IGTP

Germans Trias i Pujol Research Institute

Annual Report 2023

Excellence in health research, impacting patients' lives

HR EXCELLENCE IN RESEARCH

Instituto de Salud Carlos III

CERCA Centres de Recerca de Catalunya

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Message from the director

Dr Jordi Barretina

General Director, Germans Trias i Pujol Research Institute (IGTP)

2023 marked a period of significant activity and transformation for IGTP. Throughout the year, our institution demonstrated unwavering commitment and conducted cutting-edge research, with continuous dedication to advancing both healthcare and our scientific understanding of diseases. The combined efforts of our research community, our dedicated staff, and our invaluable partners not only cemented IGTP's standing as a prominent biomedical research institute but also propelled our mission towards shaping a healthier and more equitable world.

This report, which I trust you will find insightful, highlights the accomplishments of our research groups and their advancements in various fields of biomedical research, such as oncology, infectious diseases, cardiovascular diseases neuroscience, and genetics. The noteworthy achievements of our researchers have garnered international recognition and brought about tangible benefits for patients and communities on a global scale. Collaborations with esteemed institutions and industry partners have further amplified the impact of our findings, bridging the gap between scientific insights and novel medical solutions.

Key highlights of the year include several studies from the GCAT|Genomes for Life project, which has produced significant results in the study of chronic diseases and contributed to the genetic understanding of COVID-19. Through collaboration in international consortia, we have provided valuable data on the genetic susceptibility and severity of the disease. Moreover, the Comparative Medicine and Bioimage Centre (CMCiB) played a pivotal role in the validation of medical devices and expanded its capabilities in the area of bioimaging. We have conducted preclinical studies in collaboration with both national and international companies and increased the number of advanced surgical trainings, thus contributing to the transformation of the health systems.

We also secured competitive funding for numerous innovative projects, including the development of advanced therapies and diagnostic tools. Our institution also strengthened its position as a reference node in various international research networks.

At an institutional level, we continued to promote gender equality and inclusion. In this context, the Women in Science (WiS) working group organised the 5th edition of the "Integrating Intersectionality and Gender Perspective in Research" symposium, among other activities. Also, our communication and outreach activities expanded the reach and impact of our research, connecting us with society and promoting transparency. We launched new communication channels, such as the podcast 'Un bri de ciència', and increased our presence in digital and traditional media.

Furthermore, IGTP remains dedicated to fostering the development of the next generation of scientific leaders. Our robust training and mentorship initiatives have provided emerging researchers with the resources and support needed to develop their careers. Consequently, we continue to witness the emergence of talented individuals poised to drive biomedical innovation in the years ahead.

In conclusion, I would like to express our heartfelt gratitude to everyone who played a part in IGTP's achievements in 2023. Your steadfast dedication, passion, and collaborative approach have propelled our organisation to new heights. Looking ahead, I am confident that, together, we will continue to improve how we do our research to address global healthcare challenges and increase our societal impact.

Message from the scientific director

Dr Julia García Prado

Scientific Director, Germans Trias i Pujol Research Institute (IGTP)

This year, we have embarked on a significant journey by developing and early implementing a new strategic plan (2023-2027) at the IGTP. This plan, a culmination of collective efforts and insights, will not only guide our research initiatives in the coming years but also align with broader strategic frameworks at local, Catalan, Spanish, and international levels. This alignment ensures that our efforts are synchronised with the latest scientific and healthcare priorities, keeping you well-informed and involved in our strategic direction.

Our strategic plan identifies critical challenges around six pillars: 1) strategic alliances, 2) scientific model and promotion of transversal scientific programs, 3) promotion of clinical research, 4) resource management, training and professional development, 5) space, infrastructures and scientific platforms, 6) innovation and impact.

In this context, we have been actively working to promote and strengthen our research groups. Their research across various fields has significantly contributed to our understanding of complex diseases and set new benchmarks in biomedical research.

A key element of our scientific strategy to reinforce the alliance across institutions on our campus involves the development of transversal research programs. This year, two programs, Cancer Translational Research (CARE) and public health and Primary healthcare (CORE), are advancing on their path to consolidation.

The CARE aims to bridge the gap between laboratory discoveries and clinical applications in cancer. This programme has made significant strides in understanding the molecular mechanisms of cancer, developing novel therapies, and improving patient outcomes. The CARE program exemplifies our commitment to impactful, patient-centred research.

The CORE program focuses on public health and primary healthcare. It operates as a multidisciplinary network, bringing together researchers from various fields to address population health challenges. CORE aims to promote evidence-based public health policies and strengthen primary care, fundamental to a resilient healthcare system. The program facilitates collaborative research, the integration of research findings into practice, and the development of effective public health interventions.

This year, our strategic plan has also prioritised enhancing our research infrastructure and fostering a collaborative research environment. By leveraging shared technological platforms and facilities, we have enabled our researchers to push the boundaries of scientific discovery. Our Comparative Medicine and Bioimage Centre of Catalonia (CMCiB) has expanded its capabilities with new high-resolution imaging technologies, furthering our ability to conduct advanced preclinical studies and improve surgical techniques.

As we celebrate our accomplishments, we are mindful of the challenges ahead. We are committed to addressing health disparities, championing diversity and inclusion, and enhancing our institutional resilience. Our strategic plan provides a clear roadmap for navigating these complexities.

I would like to extend my deepest gratitude to everyone who has contributed to the success in 2023. Your dedication, passion, and collaborative spirit are the driving forces behind our mission to make a meaningful impact on health and society.

Strategic Plan 2023-2027

Strategic Plan 2023-2027

Our strategy for the coming years

In 2023, IGTP developed a strategic plan aimed at defining the institution's strategic priorities through the formulation of unique actions to be developed over the next five years. This plan will consolidate and strengthen IGTP's scientific capabilities across all areas of activity. The plan has taken into account the current context, as well as the expectations and aspirations of the organisation.

Our principles

Mission

To be a centre of excellence that forms the backbone of a multidisciplinary and multi-institutional environment, allowing for cutting-edge translational research and innovation aimed at solving health challenges, from the prevention to the cure of diseases.

Vision

To be a prestigious biomedical research centre that works to improve people's health and quality of life through maximum efficiency, sustainability, excellence, professional expertise, technological transfer, access to advanced technologies and cooperation, to ensure the greatest impact.

Values

- Leadership and research excellence
- Innovation
- Commitment to society
- Multidisciplinarity
- Ethics and humanitarian vision of biomedical research
- Sustainability
- Service orientation

Our strategic goals

These objectives are aligned with the Sustainable Development Goals of the 2030 Agenda.

Our strategic goals

1 GROWTH AND INSTITUTIONAL ALLIANCES

SO1 Opting for a campus model that facilitates the participation and coordination of R+D+I activities between institutions and creates an environment with unique capabilities.

SO2 Promoting the participation of professionals from the HUGTiP in research activities and networking with other organizations in the environment.

2 SCIENTIFIC MODEL AND FOSTERING TRANSVERSAL RESEARCH PROGRAMS

SO3 Consolidate collaboration between the research groups of the institutions of the campus, affirm scientific programs and favour high-impact multidisciplinary projects.

SO4 Strengthen scientific infrastructure and coordinate areas and research groups with a system that permits both the redefinition of the areas and the evaluation of groups.

3 DRIVING CLINICAL RESEARCH

SO5 Drive the growth of clinical research in the healthcare services of the HUGTiP, developing the Clinical Trials Unit, the processes and the necessary resources.

4 RESOURCE MANAGEMENT, PROFESSIONAL CAPACITATION AND DEVELOPMENT

SO6 Guarantee the management processes for R+D+I, insure the suitability of resources and the provision and functional distribution of floor space.

