nadeu F, Giné E, Pinyol M, Jaffe ES, Ott G, Staudt LM, Rosenwald A, Scott DW, Rimsza LM, López-Guillermo A, Beà S, Campo E, Jares P. **A cyclin D1-dependent transcriptional program predicts clinical outcome in mantle cell lymphoma.** *Clinical Cancer Research.* 27(1):213-225. D1

11. Rivas-Delgado, A; Nadeu, F; Enjuanes, A; Casanueva-Eliceiry, S; Mozas, P; Magnano, L; de Anta, NC; Rovira, J; Dlouhy, I; Martin, S; Osuna, M; Rodriguez, S; Simo, M; Pinyol, M; Baumann, T; Bea, S; Balague, O; Delgado, J; Villamor, N; Setoain, X; Campo, E; Gine, E; Lopez-Guillermo, A. **Mutational Landscape and Tumor Burden Assessed by Cell-free DNA in Diffuse Large B-Cell Lymphoma in a Population-Based Study.** *Clinical Cancer Research.* 27(2):513-521. D1

12. Gassner FJ, Zaborsky N, Buchumenski I, Levanon EY, Gatterbauer M, Schubert M, Rauscher S, Hebenstreit D, Nadeu F, Campo E, Egle A, Greil R, Geisberger R. **RNA editing contributes to epitranscriptome diversity in chronic lymphocytic leukemia.** *Leukemia.* 35(4):1053-1063. D1

13. Valero JG, Matas-Céspedes A, Arenas F, Rodriguez V, Carreras J, Serrat N, Guerrero-Hernández M, Yahiaoui A, Balagué O, Martin S, Capdevila C, Hernández L, Magnano L, Rivas-Delgado A, Tannheimer S, Cid MC, Campo E, López-Guillermo A, Colomer D, Pérez-Galán P. **The receptor of the colony-stimulating factor-1 (CSF-1R) is a novel prognostic factor and therapeutic target in follicular lymphoma.** *Leukemia.* 35(9):2635-2649. D1

14. Rustad EH, Nadeu F, Angelopoulos N, Zicchedda B, Bolli N, Puente XS, Campo E, Landgren O, Maura F. **mmsig: a fitting approach to accurately identify somatic mutational signatures in hematological malignancies.** *Commun Biol.* 4(1):424. D1

15. Sutton LA, Ljungström V, Enjuanes A, Cortese D, Skaftason A, Tausch E, Stano Kozubik K, Nadeu F, Armand M, Malcikova J, Pandzic T, Forster J, Davis Z, Oscier D, Rossi D, Ghia P, Strefford JC, Pospisilova S, Stilgenbauer S, Davi F, Campo E, Stamatopoulos K, Rosenquist R, On Behalf Of The European Research Initiative On Cll Eric. **Comparative analysis of targeted next-generation sequencing panels for the detection of gene mutations in chronic lymphocytic leukemia: an ERIC multi-center study.** Haematologica. 106(3):682-691. Q1

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17. Rodriguez-Pinilla SM; Domingo-Domenech E; Climent F; Sanchez J; Perez Seoane C; Lopez Jimenez J; Garcia-Cosio M; Caballero D; Blanco Muñez OJ; Carpio C; Castellvi J; Martinez Pozo A; Gonzalez Farre B; Bendaña A; Aliste C; Gonzalez AJ; Gonzalez de Villambrosia S; Piris MA; Gomez Codina J; Mayordomo-Aranda E; Navarro B; Bellas C; Rodriguez G; Borrero JJ; Ruiz-Zorrilla A; Grande M; Montoto C; Cordoba R. **Clinical and pathological characteristics of peripheral T-cell lymphomas in a Spanish population: a retrospective study.** *British Journal Of Haematology.* 192(1):82-99. Q1

18. Mozas P, Rivero A, Rivas-Delgado A, Fabregat A, Piñeyroa JA, Correa JG, Nadeu F, Oliver A, Bataller A, Giné E, Delgado J, Villamor N, Cibeira MT, Fernández de Larrea C, Rosiñol L, Campo E, Aróstegui JI, Bladé J, Magnano L, López-Guillermo A. **Baseline correlations and prognostic impact of serum monoclonal proteins in follicular lymphoma.** *British Journal Of Haematology.* 193(2):299-306. Q1

19. Barés G; Beà A; Hernández L; Navaridas R; Felip I; Megino C; Blasco N; Nadeu F; Campo E; Llovera M; Dolcet X; Sanchis D. **Endog impacts on tumor cell proliferation and tumor prognosis in the context of pi3k/pten pathway status.** *Cancers.* 13(15):3803. Q1

20. Rivero A; Mozas P; Jiménez L; López-guerra M; Colomer D; Bataller A; Correa J; Rivas-delgado A; Bastidas G; Baumann T; Martínez-trillos A; Delgado J; Giné E; Campo E; López-guillermo A; Villamor N; Magnano L; Matutes E. **Clinicobiological characteristics and outcomes of patients with t-cell large granular lymphocytic leukemia and chronic lymphoproliferative disorder of natural killer cells from a single institution.** *Cancers.* 13(15):3900. Q1

21. Solans M; Fernández-Barrés S; Romaguera D; Benavente Y; Marcos-Gragera R; Gracia-Lavedan E; Costas L; Robles C; Gonzalez-Barca E; Banda Edl; Alonso E; Aymerich M; Campo E; Llorca J; Fernández-Tardón G; Olmedo-Requena R; Gimeno E; Castaño-Vinyals G; Aragonés N; Kogevinas M; Pollán M; Sanjose Sd; Amiano P; Casabonne D. **Consumption of ultra-processed food and drinks and chronic lymphocytic leukemia in the mcc-spain study.** *International Journal Of Environmental Research And Public Health.* 18(10). Q1

22. Au-Yeung RKH; Richter J; Iaccarino I; Abramov D; Bacon CM; Balagué O; d'Amore ESG; Simonitsch-Klupp I; Hebeda K; Nakazawa A; Oschlies I; Kontny U; Woessmann W; Burkhardt B; Klapper W. **Molecular features of non-anaplastic peripheral T-cell lymphoma in children and adolescents.** *Pediatric Blood & Cancer.* 68(11):e29285. Q1

23. Mozas P; Rivero A; Rivas-Delgado A; Correa JG; Condom M; Nadeu F; Giné E; Delgado J; Villamor N; Campo E; Magnano L; López-Guillermo A. **Prognostic ability of five clinical risk scores in follicular lymphoma: A single-center evaluation.** *Hematological Oncology.* 39(5):639-649. Q2

24. Mozas P, Rivero A, Rivas-Delgado A, Nadeu F, Correa JG, Castillo C, Bataller A, Baumann T, Giné E, Delgado J, Villamor N, Campo E, Magnano L, López-Guillermo A. **Age and comorbidity are determining factors in the overall and relative survival of patients with follicular lymphoma.** *Annals Of Hematology.* 100(5):1231-1239. Q2

25. Mozas P; Rivero A; Rivas-Delgado A; Nadeu F; Clot G; Correa JG; Castillo C; Bataller A; Baumann T; Giné E; Delgado J; Villamor N; Campo E; Pérez-Galán P; Magnano L; López-Guillermo A. **A low lymphocyte-to-monocyte ratio is an independent predictor of poorer survival and higher risk of histological transformation in follicular lymphoma.** *Leukemia & Lymphoma.* 62(1):104-111. Q3

26. Kretzmer H, Biran A, Purroy N, Lemvigh C, Clement K, Gruber M, Gu H, Rassenti L, Mohammad AW, Lesnick C, Slager SL, Braggio E, Shanafelt TD, Kay NE, Fernandes S, Brown JR, Wang L, Li S, Livak KJ, Neuberg DS, Klages S, Timmermann B, Kipps TJ, Campo E, Gnirke A, Wu CJ, Meissner A. **Preneoplastic Alterations Define CLL DNA Methylome and Persist through Disease Progression and Therapy.** *Blood Cancer Discov.* 2(1):54-69

Review

1. Araujo-Ayala F, Perez-Galan P, Campo E. **Vulnerabilities in the tumor and microenvironment in follicular lymphoma.** *Hematological Oncology.* 39:83-87. Q2

Letters

1. Mozas P, Pineyroa JA, Nadeu F, Magnano L, Rivero A, Rivas-Delgado A, Bataller A, Fabregat A, Gine E, Baumann T, Villamor N, Arostegui JI, Aymerich M, Lopez-Guillermo A, Campo E, Delgado J . **Serum monoclonal component in chronic lymphocytic leukemia: baseline correlations and prognostic impact.** *Haematologica.* 106(6):1754-1757. Q1

2. Bataller A, Guijarro F, Caye-Eude A, Strullu M, Sterin A, Molina O, Chevallier P, Zaliova M, Zuna J, Mozas P, Magnano L, Grardel N, Cornillet-Lefebvre P, Fu JF, Shih LY, Boneva T, Nacheva E, Beà S, López-Guerra M, Bueno C, Menéndez P, Esteve J, Larghero P, Meyer C, Marschalek R . **KMT2A-CBL rearrangements in acute leukemias: clinical characteristics and genetic breakpoints**. *Blood Advances.* 5(24):5617-5620. Q1

3. Bühler MM, Lu J, Scheinost S, Nadeu F, Roos-Weil D, Hensel M, Thavayogarajah T, Moch H, Manz MG, Haralambieva E, Marques Maggio E, Beà S, Giné E, Campo E, Bernard OA, Huber W, Zenz T . **SAMHD1 mutations in mantle cell lymphoma are recurrent and confer in vitro resistance to nucleoside analogues.** *Leukemia Research.* 107:106608. Q3

4. Mozas P, Sorigué M, Rivas-Delgado A, Rivero A, Correa JG, Castillo C, Nadeu F, Bataller A, Giné E, Baumann T, Delgado J, Villamor N, Campo E, Magnano L, Sancho JM, López-Guillermo A . **The interval between frontline treatment and the second relapse (PFS2) predicts survival from the second relapse in follicular lymphoma patients.** *European Journal Of Haematology.* 106(3):428-432. Q3

Editorial

1. Campo E, Jaffe ES. **Taking gray zone lymphomas out of the shadows.** *Blood.* 137(13):1703-1704. D1

GRANTS FOR RESEARCH IN PROGRESS

Beà S. **Resistance mechanisms of molecular targeted therapies in mantle Cell lymphoma (RESTMCL).**
Sponsored by: Fundació La Marató de TV3. Cancer_19
Duration: 30/07/2020-29/07/2023

Beà S. **Caracterización de la inestabilidad genómica y las mutaciones somáticas en linfoma de células del manto y su impacto pronóstico.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/01061
Duration: 01/01/2018-30/06/2022

Beà S. **Mutational landscape of follicular lymphoma at late relapse, early failure and histological transformation.**
Sponsored by: Fundación científica asociación española contra el cáncer. AECC_Proyectos18
Duration: 01/11/2018-31/10/2022

Campo E**. Patologia Molecular Oncològica (Prèviament Oncomorfologia Funcional Humana i Experimental).**
Sponsored by: Generalitat de Catalunya. AGAUR_SGR17_01142
Duration: 01/01/2017-30/09/2021

Campo E. **Genomic and epigenomic drivers of disease evolution in chronic lymphocytic leukemia. Targets for clinical intervention.**
Sponsored by: Fundació Bancaria "La Caixa". HealthRes17
Duration: 31/12/2018-31/12/2022

Campo E. **Alteraciones genómicas y epigenómicas en la evolución de linfomas agresivos. Dianas para aplicaciones clínicas.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_RTI2018-094274-B-I00
Duration: 01/01/2019-30/09/2022

Campo E. **EUCANCan: a federated network of aligned and interoperable infrastructures for the homogeneous analysis, management and sharing of genomic oncology data for Personalized Medicine.**
Sponsored by: European Commission. CE_H2020-SC1_18_1s
Duration: 01/01/2019-30/06/2023

Campo E. **Single-cell genomics to comprehensively understand healthy B-cell maturation and transformation chronic lymphocytic leukemia.**
Sponsored by: European Commission. CE_H2020-ERC-2018_Sy
Duration: 01/04/2019-31/03/2024

Campo E. **Molecular Diagnosis, Prognosis, and Therapeutic Targets in Mantle Cell Lymphoma.**
Sponsored by: National Institutes of Health. INT_NIH_PAR-16-457_01
Duration: 19/09/2018- 31/08/2023

Hernández-Pous L. **Search of non-coding RNAs as new biomarkers and targets for improving the response to Ibrutinib treatment in CLL.**
Sponsored by: Fundació La Marató de TV3. Cancer_19
Duration: 30/09/2020-29/09/2023

Jares P. **Caracterizar el estrés transcripcional y el de replicación inducidos por la sobreexpresión de ciclina D1 en células B, relevancia en la patogénesis del LCM y potenciales implicaciones terapéuticas.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/01838
Duration: 01/01/2020-31/12/2022

Nadeu F. **Tracking the origin of chronic lymphocytic leukemia progression and transformation through its genomic.**
Sponsored by: The Tata group. INT_LADY_-TATA_21_3223
Duration: 01/10/2021-30/09/2022

5.5 Experimental therapies in lymphoid neoplasms

LOCATION
CEK building, floor 2

KEYWORDS
1. **Hematological malignancies**
2. **Targeted therapies**
3. **Preclinical models**

RELATED DISEASES
1. **Lymphoid malignancies**
2. **Chronic lymphocytic leukemia**
3. **Mantle cell lymphoma**

GROUP INVOLVED IN
CIBERONC
AGAUR_SGR17: 1009

Original publications

TOTAL	19
Mean IF	**10,14**
Q1	**79%**
D1	**47%**
MA	**0%**
OA	**68%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Recently, a large number of genetic alterations have been identified that have opened up a wide range of possibilities for the discovery of new therapeutic strategies and new predictive markers for lymphoid B neoplasms. Although more effective therapies have been developed lately, as yet there is still no curative treatment for these diseases.

In addition, the generation of resistance (due to the heterogeneity of both the tumour and the accompanying cells, the tumour microenvironment) is an obstacle to success in the long term.

APPROACH

The group's research focuses on the development and validation of new specific therapies, on the search for possible combinations with other drugs and on the study of resistance in preclinical models of chronic lymphatic leukaemia (CLL) and mantle cell lymphoma (MCL).

To carry out this experimental work, the group evaluates the efficacy of new drugs in isolated tumour cells of patients, in cellular lines and in animal models, taking into account the interaction between the tumour cell and its microenvironment.

IMPACT

The group wants to make sure that the experimental results have practical benefits and serve to improve patients' quality of life and life expectancy. The project is based on the development of new preclinical therapies, on the validation of these experimental results in mouse models, and on describing both the action and the resistance mechanisms.

The aim is that the results can be applied to clinical practice and thus to create personalised therapies based on the optimisation of treatment for each patient, improving benefits and avoiding adverse side effects.

RESEARCH LINES

- Characterization of the functional impact of driver mutations and the analysis of new potential therapeutic approaches.

- Development of predictive models recapitulating tumor heterogeneity and their impact on disease evolution, therapy resistance and susceptibility to novel targeted therapies.

- Mechanisms of resistance to targeted therapy.

PUBLICATIONS

Originals

1. Hanna BS, Llaó-Cid L, Iskar M, Roessner PM, Klett LC, Wong JKL, Paul Y, Ioannou N, Öztürk S, Mack N, Kalter V, Colomer D, Campo E, Bloehdorn J, Stilgenbauer S, Dietrich S, Schmidt M, Gabriel R, Rippe K, Feuerer M, Ramsay AG, Lichter P, Zapatka M, Seiffert M. **Interleukin-10 receptor signaling promotes the maintenance of a PD-1 int TCF-1 +**

CD8 + T cell population that sustains anti-tumor immunity. *Immunity*. 54(12):2825. D1

2. Magaz M, Alvarez-Larrán A, Colomer D, López-Guerra M, García-Criado MÁ, Mezzano G, Belmonte E, Olivas P, Soy G, Cervantes F, Darnell A, Ferrusquía-Acosta J, Baiges A, Turon F, Hernández-Gea V, García-Pagán JC. **Next generation sequencing in the diagnosis of non-cirrhotic splanchnic vein thrombosis.** *Journal Of Hepatology*. 74(1):89-95. D1

3. Vilarrasa-Blasi R, Soler-Vila P, Verdaguer-Dot N, Russiñol N, Di Stefano M, Chapaprieta V, Clot G, Farabella I, Cuscó P, Kulis M, Agirre X, Prosper F, Beekman R, Beà S, Colomer D, Stunnenberg HG, Gut I, Campo E, Marti-Renom MA, Martin-Subero JI. **Dynamics of genome architecture and chromatin function during human B cell differentiation and neoplastic transformation.** *Nature Communications*. 12(1):651. D1

4. Rivas-Delgado, A; Nadeu, F; Enjuanes, A; Casanueva-Eliceiry, S; Mozas, P; Magnano, L; de Anta, NC; Rovira, J; Dlouhy, I; Martin, S; Osuna, M; Rodriguez, S; Simo, M; Pinyol, M; Baumann, T; Bea, S; Balague, O; Delgado, J; Villamor, N; Setoain, X; Campo, E; Gine, E; Lopez-Guillermo, A. **Mutational Landscape and Tumor Burden Assessed by Cell-free DNA in Diffuse Large B-Cell Lymphoma in a Population-Based Study.** *Clinical Cancer Research*. 27(2):513-521. D1

5. Roessner PM; Llaó Cid L; Lupar E; Roider T; Bordas M; Schifflers C; Arseni L; Gaupel AC; Kilpert F; Krötschel M; Arnold SJ; Sellner L; Colomer D; Stilgenbauer S; Dietrich S; Lichter P; Izcue A; Seiffert M. **EOMES and IL-10 regulate antitumor activity of T regulatory type 1 CD4+ T cells in chronic lymphocytic leukemia.** *Leukemia*. 35(8):2311-2324. D1

6. Valero JG, Matas-Céspedes A, Arenas F, Rodriguez V, Carreras J, Serrat N, Guerrero-Hernández M, Yahiaoui A, Balagué O, Martin S, Capdevila C, Hernández L, Magnano L, Rivas-Delgado A, Tannheimer S, Cid MC, Campo E, López-Guillermo A, Colomer D, Pérez-Galán P . **The receptor of the colony-stimulating factor-1 (CSF-1R) is a novel prognostic factor and therapeutic target in follicular lymphoma.** *Leukemia*. 35(9):2635-2649. D1

7. Llaó-Cid L, Roessner PM, Chapaprieta V, Öztürk S, Roider T, Bordas M, Izcue A, Colomer D, Dietrich S, Stilgenbauer S, Hanna B, Martín-Subero JI, Seiffert M. **EOMES is essential for antitumor activity of CD8 + T cells in chronic lymphocytic leukemia.** *Leukemia*. 35(11):3152-3162. D1

8. Baumann T, Moia R, Gaidano G, Delgado J, Condoluci A, Villamor N, Payedimarri AB, Costa D, Patriarca A, Jiménez-Vicente C, Rossi D, Montserrat E. **Lymphocyte doubling time in chronic lymphocytic leukemia modern era: a real-life study in 848 unselected patients.** *Leukemia*. 35(8):2325-2331. D1

9. Ortíz-Maldonado V, Rives S, Castellà M, Alonso-Saladrigues A, Benítez-Ribas D, Caballero-Baños M, Baumann T, Cid J, Garcia-Rey E, Llanos C, Torrebadell M, Villamor N, Giné E, Díaz-Beyá M, Guardia L, Montoro M, Català A, Faura A, González EA, Español-Rego M, Klein-González N, Alsina L, Castro P, Jordan I, Fernández S, Ramos F, Suñé G, Perpiñá U, Canals JM, Lozano M, Trias E, Scalise A, Varea S, Sáez-Peñataro J, Torres F, Calvo G, Esteve J, Urbano-Ispizua Á, Juan M, Delgado J. **CART19-BE-01: A Multicenter Trial of ARI-0001 Cell Therapy in Patients with CD19+ Relapsed/Refractory Malignancies.** *Molecular Therapy*. 29(2):636-644. D1

10. Condom M; Climent F; Fernández D; Colomer D; Lopez-Guerra M; Varela M; Carro I; Maluquer C; Mercadal S; Oliveira AC; Pané M; Matias-Guiu X; González-Barca E; Sureda A; Domingo-Domenech E. **Clonal relationship in multisited mucosa-associated lymphoid tissue lymphomas: a single-centre experience.** *British Journal Of Haematology*. 192(6):1020-1025. Q1

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16. Mozas P; Rivero A; Rivas-Delgado A; Correa JG; Condom M; Nadeu F; Giné E; Delgado J; Villamor N; Campo E; Magnano L; López-Guillermo A. **Prognostic ability of five clinical risk scores in follicular lymphoma: A single-center evaluation.** *Hematological Oncology*. 39(5):639-649. Q2

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18. Mozas P, Rivero A, Rivas-Delgado A, Nadeu F, Correa JG, Castillo C, Bataller A, Baumann T, Giné E, Delgado J, Villamor N, Campo E, Magnano L, López-Guillermo A.

Age and comorbidity are determining factors in the overall and relative survival of patients with follicular lymphoma. *Annals Of Hematology.* 100(5):1231-1239. Q2

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Review

1. López-Oreja I, Playa-Albinyana H, Arenas F, López-Guerra M, Colomer D. **Challenges with Approved Targeted Therapies against Recurrent Mutations in CLL: A Place for New Actionable Targets.** *Cancers.* 13(13):3150. Q1

Letters

1. Magaz M, Alvarez-Larrán A, Colomer D, López M, Turon F, Cervantes F, Virginia-Hernández-Gea , García-Pagán JC. **Next-generation sequencing in the diagnosis of non-cirrhotic splanchnic vein thrombosis.** *Journal Of Hepatology.* 74(1):252-254. D1

2. Ortiz-Maldonado V, Rives S, Español-Rego M, Alonso-Saladrigues A, Montoro M, Magnano L, Giné E, Pascal M, Díaz-Beyá M, Castella M, Català A, Faura A, Rodríguez-Lobato LG, Oliver-Caldes A, Martínez-Roca A, Rovira M, González-Navarro EA, Ortega JR, Cid J, Lozano M, Garcia-Rey E, Fernández S, Castro P, Jordan I, Villamor N, Aymerich M, Torrebadell M, Deyà À, Fernández de Larrea C, Benitez-Ribas D, Trias E, Varea S, Calvo G, Esteve J, Urbano-Ispizua A, Juan M, Delgado J. **Factors associated with the clinical outcome of patients with relapsed/refractory CD19+ acute lymphoblastic leukemia treated with ARI-0001 CART19-cell therapy.** *Journal For Immunotherapy Of Cancer.* 9(12):e003644. D1

3. Mozas P, Pineyroa JA, Nadeu F, Magnano L, Rivero A, Rivas-Delgado A, Bataller A, Fabregat A, Gine E, Baumann T, Villamor N, Arostegui JI, Aymerich M, Lopez-Guillermo A, Campo E, Delgado J. **Serum monoclonal component in chronic lymphocytic leukemia: baseline correlations and prognostic impact.** *Haematologica.* 106(6):1754-1757. Q1

4. Bataller A, Guijarro F, Caye-Eude A, Strullu M, Sterin A, Molina O, Chevallier P, Zaliova M, Zuna J, Mozas P, Magnano L, Grardel N, Cornillet-Lefebvre P, Fu JF, Shih LY, Boneva T, Nacheva E, Beà S, López-Guerra M, Bueno C, Menéndez P, Esteve J, Larghero P, Meyer C, Marschalek R. **KMT2A-CBL rearrangements in acute leukemias: clinical characteristics and genetic breakpoints.** *Blood Advances.* 5(24):5617-5620. Q1

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Editorial

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GRANTS FOR RESEARCH IN PROGRESS

Colomer D. **Dianes terapèutiques i noves tècniques diagnostiques en neoplàsies limfoides.**
Sponsored by: Generalitat de Catalunya.
AGAUR_SGR17_01009
Duration: 01/01/2017-30/09/2021

Colomer D. **Nuevos modelos para el estudio de las alteraciones genéticas recurrentes y resistencia a fármacos en la leucemia crónica.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_R-TI2018-094584-B-I00
Duration: 01/01/2019-30/06/2022

Colomer D. **Red transfonteriza de inmunoterapias personalizadas para linfomas no Hodgkin.**
Sponsored by: European Commission.
CE_Interreg-16_POCTE
Duration: 01/01/2018-31/12/2021

5.6 Molecular pathology of inflammatory conditions and solid tumours

LOCATION
HCB building

KEYWORDS
1. **Cancer**
2. **Molecular pathology**
3. **Autoinmmunity**
4. **Fibrosis**
5. **Artificial intelligence**
6. **Digital pathology**

RELATED DISEASES
1. **Solid tumours, carcinoma**
2. **Cutaneous inflammatory diseases**
3. **Kidney inflammatory diseases**

GROUP INVOLVED IN
CIBEREHD
AGAUR_SGR17: 00653

Original publications

TOTAL	53
Mean IF	**5,85**
Q1	**72%**
D1	**26%**
MA	**9%**
OA	**83%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The development and progression of human neoplasms and inflammatory diseases involve genetic and molecular mechanisms which can be learned through digital and molecular techniques applied to tissues.

APPROACH

The technological platforms applied to research in inflammatory diseases and human tumours enable the knowledge generated by basic research to be transferred to clinical practice.

For this reason, applied molecular pathology techniques are used at diagnostic level, including genetics, epigenetics, proteomics, glycomics, and digital pathology with artificial intelligence algorithms, spectral microscopy, and ex vivo confocal microscopy.

IMPACT

Thanks to the identification of therapeutic targets, the group has distinguished parameters that enable improvement of the diagnosis and prognosis of inflammatory and neoplastic diseases.

The group is a leader in the molecular diagnosis of lung and breast cancer and molecular nodal staging in colorectal cancer, as well as in the underlying molecular mechanisms in cutaneous and renal inflammatory processes, molecular characterisation techniques in melanoma and tumours of the central nervous system.

RESEARCH LINES

- Head and neck carcinomas, oncogenesis and prognostic factors.

- Molecular lymph node staging in colorectal carcinoma.

- Molecular techniques applied to melanocytic neoplasia, especially to melanoma diagnosis.

- Neurodegenerative diseases and tumors of the central nervous system.

- Skin and kidney involvement in haematological and systemic diseases.

- Transcriptional expression profiles involved in molecular mechanisms of carcinogenesis.

