



SANT PAU
Campus Salut
Barcelona



Institut
de Recerca
Sant Pau

2023

Sant Pau Research Institute

SCIENTIFIC REPORT

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Foreword





Jordi Surrallés

Scientific Director IR Sant Pau



The 2023 has been an extraordinary year, marked by exceptional achievements and significant advancements at the Sant Pau Research Institute. I am thrilled to announce that we have celebrated the most successful year in our institute's history. This remarkable success stems from a year of outstanding scientific contributions and record-breaking milestones across various indicators, including project grants, top-tier journal publications, clinical trials and financial growth.

This year we applaud Sant Pau Campus Salut Barcelona for its strategic dedication to the advancement of research. I am honored to highlight the joined efforts and dynamic synergy fostered under the new Campus Sant Pau brand, underscoring our unwavering dedication to advancing medical research. Our Research Day is a great illustration of this commitment since it honors the significant work that is being done.

One of the things we are most proud this year is the launch of the new transversal research program in Women's Health and Gender, developed within the Responsible Research and Innovation Plan (RRI). This program aims to attract talent with an emphasis on gender research, collaborate across research groups, increase female representation in studies, and promote gender-sensitive health research. Through the use of an intersectional approach, this groundbreaking project aims to optimize health outcomes for everyone and establishes IR Sant Pau as a premier center dedicated to gender equality in research.

Our Science and Its Impact

IR Sant Pau's standing as a premier scientific institution is cemented by our institute's ongoing success. Out of the 1,311 publications we have published, 22% fall into the top decile and 53% fall into the top quartile. 38% of these articles were led by our researchers, and 48% of these leaders were female scientists. Furthermore, 50% of our publications involved international collaborations.

In 2023, we completed 677 clinical trials, including 49 academic trials promoted by IR Sant Pau investigators, bringing scientific knowledge closer to our patients. This accomplishment reflects our mission to enhance health and quality of life through scientific knowledge.

Our unwavering dedication to innovation and technology transfer sowed in the maintenance of 23 active patent families, the purchase of 13 additional intellectual property registers, the granting of 22 IP and product licenses, and the generation of 1.9 million euros in revenue. Furthermore, we have kept up six startups and spin-offs, which have strengthened our position in the biomedical industry. These initiatives demonstrate our innovative capabilities and commitment to turning research into practical solutions that advance healthcare and improve patient outcomes, as does our cooperation between researchers and industry partners.

A record-breaking 15.49 million euros was funded by IR Sant Pau in 2023, with 126 new competitive grants



and 350 active projects. The funding was made up of 5.08 million euros from international grants and 10.41 million euros from national grants. This substantial competitive funding underscores our dedication to advancing scientific knowledge, fostering innovation, and translating discoveries into practical health solutions through a multidisciplinary and collaborative approach.

Talent

During 2023 we have witnessed the stabilization of a new generation of high-caliber researchers within our institute, while also expressing our gratitude to our senior researchers who have concluded their professional journeys with us. Their contributions have laid a solid foundation for our future.

Our ability and knowledge base keeps expanding as new groups, areas, and individuals join us. At a scientific level, we welcomed a new research group in Advanced Medical Imaging, Artificial Intelligence, and Image-Guided Therapy. This cross-sectional and multidisciplinary study will be led by Dr. Josep Munuera, a renowned expert in AI applications to medicine and the director of the Radiodiagnosis Service at the Sant Pau Hospital, pushing the limits of conventional specializations.

Public Engagement and Society

Our engagement with the public and society reached unprecedented heights. We organized 53 public engagement and outreach activities, impacting over

25,000 people. Our initiatives included collaborations with 19 schools, 14 community centers, and 7 secondary schools, reaching a total of 1,852 participants. Additionally, our research and activities were highlighted in 96 news articles and 32 press releases, resulting in 1,990 appearances in print and online media with an audience reach of 3.23 million. Events such as the 48h Open House, Sónar+D, Future Music Forum, and La Marató Visits played a significant role in promoting scientific education and fostering a closer relationship between science and the community.

Embracing The Future

The trust and continuous support from our Board of Trustees, including the consolidation of structural funding from the Generalitat de Catalunya exceeding 4.3 million euros, have been invaluable. The Board has approved measures to reinforce our structural integrity in scientific, financial, legal, and transparency areas. We will continue to fortify the institute's foundation to ensure its resilience and strength.

Our achievements in 2023 have set us up for future success. I am confident that our institute will not only maintain these outstanding records but also embrace new challenges in 2024 with optimism. This year will lay the groundwork for our transformative and ambitious new strategic plan. Together, we will build on our achievements and aspire to even greater heights.

I look forward to working together on these initiatives and challenges. Thank you all for being part of this journey!



ACKNOWLEDGMENTS

We thank the support of the board of trustees and other governing bodies, entities, organisations and companies that trusted us and financed our research. We also thank all the citizens and patient's associations who generously contribute through their private donations but, more important, by helping us in our mission while contributing to make our research projects possible and meaningful.

Presentation



Presentation

2.1 ABOUT US

The Sant Pau Research Institute (hereinafter IR Sant Pau) is a Research Centre of Catalonia (CERCA center) and has been accredited as a Biomedical Research Institute by the Spanish Institute of Health Carlos III (ISCIII) since 2011.

Located at the Sant Pau Health Campus, the IR Sant Pau's mission is to improve both populations' health and life quality through the production and dissemination of scientific knowledge, health-care innovation, and the application of these advances to clinical practice and health-care policy. Is one of the most active research centers in Catalonia particularly for translational research and the application of discoveries to clinical practice.

The creation of the IR Sant Pau meant a qualitative leap to reinforce biomedical and translational research and helped to bridge the gap between basic research and clinical Practice. Our research areas are aligned with advanced therapies and precision medicine, as well as genomic medicine and rare diseases. We also tackle infectious diseases, diagnostic techniques and biomarkers, and healthcare improvements. Highlight the institution's commitment promoting research with a gender perspective through the creation of a specific cross-cutting program on women's health and gender.



2.2 WHO WE ARE



Institut
de Recerca
Sant Pau



BANC DE SANG
I TEIXITS



Hospital de
la Santa Creu i
Sant Pau



Cochrane
Iberoamèrica



Fundació
Privada Hospital
de la Santa Creu i
Sant Pau

eap | sardenya
Centre Universitari

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de Barcelona

CSB Consorci Sanitari
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de Salut Pública



Fundació Puigvert



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Appointed by the Institut de Recerca Sant Pau, upon proposal from the Fundació Privada Hospital de la Santa Creu i Sant Pau.

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Vice presidents

Robert Belvís (CEim President)

Innovation, Quality, and training

Miriam Ors (Deputy Scientific Director. Innovation, Training, and Quality)

Members by direct designation of the IR Sant Pau's Director

Elisa Llurba (Women & Perinatal Health Research)

Noemí Rotllan (Ramon y Cajal Researcher)

Gemma Mas (Nursing Care Research)

Silvia Mateu (Puigvert Foundation)

Members from each IR Sant Pau's research areas

Lina Badimon (Cardiovascular Diseases Area)

José M Guerra (Cardiovascular Diseases Area)

José Manuel Soria (Cardiovascular Diseases Area)

Javier Briones (Oncohematological Diseases Area)

Ramón Mangués (Oncohematologic Diseases Area)

Agustí Barnadas (Oncohematological Diseases Area)

Juan Fortea (Neurological Diseases, Neuroscience & Mental Health Area)

Maria J Portella (Neurological Diseases, Neuroscience & Mental Health Area)

Israel Fernández (Neurological Diseases, Neuroscience & Mental Health Area)

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Maica Rodríguez (Epidemiology, Public Health & Primary Care Area)

Carles Brotons (Epidemiology, Public Health & Primary Care Area)

Didac Mauricio (Translational Medicine Area)

Sílvia Vidal (Translational Medicine Area)

Roser Torra (Translational Medicine Area)

Secretary of the Internal Scientific Committee

Miriam Ors Griera

IR SANT PAU EXTERNAL SCIENTIFIC COMMITTEE

Chair

José López-Barneo

Professor of Physiology
Instituto de Biomedicina de Sevilla (IBiS)
Hospital Universitario Virgen del Rocío/CSIC/
Universidad de Sevilla

Secretary

Jordi Surrallés

IR Sant Pau Scientific Director

Members

Ángel Maria Carracedo Álvarez

Instituto de Medicina Legal
Facultade de Medicina e Odontoloxía, Santiago de
Compostela

José Palacios

Jefe de Servicio de Anatomía Patológica
Hospital Ramón y Cajal, Madrid

Mercedes Robledo

Hereditary Endocrine Cancer Group, Group Leader
Human Cancer Genetics Program, CNIO, Madrid

Judith García

Barcelona Institute for Global Health – Campus MAR
ISGlobal, Barcelona

Magdalena Sanz

Associate Professor, Department of Obstetrics and
Gynecology
Fetal Surgery and Intervention, Baylor College of
Medicine, Houston-Texas

Manuel Arellano

Plataforma de Organizaciones de Pacientes

Gloria Gonzalez

Directora del Programa de Terapia Génica y
Regulación de la Expresión Génica CIMA-Navarra

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Adrià Comella

Fundació Gestió Sanitària Hospital de la Santa Creu
i Sant Pau

Secretary

Miriam Ors

IR Sant Pau Deputy Scientific Director

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Pau

Assumpta Malgosa

Universitat Autònoma de Barcelona

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Puigvert Foundation

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Iberoamerican Cochrane Centre

Jaume Sellarés

Barcelona-Sardenya Primary Health Centre

Carme Borrell

Public Health Agency of Barcelona

Jordi Surrallés

IR Sant Pau Director
Fundació Institut de Recerca Hospital Santa Creu i
Sant Pau



We are



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Managing Director

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Deputy Scientific Director

Miriam Ors

Director of Legal Advisory

Sílvia Ribas Martínez

Communications Director

Laura Díaz-Roig

Assistant to the Management Team

Eva Sanfeliu

2.3 ETHICS COMMITTEES

2.3.1 ETHICS COMMITTEE FOR INVESTIGATION WITH MEDICINAL PRODUCTS (CEIM)

President

Robert Belvís Nieto

Physician. Specialist in Medical Neurology

Vice-President

Estela Moreno Martínez

Specialist in Hospital Pharmacology

Secretary

Milagros Alonso Martínez

Specialist in Clinical Pharmacology

Members

Juan Ángel Aibar Durán

Physician. Specialist in Neurosurgery

Núria Alberich Margalef

Lawyer and DPD

Cristina Arqueros Nuñez

Physician. Specialist in Oncology

Maria Rosa Ballester Veneda

Pharmacist



Claudia Erika Delgado Espinoza
Physician. Specialist in Clinical Pharmacology

Beatriz Fernández-Montells Rama
Biomedical Engineer

Ignasi Gich Saladich
Physician

Marta Lestón Vázquez
Primary care pharmacist

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Physician. Specialist in Internal Medicine.

Indalecio Morán Chorro
Physician. Specialist in Intensive Care Medicine

Silvana Novelli Canales
Physician. Specialist in Haematology

Maria Jesús Portella Moll
Psychologist

Marta Pujol Benaiges
Patient's representative. Non sanitary

Maria Teresa Ricart Basagaña
Nurse

Miguel Alberto Rizzi Bordigoni
Physician. Specialist in Internal Medicine

Santiago Sánchez Cabús, Santiago
Physician. Specialist in Digestive Surgery

Jordi Torralbas Ortega
Nurse

Lucía Vallez Valero
Pharmacist

Miguel Àngel Viciano Rodríguez
User Attention Unit

MISSION, FUNCTIONS, AND AREAS OF ACTION

The Ethics Committee for Research with Medicinal Products (CEIm) is an independent body that, by the corresponding legal provisions, ensures that the rights, safety, and well-being of clinical trial subjects are protected.

The CEIm provides public assurance of that protection by reviewing and approving clinical trial protocols and the methods used to collect and document the informed consent of the subjects and by ensuring the suitability of investigators, facilities and materials.

2.3.2 ETHICS COMMITTEE FOR ANIMAL RESEARCH (CEEA)

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Secretary
Sergi Florit

Vocals
Sandra Camino
Jose M. Guerra
Esther Peña
Cristina Rodríguez
Elisabet Sánchez
Gemma Vilahur



The Ethics Committee for Animal Research (CEEA) of the Sant Pau Research Institute is an independent body that, according to the current legislation on laboratory research animals, serves as an expert and advisory committee in the area of animal experimentation, with members drawn from various disciplines – basic research, veterinary medicine, animal welfare and human medicine. Any animal research carried out in the Animal Facilities in the Institute must be approved by the CEEA.

The working guiding principles of this Committee are good science and good animal welfare, based on the 3R's Principles: replacement, refinement, and reduction.

Highlighted News of 2023

A new tool, for the first time, combines clinical and genomic data, showing excellent predictive capability for the risk of thrombosis in cancer patients



3 February 2023

-  Scientific Paper
-  News Article



First-trimester screening reduces the incidence of preterm preeclampsia by 68% with low-dose aspirin treatment between weeks 12 and 36 of pregnancy

8 February 2023

-  Scientific Paper
-  News Article

The Sant Pau Research Institute initiates the first Phase II clinical trial with an active vaccine against amyloid protein, crucial in the onset of Alzheimer's

21 March 2023

-  News Article



The Sant Pau Research Institute establishes the emerging Epilepsy group

11 April 2023

News Article



Sant Pau begins administering a new CAR-T medication, self-produced, against B-cell lymphomas

3 May 2023

News Article

A study reveals the existence of different patterns of cognitive progression in Huntington's disease, confirming at least two cognitive phenotypes that significantly differ in terms of progression rate

4 May 2023

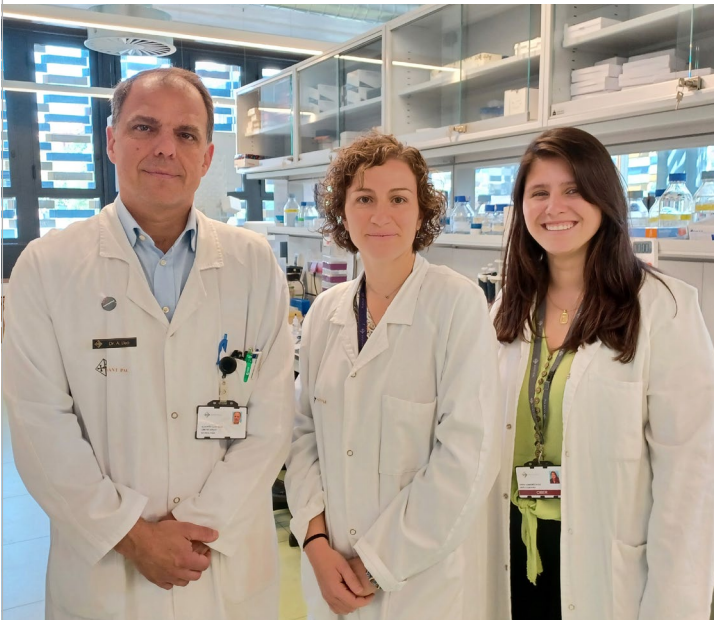
Scientific Paper
 News Article



Sant Pau creates a new cross-cutting research program on Women's Health and Gender

21 December 2023

News Article



A study describes that harmful proteins accumulating in the brains of individuals with Alzheimer's disease spread through synapses

16 May 2023

Scientific Paper
 News Article

A new treatment significantly improves survival in non-small cell lung cancer patients

7 June 2023

Scientific Paper
 Scientific Paper
 News Article



Prolonged breastfeeding implies a higher volume of gray matter at the age of 10

7 June 2023

- Scientific Paper
- News Article



Sant Pau promotes a framework agreement for sharing data, images, and samples among twenty Spanish hospitals and primary care centers to enhance maternal and child research

7 June 2023

- News Article

A renal cancer patient survives remarkably

15 June 2023

- Scientific Paper
- News Article



Deep brain stimulation demonstrates long-term benefits in treatment-resistant depression patients

29 June 2023

- Scientific Paper
- News Article



Combined therapy, a new option for patients with advanced urothelial cancer unable to receive conventional chemotherapy

17 July 2023

- Scientific Paper
- News Article

Transferring hemorrhagic stroke patients to the nearest center improves their prognosis



13 August 2023

- Scientific Paper
- News Article



Circulating microRNA could help predict and detect metastasis in early-stage breast cancer

22 September 2023

-  Scientific Paper
-  News Article



Top Scientific Articles

According to Impact Factor over 15

- **Effect of Colchicine on Perioperative Atrial Fibrillation and Myocardial Injury after Non-Cardiac Surgery in Patients Undergoing Major Thoracic Surgery (COP-AF): an International Randomised Trial.** Conen D, Ke M, Popova E, Chan MTV, Landoni G, Cata JP, Reimer C, McLean SR, Srinathan SK, Reyes JCT, Grande AM, Tallada AG, Sessler DI, Fleischmann E, Kabon B, Voltolini L, Cruz P, Maziak DE, Gutiérrez L, McIntyre WF, Tandon V, Martínez E, Guerra JJ, DuMerton D, et al. *LANCET*. 2023; 402(10413)DOI:10.1016/S0140-6736(23)01689-6. PMID:37640035. IF:168,900 (Q1/1D).
- **Perioperative Pembrolizumab for Early-Stage Non-Small-Cell Lung Cancer.** Wakelee H, Liberman M, Kato T, Tsuboi M, Lee S-H, Gao S, Chen K-N, Dooks C, Majem M, Eigendorff E, Martinengo GL, Bylicki O, Rodríguez D, Chaft JE, Novello S, Yang J, Keller SM, Samkari A, Spicer JD. *NEW ENGLAND JOURNAL OF MEDICINE*. 2023; 389(6)DOI:10.1056/NEJMoa2302983. PMID:37272513. IF:158,500 (Q1/1D).
- **Overall Survival with Osimertinib in Resected EGFR-Mutated NSCLC.** Tsuboi M, Herbst RS, John T, Kato T, Majem M, Grohé C, Wang J, Goldman JW, Lu S, Su WC, De Marinis F, Shepherd FA, Lee KH, Le NT, Dechaphunkul A, Kowalski D, Poole L, Bolanos A, Rukazenkov Y, Wu YL, ADAURA I. *NEW ENGLAND JOURNAL OF MEDICINE*. 2023; 389(2)DOI:10.1056/NEJMoa2304594. PMID:37272535. IF:158,500 (Q1/1D).
- **Phase 3 Trial of Nemolizumab in Patients with Prurigo Nodularis.** Kwatra SG, Yosipovitch G, Legat FJ, Reich A, Paul C, Simon D, Naldi L, Lynde C, De Bruin MS, Nahm WK, Sauder M, Gharib R, Barbarot S, Szepietowski JC, Conrad C, Fleischer A, Laquer VT, Misery L, Serra E, Lapeere H, Ahmad F, López ZKJ, Piketty C, Ständer S, OLYMPIA 2. *NEW ENGLAND JOURNAL OF MEDICINE*. 2023; 389(17)DOI:10.1056/NEJMoa2301333. PMID:37888917. IF:158,500 (Q1/1D).
- **Tarlatamab for Patients with Previously Treated Small-Cell Lung Cancer.** Ahn MJ, Cho BC, Felip E, Korantzis I, Ohashi K, Majem M, Juan O, Handzhiev S, Izumi H, Lee JS, Dziadziuszko R, Wolf J, Blackhall F, Reck M, Alvarez JB, Hummel HD, Dingemans A, Sands J, Akamatsu H, Owonikoko TK, Ramalingam SS, Borghaei H, Johnson ML, Huang S, Mukherjee S, Minocha M, Jiang TY, Martinez P, Anderson ES, Paz L, DeLLphi I. *NEW ENGLAND JOURNAL OF MEDICINE*. 2023; 389(22) DOI:10.1056/NEJMoa2307980. PMID:37861218. IF:158,500 (Q1/1D).
- **Down Syndrome in a New Era for Alzheimer Disease.** Rafii MS, Fortea J. *JAMA-JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*. 2023; 330(22)DOI:10.1001/jama.2023.22924. PMID:37991807. IF:120,700 (Q1/1D).
- **Motixafortide and G-CSF to Mobilize Hematopoietic Stem Cells for Autologous Transplantation in Multiple Myeloma: a Randomized Phase 3 Trial.** Crees ZD, Rettig MP, Jayasinghe RG, Stockerl K, Larson SM, Arpad I, Milone GA, Martino M, Stiff P, Sborov D, Pereira D, Micallef I, Moreno G, Mikala G, Coronel MLP, Holtick U, Hiemenz J, Qazilbash MH, Hardy N, Latif T, García I, Vainstein A, Sorani E, Gliko I, Goldstein I, Ickowicz D, Shemesh L, Kadosh S, Gao F, Schroeder MA, Vij R, DiPersio JF. *NATURE MEDICINE*. 2023; 29(4)DOI:10.1038/s41591-023-02273-z. PMID:37069359. IF:82,900 (Q1/1D).
- **Cloxacillin Plus Fosfomycin Versus Cloxacillin Alone for Methicillin-Susceptible Staphylococcus Aureus Bacteremia: a Randomized Trial.** Grillo S, Pujol M, Miró JM, López J, Euba G, Gasch O, Boix L, García MJ, Pérez MT, Gomez S, Oriol I, López LE, Pedro ML, San R, Aguado JM, Gioia F, Iftimie S, Morata L, Jover A, García G, Loeches B, Izquierdo Á, Goikoetxea AJ, Gomila A, Dietl B, Berbel D, Videla S, Hereu P, Padullés A, Pallerès N, Tebé C, Cuervo G, Carratalà J, SAFO G.



NATURE MEDICINE. 2023; 29(10)DOI:10.1038/s41591-023-02569-0. PMID:37783969. IF:82,900 (Q1/1D).

- Genomics of Perivascular Space Burden Unravels Early Mechanisms of Cerebral Small Vessel Disease.** Duperron MG, Knol MJ, Le Q, Evans TE, Mishra A, Tsuchida A, Roshchupkin G, Konuma T, Tregouet DA, Romero JR, Frenzel S, Luciano M, Hofer E, Bourgey M, Dueker ND, Delgado P, Hilal S, Tankard RM, Dubost F, Shin J, Saba Y, Armstrong NJ, Bordes C, Bastin ME, Beiser A, et al. NATURE MEDICINE. 2023; 29(4)DOI:10.1038/s41591-023-02268-w. PMID:37069360. IF:82,900 (Q1/1D).
- Second International Consensus Report on Gaps and Opportunities for the Clinical Translation of Precision Diabetes Medicine.** Tobias DK, Merino J, Ahmad A, Aiken C, Benham JL, Bodhini D, Clark AL, Colclough K, Corcoy R, Cromer SJ, Duan D, Felton JL, Francis EC, Gillard P, Gingras V, Gaillard R, Haider E, Hughes A, Ikle JM, Jacobsen LM, Kahkoska AR, et al. NATURE MEDICINE. 2023; 29(10)DOI:10.1038/s41591-023-02502-5. PMID:37794253. IF:82,900 (Q1/1D).
- Fixed-Duration Ibrutinib-Venetoclax Versus Chlorambucil-Obinutuzumab in Previously Untreated Chronic Lymphocytic Leukaemia (GLOW): 4-Year Follow-Up from a Multicentre, Open-Label, Randomised, Phase 3 Trial.** Niemann CU, Munir T, Moreno C, Owen C, Follows GA, Benjamini O, Janssens A, Levin MD, Robak T, Simkovic M, Voloshin S, Vorobyev V, Yagci M, Ysebaert L, Qi KQ, Qi QY, Sinet P, Parisi L, Srinivasan S, Schuier N, Baeten K, Howes A, Caces DB, Kater AP. LANCET ONCOLOGY. 2023; 24(12)DOI:10.1016/S1470-2045(23)00452-7. PMID:37944541. IF:51,100 (Q1/1D).
- Short-Term Outcomes of Chemoradiotherapy and Local Excision Versus Total Mesorectal Excision in T2-T3ab,N0,M0 Rectal Cancer: a Multicentre Randomised, Controlled, Phase III Trial (The TAU-TEM Study).** Serra X, Pericay C, Badia J, Golda T, Biondo S, Hernández P, Targarona E, Borda N, Reina A, Delgado S, Vallribera F, Caro A, Gallego J, Pascual M, Álvarez C, Gualajara HG, Mora L. ANNALS OF ONCOLOGY. 2023; 34(1)DOI:10.1016/j.annonc.2022.09.160. PMID:36220461. IF:50,500 (Q1/1D).
- Association of Location of Brca1 and Brca2 Mutations with Benefit from Olaparib and Bevacizumab Maintenance in High-Grade Ovarian Cancer: Phase III PAOLA-1/ENGOT-ov25 Trial Subgroup Exploratory Analysis.** Labidi SI, Rodrigues M, Sandoval JL, Kurtz JE, Heitz F, Mosconi AM, Romero I, Denison U, Nagao S, Vergote I, Parma G, Nøttrup TJ, Rouleau E, Garnier G, El A, Zamagni C, Martín C, Pujade E, Fiévet A, Ray IL. ANNALS OF ONCOLOGY. 2023; 34(2)DOI:10.1016/j.annonc.2022.11.003. PMID:36564284. IF:50,500 (Q1/1D).
- Osimertinib Treatment Based on Plasma T790M Monitoring in Patients With EGFR-Mutant Non-Small-Cell Lung Cancer (NSCLC): Eortc Lung Cancer Group 1613 APPLE Phase II Randomized Clinical Trial.** Remon J, Besse B, Aix SP, Callejo A, Al K, Bernabe R, Greillier L, Majem M, Reguart N, Monnet I, Cousin S, Garrido P, Robinet G, Campelo RG, Madroszyk A, Mazieres J, Curcio H, Wasag B, Pretzenbacher Y, Fournier B, Dingemans A, Dziadziuszko R. ANNALS OF ONCOLOGY. 2023; 34(5)DOI:10.1016/j.annonc.2023.02.012. PMID:36863484. IF:50,500 (Q1/1D).
- Neurological Adverse Events Related to Immune-Checkpoint Inhibitors in Spain: a Retrospective Cohort Study.** Fonseca E, Cabrera JM, Ruiz R, Naranjo L, Diaz C, Velasco R, Macias A, Mili-senda JC, Munoz E, Pascual E, Perez JG, Saiz A, Dalmau J, Blanco Y, Graus F, Martinez E. LANCET NEUROLOGY. 2023; 22(12)DOI:10.1016/S1474-4422(23)00335-6. PMID:37977714. IF:48,000 (Q1/1D).
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- Prevalence, Characteristics, and Prognostic Relevance of Donor-Transmitted Coronary Artery Disease in Heart Transplant Recipients.** Couto D, Almenar L, Barge E, Hernández FJ, López JC, Valero MJ, Castel MÁ, Mirabet S, Garrido IP, Díez C, López A, Manrique R, Fernández CN, Muñiz J, Crespo MG. *JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY*. 2023; 82(9) DOI:10.1016/j.jacc.2023.06.016. PMID:37612006. IF:24,000 (Q1/1D).
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- Rapid Reduction of HbA1c and Early Worsening of Diabetic Retinopathy: a Real-world Population-Based Study in Subjects with Type 2 Diabetes.** Simo R, Franch J, Vlachos B, Real J, Amado E, Flores J, Mata M, Ortega E, Rigla M, Valles J-A, Hernandez C, Mauricio D. *DIABETES CARE*. 2023;46(9)DOI:10.2337/dc22-2521. PMID:37428631. IF:16,200 (Q1/1D).
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Facts and Figures

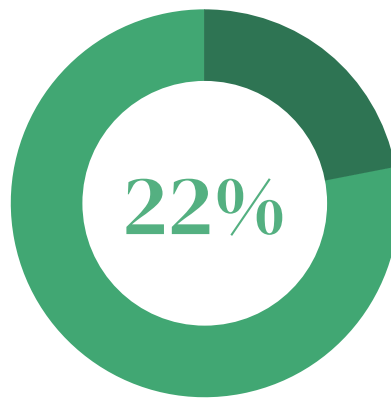


Facts and Figures

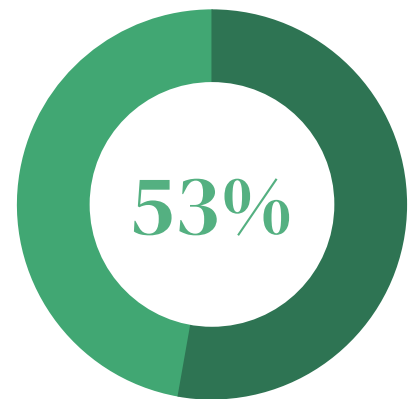
4.1 PUBLICATIONS

1,171

Articles & Reviews with JCR



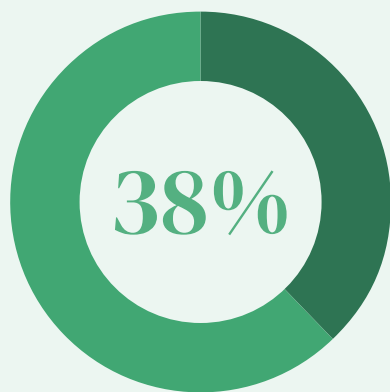
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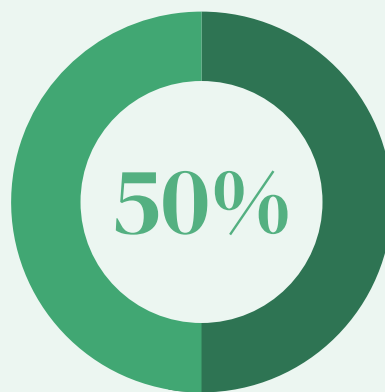
Q1

1,311

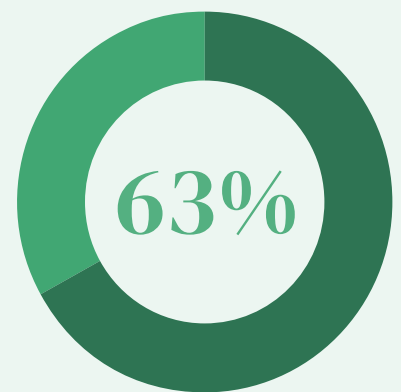
Articles & Reviews



Led by IR Sant Pau



International Collaboration



Open Access

48%

Led by Women

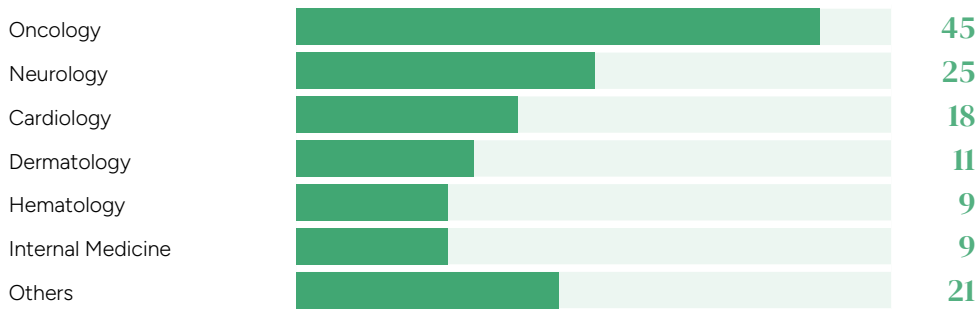
4.2 CLINICAL TRIALS

138
Clinical Trials Initiated in 2023

4
Independent Clinical Trials

134
Industry led Clinical Trials

BY FIELD

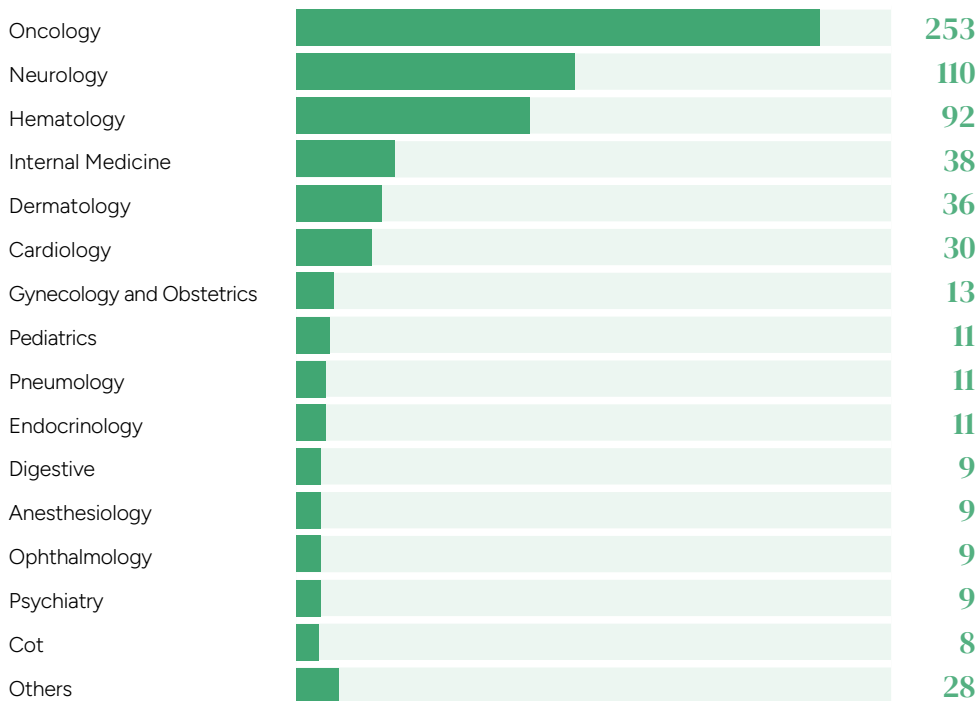


677
Active Clinical Trials in 2023

49
Independent Clinical Trials

628
Industry led Clinical Trials

BY FIELD



4.3 INNOVATION AND TECHNOLOGY TRANSFER



4.4 EDUCATION

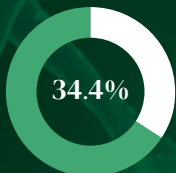
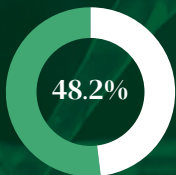
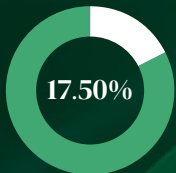
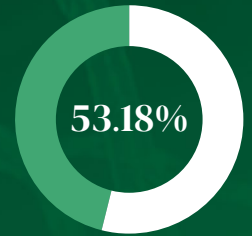
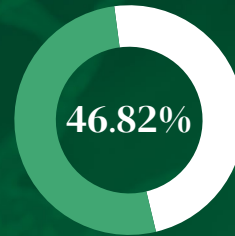


4.5 FUNDING

30.03M€
Income

Public Funds

Private Funds



CORE FUNDING

Generalitat de Catalunya		14.39%	4,322,519
Fundació Privada Hospital Santa Creu i Sant Pau		3.11%	933,700

NON COMPETITIVE FUNDING

Clinical Trials		27.22%	8,173,396
Teaching		5.74%	1,722,347
Others		12.25%	4,578,263

COMPETITIVE FUNDING

National and International Grants and Projects		34.3%	10,300,831
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TOTAL 30,031,088

4.6 COMPETITIVE PROJECTS

126

New Projects

350

Active Projects

15.49M€

Total Amount Granted

10.41M€

National Grants

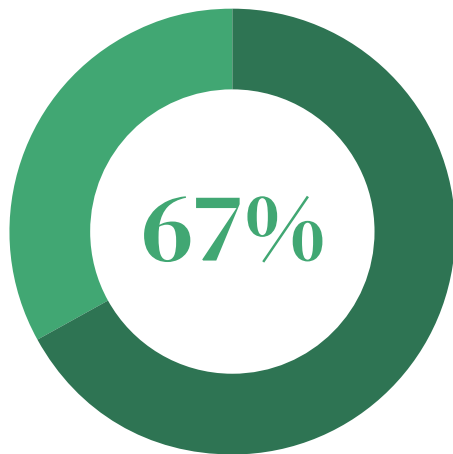
5.08M€

International Grants

4.7 PEOPLE

1,399

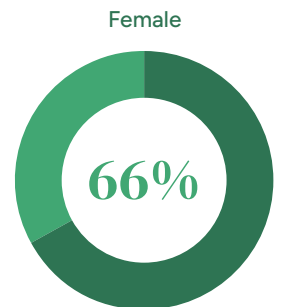
People



Female

1,274

Research Staff

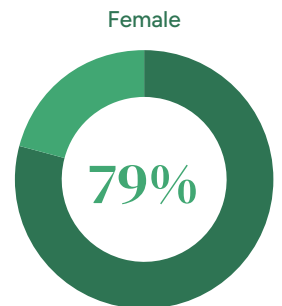


Female

		% Female
Group Leaders	69	41%
Researchers (R2, R3)	852	63%
First Stage Researchers (R1)	56	64%
Technicians	297	79%

125

Administration and Scientific Support Staff



Female

		% Female
Management Staff	102	78%
Core Facilities Staff	23	83%

4.8 SCIENCE AND SOCIETY

96

News

32

Press Release

1,990

Print and Online Media Appearances

3,230M

Impacted Audience

PUBLIC ENGAGEMENT AND OUTREACH ACTIVITIES
DAILY ACTIVITY

53

Activities

19

Schools

7

Secondary Schools

14

Community Centers

13

Others

1,852

Participants

412

School Audiences

1,440

General Audiences

EVENTS AND COLLABORATIONS

+25,000

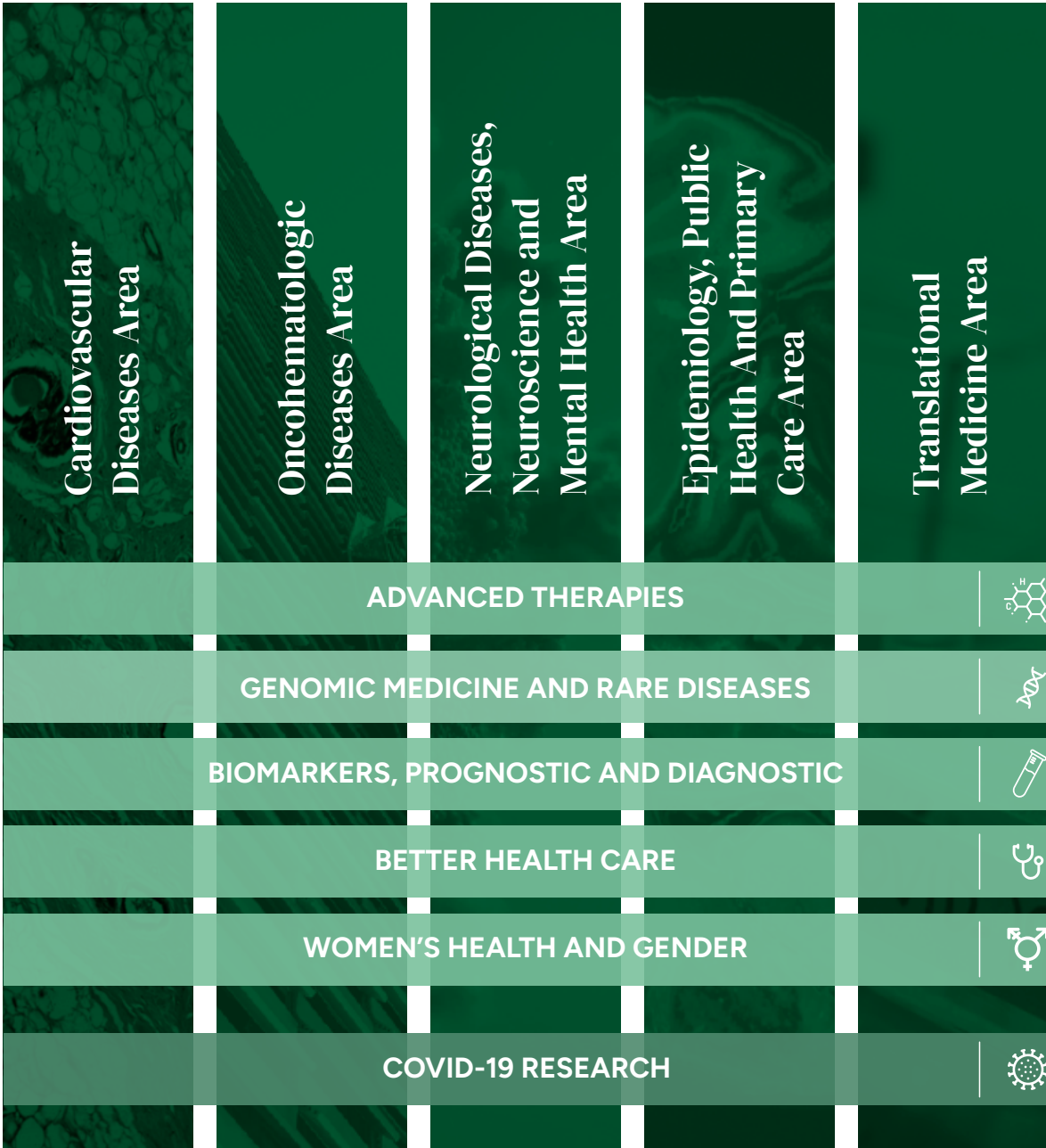
Impacted Audience

- 48h Open House
- Future Music Forum
- La Marató Visits
- Brain's Week
- La Caixa Research
- Festa de la Ciència
- Sónar+D
- Exporecerca

Our Research



5.1 Strategic Scientific Research Areas



TRANSVERSAL PROGRAMMES

TEMPORARY TRANSVERSAL PROGRAMME

ASSOCIATED GROUPS

5.1.1 Cardiovascular Diseases Area



Lina Badimon
Area Director

The incorporation of new technologies that facilitate molecular profiling and gene regulation has led to innovative research into heart and other cardiovascular diseases including arrhythmias, aorta aneurysm, vascular diseases, thrombosis, etc. The great diversity of groups in this area gives varied perspectives to ongoing research, whether in developing or testing the effectiveness of new biomarkers (as in the investigation of the metabolic and genetic bases of cardiovascular diseases) or therapeutic applications in the short term. Before final translation to humans, many of the advances in this area can be validated in animal models including small and large mammals including pigs.

RESEARCH GROUPS

Clinical and Translational Cardiology

Guerra Ramos, José Maria

Thrombosis and Haemostasis

Souto Andrés, J. Carles

Cardiovascular Biochemistry

Sánchez Quesada, José Luis

Molecular Pathology and Therapeutic of Ischaemic and Atherothrombotic Diseases

Badimon Maestro, Lina

Biomarkers for Cardiovascular Disease

Padro Capmany, Teresa

Regulation of Cardiac Rhythm and Contraction

Hove-Madsen, Leif

Lipids and Cardiovascular Pathology

Llorente Cortés, Concepción Vicenta

Genomics of Complex Diseases

Soria Fernández, José Manuel

Regulatory Mechanisms of Cardiovascular Remodelling

Rodríguez Sinovas, Cristina

Pathophysiology of lipid-related disease

Blanco Vaca, Francisco (until January 2023)

Escola Gil, Joan Carles (from February 2023)

Clinical and Translational Cardiology

Group leader

Guerra Ramos, José Maria (FGS)

Researchers

Acebes Pinilla, César (FGS)
 Alonso Martin, Concepción (FGS)
 Amoros Figueras, Gerard (CIBER)
 Arzamendi Aizpurua, Dabit (FGS)
 Asmarats Serra, Lluís (FGS)
 Barros Membrilla, Antonio Jose (FGS)
 Bonet Basiero, Ana (FGS)
 Bos Real, Lidia (FGS)
 Bosch Rue, Èlia (UAB)
 Bragagnini, Walter (FGS)
 Brossa Loidi, Vicente (FGS)
 Campos García, Bieito (FGS)
 Camprecios Crespo, Marta (FGS)
 De Antonio Ferrer, Marta (FGS)
 Descalzo Buey, Martin Luis (FGS)
 Doñate Rodríguez, Maria Teresa (FGS)
 Duran Cambra, Alberto (FGS)
 Fernández Martinez, Juan (FGS)
 Fernández Peregrina, Estefania (FGS)
 García-Moll Marimon, Francesc Xavier (FGS)
 Gual Santandreu, Miquel (FGS)
 Jimenez Kockar, Marcelo Fabian (FGS)
 Leta Petracca, Ruben (FGS)
 Li Li, Chi Hion (FGS)
 López López, Laura (FGS)
 Maestro Benedicto, Alba (FGS)
 Mendez Zurita, Francisco Javier (FGS)
 Menduiña Gallego, Irene (FGS)
 Millan Alvarez, Xavier (FGS)
 Mirabet Perez, Sónia (FGS)
 Moreno Weidmann, Zoraida (FGS)
 Moustafa, Abdel Hakim (FGS)
 Padilla López, Mireia (FGS)
 Peña Ortega, Pedro (FGS)
 Pomares Varo, Antonia (FGS)
 Pujadas Olano, Sandra (FGS)
 Rodríguez Font, Enrique (FGS)
 Rodríguez Perez, Álvaro (IR)
 Rodríguez Sotelo, Laura (FGS)
 Ruiz López, Adrian (FGS)
 Salido Iniesta, Mario (FGS)
 Simon Ramon, Clara (IR)
 Sionis, Alessandro (FGS)
 Vila Perales, Montserrat (FGS)
 Vilades Medel, David (FGS)
 Viñolas Prat, Xavier (FGS)
 Zegri Reiriz, Isabel (FGS)

Research Technicians

Angli Ferrandiz, Laia (IR)
 Herraiz Nieto, Silvia (IR)
 Jimenez Xarrie, Elena (IR)



DESCRIPTION

The Clinical and Translational Cardiology research group is a multidisciplinary research group focused on cardiovascular research. Our lines of work include basic and clinical electrophysiology, heart failure and heart transplantation, ischemic heart disease, valvular heart disease, diseases of the aorta, cardiac imaging, cardiac modeling, 3D printing, bioengineering, and innovation in health care management. The research group has access to all patient and clinical facilities of Hospital de la Santa Creu i Sant Pau and the research facilities of the research institute. The group keeps multiple research collaborations at the national and international levels.

MAIN LINES OF RESEARCH

- Basic and clinical electrophysiology: JM Guerra.
- Biomarkers of cardiovascular disease: S Mirabet, A Sionis.
- Heart failure and heart transplantation: S Mirabet.
- Ischemic heart disease: Dr. Arzamendi, A Sionis.
- Valvular heart disease: Chi Hio Li.
- Diseases of the Aorta: A Barros.
- Cardiac Imaging: Dr. Vilades.
- Cardiovascular genetics: JM Guerra.
- Cardiac modelling and 3D printing: Abdel Hakim Moustafa.
- Bioengineering applied to cardiovascular disease: G Amoros.
- Innovation in health care management: X Viñolas.



05.1.1 Cardiovascular Diseases Area

SCIENTIFIC CHALLENGES

Electrophysiology

- Mechanisms of tachycardia-induced cardiomyopathy.
- Mechanisms of lesion formation in Pulsed Field Ablation. New applications.
- Use of bioimpedance for tissue characterization in arrhythmia procedures.

Heart failure

- Mechanisms of vascular disease in heart transplant patients.
- New treatments for the management of heart failure patients.
- Biomarkers of disease prognosis in heart failure patients.
- Markers for early detection of cardiac graft rejection in transplanted patients.
- Palliative care programs for patients with advanced heart failure.

Ischemic heart disease

- Multidisciplinary treatment of cardiac sudden death.
- Takotsubo syndrome.
- Cardiogenic shock.

Valvular heart disease

- Implement new percutaneous techniques for the treatment of mitral and tricuspid valve regurgitation and degenerative aortic stenosis.
- Implement novel devices for the treatment of prosthetic valve leaks.

Cardiac imaging

- Implement new imaging software analysis to detect structural abnormalities of the myocardium (fibrosis, necrosis).

ACTIVE GRANTS

- Guerra Ramos, José Maria. Estudio traslacional para caracterizar las alteraciones estructurales y moleculares subyacentes a la reversibilidad de la miocardiopatía inducida por taquicardia. PI20/01702. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2023. 187.550,00 €.

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Thrombosis and Haemostasis

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DESCRIPTION

Our group is dedicated to clinical and basic research of hemostasis diseases, both thromboembolic and hemorrhagic, and to the clinical development of antithrombotic and antihemorrhagic therapies. We apply modern epidemiological methods for the study of complex diseases, such as venous thrombosis. Currently, we are working in the development of predictive mathematical models of the individual thrombosis risk, using IA. We also perform scientific translational research on new anticoagulants, anti IIa, anti Xa, and anti XI, and a self-management model of anticoagulant treatment with VKA drug.

MAIN LINES OF RESEARCH

- Biomarkers of venous thromboembolism, Dr. JC Souto.
- Genetics of thrombosis, Dr. JC Souto.
- New models of management of antithrombotic therapies, Dr. JC Souto.
- New antihemophilic treatments, Dr. J Mateo.

SCIENTIFIC CHALLENGES

- Risk assessment models for the individual risk of venous thromboembolism.
- Clinical management of direct oral anticoagulants to decrease the incidence of severe thrombotic and hemorrhagic complications.

ACTIVE GRANTS

- R. Souto Andrés, J. Carles. Perfil individual de Riesgo de Enfermedad TROMboembólica VENosa (RETROVE 4). PI21/01772. Instituto de Salud Carlos III



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(ISCIII). Duration: 2022-2024. 205.700,00 €.

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Cardiovascular Biochemistry

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García Osuna, Álvaro (FGS)

Grau Agramunt, Margarita (FGS)

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Research Technicians

Porcel Jabalera, Inmaculada (FGS)



DESCRIPTION

The group is made up of personnel from the Research Institute of the Hospital de Sant Pau (IR-HSP) and the Biochemistry Department of the Hospital de la Santa Creu and Sant Pau (HSCSP). The group's main lines of research focus on the study of the molecular mechanisms underlying the development of cardiovascular diseases, specifically those derived from alterations in lipoprotein metabolism or inflammatory processes. Our objective is to transfer the knowledge obtained from the lines of translational research to clinical application in a Clinical Biochemistry Laboratory of a University Hospital.

MAIN LINES OF RESEARCH

Atherosclerosis Mechanisms

- Mechanisms leading to lipoprotein aggregation and cholesterol accumulation in the arterial wall.
- Mimetic peptides derived from apoJ as therapeutic tools.
- Inflammatory, apoptotic, and lipid accumulation-related pathways induced by modified LDL in monocytes, endothelial cells, and cardiomyocytes, in the context of diabetes, obesity, heart failure, and ischemic stroke.
- Analysis of the secretome of the adipose tissue from cardiac surgery patients with diabetes or obesity.

Diagnosis and Biomarkers

- Analysis of apolipoprotein J (apoJ) as a marker of CVR.



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- Assessment of new biomarkers of acute and chronic cardiovascular disease.
- Biomarkers of epicardial fat accumulation.
- Development of algorithms for ruling out acute coronary disease.
- Development of methods for point-of-care biomarker measurement.
- Vulnerability markers to assess carotid plaque inflammation in ischemic stroke.
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- Sánchez Quesada, Jose Luis. Tejido adiposo epicárdico en obesidad y diabetes. Mecanismos moleculares de riesgo cardiovascular y búsqueda de nuevos biomarcadores. PI20/00334. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2023. 147.620,00 €.

SCIENTIFIC CHALLENGES

- Determine the intracellular mechanisms involved in the inflammatory response induced by LDL(-) and the components of the particle that entail atherogenicity.
- Analyze the therapeutic potential of mimetic peptides derived from apoJ to delay the development of atherosclerosis in animal models.
- Find new markers of cardiovascular risk in diseases such as diabetes, obesity, HIV, or cardiac failure.
- Strengthen international collaborations to set up future applications for International funding and participation in multidisciplinary international research projects. Investigate if PCSK9 antibodies correct HDL dysfunction in familial hypercholesterolemia.

ACTIVE GRANTS

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GRANTS AWARDED

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Molecular Pathology and Therapeutic Of Ischaemic and Atherothrombotic Diseases

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Schoch , Leonie (IR)

Suades Soler, Rosa (CIBER)

Vilahur García, Gemma (IR)

Research Technicians

Canovas Noe, Maria Angeles (IR)

Catalina García, Pablo (IR)

Gallinat O'Callaghan, Alexandre (IR)

García García, Olaya (IR)

Gerboles Freixas, Esther (IR)

Grau Ruiz, Gerard (IR)

Huertas Segarra, Sónia (IR)

López Bernal, Sergio (IR)

Morato Simo, Silvia (IR)

Pescador Romero, Monica (IR)

Pimentel Mayordomo, Noelia (IR)

Ramos Regalado, Lisaidy (IR)



DESCRIPTION

The Group led by Lina Badimon has proven expertise in cardiovascular research, with molecular/genetics to translational and clinical approaches, and focus on atherosclerosis/ thrombosis, ischemic heart disease, aging, and the axis heart-brain. The investigators in the group have positions of trust in International and National Scientific Societies and Networks of Excellence; they are international key opinion leaders; they have a powerful dissemination capacity in academic and social circuits; and, they are consultants and reviewers for National and International Funding Agencies.

MAIN LINES OF RESEARCH

- Search of novel therapies against atherothrombosis and ischemic heart disease: From nutritional interventions to -omics and precision medicine. IP: Lina Badimon.
- Advanced therapies to promote tissue microvascular perfusion in ischemic diseases. IP: Lina Badimon.
- Extracellular microvesicles as vehicles of crosstalk messages in health and disease. IP: L. Badimon.
- Teràpia cel·lular: inducció dels processos angiogènics en les malalties cardiovasculars. IP: Gemma Arderiu.
- Pathophysiological role of LRP6 in chronic diseases. IP: Maria Borrell.
- Role of lipids and inflammation in atherosclerosis and ischemic heart disease. IP: Maria Borrell.
- Cardioprotection and adverse left ventricular remodeling in ischemic heart disease. IP: Gemma Vilahur.



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- Role of HDL and triglycerides in cardiac ischemic heart disease. IP: Gemma Vilahur.

ACTIVE GRANTS

- Arderiu Marques, Gemma. Reprogramación directa de las ASCs a células endoteliales mediante factores de transcripción para inducir la regeneración vascular en la enfermedad arterial periférica. PI20/01517. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2023. 147.620,00 €.
- Badimon Maestro, Lina. Medicina de Precisión en Hipercolesterolemia Familiar y enfermedad cardiovascular prematura mediante la integración de tecnologías ómicas y de imagen (MedPreHF). PMP22/00108. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2025. 1.469.930,00 €.
- Badimon Maestro, Lina. Prevención del deterioro cognitivo de origen vascular (VCI) mediante la activación del tráfico de colesterol y la reducción de la oxidación celular. AC20/00054. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2023. 174.978,10 €.
- Badimon Maestro, Lina. Nuevas terapias avanzadas para mejorar la disfunción microvascular y regenerar tejido isquémico. PID2019-107160RB-I00. Ministerio de Ciencia e Innovación (MICINN). Duration: 2020-2024. 484.000,00 €.
- Badimon Maestro, Lina. RICORS TERAV. RD21/0017/0013. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 90.000,90 €.
- Badimon Maestro, Lina. TRANSBIOLINE: Translational Safety Biomarker Pipeline (TransBioLine): Enabling development and implementation of novel safety biomarkers in clinical trials and diagnosis of disease. TRANSBIOLINE 821283. H2020-JTI-IMI2-2017-13-two-stage. Unión Europea. Duration: 2019-2024. 182.600,00 €.
- Badimon Maestro, Lina. COVIRNA: Medical technologies, digital tools and artificial intelligence analytics to improve surveillance and care at high technology readlines. COVIRNA 101016072. H2020-SC1-PHE-CORONAVIRUS-2020-2-CNECT. Unión Europea. Duration: 2020-2023. 273.943,00 €.
- Badimon Maestro, Lina. Network of excellence for the development of advanced therapies from the treatment of myocardial infarctions based on regenerative medicine amb 3d printing. CARDIO-PATCH SOE4/P1/E1063. Unión Europea. Duration: 2020-2023. 123.748,76 €.
- Badimon Maestro, Lina. CARDIATEAM: Cardiomyopathy in type 2 diabetes mellitus. CARDIATEAM AMD-821508-11. H2020-JTI-IMI2-2017-13-two-stage. Unión Europea. Duration: 2019-2026. 50.000,00 €.
- Badimon Maestro, Lina. PROTAIS: Protection of heart and brain against ischemia. GINJOL 2022-11-012. iCERCA. Duration: 2022-2023. 10.000,00 €.
- Badimon Maestro, Lina. Patologia Molecular i Terapeutica de les Malalties Aterotrombòtiques. INV-1 00048. Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR). Duration: 2022-2024. 66.217,84 €.
- Badimon Maestro, Lina. Antiplatelet effects of APT102. Non-competitive. ASTRAZENECA. Duration: 2018-2023. 500.000,00 €.
- Badimon Maestro, Lina. Efectos del probiótico "AB-Life" sobre la cantidad y perfil de ácidos biliares, y el perfil lipídico y metabólico en sujetos sanos con sobrepeso moderado. Non-competitive. AB-BIOTICS. Duration: 2020-2023. 277.052,00 €.
- Borrell Pages, Maria. Progresión de la aterosclerosis: nuevas funciones del PCSK9 y los LRP. PI20/01282. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2023. 135.520,00 €.
- Borrell Pages, Maria. Rol del PCSK9 en la enfermedad vascular: impacto del PCSK9 de la pared vascular. SEC 2019. Sociedad Española de Cardiología (SEC). Duration: 2019-2023. 15.000,00 €.
- Vilahur García, Gemma. Mejora de la función cardíaca mediante el conocimiento del eje metabólico triglicéridos/HDL: Impacto en las células de la médula ósea y el corazón. PID2021-128891OB-I00. Ministerio de Ciencia e Innovación (MICINN). Duration: 2022-2025. 302.500,00 €.
- Vilahur García, Gemma. Noves estratègies de protecció de l'eix cor-cervell després d'una parada cardíaca. CCR 2021. Fundació Acadèmia de Ciències Mèdiques i de la Salut de Catalunya i Balears. Duration: 2021-2024. 6.000,00 €.



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- Vilahur García, Gemma. Avances en el diagnóstico y pronóstico de Aterosclerosis en pacientes diabéticos. PLEC2021-007664. Ministerio de Ciencia e Innovación (MICINN). Duration: 2021-2024. 271.697,00 €.
- Vilahur García, Gemma. Nueva aproximación terapéutica para prevenir el desarrollo de cardiomiopatía diabética a través de la inhibición funcional de la HMGCoA-reductasa y la activación de la vía de señalización de la AMPK. SEC 2020. SEC/FEC-INV-TRL 20/01.Sociedad Española de Cardiología (SEC). Duration: 2020-2024. 15.000,00 €.
- Vilahur García, Gemma. Nanotechnology-based therapeutics to protect the infarcted heart: deciphering the role of innovative HDL bioengineered nanoconstructs. MARATO 202337-30. Fundacio La Marato de TV3. Duration: 2024-2027. 187.248,75 €.

GRANTS AWARDED

- Arderiu Marques, Gemma. Nueva estrategia terapéutica mediante vesículas extracelulares derivadas de células madre derivadas de tejido adiposo como medicina regenerativa en enfermedades vasculares periféricas. PI23/01136. Instituto de Salud Carlos III. Duration: 2024-2026. 152.500,00 €.
- Arderiu Marques, Gemma. Repairing early endothelial cell damage to promote cardiovascular health: interplay between endothelial cells and monocytes as a primary strategy in ischemic diseases. MARATO 202303-30. Fundacio La Marato de TV3. Duration: 2024-2027. 149.785,00 €.
- Badimon Maestro, Lina. Patologia Molecular i Terapèutica de les Malalties Isquèmiques i Aterotrombòtiques. 2021 SGR 01006. Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR). Duration: 2022-2024. 60.000 €.
- Borrell Pages, Maria. LDLR family and PCSK9's role in cerebral lipid homeostasis in ischemic stroke. PI23/00589. Instituto de Salud Carlos III. Duration: 2024-2026. 140.000,00 €.
- Borrell Pages, Maria. Cerebral lipid homeostasis in ischemic stroke: role of lipoprotein receptors and pharmacological interventions. MARATO 202304-10. Fundacio La Marato de TV3. Duration: 2024-2027. 197.937,50 €.
- Vilahur García, Gemma. Targeted nanomedicine to reverse fibrosis in ischemic cardiomyopathies. PCI2023-143431. Ministerio de Ciencia e Innovación (MICINN). Duration: 2023-2026. 157.300,00 €.
- Gallinat O'Callaghan, Alex. Molecular basis of ischemic post-conditioning: DJ-1 in cardioprotection. 30/01/2023. Universitat Autònoma de Barcelona. Supervisors: Badimon Maestro, Lina; Blanco Vaca, Francisco. <http://hdl.handle.net/10803/688588>.
- Radiké, Monika. High resolution cardiovascular magnetic resonance as a tool for evaluating the efficacy of P2Y12 receptor antagonists to preserve cardiac microcirculation and limit adverse left ventricular remodelling post-myocardial infarction. 28/04/2023. Universitat Autònoma de Barcelona. Supervisors: Hidalgo Pérez, José Alberto; Vilahur García, Gemma; Badimon Maestro, Lina; Cinca Cusculola, Juan María. <http://hdl.handle.net/10803/690535>.
- Schoch, Leonie. Nuevas estrategias para restaurar la protección de las HDLs. 09/03/2023. Universitat de Barcelona. Supervisors: Vilahur García, Gemma; Badimon Maestro, Lina.
- Sutelman, Pablo. Nuevas estrategias de condicionamiento miocárdico: cardioprotección por nutraceuticos en cardiopatía isquèmica. 15/09/2023. Universitat de Barcelona. Supervisors: Vilahur García, Gemma; Badimon Maestro, Lina.
- Vilella Figuerola, Alba. Circulating cell-derived extracellular vesicles and epigenetic small non-coding ribonucleic acids in chronic heart failure. 28/03/2023. Universitat Autònoma de Barcelona. Supervisors: Badimon Maestro, Lina; Padró Capmany, Teresa; Blanco Vaca, Francisco. <http://hdl.handle.net/10803/689764>.