SO7 Guarantee the application of initiatives that facilitate the promotion, capacitation, training and development of researchers and ensure gender equality.

5 FLOOR SPACE, INFRASTRUCTURE AND CORE FACILITIES

SO8 Position the IGTP as a reference node for scientific core facilities in the environment and position the CMCiB as a unique national and international facility.

6 INNOVATION AND IMPACT

SO9 Strengthen and consolidate the culture of innovation within the institute and actions aimed at supporting the processes of innovation and technology transfer.

SO10 Promote the communications of the IGTP, considering both scientific activity and those that promote participation by society.

About us

About us

Organisational chart

IGTP is committed to fostering an ideal research environment, ensuring that its researchers receive comprehensive support from its dedicated research support units.

Management committee

Jordi Barretina
General director

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Director secretary
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Carles Esquerré
Managing director

Jessica Soria
Managing director secretary
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Julia García
Scientific director and head of Scientific Management and Technical Secretariat
direccio@igtp.cat

Cristina Vilaplana
Head of Institutional Relations

Raül Zurita
Head of the Innovation & Business Development Unit

HEADS OF RESEARCH SUPPORT UNITS

Tamara Gutiérrez
Head of the Communications Unit

Carol Gálvez
Core Facility manager

Iris Bargalló
Data Protection coordinator

Eva Garcia
Head of the Finance Unit

Anna Duran
Head of the Fundraising Unit

Francesc Velarde
Head of the General Services Unit

Raül Zurita
Head of the Innovation & Business Development Unit

Ruben Cobo
Head of the IT Unit

David Izquierdo
Head of the Laboratory Management Unit

Janire Gesto
Legal Services technician

Montserrat González
Head of the People Management Unit

Oscar Fraile
Head of the Project Management Unit

Juan Giardini
Head of the Purchasing Unit

Julia García
Head of the Scientific Management and Technical Secretariat Unit

Governance

Board of trustees

*The positions outlined here refer to the year 2023

PRESIDENT
Manel Balcells
Minister of Health, Government of Catalonia

FIRST VICE-PRESIDENT
Joaquim Nadal
Minister of Research and Universities, Government of Catalonia

SECOND VICE-PRESIDENT
Francisco Javier Lafuente
Vice-chancellor of the Universitat Autònoma de Barcelona (UAB)

OTHER MEMBERS
Joan Gómez
General director of Research of the Ministry of Research and Universities, Government of Catalonia

Aina Plaza
General director of Health Planning for the Department of Health, Government of Catalonia

Lluís Rovira
Director of CERCA

Assumpció Malgosa
Vicerector for Research and Knowledge Transfer, Universitat Autònoma de Barcelona (UAB)

Jordi Ara
Managing director of the North Metropolitan Territory, Institut Català de la Salut (ICS)

Josep M. Mòdol
Director of the Germans Trias i Pujol University Hospital

Xavier Garcia
Mayor of Badalona, Badalona City Council

Cristina Agüera
(deputy representative)
Councillor, Badalona City Council

Montserrat Bernabeu
Assistant director and co-director, Fundació Institut Guttmann

Bonaventura Clotet
Director of IrsiCaixa

Montserrat Llavayol
Deputy director of Research and Innovation of the Department of Governance and Institutional Relations (DGRI), Department of Health of the Government of Catalonia

Evarist Feliu
President of the Management Commission, Josep Carreras Leukaemia Research Institute

Pending appointment – Marc Vilar
i*Managing director, Germans Trias i Pujol University Hospital (HUGTP)*

Ramon Salazar
General director, Institut Català d'Oncologia (ICO)

Joaquim Delgadillo
Scientific director, Banc de Sang i Teixits

SECRETARY
Josep M Alcoberro
CERCA

*The positions outlined here refer to the year 2023

Executive committee

PRESIDENT
Montserrat Llavayol
Deputy director of Research and Innovation of the Department of Governance and Institutional Relations (DGRI), Department of Health of the Government of Catalonia

VOCALS
Lluís Rovira
Director of CERCA

Assumpció Malgosa
Vicerector for Research and Technology Transfer, Autonomous University of Barcelona (UAB)

Ramon Salazar
General director, Institut Català d'Oncologia (ICO)

Jordi Ara
Managing director of the North Metropolitan Territory, Institut Català de la Salut (ICS)

Josep Mª Mòdol
Director of the Germans Trias i Pujol University Hospital

SECRETARY
Josep M Alcoberro
CERCA

External scientific board

CHAIR
Angel Pellicer
Adjunct professor, Department of Pathology, New York University School of Medicine

MEMBERS
Justo Castaño
Professor of Cell Biology at the Department of Cell Biology, Physiology and Immunology, University of Cordoba, and head of the Hormones and Cancer Research Group, IMIBIC - Maimónides Biomedical Research Institute of Córdoba

Marina Pollan
Scientific director of CIBERESP, IMPACT cohort coordinator

Alfonso Valencia
Director of the Life Sciences Department, Barcelona Super Computing Centre, ICREA Research Professor, IMPACT data coordinator

Internal scientific board

PRESIDENT
Julia García
Germans Trias i Pujol Research Institute (IGTP) & IrsiCaixa

SECRETARY
Eduard Serra
Germans Trias i Pujol Research Institute (IGTP)

MEMBERS
Javier Solana
Fundació Institut Guttmann

Julià Blanco
IrsiCaixa

Eva Martínez
Institut Català d'Oncologia (ICO)

Mònica Millán
Germans Trias i Pujol University Hospital (HUGTiP)

Montserrat González
Germans Trias i Pujol Research Institute (IGTP)

Raquel Guillamat
Germans Trias i Pujol Research Institute (IGTP)

Maria Saigi (temporarily Anna Martinez)
Institut Català d'Oncologia (ICO)

Carlos Rodrigo
Germans Trias i Pujol University Hospital (HUGTiP)

Pere Torán
Fundació Institut Universitari per a la Recerca a l'Atenció Primària de Salut Jordi Gol i Gurina (IDIAPJGol)

Magí Farré
Germans Trias i Pujol University Hospital (HUGTiP)

Raül Zurita
Germans Trias i Pujol Research Institute (IGTP)

Santi Roura
Germans Trias i Pujol Research Institute (IGTP)

Iris Bargalló
Germans Trias i Pujol Research Institute (IGTP)

Omar Ortega
Consorci Sanitari del Maresme (CSdM)

Ariadna Huertas
Germans Trias i Pujol University Hospital (HUGTiP)

Eva Martínez
Germans Trias i Pujol University Hospital (HUGTiP)

Research areas and groups

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GROUPS contracted directly by IGTP and affiliated groups from ICO, ISGlobal and Consorci Sanitari del Maresme

Read more

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AFFILIATED INSTITUTIONS

- Barcelona Institute for Global Health (ISGlobal)
- Consorci Sanitari del Maresme (CSdM)
- Fundació Lluita contra les Infeccions
- Fundació Institut Universitari per a la Recerca a l'Atenció Primària de Salut Jordi Gol i Gurina (IDIAPJGol)
- Fundació Institut Guttmann
- Institut Català d'Oncologia (ICO)
- IrsiCaixa
- Josep Carreras Leukaemia Research Institute (IJC)

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RESEARCH AREAS

Cancer	Cardiovascular and Respiratory Disease	Community Health
Diseases of the Liver and Digestive Tract	Endocrine and Diseases of the Metabolism, Bones and Kidneys	Immunology and Inflammation
Infectious Diseases	Neuroscience	Science of Behaviour and Substance Abuse

Transversal programs

Translational Program in Cancer Research (CARE)

The CARE Program (Translational Program in Cancer Research) is a multidisciplinary network of researchers who share common interests and resources in the field of cancer research. The program is housed on the Can Ruti Campus and is an integral part of the core scientific structure at IGTP.