PUBLICATIONS

Originals

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3. Gómez-Martín I, Collgros H, Ferguson PM, Barreiro A, Guitera P, Andrades-López E, Puig S, Pujol RM, Barranco C, Alòs L, Segura S . **Diagnostic accuracy of pigmented labial macules by in vivo reflectance confocal microscopy and correlation among techniques.** *Journal Of The American Academy Of Dermatology.* 85(5):1151-1160. D1

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5. Cabot D, Brun S, Paco N, Ginesta MM, Gendrau-Sanclemente N, Abuasaker B, Ruiz-Fariña T, Barceló C, Cuatrecasas M, Bosch M, Rentero C, Pons G, Estanyol JM, Capellà G, Jaumot M, Agell N . **KRAS phosphorylation regulates cell polarization and tumorigenic properties in colorectal cancer.** *Oncogene.* 40(38):5730-5740. D1

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7. Rakislova N, Rodrigo-Calvo MT, Marimon L, Ribera-Cortada I, Ismail MR, Carrilho C, Fernandes F, Ferrando M, Sanfeliu E, Castillo P, Guerrero J, Ramírez-Ruz J, Saez de Gordoa K, López Del Campo R, Bishop R, Ortiz E, Muñoz-Beatove A, Vila J, Hurtado JC, Navarro M, Maixenchs M, Delgado V, Aldecoa I, Martinez-Pozo A, Castro P, Menéndez C, Bassat Q, Martinez MJ, Ordi J . **Minimally Invasive Tissue Sampling Findings in 12 Patients With Coronavirus Disease 2019.** *Clinical Infectious Diseases.* 73(5):S454-S464. D1

8. Bassat Q, Varo R, Hurtado JC, Marimon L, Ferrando M, Ismail MR, Carrilho C, Fernandes F, Castro P, Maixenchs M, Rodrigo-Calvo MT, Guerrero J, Martínez A, Lacerda MVG, Mandomando I, Menéndez C, Martinez MJ, Ordi J, Rakislova N. **Minimally Invasive Tissue Sampling as an Alternative to Complete Diagnostic Autopsies in the Context of Epidemic Outbreaks and Pandemics: The Example of Coronavirus Disease 2019 (COVID-19).** *Clinical Infectious Diseases.* 73(5):S472-S479. D1

9. Letang, E; Rakislova, N; Martinez, MJ; Hurtado, JC; Carrilho, C; Bene, R; Mandomando, I; Quinto, L; Nhampossa, T; Chicamba, V; Luis, E; Ismail, MR; Fernandes, F; Lorenzoni, C; Ferreira, L; Freire, M; Rodrigo-Calvo, MT; Guerrero, J; Munguambe, K; Maixenchs, M; Navarro, M; Casas, I; Marimon, L; Ferrando, M; Macete, E; Lacerda, M; Bassat, Q; Menendez, C; Ordi, J. **Minimally Invasive Tissue Sampling: A Tool to Guide Efforts to Reduce AIDS-Related Mortality in Resource-Limited Settings.** *Clinical Infectious Diseases.* 73:S343-S350. D1

10. Garrido-Pontnou M, Navarro A, Camacho J, Crispi F, Alguacil-Guillén M, Moreno-Baró A, Hernandez-Losa J, Sesé M, Ramón Y Cajal S, Garcia Ruíz I, Serrano B, Garcia-Aguilar P, Suy A, Ferreres JC, Nadal A. **Diffuse trophoblast damage is the hallmark of SARS-CoV-2-associated fetal demise.** *Modern Pathology.* 34(9):1704-1709. D1

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51. Moncunill-Mira J; Brunet-Llobet L; Cuadras D; Lorente-Colomé N; Pascal R; Rovira C; Nadal A; Miranda-Rius J. **Do the clinical criteria used to diagnose periodontitis affect the association with prematurity?** *Odontology.* 109(2):455-463. Q2

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Review

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2. Teixido C, Castillo P, Martinez-Vila C, Arance A, Alos L . **Molecular Markers and Targets in Melanoma.** *Cells.* 10(9):2320. Q2

Letters

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Mandomando I; Vila J; Bassat Q; Menendez C; Ordi J; Martínez MJ. **Performance of the Xpert MTB/RIF Ultra Assay for Determining Cause of Death by TB in Tissue Samples Obtained by Minimally Invasive Autopsies.** *Chest*. 159(1):103-107. D1

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3. Nadal A . **On "Fetal and Perinatal Brain Autopsy: Useful Macroscopic Techniques Including Agar In-Situ and Pre-Embedding Methods"**. *Pediatric And Developmental Pathology*. 10935266211054589. Q4

Case Reports

1. Sanchis L; Farrero M; Martinez D; Castel MA; Sandoval E; Alcocer J; Regueiro A; Flores-Umanzor E; Cepas-Guillen P; Sabaté M; Sitges M; Freixa X. **Anatomical Fusion of MitraClip Device With Native Mitral Apparatus: Insights From an Explanted Human Heart.** *JACC-Cardiovascular Interventions*. 14(11):1257-1258. D1

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3. Archilla I, Guerrero J, Reyes Figueroa LA, Capurro S, Bombí JA, Ribalta T, Aldecoa I . **Intra-Axial Frontal Cyst with Ependymoma-Like Proliferation: Neuroectodermal or Neurenteric?** *Journal Of Neuropathology And Experimental Neurology*. 80(1):93-95. Q2

4. Saco A, Rakislova N, Marimon L, Torne A, Diaz-Feijoo B, Salvador R, Alos S, Jordao D, Hurtado JC, Ordi J. **Malacoplakia of the Uterine Cervix: A Case Report.** *Pathogens*. 10(3):343. Q2

5. Moscoso O, Reques A, Saco A, Castellví J, Gómez-Hidalgo NR, Ramón Y Cajal S, García Á . **Vulvar Adenocarcinoma of Intestinal Type: A Case Report of an Uncommon Entity.** *International Journal Of Gynecological Pathology*. 41(1):98-103. Q3

6. Saez de Gordoa K, Guerrero J, Bishop R, Archilla I, Rodrigo M, Sendino O, Momblan D, Sauri T, Jares P, Cuatrecasas M . **Submucosal gland adenocarcinoma of the esophagus.** *Gastroenterologia Y Hepatologia*. 44(5):367. Q4

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Clinical Guidelines

1. Cubiella J; Pérez Aisa Á; Cuatrecasas M; Díez Redondo P; Fernández Esparrach G; Marín-Gabriel JC; Moreira L; Núñez H; Pardo López ML; Rodríguez de Santiago E; Rosón P; Sanz Anquela JM; Calvet X. **Gastric cancer screening in low incidence populations: Position statement of AEG, SEED and SEAP.** *Gastroenterologia y Hepatologia*. 44(1):67-86. Q4

2. Fernández-Esparrach G, Marín-Gabriel JC, Díez Redondo P, Núñez H, Rodríguez de Santiago E, Rosón P, Calvet X, Cuatrecasas M, Cubiella J, Moreira L, Pardo López ML, Pérez Aisa Á, Sanz Anquela JM, en representación de la Asociación Española de Gastroenterología, la Sociedad Española de Endoscopia Digestiva y la Sociedad Española de Anatomía Patológica. **Quality in diagnostic upper gastrointestinal endoscopy for the detection and surveillance of gastric cancer precursor lesions: position paper of aeg, seed and seap**. *Gastroenterologia y Hepatologia*. 44(6):448-464. Q4

Consortium Publications

1. Hernández-Meneses M, González-Martin J, Agüero D, Tolosana JM, Sandoval E, Falces C, San Antonio R, Vidal B, Moreno A, Ambrosioni J, Miró JM, Hospital Clínic of Barcelona Infectious Endocarditis Team. **Mycobacterium Wolinskyi: A New Non-Tuberculous Mycobacterium Associated with Cardiovascular Infections?** *Infectious Diseases And Therapy*. 10(2):1073-1080. Q1

2. Escrihuela-Vidal F, López-Cortés LE, Escolà-Vergé L, De Alarcón González A, Cuervo G, Sánchez-Porto A, Fernández-Hidalgo N, Luque R, Montejo M, Miró JM, Goenaga MÁ, Muñoz P, Valerio M, Ripa M, Sousa-Regueiro D, Gurguí M, Fariñas-Alvarez MC, Mateu L, García Vázquez E, Gálvez-Acebal J, Carratalà J, Grupo de Apoyo al Manejo de la Endocarditis Infecciosa en España (GAMES) Cohort Investigators and the Barcelona Endocarditis Study Team (BEST) . **Clinical Features and Outcomes of Streptococcus anginosus Group Infective Endocarditis: A Multicenter Matched Cohort Study.** *Open Forum Infectious Diseases*. 8(6):ofab163. Q2

GRANTS FOR RESEARCH IN PROGRESS

Aldecoa I. **Parkinson's Progression Markers Initiative (PPMI) study.**
Sponsored by: Michael J. Fox Foundation for Parkinson. INT_MJFF_NOCALL_20
Duration: 01/01/2021-31/12/2021

Iranzo A, Aldecoa I. **Detección de alfa-sinucleína en biopsias y resecciones quirúrgicas de órganos periféricos en el trastorno de conducta del sueño REM, como modelo premotor de la enfermedad de Parkinson.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00764
Duration: 01/01/2021-31/12/2023

Camps J, Cuatrecasas M. **Nuevas estrategias para la estratificación del riesgo de recidiva en pacientes con cáncer de colon en estadio II: Integración de perfiles genómicos y carga tumoral ganglionar.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/01304
Duration: 01/01/2018-30/06/2022

Camps J, Cuatrecasas M. **Distribución espacial de alteraciones genómicas en "tumor buds" y grupos de células pobremente diferenciadas en el cáncer colorrectal y su implicación en la evasión inmune y la metástasis.** Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00863
Duration: 01/01/2021-31/12/2023

DOCTORAL THESIS

Cuatrecasas M, Pellisé M. **Estudio de concordancia en el diagnóstico histológico de lesiones premalignas colorrectales.**
PhD student: Mireya Jimeno Ramiro

5.7 Hemotherapy - hemostasis

LOCATION
HCB building

KEYWORDS
1. **Platelets**
2. **Coagulation**
3. **Thrombosis**
4. **Transfusion**
5. **Aphaeresis**

RELATED KEYWORDS
1. **Thrombosis**
2. **Hemorrhagic diathesis**
3. **Thrombotic microangiopathies**
4. **Chronic kidney disease**
5. **Obesity**
6. **Major depression**
7. **Hematopoietic stem cell transplantation complications**

GROUP INVOLVED IN
AGAUR_SGR17: 0675

Original publications

TOTAL	26
Mean IF	**5,70**
Q1	**54%**
D1	**12%**
MA	**27%**
OA	**58%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Venous and arterial thrombosis, and associated vascular disease, are the leading cause of death and disability worldwide. Direct and indirect annual costs and some of its treatments exceed 49 billion euros in the European union, including direct health costs (24 billion euros), loss of productivity (17 billion euros) and patient care (9 billion euros).

It is expected that the medical costs associated with the treatment of these conditions, some of them preventable, will increase exponentially over the next two decades. Macroangiopathic and microbial dysfunctions are likely to be strongly implicated in the origin of these diseases, which present high morbidity/mortality rates.

APPROACH

Haemorrhage and thrombosis represent the two sides of vascular and haemostatic alterations. The group explores the clinical, genetic, and molecular characteristics of both congenital and acquired haemostasis in order to obtain solid foundations for a better understanding of these disorders.

Endothelial dysfunction (ED, loss of endothelial function) is a common condition in many health disorders and leads to the most serious complications.

Investigating the mechanisms of ED at the macro and microvascular level is of great importance in defining the objectives for preventing and/or correcting its harmful impact on the disorders in which it is involved.

IMPACT

The group has improved the characterisation of haemorrhagic and thrombotic phenotypes and it has identified common and specific biomarkers of ED; it has investigated and defined biomarkers of ED that predict graft versus host disease (GVHD) within the context of the transplantation of hematopoietic cell progenitors; it has explored therapeutic interventions in ED and microvascular complications; it has evaluated pharmacological/transfusion therapies; and it has developed algorithms for the diagnosis and treatment of thrombotic microangiopathies.

RESEARCH LINES

- Characterization of endothelial dysfunction in association with different pathological situations.

- Diagnosis and treatment of thrombotic microangiopathies.

- Evaluation of the physiological and pathological implications of circulating and/or platelet associated procoagulant microparticles in atherothrombosis.

- Search for biomarkers of graft-versus-host disease (GVHD).

- Study of the molecular mechanisms involved in the development of bleeding and thrombotic disorders.

PUBLICATIONS

Originals

1. Turon F, Driever EG, Baiges A, Cerda E, García-Criado Á, Gilabert R, Bru C, Berzigotti A, Nuñez I, Orts L, Reverter JC, Magaz M, Camprecios G, Olivas P, Betancourt-Sanchez F, Perez-Campuzano V, Blasi A, Seijo S, Reverter E, Bosch J, Borràs R, Hernandez-Gea V, Lisman T, Garcia-Pagan JC. **Predicting portal thrombosis in cirrhosis: A prospective study of clinical, ultrasonographic and hemostatic factors.** *Journal Of Hepatology.* 75(6):1367-1376. D1

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3. Cucarull B, Tutusaus A, Hernáez-Alsina T, García de Frutos P, Reig M, Colell A, Marí M, Morales A . **Antioxidants Threaten Multikinase Inhibitor Efficacy against Liver Cancer by Blocking Mitochondrial Reactive Oxygen Species.** *Antioxidants.* 10(9):1336. D1

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5. Blasco M, Martínez-Roca A, Rodríguez-Lobato LG, Garcia-Herrera A, Rosiñol L, Castro P, Fernández S, Quintana LF, Cibeira MT, Bladé J, Fernández de Larrea C, Tovar N, Jimenez R, Poch E, Guillen E, Campistol JM, Carreras E, Diaz-Ricart M, Palomo M. **Complement as the enabler of carfilzomib-induced thrombotic microangiopathy.** *British Journal Of Haematology.* 193(1):181-187. Q1

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7. Fernández S, Palomo M, Molina P, Díaz-Ricart M, Escolar G, Tellez A, Seguí F, Ventosa H, Torramade-Moix S, Rovira M, Carreras E, Nicolás JM, Castro P . **Progressive endothelial cell damage in correlation with sepsis severity.** *Journal Of Thrombosis And Haemostasis.* 19(8):1948-1958. Q1

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9. Boldú L, Merino A, Acevedo A, Molina A, Rodellar J. **A deep learning model (ALNet) for the diagnosis of acute leukaemia lineage using peripheral blood cell images.** *Computer Methods And Programs In Biomedicine.* 202:105999. Q1

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11. Acevedo A, Merino A, Boldú L, Molina Á, Alférez S, Rodellar J. **A new convolutional neural network predictive model for the automatic recognition of hypogranulated neutrophils in myelodysplastic syndromes.** *Computers In Biology And Medicine.* 134:104479. Q1

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13. Youssef L, Miranda J, Blasco M, Paules C, Crovetto F, Palomo M, Torramade-Moix S, García-Calderó H, Tura-Ceide O, Dantas AP, Hernandez-Gea V, Herrero P, Canela N, Campistol JM, Garcia-Pagan JC, Diaz-Ricart M, Gratacos E, Crispi F. **Complement and coagulation cascades activation is the main pathophysiological pathway in early-onset severe preeclampsia revealed by maternal proteomics.** *Scientific Reports.* 11(1):3048. Q1

14. Huckriede J, Anderberg SB, Morales A, de Vries F, Hultström M, Bergqvist A, Ortiz-Pérez JT, Sels JW, Wichapong K, Lipcsey M, van de Poll M, Larsson A, Luther T, Reutelingsperger C, de Frutos PG, Frithiof R, Nicolaes GAF. **Evolution of NETosis markers and DAMPs have prognostic value in critically ill COVID-19 patients.** *Scientific Reports.* 11(1):15701. Q1

15. Pineiro, GJ, Montagud-Marrahi, E, Rios, J, Ventura-Aguiar, P, Cucchiari, D, Revuelta, I, Lozano, M, Cid, J, Cofan, F, Esforzado, N, Palou, E, Oppenheimer, F, Campistol, JM, Bayes-Genis, B, Rovira, J, Diekmann, F. **Influence of Persistent Inflammation in Follow-Up Biopsies After Antibody-Mediated Rejection in Kidney Transplantation.** *Frontiers Of Medicine.* 8:761919. Q2

16. Rodriguez-Villarreal AI, Ortega Tana L, Cid J, Hernandez-Machado A, Alarcon T, Miribel-Catala P, Colomer-Farrarons J. **An Integrated Detection Method for Flow Viscosity Measurements in Microdevices.** *IEEE Transactions On Biomedical Engineering.* 68(7):2049-2057. Q2

17. Constans M, Santiago R, Jimenez L, Motllo C, Lopez R, Trapé J, Reverter JC, Altes A. **Lupus anticoagulant is an independent risk factor for non-thrombotic in-hospital mortality in COVID-19 patients.** *Thrombosis Research.* 208:99-105. Q2

18. Torramade-Moix S, Palomo M, Vera M, Jerez D, Moreno-Castaño AB, Zafar MU, Rovira J, Diekmann F, Garcia-Pagan JC, Escolar G, Cases A, Diaz-Ricart M. **Apixaban Downregulates Endothelial Inflammatory and Prothrombotic Phenotype in an In Vitro Model of Endothelial Dysfunction in Uremia.** *Cardiovascular Drugs And Therapy.* 35(3):521-532. Q2

19. Koller T, Kinast N, Castellanos AG, Garcia SP, Iglesias PP, Vintro XL, Arranz JM, Seto NV, García MVM, Moreno-Castaño AB, Aznar-Salatti J, Albaladejo GE, Diaz-Ricart M . **Normalization of blood clotting characteristics using prothrombin complex concentrate, fibrinogen and FXIII in an albumin based fluid: experimental studies in thromboelastometry.** Scandinavian Journal Of Trauma Resuscitation & Emergency Medicine. 29(1):57. Q2

20. Martinez S, Garcia I, Ruiz A, Tàssies D, Reverter JC, Colmenero J, Beltran J, Fondevila C, Blasi A . **Is antivitamin K reversal required in patients with cirrhosis undergoing liver transplantation?** *Transfusion.* 61(10):3008-3016. Q3

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22. Pascual-Izquierdo C, del Rio-Garma J, de la Rubia J, Viejo A, Mingot E, Cid J, Solanich X, Fernandez-Sojo J, Martin-Sanchez J, Hernandez L, Garcia-Gala JM, Alonso N, Gonzalez V, Oliva A, Gomez-Segui I, Goterris R, Guerra L, Garcia-Candel F, Fernandez-Docampo M, Antelo ML, Salgado-Barreira A, Salinas R; Spanish Apheresis Grp GEA, Spanish Thrombotic Thrombocytopeni. **Incidence, diagnosis, and outcome of immune-mediated thrombotic thrombocytopenic purpura: A nationwide survey by the Spanish registry of thrombotic thrombocytopenic purpura.** *Journal Of Clinical Apheresis.* 36(4):563-573. Q3

23. Gabara C, Solarat B, Castro P, Fernández S, Badia JR, Toapanta D, Schulman S, Reverter JC, Soriano A, Moisés J, Aibar J. **Anticoagulation strategies and risk of bleeding events in critically ill COVID-19 patients.** *Medicina Intensiva.* S0210-5691(21):00178-9. Q3

24. Ibañez C, Perdomo J, Calvo A, Ferrando C, Reverter JC, Tassies D, Blasi A. **High D dimers and low global fibrinolysis coexist in COVID19 patients: what is going on in there?** *Journal Of Thrombosis And Thrombolysis.* 51(2):308-312. Q3

25. Plasin-Rodriguez MA, Patricio P, Monteagudo J, Garcia-Criado A, Cervera R, Reverter JC, Espinosa G, Tassies D. **Procoagulant microparticles are associated with arterial disease in patients with systemic lupus erythematosus.** *Journal Of Thrombosis And Thrombolysis.* 52(1):30-41. Q3

26. Cid J, Monsalvo S, Castillo C, Pascual C, Moreno-Jiménez G, López-Parra M, Andón C, Guerra L, Esquirol A, Sánchez-Ortega I, Ortega S, Zalba S, Martínez C, Rovira M, Marín P, Lozano M, Grupo Español de Trasplante Hematopoyético (GETH). **Addition of plerixafor to G-CSF in poor mobilizing healthy related donors overcame mobilization failure: An observational case series on behalf of the Grupo Español de Trasplante Hematopoyético (GETH).** *Transfusion And Apheresis Science.* 60(2):103052-103052. Q4

Review

1. Richardson E, García-Bernal D, Calabretta E, Jara R, Palomo M, Baron RM, Yanik G, Fareed J, Vlodavsky I, Iacobelli M, Díaz-Ricart M, Richardson PG, Carlo-Stella C, Moraleda JM. **Defibrotide: potential for treating endothelial dysfunction related to viral and post-infectious syndromes.** *Expert Opinion On Therapeutic Targets.* 25(6):423-433. D1

2. Blasco M, Guillén E, Quintana LF, Garcia-Herrera A, Piñeiro G, Poch E, Carreras E, Campistol JM, Diaz-Ricart M, Palomo M. **Thrombotic microangiopathies assessment: mind the complement.** *Clinical Kidney Journal.* 14(4):1055-1066. Q1

3. Koller T, Parera Ruiz A, Diaz-Ricart M, Gómez Caro AM. **Role of fibrinogen concentrates for treatment of critical perioperative hemorrhage.** *Drugs Of Today.* 57(3):219-239. Q4

4. Martinaud, C, Scorer, T, Lozano, M, Miles, A, Fitchett, G, Ba, A, Wikman, A, Nimberger-Hansson, P, Enbuske, S, Bohonek, M, Devine, D, Beckett, AN, Mbanya, D, T'Sas, F, Degueldre, J, Chueca, M, Dedome, E, Apelseth, T, Strandenes, G, Wendel, S, Fachini, R, Olszewski, A, Dupont, C, Glassberg, E, Shinar, E, Taylor, AL, Corley, JB, Nadarajan, VS, Dunbar, N. **International Forum on Walking Blood Bank Programmes: Summary.** *Vox Sanguinis.* 116(8):924-929. Q4

5. Brand A, De Angelis V, Vuk T, Garraud O, Lozano M, Politis D, European Mediterranean Initiative for Transfusion Medicine. **Review of indications for immunoglobulin (IG) use: narrowing the gap between supply and demand.** *Transfusion Clinique Et Biologique.* 28(1):96-122. Q4

Letters

1. Esteve-Puig R, Climent F, Piñeyro D, Domingo-Domènech E, Davalos V, Encuentra M, Rea A, Espejo-Herrera N, Soler M, Lopez M, Ortiz-Barahona V, Tapia G, Navarro JT, Cid J, Farré L, Villanueva A, Casanova I, Mangues R, Santamarina-Ojeda P, Fernández AF, Fraga MF, Piris MA, Kol N, Avrahami C, Moshitch-Moshkovitz S, Rechavi G, Sureda A, Esteller M. **Epigenetic Loss of m1A RNA Demethylase ALKBH3 in Hodgkin Lymphoma Targets Collagen Conferring Poor Clinical Outcome.** *Blood.* 137(7):994-999. D1

2. Ortiz-Maldonado V, Rives S, Español-Rego M, Alonso-Saladrigues A, Montoro M, Magnano L, Giné E, Pascal M, Díaz-Beyá M, Castella M, Català A, Faura A, Rodríguez-Lobato LG, Oliver-Caldes A, Martínez-Roca A, Rovira M, González-Navarro EA, Ortega JR, Cid J, Lozano M, Garcia-Rey E, Fernández S, Castro P, Jordan I, Villamor N, Aymerich M, Torrebadell M, Deyà À, Fernández de Larrea C, Benitez-Ribas D, Trias E, Varea S, Calvo G, Esteve J, Urbano-Ispizua A, Juan M, Delgado J. **Factors associated with the clinical outcome of patients with relapsed/refractory CD19+ acute lymphoblastic leukemia treated with ARI-0001 CART19-cell therapy.** *Journal For Immunotherapy Of Cancer.* 9(12):e003644. D1

3. Fernandez J, Toapanta ND, Lozano M. **Online letter to the Editor.** *Critical Care Medicine.* 49(6):E652-E653. Q1

4. Pires da Rosa G, Bettencourt P, Ferreira E, Reverter JC, Cervera R, Espinosa G . **Comment on: EUREKA algorithm predicts obstetric risk and response to treatment in women with different subsets of anti-phospholipid antibodies.** *Rheumatology.* 60(5):E181-E183. Q1

5. Cid J, Lozano M. **Extracorporeal photopheresis is catching up the pole position.** *Bone Marrow Transplantation.* 56(2):303-304. Q1

6. Merino A, Molina A, Rodríguez-García M, Vicente-Steijn R, Tomé A, Maduell F, Xipell M, Castro P. **Detection and significance of green inclusions in peripheral blood neutrophils and monocytes.** *International Journal Of Laboratory Hematology.* 43(2):e92-e94. Q3

7. Sanz C, Faúndez A, García A, Rodríguez M, Coromoto Jaramillo A, Pereira A . **Clinical characteristics and indications for blood transfusion in patients with SARS-CoV-2 infection.** *Medicina Clinica.* Q3

Case Reports

1. Oliver-Caldes, A, Jimenez, R, Espanol-Rego, M, Cibeira, MT, Ortiz-Maldonado, V, Quintana,

LF, Castillo, P, Guijarro, F, Tovar, N, Montoro, M, Benitez-Ribas, D, Bataller, A, Gonzalez-Navarro, EA, Cid, J, Lozano, M, Perez-Amill, L, Martin-Antonio, B, Mena, MP, Moreno, DF, Rodriguez-Lobato, LG, Campistol, JM, Calvo, G, Blade, J, Rosinol, L, Juan, M, Pascal, M, Urbano-Ispizua, A, de Larrea, CF. **First report of CART treatment in AL amyloidosis and relapsed/refractory multiple myeloma.** *Journal For Immunotherapy Of Cancer.* 9(12):e003783. D1

2. Moreno-Castaño AB, Ramos A, Pino M, Parra R, Altisent C, Vidal F, Corrales I, Borràs N, Torramadé-Moix S, Palomo M, Escolar G, Diaz-Ricart M. **Diagnostic challenges in von Willebrand disease.** *Platelets*. 32(5):697-700. Q2

3. Cid J, Pérez-Valencia AI, Torrente MÁ, Ávarez-Larrán A, Díaz-Ricart M, Esteve J, Lozano M. **Successful management of three patients with autoimmune thrombotic thrombocytopenic purpura with paradigm-changing therapy: Caplacizumab, steroids, plasma exchange, rituximab, and intravenous immunoglobulins (CASPERI).** *Transfusion And Apheresis Science.* 60(1):103011. Q4

Clinical Guidelines

1. Mingot Castellano ME, Pascual Izquierdo C, González A, Viejo Llorente A, Valcarcel Ferreiras D, Sebastián E, García Candel F, Sarmiento Palao H, Gómez Seguí I, de la Rubia J, Cid J, Martínez Nieto J, Hernández Mateo L, Goterris Viciedo R, Fidalgo T, Salinas R, Del Rio-Garma J, Grupo Español de Aféresis (GEA). **Recommendations for the diagnosis and treatment of patients with thrombotic thrombocytopenic purpura.** *Medicina Clinica.* 158(12):630.e1-630.e14. Q3

GRANTS FOR RESEARCH IN PROGRESS

Díaz-Ricart I, Escolar G. **Serin-Proteasas, disfunción endotelial y riesgo cardiovascular: terapia Anti-XA.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00888
Duration: 01/01/2020-31/12/2022

Escolar G. **Hemotrom.**
Sponsored by: Generalitat de Catalunya. AGAUR_SGR17_00675
Duration: 01/01/2017-30/09/2021

Reverter JC , Blasi A. **Desarrollo de un modelo mecanístico computacional de complejidad reducida de la hemostasia portal a partir de parámetros en sangre periférica, y evaluación de su capacidad predictiva de aparición de thrombosis.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00076
Duration: 01/01/2020-31/12/2022

DOCTORAL THESES

Merino A, Rodellar J. **Automatic recognition of different types of acute leukaemia using peripheral blood cell images.**
PhD student: Laura Boldú Nebot

Diaz-Ricart M, Palomo M. **Lesión endotelial como factor común en enfermedades con riesgo cardiovascular asociado. Reversión mediante estrategias terapéuticas.**
PhD student: Sergi Torramadé Moix

Espinosa G, Tassies D. **Haplotipos del receptor endotelial de la proteína C (EPCR) y acción sobre la hemostasia de las micropartículas circulantes en el síndrome antifosfolipídico y en el lupus eritematoso sistémico: Relación con la arteriosclerosis y la trombosis.**
PhD student: Miguel Angel Plasín Rodríguez

Servitje O, Cid J. **Diferències histopatològiques entre els limfomes cutanis primaris i secundaris: una anàlisi dels limfomes fol·liculars i T/NK.**
PhD student: Maria Josepa Climent Esteller

5.8 Endocytosis and intracellular trafficking of proteins and cholesterol

LOCATION
CELLEX building, floor 1B
UB School of Medicine

KEYWORDS
1. **Cell biology**
2. **Endocytosis and exocytosis**
3. **Lipids and cholesterol transport and storage**
4. **Signal transduction**
5. **Liver regeneration**

RELATED DISEASES
1. **NPC1**

GROUP INVOLVED IN
AGAUR_SGR17: 01225
Redes Temáticas de Investigación

Original publications

TOTAL	4
Mean IF	**7,66**
Q1	**75%**
D1	**75%**
MA	**50%**
OA	**75%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Lysosomal storage disorders such as Niemann-Pick type C (NP-C) lead to the lysosomal accumulation of cholesterol and other lipids, resulting in malfunctions. This accumulation of cholesterol causes alterations in cell physiology, and these are responsible for the liver and neurodegenerative problems that affect patients with NP-C.