DOCTORAL THESES DEFENDED

- Gallinat O'Callaghan, Alex. Molecular basis of ischemic post-conditioning: DJ-1 in cardioprotection. 30/01/2023. Universitat Autònoma de Barcelona. Supervisors: Badimon Maestro, Lina; Blanco Vaca, Francisco. <http://hdl.handle.net/10803/688588>.
- Radiké, Monika. High resolution cardiovascular magnetic resonance as a tool for evaluating the efficacy of P2Y12 receptor antagonists to preserve cardiac microcirculation and limit adverse left ventricular remodelling post-myocardial infarction. 28/04/2023. Universitat Autònoma de Barcelona. Supervisors: Hidalgo Pérez, José Alberto; Vilahur García, Gemma; Badimon Maestro, Lina; Cinca Cusculola, Juan María. <http://hdl.handle.net/10803/690535>.
- Schoch, Leonie. Nuevas estrategias para restaurar la protección de las HDLs. 09/03/2023. Universitat de Barcelona. Supervisors: Vilahur García, Gemma; Badimon Maestro, Lina.
- Sutelman, Pablo. Nuevas estrategias de condicionamiento miocárdico: cardioprotección por nutraceuticos en cardiopatía isquèmica. 15/09/2023. Universitat de Barcelona. Supervisors: Vilahur García, Gemma; Badimon Maestro, Lina.
- Vilella Figuerola, Alba. Circulating cell-derived extracellular vesicles and epigenetic small non-coding ribonucleic acids in chronic heart failure. 28/03/2023. Universitat Autònoma de Barcelona. Supervisors: Badimon Maestro, Lina; Padró Capmany, Teresa; Blanco Vaca, Francisco. <http://hdl.handle.net/10803/689764>.

SCIENTIFIC PRODUCTION

- Andreotti F, Geisler T, Collet JP, Gigante B, Gorog DA, Halvorsen S, Lip GYH, Morais J, Navarese EP, Patrono C, Rocca B, Rubboli A, Sibbing D, Storey RF, Verheugt F, Vilahur G. Acute, periprocedural and longterm antithrombotic therapy in older adults 2022 Update by the ESC Working Group



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- on Thrombosis. EUROPEAN HEART JOURNAL. 2023; 44(4)DOI:10.1093/eurheartj/ehac515. PMID:36477po865. IF:39,300 (Q1/1D). Document type: Review.
- Arderiu G, Civit A, Badimon L. Adipose-Derived Stem Cells to Treat Ischemic Diseases: The Case of Peripheral Artery Disease. INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES. 2023; 24(23):16752. DOI:10.3390/ijms242316752. PMID:38069074. IF:5,600 (Q1/3D). Document type: Review.
 - Arderiu G, Mendieta G, Gallinat A, Lambert C, Díez A, Ballesta C, Badimon L. Type 2 Diabetes in Obesity: A Systems Biology Study on Serum and Adipose Tissue Proteomic Profiles. INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES. 2023; 24(1):827. DOI:10.3390/ijms24010827. PMID:36614270. IF:5,600 (Q1/3D). Document type: Article.
 - Badimon L, Arderiu G. Atherosclerotic Plaque VASA Vasorum in Diabetic Macroangiopathy: WHEN IS Important, but also HOW IS Needed. THROMBOSIS AND HAEMOSTASIS. 2023; 123(10) DOI:10.1055/a-2116-7261. PMID:37353212. IF:6,700 (Q1/2D). Document type: Editorial Material.
 - Badimon L, Mendieta G, Vilahur G. Statins revisited: therapeutic applications beyond lipid lowering?. EUROPEAN HEART JOURNAL. 2023; 44(25)DOI:10.1093/eurheartj/ehad324. PMID:37316965. IF:39,300 (Q1/1D). Document type: Editorial Material.
 - Badimon L, Vilahur G, Padro T, Mendieta G. Cardiovascular residual risk: etiology, lipids, and inflammation. Revista Española De Cardiología Suplementos. 2023; 23DOI:10.1016/S1131-3587(23)00008-0. Document type: Article.
 - Badimon L, Padro T, Vilahur G. Chapter 27: Moving from reactive to preventive medicine. Aging. 2023; 663-681. DOI: 10.1016/B978-0-12-823761-8.00003-3. Document type: Book Chapter.
 - Badimon L, Vilahur G. Chapter 1: Arterial thrombosis: pathophysiological background. The ESC Textbook of Thrombosis. The European Society of Cardiology Series. Oxford Academic. 2023; C1-C1P114. DOI:10.1093/med/9780192869227.003.0001. Document type: Book Chapter.
 - Benincasa G, Suades R, Padrò T, Badimon L, Napoli C. Bioinformatic platforms for clinical stratification of natural history of atherosclerotic cardiovascular diseases. European Heart Journal-Cardiovascular Pharmacotherapy. 2023; 9(8) DOI:10.1093/ehjcvp/pvad059. PMID:37562936. IF:7,100 (Q1/1D). Document type: Article.
 - Bergami M, Manfrini O, Nava S, Caramori G, Yoon J, Badimon L, Cenko E, David A, Demiri I, Dorobantu M, Fabin N, Gheorghe O, Jankovic R, Kedev S, Ladjevic N, Lasica R, Loncar G, Mancuso G, Mendieta G, Milicic D, Mjehovic P, Pasalic M, Petrovic M, Poposka L, Scarpone M, Stefanovic M, van der Schaar M, Vasiljevic Z, Vavlukis M, Pittao MLV, Vukomanovic V, Zdravkovic M, Bugiardini R. Relationship Between Azithromycin and Cardiovascular Outcomes in Unvaccinated Patients With COVID-19 and Preexisting Cardiovascular Disease. Journal of the American Heart Association. 2023; 12(14):e028939. DOI:10.1161/JAHA.122.028939. PMID:37449568. IF:5,400 (Q2/3D). Document type: Article.
 - Bonfrate L, Di A, Khalil M, Farella I, Chirico R, Vilahur G, Portincasa P. Gender-dependent impact of COVID-19 lockdown on metabolic and psychological aspects. Internal and Emergency Medicine. 2023; 18(2)DOI:10.1007/s11739-022-03173-9. PMID:36703077. IF:4,600 (Q2/3D). Document type: Article.
 - Borrell M, Luquero A, Vilahur G, Padró T, Badimon L. Canonical Wnt pathway and the LDL receptor superfamily in neuronal cholesterol homeostasis and function. CARDIOVASCULAR RESEARCH. 2023; DOI:10.1093/cvr/cvad159. PMID:37882606. IF:10,800 (Q1/1D). Document type: Article.
 - Bugiardini R, Nava S, Caramori G, Yoon J, Badimon L, Bergami M, Cenko E, David A, Demiri I, Dorobantu M, Fronea O, Jankovic R, Kedev S, Ladjevic N, Lasica R, Loncar G, Mancuso G, Mendieta G, Milicic D, Mjehovic P, Pasalic M, Petrovic M, Poposka L, Scarpone M, Stefanovic M, van der Schaar M, Vasiljevic Z, Vavlukis M, Pittao MLV, Vukomanovic V, Zdravkovic M, Manfrini O. Sex differences and disparities in cardiovascular outcomes of COVID-19. CARDIOVASCULAR RESEARCH. 2023; 119(5)DOI:10.1093/cvr/cvad011. PMID:36651866. IF:10,800 (Q1/1D). Document type: Article.



05.1.1 Cardiovascular Diseases Area

- Charalampous P, Haagsma JA, Jakobsen LS, Gorasso V, Noguer I, Padron A, Sarmiento R, Santos JV, McDonald SA, Plass D, Wyper GMA, Assunção R, Von Der Lippe E, Ádám B, Alkerwi A, Arabloo J, Baltazar AL, Bikbov B, Borrell M, Brus I, Burazeri G, Chaintoutis SC, Chen J, Chkhaberidze N, Cilovic S, Corso B, Cuschieri S, Di C, Dopelt K, Economou M, Emeto TI, Fantke P, Fischer F, Freitas A, García JM, Gazzelloni F, Gissler M, Gkitakou A, Gulmez H, Gunes S, Haller S, Haneef R, Hincapié CA, Hynds P, Idavain J, Ilic M, Ilic I, Isola G, Kabir Z, Kamusheva M, Kolkhir P, Konar NM, Kostoulas P, Kulimbet M, La Vecchia C, Lauriola P, Levi M, Majer M, Mechili EA, Monasta L, Mondello S, Muñoz J, Nena E, Ng ESW, Nguewa P, Niranjana V, Nola IA, O'caomh R, Obradovic M, Pallari E, Peyroteo M, Pinheiro V, Pranjic N, Reina M, Riva S, Santoso CMA, Santric M, Schmitt T, Speybroeck N, Sprügel M, Steiropoulos P, Stevanovic A, Thygesen LC, Tozija F, Unim B, Bektas H, Varga O, Vasic M, Vieira RJ, Yigit V, Devleeschauwer B, Pires SM. Burden of infectious disease studies in Europe and the United Kingdom: a review of methodological design choices. *EPIDEMIOLOGY AND INFECTION*. 2023; 151:e19. DOI:10.1017/S0950268823000031. PMID:36621004. IF:4,200 (Q2/4D). Document type: Review.
- Cordero A, Fernández R, Badimon L, Santos CG, Castellano JM, Fácila L, Rodríguez M, Bonanad C, Vilahur G, Escribano D, Badimon JJ, González JR. The efficacy of intensive lipid-lowering therapies on the reduction of LDLc and of major cardiovascular events. *Journal of Clinical Lipidology*. 2023; 17(5)DOI:10.1016/j.jacl.2023.08.006. PMID:37775463. IF:4,400 (Q2/3D). Document type: Article.
- Cordero A, Munoz N, Padro T, Vilahur G, Bertomeu V, Escribano D, Flores E, Zuazola P, Badimon L. HDL Function and Size in Patients with On-Target LDL Plasma Levels and a First-Onset ACS. *INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES*. 2023; 24(6):5391. DOI:10.3390/ijms24065391. PMID:36982465. IF:5,600 (Q1/3D). Document type: Article.
- Davidson SM, Boulanger CM, Aikawa E, Badimon L, Barile L, Binder CJ, Brisson A, Buzas E, Emanueli C, Jansen F, Katsur M, Lacroix R, Lim SK, Mackman N, Mayr M, Menasché P, Nieuwland R, Sahoo S, Takov K, Thum T, Vader P, Wauben MHM, Witwer K, Sluijter JPG. Methods for the identification and characterization of extracellular vesicles in cardiovascular studies: from exosomes to microvesicles. *CARDIOVASCULAR RESEARCH*. 2023; 119(1)DOI:10.1093/cvr/cvac031. PMID:35325061. IF:10,800 (Q1/1D). Document type: Review.
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- Encinas LF, Lluch N, Wu A, Kaski JC, Badimon L, Cubedo J. A Novel ELISA for the Quantification of Serum Levels of 2 Glycosylated Variants of Apolipoprotein J: Biomarkers for Myocardial Ischemia. *Journal Of Applied Laboratory Medicine*. 2023; 8(5)DOI:10.1093/jalm/jfad034. PMID:37473435. Document type: Article.
- Gallinat A, Vilahur G, Padro T, Badimon L. Effects of Antioxidants in Fermented Beverages in Tissue Transcriptomics: Effect of Beer Intake on Myocardial Tissue after Oxidative Injury. *Antioxidants*. 2023; 12(5):1096. DOI:10.3390/antiox12051096. PMID:37237963. IF:7,000 (Q1/1D). Document type: Article.
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- Biology, and the International Society on Thrombosis and Haemostasis. *EUROPEAN HEART JOURNAL*. 2023; 44(32)DOI:10.1093/eurheartj/ehad388. PMID:37439553. IF:39,300 (Q1/1D). Document type: Article.
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 - López A, Padro T, Villaplana VD, Muñoz N, Pérez A, Vilahur G, Badimon L. Vascular and Platelet Effects of Tomato Soffritto Intake in Overweight and Obese Subjects. *Nutrients*. 2023; 15(24):5084. DOI:10.3390/nu15245084. PMID:38140343. IF:5,900 (Q1/2D). Document type: Article.
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Biomarkers for Cardiovascular Disease

Group leader

Padro Capmany, Teresa (IR)

Researchers

De Santisteban Villaplana, Victoria Marta (IR)

García Arguinzonis, Maisa Ines (IR)

Research Technicians

Gomez-Pardo Arellano, Montserrat (IR)



DESCRIPTION

The group's research focuses on the identification and characterization of molecular and cellular biomarkers of atherothrombosis and ischaemic heart disease with potential applications in prevention, diagnosis, risk stratification, and treatment. Research covers a range of cardiovascular diseases at both subclinical and clinical stages. It includes studies on tissue remodeling, inflammation, atherosclerosis, thrombosis, and risk factors. Biomarkers and potential therapeutic targets are investigated in animal models and clinical samples, and mechanistically in cell culture studies.

MAIN LINES OF RESEARCH

- Biomarkers and molecular targets of vascular remodeling in atherosclerosis progression, thrombosis, and subsequent ischemic events (Proteomic-based studies).
- Extracellular matrix and cardiac remodeling post-myocardial infarction.
- Circulating extracellular vesicles (microvesicles / exosomes) in subclinical and clinical cardiovascular diseases.
- Functional epigenomics (plasma and total blood non-coding RNAs): Novel biomarkers in cardiovascular diseases and special groups at high CVD risk (Familial Hypercholesterolemia).
- Lipidome and metabolome regulation in cardiovascular disease prevention.

SCIENTIFIC CHALLENGES

- Identify and characterize new biomarkers and molecular targets of tissue remodeling in athe-



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rosclerotic vessels and cardiac tissue post-myocardial infarction.

- Generate new information on circulating non-coding RNAs and extracellular vesicles (microvesicles /exosomes) due to their specific feature as carriers of non-coding RNAs (miRNA, lncRNAs) and proteins derived from the parental cells providing precise bioprints of defined pathophysiological scenarios and consequently being ideal biomarker candidates of disease evolution.
- The use of "omic" approaches and in silico studies to identify and characterize circulating biomarkers associated with cardiovascular disease, both in biological fluids (serum, plasma, urine) and carried by lipoproteins or microvesicles. Studies will include proteomic technologies based on liquid chromatography/bidimensional electrophoresis and mass spectrometry, lipidomic approaches using mass spectrometry coupled to ultra-performance liquid chromatography and nuclear magnetic resonance (NMR), transcriptomic studies (mRNA, non-coding RNA) based on array systems, next-generation sequencing, and real-time PCR.
- To validate novel biomarkers (proteins / non-coding RNAs) for prognosis and risk-stratification of cardiovascular diseases in clinical cohorts.
- Characterisation at the cellular level of molecular and functional mechanisms (gene and protein expression regulation, epigenetic regulation, sub-cellular distribution of proteins, paracrine effects, cell functions) for selected biomarkers/molecular targets in cardiovascular pathology and myocardial remodeling.

ACTIVE GRANTS

- Padro Capmany, Teresa. Identificación en la matriz extracelular post-infarto de moléculas estimulantes de regeneración cardiaca (MATRI-REG). PI22/01930. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2025. 171.820,00 €.
- Padro Capmany, Teresa. Reparación de la matriz estructural miocárdica en el corazón infartado: Papel regulador de la Adipsina, una proteína de inmunidad innata asociada al matrisoma de la matriz extracelular. PI19/01687. Instituto de Salud Carlos III (ISCIII). Duration: 2020-2023. 177.870,00 €.

- Padro Capmany, Teresa. TRANSBIOLINE: Translational Safety Biomarker Pipeline (TransBioLine): Enabling development and implementation of novel safety biomarkers in clinical trials and diagnosis of disease. TRANSBIOLINE 821283. Unión Europea. Duration: 2019-2024. 182.600,00 €.
- Padro Capmany, Teresa. COVIRNA: Medical technologies, digital tools and artificial intelligence analytics to improve surveillance and care at high technology readlines. COVIRNA 101016072. Unión Europea. Duration: 2020-2023. 273.943,00 €.
- Padro Capmany, Teresa. Efectos del probiótico "AB-Life" sobre la cantidad y perfil de ácidos biliares, y el perfil lipídico y metabólico en sujetos sanos con sobrepeso moderado. Non-competitive. AB-BIOTICS. Duration: 2020-2022. 277.052,00 €.

GRANTS AWARDED

- Padro Capmany, Teresa. Impact of lipoprotein molecular and functional composition and inflammation on ACVD clinical event presentation in familial hypercholesterolemia (LipoComp). 202329-10. Fundació La Marató de TV3. Duration: 2024-2027. 199.997,50 €

DOCTORAL THESES DEFENDED

- Vilella Figuerola, Alba. Circulating cell-derived extracellular vesicles and epigenetic small non-coding ribonucleic acids in chronic heart failure. 28/03/2023. Universitat Autònoma de Barcelona. Supervisors: Badimon Maestro, Lina; Padró Capmany, Teresa; Blanco Vaca, Francisco. <http://hdl.handle.net/10803/689764>

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- Cordero A, Munoz N, Padro T, Vilahur G, Bertomeu V, Escribano D, Flores E, Zuazola P, Badimon L. HDL Function and Size in Patients with On-Target LDL Plasma Levels and a First-Onset ACS. *INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES*. 2023; 24(6):5391. DOI:10.3390/ijms24065391. PMID:36982465. IF:5,600 (Q1/3D). Document type: Article.
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Regulation of Cardiac Rhythm and Contraction

Group leader

Hove-Madsen, Leif (CSIC)

Researchers

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Research Technicians

Aceituno Fernández, Cristina (CSIC)

Izquierdo Castro, Paloma (CSIC)



DESCRIPTION

The Cardiac Rhythm and Contraction Group has since its creation focused on identifying molecular and cellular electrophysiological mechanisms contributing to the development of cardiac arrhythmia, to improve risk prediction and identify novel disease-specific therapeutic targets. We are one of a few groups that use human atrial myocytes to study pathological alterations in cardiomyocyte function. Our primary goal is to identify key mechanisms underlying the alterations in calcium homeostasis and abnormal electrical activity that occur in atrial myocytes in patients with atrial fibrillation.

MAIN LINES OF RESEARCH

- Neuro-hormonal regulation of intracellular calcium homeostasis in cardiac myocytes.
- Impact of genetic variants on electrophysiological and contractile function in cardiac myocytes.
- Impact of clinical factors and circulating biomarkers on human atrial myocyte function.
- Development of computational tools for automated analysis of live-cell imaging experiments or protein distribution in large confocal image stacks.
- Development of detailed high-resolution mathematical myocyte models.

SCIENTIFIC CHALLENGES

The association of more than 140 single nucleotide polymorphisms (SNPs) with increased risk of atrial fibrillation over the past decade affords one of the biggest recent opportunities to make a substantial advance in risk stratification and personalized treatment of atrial fibrillation.



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The challenge is the vast number of SNPs, each associated with a modest increase in risk and unknown impact on function.

Our opportunity is to identify SNP combinations causing synergic derangements in human atrial myocyte function and a corresponding increase in the risk of atrial fibrillation.

ACTIVE GRANTS

- Hove-Madsen, Leif. Impact of Genetic and Clinical Risk on Molecular Signaling and Electrophysiological Dysfunction in Atrial Fibrillation (GenRiskAF) (2 sub-project). PID2020-116927RB-C21. Duration: 2021-2024. 181.500,00 € (CSIC).

DOCTORAL THESES DEFENDED

- Casabella Ramón, Sergi. Alteraciones en la homeostasis del calcio y la actividad eléctrica que se asocian con la fibrilación auricular en miocitos auriculares humanos y un modelo porcino de infarto auricular. 01/12/2023. Universitat Autònoma de Barcelona. Supervisors: Hove Madsen, Leif; Jiménez Farrerons, Marcel.

SCIENTIFIC PRODUCTION

- Amorós G, Casabella S, Company G, Arzamendi D, Jorge E, García A, Macías Y, Sánchez D, Rosell J, Guerra JM, Cinca J. Electrophysiological and histological characterization of atrial scarring in a model of isolated atrial myocardial infarction. *Frontiers in Physiology*. 2023; 13:1104327. DOI:10.3389/fphys.2022.1104327. PMID:36714312. IF:4,000 (Q2/3D). Document type: Article.
- Amorós G, Casabella S, Moreno Z, Ivorra A, Guerra JM, García T. Dynamics of High-Density Unipolar Epicardial Electrograms During PFA. *Circulation-Arrhythmia and Electrophysiology*. 2023; 16(9):e011914. DOI:10.1161/CIRCEP.123.011914. PMID:37577822. IF:8,400 (Q1/2D). Document type: Article.
- Franco D, Hove L, Daimi H. Editorial: Molecular, structural and electrophysiological remodeling in atrial fibrillation. *Frontiers in Physiology*. 2023; 14:1303328. DOI:10.3389/fphys.2023.1303328. PMID:37900957. IF:4,000 (Q2/3D). Document type: Editorial Material.
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- Jimenez V, Casabella S, Llach A, Gich I, Casellas S, Ciruela F, Chen SRW, Guerra JM, Ginel A, Benitez R, Cinca J, Tarifa C, Hove L. Beta-blocker treatment of patients with atrial fibrillation attenuates spontaneous calcium release-induced electrical activity. *BIOMEDICINE & PHARMACOTHERAPY*. 2023; 158:114169. DOI:10.1016/j.biopha.2022.114169. PMID:36592495. IF:7,500 (Q1/1D). Document type: Article.
- Ni MK, Li YH, Wei JH, Song ZP, Wang H, Yao JJ, Chen YX, Belke D, Estillore JP, Wang RW, Vallmitjana A, Benitez R, Hove L, Feng W, Chen J, Roston TM, Sanatani S, Lehman A, Chen SRW. Increased Ca²⁺ Transient Underlies RyR2-Related Left Ventricular Noncompaction. *CIRCULATION RESEARCH*. 2023; 133(2)DOI:10.1161/CIRCRESAHA.123.322504. PMID:37325910. IF:20,100 (Q1/1D). Document type: Article.
- Puertas L, Alonso J, Hove L, Martínez J, Rodríguez C. PDE4 Phosphodiesterases in Cardiovascular Diseases: Key Pathophysiological Players and Potential Therapeutic Targets. *INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES*. 2023; 24(23):17017. DOI:10.3390/ijms242317017. PMID:38069339. IF:5,600 (Q1/3D). Document type: Review.
- Tarifa C, Jimenez V, Franco R, Montiel J, Guerra J, Ciruela F, Hove L. Expression and Impact of Adenosine A(3) Receptors on Calcium Homeostasis in Human Right Atrium. *INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES*. 2023; 24(5):4404. DOI:10.3390/ijms24054404. PMID:36901835. IF:5,600 (Q1/3D). Document type: Article.
- Tarifa C, Serra SA, Herraiz A, Lozano E, Benitez R, Aranega A, Franco D, Hove L. Pitx2c deficiency confers cellular electrophysiological hallmarks of atrial fibrillation to isolated atrial myocytes.



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BIOMEDICINE & PHARMACOTHERAPY. 2023; 162:114577. DOI:10.1016/j.biopha.2023.114577. PMID:37001181. IF:7,500 (Q1/1D). Document type: Article.

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Lipids and Cardiovascular Pathology

Group leader

Llorente Cortés, Concepción Vicenta (CSIC)

Researchers

Benitez Amaro, Aleyda (CSIC)

Bosch Rue, Èlia (UAB)

García Rodríguez, Jesus Eduardo (IR)

La Chica Lhoest, Maria Teresa (CSIC)

Research Technicians

Martinez Jimenez, Andrea (IR)



DESCRIPTION

Our group focuses its activity on the cardiovascular area, and on the study of the mechanisms related to the impact of modified lipoproteins on the functional alterations of vascular and cardiac cells. We have identified new molecular mechanisms underlying the abnormal cholesteryl ester accumulation in intracellular suborganelle, as well as the pathological consequences for cardiac function. We have identified new peptide and omics biomarkers with diagnostic and prognostic value in cardiovascular diseases, and we are currently developing innovative treatments potentially transferable to humans.

MAIN LINES OF RESEARCH

- Identification of new connecting axes of cardiac and hepatic functionality and their consequences in the regulation of metabolism and body weight.
- Applicability of LRP1-based assets for the treatment of pancreatic cancer.
- Development of innovative LRP1-based peptides against Tau fibrillation.
- Development of humanized anti-LRP1 monoclonal antibodies to comprehensively block atherosclerosis and heart failure.
- Integration of clinical, and experimental data (in vitro and in vivo models) and modeling to improve the prediction of atherosclerotic plaque progression towards clinical events.

SCIENTIFIC CHALLENGES

- To develop new peptides with efficiency against Tau fibrillation in the brain.



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- To develop a monoclonal antibody with efficacy to block heart failure onset and progression.
- To find new circulating biomarkers with predictive value for atherosclerotic plaque progression towards clinical events.
- To identify new dyslipidemia-related mechanisms involved in pancreatic cancer progression.

ACTIVE GRANTS

- Llorente Cortés, Concepción Vicenta. The role of ABCB10 posttranslational modifications in cardiovascular disease. Proyectos BBQ-CSIC 2022. Duration: 2022-2023. 10.000,00 € (IIBB-CSIC).
- Llorente Cortés, Concepción Vicenta. Differential LRP1 interactome in Foam Vascular Smooth Muscle cells as a source of coronary risk biomarkers in liquid biopsy. PI21/01523. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 214.170,00 € (IIBB-CSIC).
- Llorente Cortés, Concepción Vicenta. Translational Molecular Imaging for Detection of Cholesterol Entrapment in the Vasculature with ⁶⁸Ga-labeled LRP1-derived Peptides (PlaqueCHOL). BBVA 2019. Fundación BBVA. Duration: 2020-2023. 125.000,70 €.

GRANTS AWARDED

- Llorente Cortés, Concepción Vicenta i Belbin, Olivia. LRP1-based peptides as an anti-Tau therapeutic strategy for neurodegenerative diseases (PepTau). INN00061. Fundació Privada HSCP (INNOPAU). Duration: 2024-2026. 50.000,00 €.

SCIENTIFIC PRODUCTION

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- García E, Camps P, Puig N, Fernández A, Aguilera A, Benitez A, Solé A, Vilades D, Sánchez JL, Martí J, Jiménez E, Benitez S, Llorente V. Soluble low-density lipoprotein receptor-related protein 1 as a surrogate marker of carotid plaque inflammation assessed by ¹⁸F-FDG PET in patients with

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- Samouillan V, García E, Benitez A, Lhoest MTL, Dandurand J, Dato VA, Guerra JM, Escola JC, Chiabrando G, Enrich C, Llorente V. Inhibitory Effects of LRP1-Based Immunotherapy on Cardiac Extracellular Matrix Biophysical Alterations Induced by Hypercholesterolemia. *JOURNAL OF MEDICINAL CHEMISTRY*. 2023; 66(9)DOI:10.1021/acs.jmedchem.2c02103. PMID:37116069. IF:7,300 (Q1/1D). Document type: Article.
- Soler MC, Romero MD, Todorovic M, Delgado K, Calatayud C, Benitez A, Lhoest MTL, Mera P, Zagmutt S, Bastias M, Ibeas K, Casals N, Escola JC, Llorente V, Consiglio A, Serra D, Herrero L. Implantation of CPT1AM-expressing adipocytes reduces obesity and glucose intolerance in mice. *METABOLIC ENGINEERING*.



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type: Article.

Genomics of Complex Diseases

Group leader

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Researchers

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Uribezubia Azpitarte, Ager (IR)

Vega Mendez, Anton (IR)



DESCRIPTION

Our group is focused on the acquisition, management, and analysis of multi-omics data and its integration with clinical and biological data for the identification of new biomarkers and the generation of risk prediction models to facilitate clinical decision-making in patients with vascular diseases (venous and arterial thrombosis and aneurysms). Also, to the study of biological processes in healthy people exposed to conditions of physiological stress (such as extreme sports). Our multidisciplinary team (Basic/Clinic) has a molecular biology laboratory, including functional analysis and cell cultures, that allows the control of the entire workflow of the process: from the generation of samples and data to the analysis and interpretation of the results.

MAIN LINES OF RESEARCH

- Venous Thrombosis. Led by Dr. José Manuel Soria.
- Angiology and Vascular Biology. Led by Dra. Mercedes Camacho.
- Genomics of Arterial Vascular Disease. Led by Dra. Maria Sabater-Lleal.
- Genomics in Sport Medicine. Led by Dr. José Manuel Soria.
- Interdisciplinary Areas of Bioinformatics and multi-omics Data. Led by Dr. José Manuel Soria.

SCIENTIFIC CHALLENGES

- Analysis of Omics data (Genomics, transcriptomics, epigenomics) in the field of complex diseases with a translational approach in cooperation with clinical groups.



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- Identify new biomarkers (genetic, epigenetic and/or plasmatic) that determine susceptibility to complex diseases.
- Identify new mechanisms involved in the development and progression of complex traits (susceptibility to complex diseases and to healthy status).
- Development of predictive algorithms that integrate the genetic, biological, and clinical information of the patients (Personalized Medicine).
- Development of computational tools based on mathematical models of artificial intelligence for modeling of diseases and physiological processes and patient virtualization from real data.
- Soria Fernández, José Manuel. Un enfoque genómico de e-Health en la trombosis asociada al cáncer (Proyecto ONCOTHROMB_2). PI20/00325. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2023. 159.720,00 €.
- Soria Fernández, José Manuel. IMPaCT-DATA (IMP/00019) Programa de Ciencia de Datos "Infraestructura de datos para Medicina Personalizada". IMP/00019. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2023. 21.633,33 €.
- Soria Fernández, José Manuel. UNITAT DE GENOMICA DE MALALTIES COMPLEXES. 2022 INV-1 00048. Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR). Duration: 2022-2024. 66.217,84 €.

ACTIVE GRANTS

- Camacho Perez, Maria Mercedes. Descifrando los mecanismos moleculares subyacentes a la formación del aneurisma de aorta: el estrés del retículo endoplásmico y el estrés oxidativo mitocondrial como nuevas dianas terapéuticas. PI20/01004. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2024. 145.200,00 €.
- Lobato Delgado, Barbara. Contratos predoctorales PFIS 2021. FI21/00197. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2025. 89.900,00 €.
- Sabater Lleal, Maria. Contratos Miguel Servet I 2017. CP17/00142. Instituto de Salud Carlos III (ISCIII). Duration: 2018-2023. 202.500,00 €.
- Sabater Lleal, Maria. Contratos Miguel Servet II 2022. CPII22/00007. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2025. 101.250,00 €.
- Sabater Lleal, Maria. Nuevo enfoque ómico para predecir el crecimiento y la rotura del aneurisma aórtico abdominal. PID2019-109844RB-I00. Ministerio de Ciencia e Innovación (MICINN). Duration: 2020-2024. 133.100,00 €.
- Sabater Lleal, Maria. Population genomic variation, functional biology and the risk of venous thrombosis. NIH WASHINGTON 5R01HL134894-02. University of Washington. Duration: 2018-2023. 76.985,85 €.
- Sabater Lleal, Maria. Structural and Nucleotide Variation as Genomic Risks for Venous Thrombosis: TOPMED and INVENT Collaboration. R01HL154385. NIH. Duration: 2022-2024. 21.570,85 €.
- Soria Fernández, José Manuel. Desarrollo y validación de una nueva tecnología de análisis de datos transcriptómicos basada en IA para optimizar el seguimiento y tratamiento personalizado de pacientes con sobrepeso y obesidad. CPP2021-008423. Ministerio de Ciencia e Innovación (MICINN). Duration: 2022-2025. 265.248,90 €.
- Temprano Sagrera, Gerard. Nuevo enfoque ómico para predecir el crecimiento y la rotura del aneurisma aórtico abdominal. SLT017/20/000100. Departament de Salut Generalitat de Catalunya. Duration: 2021-2023. 90.579,14 €.

GRANTS AWARDED

- Soria Fernández, José Manuel. Genomics of Complex Diseases. 2021 SGR 00830. Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR). Duration: 2022-2024. 60.000 €.

DOCTORAL THESES DEFENDED

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SCIENTIFIC PRODUCTION

- Gené A, Casasa A, Puig T, de La Figuera M, Jimenez MJ, Fité J, Roman J, Bellmunt S. Normal Infra renal Aortic Diameter in Men and



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Women in a Mediterranean Area. *ANNALS OF VASCULAR SURGERY*. 2023; 92:DOI:10.1016/j.avsg.2022.12.087. PMID:36639098. IF:1,500 (Q3/8D). Document type: Article.

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- Iglesias MJ, Sánchez L, Ibrahim M, Naudin C, Munsch G, Goumidi L, Farm M, Smith PM, Thibord F, Kral JB, Hong M-G, Suchon P, Germain M, Schottmaier W, Dusart P, Boland A, Kotol D, Edfors F, Koprulu M, Pietzner M, Langenberg C, Damrauer SM, Johnson AD, Klarin DM, Smith NL, Smadja DM, Holmström M, Magnusson M, Silveira A, Uhlén M, Renné T, Martinez A, Emmerich J, Deleuze J-F, Antovic J, Soria JM, Assinger A, Schwenk JM, Souto JC, Morange P-E, Butler LM, Trégouët D-A, Odeberg J. Elevated plasma complement factor H related 5 protein is associated with venous thromboembolism. *Nature Communications*. 2023; 14(1):3280. DOI:10.1038/s41467-023-38383-y. PMID:37286573. IF:16,600 (Q1/1D). Document type: Article.
- Ji YK, Temprano G, Holle LA, Bebo A, Brody JA, Le NQ, Kangro K, Brown MR, Martinez A, Sitlani CM, Suchon P, Kleber ME, Emmert DB, Ozel AB, Dobson DA, Tang WH, Llobet D, Tracy RP, Deleuze JF, Delgado GE, Gogele M, Wiggins KL, Souto JC, Pankow JS, Taylor KD, Tregouet DA, Moissl AP, Fuchsberger C, Rosendaal FR, Morrison AC, Soria JM, Cushman M, Morange PE, Marz W, Hicks AA, Desch KC, Johnson AD, de Vries PS, Wolberg AS, Smith NL, Sabater M, INVENT C, CHARGE Consortium Hemostasis W, INVENT C. Anti-thrombin, Protein C, and Protein S: Genome and Transcriptome-Wide Association Studies Identify 7 Novel Loci Regulating Plasma Levels. *ARTERIOSCLEROSIS THROMBOSIS AND VASCULAR BIOLOGY*. 2023; 43(7):e254-e269. DOI:10.1161/ATVBAHA.122.318213. PMID:37128921. IF:8,700 (Q1/1D). Document type: Article.
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- León X, Bague S, Holgado A, Quer M, Terra X, Camacho M, Avilés FX. Relationship between transcriptional expression of pyruvate dehydrogenase and local control of disease in patients with oral cavity carcinomas. *Acta Otorrinolaringologica Española*. 2023; 74(6):DOI:10.1016/j.otorri.2023.05.001. Document type: Article.
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- Martín L, García I, López S, Martínez A, Vilalta N, Plaza M, Moret C, Vinuela A, Brown AA, Panousis NI, Buil A, Dermitzakis ET, Corrales I, Souto JC, Vidal F, Soria JM. Multiallelic Copy Number Variation in ORM1 is Associated with Plasma Cell-Free DNA Levels as an Intermediate Phenotype for Venous Thromboembolism. *THROMBOSIS AND HAEMOSTASIS*. 2023; 123(04) DOI:10.1055/s-0043-1760844. PMID:36696913. IF:6,700 (Q1/2D). Document type: Article.
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- Muñoz A, Salas E, Soria JM. Reply to FI Mulder et al. *JOURNAL OF CLINICAL ONCOLOGY*. 2023; 41(36)DOI:10.1200/JCO.23.00817. PMID:37816210. IF:45,300 (Q1/1D). Document type: Letter.
- Muñoz AJ, Ortega L, Gutiérrez A, Gallardo E, Rubio D, Rubio C, Morón B, García P, Soria JM. Cost-effectiveness of apixaban and rivaroxaban in thromboprophylaxis of cancer patients treated with chemotherapy in Spain. *JOURNAL OF MEDICAL ECONOMICS*. 2023; 26(1)DOI:10.1080/13696998.2023.2248839. PMID:37602646. IF:2,400 (Q3/6D). Document type: Article.
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- Puig N, Rives J, Estruch M, Aguilera A, Rotllan N, Camacho M, Colomé N, Canals F, Sánchez JL, Benitez S. Presence of Ceramidase Activity in Electronegative LDL. *INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES*. 2023; 24(1):165. DOI:10.3390/ijms24010165. PMID:36613609. IF:5,600 (Q1/3D). Document type: Article.
- Rodríguez A, Tello C, Vergara AC, Fernández C, Moustafa AH, Pinilla CA, Ginel A, Barros AJ, Dilme JF. Case Report: Kommerell's diverticulum and left aberrant subclavian artery stenosis hybrid treatment with branched aortic stent-graft. *Frontiers in Cardiovascular Medicine*. 2023; 10:1309839. DOI:10.3389/fcvm.2023.1309839. PMID:38155991. IF:3,600 (Q2/5D). Document type: Article.
- Roychowdhury T, Klarin D, Levin MG, Spin JM, Rhee YH, Deng A, Headley CA, Tsao NL, Gellatly C, Zuber V, Shen F, Hornsby WE, Laursen IH, Verma SS, Locke AE, Einarsson G, Thorleifsson G, Graham SE, Dikilitas O, Pattee JW, Judy RL, Pauls F, Nielsen JB, Wolford BN, Brumpton BM, Dilmé J, Peypoch O, Juscafresa LC, Edwards TL, Li D, Banasik K, Brunak S, Jacobsen RL, García MT, Zhang J, Rasmussen LM, Lee R, Handa A, Wanhainen A, Mani K, Lindholt JS, Obel LM, Strauss E, Oszkinis G, Nelson CP, Saxby KL, van JA, van der Laan SW, van J, Camacho M, Davis FM, Wasikowski R, Tsoi LC, Gudjonsson JE, Eliason JL, Coleman DM, Henke PK, Ganesh SK, Chen YE, Guan W, Pankow JS, Pankratz N, Pedersen OB, Erikstrup C, Tang W, Hveem K, Gudbjartsson D, Gretarsdottir S, Thorsteinsdottir U, Holm H, Stefansson K, Ferreira MA, Baras A, Kullo IJ, Ritchie MD, Christensen AH, Iversen KK, Eldrup N, Sillesen H, Ostrowski SR, Bundgaard H, Ullum H, Burgess S, Gill D, Gallagher K, Sabater M, Dudbridge F, Samani NJ, Surakka I, Jones GT, Bown MJ, Tsao PS, Willer CJ, Damrauer SM. Genome-wide association meta-analysis identifies risk loci for abdominal aortic aneurysm and highlights PCSK9 as a therapeutic target. *NATURE GENETICS*. 2023; DOI:10.1038/s41588-023-01510-y. PMID:37845353. IF:30,800 (Q1/1D). Document type: Article.
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- Tello C, Romero JM, Soto B, Moreno J, Aloy C, Dilmé JF. Type Ib endoleak repaired with a thoracic endovascular graft inside previous visceral debranching bypass in a patient with chronic type B aortic dissection. *Journal Of Vascular Surgery Cases, Innovations And Techniques*. 2023; 9(2):101186. DOI:10.1016/j.jvscit.2023.101186. PMID:37305360. Document type: Case Reports.



05.1.1 Cardiovascular Diseases Area

- Torres JK, Niño J, Martínez P, Diarte EMG, Méndez KA, del Olmo TV, Rotllan N, Julián MT, Alonso N, Mauricio D, Camacho M, Muñoz JP, Rossell J, Julve J. Nicotinamide Prevents Diabetic Brain Inflammation via NAD⁺-Dependent Deacetylation Mechanisms. *Nutrients*. 2023; 15(14):3083. DOI:10.3390/nu15143083. PMID:37513501. IF:5,900 (Q1/2D). Document type: Article.
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- Ward J, Le NQ, Suryakant S, Brody JA, Amouyel P, Boland A, Bown R, Cullen B, Debette S, Deleuze JF, Emmerich J, Graham N, Germain M, Anderson JJ, Pell JP, Lyall DM, Lyall LM, Smith DJ, Wiggins KL, Soria JM, Souto JC, Morange PE, Smith NL, Trégouët DA, Sabater M, Strawbridge RJ. Polygenic risk of major depressive disorder as a risk factor for venous thromboembolism. *Blood Advances*. 2023; 7(18)DOI:10.1182/bloodadvances.2023010562. PMID:37399490. IF:7,500 (Q1/2D). Document type: Article.

Regulatory Mechanisms of Cardiovascular Remodelling

Group leader

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Researchers

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Alonso Nieto, Judith (CIBER)

Ballester Servera, Carme (CSIC)

Martinez Gonzalez, Jose (CSIC)

Puertas Umbert, Lidia (IR)

Vazquez Sufuentes, Paula (CSIC)

Research Technicians

Aguilo Nuñez, Silvia (IR)

Blanco Casoliva, Laia (CSIC)



DESCRIPTION

Our group addresses different aspects of vascular biology, thrombosis, and myocardial pathophysiology aimed at studying the mechanisms underlying the onset, progression, and complication of cardiovascular diseases (CVDs) with high morbidity and mortality, such as atherosclerosis, aortic aneurysms, cardiac hypertrophy, and myocardial infarction. Our ultimate goal is to develop tools for early diagnosis and new therapeutic strategies for these diseases.

MAIN LINES OF RESEARCH

- L1. Extracellular matrix (ECM) integrating and modifying proteins in CVDs (PI: Dr. C. Rodríguez).
- L2. The nuclear receptor NOR-1 in coronary artery disease, abdominal aortic aneurysm (AAA) and cardiac function, and remodeling after myocardial infarction (PI: Dr. J. Martínez-González).

SCIENTIFIC CHALLENGES

- Analysis of the molecular basis of abdominal aortic aneurysm: Identification of new therapeutic targets.
- Physiopathological mechanisms underlying the development of thoracic aortic aneurysm in syndromic patients.
- Identification of new biomarkers and therapeutic targets in hypertensive cardiac hypertrophy and myocardial infarction.
- Analysis of the molecular mechanisms underlying cardiovascular calcification.
- Identification and validation of novel pharmacological tools in cardiovascular diseases.



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- Development and characterization of new animal models in cardiovascular diseases.

ACTIVE GRANTS

- Ballester Servera, Carme. Ayuda de formación de profesorado Universitario. FPU19/05257. Ministerio de Educación Cultura Y Deporte. Duration: 2020-2024. 89.286,00 € (CSIC).
- Martinez Gonzalez, Jose. El receptor nuclear NOR-1 en la homeostasis del calcio, el estrés oxidativo y la arritmogénesis cardíaca. Fundación Española del Corazón (FEC)-Sociedad Española de Cardiología (SEC). Duration: 2022-2026. 15.000,00 € (CIBER).
- Martinez Gonzalez, Jose. El enzima lisil oxidasa (LOX) en la aterosclerosis y la calcificación: estudio en un modelo de aterosclerosis experimental y en válvulas aórticas humanas calcificadas. Fundación Española de Arteriosclerosis (FEA)- Sociedad Española de Arteriosclerosis (SEA). Duration: 2022-2025. 15.000,00 €.
- Martinez Gonzalez, Jose. Deciphering the role of NOR-1 in abdominal aortic aneurysm progression, cardiac arrhythmogenesis, and cardiac function and remodeling after myocardial infarction (NORemolCar) (PID2021-122509OB-I00). MICIN. Duration: 2022-2025. 242.000,00 € (CSIC).
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- Rodríguez Sinovas, Cristina. Descifrando el potencial de LOX y de la proteína matricelular TSP4 como nuevas dianas terapéuticas en la aterosclerosis y el aneurisma de aorta abdominal. PI21/01048. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 226.270,00 €.
- Rodríguez Sinovas, Cristina. Impacto del ácido bempedoico sobre la inflamación y el remodelado vascular en el aneurisma aórtico abdominal. Un estudio de reposicionamiento terapéutico. F. EUGENIO RODRÍGUEZ PASCUAL 2022. Fundación Eugenio Rodríguez Pascual. Duration: 2023-2024. 24.990,00 €.

GRANTS AWARDED

- Martinez Gonzalez, Jose. RESolution of inflammation after myocardial injury through Targeting

novel regulatory molecules. Fundació La Marató de TV3. Duration: 2024-2027. 150.000,00 € (CSIC).

- Martinez Gonzalez, Jose. Inflammation and Cardiovascular Damage in Lung Cancer: Studying the Role of Immunomodulatory Therapies in Reducing Cardiotoxicity and Vascular Injury. InCaRe Intramural project CIBERONC/CIBERCV called 2023. 65.000,00 € (CIBER).

DOCTORAL THESES DEFENDED

- Ballester Servera, Carme. Mecanismos de remodelado y calcificación cardiovascular: papel del receptor nuclear NOR-1 y la LOX. 16/10/2023. Universitat de Barcelona. Supervisors: Martínez González, José; Rodríguez Sinovas, Cristina; Tauler Girona, Albert. <http://hdl.handle.net/10803/689493>.

SCIENTIFIC PRODUCTION

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 - Navas M, Almendra R, Puertas L, Jimenez F, Julve J, Perez B, Consegal M, Kassan M, Martinez J, Rodríguez C, Galan M. Targeting mitochondrial stress with Szeto-Schiller 31 prevents experimental abdominal aortic aneurysm: Crosstalk with endoplasmic reticulum stress. *BRITISH JOURNAL OF PHARMACOLOGY*. 2023; 180(17). DOI:10.1111/bph.16077. PMID:36964990. IF:7,300 (Q1/1D). Document type: Article.
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Pathophysiology of Lipid-related Disease

Group leader

Escola Gil, Joan Carles (IR)
Blanco Vaca, Francisco (FGS) until 2023/02/02

Researchers

Blanco Vaca, Francisco (FGS)
Borras Querol, Carla (IR)
Canyelles Vich, Marina (FGS)
Illana Camara, Francisco Jose (FGS)
Muñoz Neculman, Juan Pablo (CIBER)
Revilla Senra, Giovanna (IR)
Rotllan Vila, Noemi (IR)
Sole Galvez, Arnau (CIBER)
Tondo Colomer, Mireia (FGS)

Research Technicians

Griñan Gonzalez, Raquel (IR)
Martinez Figueroa, Susana (FGS)
Roig Martinez, Rosa (FGS)
Santos Palacios, David (CIBER)



DESCRIPTION

The Pathophysiology of Lipid-Related Diseases Group is an interdisciplinary and translational research team that primarily focuses on lipoprotein metabolism and dyslipidemias. These disorders are causally linked to atherosclerotic cardiovascular disease and are closely associated with the development of type 2 diabetes, metabolic syndrome, Alzheimer's disease, and certain forms of cancer. Our research aims to identify novel, potentially targeted therapies and biomarkers related to lipid abnormalities in the aforementioned diseases, to improve diagnosis and patient management.

MAIN LINES OF RESEARCH

- Lipoprotein metabolism variations, focusing on HDL and remnant lipoproteins, and their links to atherosclerotic cardiovascular disease, type 2 diabetes, and specific cancers. Emphasis on lipoprotein functions as novel prognostic biomarkers (Joan Carles Escolà Gil and Marina Canyelles Vich).
- New microRNAs as determinants of metabolic pathways related to homocysteine and as regulators of lipoprotein metabolism and atherosclerosis progression, as well as their therapeutic use in vivo (Noemí Rotllan).
- Diagnosis and molecular characterization of metabolic disorders, mainly of endocrinological or metabolic nature. The optimization and validation of analysis methods for conducting these studies have been carried out in our laboratory through innovation activities (Francisco Blanco Vaca and Mireia Tondo).



05.1.1 Cardiovascular Diseases Area

- Lipid-related biomarkers for the diagnosis of neurodegenerative diseases such as Alzheimer's disease, Parkinson's disease, and other dementias. This line is relatively new and specific to Dr. Mireia Tondo, who collaborates regularly with the Memory Unit of the Neurology Service of our hospital.
- García Rodríguez, Jesus Eduardo. Formación de Personal Universitario. FPU21/01173. Ministerio de Universidades. Duration: 2022-2026. 74.857,00 €.
- Illana Camara, Francisco Jose. Desarrollo de un método de detección de ADN libre circulante metilado para la detección de cáncer colorrectal. SEQC 2022. Fundación José Luis Castaño. Duration: 2022-2023. 6.000,00 €.

SCIENTIFIC CHALLENGES

- Investigate if PCSK9 antibodies correct HDL dysfunction in familial hypercholesterolemia.
- Explore HDL-associated miRNAs' role in coronary heart disease and assess vascular effects of miRNA-enriched sHDL nanoparticles.
- Examine CSF HDL-like lipoproteins from Alzheimer's disease patients for their ability to promote cholesterol efflux in astrocytes and mediate cholesterol delivery in neurons.
- Assess blood biomarkers' diagnostic accuracy for Alzheimer's disease pathophysiology on an automated platform and CSF biomarkers' for Parkinson's disease through RT-QulC.
- Evaluate vascular smooth muscle cells 'cholesterol efflux pathways' contribution to atherosclerosis progression.
- Julve Gil, Josep. Therapeutic potential of nicotine supplement on adiposity, impaired insulin signaling and non-alcoholic liver fatty disease severity. PI2100770. Instituto de Salud Carlos III (ISCIII). 2022-2024. 122.210,00 €.
- Revilla Senra, Giovanna. TMAO y su relación con la disfuncionalidad de HDL y el riesgo de enfermedad coronaria en pacientes con hipercolesterolemia familiar y diabetes tipo 2. FI19/00007. Instituto de Salud Carlos III (ISCIII). Duration: 2020-2023. 82.400,00 €.
- Rotllan Vila, Noemi. Potenciales microRNAs como nuevas dianas terapéuticas en la arteriosclerosis relacionada con hiperhomocisteinemia. PID2019-104367RB-I00. Ministerio de Ciencia e Innovación (MICINN). Duration: 2020-2023. 96.800,00 €.
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ACTIVE GRANTS

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- Borrás Querol, Carla. Formación de Personal Universitario. FPU21/01173. Ministerio de Universidades. Duration: 2021-2025. 74.156,00 €.
- Canyelles Vich, Marina. Juan Rodés. JR22/00003. Instituto de Salud Carlos III (ISCIII) Duration: 2023-2026. 180.000,00 €.
- Escola Gil, Juan Carlos. Adiposidad, inflamación y la desregulación del colesterol en el carcinoma de tiroides. Evaluación de estrategias terapéuticas basadas en la reducción del colesterol y la activación de LXR. PI19/00136. Instituto de Salud Carlos III (ISCIII). Duration: 2020-2024. 111.320,00 €.

GRANTS AWARDED

- Canyelles Vich, Marina; Escolà Gil, Joan Carles. Impacto de las lipoproteínas remanentes y HDL en el riesgo cardiovascular: evaluación de biomarcadores predictivos en el estudio prospectivo Di@bet.es y un estudio longitudinal en sujetos con diabetes tipo 2. Competitiu. Expedient: PI23/00232. Instituto de Salud Carlos III. Duration: 2024-2026. 165.000,00 €.
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DOCTORAL THESES DEFENDED

- Revilla Senra, Giovanna. Action of cholesterol, 27-hydroxycholesterol and adipose tissue in Thyroid Cancer. 22/12/2023. Universitat Autònoma de Barcelona. Supervisors: Escolà Gil, Joan Carles; Mató Matute, Eugènia.
- Gallinat O'Callaghan, Alex. Molecular basis of ischemic post-conditioning: DJ-1 in cardioprotection. 30/01/2023. Universitat Autònoma de Barcelona. Supervisors: Badimon Maestro, Lina; Blanco Vaca, Francisco. <http://hdl.handle.net/10803/688588>
- Vilella Figuerola, Alba. Circulating cell-derived extracellular vesicles and epigenetic small non-coding ribonucleic acids in chronic heart failure. 28/03/2023. Universitat Autònoma de Barcelona. Supervisors: Badimon Maestro, Lina; Padró Capmany, Teresa; Blanco Vaca, Francisco. <http://hdl.handle.net/10803/689764>

SCIENTIFIC PRODUCTION

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- Canyelles M, Blanco F, Pérez A, Escolà JC. Comment on Huh et al. Remnant Cholesterol Is an Independent Predictor of Type 2 Diabetes: A Nationwide Population-Based Cohort Study. *Diabetes Care* 2023;46:305-312. *DIABETES CARE*. 2023; 46(10):e203. DOI:10.2337/dc23-0774. PMID:37729500. IF:16,200 (Q1/1D). Document type: Letter.
- Canyelles M, Borràs C, Rotllan N, Tondo M, Escolà JC, Blanco F. Gut Microbiota-Derived TMAO: A Causal Factor Promoting Atherosclerotic Cardiovascular Disease?. *INTERNATIONAL JOURNAL*

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- Ferrer R, Mansilla A, Tondo M, Blanco F. Remnant cholesterol: new outcomes highlight its potential as a clinically useful cardiovascular risk factor. *Journal Of Laboratory And Precision Medicine*. 2023; 8:A5. DOI:10.21037/jlpm-22-70. Document type: Note.
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- García A, Muñoz LG, Pallaruelo MC, Usero AM, Eduardo BC, Ramos JL, Canyelles M, Brú CM, Cámara F. Characterization of add-on testing before and after automation at a core laboratory. *Heliyon*. 2023; 9(11):e22096. DOI:10.1016/j.heliyon.2023.e22096. PMID:38034602. IF:4,000 (Q2/4D). Document type: Article.
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 - Nan MN, García A, Mora J, Trilla C, Antonijuan A, Orantes V, Cruz M, Blanco F, Llorba E. Impact of Angiogenic and Cardiovascular Biomarkers for Prediction of Placental Dysfunction in the First Trimester of Pregnancy. *Biomedicines*. 2023; 11(5):1327. DOI:10.3390/biomedicines11051327. PMID:37238997. IF:4,700 (Q1/3D). Document type: Article.
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 - Rossi G, Belmonte T, Rivas A, Benitez S, Rotllan N, Crespo J, Llorente V, Sánchez JL, de Gonzalo D. Circulating lipoprotein-carried miRNome analysis reveals novel VLDL-enriched microRNAs that strongly correlate with the HDL-microRNA profile. *BIOMEDICINE & PHARMACOTHERAPY*. 2023; 162:114623. DOI:10.1016/j.biopha.2023.114623. PMID:37023624. IF:7,500 (Q1/1D). Document type: Article.
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5.1.2 Oncohematologic Diseases Area



Javier Briones
Area Director

A broad range of translational cancer research is conducted in this area, particularly in sarcomas, head-and-neck, breast, ovarian, endometrial, colorectal, and hematological cancers, among others. Research covers a wide range of fields, with disciplines that include from genetic research on cancer susceptibility syndromes to advanced therapies such as those based on targeted drug delivery with nanoparticles, preclinical development of new anticancer agents with disease-specific mouse models, immunotherapy with CAR-T cells, gene therapy, drug repurposing, and predictive molecular markers. Next-generation sequencing approaches are developed and applied to identify novel prognostic or response factors. A large number of clinical trials are performed within this area by our clinical researchers, including phase I, II and III trials with new anticancer drugs.

RESEARCH GROUPS

Clinical Oncology

Barnadas Molins, Agusti

Oncogenesis and Antitumour Drugs

Mangues Bafalluy, Ramon

Haematological Diagnosis

Nomdedeu Guinot, Josep Francesc

Molecular Pathology of Gynaecologic Cancer

Lerma Puertas, Enrique

Otorhinolaryngology and Head and Neck Cancer

Quer Agusti, Miquel

Oncology/Haematology and Transplantation

Sierra Gil, Jordi

Cancer Predisposition and DNA Repair Syndromes

Surralles Calonge, Jordi

Gynecologic and Peritoneal Oncology

Cespedes Navarro, Maria Virtudes

Clinical Research in Transfusion Medicine

Salinas Argente, Ramon (until June 2023)

Medina Marrero, Laura (from July 2023)

Clinical Oncology

Group leader

Barnadas Molins, Agusti (FGS)

Researchers

Anguera Palacios, Georgia (FGS)
 Arqueros Nuñez, Cristina (FGS)
 Barba Joaquin, Andrés (FGS)
 Boronat Ruiz, Laia (FGS)
 Calvo Verges, Nuria (FGS)
 Cerda Serda, Paula (FGS)
 Escuin Borrás, Daniel (IR)
 Gallego Rubio, Oscar Salvador (FGS)
 Juan Linares, Eva (FGS)
 López Pousa, Antonio (FGS)
 Majem Tarruella, Margarita (FGS)
 Maroto Rey, Jose Pablo (FGS)
 Paez López-Bravo, David (FGS)
 Ramon Y Cajal Asensio, Teresa (FGS)
 Salazar Blanco, Juliana (IR)
 Sebio García, Ana (FGS)
 Sullivan, Ivana Gabriela (FGS)
 Teres Lleida, Raul (FGS)
 Tibau Martorell, Ariadna (FGS)
 Virgili Manrique, Anna Cristina (FGS)

Research Technicians

Alfonso Ruiz, Rosa (IR)
 Andrés Nieto, Marta (IR)
 Bell Ramirez, Olga Lidia (IR)
 Calero Perez, Maria Del Pilar (IR)
 Castells Tello, Diana (IR)
 Di Giovanni Nuñez, Susana (IR)
 García Belinchon, Merce (IR)
 Gisbert Beamud, Alexandra (IR)
 Gonzalez Gomez, Luis (IR)
 Gonzalez Guerrero, Laura (IR)
 Hernandez García, Ricardo (IR)
 Lavernia Rosell, Laia (IR)
 Layana Antepará, Michelle Elizabeth (IR)
 Llobet Busquets, Mireia (IR)
 López Sanmartin, Consuelo (FGS)
 Menéndez Cuervo, Dulce Maria (IR)
 Molina Bayona, Silvia (IR)
 Moreno Gomez, Laura (IR)
 Perez Gorrini, Tiziana Giselle (IR)
 Ramirez García, Ona (IR)
 Reyes Vilasalo, Judith (IR)
 Ribas Bellavista, Laia (IR)
 Ribas Carbonell, Romina (IR)
 Roca Sola, Marc (IR)
 Salles Niubo, Mireia (IR)
 Serra López, Jorgina (FGS)
 Sola Vazquez, Eduard (IR)
 Tortosa Gallego, Belen (IR)
 Tricas Albareda, Andrea (IR)
 Vall Montero, Gaudi (IR)
 Van Veen Romero, Erika (IR)



DESCRIPTION

Clinical research: development of new therapeutic strategies; evaluation of the effectiveness of target treatments; detection of residual disease; design of clinical trials; development of phase I clinical trials; improvement of patient and their family's quality of life.

Translational research: design of personalized therapy studies; evaluation of prognostic and predictive molecular markers of response to treatment; molecular mechanisms of action and resistance to drugs; pharmacogenetics of cancer. We aim to translate this knowledge to (1) predict those patients with a higher risk of recurrence, (2) select patients more likely to benefit from specific treatments based on their tumor molecular characteristics and (3) assess the risk of toxicity of treatments according to the genetic characteristics of patients.