Scope and aim

The program's research focuses on various forms of cancer, with the goal of accelerating the transfer of cutting-edge knowledge and technological progress in the diagnosis, treatment, and prevention of cancer. Through this program, the quality of cancer research will be enhanced and its impact in clinical practice will be maximised. The CARE Program has several scientific and functional aims that are designed to:

- Promote the development and implementation of precision and personalised medicine.
- Advance basic and translational research towards innovation and technology transfer.
- Establish a collaborative and transversal network of clinical, translational and basic researchers.
- Implement an efficient working framework among researchers to increase research impact.
- Enable advanced computational tools in translational research practices.

Structure of the program

Institutions

- Core members: IGTP / HGTiP / ICO
- Associate institutions: IJC, IRSICaixa, UAB

Executive Committee

- Directors: Mireia Margelí (Clinical research), Miguel A Peinado Basic research)
- Sections' coordinators: Anna Martínez-Cardús (Networking), Eduard Serra (Scientific), Arola Fortian (Training & Communication)

Highlights

In 2023, the CARE Program made significant strides in enhancing cancer research and its application in clinical settings.

The program continued to organise seminars, courses and meetings, while also participating in outreach activities.

3
internal presentations

1
symposium

7
courses and scientific meetings

3
outreach activities

18
CARE Translational Seminars in Cancer Research

As a new development, the program created focused nodes on translational cancer research:

- Preclinical models
- Immunology / Immunotherapy
- Tumour heterogeneity & liquid biopsy

Transversal Program in Public Health and Primary Healthcare (CORE)

The CORE Program (Transversal Program for Public Health and Primary Healthcare) operates as a multidisciplinary network of researchers united by shared interests and resources in population research. Located on the Can Ruti Campus, it forms a key component of IGTP's core scientific structure.

Scope and aim

The CORE Program aims to create a multidisciplinary research framework that facilitates synergies to design and implement applied research at the population level. It aims to generate knowledge to promote management and public health policies based on scientific evidence and to strengthen primary care as the core pillar of the health system.

The aims of the CORE Program are designed to:

- Encourage population based collaborative multidisciplinary research between the different actors on the Can Ruti Campus, including Primary Healthcare, and other primary care and public health units.
- Promote and visualise action-oriented program-based and participatory research.
- Facilitate the integration of research results into primary care clinical practice and public health policies.
- Facilitate the integration of talent into research groups of the program and implement strategies to assure their sustainability and competitivity.
- Facilitate the use of shared technological platforms, facilities and analytical skills.
- Act as a hub for training and teaching to improve the research abilities of its investigators and those on the Can Ruti Campus.
- Strengthen emerging groups.

Structure of the program

Institutions

- Promoters: CEEISCAT-IGTP / IDIAPJGol
- Associate institutions: IDIAPJGol / HUGTiP / ICS Metropolitana Nord / Health Department

Members of the Management Committee

- Directors: Jordi Casabona (CEEISCAT-IGTP), Pere Toran (IDIAPJGol-USR-MPN)
- Sections' coordinators: Cinta Folch and Rosa García (Scientific), Evelin López and Josep Maria Manresa (Educational & Training), Cristina Agustí and Guillem Pera (Internal operational working group), Montse Galdon and Marta Ruiz (Administration), Pol Romano and Andrea Gil-Bermejo (Communication)

Working groups are open to new interested members.

Executive Committee

- Secretary of Public Health. Health Department: Carmen Cabezas
- Director /Scientific Director of IGTP: Jordi Barretina and Julia García
- Scientific Director IDIAP: Josep Basora
- Director of Care Strategy and Innovation HUGTIP: Oriol Estrada
- Clinical Director HUGTIP: Josep Maria Mòdol
- Director Head of Primary Health Care BMN: Laura Conangla
- Clinical Territorial Directors BMN HUGTIP: Bonaventura Clotet
- Program directors: Jordi Casabona (CEEISCAT) and Pere Toran (IDIAP-USR-MPN)

Highlights

The CORE Program was established in June 2023 and officially presented on 29 November at the 3rd IGTP Retreat. The program already organised six scientific and formative activities throughout the year, including Can Ruti Campus STI Sessions and CORE Seminars.

Strategic projects

GCAT|GENOMES FOR LIFE PROJECT

GCAT|Genomes for Life is a population-based multi-purpose cohort to identify genomic, epigenomic and environmental factors in the development of multi-factorial chronic diseases.

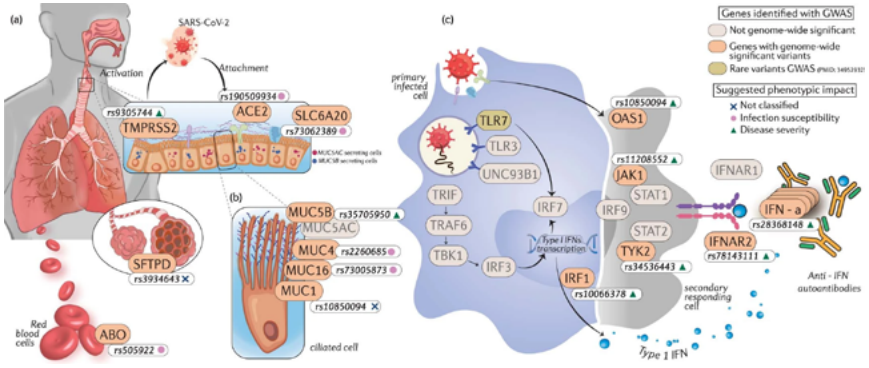
With the setting up of GCAT in 2013, IGTP opted for a stake in genomics medicine. After completing the recruitment phase, the cohort profile was published in the *British Medical Journal Open* in 2018 and GCAT published the first results of a range of projects. Two years after, the cohort showed its adaptability by quickly joining international consortia working on COVID-19, contributing to major publications on the genomic aetiology of the pandemic and its social consequences.

Currently, the research team of the cohort is collaborating on projects spanning diverse health areas such as cardiology, inflammatory diseases, respiratory diseases, diabetes, neuromuscular diseases or response to infectious disease (including COVID-19), joining a diverse interconnected network of Spanish and European consortia on Diabetes, Stroke, Long COVID, Urban exposome impact and work exposures.

COVID-19

As the culmination of a global genetic effort to unravel the genetics of COVID-19, the GCAT team once again collaborated with the COVID-19 Host Genetics Initiative to define the complete landscape of the disease.

In the following figure, the major COVID-19 biological pathways are illustrated, identifying susceptibility and severity using a GWAS approach as a dissection tool. This involves three main biological pathways: (a) viral entry and innate immunity, (b) defence at the entry in airway mucus, and (c) virus defence in tissues via the type I interferon pathways.

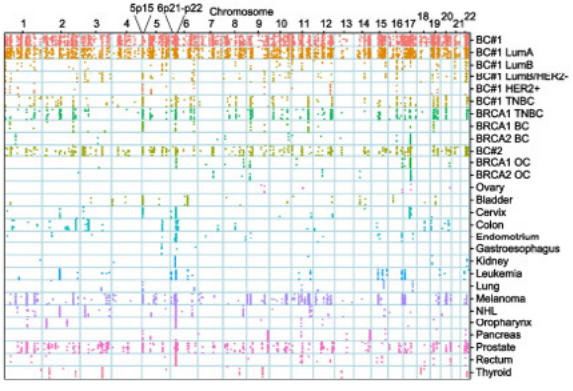


Major COVID-19 biological pathways mapped with susceptibility and severity GWAS loci. Source: COVID-19 Host Genetics Initiative. *Nature*. September 2023. DOI: 10.1038/s41586-023-06355-3

GENOME

GCAT executes its holistic approach by analysing the pleiotropic properties of genome variants, pleiotropism, defined a century ago as the phenomenon in which a single locus affects two or more distinct phenotypic traits.