Only by performing a detailed analysis of the molecular components and their interactions with lysosomes can the group stimulate alternative pathways to reduce surplus lipids and reactivate the lysosomal function.

APPROACH

Our knowledge of the proteomic repertoire of lysosomes has opened the door to the study of the interactions between the proteins involved in cholesterol transport and removal.

The group is now studying the way in which the regulation, overexpression and silencing of determined proteins in this lysosomal environment affect the accumulated lipid levels and how to restore the cell function.

The most innovative strategy makes it possible to induce the formation of junctions between the lysosome membranes and other membranes of neighbouring compartments in order to promote molecular transfer.

IMPACT

The main objective is to restore the lysosomal and cellular function in vital organs such as the liver and brain in cell-based lysosomal storage disorder models.

So far, the group has discovered a new pathway that enables the removal of cholesterol from the lysosomes that is independent of the most common transporter, the NPC1 protein (which is the cause of Niemann Pick type C disease).

RESEARCH LINES

- Annexin A6 and signalling.

- Annexin A6 in membrane trafficking and organization.

- Role of annexin A6 during liver regeneration.

- Biology of exosomes: biogenesis and uptake.

- Regulation of intracellular cholesterol transport: role of membrane contact sites (MCS).

PUBLICATIONS

Originals

1. Abdelli F, Jellali K, Anguita E, González-Muñoz M, Villalobo E, Madroñal I, Alcalde J, Ben Ali M, Elloumi-Mseddi J, Jemel I, Tebar F, Enrich C, Aifa S, Villalobo A. **The role of the calmodulin-binding and calmodulin-like domains of the epidermal growth factor receptor in tyrosine kinase activation.** *Journal Of Cellular Physiology.* 236(7):4997-5011. D1

2. Torres S, Solsona-Vilarrasa E, Nuñez S, Matías N, Insausti-Urkia N, Castro F, Casasempere M, Fabriás G, Casas J, Enrich C, Fernández-Checa JC, Garcia-Ruiz C. **Acid ceramidase improves mitochondrial function and oxidative stress in**

Niemann-Pick type C disease by repressing STARD1 expression and mitochondrial cholesterol accumulation. *Redox Biology.* 45(102052):102052. D1

3. Cabot D, Brun S, Paco N, Ginesta MM, Gendrau-Sanclemente N, Abuasaker B, Ruiz-Fariña T, Barceló C, Cuatrecasas M, Bosch M, Rentero C, Pons G, Estanyol JM, Capellà G, Jaumot M, Agell N. **KRAS phosphorylation regulates cell polarization and tumorigenic properties in colorectal cancer.** *Oncogene.* 40(38):5730-5740. D1

4. Meneses-Salas E, Garcia-Forn M, Castany-Pladevall C, Lu A, Fajardo A, Jose J, Wahba M, Bosch M, Pol A, Tebar F, Klein AD, Zanlungo S, Pérez-Navarro E, Grewal T, Enrich C, Rentero C. **Lack of Annexin A6 exacerbates liver dysfunction and reduces lifespan of NPC1-deficient mice**. *American Journal Of Pathology.* 191(3):475-486. Q2

Review

1. Enrich C, Lu A, Tebar F, Rentero C, Grewal T. **Annexins Bridging the Gap: Novel Roles in Membrane Contact Site Formation.** *Frontiers In Cell And Developmental Biology.* 9:797949. Q1

2. Grewal T, Rentero C, Enrich C, Wahba M, Raabe CA, Rescher U. **Annexin Animal Models-From Fundamental Principles to Translational Research.** *International Journal Of Molecular Sciences.* 22(7):3439. Q1

GRANTS FOR RESEARCH IN PROGRESS

Lu A. **NPC1-mediated export of cholesterol from lysosomes.**
Sponsored by: Stanford University. INT_APMRF_NDU_20_01
Duration: 01/11/2020-31/03/2021

Lu A. **LRRK2 kinase and glucocerebrosidae (Gcase) activity-meadiated regulation of a lysosomal phospholipid, bis(monoacylglycerol)-phosphate (BMP).**
Sponsored by: Michael J. Fox Foundation for Parkinson. INT_MJFF-019043
Duration: 01/04/2021-31/03/2023

Enrich C, Rentero C. **Role of Annexin A6 in cholesterol transport through membrane contact sites (MCS) and exosome biology.**
Sponsored by: Ministerio de Ciencia e Innovación_PID2020-115910RB-I00
Duration: 01/09/2021-31/12/2023

5.9 Myeloid neoplasms

LOCATION
CEK building, floor 2

KEYWORDS
1. **Genomic profile**
2. **Myeloproliferative neoplasms**
3. **Acute myeloid leukemia**

RELATED DISEASES
1. **Primary myelofibrosis**
2. **Chronic myeloid leukemia**
3. **Essential thrombocythemia**
4. **Polycythemia vera**
5. **Myelodysplastic syndrome**
6. **Acute myeloid leukemia**
7. **Acute lymphoblastic leukemia**

GROUP INVOLVED IN
RTICC
AGAUR_SGR17: 01655

Original publications

TOTAL	23
Mean IF	**9,55**
Q1	**78%**
D1	**43%**
MA	**13%**
OA	**65%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

In recent years there have been important advances in the treatment of patients with haematologic neoplasms. But for a significant proportion of these patients, the benefits obtained, in terms of both treatment response and survival, are still limited.

In view of this situation, greater knowledge of the biology of these neoplasms is sure to contribute to the improvement of therapeutic results and, therefore, of the prognosis and survival of patients.

APPROACH

The strategy of the group is the analysis of genomics of diverse myeloid neoplasms for a more precise estimation of risk and refined prediction of response to main treatment strategies.

The group is also deeply committed to the search of novel therapeutic agents for these diseases, including the development of innovative immunotherapy strategies and targeting novel pathways.

IMPACT

The results of the group's research have contributed to a more precise evaluation of transplantation outcome based on AML genetic features; the evaluation of a preemptive strategy based on measurable residual disease (MRD) monitoring in NPM1-mutated AML; development of novel agents in clinical practice; and estimation of the thrombotic risk and prognosis of myeloproliferative neoplasms.

RESEARCH LINES

- Elucidation of natural history and prognostic factors of myeloproliferative neoplasms.

- Prognostic impact of main AML genetic drivers on treatment outcome, including allogeneic hematopoietic transplantation .

- Role of non-coding RNA in AML.

- Development of novel agents for myeloid neoplasms and paroxysmal nocturnal hemoglobinuria (PNH) .

PUBLICATIONS

Originals

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Review

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Letters

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Editorial

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GRANTS FOR RESEARCH IN PROGRESS

Álvarez-Larrán A. **Evolución natural, caracterización molecular y disfunción endotelial de las neoplasias mieloproliferativas que debutan en forma de trombosis esplácnica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00205
Duration: 01/01/2019-31/12/2022

Esteve J, Día-Beyá M. **Caracterización clínico-biológica de la leucemia mieloide aguda no definida molecularmente: perfil mutacional y de expresión génica, arquitectura clonal, pronóstico y sensibilidad a nuevos tratamientos.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/01476
Duration: 01/01/2020-31/12/2022

Esteve J. **Lysosomal impairment-based therapeutic approach for leukemia.**
Sponsored by: Fundació La Marató de TV3. Cancer_19
Duration: 30/07/2020-29/07/2023

Esteve J. **CART19-BE-02: Phase II clinical trial on the use of ARI-0001 cells in patients with CD19+ relapsed/refractory acute lymphoid leukemia.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PIC18/00012
Duration: 01/01/2019-31/12/2022

5.10 Mechanisms of progression in monoclonal gammopathies

LOCATION
CEK building, floor 2

KEYWORDS
1. **Multiple myeloma**
2. **Immune checkpoints**
3. **CAR T cells**
4. **Immunotherapy**
5. **Monoclonal gammopathies**

RELATED DISEASES
1. **Myeloma multiple**
2. **Macroglobulinemia**
3. **Amyloidosis**
4. **Monoclonal gammopathy of undetermined significance**

GROUP INVOLVED IN
AGAUR_SGR17: 00792

Original publications

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Mean IF	6,66
Q1	78%
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PROBLEM

Multiple myeloma is a disease of the plasma cells, responsible for generating antibodies. The malignant proliferation of these cells, especially in the bone marrow, causes fractures, anaemia, renal insufficiency and elevation of calcium.

Therapies for treating multiple myeloma include chemotherapy, bone marrow autologous transplant, proteasome inhibitors, immunomodulatory agents, and monoclonal antibodies. Despite the wide range of therapies that exist to treat it, multiple myeloma is still an incurable pathology.

APPROACH

The group's line of work consists of identifying innovative treatment options related to the patient's immune system and the tumour's micro-environment.

It studies, for example, molecules related to the control and evasion of myeloma after treatment in order to develop new therapeutic strategies.

In this direction, generating modified cells in the laboratory, called CAR T cells, enables a patient's lymphocytes (a type of white blood cell) to be targeted in a specific way so that they only attack malignant plasma cells.

IMPACT

The goal is the long-term remission of multiple myeloma; even the possibility that some patients may be cured thanks to the increased effect of the immune cells on the malignant cells.

An alternative is to return to the initial state of multiple myeloma, in which the balance between malignant plasma cells and other cells in the bone marrow allow the patient to live symptom-free and without suffering the consequences of the disease for many years.

RESEARCH LINES

- CAR-T cells against BCMA in multiple myeloma: prognostic factors related to their activity and development of a new generation of chimeric receptors.

- Mechanisms of immune control involved in the progression after treatment in the multiple myeloma.

- MicroRNA profile in bone marrow mesenchymal stromal cells from patients with multiple myeloma in different status disease.

- Mechanism of progression in macroglobulinemia and IgM MGUS.

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Fernández de Larrea C. **Reposicionamiento de la doxiciclina en el tratamiento de la amiloidosis AL cardiaca.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_AC16/00058
Duration: 01/01/2017-30/06/2021

Fernández de Larrea C. **Ensayo clínico fase II sobre el uso de un CART humanizado dirigido contra BCMA (ARI0002h) en pacientes con mieloma múltiple recaído/refractario a inhibidores del proteasoma, inmunomoduladores y anticuerpos anti-CD38.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_ICI19/00025
Duration: 01/01/2020-31/12/2023

Fernández de Larrea C. **Optimización de la inmunoterapia con células T CAR a través de la inhibición de immune checkpoints para alcanzar una respuesta prolongada en pacientes con mieloma múltiple.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00669
Duration: 01/01/2020-31/12/2022

Fernández de Larrea C. **Strategies to overcome antigen escape relapses and improve CAR T-cell persistence in multiple myeloma.**
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Duration: 01/11/2021-31/10/2024

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Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00436
Duration: 01/01/2021-31/12/2023

5.11 Lymphoid neoplasms

LOCATION
CEK building, floor 2

KEYWORDS
1. **Lymphoma**
2. **Chronic lymphocytic leukemia**
3. **Prognosis**
4. **Mutational profile and CNA**
5. **Clinical trials proliferative disorders**

RELATED DISEASES
1. **Hodgkin lymphoma**
2. **Non-hodgkin lymphoma**
3. **Chronic lymphocytic leukemia**
4. **Other lymphoproliferative disorders**

GROUP INVOLVED IN
CIBERONC
GELTAMO, eMCLN, IELSG
Lymphoma/Leukemia Molecular Profiling Project
European Lymphoma Institute
Pethema/ Grupo Español LLC
Grupo Español CART

Original publications

TOTAL	18
Mean IF	**8,67**
Q1	**78%**
D1	**50%**
MA	**39%**
OA	**83%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Lymphomas and other lymphoproliferative neoplasms are malignant diseases originated at the different steps of maturation of lymphoid cells.

Their classification is highly complex, with more than 50 entities being recognized nowadays. Although many cases could be currently cured or may survive for a long time with immunochemotherapy, still lymphoproliferative diseases lead to the death of a large number of patients.

The study of clinic-biological features of the disease, particularly genetic and molecular alterations, is essential to know the prognosis, choose the best treatment and to develop new therapies.

APPROACH

We use different strategies to improve the understanding on biology, prognosis and treatment of patients with lymphoproliferative disorders, including the following:

1) Epidemiology.
2) Gene expression.
3) Mutational landscape and copy number alterations.
4) Study of the microenvironment.
5) Clinical trials with new treatments and innovative procedures.

All of this is carried out in collaboration with other research groups of IDIBAPS.

IMPACT

The group has obtained results in different areas, from biological data that cannot yet be applied to patients, to clinical trials.

Its most notable results include the genetic characterization of chronic lymphocytic leukemia and diffuse large B-cell lymphoma, the development of prognostic scores and clinical guidelines for the principal lymphoproliferative diseases, and innovative trials with new molecules and therapies (i.e., CAR-T cells therapies).

RESEARCH LINES

- Genomic profile of lymphoproliferative disorders.

- Cellular microenvironment in CLL and other lymphomas.

- Prognostic models in lymphomas.

- Clinical trials in lymphoproliferative disorders, including advanced therapies.

PUBLICATIONS

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11. Mozas P; Sorigué M; López-Guillermo A. **Follicular lymphoma: an update on diagnosis, prognosis, and management**. *Medicina Clinica.* 157(9):440-448. Q3

12. Pablo Mozas; Marc Sorigué; Armando López Guillermo. **Actualización en el diagnóstico, pronóstico y tratamiento del linfoma folicular.** *Medicina Clinica.* 157(9):440-448. Q3

Letters

1. Ortiz-Maldonado V, Rives S, Español-Rego M, Alonso-Saladrigues A, Montoro M, Magnano L, Giné E, Pascal M, Díaz-Beyá M, Castella M, Català A, Faura A, Rodríguez-Lobato LG, Oliver-Caldes A, Martínez-Roca A, Rovira M, González-Navarro EA, Ortega JR, Cid J, Lozano M, Garcia-Rey E, Fernández S, Castro P, Jordan I, Villamor N, Aymerich M, Torrebadell M, Deyà À, Fernández de Larrea C, Benitez-Ribas D, Trias E, Varea S, Calvo G, Esteve J, Urbano-Ispizua A, Juan M, Delgado J. **Factors associated with the clinical outcome of patients with relapsed/refractory CD19+ acute lymphoblastic leukemia treated with ARI-0001 CART19-cell therapy.** *Journal For Immunotherapy Of Cancer*. 9(12):e003644. D1

2. Mozas P, Pineyroa JA, Nadeu F, Magnano L, Rivero A, Rivas-Delgado A, Bataller A, Fabregat A, Gine E, Baumann T, Villamor N, Arostegui JI, Aymerich M, Lopez-Guillermo A, Campo E, Delgado J. **Serum monoclonal component in chronic lymphocytic leukemia: baseline correlations and prognostic impact.** *Haematologica.* 106(6):1754-1757. Q1

3. Dlouhy I, Armengol M, Recasens-Zorzo C, Ribeiro ML, Pérez-Galán P, Bosch F, López-Guillermo A, Roué G. **IInterleukin-1 receptor associated kinase 1/4 and bromodomain and extra-terminal inhibitions converge on NF-κB blockade and display synergistic antitumoral activity in activated B-cell subset of diffuse large B-cell lymphoma with MYD88 L265P mutation.** *Haematologica*. 106(10):2749-2753. Q1

4. Bataller A, Guijarro F, Caye-Eude A, Strullu M, Sterin A, Molina O, Chevallier P, Zaliova M, Zuna J, Mozas P, Magnano L, Grardel N, Cornillet-Lefebvre P, Fu JF, Shih LY, Boneva T, Nacheva E, Beà S, López-Guerra M, Bueno C, Menéndez P, Esteve J, Larghero P, Meyer C, Marschalek R . **KMT2A-CBL rearrangements in acute leukemias: clinical characteristics and genetic breakpoints.** *Blood Advances*. 5(24):5617-5620. Q1

5. Mozas P, Rivero A, Rivas-Delgado A, Correa JG, Condom M, Nadeu F, Giné E, Delgado J, Villamor N, Campo E, Magnano L, López-Guillermo A . **First external validation of the FLIPI-L score in a single-center**

series of patients with follicular lymphoma. *Hematological Oncology.* 40(2):297-301. Q2

6. Mozas P; López-Guillermo A. **Response to: The lymphocyte-to-monocyte ratio in follicular lymphoma.** *Leukemia & Lymphoma.* 62(10):2562-2563. Q3

7. Bühler MM, Lu J, Scheinost S, Nadeu F, Roos-Weil D, Hensel M, Thavayogarajah T, Moch H, Manz MG, Haralambieva E, Marques Maggio E, Beà S, Giné E, Campo E, Bernard OA, Huber W, Zenz T. **SAMHD1 mutations in mantle cell lymphoma are recurrent and confer in vitro resistance to nucleoside analogues.** *Leukemia Research.* 107:106608. Q3

8. Mozas P, Sorigué M, Rivas-Delgado A, Rivero A, Correa JG, Castillo C, Nadeu F, Bataller A, Giné E, Baumann T, Delgado J, Villamor N, Campo E, Magnano L, Sancho JM, López-Guillermo A . **The interval between frontline treatment and the second relapse (PFS2) predicts survival from the second relapse in follicular lymphoma patients.** *European Journal Of Haematology.* 106(3):428-432. Q3

Consortium Publications

1. Azoulay É, Castro P, Maamar A, Metaxa V, de Moraes AG, Voigt L, Wallet F, Klouche K, Picard M, Moreau AS, Van De Louw A, Seguin A, Mokart D, Chawla S, Leroy J, Böll B, Issa N, Levy B, Hemelaar P, Fernandez S, Munshi L, Bauer P, Schellongowski P, Joannidis M, Moreno-Gonzalez G, Galstian G, Darmon M, Valade S, Nine-I investigators. **Outcomes in patients treated with chimeric antigen receptor T-cell therapy who were admitted to intensive care (CARTTAS): an international, multicentre, observational cohort study.** *Lancet Haematology.* 8(5):E355-E364. D1

GRANTS FOR RESEARCH IN PROGRESS

Delgado J. **Rol de los nuevos fármacos en la optimización del efecto antitumoral del tratamiento mediante linfocitos T con receptores antigénicos quiméricos anti CD19 (CART19) en leucemia linfática crónica.**
Sponsored by: Fundación Española de Hematología y Hemoterapia. FEHH_BE-CAS17_02
Duration: 01/03/2018-

Delgado J. **CART19-BE-02: Phase II clinical trial on the use of ARI-0001 cells in patients with CD19+ relapsed/refractory acute lymphoid leukemia.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PIC18/00012
Duration: 01/01/2019-31/12/2022

López-Guillermo A, Giné E. **Predictive biomarkers (gene alterations, microenvironment and tumor burden) in B-cell aggressive lymphomas candidate to intensive treatment (transplantation or CAR-T cell therapy).**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00887
Duration: 01/01/2020-31/12/2022

López-Guillermo A. **Sequential assessment of the mutational landscape of follicular lymphoma in different clinical situations, including late relapse, early failure and histological transformation.**
Sponsored by: Gilead Sciences (SLU). GLD17/00197
Duration: 11/12/2017-

Magnano L. **Caracterización del perfil inmune de pacientes con linfoma folicular. Impacto en la respuesta al tratamiento y relevancia pronóstica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00925
Duration: 01/01/2020-31/12/2022

DOCTORAL THESIS

López-Guillermo A. **Factores clínicos, analíticos y genómicos para refinar el pronóstico de los pacientes con linfoma folicular.**
PhD student: Pablo Javier Mozas Fernandez

5.12 Biomedical epigenomics

LOCATION
CEK building, floor 2

KEYWORDS
1. **Epigenomics**
2. **Chromatin**
3. **DNA methylation**
4. **Bioinformatics**
5. **Epigenetic biomarkers**
6 **Leukemia**
7. **Lymphoma**
8 **Single cell omics**

RELATED DISEASES
1. **Chronic lymphocytic leukemia**
2. **Mantle cell lymphoma**
3. **Multiple myeloma**
4. **Diffuse large B cell lymphoma**

GROUP INVOLVED IN
AGAUR_SGR17: 00736
CIBERONC

AWARDS
10th National Award in Cancer Research Doctores Diz Pintado
Institution: Fundación Doctores Diz Pintado para la Docencia e Investigación en la Lucha contra el Cáncer
Awardee/s: Jose Ignacio Martin Subero

XXII Premios Fundación Pfizer de Innovación Científica para Jóvenes Investigadores
Institution: Fundación Pfizer
Awardee/s: Martí Duran Ferrer

Original publications

TOTAL	10
Mean IF	**15,30**
Q1	**100%**
D1	**90%**
MA	**20%**
OA	**90%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Lymphoid neoplasms represent a heterogeneous group of diseases covering a broad spectrum of biological and clinical characteristics. Understanding the mechanisms underlying the development and evolution of these neoplasms is essential to gradually improve their diagnosis, estimate their prognosis and develop more appropriate therapeutic strategies.

APPROACH

The group studies lymphoid neoplasms from the perspective of epigenetics, which is the science that analyzes gene regulation and genome function.

The global aim is to study the causes and consequences of gene deregulation in leukemias and lymphomas. To achieve this, the group studies different epigenetic marks such as DNA methylation, histone modifications, chromatin accessibility, and 3D genome structure using bulk and single cell approaches as well as detailed functional experiments through genome editirng.

IMPACT

The research activities of the group have led to new insights into the cellular origin, development, evolution and clinical behavior of various mature B cell neoplasms. For instance, the group has identified DNA methylation signatures associated with epigenetic memory, that distant enhancers and 3D genome reorganization are essential to deregulate gene expression in lymphoid cancers and that certain transcription factors appear to be essential to alter the activity of the regulatory elements.

Apart from helping to understand how lymphoid neoplasms function, these studies have enabled the group to better calculate the clinical outcome of patients and identify new therapeutic targets.

RESEARCH LINES

- Integrative epigenomic characterization of normal and neoplastic B cells.

- Study the origin and evolution of intraclonal heterogeneity in B cell tumors through single cell technologies.

- Functional analysis of deregulated transcriptional networks in lymphoid neoplasms.

- Decipher the clinical impact of epigenomics in lymphoid neoplasms.

PUBLICATIONS

Originals

1. Klintman J, Appleby N, Stamatopoulos B, Ridout K, Eyre TA, Robbe P, Pascua LL, Knight SJL, Dreau H, Cabes M, Popitsch N, Ehinger M, Martín-Subero JI, Campo E, Månsson R, Rossi D, Taylor JC, Vavoulis DV, Schuh A.