MAIN LINES OF RESEARCH

- Breast Tumors: Dr. Barnadas, Dra. Ramón y Cajal, Dra. Tibau, Dra. Arqueros, Dra. Andrés, Dra. Boronat and Dr. Escuin.
- Lung Tumors and melanomas: Dra. Majem, Dra. Sullivan, Dr. Barba, Jorgina Serra.
- Neuroendocrine Tumors: Dra. Sullivan, Dr. Paez.
- Head and Neck Tumors and central nervous system tumors: Dr. Gallego, Dra. Sebio.
- Hereditary and familial cancer: Dra. Ramón y Cajal, Dr. N Calvo.
- Digestive Tumors: Dr. Páez, Dra. Sebio, Dra. Virgili, Dr. Pelegrin, Dra. Martin Cullell, Dra. Cerda.



05.1.2 Oncohematologic Diseases Area

- Urologic Tumors: Dr. Maroto, Dra. Anguera.
- Sarcomas Unit: Dra. Sebio, Dra. Virgili, Dr. Terés, Dr. López Pousa.
- Laboratory of Translational Oncology: Dr. Escuin.

SCIENTIFIC CHALLENGES

- Identification of tumor molecular alterations and their clinical evolutionary course. Identification of these alterations would allow the use of specific targets and improvement of clinical responses. Currently, this is only possible for some neoplasms, and targeted therapies are administered to patients with advanced disease, for whom acceptable results are expected in terms of survival and tolerance. In recent years, we have implemented the use of next-generation sequencing cancer panels in certain tumors (lung, sarcomas, melanoma, colon, etc.) to identify patients eligible to specific target treatments. Our challenge is to expand this strategy to other carcinomas and to incorporate bioinformatics in the clinical practice to extract the maximum benefit from the information obtained to advance towards Precision Oncology.
- Response to treatment is short in certain cancers due to the heterogeneity of the tumors and the development of tumor clones that are resistant to the initial treatment. Therefore, it is essential to accurately identify the initial genetic alterations and those that develop secondarily to the treatment, to identify the mechanisms of resistance to systemic therapy and define therapeutic strategies based on this information.
- The use of liquid biopsy would allow the identification of molecular alterations at early stages of the disease, to evaluate the tumor load, and to monitor responses to systemic treatment. Our challenge is to set up a prospective sample collection strategy in patients with a high-risk of relapse to assess and monitor the effectiveness of therapies.
- To determine the immunological response of cancer patients, to identify treatments that potentiate the response in the tumor cells, and to define strategies to monitor those effects.

ACTIVE GRANTS

- Escuin Borrás, Daniel. Investigación del papel de los miRNAs y snoRNAs circulantes como marcadores surrogados del estatus de los ganglios

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- Serra López, Jorgina. PR-405/2020. Fundació Infermeria i Societat. Duration: 2021-2023. 4.290,00 €.

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Oncogenesis and Antitumour Drugs

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DESCRIPTION

We are developing targeted protein-based nanoparticles and nanoconjugates to selectively ablate cancer stem cells, or cancer associated fibroblasts, and inhibitors of Immune checkpoints to improve current treatment of solid (colorectal, head and neck) and hematological (DLBCL, AML) neoplasias. We also generate immunosuppressed and immunocompetent, subcutaneous, or orthotopic, cancer mouse models to preclinically evaluate the anticancer effect and the associated toxicity of these nanomedicines and their combination for clinical translation and industrial transference.

MAIN LINES OF RESEARCH

- To develop a humanized nanoconjugate of auristatin directed to leukemic stem cells for the treatment of Acute Myeloid Leukemia. Within this line, the activity of the nanoconjugate is being evaluated in new animal models derived from patient samples (PDX) and humanized murine models. We are also studying the ability of the nanoconjugate to activate the immune system and the possible synergies of its combination with other precision drugs. Isolda Casanova.
- To design and develop protein nanodrugs for the treatment of cancer. This line seeks to offer innovative therapeutic proposals based on rational design and development of active targeted protein nanoparticles for the selective delivery of therapeutic protein domains or conjugated anti-tumor drugs to tumor cells. Ugutz Unzueta.
- To develop and preclinical validation of tumor microenvironment targeted nanoparticles. This



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research line aims to target cancer-associated fibroblasts within solid tumors to reprogram the tumor microenvironment to reduce cancer cell aggressiveness and block metastatic dissemination. Lorena Alba.

- Induction of local tumor pyroptosis, by administration of nanotoxins, to turn cold solid tumors into immune-hot ones, to achieve T cell cancer tissue infiltration, activation of anticancer immunity, and the search for synergistic activity by its combination with Checkpoint inhibitors and T Cell Receptor Agonists to reverse immune exhaustion. Ramon Mangués.

SCIENTIFIC CHALLENGES

- To develop nanomedicines to define preclinical protocols to achieve effective immunogenic activity against solid tumors, which are currently resistant to Immunotherapy.
- To develop new protein nanoconjugates for targeted delivery of antitumor drugs with innovative mechanisms of action for the treatment of tumors resistant to common drugs.
- To develop efficient protein nanovehicles for the targeted delivery of therapeutic nucleic acids to tumor cells in vivo as an alternative to viral vectors.
- To develop protein nanopharmaceuticals for the activation of the immune system against cancer as a more effective nano-immuno-oncology approach than current treatments.
- To develop targeted-nanotherapy to reprogram the tumor microenvironment to enhance their antitumor role.

ACTIVE GRANTS

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- Mangués Bafalluy, Ramon. Oncogenesis and Antitumor Drugs. 2021 SGR 01140. Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR). Duration: 2022-2024. 60.000 €.
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DOCTORAL THESES DEFENDED

- López Laguna, Héctor. Simple biochemistry for complex protein-based materials. 31/03/2023. Universitat Autònoma de Barcelona. Supervisors: Villaverde Corrales, Antonio; Vázquez Gómez, Esther; Unzueta Elorza, Ugutz. <http://hdl.handle.net/10803/690077>.
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SCIENTIFIC PRODUCTION

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Haematological Diagnosis

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San Jose Alonso, Paula (FGS)

Sánchez García, Jana (FGS)

Research Technicians

Brell Martinez, Albert (FGS)

Bussaglia Petrillo, Elena Mart (FGS)

Carricondo Morcillo, Maite (FGS)

Castellet Farrus, Helena (IR)

Espadaler Pare, Montserrat (FGS)

Fernández Rosales, Maria Nieves (FGS)

Fuentes Hernandez, Francisca (FGS)

Gine Vilalta, Anna (IR)

Martinez Sánchez, Elisabeth (FGS)

Ortin Quilez, Rosa (FGS)

Serra Ferrer, Marta (FGS)

Ubeda Rodenas, Jose (FGS)



DESCRIPTION

The diagnostic hematology group's primary goal is to improve the characterization of hematologic disorders and contribute to better management of the patients, especially those with hematologic neoplasms. Our efforts focus on platform improvement (next-generation sequencing), multiparameter flow cytometry and molecular karyotyping, and unraveling the molecular mechanisms of leukemogenesis of selected genes (WT1, KMT2a, IdH1, and IdH2).

MAIN LINES OF RESEARCH

- Predisposing alleles to myeloid neoplasms and leukemia genomics: Marta Pratcorona.
- WT1 biology and KMT2a molecular alterations: Josep Nomdedéu.
- Digital PCR utility in MRD studies: Josep Nomdedéu.

SCIENTIFIC CHALLENGES

- To enlarge and refine NGS panels for covering all hematologic neoplasms.
- To improve genetic approaches to non-neoplastic disorders (algorithms based on hematologic findings).
- To validate bulk and scRNAseq approaches in leukemia diagnosis.
- To develop new platforms of MRD analysis in acute myeloid leukemia.

DOCTORAL THESES DEFENDED

- Oñate Hospital, Guadalupe. Impacto de las co-mutaciones y la terapia dirigida en la leucemia



05.1.2 Oncohematologic Diseases Area

mieloide aguda con mutaciones. 20/10/2023. Universitat Autònoma de Barcelona. Supervisors: Sierra Gil, Jordi; Pratcorona Canela, Marta.

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Molecular Pathology of Gynaecologic Cancer

Group leader

Lerma Puertas, Enrique (FGS)

Researchers

Bague Rosell, Silvia (FGS)

Espinosa Mariscal, Iñigo (FGS)

Fumagalli, Caterina (FGS)

Fuste Chimisana, Victoria (FGS)

Gallardo Alcañiz, Alberto (FGS)

López Vilaro, Laura (FGS)

Manzotti, Carolina (FGS)

Mozos Rocafort, Ana (FGS)

Orellana Fernández, Ruth (FGS)

Research Technicians

Catusas Cols, Lluís (FGS)

Clua Gonzalez, Agustin (FGS)

Ferre Figa, Malena (FGS)

Gonzalez Vidal, Alan (FGS)

Gutierrez Montalban, Raquel (FGS)



DESCRIPTION

The group is focused on molecular and translational research on breast and gynecological tumors. Our research seeks the applicability of the results in the field of biomedicine, in particular, in the development of methods that help and facilitate the diagnosis, prognosis, and treatment of breast and gynecological tumors.

MAIN LINES OF RESEARCH

- Pathogenic mechanisms of gynecological cancer (breast/endometrial/ovarian cancer).
- Molecular mechanisms of stromal response and immunosuppression in breast and endometrial cancer.
- Clinical application of prognostic factors in common cancers (breast, endometrial, ovarian, etc).
- Clinical application of tumor markers.
- Molecular biology of uterine and extra-uterine sarcomas.

SCIENTIFIC CHALLENGES

- Progress as a productive translational gynecological cancer research group, capable of competing with other highly visible groups in Barcelona that publish regular articles in reputable journals.
- Cooperate with other groups at the national and international levels.

DOCTORAL THESES DEFENDED

- Bagué Rosell, Sílvia. Capacitat pronòstica de l'expressió de gens relacionats amb el metabolisme de la glucosa en el control local dels pacients



05.1.2 Oncohematologic Diseases Area

amb carcinoma de cap i coll. 17/02/2023. Universitat Autònoma de Barcelona. Supervisors: Avilés Jurado, Francesc Xavier; Camacho Perez de Madrid, Mercedes; León i Vintró, Xavier. <http://hdl.handle.net/10803/688678>

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- Álvarez Álvarez R, Manzano A, Agra Pujol C, Artigas Raventós V, Correa R, Cruz Jurado J, Fernández JA, García Del Muro X, Gonzalez JA, Hindi N, Lozano Lominchar P, Martínez-Trufero J, Méndez R, Muñoz M, Muñoz Casares C, Orbis Castellanos F, Orellana Fernández R, Paniagua González M, Redondo A, Valverde Morales C, Asencio JM. Updated Review and Clinical Recommendations for the Diagnosis and Treatment of Patients with Retroperitoneal Sarcoma by the Spanish Sarcoma Research Group (GEIS). *Cancers*. 2023; 15(12):3194. DOI: 10.3390/cancers15123194. PMID: 37370803. IF:5,200 (Q2/4D). Document type: Review.
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- Arqueros C, Salazar J, Gallardo A, Andrés M, Tibau A, Bell OL, Artigas A, Lasa A, Cajal T, Lerma E, Barnadas A. Secreted Protein Acidic and Rich in Cysteine (SPARC) Polymorphisms in Response to Neoadjuvant Chemotherapy in HER2-Negative Breast Cancer Patients. *Biomedicine*. 2023; 11(12):3231. DOI:10.3390/biomedicine11123231. PMID:38137452. IF:4,700 (Q1/3D). Document type: Article.
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- Carmona E, Aguado M, Tubau C, Sánchez S, Mozos A, Sullivan I, Spertino J. Epidermolysis bullosa acquisita induced by atezolizumab. *JOURNAL DER DEUTSCHEN DERMATOLOGISCHEN GESELLSCHAFT*. 2023; DOI:10.1111/ddg.15203. PMID:37658659. IF:3,600 (Q1/3D). Document type: Letter.
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05.1.2 Oncohematologic Diseases Area

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05.1.2 Oncohematologic Diseases Area

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- Serret Miralles P, Orellana Fernández R, Parra Parente T, García-Chamón Brígido RB, Carrera Salas R. Tumor de células gigantes óseo en arco costal, tratado con denosumab. Reporte de un caso [Giant cell tumour of bone in the rib cage treated with denosumab. A case report]. *Rev Esp Patol*. 2023; 56(2):119-123. DOI: 10.1016/j.patol.2021.04.002. PMID: 37061238. Document type: Article.
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Otorhinolaryngology and Head and Neck Cancer

Group leader

Quer Agustí, Miquel (FGS)

Researchers

Casasayas Plass, Maria (FGS)

De Juan Beltran, Julia (FGS)

Gras Cabrerizo, Juan Ramon (FGS)

Holgado Clua, Anna (FGS)

Kolanczak, Katarzyna Alicj (FGS)

Leon Vintro, Xavier (FGS)

López Vilas, Montserrat (FGS)

Orus Dotu, César (FGS)

Pujol Olmo, Albert (FGS)

Valero Mayor, Cristina (FGS)

Vazquez López, Cristina (FGS)

Venegas Pizarro, Maria Del Prado (FGS)



DESCRIPTION

Our group is dedicated to research related to Otorhinolaryngology and Head and Neck tumors, both at a clinical and translational level.

The main area of research of our group is Head and Neck Cancer. In this field, we have a large database of all Head and Neck Cancers treated in our Hospital since 1985. We research on clinical aspects, as well as the study of genetic, molecular, or inflammatory factors that are relevant to prognosis and/or response to different treatments. In recent years we also focused on the use of nanoparticles in the treatment of head and neck cancer. In this field, we have permanent and strong collaborations. Inside the IR we collaborate with two groups mainly: Oncogenesis and antitumour drugs (Dr. Ramon Mangues) and Genomics of Complex Diseases (Dr. Mercedes Camacho). Outside our institution we also have permanent collaborations with national and international groups.

Also, we are dedicated to clinical studies in endoscopic nasal and skull base surgery. Finally we work also on different otological problems, mainly genetic deafness with strong collaboration with the Genetic Department.

MAIN LINES OF RESEARCH

- Head and Neck Cancer.
- Endoscopic nasal and skull base surgery.
- Otologic genetic disorders.

ACTIVE GRANTS

- Leon Vintro, Xavier. Evaluación de nanopartículas para la entrega dirigida de fármacos contra células tumorales CXCR4+ en modelos in vitro y murinos.



05.1.2 Oncohematologic Diseases Area

nos de Carcinoma Escamoso de Cabeza y Cuello. PI19/01661. Instituto de Salud Carlos III (ISCIII). Duration: 2020-2023. 125.840,00 €.

- Quer Agustí, Miquel. Nanopartículas dirigidas al estroma tumoral como nuevo tratamiento para el cáncer escamoso de cabeza y cuello. PI21/00232. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 159.720,00 €.

DOCTORAL THESES DEFENDED

- Bagué Rosell, Sílvia. Capacitat pronòstica de l'expressió de gens relacionats amb el metabolisme de la glucosa en el control local dels pacients amb carcinoma de cap i coll. 17/02/2023. Universitat Autònoma de Barcelona. Supervisors: Avilés Jurado, Francesc Xavier; Camacho Perez de Madrid, Mercedes; León i Vintró, Xavier. <http://hdl.handle.net/10803/688678>.
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SCIENTIFIC PRODUCTION

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Oncology/Haematology and Transplantation

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DESCRIPTION

The group develops translational and clinical research in the field of blood cancer and hematopoietic transplants, focusing on the prognostic impact of molecular markers and promoting early and late clinical trials with innovative therapies. The group also includes other well-known clinicians and scientists with prominent roles in International research groups.

The group is intensively focused on the study of innovative genetically modified T cells with antigen-specific chimeric receptors (CARs) and their clinical application in patients with hematological cancer.

MAIN LINES OF RESEARCH

- Clinical trials of CART cells for Hodgkin and B cell non-Hodgkin Lymphoma. J. Briones, AC Caballero.
- Development of memory-enriched CART cells under GMP conditions for clinical application. L. Escribá, C. Ujaldón, J. Briones, AC Caballero.
- Preclinical development of fourth-generation CART cells for hematological malignancies. E. Escudero, L. Escriba, J. Briones.
- Study of the prognostic value of clinical and biological parameters in acute myeloid leukemia. J. Sierra, A. Garrido, G. Oñate.
- Study of the molecular and cellular pathophysiology of lymphoma, myeloma, and chronic lymphocytic leukemia. J. Briones, AC Caballero, J. López, M. Argüello, A. Muntañola.
- Design of new modalities of chemotherapy, biotherapy and drug treatment targeting molecular



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mechanisms. J, Sierra, J. Briones, AC Caballero, J. López, M. Argüello, A Muntañola.

- Design of new modalities of haematopoietic stem-cell transplantation. R. Martino, I. García Cadenas, A. Esquirol, S. Redondo.

SCIENTIFIC CHALLENGES

- Development of academic CAR-T cell therapies.
- Novel CART generation with enhanced antitumor efficacy.
- Implementation and full development of Phase I/II clinical trials with In-House created CART cells.
- Identify new prognostic parameters for risk and therapeutic stratifications in leukemia and lymphoma.
- Molecularly characterize acute myeloid leukemia and determine the prognostic value of known genes and other genes of uncertain significance (with the Diagnosis Hematology Laboratory).
- Establish Liquid biopsy for monitoring hematological neoplasm: acute leukemia, lymphoma and myeloma.
- Reduce toxicity and increase availability of allogeneic transplants. New conditioning treatments.

ACTIVE GRANTS

- Briones Mejjide, Javier. Non-invasive tumor immunoglobulin gene next generation sequencing from circulating tumor DNA in diffuse large B cell lymphoma: prognostic implications and assessment of tumor response. GILEAD 2019-1. Gilead Sciences INC. Duration: 2019-2023. 49.995,00 €.
- Briones Mejjide, Javier. Ensayo fase I-II de inmunoterapia con células HSP-CAR30 para pacientes con linfoma de HODGKIN y linfoma T con expresión CD30 refractario o en recidiva. ICI19/00060. Instituto de Salud Carlos III (ISCIII). Duration: 2020-2023. 1.175.051,90 €.
- Moreno Atanasio, Carolina. Nuevas estrategias para monitorizar la enfermedad mínima residual (EMR) en la Leucemia Linfática Crónica. PI19/00753. Instituto de Salud Carlos III (ISCIII). Duration: 2020-2023. 99.220,00 €.
- Oñate Hospital, Guadalupe. Contractes Rio Hortega 2020. CM20/00061. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2023. 53.732,00 €.

- Sierra Gil, Jordi. Humanized nanomedicines selectively killing CXCR4+ cancer cells for Acute Myeloid Leukemia therapy. MARATO 201941-30. Fundació La Marató de TV3. Duration: 2020-2023. 18.750,00 €.
- Pratcorona Marta/Sierra Gil, Jordi. Poblaciones subclonales de LMA y células madre leucémicas identificadas mediante secuenciación de ARN de una sola célula y citometría de flujo multiparamétrica: impacto en la respuesta al tratamiento. PI20/01621. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2023. 304.920,00 €.
- Briones Mejjide, Javier/Sierra Gil, Jordi. RICORS TERAV. RD21/0017/0011. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 169.222,90 €.

GRANTS AWARDED

- Briones Mejjide, Javier. Consorcio Estatal en Red para el desarrollo de Medicamentos de Terapias Avanzadas (CERTERA). CER22/0012. Duration: 2023-2026. 1.320.633 €.

DOCTORAL THESES DEFENDED

- Caballero González, Ana Carolina. Immunotherapy with memory "STEM" T-cells modified with chimeric antigen-specific receptors (CARs) for patients with lymphoid neoplasms. 12/06/2023. Universitat Autònoma de Barcelona. Supervisors: Briones Mejjide, Francisco Javier; Álvarez Fernández, Carmen; Sierra Gil, Jordi. <http://hdl.handle.net/10803/690750>.
- Escudero López, Eva. Desarrollo de nuevas terapias de células T con receptor de antígeno quimérico (CAR) para linfoma. 20/11/2023. Universitat Autònoma de Barcelona. Supervisors: Briones Mejjide, Francisco Javier; Álvarez Fernández, Carmen; Vidal Alcorisa, Sílvia.
- Oñate Hospital, Guadalupe. Impacto de las co-mutaciones y la terapia dirigida en la leucemia mieloide aguda con mutaciones. 20/10/2023. Universitat Autònoma de Barcelona. Supervisors: Sierra Gil, Jordi; Pratcorona Canela, Marta.
- Redondo Velao, Sara. Nuevas estrategias en la prevención y tratamiento de la enfermedad injerto contra receptor: Ciclofosfamida postrasplante y terapia con Ruxolitinib. 16/10/2023. Universitat Autònoma de Barcelona. Supervisors: Martino Bojarull, Rodrigo; Sierra Gil, Jordi.



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SCIENTIFIC PRODUCTION

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05.1.2 Oncohematologic Diseases Area

Review of the Literature. *Transplantation And Cellular Therapy*. 2023; 29(7):473.e1-473.e6. DOI:10.1016/j.jtct.2023.04.008. PMID:37086849. IF:3,200 (Q2/5D). Document type: Review.

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Cancer Predisposition and DNA Repair Syndromes

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DESCRIPTION

This research group works in the field of genetic diseases characterized by a high predisposition to cancer. Many of these syndromes are caused by mutations in DNA repair genes. These genes are important to avoid the accumulation of mutations and prevent cancer transformation. Research on these syndromes is crucial to unravel the mechanisms that protect us from cancer.

In the past few years, the team has identified and studied several genes involved in such syndromes and performed therapeutic research leading to two orphan drug designations by the European Medicines Agency.

Their researchers are also involved in several clinical trials on gene therapy and drug repurposing and investigate DNA repair genes involved in these syndromes as therapeutic targets against cancer in the general population.

There are an increasing number of novel therapeutic strategies based on the deep knowledge of the genetic causes of the disease. Therefore, a proper genetic diagnosis is important not only to provide adequate genetic counseling and clinical management to the patients and their families but also to provide personalized medicine based on genomic information.

MAIN LINES OF RESEARCH

- Genetics and molecular biology of cancer-prone genetic syndromes with a focus on familial breast cancer and Fanconi Anemia and related chromosome fragility syndromes such as ataxia telangiectasia.



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- Development of new diagnostic and therapeutic tools in Fanconi anemia, including gene therapy, regenerative medicine, and drug repurposing.
- Mechanism of genomic instability and predisposition to cancer. Study of DNA repair mechanism and biological and clinical consequences of DNA repair failure.
- Fanconi/BRCA pathway in cancer. Implications of Fanconi genes in cancer and their use as therapeutic targets against cancer. Development of DNA repair inhibitors against cancer by synthetic lethality.
- Application of next-generation sequencing, genome medicine, and genome editing to better identify pathogenic mutations and perform functional studies of variants of known significance in rare diseases.

SCIENTIFIC CHALLENGES

- Optimization of our drug candidate to inhibit FA pathway in a valorization process under the financial help of a Proof of Concept Grant by the Spanish Ministry.
- Follow up of functional assay to classify variants of unknown significance in cancer predisposing genes.
- As we signed a collaboration agreement with US based Rocket Pharma Ltd for 10 years follow-up of FA patients undergoing gene therapy, we will continue to do so.
- Initiation of our AFAN clinical trial for the repurposing of afatinib to treat Fanconi anemia patients with advanced head-and-neck cancer.
- Performing a drug screening to find drugs reactivating the Fanconi pathway in cells expressing a FANCA mutant protein.
- Develop and apply advanced genomic medicine tools and pipelines for the detection of pathogenic mutations in genes involved in rare diseases.
- Validation of gene candidates identified and prioritized in a genome-wide CRISPR-Cas screen to identify synthetic lethal and viable interactions with the Fanconi/BRCA pathway.

ACTIVE GRANTS

- NIH Center Comprehensive Program for Natural History of Development of Squamous Cell

Carcinoma in Fanconi Anemia Co-PI: Neelam Giri, MD and Sharon A Savage, MD (National Institute of Health). Co-IP Spanish team: Jordi Surrallés. Fanconi Anemia Research Fund. 2022-2025. Total Funds Awarded (USD): \$ 1,107,464. Surrallés team Budget: \$ 80.000.

- Infraestructura de Medicina de Precisión asociada a la Ciencia y Tecnología (IMPACT). Acción Estratégica en Salud 2017-2020, Programa de Medicina Genómica. Ref. IMP/00009. Proyecto coordinado por el Consorcio Centro de Investigación Biomédica en red M.P. CIBER. Duración 2021-2023. 7.249.990 €.
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- ACCI 29-Cellular models for high-content drug screening in Fanconi anemia therapeutics. Ref. ER22P7AC745. Acciones Cooperativas y Complementarias Intramurales Conv.2021 (ACCI). CIBERER. (01/10/2022-29/02/2024) IP Jordi Surrallés. 52.600 €.
- Federated network for functional genomics of undiagnosed and rare diseases-rarefunction. Acciones Cooperativas y Complementarias Intramurales 2021 (ACCI).Ref. ER22P4AC7322/2023 / CB06/07/0001. CIBERER. Coordinador Francisco Palau. PI grupo Jordi Surrallés/ Massimo Bogliolo). 73.500 €.
- Reposicionamiento de afatinib para HNSCC en pacientes con anemia de Fanconi. Ref. ICI22/00076. Proyectos de Investigación Clínica Independiente de la convocatoria 2022. Acción Estratégica en Salud. Instituto de Investigación Carlos III. (ene2023-dic2026) IP Jordi Surrallés. 396.101,20 €.
- Valorización y prueba de concepto de un inhibidor de la reparación del DNA por la via Fanconi/BRCA para el tratamiento del cáncer por letalidad

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- Precision Medicine in FA: drug screening to identify a mutation specific drug. (Fanconi-cure). Convocatoria "Proyectos Colaborativos" en Cataluña (IBEC.Institute for Bioengineering of Catalonia). Plan Complementario de Biotecnología aplicada a la Salud del programa NextGeneration Europe. 2022. IP Jordi Surrallés. 178.650 €.
 - Catalan Interhospital web of genetic variants to improve genetic diagnosis in rare diseases. Agència financeradora: Fundació La Marató de TV3. Financiació (en milers d'euros): 399.932,70 euros. Duració: 2021-2023. Codi Expedient: FLMTv3 202040. IP Benjamín Rodríguez.

GRANTS AWARDED

- AFAN trial. Phase Ib/II study to investigate the safety and efficacy of Afatinib when administered as therapy in Fanconi anemia patients with unresectable and / or metastatic locoregionally advanced squamous cell carcinoma of the oral cavity, oropharynx or hypopharynx or larynx. (FARF) Fanconi Anemia Research Fund. Conv. FARF Research Grant Award (RGA) Program. (30/04/2023-29/04/2027). PI Jordi Surrallés. 296.303 €.
- Development and implementation of a functional genomics platform for undiagnosed hereditary cancer. (IMPaCT_VUSCan). Convocatoria proyectos de investigación de medicina personalizada (2022). Subdirección General de Evaluación y Fomento de la Investigación. Ministerio de Ciencia e Innovación. Ref. PMP22/00064. Multicéntrico. IP Coordinadora Concepción Lázaro García (IDIBELL).01/01/2023-31/12/2025. Presupuesto global 3.182.544 €. Presupuesto grupo Surrallés 144.320 €.
- SGR-Cat 2021 (AGAUR). Genomic medicine and rare diseases group. Ref. 2021-SGR-00835. (2023-2025) IP Jordi Surrallés. 40.000 €.
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- Grupo de Bioinformática: Actualización en el análisis de datos de NGS para el diagnóstico. Convocatoria Grupos de Trabajo (GdT) 2023. CIBERER.

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Gynecologic and Peritoneal Oncology

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DESCRIPTION

The Gynecologic and Peritoneal Oncology research group (GOGYP), coordinated by Dr. Maria Virtudes Céspedes, is an emerging group, led by a Miguel Servet investigator. We belong to the onco-hematological diseases research area and joined both, the biomarkers, prognostic, and diagnostic Programs and in the Advanced therapies Program within the transversal research Programs in the IR-HSCSP. Recently, the GOGYP was accredited as an emergent group with financial support by the AGAUR agency [2021 SGR-00976]. We are a multidisciplinary and translational research team, composed of physicians from the Gynecology-Oncology & Laparoscopy Unit from the Obstetrics and Gynecology dept. and of clinical staff of the Medical Oncology Dept. at Hospital Sant Pau as well as basic and translational researchers from IR-Sant Pau. We are active in surgical technical advances, diagnostic tools, and innovative therapies based on nanotechnology, preclinical development of drugs, and clinical assays. Our research comprises patient sample screening to in vitro and in vivo models of experimentation.

MAIN LINES OF RESEARCH

- Identificación de nuevos marcadores pronóstico y nuevas dianas terapéuticas para la estratificación del riesgo de recaída en pacientes con cáncer de endometrio.
- Estudio del efecto del sistema nervioso en la progresión y diseminación tumoral de cánceres ginecológicos y peritoneales de alto grado.
- Modelización en animales de los cánceres ginecológicos y peritoneales de alto grado, para



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el estudio de la progresión y diseminación tumoral.

- Evaluación y desarrollo preclínico de nuevos compuestos antitumorales, mediante nanotecnología, dirigidos al tratamiento de las metástasis en cánceres ginecológicos de alto grado.

SCIENTIFIC CHALLENGES

- Potenciar la colaboración con otros grupos clínicos y de investigación en Sant Pau y otros hospitales, y captar talento predoctoral y posdoctoral.
- Promover la investigación clínica y traslacional en cánceres ginecológicos de alto grado, aportando soluciones diagnósticas, pronósticas y terapéuticas.
- Obtener financiación pública nacional, regional y privada.
- Identificación y validación de nuevas dianas terapéuticas relacionadas con la neuromodulación en la progresión tumoral de cánceres ginecológicos de alto grado.
- Modelado de cánceres peritoneales de alto grado en animales para estudiar la fisiopatología tumoral y para su uso en la evaluación preclínica de compuestos antineoplásicos.
- Desarrollo de nuevos fármacos antitumorales, utilizando nanotecnología, para su aplicación en terapia dirigida a cánceres ginecológicos.

ACTIVE GRANTS

- Caruana Santiago, Pablo. Contractes predoctorals PFIS 2021. FI21/00146. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2025. 119.567,00 €.
- Cespedes Navarro, Maria Virtudes. Innovative nanotherapy for highly-metastatic peritoneal cancers: activating neuroreceptors to kill cancer stem cells. PI20/00623. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2024. 173.030,00 €.
- Cespedes Navarro, Maria Virtudes. Genomic signatures for the prediction of recurrence and metastasis in Endometrial Cancers. MARATO 201911-30. Fundació La Marató de TV3. Duration: 2020-2023. 190.000,00 €.
- Cespedes Navarro, Maria Virtudes. GRUP D'ONCOLOGIA GINECOLOGICA I PERITONEAL

(GOGyP). 2022 INV-1 00048. Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR). Duration: 2022-2024. 66.217,84 €.

- Cespedes Navarro, Maria Virtudes. Contractes "Miguel Servet II" 2020. CPII20/00007. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2024. 101.250,00 €.
- Edwards, Maria. InPHINIT 22. Fundació La Caixa. Duration: 2022-2025. 115.092,00 €.

GRANTS AWARDED

- Cespedes Navarro, Maria Virtudes. Grup d'Oncologia Ginecológica i peritoneal (GOGYP). 2021 SGR 00976. Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR). Duration: 2022-2025. 36.000 €.

SCIENTIFIC PRODUCTION

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- Español P, RAMON N, Caruana P, Luna R, Soler C, Teixeira N, Rodríguez F, Gallardo A, Edwards M, Porta O, Gamez M, Sánchez O, Llurba E, Corchero JL, Cespedes MV. Dopamine receptors D1 and D2 show prognostic significance and potential therapeutic applications for endometrial cancer patients. *GYNECOLOGIC ONCOLOGY*. 2023; 176DOI:10.1016/j.ygyno.2023.06.019. PMID:37437489. IF:4,700 (Q1/2D). Document type: Article.
- Español P, Luzarraga A, Teixeira N, Soler C, Luna R, RAMON N. An institutional study: Does Body Mass Index influence surgical approach, surgical morbidities, and outcomes in endometrial cancer patients?. *Facts Views And Vision In Obgyn*. 2023; 15(3)DOI:10.52054/FVVO.15.3.081. PMID:37742203. Document type: Article.



05.1.2 Oncohematologic Diseases Area

- García NG, Moreno CS, Teixeira N, Lloret PE, Guibourg R, RAMON N. Comparison of laparoscopy and laparotomy in the management of early-stage ovarian cancer. *Gynecology And Minimally Invasive Therapy*. 2023; 12(2)DOI:10.4103/gmit.gmit_99_22. PMID:37416098. Document type: Article.
- Habib N, Moufawad G, Hayek J, Fatcher F, Chiantera V, RAMON N, Devassy R, Centini G, Mereu L. A Reappraisal of Lymphadenectomy in Common Gynecological Cancers. *Clinical and Experimental Obstetrics & Gynecology*. 2023; 50(9):181. DOI:10.31083/j.ceog5009181. IF:0,200 (Q4/10D). Document type: Review.
- Hernansanz A, RAMON N, Basomba J, Comas R, Casals A. EndoTrainer: a novel hybrid training platform for endoscopic surgery. *International Journal of Computer Assisted Radiology and Surgery*. 2023; 18(5)DOI:10.1007/s11548-023-02837-x. PMID:36781742. IF:3,000 (Q2/3D). Document type: Article.
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- Pujade E, Brown J, Barnicle A, Wessen J, Lao P, Criscione SW, du A, Lorusso D, Romero I, Petru E, Yoshida H, Vergote I, Colombo N, Hietanen S, Provansal M, Schmalfeldt B, Pignata S, Martín C, Berton D, Runnebaum IB, Ray I. Homologous Recombination Repair Gene Mutations to Predict Olaparib Plus Bevacizumab Efficacy in the First-Line Ovarian Cancer PAOLA-1/ENGOT-ov25 Trial. *JCO Precision Oncology*. 2023; 7:e2200258. DOI:10.1200/PO.22.00258. PMID:36716415. IF:4,600 (Q2/4D). Document type: Article.
- Revilla G, Al Qtaish N, Caruana P, Sainz M, López T, Rodríguez F, Paez V, Li CD, Vallverdú NF, Edwards M, Moral A, Pérez JI, Escolà JC, Pedraz JL, Gallego I, Corcoy R, Céspedes MV, Puras G, Mato E. Lenvatinib-Loaded Poly(lactic-co-glycolic acid) Nanoparticles with Epidermal Growth Factor Receptor Antibody Conjugation as a Preclinical Approach to Therapeutically Improve Thyroid Cancer with Aggressive Behavior. *Biomolecules*. 2023; 13(11):1647. DOI:10.3390/biom13111647. PMID:38002329. IF:5,500 (Q1/3D). Document type: Article.
- Rodríguez A, Maroto P, Font A, Martín C, Mellado B, Corbera A, Orrillo M, Reig O, Querol R, Rios A, Cano L, Alonso J, Martínez G, Galtes S, Taus A, Martínez M, Juanpere N, Juan O, Bellmunt J. Safety and efficacy of avelumab plus carboplatin in patients with metastatic castration-resistant prostate cancer in an open-label Phase Ib study. *BRITISH JOURNAL OF CANCER*. 2023; 128(1)DOI:10.1038/s41416-022-01991-4. PMID:36289372. IF:8,800 (Q1/2D). Document type: Article.
- Tarrie JE, Capo JP, Sánchez RM. Update on the possibilities of hormonal medical treatment for heavy menstrual bleeding. *CLINICA E INVESTIGACION EN GINECOLOGIA Y OBSTETRICIA*. 2023; 50(1). DOI: 10.1016/j.gine.2022.100819. Document type: Review.

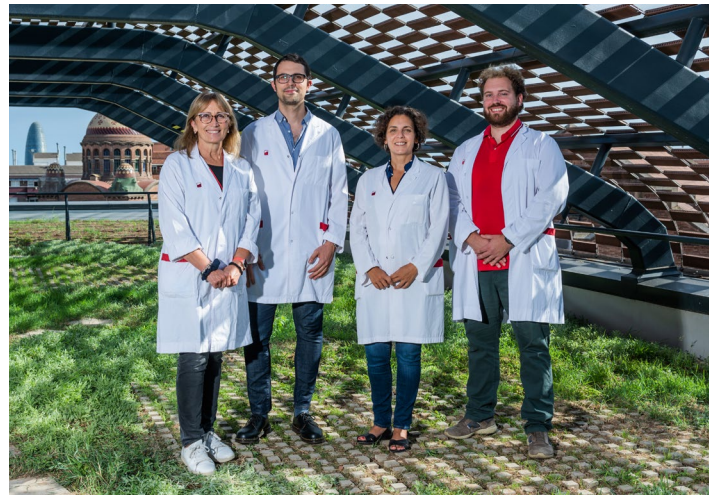
Clinical Research in Transfusion Medicine

Group leader

Medina Marrero, Laura (BST)
Salinas Argente, Ramon (BST) until 2023/09/28

Researchers

Bosch Llobet, M. Alba (BST)
Casanovas López, Enric Lluís (BST)
Ene, Gabriela Simona (BST)
Ferrer Garrido, Gonzalo Jose (BST)
Salinas Argente, Ramon (BST)
Sanz Linares, Gabriela (BST)
Subira Casellas, Maricel (BST)



DESCRIPTION

This group has moved to the Onco-Hematologic Diseases Area because of our sense of belonging and daily clinical work, procedures and projects.

Key highlights are directed towards developing strategies to assess and improve Patient Blood Management, encourage novel Cellular Therapy projects like CAR-T lines, and approach collaborations with other departments or research groups in therapeutic apheresis issues.

Our knowledge dissemination spirit has been shown throughout an increasingly active participation at the Transfusion Hospital Commission, communications to congresses, and accredited courses.

MAIN LINES OF RESEARCH

The objectives of this group will focus on the following fields of study:

- Coagulation disorders and bleeding, especially those involving platelets and coagulation factors.
- Blood transfusion and haemovigilance.
- Good use and efficiency of blood components: patient blood management, product quality, patient safety, etc.
- Therapeutic apheresis: replacement of blood components, extracorporeal photopheresis, and therapeutic cytopheresis.

SCIENTIFIC CHALLENGES

Among the challenges and study proposals planned for the achievement of the objectives, it is worth noting:



05.1.2 Oncohematologic Diseases Area

- Cooperation with other groups within the framework of transfusion and cell therapy research, such as the CAR-T group (Dr. Javier Briones).
 - Progress as a productive group of translational research in the fields of blood transfusion and cell therapy, it is intended to be carried out by analyzing the impact of therapeutic plasma exchange in autoimmune diseases of the neurology service (Dr. Luis Querol).
 - Analyzing the effective use of blood transfusion and the main causes of its variability, is done with the collaboration of the massive transfusion subcommittee (Dr. Pilar Paniagua).
 - Recent enrollment from members of the group in research training projects such as master's or doctoral thesis, will also have a positive result in our research group, encouraging us to achieve new goals and generate scientific impact with them.
- PMID:37986640. IF:2,700 (Q3/7D). Document type: Article.
- Pascual C, Salmeron PP, Ruiz FT, Ferreiras DV, Hernandez SJ, Argente RS, Galan CD, Comos JD. Immune thrombotic thrombocytopenic purpura: clinical suspicion and basic management in emergency departments - an expert review and consensus statement from the Spanish societies of hematology and hemotherapy (SEHH) and emergency medicine (SEMES). *Emergencias*. 2023; 35(1)PMID:36756916. IF:5,500 (Q1/2D). Document type: Review.
 - Regalado I, García M, Medina L, Fernández J, Esquirol A, García I, Martino R, Briones J, Sierra J, Novelli S. Age, CD34+cell dose, conditioning, and pre-transplant cytopenias can help predict transfusion support in lymphoma patients undergoing autologous stem cell transplantation. *VOX SANGUINIS*. 2023; 118(8)DOI:10.1111/vox.13486. PMID:37356813. IF:2,700 (Q3/7D). Document type: Article.

DOCTORAL THESES DEFENDED

- Medina Marrero, Laura. Proposal for a new consensus on the administration of Plerixafor, to decrease the percentage of failures of mobilization of hematopoietic progenitors. 12/06/2023. Universitat Autònoma de Barcelona. Supervisors: Querol Giner, Sergi; Sierra Gil, Jordi.

SCIENTIFIC PRODUCTION

- Fernández J, Delgadillo J, Vives J, Rodríguez L, Mendoza A, Azqueta C, García A, Valdivia E, Martorell L, Rubio N, Linares M, Alonso S, Ancochea A, Garcfa E, García N, Medina L, Querol S. A hub-and-spoke model to deliver effective access to chimeric antigen receptor T-cell therapy in a public health network: the Catalan Blood and Tissue Bank experience. *CYTOTHERAPY*. 2023; 25(1) DOI:10.1016/j.jcyt.2022.07.011. PMID:36041984. IF:4,500 (Q2/3D). Document type: Article.
- Martínez IR, Avendaño C, Da CV, Llobet AB, Erce J, Fraile M, Domínguez LG, Andrés IV, Velasco JA, Rodríguez VPG, Contreras E, Uranga SU, Herraiz A, Jimenez T, Pérez A, Rodríguez J, Pérez M, Ramos A, Velasco A, Cabrera JLB, Duarte RF. Factors related to the development of high antibody titres against SARS-CoV-2 in convalescent plasma donors from the ConPlas-19 trial. *VOX SANGUINIS*. 2023; 119(1)DOI:10.1111/vox.13561.

5.1.3 Neurological Diseases, Neuroscience & Mental Health Area



Juan Fortea
Area Director

This area covers research in neurological, neurodevelopmental and mental disorders. Among these are diseases such as stroke, neuromuscular conditions, neurodegenerative diseases, schizophrenia, depression, or chronic pain. A large variety of neuroscience techniques are used in the area. Some groups work on the genetic bases of neurological diseases, the identification of biomarkers, brain imaging, neurosurgical methods, deep-brain stimulation or omics sciences, while other groups work with models of pain, in the biology of synapses or neuropharmacology. Large population cohorts of patients with clinical follow-ups are analyzed in this area.

RESEARCH GROUPS

Cerebrovascular Diseases

Marti Fabregas, Joan

Neuromuscular Diseases

Olive Plana, Montserrat

Parkinson's Disease and Movement Disorder

Kulisevsky Bojarski, Jaime

Molecular Neuropharmacology

Pol Rigau, Olga

Pharmacological Research in Humans

Antonijuan Arbos, Rosa

Mental Health

Portella Moll, Maria

Neurobiology of Dementias

Fortea Ormaechea, Juan

Molecular Physiology of the Synapse

Bayes Puig, Alejandro

Stroke Pharmacogenomics and Genetics

Fernández Cadenas, Israel

Genetic Diseases

Gallano Petit, Maria Pia

Neurosurgery

Muñoz Hernandez, Fernando

Molecular Neurodegeneration

Belbin, Olivia Elizabeth

Epilepsy

Boronat Guerrero, Susana

Cerebrovascular Diseases

Group leader

Marti Fabregas, Joan (FGS)

Researchers

Camps Renom, Pol (FGS)

Gallego Fabrega, Cristina (IR)

Lambea Gil, Álvaro (IR)

Martinez Domeño, Alejandro (FGS)

Prats Sánchez, Luis Antonio (FGS)

Puig Grifol, Nuria (IR)

Ramos Pachon, Anna (FGS)

Research Technicians

Aguilera Simon, Ana (IR)

Ezcurra Diaz, Garbiñe (IR)

Guasch Jimenez, Marina (IR)

Marin Bueno, Rebeca (IR)



DESCRIPTION

Our research has a strong clinical basis and focuses on non-traumatic vascular diseases of the central nervous system, both ischemic stroke (cerebral infarction, transient ischemic attack) and hemorrhagic stroke (spontaneous intracerebral hemorrhage and subarachnoid hemorrhage). We are also interested in translational research applied to stroke.

MAIN LINES OF RESEARCH

- Reperfusion treatments in acute ischemic stroke: Intravenous thrombolysis, endovascular treatment (mechanical thrombectomy).
Factors associated with the degree and maintenance of collateral circulation.
Blood pressure management after endovascular treatment.
Mechanisms, prevention and clinical significance of hemorrhagic complications.
Reperfusion injury.
Intra and extracranial stenting during mechanical thrombectomy.
Relevance of progenitor endothelial cell counts.
- Vulnerability of the atheromatous carotid plaque.
Positron emission tomography, plasma, and ultrasonographic markers of inflammation. Variables associated with stroke recurrence.
Asymptomatic carotid stenosis.
- Acute spontaneous intracerebral hemorrhage:
Factors related to hematoma growth.



5.1.3 Neurological Diseases, Neuroscience & Mental Health Area

Logistical aspects (type of hospital, time to treatment, inter-hospital transfer).

Relevance of the microbiota in clinical, radiological, and prognostic variables.

Frequency, markers, and prognostic relevance of perihematoma edema.

Inflammatory factors associated with recurrence.

Prevention of recurrence in patients with atrial fibrillation and cerebral hemorrhage.

Treatment with statins in patients with cerebral hemorrhage.

Benefits and risks of antithrombotics and statins in the secondary prevention of stroke.

Influence of microbleeds, hyperintense white matter lesions and cortical superficial siderosis in the risk of intracerebral hemorrhage associated with oral anticoagulants.

tras el tratamiento endovascular en pacientes con ictus isquémico (Estudio HOPE). ICI20/00137.

Instituto de Salud Carlos III (ISCIII). Duration: 2021-2024. 362.939,50 €.

- Marti Fabregas, Joan. PREVICTUS:Farmacogenética para prevenir los efectos adversos del tratamiento del ictus. pmp21/00165. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2025. 1.067.000,00 €.
- Marti Fabregas, Joan. Red de Enfermedades Vasculares Cerebrales. INVICTUS PLUS. RD16/0019/0010. Instituto de Salud Carlos III (ISCIII). Duration: 2017-2022. 137.522,00 €
- Marti Fabregas, Joan. RICORS-ICTUS. RD21/0006/0006. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 249.005,90 €.
- Marti Fabregas, Joan. Edema cerebral en la hemorragia intracerebral: variables asociadas y estudio evolutivo de su implicación clínica y pronóstica. PI22/01156. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2025. 196.020,00 €.
- Prats Sánchez, Luis Antonio. Proyecto MISTIC: papel del Microbioma inteStinal en la evolución neurològica de pacienTes con hemorragia IntraCerebral espontánea. PI20/00925. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2023. 87.120,00 €.
- Puig Grifol, Nuria. Contractes Predoctorals PFIS 2020. FI20/00252. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2024. 82.400,00 €.

SCIENTIFIC CHALLENGES

- To enhance cooperation with other groups in the framework of Spanish stroke research (Spanish research network (RICORS/ICTUS) and also intra-hospital and extra-hospital cooperation.
- To obtaining funding from national calls (Instituto de Salud Carlos III), European community calls, regional authorities, and private companies.
- To increase the number of hired and grant-aided researchers and professional development of existing researchers.
- To obtain patents.

ACTIVE GRANTS

- Camps Renom, Pol. Impacto de la Inflamación en la Progresión de la Aterosclerosis Carotidea y el Riesgo de Ictus (estudio INCREASE). PI22/01659. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2025. 141.570,00 €.
- Gallego Fabrega, Cristina. CD20/00043. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2023. 80.598,00 €.
- Lambea Gil, Álvaro. Contratos Rio Hortega 2022. CM22/00265. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2024. 65.000,00 €.
- Marti Fabregas, Joan. Ensayo clínico sobre optimización hemodinámica de la perfusión cerebral

DOCTORAL THESES DEFENDED

- Guisado Alonso, Daniel. Estratègies per optimitzar el tractament endovascular en l'íctus agut: anàlisi dels criteris de selecció i de la relació entre la circulació col·lateral i la pressió arterial. 28/04/2023. Universitat Autònoma de Barcelona. Supervisors: Martí Fàbregas, Joan; Delgado Mederos, Raquel; Granell Moreno, Esther.
- Cárcel Márquez, Jara. Study of genetic risk factors associated with ischemic stroke. 24/01/2023. Universitat Autònoma de Barcelona. Supervisors: Fernández Cadenas, Israel; Martí i Fàbregas, Joan. <http://hdl.handle.net/10803/688764>
- Puig Grifol, Núria. Lipoprotein-related biomarkers and carotid plaque inflammation in ischemic

5.1.3 Neurological Diseases, Neuroscience & Mental Health Area

ictus". 30/11/2023. Universitat Autònoma de Barcelona. Supervisors: Benítez González, Sónia; Sánchez Quesada, José Luis; Camps Renom, Pol.

SCIENTIFIC PRODUCTION

- Benitez S, Puig N, Rives J, Sole A, Sánchez JL. Can Electronegative LDL Act as a Multienzymatic Complex?. *INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES*. 2023; 24(8):7074. DOI:10.3390/ijms24087074. PMID:37108253. IF:5,600 (Q1/3D). Document type: Review.
- Bonaterra A, Benítez S, Pancorbo O, Rodríguez D, Vert C, Rovira A, Freijo MM, Tur S, Martínez M, Portela PC, Vera R, Lebrato L, Arenillas JF, Pérez S, Domínguez A, Fabregas JM, Mauri G, Montaner J, Sánchez JL, Hernández M. Association of candidate genetic variants and circulating levels of ApoE/ApoJ with common neuroimaging features of cerebral amyloid angiopathy. *Frontiers in Aging Neuroscience*. 2023; 15:1134399. DOI:10.3389/fnagi.2023.1134399. PMID:37113571. IF:4,800 (Q2/3D). Document type: Article.
- García E, Camps P, Puig N, Fernández A, Aguilera A, Benitez A, Solé A, Vilades D, Sánchez JL, Martí J, Jiménez E, Benitez S, Llorente V. Soluble low-density lipoprotein receptor-related protein 1 as a surrogate marker of carotid plaque inflammation assessed by 18F-FDG PET in patients with a recent ischemic stroke. *Journal of Translational Medicine*. 2023; 21(1):131. DOI:10.1186/s12967-022-03867-w. PMID:36805772. IF:7,400 (Q1/3D). Document type: Article.
- Gorey S, McCabe JJ, Camps P, Giannotti N, McNulty JP, Barry M, Cassidy T, Cronin S, Dolan E, Fernández A, Foley S, Harbison J, O'Connell M, Williams DJ, Marnane M, Martí J, Kelly PJ. Symptomatic Carotid Atheroma Inflammation Lumen-stenosis score compared with Oxford and Essen risk scores to predict recurrent stroke in symptomatic carotid stenosis. *European Stroke Journal*. 2023:23969873231186911. DOI:10.1177/23969873231186911. PMID:37480278. IF:6,100 (Q1/2D). Document type: Article.
- Lambea A. Neurology teaching difficulties and the academic consequences of the COVID-19 pandemic. Reply. *REVISTA DE NEUROLOGIA*. 2023; 77(5). DOI:10.33588/rn.7705.2023189. PMID:37612831. IF:1,200 (Q4/10D). Document type: Letter.
- Lledós M, Prats L, Lluçà L, Cárcel J, Muino E, Culléll N, Gallego C, Martín JM, Aguilera A, Guasch M, Guisado D, Ramos A, Martínez A, Izquierdo A, Marín R, Camps P, Martí J, Fernández I. Ischaemic stroke patients present sex differences in gut microbiota. *EUROPEAN JOURNAL OF NEUROLOGY*. 2023; 30(11). DOI:10.1111/ene.15931. PMID:37329328. IF:5,100 (Q1/3D). Document type: Article.
- Lluçà L, Muiño E, Culléll N, Cárcel J, Lledós M, Gallego C, Martín J, Martí J, Aguilera A, Planas AM, DeDiego ML, de Felipe A, Masjuan J, García S, Segura T, González E, Serrano G, Domínguez A, Menéndez P, Montaner J, Migeotte I, Rahmouni S, Darcis G, Bernardo D, Rojo S, Schulte EC, Protzer U, Fricke L, Winter C, Niemi M, Cordioli M, Delgado P, Fernández I. Genetic Architecture of Ischaemic Strokes after COVID-19 Shows Similarities with Large Vessel Strokes. *INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES*. 2023; 24(17):13452. DOI:10.3390/ijms241713452. PMID:37686257. IF:5,600 (Q1/3D). Document type: Article.
- Martí J, Camps P, Best JG, Ramos A, Guasch M, Martínez A, Guisado D, Gomez BM, Ambler G, Wilson D, Lee KJ, Lim JS, Bae HJ, Shiozawa M, Koga M, Toyoda K, Hennerici MG, Chabriat H, Jouvent E, Wong DYK, Mak H, Lau KK, Kim YD, Song TJ, Heo JH, Eppinger S, Gattringer T, Uysal E, Demirelli DS, Bornstein N, Ben E, Halleli H, Molad JA, Nishihara M, Tanaka J, Hara H, Yakushiji Y, Coutts SB, Smith E, Polymeris AA, Wagner B, Seiffge D, Lyrer PA, Peters N, Engelter ST, Salman RA, Jager HR, Lip GYH, Goeldlin M, Panos L, Karayiannis CC, Phan TG, Srikanth VK, Christ N, Gunkel S, Fluri F, Leung TW, Soo Y, Chu WN, Abrigo J, Barbato C, Browning S, Simister R, Mendyk AM, Bordet R, Hlal S, Gyanwali B, Chen CSP, Jung SM, Orken DN, Werring D, Prats L, Microbleeds Int Collaborative N. Stroke Risk and Antithrombotic Treatment During Follow-up of Patients With Ischemic Stroke and Cortical Superficial Siderosis. *NEUROLOGY*. 2023; 100(12):e1267-e1281. DOI:10.1212/WNL.000000000000201723. PMID:36535778. IF:9,900 (Q1/1D). Document type: Article.
- Martínez A, Xuclà T, Collet R, Olmedo G, Martí J, Izquierdo A, Martínez A, Prats L, Guasch M,



5.1.3 Neurological Diseases, Neuroscience & Mental Health Area

- Guisado D, Ramos A, Camps P. Clinical characteristics and outcome of amaurosis fugax due to transient retinal ischemia: Results from a contemporary cohort. *Journal of Stroke & Cerebrovascular Diseases*. 2023; 32(11):107335. DOI:10.1016/j.jstrokecerebrovasdis.2023.107335. PMID:37748428. IF:2,500 (Q3/7D). Document type: Article.
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Neuromuscular Diseases

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DESCRIPTION

The Neuromuscular Diseases Unit is a multidisciplinary unit with extensive experience in the diagnosis, treatment and research of neuromuscular diseases. It is a team in which clinical and research activity are perfectly overlapped and in which clinical problems are addressed in the laboratory to find new biomarkers and diagnostic tools, new pathological mechanisms of disease, and new therapeutic targets. The Unit is composed of neurologists, biologists, and laboratory technicians who are all experts in basic and translational research and the organization and management of sample collections.

MAIN LINES OF RESEARCH

- Autoimmune neuromuscular diseases (myasthenia, neuropathies, and myopathies).
 - Characterization of new target antigens in Myasthenia Gravis (MG), and immune neuropathies (CIDP, GBS, MMN). Their use as diagnostic and therapeutic biomarkers.
 - Nerve damage biomarkers.
 - Pathogenesis of newly recognized antigens both in MG and in CIDP.
 - Collaborators of the IGOS database for Guillain Barre syndrome.
 - Coordinators of the INCBBase (international database for CIDP).
 - NMD-ES Spanish registry for neuromuscular diseases.
- Muscular dystrophies.



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- Muscle MRI analysis as a biomarker of different muscular dystrophies.
- Natural history of Dysferlinopathies. The international COS-study Jain Foundation.
- Development of cell models of NMD diseases to study pathogenic.
- Pathogenic mechanisms in inflammatory myopathies (DM, necrotizing myopathies).
- Clinical, pathological, and molecular characterization of rare myopathies.
- Amyotrophic lateral sclerosis.
 - Gene profile of ALS patients in Spain.
 - Biomarkers profile in different phenotypes of ALS.
- Advance in the knowledge of the pathogenetic mechanisms involved in ALS.
- Use of the NMD.ES registry to perform research in different NMD.
- Search for new myopathy causative genes.
- Characterization of new muscle disorders.

ACTIVE GRANTS

SCIENTIFIC CHALLENGES

- Advance in the knowledge of the immunological mechanisms involved in the pathogenesis of autoimmune neuromuscular diseases (MG, CIDP, MMN).
- Evaluate the use of Nfl and myelin proteins as biomarkers of nerve damage in inflammatory neuropathies.
- To develop 2D and 3D cell-based assays to understand the effect of autoantibodies in Myasthenia gravis.
- To develop mouse models to demonstrate the pathogenic effect of antibodies to new antigens in MG.
- Advance in the knowledge of the pathogenetic mechanisms of inflammatory myopathies (DM, necrotizing myopathies).
- Search for new antigens and develop diagnostic tests with known and new biomarkers in immune-mediated neuropathies, myasthenia gravis, and inflammatory myopathies.
- Implement new diagnostic and disease follow-up methods for muscular dystrophies resulting from dysferlinopathy and other myopathies research (biomarkers (miRNA, proteome), MRI, etc).
- Advance in the knowledge of the pathogenetic mechanisms involved in muscular dystrophies.
- Search for new genes and biomarkers in the different phenotypes of ALS.
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- Rojas García, Ricardo. Validación de biomarcadores candidatos para el diagnóstico y la progresión de la Esclerosis Lateral Amiotrófica y estudio de las vías fisiopatogénicas implicadas. PI19/01543. Instituto de Salud Carlos III (ISCIII). Duration: 2020-2024. 123.420,00 €.

GRANTS AWARDED

- Gallardo Vigo, Eduard. Characterization and optimization of myasthenia gravis care. OptiMyG. Competitiu. EJPR23-104 European Joint Programme of Rare Diseases. AC23_2/00030 EJP-RD ISCIII. 2024-2026. 174.918,00 €.
- Roja García, Ricardo. Caracterización del perfil transcriptómico en el espectro completo de Esclerosis Lateral Amiotrófica-Demencia frontotemporal (ELADFT) para la investigación y validación de biomarcadores en biofluidos. PI23/00845. Instituto de Salud Carlos III (ISCIII). Duration: 2024-2026. 127.500,00€.

DOCTORAL THESES DEFENDED

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Parkinson's Disease and Movement Disorder

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DESCRIPTION

Led by Jaime Kulisevsky MD, PhD, and based at the Movement Disorders Unit of Sant Pau Hospital and Sant Pau Biomedical Research Institute, the group focuses its interest on Parkinson's disease, Huntington's disease, atypical parkinsonisms, tremor, and other movement disorders research.

The priority lines include the study of neuronal mechanisms related to cognitive impairment development and neuropsychiatric symptoms in movement disorders, the development of specific instruments for these symptoms' diagnosis and the study of different pharmacological agents' responses.

To meet the challenge of deepening our knowledge of the mechanisms involved in these symptoms' development, the group works with neuroimaging techniques, neuropsychology, clinical assessment, brain stimulation, genetics, and biomarkers, among others.

MAIN LINES OF RESEARCH

- Cognitive Impairment, Behavioural Dysfunctions and other non-motor symptoms in Parkinson Disease (PD):
 - Study of the neural correlates of cognitive performance, mild cognitive impairment, dementia, and behavioral alterations (apathy, visual hallucinations and impulse control disorders) in PD using neurophysiological techniques (event related brain potentials), structural, functional, and molecular neuroimaging.
 - Characterization of the neurodegenerative process underlying cognitive impairment in PD through the study of cortical atrophy patterns related to genetic and biomarker indicators.



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- Development and validation of PD-specific tools for cognitive and functional assessment to detect subtle changes in cognitive performance and treatment response.
- Prospective follow-up study of cognition and mood in PD patients with deep-brain stimulation of the subthalamic nucleus.
- Identification of blood-based, cognitive, and neurophysiological biomarkers of cognitive deterioration in PD.
- Identification of genetic and neurophysiological biomarkers of apathy and impulse control disorders in PD.
- Data science applied to large PD databases such as PPMI.
- Surgery and treatments of continuous infusion of intraduodenal levodopa.
- Study of the effects of continuous infusion of intraduodenal levodopa on cognition and mood.
- Follow-up and etiologic study of weight loss in patients treated with continuous infusion of intraduodenal levodopa.
- Huntington's disease (HD):
 - Characterization of the natural course HD in large and international cohort and studies (Enroll-HD).
 - Study of the neural correlates of clinical progression, cognitive performance, mild cognitive impairment, dementia and behavioral alterations in HD using neurophysiological techniques (event-related brain potentials), structural, functional and molecular neuroimaging.
 - Identification of potential neuroimaging, blood-based, muscular tissue, CSF, and clinical biomarkers of disease progression in premanifest and manifest HD.
 - Study of the prevalence and neural substrates of behavioral alterations in premanifest and manifest HD.
 - Development and validation of HD-specific tools for cognitive and functional assessment to detect subtle changes in cognitive performance and treatment response.
- Study of the effect of intermediate alleles and homozygous on the clinical presentation of HD.
- Data science applied to large HD databases such as Enroll-HD and Registry.
- Identification of different cognitive phenotypes in HD.
- Study of the role of TAU in the heterogeneity of cognitive deterioration and trajectory of neurodegeneration in HD.
- Progressive supranuclear palsy (PSP):
 - Development of a PSP-specific cognitive rating scale.
 - Development of a standardized eye movement evaluation.
 - Study of the neural correlates of clinical progression, cognitive performance and behavioral alterations in PSP using structural and functional neuroimaging.
- Essential tremor:
 - Molecular neuroimaging in essential tremor.
 - Clinical, neurophysiological and neuroimaging assessment of patients with FXTAS (fragile X-associated tremor/ataxia syndrome).