In an innovative work, conducted in collaboration with Institut Català d'Oncologia (ICO), the team investigated pleiotropy in cancer and immunologically related traits. The immune system plays a central role in preventing carcinogenesis. Alterations in systemic immune cell levels may increase cancer risk. However, the extent to which common genetic variations influence blood traits and cancer risk remains largely undetermined. GCAT identified extensive pleiotropism between blood traits and cancer risk. This pleiotropism is linked to factors and processes involved in haematopoietic development and immune system function, including components of the major histocompatibility complexes and regulators of telomere length and myeloid lineage. Overexpression of pleiotropic-associated Y-RNA elements might indicate an increased risk of cancer.

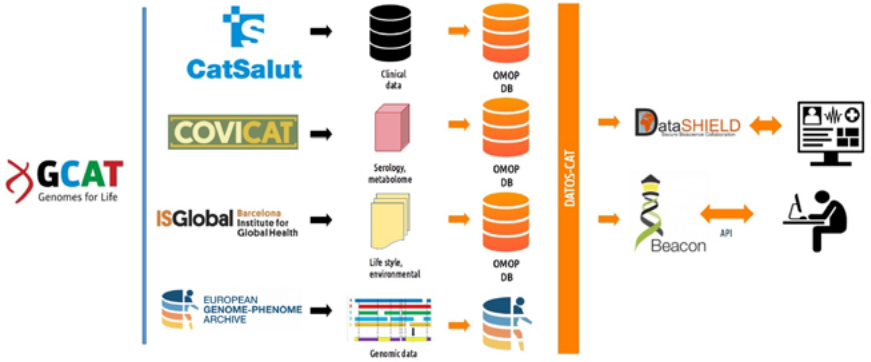


Graph showing the identified pleiotropic hotspots across human chromosomes 1–22. Source: Pardo-Cea et al. *Genome Medicine*. February 2024. DOI: 10.1186/s13073-024-01294-8

DATA: Implementation and Analysis of Databases in Precision Medicine

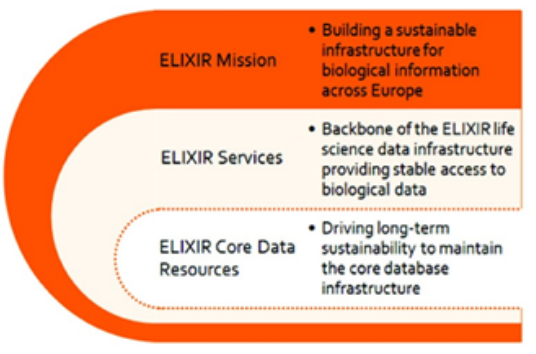
GCAT is committed to advancing personalised medicine, and long-term data collection such as that of the GCAT cohort is essential for tracking disease progression and understanding genetic and environmental risk factors.

However, the lack of standardised systems for collecting, storing, and sharing data among researchers and hospitals remains a challenge. The DATOS-CAT project addresses this gap by enhancing the visibility and scientific impact of Catalonia's population cohorts, including GCAT|Genomes for Life. This project aims to improve data interoperability in accordance with FAIR principles (Findable, Accessible, Interoperable, Reusable) and to facilitate its scientific use.



DATA: European distributed infrastructure for life science information

In 2023, GCAT joined the INB-ELIXIR-SPAIN node of ELIXIR, which is a European life sciences infrastructure that fosters collaboration among scientists from various countries and research institutes. Its goal is to enable researchers to efficiently access and analyse life science data, thereby amplifying the impact of life science research on domains such as public health, the environment, and the economy.



Highlighted publications

COVID-19 Host Genetics Initiative. **A second update on mapping the human genetic architecture of COVID-19.** *Nature*. 2023 Sep;621(7977):E7-E26. DOI: 10.1038/s41586-023-06355-3

Kogevinas M, Karachaliou M, Espinosa A, Aguilar R, Castaño-Vinyals G, Garcia-Aymerich J, Carreras A, Cortés B, Pleguezuelos V, Papantoniou K, Rubio R, Jiménez A, Vidal M, Serra P, Parras D, Santamaría P, Izquierdo L, Cirach M, Nieuwenhuijsen M, Dadvand P, Straif K, Moncunill G, de Cid R, Dobaño C, Tonne C. **Long-Term Exposure to Air Pollution and COVID-19 Vaccine Antibody Response in a General Population Cohort (COVICAT Study, Catalonia).** *Environ Health Perspect.* 2023 Apr;131(4):47001. DOI: 10.1289/EHP11989

Farré X, Blay N, Cortés B, Carreras A, Iraola-Guzmán S, de Cid R. **Skin Phototype and Disease: A Comprehensive Genetic Approach to Pigmentary Traits Pleiotropy Using PRS in the GCAT Cohort.** *Genes (Basel).* 2023 Jan 5;14(1):149. DOI: 10.3390/genes14010149

COMPARATIVE MEDICINE & BIOIMAGE CENTRE OF CATALONIA (CMCiB)

The Comparative Medicine & Bioimage Centre of Catalonia (CMCiB) is the translational medicine centre of the Germans Trias i Pujol Research Institute (IGTP), affiliated with the Germans Trias i Pujol University Hospital on the Can Ruti Campus in Badalona. The centre has been designed and equipped to accommodate and support a wide range of biomedical research and technological development projects while maintaining strict sustainability and research standards within the 3R policy.

CMCiB is a state-of-the-art high-tech biomedical research centre uniquely designed to support preclinical translational research, from the earliest stages of research to product development, across all fields of biomedicine. It serves a diverse clientele, ranging from Catalan research groups and centres to international private companies, and has multiple strategic partners. It offers opportunities for advanced biomedical research, innovation in surgery, and technological development, with expert consulting services and cutting-edge training programs for healthcare professionals and researchers worldwide. CMCiB is one of the few centres in southern

Europe that is part of the European 3R network, and since 2021, it has been accredited for Good Laboratory Practices (GLP). This accreditation has allowed CMCiB to participate in the validation of various medical devices and products currently in clinical validation or in the process of obtaining CE marking.

Highlights

2019-2023

>300
Approved studies

>10
Strategic partnerships

>100
Clients worldwide

>500
Researchers registered at CMCiB

>300
Volunteers in bioimaging projects (Human MRI)

2023

48
Ethical approved animal procedures

15
New clients

123
New registered researchers

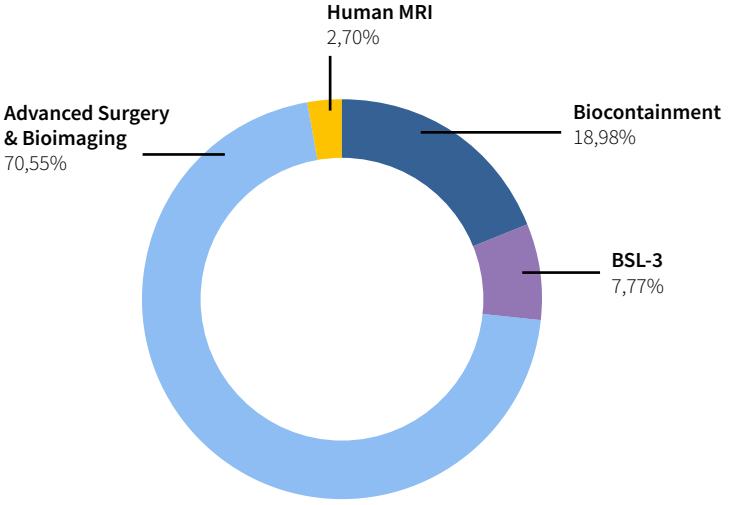
~150
Volunteers in bioimaging projects (Human MRI)