Genomic and transcriptomic correlates of Richter's transformation in Chronic Lymphocytic Leukemia. *Blood*. 137(20):2800-2816. D1

2. Nadeu F, Royo R, Clot G, Duran-Ferrer M, Navarro A, Martín S, Lu J, Zenz T, Baumann T, Jares P, Puente XS, Martín-Subero JI, Delgado J, Campo E . **IGLV3-21R110 identifies an aggressive biological subtype of chronic lymphocytic leukemia with intermediate epigenetics.** *Blood*. 137(21):2935-2946. D1

3. Haertle L; Barrio S; Munawar U; Han S; Zhou X; Vogt C; Fernández RA; Bittrich M; Ruiz-Heredia Y; Da Viá M; Zovko J; Garitano-Trojaola A; Bolli N; Ruckdeschel A; Stühmer T; Chatterjee M; Kull M; Krönke J; Agirre X; Martin-Subero JI; Raab P; Einsele H; Rasche L; Martinez-Lopez J; Haaf T; Kortüm KM. **Cereblon enhancer methylation and IMiD resistance in multiple myeloma.** *Blood*. 138(18):1721-1726. D1

4. Farabella I; Di Stefano M; Soler-Vila P; Marti-Marimon M; Marti-Renom MA. **Three-dimensional genome organization via triplex-forming RNAs.** *Nature Structural & Molecular Biology*. 28(11):945-954. D1

5. Vilarrasa-Blasi R, Soler-Vila P, Verdaguer-Dot N, Russiñol N, Di Stefano M, Chapaprieta V, Clot G, Farabella I, Cuscó P, Kulis M, Agirre X, Prosper F, Beekman R, Beà S, Colomer D, Stunnenberg HG, Gut I, Campo E, Marti-Renom MA, Martin-Subero JI. **Dynamics of genome architecture and chromatin function during human B cell differentiation and neoplastic transformation.** *Nature Communications*. 12(1):651. D1

6. Carrasco-Leon A; Ezponda T; Meydan C; Valcárcel LV; Ordoñez R; Kulis M; Garate L; Miranda E; Segura V; Guruceaga E; Vilas-Zornoza A; Alignani D; Pascual M; Amundarain A; Castro-Labrador L; Martín-Uriz PS; El-Omri H; Taha RY; Calasanz MJ; Planes FJ; Paiva B; Mason CE; San Miguel JF; Martin-Subero JI; Melnick A; Prosper F; Agirre X. **Characterization of complete lncRNAs transcriptome reveals the functional and clinical impact of lncRNAs in multiple myeloma.** *Leukemia*. 35(5):1438-1450. D1

7. Llaó-Cid L, Roessner PM, Chapaprieta V, Öztürk S, Roider T, Bordas M, Izcue A, Colomer D, Dietrich S, Stilgenbauer S, Hanna B, Martín-Subero JI, Seiffert M. **EOMES is essential for antitumor activity of CD8+ T cells in chronic lymphocytic leukemia.** *Leukemia*. 35(11):3152-3162. D1

8. Valcarcel, Luis V.; Amundarain, Ane; Kulis, Marta; Charalampopoulou, Stella; Melnick, Ari; San Miguel, Jesus; Martin-Subero, Jose, I; Planes, Francisco J.; Agirre, Xabier; Prosper, Felipe. **Gene expression derived from alternative promoters improves prognostic stratification in multiple myeloma**. *Leukemia*. 35(10):3012-3016. D1

9. Hübschmann D, Kleinheinz K, Wagener R, Bernhart SH, López C, Toprak UH, Sungalee S, Ishaque N, Kretzmer H, Kreuz M, Waszak SM, Paramasivam N, Ammerpohl O, Aukema SM, Beekman R, Bergmann AK, Bieg M, Binder H, Borkhardt A, Borst C, Brors B, Bruns P, Carrillo de Santa Pau E, Claviez A, Doose G, Haake A, Karsch D, Haas S, Hansmann ML, Hoell JI, Hovestadt V, Huang B, Hummel M, Jäger-Schmidt C, Kerssemakers JNA, Korbel JO, Kube D, Lawerenz C, Lenze D, Martens JHA, Ott G, Radlwimmer B, Reisinger E, Richter J, Rico D, Rosenstiel P, Rosenwald A, Schillhabel M, Stilgenbauer S, Stadler PF, Martín-Subero JI, Szczepanowski M, Warsow G, Weniger MA, Zapatka M, Valencia A, Stunnenberg HG, Lichter P, Möller P, Loeffler M, Eils R, Klapper W, Hoffmann S, Trümper L,, Küppers R, Schlesner M, Siebert R ICGC MMML-Seq consortium, ICGC DE-Mining consortium, BLUEPRINT consortium. **Mutational mechanisms shaping the coding and noncoding genome of germinal center derived B-cell lymphomas.** *Leukemia*. 35(7):2002-2016. D1

10. Farre L, Sanz G, Ruiz-Xivillé N, Castro de Moura M, Martin-Tejera JF, Gonçalves-Ribeiro S, Martinez-Iniesta M, Calaf M, Luis Mosquera J, Martín-Subero JI, Granada I, Esteller M, Domingo-Domenech E, Climent F, Villanueva A, Sureda A. **Extramedullary multiple myeloma patient derived orthotopic xenograft with high disturbed genome: combined exhaustive molecular and therapeutic studies**. *Disease Models & Mechanisms*. 14(7):dmm048223. Q1

GRANTS FOR RESEARCH IN PROGRESS

Maiques A, Martín-Subero I. **Role of transcription factors as drivers of chronic lymphocytic leukemia.**
Sponsored by: Lady Tata memorial trust.
INT_LADY_TATA_19_2664
Duration: 01/10/2019-31/03/2021

Martín-Subero I. **Biomedical Epigenomics.**
Sponsored by: Generalitat de Catalunya.
AGAUR_SGR17_00736
Duration: 01/01/2017-30/09/2021

Martín-Subero I. **Deciphering the role of transcription factors as chromatin modulators and drivers of lymphoid neoplasm.**
Sponsored by: Fundació La Marató de TV3.
Cancer_19
Duration: 30/07/2020-29/07/2023

Martín-Subero I. **ChromMCL: Análisis a escala genómica de la estructura de la cromatina en el linfoma de las células del manto: Impacto biológico y clínico.**
Sponsored by: Ministerio de Economía y Competitividad. MINECO_SAF2017-86126-R
Duration: 01/01/2018-30/06/2021

Martín-Subero I. **Causas y consecuencias de la activación de la cromatina en el linfoma de las células del manto: un estudio mecanístico y de single cells.**
Sponsored by: Agencia Estatal de Investigación. AEI_PE20
Duration: 01/09/2021-31/08/2024

Martín-Subero I. **Single-cell genomics to comprehensively understand healthy B-cell maturation and transformation chronic lymphocytic leukemia.**
Sponsored by: European Commission.
CE_H2020-ERC-2018_Sy (810287_JIMS)
Duration: 01/04/2019-31/03/2024

Martín-Subero I. **Early detection and intervention: Understanding the mechanisms of transformation and hidden resistance of incurable haematological malignancies.**
Sponsored by: Fundación para la Investigación Médica Aplicada and Fundación científica Asociación Española contra el Cáncer.
INT_AA_17 and AccAward17
Duration: 01/12/2018-30/11/2023

5.13 Molecular biology of reproduction and development

LOCATION
UB School of Medicine

KEYWORDS
1. **Germinal cell line**
2. **Male infertility**
3. **Proteomics**
4. **Epigenetics**
5. **Cancer**
6. **Endocrine system**
7. **iPSC**

RELATED DISEASES
1. **Male sterility/infertility**
2. **Cancer**

GROUP INVOLVED IN
AGAUR_SGR17: 01555

Original publications

TOTAL	3
Mean IF	**2,97**
Q1	**33%**
D1	**0%**
MA	**67%**
OA	**33%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Sterility, and alterations in cellular development and differentiation, are very common medical problems that affect 1 in 5 couples of reproductive age and a very large proportion of the adult population.

Most causes are still unknown, a fact which has a negative effect on the success of reproduction treatments.

The group is investigating the molecular causes of male sterility and alterations in the differentiation of germ cells, embryonic development, and the transmission of information to subsequent generations.

Thus, it will be possible to obtain a correct diagnosis and prognosis, as well as open the door to new strategies for prevention and treatment.

APPROACH

The group applies genetic, genomic, epigenomic, transcriptomic and proteomic description strategies to the study of the male germinal line.

Its objective is to identify both normal molecular mechanisms and alterations in the reproductive function, embryonic development, and the transmission of information, that can affect the health of the following generations.

IMPACT

The group has been a pioneer group in the molecular description of the normal male germinal line and of the alterations associated with sterility and reproductive failures. Its research has enabled it to identify embryo proteins exclusively from the father.

The group is currently investigating parental contribution to embryogenesis (embryo formation and development), the health of offspring from the perspective of RNA, proteins and epigenetic information – which could explain many of the alterations associated with reproductive failure – to metabolic problems or cell differentiation in adulthood.

RESEARCH LINES

- Characterization of epigenetic signatures in the sperm chromatin.

- Characterization of exosomes isolated from seminal fluid and development of clinically relevant diagnostic and prognostic biomarkers.

- Characterization of genes involved in the familial non-syndromic differentiated thyroid carcinoma.

- Functional validation of paternally-derived embryo proteins during early embryogenesis.

- Genetics of endocrine disorders.

- Mechanisms involved in redifferentiation of cancer cells.

- Molecular alterations in semen from couples with idiopathic infertility.

PUBLICATIONS

Originals

1. Torra-Massana M, Jodar M, Barragán M, Soler-Ventura A, Delgado-Dueñas D, Rodríguez A, Oliva R, Vassena R . **Altered mitochondrial function in sperm from patients with repetitive fertilization failure after ICSI revealed by proteomics.** *Andrology*. 9(4):1192-1204. Q1

2. Lorente G, Ntostis P, Maitland N, Mengual L, Musquera M, Muneer A, Oliva R, Iles D, Miller . **Semen sampling as a simple, noninvasive surrogate for prostate health screening.** *Systems Biology In Reproductive Medicine*. 67(5):354-365. Q3

3. Oriola J; Sanchez A; Paniello B; de la Bellacasa JP; Biarnés J. **A novel germline variant inRETgene resulting in an additional cysteine in a family with familial medullary thyroid carcinoma**. *Familial Cancer*. 20(3):253-256. Q3

Review

1. Anifandis G; Tempest HG; Oliva R; Swanson GM; Simopoulou M; Easley CA; Primig M; Messini CI; Turek PJ; Sutovsky P; Ory SJ; Krawetz SA. **COVID-19 and human reproduction: A pandemic that packs a serious punch.** *Systems Biology In Reproductive Medicine*. 67(1):3-23. Q3

2. Orois A, Mora M, Halperin I, Oriola J. **Familial non medullary thyroid carcinoma: Beyond the syndromic forms.** *Endocrinologia Diabetes y Nutricion*. 68(4):260-269. Q4

Letters

1. Arriba M, Oriola J, Ezquieta B. **A new synonymous variant involving an mRNA splicing site in CYP21A2 detected in 12 unrelated patients with deficiency of 21-hydroxylase.** *Clinical Genetics*. 100(5):634-636. Q2

Case Reports

1. Frigola G; Del Rincón OG; Florián VB; Fita AV; Campos B; Pauta M; Puimedon MS; Oliva R; Borrell A; Nadal A. **Histopathology of recurrent Steel syndrome in fetuses caused by novel variants of COL27A1 gene.** *Virchows Archiv*. 479(2):413-418. Q2

2. Villabona C; Oriola J; Serrano T; Guerrero-Pérez F; Valdés N; Chiara M; Robledo M. **The recurrent p.(Pro540Ser) MEN1 genetic variant should be considered nonpathogenic: A case report.** *American Journal Of Medical Genetics Part a.* 185(12):3872-3876. Q3

GRANTS FOR RESEARCH IN PROGRESS

Oliva R. **Funció reproductiva masculina en pacients COVID-19.**
Sponsored by: Fundació la Marató de TV3.
TV3_COVID19_21
Duration: 20/10/2021-19/10/2024

Oliva R. **Madurez molecular de la cromatina del espermatozoide y selección espermática en los tratamientos de reproducción asistida.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI20/00936
Duration: 01/01/2021-31/12/2023

Oliva R. **ANDRONET. European andrology network– research coordination, education and public awareness.**
Sponsored by: European Commission.
CE_H2020-COST20
Duration: 01/11/2021-31/10/2025

DOCTORAL THESES

Oliva R, Jodar M. **Nous paradigmes de la contribució paterna al desenvolupament embrionari primerenc mitjançant l'anàlisi de l'espermatozoide humà amb tècniques d'alt rendiment.**
PhD student: Ada Soler Ventura

5.14 Microenvironment in lymphoma pathogenesis and therapy

LOCATION
CEK building, floor 2

KEYWORDS
1. **Non Hodgkin lymphoma**
2. **Microenvironment**
3. **Immunotherapy**
4. **Targeted therapy**

RELATED DISEASES
1. **Lymphoma**
2. **Leukemia**

GROUP INVOLVED IN
CIBERONC
AGAUR_SGR17: 0009

Original publications

TOTAL	3
Mean IF	7,02
Q1	67%
D1	33%
MA	33%
OA	67%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

B-cell non-Hodgkin lymphomas (B-NHL) are haematological cancers. Their origin lies in a close cooperation between the genetic alterations of the lymphoma and the support of surrounding cells, which is known as the tumour microenvironment.

For a treatment to be effective, it is mandatory to attack the lymphoma cells using targeted therapies, and to dismantle this protective lymphoma-microenvironment network.

APPROACH

The group studies the crosstalk between lymphoma cells and its immune microenvironment. This knowledge may allow establishing the basis to manipulate these interactions and the design of novel, targeted and personalised therapies.

For this purpose, the group has generated next-generation ex vivo 3D cultures composed of cells from patients diagnosed of B-NHL at HCB with associated genetic information, including tumour microenvironment cells.

These systems constitute robust lymphoma models to test novel targeted therapies, immunotherapies and combinations.

IMPACT

The group's objective is unquestionably to conduct basic research in order to improve the treating options for lymphoma patients, characterising their mechanisms of action and resistance.

The group has a privileged organisation working in a multidisciplinary setting, where collaborations among basic researchers, haematologists and pathologists facilitates bench-to bedside translation

RESEARCH LINES

- 3D lymphoma patient derived primary cultures: a superior in vitro system for personalized medicine.

- Follicular lymphoma crosstalk with its immune microenvironment as a source novel targeted therapies.

- Novel immunotherapeutic approaches in non-Hodgkin lymphoma (NHL).

PUBLICATIONS

Originals

1. Valero JG, Matas-Céspedes A, Arenas F, Rodriguez V, Carreras J, Serrat N, Guerrero-Hernández M, Yahiaoui A, Balagué O, Martin S, Capdevila C, Hernández L, Magnano L, Rivas-Delgado A, Tannheimer S, Cid MC, Campo E, López-Guillermo A, Colomer D, Pérez-Galán P. **The receptor of the colony-stimulating factor-1 (CSF-1R) is a novel prognostic factor and therapeutic target in follicular lymphoma.** *Leukemia.* 35(9):2635-2649. D1

2. Gava F; Faria C; Gravelle P; Valero JG; Dobano-Lopez C; Morin R; Norlund M; Gomes A; Lagarde JM; Rossi C; Bordenave J; Pieruccioni L; Rouquette J; Matas-Cespedes A; Fournie JJ; Ysebaert L; Laurent C; Perez-Galan P; Bezombes C. **3D Model Characterization by 2D and 3D Imaging in t(14;18)-Positive B-NHL: Perspectives for**

In Vitro Drug Screens in Follicular Lymphoma. *Cancers*. 13(7):1490. Q1

3. Mozas P; Rivero A; Rivas-Delgado A; Nadeu F; Clot G; Correa JG; Castillo C; Bataller A; Baumann T; Giné E; Delgado J; Villamor N; Campo E; Pérez-Galán P; Magnano L; López-Guillermo A. **A low lymphocyte-to-monocyte ratio is an independent predictor of poorer survival and higher risk of histological transformation in follicular lymphoma.** *Leukemia & Lymphoma.* 62(1):104-111. Q3

Review

1. Dobaño-López C, Araujo-Ayala F, Serrat N, Valero JG, Pérez-Galán P. **Follicular Lymphoma Microenvironment: An Intricate Network Ready for Therapeutic Intervention**. *Cancers*. 13(4):641. Q1

2. Araujo-Ayala, Ferran; Perez-Galan, Patricia; Campo, Elias. **Vulnerabilities in the tumor and microenvironment in follicular lymphoma.** *Hematological Oncology.* 39:83-87. Q2

Letters

1. Dlouhy I, Armengol M, Recasens-Zorzo C, Ribeiro ML, Pérez-Galán P, Bosch F, López-Guillermo A, Roué G . **Interleukin-1 receptor associated kinase 1/4 and bromodomain and extra-terminal inhibitions converge on NF-κB blockade and display synergistic antitumoral activity in activated B-cell subset of diffuse large B-cell lymphoma with MYD88 L265P mutation.** *Haematologica.* 106(10):2749-2753. Q1

Editorial

1. Bezombes C, Perez-Galan P. **Immunotherapies in Non-Hodgkin's Lymphoma.** *Cancers*. 13(14):3625. Q1

GRANTS FOR RESEARCH IN PROGRESS

Pérez-Galán P. **Tailored Immunotherapies in 3D models of Follicular Lymphoma (TAIFOL).**
Sponsored by: Fundació La Marató de TV3.
Cancer_19
Duration: 20/07/2020-19/07/2023

Pérez-Galán P, Cid MC. **Interacciones multi-celulares en la progresión de las enfermedades inflamatorias crónicas y síndromes linfoproliferativos: modelos 3D para investigar inmunoterapias dirigidas.**
Sponsored by: Ministerio de Economía y Competitividad. MINECO_SAF2017-88275-R
Duration: 01/01/2018-30/06/2021

Pérez-Galán P. **IMLINFO: Red transfronteriza de immunoterapias personalizadas para linfomas no Hodgkin.**
Sponsored by: European Commission.
CE_Interreg-16_POCTEFA
Duration: 01/01/2018-31/12/2021

5.15 Lipid trafficking and disease

LOCATION
CELLEX building, floor 1A
UB School of Medicine

KEYWORDS
1. **Lipid droplets**
2. **Mitochondria**
3. **Metabolism**
4. **Immunity**

RELATED DISEASES
1. **Obesity**
2. **Diabetes**
3. **Metabolic syndrome**
4. **Immunity**

Original publications

TOTAL	2
Mean IF	**8,24**
Q1	**50%**
D1	**50%**
MA	**0%**
OA	**100%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

The human body has 200 different types of cells that are exquisitely coordinated. The failure of one or more components of this orchestra gives rise to disease.

One of the most common causes of disease is lipotoxicity. Lipids such as cholesterol or fatty acids are basic elements in building cells and keeping them active, but when they are present in excess, they damage them.

Lipotoxicity gives rise to, or aggravates, obesity, diabetes, atherosclerosis, cancer and neurodegeneration. Statistics show that 100% of Europeans will develop at least one of these diseases during their lifetime.

APPROACH

Lipotoxicity can affect any type of cell and the first step to prevent it is to adopt a healthy lifestyle. This does not mean eliminating lipids from one's diet, as they are essential for life and account for 10% of a cell's weight and 50% of the cell membranes.

The group strives to understand the molecular mechanisms of lipotoxicity and find out why some lipids are toxic and others, beneficial, studying the way in which cells store, use and eliminate fat.

This knowledge leads to the establishment of correct therapeutic targets and effective medicines to treat the different aspects of lipotoxicity.

IMPACT

Since 2001 the group has studied the cell biology and physiology of lipid bodies (lipid droplets, LDs). LDs are intracellular organelles specifically designed during the evolution of diverse forms of life to prevent lipotoxicity.

The group has studied them from the time they are formed to the time they are used and is also evaluating the role they play in different situations such as obesity, liver regeneration and immune response.

RESEARCH LINES

- Caveolins in the endoplasmic reticulum: homeostatic cholesterol sensors?

- Exploring new functions for lipid droplets: from immunity to cancer.

- The role of hepatic endosomes in the regulation of systemic cholesterol: the why, the where and the how of arteriosclerosis.

- Understanding the biogenesis and consumption of lipid droplets: decoding the metabolic syndrome?

PUBLICATIONS

Originals

1. Cabot D, Brun S, Paco N, Ginesta MM, Gendrau-Sanclemente N, Abuasaker B, Ruiz-Fariña T, Barceló C, Cuatrecasas M, Bosch M, Rentero C, Pons G, Estanyol JM, Capellà G, Jaumot M, Agell N. **KRAS phosphorylation regulates cell polarization and tumorigenic properties in colorectal cancer.** *Oncogene.* 40(38):5730-5740. D1

2. Meneses-Salas E, Garcia-Forn M, Castany-Pladevall C, Lu A, Fajardo A, Jose J, Wahba M, Bosch M, Pol A, Tebar F, Klein AD, Zanlungo S, Pérez-Navarro E, Grewal T, Enrich C, Rentero C. **Lack of Annexin A6 exacerbates liver dysfunction and reduces lifespan of NPC1-deficient mice.** *American Journal Of Pathology*. 191(3):475-486. Q2

Review

1. Bosch M, Sweet MJ, Parton RG, Pol A . **Lipid droplets and the host-pathogen dynamic: FATal attraction?** *Journal Of Cell Biology*. 220(8):e202104005. Q1

GRANTS FOR RESEARCH IN PROGRESS

Pol A. **Cuerpos Lipídicos y Mitocondrias: centros inmunes que controlan la defensa del huésped y el inmunometabolismo.**
Sponsored by: Ministerio de Ciencia e Innovación y Universidades. MCIU_R-TI2018-098593-B-I00
Duration: 01/01/2019-30/09/2022

Pol A. **EU Training Network in understanding the molecular regulation and the role of endo-lysosomal.**
Sponsored by: European Commission. CE_H2020-MSCA-ITN-20
Duration: 01/01/2021-31/12/2024

Pol A. **Discovering the Partners of PCSK9 in Hepatic Endosomes: The Where, How, and Why of PCSK9 in Atherosclerosis.**
Sponsored by: AMGEN (INC). INT_AMGEN_PCSK9_18
Duration: 01/09/2018-31/08/2021

5.16 Diagnosis and therapy in oncology

LOCATION
HCB building

KEYWORDS
1. **Oncology molecular studies**
2. **Radiotherapy**
3. **Breast cancer diagnosis**
4. **Sentinel lymph node**
5. **Positron emission tomography**

RELATED DISEASES
1. **Breast cancer**
2. **Malignant melanoma**
3. **Lymphoma**
4. **Head and neck tumours**
5. **Gynecological carcinoma**

GROUP INVOLVED IN
AGAUR_SGR17: 00682, 01150
CIBER-BNN

Original publications

TOTAL	38
Mean IF	**5,82**
Q1	**66%**
D1	**24%**
MA	**16%**
OA	**74%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Cancer is the second leading cause of death in Europe and the first among people aged under 65. Its incidence increases as the population ages and it is calculated that by 2030, one new case of cancer will develop in Spain every 1.8 minutes, with one death every 3.8 minutes.

Increasing and optimising efforts to prevent, diagnose and treat cancer is of the utmost importance. The group's opinion is that the best way to do this is to promote translational research and incorporate clinical practice as quickly as possible into the ground-breaking advances made by laboratories.

APPROACH

The arsenal of diagnostic and therapeutic tools available for cancer patients includes molecular studies, diverse diagnostic imaging techniques and radiation therapy.

The research conducted by the group is focused on these areas, with the aim of developing techniques to improve diagnosis, prognostic assessment and evaluation of the response to treatment in these diseases.

In addition, work is being carried out on new cancer therapies based on the use of encapsulated and non-encapsulated ionising radiation.

IMPACT

The group's intention is for molecular studies to provide information to enable doctors to offer patients more specific treatments.

Furthermore, in relation to diagnostic imaging techniques, magnetic resonance imaging (MRI) makes it possible to better establish the state of certain tumours and improve the prediction of the pathological response; positron emission tomography/computed tomography (PET/CT) has proven to be extremely useful in evaluating the response to treatment in diverse neoplasms; sentinel lymph node detection prevents a large number of unnecessary lymph node extractions, and radiation therapy studies comparing conventional radiation to new types of radiation show promising results.

RESEARCH LINES

- Breast magnetic resonance imaging (MRI).

- Effects of synchrotron radiation upon the neoplastic cell.

- Functional magnetic resonance imaging (fMRI) techniques.
- Molecular studies in embryonic and tumor cells: applications to pharmacogenomics.

- Positron emission tomography/computed tomography (PET/CT).

- Scintigraphic detection of the sentinel node and hybrid tracers in radioguided surgery.

- Study of bacterial radiosensitivity.