SCIENTIFIC CHALLENGES

Parkinson's Disease (PD)

- General
 - COPPADIS: Cohort of Patients with Parkinson's Disease in Spain (national collaborative study).
 - Intensification for Specialist Physicians of the "Strategic Research and Innovation Plan" (PERIS) Expedient Number: SLT008 / 18.
- Cognition
 - DuoCog: randomized, double blind and crossed study (immediate levodopa vs. intraduodenal in cognition and mood).
 - Neuropsychiatric disorders.
 - Prospective study: new method of music therapy in apathy and depression.
 - Choral singing in patients with PD. Study on its effects on apathy and depression.



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- Effects of mindfulness on the presence and development of TCI.
- Natural history and neural correlates of psychotic symptoms in PD patients.
- Advanced PD
 - Nutritional analysis in patients with intraduodenal levodopa.
 - Prospective study of cognitive, behavioral, sleep and quality of life in patients with deep brain stimulation (DBS) and intraduodenal levodopa.
 - Prospective study of patient satisfaction after DBS.
 - Subthalamic DBS study in PD: functional reorganization of brain networks and repercussions on postsurgical complications.
 - Monitoring the mobility using a sensor in fluctuating PD for therapeutic purposes. Multicenter Clinical Trial (INV-PROC-A118).

Huntington Disease (HD)

- Coordination of the "Cognitive Phenotype Working Group" (European Huntington's Disease Network).
- Spanish Coordination of Enroll-HD: A Prospective Registry Study in a Global Huntington's Disease Cohort (PI in Spain: J. Kulisevsky)
- Validation of cognitive (HD-CRS) and functionality (HD-CFRS) scales.
- Development and validation of new tools for cognitive and functional assessment of cognitive impairment in HD.

Tremor

- Development of a tremor diagnostic system using a mobile app and software. Joint project with Mediktor company
- Perampanel in essential tremor. "Real life" study.

Other neurodegenerative diseases

- Neural correlates of hypofrontality in different subtypes of progressive supranuclear palsy (PSP).
- Neuropsychiatric and behavioral symptoms in PSP subtypes.
- FXTAS: collaborative research with Genetics

from Hospital Clínic (Barcelona) and Associació Catalana X Fràgil (ACXF).

- Collaboration with GEMT-CAT (Movement Disorders Group Catalan Neurology Society) in the Consensus Document on Genetics in Movement Disorders.

Neuroimaging and data engineering

- Dynamic connectivity models in cognitive impairment in PD. In collaboration with the Center for Brain and Cognition, Pompeu Fabra University, Barcelona.
- Neuroimaging and neurophysiology of hallucinations in PD: Project: "Unraveling dysfunctional brain networks in patients with Parkinson's disease suffering from hallucinations", in collaboration with Prof. Blanke, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland.
- Effects of dopaminergic treatment of PD on neurocognitive networks. Collaborative study with Hospital del Mar, Barcelona.
- Functional and structural brain correlates in HD: cognition, apathy, depression, irritability, biomarkers, oxytocin levels. Collaborative study with Hospital de Burgos (HUBU).
- Analysis of collaborative databases ("big-data"): ENROLL (EH), PPMI (EP), COPPADIS (EP).
- Analysis of local databases: PSP, EH, EP.

Parkinson's disease and other movement disorders' laboratory

- Processing, biobanking and biomarker analyses of human liquid biological samples (plasma, serum, CSF, and urine) from different movement disorders.
- Development and optimization of methods for extracellular vesicle isolation from different biofluids in movement disorders.
- Identification of molecular signatures in brain, plasma, CSF, and urine extracellular vesicles in Huntington's disease to improve disease prognosis and stratification of patients in clinical trials.
- To explore the clinical utility of the determination of tau and phosphorylated alpha-synuclein in skin tissue, for the early and di-



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Differential diagnosis of Atypical Parkinsonian Syndromes.

ACTIVE GRANTS

- Aracil Bolanos, Ignacio. Contratos Juan Rodés 2022. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2026. 180.000,00 €.
- Kulisevsky Bojarski, Jaime. Historia natural y correlatos neuronales de los síntomas psicóticos en pacientes con enfermedad de Parkinson. PI18/01717. Instituto de Salud Carlos III (ISCIII). Duration: 2019-2023. 93.170,00 €.
- Kulisevsky Bojarski, Jaime. Desarrollo y validación de instrumentos específicos de evaluación cognitiva basados en la biología de la enfermedad de Huntington. PI21/01758. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 244.420,00 €.
- Kulisevsky Bojarski, Jaime. ParkinsonAID. ParkinsonAID. Unión Europea. Duration: 2022-2023. 30.000,00 €.
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- Ruiz Barrio, Iñigo. Contratos Rio Hortega 2022. CM22/00072. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2024. 65.000,00 €.

GRANTS AWARDED

- Kulisevsky Bojarski, Jaime. Investigación y desarrollo de una nueva terapia para el tratamiento de la enfermedad de Huntington. CPP2022-009575. Ministerio de Ciencia e Innovación (MICIIN). Duration: 2023-2026. 312.446,20 €.

SCIENTIFIC PRODUCTION

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Molecular Neuropharmacology

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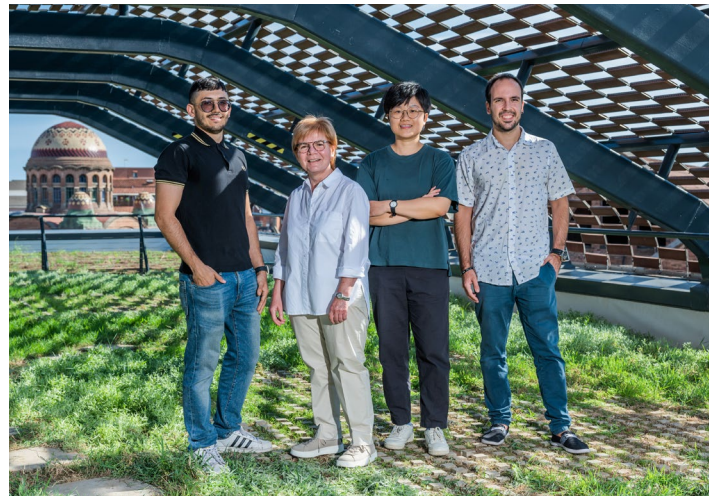
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DESCRIPTION

Chronic pain is an important clinical problem due to the low efficacy of conventional treatments and their numerous side effects. Chronic pain is also accompanied by emotional disorders such as depression, anxiety, and memory loss, which negatively influence the perception of pain, creating a vicious circle that contributes to the deterioration of the patients' quality of life. Our main objective is to find new treatments that effectively relieve chronic pain and the associated comorbidities by using pharmacological, molecular, and genetic techniques.

MAIN LINES OF RESEARCH

- New strategies for the treatment of chronic pain.
Identification of new compounds that effectively inhibit inflammatory, osteoarthritic, and/or neuropathic pain induced by nerve injury or chemotherapy and its underlying mechanisms of action.
- New therapies for the emotional disorders associated with chronic pain
Investigation of the role played by different gaseous neurotransmitters in the modulation of the anxiety- and depressive-like behaviors and/or cognitive deficits accompanying persistent pain.
- Neuropharmacology of opioids and cannabinoids
Development of new strategies to potentiate the analgesic effects of opioids and cannabinoids during chronic pain, minimizing the adverse effects of these drugs.
- Sex-related differences in chronic pain and mood disorders



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Evaluation of the impact of sex on pain sensitivity and tolerance, and on the effectiveness of treatments used for chronic pain and related mental illnesses.

- New stratagems for the treatment of diabetic neuropathy

Identification of new approaches to inhibit oxidative stress and neuropathy two major complications of diabetes.

SCIENTIFIC CHALLENGES

- Identify new pharmacological compounds that effectively abolish chronic pain with few side effects whose can be transferred to clinical practice and/or be patentable.
- Evaluate the antidepressant, anxiolytic and pain-relieving effects of novel nanoparticles capable of liberating one or more gasses and study their actions on the functional disability and memory loss linked with chronic pain.
- Identify new antioxidant compounds as potential therapeutic targets and study their effects on proinflammatory signals and plasticity changes provoked by nerve injury, chemotherapeutic agents, or metabolic disorders.
- Evaluate the neuroprotective, anti-apoptotic, and antioxidant mechanisms implicated in the modulation of inflammatory pain induced by the Nrf2/heme oxygenase 1 signaling pathway activation and its interaction with the endogenous cannabinoid and opioid systems.
- Analyze differences between sexes in pain sensitivity and in the efficacy of molecular hydrogen in modulating the allodynia and anxiety-depressive-like behaviors accompanying chemotherapy-induced neuropathic pain.
- Develop new strategies to enhance the effectiveness of opioids and cannabinoids on relieving chronic pain with few side effects.
- Identify new pharmacological targets for treating nociplastic pain and comorbidities associated and assess their mechanism of action.

ACTIVE GRANTS

- Pol Rigau, Olga. Nuevos enfoques para el tratamiento del dolor crónico y comorbilidades

asociadas. PI18/00645. Instituto de Salud Carlos III (ISCIII). Duration: 2019–2023. 117.370,00 €.

- Pol Rigau, Olga. Nuevas dianas moleculares para el tratamiento del dolor crónico. PI21/00592. Instituto de Salud Carlos III (ISCIII). Duration: 2022–2024. 166.980,00 €.

DOCTORAL THESES DEFENDED

- Bai, Xue. New modalities for treating neuropathic pain and associated emotional disorders. 25/07/2023. Universitat Autònoma de Barcelona. Supervisors: Pol Rigau, Olga; Pol Rigau, Olga.
- Batallé Melgarejo, Gerard. New strategies for the treatment of osteoarthritis pain and associated comorbidities. 12/07/2023. Universitat Autònoma de Barcelona. Supervisors: Pol Rigau, Olga; Pol Rigau, Olga.

SCIENTIFIC PRODUCTION

- Bai X, Batalle G, Martinez I, OLGA R. Hydrogen Sulfide Interacting with Cannabinoid 2 Receptors during Sciatic Nerve Injury-Induced Neuropathic Pain. *Antioxidants*. 2023; 12(6):1179. DOI:10.3390/antiox12061179. PMID:37371911. IF:7,000 (Q1/1D). Document type: Article.
- Batallé G, Bai X, Balboni G, OLGA R. The Impact of UFP-512 in Mice with Osteoarthritis Pain: The Role of Hydrogen Sulfide. *Antioxidants*. 2023; 12(12):2085. DOI:10.3390/antiox12122085. PMID:38136204. IF:7,000 (Q1/1D). Document type: Article.
- Martinez I, Olga R. A Novel Therapy for Cisplatin-Induced Allodynia and Dysfunctional and Emotional Impairments in Male and Female Mice. *Antioxidants*. 2023; 12(12):2063. DOI:10.3390/antiox12122063. PMID:38136183. IF:7,000 (Q1/1D). Document type: Article.
- Pérez M, Suárez I, Bai X, Martínez I, Ciaffaglione V, Pittalà V, Salerno L, OLGA R. Novel Heme Oxygenase-1 Inducers Palliate Inflammatory Pain and Emotional Disorders by Regulating NLRP3 Inflammasome and Activating the Antioxidant Pathway. *Antioxidants*. 2023; 12(10):1794. DOI:10.3390/antiox12101794. PMID:37891874. IF:7,000 (Q1/1D). Document type: Article.
- Suárez I, Pérez M, Bai X, Martínez I, Intagliata S, Pittalà V, Salerno L, OLGA R. The Inhibition of



5.1.1.3 Neurological Diseases, Neuroscience & Mental Health Area

Neuropathic Pain Incited by Nerve Injury and Accompanying Mood Disorders by New Heme Oxygenase-1 Inducers: Mechanisms Implicated. Antioxidants. 2023; 12(10):1859. DOI:10.3390/antiox12101859. PMID:37891937. IF:7,000 (Q1/1D). Document type: Article.

Pharmacological Research in Humans

Group leader

Antonijuan Arbos, Rosa (FGS)

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Sánchez Nuñez, Isabel (IR)



DESCRIPTION

The main objective (CIM) is to perform clinical drug trials and/or clinical research with the assurance of compliance with the legal, ethical, and methodological requirements stated in international standards.

Clinical trials (phase I): Activity is focused on the evaluation of systemic and local tolerability, pharmacokinetics, bioavailability, and bioequivalence (generics), and pharmacological effects.

Studies are also performed in healthy volunteers and special populations with specific characteristics, such as the healthy elderly, obesity, post-menopausal women, or renal or hepatic insufficiency.

Clinical trials (phases Ib, IIa): Specific interventions are performed in this phase, and controlled monitoring of the patient's response is required.

Furthermore, support from the integration of administrative, computer, and statistical systems enables optimal performance of clinical studies.

MAIN LINES OF RESEARCH

- Phase I clinical trials (healthy volunteers) whose main objectives include: first-time-in-humans, safety and tolerability, pharmacokinetics, bioavailability and bioequivalence (generic drugs), pharmacodynamics, interactions (drug-drug, drug-food), evaluation and characterization of biomarkers, proofs of concept, acceptability and preference studies.
- Follow-up studies in populations with the same or different characteristics: the elderly, obese volunteers, postmenopausal volunteers, the patients with liver, or kidney failure.

5.1.3 Neurological Diseases, Neuroscience & Mental Health Area

- Collaboration with clinical services to conduct phase II or phase III studies.

SCIENTIFIC CHALLENGES

- Consolidate and strengthen leadership in this field in Spain, conserve relationships with the pharmaceutical industry on a national level, and strengthen and extend relations abroad with multinational enterprises and industries from other sectors.
- Broaden the range of questions to address in research projects.
- Promote dissemination of our activity with a double objective: to return the knowledge generated to society and to demystify research in humans, bringing it closer to the community to foster participation in clinical trials (particularly in specific sectors of the populations, such as the elderly).
- Set up educational activities related to the two main research lines, i.e., the application of good clinical practices (GCPs) in clinical research (pathology and treatment) and social (quality of life, prevention of accident risk) consequences.

ACTIVE GRANTS

- Antonijoan Arbos, Rosa. Investigación del potencial de nuevas moléculas para el tratamiento de enfermedades fibróticas (DEFIBER III). CPP2021-008747. Ministerio de Ciencia e Innovación (MICINN). Duration: 2022-2025. 243.536,44 €.
- Antonijoan Arbos, Rosa. ERA4TB (European Accelerator of Tuberculosis Regime) project. ERA4TB GA 853989. Unión Europea. Duration: 2022-2025. 277.500,00 €.

DOCTORAL THESES DEFENDED

- Espinosa Guerrero, Alejandra Nallely. Estudio farmacoeconómico del uso de albúmina humana en pacientes sometidos a cirugía cardiaca bajo circulación extracorpórea sobre el desarrollo de Lesión renal aguda en el Hospital de la Santa Creu i Sant Pau. 18/12/2023. Universitat Autònoma de Barcelona. Supervisors: Antonijoan Arbós, Rosa Maria.

SCIENTIFIC PRODUCTION

- Mas E, Ferreri L, Cardona G, Zatorre RJ, Pla F, Antonijoan RM, Riba J, Valle M, Rodríguez A. The role

of opioid transmission in music-induced pleasure. ANNALS OF THE NEW YORK ACADEMY OF SCIENCES. 2023; 1520(1)DOI:10.1111/nyas.14946. PMID:36514207. IF:5,200 (Q1/3D). Document type: Article.

- Moraga P, Prieto P, Conradie A, Benhayoun M, Rousell V, Davy M, Fuhr U, Antonijoan Arbos R, Abad F, Portolés A, Van Duinen J, Carcas AJ, Borobia AM. Academia and industry agreement on a feasibility tool for first-time-in-human clinical trial units. CTS-Clinical and Translational Science. 2023; 16(12)DOI:10.1111/cts.13655. PMID:37818923. IF:3,900 (Q3/6D). Document type: Article.

Mental Health

Group leader

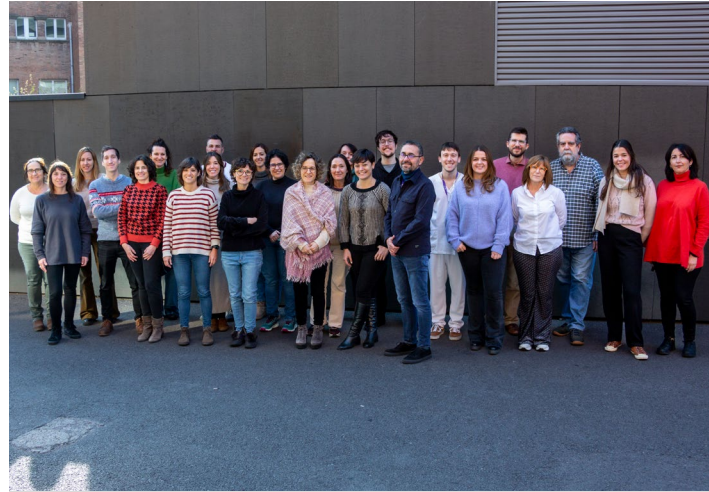
Portella Moll, Maria (IR)

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 Trujols Albet, Joan (FGS)
 Vera Igual, Javier (FGS)
 Vicent Gil, Muriel (FGS)

Research Technicians

Jubero Urgell, Miriam (IR)
 Selma Gonzalez, Judit (IR)



DESCRIPTION

The research group is dedicated to exploring innovative therapeutic approaches and unraveling the underlying causes of mental diseases to inform the development of novel treatment strategies ranging from psychotherapies to neuromodulation and new drugs. This involves leveraging acquired knowledge to guide the implementation of these cutting-edge treatments.

MAIN LINES OF RESEARCH

- Affective disorders -major depressive disorder, bipolar disorder, suicide and validation of scales- (Dr. Narcís Cardoner, Dr. Maria J Portella and Dr. Javier de Diego).
- Psychotic disorders -treatment-resistant schizophrenia, meta-cognitive treatment for patients with schizophrenia, DBS and digital Health- (Dr. Eva Grasa and Dr. Alexandra Roldán).
- Borderline personality disorder (Dr. Joaquim Soler).
- Eating Disorders (Dr. Mar Carceller-Sindreu and Dr. Cristina Carmona).
- Intensive Home Treatment (IHT) and other Community Interventions (Dr. Ana Martín-Blanco).

SCIENTIFIC CHALLENGES

- Foster research that reduces the healthcare, social and personal costs of mental illness by exploring areas such as epidemiology, etiopathogenesis, physiopathology, prevention and treatment.
- Foster research into mental health treatments including psychotherapy, psychopharmacology and neuromodulation.



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- Foster research to improve quality of life of patients with mental disorders.
 - Research into Affective Disorders
 - Identification and evaluation of new therapeutic targets in depression.
 - Neuroimaging studies in first psychotic episodes.
 - Biological and genetic markers in affective disorders.
 - Implementation of new therapeutic programmes, depression evaluation and social aspects of depression.
 - Research into Psychotic Disorders
 - Study of treatment resistance in schizophrenia.
 - Study of novel treatments (DBS, digital health) in schizophrenia and first episode of psychosis.
 - Neuroimaging studies in psychosis.
 - Study of environmental, biological and genetic factors in psychosis.
 - Efficacy and effectiveness studies of antipsychotic drugs.
 - Efficacy and effectiveness studies of meta-cognitive and emotion regulation therapies -for schizophrenia and first episode of psychoses.
 - Research into Personality Disorders
 - Clinical trials regarding the usefulness of mixed treatment in patients with borderline personality disorder and validation of diagnostic instruments.
 - Genetic-neuroimaging studies of borderline personality disorder (BPD).
 - Efficacy and effectiveness studies of psychotherapy for treating borderline personality disorder.
 - Research into Community intervention:
 - Community psychiatry.
 - Validation of patient and caregiver satisfaction scales and programs.

ACTIVE GRANTS

- Carceller Sindreu, Maria Del Mar. Avaluació de la seguretat i els efectes terapèutics del nou protocol de renutrició intensiva de l'hospital de dia de trastorns de la conducta alimentària. SCPSM 2022. Societat Catalana de Psiquiatria i Salut Mental (SCPiSM). Duration: 2022-2024. 3.000,00 €.
- Cardoner Alvarez, Narcis. Marcadores translacionales de estrés traumático. Translational biomarkers of traumatic stress (BioStress) NEURON-074. AC19/00088. Instituto de Salud Carlos III (ISCIII). Duration: 2020-2023. 99.825,00 €.
- Cardoner Alvarez, Narcis. Biomarcadores centrales y periféricos de respuesta antidepressiva: Estudio translacional entre pacientes con trastorno depresivo resistente al tratamiento y modelo de depresión en rata. PI18/00036. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2023. 119.339,77 €.
- Cardoner Alvarez, Narcis. Predicción de la respuesta terapéutica en la depresión resistente al tratamiento a través de algoritmos de aprendizaje automático: mejora de la traslación de la neuroimagen a la atención clínica. PI21/01756. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 111.320,00 €.
- Cardoner Alvarez, Narcis. Unraveling the influence of gut microbiota and derived metabolites on major depression: A cross-sectional neuroimaging-metabolomics study based on knowledge transfer from irritable bowel syndrome (IBS) and a porcine model: MOODGUT. MARATO 202209-30. 182.500,00 €.
- Corripio Collado, Iluminada. Estimulación Cerebral Profunda: hacia una nueva intervención para la recuperación del paciente con esquizofrenia resistente al tratamiento. PI19/00242. Instituto de Salud Carlos III (ISCIII). Duration: 2020-2024. 102.850,00 €.
- De Diego Adeliño, Franciso Javier. Depression and its treatment: Role of miRNAs in the anterior cingulate cortex, as peripheral biomarkers, and their targeted modulation by nano-tools as a promising antidepressant therapy (DemiRNApy). MARATO 202207-32. Fundacio la Marato de TV3. Duration: 2023-2026. 72.837,50 €.



5.1.3 Neurological Diseases, Neuroscience & Mental Health Area

- Nuñez Leanez, Christian. CD20/00142. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2023. 80.598,00 €.
- Nuñez Leanez, Christian. Identificación de variantes genéticas de riesgo para el diagnóstico de los trastornos psicóticos y afectivos. MV22/00108. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2023. 10.235,00 €.
- Portella Moll, Maria. Rehabilitación Integral cognitiva para DEpresión Mayor (RIDEM). Ensayo clínico multicéntrico, aleatorizado para investigar su eficacia. PI20/00270. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2023. 116.765,00 €.
- Portella Moll, Maria. A Phase III, Randomized, Active Comparator-controlled, Clinical Trial to Study the Efficacy and Safety of the INtegral Cognitive REMediation program (INCREM) in patients with Depression. MARATO 202227-30. Fundacio la Marato de TV3. Duration: 2023-2026. 186.408,75 €.
- Soler Ribaudi, Joaquin. Ensayo clínico sobre los efectos de un entrenamiento de habilidades en síntomas de larga evolución en pacientes con Trastorno Límite de Personalidad. PI19/00087. Instituto de Salud Carlos III (ISCIII). Duration: 2020-2024. 25.168,00 €. Soler Ribaudi, Joaquin. Estudio piloto aleatorizado de terapia dialéctica conductual y EMDr. para el tratamiento del trastorno límite de la personalidad y el trauma . 2020 EMDr. EUROPE INVESTIGATOR GRANT. EMDr. Europe. Duration: 2020-2023. 17.000,00 €.
- Soler Ribaudi, Joaquin. Assaig controlat aleatoritzat per avaluar l'eficàcia de l'entrenament d'habilitats de la RO-DBT en pacients amb trastorns alimentaris i trets de l'espectre autista: un estudi de prova de concepte. MARATO 202231-10. Fundacio la Marato de TV3. Duration: 2023-2026. 148.306,25 €.
- Trujols Albet, Joan. Invariancia de medición de los instrumentos de uso habitual en investigación sobre prevención y tratamiento del trastorno de juego. SUBV/00014. Ministerio de Consumo. Duration: 2022-2024. 11.660,00 €.
- De Diego Adeliño, Franciso Javier. Ayudas para contratos Juan de la Cierva 2022. JDC2022-048445-I. Ministerio de Ciencia e Innovacion (MICINN). Duration: 2024-2025. 67.400,00 €.
- De Diego Adeliño, Franciso Javier. Biomarcadores multimodales de conectividad y señal neural para la personalización de la Estimulación Cerebral Profunda (DBS) en la depresión refractaria. PI23/00469. Instituto de Salud Carlos III (ISCIII). Duration: 2024-2026. 62.500,00 €.
- Portella Moll, Maria & Vicent Gil, Muriel. Proteínas Sinápticas e Inflamatorias como Marcadores de Disfunción Cognitiva en Pacientes con Depresión Mayor Tratados con el Programa de Remediación Cognitiva RIDEM. PI23/00468. Instituto de Salud Carlos III (ISCIII). Duration: 2024-2026. 115.000,00 €.
- Portella Moll, Maria. Grup de Recerca en Salut Mental Sant Pau. 2021 SGR 00832. Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR). Duration: 2022-2025. 60.000,00 €.
- Portella Moll, Maria. Towards the next generation of excellent yoUng researchers on mental health by developing an intersectoral & transdisciplinary approach. 101126533 — TOUCH Project. HORIZON-MSCA-2022-COFUND-01 (UAB). Duration: 2024-2029. 84.600,00 €.

DOCTORAL THESES DEFENDED

- Deu Coll, Àngels. Característiques neuropsicològiques, psicopatològiques i tret de personalitat impulsiu en la conducta suïcida. 22/06/2023. Universitat Autònoma de Barcelona. Supervisors: Deus Yela, Joan; Pérez Solà, Víctor; De Diego Adeliño, Francisco Javier. <http://hdl.handle.net/10803/690755>.
- Porta Casteràs, Daniel. Alteracions neurals persistents en trastorn bipolar: Estudi de neuroimatge amb pacients eutímics. 13/12/2023. Universitat Autònoma de Barcelona. Supervisors: Cardoner Álvarez, Narcís; Cano Català, Marta; Subirà Coromina, Marta.

GRANTS AWARDED

- Cardoner Alvarez, Narcis. Avaluació d'intervencions de prevenció del dol per supervivents de suïcidi: IDOLS. Fundació La Caixa. Duration: 2023-2025. 32.336,70 €.

SCIENTIFIC PRODUCTION

- Aibar JA, Collado IC, Bejarano AR, Nevado RS, Bolanos IA, García J, Alonso A, Bello E, Schmidt CD, Hernandez FM, Teixido JM, Rodríguez RR. Long-term outcomes of deep brain stimulation



5.1.3 Neurological Diseases, Neuroscience & Mental Health Area

- for treatment-resistant schizophrenia: Exploring potential targets. *JOURNAL OF PSYCHIATRIC RESEARCH*. 2023; 163DOI:10.1016/j.jpsychires.2023.05.056. PMID:37245316. IF:4,800 (Q2/3D).Document type: Article.
- Alcantarilla L, López M, Betriu M, Torres A, García C, Solé E, Gelabert E, Roca A. Risk factors for relapse or recurrence in women with bipolar disorder and recurrent major depressive disorder in the perinatal period: a systematic review. *Archives of Womens Mental Health*. 2023; 26(6)DOI:10.1007/s00737-023-01370-9. PMID:37718376. IF:4,500 (Q2/4D).Document type: Review.
 - Aleman C, Puigdemont D, Martín A, Rodríguez R, Aibar JA, Vicent M, Álvarez E, Pérez V, Portella MJ, de Diego J. Response and Safety Outcomes in Treatment-Resistant Depression After Subcallosal Cingulate Gyrus Deep Brain Stimulation: Long-term Follow-up Study. *JOURNAL OF CLINICAL PSYCHIATRY*. 2023; 84(4):22m14622. DOI:10.4088/JCP.22M14622. PMID:37378475. IF:5,300 (Q1/2D).Document type: Article.
 - Arca G, Nunez C, Stephan C, Arnaez J, Agut T, Cordeiro M, Boronat N, Lubian S, Benavente I, Valverde E, García A. Massive Neonatal Arterial Ischemic Stroke. *PEDIATRIC NEUROLOGY*. 2023; 144DOI:10.1016/j.pediatr-neurol.2023.03.013. PMID:37087915. IF:3,800 (Q1/2D).Document type: Article.
 - Argyelan M, Deng ZD, Ousdal OT, Oltedal L, Angulo B, Baradits M, Spitzberg AJ, Kessler U, Sartorius A, Dols A, Narr KL, Espinoza R, van JA, Tendolkar I, van P, van GA, Takamiya A, Kishimoto T, Jorgensen MB, Jorgensen A, Paulson OB, Yroni A, Pérán P, Soriano C, Cardoner N, Cano M, van L, Schrijvers D, Belge JB, Emsell L, Bouckaert F, Vandenbulcke M, Kiebs M, Hurlemann R, Mulders PCR, Redlich R, Dannlowski U, Erhan K, Kritzer MD, Ellard KK, Camprodon JA, Petrides G, Malhotra AK, Abbott CC. Electroconvulsive therapy-induced volumetric brain changes converge on a common causal circuit in depression. *MOLECULAR PSYCHIATRY*. 2023; DOI:10.1038/s41380-023-02318-2. PMID:37985787. IF:11,000 (Q1/1D).Document type: Article.
 - Baeza I, de la Serna E, Mezquida G, Cuesta MJ, Vieta E, Amoretti S, Lobo A, Gonzalez A, Diaz CM, Corripio I, Valli I, Puig O, Mane A, Bioque M, Ayora M, Bernardo M, Castro J, PEPs GRP. Prodromal symptoms and the duration of untreated psychosis in first episode of psychosis patients: what differences are there between early vs. adult onset and between schizophrenia vs. bipolar disorder?. *EUROPEAN CHILD & ADOLESCENT PSYCHIATRY*. 2023; DOI:10.1007/s00787-023-02196-7. PMID:37027026. IF:6,400 (Q1/1D).Document type: Article.
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 - Butjosa A, Usall J, Vila R, Mezquida G, Cuesta MJ, Rodríguez E, Amoretti S, Lobo A, Gonzalez A, Espliego A, Corripio I, Vieta E, Baeza I, Berge D, Bernardo M. Impact of traumatic life events on clinical variables of individuals with first-episode psychosis and healthy controls. *INTERNATIONAL JOURNAL OF SOCIAL PSYCHIATRY*. 2023; 69(1):00207640211070398. DOI:10.1177/00207640211070398. PMID:35068217. IF:7,500 (Q1/2D).Document type: Article.
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5.1.3 Neurological Diseases, Neuroscience & Mental Health Area

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- Contreras O, Reales M, Fernández S, Cimpean A, Arnoriaga M, Puig J, Biarnes C, Motger A, Cano M, Fernández JM. Consumption of ultra-processed foods is associated with depression, mesocorticolimbic volume, and inflammation. *JOURNAL OF AFFECTIVE DISORDERS*. 2023; 335DOI:10.1016/j.jad.2023.05.009. PMID:37207947. IF:6,600 (Q1/2D).Document type: Article.
 - Costas A, Verdolini N, García C, Mezquida G, Janssen J, Valli I, Corripio I, Sánchez AM, Bioque M, Lobo A, Gonzalez A, Rapado M, Vieta E, de la Serna H, Mane A, Roldan A, Crossley N, Penades R, Cuesta MJ, Parellada M, Bernardo M, PEPs GRP. Difficulties during delivery, brain ventricle enlargement and cognitive impairment in first episode psychosis. *PSYCHOLOGICAL MEDICINE*. 2023; DOI:10.1017/S0033291723003185. PMID:38014924. IF:6,900 (Q1/1D).Document type: Article.
 - 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. *Span J Psychiatry Ment Health*. 2023;16(3):184-191. DOI: 10.1016/j.rpsm.2021.02.003. PMID: 33631372. Document type: Article.
 - De la Serna E, Puig O, Mezquida G, Moreno L, Merchan J, Amoretti S, Ruiz P, Gonzalez A, Molina M, Corripio I, Vieta E, Baeza I, Berge D, Penades R, Sánchez A, Cuesta MJ, Bernardo M, Castro J. Relationship between cognition and age at onset of first-episode psychosis: comparative study between adolescents, young adults, and adults. *EUROPEAN CHILD & ADOLESCENT PSYCHIATRY*. 2023; 32(4)DOI:10.1007/s00787-021-01901-8. PMID:34714406. IF:6,400 (Q1/1D). Document type: Article.
 - Fagiolini A, Cardoner N, Pirildar S, Ittsakul P, Ng B, Duailibi K, El Hindy N. Moving from serotonin to serotonin-norepinephrine enhancement with increasing venlafaxine dose: clinical implications and strategies for a successful outcome in major depressive disorder. *EXPERT OPINION ON PHARMACOTHERAPY*. 2023; 24(15)DOI:10.1080/14656566.2023.2242264. PMID:37501324. IF:3,200 (Q3/6D).Document type: Review.
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Neurobiology of Dementias

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DESCRIPTION

This multidisciplinary team is made up of more than 40 researchers including neurologists, neuropsychologists, biologists, biochemists, engineers and laboratory technicians. This is a highly translational team combining basic research with clinical research in humans to advance our understanding of these diseases. The group is very productive in generating publications and attracting competitive resources. The group regularly trains national and international residents, Master's students and pre- and postdoctoral researchers. The group offers an excellent place for the training of young researchers in a unique translational environment.

MAIN LINES OF RESEARCH

- Identification and characterization of novel biomarkers for the diagnostic and prognostic evaluation of patients with neurodegenerative diseases.
- Understanding the natural history of Alzheimer's disease clinical and biomarker changes in people with Down syndrome.
- Understanding the genetic causes underlying neurodegenerative disorders and developing new genetic-based biomarkers to aid in disease diagnosis and prognosis.
- Characterizing the molecular mechanisms underlying neurodegenerative dementias.
- Digital neuropathology applied to neurodegenerative diseases.
- The intersection between sleep, epilepsy, and Alzheimer's disease.



5.1.3 Neurological Diseases, Neuroscience & Mental Health Area

- Clinical trials in Alzheimer's disease and Down syndrome.

SCIENTIFIC CHALLENGES

Since its founding over 15 years ago, our group has experienced continual and exponential growth and is firmly consolidated as a leader in translational research into neurodegenerative dementias. We currently have a total of 11 principal investigators of active, competitive research grants. Although this is a positive sign of our growth in recent years, it also brings with it many organizational challenges that need to be met. Within our research setting, our group is a relative exception not only in size but also in the levels of clinical care and scientific excellence achieved. Moving forward, our objective is to maintain a sustainable growth without compromising on the values and vision that we have sustained until now and that have made this growth possible.

Recent advances in the field of Dementia are expected to herald a revolution in the coming years that will have a substantial impact on our clinical and research activity. For example, digital tools and plasma biomarkers are already here and pharmacological treatments that change the course of Alzheimer's disease could be available in the next 24 months. The detection of low abundant proteins in plasma requires ultrasensitivity, such as that provided by Single Molecule Array (SIMOA) digital ELISA technology (Quanterix), which is available in our group. Combined with our active participation in multiple clinical trials, our group is perfectly placed to lead the charge in this field and adapt to these changes.

Based on the aforementioned advances, the challenges moving forward include:

- Maintain our scientific production and funding, prioritizing the projects with higher impact.
- Consolidate our number of granted projects in European and international applications.
- Unfold the potential to collaborate with pharma and technological companies to foster additional patent applications and contracts.
- Adapt our research in response to the integration of the first disease-modifying therapy.
- Continue to innovate by developing ever more sensitive technologies for digital and blood based biomarkers.

ACTIVE GRANTS

- Alcolea Rodríguez, Daniel Andrés. Utilidad diagnóstica de A β 42 y A β 42/40 en LCR y plasma para detectar amiloidosis cerebral y correlación con marcadores subrogados de producción de β -amiloide en enf. de Alzheimer. PI18/00435. Instituto de Salud Carlos III (ISCIII). Duration: 2019-2023. 147.620,00 €.
- Alcolea Rodríguez, Daniel Andrés. Caracterización multimodal de las etapas prodrómicas del espectro Alzheimer-Lewy. PI22/00611. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2025. 153.670,00 €.
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- Arranz Martinez, Javier Jose. Contractes Rio Hortega 2021. CM21/00243. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2023. 65.000,00 €.
- Arriola Infante, Jose Enrique. Contratos Rio Hortega 2022. CM22/00219. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2024. 65.000,00 €.
- Bejanin, Alexandre Pierre Armand. Contractes Miguel Servet I 2020. CP20/00038. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2026. 202.500,00 €.
- Bejanin, Alexandre Pierre Armand. Neuroimagen multimodal de la enfermedad de pequeños vasos relacionada con la enfermedad de Alzheimer en el síndrome de Down. PI22/00307. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2025. 165.770,00 €.
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- Carmona Iragui, Maria. Multimodal assessment of brain inflammatory biomarkers in DS-associated AD. AARG-22-973966. Alzheimer's Association. Duration: 2023-2025. 141.246,28 €.
- Dols Icardo, Oriol. Estudio longitudinal del papel de las células inmunitarias periféricas en la evolución de la ELA. FUND.HNA. Fundación HNA. Duration: 2021-2023. 100.000,00 €.
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- Dols Icardo, Oriol. Caracterización transcriptómica y neuropatológica del tejido postmortem de pacientes con esclerosis lateral amiotrófica portadores de la expansión en el gen C9orf72. PI21/01395. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 87.120,00 €.
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5.1.3 Neurological Diseases, Neuroscience & Mental Health Area

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Molecular Physiology of the Synapse

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DESCRIPTION

The Molecular Physiology of the Synapse Laboratory is focused on understanding the organization and dynamics of the proteome from synapses of the forebrain, particularly excitatory synapses from the cortex and hippocampus. We want to unravel how synaptic proteome physiology orchestrates synaptic plasticity, ultimately contributing to cognition and behavior. Furthermore, we pursue to understand how disruption of normal molecular synaptic physiology can contribute to certain disorders, particularly cognitive disorders such as Intellectual Disability or Autism.

MAIN LINES OF RESEARCH

- Molecular and cellular analyses of the vertebrate synapse.
- Molecular and cellular dysfunctions underlying intellectual disability and autism.
- Research into animal models of mental and behavioral disorders.
- Development of new biochemical methods to study the synapse.

SCIENTIFIC CHALLENGES

- Characterize the molecular roots of cognition and behaviour.
- Identify the synaptic molecules and mechanisms involved in mental and behavioural disorders, mainly intellectual disabilities and autism spectrum disorders.
- Identify drugs which might help treat mental and behavioural disorders.



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- Study the reversibility after birth of neurodevelopmental disorders affecting cognition.

ACTIVE GRANTS

- Bayes Puig, Alejandro. La Sobre-activación de Camk2 Sustentaría las Disfunciones Sinápticas Observadas en la Encefalopatía Epiléptica SYNGAP1. PID2021-124411OB-I00. Ministerio de Ciencia e Innovación (MICINN). Duration: 2022-2025. 181.500,00 €.
- Bayes Puig, Alejandro. Lithium as a Treatment to Improve Core Behavioural and Cognitive Symptoms of the Neurodevelopmental Disorder Caused by SYNGAP1. Asociación SYNGAP1 España. Duration: 2023-2023. 10.000,00 €.

GRANTS AWARDED

- Bayes Puig, Alejandro. Grup De Senyalització Sinàptica. 2021 SGR 01005. Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR). Duration: 2022-2025. 40.000,00 €.
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SCIENTIFIC PRODUCTION

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Stroke Pharmacogenomics and Genetics

Group leader

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Alzate Piñol, Sayoa (IR)

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Marine Llorente, Laia (IR)



DESCRIPTION

The Stroke Pharmacogenomics and Genetics group is a multidisciplinary group composed of 11 members including biologists, biotechnologists and neurologists. The objectives of the group are to find treatments for stroke and other neurological diseases that can be used in clinical practice. To find these treatments we are using genome-wide techniques such as GWAS, EWAS, TWAS, PWAS, or microbiome analysis. This includes genetics, epigenetics, transcriptomics, proteomics, and microbiomics with large cohorts of patients.

MAIN LINES OF RESEARCH

L1 Genetic risk factors in stroke.

- In this line, we study the genetic risk factors associated with ischemic stroke. Currently, the Generation project (PI15 / 01978, PI: Israel Fernández) is being carried out, which intends to carry out the first study using Genome Wide Association Studies (GWAs) in the Spanish population with the aim of generating a clinical-genetic prediction algorithm to be applied in clinical practice. In this study we conducted a discovery phase where we analyzed more than 6,000 patients and controls using GWAs arrays (Infinium Human-Exon BeadChip (Illumina) that can detect 500,000 genetic variants across the genome.
- We have found loci associated with cardioembolic stroke and we generated a clinical-genetic score to predict the risk of cardioembolic stroke (Carcel et al, 2022).
- Finally in this line, we have actively collaborated in the study Megastroke and Gigastroke an interna-



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tional project and consortium that has analyzed more than 1.000,000 cases of stroke and controls through GWAs. The results of this study have been published in the journal Nature Genetics and Nature being our group the only Spanish group that is part of the executive / scientific committee of these two studies (Malik et al Nat Gen 2018; Mishra et al Nature 2022).

- Jara Cárcel Postdoctoral researcher from our group is the coordinator of this line of research.

L2 Pharmacogenetics of neurovascular diseases.

- In this line, the genetic factors associated with the response to drugs used in ischemic stroke are studied both in the acute phase (rt-PA) and for secondary prevention (antiplatelet agents and anticoagulants). In the field of pharmacogenetics associated with the response to rt-PA our group is one of the most important research groups in the field with the largest number of published articles. Last year we obtained a grant from the Medicina Personalizada program to study the pharmacogenetics of rt-PA and its implementation in the clinical-practise.
- In this line, we have obtained international funding for two projects: SEDMAN Project and APHAS Project. The two projects are focused on the search for genetic factors associated with the response to anticoagulant drugs. Israel Fernández is PI of these two projects.
- In this line, we have carried out the first study with GWAs in patients with ischemic stroke treated with t-PA. We have performed an analysis on more than 1.000 patients. Several of these results will be published in the journal Neurology and Brain (Carrera et al, Neurology 2019; Carrera et al. Brain 2021).

L3 Genetic and epigenetic risk factors associated with the neurological deterioration and the disability after stroke.

- In this line we study whether the genetic and epigenetic factors can influence the stroke outcome. We analyze the neurological deterioration during the acute phase of stroke (24h) and the long-term disability (three months).
- A GWAS analysis performed by our group (n = 3500 patients with ischemic stroke) revealed a

locus associated with disability post-stroke. This loci is found in the INADL / PATJ gene. It has been the first gene confirmed to be associated with long term outcome in stroke. These results have been published in Circulation Research this year. Israel Fernández is the corresponding author of this paper (Mola-Caminal et al Circulation Research 2019).

- Currently, we are conducting studies in cell cultures and animal models to study the reasons for this association and the potential use of the protein codified in the gene as a new drug target.
- Natalia Cullell post-doctoral researcher from our group is the coordinator of this line of research.

L4 Genetic, epigenetic, and proteomic factors associated with the endophenotypes of the acute phase of stroke. Integromics.

- The aim of this research line is to find genetic, epigenetic, and protein factors associated with different endophenotypes of the acute phase of stroke, such as post-stroke infections, edema formation, leukocyte levels during the acute phase of stroke. The hypothesis is that neurological evolution and post-stroke disability is influenced by multiple factors.
- We have now carried out a genetic analysis in 1,183 patients with neutrophil and post-stroke outcome data. We collaborate in the GENESIS study, led by Dr. Jin-Moo Lee an international study with different networks (United States, Spain, South America, and Central Europe). Currently, we are leading the Spanish network. This study analyzed 6.000 strokes with endophenotype data of the acute phase of stroke using GWAs and found loci associated with neurological deterioration (Ibañez et al Brain 2022).

L5 Microbiome and Stroke.

- The estimated total cell count of a typical human body is 6.8×10^{13} . However, 66% of these cells are bacteria that live within us. At the same time, the genome size of the human gut microbiota is 150 larger than the human genome. The dysbiosis of the gut microbiome (changes in the composition of the types of microorganisms) has been identified as a potential risk factor for susceptibility to numerous diseases, including stroke, influencing systemic inflammation by altering intestinal permeability.



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- In this line, we aim to investigate whether the gut microbiome could also be influencing the neurological evolution after a stroke, modulating the antigen-specific immune responses of the central nervous system. If this is confirmed, changes in the intestinal flora could be promoted, either through the use of probiotics in the diet or through fecal transplantation from healthy donors, in order to discover new therapies that could improve the evolution of patients after having suffered a stroke. Miquel Lledós coordinates this line of research.

L6 Lipids and Stroke.

- According to numerous observational studies and randomized controlled trials, low-density lipoprotein cholesterol (LDL-C) is a risk factor for cardiovascular disease, including myocardial infarction, peripheral vascular disease, and stroke. Other studies, however, have described an inverse association between the plasma level of LDL-C and the risk of hemorrhagic stroke. The mechanism by which dyslipidemias are associated with coronary heart disease has been widely studied. However, the mechanism underlying the association between cholesterol and stroke is not well established and could present significant differences due to the peculiar structure of the cerebral arteries and the peculiarities of cerebral metabolism.
- Our goal is to apply genomic analysis techniques to detect genes and lipid metabolism pathways involved in the risk and prognosis of different types of stroke, identify potential therapeutic targets and thus improve stroke prevention and treatment.
- The senior researcher Jesús Martín coordinates this line of research.

L7 CADASIL and other orphan diseases associated with stroke.

- The objective of this research line is to study monogenic diseases associated with stroke. We have focused specifically on CADASIL and other monogenic causes of small vessel stroke. Currently we are performing transcriptomics and proteomics studies in CADASIL. In addition, we have the first clinical consult focus on CADASIL disease and other monogenic diseases associa-

ted with stroke and small vessel disease in the country.

- We have a fluid relationship with the Spanish association of CADASIL patients. We collaborate with the CADASIL SPAIN Patient Association (<https://cadasil.org/>) organizing and participating in informative days about the disease.
- In this line we have created a website www.cadasil.es where we respond the clinical doubts from CADASIL patients or relatives. In this line we have carried out a crowdfunding project with the PRECIPITA project of the Spanish Science and Technology Foundation (FECYT) with the aim of raising funds for CADASIL studies: <https://www.precipita.es/precipitado/cadasil-una-enfermedad-genetica-sin-tratamiento.html>.
- We recently have obtained an international grant to study CADASIL from the Million Dollar Bike Program being our group the coordinator of this study. The postdoctoral researcher Elena Muiño participates in this line.

L8 Genetic susceptibility to COVID-19, COVID-19 and stroke.

- In this line we analyze the genetic factors associated with the risk and severity of COVID-19 using broad-spectrum genetic tools. Also, we analyze the genetic factors associated with post-COVID-19 stroke. We have analyzed a cohort of more than 600 patients with GWAS data. We are part of the INMUNGEN-CoV2 study financed by the CSIC and of which Anna Planas (CSIC-IDIBAPS) is the principal investigator. In this line we also collaborate with Drs Jordi Pérez Cruz (CSIC-Valencia) and Marta López de Diego (CSIC-Madrid). We have also received funding from the Marató of TV3 for the omic study of the severity of COVID-19 and its relationship with the persistent symptoms of this pathology.
- Laia Lluçà and Sayoa Alzate work in this line of research.

ACTIVE GRANTS

- Fernández Cadenas, Israel. iBioStroke: Identificación y validación clínica de biomarcadores para la evolución clínica post-ictus. AC19/00106. Instituto de Salud Carlos III (ISCIII). Duration: 2020-2023. 93.170,00 €.

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- Fernández Cadenas, Israel. CNV and Stroke (CaNVAS). NIH MARYLANDO (CaNVAS) 1R01NS114045-01. National Institute of Neurological Disorders . Duration: 2020-2023. 100.084,00 €.
- Fernández Cadenas, Israel. Single-nuclei RNA-seq for CADASIL understanding and therapeutic target discovery. MDBR-22-127-CADASIL. . Duration: 2022-2023. 53.205,00 €.
- Fernández Cadenas, Israel. Biomarcadors proteòmics cardiometabòlics i immunitaris de la Covid-19 per a l'avaluació clínica de la infecció, la gravetat de la malaltia i les complicacions post-pandèmiques de salut. MARATO 202107-31. Fundació La Marató de TV3. Duration: 2022-2024. 129.750,00 €.
- Fernández Cadenas, Israel. Elucidating the Key Mediators and Mechanisms of Cerebral Edema and Hemorrhagic Transformation after Hemispheric Stroke using Quantitative Imaging and Genetics. NIH RO1 edema. (Raj Dhar and Spanish network) NIH - WUSTL . Duration: 2022-2027. 344.242,00 €.
- Universitat Autònoma de Barcelona. Supervisors: Fernández Cadenas, Israel; Martí i Fàbregas, Joan. <http://hdl.handle.net/10803/688764>
- Cullell Fornés, Natalia. Estudio Epigenómico de los factores de riesgo y pronostico del ictus isquémico. 21/06/2023. Universitat Autònoma de Barcelona. Supervisors: Fernández Cadenas, Israel; Krupinski, Jerzy; Chamorro, Àngel.

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GRANTS AWARDED

- Fernández Cadenas, Israel. CADASIL-Historia Natural (CADANHIS). AC23_2/00041. Instituto de Salud Carlos III (ISCIII). Duration: 2024-2026. 179.375,00 €.
- Fernández Cadenas, Israel. Stopped-Stroke. Reversible epigenetic therapies to SToP biological age and reduce STroke risk. MARATO 202310-30. Fundació La Marató de TV3. Duration: 2024-2027. 133.972,50 €.
- Carcel Marquez, Jara. Gen-X project: Genetic and epigenetic study of ischemic stroke and its sex differences. MARATO 202306-30. Fundació La Marató de TV3. Duration: 2024-2027. 199.801,25 €.

DOCTORAL THESES DEFENDED

- Cárcel Márquez, Jara. Study of genetic risk factors associated with ischemic stroke. 24/01/2023.



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Genetic Diseases

Group leader

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DESCRIPTION

The Genetic Diseases Group is a multidisciplinary group with an important clinical component in its research within the Genetics Department of the Hospital de Sant Pau. Its activities also have a translational orientation facilitated by the clinical environment in which it performs the laboratory work.

The primary objective of the Genetic Diseases Group is the progress of the molecular diagnosis of genetic and rare diseases through genomic, transcriptomic, functional, and pharmacogenetic studies improving the knowledge of the molecular mechanisms of described genes and the identification of new ones. The results of these genetic studies allow us to establish in many cases different therapeutic options and to offer genetic counseling to the families. The fact that the group is made up entirely of Sant Pau Genetics Dept staff, supports the clinical translational effect of their research work.

MAIN LINES OF RESEARCH

- Genetics of congenital myopathies, congenital, and adult muscular dystrophies, including limb girdle muscle dystrophies, and congenital myasthenic syndromes.
- Spinal atrophy and smn genes.
- Genetics of hereditary cancer.
- Pharmacogenetics.
- Cardiogenetics.
- Genetics in pediatrics-obstetrics.



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SCIENTIFIC CHALLENGES

Congenital myopathies, congenital and adult muscular dystrophies, including limb girdle muscle dystrophies, and congenital myasthenic syndromes

- Identification of mutations and genetic variants.
- Studies of molecular pathology and disease mechanisms of neuromuscular diseases-related genes.
- Transcriptome analysis by RNA Seq technology.
- Functional studies on the DMD genes to determine the pathogenic effect of the identified variants.
- Long Read Sequencing by ONT technology to characterize long repeat expansions in size and composition.

Spinal atrophy and SMN genes

- To design new strategies for the study and improvement of the molecular diagnosis of atypical cases.
- To perform functional studies for the characterization of genetic variants of uncertain clinical effect to improve diagnosis.
- Studies of molecular pathology, disease mechanisms, and SMN gene expression.
- Identification of modifying genes.
- Study of biomarkers for validation processing in spinal muscular atrophy.
- Study of the neuromuscular junction in human development.

Hereditary cancer

- Development of Precision Medicine in hereditary syndromes of predisposition to cancer: an approach to the diagnosis, treatment and prevention of cancer through the identification of pathogenic variants in multigene assays.
- Development of functional studies for the characterization of genetic variants of uncertain clinical effects.
- Analysis of biomarkers in liquid biopsy-free circulating tumor DNA (cfDNA) as a predictor of response to the treatment of breast cancer.

- Contribution to the development of an open database of genetic variants included in Hereditary Cancer Genetic Testing Panels.

Pharmacogenetics

- Identification of biomarkers of response/toxicity to drugs used in cancer, rheumatology, inflammatory bowel diseases, cardiology, hematology.
- Congenital coagulopathies: molecular pathology of hemophilia.
- Duchenne and Becker muscular dystrophy: molecular pathology of DMD gene.
- Identification of the molecular alterations responsible for hereditary hearing loss.
- Studies of the molecular pathology causing ataxias.
- Clinical and Molecular diagnosis of complex diseases of pediatric-onset with special attention in Neurodevelopmental Disorders.

Cardiogenetics

- Clinical and Molecular studies of patients with cardiomyopathies (dilated, hypertrophic, arrhythmogenic, non-compacted, etc) to identify disease-associated genetic variants.
- Study of clinically discordant families with the same pathogenic genetic variant to identify phenotype modifiers in cardiomyopathies.
- Clinical and Molecular characterization of patients with aortic diseases (Aortic Aneurysms, Aortic Valvular Disease, Aortic Occlusive Disease, Traumatic Aortic Disease, Aortic Dissections).

Pediatrics-obstetrics

- Clinical and Molecular studies of syndromic patients:
- Identification of responsible variants and discovery of new genes
- Clinical and Molecular studies of fetal anomalies detected during pregnancy.

ACTIVE GRANTS

- Gonzalez Quereda, Lidia. Análisis integrado de datos genómicos y transcriptómicos para el avance en el conocimiento molecular y diagnóstico de las miopatías. PI22/01859. Instituto



5.1.3 Neurological Diseases, Neuroscience & Mental Health Area

- de Salud Carlos III (ISCIII). Duration: 2023-2025. 87.120,00 €.
- Riera Armengol, Pau. Integración de la farmacogenética y la telemedicina mediante salud móvil para el manejo de los efectos adversos en pacientes con cáncer colorrectal. (ePGx study). PI21/01913. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 63.525,00 €.
 - Riera Armengol, Pau. Integració de la farmàcia hospitalària i comunitària per a la implementació de la farmacogenètica a la pràctica assistencial. JOAQUIM BONAL 2019. Fundació Acadèmia de Ciències Mèdiques i de la Salut de Catalunya i Balears. Duration: 2019-2023. 14.000,40 €.
 - Riera Armengol, Pau. Integración de la farmacogenética y la telemedicina mediante salud móvil para el manejo de los efectos adversos en pacientes con cáncer colorrectal. (ePGx study). FEFH 2022. Fundación Española de Farmacia Hospitalaria. Duration: 2021-2023. 15.400,00 €.
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 - Collet R, Olmedo G, Ruiz I, Martinez A, Rodríguez B, Bernal S, Kulisevsky J, Pagonabarraga J. Late-Onset Beta-Propeller Protein-Associated Neurodegeneration: A Case Report. Movement Disorders Clinical Practice. 2023; 10(8)DOI:10.1002/mdc3.13811. PMID:37635772. IF:4,000 (Q2/4D). Document type: Article.
 - De Pourcq JT, Riera P. Critical Commentary on the paper: Compatibility of prolonged infusion antibiotics during Y-site administration with parenteral nutrition. Nursing in Critical Care. 2023; 28(6)DOI:10.1111/nicc.12910. PMID:37232328. IF:3,000 (Q1/2D). Document type: Editorial Material.

SCIENTIFIC PRODUCTION

- Abuli A, Costa M, Codina M, Valenzuela I, Leno J, Rovira E, Cueto A, Fernández P, García E, Cusco I, Tizzano EF. Experience using singleton exome sequencing of probands as an approach to preconception carrier screening in consanguineous couples. JOURNAL OF MEDICAL GENETICS. 2023; 60(6)DOI:10.1136/jmg-2022-108607. PMID:36600615. IF:4,000 (Q2/3D). Document type: Article.
- Arqueros C, Salazar J, Gallardo A, Andrés M, Tibau A, Bell OL, Artigas A, Lasa A, Cajal T, Lerma E, Barnadas A. Secreted Protein Acidic and Rich in Cysteine (<i>SPARC</i>) Polymorphisms in Response to Neoadjuvant Chemotherapy in HER2-Negative Breast Cancer Patients. Biomedicines. 2023; 11(12):3231. DOI:10.3390/biomedicines11123231. PMID:38137452. IF:4,700 (Q1/3D). Document type: Article.
- Bermejo L, Fernández CPD, González L, Segarra A, Nedkova V, Gallano P, Martín P, Hernández A, Olivé M, Arteché A, Domínguez C. Distal myopathy due to digenic inheritance of <i>TIA1</i> and <i>SQSTM1</i> variants in two unrelated Spanish patients. NEUROMUSCULAR DISORDERS. 2023; 33(12)DOI:10.1016/j.nmd.2023.10.016. PMID:38016875. IF:2,800 (Q3/6D). Document type: Article.
- Esmel R, Valenzuela I, Riaza L, Rodríguez B, Rosés F, Boronat S, Sabaté A. Arterial tortuosity syndrome: Phenotypic features and cardiovascular manifestations in 4 newly identified patients. European Journal of Medical Genetics. 2023; 66(9):104823. DOI:10.1016/j.ejmg.2023.104823. PMID:37619836. IF:1,900 (Q4/8D). Document type: Article.
- Iznardo H, Bernal S, Boronat S, Roé E. Sclerotic Bone Lesions as a Clue in the Diagnosis of Three Generations of Tuberous Sclerosis Complex: Case Report and Review of Literature. PEDIATRIC NEUROLOGY. 2023; 148DOI:10.1016/j.pediatr-neurol.2023.07.022. PMID:37634327. IF:3,800 (Q1/2D). Document type: Article.
- Miarons M, Gordon AM, Riera P, Nicolas FG, Spanish Soc Hosp Pharm S. Allelic Frequency of DPYD Genetic Variants in Patients With Cancer in Spain: The PhotoDPYD Study. ONCOLOGIST. 2023; 28(5):e304-e308. DOI:10.1093/oncolo/oyad077. PMID:37014829. IF:5,800 (Q1/3D). Document type: Article.