>400
Advanced surgical trainings

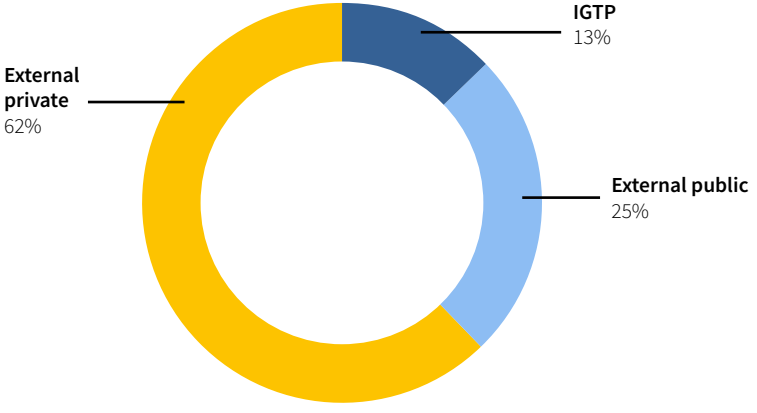
>1,200
Trained KOL's/surgeons

>300
Visitors

REVENUES PER ACTIVITY



REVENUE STREAMS



Highlights

- More than 60 disease models and 20 surgical techniques
- New super-resolution confocal microscope (BSL-3 facility)
- Increase of the number of Advanced Surgical Trainings
- Increase of industrial customers (Medical Device validation)
- Animal trial support in several EU consortia and International/national research projects – RECOGNISED, TriAnkle, Tiny Brains, ISIDORe, TuBerculosis Vaccine Initiative (TBVI), IMPROVE, SENSO-eAxon – in multiple therapeutic areas (regenerative medicine, neurology, infectious diseases, oncology, respiratory, etc.) with different animal models or alternative methods (Organoids, alternative tissue models, computer simulator, *Drosophila melanogaster*, rodents, porcine and ovine models)
- GLP certification renewal
- Set-up infrastructure Computational Anatomy Unit
- Consolidation imaging management System (PACS)+data Distribution platform
- Increase in MRI image analysis demands (~70%)
- Institutional visits from ISCIII's director and Catalan Minister of Research and Universities

3R Programs

Replacement	Reduction	Refinement
45% use of alternative models	60% use of bioimage techniques	583 participants in CMCiB 3R seminars

- CMCiB participates in the COST Action "3Rs concepts to improve the quality of biomedical science" (IMPROVE), which started in 2022 and will end in 2026.
- CMCiB took part in the 2023 Meeting of the Sociedad Española para las Ciencias del Animal de Laboratorio (SECAL).

Accreditations and partnerships

CMCiB renews its certificate of compliance with Good Laboratory Practices (GLP) for the preclinical validation of medical devices

CMCiB participates in the preclinical studies of Rob Surgical's surgical robot, the first one designed and manufactured in Catalonia

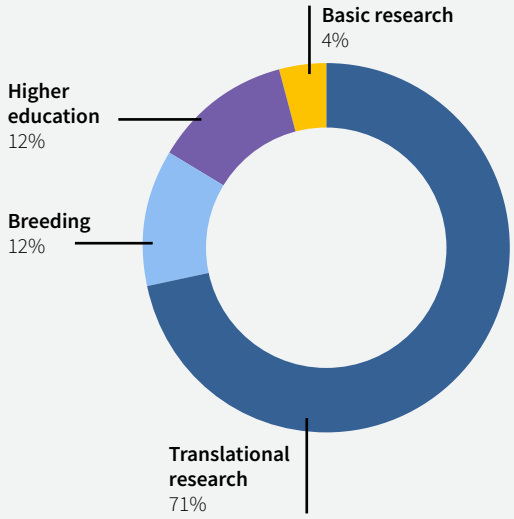
EMA gives green light to HIPRA's COVID-19 vaccine as a booster