PUBLICATIONS

Originals

1. Salvadó G, Milà-Alomà M, Shekari M, Minguillon C, Fauria K, Niñerola-Baizán A, Perissinotti A, Kollmorgen G, Buckley C, Farrar G, Zetterberg H, Blennow K, Suárez-Calvet M, Molinuevo JL, Gispert JD, ALFA study. **Cerebral amyloid-β load is associated with neurodegeneration and gliosis: Mediation by p-tau and interactions with risk factors early in the Alzheimer's continuum.** *Alzheimers & Dementia.* 17(5):788-800. D1

2. Pose E, Coll M, Martínez-Sánchez C, Zeng Z, Surewaard BGJ, Català C, Velasco-de Andrés M, Lozano JJ, Ariño S, Fuster D, Niñerola-Bazán A, Graupera I, Muñoz É, Lozano F, Sancho-Bru P, Kubes P, Ginès P . **PD-L1 is overexpressed in liver macrophages in chronic liver diseases and its blockade improves the antibacterial activity against infections.** *Hepatology.* 74(1):296-311. D1

3. Esteve-Codina A, Alameda F, Carrato C, Pineda E, Arpí O, Martinez-García M, Mallo M, Gut M, Dabad M, Tortosa A, Del Barco S, Capellades J, Puig J, Gallego O, Pujol T, Oleaga L, Gil-Gil M, de Quintana-Schmidt C, Valduvieco I, Martinez-Cardús A, Bellosillo B, Muñoz-Marmol AM, Esteve A, Domenech M, Camins A, Craven-Bartle J, Villa S, Marruecos J, Domenech S, de la Iglesia N, Balana C . **RNA-Sequencing and immunohistochemistry reveal ZFN7 as a stronger marker of survival than molecular subtypes in G-CIMP-negative glioblastoma.** *Clinical Cancer Research.* 27(2):645-655. D1

4. Rivas-Delgado, A; Nadeu, F; Enjuanes, A; Casanueva-Eliceiry, S; Mozas, P; Magnano, L; de Anta, NC; Rovira, J; Dlouhy, I; Martin, S; Osuna, M; Rodriguez, S; Simo, M; Pinyol, M; Baumann, T; Bea, S; Balague, O; Delgado, J; Villamor, N; Setoain, X; Campo, E; Gine, E; Lopez-Guillermo, A. **Mutational Landscape and Tumor Burden Assessed by Cell-free DNA in Diffuse Large B-Cell Lymphoma in a Population-Based Study.** *Clinical Cancer Research.* 27(2):513-521. D1

5. Mila-Aloma, M; Brinkmalm, A; Ashton, NJ; Kvartsberg, H; Shekari, M; Operto, G; Salvado, G; Falcon, C; Gispert, JD; Vilor-Tejedor, N; Arenaza-Urquijo, EM; Grau-Rivera, O; Sala-Vila, A; Sanchez-Benavides, G; Gonzalez-de-Echavarri, JM; Minguillon, C; Fauria, K; Ninerola-Baizan, A; Perissinotti, A; Kollmorgen, G; Suridjan, I; Zetterberg, H; Molinuevo, JL; Blennow, K; Suarez-Calvet, M. **CSF Synaptic Biomarkers in the Preclinical Stage of Alzheimer Disease and Their Association With MRI and PET A Cross-sectional Study.** *Neurology.* 97(21):e2065-e2078. D1

6. Vidal-Sicart, S; Rioja, ME; Prieto, A; Goni, E; Gomez, I; Albala, MD; Lumbreras, L; Leon, LF; Gomez, JR; Campos, F. **Sentinel Lymph Node Biopsy in Breast Cancer with Tc-99m-Tilmanocept: A Multicenter Study on Real-Life Use of a Novel Tracer.** *Journal Of Nuclear Medicine.* 62(5):620-627. D1

7. Collij LE, Salvadó G, Shekari M, Lopes Alves I, Reimand J, Wink AM, Zwan M, Niñerola-Baizán A, Perissinotti A, Scheltens P, Ikonomovic MD, Smith APL, Farrar G, Molinuevo JL, Barkhof F, Buckley CJ, van Berckel BNM, Gispert JD, ALFA study, AMYPAD consortium. **Visual assessment of [18F]flutemetamol PET images can detect early amyloid pathology and grade its extent.** *European Journal Of Nuclear Medicine And Molecular Imaging.* 48(7):2169-2182. D1

8. González de Aledo-Castillo JM, Casanueva-Eliceiry S, Soler-Perromat A, Fuster D, Pastor V, Reguart N, Viñolas N, Reyes R, Vollmer I, Paredes P, Puig-Butillé JA . **Cell-free DNA concentration and fragment size fraction correlate with FDG PET/CT-derived parameters in NSCLC patients**. *European Journal Of Nuclear Medicine And Molecular Imaging.* 48(11):3631-3642. D1

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10. Grau-Rivera O, Navalpotro-Gomez I, Sánchez-Benavides G, Suárez-Calvet M, Milà-Alomà M, Arenaza-Urquijo EM, Salvadó G, Sala-Vila A, Shekari M, González-de-Echávarri JM, Minguillón C, Niñerola-Baizán A, Perissinotti A, Simon M, Kollmorgen G, Zetterberg H, Blennow K, Gispert JD, Molinuevo JL, ALFA Study. **Association of weight change with cerebrospinal fluid biomarkers and amyloid positron emission tomography in preclinical Alzheimer's disease.** *Alzheimers Research & Therapy.* 13(1):46. Q1

11. Mila-Aloma, M; Shekari, M; Salvado, G; Gispert, JD; Arenaza-Urquijo, EM; Operto, G; Falcon, C; Vilor-Tejedor, N; Grau-Rivera, O; Sala-Vila, A; Sanchez-Benavides, G; Gonzalez-de-Echavarri, JM; Minguillon, C; Fauria, K; Ninerola-Baizan, A; Perissinotti, A; Simon, M; Kollmorgen, G; Zetterberg, H; Blennow, K; Suarez-Calvet, M; Molinuevo, JL. **Cognitively unimpaired individuals with a low burden of A beta pathology have a distinct CSF biomarker profile.** *Alzheimers Research & Therapy.* 13(1):134. Q1

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14. Martin-Deleon R, Teixido C, Lucena CM, Martinez D, Fontana A, Reyes R, García M, Viñolas N, Vollmer I, Sanchez M, Jares P, Pérez FM, Vega N, Marin E, Marrades RM, Agustí C, Reguart N . **EBUS-TBNA Cytological**

Samples for Comprehensive Molecular Testing in Non-Small Cell Lung Cancer. *Cancers*. 13(9):2084. Q1

15. Aya F, Benegas M, Viñolas N, Reyes R, Vollmer I, Arcocha A, Sánchez M, Reguart N . **A Pilot Study to Evaluate Early Predictive Value of Thorax Perfusion-CT in Advanced NSCLC.** *Cancers*. 13(21):5566. Q1

16. Martín J, Castellano JJ, Marrades RM, Canals J, Viñolas N, Díaz T, Molins L, Martinez D, Han B, Moisés J, He Y, Monzó M, Navarro A . **Role of the epithelial-mesenchymal transition-related circular RNA, circ-10720, in non-small-cell lung cancer.** *Translational Lung Cancer Research*. 10(4):1804-1818. Q1

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18. Renu A, Blasco J, Millan M, Marti-Fabregas J, Cardona P, Oleaga L, Macho J, Molina C, Roquer J, Amaro S, Davalos A, Zarco F, Laredo C, Tomasello A, Guimaraens L, Barranco R, Castano C, Vivas E, Ramos A, Lopez-Rueda A, Urra X, Muchada M, Cuadrado-Godia E, Camps-Renom P, Roman LS, Rios J, Leira EC, Jovin T, Torres F, Chamorro A; CHOICE Investigators. **The Chemical Optimization of Cerebral Embolectomy trial: Study protocol.** *International Journal Of Stroke*. 16(1):110-116. Q1

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22. Trilla-Fuertes L, Gámez-Pozo A, Maurel J, Garcia-Carbonero R, Capdevila J, G-Pastrián L, Mendiola M, Peña C, López-Vacas R, Cuatrecasas M, García-Alfonso P, Ramos-Ruiz R, Llorens C, Ghanem I, Conill C, Heredia-Soto V, Campos-Barros Á, Fresno Vara JÁ, Feliu J. **Description of the genetic variants identified in a cohort of patients diagnosed with localized anal squamous cell carcinoma and treated with panitumumab.** *Scientific Reports*. 11(1):7402-7402. Q1

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37. Iurina E, Bailles E, Carreño M, Donaire A, Rumià J, Boget T, Bargalló N, Setoain X, Roldan P, Conde-Blanco E, Centeno M, Pintor L. **Personality changes in patients suffering from drug-resistant epilepsy after surgical treatment: a 1-year follow-up study.** *Epilepsy Research.* 177:106784. Q3

38. Sabater, S; Pastor-Juan, M R; Andres, I; Lopez-Martinez, L; Lopez-Honrubia, V; Tercero-Azorin, M, I; Sevillano, M; Lozano-Setien, E; Jimenez-Jimenez, E; Berenguer, R; Rovirosa, A; Castro-Larefors, S; Marti-Laosa, M Magdalena; Roche, O; Martinez-Terol, F; Arenas, M. MRI prostate contouring is not impaired by the use of a radiotherapy image acquisition set-up. **An intra- and inter-observer paired comparative analysis with diagnostic set-up images.** *Cancer Radiotherapie.* 25(2):107-113. Q4

Review

1. Fuster-Garcia, Elies; Estelles, David Lorente; Alvarez-Torres, Maria del Mar; Juan-Albarracin, Javier; Chelebian, Eduard; Rovira, Alex; Acosta, Cristina Auger; Pineda, Jose; Oleaga, Laura; Molla-Olmos, Enrique; Filice, Silvano; Due-Tonnessen, Paulina; Meling, Torstein R.; Emblem, Kyrre E.; Garcia-Gomez, Juan M. **MGMT methylation may benefit overall survival in patients with moderately vascularized glioblastomas.** *European Radiology.* 31(3):1738-1747. Q1

2. Perez-Serrano, Carlos; Bartolome, Alvaro; Bargallo, Nuria; Sebastia, Carmen; Nadal, Alfons; Gomez, Olga; Oleaga, Laura. **Perinatal post-mortem magnetic resonance imaging (MRI) of the central nervous system (CNS): a pictorial review.** *Insights Into Imaging.* 12(1):104. Q1

3. Molla, Meritxell; Fernandez-Plana, Julen; Albiol, Santiago; Fondevila, Constantino; Vollmer, Ivan; Cases, Carla; Garcia-Criado, Angeles; Capdevila, Jaume; Conill, Carles; Fundora, Yliam; Fernandez-Martos, Carlos; Pineda, Estela. **Limited Liver or Lung Colorectal Cancer Metastases. Systemic Treatment, Surgery, Ablation or SBRT.** *Journal Of Clinical Medicine.* 10(10):2131. Q1

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5. Würnschimmel C; Wenzel M; Maurer T; Valdés Olmos RA; Vidal-Sicart S. **Contemporary update of SPECT tracers and novelties in radioguided surgery: a perspective based on urology.** *Quarterly Journal Of Nuclear Medicine And Molecular Imaging.* 65(3):215-228. Q3

6. Goni-Girones, E; Fuertes-Cabero, S; Blanco-Saiz, I; Casans-Tormo, I; San Miguel, PGT; Martin-Gil, J; Sampol-Bas, C; Abreu-Sanchez, P; Diaz-Exposito, R; Vidal-Sicart, S. **Radioguided surgery in primary hyperparathyroidism: a review of the different available techniques.** *Revista Española de Medicina Nuclear e Imagen Molecular.* 40(1):57-66. Q4

Letters

1. Mariani G, Valdés Olmos RA, Vidal-Sicart S, Strauss HW. **Radioguided Surgery.** *Journal Of Nuclear Medicine*. 62(4):591-592. D1

2. Escande A, Crop F, Liem X, Mirabel X, Julieron M, Mouttet-Audouard R, El Bedoui S, Lartigau EF, Cordoba A. **Magnetic guided brachytherapy: Time for non-pelvic cancer? Example from tongue brachytherapy.** *Radiotherapy And Oncology.* 155:e3-e4. Q1

3. Sabater S; Rovirosa À; Arenas M. **In response to Korreman s. et al. Radiation oncologists are, above all, medical doctors.** *Clinical And Translational Radiation Oncology.* 28:116-117. Q2

4. Lisei Coscia D; Sanchez Izquierdo N; Casanueva Eliceiry S; Martinez Hernandez D; Vidal Perez O; Vidal Sicart S. **Incidental finding of thyroid carcinoma in a case of primary hyperparathyroidism diagnosed with 18F-PET/CT fluorcholine.** *Revista Española De Medicina Nuclear E Imagen Molecular.* 40(1):55-56. Q4

Editorial

1. Buckle T; Schilling C; Maurer T; Vidal-Sicart S. **Image-guided surgery: from classical techniques to novel aspects and approaches.** *Quarterly Journal Of Nuclear Medicine And Molecular Imaging.* 65(3):187-189. Q3

2. Paredes P; Díaz-Feijoo B. **Sentinel lymph node in endometrial cancer, is the role of Nuclear Medicine specialist still needed?** *Revista Española De Medicina Nuclear E Imagen Molecular.* 40(5):273-274. Q4

Case Reports

1. Cajiao K, Setoain FJ, Peris P. **Multifocal Osteonecrosis The Usefulness of Bone Scintigraphy.** *Journal Of Clinical Rheumatology.* 27(5):e196-e197. Q3

Clinical Guidelines

1. Mossa-Basha M; Schnall M; Meltzer C; Oleaga L; Filippi CG; Mahoney M; Donoso L; Tan BS; RSNA COVID-19 Task Force. **Special Report of the RSNA COVID-19 Task Force: Crisis Leadership of Major Health System Radiology Departments During COVID-19.** *Radiology.* 299(1):203518. D1

2. Samper Ots PM; Rovirosa Casino A; Herreros Martínez A; Rodriguez Villalba S; Pérez Calatayud J; Polo Cezón R; Gutiérrez Miguélez C; Anchuelo Latorre J; Rodríguez Rodríguez I; Córdoba Largo S; Pérez Echagüen S; Sanz Freire CJ; Clemente Gutiérrez F; De Las Peñas Cabrera D; Villafranca Iturre E; SEOR and the SEFM Brachytherapy Groups SEOR and the SEFM Brachytherapy Groups. **Consensus and recommendations on vaginal-cuff Brachytherapy of the Spanish Brachytherapy Groups of SEOR and SEFM.** *Clinical & Translational Oncology.* 23(6):1193-1200. Q3

Consortium Publications

1. Pericàs JM, Ambrosioni J, Muñoz P, de Alarcón A, Kestler M, Mari-Hualde A, Moreno A, Goenaga MÁ, Fariñas MC, Rodríguez-Álvarez R, Ojeda-Burgos G, Gálvez-Acebal J, Hidalgo-Tenorio C, Noureddine M, Miró JM, GAMES Investigators. **Prevalence of Colorectal Neoplasms Among Patients With Enterococcus faecalis Endocarditis in the GAMES Cohort (2008-2017).** *Mayo Clinic Proceedings.* 96(1):132-146. Q1

2. Ortega, G; Espinosa, A; Alegret, M; Monte-Rubio, GC; Sotolongo-Grau, O; Sanabria, A; Tartari, JP; Rodriguez-Gomez, O; Marquie, M; Vivas, A; Gomez-Chiari, M; Alarcon-Martin, E; Perez-Cordon, A; Roberto, N; Hernandez, I; Rosende-Roca, M; Vargas, L; Mauleon, A; Abdelnour, C; De Antonio, EE; Lopez-Cuevas, R; Alonso-Lana, S; Moreno-Grau, S; de Rojas, I; Orellana, A; Montrreal, L; Tarraga, L; Ruiz, A; Boada, M; Valero, S. **Combination of white matter hyperintensities and A beta burden is related to cognitive composites domain scores in subjective cognitive decline: the FACEHBI cohort.** *Alzheimers Research & Therapy.* 13(1):141. Q1

3. Varela Barca L, Vidal-Bonnet L, Fariñas MC, Muñoz P, Valerio Minero M, de Alarcón A, Gutiérrez Carretero E, Gutiérrez Cuadra M, Moreno Camacho A, Kortajarena Urkola X, Goikoetxea Agirre J, Ojeda Burgos G, López-Cortés LE, Porres Azpiroz JC, Lopez-Menendez J, GAMES Investigators. **Analysis of sex differences in the clinical presentation, management and prognosis of infective endocarditis in Spain.** *Heart.* 107(21):1717-1724. Q1

4. Hernández-Meneses M, González-Martin J, Agüero D, Tolosana JM, Sandoval E, Falces C, San Antonio R, Vidal B, Moreno A, Ambrosioni J, Miró JM, Hospital Clínic of Barcelona Infectious Endocarditis Team. **Mycobacterium Wolinskyi: A New Non-Tuberculous Mycobacterium Associated with Cardiovascular Infections?** *Infectious Diseases And Therapy.* 10(2):1073-1080. Q1

5. Gutierrez-Villanueva, A; Munoz, P; Delgado-Montero, A; Olmedo-Samperio, M; de Alarcon, A; Gutierrez-Carretero, E; Zarauza, J; Pares, DGI; Goenaga, MA; Ojeda-Burgos, G; Goikoetxea-Agirre, AJ; Reguera-Iglesias, JM; Ramos, A; Fernandez-Cruz, A. **Mural Endocarditis: The GAMES Registry Series and Review of the Literature.** *Infectious Diseases And Therapy.* 10(4):2749-2764. Q1

6. Escrihuela-Vidal F, López-Cortés LE, Escolà-Vergé L, De Alarcón González A, Cuervo G, Sánchez-Porto A, Fernández-Hidalgo N, Luque R, Montejo M, Miró JM, Goenaga MÁ, Muñoz P, Valerio M, Ripa M, Sousa-Regueiro D, Gurguí M, Fariñas-Alvarez MC, Mateu L, García Vázquez E, Gálvez-Acebal J, Carratalà J, Grupo de Apoyo al Manejo de la Endocarditis Infecciosa en España (GAMES) Cohort Investigators and the Barcelona Endocarditis Study Team (BEST). **Clinical Features and Outcomes of Streptococcus anginosus Group Infective Endocarditis: A Multicenter Matched Cohort Study.** *Open Forum Infectious Diseases.* 8(6):ofab163. Q2

GRANTS FOR RESEARCH IN PROGRESS

Paredes P, Vidal-Sicart S. **Ganglio centinela en el cáncer de endometrio mediante detección híbrida (99mTc-nanocoloide de albúmina-ICG). Mapa linfático de la punción cervical versus miometrial.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00728
Duration: 01/01/2019-30/06/2023

Vidal-Sicart S. **Cirugía radioguiada en cánceres genito-urinarios. Mejoría en la detección intraoperatoria y bases para desarrollos futuros.**
Sponsored by: Sociedad Española de Medicina Nuclear e Imagen Molecular.
SEMNIM_JanssenProy21
Duration: 01/09/2021-31/08/2022

DOCTORAL THESES

del Pino M, Paredes P. **Evaluación del ganglio centinela obtenido mediante la técnica de inyección miometrial de radiotrazador guiada por ecografía transvaginal en pacientes con cáncer de endometrio de riesgo intermedio y alto.**
PhD student: Martina Angeles Fité

Nicolau C, Oleaga L. **Eficàcia de la hidratació oral com a mesura preventiva de la lesió renal aguda postcontrast iodat.**
PhD student: Maria Carmen Sebastia Cerqueda

5.17 Gene regulation in stem cells, cell plasticity, differentiation and cancer

LOCATION
CELLEX building, floor 1B

KEYWORDS
1. **Stem cells**
2. **Cancer**
3. **Inflammation**
4. **Cellular plasticity and differentiation**
5. **Tissue regeneration**

RELATED DISEASES
1. **Cancer**
2. **Inflammation**
3. **Muscle dystrophies and muscle pathology**

GROUP INVOLVED IN
AGAUR_SGR17: 01174
CIBEREHD

Original publications

TOTAL	1
Mean IF	**14,14**
Q1	**100%**
D1	**100%**
MA	**100%**
OA	**100%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access

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PROBLEM

Organisms are comprised of hundreds of different types of cells, each with a specific attribute and function. This diversity of cell traits and roles is determined by a particular 'gene expression signature'.

This gene expression signature defines each cell type but also evolves as cells change during differentiation, development, and disease. Gene expression is regulated at multiple levels, including by some proteins (known as "transcription factors") that bind to the regulatory regions in the DNA to switch on/off gene expression.

Understanding how genes are regulated is critical for designing tools to maintain health and to prevent and cure diseases.

APPROACH

The ability of cells to change their identity (phenotype) and function along a spectrum is referred to as cellular plasticity.

Cellular plasticity serves as a mechanism through which cells and tissues adapt to environmental changes and occurs not only during embryonic development but also in adult tissues both under physiological conditions as well as in disease.

For instance, cellular plasticity allows cells to respond to stress or injury (e.g., tissue regeneration by adult stem cells). But cellular plasticity also allows cells to adopt a pathological phenotype and function in response to some cues (e.g., tumor initiation by cancerous stem cells).

The group studies gene regulation of cell plasticity during normal cell differentiation (the process through which cells, tissues and organs change structure and shape to carry out specific functions) and in disease, with ongoing projects in inflammation, cancer, stem cell differentiation, and muscle injury and regeneration.

Cellular plasticity is orchestrated by a number of transcription factors and epigenetic modifications. Our group focuses on the ZEB1 and ZEB2 cell plasticity factors that play key roles in all of these physiological and pathological processes.

Our research uses multiple technical approaches ranging from unique conditional transgenic mice, ex vivo cultures and manipulation of stem cells to high-throughput techniques (OMICs: RNAseq, single cell-RNAseq, etc) and differentiation of human embryonic stem cells.

IMPACT

By understanding the mechanisms that regulate gene expression and how gene expression is regulated under physiological conditions and altered in disease, our group aims to: a) define markers that trace the initiation and progression of diseases and b) inform the design of new and personalized therapies that restore normal gene expression and function.

RESEARCH LINES

- Cancer Stem Cells and Cell Plasticity in Cancer.

- Stem Cells, Cell Differentiation and Tissue Regeneration.

- Cell Plasticity in Immune Cells during Inflammation in Tissue Regeneration and Cancer.

PUBLICATIONS

Originals

1. Guo Y, Lu X, Chen Y, Rendon B, Mitchell RA, Cuatrecasas M, Cortés M, Postigo A*, Liu Y*, Dean DC* (equal corresponding authors). **Zeb1 induces immune checkpoints to form an immunosuppressive envelope around invading cancer cells.** *Science Advances.* 7(21):eabd7455. D1

GRANTS FOR RESEARCH IN PROGRESS

Postigo A. **Group of Regulation in Cell Differentiation and Cancer. Prognostic and predictive biomarkers and therapeutic targets in cancer.**
Sponsored by: Generalitat de Catalunya. AGAUR_SGR17_01174
Duration: 01/01/2017-30/09/2021

Postigo A. **Metabolic cooperation and competition between colorectal carcinomas (CRC) and their tumor microenvironment: Validation of ZEB factors as prognostic and predictive biomarkers and metabolic therapeutic targets in CRC.**
Sponsored by: Fundació Privada Olga Torres (FOT). FUND_OLGATORRES_19_3
Duration: 01/01/2020-31/12/2023

Postigo A. **ZEBTME: Metabolismo e interacción tumor-microambiente: Papel de los factores ZEB en la reprogramación metabólica de las células tumorales y estromales y de su interacción mutua.**
Sponsored by: Ministerio de Economía y Competitividad. MINECO_SAF2017-84918-R
Duration: 01/01/2018-30/06/2021

Postigo A. **Validación del factor ZEB2 como biomarcador pronóstico predictivo y potencial objetivo terapéutico en la distrofia muscular de Duchenne.**
Sponsored by: Duchenne Parent Project España. DPP_18_01
Duration: 15/12/2018-15/02/2021

Postigo A. **Validation of ZEB factors as prognostic and predictive biomarkers, and therapeutic targets in colorectal carcinomas.**
Sponsored by: Fundación científica Asociación Española contra el Cáncer. AECC_Proyectos19
Duration: 01/11/2019-31/10/2023

Postigo A. **Identificación de perfiles de expresión génica regulados por la vía microRNA /ZEB 1-ZEB 2 y su papel en la capacidad invasiva y metastásica de carcinomas de mama y la respuesta al tratamiento.I Beca en Investigación en Cáncer de Mama.**
Sponsored by: Avon Cosmetics S.A. (12/259)
Duration: 01/09/2012-31/12/2022

Postigo A. **Factores EMT más allá de la célula tumoral: ¿Regulan los factores ZEB y cómo la plasticidad y reprogramación tumor-supresora a inmunosupresora en macrofagos asociados a tumor?**
Sponsored by: Agencia Estatal de Investigación. AEI_PE20
Duration: 01/09/2021-31/08/2024

Postigo A. **Psoriasis, a metabolic dysregulation of the innate immune system? Targeting ZEB1 in macrophages as a new therapeutic approach to psoriasis.**
Sponsored by: LEO Foundation.INT_LEO_19
Duration: 01/03/2020-31/08/2023

DOCTORAL THESES

Postigo A, Cortes M. **Role of ZEB factors in macrophages in atherosclerosis and ovarian cancer.**
PhD student: Maria Carmen Martinez Campanario

5.18 Translational genomics and targeted therapies in solid tumours

LOCATION
CEK building, floor 1A

KEYWORDS
1. **Solid tumors**
2. **Genomics**
3. **Biomarkers**
4. **Targeted therapies**
5. **Immunotherapy**

RELATED DISEASES
1. **Breast cancer**
2. **Gynecological cancer**
3. **Urological cancer**
4. **Lung cancer**
5. **Melanoma**
6. **Central nervous system**
7. **Colorectal cancer**
8. **Upper gastrointestinal cancer**
9. **Solid tumors**

GROUP INVOLVED IN
AGAUR_SGR17: 01554

Original publications

TOTAL	101
Mean IF	**9,79**
Q1	**83%**
D1	**30%**
MA	**22%**
OA	**81%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Cancer is a very heterogeneous disease, both clinically and biologically. Over the last decade, the survival of cancer patients has improved thanks to the introduction of targeted therapies. Even so, there are still patients who do not respond to current treatments or who develop resistance.

Therefore, it is necessary to classify cancer in subgroups, identify predictive response biomarkers and new therapeutic targets to combat resistance to current treatments.

APPROACH

Our group uses genomic and molecular data to guide the design of clinical trials and the development and implementation of biomarkers in the clinical setting.

To accomplish this, we use patient´s tumor and blood samples and preclinical cancer models, and study the molecular mechanisms of drug sensitivity and resistance.

IMPACT

The approach starts from the observations obtained from patients: our group transfers them to the laboratory to identify new biomarkers and therapies. Promising preclinical results give rise to new clinical trials, in which we explore whether these are truly valid for patients. Thanks to these studies, we hope to obtain more personalized treatments for patients with cancer.