5.1.3 Neurological Diseases, Neuroscience & Mental Health Area

- Mir JF, Rodríguez C, Estrada M, de Gamarra EF, Mangues MA, Bagaria G, Riera P. An Integrated Multidisciplinary Circuit Led by Hospital and Community Pharmacists to Implement Clopidogrel Pharmacogenetics in Clinical Practice. *Pharmacy*. 2023; 11(2):76. DOI:10.3390/pharmacy11020076. PMID:37104082. Document type: Article.
- Palones E, Curto E, Plaza V, Gonzalez L, Segarra A, Querol L, Bertolotti F, Rodríguez MJ, Gallano P, Crespo A. Clinical and functional characteristics, possible causes, and impact of chronic cough in patients with cerebellar ataxia, neuropathy, and bilateral vestibular areflexia syndrome (CANVAS). *JOURNAL OF NEUROLOGY*. 2023; DOI:10.1007/s00415-023-12001-9. PMID:37917234. IF:6,000 (Q1/2D). Document type: Article.
- Paneque M, Guimarães L, Bengoa J, Pasalodos S, Cordier C, Esteban I, Lemos C, Moldovan R, Serra C. An European overview of genetic counselling supervision provision. *European Journal of Medical Genetics*. 2023; 66(4):104710. DOI:10.1016/j.ejmg.2023.104710. PMID:36731744. IF:1,900 (Q4/8D). Document type: Article.
- Rodríguez PM, Ravenscroft G, Natera D, Carr A, Manzur A, Liu WW, Vella NR, Jericó I, Gonzalez L, Gallano P, Montalto SA, Davis MR, Lamont PJ, Laing NG, Bourque P, Nascimento A, Muntoni F, Polavarapu K, Lochmüller H, Palace J, Besson D. A novel phenotype of AChR-deficiency syndrome with predominant facial and distal weakness resulting from the inclusion of an evolutionary alternatively-spliced exon in CHRNA1. *NEUROMUSCULAR DISORDERS*. 2023; 33(2) DOI:10.1016/j.nmd.2022.12.011. PMID:36634413. IF:2,800 (Q3/6D). Document type: Article.
- Sainz L, Riera P, Moya P, Bernal S, Casademont J, Díaz C, Millán AM, Park HS, Lasa A, Corominas H. Clinical Value of IL6R Gene Variants as Predictive Biomarkers for Toxicity to Tocilizumab in Patients with Rheumatoid Arthritis. *Journal of Personalized Medicine*. 2023; 13(1):61. DOI:10.3390/jpm13010061. PMID:36675722. IF:3,508 (Q2/4D). Document type: Article.
- Sainz L, Riera P, Moya P, Bernal S, Casademont J, Diaz C, Millan AM, Park HS, Lasa A, Corominas H. Impact of IL6R genetic variants on treatment efficacy and toxicity response to sarilumab in rheumatoid arthritis. *ARTHRITIS RESEARCH & THERAPY*. 2023; 25(1):226. DOI:10.1186/s13075-023-03209-1. PMID:38001504. IF:4,900 (Q2/4D). Document type: Article.
- Sarkozy A, Bourke JP, Ferlini A, Barthélémy I, Cripe LH, Reuben E, Evangelista T et al. 263rd ENMC International Workshop: Focus on female carriers of dystrophinopathy: refining recommendations for prevention, diagnosis, surveillance, and treatment. Hoofddorp, The Netherlands, 13-15 May 2022. THE BOULEVARD, LANGFORD LANE, KIDLINGTON, OXFORD OX5 1GB, ENGLAND: PERGAMON-ELSEVIER SCIENCE LTD. 2023. p.p. 274-284. Document type: Conference Paper.
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- Segarra A, Dominguez C, Hernandez A, Sánchez MT, Camacho A, Rivas E, Campo A, Madruga M, Ortez C, Natera D, Nascimento A, Codina A, Rodríguez MJ, Gallano P, Gonzalez L. Genetic diagnosis of Duchenne and Becker muscular dystrophy through mRNA analysis: new splicing events. *JOURNAL OF MEDICAL GENETICS*. 2023; 60(6) DOI:10.1136/jmg-2022-108828. PMID:36535754. IF:4,000 (Q2/3D). Document type: Article.
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Neurosurgery

Group leader

Muñoz Hernandez, Fernando (FGS)

Researchers

Aibar Duran, Juan Angel (FGS)

Anka, Michael Oladotun (FGS)

Borras Pino, Xavier (FGS)

De Quintana Schmidt, Cristian Jose (FGS)

Freixer Palau, Berta (FGS)

Leidinger, Andreas (FGS)

Patino Alvarado, Juan Diego (FGS)

Perales Susan, Mario (IR)

Rico Pereira, Marta (FGS)

Rodríguez Rodríguez, Rodrigo (FGS)

Roig Arsequell, Clara (FGS)

Sánchez Nevado, Raquel (FGS)

Tello Vicente, José Antonio (FGS)



DESCRIPTION

The neurosurgery team is a young research group with a clear mission: improve the quality of life of patients and, at the same time, be able to contribute to improvements in healthcare practice through research into potential surgical neurological disease. There are 4 areas of knowledge where our group stands out nationally and internationally: neuro oncology, skull base, functional neurosurgery, and spine surgery.

MAIN LINES OF RESEARCH

- Tumor biology: gliomas (prognostic value of different mutations in anaplastic astrocytoma and GBM). Dr. de Quintana.
- Biomarkers in anaplastic astrocytomas, and glioblastoma multiforme. Application of new technologies in the resection of intracranial tumors. Dr. de Quintana.
- Tumor biology: pituitary gland adenomas, pathology molecular analysis. Dr. F. Muñoz.
- Prospective study of patients operated by endoscopic endonasal approach. Dr. F. Muñoz.
- Biomaterials: a comparative study of two different cranial bone fixations. Dra. M. Rico.
- Study about cerebral plasticity in patients with cervical myelopathy. Dr. J. Patino.
- Muscle atrophy after spinal surgery (lumbar lateral approach). Dr. A. Leidinger.
- Clinical evaluation of neurostimulation techniques in different neurological entities (Parkinson disease and neuropathic pain). Dr. Rodríguez and Dr. Aibar.



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- Deep brain stimulation on psychiatric disorders: Depression and Schizophrenia. Dr. Rodríguez and Dr. Aibar.
- Safety and effectiveness of dialysis. Dr. de Quintana.
- Asencio C, Villalba G, De Vilalta Á, Serrano L, Álvarez MJ, Montes G, Málaga X, Muñoz F, Gabarrós A. Safety and Performance of a New Burr Hole Covering Device: Results of the Multi-center COVER Registry. *Journal of Neurological Surgery Part A-Central European Neurosurgery*. 2023; 84(5). DOI:10.1055/a-1883-0344. PMID:35738392. IF:1,000 (Q4/9D). Document type: Article.

SCIENTIFIC CHALLENGES

- Neurostimulation for resistant craniofacial pain (jointly with Neurology and Pain Clinic Unit). Dr. Rodríguez and Dr. Aibar.
- Use of intraoperative echography for treatment of brain tumors. Dr. de Quintana.
- Monitor the glioma tumor diagnosis, treatment and prognostic factors (Hospital Sant Pau - Hospital del Mar). Dr. de Quintana.
- Pituitary adenoma treatment: medial cavernous sinus wall approach to cure adenomas. Intraoperative neuromonitoring of oculomotor cranial nerves in skull base tumors. Dr. F. Muñoz.
- Gil J, Marques M, Valassi E, Serra G, Salinas I, Xifra G, Casano P, Carrato C, Biagetti B, Sesmiolo G, Marcos J, Rodríguez H, Rueda A, Aulinas A, Blanco A, Hostalot C, Simó A, Muñoz F, Rico M, Ibanez J, Cordero E, Webb SM, Jordà M, Puig M. Molecular characterization of epithelial-mesenchymal transition and medical treatment related-genes in non-functioning pituitary neuroendocrine tumors. *Frontiers in Endocrinology*. 2023; 14:1129213. DOI:10.3389/fendo.2023.1129213. PMID:37033229. IF:5,200 (Q1/3D). Document type: Article.

ACTIVE GRANTS

- De Quintana Schmidt, Cristian Jose. Ecografía intraoperatoria en la exéresis de metástasis cerebrales y estudio de los márgenes de resección: correlación con la resonancia magnética, la tomografía de emisión de positrones y la histología. IIBSP-ECO-2022-49. Duration: 2022-2023.
- Latorre G, González N, García J, González C, Porta J, Molina FJ, Guerrero AL, Belvis R, Rodríguez R, Bescós A, Irimia P, Santos S. Diagnosis and treatment of trigeminal neuralgia: Consensus statement from the Spanish Society of Neurology's Headache Study Group. *NEUROLOGIA*. 2023; 38. DOI:10.1016/j.nrl.2021.09.015. IF:3,900 (Q2/4D). Document type: Review.

SCIENTIFIC PRODUCTION

- Aibar JA, Collado IC, Bejarano AR, Nevado RS, Bolanos IA, García J, Alonso A, Bello E, Schmidt CD, Hernandez FM, Teixido JM, Rodríguez RR. Long-term outcomes of deep brain stimulation for treatment-resistant schizophrenia: Exploring potential targets. *JOURNAL OF PSYCHIATRIC RESEARCH*. 2023; 163. DOI:10.1016/j.jpsychires.2023.05.056. PMID:37245316. IF:4,800 (Q2/3D). Document type: Article.
- Alemay C, Puigdemont D, Martín A, Rodríguez R, Aibar JA, Vicent M, Álvarez E, Pérez V, Portella MJ, de Diego J. Response and Safety Outcomes in Treatment-Resistant Depression After Subcallosal Cingulate Gyrus Deep Brain Stimulation: Long-term Follow-up Study. *JOURNAL OF CLINICAL PSYCHIATRY*. 2023; 84(4):22m14622. DOI:10.4088/JCP.22M14622. PMID:37378475. IF:5,300 (Q1/2D). Document type: Article.
- Leidinger A, Zuckerman SL, Feng YQ, He YT, Chen XR, Cheserem B, Gerber LM, Lessing NL, Shabani HK, Haertl R, Mangat HS. Predictors of spinal trauma care and outcomes in a resource-constrained environment: a decision tree analysis of spinal trauma surgery and outcomes in Tanzania. *JOURNAL OF NEUROSURGERY-SPINE*. 2023; 38(4). DOI:10.3171/2022.11.SPINE22763. PMID:36640104. IF:2,800 (Q2/4D). Document type: Article.
- Martinez S, Aracil I, Perez J, Perez L, García J, Campolongo A, Aibar JA, Rodríguez R, Pascual B, Kulisevsky J. Theta/Alpha Band Suppression and Clinical Outcomes During Globus Pallidus Internus Deep Brain Stimulation in Huntington's Disease. *Movement Disorders Clinical Practice*. 2023; 10(3). DOI:10.1002/mdc3.13644. PMID:36949795. IF:4,000 (Q2/4D). Document type: Letter.-Vol-tà E, Parladé E, Serna N, Villaverde A, Vazquez



5.1.3 Neurological Diseases, Neuroscience & Mental Health Area

E, Unzueta U. Endosomal escape for cell-targeted proteins. Going out after going in. *BIO-TECHNOLOGY ADVANCES*. 2023; 63:108103. DOI:10.1016/j.biotechadv.2023.108103. PMID:36702197. IF:16,000 (Q1/1D). Document type: Review.

Molecular Neurodegeneration

Group leader

Belbin , Olivia Elizabeth (IR)

Researchers

Cervantes Gonzalez, Alba (IR)

Research Technicians

Lidon Gil, Laia (IR)

Perlaza Meneses, Danna Alejandra (IR)

Serrano Requena, Sara (IR)



DESCRIPTION

The principal focus of the research group is the application of proteomic and genomic techniques to understand the process of synapse degeneration, an early event in AD and other neurodegenerative diseases. The identification of protein biomarkers and genetic risk factors is meticulously validated in clinical and neuropathological studies using ultrasensitive immunoassays (Simoa) and state-of-the-art technologies including targeted/quantitative mass spectrometry, isolation of synaptosome fractions, RNA sequencing, proximity ligation assays and in vitro massively parallel reporter gene assays.

MAIN LINES OF RESEARCH

- Development of polygenic risk scores based on genetically regulated synapse dysfunction to improve the early detection of individuals at risk for neurodegenerative diseases and psychiatric disorders.
- Development of synaptic biomarkers to improve the diagnosis of neurodegenerative diseases and psychiatric disorders.
- Study of miRNA-mediated synapse dysfunction in neurodegenerative diseases and psychiatric disorders to guide future therapeutic strategies.

SCIENTIFIC CHALLENGES

Our research has a great impact on society because we want to transfer the knowledge and technology of our work to the National Healthcare System. With emerging disease-modifying therapies on the horizon, there is an urgent need for biomarkers that reflect target engagement and therapeutic respon-



5.1.3 Neurological Diseases, Neuroscience & Mental Health Area

se, a gap that could be filled by these promising biomarkers.

- Knowledge and technological transfer. Our goal is to transfer the antibodies and immunoassays validated for synaptic proteins to market. Initially for research use and, in the long term, for approval of in vitro diagnostic assays to incorporate the biomarkers into clinical routine (there are no biofluid markers of synapse loss currently used in clinical routine). In addition, our findings will have an important impact on human health by guiding therapeutic strategies that could prevent or relieve synaptic stresses in AD.
- International funding. One of the strengths of our group is the internationalisation capacity, based on the awarded projects (JPND, Alzheimer Association), the participation in international networks (University of Gothenburg, University of Eastern Finland, University of Amsterdam, University of Pennsylvania, Mayo Clinic, John Hopkins, Oxford University, University of Nottingham among others) and incorporation into international consortium (European Alzheimer DNA Bank). We want to achieve new international grants that support our research in parallel to national funding and collaborations.
- Visibility and scientific dissemination activities. Perform social and health professional talks to transfer our research, as well as participate in different national and international meetings by posters and oral presentations.

ACTIVE GRANTS

- Belbin, Olivia Elizabeth. Prediagnostic early synaptic disturbances in neurodegenerative diseases. JPND2021-650-078. EU JOINT ACTIONS. Alteraciones preclínicas de sinapsis en enfermedades neurodegenerativas. AC21_2/00017. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 154.880,00 €.
- Belbin, Olivia Elizabeth. Estudio traslacional de una predicción de riesgo poligénico y biomarcadores para la detección de la degeneración sináptica en la enfermedad de Alzheimer. PI21/00063. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 111.320,00 €.
- Belbin, Olivia Elizabeth. Role of synaptic miRNA and astrocyte miRNA delivery in Alzheimer's di-

sease. AARG-22-974373. Alzheimer's Association. Duration: 2022-2025. 141.222,50 €.

- Belbin, Olivia Elizabeth. Validación de prototipos de inmunoensayos para la detección y seguimiento de sinaptopatía en biofluidos de pacientes con enfermedades neurodegenerativas y trastornos afectivos. DTS22/00111. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2025. 84.700,00 €.
- Cervantes Gonzalez, Alba. Contratos PFIS 2022. FI22/00241. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2026. 119.567,00 €.

GRANTS AWARDED

- Belbin, Olivia Elizabeth. Grup de Recerca en Demències: Sant Pau. 2021 SGR 00979. Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR). Duration: 2022-2025. 40.000,00 €.

SCIENTIFIC PRODUCTION

- Colom M, Davies C, Sirisi S, Lee J-E, Simzer EM, Tzioras M, Querol M, Sánchez É, Chang YY, Holt K, McGeachan RI, Rose J, Tulloch J, Wilkins L, Smith C, Andrian T, Belbin O, Pujals S, Horrocks MH, Lleó A, Spires TL. Synaptic oligomeric tau in Alzheimer's disease A potential culprit in the spread of tau pathology through the brain. NEURON. 2023; 111(14):2170-2183.e6. DOI:10.1016/j.neuron.2023.04.020. PMID:37192625. IF:16,200 (Q1/1D). Document type: Article.
- Ferrer P, Puertollano D, Querol M, Sánchez É, Valle N, Cervantes A, Nuñez R, Pegueroles J, Dols O, Iulita MF, Aldecoa I, Molina L, Sánchez R, Fortea J, Belbin O, Sirisi S, Lleó A. Amyloid precursor protein BCTF accumulates in synapses in sporadic and genetic forms of Alzheimer's disease. NEUROPATHOLOGY AND APPLIED NEUROBIOLOGY. 2023; 49(1):e12879. DOI:10.1111/nan.12879. PMID:36702749. IF:5,000 (Q1/2D). Document type: Article.
- Goossens J, González AC, Dewit N, Lidón L, Fortea J, Alcolea D, Lleó A, Belbin O, Vanmechelen E. Evaluation of cerebrospinal fluid levels of synaptic vesicle protein, VAMP-2, across the sporadic Alzheimer's disease continuum. Alzheimers Research & Therapy. 2023; 15(1):186. DOI:10.1186/s13195-023-01336-0. PMID:37898760. IF:9,000 (Q1/1D). Document type: Article.



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- Iulita MF, Bejanin A, Vilaplana E, Carmona M, Benejam B, Videla L, Barroeta I, Fernández S, Altuna M, Pegueroles J, Montal V, Valldeneu S, Gimenez S, González S, Torres S, El Bennadi SE, Padilla C, Aranha MR, Estelles T, Illán I, Belbin O, Valle N, Camacho V, Blessing E, Osorio RS, Videla S, Lehmann S, Holland AJ, Zetterberg H, Blennow K, Alcolea D, Clarimón J, Zaman SH, Blesa R, Lleó A, Fortea J. Association of biological sex with clinical outcomes and biomarkers of Alzheimer's disease in adults with Down syndrome. *Brain Communications*. 2023; 5(2):fcad074. DOI:10.1093/braincomms/fcad074. PMID:37056479. Document type: Article.

Epilepsy

Group leader

Boronat Guerrero, Susana (FGS)

Researchers

Aledo Serrano, Angel (FGS)

Gil-Nagel Rein, Antonio (IR)

Sierra Marcos, Alba (FGS)

Turon Viñas, Eulalia (FGS)

Turon Viñas, Marc (FGS)



DESCRIPTION

This is a multidisciplinary group including the fields of epileptology, pediatric neurology, neuropsychology, and clinical genetics. We study several aspects of Epilepsy, mainly genotype-phenotype correlation of genetic epilepsy, electroclinical phenotyping, status epilepticus and neuropsychological comorbidities. Our research includes patients of all ages, children and adults, to increase knowledge about the natural history of epilepsy. We also offer new treatments for refractory patients with no other therapeutic options, providing them access to clinical trials.

MAIN LINES OF RESEARCH

- Genotype-phenotype correlation in genetic epilepsy (Susana Boronat, Asun Díaz, and Victoria Ros).
- Electroclinical and neuroimaging phenotyping (Alba Sierra).
- Neuropsychological comorbidities (Marc Turon).
- Emergency management of acute seizures and status epilepticus (Laia Turon).

SCIENTIFIC CHALLENGES

- Increase knowledge about deep phenotyping of genetic epilepsies, including electroclinical phenotyping and neuroimaging features.
- Description of new epileptic genetic syndromes.
- Improving therapeutic options for acute seizures, status epilepticus, and neuropsychological comorbidities.

5.1.3 Neurological Diseases, Neuroscience & Mental Health Area

ACTIVE GRANTS

- Boronat Guerrero, Susana. VISOR EEG (dispositivo registrador de EEG). CPP2021-008311. Ministerio de Ciencia e Innovación (MICINN). Duration: 2022-2025. 121.887,00 €.
- Boronat Guerrero, Susana. ENVISION: Estudio de la evolución natural de lactantes y niños con encefalopatías epilépticas y del desarrollo (EED). ETX-DS-001. Natural History Study of Infants and Children with SCN1A-positive Dravet Syndrome. Encoded Therapeutics INC. Non-competitive. Duration: 2021-2023. 9.000,00 €.
- Turón E, López I, Coca E, Badell I, Sierra A, Turón M, Ribosa R, Boronat S. Seizures in children undergoing stem cell transplantation. PEDIATRIC TRANSPLANTATION. 2023; :e14619. DOI:10.1111/ptr.14619. PMID:37803946. IF:1,300 (Q4/9D). Document type: Article.
- SION natural history study. EPILEPSIA. 2023; DOI:10.1111/epi.17850. PMID:38049202. IF:5,600 (Q1/2D). Document type: Article.

GRANTS AWARDED

- Boronat Guerrero, Susana. Study of genomic disease burden to complement Cause of Death investigation in Sub-Saharan African: a pilot study from Child Health and Mortality Prevention Surveillance (CHAMPS) Network. OPP1126780 GATES. Gates Foundation. Duration: 2023-2025. 252.118,96 €.

SCIENTIFIC PRODUCTION

- Esmel R, Valenzuela I, Riaza L, Rodríguez B, Rosés F, Boronat S, Sabaté A. Arterial tortuosity syndrome: Phenotypic features and cardiovascular manifestations in 4 newly identified patients. European Journal of Medical Genetics. 2023; 66(9):104823. DOI:10.1016/j.ejmg.2023.104823. PMID:37619836. IF:1,900 (Q4/8D). Document type: Article.
- Iznardo H, Bernal S, Boronat S, Roé E. Sclerotic Bone Lesions as a Clue in the Diagnosis of Three Generations of Tuberous Sclerosis Complex: Case Report and Review of Literature. PEDIATRIC NEUROLOGY. 2023; 148DOI:10.1016/j.pediatr-neurol.2023.07.022. PMID:37634327. IF:3,800 (Q1/2D). Document type: Article.
- Perry MS, Scheffer IE, Sullivan J, Brunklaus A, Boronat S, Wheless JW, Laux L, Patel AD, Roberts CM, Dlugos D, Holder D, Knupp KG, Lallas M, Phillips S, Segal E, Smeyers P, Lal D, Wirrell E, Zuberi S, Brünger T, Wojnaroski M, Maru B, O'Donnell P, Morton M, James E, Vila MC, Huang NR, Gofshetyan JS, Rico S. Severe communication delays are independent of seizure burden and persist despite contemporary treatments in <i>SCN1A</i>+ Dravet syndrome: Insights from the ENVI-

5.1.4 Epidemiology, Public Health And Primary Care Area



Pablo Alonso Coello
Area Director

Research in this area involves the study of population health and its social, political, and environmental determinants with special attention to inequalities and their consequences. It evaluates the effectiveness and health impact of public interventions and policies, as well as the promotion of evidence-based practical medicine to make health intervention more effective, appropriate, and safe. Also important is the development and evaluation of methods or strategies to improve the generation, evaluation, communication and transfer of scientific evidence. This area finally studies the epidemiology of communicable diseases in the population of Barcelona, with special attention to the impact of the prevention and control strategies developed. The aim of this area is therefore to achieve wellness in public health through improving policies and medical management.

RESEARCH GROUPS

Clinical Epidemiology and Healthcare Services

Alonso Coello, Pablo Ignacio

Evaluation of Public Health Policies and Programmes

Continente García, Xavier

Urban Health Inequalities

Perez Gonzalez, Catherine

Transmissible Diseases

Rius Gibert, Cristina

Primary Care

Brotons Cuixart, Carles

Clinical Epidemiology and Healthcare

Group leader

Alonso Coello, Pablo Ignacio (IR)

Researchers

Bolibar Ribas, Ignasi (FGS)

Bonfill Cosp, Xavier (FGS)

Canelo Aybar, Carlos Gilberto (ACCIB)

Carrera Fabia, Maria Paz (ACCIB)

Casino Rubio, Gonzalo (ACCIB)

De La Torre Perez, Laura (IR)

Gich Saladich, Ignasi Josep (FGS)

Martinez García, Laura (IR)

Martinez Zapata, Maria Jose (IR)

Medina Aedo, Nedavia Melixa (ACCIB)

Nieto Gutierrez, Wendy Carolina (ACCIB)

Pereira Nunes Pinto, Ana Carolina (ACCIB)

Perez Bracchiglione, Javier Andrés (CIBER)

Puig Reixach, Maria Teresa (FGS)

Quintana Ruiz, Maria Jesus (FGS)

Requeijo Lorenzo, Carolina (FGS)

Rigau Comas, David (ACCIB)

Rojas Reyes, Maria Ximena (IR)

Samso Jofra, Laura (FGS)

Santero Sosa, Marilina (IR)

Sola Arnau, Ivan (FGS)

Urrutia Cuchi, Gerard (FGS)

Vazquez Niebla, Juan Carlos (ACCIB)

Research Technicians

ABeltran Puerta, Jessica (ACCIB)

Cervera Alepuz, Andrea (ACCIB)

Fernández Saenz, Fiorella Karina (ACCIB)

García Mas, Margarita (ACCIB)

Giros Boixados, Meritxell (IR)

Gorgues Sendra, Marta (FGS)

Popova Sherozia, Ekaterine (IR)

Roque Figuls, Marta Cristina (IR)

Savall Esteve, Olga (IR)

Sola Roca, Judit (ACCIB)



DESCRIPTION

Our group conducts intense national and international research, focusing on applied clinical research, health-care services evaluation and non-commercial clinical trials. Recognized as an evidence synthesis hub, we produce various synthesis products and healthcare guidelines, promoting methodological research and offering advice and training to different stakeholders. Our group hosts a Cochrane and GRADE centres and we are internationally recognized for research excellence. We also conduct clinical decision-making research.

MAIN LINES OF RESEARCH

- Clinical practice guidelines and decisions making. Coordinator: Pablo Alonso Coello.
- Primary clinical research. Coordinator: M. José Martínez Zapata.
- Knowledge synthesis, knowledge transfer and health services research. Coordinator: Xavier Bonfill Cosp.

SCIENTIFIC CHALLENGES

- To consolidate our group as a leader organization for evidence synthesis production, research and education, both nationally and internationally.
- To increase the global profile of the group in the field of guideline methodology and education.
- To attract international talent in the different areas of interest, as well as succeed to secure international funding, specially from the European Union.
- To increase shared-decision making in clinical practice, linking guidelines and clinical data.



5.1.4 Epidemiology, Public Health And Primary Care Area

- To foster multicenter national and international clinical trials in the area of surgery patients' safety and perioperative medicine and consolidate a research programme within Sant Pau Research Institute.
- To promote research and actions oriented to the implementation of the evidence in order to improve quality and appropriateness of the health-care.
- To consolidate the adoption of a gender perspective into the design, conduct and reporting of our research.

ACTIVE GRANTS

- Alonso Coello, Pablo Ignacio. La toma de decisiones compartida en el tratamiento para la prevención de fracturas en mujeres postmenopáusicas. PI20/00681. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2023. 83.490,00 €.
- Bonfill Cosp, Xavier. Análisis y mejora de adecuación de la prescripción de quimioterapia al final de la vida. PI18/00034. Instituto de Salud Carlos III (ISCIII). Duration: 2019-2023. 67.760,00 €.
- Bonfill Cosp, Xavier. Impacto del COVID-19 sobre la morbilidad y mortalidad de los. PI21/00062. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 168.190,00 €.
- Bonfill Cosp, Xavier. CRA-ENV-2021-2. Int Agency for Research on Cancer. Duration: 2021-2022. 100.000,00 €.
- De La Torre Perez, Laura. Contractes Rio Hortega 2021. CM21/00206. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2023. 65.000,00 €.
- De La Torre Perez, Laura. Evaluación económica en la evaluación de tecnologías sanitarias en Salud. MV22/00105. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2023. 19.550,00 €.
- Leon García, Montserrat. La toma de decisiones compartida de la terapia trombotrófica durante el embarazo: el valor añadido del método de análisis de decisión. FI18/00014. Instituto de Salud Carlos III (ISCIII). Duration: 2019-2023. 82.400,00 €.
- Martinez García, Laura. Evaluation of primary school resources from the Informed Health Choices project in improving the ability of Spanish children to assess claims about treatments. CP18/00007. Instituto de Salud Carlos III (ISCIII). Duration: 2019-2024. 202.500,00 €.
- Martinez García, Laura. Contextualización de los recursos didácticos para niños en educación primaria del proyecto Decisiones Informadas en Salud. PI19/00068. Instituto de Salud Carlos III (ISCIII). Duration: 2020-2024. 36.300,00 €.
- Martinez Zapata, Maria Jose. Contractes "Miguel Servet II" 2020. CPII20/00023. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2024. 101.250,00 €.
- Popova, Ekaterine. Programa internacional de recerca clínica en medicina perioperatoria. SLT017/20/000089. Departament de Salut Generalitat de Catalunya. Duration: 2021-2023. 85.691,20 €.
- Rojas Reyes, Maria Ximena. Fortalecimiento de la capacidad en la toma de decisiones en el Sistema de Salud español a través de evidencia viva: Un marco de trabajo innovador. PI21/01564. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 114.950,00 €.
- Santero Sosa, Marilina. Análisis y mejora de la adecuación de la prescripción de quimioterapia al final de la vida. FI19/00335. Instituto de Salud Carlos III (ISCIII). Duration: 2020-2024. 82.400,00 €.
- Santero Sosa, Marilina. Evaluación Económica en Salud sobre el adecuado Tratamiento Oncológico Sistémico del Cáncer de Esófago Avanzado en España. MV22/00119. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2023. 19.550,00 €.
- Urrutia Cuchi, Gerard. Resultados centrados en el paciente y utilización de recursos después de la cirugía no cardiaca (España) (PACORUS-S). PI21/01742. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 75.020,00 €.

GRANTS AWARDED

- Alonso Coello, Pablo Ignacio. Grup de Recerca Clínica i Sanitària Aplicada. 2021 SGR 00982. Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR). Duration: 2022-2025. 40.000,00 €.
- Alonso Coello, Pablo Ignacio. Desarrollos metodológicos para guías de práctica clínica en el



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Sistema Nacional de Salud (SNS). PI23/01813. Instituto de Salud Carlos III (ISCIII). Duration: 2024-2026. 65.000,00 €.

- Martínez Zapata, Maria Jose. Evaluación de una estrategia terapéutica para acortar el tiempo de estancia hospitalaria en apendicitis complicada pediátrica: ensayo clínico aleatorizado, paralelo, multicéntrico, abierto, de no inferioridad. ICI23/00070. Instituto de Salud Carlos III (ISCIII). Duration: 2024-2026. 252.560,00 €.

DOCTORAL THESES DEFENDED

- Anaya Camacho, Rafael. Optimización del tiempo de espera para la cirugía, en pacientes con fractura proximal de fémur y en tratamiento crónico con antiagregantes plaquetarios, de manera individualizada guiada por métodos de medición de agregabilidad plaquetaria. 14/06/2023. Universitat Autònoma de Barcelona. Supervisors: Martínez Zapata, Maria José; Rodríguez Prieto, Mireia; León Vitró, Xavier. <http://hdl.handle.net/10803/690738>.
- Ariel Franco, Juan Víctor. Evidence synthesis on the management of benign prostatic hyperplasia. 19/19/2023. Universitat Autònoma de Barcelona. Supervisors: Hung Jung, Jae; Bonfill Cosp, Xavier.
- Duarte Meza, Valentina. Calidad de vida en pacientes con deformidades dentofaciales. 09/01/2023. Universitat Autònoma de Barcelona. Supervisors: Ferrer Forés, Montse; Villanueva Maffei, Julio; Zaror Sánchez, Carlos; Bonfill Cosp, Xavier. <http://hdl.handle.net/10803/688444>.
- Martín Roncero, Unai. Migraciones internas y desigualdades sociales en salud: el caso de las migraciones hacia la Comunidad Autónoma del País Vasco en las décadas de 1950 a 1970. 20/03/2023. Universitat Autònoma de Barcelona. Supervisors: Bolívar Ribas, Ignasi; Jansà López del Vallado, Josep Maria; Puig Reixach, Maria Teresa. <http://hdl.handle.net/10803/689698>.
- Merchán Galvis, Ángela María. Evaluación de la calidad de vida y complicaciones postoperatorias en pacientes con fractura de cadera. 05/10/2023. Universitat Autònoma de Barcelona. Supervisors: Martínez Zapata, Maria José; Bonfill Cosp, Xavier.
- Mas Dalmau, Gemma. La prescripció antibiòtica diferida en infeccions respiratòries a l'atenció primària: assaig clínic, anàlisi cost-efectivitat i estudi qualitatiu. 12/12/2023. Universitat Autònoma de Barcelona. Supervisors: Alonso Coello, Pablo; Cruz Gómez, Irene; Bonfill Cosp, Xavier.
- Niño de Guzmán Quispe, Ena Pery. Patients' And Caregivers' Perspectives On Outcomes Of Self-Management Interventions For Type 2 Diabetes: Applying Meta-Review Synthesis Methods. 10/11/2023. Universitat Autònoma de Barcelona. Supervisors: Alonso Coello, Pablo; Martínez García, Laura; Bonfill Cosp, Xavier.
- Roel Herranz, Elena. Timely insights into the COVID-19 pandemic using real-world data. 10/05/2023. Universitat Autònoma de Barcelona. Supervisors: Duarte Salles, Talita; Prieto Alhambra, Daniel; Bolívar Ribas, Ignasi. <http://hdl.handle.net/10803/690710>.
- Roso Llorach, Albert. Multimorbidity patterns in an older population from North Europe. 10/02/2023. Universitat Autònoma de Barcelona. Supervisors: Violán Fors, Concepció; Puig Reixach, Maria Teresa. <http://hdl.handle.net/10803/688770>.
- Suclupe Obregón, Stefanie Chriss. Detection of errors in health care and evaluation of preventive measures for patient safety. 19/05/2023. Universitat Autònoma de Barcelona. Supervisors: Martínez Zapata, María José; Robleda Font, Gemma; Bonfill Cosp, Xavier. <http://hdl.handle.net/10803/690718>.
- Valli, Claudia. Values and preferences about meat consumption: synthesis and integration in dietary guideline recommendations. 02/05/2023. Universitat Autònoma de Barcelona. Supervisors: Alonso Coello, Pablo Ignacio; Rabassa Bonet, Montserrat; Bonfill Cosp, Xavier. <http://hdl.handle.net/10803/690563>.
- Vargas Stevenson, Ingrid. Eliminación de la transmisión materno-infantil de VIH y sífilis en continente americano. 10/07/2023. Universitat Autònoma de Barcelona. Supervisors: Silva Dreyer, Ana María; Puig Reixach, Maria Teresa.
- Vázquez Niebla, Juan Carlos. Síntesis de la evidencia científica sobre algunos aspectos controversiales en el tratamiento neoadyuvante del cáncer de mama no metastásico. 16/03/2023. Universitat Autònoma de Barcelona. Supervisors:



5.1.4 Epidemiology, Public Health And Primary Care Area

Bonfill Cosp, Xavier; Urrútia Cuchí, Gerard. <http://hdl.handle.net/10803/689763>.

SCIENTIFIC PRODUCTION

- Aburto TC, Romieu I, Stern MC, Barquera S, Corvalán C, Hallal PC, Reynales LM, Barnoya J, Cavalcante TM, Canelo C, Santero M, Feliu A, Espina C, Rivera JA. Latin American and the Caribbean Code Against Cancer 1st edition: Weight, physical activity, diet, breastfeeding, and cancer. *Cancer Epidemiology*. 2023; 86:102436. DOI:10.1016/j.canep.2023.102436. PMID:37852731. IF:2,600 (Q3/7D). Document type: Article.
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- Angel G, Trujillo C, Mallama M, Alonso P, Klimek M, Calvache JA. Methodological transparency of preoperative clinical practice guidelines for elective surgery. *Systematic review. PLoS One*. 2023; 18(2):e0272756. DOI:10.1371/journal.pone.0272756. PMID:36827452. IF:3,700 (Q2/4D). Document type: Article.
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- Bendersky J, Uribe M, Bravo M, Vargas JP, Villanueva J, Urrutia G, Bonfill X. Systematic mapping review of interventions to prevent blood loss, infection and relapse in orthognathic surgery. *Medicina Oral Patologia Oral y Cirugia Bucal*. 2023; 28(2)DOI:10.4317/medoral.25530. PMID:36806025. IF:2,200 (Q3/7D). Document type: Review.
- Bendersky J, Uribe M, Bravo M, Vargas JP, Villanueva J, Urrutia G, Bonfill X. Systematic Mapping Review of Orthognathic Surgery (Protocol). *Craniomaxillofacial Trauma & Reconstruction*. 2023; 16(2)DOI:10.1177/19433875221078385. PMID:37222982. Document type: Review.
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5.1.4 Epidemiology, Public Health And Primary Care Area

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5.1.4 Epidemiology, Public Health And Primary Care Area

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Evaluation of Public Health Policies and Programmes

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DESCRIPTION

The main objective of our group is to advance in the research related to the evaluation of policies, programs, and other interventions in public health. We promote high-quality research, internationalization, and knowledge transfer to the scientific community, and citizens. We generate evidence on the effectiveness and impact of public policies, plans, or interventions (tobacco control law, mental health plan, urbanistic interventions) that may affect population health. We promote the development and application of innovative methodologies to evaluation with an equity and gender perspective.

MAIN LINES OF RESEARCH

- Monitoring of behaviors and other health risk factors such as environmental exposure (FRESC survey and monitorization of second-hand smoke).
- Evaluation of public health policies and Action Plans (Tobacco control Law, Barcelona mental health action plan, housing with services, and transformation of schoolyards in Barcelona).
- Evaluation of public health programs and services (school-based prevention programmes, community-based interventions, breast cancer screening programs).

SCIENTIFIC CHALLENGES

- To promote research into the evaluation of policies and programs.
- To support the debate on conceptual and methodological aspects of the impact evaluation of interventions on population health.
- To consolidate the group's research, foste-



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ring less developed aspects such as economic evaluation and evaluation of health protection interventions.

- To develop a theoretical corpus of concepts, principles, methods, and examples that contribute to filling the gap in undergraduate and postgraduate teaching regarding the design and evaluation of public policies, plans, and other interventions.
- To promote impact evaluation of policies, plans, and other interventions with an equity and gender perspective.

ACTIVE GRANTS

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Urban Health Inequalities

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DESCRIPTION

The GIUH is a consolidated group of researchers, with extensive expertise in collective health, social determinants of health, and environmental health/urban planning/housing, and with a long itinerary in research through national and international groups. The main objectives of the group are to deepen the knowledge of health and the determinants of health in urban areas, as well as to analyze their unequal distribution in population groups. In addition, it seeks to assess the impact of policies aimed at reducing health inequalities. Thus, the group's activity is located in the field of social and environmental epidemiology, where it works to make visible both inequalities and their causes in the formulation of inequitable policies, looking for points of intervention for action.

MAIN LINES OF RESEARCH

- Health effects and its determinants of different environmental factors such as air pollution, environmental noise, or climate change, as well as other characteristics of the urban environment. Dr. Laia Font, Marc Marí.
- The relationship between housing and health, such as the mechanisms and mediators between residential insecurity, energy poverty, and health, and evaluate housing policies, such as cooperatives in cession of use. Dr. Ana Novoa, Dr. Juli Carrere.
- Evaluation of health impacts of urban planning policies and other policies aimed at reducing air pollution and environmental noise (e.g. Eixos Verds, Protegim les escoles), including road sa-



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fety, as well as policies for mitigating and adapting to climate change (e.g. climate shelters). Dr. Catherine Pérez, Dr. Anna Gómez.

- Evaluation of programs to promote equitable and healthy relationships on the reduction of gender violence and on improving the health of children, adolescents, and young people in schools from an intersectional perspective. Dr. Glòria Pérez, Dr. Olga Juárez.
- Inequality in the field of prevention (vaccines, early detection, etc.) and the promotion of health and well-being, and to develop and evaluate interventions aimed at preventing, and mitigating them. Dr. Èlia Díez.
- Evaluation of programs of community health implemented at neighborhood level (within the framework of Barcelona Salut als Barris) aimed at reducing social inequalities in health and analyzing the mechanisms that influence the effectiveness of the programmes. Dr. Maribel Pasarin, Dr. Ferran Daban.
- Health effects of determinants to safe, healthy, and sustainable eating, and evaluate the results, consistency, and effectiveness of control and surveillance programs and interventions related to food and marketing, production, and consumption environments. Dr. Maica Rodríguez, Samuel Portaña.
- Relationship between working conditions and health, including lack of access to work, job insecurity, or involuntary reduced working hours, and time poverty, among other situations. This line includes both paid work and unpaid domestic and care work Dr. Imma Cortés, Dr. Lucía Artazcoz.
- Some areas that are cross sectional to all areas such as social inequalities in health according to the different axes of inequality. It is the line with the longest trajectory, with the group having extensive experience in the in-depth study of health inequalities according to gender, social class, territory, age, and ethnicity, as well as the effect of the intersection between the different axes. It highlights the activity in deepening the social construction of social class, its measurement, and its impact on health and health inequalities. It also includes extensive experience in gender inequalities in health and their intersection with social class. Dr. Borrell, Dr. Lucía Artazcoz.

SCIENTIFIC CHALLENGES

- Understanding and addressing health inequalities. The persistence of health inequalities based on various socio-demographic factors presents a scientific challenge. Effective interventions hinge upon a comprehensive understanding of the intricate interplay between social determinants of health and health outcomes.
- Harnessing digitalization, data accessibility, and big data analytics. The scientific community faces the challenge of leveraging digitalization and accessing vast datasets for meaningful analysis. Overcoming barriers to data accessibility, along with the development of sophisticated analytical tools, is imperative for extracting actionable insights from the increasing volume of health data.
- Promoting multi-disciplinary collaboration in public health research. The complexity of public health issues necessitates interdisciplinary collaboration to elucidate multifaceted challenges. Bridging disciplinary divides and fostering collaboration across research groups are critical scientific endeavors for addressing the intricacies of public health challenges effectively.
- Translating research findings into practical solutions. One of the foremost scientific challenges in public health research is the translation of empirical findings into tangible and effective interventions and policies. Bridging the gap between research and practice demands innovative strategies and robust implementation frameworks to ensure the seamless integration of evidence-based solutions into real-world settings.
- To develop protein nanopharmaceuticals for the activation of the immune system against cancer as a more effective nano-immuno-oncology approach more than current treatments.

ACTIVE GRANTS

- Díez David, Èlia. Efectividad de una intervención sobre la retención vacunal entre las enfermeras pediátricas y los pediatras: Un estudio de metodología mixta. PI21/01710. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 141.570,00 €.
- Novoa Pardo, Ana. Impacto en salud y bienestar de la vivienda cooperativa en cesión de uso.



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PI18/01761. Instituto de Salud Carlos III (ISCIII). Duration: 2019-2023. 75.020,00 €.

- Perez Gonzalez, Catherine. Injury Surveillance System. Partnership for Healthy Cities. Non-competitive. Duration: 2022-2023. 38.800,00 €.

GRANTS AWARDED

- Novoa Pardo, Ana & Perez Gonzalez, Catherine. INSeguridad residencial e infancia: impacto en salud y propuesta de abordajes para la Protección y empoderamiento de la infancia afectada (INSPIRA). PI23/01634. Instituto de Salud Carlos III (ISCIII). Duration: 2024-2026. 140.000,00 €.
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DOCTORAL THESES DEFENDED

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SCIENTIFIC PRODUCTION

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Transmissible Diseases

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DESCRIPTION

Our group focuses its activity in the area of the epidemiology of communicable diseases, developing lines of collaborative and multidisciplinary research in the surveillance, prevention and control mainly of the following communicable diseases: tuberculosis, HIV/sexually transmitted infections, hepatitis, vaccinate diseases, and vaccine hesitancy and vector borne diseases. In addition, we develop research in the area of community health workers (CHW) and their intervention in the migrant population with communicable diseases prevention and control.

- Tuberculosis:
 - Evaluation of interventions to improve surveillance and tuberculosis (TB) control, diagnosis, treatment, and prevention.
 - Predictors of TB in a cohort of TB-infected contacts to determine the disease incidence at 2 and 5 years in Catalonia.
 - Characterization of TB in vulnerable populations: immigrants, homeless, children, bad adherence TB patients, HIV, etc.
 - Latent TB infection characterization, prescription, and treatment completion in vulnerable populations.
- Sexually transmitted infections (STI) / HIV:
 - Use of information and communication technologies for the prevention and control of STI/HIV: a) Creation of Apps to promote sexual health both in HIV-positive and HIV-negative men. b) Use of Apps to offer rapid tests outside the sanitary circuit



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- New technologies: APPS for HIV and STD contact tracing.
- Study of the proportion of pelvic inflammatory disease due to chlamydia.
- Study of HIV contacts to determine the incidence among them.
- CHW for communicable diseases control: with the immigration increase we have incorporated CHW that aids in the prevention and control of these diseases. They act as mediators and translators.
- Incidence studies of mumps, whooping cough, and STIs, as well as the influence of the crisis on some communicable diseases such as TB and hepatitis. Study of factors influencing the transmission of pertussis in homes as well as the effectiveness of immunization and chemoprophylaxis.
- Outbreaks:
 - Investigation of the causes and implementation of control measures as in the case of different outbreaks by norovirus.
 - Characterization of Mpox cases in Barcelona during two epidemics and implementation of prevention and control measures.
- To monitor vaccine hesitancy, study its determinants, and develop interventions to reduce and prevent it:
 - Estimation of vaccine refusal in families with children under 15 years-old in Barcelona.
 - Knowledge, attitudes and beliefs about systematic childhood vaccines in pediatric health-care workers in Barcelona.
- Vector-borne diseases: cases surveillance and environmental factors related to vector distribution, specially *Aedes albopictus* and *Culex pipiens*, and their impact on risk of local transmission of arboviral diseases.

The group is composed of a multidisciplinary group of epidemiologists, public health professionals and doctors of different specialties who work in the clinic field, at the laboratory or in the epidemiological surveillance of communicable infectious diseases.

MAIN LINES OF RESEARCH

Tuberculosis:

- Use of new technologies to improve tuberculosis (TB) control, diagnostic, treatment, and prevention: video DOT, website of the Barcelona TB Research Unit, twitter and Enfermedades Emergentes Journal. Role of diabetes in different clinical presentations and evolution of TB.
- Evaluation of COVID-19 pandemic in the prevention and control activities in tuberculosis patients and the impact on the future incidence.
- Evaluation of interventions to improve surveillance and tuberculosis (TB) control, diagnosis, treatment among injecting drug users.
- Predictors of TB in a cohort of TB-infected contacts to determine the disease incidence at 2 and 5 years in Catalonia.
- Characterization of TB in vulnerable populations: immigrants, homeless, children, bad adherence TB patients, HIV, Diabetes, etc.
- Latent TB infection characterization, prescription, and treatment completion in vulnerable populations.

Sexually transmitted infections (STI) / VIH:

- Use of information and communication technologies for the prevention and control of STI/HIV:
 - a) Creation of Apps to promote sexual health both in HIV-positive and HIV-negative men.
 - b) Use of Apps to offer rapid tests outside the sanitary circuit
- New technologies: APPS for HIV and STD contact tracing.
- Characterization of Mpox cases in Barcelona during two epidemics.
- Study of HIV contacts to determine the incidence among them.

Community health workers (CHW) for communicable diseases control: with the immigration increase we have incorporated CHW aid in the prevention and control of these diseases. They act as mediators and translators.

Incidence studies of mumps, whooping cough and STIs, as well as the influence of the crisis on some



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communicable diseases such as TB and hepatitis. Study of factors influencing the transmission of pertussis in homes as well as the effectiveness of immunization and chemoprophylaxis.

Outbreaks and COVID-19:

- Investigation of the causes and implementation of control measures as in the case of different outbreaks by norovirus.
- COVID-19 outbreak characterization in different settings in Barcelona city.
- Impact of COVID-19 in incidence and mortality in nursing homes and associated factors.
- Vaccination hesitancy and COVID-19.
- To assess if there is a difference in the amount of viable SARS-CoV-2 virus released by the vaccinated individuals in comparison with non-vaccinated. Can vaccinated people transit COVID-19? To study the systemic and local immune response in both groups of patients.

To monitor vaccine hesitancy, study its determinants, and develop interventions to reduce it and prevent it:

- Estimation of vaccine refusal in families with children under 15 years-old in Barcelona.
- knowledge, attitudes, and beliefs about systematic childhood vaccines in pediatric healthcare workers in Barcelona.

Vector-borne diseases:

- Environmental factors related to vector distribution, specially *Aedes albopictus*, and *Culex pipiens*, and their impact on risk of local transmission of arboviral diseases.

SCIENTIFIC CHALLENGES

- Prevent sexually transmitted infections and other transmissible diseases.
- Evaluate HIV screening programs in different gay venues.
- Improve detection and research into causes of C hepatitis.
- Improve detection and control measures of outbreaks.

- Improve adherence to tuberculosis and latent tuberculosis infection.
- STD/HIV and TB contact tracing and screening.
- Cost-effective analysis of public health interventions.

ACTIVE GRANTS

- Montalvo Porro, Tomas. An early warning and response system for the detection and prevention of vector-borne disease importation and spread in the Mediterranean (IDAlert). IDAlert. Unión Europea. Duration: 2022-2027. 93.917,00 €.

GRANTS AWARDED

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DOCTORAL THESES DEFENDED

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- Tamarit Romero, Arantxa. Evaluación de herramientas para un manejo asistencial más personalizado, integral y eficaz para las personas con tuberculosis. 11/12/2023. Universitat Autònoma de Barcelona. Supervisors: Vilaplana, Cristina; Sánchez MontalvÀ, Adrià; Millet Vilanova, Joan Pau.

SCIENTIFIC PRODUCTION

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Document type: Review.

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Primary Care

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DESCRIPTION

The research unit at EAP Sardenya, affiliated with the Hospital of Sant Pau Research Institute, acts as coordinator of vv research. Established in March 2002, the unit engages in research projects funded by competitive grants from public institutions and pharmaceutical industry-supported clinical trials. Current research areas focus on cardiovascular disorders and adult immunizations. Recently, pharmacoepidemiology and drug safety in primary care have been added. The research unit, led by Dr. Brotons Cuixart, comprises two family physicians, epidemiologists, research nurses, a statistician, and administrative staff.

MAIN LINES OF RESEARCH

- Cardiovascular research line (Hypertension, Diabetes, Lipids). Dr. Carlos Brotons Cuixart.
- Immunization. Dr. Carlos Brotons Cuixart.
- Pharmacoepidemiology and drug safety. Dra Carlen Reyes Reyes.

SCIENTIFIC CHALLENGES

- To implement multicenter research projects in primary care.
- To encourage collaboration with other research groups of the Biomedical Research Institute Sant Pau.
- To encourage the dissemination of the results in peer reviewed scientific journals.
- To increase the number of clinicians participating and conducting research in primary care.

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SCIENTIFIC PRODUCTION

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Dídac Mauricio
Area Director

Sant Pau Hospital is a tertiary high-complexity university hospital and, together with Fundació Puigvert, covers all specialties in medical care. This complexity leads to a high variety of biomedical translational research to improve patient's care in multiple fields including inflammatory or immunological processes and on factors linked to the innate immune system, osteoporosis, nephrology, surgery, aging-related macular degeneration, microbiology and infectious diseases, diabetes, pituitary, and other endocrine diseases, respiratory diseases, or perinatal health research and clinical approaches based on human cells and tissues. The main focus of this research area is evidence-based translational medicine to improve patients' care.

RESEARCH GROUPS

Inflammatory Diseases

Vidal Alcorisa, Silvia

Endocrinology, Diabetes and Nutrition

Mauricio Puente, Dídac

Pituitary Gland Disorders

Webb Youdale, Susana

Digestive Diseases

Maria Angels

Microbiology and Infectious Diseases

Navarro Risueño, Ferran

Multi-organ Damage and Rheumatology

Corominas Macias, Hector

Chronic Respiratory Diseases

Plaza Moral, Vicente

Regenerative Medicine and Tissue Bioengineering

Castells Sala, Cristina

General and Digestive Surgery

Moral Duarte, Antonio

Nephrology

Guirado Perich, Lluís

Women and Perinatal Health

Llurba Olive, Elisa

Advanced Medical Imaging, Artificial Intelligence, and Imaging-Guided Therapy

Munuera Del Cerro, Josep Lluís

(Consolidated from November 2023)

Inflammatory Diseases

Group leader

Vidal Alcorisa, Silvia (IR)

Researchers

Alserawan De Lamo, Leticia (UAB)

Calvet Lacruz, Anna (FGS)

De La Calle Martin, Oscar (FGS)

Franco Leyva, Teresa (FGS)

Juarez Rubio, Candido (FGS)

Lynton Pons, Elionor (FGS)

Mariscal Rodríguez, Anais (FGS)

Martinez Martinez, Laura (FGS)

Moga Naranjo, Maria Esther (FGS)

Research Technicians

Alejandro Santiago, Jose (IR)

Canto Naves, Elisabeth (IR)

Esteban Aguilera, Cristina (IR)

Mulet Gual, Maria (IR)

Ortiz De Juana, Maria Angels (IR)

Osuna Gomez, Ruben (IR)



DESCRIPTION

The Inflammatory Diseases group is a multidisciplinary team: Our research aims are: a) to study etiopathogenic mechanisms of immune-mediated diseases to develop tools to advance toward a more personalized medicine; b) to find biomarkers of response to immunotherapy treatments in cancer and chronic inflammatory diseases to select the most suitable drugs and to identify the patient population that can benefit from them, and c) to analyze the involvement immune system in the pathogenesis of autoimmune processes, immunodeficiencies, and immunosenescence.

MAIN LINES OF RESEARCH

- The role of the immune system in the development and perpetuation of autoimmune, immune mediated diseases and chronic inflammatory processes.
- The immunological response associated with the clinical course during immunomodulatory therapies.
- The involvement of autoantibodies, components of the adaptive immune system, in the pathogenesis of autoimmune processes.
- Mechanisms involved in immunodeficiency.
- Immunosenescence.

SCIENTIFIC CHALLENGES

- To study regulatory pathways in chronic inflammatory diseases to identify cellular and molecular therapeutic targets.
- To understand the appearance and evolution of



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autoimmune events, immunodeficiencies, infections, and cardiovascular diseases to improve diagnosis tools.

- To decipher the immune response involved in the development or the control of tumors to discover new biomarkers of prognosis to immunotherapies.
- To elucidate biomarkers related to immune sense and susceptibility to infections.
- To characterize cellular immune responses in immunological disorders such as infections, hypersensitivity reactions and immunodeficiencies.
- Different strategies were applied according to the goal and pathology:
- Characterization of cell populations in complex human biological fluids by multiparametric flow cytometry analysis complemented with dimensionality reduction and data visualization techniques.
- Study the expression and dynamics of inflammatory mediators with advance clustering analysis.
- Identification of new specificities of autoantibodies in subgroups of patients.
- Study of mechanisms involved in immunodeficiency caused by alterations of molecular components.

ACTIVE GRANTS

- Vidal Alcorisa, Silvia. Estudio del perfil pro-inflamatorio de las plaquetas y sus derivados en pacientes con artritis reumatoide para identificar biomarcadores de inflamación y dianas terapéuticas. PI20/00184. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2023. 87.120,00 €.
- Vidal Alcorisa, Silvia. Determination of circulating leukocyte-platelet complexes & PD-L1 expression on circulating cells in patients with advanced SCLC patients receiving anti-PD-L1 blockade agents in combination with platinum and etoposide. Non-competitive. PNC00088/6. Roche Farma SA. Duration: 2021-2023. 40.000,00 €.
- Vidal Alcorisa, Silvia. In vitro assessment of cytokine production in HBV patients. IIBSP-PRG-2021-57. Non-competitive. PRECIGEN. Duration: 2021-2023. 29.940,00 €.

GRANTS AWARDED

- Mariscal Rodríguez, Anais. Análisis comparativo de los resultados de especificidades antigénicas de muestras de neuropatías autoinmunes y síndromes miasténicos. IIBSP-NEU-2023-63. Duration: 2023-2023.
- Mariscal Rodríguez, Anais. Detección de anticuerpos anti-sintetasa: comparación entre métodos. IIBSP-AAS-2023-87. Duration: 2023-2024.
- Moga Naranjo, Maria Esther. Estudio VAN: correlación de la sensibilidad in Vitro de pacientes con alergia respiratoria y alimentaria mediante la utilización de ImmunoCap, Alex y Noveos. IIBSP-VAN-2022-74 (Estudio VAN). Duration: 2023-2024.
- Vidal Alcorisa, Silvia. Therapeutic targets in mechanisms of tolerance for autoimmune disease patients, 2nd part (IL-11). Non-competitive. PRECIGEN. Duration: 2023-2025. 75.000,00 €.

DOCTORAL THESES DEFENDED

- Julià Agulló, Germa. Comparació de la resposta immune als pacients de COVID-19 amb evolució greu i moderada. 12/09/2023. Universitat Autònoma de Barcelona. Supervisors: Vidal Alcorisa, Sílvia.
- Ronny de la Torre Cevallos. Immunodeficiencias Primarias en Ecuador: Como crear un sistema de diagnóstico estructurado. 15/11/ 2023. Universitat Autònoma de Barcelona. Supervisors: Martínez Martínez, Laura; de la Calle Martín, Óscar.

SCIENTIFIC PRODUCTION

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- Fonseca E, Guasp M, Hernando A, Martínez-Hernández E, Olivé-Cirera G, López-Contreras J, Martín-Aguilar L, Martínez-Martínez L, Rombauts A, Rodés M, Sabater L, Sepulveda M, Solana E, Tejada-Illa C, Vidal-Fernández N, Vilella A, Fortuny C, Armangué T, Dalmau JO, Querol L, Saiz A. mRNA COVID-19 Vaccination Does Not Exacerbate Symptoms or Trigger Neural Antibody Responses in Multiple Sclerosis. *Neurol Neuroimmunol Neuroinflamm.* 2023; 10(6):e200163. DOI: 10.1212/NXI.000000000200163. PMID: 37679040. IF:8,800 (Q1/1D). Document type: Article.
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 - García B, Van Den Rym A, Martínez L, Franco T, Pérez JJ, Markle J, Cubillos C, Marín AV, Recio MJ, Regueiro JR, Navarro A, Mestre C, Ferreras C, Martín C, Mena R, de la Calle C, López A, Fernández M, Pérez A, López E, Sánchez S, Casanova J-L, Martínez R, de la Calle O, Pérez de Diego R. Inherited human ezrin deficiency impairs adaptive immunity. *JOURNAL OF ALLERGY AND CLINICAL IMMUNOLOGY.* 2023; 152(4):997-1009.e11. DOI:10.1016/j.jaci.2023.05.022. PMID:37301410. IF:14,200 (Q1/1D). Document type: Article.
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 - Navarro V, Puig L, Vidal S, Ramírez J, Llamas M, Fernández C, Almodóvar R, Pinto JA, Galíndez E, Zarco P, Joven B, Gratacós J, Juanola X, Blanco R, Arias S, Sanz J, Queiro R, Canete JD. The paradigm of IL-23-independent production of IL-17F and IL-17A and their role in chronic inflammatory diseases. *Frontiers in Immunology.* 2023; 14:1191782. DOI:10.3389/fimmu.2023.1191782. PMID:37600764. IF:7,300 (Q1/3D). Document type: Review.
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 - Osuna R, Castellvi I, Mulet M, Ortiz MA, Brough DE, Sabzevari H, Semnani RT, Vidal S. Impai-



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Endocrinology, Diabetes, and Nutrition

Group leader

Mauricio Puente, Didac (FGS)

Researchers

Aguilar Galvez, Xavier (FGS)

Chico Ballesteros, Ana Isabel (FGS)

Corcoy Pla, Rosa (FGS)

Cubero Marcos, José Maria (FGS)

Doria Cervos, Montserrat (FGS)

Genua Trullós, Idoia (IR)

Gonzalez Blanco, Cintia (FGS)

Julve Gil, Josep (IR)

Mateu Salat, Manel (IR)

Mato Matute, Eugenia (CIBER)

Mendoza Mathison, Lilian Cristina (FGS)

Miñambres Donaire, Inka (FGS)

Perez Perez, Antonio (FGS)

Rojo López, Marina Idalia (IR)

Rosell Rusiñol, Joana (CIBER)

Sarda Simo, Helena (FGS)

Tundidor Rengel, Diana (FGS)

Research Technicians

Boluda Sanson, Alejandro (IR)

Cuixart Carruesco, Gemma (IR)

Fernández Camins, Berta (IR)

Figueroa Cruz, David (IR)

García Patterson, Apolonia Gabriela (IR)

López Argudo, Alicia (IR)

Mangas Fernández, Natalia (IR)

Martinez Mores, Santiago (IR)

Niño-Narvion García, Julia (IR)

Subias Burrel, Miguel (IR)

Vlacho, Bogdan (CIBER)



DESCRIPTION

Our group, led by Dídac Mauricio, is a multidisciplinary team consisting of endocrinologists, pharmacologists, biologists, and nutritionists. The group has different research lines in the area of diabetes and its associated metabolic diseases and complications, encompassing epidemiological, clinical, and translational research. This is a highly active, productive, and competitive group, both at national and international levels, a member of XARTEC Salut network, AGAUR, and with 2 research groups belonging to Centro de investigación biomédica en red (CIBER, ISCIII).

MAIN LINES OF RESEARCH

- Complications of diabetes, atherosclerosis, and cardiovascular disease (D. Mauricio; ORCID: 0000-0002-2868-0250): This line encompasses clinical and translational studies on the pathogenesis, biomarker, and early detection and treatment of these complications leading most of the burden in terms of morbidity and mortality in diabetes. Several projects in precision medicine in diabetes are currently underway.
- Epidemiology of diabetes, primary care research, and research with large databases (D. Mauricio): This line is focused on the research of epidemiological aspects of diabetes using different sources of real-world data, with large databases, especially the SIDIAP database (real-world evidence) in collaboration with J. Franch (IDIAP Jordi Gol research institute).
- Endocrinological diseases and pregnancy (R. Corcoy; ORCID: 0000-0001-5055-6814): Senior



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researcher in diabetes in pregnancy and technologies in the management of diabetes, such as insulin pumps and glucose sensors. This researcher's team has participated in landmark studies in gestational diabetes, such as the CONCEPT trial.