Projects

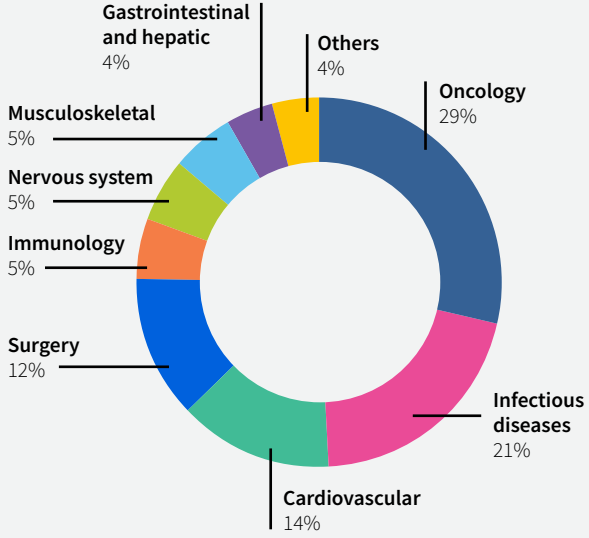
73

Projects

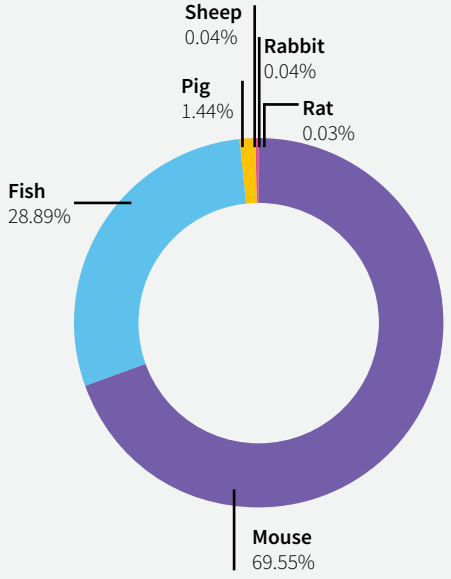
% OF PRECLINICAL PROJECTS BY CATEGORY



% OF PROJECTS BY SPECIALTY

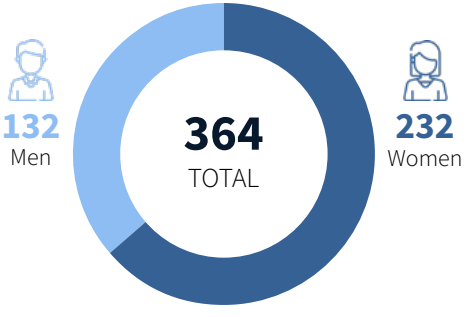


% OF ANIMALS USED BY SPECIES

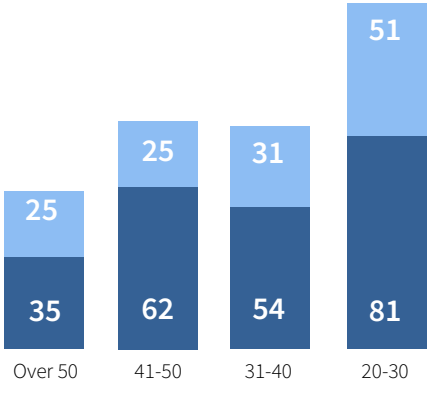


Staff

CONTRACTED STAFF

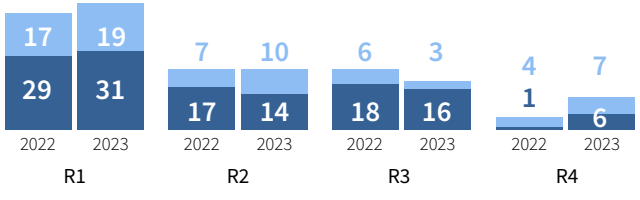


Age

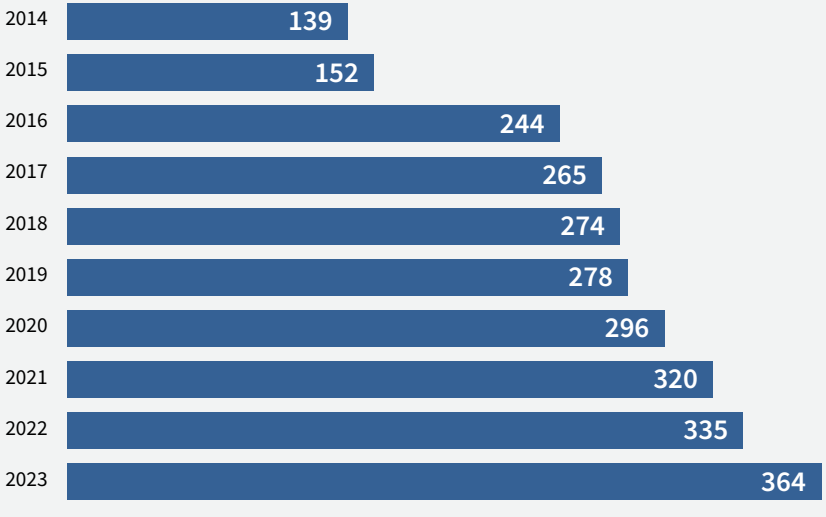


Professional categories

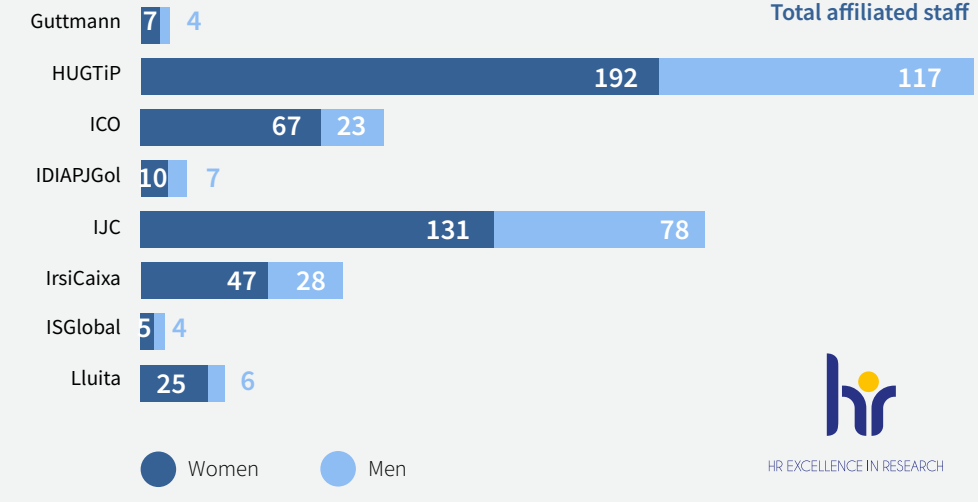
Researchers



STAFF EVOLUTION



AFFILIATED STAFF



HR EXCELLENCE IN RESEARCH

Research support units

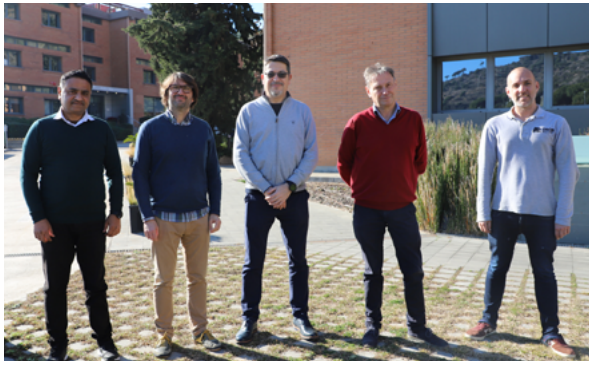
Communications Unit
Promotion of the research activity conducted at IGTP, both externally and internally.

Core Facilities and Services
Centralisation of procedures and equipment, favouring researchers' access to advanced technology and offering experience in highly complex techniques.

Data Protection Unit
Implementation and functioning of the transversal quality management system.

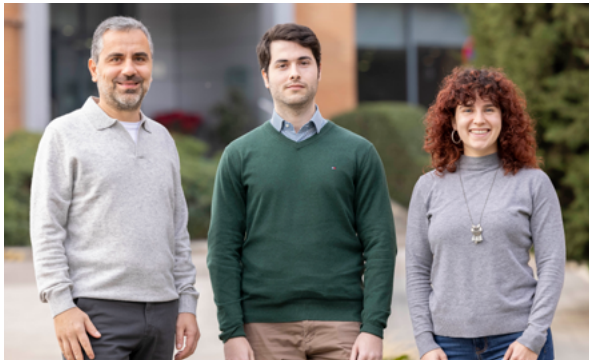
Finance Unit
Provision of economic and financial information for the management team and other agents who require it.

Fundraising Unit
Enhancement of philanthropic engagement for the Can Ruti Campus.

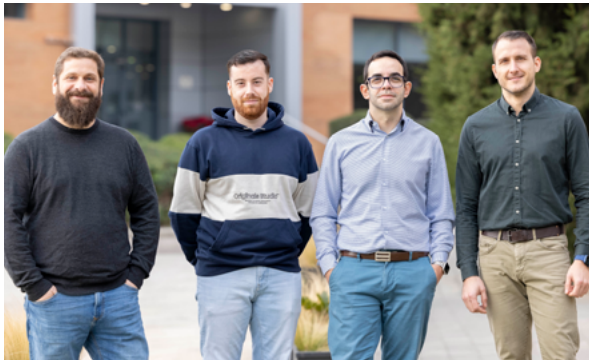


General Services Unit
Support to all personnel, ensuring access to the high-quality infrastructure.

Research support units

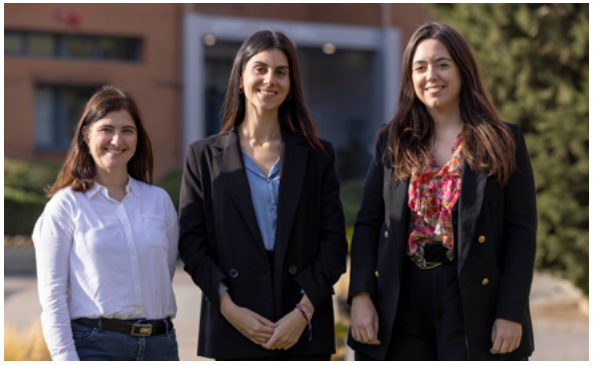


Innovation & Business Development Unit
Comprehensive assistance throughout the innovation process in healthcare to facilitate the transfer of technology developed by research personnel.



IT Unit
Provision of the technical tools needed to carry out the work of personnel.

Laboratory Management Unit
Support of laboratory operations, encompassing equipment management, safety protocols, and coordination of auxiliary services.



Legal Services Unit
Reinforcement of legal compliance and security.

People Management Unit
Guarantee of human resources services, fostering a positive environment to promote the potential of the members of the institution.

Project Management Unit
Securing of competitive funding at both national and international levels.

Research support units

Purchasing Unit
Support and advice to comply with the law and maximise value for money.

Scientific Management and Technical Secretariat
Management of scientific governance, strategic planning, and RRI compliance, along with scientific monitoring and institutional reporting.