RESEARCH LINES

-Breast cancer
-Cancer immunotherapy
-Urologic cancer
-Upper gastrointestinal tumors
-Lung cancer
-Colorectal cancer
-Brain tumors
-Melanoma
-Early drug development (IntherUnit)

PUBLICATIONS

Originals

1. Prat A, Chaudhury A, Solovieff N, Paré L, Martinez D, Chic N, Martínez-Sáez O, Brasó-Maristany F, Lteif A, Taran T, Babbar N, Su r. **Correlative Biomarker Analysis of Intrinsic Subtypes and Efficacy Across the MONALEESA Phase III Studies.** *Journal Of Clinical Oncology.* 39(13):1458. D1

2. Mayer EL, Dueck AC, Martin M, Rubovszky G, Burstein HJ, Bellet-Ezquerra M, Miller KD, Zdenkowski N, Winer EP, Pfeiler G, Goetz M, Ruiz-Borrego M, Anderson D, Nowecki Z, Loibl S, Moulder S, Ring A, Fitzal F, Traina T, Chan A, Rugo HS, Lemieux J, Henao F, Lyss A, Antolin Novoa S, Wolff AC, Vetter M, Egle D, Morris PG, Mamounas EP, Gil-Gil MJ, Prat A, Fohler H, Metzger Filho O, Schwarz M, DuFrane C, Fumagalli D, Theall KP, Lu DR, Bartlett CH, Koehler M, Fesl C, DeMichele A, Gnant M. **Palbociclib with adjuvant endocrine therapy in early breast cancer (PALLAS): interim analysis of a multicentre, open-label, randomised, phase 3 study**. *Lancet Oncology.* 22(2):212-222. D1

3. Rugo HS, Lerebours F, Ciruelos E, Drullinsky P, Ruiz-Borrego M, Neven P, Park YH, Prat A, Bachelot T, Juric D, Turner N, Sophos N, Zarate JP, Arce C, Shen YM, Turner S, Kanakamedala H, Hsu WC, Chia S. **Alpelisib plus fulvestrant in PIK3CA-mutated, hormone receptor-positive advanced breast cancer after a CDK4/6 inhibitor (BYLieve): one cohort of a phase 2, multicentre, open-label, non-comparative study.** *Lancet Oncology.* 22(4):489-498. D1

4. Pérez-García JM, Gebhart G, Ruiz Borrego M, Stradella A, Bermejo B, Schmid P, Marmé F, Escrivá-de-Romani S, Calvo L, Ribelles N, Martinez N, Albacar C, Prat A, Dalenc F, Kerrou K, Colleoni M, Afonso N, Di Cosimo S, Sampayo-Cordero M, Malfettone A, Cortés J, Llombart-Cussac A, PHERGain steering committee and trial investigators. **Chemotherapy de-escalation using an ^{18}F-FDG-PET-based pathological response-adapted strategy in patients with HER2-positive early breast cancer (PHERGain): a multicentre, randomised, open-label, non-comparative, phase 2 trial.** *Lancet Oncology.* 22(6):858-871. D1

5. Gogas H, Dréno B, Larkin J, Demidov L, Stroyakovskiy D, Eroglu Z, Francesco Ferrucci P, Pigozzo J, Rutkowski P, Mackiewicz J, Rooney I, Voulgari A, Troutman S, Pitcher B, Guo Y, Yan Y, Castro M, Mulla S, Flaherty K, Arance A. **Cobimetinib plus atezolizumab in BRAF ^{V600} wild-type melanoma: primary results from the randomized phase III IMspire170 study.** *Annals Of Oncology.* 32(3):384-394. D1

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Letters

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2. Tarantino P; Prat A; Curigliano G. **New anti-HER2 agents for brain metastasis: histology-agnostic weapons?** *Breast Cancer Research And Treatment*. 185(3):879-881. Q2

3. Goma, Carles. **Comment on 'Lateral response heterogeneity of Bragg peak ionization chambers for narrow-beam photon and proton dosimetry'.** *Physics In Medicine And Biology*. 66(16). Q2

Editorial

1. Remon J, Reguart N, García-Campelo R, Conde E, Lucena CM, Persiva O, Navarro-Martin A, Rami-Porta R . **Lung Cancer in Spain.** *Journal Of Thoracic Oncology*. 16(2):197-204. D1

2. Lopez-Castro, R; Recondo, G; Gorria, T; Mezquita, L. **A New Pretreatment Mesothelioma Risk Score: Integrating Clinical and Molecular Factors for Predicting Outcomes in Malignant Pleural Mesothelioma.** *Journal Of Thoracic Oncology*. 16(11):1782-1784. D1

Case Reports

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Clinical Guidelines

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Consortium Publications

1. Gelmon KA, Fasching PA, Couch FJ, Balmaña J, Delaloge S, Labidi-Galy I, Bennett J, McCutcheon S, Walker G, O'Shaughnessy J, Collaborating Investigators. **Clinical effectiveness of olaparib monotherapy in germline BRCA-mutated, HER2-negative metastatic breast cancer in a real-world setting: phase IIIb LUCY interim analysis.** *European Journal Of Cancer.* 152:68-77. Q1

GRANTS FOR RESEARCH IN PROGRESS

Arance AM. **Determinación de subpoblaciones linfocitarias T y ctDNA en pacientes con melanoma avanzado en respuesta objetiva (completa o parcial) a los 6-12 meses y a los 2 años de tratamiento con terapia anti-PD-1 y su relación con respuesta prolongada (>=2 años).**
Sponsored by: Fundación Sociedad Española de Oncología Médica. SEOM_PrInmunoOnco20
Duration: 01/01/2021-31/12/2022

Maurel J. **Mejora de la inmunoterapia del cáncer de colon metastásico mediante nuevas terapias dirigidas contra el metabolismo de células tumorales y células inmunes.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/00740
Duration: 01/01/2020-31/12/2022

Mellado B. **Plasticidad celular y perfil asociados al tratamiento en cáncer de próstata metastásico.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_FIS_PI18/00714
Duration: 01/01/2019-31/12/2022

Mezquita L**. RADAR study: Molecular signature of radioactivity-induced lung cancer based on radon-induced lung cancer rats from the frech atomic energy commission cohort.**
Sponsored by: Fundación Sociedad Española de Oncología Médica. SEOM_RETORNO19_01
Duration: 01/07/2020-30/03/2022

Mezquita L. **Towards effective radiation protection based on improved scientific evidence and social considerations - focus on radon and NORM.**
Sponsored by: European Commission. CE_H2020-NFRP-19
Duration: 01/09/2020-31/08/2025

Pineda E. **Study of the molecular mechanisms involved in primary (glioblastoma) and secondary (metastasis) brain tumors to identify novel therapeutic targets and anti-cancer agents, biomarkers to select treatments and novel non-invasive methods for molecular diagnos.**
Sponsored by: Fundación científica asociación española contra el cáncer. AECC_GrupoTraslac17
Duration: 15/11/2017-14/11/2022

Prat A. **Translational Genomics and Targeted Therapeutics in Solid Tumors.**
Sponsored by: Generalitat de Catalunya. AGAUR_SGR17_01554
Duration: 01/01/2017-30/09/2021

Prat A. **Identification of mechanisms of response to CDK4/6 inhibition in hormone receptor-positive breast cancer.**
Sponsored by: Fundació La Marató de TV3. Cancer_19
Duration: 30/07/2020-29/07/2023

Prat A. **Doble bloque HER2 sin quimioterapia en cáncer de mama precoz HER2+.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/00904
Duration: 01/01/2017-30/06/2022

Prat A. **Identificación de nuevas dianas terapéuticas para el tratamiento del fenotipo molecular HER2-enriched en cáncer de mama receptor hormonal positivo.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI19/01846
Duration: 01/01/2020-31/12/2022

Prat A. **Terapia celular adoptiva mediante transferencia de linfocitos CD3+/PD1+ infiltrantes de tumor en pacientes con cáncer de mama avanzado.**
Sponsored by: Fundación científica asociación española contra el cáncer. AECC_GruposCoord19
Duration: 01/12/2019-30/11/2024

Prat A. **Estudio prospectivo exploratorio para la determinación de DNA circulante tumoral (ctDNA) en muestras sanguíneas de pacientes tratadas por cáncer de mama en seguimiento y sin evidencia de recidiva: ESTUDIO B-CRONOS.**
Sponsored by: Fundación de investigación médica Mutua Madrileña. FundMM_AP168952018
Duration: 06/07/2018-05/07/2021

Prat A. **Prospective exploratory study for determination of circulating tumor DNA (ctDNA) in blood samples from patients treated for breast cancer in follow-up and without evidence of relapse (B-CRONOS).**
Sponsored by: Fundación Quirón Salud. TERAPIA_AMIGOS_18_01
Duration: 11/02/2019-10/02/2022

Prat A. **Caracterizacion de los linfocitos T CD8+/PD1+ en cancer de mama avanzado receptor hormonal-positivo con un fenotivo agresivo HER2-enriched.**

Sponsored by: Fundación Merck Salud. FSalud_19-IO-011
Duration:01/07/2019-30/06/2021

Prat A. **Desarrollo de un test basado en DNA tumoral circulante (ctDNA) para identificar los subtipos moleculares intrínsecos de cáncer de mama.**
Sponsored by: Asociación Cáncer de Mama Metastásico. CMM_CHIARAG19_001
Duration: 01/02/2020-31/07/2021

Prat A. **Predicción de beneficio a inhibidores de CDK4/6 y tratamiento endocrino en cáncer de mama metastásico, receptor hormonal positivo/HER2 negativo.**
Sponsored by: Asociación Cáncer de Mama Metastásico. CMM_METAPREMIOS20_01
Duration: 02/12/2020-01/12/2021

Prat A. **Predicccción de beneficio a inhibidores de CDK4/6 y tratamiento endocrino en cáncer de mama metastásico, receptor hormonal positivo/HER2 negativo.**
Sponsored by: Fundación Sociedad Española de Oncología Médica. SEOM_CancerMama20
Duration: 15/01/2021-14/01/2022

Prat A. **RESCUER: Resistance under combinatorial treatment in ER+ and ER- breast cancer.**
Sponsored by: European Commission. CE_H2020-SC1_2019_2s
Duration: 01/01/2020-31/12/2024

Prat A. **EuCanImage. A European Cancer Image Platform Linked to Biological and Health Data for Next-Generation Artificial Intelligence and Precision Medicine in Oncology.**
Sponsored by: European Commission. CE_H2020_SC1_20_1s13
Duration: 01/10/2020-30/09/2024

Prat A. **Deconstructing the evolution of metastasis.**
Sponsored by: European Commission. CE_H2020-MSCA-ITN-20
Duration: 01/03/2021-28/02/2025

Prat A. **Targeting the HER2-enriched phenotype in hormone receptor-positive breast cancer.**
Sponsored by: Breast Cancer Now.INT_BCN_Catalyst_18
Duration: 01/03/2019-28/02/2022

Prat A. **Tailoring systemic treatment of Luminal B breast cancer.**
Sponsored by: American Association for Cancer Research. INT_BCRF_AACR_18
Duration: 01/07/2019-30/06/2022

DOCTORAL THESIS

Prat A, Vidal M. **How to identify patients with high-risk HRpositive/ HER2-negative breast cancer in the absence of gene expression platforms.**
PhD student: Aranzazu Fernandez Martinez

Prat A. **Predicción de Beneficio Terapéutico en Cáncer de Mama Avanzado Receptor Hormonal Positivo y HER2 Negativo.**
PhD student: Olga Martinez Saez

Maurel J. **Mecanismos de resistencia a quimioterapia y a bevacizumab en cáncer colorectal metastásico.**
PhD student: Estela Pineda Losada

5.19 Melanoma: imaging, genetics and immunology

LOCATION
CEK building, floor 2

KEYWORDS
1. **Melanoma**
2. **Genetics**
3. **Dermoscopy**
4. **Confocal microscopy**
5. **Susceptibility**

RELATED KEYWORDS
1. **Melanoma**
2. **Giant congenital melanocytic nevi (GCMN)**
3. **Squamous cell carcinoma (SCC)**
4. **Basal cell carcinoma (BCC)**
5. **Xeroderma pigmentosum (XP)**
6. **Kindler syndrome (KS)**
7. **Recessive dystrophic epidermolysis bullosa (RDEB)**

GROUP INVOLVED IN
AGAUR_SGR17: 01134
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Original publications

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Mean IF	8,15
Q1	70%
D1	23%
MA	30%
OA	70%

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OA = Open Access



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PROBLEM

Skin cancer is the most common cancer in humans and, among the various common skin tumours, melanoma is the most aggressive and has the worst prognosis. Sun exposure habits and the ageing population are, nowadays, a growing problem in western societies.

The group focuses on the study of melanoma and non-melanoma skin cancer, as well as other skin conditions related to the risk of developing these cancers. The purpose is to improve prevention, early diagnosis and the achievement of a more personalised treatment of melanoma and non-melanoma skin cancer.

APPROACH

The group's research is multidisciplinary and its members include dermatologists, pathologists, nurses, biologists, biotechnologists, engineers, physicists, technicians and other specialists. Its research is translational.

In other words, it combines clinical studies with more molecular studies and projects that combine the two aspects, with the aim of identifying improvements both in prevention and in patient diagnosis, management, monitoring and treatment.

These improvements are transferred directly to patients, improving their quality of life and that of their families. The group uses a combination of new imaging technologies, molecular studies and artificial intelligence tools.

IMPACT

Thanks to the studies the group has carried out, it has been able to improve early diagnosis of skin cancer, reducing the number of benign lesions removed and diagnosing melanomas that are not very thick and have a good prognosis.

In addition, it has described the main melanoma susceptibility genes in the population and it has identified several molecular prognostic markers useful in clinical practice. With the group's new research lines, it intends to improve the classification of patients into specific prognosis groups to improve their management and treatment. The group is aiming to identify prognostic and predictive biomarkers.

RESEARCH LINES

- Analysis of the influence of the microbiota in skin cancer.

- Dermoscopy, digital dermoscopy, confocal microscopy and new photonic and physic technologies.

- Development of new treatment strategies for melanoma and other skin tumors.

- Evaluation of immune response in melanoma.

- Genetic epidemiology in melanoma and non-melanoma skin cancer.

- Giant congenital nevi.

- Identification of biomarkers for melanoma.

- Identification of genetic prognostic profiles in melanoma.

- Study of the mechanisms involved in carcinogenesis and photocarcinogenesis in melanoma and non-melanoma skin cancer.

- Artificial Intelligence for skin cancer diagnosis, prognosis and management.

PUBLICATIONS

Originals

1. Eggermont AMM, Blank CU, Mandalà M, Long GV, Atkinson VG, Dalle S, Haydon AM, Meshcheryakov A, Khattak A, Carlino MS, Sandhu S, Larkin J, Puig S, Ascierto PA, Rutkowski P, Schadendorf D, Koornstra R, Hernandez-Aya L, Di Giacomo AM, van den Eertwegh AJM, Grob JJ, Gutzmer R, Jamal R, Lorigan PC, van Akkooi ACJ, Krepler C, Ibrahim N, Marreaud S, Kicinski M, Suciu S, Robert C, EORTC Melanoma Group. **Adjuvant pembrolizumab versus placebo in resected stage III melanoma (EORTC 1325-MG/KEYNOTE-054): distant metastasis-free survival results from a double-blind, randomised, controlled, phase 3 trial.** *Lancet Oncology.* 22(5):643-654. D1

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4. Malvehy J, Samoylenko I, Schadendorf D, Gutzmer R, Grob JJ, Sacco JJ, Gorski KS, Anderson A, Pickett CA, Liu K, Gogas H. **Talimogene laherparepvec upregulates immune-cell populations in non-injected lesions: findings from a phase II, multicenter, open-label study in patients with stage IIIB-IVM1c melanoma**. *Journal For Immunotherapy Of Cancer.* 9(3):e001621. D1

5. Gómez-Martín I, Collgros H, Ferguson PM, Barreiro A, Guitera P, Andrades-López E, Puig S, Pujol RM, Barranco C, Alòs L, Segura S. **Diagnostic accuracy of pigmented labial macules by in vivo reflectance confocal microscopy and correlation among techniques.** *Journal Of The American Academy Of Dermatology.* 85(5):1151-1160. D1

6. Nikolaou V; Sibaud V; Fattore D; Sollena P; Ortiz-Brugués A; Giacchero D; Romano MC; Riganti J; Lallas K; Peris K; Voudouri D; Lallas A; Fabbrocini G; Lazaridou E; Carrera C; Annunziata MC; Rossi E; Patri A; Rigopoulos D; Stratigos AJ; Apalla Z. **Immune checkpoint-mediated psoriasis: A multicenter European study of 115 patients from the European Network for Cutaneous Adverse Event to Oncologic Drugs (ENCADO) group.** *Journal Of The American Academy Of Dermatology.* 84(5):1310-1320. D1

7. Reynolds KA, Schlessinger DI, Yanes AF, Godinez-Puig V, Chen BR, Kurta AO, Cotseones JK, Chiren SG, Iyengar S, Ibrahim SA, Kang BY, Worley B, Behshad R, DeHoratius DM, Denes P, Drucker AM, Dzubow LM, Etzkorn JR, Harwood CA, Kim JYS, Lawrence N, Lee EH, Lissner GS, Marghoob AA, Guminiski A, Matin RN, Mattox AR, Mittal BB, Thomas JR, Zhou XA, Zloty D, Hughes BGM, Nottage MK, Green AC, Testori AAE, Argenziano G, Longo C, Zalaudek I, Lebbe C, Malvehy J, Saiag P, Cernea SS, Schmitt J, Kirkham JJ, Poon E, Sobanko JF, Cartee TV, Maher IA, Alam M . **Development of a Core Outcome Set for Cutaneous Squamous Cell Carcinoma Trials: Identification of Core Domains and Outcomes.** *British Journal Of Dermatology.* 184(6):1113-1122. D1

8. Visconti A, Bataille V, Rossi N, Kluk J, Murphy R, Puig S, Nambi R, Bowyer RCE, Murray B, Bournot A, Wolf J, Ourselin S, Steves CJ, Spector TD, Falchi M. **Diagnostic value of cutaneous manifestation of SARS-CoV-2 infection.** *British Journal Of Dermatology.* 184(5):880-887. D1

9. Nagore, E; Martinez-Garcia, M A; Gomez-Olivas, J D; Manrique-Silva, E; Martorell, A; Banuls, J; Carrera, C; Ortiz, P; Gardeazabal, J; Boada, A; de Eusebio, E; Chiner, E; Gonzalez, C; Perez-Gil, A; Cullen, D; Formigon, M; de Unamuno, B; Navarro-Soriano, C; Muriel, A; Gozal, D. **Relationship between type 2 diabetes mellitus and markers of cutaneous melanoma aggressiveness: an observational multicentric study in 443 patients with melanoma.** *British Journal Of Dermatology.* 185(4):756-763. D1

10. González de Aledo-Castillo JM, Casanueva-Eliceiry S, Soler-Perromat A, Fuster D, Pastor V, Reguart N, Viñolas N, Reyes R, Vollmer I, Paredes P, Puig-Butillé JA. **Cell-free DNA concentration and fragment size fraction correlate with FDG PET/CT-derived parameters in NSCLC patients.** *European Journal Of Nuclear Medicine And Molecular Imaging.* 48(11):3631-3642. D1

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GRANTS FOR RESEARCH IN PROGRESS

Carrera C. **Caracterización fenotípica-molecular de síndrome de nevus congénito gigante y su impacto psicoemocional. Identificación de patrones clínicos y genéticos relacionados con melanoma.**
Sponsoredby: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00959
Duration: 01/01/2019-30/06/2023

Malvehy J. **Implementation of personalized medicine in malignant melanoma patients aided by artificial intelligence.**
Sponsoredby: Fundació La Marató de TV3. Cancer_19
Duration: 07/08/2020-06/08/2023

Malvehy J. **Implementation of Artifficial Intelligence for the diagnosis of Skin Cancer.**
Sponsored by: Barcelona Mobile Ventures. MWCapital_COLLIDER20_001
Duration: 01/09/2020-30/06/2021

Malvehy J. **El metabolismo de losesfingolípicoscomodianaterpéutica para mejorar la inmunoterapia del melanoma.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_AC16/00081
Duration: 01/01/2017-30/06/2021

Malvehy J. **Intelligent Total Body Scanner for Early Detection of Melanoma.**
Sponsored by: European Commission. CE_H2020-SC1_20_2s04
Duration: 01/04/2021-31/03/2025

Puig S. **Implicación del perfil inmunológico específico cutáneo determinado en sangre periférica en el pronóstico y respuesta a tratamiento del melanoma.**
Sponsoredby: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00419
Duration: 01/01/2019-30/06/2023

Puig S. **Monitoring multidimensional aspects of QUAlity of Life after cancer ImmunoTherapy - an Open smart digital Platform for personalized prevention and patient management.**
Sponsored by: European Commission. CE_H2020-SC1_19_1s24
Duration: 01/01/2020-31/12/2023

Puig-Butille JA, Malvehy J. **Utilidad del ADN libre en el seguimiento de pacientes con melanoma: identificación de factores clave y relevancia clínica.**
Sponsoredby: Instituto de Salud Carlos III (ISCIII). FIS_PI18/01077
Duration: 01/01/2019-30/06/2023

DOCTORAL THESES

Puig JA. **Implementación del análisis del ADN libre circulante en plasma en el diagnóstico de pacientes con cáncer de pulmón de células no pequeñas.**
PhD student: Jose Manuel Gonzalez de Aledo Castillo

5.20 Molecular genetics of paediatric lymphomas

LOCATION
CEK building, floor 2

KEYWORDS
1. **Lymphoid neoplasms**
2. **Genomic alterations**
3. **Epigenome**
4. **Transcriptional regulation**
5. **Molecular pathology**

RELATED KEYWORDS
1. **Lymphoid neoplasms**

GROUP INVOLVED IN
AGAUR_SGR17: 01107
CIBERONC
ICGC
LLMPP

Original publications

TOTAL	1
Mean IF	9,94
Q1	100%
D1	0%
MA	100%
OA	100%

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Evidence shows that paediatric and adult lymphomas present clinical and biological differences, yet only molecular markers of adult patients are used in clinical practice (basically because few studies of non-Hodgkin lymphoma in children exist).

Furthermore, paediatric patients with non-Hodgkin lymphoma are treated based on a strict age limit (up to 18 years of age), instead of taking into account the biological complexity of each tumour.

APPROACH

The group studies the genetic and molecular profiles of the different subtypes of non-Hodgkin lymphoma in the paediatric population and in young adults, using high-resolution techniques.

These studies provide more information on the biological basis of each subtype of non-Hodgkin lymphoma and make it possible to identify useful biomarkers for diagnosing and treating these patients.

The findings of these studies facilitate the stratification of patients in risk groups based on the body's response to different treatments, which opens the way to research on new therapeutic strategies aimed at specific targets.

IMPACT

The group has identified genetic abnormalities involved in the development of several paediatric lymphomas. Some had already been described as important targets in adult cancers, but others may be specific to paediatric lymphomas.

This highlights the importance of a comprehensive approach to understanding paediatric non-Hodgkin lymphoma. These findings open the way to developing specific treatments that benefit patients with lymphoma, especially recurrent cases, many of which are incurable.

RESEARCH LINES

- Identification of genetic biomarkers and drug targets.

- Integrative genetic profile and identification diagnostic markers

- Study of intratumoral heterogeneity.

PUBLICATIONS

Originals

1. Ramis-Zaldivar JE, Gonzalez-Farre B, Nicolae A, Pack S, Clot G, Nadeu F, Mottok A, Horn H, Song JY, Fu K, Wright G, Gascoyne RD, Chan WC, Scott DW, Feldman AL, Valera A, Enjuanes A, Braziel RM, Smeland EB, Staudt LM, Rosenwald A, Rimsza LM, Ott G, Jaffe ES, Salaverria I, Campo E. **MAP-kinase and JAK-STAT pathways dysregulation in plasmablastic lymphoma.** *Haematologica*. 106(10):2682-2693. Q1

GRANTS FOR RESEARCH IN PROGRESS

Salaverria I. **Linfomas en niños y adultos jóvenes: Impacto de las alteraciones genéticas y moleculares en la clasificación**

y estratificación de los pacientes.
Sponsored by: Fundación científica Asociación Española contra el Cáncer. AECC_CanclInf_Raros17
Duration: 01/12/2017-30/06/2021

Salaverria I. **Mutaciones con impacto diagnóstico y pronóstico en linfoma No-Hodgkin en pacientes inmunocompetentes y posttrasplantes (PTLD) pediátricos y adultos jóvenes.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI18/00471
Duration: 01/01/2019-30/06/2022

Salaverria I. **Implementación de la biopsia líquida como herramienta diagnóstica en linfoma No-Hodgkin pediátrico.**
Sponsored by: Fundación SEHOP. SEHOP_KM20_01
Duration: 21/05/2021-20/05/2022

Salaverria I. **Nuevas firmas genéticas para avanzar en la Medicina de precisión en Linfoma B No-Hodgkin Pediátrico.**
Sponsored by: Fundación científica asociación española contra el cáncer. AECC_Proyectos21
Duration: 01/12/2021-30/11/2024

Salaverria I. **Dissecting the genetics underlying paediatric Anaplastic Lymphoma Kinase negative (ALK-), Anaplastic Large Cell Lymphoma (ALCL): A European Intergroup for Childhood Non-Hodgkin Lymphoma (EICNHL) biological study.**
Sponsored by: Children's Cancer and Leukemia Group. INT_CCLG_SR_19
Duration: 01/05/2020-30/04/2022

DOCTORAL THESIS

Salaverria I. **Decoding the genetic landscape of pediatric and young adult germinal center-derived B-cell non-Hodgkin lymphoma.**
PhD student: Joan Enric Ramis Zaldívar

5.21 Hematopoietic progenitor cell transplantation

LOCATION
CEK building, floor 2

KEYWORDS
1. **Allogeneic transplantation**
2. **Immunotherapy**
3. **Adoptive T cell transfer**
4. **Chimeric antigen receptor**
5. **Veno-oclussive disease**
6. **Graft versus host disease**
7. **Infectious diseases**

RELATED DISEASES
1. **Hematology malignancies**
2. **Solid tumors**

GROUP INVOLVED IN
RTICC_2012

Original publications

TOTAL	26
Mean IF	**8,07**
Q1	**85%**
D1	**19%**
MA	**27%**
OA	**58%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Patients with advanced malignant haemopathies and solid tumors have a very short life expectancy.

The group devotes its efforts to modifying the patient's immune system, thus making it possible to generate a more specific and powerful anti-tumour response.

APPROACH

The group performs the genetic modification of the patient's lymphocytes (CAR T cells), causing them to express a receptor that identifies cancer cells and that, once recognised, has high capacity to proliferate and to attack them.

IMPACT

The group is a pioneer centre in Europe conducting clinical trials with academic CAR-T cells. ARI-001, a CD19-CAR-T therapy developed in house, is the first European-developed CAR-T therapy approved for the treatment of acute lymphoblastic leukaemia under hospital exemption. ARI-002, a BCMA-CAR-T cell therapy developed by the group is currently being tested in a phase I clinical trial.

The group is currently focused on: (a) understanding the obstacles that lead to CAR therapy failure in solid tumors and hematologic malignancies and (b) developing next-generation CAR-T cell therapies with enhanced therapeutic potential.

RESEARCH LINES

- CAR-T and CAR-NK therapy for the treatment of hematological malignancies.

- CAR-T cell therapies for solid tumours.

- Mechanisms of antitumor cytotoxicity of immune cells (NK and T lymphocytes).

- Allogeneic stem cell transplantation: graft versus host disease (GVHD) and infectious complications.