- Thyroid nodular disease and cancer (E. Mato; ORCID: 0000-0001-8121-9335): Tumoral thyroid disease poses a diagnostic and therapeutic challenge. This researcher focuses on the contribution of lipid metabolism in nodular thyroid malignancies.
- Diabetes and cardiovascular risk factors (A. Pérez; ORCID: 0000-0001-5528-1143): This line studies the contribution of lipoprotein metabolism disorders to cardiovascular disease in patients with diabetes, dyslipidemia, and obesity.
- Cellular injury in diabetes and associated metabolic diseases (J. Julve; ORCID: 0000-0002-6531-2246): The general objective is to identify new biomarker candidates for the diagnosis/prognosis of hepatic and myocardial complications; and the evaluation of new therapeutic strategies in this area in experimental models and in patients.

SCIENTIFIC CHALLENGES

Endocrine neoplasms

- Molecular markers of the epithelial lineage: expression of the ABCG2 gene/BCRP1 transporter.
- Transcriptomics and proteomics as prediction and prognosis instruments for epithelial thyroid cancer.
- Intramural CELL-NANO-THYROID project: investigation of human mesenchymal cell capacity as an instrument for administering anti-tumour cell drugs in the form of conjugated nanoparticles.
- Role of cholesterol & cholesterol metabolites in thyroid neoplasms differentiation.
- Assessment of glycosylated immunoglobulins as serologic markers of thyroid carcinoma.

Autoimmune Diabetes Mellitus

- Classic type 1 autoimmune diabetes mellitus: discovery of genes that influence susceptibility to autoimmune diabetes (classic type 1).
- LADA type diabetes: prevalence of metabolic

syndrome among patients with LADA compared to prevalence among patients with classic type 1 diabetes, type 2 diabetes, and the general non-diabetic population in European countries.

Diabetes and pregnancy

- Clinical research aimed at optimizing care for women with pre-gestational and gestational diabetes at preconception, pregnancy, birth, and postpartum stages. Specifically, addressing the relevance of adequacy of pregnancy weight gain, maternal predictive characteristics, and association with pregnancy outcomes.

Technology, Telemedicine, and Intelligent Systems for Therapeutic Optimization of Diabetes Mellitus

- Technology in the treatment of diabetes with a special focus on insulin (new insulins, pumps), and glucose measurement including sensors.
- Development of a technological platform for the prediction, prevention, and treatment of obesity, DM, HTA, dyslipidemia, and cardiometabolic risk.

Optimization of the Treatment of Obesity, Hyperlipidaemia, Metabolic Syndrome, and Complications

- Mechanisms linking diabetes, obesity, and dyslipidemia with cardiovascular disease.
- Optimal treatment and prevention of cardiovascular risk associated with obesity, hyperlipidemia, metabolic syndrome, and diabetes.

Diabetic complications: atherosclerosis and microvascular disease

- Clinical and translational studies that explore research in the pathogenesis, biomarkers, and early detection and treatment of microvascular and chronic complications, especially atherosclerosis.

Precision medicine in diabetes

- Genotyping and deep phenotyping of people with diabetes.
- Use of artificial intelligence in the characterization of diabetes.

Diabetic epidemiology: primary care research, with large databases.

- Research on diabetes mellitus in Primary Health Care of Catalonia. In recent years, the group has developed projects using the SIDIAP database, in different aspects of real-world evidence.



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- Use of AI as an approach to characterize diabetes mellitus using real-world practice databases.

Clinical trials in the area of the Endocrinology, Diabetes, and Nutrition Research Group.

- There are currently 28 ongoing clinical trials in our group.

Nicotinamide supplementation

- Research on the role of nicotinamide (NAM) supplementation in several tissues of experimental models (brain, intestinal epithelial, cardiac).
- Study of the effects of NAM on the intestinal microbiome and its relationship with diabetes.
- Identification of new NAM-sensitive biomarkers to fight diabetes.

ACTIVE GRANTS

- Corcoy Pla, Rosa. Desarrollo de una herramienta para la determinación de riesgo genético y prevención personalizada de la diabetes gestacional. RTC2019-007406-1. Ministerio de Ciencia e Innovación (MICINN). Duration: 2020-2023. 158.119,34 €.
- Corcoy Pla, Rosa. Medical comorbidities in bipolar disorder: clinical validation of risk factors and biomarkers to improve prevention and treatment (BIPCOM). EraPerMed Corcoy. Unión Europea (GenCat FUNDING - Acciones complementarias). Duration: 2023-2025. 199.977,00 €.
- Genua Trullós, Idoia. Contractes Rio Hortega 2021. CM21/00077. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2023. 65.000,00 €
- Genua Trullós, Idoia. SED 2021. Sociedad Española de Diabetes (SED). Duration: 2021-2023. 20.000,00 €.
- Julve Gil, Josep. Potencial terapéutico de la suplementación con nicotinamida sobre la adiposidad, señalización de la insulina y de la enfermedad hígado graso no alcohólico. PI21/00770. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 122.210,00 €.
- Mauricio Puente, Didac. Caracterización de subgrupos de diabetes tipo 2 al diagnóstico: un paso necesario hacia la medicina de precisión en diabetes. PI21/01163. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 159.720,00 €.

- Mauricio Puente, Didac. ImpactT2D: una estrategia genómica para implementar medicina de precisión en la diabetes tipo 2. PMP21/00100. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2025. 207.900,00 €.
- Mauricio Puente, Didac. Study of the differential lipidome in thyroid follicular adenomas and carcinomas using mass spectrometry images. Sociedad Española de Endocrinología y Nutrición. Duration: 2021-2023. 25.000,00 €.
- Mauricio Puente, Didac. Gestational diabetes and complications among pregnant women attended in primary care sexual and reproductive health services in Catalonia. PCDE 2021/4 PCD Europe. Research Grant 2021. Duration: 2021-2024. 10.000,00 € (CIBER).
- Mauricio Puente, Didac. Epidemiology of SARS-CoV-2 in persons with diabetes mellitus and obesity in Catalonia – Study epiCOVID19DMO. PCDE 2021/4. Primary Care Diabetes Europe. Research Grant 2020. COV20/01301 (EPICOID19DMO). Duration: 2021-2023. 10.000,00 € (CIBER).
- Rojo López, Marina Idalia. Descubrimiento y validación de marcadores de predicción de diabetes tipo 2. SLT017/20/000107. Departament de Salut Generalitat de Catalunya. Duration: 2021-2023. 103.040,20 €.

DOCTORAL THESES DEFENDED

- Dòria Cervós, Montse. Comorbiditats i mesura de qualitat de vida en el pacient amb peu diabètic en diferents situacions clíniques. 18/04/2023. Universitat Autònoma de Barcelona. Supervisors: Mauricio Puente, Dídac; Hernández García, Marta; Puig Domingo, Manuel Luis. <http://hdl.handle.net/10803/690447>.
- Puig Jové, Carles. Marcadores séricos y alteraciones en el metabolismo lipídico y su relación con la disfunción miocárdica subclínica en sujetos con diabetes mellitus. 05/07/2023. Universitat Autònoma de Barcelona. Supervisors: Alonso Pedrol, Núria; Mauricio Puente, Dídac; Puig Domingo, Manuel Luis.
- Revilla Senra, Giovanna. Action of cholesterol, 27-hydroxycholesterol and adipose tissue in Thyroid Cancer. 22/12/2023. Universitat Autònoma de Barcelona. Supervisors: Escolà Gil, Joan Carles; Mató Matute, Eugènia; Blanco Vaca, Francisco.



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SCIENTIFIC PRODUCTION

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Pituitary Gland Disorders

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DESCRIPTION

We investigate pituitary diseases & their impact, i.e., acromegaly, Cushing's sd. (coordinators of the European registry ERCUSYN), hypopituitarism among others. We are currently carrying out the project "Epidemiology in Catalonia" & investigating residual myopathy and its impact on psychological aspects and health-related quality of life (with specific questionnaires developed by us and used worldwide) after treating these diseases, pathophysiology of oxytocin deficiency and precision medicine in acromegaly, thanks to a recently funded project by the IMPACT strategy in a multicentric study.

MAIN LINES OF RESEARCH

- ERCUSYN: European Registry of Cushing's Syndrome. Maintenance and operation of the database contains more than 2500 patients and is the largest one so far worldwide on these patients. Leaders SM Webb & A Santos.
- Study of the physiological and pathological secretion of oxytocin in humans besides pregnancy and lactation. Identification and clinical relevance of an oxytocin deficient state in patients with hypothalamic and pituitary diseases, who are presumably at highest risk for an oxytocin deficiency. Leader A Aulinas.
- Effects of Mindfulness therapy in patients with acromegaly and Cushing's syndrome. Leader A Santos.
- Spanish Molecular Registry on Pituitary Adenomas (REMAH study). Leaders J Gil and SM Webb.
- ACROFAST and ACROMICS: Personalized Medicine in acromegaly, to identify markers with a



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- therapeutic value. Leaders J Gil, A Aulinas and SM Webb.
- Epidemiology of hypothalamic-pituitary diseases in Catalonia. Leaders A Aulinas and SM Webb.
- Study of bone microarchitecture and resistance and factors that determine them in Cushing's syndrome or acromegaly in remission. Model for investigating the body's bone-fat interaction. Leader SM Webb.
- Role of myosteatosis in the development and persistence of residual muscle weakness in treated acromegaly and Cushing syndrome. Study of the involved mechanisms. Leader SM Webb.
- Pathophysiology of sleep disorders in patients with hypothalamic and pituitary damage, using a multidisciplinary approach. Leader A Aulinas.

SCIENTIFIC CHALLENGES

- Evaluate long-term persistent morbidity and mortality in patients who have had Cushing's syndrome or acromegaly, bone quality, psychological outcomes, muscular dysfunction, and quality of life.
- Analyze and update the European database of patients with Cushing syndrome (ERCUSYN), which in 2023 included over 2400 patients, with partners from 61 centers in 27 countries.
- Identification of a provocative test to unmask an oxytocin deficient state in patients with hypothalamic and pituitary diseases using a randomized, crossover, placebo-controlled design.
- Increase our understanding of oxytocin physiology and pathophysiology in healthy humans and clinical conditions (patients with hypothalamic and pituitary diseases, obesity, and eating disorders).
- Conduct in vitro molecular analysis of operated pituitary adenomas within the REMAH (Molecular Registry of Pituitary Adenomas) study, sponsored by the Spanish Endocrinology and Nutrition Society (SEEN), to investigate personalized markers of therapeutic response (mainly in acromegaly, corticotroph adenomas, and non-functioning pituitary adenomas).
- Analyze clinical and molecular aspects of pituitary adenomas diagnosed at a young age, in collaboration with Hospital Universitario Cruces.

- Perform the first epidemiological study in Catalonia on hypothalamic-pituitary diseases and compare it with the PADRIS database of CatSalut.
- Personalized Medicine (IMPACT strategy) through next-generation precision medicine in the diagnosis and treatment of Acromegaly.

ACTIVE GRANTS

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Digestive Diseases

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DESCRIPTION

Our research group is highly heterogeneous and includes both clinical and experimental research. Our experience in clinical research has a wide circulation starting more than 30 years ago. Experimental studies have also been done including gastroenterological as well as hepatic diseases either with high prevalence (alcoholic and viral liver diseases, non-alcoholic steatohepatitis, inflammatory bowel disease, etc) or outstanding relevance (variceal bleeding, esophageal diseases, Barrett's esophagus, etc). Indeed, our group plays an important role in the structure of CIBERhd (ISCIII).

MAIN LINES OF RESEARCH

Experimental research: (These research lines are led by: Dr. Carlos Guarner, Dr. Germán Soriano, Dr. Cándid Villanueva, Dra. Edilmar Alvarado, Dra. Elisabet Sánchez).

- Experimental rat model of cirrhosis and ascites.
- Mechanisms and prevention of bacterial translocation in rats with cirrhosis.
- Experimental model of spontaneous and induced bacterial peritonitis: physiopathology and treatment.
- MiRNAs expression profile in inflammatory bowel disease after stimulation with toll-like receptor ligands.

Clinical investigation: (These research lines are led by: Dr. Àngels Escorsell, Dr. Carlos Guarner, Dr. Germán Soriano, Dr. Cándid Villanueva, Dra. Edilmar Alvarado, Dr. Gallego, Dr. Guarner Argente, Dra Esther García Planella, Dr. Xavier Torras).



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- Physiopathology, diagnosis, treatment, and prevention of bacterial infections, ascites and hepatorenal syndrome in cirrhosis.
- Diagnosis and treatment of hepatic encephalopathy in cirrhosis.
- Cognitive impairment, falls, and quality of life in patients with cirrhosis.
- Physiopathology, diagnosis, treatment, and prevention of digestive haemorrhage due to non-varicose origin.
- Physiopathology, diagnosis, treatment, and prevention of portal hypertension related complications.
- Diagnosis and treatment of chronic hepatitis B and C.
- Diagnosis, prevention and treatment of non-alcoholic fatty liver disease.
- Diagnosis and treatment of hepatocarcinoma.
- Physiopathology, diagnosis, and treatment of intestinal inflammatory disease (inflammatory bowel disease).
- Diagnosis and treatment in advanced gastrointestinal endoscopy.
- Diagnosis and treatment of acute pancreatitis.
- Prevention of acute post-ERCP pancreatitis.
- Chronic pancreatitis and pancreatic neoplasms: molecular studies, early detection, and treatment.
- Evaluation of acute alcohol hepatitis.
- Consolidate the pancreatic illness research line.
- Consolidate the inflammatory bowel disease research line.
- Consolidate the polyps and colon cancer research line.
- Develop a digestive endoscopy research line.
- Consolidate the endoscopy unit as CSUR (central for reference and excellency) in peroral endoscopic myotomy in Spain.
- Group CIBERehd-evs.

ACTIVE GRANTS

SCIENTIFIC CHALLENGES

- Alvarado Tapias, Edilmar. Contractes Juan Rodés 2020. JR20/00047. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2025. 180.000,00 €.
- Alvarado Tapias, Edilmar. Identificación de biomarcadores no invasivos de reversión en la enfermedad hepática por alcohol a través del estudio: vesículas extracelulares y parámetros hemodinámicos. PI21/01995. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 87.120,00 €.
- Escorsell Mañosa, Maria Angels. PATOLOGIA DIGESTIVA. 2022 INV-1 00048. Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR). Duration: 2022-2024. 66.217,84 €.
- Roman Abal, Eva Maria. Fragilidad en pacientes con cirrosis: efecto de una intervención multifactorial (ejercicio domicilio, aminoácidos ramificados y probióticos). PR-415/2020. Fundació Infermeria i Societat. Duration: 2021-2023. 5.280,00 €.
- Soriano Pastor, German. Fragilidad en pacientes con cirrosis: valor pronóstico del ángulo de fase en pacientes hospitalizados y efecto de una intervención multifactorial (ejercicio en domicilio, aminoácidos ramificados y probiótico). PI19/00275. Instituto de Salud Carlos III (ISCIII). Duration: 2020-2024. 141.570,00 €.
- Villanueva Sánchez, Candid. Caracterización de la interrelación entre la hipertensión portal y la inflamación en la circulación intra-hepática y sistémica en la cirrosis descompensada. PI22/01917. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2025. 93.170,00 €.
- Consolidate the CIBEREHD, CIBER, Institut de salut Carlos III research group by studying complications in cirrhosis.
- Research Grup de Recerca de la UAB (Universitat Autònoma de Barcelona): Grup de Recerca de Complicacions de la Cirrosi Hepàtica.
- Grup de Recerca Consolidad de la Generalitat (SGR).
- Expand the hepatology research lab and develop new research.
- Consolidate the portal hypertension research group.
- Consolidate the non-alcoholic fatty liver disease research group.



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GRANTS AWARDED

- Roig Ramos, Cristina. Utilidad de los criterios ICCE para la preselección de pacientes con sospecha de enfermedad de Crohn tributarios a estudio con cápsula endoscópica, ¿estamos utilizando los criterios adecuados?. IIBSP-ICC-2023-125. Duration: 2023.

DOCTORAL THESES DEFENDED

- Colán Hernández, Juan. Aspectos técnicos de la ecoendoscopia y colangiopancreatografía retrógrada endoscópica. 02/05/2023. Universitat Autònoma de Barcelona. Supervisors: Guarner Argente, Carlos; Guarner Aguilar, Carlos. <http://hdl.handle.net/10803/690367>
- Romero Mascarell, Cristina. Optimització de l'estudi de l'intestí prim en la malaltia de Crohn: Càpsula endoscòpica, enterografia per ressonància magnètica i calprotectina fecal. 17/11/2023. Universitat de Barcelona. Supervisors: González Suárez, Begoña; Fernández Esparrach, Maria Gloria.

SCIENTIFIC PRODUCTION

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Microbiology and Infectious Diseases

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DESCRIPTION

The Microbiology and Infectious Diseases group comprises a diverse team including physicians, microbiologists, nurses, technicians, and students. Research focuses on Clinical Microbiology, Kidney Transplant, and Infectious Diseases. In Clinical Microbiology, studies include drug resistance mechanisms, tuberculosis, Leishmaniasis, Chagas, viral infections, and microbiome analysis. Kidney Transplant research examines biomarkers, immune responses to infections like CMV and COVID-19, and the impacts of immunosuppression reduction. Infectious Diseases research covers antibiotic policies, multiresistant microorganisms, infections related to foreign bodies, diabetic foot diseases, and tuberculosis. Cutting-edge techniques like Next Generation Sequencing and bioinformatics are employed.

MAIN LINES OF RESEARCH

Clinical Microbiology

- Detection and characterization of different antimicrobial mechanisms of resistance. (Ferran Navarro).
- Epidemiology of tuberculosis and anti-tuberculosis resistance mechanisms (Montserrat Garrigó).
- Molecular diagnosis in infectious diseases, taxonomy (Ferran Navarro and Elisenda Miró).
- Microbiome description in clinical samples (Ferran Navarro, Elisenda Miró, and Alba Rivera).
- Leishmaniasis: epidemiology, characterization and diagnosis and Chagas: diagnosis and congenital infection (Carmen Muñoz and Teresa Llovet).



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- Medical care projects (Ferran Sánchez). Early bloodstream infection detection by NGS of cfDNA (Alba Rivera).

Infectious Diseases

- Restricted-use policies for antimicrobial agents and suitable use of antimicrobial agents.
- Study of antimicrobial multiresistant microorganism infections requiring patient isolation.
- Study of foreign body infections such as joint prostheses, catheters, cardiac prosthesis, and pacemakers.
- Tuberculosis infectious diseases.

SCIENTIFIC CHALLENGES

- **Technique Standardization:** Each research area, including Clinical Microbiology, Kidney Transplant, Infectious Diseases, and cfDNA analysis, requires standardized techniques. Ensuring consistency in methodologies across diverse disciplines poses a significant challenge.
- **Data Management and Analysis:** With the adoption of advanced techniques like Next Generation Sequencing and bioinformatics in various fields, managing and analyzing large datasets becomes crucial. Developing robust analytical tools and strategies applicable to different research domains is a challenge.
- **Sample Quality and Handling:** Maintaining sample integrity and minimizing contamination during collection, processing, and storage is vital across all research areas. Developing standardized protocols and ensuring reproducibility are key challenges.
- **Interdisciplinary Collaboration:** As research becomes increasingly multidisciplinary, fostering effective collaboration among experts from diverse fields poses a challenge. Overcoming communication barriers and integrating knowledge from different disciplines are essential for holistic research outcomes.
- **Addressing Antimicrobial Resistance:** Understanding and combating antimicrobial resistance remains a critical challenge in Clinical Microbiology and Infectious Diseases research. Developing novel strategies to tackle resistant pathogens while preserving antibiotic efficacy is imperative.
- **Integration into Healthcare Systems:** Successfully integrating research findings and innovative

technologies into existing healthcare systems presents logistical and structural challenges.

ACTIVE GRANTS

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MAIN LINES OF RESEARCH

Bone Metabolism and Osteoporosis

- Analysis of genetic influence on osteoporosis using aggregation studies in families of three or more generations with a minimum of 15 members.
- Bone structure study with quantitative CT of hip and spine, analyzing the contribution of trabecular and cortical components using HRCT.
- Description of fat values and percentages in a normal population (in collaboration with the HIV Unit and CETIR Medical Group).
- Description of bone structure in patients with a history of acromegaly assessed by DXA and HRQCT.

Hypertension and Vascular Risk

- Hypertension and quality of life.
- Refractory hypertension.
- Use of alirocumab in hypercholesterolaemia.

Clinical Management, Internal Medicine and Geriatrics

- Health-care quality indexes (mortality, readmissions, etc).
- Perioperative medicine, including orthogeriatrics.
- Geriatric evaluation before cardiac and vascular invasive procedures.
- Central Sensitization Syndromes.

Rheumatology and Rheumatoid Arthritis

- Immunological basis and pathogenic studies



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of rheumatoid arthritis and other inflammatory conditions.

- Pharmacogenetic studies of disease-modifying and immunomodulatory drugs in autoimmune and inflammatory diseases.
- JAK-STAT pathway in autoimmune processes, mainly focused in rheumatoid arthritis.

Systemic Sclerosis

- Capillaroscopy patterns and correlation with auto-antibodies and pulmonary function tests.
- Study of capillaroscopy patterns in diffuse connective tissue diseases: QuantiCAP study.

Gout

- Epidemiology of hyperuricemia and gout.
- Association of Parkinson and clinical gout and arthritis

Sjögren Syndrome, SLE and others

- Study of the pattern of interstitial lung disease in primary Sjögren's syndrome.

SCIENTIFIC CHALLENGES

- To establish stable work relations between the HSCSP Bone Metabolism and Genomics of Complex Diseases Groups and the Bone Metabolism Unit of Hospital del Mar Medical Research Institute and the Faculty of Biology of the University of Barcelona.
- To strengthen ties between the HSCSP Rheumatology and Immunology departments regarding the study of immunological diseases.

DOCTORAL THESES DEFENDED

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- Colalillo A, Hoffmann A-M, Pellicano C, Romaniello A, Gabrielli A, Hachulla E, Smith V, Simeón C-P, Castellví I, Airó P, Truchetet M-E, Siegert E, Distler O, Rosato E, the C. The role of TAPSE/sPAP ratio in predicting pulmonary hypertension and mortality in the systemic sclerosis EUSTAR cohort. *AUTOIMMUNITY REVIEWS*. 2023; 22(4):103290. DOI:10.1016/j.autrev.2023.103290. PMID:36746368. IF:13,600 (Q1/1D). Document type: Review.
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Chronic Respiratory Diseases

Group leader

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Researchers

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 Crespo Lessmann, Astrid (FGS)
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 Palones Femenia, Esther (FGS)
 Paz Del Rio, Luis Daniel (FGS)
 Peñacoba Toribio, Patricia (FGS)
 Podzamczar Valls, Ines (FGS)
 Puy Rion, Maria Carme (FGS)
 Rafecas Codern, Albert (FGS)
 Ramos Barbon, David (FGS)
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 Gutierrez Rouco, Marta (FGS)
 Mateus Medina, Eder Fredy (IR)
 Panadero Paz, Carolina (IR)
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 Segura Medina, Macarena (FGS)



DESCRIPTION

The Research Group on Chronic Respiratory Diseases (GREC) of the Department of Pulmonology at the Hospital Universitario de la Santa Creu i Sant Pau (HSCSP) has been a pioneer and is currently one of the leaders in pulmonary research. It combines clinical and translational research on chronic obstructive pulmonary disease (COPD)-Respiratory Insufficiency, Asthma, and obstructive sleep apnea-hypopnea syndrome (OSAHS). It hosts a basic science laboratory specialized in respiratory disease animal models and cell & molecular biology.

MAIN LINES OF RESEARCH

- **Asthma:** Asthma exacerbations; Severe asthma; Good clinical practice guidelines for asthma; Bronchial inflammation; Experimental asthma and pathogenic mechanisms; Multicentre biobank specializing in bronchial biopsies for asthma research; Bronchial thermoplasty; Clinical trials.
- **COPD and Respiratory Failure:** Non-invasive mechanical ventilation; Respiratory rehabilitation; Pathophysiology; Exacerbation.
- **Obstructive Sleep Apnoea (OSA):** Physiology and clinical, diagnostic and treatment consequences of sleep disorders; Obesity-hypoventilation syndrome; Analysis of airway inflammation in patients with OSA.

SCIENTIFIC CHALLENGES

- Consolidate a leading clinical trial unit in respiratory diseases. Capture pre-clinical development contracts from the pharmaceutical and biotech industry, using the capabilities of our basic



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research lab and experimental animal models. Recruit research trainees seeking a doctoral degree. Support the development of multidisciplinary research networks such as the Barcelona Respiratory Network and the Programme for Integrated Research for Asthma of the Spanish Society of Pneumology and Thoracic Surgery (SEPAR), and collaborate with or become involved in existing networks such as CIBER-Respiratory Disorders. Achieve and transfer pharmaceutical discovery in the core research line of the basic science lab.

DOCTORAL THESES DEFENDED

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Regenerative Medicine and Tissue Bioengineering

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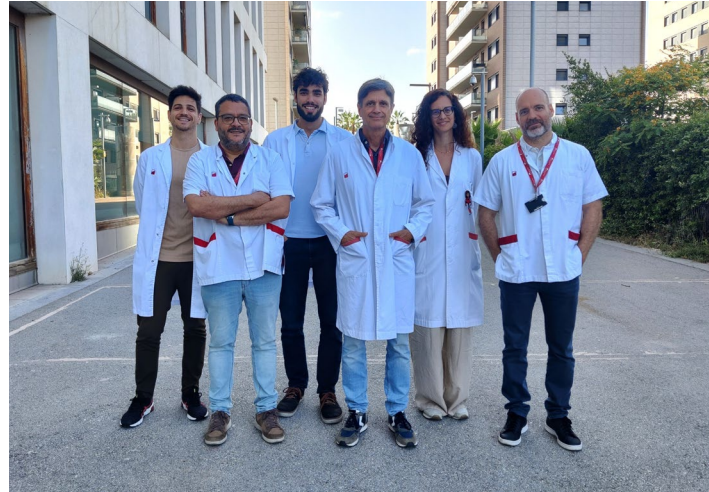
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DESCRIPTION

BTB research lines can be divided into five blocks: amniotic membrane bank, cardiovascular bank, skin bank, ocular bank, and musculoskeletal bank. At the same time, these lines can be divided in three different sections: (1) new preservation techniques, (2) new processing technologies, and (3) therapeutic innovations.

During the last few years, part of the effort has been invested in the development of techniques to improve the methods and preservation times of the processed tissues, made available for clinical practice. Moreover, new processing methodologies such as decellularization have been addressed.

MAIN LINES OF RESEARCH

- Tissue obtaining, clinical application, ethics, and regulation.
- Preservation of living tissue.
- Tissue decellularization.
- Medical products of advanced therapies through the recellularization of decellularized tissues.
- SoHo bioinks for 3D printing.
- Processing and product improvement.
- Technical innovation for tissue processing.
- Extension of clinical indications of the grafts.
- Cellular therapy for eye diseases.

SCIENTIFIC CHALLENGES

- Improvement and optimizations of the process related to the donor and tissue processing in clean rooms.



5.1.5 Translational Medicine Area

- Advances in the development of criteria, regulation and ethics for donors and tissues.
- Technical excellence related to the processing of cells, tissues and advanced therapy medicinal products (ATMP).
- Development of new approaches and medical products of advanced therapies for regenerative medicine.

ACTIVE GRANTS

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García Romera, Angel (FGS)

Gonzalez López, Jose Antonio (FGS)

Hernandez Casanovas, Maria Pilar (FGS)

Julia Verdager, Elisabet (FGS)

Martin Arnau, Ana Belen (FGS)

Martinez Sánchez, Maria Del Carmen (FGS)

Medrano Caviedes, Rodrigo Gustavo (FGS)

Molina Santos, Victor (FGS)

Perez García, Jose Ignacio (FGS)

Perez Romero, Noelia (FGS)

Pino Perez, Oriol (FGS)

Rofin Serra, Silvia (FGS)

Sánchez Cabus, Santiago (FGS)

Sánchez López, Anna (FGS)

Santanach Soler, Clara (FGS)

Solans Solerdelcoll, Mireia (FGS)

Targarona Soler, Eduardo Maria (FGS)



DESCRIPTION

- General Surgery Unit

A research group in the treatment of mesenchymal tumors, especially retroperitoneal sarcomas, with lines of research in surgical techniques and new technologies for the application of local chemotherapy in the retroperitoneum. Endocrine, breast, and abdominal wall surgery. Research and dissemination of incisional hernia prevention techniques.

- Hepatopancreatic Surgery Unit

Our group's objective is research on different topics: liver surgery (liver metastases, hepatocellular carcinoma, other liver lesions), pancreatic surgery (pancreatic cancer, neuroendocrine tumors, IPMN, other types of pancreatic lesions), bile duct surgery, and minimally invasive surgery in general of the HBP field.

- Gastrointestinal Surgery Unit

The research carried out in the Esophagogastric and Bariatric Surgery Unit is mainly clinical and translational. It includes different lines of research focused mainly on the analysis of the diagnostic process and the treatment of gastric cancer and on revisional surgery of the esophagogastric junction pathology. In the field of bariatric surgery, studies have focused particularly on the results obtained in the elderly population.

The colorectal surgery unit develops research based on clinical parameters. its main lines of research include malignant and benign colorectal pathology, with special interest in quality of life and functional alterations after rectal cancer treatment. it also highlights the creation in the last two years of the functional unit of advanced proctology-HPV.



5.1.5 Translational Medicine Area

- Emergency and Critical Care Surgery Unit

The research carried out in the Emergency and Critical Care Surgery Unit is mainly clinical and translational. It includes different lines of research focused mainly on the analysis of the diagnostic process and the treatment of severely injured patient after trauma and on emergency surgery, specially in bowel ischemia and damage control surgery on non-traumatic patients..

MAIN LINES OF RESEARCH

General Surgery Unit

- Surgery of the thyroid gland. Research on thyroid cancer.
- Advanced surgery on parathyroid glands (primary and secondary hyperparathyroidism).
- Adrenal surgery.
- Surgery for sarcomas: participation in the development and results of surgery for retroperitoneal tumours.
- Surgery for sarcomas: participation in GIST research through the Spanish Sarcoma Research Group (GEIS) and other entities.
- Surgery of advanced gynecological tumors.
- Advanced surgery of abdominal wall. New techniques for ventral hernia repair.
- Dr. José A González and Dra. Mireia Solans: lines of research in surgical techniques and new technologies for the application of local chemotherapy in the retroperitoneum.
- Dr. José A González Dra. Mireia Solans: Research and dissemination of incisional hernia prevention techniques.

Hepatobiliopancreatic Surgery Unit

- Pancreatic cancer: Dr. Sánchez Cabús, Dr. García Romera
- Liver cancer: Dr. Víctor Molina, Dr. Sánchez Cabús
- Biliary pathology: Dr. Belén Martín, Dr. Sánchez Cabús

Gastrointestinal Surgery Unit

- Surgical reinterventions after failed hiatal hernia repair or antireflux surgery (IP: Sónia Fernández Ananín)

- Obesity in elderly population (IP: Sónia Fernández Ananín)
- Consequences of sarcopenia after bariatric surgery (IP: Noelia Pérez)
- Analysis of cruroplasty closure in paraesophageal hernias (IP: Sónia Fernández Ananín)
- Laparoscopic approach to gastric non-epitelial tumors: do size and location matter? (IP: Sónia Fernández Ananín)
- Analysis of the diagnostic process and the treatment of early gastric cancer precocious gastric (IP: Noelia Pérez)
- Implementation of an App for the control of anterior resection syndrome (IP: Carmen Martínez).
- Quality of life and functional alterations in rectal cancer (IP: Carmen Martínez).
- Diagnosis and treatment of anal dysplasia in the immunodeprimal patient (IP: Carmen Martínez).

Emergency and Critical Care Surgery Unit

- Safe practices for polytraumatized patients.
- Safe practices for polytraumatized patients in a Multicentric collaborative database through the Catalan Trauma Database - TraumaCAT.
- Clinical safety for fragile and elder patients in emergency surgery and care through an accredited Geriatric Emergency department by the American College of Physicians at our Hospital.
- Emergency surgical Treatment for aorta-enteric fistulae in collaboration with the Vascular Surgery Department.
- Ambulatory treatment on non-complicated Diver-ticulitis.
- Open Abdomen and Damage Control Surgery in non-traumatic Patients.
- Good practices in emergency surgery for prevention of burst abdomen and acquired abdominal hernia after surgery.
- Good practices in emergency surgery for small bowel occlusion syndrome.

SCIENTIFIC CHALLENGES

Breast Surgery

- Technological innovations in surgery.



5.1.5 Translational Medicine Area

- Possible role of genetic studies in diagnosis and follow-up.
- Endocrine and Cervical Surgery.
- Technical innovations in surgery.

Hepato Bilio Pancreatic Surgery Unit

- To contribute to the improvement of survival and quality of life of patients affected by pathologies related to the liver, pancreas, and bile duct. Promote research and development in diseases in the area as well as focus on their surgical treatment, especially through the minimally invasive approach.

Gastrointestinal Surgery Unit

- Experimental surgery program and collaboration with an IR working group.

ACTIVE GRANTS

- Fernández Ananin, Sónia. Impacto de la técnica de cierre del hiato esofágico en las hernias paraesofágicas sobre la recidiva herniaria. Estudio comparativo entre sutura continua barbadada versus puntos interrumpidos en X. IIBSP-HPE-2022-53. Duration: 2022-2023.
- Moral Duarte, Antonio. Adiposidad, inflamación y la desregulación del colesterol en el carcinoma de tiroides. Evaluación de estrategias terapéuticas basadas en la reducción del colesterol y la activación de LXR. PI19/00136. Instituto de Salud Carlos III (ISCIII). Duration: 2020-2023. 111.320,00 €.

SCIENTIFIC PRODUCTION

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Carrano FM, Chand M, Jenkins JT, Davies J, Rivilla SD, Delrio P, Elmore U, Espin E, Fichera A, Lorenz BF, Francis N, Ruiz MG, Hahnloser D, Licardie E, Martinez C, Ortenzi M, Panis Y, Idoate CP, Paganini AM, Pera M, Perinotti R, Popowich DA, Rockall T, Rosati R, Sartori A, Scoglio D, Shalaby M, Fernández VS, Smart NJ, Spinelli A, Sylla P, Tanis PJ, Valdes J, Wexner SD, Sileri P. Protective ileostomy creation after anterior resection of the rectum: Shared decision-making or still subjective?. *Colorectal Disease*. 2023; 25(4). DOI:10.1111/codi.16454. PMID:36527323. IF:3,400 (Q1/2D). Document type: Article.

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- Clàudia C, López AS, Rocío L, Irene M, Pilar H, Carmen M, Jesús B, Eduardo MT. Laparoscopic anterior resection of a deep infiltrating rectal endometriosis: A Video Vignette. *Colorectal Disease*. 2023; DOI:10.1111/codi.16819. PMID:38124238. IF:3,400 (Q1/2D). Document type: Letter.
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- Galán C, Hernández MP, Sala L, Sánchez A, Martínez MC, Bollo J, Pareja E, Targarona EM. Our experience in the short-term diagnostic-therapeutic management of the patient with anal dysplasia. *CIRUGIA ESPAÑOLA*. 2023; 101(3). DOI:10.1016/j.ciresp.2022.03.010. PMID:36152962. IF:1,900 (Q3/6D). Document type: Article.
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 - Vazquez EB, Rodríguez JB, Santos VM, D'Ambrosio GM, Vitiello G, Soler EMT, Cabús SS, Duarte AM. Laparoscopic right colectomy with D3 lymphadenectomy and hepatic metastasectomy in the caudate lobe: A video vignette. *Colorectal Disease*. 2023; DOI:10.1111/codi.16686. PMID:37691158. IF:3,400 (Q1/2D). Document type: Letter.
 - Vitiello G, Fernández S, Pérez N, Targarona EM. Laparoscopic repair of a giant right diaphragmatic hernia. *CIRUGIA ESPAÑOLA*. 2023; 101(12). DOI:10.1016/j.ciresp.2023.03.014. IF:1,900 (Q3/6D). Document type: Editorial Material.

Nephrology

Group leader

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Viera Ramirez, Elizabeth Romelia (IR)



DESCRIPTION

The Nephrology Research Group of Fundació Puigvert carries out translational research in the field of renal diseases. Most of our research is clinical (clinical trials, large cohorts of patients, collaborative studies, participation in clinical guidelines, observational studies in specific groups of renal patients, etc). The group's basic research focuses on the study of fibrosis and inflammation in kidney transplantation and glomerular diseases, and genomic as well as clinical studies in inherited kidney diseases.

The group actively participates in Spanish research networks in renal diseases, as well as some European ones.

MAIN LINES OF RESEARCH

- Inherited kidney diseases: research in this area is carried out from both the clinical and genomic perspective. The first one led by R. Torra and the second one by E. Ars. Both have led many research projects on these diseases, and have supervised several doctoral theses.
- Dr. R. Torra new line of research consist on the use of artificial intelligence for the diagnosis of inherited kidney diseases: 1) Use of a machine learning approach to develop a diagnostic tool and 2) use of natural Language processing to identify undiagnosed inherited kidney diseases within electronic health records. Both are funded projects.
- The hereditary renal diseases team is currently analyzing phenotype variability of autosomal dominant diseases, both in its genomic and its clinical dimension ad developing a prediction tool



5.1.5 Translational Medicine Area

for autosomal dominant Alport syndrome. Also, several studies have been performed to test prediction tools for autosomal dominant polycystic kidney disease.

- Dr. E. Ars has led the setup of the genetic testing pipeline by developing a gene panel (massive parallel sequencing) containing more than 400 genes causing inherited kidney diseases. This panel has been used for several cohort studies. Her funded research right now deepens into negative genetic tests by using RNA analysis.
- Kidney Transplantation: led by Dr. L. Guirado and Dr. C. Facundo. The group is participating in or leading more than 20 studies, including clinical trials of drugs for the treatment of kidney rejection or associated viral infections. Their active participation and leadership in the investigation of biochemical, serological and genomic biomarkers of both rejection and viral infections associated with kidney transplantation is outstanding. They are also part of an EU initiative on the use of AI for kidney transplant prognosis.
- A new study based on HLA epitope and interferon elispot incompatibilities detected between donor and recipient prior to transplantation in the Living Donor Kidney Transplant Program is underway; it aims to individualize immunosuppression with the objective of maintaining a low rejection rate by minimizing the dose of immunosuppression administered.
- The group is starting a collaboration with the Microbiology and Infectious Diseases group to study the impact of microbiota on recurrent urinary tract infections in kidney transplant recipients.
- Glomerular diseases: This is an important area of nephrology led by Dr. M. Diaz with many RCTs, observational and interventional studies in different glomerulopathies. Basic research has also been done in this area by studying the process of fibrosis and inflammation. New projects on IgA nephropathy (led by Dr. H Marco) and onconephrology (led by Dr. X Barros) are on its way.
- Renal osteodystrophy: led by Dr. MJ. Lloret. She is conducting a pilot study to bone quality with bone microindentation (in addition to bone

quantity with DXA) in renal patients. Dialysis: Clinical studies are led by Dr. JM. Diaz and studies on genomic damage research and the effect of BPA and plastics on it are led by Dr. E. Coll.

- Cardiovascular risk in CKD. Led by Dr. P. Fernández-Llama studies the 24-hour central arterial pressure, its circadian rhythms and their relationship with organic damage. This group is part of RICORS coordinated by Dr. Elisa Llurba on the topic of pregnancy and CKD.
- Ms. Luz San Miguel, Dr. Cristina Canal, Ms. Judith Ballart, Ms. Irene Silva and Ms. Beatriz Bardají are the coordinators of Clinical studies and trials. Their work is essential and of the utmost importance for carrying out the high number of clinical trials performed by the group.

SCIENTIFIC CHALLENGES

- Strengthen our translational character and maintain our scientific production.
- To make the transfer of research results to society our main objective.
- To maintain and strengthen our relationship with patient associations in order to progressively integrate the RRI approach into our translational research, with the aim of better aligning the research process and its results with the values, needs and expectations of our patients.
- Enhance innovation by incorporating artificial intelligence tools and collaborating with Information and Communication Technologies (ICT) for educational purposes and patient empowerment.
- To continue the active collection of research samples from CKD and transplant patients.
- To work towards precision medicine, especially in the field of kidney transplantation.
- Strengthen collaborative research with other IR groups.
- To maintain and increase participation in national working groups and to increase international collaboration. To achieve access to European project funds in the field of rare inherited diseases.
- To consolidate our participation in the development of national and international clinical nephrology guidelines.



5.1.5 Translational Medicine Area

- To increase our participation in relevant private pharmaceutical clinical trials, especially early stage clinical trials.
- Improve the statistical support for our scientific production.

ACTIVE GRANTS

- Ars Criach, Elisabet. Heterogeneidad clínica, genética y alélica de las enfermedades renales hereditarias de debut temprano: nuevas causas moleculares de anomalías congénitas del riñón y el tracto urinario. PI19/01633. Instituto de Salud Carlos III (ISCIII). Duration: 2020-2024. 93.170,00 €.
- Diaz Encarnacion, Maria Montserrat. Papel de la vía del succinato en la inflamación de los riñones procedentes de donantes cadáver. FMM 2019. Fundación Mutua Madrileña. Duration: 2019-2023. 99.997,00 €.
- Fernández De La Llama, Patricia. Primary care interventions to prevent maternal and child chronic diseases of perinatal and developmental origin. RD21/0012/0019. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 124.080,00 €.
- Fernández De La Llama, Patricia. Evolución de la variabilidad de la presión arterial posicional y temporal y su relación con el daño orgánico en ancianos hipertensos. Fundación Senefro. Ayudas 2019 a la investigación en Nefrología. Duration: 2019-2022. 24.000 € (F.PUIGVERT).
- Lloret Cora, Maria Jesus . Estudio del comportamiento de biomarcadores de recambio óseo durante el primer año post-trasplante renal. BECA FEIOMM 2022 INVESTIGACIÓN CLÍNICA. Sociedad Española de Investigación Ósea y Metabolismo Mineral. Duration: 2022-2022. 7.000,00 € (F.PUIGVERT).
- Torra Balcells, Roser. Use of artificial intelligence and systems biology for diagnosis and personalized risk assessment for inherited kidney diseases, focusing on alport syndrome. MARATO 202036-30. Fundació La Marató de TV3. Duration: 2021-2024. 112.500,00 €.
- Torra Balcells, Roser. Modelos de predicción en las nefropatías hereditarias autosómicas dominantes. PI18/00362. Instituto de Salud Carlos III (ISCIII). Duration: 2019-2022. 99.220,00 €.

- Torra Balcells, Roser. Búsqueda de enfermedades renales hereditarias no sospechadas: una aguja en un pajar. PI22/00361. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2025. 123.420,00 €.
- Torra Balcells, Roser. Inflamación e inmunopatología de órganos y sistemas. RD21/0005/0006-1. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 105.765,00 €.

GRANTS AWARDED

- Ars Criach, Elisabet. Estudio genómico y transcriptómico de pacientes con nefropatía no filiada con sospecha de causa monogénica. PI23/00426. Instituto de Salud Carlos III (ISCIII). Duration: 2024-2026. 102.500,00 €.

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5.1.5 Translational Medicine Area

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Women and Perinatal Health

Group leader

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DESCRIPTION

The Women and Perinatal Health Research Group is focused on the study of diseases derived from placental insufficiency, such as preeclampsia and growth restriction, and alterations of the fetal heart and neurodevelopment. The group is the coordinator of the framework of RICORS network entitled Primary Care Interventions to Prevent Maternal and Child Chronic Diseases of Perinatal and Developmental Origin, RD21/0012/0001 (ISCIII) and it has been recognized as a consolidated group recognized by the Agència de Gestió d'Ajuts Universitaris i de Recerca, AGAUR Generalitat de Catalunya (2021 SGR 01002).

MAIN LINES OF RESEARCH

- Prediction and prevention of complications arising from placental insufficiency, intrauterine growth restriction/preeclampsia (IUGR/PE).
- Placental insufficiency and maternal cardiovascular risk later in life.
- Development of predictive methods based on the Integration of pre and postnatal factors for the detection of abnormal neurodevelopment in congenital heart disease.
- Toxics and air pollution effects on pregnancy and fetal programming.
- Management of pelvic floor dysfunction: chronic pelvic pain, urinary incontinence, and pelvic organ prolapse.
- Maternal and fetal cardiovascular programming in assisted reproduction treatments (ART).
- Cardiovascular Health and ART outcomes.



5.1.5 Translational Medicine Area

- COVID-19 and gestation.
- Innovative methods in delivery care.

SCIENTIFIC CHALLENGES

- To study new placental biomarkers for the diagnosis and prognosis of preeclampsia (PE) and intrauterine growth restriction (IUGR), aiming to generate future hypotheses on prevention targets and therapeutic interventions for these diseases.
- To determine the utility of new placental biomarkers (sFlt-1/PIGF ratio) in the diagnosis and prognosis of preeclampsia (PE) to change existing healthcare policies and improve maternal and neonatal health.
- To study new maternal cardiovascular risk biomarkers after experiencing placental insufficiency and explore preventive strategies to identify which mothers are at risk of long-term cardiovascular diseases.
- To study the role of placental insufficiency and hypoxia in congenital heart diseases to increase our understanding of the relationship between hypoxia-dependent placental morphogenesis, placental function, and effects on fetal oxygen metabolism.
- To identify new biomarkers detectable during fetal and neonatal stages that help predict postnatal neurological risk in congenital heart diseases.
- To evaluate the impact of maternal exposure to environmental factors on gestation, placental complications, and fetal neurodevelopment to evidence to support regulation and implementation of necessary interventions by health authorities.
- To evaluate the impact of Sars-Cov2 infection on gestation and the neonate.
- To conduct clinical research focused on improving obstetric care by implementing innovative solutions in the labor and postpartum process.

ACTIVE GRANTS

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- Llurba Olive, Elisa. Primary care interventions to prevent maternal and child chronic diseases of perinatal and developmental origin. RD21/0012/0001. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2024. 245.080,00 €.
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GRANTS AWARDED

- Murcia Oliveras, Maria Teresa. Contratos Rio Hortega 2023. CM23/00270. Instituto de Salud Carlos III (ISCIII). Duration: 2024-2026. 65.000,00 €.

DOCTORAL THESES DEFENDED

- Garrido Giménez, Carmen. Implicación de los factores angiogénicos en el riesgo cardiovascular



5.1.5 Translational Medicine Area

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- Mazarico E, Meler E, Mendoza M, Herraiz I, Llurba E, De Diego R, Comas M, Boada D, González A, Bonacina E, Armengol M, Moline E, Hurtado I, Torre N, Gomez MD, Galindo A, Figueras F. Mortality and severe neurological morbidity in extremely preterm fetal growth-restricted fetuses. *ULTRASOUND*



5.1.5 Translational Medicine Area

IN OBSTETRICS & GYNECOLOGY. 2023; 62(6).
DOI:10.1002/uog.26290. PMID:37325877. IF:7,100
(Q1/1D). Document type: Article.

- Nan MN, García A, Mora J, Trilla C, Antonijuan A, Orantes V, Cruz M, Blanco F, Llurba E. Impact of Angiogenic and Cardiovascular Biomarkers for Prediction of Placental Dysfunction in the First Trimester of Pregnancy. *Biomedicines*. 2023; 11(5):1327. DOI:10.3390/biomedicines11051327. PMID:37238997. IF:4,700 (Q1/3D). Document type: Article.
- Perelló J, Estadella J, Gich I, Bailón M, Llurba E, Calaf J. Bleeding profile and safety of a levonorgestrel 13.5 mg intrauterine device versus Nova T copper 380 mm(2) intrauterine device: Results of a 3-year, single-center, randomized phase 4 study. *CONTRACEPTION*. 2023; 127:110127. DOI:10.1016/j.contraception.2023.110127. PMID:37487868. IF:2,900 (Q2/5D). Document type: Article.

Advanced Medical Imaging, Artificial Intelligence, and Imaging-Guided Therapy

Group leader

Munuera Del Cerro, Josep Lluís (FGS)

Researchers

Alfonso Cerdan, Sheila (FGS)

Aubanell Creus, Anton (FGS)

Codo Tarraubella, Xenia (FGS)

Gimenez Nadal, Anna (FGS)

Gomez Chiari, Marta Cecilia (FGS)

Granell Moreno, Esther (FGS)

Hernandez Giraldo, Cristian David (FGS)

Hernandez Jover, Diana (FGS)

Lozano Martinez, Gloria Andrea (FGS)

Mendez Escalante, Jorge Eliecer (FGS)

Menso , Maria Magdalena (FGS)

Oliva Ibarz, Javier (FGS)

Otero Ruiz, Jorge Enrique (FGS)

Pernas Canadell, Juan Carlos (FGS)

Rios Vives, Miguel Angel (FGS)

Sánchez Fernández, Juan Jose (FGS)

Tecame , Mario (FGS)

Valverde Lavirgen, Sandra (FGS)

Villalba Auñon, Jorge (FGS)



MAIN LINES OF RESEARCH

- Artificial Intelligence.
- Quantitative Medical Imaging Advances and Radiomics.
- Innovative Imaging Technologies.
- Image-Guided Therapy 3D Imaging and Surgical Planning.
- Design and Testing of Medical Devices.

SCIENTIFIC CHALLENGES

- Increasing knowledge in the implementation of digital technologies in healthcare through the design and testing of tools supporting clinical and radiological decision-making, based on Artificial Intelligence and Robotics.
- Promoting the development and use of advanced biomarkers in medical imaging, including new acquisition methods, techniques, or procedures, especially quantitative and omics biomarkers.
- Encouraging the use of advanced imaging technologies and 3D printing for the enhancement of educational resources and clinical-surgical planning.
- Enhancing participation in national and international research networks focused on diagnostic imaging, as well as fostering collaboration in multidisciplinary research teams.

DOCTORAL THESES DEFENDED

- Guisado-Alonso, Daniel. Estratègies per optimitzar el tractament endovascular en l'íctus agut: anàlisi dels criteris de selecció i de la relació



5.1.5 Translational Medicine Area

entre la circulació col·lateral i la pressió arterial.
28/04/2023. Universitat Autònoma de Barcelo-
na. Supervisors: Martí Fàbregas, Joan; Delgado
Mederos, Raquel; Granell Moreno, Esther. [http://
hdl.handle.net/10803/690489](http://hdl.handle.net/10803/690489).

5.1.6 Associated Groups

Emerging Processes in Prevalent Diseases

Puig Campmany, Mireia

Radiophysics and Radioprotection

Carrasco De Fez, Pablo

Paediatrics

Moliner Calderon, Elisenda

Ophthalmology

Del Campo Carrasco, Zoraida

Nuclear Medicine

Carrió Gasset, Ignasi (until October 2023)

Flotats Giralt, Albert (from November 2023)

Intensive Medicine

Moran Chorro, Indalecio

Pharmacy

Mangues Bafalluy, Maria Antònia (until October 2023)

Feliu Ribera, Anna (from November 2023)

Dermatology

Puig Sanz, Luis

Anaesthesiology

Paniagua Iglesias, Pilar

Plastic Surgery

Masia Ayala, Jaume

Palliative Care

Pascual López, Antonio

Andrology

Ruiz Castañe, Eduard

Urology

Palou Redorta, Juan

Reproductive Health

Calaf Alsina, Joaquim

Radiation Oncology

Sancho Pardo, Gemma

Locomotor System

Crusi Sererols, Xavier

Pain and Neurosciences

Català Puigbò, Elena (until October 2023)

Revuelta Rizo, Miren Eli (from November 2023)

Nursing Care

Mas Dalmau, Gemma

Cardiac Surgery

Ginel Iglesias, Antonino

HIV and AIDS

Domingo Pedrol, Pere

Emerging Processes in Prevalent Diseases

Group leader

Puig Campmany, Mireia (FGS)

Researchers

Agra Montava, Ivan (FGS)
 Albuixech Ginesta, Mireia (FGS)
 Alquezar Arbe, Aitor (FGS)
 Alvarez Albarran, Maria Teresa (FGS)
 Arenos Sambro, Roser (FGS)
 Barcons Pujol, Miquel (FGS)
 Blazquez Andion, Marta (FGS)
 Borja Cano, Maria (FGS)
 Borrego Yanes, Isel (FGS)
 Caballero Flores, Francisco (FGS)
 Calvet Pujol, Adria (FGS)
 Castella Rovira, Marta (FGS)
 Castellero Diaz, Lluís Enric (FGS)
 Cercas Lobo, Silvia (FGS)
 Ceresuela Lobera, Andrés (FGS)
 Davalos Benites, Lucio Jair (FGS)
 Diez Diez, Veronica (FGS)
 Docio Alfaya, Marta (FGS)
 Doi Grande, Adriana Laura (FGS)
 Donniacono, Domenico (FGS)
 Escribano Lazaro, Alicia (FGS)
 Fernández, Gaston (FGS)
 Fernández Castaño, Irene (FGS)
 Fernández Gonzalez, Diego (FGS)
 Garrido Quintero, Maria Andrea (FGS)
 Gil Olivas, Eva (FGS)
 Gomez Robles, Joaquin Jose (FGS)
 Gonzalez Diez, Ane (FGS)
 Guardiola Tey, José Maria (FGS)
 Hernandez Ontiveros, Hector (FGS)
 Herrera Mateo, Sergio Antonio (FGS)
 Higa Sansone, Jorge Leopoldo (FGS)
 Jodar Manzanera, Victoria (FGS)
 Jordan Lucas, Sara (FGS)
 Lazzari, Roberto (FGS)
 Leal Cebrecos, Jesus (FGS)
 López Ortega, Laura (FGS)
 Lozano Polo, Laura (FGS)
 Mateo Roca, Miriam (FGS)
 Mauri Plana, Albert (FGS)
 Moline Pareja, Antoni (FGS)
 Montiel Dacosta, Josep Antoni (FGS)
 Moragues Escalona, Laura (FGS)
 Motos Bescos, Meritxell (FGS)
 Palacio Alvare, Pablo (FGS)
 Perez Baena, Sergio (FGS)
 Perez Mendez, Maria Carmenza (FGS)
 Piera Salmeron, Aina (FGS)
 Ponte Marquez, Paola Helena (FGS)
 Ris Romeu, Josep (FGS)
 Rizzi, Miguel Alberto (FGS)
 Rodríguez Armas, Maria (FGS)
 Romero Carrete, Carlos Jose (FGS)
 Rossi, Amelia (FGS)
 Santalo Bel, Miguel (FGS)
 Sanz López, Natalia (FGS)
 Seres Roig, Montserrat (FGS)
 Serrano Garcia-Calvo, Alicia (FGS)
 Serrano Herran, Marta (FGS)
 Sizova, Marina (FGS)
 Torres Tornos, Andreu (FGS)
 Trejo Gutierrez, Olga Maria (FGS)
 Villarejo Jimenez, Ana (FGS)
 Villate Robles, Luisa Fernanda (FGS)

Research Technician

Soriano Gamero, Miriam (IR)



DESCRIPTION

Our group mainly studies urgent and emerging processes, in prevalent diseases, with special interest in demographic aspects (gender perspective, older adults). It is an eminently clinical research, based on our own and multicenter projects. The interest is the knowledge of the diseases, their diagnosis and treatment taking into account the particularities, and the organisational aspects of the emergency departments. In short, to promote quality, safe and efficient care in the emergency department.

MAIN LINES OF RESEARCH

- Clinical Organization and Management (Mireia Puig, Josep Ris, Miriam Mateo).
- Patient safety and emergency department quality. (Maite Álvarez).
- Teaching (Josep Anton Montiel, J. Leopoldo Higa)
- Ecography (R Lazzari).
- Organ Donation and Coordination (Francisco Caballero).
- Frailty and elderly (Marta Blázquez).

Processes

- Infection (Albert Mauri, Maire Álvarez).
- Travel disease (Eva Gil).
- Sexually transmitted diseases (Montse Seres).
- Sepsis (Anotni Moliné, Aina Piera).
- Respiratory System Disorders and Acute Respiratory Failure (Antoni Moliné).
- Thromboembolic disease (Laura Lozano).

5.1.6 Associated Groups

- Cardiovascular System (Miquel Santaló).
- Acute coronary syndrome (Roberto Lazzari).
- Ultrasensitive markers in acute coronary syndrome (Aitor Alquézar).
- Cardiovascular Risk (Paola Ponte).
- Cardiac failure (Sergio Herrera, Aitor Alquézar).
- Arrhythmias (Olga Trejo, Héctor Hernández).
- Diabetes care (Iván Agra).
- Toxicology (J. Leopoldo Higa, Héctor Hernández).
- Psychiatry (Paola Ponte, Marta Castellà).
- Ultrasound in emergency patient (Roberto Lazzari, Sergio Pérez Baena).

SCIENTIFIC CHALLENGES

- Emergency and Urgent Care Management, new organisational models.
- Ageing population, frailty, and emergency care.
- Medication-related health problems.
- Heart failure, new therapeutic scenarios, prevention and home-care Infection, diagnosis and control.
- Urgent processes from a gender perspective.
- Urgent processes with age perspective.

ACTIVE GRANTS

- Alquezar Arbe, Aitor. Epidemiología de la Insuficiencia Cardíaca Aguda en servicios de urgencias hospitalarios. Factores asociados a la mortalidad a los 30 días y al año en pacientes con Insuficiencia Cardíaca Aguda atendidos en los Servicios de Urgencias Hospitalarios. Estudios EAHFE-5. ESTUDIO EAHFE. ICA-SEMES.
- Guardiola Tey, José María. Presentación atípica de la infección COVID-19 en los servicios de Urgencias. INFECCIÓN COVID-19. INFURG-SEMES.
- Guardiola Tey, José María. Evaluación de las visitas a Urgencias previas a un diagnóstico de VIH. QP-1. INFURG-SEMES.
- Puig Campmany, Mireia. TIQUE - 965356 - Innovative care services, enhanced with technology, to deliver QUICK responses for individuals with advanced heart failure and complex care needs through integrated care. Horizon 2020.

European Commission. Duration: 2020 - 2026. 4.548.678,70 € (FGS).

- Rizzi, Miguel Alberto. Estudio epidemiológico sobre el efecto de la pandemia por SARS-CoV-2 en la atención en Urgencias del paciente mayor: estudio EDEN (Emergency Department and Elders in Need). ESTUDIO EDEN. SEMES.

GRANTS AWARDED

- Sizova, Marina. Análisis de frecuencia de consultas en el servicio de Urgencias y el Hospital del Día de Oncología de los pacientes con cáncer de pulmón no microcítico metastático en tratamiento de primera línea con quimioinmunoterapia, quimioterapia o inmunoterapia. IIBSP-PUL-2023-01.

DOCTORAL THESES DEFENDED

- López Laguna, Héctor. Simple biochemistry for complex protein-based materials. 31/03/2023. Universitat Autònoma de Barcelona. Supervisors: Villaverde Corrales, Antonio; Vázquez Gómez, Esther; Unzueta Elorza, Ugutz. <http://hdl.handle.net/10803/690077>.
- Núñez Amela, Yáiza. Nanopartículas dirigidas a células madre CXCR4+ per al tractament de la leucèmia mieloide aguda. 12/04/2023. Universitat de Barcelona. Supervisors: Mangues Bafalluy, Ramon; Casanova Rigat, Isolda; Cascante i Serratos, Marta. <http://hdl.handle.net/10803/688200>.
- Voltà Durán, Eric. Exploring and exploiting multi-domain recombinant proteins as targeted nanomedical tools. 12/09/2023. Universitat Autònoma de Barcelona. Supervisors: Unzueta Elorza, Ugutz; Villaverde Corrales, Antonio; Vázquez Gómez, Esther.