Can Ruti Working Group Women in Science (WiS)

The independent Can Ruti Working Group Women in Science (WiS) continued its activities with the support of IGTP. Members of WiS are volunteers from institutions across the campus with an interest in promoting a data-driven approach to gender equality in research institutes and also gender perspective in biomedical research. It promotes awareness and understanding through sessions open to everybody.

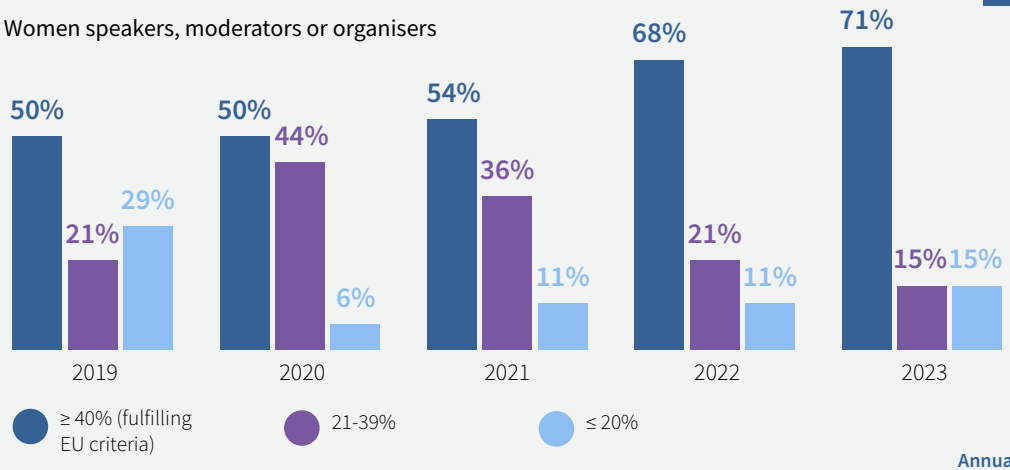
In 2023, WiS held its fifth symposium to celebrate the International Day of Women and Girls in Science on 11 February. The meeting centred on "Integrating Intersectionality and Gender Perspective in Research". In September, WiS organized the seminar "Abortion, where are we and where are we headed?" which combined the views of a medical practitioner and a sexual and reproductive rights activist in the light of recent regressive changes in legislation in several countries in the world.

WiS writes to all the organisers of events identified by its observatory each year in order to raise awareness of the need for inclusive meetings.

WOMEN'S PRESENCE IN CAN RUTI CAMPUS SCIENTIFIC EVENTS IN 2023

Equality at IGTP

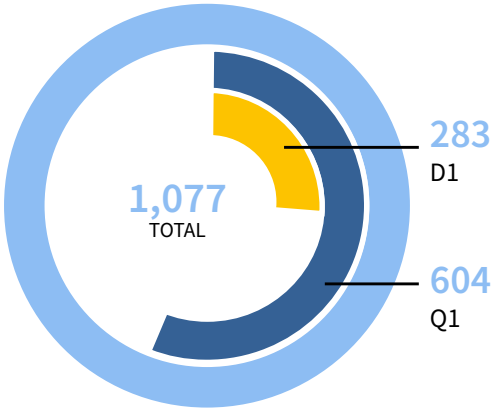
Women speakers, moderators or organisers



Research and innovation outputs

Research and innovation outputs

Scientific publications

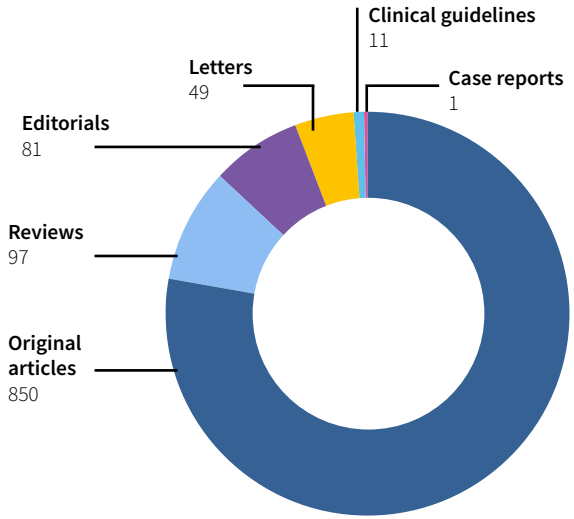


9.06

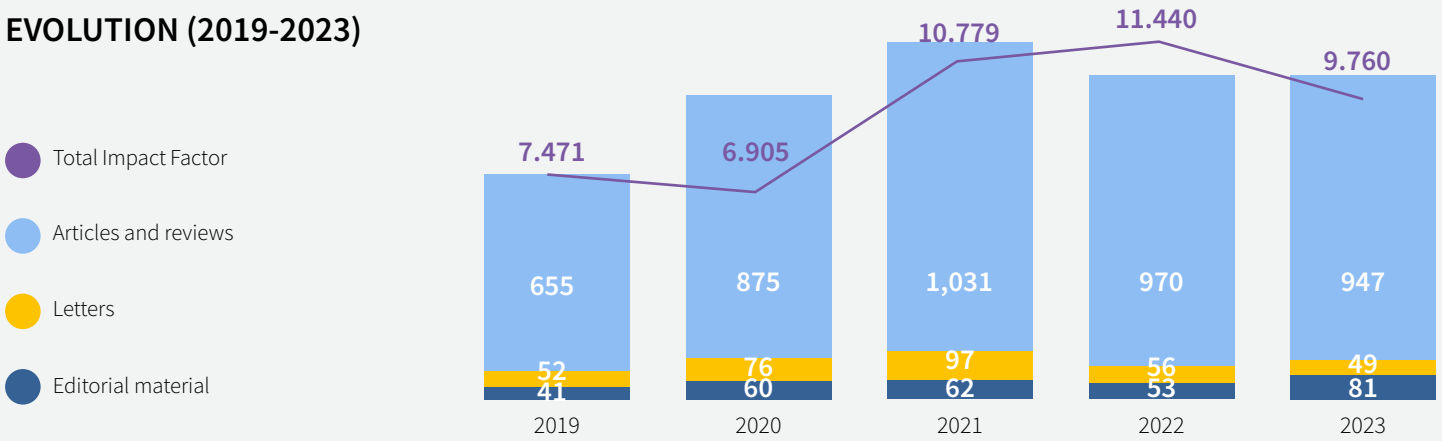
AVERAGE IMPACT FACTOR

9,760

TOTAL IMPACT FACTOR



EVOLUTION (2019-2023)



Innovation and technology transfer

As outlined in its strategic plan, IGTP aims to enhance and solidify its culture of innovation, as well as actions directed towards supporting processes in innovation and technology transfer.