PUBLICATIONS

Originals

1. Good, CR; Aznar, MA; Kuramitsu, S; Samareh, P; Agarwal, S; Donahue, G; Ishiyama, K; Wellhausen, N; Rennels, AK; Ma, YJ; Tian, LF; Guedan, S; Alexander, KA; Zhang, Z; Rommel, PC; Singh, N; Glastad, KM; Richardson, MW; Watanabe, K; Tanyi, JL; O'Hara, MH; Ruella, M; Lacey, SF; Moon, EK; Schuster, SJ; Albelda, SM; Lanier, LL; Young, RM; Berger,

SL; June, CH. **An NK-like CAR T cell transition in CAR T cell dysfunction.** *Cell.* 184(25):6081. D1

2. Sanz J, Galimard JE, Labopin M, Afanasyev B, Sergeevich MI, Angelucci E, Kröger N, Koc Y, Ciceri F, Diez-Martin JL, Arat M, Sica S, Rovira M, Aljurf M, Tischer J, Savani B, Ruggeri A, Nagler A, Mohty M. **Post-transplant cyclophosphamide containing regimens after matched sibling, matched unrelated and haploidentical donor transplants in patients with acute lymphoblastic leukemia in first complete remission, a comparative study of the ALWP of the EBMT.** *Journal Of Hematology & Oncology.* 14(1):84. D1

3. Bachiller M, Perez-Amill L, Battram AM, Carné SC, Najjar A, Verhoeyen E, Juan M, Urbano-Ispizua A, Martin-Antonio B. **NK cells enhance CAR-T cell antitumor efficacy by enhancing immune/tumor cells cluster formation and improving CAR-T cell fitness.** *Journal For Immunotherapy Of Cancer.* 9(8):e002866. D1

4. Ortíz-Maldonado V, Rives S, Castellà M, Alonso-Saladrigues A, Benítez-Ribas D, Caballero-Baños M, Baumann T, Cid J, Garcia-Rey E, Llanos C, Torrebadell M, Villamor N, Giné E, Díaz-Beyá M, Guardia L, Montoro M, Català A, Faura A, González EA, Español-Rego M, Klein-González N, Alsina L, Castro P, Jordan I, Fernández S, Ramos F, Suñé G, Perpiñá U, Canals JM, Lozano M, Trias E, Scalise A, Varea S, Sáez-Peñataro J, Torres F, Calvo G, Esteve J, Urbano-Ispizua Á, Juan M, Delgado J. **CART19-BE-01: A Multicenter Trial of ARI-0001 Cell Therapy in Patients with CD19+ Relapsed/Refractory Malignancies.** *Molecular Therapy.* 29(2):636-644. D1

5. Solano, Carlos; Vazquez, Lourdes; Gimenez, Estela; de la Camara, Rafael; Albert, Eliseo; Rovira, Montserrat; Espigado, Ildefonso; Calvo, Carmen M.; Lopez-Jimenez, Javier; Suarez-Lledo, Maria; Chinea, Anabella; Esquirol, Albert; Perez, Ariadna; Bermudez, Aranzazu; Saldana, Raquel; Heras, Inmaculada; Gonzalez-Huerta, Ana J.; Torrado, Tamara; Bautista, Guiomar; Batlle, Montserrat; Jimenez, Santiago; Vallejo, Carlos; Barba, Pere; Cuesta, Maria a.; Pinana, Jose L.; Navarro, David. **Cytomegalovirus DNAemia and risk of mortality in allogeneic hematopoietic stem cell transplantation: Analysis from the Spanish Hematopoietic Transplantation and Cell Therapy Group.** *American Journal Of Transplantation.* 21(1):258-271. D1

6. Perez-Amill L, Suñe G, Antoñana-Vildosola A, Castella M, Najjar A, Bonet J, Fernández-Fuentes N, Inogés S, López A, Bueno C, Juan M, Urbano-Ispizua A, Martín-Antonio B. **Preclinical development of a humanized chimeric antigen receptor against B cell maturation antigen for multiple myeloma.** *Haematologica.* 106(1):173-184. Q1

7. Henes J, Oliveira MC, Labopin M, Badoglio M, Scherer HU, Del Papa N, Daikeler T, Schmalzing M, Schroers R, Martin T, Pugnet G, Simoes B, Michonneau D, Marijt EWA, Lioure B, Olivier Bay J, Snowden JA, Rovira M, Huynh A, Onida F, Kanz L, Marjanovic Z, Farge D. **Autologous stem cell transplantation for progressive systemic sclerosis: a prospective non-interventional study from the European Society for Blood and Marrow Transplantation Autoimmune Disease Working Party.** *Haematologica.* 106(2):375-383. Q1

8. Isola I, Brasó-Maristany F, Moreno DF, Mena MP, Oliver-Calders A, Paré L, Rodríguez-Lobato LG, Martin-Antonio B, Cibeira MT, Bladé J, Rosiñol L, Prat A, Lozano E, Fernández de Larrea C. **Gene Expression Analysis of the Bone Marrow Microenvironment Reveals Distinct Immunotypes in Smoldering Multiple Myeloma Associated to Progression to Symptomatic Disease.** *Frontiers In Immunology.* 12(792609):792609. Q1

9. Blasco M; Martínez-Roca A; Rodríguez-Lobato LG; Garcia-Herrera A; Rosiñol L; Castro P; Fernández S; Quintana LF; Cibeira MT; Bladé J; Fernández de Larrea C; Tovar N; Jimenez R; Poch E; Guillen E; Campistol JM; Carreras E; Diaz-Ricart M; Palomo M. **Complement as the enabler of carfilzomib-induced thrombotic microangiopathy.** *British Journal Of Haematology.* 193(1):181-187. Q1

10. Moreno DF, Pereira A, Tovar N, Cibeira MT, Magnano L, Rozman M, López-Guerra M, Colomer D, Martín-Antonio B, Jiménez-Segura R, Isola I, Rodríguez-Lobato LG, Oliver-Caldés A, Mena MP, Rosiñol L, Bladé J, Fernández de Larrea C. **Defining an Ultra-Low Risk Group in Asymptomatic IgM Monoclonal Gammopathy.** *Cancers.* 13(9):2055. Q1

11. Battram, AM.; Bachiller, M; Lopez, V; Fernandez de Larrea, C; Urbano-Ispizua, A; Martin-Antonio, B. I**L-15 Enhances the Persistence and Function of BCMA-Targeting CAR-T Cells Compared to IL-2 or IL-15/IL-7 by Limiting CAR-T Cell Dysfunction and Differentiation.** *Cancers.* 13(14):3534. Q1

12. Schettini F, Barbao P, Brasó-Maristany F, Galván P, Martínez D, Paré L, De Placido S, Prat A, Guedan S . **Identification of cell surface targets for CAR-T cell therapies and antibody-drug conjugates in breast cancer.** *ESMO Open.* 6(3):100102. Q1

13. Fernández S, Palomo M, Molina P, Díaz-Ricart M, Escolar G, Tellez A, Seguí F, Ventosa H, Torramade-Moix S, Rovira M, Carreras E, Nicolás JM, Castro P. **Progressive endothelial cell damage in correlation with sepsis severity.** *Journal Of Thrombosis And Haemostasis.* 19(8):1948-1958. Q1

14. Juan M, Delgado J, Calvo G, Trias E, Urbano-Ispizua A. **Is Hospital Exemption an alternative or a bridge to EMA for developing Academic CAR-T in Europe? Our experience with ARI0001**. *Human Gene Therapy.* 32(19-20):1004-1007. Q1

15. Bazarbachi AH, Al Hamed R, Labopin M, Halaburda K, Labussiere H, Bernasconi P, Schroyens W, Gandemer V, Schaap NPM, Loschi M, Jindra P, Snowden J, Wu D, Guffroy B, Rovira M, Chantepie SP, Poiré X, Lopez-Corral L, Nikolousis M, Pelosini M, Ciceri F, Baron F, Bazarbachi A, Corbacioglu S, Savani BN, Peric Z, Nagler A, Carreras E, Mohty M. **Underdiagnosed veno-occlusive disease/-sinusoidal obstruction syndrome (VOD/SOS) as a major cause of multi-organ failure in acute leukemia transplant patients: an analysis from the EBMT Acute Leukemia Working Party.** *Bone Marrow Transplantation.* 56(4):917-927. Q1

16. Giebel S, Labopin M, Sobczyk-Kruszelnicka M, Stelljes M, Byrne JL, Fegueux N, Beelen DW, Rovira M, Spyridonidis A, Blaise D, Bornhäuser M, Karadogan I, Savani BN, Nagler A, Mohty M; Principal investigators of the contributing institutions. **Total body irradiation plus fludarabine compared to busulfan plus fludarabine as "reduced-toxicity conditioning" for patients with acute myeloid leukemia treated with allogeneic hematopoietic cell transplantation in first complete remission: a study by the Acute Leukemia Working Party of the EBMT.** *Bone Marrow Transplantation.* 56(2):481-491. Q1

17. Solano C; Vazquez L; Gimenez E; de la Camara R; Albert E; Rovira M; Espigado I; Calvo CM; Lopez-Jimenez J; Suarez-Lledo M; Chinea A; Esquirol A; Perez A; Bermudez A; Saldana R; Heras I; Gonzalez-Huerta AJ; Torrado T; Batlle M; Jimenez S; Vallejo C; Barba P; Cuesta MA; Pinana JL; Navarro D; Spanish Grp Hematopoietic Transp.

Clinical outcomes of allogeneic hematopoietic stem cell transplant recipients developing Cytomegalovirus DNAemia prior to engraftment. *Bone Marrow Transplantation.* 56(6):1281-1290. Q1

18. Waidhauser J, Labopin M, Esteve J, Kröger N, Cornelissen J, Gedde-Dahl T, Van Gorkom G, Finke J, Rovira M, Schaap N, Petersen E, Beelen D, Bunjes D, Savani B, Schmid C, Nagler A, Mohty M, Acute Leukemia Working Party of EBMT. **Allogeneic stem cell transplantation for AML patients with RUNX1 mutation in first complete remission: a study on behalf of the acute leukemia working party of the EBMT.** *Bone Marrow Transplantation.* 56(10):2445-2453. Q1

19. Puerta-Alcalde P, Ambrosioni J, Chumbita M, Hernández-Meneses M, Garcia-Pouton N, Cardozo C, Moreno-García E, Marco F, Mensa J, Rovira M, Esteve J, Martínez JA, García F, Mallolas J, Soriano A, Miró JM, Garcia-Vidal C. **Clinical Characteristics and Outcome of Bloodstream Infections in HIV-Infected Patients with Cancer and Febrile Neutropenia: A Case-Control Study.** *Infectious Diseases And Therapy.* 10(2):955-970. Q1

20. Garcia-Vidal C, Puerta-Alcalde P, Cardozo C, Orellana MA, Besanson G, Lagunas J, Marco F, Del Rio A, Martínez JA, Chumbita M, Garcia-Pouton N, Mensa J, Rovira M, Esteve J, Soriano A, ID-INNOVATION study group. **Machine Learning to Assess the Risk of Multidrug-Resistant Gram-Negative Bacilli Infections in Febrile Neutropenic Hematological Patients.** *Infectious Diseases And Therapy.* 10(2):971-983. Q1

21. Santos Bravo M, Plault N, Sánchez Palomino S, Mosquera Gutierrez MM, Fernández Avilés F, Suarez Lledo M, Sabé Fernández N, Rovira M, Alain S, Marcos Maeso MÁ. **Phenotype and genotype study of novel C480F maribavir-ganciclovir cross-resistance mutation detected in hematopoietic stem cell and solid organ transplanted patients.** *Journal Of Infectious Diseases.* 224(6):1024-1028. Q1

22. Giavedoni P; Martinez C; Podlipnik S; Suarez-Lleido M; Marti-Marti I; Morgado-Carrasco D; Rovira M; Fernandez-Aviles F; Gutierrez G; Rosinol L; Cid J; Lozano M; Mascaro Jr JM. **Assessment of Sclerodermoid Chronic Graft-versus-host Disease with Colour Doppler Ultrasound.** *Acta Dermato-Venereologica.* 101:adv00395. Q1

23. Lendak D, Puerta-Alcalde P, Moreno-García E, Chumbita M, García-Pouton N, Cardozo C, Morata L, Suárez-Lledó M, Hernández-Meneses M, Ghiglione L, Marco F, Martinez JA, Mensa J, Uroševi? I, Soriano A, Garcia-Vidal C. **Changing epidemiology of catheter-related bloodstream infections in neutropenic oncohematological patients.** *Plos One.* 16(4):e0251010. Q2

24. Parra Salinas I, Bermudez A, López Corral L, Lopez Godino O, Móles-Poveda P, Martín G, Costilla Barriga L, Ferrá Coll C, Márquez-Malaver F, Ortí G, Zudaire Ripa MT, Rifon J, Martinez C, Spanish Group of Hematopoietic Transplantation (GETH). **Treatment of steroid-refractory chronic graft-versus-host disease with imatinib: Real-life experience of the Spanish Group of Hematopoietic Transplantation (GETH).** *Clinical Transplantation.* 35(5):e14255. Q2

25. Bueno F, Solano C, Vázquez L, Giménez E, de la Cámara R, Albert E, Rovira M, Espigado I, Martín Calvo C, López-Jiménez J, Suárez-Lledó M, Chinea A, Esquirol A, Pérez A, Bermúdez A, Saldaña R, Heras I, González-Huerta AJ, Torrado T, Batlle M, Jiménez S, Vallejo C, Barba P, Cuesta MÁ, Duarte R, Piñana JL, Navarro D, Spanish Group of Hematopoietic Transplantation, Cell Therapy (GETH). **Assessment of the association between Cytomegalovirus DNAemia and subsequent acute Graft-versus-Host Disease in allogeneic peripheral blood stem cell transplantation: A multicenter study from the Spanish Hematopoietic Transplantation and Cell Therapy Group.** *Transplant Infectious Disease.* 234:e13627. Q3

26. Cid J, Monsalvo S, Castillo C, Pascual C, Moreno-Jiménez G, López-Parra M, Andón C, Guerra L, Esquirol A, Sánchez-Ortega I, Ortega S, Zalba S, Martínez C, Rovira M, Marín P, Lozano M, Grupo Español de Trasplante Hematopoyético (GETH). **Addition of plerixafor to G-CSF in poor mobilizing healthy related donors overcame mobilization failure: An observational case series on behalf of the Grupo Español de Trasplante Hematopoyético (GETH).** *Transfusion And Apheresis Science.* 60(2):103052-103052. Q4

Review

1. Bartoló-Ibars A; Uribe-Herranz M; Muñoz-Sánchez G; Arnaldos-Pérez C; Ortiz-Maldonado V; Urbano-Ispizua Á; Pascal M; Juan M. **Car-t after stem cell transplantation in b-cell lymphoproliferative disorders: Are they really autologous or allogenic cell therapies?** *Cancers.* 13(18):4664. Q1

2. Irving M, Lanitis E, Migliorini D, Ivics Z, Guedan S. **Choosing the Right Tool for Genetic Engineering: Clinical Lessons from Chimeric Antigen Receptor-T Cells**. *Human Gene Therapy.* 32(19-20):1044-1058. Q1

3. Greco R, Alexander T, Burman J, Del Papa N, de Vries-Bouwstra J, Farge D, Henes J, Kazmi M, Kirgizov K, Muraro PA, Ricart E, Rovira M, Saccardi R, Sharrack B, Snarski E, Withers B, Jessop H, Boglione C, Kramer E, Badoglio M, Labopin M, Orchard K, Corbacioglu S, Ljungman P, Mikulska M, De la Camara R, Snowden JA, European Society for Blood and Marrow Transplantation (EBMT) Autoimmune Diseases Working Party (ADWP), Infectious Diseases Working Party (IDWP), Pediatric Working Party (PWP), Joint Accreditation Committee of the International Society for Cellular Therapy (ISCT) and EBMT (JACIE), EBMT Nurses Group and Patient Advocacy Committee. **Hematopoietic stem cell transplantation for autoimmune diseases in the time of COVID-19: EBMT guidelines and recommendations.** *Bone Marrow Transplantation.* 56(7):1493-1508. Q1

4. Richardson PG; Palomo M; Kernan NA; Hildebrandt GC; Chao N; Carreras E. **The importance of endothelial protection: the emerging role of defibrotide in reversing endothelial injury and its sequelae.** *Bone Marrow Transplantation.* 56(12):2889-2896. Q1

5. Nicolini F, Bravaccini S, Mazza M, Gruszka AM, Tazzari M, Martín-Antonio B, Juan M, Ibrahim T, Maltoni R, Martinelli G, Cerchione C. **CAR T cells targeting options in the fight against multiple myeloma.** *Panminerva Medica.* 63(1):37-45. Q1

6. Blasco M, Guillén E, Quintana LF, Garcia-Herrera A, Piñeiro G, Poch E, Carreras E, Campistol JM, Diaz-Ricart M, Palomo M. **Thrombotic microangiopathies assessment: mind the complement.** *Clinical Kidney Journal.* 14(4):1055-1066. Q1

Letters

1. Ortiz-Maldonado V, Rives S, Español-Rego M, Alonso-Saladrigues A, Montoro M, Magnano L, Giné E, Pascal M, Díaz-Beyá M, Castella M, Català A, Faura A, Rodríguez-Lobato LG, Oliver-Caldes A, Martínez-Roca A, Rovira M, González-Navarro EA, Ortega JR, Cid J, Lozano M, Garcia-Rey E, Fernández S,

Castro P, Jordan I, Villamor N, Aymerich M, Torrebadell M, Deyà À, Fernández de Larrea C, Benitez-Ribas D, Trias E, Varea S, Calvo G, Esteve J, Urbano-Ispizua A, Juan M, Delgado J. **Factors associated with the clinical outcome of patients with relapsed/refractory CD19+ acute lymphoblastic leukemia treated with ARI-0001 CART19-cell therapy.** *Journal For Immunotherapy Of Cancer.* 9(12):e003644. D1

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Case Reports

1. Oliver-Caldes, A; Jimenez, R; Espanol-Rego, M; Cibeira, MT; Ortiz-Maldonado, V; Quintana, LF; Castillo, P; Guijarro, F; Tovar, N; Montoro, M; Benitez-Ribas, D; Bataller, A; Gonzalez-Navarro, EA; Cid, J; Lozano, M; Perez-Amill, L; Martin-Antonio, B; Mena, MP; Moreno, DF; Rodriguez-Lobato, LG; Campistol, JM; Calvo, G; Blade, J; Rosinol, L; Juan, M; Pascal, M; Urbano-Ispizua, A; de Larrea, CF. **First report of CART treatment in AL amyloidosis and relapsed/refractory multiple myeloma.** *Journal For Immunotherapy Of Cancer.* 9(12):e003783. D1

GRANTS FOR RESEARCH IN PROGRESS

Guedan S. **Células T genéticamente modificadas para expresar receptores quiméricos de antígeno para el tratamiento de tumores sólidos.**
Sponsored by: Agencia Estatal de Investigación. AEI_PE19
Duration: 01/06/2020-31/05/2023

Guedan S. **CAR-T cells as drug delivery agents for the tratment of solid tumors.**
Sponsored by: Fundación científica Asociación Española contra el Cáncer. AECC_Lab20
Duration: 01/12/2020-30/11/2023

Guedan S. **Exhaustion-resistant Chimeric Antigen Receptor (CAR)-modified T cells for the treatment of solid tumors.**
Sponsored by: Gilead Sciences (INC). INT_GILEAD_KITE_ISR_2019
Duration: 25/06/2020-24/06/2023

Guedan S. **Accelerating Development and Improving Access to CAR and TCR-engineered T cell therapy (T2EVOLVE).**
Sponsored by: Innovative Medicine Initiative. IMI2-RIA. CE_IMI12_18th_2stg
Duration: 01/12/2021-30/11/2025

Ricart E, Marin PJ. **Eficacia y seguridad del trasplante autólogo de progenitores hematopoyéticos para la enfermedad de Crohn refractaria tras movilización libre de ciclofosfamida.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/00513
Duration: 01/01/2018-30/06/2022

ANNUAL
SCIENTIFIC REPORT
2021

TRANSVERSAL AREA

TRANSVERSAL RESEARCH GROUPS



Foto: **Mercè Alba i Lídia Sabater**

TRANSVERSAL RESEARCH GROUPS

T.1 **Clinical pharmacology**
Gonzalo Calvo

T.2 **Primary healthcare transversal research group**
Antoni Sisó

T.3 **Research in nursing**
Adelaida Zabalegui

T.1 Clinical pharmacology

LOCATION

Casanova 150 (floor 2)
Mallorca 183
(rooms 3, 10, 78, 86, 89, 90, 91)

KEYWORDS

1. **Clinical trials, design and methodology**
2. **Ethics in clinical research**
3. **Drug regulation**
4. **Pharmacoepidemiology**
5. **Pharmacovigilance**
6. **Advanced therapies**
7. **Medical devices**

GROUP INVOLVED IN

ECRIN
SCReN

Original publications

TOTAL	38
Mean IF	**7,27**
Q1	**58%**
D1	**24%**
MA	**0%**
OA	**55%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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Jose Rios (HCB)
Sandra Serrano (IDIBAPS)
Sara Varea (HCB)

PROBLEM, APPROACH & IMPACT

- Ethics in clinical research: Search for quality and the extent and context of application of current ethical principles in clinical research projects. It is developed in group studies and as support to researchers offered by the CEIm Technical Secretary, integrated within the Drug Research Ethics Committee (Àrea del Medicament of Hospital Clínic of Barcelona).

- Support to clinical research: Design, methodology, regulatory, project management, monitoring, data management and statistics: Optimization of methodological and statistical support for clinical research and full-service CRO for phase I-IV clinical trials sponsored by academic investigators and pharmaceutical companies. It is developed within the framework of the Clinical Trials Unit (CTU) and the IDIBAPS Medical Statistics Platform.

- Active collaboration in national clinical research networks, such as SCReN, or international networks, such as ECRIN, to carry out multicenter clinical research projects on a national and international scale.

- Pharmacovigilance: Research on the molecular and pathophysiological mechanisms of adverse drug reactions and implementation of active pharmacovigilance systems that allow optimizing the detection of adverse drug reactions in a context of real clinical practice.

- Pharmacogenetics and pharmacogenomics: Development of studies to relate genetics with the activity and response to the action of drugs.

- Advanced Therapies: Coordination of the transfer of basic research in advanced therapies from the Hospital Clínic to its clinical application, through the scientific evaluation of the projects, the alignment of efforts and the evaluation and distribution of available resources.

RESEARCH LINES

- Clinical research: Design, methodology, regulatory, project management, monitoring, data management and statistics

- Ethics in clinical research

- Pharmacovigilance and pharmacoepidemiology

- Pharmacogenetics and pharmacogenomics

- Advanced therapies

- Medical Devices

PUBLICATIONS

Originals

1. Ducrocq G, Gonzalez-Juanatey JR, Puymirat E, Lemesle G, Cachanado M, Durand-Zaleski I, Arnaiz JA, Martínez-Sellés M, Silvain J, Ariza-Solé A, Ferrari E, Calvo G, Danchin N, Avendaño-Solá C, Frenkiel J, Rousseau A, Vicaut E, Simon T, Steg PG, REALITY Investigators. **Effect of a Restrictive vs Liberal Blood Transfusion Strategy on Major Cardiovascular Events Among Patients With Acute Myocardial Infarction and Anemia: The REALITY Randomized Clinical Trial.** *JAMA-Journal of the American Medical Association.* 325(6):552-560. D1

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22. Sabater-Cruz N, Otero N, Dotti-Boada M, Ríos J, Gris O, Güell JL, Vilarrodona A, Casaroli-Marano RP. **Eye bank and theatre factors for positive microbiological culture of corneoscleral rim and cornea storage medium in the real-world.** *Eye.* 35(11):3087-3093. Q1

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24. Díaz-González Á, Sapena V, Boix L, Torres F, Sanduzzi-Zamparelli M, Da Fonseca LG, LLarch N, Iserte G, Guedes C, Muñoz-Martínez S, Darnell A, Belmonte E, Rimola J, Forner A, Ayuso C, Bruix J, Reig M. **Early diarrhoea under sorafenib as a marker to consider the early migration to second-line drugs.** *United European Gastroenterology Journal.* 9(6):655-661. Q2

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32. Varona M, Coll-Vinent B, Martín A, Carbajosa J, Sánchez J, Tamargo J, Cancio M, Sánchez S, Del Arco C, Ríos J, Fernández-Simón A, Ormaetxe JM, Suero C, EMERG-AF investigators. **Factors associated with poor prognosis in patients with atrial fibrillation: An emergency department perspective the EMERG-AF study.** *American Journal of Emergency Medicine.* 50:270-277. Q2

33. Cantero F; Ortillés Á; Peña MT; Gogova S; Molina R; Ríos J; Leiva M. **Safety and efficacy of unilateral topical application of rocuronium bromide in healthy scops owls (Otus scops).** *Veterinary Ophthalmology.* 24(2):169-176. Q2

34. Ducrocq G, Calvo G, González-Juanatey JR, Durand-Zaleski I, Avendano-Sola C, Puymirat E, Lemesle G, Arnaiz JA, Martínez-Sellés M, Rousseau A, Cachanado M, Vicaut E, Silvain J, Karam C, Danchin N, Simon T, Steg PG, REALITY investigators.