SCIENTIFIC PRODUCTION

- Afonso FJ, Comas M, Castells X, Cirera I, García D, Pujadas T, Ichart X, Puig M, Vena AB, Renom A. Emergency department admissions and economic costs burden related to ambulatory care sensitive conditions in older adults living in care homes. REVISTA CLINICA ESPAÑOLA. 2023; 223(10). DOI:10.1016/j.rce.2023.09.004. PMID:37838224. IF:2,900 (Q2/5D). Document type: Article.
- Agra Montava I, Romero Carrete CJ, Borrego Yanes I, Villate Robles LF. Hipotermia y onda de



5.1.6 Associated Groups

- Osborn; *Rev Esp Urg Emerg*. 2023;2:118–119. Document type: Letter.
- Alonso CF, Ferrer M, García EJ, Mir SA, Jiménez S, Rodríguez JJ, Salmerón PP, Gil A, Llorens P, Burillo G, Pérez FJM, Alquezar A, Gallardo RR, Díez M, Más MT, López N, Soler AC, Nespereira EG, García AG, Ezponda P, Lorenzo AM, Liarte J, Martín JMS, Puente PH, Villalibre AM, del Castillo JG, Miró O. Impact of functional dependency of elderly patients seen in Spanish emergency departments during the first wave of the COVID-19 pandemic on mortality at 30, 180 and 365 days depending on the diagnosis (COVID versus non-COVID). *Revista Española de Salud Pública*. 2023; 97:e202310085. IF:1,100 (Q4/10D). Document type: Article.
 - Alquézar A, Osorio GI, Jacob J, García EJ, Piñera P, Llorens P, Burillo G, Requena AC, Gil A, Fernández C, Aguiló S, Jiménez S, Escudero B, Rosendo D, Mojarro EM, Vaswani A, Rodríguez M, Alarcón P, Gioya GD, Alemany FX, González M, Bóveda M, Espinosa B, Llopis F, Suero C, González Del Castillo J, Miró Ò, SIESTA N. Influence of type of household on prognosis at one year in patients =65 years attending hospital emergency departments in Spain. The EDEN-6 study. *MATURITAS*. 2023; 178:107852. DOI:10.1016/j.maturitas.2023.107852. PMID:37774596. IF:4,900 (Q1/2D). Document type: Article.
 - Artajona L, García A, Aguiló S, Burillo G, Alquézar A, Fernández C, Fernández A, Cardona MF, Vera MTM, Vela MI, Español PT, Mota MS, García AG, Aguilera CL, Llopis F, Herrero P, Grande A, Lázaro LS, García AC, Bermejo JJN, Cubillas AI, Martínez MJH, González F, Ramón SS, Fernández BE, del Castillo JG, Miró O, SIESTA I. Influence of income on in-hospital mortality in older adults during the first wave of the COVID-19 pandemic: results from the EDEN-33 study. *Emergencias*. 2023; 35(6). PMID:38116966. IF:5,500 (Q1/2D). Document type: Article.
 - Benito M, López P, Rodríguez S, Llorens P, Domínguez A, Aguirre A, Alquézar A, Jacob J, Gil V, Martín FJ, Mir M, Andueza JA, Burillo G, Miró Ò, en representacion I. Analysis of the relationship between ambient air pollution and the severity of heart failure decompensations in two Spanish metropolises (Barcelona and Madrid). *MEDICINA CLINICA*. 2023; 161(1). DOI:10.1016/j.medcli.2023.02.016. PMID:37055253. IF:3,900 (Q2/4D). Document type: Article.
 - Blázquez M, Montiel JA, Rizzi M, Acosta B, Moliné A, Ris J, Puig M. Frailty and mortality: Utility of Frail-VIG index in ED short-stay units for older adults. *ARCHIVES OF GERONTOLOGY AND GERIATRICS*. 2023; 115:105208. DOI:10.1016/j.archger.2023.105208. PMID:37774490. IF:4,000 (Q2/5D). Document type: Article.
 - Burillo G, Parra P, Aguiló S, Jiménez S, Jacob J, Piñera P, Llorens P, García EJ, Montero FJ, Muñoz E, Gil A, Fernández C, Alquezar A, Salido M, Gil RJ, Pedraza J, Cobos A, Gargallo E, de Diego M, Iglesias M, Pérez RA, Pérez SDM, Valle B, Quero E, Morales B, Adroher M, González del Castillo J, Miró Ò, en representacion S. Study EDEN-12: analysis of access to intensive care units of patients older than 65 years requiring emergency hospitalization. *Medicina Intensiva*. 2023; 47(11). DOI:10.1016/j.medin.2023.04.006. IF:3,000 (Q3/7D). Document type: Article.
 - Congost GB, Momblan M, Bernal JV, López AM, Gabalda JR, García J, García J, Brugaletta S. Association of sex and age and delay predictors on the time of primary angioplasty activation for myocardial infarction patients in an emergency department. *HEART & LUNG*. 2023; 58. DOI:10.1016/j.hrtlng.2022.10.014. PMID:36335910. IF:2,800 (Q1/2D). Document type: Article.
 - Díez MPL, Jacob J, Llorens P, Espinosa B, Ramón SS, Aguirre A, Andueza JA, Escoda R, Gil V, Millán J, López ML, Ferrer ES, Lucas FJ, Rodríguez E, Llauger L, Garate RT, Gil C, Herrera S, Martín FJ, Miró Ò. Relação entre o tipo de hospital e seu volume de atendimento em emergências e o manejo da insuficiência cardíaca aguda em emergência] [Relación entre tipo de hospital y su volumen asistencial en urgencias y el manejo de la insuficiencia cardíaca aguda en urgencias. *Insuficiencia Cardiaca*. 2023; 18(2). Document type: Article.
 - Eiroa P, Matos S, Aguiló S, Alquezar A, Jacob J, Fernández C, Llorens P, Ruiz SM, Jimenez LC, Vaswani A, Rodríguez M, Pineda MCS, Fresno SA, Osorio IG, Alcaraz A, Collado JM, Benito MV, Chamorro F, Rocio LA, Gallardo VT, Chaib FB,



5.1.6 Associated Groups

- García JP, Espinosa FDQ, Lucena MJ, León GY, Revuelta EG, Aroca SS, del Castillo JG, Burillo G, Miró O, Red S. Factors related to bladder catheterization in older patients and its possible association with prognosis: results of the EDEN-30 study. *Emergencias*. 2023; 35(6). PMID:38116965. IF:5,500 (Q1/2D). Document type: Article.
- Espinosa B, Llorens P, Gil V, Jacob J, Alquezar A, Masip J, Llauger L, Tost J, Andueza JA, Garrido JM, Soy E, Aguera C, Herrero P, Gil A, Millan J, Mecina AB, Torres R, Cabrera N, Nunez J, Miro O, ICA GRP. Impact of congestion and perfusion status in the emergency department on severity of decompensation and short-term prognosis in patients with acute heart failure. *European Heart Journal-Acute Cardiovascular Care*. 2023; 12(3). DOI:10.1093/ehjacc/zuac115. PMID:36137176. IF:4,100 (Q2/4D). Document type: Article.
 - Juanes A, Ruiz J, Puig M, Blazquez M, Gilabert A, López L, Baena MI, Guiu JM, Mangues MA. The Effect of the Drug-Related Problems Prevention Bundle on Early Readmissions in Patients From the Emergency Department: A Randomized Clinical Trial. *ANNALS OF PHARMACOTHERAPY*. 2023; 57(9). DOI:10.1177/10600280221143237. PMID:36539949. IF:2,900 (Q3/6D). Document type: Article.
 - Lazzari, Roberto; Condom Siñol, M. (2023). Dealing with specialist pathology: an unusual case of ovarian hyperstimulation syndrome managed in the emergency department with point of care ultrasound. *Acute Care Medicine Surgery and Anesthesia*, 1(1). DOI:10.4081/amsa.2023.31. Document type: Article.
 - Llauger L, Espinosa B, Rafique Z, Boone S, Beuhler G, Millan J, Gil V, Jacob J, Alquezar A, Campos M, Escoda R, Tost J, Martin E, Aguirre A, López ML, Nunez J, Mullens W, López P, Mueller C, Llorens P, Peacock F, Miro O, ICA GRP. Impact of worsening renal function detected at emergency department arrival on acute heart failure short-term outcomes. *European Journal of Emergency Medicine*. 2023; 30(2). DOI:10.1097/MEJ.0000000000001016. PMID:36787242. IF:4,400 (Q1/2D). Document type: Article.
 - Llorens P, Miro O, Benito MV, Fernández C, Jacob J, Burillo G, Alquezar A, Aguilo S, Ballard MP, Baena SB, Cho J, Romero MSJ, Palma M, Madrigal AA, Romero MR, López M, Gonzalez RG, Fernández MC, Franco BM, Ferrer E, Guillen VG, Martin SG, Sindin GS, Zapico AP, Marquez PP, Espinosa B, del Castillo JG, Representacion S. Plasma sodium concentration in older patients as an indicator of severity in emergencies: Results from the Emergency Department and Elder Needs-16 study. *Emergencias*. 2023; 35(4). PMID:37439421. IF:5,500 (Q1/2D). Document type: Article.
 - López MP, Alquezar A, Jacob J, Llorens P, Llauger L, Herrero P, Gil V, Nunez J, Martin FJ, Miro O, ICA GRP. Hospital development of heart failure follow-up units and short-term prognosis after acute decompensation in Spain. *INTERNATIONAL JOURNAL OF CARDIOLOGY*. 2023; 378. DOI:10.1016/j.ijcard.2023.02.031. PMID:36804513. IF:3,500 (Q2/5D). Document type: Article.
 - Martin E, Gil V, Llorens P, Flores S, Troiano OJ, Alquézar A, Jacob J, Herrero P, Sánchez C, Miró O, Investigadores ICA SEMES GRP. Factors associated with unjustified chronic treatment with digoxin in patients with acute heart failure and relationship with short-term prognosis. *REVISTA CLINICA ESPAÑOLA*. 2023; 223(9). DOI:10.1016/j.rce.2023.08.001. PMID:37716426. IF:2,900 (Q2/5D). Document type: Article.
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5.1.6 Associated Groups

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Radiophysics and Radioprotection

Group leader

Carrasco De Fez, Pablo (FGS)

Researchers

Anson Marcos, Cristina (FGS)

Barcelo Pages, Marta (FGS)

Gallego Franco, Pedro (FGS)

García Apellaniz, Nagore (FGS)

Jornet Sala, Nuria (FGS)

Perez-Alija Fernández, Jaime (FGS)

Ruiz Martinez, Agustin (FGS)

Tejedor Aguilar, Natalia (FGS)

Vivancos Bargallo, Helena (FGS)

Research Technician

Pallerol Pinzano, Rosa Maria (FGS)



DESCRIPTION

The Radiation Physics and Radiation Protection research group carries out applied research on three fields of application of ionising radiation in medicine: radiation therapy, nuclear medicine, and radiology. This research is intended to solve gaps of knowledge in the safe application of radiation in medicine due to new technology, new techniques, new procedures, or application of new legislation.

MAIN LINES OF RESEARCH

- Clinical Audits in Radiotherapy. Line shared with the Radiation Oncology department. At the Radiation Physics and Radiation Protection department this line is conducted by Núria Jornet.
- Standardization in Nuclear Medicine. Line conducted by Agustí Ruiz and Marta Barceló.
- Diagnostic Reference Levels (DRL) using a radiation dose management solution. Line conducted by Marta Barceló and Agustí Ruiz.
- Biological Dosimetry. Line conducted by Pablo Carrasco and Jaime Pérez-Alija.

SCIENTIFIC CHALLENGES

- To derive clinically relevant tolerance actions for EPID-based in vivo dosimetry on each anatomical treatment site in radiation therapy.
- To make radiotherapy treatment planning less person-dependent, to decrease variability, and optimise treatment plans.
- To define a strategy to perform clinical audits in radiotherapy at a regional level that could be escalated to national and international levels.

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- To set up clinical audits in radiotherapy in Catalonia.
- To standardise quantitative image acquisition in PET and SPECT imaging.
- To get all imaging modalities integrated into the dose management system provided from the Catalan government, and to derive DRLs values for all the equipment at HSCSP.
- To manage DRLs and compare them against regional, national, and international values.
- To update the dose-biological effect calibration curve, relating chromosomal aberrations to radiation absorbed dose, based on modern automatic systems.
- To derive an easy test to classify irradiated individuals from a potential accident into those that would require special following and treatment and those that were exposed to non-critical doses.

ACTIVE GRANTS

- Barcelo Pages, Marta. International study of patient doses and tissue reactions from fluoroscopy guided interventional procedures. IAEA. Duration: 2023-2023.
- Jornet Sala, Nuria. EU-REST (European Union Radiation, Education, Staffing & Training). HA-DEA/2022/OP/0003. UE. Duration: 2022-2024. (FGS).
- Jornet Sala, Nuria. SAMIRA study on the definition of Key Performance Indicators on Quality and Safety of medical applications of ionising radiation. ENER/D3/2023-101-1. UE. Duration: 2023-2023 (FGS).

GRANTS AWARDED

- Jornet Sala, Nuria. Catalan Clinical Audit network for Quality Improvement in RT [CAT-ClinART]. EU4H Action Grants 2023. UE. 374.999,92 € (FGS).
- Tejedor Aguilar, Natalia. Desarrollo y evaluación de modelos de inteligencia artificial para predicción de dosis y generación automática de planes clínicos para tratamientos de mama con IMRT. SEFM 2023. Duration: 2023-2025. 2.000,00 €.

SCIENTIFIC PRODUCTION

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5.1.6 Associated Groups

Paediatrics

Group leader

Moliner Calderon, Elisenda (FGS)

Researchers

Alvarez Perez, Roser (FGS)

Armendariz Lacasa, Laura (FGS)

Badell Serra, Isabel (UAB)

Balcells Moline, Maria Reyes (FGS)

Barcelo Carceller, Irene (FGS)

Bianchi, Federicha (FGS)

Brio Sanagustin, Sónia (FGS)

Carreras Gonzalez, Gemma (FGS)

Castillo Gomez, Fatima (FGS)

Coca Fernández, Elisabet (FGS)

Esmel Vilomara, Roger (FGS)

Fraga Rodríguez, Gloria M. (FGS)

García Del Cerro, Gemma (FGS)

Gonzalez Rioja, Xoan (FGS)

Josa Eritja, Maria (FGS)

López Torija, Ivan (FGS)

Salazar Quiroz, Juan (FGS)

Sensarrich Roset, Mireia (FGS)

Tirado Capistros, Mireia (FGS)

Torrent Español, Montserrat (FGS)

Valle T-Figueras, José Maria (FGS)



DESCRIPTION

The Pediatrics research group is a young group of researchers that includes pediatricians who, in addition to the care activity they carry out in the hospital, are interested in and express the need for research to improve the management and treatment of the children we care for. Aware of the small population in our area of assistance, we know of the need to carry out research together with other centers to achieve greater robustness in pediatric research.

Our short-term approach is to create a group where all pediatric healthcare providers with pediatric concerns are represented and include primary care pediatricians for community research into major pediatric conditions.

MAIN LINES OF RESEARCH

- Pediatric Bone marrow transplantation. Reference center of the National Health System (CSUR). PH. D. Ivan Torrija.
- Hereditary erythro pathology. Reference center of the National Health System (CSUR). M. D. Montserrat Torrent.
- Fanconi anaemia and other hereditary anemias. M. D. Montserrat Torrent.
- Sarcomas. Reference center of the National Health System (CSUR). M. D. Montserrat Torrent.
- Neonatal Infectious Diseases. PH. D. Elisenda Moliner.
- Neonatal Resuscitation and hypoxic ischemic encephalopathy. PH. D. Elisenda Moliner. M. D. María García Borau.



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- Sonography in critical neonatal care. M. D. Juan José Salazar. M. D. Judit Becerra.
- Neonatal Pharmacology. Ph. D. Edurne Fernández de Gamara. M. D. MJ García borau.
- Hereditary renal diseases: Primary hyperoxaluria, C3 glomerulopathy, Alport syndrome. PH. D. Gloria Fraga.
- Reference center for the treatment of bladder exstrophy in the neonatal age (CSUR F. Puigvert-H. Sant Pau). PH. D. Anna Bujons PH. D. Elisenda Moliner.
- Genetic diseases with cardiac expresión. M. D. Roger Esmel.
- Effect of exercise on cardiac remodeling in children undergoing chemotherapy. M. D. Roser Alvarez.
- Diagnosis of chronic lung disease in children undergoing hematopoietic cell transplantation. IP M. D. Gemma García del Cerro.
- Eosinophil populations in pediatric patients with eosinophilic asthma. IP M.D. Laura Armendariz.
- García Del Cerro, Gemma. La oscilometría como herramienta para la detección precoz de patología respiratoria en pacientes sometidos a trasplante de progenitores hematopoyéticos en comparación con espirometría/pletismografía. IIBSP-OSC-2023-111.
- López Torija, Ivan. Trasplante alogénico de células madre en niños y adolescentes con leucemia linfoblástica aguda - FORUN (Para omitir radioterapia por debajo de la mayoría de edad). ALL SCTPED 2012 FORUM
- Moliner Calderon, Elisenda. Evaluación de una intervención basada en la evidencia para reducir la bacteriemia asociada a catéter vascular central en recién nacidos de muy bajo peso. INBERBAC-neo PI17/00565. Duration: 2018-2023.

SCIENTIFIC CHALLENGES

- Pediatric haematopoietic progenitor cell transplantation from alternative donors.
- Pediatric haematopoietic progenitor cell transplantation in congenital immunodeficiencies.
- Pediatric haematopoietic progenitor cell transplantation in congenital metabolic pathologies.
- Fanconi anaemia (group recognized by the UAB, Barcelona).
- Polytraumatized patient care programme. PPT implementation code at HSCSP and in the CatSalut central register.
- Preterm new-borns. CatSalut central register.
- Therapeutic hypothermia in the treatment of perinatal hypoxic ischemic encephalopathy. CatSalut central register.

ACTIVE GRANTS

- Armendáriz Lacasa, Laura. Caracterización de las poblaciones de eosinófilos en pacientes pediátricos con asma eosinofílica: evaluación de la expresión de marcadores de activación mediante citometría de flujo. IIBSP-ASM-2022-46.

GRANTS AWARDED

- Esmel Vilomara, Roger. Miocardi atordit neurogènic en el pacient pediàtric neurocrític. IIBSP-MAN-2022-147. Duration: 2023
- Salazar Quiroz, Juan. Ensayo clínico aleatorizado simple ciego en prematuros con Síndrome de Distrés Respiratorio (SDR) tributarios de tratamiento con surfactante exógeno identificados precozmente mediante ultrasonografía pulmonar. IIBSP-SUR-2022-61. Duration: 2023
- Sensarrich Roset, Mireia. - Manejo del paciente con fiebre sin foco de 3-36 meses de edad. Descripción del estado actual. IIBSP-FIE-2023-08. Duration: 2023

DOCTORAL THESES DEFENDED

- Pena Schesquini Roriz, Katia Regina. Estudio de la enfermedad celíaca en los últimos 10 años de pacientes pediátricos: clínica y diagnóstico. 11/12/2023. Universitat Autònoma de Barcelona. Supervisors: Badell Serra, Isabel; Fraga Rodríguez, Gloria María; Rodrigo Gonzalo de Liria, Carlos.

SCIENTIFIC PRODUCTION

- Ariceta G, Collard L, Abroug S, Mochhala SH, Gould E, Boussetta A, Ben M, S, Hunley TE, Jarraya F, Fraga G, Banos A, Lindner E, Dehmel B, Schalk G. ePHex: a phase 3, double-blind, placebo-controlled, randomized study to evaluate long-term efficacy and safety of Oxalobacter formigenes in patients with primary



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 - Casadesús-Cabral D, Rello-Saltor V, Vila-Soler J, Fernández-Ledesma B, Barceló-Carceller IC. Enterocolitis associada a malaltia de Hirschsprung. *Pediatr Catalana*. 2023; 83(1):13-6. Document type: Article.
 - Esmel R, Rianza L, Dolader P, Sabaté A, Rosés F, Gran F. New-onset heart failure in infants: when the aetiological diagnosis becomes a challenge. *EUROPEAN JOURNAL OF PEDIATRICS*. 2023; DOI:10.1007/s00431-023-05286-5. PMID:37843615. IF:3,600 (Q1/2D). Document type: Article.
 - Esmel R, Valenzuela I, Rianza L, Rodríguez B, Rosés F, Boronat S, Sabaté A. Arterial tortuosity syndrome: Phenotypic features and cardiovascular manifestations in 4 newly identified patients. *European Journal of Medical Genetics*. 2023; 66(9):104823. DOI:10.1016/j.ejmg.2023.104823. PMID:37619836. IF:1,900 (Q4/8D). Document type: Article.
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- Martin N, Pilco M, Agraz I, Gonzalez JD, Panizo N, Fraga G, Fernández L, López MT, Dall'Anese C, Ortiz A, Torra R, Marcas L, Rius A, Tomas P, García L, Luna E, Martin MA, Inigo P, Martins J, Ramos F, García R, García LD, Merino MD, Fernández MJ, Madariaga L, Canal C, Martinez AM, Echarri R, Bouarich H, Cabezas A, R. Autosomal dominant polycystic kidney disease in young adults. *Clinical Kidney Journal*. 2023; 16(6). DOI:10.1093/ckj/sfac251. PMID:37260991. IF:4,600 (Q1/2D). Document type: Article.
- Mazarico E, Meler E, Mendoza M, Herraiz I, Llubra E, De Diego R, Comas M, Boada D, González A, Bonacina E, Armengol M, Moline E, Hurtado I, Torre N, Gomez MD, Galindo A, Figueras F. Mortality and severe neurological morbidity in extremely preterm fetal growth-restricted fetuses. *ULTRASOUND IN OBSTETRICS & GYNECOLOGY*. 2023; 62(6). DOI:10.1002/uog.26290. PMID:37325877. IF:7,100 (Q1/1D). Document type: Article.
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5.1.6 Associated Groups

Ophthalmology

Group leader

Del Campo Carrasco, Zoraida (FGS)

Researchers

Castillo Campillo, Lorena (FGS)

Castro Seco, Roberto (FGS)

Crespi Vilimelis, Jaume (FGS)

Delgado Weingartshofer, Ruben (FGS)

Díaz Cascajosa, Jesus (FGS)

García Pares, Eva (FGS)

Gil Arnal, Julian Miguel Angel (FGS)

Gomez Gutierrez, Cecilia (FGS)

Gomez Prieto, Maria Jose (FGS)

Lazaro Rodríguez, Victor (FGS)

Liscombe Sepulveda, John Paul (FGS)

Luna Marine, Maria Sabina (FGS)

Molina Montero, Jose Alberto (FGS)

Oliva Sierra, Ruth (FGS)

Piquer Perez, Maria Pilar (FGS)

Rego Lorca, Daniela (FGS)

Rodríguez Vidal, Cristina (FGS)

Rosello Silvestre, Noemi (FGS)

Sabater Cruz, Noelia (FGS)

Salvador Miras, Ignacio (FGS)

Tellez Vazquez, Jesus Maria (FGS)

Vela Segarra, Jose Ignacio (FGS)

Research Technician

Benitez Reina, Pilar (IR)



MAIN LINES OF RESEARCH

- Optimization of the functional rehabilitation of patients after cataract surgery using multifocal intraocular lens, and evaluation of vision quality in terms of parameters such as visual acuity, sensitivity to contrast, and aberrometry.
- Ocular repercussions of allogeneic medullary transplants and evaluation of the different clinical manifestations and response to treatment in graft-versus-host disease.
- Comparison of the effectiveness and safety of intravitreal injection of ranibizumab vs laser photocoagulation in patients with visual alteration due to diabetic macular edema.

SCIENTIFIC PRODUCTION

- Vela JI, Perich S, Bulnes V, Loscos I, Baradad M. Bilateral Progressive Optic Neuropathy in a Patient with Familial Amyloid Polyneuropathy: Amyloid Deposits in Optic Nerve Head?. NEURO-OPHTHALMOLOGY. 2023;47(3)DOI:10.1080/01658107.2023.2176890. PMID:37398503. IF:0,184 (Q4/10D). Document type: Article.

Nuclear Medicine

Group leader

Flotats Giralt, Albert (FGS)

Carrió Gasset, Ignasi (FGS) until 2023/11/09

Researchers

Abouzian Senhaji, Safae (FGS)

Calls Calahorro, Marc (FGS)

Camacho Marti, M. Del Valle (FGS)

Carrio Gasset, Ignasi (UAB)

Castejon Echevarne, Simona (FGS)

Duch Renom, Joan (FGS)

Fernández Leon, Alejandro (FGS)

Soldevila Lozano, Cristina (FGS)

Stefaneli Mormandi, Patricia (FGS)

Torres Quintana, Maria Paula (FGS)

Valverde Jorge, Rafael (FGS)

Velasco Nuño, Monica (FGS)



DESCRIPTION

Current research includes, on the one hand, molecular imaging in cancer, neurodegenerative diseases, and cardiovascular inflammation, taking advantage of the development in radiomics and artificial intelligence and, on the other hand, the use of radioligand therapy in cancer care. Fundamentally, our research is based on the use of SPECT/CT, PET/CT and radiolabeled tracers to characterize pathophysiological processes and improve disease diagnosis, staging, prognostication, and therapy.

MAIN LINES OF RESEARCH

- Molecular imaging in cancer: Valle Camacho, Alejandro Fernández.
- Brain imaging in neurodegenerative disorders: Valle Camacho.
- Cardiovascular inflammation: Alejandro Fernández.
- A.I. in image reading: Ignasi Carrió i Albert Flotats.

SCIENTIFIC CHALLENGES

- New technologies in diagnosis and therapy.
- Molecular imaging of disease.
- Integration of A.I. tools in research and the clinic.

ACTIVE GRANTS

- Camacho Marti, M. Del Valle. Estudio pseudoexperimental sobre el efecto de la inflamación asociada a la obesidad sobre el sistema nervioso central y la enfermedad de Alzheimer. PI19/O1512. Instituto de Salud Carlos III (ISCIII). Duration: 2020-2024. 232.320,00 €.



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5.1.6 Associated Groups

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5.1.6 Associated Groups

Intensive Medicine

Group leader

Moran Chorro, Indalecio (FGS)

Researchers

Baldira Martinez De Irujo, Jaume (FGS)

Belles Casas, Ariadna (FGS)

Betbese Roig, Antoni J. (FGS)

Cordon Abalde, Alejandra (FGS)

Diaz Tormo, Carmen (FGS)

Flores Orella, Matias Nicolas (FGS)

Gomila Sintes, Carme (FGS)

Goyeneche Cepeda, Juan Miguel (FGS)

Izura Gomez, Marta (FGS)

Mas Serra, Arantxa (FGS)

Morales Quinteros, Luis Fernando (FGS)

Nievas, Maria Veronica (FGS)

Ovejero Gordillo, Miguel Alfredo (FGS)

Rodríguez Farre, Nuria (FGS)

Santos Rodríguez, Jose Alberto (FGS)

Suarez Montero, Juan Carlos (FGS)

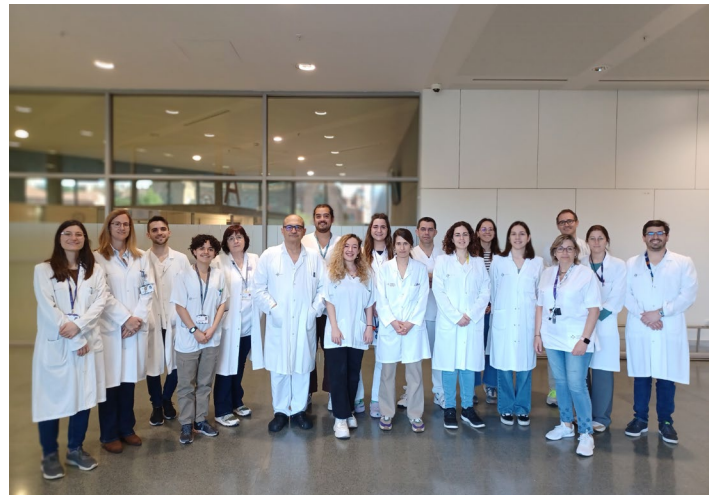
Torrens Sonet, Maria (FGS)

Vera Artazcoz, Paula (FGS)

Zapata Fenor, Luis (FGS)

Research Technicians

Serrano García, Maria Angeles (FGS)



DESCRIPTION

The Intensive Care Medicine Research Group was performed with the integration of different subgroups that cover the areas of knowledge and expertise of the set of pathologies that affect critically ill patients. In addition, it makes occasional collaborations with other groups associated with the Research Institute. The Critically Ill Research Group's main lines of research are described below; all of them have the same main objective: to advance in the knowledge and apply tools and treatments to improve critical care practice that will have a direct impact on patients. Our group is coordinated by Dr. Indalecio Morán and has the participation of different associate doctors from our service with recognition and consolidated scientific trajectory for each specific area of critical ill knowledge. Our way of understanding research from understanding the physiopathology applied to our patients to our participation in international multicenter studies shows our commitment to generating knowledge. In addition, the fact of providing data on the population in our environment helps to locally corroborate the results of international research and allows us to approach and apply the global results to our population.

MAIN LINES OF RESEARCH

Acute respiratory failure and artificial ventilation (Indalecio Morán)

- Non-invasive ventilation.
- New ventilation modes: proportional-assist ventilation and NAVA.
- Prone decubitus in acute respiratory dysfunction syndrome (ARDS).



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- Artificial ventilation withdrawal.
- Expert ventilation systems.
- Sleep and artificial ventilation.
- Early and active mobilization of the critical patient.
- Extracorporeal CO2 removal in ARDS patients.
- High-flow oxygen administration by nasal cannula in postextubation phase.

Study of the usefulness of new biomarkers in critically ill patients (Antoni J. Betbesé)

- BNP in weaning from mechanical ventilation.
- Use of the NGAL protein in the renal prognosis of critically ill patients.
- Strict control of blood glucose in critically ill patients.
- Prophylaxis of acute gastric mucosal injury in critically ill patients.
- Study of the haemodynamic effects of different antipyretic drugs in critically ill patients.
- Influence of position change to supine decubitus position in intra-abdominal pressure

Other study lines in critical care topics

- Neurocritical patient (Dr. I. Morán).
- Acute renal failure (Dr. A.J. Betbesé).
- Severe infectious pathology. Sepsis and septic shock (Dra. P. Vera).
- Drug interactions in critically ill patients and clinical toxicology (Dr. I. Morán).
- Nursing research lines: humanization in critical care and discharge process of the critically ill (Dra. A. Mateos).
- Hemodynamic control, heart failure markers and dynamic echocardiography (Dr. Ll. Zapata).

SCIENTIFIC CHALLENGES

- Consolidate clinical and physiological research into ventilation and acute respiratory failure in critically ill patients through multicentre and multinational networking.
- Create a stable and well-trained group of researchers in this discipline.

- Promote research in the field of the neurocritical patient.
- New goals in the care of hemato-oncological patients admitted to the intensive care unit. CART therapy complications.
- Attention to the critically ill fragility patient. Post-ICU syndrome.

DOCTORAL THESES DEFENDED

- Mateos Dávila, Maria Almudena. Anticoagulación con citrato diluido y concentrado en la terapia depurativa renal continua. 22/11/2023. Universitat de Barcelona. Supervisors: Betbesé Roig, Antoni Jordi; Guix Comellas, Eva Maria; Tortosa i Moreno, Avelina. <http://hdl.handle.net/10803/689562>.

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- López JC, Servia L, Grau T, Bordeje L, Portugal E, Lorenzo C, Vera P, Macaya L, Martínez JF, Marin J, Flordelis JL, Seron C, Alcazar MLN, Navas E, Aldunate S, Nieto B, Martínez de Lagran I. Factors associated with the need of parenteral nutrition in critically ill patients after the initiation of enteral nutrition therapy. *Frontiers in Nutrition*. 2023; 10:1250305. DOI:10.3389/fnut.2023.1250305. PMID:37693244. IF:5,000 (Q2/4D). Document type: Article.
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5.1.6 Associated Groups

Pharmacy

Group leader

Feliu Ribera, Anna (FGS)
Mangues Bafalluy, Maria Antònia (FGS) until
2023/11/09

Researchers

Cardenete Ornaque, Juana (FGS)
De Dios López, Anna (FGS)
De Pourcq, Jan Thomas (FGS)
Edo Peñarrocha, Josep (FGS)
Fernández De Gamarra Martinez, Edurne (FGS)
Gamez Lechuga, Maria (FGS)
Garin Escriva, Noe (FGS)
Gasó Gago, Ingrid (FGS)
Gomis Pastor, Mar (FGS)
Gras Martin, Laura (FGS)
Juanes Borrego, Ana Maria (FGS)
Mangues Bafalluy, Maria Antonia (FGS)
Marcos Fendian, Angel (FGS)
Masip Torne, Montserrat (FGS)
Medina Catalan, David (FGS)
Moreno Martinez, Maria Estela (FGS)
Pages Puigdemont, Neus (FGS)
Pelegrin Cruz, Rebeca (FGS)
Plaza Diaz, Adrian (FGS)
Riba Sole, Mireia (FGS)
Rodríguez Murphy, Esther (FGS)
Ruiz Ramos, Jesus (FGS)
Vallez Valero, Lucia (FGS)
Villamarin Vallejo, Laura (FGS)
Zarate Tamames, Borja (FGS)

Research Technicians

Berga Garrote, Nuria (IR)
Crusat Abello, Xenia (IR)
Fuset Gonzalez, Marina (IR)
Jorba Cortada, Celia (IR)
Juanes Borrego, Maria Elena (IR)
Rodríguez-Arias Pal, Ainhoa (IR)
Zari Kasas, Nabila (IR)



DESCRIPTION

Our research group is to investigate and improve the use of medications and optimize patient outcomes through research and evidence-based practice.

MAIN LINES OF RESEARCH

- Pharmaceutical care and personalized medicine.
- Clinical Epidemiology and Public Health.
- Artificial nutrition.
- Pharmaceutical formulation.
- Oncohematology.
- Independent clinical trials.
- Innovation, artificial intelligence & big data.

SCIENTIFIC CHALLENGES

- Evaluate the impact of different pharmaceutical care programs on the effectiveness and the safety of pharmacological treatments: personalized medicine (clinical pharmacokinetics & pharmacogenetics), health education, medication reconciliation, identification and prevention of drug-related health problems, etc.
- Use of clinical epidemiology to gain evidence in patient care: association between risk factors and health outcomes, study of drug interactions, medication adherence, assessment of regular clinical practice.
- Evaluate the impact of artificial nutrition on the clinical evolution of patients.
- Study the stability of cytostatics in different pharmaceutical forms.



5.1.6 Associated Groups

- Determine the stability and the PK-PD of protein nanoparticles with antimetastatic activity.
- Actively cooperate in independent clinical trials performed in Sant Pau.
- Health, eHealth, artificial intelligence, big data, innovative procedures, etc.

ACTIVE GRANTS

- Mangués Bafalluy, Maria Antonia. Abordaje integral de los problemas de salud relacionados con los medicamentos: Código Medicamento. PI18/00889. Instituto de Salud Carlos III (ISCIII). Duration: 2019-2023. 87.120,00 €.
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 - Ruiz J, Ramírez P. Antimicrobial stewardship programs in the intensive care unit in patients with infections caused by multidrug-resistant gram-negative bacilli. *Medicina Intensiva*. 2023; 47(2). DOI:10.1016/j.medin.2022.07.007. PMID:36319534. IF:3,000 (Q3/7D). Document type: Article.
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5.1.6 Associated Groups

Dermatology

Group leader

Puig Sanz, Luis (FGS)

Researchers

Altemir Vidal, Arcadi (FGS)

Garcés Gatnau, Joan Ramon (FGS)

García Muret, M. Pilar (FGS)

Iznardo Ruiz, Helena (FGS)

López Ferrer, Anna (FGS)

López Sánchez, Cristina (FGS)

Morales Munera, Caridad Elena (FGS)

Roe Crespo, Esther (FGS)

Ruiz Salas, Verónica (FGS)

Rusiñol Batlle, Lluís (FGS)

Serra Baldrich, Esther (FGS)

Spertino, Jorge Luis (FGS)

Vilarrasa Rull, Eva (FGS)

Yelamos Pena, Oriol (FGS)

Research Technicians

Bravo Gonzalez, Marina (IR)

Díaz-Salazar Monreal, María (IR)

Flores Climente, Víctor Adrián (IR)

Fuentes García, Rubén (IR)

Gely Vila, Cristina (IR)



DESCRIPTION

Clinical trials and translational research (in collaboration with the Inflammatory Diseases Translational Medicine Research Group) on inflammatory-mediated dermatoses including psoriasis, atopic dermatitis, hidradenitis suppurativa, urticaria, vitiligo, and alopecia areata. Epidemiology, genetics, AI-assisted imaging, and treatment of different types of skin cancers and its precursors (melanoma, basal cell carcinoma, squamous cell carcinoma, actinic keratoses). Epidemiological research on Cutaneous Lymphoma.

MAIN LINES OF RESEARCH

- Psoriasis: Dr. Anna López.
- Hidradenitis: Dr. Eva Vilarrasa.
- Atopic dermatitis and urticaria: Dr. Esther Serra.
- Skin Cancer (MM and NMSC): Dr. Oriol Yélamos.
- Cutaneous Lymphoma: Dr. M^a Pilar García Muret.

SCIENTIFIC CHALLENGES

- Translation of scientific results into clinical practice. External validation of AI studies.

DOCTORAL THESES DEFENDED

- Vilarrasa Rull, Eva. Dosis acumulada de metotrexato y fibrosis hepática en pacientes con psoriasis: cuantificación mediante elastografía transitoria. 05/10/2023. Universitat Autònoma de Barcelona. Supervisors: Puig Sanz, Luis. <http://hdl.handle.net/10803/691060>.



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5.1.6 Associated Groups

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5.1.6 Associated Groups

Anaesthesiology

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DESCRIPTION

Different members of the Anesthesiology department actively collaborate in the international line of research in Perioperative Medicine led by Dr. PJ Devereaux of the Population Health Research Institute (PHRI) - McMaster University (Hamilton, Canada), some of them acting as local principal investigator of numerous international research projects (POISE-1, POISE-2, VISION, VISION Cardiac Surgery, MANAGE, POISE-3). The Anesthesiology department has also contributed to European multicentre studies such as EUSOS or POSE focused on peri interventional outcomes in the elderly population.

Other field of research in our group is about mechanical ventilation approach: iPROVE studies.

DOCTORAL THESES DEFENDED

- Anaya Camacho, Rafael. Optimización del tiempo de espera para la cirugía, en pacientes con fractura proximal de fémur y en tratamiento crónico con antiagregantes plaquetarios, de manera individualizada guiada por métodos de medición de agregabilidad plaquetaria. 14/06/2023. Universitat Autònoma de Barcelona. Supervisors: Martínez Zapata, Maria José; Rodríguez Prieto, Mireia; León Vintró, Xavier. <http://hdl.handle.net/10803/690738>.
- Beltrán de Heredia Marrodán, Sandra. Complicacions cardiovasculars i cerebrovasculars i mortalitat en pacients amb lesió miocàrdica perioperatòria (MINS) tractats amb aspirina i estatinas: estudi prospectiu observacional. 23/01/2023. Universitat Autònoma de Barcelona. Supervisors:



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5.1.6 Associated Groups

Plastic Surgery

Group leader

Masia Ayala, Jaume (FGS)

Researchers

Condrea , Silvia (FGS)

Fernández Garrido, Manuel (FGS)

Guerrero Lojano, Andrea Elisabeth (FGS)

Leoveanu , Floriana Irina (FGS)

López Fernández, Susana (FGS)

Lusetti , Irene Laura (FGS)

Olivares Dominguez, Maria De Leyre (FGS)

Perez Sempere, Maria (FGS)

Pons Playa, Gemma (FGS)

Vega García, Maria Del Carmen (FGS)

Vela Lasagabaster, Arturo (FGS)

Zamora Alarcon, Paul David (FGS)

Research Technicians

Masso Cercos, Silvia (IR)

Mohedano Puig, Elena (IR)



DESCRIPTION

The fields of research of our group are centered mainly in the development of new tools in microsurgery and supermicrosurgery and breast reconstruction.

In microsurgery and supermicrosurgery we are using a robot (Symani) in a multicentric study to monitor his efficacy and safety.

We form part of multicentric studies for breast reconstruction specifically for developing a hybrid reconstruction (fat and implants) and to confirm the efficacy of new implants. We are using different types of ADM to monitor their results and comparing them with other centers.

MAIN LINES OF RESEARCH

- Motiva Flora Tissue Expander – Hybrid breast reconstruction, pivotal study. Started in July 2023. It is a multicentric study where we are using this kind of expander (Motiva Flora) to develop a hybrid breast reconstruction with fat and implant.
- PRIMO Post-Market, Non-Randomized, Multi-centre PMCF Study To Monitor The Safety And Performance Of Symani System In Microsurgical Reconstructive Procedures In A Real Life Setting. It is a multicentric study in order to monitor the safety and the efficacy of the Symani Robot in microsurgery and supermicrosurgery. Thanks to this device we are improving the treatment of lymphedema both as a prophylactic treatment after axillary lymph node dissection in breast cancer and as a physiological treatment in cases where the lymphedema is already present.
- ABI: Research study to confirm the security of breast implants Motiva Anatomical TrueFixation – Started in July 2023.



5.1.6 Associated Groups

SCIENTIFIC PRODUCTION

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Palliative Care

Group leader

Pascual López, Antonio (FGS)

Researchers

Güell Perez, Ernest (FGS)

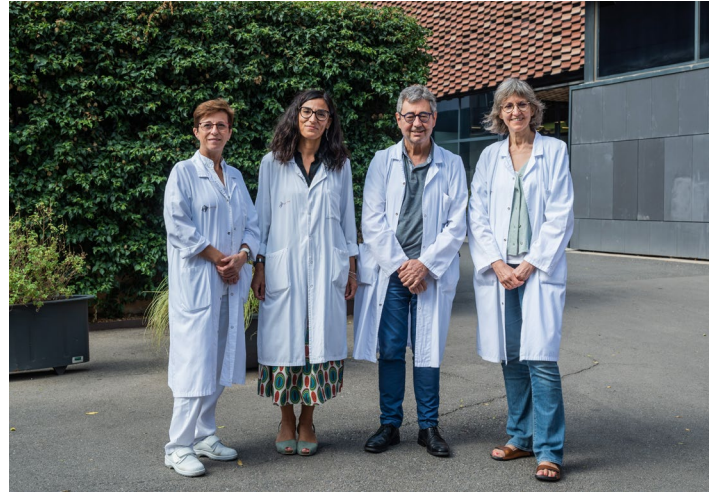
Martinez Peralta, Susana (FGS)

Navarri Sese, Laia (FGS)

Prada Jaiimez, Maria Luisa (FGS)

Research Technicians

Collette, Nadia (IR)



DESCRIPTION

Clinical research carried out by an interdisciplinary team in an acute palliative care hospital unit.

MAIN LINES OF RESEARCH

- Art therapy at the end of life. Nadia Collette.
- Prevention and management of professional stress through art therapy Nadia Collette.
- Electronic patient-reported outcome measures (PROMs). Susana Martínez.
- Training in palliative care: training needs, outcomes. Antonio Pascual.

SCIENTIFIC PRODUCTION

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5.1.6 Associated Groups

Andrology

Group leader

Ruiz Castañe, Eduard (F.Puigvert)

Researchers

Bassas Arnau, Lluís (F.Puigvert)

De Rocco Ponce, Maurizio (F.Puigvert)

Gonzalez Fernández, Monica (F.Puigvert)

Krausz, Csilla Gabriella (F.Puigvert)

Maestre Loren, Francesc (F.Puigvert)

Martinez Pasarell, Olga (F.Puigvert)

Riera Escamilla, Antoni (F.Puigvert)

Sánchez Curbelo, Josvany (F.Puigvert)

Sarquella Geli, Joaquim (F.Puigvert)

Vives Suñe, Álvaro (F.Puigvert)

Research Technicians

Spinelli, Matilde (F.Puigvert)



DESCRIPTION

The Andrology Group focuses its research on several different fields. The most important areas of interest are: (1) diagnosis and treatment of male and female sexual dysfunction (including erectile dysfunction, premature ejaculation, Peyronie disease, hypoactive sexual desire), (2) diagnosis and treatment of male infertility (including genetics of male infertility and reproductive genomics, and “oncofertility”), (3) sexual transmitted infections, and (4) endocrinological impairments related to male infertility and sexual dysfunctions (including hypogonadism, hyperprolactinemia, and obesity). This research activity is oriented to improve both medical and surgical approaches for each issue.

MAIN LINES OF RESEARCH

- Genetics applied to male infertility. C. Krausz / A. Riera.
- Male fertility preservation in oncological patients. C. Krausz/ A. Riera.
- Optimisation of preimplantation genetics diagnosis and in vitro fertilization techniques. O. Martínez.
- New surgical procedures, drugs and medical devices applied to diagnosis, prevention and treatment of andrological diseases and conditions (male sexual dysfunction, hypogonadism, Peyronie disease, premature ejaculation, sexually transmitted diseases). E. Castañé.
- Sexually transmitted diseases and public health. A. Vives.
- Quality of life and integral sexual approach: gender and psychological aspects. F. Maestre.



5.1.6 Associated Groups

SCIENTIFIC CHALLENGES

Our multidisciplinary team of professionals develops translational and clinical research in the field of diagnosis and treatment of andrological disorders and female sexuality.

- To improve our knowledge and thereby improve healthcare for patients, we seek to continue active projects, develop new lines of investigation, increase the number of international publications, train professionals and enhance collaboration with hospital and university groups inside and outside the IR Sant Pau.
- To promote awareness and divulgate sexuality as a health topic and as the main aspect of global health and quality life inclusive in chronic and ill patients to professionals who require a broad and multidisciplinary approach to their patients.
- To work up in the relationship with patients associations and progressively incorporate them as a work team to develop responsible research with relevant results with social impact.

ACTIVE GRANTS

- Bassas Arnau, Lluís. Impact of COVID-19 on male reproductive health. 202128-31. Fundació La Marató de TV3. Duration: 2021-2024. 50.000,00 €.
- Krausz, Csilla Gabriella. Análisis del exoma en pacientes azoospermicos con bloqueo de la espermatogénesis: desarrollo de un panel genético con valor diagnóstico y pronóstico pre-biopsia testicular. PI20/01562. Instituto de Salud Carlos III (ISCIII). Duration: 2021-2023. 97.889,00 €.
- Krausz, Csilla Gabriella. Severe spermatogenic failure as a centinel for early diagnosis of late-onset Fanconi Anemia. Fanconi Anemia Research Foundation. Duration: 2021-2023. 103.900,00 \$ (F. PUIGVERT).

GRANTS AWARDED

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SCIENTIFIC PRODUCTION

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- Chan D, Oros K, Riera A, Krausz C, O'Flaherty C, Chan P, Robaire B, Trasler JM. Sperm DNA methylome abnormalities occur both pre- and post-treatment in men with Hodgkin disease and testicular cancer. *Clinical Epigenetics*. 2023; 15(1):5. DOI:10.1186/s13148-022-01417-1. PMID:36611168. IF:5,700 (Q1/2D). Document type: Article.
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- Kimmins S, Anderson RA, Barratt CLR, Behre HM, Catford SR, De Jonge CJ, Delbes G, Eisenberg ML, Garrido N, Houston BJ, Jorgensen N, Krausz C, Lisper A, Mclachlan RI, Minhas S, Moss T, Pacey A, Priskorn L, Schlatt S, Trasler J, Trasande



5.1.6 Associated Groups

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- Krausz C, Navarro P, Wilke M, Tüttelmann F. EAA/EMQN best practice guidelines for molecular diagnosis of Y-chromosomal microdeletions: State of the art 2023. *Andrology*. 2023; DOI:10.1111/andr.13514. PMID:37674303. IF:4,500 (Q1/3D). Document type: Review.
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Urology

Group leader

Palou Redorta, Juan (F. Puigvert)

Researchers

Algaba Arrea, Fernando (F. Puigvert)
 Angerri Feu, Oriol (F. Puigvert)
 Breda , Alberto (F. Puigvert)
 Bujons Tur, Ana (F. Puigvert)
 Emiliani Sanz, Esteban (F. Puigvert)
 Errando Smet, Carlos (F. Puigvert)
 Gallioli , Andrea (F. Puigvert)
 Ponce De Leon Roca, Javier (F. Puigvert)
 Rodríguez Faba, Oscar (F. Puigvert)
 Sanguedolce , Francesco (F. Puigvert)



DESCRIPTION

The investigation urology group is dedicated to advancing our knowledge of urological diseases and disorders, with a focus on urological malignancies, functional urology, stone disease, pediatric urology, renal transplant, and reconstructive surgery. Our team of expert clinicians work together to conduct innovative studies and clinical trials to improve patient outcomes and develop new treatments. The majority of research topics are clinical, with a special interest in technological advancements, rare urological diseases, and biomarkers.

MAIN LINES OF RESEARCH

- The Urology Clinical and Basic Research group has been an associated group of IR Santpau since its very beginning. The group carries out clinical translational research within the field of urinary tract diseases along different lines from urological cancer, functional urology, stone disease, pediatric urology, renal transplant, and reconstructive surgery.

Existing lines of research are:

- In the area of urological cancer, Dr. Breda is leading several projects mainly related to liquid biopsy in urothelial and prostate cancers, focal treatment of prostate cancer, methodology in enhancing lymph nodes in prostate and upper urinary tract disease, intraoperative detection of tumor grade with confocal endomicroscopy in order to facilitate clinical decisions and avoid unnecessary procedures, the role of systemic chemotherapy in upper urinary tract tumors and the role



5.1.6 Associated Groups

of PET-CT in renal masses and 3D reconstruction in order to facilitate complex renal surgeries.

- In testis cancer we are evolving to minimally invasive surgery with robotic retroperitoneal dissection in metastatic disease and improving the diagnosis using the sentinel node technique in penile cancer, and also reconstructive surgery after partial penectomy plus laparoscopic lymphadenectomy of the groin.
- Dr. Palou is leading mainly the projects in bladder cancer: there is a collaborative translational research line of predictive biomarkers in NMIBC progression with the Inflammatory Group and Malmö University. He is leading several studies with new drugs (durvalumab, sansalimab, vedotin enfortumab, etc). Bladder preservation in high grade tumors is a difficult decision and the possibility to detect those who will progress will allow earlier aggressive treatment. Another line of research is the robotic nerve sparing surgery in cystectomy and neobladder reconstruction in order to preserve sexual function after radical surgery. He is leading as well robotic retroperitoneal surgery in testis cancer and reconstructive surgery.
- In the pediatric urology unit, led by Dra. There are several topics under research related to long term followup in reconstructive surgery, sexual function in neurological diseases and fertility in patients after scrotal surgery (varicocele, orchidopexy). This includes the study of the usefulness of botuline toxine in hyperactive bladder in children, PH urine studies for the risk of infection in urinary tract anomalies, optimisation of irrigation fluids for the prevention of unnoticed perioperative hypothermia in children during RIRS and NLP and the Autologous fat graft with stem cells as a treatment for abdominal wall defects in patients with complex exstrophy epispadias.
- In the urolithiasis line chaired by Dr. Angerri, clinical and basic research is performed in the following topics: laser energy devices for stone destruction (holmium, thulium, super thulium) comparative outcomes and settings, collaboration with IIBSantPau General and Digestive Surgery Group for primary hyperparathyroidism, treatment and pH urine research for the management of cystinuria. In cystinuria, there exists extensive collaborative research with IDIBELL for its genetic study and an active participation in the National Registry of this Rare Disease. New study to use Artificial Intelligence in the recognition of stone composition during endoscopic surgery, using our stone library of more than 50.000 stones analyzed through infrared spectrophotometry.
- The functional urology Unit by Dr. Errando is evaluating the clinical results of different surgical techniques and devices in incontinence in both sexes such as paraurethral substance injections, laparoscopic colposacropexy technique, long term functional results of botox in males, functional results of the trans cavernous artificial urinary sphincter implantation in high risk patients, usefulness of probiotics in the prevention of recurrent urinary tract infections, acidification of urine pH for women with recurrent UTIs. A quality of life research collaboration with the Centre de Fisioteràpia de Barcelona RAP Barcelona (Abdomino-Pelvic Reeducation) associated to the UAB Vall d'Hebron, in clinical evaluation tools for patients with low urinary tract dysfunction has recently begun.
- Renal transplantation unit by Dr. Breda is investigating 3D reconstruction models to facilitate renal transplant for a better preservation of the kidney. The group is establishing robotic renal transplant all over Europe and undergoing analysis of the urogenital tumors in renal transplant patients to update and change daily practice.
- BPH surgery is one of the most common in urology and the group of Dr. Ponce de Leon is investigating the way to perform surgery with preservation of antegrade ejaculation with different methodologies (TURP, Rezum). The group also study the use of the Rezum system (intra-prostatic vaporization) in BPH, the quality of life of patients who had undergone urethroplasty due to urethral stenosis, the use of oral mucosa for urethroplasty. A recent national collaboration for an Urethroplasties Registry has recently begun. In reconstructive urethral surgery and BPH, Dr. Ponce de León is leading an international research prospective study on prostate inflammation to validate a clinical nomogram in patients with lower urinary symptoms, and a prospective



5.1.6 Associated Groups

multicenter study on buccal mucosa extraction effect on patients' quality of life.

- Dr. Gallioli leads the clinical coordination within the group. Mrs Vanessa Muñoz and the nurse Ana Palomino are the coordinators of individual clinical studies and trials. They are key pieces to continue with the ongoing studies of the department.

SCIENTIFIC CHALLENGES

- To continue the national and international positions in order to increase the scientific networking of the department.
- Participate and evolve in the elaboration of European Guidelines.
- Continue in basic and clinical research of the different established areas.
- Continue and improve relations with industry (pharmaceutics, medical devices industries, and biotechnology companies) in order to be upfront in the development of new compounds and surgical techniques.

ACTIVE GRANTS

- Bujons Tur, Ana. ERN eUROGEN registry Protocol (Red Europea Referente de Enfermedades Urogenitales), eUROGEN, European competitive project. Duration: 2022-2023.

SCIENTIFIC PRODUCTION

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Reproductive Health

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DESCRIPTION

Gender health is determined by hormonal regulation of the reproductive system, affecting any organ with hormonal receptors.

Thus, its disturbances, either by excess, defect, or dysregulation, also have systemic effects. The group aims to identify the consequences of these abnormalities and the best treatment alternatives.

Moreover, menstruating persons periodically face a bleeding event that is not always healthy and friendly. Consequently, measures to modify its profile towards a milder impact on quality of life are welcome.

Our purpose is also to generate tools to identify abnormal patterns and alternatives to surgery to minimize its impact on health.

MAIN LINES OF RESEARCH

- Identification of menstrual abnormalities in the population.
- Effects of environment on menstrual characteristics.
- The medical approach to organic causes of heavy menstrual bleeding.
- Menstrual pattern with the different contraceptive alternatives.
- Premature ovarian insufficiency its effects, and prevention.

SCIENTIFIC CHALLENGES

- Validate and widespread a simple, sensitive, and reproducible test to identify heavy menstrual bleeding and its response to treatment.



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- Test efficient evidence-based approaches to minimize the effect of adnexectomy in Brca mutation carriers.
- Identify the best contraceptive alternatives for sufferers of chronic menstrual disturbances.

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Radiation Oncology

Group leader

Sancho Pardo, Gemma (FGS)

Researchers

Balart Serra, Josep (FGS)

Farre Bernado, Nuria (FGS)

Isern Verdum, Josep (FGS)

Julia Sanahuja, Joan Carles (FGS)

Majercakova, Katarina (FGS)

Mera Errasti, Maria Arantzazu (FGS)

Montezuma Niño, Laura Constanza (FGS)

Rojas Cordero, Jady Vivian (FGS)

Soto Cambres, Ana Maria (FGS)

Vila Capel, Antoni (FGS)

Research Technicians

Cifuentes Antolinez, Patricia (IR)



DESCRIPTION

Our research is primarily clinical, focusing on changes in fractionation, incorporation of techniques for respiratory motion control, molecular imaging-based planning, and combination with new systemic treatments, both treatment of the primary tumor and oligometastases.

We collaborate with different groups to identify predictors of response and toxicity to radiotherapy in combination with systemic antineoplastic treatments, including immunotherapy.

During 2023 we started the development of a total body irradiation model with VMAT and SBRT (Stereotactic Body Radiation Therapy) in rats.

MAIN LINES OF RESEARCH

- We participate in a European project for the development of a predictive model for lung cancer patients, using omics-based variables that integrate established clinical factors with others derived from big data analysis and advanced imaging features, to create digital human avatars. Núria Farré, Núria Jornet (Medical Physics).
- Total Body Irradiation and SBRT in rats using modern Medical devices. Josep Balart, Saba Rabi-Mitre, Gemma Sancho, Núria Jornet (Medical Physics), Guillermo Gómez de Segura (TER), Sónia Bermejo (TER).
- Predictive factors of response to radiotherapy in head and neck tumors. Laura Montezuma, Xavier León (ENT department).
- Irradiation of large-volume sarcomas with lattice technique. Katarina Majercakova, Josep Isern.



5.1.6 Associated Groups

- SBRT (stereotactic body RT) in primary tumors (lung, pancreas, prostate) and ablative treatment of metastases in oligometastatic patients, with planning based on metabolic imaging, applying techniques for respiratory motion control such as image-guided RT (IGRT) or surface-guided RT (SGRT). Gemma Sancho, Núria Farré, Josep Balart, Josep Isern.
- Development and training of a self-segmentation programme for the definition of organs at risk and irradiation volumes. Joan Carles Julià, Pedro Gallego (Medical Physics).
- Clinical impact of the use of respiratory movement control techniques in radiotherapy for breast cancer: Eugènia Otero (MIR-3), Gemma Sancho, Núria Jornet (Medical Physics).
- Impact on clinical outcomes of peer-review sessions incorporated into clinical practice. Jady Rojas, Gemma Sancho, Núria Jornet (Medical Physics).
- Adaptation of radiotherapy schedules in geriatric oncology. Arantxa Mera, Gemma Sancho.
- Surface-guided radiotherapy with respiratory motion control techniques in SBRT. Josep Balart, Núria Farré, Sónia Bermejo, Cristina Ansón (Medical Physics).

SCIENTIFIC CHALLENGES

- Use of clinical devices to perform experimental irradiation in rats.
- Use of AI to identify predictors of response and toxicity to radiotherapy in lung and prostate cancer.
- Clinical impact of ablative radiotherapy of oligometastases.
- Surface-guided radiotherapy with respiratory motion control techniques in SBRT. Josep Balart, Núria Farré, Sónia Bermejo, Cristina Ansón (Medical Physics).
- Incorporate Deep-learning auto segmentation in clinical practice.

ACTIVE GRANTS

- Farre Bernado, Nuria. CANCER MULTI-OMICS AVATARS FOR INTEGRATED PRECISION MEDICINE. EraPerMed Farre. Unión Europea (GenCat

FUNDING - Acciones complementarias). Duration: 2023-2025. 198.202,00 €.

SCIENTIFIC CHALLENGES

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- León X, Farré N, Montezuma L, Holgado A, Vázquez R, Neumann E, Quer M. Results of radiotherapy in oropharyngeal carcinomas. *Acta Otorrinolaringologica Española*. 2023; 74(3). DOI:10.1016/j.otorri.2022.04.002. PMID:37149134. Document type: Article.
- Lococo F, Boldrini L, Diepriye CD, Evangelista J, Nero C, Flamini S, Minucci A, De Paolis E, Vita E, Césarío A, Annunziata S, Calcagni ML, Chiappetta M, Cancellieri A, Larici AR, Cicchetti G, Troost E, Róza Á, Farré N, Ozturk E, Van D, Leoncini F, Urbani A, Trisolini R, Bria E, Giordano A, Rindi G, Sala E, Tortora G, Valentini V, Boccia S, Margaritora S, Scambia G. Lung cancer multi-omics digital human avatars for integrating precision medicine into clinical practice: the LANTERN study. *BMC CANCER*. 2023; 23(1):540. DOI:10.1186/s12885-023-10997-x. PMID:37312079. IF:3,800 (Q2/5D). Document type: Article.
- Moreno P, Gamboa O, Gonzalez C, Romero A, Serra JB, Diaz GD, Malaver G, Boulefour W, Magne N. hTERT and IGF-1R Proteins Expression in Response to Treatment in Patients with HPV Alpha 9-Positive Cervical Cancer. *RADIATION RESEARCH*. 2023; 199(5). DOI:10.1667/RADE-22-00121.1. PMID:36888727. IF:3,400 (Q2/4D). Document type: Article.
- Oladeru OT, Dunn SA, Li J, Coles CE, Yamauchi C, Chang JS, Cheng SHC, Kaidar O, Meattini I, Ramiah D, Kirby A, Hijal T, Marta GN, Poortmans P, Isern J, Zissiadis Y, Offersen BV, Refaat T, Elsayad K, Hijazi H, Dengina N, Belkacemi Y, Luo FD, Lu S, Griffin C, Collins M, Ryan P, Larios D, Warren LE,



5.1.6 Associated Groups

Punglia RS, Wong JS, Spiegel DY, Jagsi R, Taghian A, Bellon JR, Ho AY. Looking Back: International Practice Patterns in Breast Radiation Oncology From a Case-Based Survey Across 54 Countries During the First Surge of the COVID-19 Pandemic. *Jco Global Oncology*. 2023; 9:e2300010. DOI:10.1200/GO.23.00010. PMID:37471670. Document type: Article.