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35. Sabater-Cruz N; Dotti-Boada M; Rios J; Carrion MT; Chamorro L; Sanchez-Dalmau BF; Casaroli-Marano RP.**Postoperative treatment compliance rate and complications with two different protocols after pterygium excision and conjunctival autografting.** *European Journal of Ophthalmology.* 31(3):932-937. Q3

36. Vernooij RWM, Law W, Peters SAE, Canaud B, Davenport A, Grooteman MPC, Kircelli F, Locatelli F, Maduell F, Morena M, Nubé MJ, Ok E, Torres F, Woodward M, Blankestijn PJ, Bots ML, HDF Pooling project investigators. **The probability of receiving a kidney transplantation in end-stage kidney disease patients who are treated with haemodiafiltration or haemodialysis: a pooled individual participant data from four randomised controlled trials.** *BMC Nephrology.* 22(1):70. Q3

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Review

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Letters

1. Agusti A, Torres F, Faner R . **Early treatment with inhaled budesonide to prevent clinical deterioration in patients with COVID-19.** *Lancet Respiratory Medicine.* 9(7):682-683. D1

2. Ortiz-Maldonado V, Rives S, Español-Rego M, Alonso-Saladrigues A, Montoro M, Magnano L, Giné E, Pascal M, Díaz-Beyá M, Castella M, Català A, Faura A, Rodríguez-Lobato LG, Oliver-Caldes A, Martínez-Roca A, Rovira M, González- Navarro EA, Ortega JR, Cid J, Lozano M, Garcia-Rey E, Fernández S, Castro P, Jordan I, Villamor N, Aymerich M, Torrebadell M, Deyà À, Fernández de Larrea C, Benitez-Ribas D, Trias E, Varea S, Calvo G, Esteve J, Urbano-Ispizua A, Juan M, Delgado J. **Factors associated with the clinical outcome of patients with relapsed/ refractory CD19+ acute lymphoblastic leukemia treated with ARI-0001 CART19-cell therapy.** *Journal for Immunotherapy of Cancer.* 9(12):e003644. D1

3. Mearin F; Pajuelo-Lorenzo F; Rios J. **Effectiveness of almagate in gastroesophageal reflux disease: a post-hoc analysis of a randomized cross-over double-blind study.** *Revista Española de Enfermedades Digestivas.* 113(6):479-479. Q4

Case Reports

1. Oliver-Caldes, A; Jimenez, R; Espanol-Rego, M; Cibeira, MT; Ortiz-Maldonado, V; Quintana, LF; Castillo, P; Guijarro, F; Tovar, N; Montoro, M; Benitez-Ribas, D; Bataller, A; Gonzalez-Navarro, EA; Cid, J; Lozano, M; Perez-Amill, L; Martin-Antonio, B; Mena, MP; Moreno, DF; Rodriguez-Lobato, LG; Campistol, JM; Calvo, G; Blade, J; Rosinol, L; Juan, M; Pascal, M; Urbano-Ispizua, A; de Larrea, CF. **First report of CART treatment in AL amyloidosis and relapsed/ refractory multiple myeloma.** *Journal for Immunotherapy of Cancer.* 9(12):e003783. D1

2. Guasp M, Giné-Servén E, Maudes E, Rosa-Justicia M, Martínez-Hernández E, Boix-Quintana E, Bioque M, Casado V, Módena-Ouarzi Y, Guanyabens N, Muriana D, Sugranyes G, Pacchiarotti I, Davi-Loscos E, Torres-Rivas C, Ríos J, Sabater L, Saiz A, Graus F, Castro-Fornieles J, Parellada E, Dalmau J. **Clinical, Neuroimmunologic, and CSF Investigations in First Episode Psychosis.** *Neurology.* 97(1):E61-E75. D1

Consortium Publications

1. Solà E, Pose E, Campion D, Piano S, Roux O, Simon-Talero M, Uschner F, de Wit K, Zaccherini G, Alessandria C, Beuers U, Caraceni P, Francoz C, Mookerjee RP, Trebicka J, Vargas V, Serra M, Torres F, Montagnese S, Krag A, Hernaez R, Korenjak M, Watson H, Abraldes JG, Kamath PS, Ginès P, LiverHope Consortium Investigators. **Endpoints and design of clinical trials in patients with decompensated cirrhosis: Position paper of the LiverHope Consortium.** *Journal of Hepatology.* 74(1):200-219. D1

2. Leal L, Couto E, Sánchez-Palomino S, Climent N, Fernández I, Miralles L, Romero Y, González T, Maleno MJ, Paño B, Pich J, Nicolau C, Gatell JM, Plana M, García F, DCV3-RISVAC04 Study Group. **Effect of Intranodally Administered Dendritic Cell-Based HIV Vaccine in Combination With Pegylated Interferon α-2a on Viral Control Following ART Discontinuation: A Phase 2A Randomized Clinical Trial.** *Frontiers in Immunology*. 12:767370. Q1

3. Petoumenos K, Kwanda L, Ryom L, Mocroft A, Reiss P, de Wit S, Pradier C, Bonnet F, Phillips A, Hatleberg CI, Arminio-Monforte A, Weber R, Sabin CA, Lundgren J, Law MG, D:A:D Study Group. **Effect of Changes in Body Mass Index on the Risk of Cardiovascular Disease and Diabetes Mellitus in HIV-Positive Individuals: Results From the D:A:D Study.** *JAIDS-Journal of Acquired Immune Deficiency Syndromes.* 86(5):579-586. Q2

4. Fernández I, de Lazzari E, Inciarte A, Diaz-Brito V, Milinkovic A, Arenas-Pinto A, Etcheverrry F, García F, Leal L, HIV-PEP Group. **Network meta-analysis of post-exposure prophylaxis randomized clinical trials.** *HIV Medicine.* 22(3):218-224. Q3

GRANTS FOR RESEARCH IN PROGRESS

Arnaiz JA, Lafuente A. **Mecanismos moleculares implicados en la Farmacogenética del síndrome metabólico inducido por antipsicóticos.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI16/01222
Duration: 01/01/2017-30/06/2021

Arnaiz JA. **Plataforma de unidades de investigación clínica y ensayos clínicos. Spanish Clinical Research Network (SCReN).**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PT17/0017/0031
Duration: 01/01/2018-30/06/2021

Arnaiz JA. **Plataforma ISCIII de soporte para la Investigación clínica.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PT20/00095
Duration: 01/01/2021-31/12/2023

Arnaiz JA. **Antibodies against Nogo-A to enhance plasticity, regeneration and functional recovery after acute spinal.**
Sponsored by: European Commission.
CE_H2020-PHC-15-1s
Duration: 01/07/2017-31/12/2022

Arnaiz JA. **Simvastatin and rifaximin as new therapy for patients with decompensated cirrhosis.**
Sponsored by: European Commission.
CE_H2020-SC1_16_1s
Duration: 01/01/2017-30/06/2022

Arnaiz JA. **Evaluating a Combination of Immune-based Therapies to Achieve a Functional Cure of HIV Infection.**
Sponsored by: European Commission.
CE_H2020-SC1_16_1s
Duration: 01/01/2017-30/06/2022

Arnaiz JA. **Optimizing response to Li treatment through personalized evaluation of individuals with bipolar I disorder: the R-LiNK initiative.**
Sponsored by: European Commission.
CE_H2020-SC1_17_2s
Duration: 01/01/2018-31/12/2022

Calvo G. **ORTHOpedic randomized clinical trial with expanded bone marrow MSC and bioceramics versus autograft in long bone nonUNIONs.**
Sponsored by: European Commission.
CE_H2020-SC1_16abr1s
Duration: 01/01/2017-31/12/2021

Calvo G. **A testing bed for the development of high-risk medical devices.**
Sponsored by: European Commission.
CE_H2020-NMBP-IND-20
Duration: 01/01/2019-28/02/2023

T.2 Primary healthcare transversal research group

LOCATION
PHC Les Corts
PHC Comte Borrell
PHC Casanova

KEYWORDS
1. **Primary healthcare**
2. **Chronic diseases**
3. **Population-based studies and community health**
4. **Health technology assessment**
5. **Autoimmune & rheumatic diseases**
6. **Health services**

RELATED DISEASES
1. **Chronic diseases**
2. **Cardiovascular diseases**
3. **Autoimmune diseases**
4. **Patient-centered care**
5. **Infectious diseases**
6. **Home care and end of life**

Original publications

TOTAL	17
Mean IF	**4,05**
Q1	**41%**
D1	**12%**
MA	**35%**
OA	**71%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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PROBLEM

Primary care is the patient's gateway to the healthcare system, and primary care centres are the areas where most of the population's health problems are solved.

It is an area where the relationship between patient, family doctor and reference nurse is crucial to preventing and curing diseases and promoting healthy habits.

APPROACH

The group conducts multidisciplinary and interdisciplinary research, essential for primary care professionals, since the daily life in their professional field requires a biological, psychological and social approach towards patients and their illnesses, both at the clinic and at home.

A comprehensive approach to the patient and long-term care throughout the patient's life allow the group to develop its own and/or collaborative studies to improve the knowledge of the population's characteristics and of diseases.

IMPACT

The research projects that the group has led have shown, among other things, that an abdominal aortic aneurysm (AAA) screening programme is viable, safe and feasible for early detection.

It has also proposed a new, one-hour blood pressure monitoring method to diagnose hypertension and classify sub-populations of hypertension. And it has found that an interdisciplinary and multifactorial intervention (with physical exercise, nutrition, polypharmacy review and social assessment) helps prevent fragility in pre-fragile patients and improves functional capacity, quality of life and adherence to the Mediterranean diet.

The group has been the first to propose and publish a clinical practice guidelines for COVID-19 persistent condition.

RESEARCH LINES

- 2.0. Health.

- Atherogenesis, risk factors and cardiovascular diseases.

- Chronic pain.

- Digestive and liver diseases.

- HIV infection-AIDS and other infectious diseases.

- Healthcare continuity and management of chronic diseases.

- Mental health, smoking and other addictions.

- The fragility-geriatrics-dependency-home care axis.

- Use of healthcare services.

- Use of medicines.

PUBLICATIONS

Originals

1. Sequeira-Aymar E; Cruz A; Serra-Burriel M; di Lollo X; Gonçalves AQ; Camps-Vilà L; Monclus-Gonzalez MM; Revuelta-Muñoz EM; Busquet-Solé N; Sarriegui-Domínguez S; Casellas A; Llorca MRD; Aguilar-Martín C; Jacques-Aviñó C; Hargreaves S; Requena-Méndez A. **Improving the detection of infectious diseases in at-risk migrants with an innovative integrated multi-infection screening digital decision support tool (IS-MiHealth) in primary care: A pilot cluster-randomized controlled trial.** *Journal of Travel Medicine*. taab100. D1

2. Díaz-Rizzolo DA; Serra A; Colungo C; Sala-Vila A; Sisó-Almirall A; Gomis R. **Type 2 diabetes preventive effects with a 12-months sardine-enriched diet in elderly population with prediabetes: An interventional, randomized and controlled trial.** *Clinical Nutrition.* 40(5):2587-2598. D1

3. Brito-Zerón P, Melchor S, Seror R, Priori R, Solans R, Kostov B, Baldini C, Carubbi F, Callejas JL, Guisado-Vasco P, Hernández-Molina G, Pasoto SG, Valim V, Sisó-Almirall A, Mariette X, Carreira P, Ramos-Casals M, Sjögren Big Data Consortium, Members of the EULAR-SS Task Force Big Data Consortium who contributed to this study. **SARS-CoV-2 infection in patients with primary Sjögren syndrome: characterization and outcomes of 51 patients.** *Rheumatology*. 60(6):2946-2957. Q1

4. Grau-Corral I, Pantoja PE, Grajales Iii FJ, Kostov B, Aragunde V, Puig-Soler M, Roca D, Couto E, Sisó-Almirall A. **Assessing Apps for Health Care Workers Using the ISYScore-Pro Scale: Development and Validation Study.** *JMIR Mhealth and Uhealth*. 9(7):e17660. Q1

5. Ramos-Casals M, Pérez-Alvarez R, Kostov B, Gómez-de-la-Torre R, Feijoo-Massó C, Chara-Cervantes J, Pinilla B, González-García A, Garcia-Morillo JS, López-Dupla M, De-Escalante B, Rascón J, Perez-Guerrero P, Bonet M, Cruz-Caparrós G, Alguacil A, Callejas JL, Calvo E, Soler C, Robles A, de Miguel-Campo B, Oliva-Nacarino P, Estela-Herrero J, Pallarés L, Brito-Zerón P, Blanco Y, SarcoGEAS-SEMI Registry. **Clinical characterization and outcomes of 85 patients with neurosarcoidosis.** *Scientific Reports*. 11(1):13735. Q1

6. Moreno S, Sisó-Almirall A, Kostov B, Expósito M, Moreno JR, de Pablo B, Coll-Vinent B. **Cardiopulmonary resuscitation skill maintenance for primary care staff: brief training sessions with feedback.** *Emergencias*. 33(3):203-210. Q1

7. Rodrigo-Baños V, Moral-Pairada MD, González-de Paz L. **A Comprehensive Assessment of Informal Caregivers of Patients in a Primary Healthcare Home-Care Program.** *International Journal of Environmental Research and Public Health.* 18(21):11588. Q1

8. Sibila O, Albacar N, Perea L, Faner R, Torralba Y, Hernandez-Gonzalez F, Moisés J, Sanchez-Ruano N, Sequeira-Aymar E, Badia JR, Agusti A, Barberà JA, Sellares J. **Lung Function sequelae in COVID-19 Patients 3 Months After Hospital Discharge.** *Archivos de Bronconeumología.* 57:59-61. Q2

9. Brito-Zeron, P; Acar-Denizli, N; Romao, VC; Armagan, B; Seror, R; Carubbi, F; Melchor, S; Priori, R; Valim, V; Retamozo, S; Pasoto, SG; Trevisani, VFM; Hofauer, B; Szanto, A; Inanc, N; Hernandez-Molina, G; Sebastian, A; Bartoloni, E; Devauchelle-Pensec, V; Akasbi, M; Giardina, F; Bandeira, M; Siso-Almirall, A; Ramos-Casals, M. **Post-COVID-19 syndrome in patients with primary Sjogren's syndrome after acute SARS-CoV-2 infection.** *Clinical and Experimental Rheumatology.* 133(6):57-65. Q2

10. Retamozo S; Acar-Denizli N; Horváth IF; Ng WF; Rasmussen A; Dong X; Li X; Baldini C; Olsson P; Priori R; Seror R; Gottenberg JE; Kruize AA; Hernandez-Molina G; Vissink A; Sandhya P; Armagan B; Quartuccio L; Sebastian A; Praprotnik S; Bartoloni E; Kwok SK; Kvarnstrom M; Rischmueller M; Soláns-Laqué R; Sene D; Pasoto SG; Suzuki Y; Isenberg DA; Valim V; Nordmark G; Nakamura H; Fernandes Moça Trevisani V; Hofauer B; Sisó-Almirall A; Giacomelli R; Devauchelle-Pensec V; Bombardieri M; Atzeni F; Hammenfors D; Maure B; Carsons SE; Gheita T; Sánchez-Berná I; López-Dupla M; Morel J; Inanç N; Fonseca-Aizpuru E; Morcillo C; Vollenweider C; Melchor S; Vázquez M; Díaz-Cuiza E; Consani-Fernández S; de-Miguel-Campo B; Szántó A; Bombardieri S; Gattamelata A; Hinrichs A; Sánchez-Guerrero J; Danda D; Kilic L; De Vita S; Wiland P; Gerli R; Park SH; Wahren-Herlenius M; Bootsma H; Mariette X; Ramos-Casals M; Brito-Zerón P; Sjögren Big Data Consortium. **Influence of the age at diagnosis in the disease expression of primary Sjögren syndrome.** *Clinical and Experimental Rheumatology.* 39 Suppl 133(6):166-174. Q2

11. Farrús M, Codina-Filbà J, Reixach E, Andrés E, Sans M, Garcia N, Vilaseca J. **Speech-based support system to supervise chronic obstructive pulmonary disease patient status.** *Applied Sciences-Basel.* 11(17). Q2

12. Rodríguez-Romero R, Herranz-Rodríguez C, Kostov B, Gené-Badia J, Sisó-Almirall A. **Intervention to reduce perceived loneliness in community-dwelling older people.** *Scandinavian Journal of Caring Sciences.* 35(2):366-374. Q2

13. Moreno-Chico C, Roy C, Monforte-Royo C, González-de Paz L, Navarro-Rubio MD, Gallart Fernández-Puebla A. **Effectiveness of a nurse-led, face-to-face health coaching intervention in enhancing activation and secondary outcomes of primary care users with chronic conditions.** *Research in Nursing & Health.* 44(3):458-472. Q2

14. Alvira C, Cabrera E, Kostov B, Risco E, Farré M, Miguel S, Zabalegui A. **Validity and reliability of the Spanish caregiver reaction assessment scale for caregivers of people with dementia.** *International Journal of Nursing Practice.* 27(4):e12848. Q2

15. Retamozo S, Brito-Zeron P, Siso-Almirall A, Flores-Chavez A, Soto-Cardenas M.J., Ramos-Casals M. **Haemophagocytic syndrome and COVID-19.** *Clinical Rheumatology.* 40(4):1233-1244. Q3

16. Zafra JA; Bonilla-Carrasco MI; Carreiro-Alonso MA; González-de Paz L. **Prevalence and self-report of bullying after in-class police orientation talk.** *Public Health Nursing.* 38(6):1131-1134. Q3

17. Cabré Font C, Colungo Francia C, Vinagre Torres I, Jansà I Morató M, Conget Donlo I. **A Therapeutic Education Program with a Diabetes Specialist Nurse for Type 2 Diabetes Patients Using Insulin in a Primary Care Setting.** *Endocrinología Diabetes y Nutrición.* 68(9):628-635. Q4

Review

1. Sisó-Almirall A, Brito-Zerón P, Conangla Ferrín L, Kostov B, Moragas-Moreno A, Mestres J, Sellarès J, Galindo G, Morera R, Basora J, Trilla A, Ramos-Casals M, On Behalf Of The CAMFiC Long Covid-Study Group. **Long Covid-19: Proposed Primary Care Clinical Guidelines for Diagnosis and Disease Management**. *International Journal of Environmental Research and Public Health.* 18(8):4350. Q1

2. Brito-Zerón P; Sisó-Almirall A; Flores-Chavez A; Retamozo S; Ramos-Casals M. **SARS-CoV-2 infection in patients with systemic autoimmune diseases.** *Clinical and Experimental Rheumatology.* 39(3):676-687. Q2

3. Sisó-Almirall A, Meijer JM, Brito-Zerón P, Conangla L, Flores-Chavez A, González de Paz L, Bootsma H, Ramos-Casals M. **Practical guidelines for the early diagnosis of Sjogren's syndrome in primary healthcare.** *Clinical and Experimental Rheumatology.* 39(6):S197-S205. Q2

4. Retamozo S, Baldini C, Bootsma H, de Vita D, Doerner T, Fisher BA, Gottenberg JE, Hernandez-Molina G, Kocher A, Kostov B, Kruize AA, Mandl T, Ng WF, Seror R, Shoenfeld Y, Sisó-Almirall A, Tzioufas AG, Vissink A, Vitali C, Bowman SJ, Mariette X, Ramos-Casals M, Brito-Zeron P. **Therapeutic Recommendations for the Management of Older Adult Patients with Sjogren's Syndrome.** *Drugs & Aging.* 38(4):265-284. Q2

5. Retamozo S, Sisó-Almirall A, Flores-Chávez A, Ramos-Casals M, Brito-Zerón P. **An update of targeted therapeutic options for primary Sjogren syndrome: current status and future development.** *Expert Opinion on Pharmacotherapy.* 22(17):2359-2371. Q2

Consortium Publications

1. Vivanco-Hidalgo RM, Molina I, Martinez E, Roman-Viñas R, Sánchez-Montalvá A, Fibla J, Pontes C, Velasco-Muñoz C, Real World Data Working Group. **Incidence of COVID-19 in patients exposed to chloroquine and hydroxychloroquine: results from a population-based prospective cohort in Catalonia, Spain, 2020.** *Eurosurveillance.* 26(9):2001202. D1

2. Ramos-Casals, M; Acar-Denizli, N; Vissink, A; Brito-Zeron, P; Li, XM; Carubbi, F; Priori, R; Toplak, N; Baldini, C; Faugier-Fuentes, E; Kruize, AA; Mandl, T; Tomiita, M; Gandolfo, S; Hashimoto, K; Hernandez-Molina, G; Hofauer, B; Mendieta-Zeron, S; Rasmussen, A; Sandhya, P; Sene, D; Trevisani, VFM; Isenberg, D; Sundberg, E; Pasoto, SG; Sebastian, A; Suzuki, Y; Retamozo, S; Xu, B; Giacomelli, R; Gattamelata, A; Bizjak, M; Bombardieri, S; Loor-Chavez, RE; Hinrichs, A; Olsson, P; Bootsma, H; Lieberman, SM; Sjogren Big Data Consortium. **Childhood-onset of primary Sjogren's syndrome: phenotypic characterization at diagnosis of 158 children.** *Rheumatology.* 60(10):4558-4567. Q1

3. Paz-Graniel I, Babio N, Becerra-Tomás N, Toledo E, Camacho-Barcia L, Corella D, Castañer-Niño O, Romaguera D, Vioque J, Alonso-Gómez ÁM, Wärnberg J, Martínez JA, Serra-Majem L, Estruch R, Tinahones FJ, Fernandez-Aranda F, Lapetra J, Pintó X, Tur JA, García-Rios A, Bueno-Cavanillas A, Gaforio JJ, Matía-Martín P, Daimiel L, Sánchez VM, Vidal J, Prieto-Sanchez L, Ros E, Razquin C, Mestres C, Sorli JV, Cuenca-Royo AM, Rios A, Torres-Collado L, Vaquero-Luna J, Pérez-Farinós N, Zulet MA, Sanchez-Villegas A, Casas R, Bernal-Lopez MR, Santos-Lozano JM, Corbella X, Mateos D, Buil-Cosiales P, Jiménez-Murcia S, Fernandez-Carrion R, Forcano-Gamazo L, López M, Sempere-Pascual MÁ, Moreno-Rodriguez A, Gea A, de la Torre-Fornell R, Salas-Salvadó J, PREDIMED-Plus Investigators. **Association between coffee consumption and total dietary caffeine intake with cognitive functioning: cross-sectional assessment in an elderly Mediterranean population.** *European Journal of Nutrition.* 60(5):2381-2396. Q1

GRANTS FOR RESEARCH IN PROGRESS

González de Paz L. **Programa de Rehabilitación Cardíaca Centrada en el paciente post infarto agudo de miocardio: Ensayo Clínico Aleatorizado en la Atención Primaria de Salud.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI019/00010
Duration: 01/01/2020-31/12/2022

González de Paz L. **A motivational interview program for cardiac rehabilitation after acute myocardial infarction: study protocol of a randomized controlled trial in primary healthcare.**
Sponsored by: Generalitat de Catalunya. SLT017/20/000205
Duration: 01/01/2019-31/12/2022

Grau I. **Artificial intelligence supporting cancer patients across Europe.**
Sponsored by: European Commission. CE_H2020-SC1_19_1s24
Duration: 01/01/2020-31/12/2022

T.3 Research in nursing

LOCATION
HCB building

KEYWORDS
1. **Older people**
2. **Chronic-care/Long-term care**
3. **Dementia**
4. **Best practice**
5. **Advance nursing practice**

RELATED DISEASES
1. **Dementia**
2. **Chronic diseases and ageing**

GROUP INVOLVED IN
AGAUR_SGR17: 01114

Original publications

TOTAL	6
Mean IF	**2,98**
Q1	**67%**
D1	**17%**
MA	**83%**
OA	**67%**

IF = Impact Factor
MA = Main authorship (last or corresponding author)
OA = Open Access



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NURSING STAFF
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ADMINISTRATIVE STAFF
Paula Rivera (HCB)

PROBLEM

The complexity and demands of caring for patients and their families require increased nursing research, to improve the medical care provided and solve problems.

APPROACH

The group's research is aimed at improving the quality of care for patients and their families at Hospital Clínic de Barcelona. The research lines are: quality/safety, prevention, pain management, therapeutic education, training of carers and the empowerment of patients and their families.

The above lines also include physical exercise and rehabilitation, maternity, mental health, care of cancer patients, transitions, chronic illness, and the care of elderly patients.

IMPACT

Thanks to the application of daily practice with scientific evidence to research, clinical nursing research brings improvements in quality of patient care, the health of the population, the experience of patients and their family carers, and professional satisfaction to staff.

The group has published national and international articles in prestigious journals and is cooperating in projects funded by the European Union and the Spanish Ministry of Economy and Competitiveness.

RESEARCH LINES

- Best practices
- Cronicity
- Dementia
- Empowerment
- Management (advanced practice)
- Safety

PUBLICATIONS

Originals

1. Casafont C, Fabrellas N, Rivera P, Olivé-Ferrer MC, Querol E, Venturas M, Prats J, Cuzco C, Frías CE, Pérez-Ortega S, Zabalegui A. **Experiences of nursing students as healthcare aid during the COVID-19 pandemic in Spain: A phemonenological research study.** *Nurse Education Today.* 97:104711. D1

2. Holmstrand C; Rahm Hallberg I; Saks K; Leino-Kilpi H; Renom Guiteras A; Verbeek H; Zabalegui A; Sutcliffe C; Lethin C. **Associated factors of suicidal ideation among older persons with dementia living at home in eight European countries**. *Aging & Mental Health.* 25(9):1730-1739. Q1

3. Venturas M, Prats J, Querol E, Zabalegui A, Fabrellas N, Rivera P, Casafont C, Cuzco C, Frías CE, Olivé MC, Pérez-Ortega S. **Lived Experiences of Hospitalized COVID-19 Patients: A Qualitative Study.** *International Journal of Environmental Research and Public Health.* 18(20):10958. Q1

4. Manzanares I, Sevilla Guerra S, Peña-Ceballos J, Carreño M, Palanca M, Lombraña M, Conde-Blanco E, Centeno M, Donaire A, Gil-Lopez F, Khawaja M, López Poyato M, Zabalegui A. **The emerging role of the advanced practice epilepsy nurse: A comparative study between two countries.** *Journal of Clinical Nursing.* 30(9-10):1263-1272. Q1

5. Pedregosa S, Fabrellas N, Risco E, Pereira M, Stefaniak M, Şenuzun F, Martin S, Zabalegui A. **Implementing dedicated education units in 6 European undergraduate nursing and midwifery students clinical placements.** *BMC Nursing.* 20(1):61. Q2

6. Alvira C; Cabrera E; Kostov B; Risco E; Farré M; Miguel S; Zabalegui A. **Validity and reliability of the Spanish caregiver reaction assessment scale for caregivers of people with dementia.** *International Journal of Nursing Practice.* 27(4):e12848. Q2

GRANTS FOR RESEARCH IN PROGRESS

Zabalegui A. **Cuidado de personas mayores con alteración cognitiva o demencia hospitalizadas en unidades de traumatología.**
Sponsored by: Instituto de Salud Carlos III (ISCIII). FIS_PI17/01049
Duration: 01/01/2018-30/06/2022

DOCTORAL THESES

Zabalegui A. **Evaluación de una intervención formativa y de apoyo social INFOSA-DEM dirigida a cuidadores informales de personas con demencia en relación con la sobrecarga y el bienestar emocional.**
PhD student: Cindy Frías Torres

Zabalegui A. **Adecuación a un sistema de prescripción informatizada para enfermeras de la Unidad de Cuidados Intensivos.**
PhD student: Miguel Ángel Giménez Lajara

Group leaders index

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