- Pérez-Fidalgo JA, Ortega E, Ponce J, Redondo A, Sevilla I, Valverde C, Isern Verdum J, de Alava E, Galera López M, Marquina G, Sebío A. Uterine sarcomas: clinical practice guidelines for diagnosis, treatment, and follow-up, by Spanish group for research on sarcomas (GEIS). *Ther Adv Med Oncol*. 2023; 15:17588359231157645. DOI: 10.1177/17588359231157645. PMID: 37007636. IF:4,900 (Q3/4D). Document type: Review.
- Redondo S, García I, Vila A, Esquirol A, Portos JM, Novelli S, Saavedra S, Moreno C, Garrido A, Arguello M, Onate G, López J, Caballero AC, Miqueleiz S, Briones J, Sierra J, Sancho G, Martino R. Sequence matters: Total body irradiation (TBI)-based myeloablative conditioning with post-transplant cyclophosphamide may reduce the early nonrelapse mortality compared with pretransplant cyclophosphamide plus TBI. *EUROPEAN JOURNAL OF HAEMATOLOGY*. 2023; 111(1). DOI:10.1111/ejh.13978. PMID:37058419. IF:3,100 (Q3/6D). Document type: Article.



5.1.6 Associated Groups

Locomotor System

Group leader

Crusi Sererols, Xavier (FGS)

Researchers

Aguilera Roig, Xavier (FGS)

Almenara Fernández, Marta (FGS)

Bascuñana Ambros, Helena (FGS)

Carrera Fernández, Ion (FGS)

Cuartero Archs, Jordi (FGS)

De Caso Rodríguez, Julio (FGS)

Gelber Ghertner, Pablo Eduard (FGS)

Gonzalez Rodríguez, Jose Carlos (FGS)

Gracia Alegria, Isidre (FGS)

Lamas Gomez, Claudia Maria (FGS)

Nadal Castells, Maria Josefa (FGS)

Peiro Ibañez, Ana (FGS)

Perez Romera, Ana Belen (FGS)

Velazquez Fragoso, Juan Jose (FGS)

DESCRIPTION

We try to develop a deep and exhaustive scientific work to improve the understanding of the pathologies affecting the foot and the ankle in terms of etiology, diagnosis, and treatment, not only orthopedic conditions but also traumatic injuries.

MAIN LINES OF RESEARCH

- Floating toe.
- Morton's neuroma.
- Achilles tendinopathy.
- Patient-related outcomes measures.
- Posterior malleolus fractures.

DOCTORAL THESES DEFENDED

- Ramírez Bermejo, Eduard. Valoración de la utilidad de la cirugía reconstructiva de lesiones osteocondrales de la rodilla mediante trasplante de aloinjerto osteocondral fresco. 19/04/2023. Universitat Autònoma de Barcelona. Supervisors: Gelber Ghertner, Pablo Eduardo. <http://hdl.handle.net/10803/690604>.

SCIENTIFIC PRODUCTION

- Bascuñana H, de Miguel C, Gil L, Monguet JM, Trejo Á. Consensus measurement of innovation in physical medicine and rehabilitation. *Rehabilitacion*. 2023; 57(1):100725. DOI:10.1016/j.rh.2022.01.002. PMID:35523615. Document type: Article.
- Casanovas A, Sebio R, Ciendones M, Cuartero J, Estanyol B, Padrós J, García B, Barnadas A, Masia J. Prehabilitation in Patients With Breast Cancer Receiving Neoadjuvant Therapy to Minimize Musculoskeletal Postoperative Complications and Enhance Recovery (PREOPTimize): A Protocol for a Randomized Controlled Trial. *PHYSICAL THERAPY*. 2023; 103(9):pzad062. DOI:10.1093/ptj/pzad062. PMID:37318267. IF:3,200 (Q1/3D). Document type: Article.
- Chesser TJ, Moran C, Willett K, Bouillon B, Sturm J, Flohé S, Ruchholtz S, Dijkink S, Schipper IB, Rubio JC, Chana F, de Caso J, Guerado E. Development of trauma systems in Europe-reports from England, Germany, the Netherlands, and Spain. *Ota International : The Open Access Journal Of Orthopaedic Trauma*. 2023; 2(Suppl



5.1.6 Associated Groups

- 1):e019. DOI:10.1097/OI9.0000000000000019. PMID:37675253. Document type: Article.
- Fa M, Almenara M, Mata JM, Gich I, Llauger J, Lamas C. Retrospective interobserver agreement on diagnoses of 4th and 5th carpometacarpal fracture-dislocation and hamate fracture in plain X-ray - Is CT essential after ulnar carpometacarpal pain?. SKELETAL RADIOLOGY. 2023; 52(12). DOI:10.1007/s00256-023-04366-9. PMID:37227483. IF:2,100 (Q3/6D). Document type: Article.
 - Fumagalli C, Orellana R, Ferre M, Gonzalez A, Catusas L, Vazquez T, Sebio A, López A, Llauger J, Peiro A, Antonescu CR. Expanding the molecular landscape of undifferentiated sarcomas of bone with a novel *EWSR1-SSX3* gene fusion. GENES CHROMOSOMES & CANCER. 2023; 63(1). DOI:10.1002/gcc.23215. PMID:38050902. IF:3,700 (Q2/4D). Document type: Article.
 - Lamas C, Morro R, Da A, Llusà M. Anatomic and Biomechanical Study of the Forearm Interosseous Membrane, Distal Oblique Bundle, and Triangular Fibrocartilage Complex: Role in Galeazzi Fracture Dislocation. Journal Of Hand Surgery Global Online. 2023; 5(6). DOI:10.1016/j.jhsg.2023.06.003. PMID: 38106930. Document type: Article.
 - Noguera L, Vila G, De Caso J, Da Ponte A, Perez AB, Velazquez JJ. Influence on Therapeutic Decision-Making of Supine and Standing Radiographs after Traumatic Thoracolumbar Fracture in the Elderly. Journal of Neurological Surgery Part A-Central European Neurosurgery. 2023; 84(3). DOI:10.1055/s-0042-1753514. PMID:36100237. IF:1,000 (Q4/9D). Document type: Article.
 - Perelli S, Gelber PE, Morales R, Ronco S, Torres R, Espregueira J, Monllau JC. Isolated lateral extra-articular tenodesis in ACL-deficient knees: in vivo knee kinematics and clinical outcomes. KNEE SURGERY SPORTS TRAUMATOLOGY ARTHROSCOPY. 2023; 31(8). DOI:10.1007/s00167-023-07344-9. PMID:36810948. IF:3,800 (Q1/2D). Document type: Article.
 - Renom M, Galán I, Vidal X, Aldevert M, Curto G, Feliu P, García I, Gonzalo L, Sibera X, Anglada E, Meza R, García M, Najas V, Mongay N, Arévalo MJ, Vidal Á, Tintoré M, Bascuñana H, Montalban X, Terré R, Sastre J. Validation of the Spanish version of DYSpHagia in Multiple Sclerosis questionnaire (DYMUS). Multiple Sclerosis and Related Disorders. 2023; 74:104724. DOI:10.1016/j.msard.2023.104724. PMID:37086636. IF:4,000 (Q2/4D). Document type: Article.
 - Renom M, Najas V, Ramirez E, Nadal MJ, Pintor A, Bascuñana H. Holistic semi-presential evaluation of oropharyngeal dysphagia with the framework of International Classification of Functioning, Disability and Health: Optimizing evaluation to improve rehabilitation treatment. Rehabilitacion. 2023; 57(1):100735. DOI:10.1016/j.rh.2022.03.001. PMID:35570031. Document type: Article.
 - Toro Á, Arenas J, Carrera I, Lamas C. Is ultrasound superior to fluoroscopy in distal radius volar fixation?. Hand Surgery & Rehabilitation. 2023; 42(6). DOI:10.1016/j.hansur.2023.07.010. PMID:37499797. IF:1,100 (Q4/9D). Document type: Article.

Pain and Neurosciences

Group leader

Revuelta Rizo, Miren Eli (FGS)

Catala Puigbo, Elena (FGS) until 2023/11/09

Researchers

Catala Puigbo, Elena (FGS)

Diaz Jover, Ruben (FGS)

Ferrandiz Mach, Marta (FGS)

Genove Cortada, Maria Merce (FGS)

Heredia Carques, Cristina (FGS)

Melo Cruz, Martha Cristina (FGS)

Muñoz Hernandez, Isabel (FGS)

Piñeiro Reboló, Maria Angeles (FGS)

Roses Alvarez, Laia (FGS)

Santeularia Verges, Maria Teresa (FGS)

Sarmiento Luque, Teresa Eugenia (FGS)



DESCRIPTION

Our lines of research are basically of a clinical nature and are directed to possible treatments to relieve pain. Our goal is multidimensional patient management, which includes addressing the biological, psychological and social spheres through pharmacological treatment, and interventional therapies.

Pain and women, identifying different factors that influence the woman and increase the pain.

Comorbidities that alter the perception of pain.

We also had a line of study with brain imaging, with a completed thesis, but we are not currently following it.

Neuromodulation, covering the electrical and chemical fields: neurostimulation and intrathecal drug delivery system (IDDS).

MAIN LINES OF RESEARCH

- Neuromodulation in Catalonia. Creation of a database of patients undergoing neurostimulation and intrathecal drug infusion: Miren Revuelta Rizo, Mercè Genové Cortada, Marta Ferrándiz Mach, Rubén Diaz Jover, Teresa Sarmiento Luque, Isabel Muñoz Hernández, Laia Rosés Alvarez.
- Identify the best profile of patients (their psychopathological characteristics) before the implementation of neuromodulation techniques: Teresa Sarmiento Luque, Miren Revuelta Rizo, Marta Ferrándiz Mach, Mercè Genové Cortada, Rubén Diaz Jover.
- The effect of pulsed radiofrequency on chronic omalgia pain: Rubén Diaz Jover.
- The effect of radiofrequency (pulsed and con-



5.1.6 Associated Groups

- ventional) on chronic articular pain: Ruben Diaz, Jover, Martha Melo Cruz, Alejandro Rodríguez Vergara, Cristina Heredia Carqués.
- The effect (analgesic & side effects) of spinal Ziconotide in patients with refractory chronic pain: Marta Ferrándiz Mach, Mercè Genové Cortada.
 - Factors that can influence postoperative pain: Teresa Santeularia Vergés, Cristina Heredia Carques, Isabel Muñoz Hernández.
 - Treatment Guidelines for Acute intrahospital Pain: Teresa Santeularia Vergés, Cristina Heredia Carques, Mercè Genové Cortada, Isabel Muñoz Hernández.
 - Characterising the profile according to gender when patients reach our pain clinic: Teresa Santeularia Vergès, Martha Melo Cruz, Elena Català Puigbò.
 - Development of a new comorbidity index associated with chronic pain: Teresa Santeularia Vergès
 - Neuropathic pain. His clinic and physical examination in a non- neurological pain unit: Martha Melo Cruz, Cristina Heredia Carques.
 - New drugs in Neuropathic Pain. Focus in postherpetic neuralgia. Mercè Genové Cortada, Martha Melo Cruz, Isabel Muñoz Hernández, Laia Rosés Alvarez, Rubén Diaz Jover, Cristina Heredia Carqués, Miren Revuelta Rizo, Elena Català Puigbò.
 - Quality of care in pain clinics using the iso 9001 – 2015 methodology (international organisation for standardisation). The audit is carried out every year: Elena Català Puigbò.
 - Persistent pain and impact on quality of life in COVID-19 patients who have required critical care: Martha Melo, Isabel Muñoz, Elena Català.
- Unify and make our databases compatible to create profiles and clusters of patients with chronic pain.
 - Improve hospital prescription of postoperative pain analgesic guidelines to preserve patient safety.
 - Determine whether the intensity of chronic neuropathic pain assessed by the patient is correlated with the patient's psychopathology, essentially anxiety, depression and catastrophizing.
 - Determine the profile of patients who would benefit from treatment with major systemic opioids in relation to night rest and establish the recommendable opioid.
 - Establish the recommended opioid dose to start a treatment and how to remove them.

SCIENTIFIC CHALLENGES

- Establish the possible differences in brain area involvement between acute and chronic pain.
- Enhance neuromodulation (electrical and chemical) at the hospital level to be a regional reference centre.
- Determine the extent of chronic pain according to the involvement of different brain areas and if these alterations can improve with the relief of pain.

ACTIVE GRANTS

- Diaz Jover, Ruben. Eficacia del abordaje del nervio supraescapular mediante la administración de corticoides versus radiofrecuencia pulsada en el dolor crónico de hombro. Ensayo clínico Aleatorizado doble ciego. IIBSP-COR-2017-98. EudraCT 2017-004612-19. Duration: 2018-2023.

SCIENTIFIC PRODUCTION

- Labandeyra H, Heredia C, Campoy JC, Váldez LF, Prats A, Sala X. Clavipectoral fascia plane block spread: an anatomical study. REGIONAL ANESTHESIA AND PAIN MEDICINE. 2023; :rapm-2023-104785. DOI:10.1136/rapm-2023-104785. PMID:37699731. IF:5,100 (Q1/3D). Document type: Article.
- Popova E, Paniagua P, Álvarez J, Vives M, González A, García Á, Rivas M, Hermenegildo G, Diaz R, Azparren G, Barceló M, Moustafa A-H, Aguilar R, Ordonez J, Alonso P. The Relevance of Implementing the Systematic Screening of Perioperative Myocardial Injury in Noncardiac Surgery Patients. Journal of Clinical Medicine. 2023; 12(16):5371. DOI:10.3390/jcm12165371. PMID:37629413. IF:3,900 (Q2/4D). Document type: Article.

5.1.6 Associated Groups

Nursing Care

Group leader

Mas Dalmau, Gemma (FGS)

Researchers

Alonso Rodríguez, Lara (FGS)
 Armora Verdu, Miriam (FGS)
 Balaguer Sancho, Judith (FGS)
 Berga Congost, Gemma (FGS)
 Buil Manzanares, Neus (FGS)
 Cebria Morales, Maria Queralta (FGS)
 Cordoba Sánchez, David (FGS)
 De Andrés Muñoz, Sandra (FGS)
 De Francisco Profumo, Seyla (FGS)
 Diez García, Cecilia (FGS)
 Fernández Sánchez, Susana Pasion (FGS)
 García Barrachina, Marina (FGS)
 Iserte Rodríguez, Judith (FGS)
 Marquez López, Adrian (F.Puigvert)
 Mateos Davila, Almudena (FGS)
 Navarro Colom, Marta (FGS)
 Palomeque Artuñedo, Amaya (FGS)
 Parrilla Rios, Ismael (FGS)
 Pujol Serra, Maria Teresa (FGS)
 Ricart Basagaña, Maria Teresa (FGS)
 Roca Sarsanedas, Jaume (FGS)
 Romero Pastor, Monica (FGS)
 Sastre Rus, Meritxell (FGS)
 Sist Viaplana, Xenia (FGS)
 Torralbas Ortega, Jordi (FGS)
 Valverde Bernal, Jonatan (FGS)
 Villalobos Abello, Alba (FGS)



DESCRIPTION

The group is made up of nurses from both clinical practice, Hospital de la Santa Creu i Sant Pau and Puigvert Foundation, and teaching, Sant Pau Nursing School University (joined the Universitat Autònoma de Barcelona). The main areas of research are: the assessment of complex care interventions, innovation, and qualitative research.

MAIN LINES OF RESEARCH

- Impact of complex care interventions.
- Patient experience and health outcomes.
- Evaluation of promotion and prevention interventions.
- Digital Health and technological innovation.
- Teaching research and innovation.
- Qualitative research.

SCIENTIFIC CHALLENGES

- Strengthen implemented research lines and disseminate the results of active projects.
- Explore the impact of nursing care for patients, strategies for care improvement, and the application of results in cure models.
- Improve the development and understanding of qualitative research in the context of the health sciences and disseminate qualitative methods and analyses of text and discourse as tools in health science research.
- Create the synergies necessary to consolidate the group's activities



5.1.6 Associated Groups

ACTIVE GRANTS

- Balaguer Sancho, Judith. Evaluación de un programa de Terapia Asistida con Animales, en personas con enfermedad mental, para la promoción de conductas de salud Mental Positiva. PR-527/2021. Fundació Infermeria i Societat. Duration: 2022-2024. 825,00 €.

DOCTORAL THESES DEFENDED

- Mateos Dávila, Maria Almudena. Anticoagulación con citrato diluido y concentrado en la terapia depurativa renal continua. 22/11/2023. Universitat de Barcelona. Supervisors: Betbesé Roig, Antoni Jordi; Guix Comellas, Eva Maria; Tortosa i Moreno, Avelina. <http://hdl.handle.net/10803/689562>.
- Mas Dalmau, Gemma. La prescripció antibiòtica diferida en infeccions respiratòries a l'atenció primària: assaig clínic, anàlisi cost-efectivitat i estudi qualitatiu. 12/12/2023. Universitat Autònoma de Barcelona. Supervisors: Alonso Coello, Pablo; Cruz Gómez, Irene; Bonfill Cosp, Xavier.
- Romero Pastor, Mónica. El alta a planta del paciente crítico: vivencias de supervivientes de la UCI de un hospital de tercer nivel. 27/10/2023. Universitat Rovira i Virgili. Supervisors: Romaní Alfonso, José Oriol; Rubio Rico, Maria Lourdes. <http://hdl.handle.net/10803/689419>.

SCIENTIFIC PRODUCTION

- Buil, Neus; Sillero Sillero, Amalia; Galbany-Estragués, Paola. M^aTeresa Castells Mas: enfermera pionera en la gestión de los quirófanos del Hospital de la Santa Creu i Sant Pau de Barcelona. *Temperamentvm*. 2023; 19: e14510. DOI: 10.58807/temperamentvm20236083. Document type: Article.
- Buil, Neus; Sillero Sillero, Amalia; Lorenzo Vaquerizo, Lauriana María; Galbany-Estragués, Paola. M^a Rosa Garín Solé: pionera de la enfermería perfusionista en el Hospital de la Santa Creu i Sant Pau de Barcelona. *Temperamentvm*. 2023; 19: e14472. DOI: 10.58807/temperamentvm20236084. Document type: Article.
- Congost GB, Momblan M, Bernal JV, López AM, Gabalda JR, García J, Brugaletta S. Association of sex and age and delay predictors on the time of primary angioplasty activation for myocardial

infarction patients in an emergency department. *HEART & LUNG*. 2023; 58. DOI:10.1016/j.hrtlng.2022.10.014. PMID:36335910. IF:2,800 (Q1/2D). Document type: Article.

- Dávila AM, PS, JM, NF, Comellas E. The catheter as a fundamental element in renal cleansing therapies. *Revista Rol De Enfermeria*. 2023; 46(1). Document type: Article.
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Cardiac Surgery

Group leader

Ginel Iglesias, Antonino (FGS)

Researchers

Casellas Casanovas, Sandra (FGS)

Irabien Ortiz, Angela (FGS)

Montiel Serrano, Jose (FGS)

Rosello Diez, Elena (FGS)

Tauron Ferrer, Manel (FGS)



MAIN LINES OF RESEARCH

- Off-pump coronary artery bypass grafting surgery.
- Mitral repair surgery.
- Aorta pathology: aortic root surgery, aortic arch surgery (hybrid techniques).
- Follow-up of sutureless aortic valve prosthesis: Perceval S.
- Follow-up of surgical checklist implementation.
- Risk scores.
- Cardiac protection: Del Nido cardioplegia.
- Mini-invasive techniques: mini-sternotomy, mini-thoracotomy, MIDCABG surgery.
- Total arterial graft revascularization.
- New valvular transcatheter prosthesis: TAVI transaxillary approach (Portico), TAVI transapical approach (Accurate).
- Aortic valve repair.

SCIENTIFIC CHALLENGES

- Consolidation as a research group in different cardiac surgery-related fields, specific sutureless valve prosthesis, radial artery in myocardial revascularization, Different TAVI approach.
- Participation in the assessment and validation of new products employed in cardiac surgery: haemostatics, sutures.
- Collaboration with different national and international research teams involved in our lines of study: epicardial fat study (Endocrinology), calcium channels in auricular myocytes (ICCV).



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5.1.6 Associated Groups

HIV and AIDS

Group leader

Domingo Pedrol, Pere (FGS)

Researchers

Cereijo Tellez, Ruben (IR)

Quesada López, Tania Paloma (IR)

Research Technicians

Herrera Bachs, Silvia (IR)

Millan Revilla, Lucia (IR)

Muñoz Rodríguez, Jessica (IR)



MAIN LINES OF RESEARCH

- Medical care projects.
- Study of pathogenic mechanisms altering body fat distribution.
- Study of metabolic disorders associated with antiretroviral treatment.
- Body composition changes.
- New antiretroviral drugs.
- Cardiovascular risk associated with antiretroviral treatment.
- Comorbid conditions associated with HIV-1 infection.
- Pharmacogenetics (toxicokinetics).
- Bacterial meningitis.
- Coronavirus infectious disease-19 and complications thereof.

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5.1.6 Associated Groups

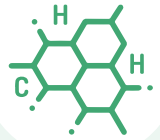
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5.2 Transversal programmes



5.2.1 ADVANCED THERAPIES

Immunotherapy, gene and cell therapy, target drug delivery with nanoparticles, synthetic lethality or drug repurposing are examples of research on advanced therapies that can be applied to several oncological, cardiovascular, or neurological diseases among others. Research shows this programme will lead to new treatments and therapeutic strategies to improve patients' lives.



5.2.2 GENOMIC MEDICINE AND RARE DISEASES

Technological and bioinformatics advances in the field of genomics led to a strong impact not only on the diagnosis of rare genetic diseases but also on determining risk factors, prognosis, and treatment of a growing number of highly prevalent pathologies. In this program we face the era of personalized precision medicine and address the challenge of diagnosing genetic disorders sooner and better.



5.2.3 BIOMARKERS, PROGNOSTIC, AND DIAGNOSTIC

Research on disease biomarkers is essential in high-complexity medical care as it allows for adjusting the diagnosis and predicting the prognosis and drug response. Biomarkers are also essential for the proper follow-up of clinical trials with new drugs. The research done in this program will help define what is the best journey for our patients, from diagnosis and clinical follow-up to treatment.



5.2.4 BETTER HEALTH CARE

We are an Institute with healthcare professionals linked to all medical specialties and nursing. The translational research of this program aims to respond to the clinical challenges of patients in the form of healthcare improvements. This is evident in improvements in diagnosis, medical, or surgical procedures or care circuits always focused on the benefit of the patients.

5.2 Transversal programmes



5.2.5 WOMEN'S HEALTH AND GENDER

Biomedical research has demonstrated the importance of sex, gender, and intersectionality in health, well-being and disease progression to the extent that it is now difficult to justify healthcare and research without a gender perspective. In this program we support the integration of a sex/gender perspective into research content to fill existing knowledge gaps, increase the reproducibility of studies by making them bias-free, contribute to minimizing delays in diagnosis and unexpected adverse effects, and increase equity and social justice. In addition, we promote research on women's health and women's diseases to contribute to the impact of our research on personalized medicine.



5.2.6 COVID-19 RESEARCH

The outbreak of the SARS-CoV-2 virus and the consequent pandemic has driven much research projects on COVID-19, including the effects on pregnancy and childbirth, the genetic or individual factors that determine its severity, the physiological mechanisms of infection and immune response, or clinical trials with new drugs. This program adds knowledge for a common goal: understanding to fight the disease.

Core Facilities and Scientific Services

Javier Crespo

Coordinator



Functions

- Facilitate access to high-level techniques and technologies that may not be available to individual groups.
- Provide services at a reduced cost and optimize human and material resources.
- Support researchers with optimized workflows and methods.
- Offer technical and methodological guidance and support.

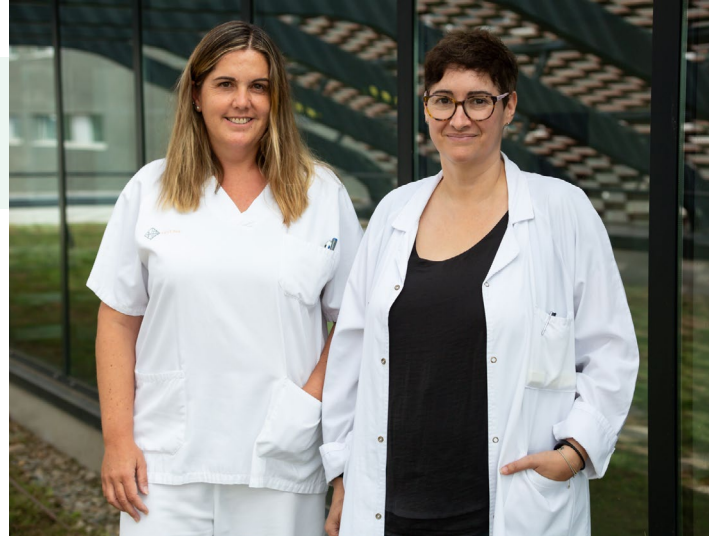
6.1 GENOMICS AND TRANSCRIPTOMICS

Sandra Camino

Coordinator

Staff

Sónia Alcolea



The Genomics and Transcriptomics platform is a core facility focused on giving advice, offering specific services in genomics and transcriptomics techniques, and making specific equipment available to researchers and to the scientific community.

The unit offers a quality service guaranteed for the ISO 9001:2015 certification.

Services

- Quantitation and quality control of nucleic acid samples (Qubit 3.0, Nanodrop 2000, and Bioanalyzer 2100).
- Sample processing for Single-Cell Analysis (Gene expression, Immune profiling, ATAC-seq).
- Sample processing for Microarrays studies (Gene expression and miRNA profiles, Cytogenetics).
- Real-time PCR projects (Gene expression, miRNA detection, allelic discrimination, CNV, absolute quantification).
- Digital PCR (rare or low target detection, mosaicism detection, CNV, allelic discrimination (>5%), Absolute quantification).
- Next-Generation Sequencing: exome sequencing, targeted RNA or DNA sequencing (Ampli-Seq technology), small RNA seq, de novo seq, ChiP-Seq, 16S rRNA sequencing, etc.).
- Sanger Sequencing: DNA sequencing, mutation and polymorphism analysis, DNA methylation studies, microorganisms identification.

- Fragment analysis: cell line authentication, copy number (MLPA), LOH, genotyping studies, microsatellites instability, DNA repeat expansion studies, etc.
- Omics Data analysis.
- Some of the equipment used to carry out these techniques can be accessible for researchers after specific user training.

Equipment

- Chromium iX (10x Genomics). Single-Cell Analysis.
- QuantStudio Absolute Q (Thermo Fisher Sci.). Digital PCR.
- SeqStudio 8 Flex capillary electrophoresis sequencer (ThermoFisher Sci).

6.2 FLOW CYTOMETRY

Marta Soler

Coordinator

Staff

Lia Ros



The flow cytometry platform provides users with the latest generation equipment for cytometric analysis and separation of cell populations, with specifically trained staff to support users in experimental design, data acquisition, and analysis of results. The flow cytometry platform is certified by ISO 9001:2015, and offers sample analysis, from staining to delivery of results, as well as the possibility of fine-tuning new techniques at the request of both internal and external users.

Services

- Conventional cytometry:
 - Characterization of cell populations by multi-color immunophenotyping.
 - Essays of cell viability and proliferation in animal and bacterial cells.
 - Essays of cell cycle and apoptosis.
 - Gene expression (analysis of fluorescent proteins) and quantification of transfection efficiency.
 - Magnetic column cell enrichment for the detection of minority populations.
- Cell sorting:
 - Up to 4 cell subpopulations can be obtained simultaneously in a biosafety cabin.
 - Automated magnetic cell separation of up to two populations.

- Cell dissociation:
 - Independent and fully automatized dissociation of up to 8 samples simultaneously.
 - Dissociation of tissue and cells for single cells or molecular downstream applications.
 - 8 individual heating units for 37°C incubations.
- High Throughput Screening (HTS)/Luminex technology:
 - Analysis of gene expression and immunophenotype profiles, detection of DNA, RNA, and protein in a single plaque.
 - Possibility to include up to 50 analytes in the same plaque.

Equipment

- MACSQuant 16 (Miltenyi Biotec). 3 lasers: 14 fluorescence parameters. Specialized in nanocytometry.
- MAGPIX (Luminex). Analysis of up to 50 analytes per plaque.
- AutoMACS Pro (Miltenyi Biotec) inside class II biosafety cabinet. Automated magnetic separation.

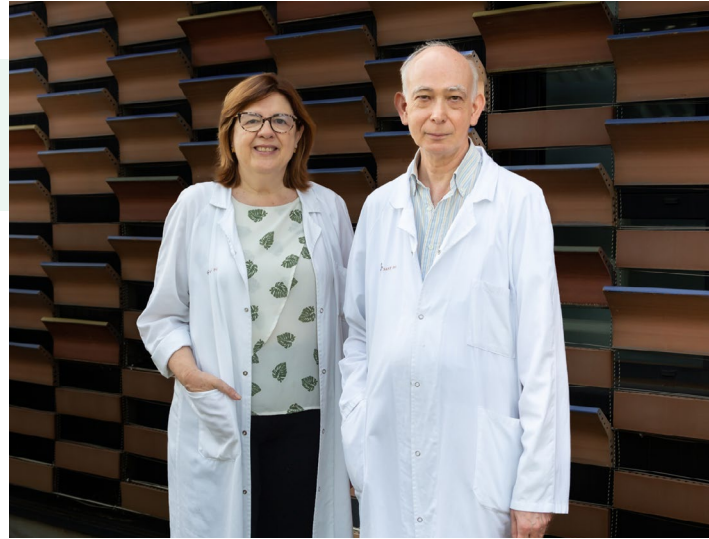
6.3 CONFOCAL MICROSCOPY

Esther Peña

Coordinator

Staff

J. Oriol Juan



The confocal microscopy platform advises on experimental design, and equipment selection according to needs, and facilitates the acquisition of high-resolution three-dimensional images, allowing detailed analysis of biological samples with high subcellular precision.

Services

- Consultation on study preparation and/or approach.
- Training.
- Immunofluorescence of 2 to 5 fluorochromes.
- Reconstruction of 3D and 4D images.
- Colocalization studies.
- Inter and intra-interactions.
- Conventional fluorescence or bright-field microscopy in live cells, fixed cells, and tissues.
- Time-lapse.
- Anatomopathological studies of different tissues, stained by immunohistochemistry (frozen or paraffin) and quantification of images.

Equipment

- Leica SP5 AOBS multispectral confocal with high-speed and high-resolution scanning system, FLIM/FCS modules, and time-lapse incubation system.

- Zeiss AXIOVERT 200M inverted fluorescence microscope with temperature and CO₂ control, with an incubation chamber allowing work with live cells in both fluorescence and bright-field. Equipped with fluorescence filters: DAPI, FITC, Rhodamine. Equipped with polarizers enabling the capture of polarized light images.
- Olympus BX51 fluorescence microscope with double head. Equipped with fluorescence filters: DAPI, FITC, TRITC, TXRED, FAR RED.

6.4 BIOBANK AND IMMUNOHISTOCHEMISTRY

Elena Serrano

Coordinator (until May 2023)

Javier Crespo

Ester Peña

Coordinator (from June 2023)

Staff

Iris Rodríguez, Josep Moreno, Oriol Juan,
María Angels Velasco

The Biobank is a support platform for biomedical research whose main function is the processing of biological samples according to quality criteria. The objective of the Biobank IIB Sant Pau is to increase the accessibility of human biological samples to applicant researchers so that they can use them in their research projects, as long as they meet the ethical and legal requirements required by current legislation.

Services

- Management of requests for biological material for research purposes.
- Ethical-legal advice on the creation of new collections.
- Scientific-technical advice on the treatment of biological samples.
- Processing of human biological samples: peripheral blood, bone marrow, urine, frozen tissue, etc.
- Conservation and custody of human biological samples.
- Cryopreservation of viable cells.
- Management of sample collections and associated data.
- Nucleic acid extraction from different types of biological samples.



Equipment

- 15 Ultra Low freezers -80°C NUAIRE NU-9668E with double-emergency system alarm. 24h monitoring.
- Liquid nitrogen tank CHART MVE 1211 with automatic filling.
- Vapor nitrogen tank CBS V-5000 EHAB with automatic filling.

6.5 PROTEOMICS

Maisa García

Coordinator



The Proteomic Unit will work as a link between IR's researchers and the specialized facilities in other institutions as CRG proteomic Unit.

Services

- Give support in the experimental design.
- Do the sample preparation in house prior LC-MS/MS analysis, adapted to the researchers needs.
- Perform analysis and interpretation of the data obtained by LC-MS/MS and/or in silico analysis for result confirmation.

6.6 RADIOACTIVITY UNIT

Javier Crespo

Coordinator

Staff

Josep Moreno



The Radioactivity Unit provides groups with specific research laboratories in which to work with radioactive isotopes in liquid form. These areas are fully equipped and adapted for the handling of radioactive material and apply optimum measures for the safety and radioprotection of staff and the environment.

Services

- In vitro labeling of proteins, lipoproteins, and liposomes.
- Cellular proliferation and toxicity.
- Nucleic acid labeling.
- Immunoassay techniques.
- Determination of enzymatic activities using radiolabeled substrates.
- Analysis and separation of labeled molecules.
- Cellular cholesterol efflux.
- In vivo metabolism.

Equipment

- Portable radiation and environmental contamination detectors.
- 2 chemical safety cabinets for gas extraction.
- 1 vertical laminar air flow cabinet for cell cultures.

6.7 CELLULAR CULTURE

Estefania Segalés

Coordinator

Staff

Margarita Domingo



The service consists of different laboratories (BSL1 and BSL2) where users can work with primary cultures obtained from human and experimental animal tissues, continuous cell lines, and Level I and II Genetically Modified Organisms (GMOs) using the necessary equipment in aseptic conditions. All the facilities and equipment are subject to the ISO 9001:2015.

Services

- Biosafety cabinets and equipment in auto service mode.
- Biosafety cabinets and equipment for experiments with cytostatic products.
- Biosafety cabinets and equipment for radioactive experiments.
- Hypoxystation.
- Periodic mycoplasma detection.
- Sterilization procedures.

Equipment

- Hypoxystation.
- Radioactive installation.

6.8 ANIMAL EXPERIMENTAL SERVICE (SEA)

Laura Casaní

Coordinator

Sergi Florit

Manager of Animal Research Facilities

Staff

Fanny Cevallos, Angel Juncosa,
Lorena Masiá, Eleonor Masiá

The service consists of different laboratories (BSL1 and BSL2) where users can work with primary cultures obtained from human and experimental animal tissues, continuous cell lines, and Level I and II Genetically Modified Organisms (GMOs) using the necessary equipment in aseptic conditions. All the facilities and equipment are subject to the ISO 9001:2015.

Services

- Officially registered (B9900067; REGA ES080190036528), ISO 9001:2015 certified and, fulfills the current legislation on laboratory research animals: European Directive 2010/63/EU, Spanish RO 53/2013, Catalan Decree 214/1997 and, use of transgenic animals (A/ES/08/I-14 & A/ES/08/21).
- The SEA is committed to help scientists to follow the principles of the '3Rs': replacing animal research with non-animal alternatives; using the least number of animals needed to get meaningful results and getting more information from those animals that are used; and refining experiments to minimize harm and discomfort to the animals.
- The SEA adheres to the transparency agreement in animal experimentation, promoted by the Confederation of Scientific Societies of Spain (COSCE).



- Care and maintenance of experimental animals (rats, mice, rabbits, and swine).
- Maintenance of genetically defined animal colonies (rats and mice): crossing, weaning, and sexing on demand.
- Daily review of the health and welfare of housed animals.
- Advice and specialized support to researchers in the design, writing, and realization of the experimental procedures and techniques that involve the use of animals.
- Advice on analgesia and anesthesia protocols for different experimental procedures and animal species.
- Management of global animal health and hygienic and sanitary conditions of the facilities, and equipment.
- Daily control and automated record-keeping of the environmental conditions in the facilities.
- Biological waste management.

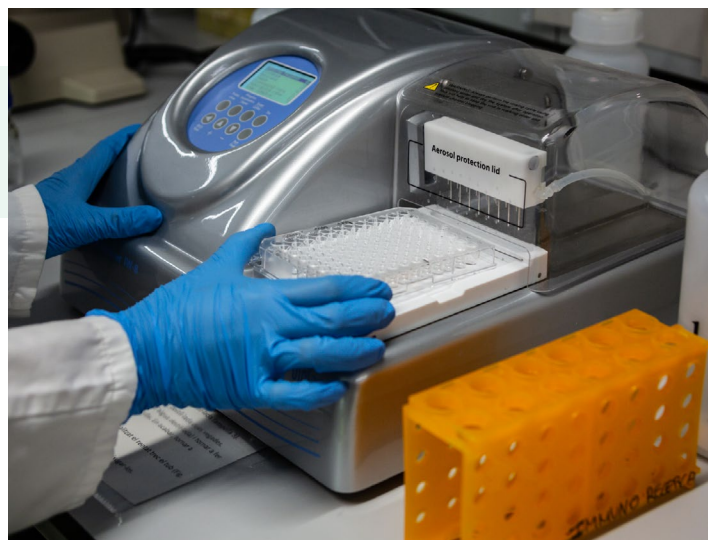
Equipment

- Support facilities include ultra-high echography machine for mice (VevoF2), 2 IVIS Spectrum (CT), 4 laparoscopic towers (Medtronic), X-Ray equipment (OEC-Elite GE), large animal echography system (Affiniti Philips).

6.9 GENERAL LABORATORY FACILITIES

Maribel Baldellou

Coordinator



The purpose of this core facility is to provide and maintain the basic equipment requirements and fulfill the needs of adapted spaces for the internal use of researchers and their teams.

It consists of almost 600 square meters and 300 units of equipment available to all users upon request or reservation.

Services and equipment

- Planning and coordination of preventive maintenance, validations, and control of all the units in IR Sant Pau (common or exclusive to a group or core facility):
 - Gas and biosecurity cabinets.
 - Sterilization units.
 - Security cabinets.
- Space distribution and maintenance for deep freezers and cryopreservation rooms (12), cool chambers at 4°C or at -20°C (8).
- Maintenance and control of general laboratory equipment available to all internal users:
 - Water treatment equipment: 21 units.
 - Security cabinets: 22 units.
 - Cleaning and sterilization: 11 units.
 - Gas and biosecurity cabinets: 28 units.
- Maintenance and control of basic laboratory instruments available to IR users, grouped as follows:
 - Centrifuges, from desktop to ultracentrifuges.
 - Precision scales.
 - PH-meters.
 - Stoves, thermic baths, thermic blocs.
 - Ultrasound bath.
 - Electrophoresis equipment.
 - Spectrophotometers.
 - Chromatographs.
 - Optic microscopes.
 - Other more specialized equipment.
- It also provides logistic support and problem-resolution advice to researchers and their teams.

6.10 CLEAN ROOM

Matilde Parreño

Coordinator

Staff

Rosa Antón



The IR Sant Pau Clean Room is accredited to develop advanced therapies at IR Sant Pau. The Research Institute of the Hospital de la Santa Creu i Sant Pau – IR Sant Pau, in collaboration with the Banc de Sang i Teixits de Catalunya, obtained the certificate of compliance with the Standards of Correct Manufacture of Advanced Therapy Medicines from the Spanish Agency of Medicines and Medical Devices (AEMPS) from the Ministry of Health, a certificate that allows the production and quality control of cellular medicines type CAR-T.

Service

- The objective of the clean room platform is the development and manufacture of advanced therapy drugs. All operations are carried out under the correct manufacturing standard (GMP).

Equipment

- BSL-2 cabinets.
- Inverted microscope.
- TC automated cell counter.
- Refrigerated centrifuge.
- 2 ClinicsMacs Prodigy

Research Support and Management

7.1. CLINICAL RESEARCH AREA

Rosa M. Antonijoan

Coordinator



7.1.1 CENTRE FOR DRUG RESEARCH (CIM)

Research Staff

**Jimena Coimbra, Pol Molina,
Montserrat Punes, Francesca Filippi**

Nursing Staff

**Maite Garrido, David Martínez, Maribel
Martínez, Marta Castillo, Isabel Sánchez**

Study Coordinator

Montserrat Ruiz, Angela Fraga

Data Management

**M^a Ángeles Funes, Ana Gomis,
Esteve Mercader**

Administrative Support

Pura Martínez

The Centre for Drug Research (CIM) began its activities in 1983, in collaboration with the Clinical Pharmacology Department of the HSCSP and the Pharmacology and Therapeutics Department of the Autonomous University of Barcelona (UAB).

Functions

The CIM conducts clinical trials with drugs and clinical research in two areas:

Research as a business unit

- Phase I clinical trials (of no therapeutic interest for participants) in special populations and healthy volunteers (bioequivalence, tolerability, pharmacokinetics and pharmacodynamics, first administration in humans).
- Collaboration with HSCSP researchers in conducting phase II, III, and IV clinical trials.



- Research in neuropsychopharmacology
- Evaluation of the effects of psychotropic drugs and other substances active in the central nervous system on the sleep-wake cycle: Studies of effects during wakefulness (behavioral safety).
- Studies of effects during wakefulness (behavioral safety).
- Studies of effects on sleep quality and architecture.
- Facilities.
- To carry out these functions two different areas are distinguished:

Care area (4 sections):

- Admissions, with 24 beds (in four modules) that allow 100% continuous visual control and two beds for polysomnography studies.
- Outpatient area, with four single rooms equipped for medical, physical, and neuropsychological and psychomotor performance testing.
- Rest and services area: showers, toilets, kitchen, dining room, leisure room.
- Restricted area for drug storage and the processing and storage of biological samples.

Data management and processing area:

- Five computerized offices to carry out non-experimental clinical trial activities.
- Monitors' area (1 room).
- Temporary documentation archive (1 room).

7.1.2 AGDAC

Enrique Peña García

Manager

Cintia Abril García

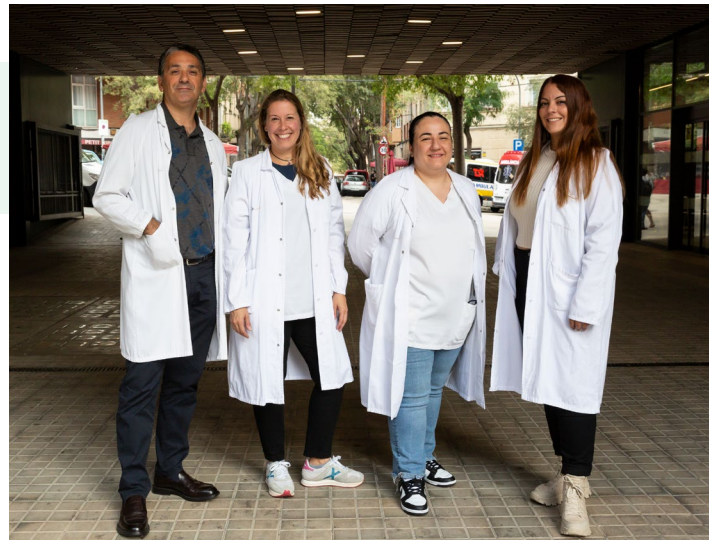
Coordinator

Staff

Elisenda Brunet, Sara Mora

Functions

- Manage and supervise all documentation associated with active clinical trials in the experimental phase and destruction of documentation for terminated clinical trials located in the external archive.
- Store the supplies until the end of the studies, when they are destroyed or recycled.
- Oversee and manage documentation of completed trials for the Centre for Drug Research (CIM).
- Maintain and update the clinical workstation database and manage clinical studies.
- Manage restricted access by clinical trial monitors to the clinical workstation.
- Supervise data processing and management.
- Coordinate researchers and monitors; draw up agendas for meetings and study monitoring.
- Provide logistical support to the cold area and the clinical materials store associated with clinical trials in the experimental phase.
- Ship biological samples to central laboratory services.



7.1.3 CLINICAL RESEARCH AND CLINICAL TRIALS UNIT (UICEC)

Alejandra Espinosa

Coordinator

Rosa M^a Antonijoan

Responsible

Staff

Yaira Mathison, Laura Serra, Sara de Jesus, Jennifer Delgado, Irina Parvanyan

Functions

The Central Clinical Research and Clinical Trials Unit (UICEC Sant Pau) provides comprehensive support to researchers in the development of independent research projects (not sponsored by the pharmaceutical industry) on the methodological, regulatory, administrative, economic, and practical aspects, subject to compliance with the ethical, good clinical practice and legislation.

UICEC Sant Pau is part of the Spanish Clinical Research Network (SCReN), a functional organization network to support the conduction of multi-center clinical trials and participates in the SCReN Platform (Spanish Clinical Research Network ISCIII).

Knowledge management

- One-stop information for independent research group projects.
- Comprehensive assessment and project coordination.
- Point of communication between researchers and technical units.



- Pharmacovigilance activities for trials including drugs or medical devices.
- Knowledge management:
 - Study of dimensionality and feasibility of projects.
 - Identification of each project's needs.
 - Advice on the preparation of documentation: protocol, annexes, monitoring report, final report.
 - Advice on the submission of documentation to Spanish Agency for Medicines and Medical Devices (AEMPS), Clinical Research Ethics Committee (CEIC), Autonomous Communities (CCAA) and other relevant authorities.
 - Advice on project registration in public databases.
 - Identification of spinoff projects.
 - Advice on the presentation of research results.

Methodological and statistical support unit

- Advice on study design.
- Data entry.
- Data processing.
- Development of statistical reports.

7.1.3 CLINICAL RESEARCH AND CLINICAL TRIALS UNIT (UICEC)

- Electronic CRFs validation and management.
- Documentation and reports.

Documentation, archiving, monitoring, and follow-up unit

- Support in document creation: EudraCT form and annexes / application forms / evaluation forms follow form.
- Support in the processing of initial applications, clarifications and amendments: AEMPS, CEIC, other health authorities regarding clinical trials, and other post-authorization studies.
- Comprehensive monitoring of clinical trials and observational studies.
- Management of initial, follow-up and final reports.
- Development and file custody promoter (Master File), file preparation investigator.
- Other communications to CEIC, autonomous communities and competent authorities.

Unit of management and financial management

- Management of clinical trials contracts with participating centers.
- Management of collaboration agreements with laboratories / companies for funding.
- Management of clinical trial-related contracts (CRO's, E-CRDs, statistics, etc.). Management of clinical trial-related client and supplier invoices.
- Management of clinical trial insurance policies.
- Preparation of financial reports for the submission of studies to ethics committees.
- Management of payment of fees to the competent authorities.

7.2 RESEARCH AND INNOVATION MANAGEMENT AREA

Míriam Ors

Coordinator



7.2.1 TECHNOLOGY TRANSFER AND INNOVATION UNIT (UTI)

Míriam Ors

Coordinator

Staff

Jana Iscla, Natalia Ichaso, Alba Arroyes

Marta Tort (April-October 2023)

Dani Benitez (until February 2023)



Functions

- It aims to create and foster an innovative ecosystem at IR Sant Pau to promote and cultivate innovative ideas. One of the key initiatives in this endeavor is the establishment of the INNOPAU incubator.
- It works to identify opportunities, and evaluates and valorises them to ensure their effective transfer to market or implementation in the SNS. The unit provides support in defining and managing the IP and market strategy, considering essential factors like regulatory compliance and stakeholder engagement.
- Offers support in the creation of spin-offs and fosters entrepreneurship.
- Supports searching for funding for technology development projects and encourages public-private collaboration.
- Promote the visibility of the IR Sant Pau in the R&D&I national and international ecosystems.

7.2.2 NATIONAL PROJECTS UNIT

Fabiola Fernández

Coordinator

—

Staff

Eva José, Eva de la Vara, Amanda García

Marta Lorente, Eva García

Eva Vicente (until October 2023)

Cristina Manjón (from November 2023)

**Functions**

Pre-Award

- Research and dissemination of calls for proposals.
- Advise and support researchers for the submission of applications (review of IP, equipment and budget).
- Registration of applications submitted.
- Follow-up of applications submitted up to the resolutions.
- Reports indicators of the activity of the Unit.

Post-Award

- Activation of the aid granted from the moment it is granted until its completion in the management application.

- Economic follow-up (economic-scientific reports, validation spent and advice to the researcher).
- Negotiations with the funding agencies: registration and cancellation of equipment, copy of contracts, starting canvas, requests for extensions.
- Response to requests from funding agencies.
- Internal and external audits of projects.
- Meetings for the creation and management of projects.
- Interaction with different cross-cutting areas to implement the provisions of the calls for proposal.

7.2.3 INTERNATIONAL PROJECTS UNIT

Noemí Carranza

Coordinator

Staff

Declan de la Fuente, Regina Rubira,
Cristina Vizcaíno



Functions

The IPU was created in 2021 with the aim of managing competitive international projects since the creation, application, justification and monitoring phase.

The objectives of the IPU are the following:

- Improve the proactive search for opportunities that can become funded proposals.
 - This objective implies contacting other European organizations, searching for companies, consortia formation, searching the necessary resources to carry out the project, supporting groups in the proposal preparation, communication, encouraging group participation and leading some proposals.
- Support in proposal preparation for HE calls.
- Contribution to the internationalization of the IR Sant Pau to increase its reputation and visibility.
 - This objective implies promoting international collaborations, creating and participating in European and international networks.
- Communication and dissemination of international projects.
- Strengthen the role of the Communication Unit to increase the dissemination and communication of results. Include internationalization in the communication plan, web content and promotion of social networks.
- Promote a cultural change accompanied by a specific training plan.
- Train and offer advice to the institute's research community to participate more actively in the environment of competitive grants and European and international networks.
- Provide a good system for data collection and exploitation of indicators, scientific activity and project management.

7.2.4 INTERNATIONAL RELATIONS UNIT

Laia Cendrós

Coordinator

Functions

The International Relations Unit supports strategically and operationally to define and develop internationalisation at IR Sant Pau. The unit aims at promoting scientific excellence through collaborative research and innovation, and by sharing infrastructures and knowledge at international level. It helps build relationships with European and international institutions and organisations, and promotes and nurtures IR Sant Pau global positioning and reputation and European and international networks.

The unit main goals are:

- To strengthen international strategic alliances.
- To promote scientific exchange and collaboration at international level.
- To improve IR Sant Pau international presence, reputation and visibility.
- To attract scientific activity, talent and opportunities to IR Sant Pau.

The new International Relations Unit was created in November 2023 and collaborates and coordinates with several units at IR Sant Pau, thus fostering and facilitating the participation of IR Sant Pau researchers in the European and global scene.



7.2.5 KNOWLEDGE MANAGEMENT UNIT

Montse Campmany

Coordinator

Staff

Cati Pérez, Neus Milán



Functions

- Ensure the accurate collection of information on institutional scientific activity and calculate monitoring indicators.
- Respond to requests for information from official bodies and the institution regarding scientific activity.
- Advise researchers on bibliometrics and publishing in scientific journals.
- Promote open science, specially in open access and research data management.

7.2.6 QUALITY ASSURANCE UNIT (QA)

Marta Mitjà Ventura

Coordinator

Staff

Agostina Robledo, Jordina Pasqual



Functions

- Establish mechanisms to assess Quality and Best Scientific Practices, promoting continuous improvement and excellence goals.
- Assessment for designing and implementation of new Quality / R+D+i standards.
- Follow-up of the Integrated Quality Management System, including the establishment of improvement policies, under the following standards:
 - Good Manufacturing Practices of Advanced Therapy Medicinal Products.
 - Good Clinical Practices.
 - ISO 9001, Quality Management System.
 - UNE 166002, R+D+i Management System.
- Perform internal audits (Advanced Therapy Medicinal Production Process / Clinical Trials / Scientific and Technical Services / Suppliers).
- Coordinate, oversee and follow up of the external Inspections (Public Administration / Clinical Trial Promoters / Certification Entities).
- Coordinate the Quality Committees.

7.2.7 RESPONSIBLE RESEARCH AND INNOVATION UNIT (RRI)

Maria Rosa Ballester

Coordinator



Functions

- Incorporate RRI principles into the governance of the institution and foster RRI at all stages of any research project.
- Promote and encourage integrity in research, by means of the creation of CIR (Integrity Committee for Research).
- Support to researchers in how to integrate the gender perspective in teams and in all phases of the project content.
- Promote, design or implement specific tools, activities, and methodologies (round table and co-creation sessions) to help researchers to improve their research proposals involving the society.
- To develop the institution's impact strategy and promote the culture of impact by supporting researchers in the definition of impact narratives in their field of research and contributing to maximize the social impact of the health research carried out at the institution.

7.2.8 SCIENTIFIC SECRETARIAT

M^a José Bartolomé

Coordinator



Functions

The scientific secretariat is an essential support to the scientific director and a liaison with the scientific community.

This unit responds proactively to needs and advises researchers on internal procedures and policies.

In addition, it assists the Scientific Director in the management and organization of various activities, including:

- Coordination of internal scientific committee.
- Support to the Directors of the Strategic Scientific Areas.
- Providing overall administrative support to strategic institutional projects, such as the Joint Scientific Project, the integration project, etc.
- Participate in evaluations and accreditations.
- Planning and organization of meetings, conferences and initiatives to promote scientific exchange, foster excellence and enhance collaboration between the different research groups and any other actions that scientific direction implementing.

7.3 ADMINISTRATION MANAGEMENT AREA

Jaume Bacardit

Managing Director



7.3.1 FINANCE UNIT

Laura San Martín

Coordinator

Staff

Accounting, Treasury, and Invoicing

Alfred Sánchez (new addition in 2023)

Ana Badenes

Anna Espallargas

Ester Andrés

Esther Monferrer

Héctor Sánchez

Meritxell Criado

Nuria García

Nuria Vanaclocha

Sandra Parera

Soraya Gonzalez

Sales

Grace Careaga

Lorena Bustamante

Sara García

Management Control

Laura Pino



Functions

- Carrying out financial and accounting management for the HSCiSP Research Institute: account management, treasury, and tax matters.
- Designing, administering, and controlling budget-related issues.
- Managing and controlling financial and material resources.
- Complying with obligations imposed by official bodies and ensuring compliance with current tax and financial regulations along with the management policies of the HSCiSP Research Institute.
- Providing support to researchers and research groups in various areas: invoicing, purchasing, project monitoring and control, and general administration.

7.3.2 LEGAL ADVICE AND PUBLIC PROCUREMENT UNIT

Sílvia Ribas

Coordinator



Staff

Lourdes Gaig, Uxue Moreno, Maria Rull,
Berta Colomer



Functions

- **Legal Counsel and Resolution of Legal Matters:** The Legal Advice and Public Procurement Unit of the IR Sant Pau is responsible for providing comprehensive support to the institute across all its domains, ensuring strict adherence to established legal frameworks. This involves:
 - Offering preemptive legal counsel.
 - Resolving legal matters across various branches of law including civil, commercial, administrative, labor, and criminal compliance, alongside transparency regulations.
- **Compliance with General Data Protection Regulation (GDPR):** The Unit oversees compliance with the GDPR by:
 - Ensuring the proper handling of data, both internally and externally.
 - Validating the functions of the data protection officer.
- **Management of Public Procurement Procedures:** The legal unit manages the corresponding procedures of public procurement to secure necessary works, services, and supplies for the foundation, in accordance with:
 - Protocols and regulations outlined in the Public Sector Contracts Act.
- **Coordination of Compliance Committee:** Finally, the Legal Unit performs the coordination functions of the Criminal Compliance Committee to ensure that the Institute complies with laws, regulations, and ethical standards. This involves:
 - Implementing and overseeing internal policies and procedures to prevent illegal, fraudulent, or unethical activities.
 - Promoting a culture of integrity and accountability among staff regarding relevant regulations.
 - Conducting regular audits to ensure compliance.

7.3.3 HUMAN RESOURCES UNIT

Ruth Acosta

Coordinator

Staff

Gisèle Domenech, Mireia Ventura,
Mónica Velasco, Inés Pérez

Functions

- Manage all processes related to human resources.
- Provide support and services to employees and research groups in all issues related to the employee life cycle (recruiting, contracting, personnel administration, payroll, training & development, teaching).
- Labour relations.
- Develop and implement policies and procedures meeting organizational objectives.
- Labour Risk Prevention.



7.3.4 EXECUTIVE SECRETARIAT

Eva Sanfeliu

Coordinator

Staff

Carina Mussuto



Functions

- Provide high-level administrative support and assistance to both management/director and administrative personnel as well as research staff.
- Maintenance of executive's agendas and plan meetings, appointments, or conferences.
- Contact point on any requirements from our trustees or stakeholders.
- Prioritise requests, IR Sant Pau representative signatures of agreements, clinical trials, fundraising, etc.
- Corporate email management.
- Manage all travel-related matters for both internal and assigned personnel, being the unique reference point for managing travels to congresses, meetings, etc... including the application for funding of travels.
- Handle all matters related to students, (PhD, master, etc...) managing all the information through platforms that Universities provide for this purpose and, among others, the renewal agreements with national or international universities and/or institutions.

7.3.5 INFORMATION SYSTEMS UNIT

Adrià Aceituno

Coordinator



Staff

David Sanfeliu, David Sánchez



Functions

- Infrastructure Management:
 - The IT department is responsible for managing and maintaining the organization's technology infrastructure. This includes servers, networks, hardware, and other essential components. Ensuring the availability, reliability, and performance of the IT infrastructure is crucial for supporting business operations.
- User Support and Helpdesk Services:
 - Providing support to end-users is a significant responsibility. This involves addressing technical issues, troubleshooting problems, and offering assistance with software applications and hardware. An effective IT department typically includes a helpdesk or support team to respond to user inquiries and resolve issues promptly.
- Data Security and Information Management:
 - Safeguarding the organization's data and information is a critical role of the IT department. This includes implementing security measures to protect against cyber threats, managing access controls, and ensuring data backups and recovery processes are in place. IT professionals are also responsible for staying informed about the latest security trends and implementing best practices to mitigate risks.
- Strategic Planning and Technology Adoption:
 - The IT department plays a key role in aligning technology with the overall business strategy. This involves strategic planning to determine the organization's technology needs, evaluating and adopting new technologies that can enhance efficiency, and ensuring that the IT infrastructure supports the long-term goals of the business. IT professionals may also be in-

7.3.6 SERVICES AND INFRASTRUCTURES COORDINATION UNIT

Javier Crespo

Coordinator

Functions

The services and infrastructures coordination unit is designed to coordinate the work between the different sub-units that form it: scientific and technical services platforms, general services and infrastruc-



tures. This provides a better solution to the needs of the scientists and staff of the centre's structural centre.

7.3.6.1 INFRASTRUCTURE UNIT

Rosa García Bravo

Staff

Functions

- Organising, selecting and determining the spaces that are distributed among the different departments and research groups.
- To interact with the institutions that form part of the Sant Pau Campus to organize the spaces distributed among them.
- Responsible for creating new spaces and workplaces to improve the working conditions of the different teams.



7.3.6.2 GENERAL SERVICE UNIT

Staff

Pau Escartin, Cristina García, Laura Rios,
Josep Moreno, Rosa García



Functions

- Building Management.
- Maintenance of the Building and equipment.
- Security.
- Warehouse.
- Booking of Meeting rooms.
- Overseeing cleaning services and treatment waste.
- Access authorization.
- Transfers.

7.3.7 COMUNICACION UNIT

Laia Cendrós

(until August 2023)

Communications Director

Laura Díaz-Roig

(from September 2023)

Communications Director

Staff

Media Relations and content creation

Karla Islas

Fundraising

Paola Grommes

Public Engagement

Júlia Massó (until July 2023)

Patricia Rodríguez (from November 2023)

Functions

- Increase the reputation and visibility of the Institute, as well as to strengthen and create new relationships with key stakeholders.
- The Communications Unit is responsible for the definition and development of the corporate image, media relations, citizen participation, scientific education, internal communication, and fundraising.
- The Unit communicates and disseminates innovative and pioneering research activities of the Institute at both national and international levels.
- Through activities and projects, the unit engages with citizens and various agents to promote their commitment and increase awareness of biomedical research in health.
- The Communications Unit is an accredited Unit of Scientific Culture and Innovation (UCC+i) by the Spanish Foundation for Science and Technology (FECYT).
- It is member of the Scientific Culture and Innovation Units Network, which includes the main agents for the dissemination of science and innovation in Spain.





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