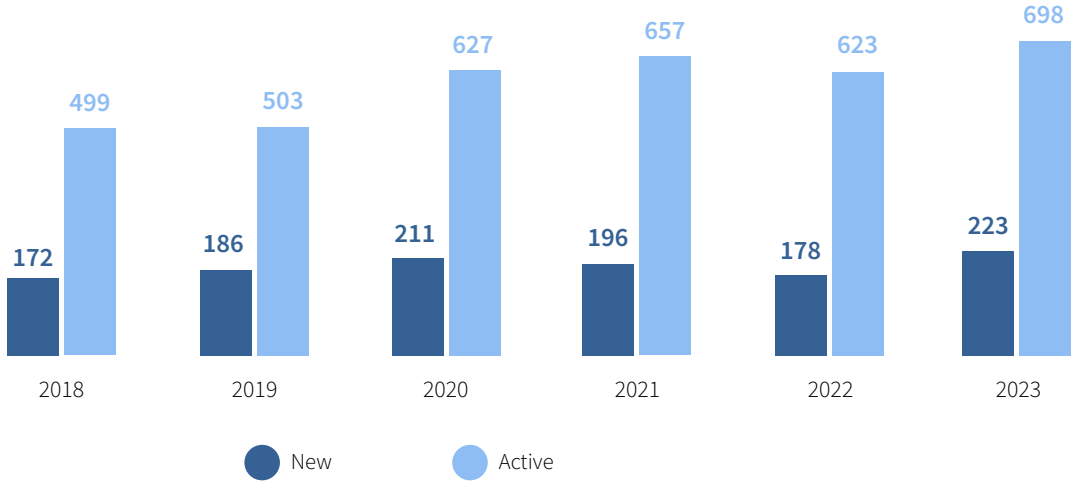
In 2023, the institute secured €899,998 through various calls for innovative projects such as “UPPLong: enabling high value care in ulcers management”, “Fibrokit”, “Novel immunotherapy strategy for targeting macrophages in solid cancers”, and “RACE Plus: AI-driven application to allow pre-hospital diagnosis and management of stroke patients”. IGTP’s researchers also published 11 clinical guidelines which will ensure the integration of the latest research into clinical practice, and ultimately improve patient outcomes.

Check innovation-oriented news on the IGTP website

Clinical trials

Between 2021 and 2023, a thorough review of the activity and functioning of the circuits and processes associated with the management of clinical research at the Campus was conducted. This review highlighted several key needs. Firstly, the need to increase the recruitment of studies and clinical trials was identified. Additionally, the importance of strengthening the economic and legal review of contracts, including aspects such as data protection, was noted. Finally, the need to improve the management and support processes for clinical research was emphasised.

The objectives of this reorganisation are clear and ambitious. Firstly, it aims to increase clinical trial activity, making the Germans Trias i Pujol University Hospital a more attractive site for conducting these studies. Moreover, it seeks to expedite the clinical trial approval process. To achieve these objectives, the creation of a clinical research support area has been proposed, which will provide the necessary support to streamline and enhance research processes. This initiative has been approved by the board and is included in the Strategic Plan.



Patents and license agreements

ACTIVE PATENTS/FAMILIES

204
ACTIVE PATENTS (41 NEWLY GRANTED IN 2023)

39
ACTIVE PATENT FAMILIES

25
ACTIVE PATENT APPLICATIONS

59%
LICENSED PATENTS

10
TECHNOLOGY OFFER PORTFOLIO

24
ACTIVE LICENSE AGREEMENTS

22
NEW IDEAS

7
INCUBATED PROJECTS

Spin-offs

Researchers from IGTP have founded 8 spin-offs since 2013. These companies leverage cutting-edge research to develop innovative products, fostering the translation of scientific discoveries into practical applications that benefit society.

HIGHLIGHTS

- **Ahead Therapeutics** successfully closed a funding round with Capital Cell, raising €1.3 million. Read more
- **Biointaxis** received a €1.8 million grant from CDTI under the CERTERA program (Consorcio de Terapias Avanzadas) for gene therapy for Friedreich's ataxia. Read more
- **Time is Brain** won the first prize in the MedTech category of the EIT Health Catapult 2023 competition, a program created by EIT Health to support European health startups. Read more
- **Aniling**, in collaboration with IGTP and ICO, was awarded €1.8 million by the Spanish State Research Agency (AEI) for the development of a new theragnostic tool to personalise the management of colorectal cancer (CRC) patients. Read more
- **NIMBLE Diagnostics** was awarded €2.5 million within the EIC Accelerator, one of the 47 companies selected from 15 countries out of a total of 648 proposals. Read more. The spin-off also closed a funding round led by Grow Ventures together with Namarel Ventures and Inveniam Group where they have secured more than one million euros. Read more

MANREMYC Health first

Founded in 2013

innovex Therapeutics, S.L.

Founded in 2014

aniling accelerating epigenomics

Founded in 2014

AHEAD THERAPEUTICS

Founded in 2017

Biointaxis

Founded in 2018

timeisbrain

Founded in 2020

breaz

Founded in 2021

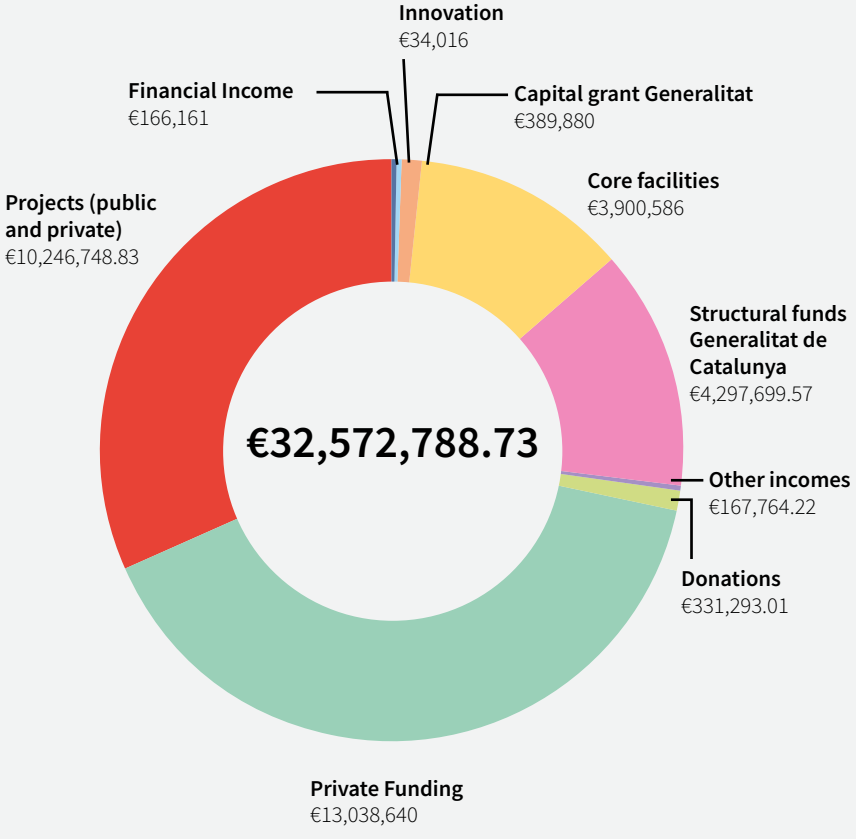
NIMBLE Diagnostics

Founded in 2022

Funding

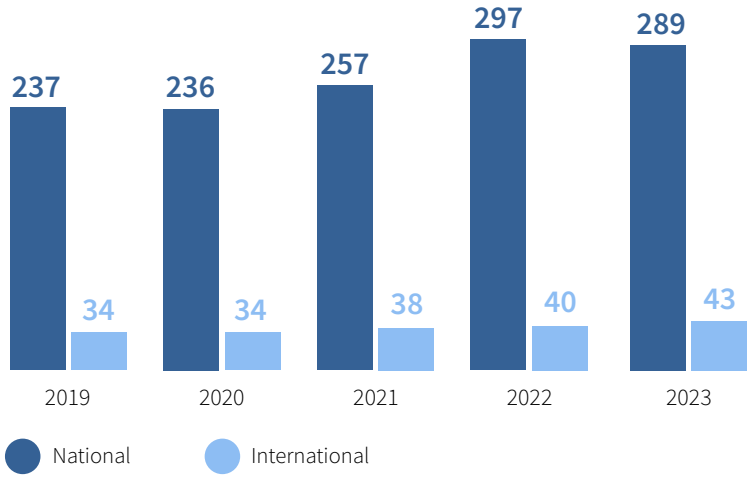
Funding

Sources of funding

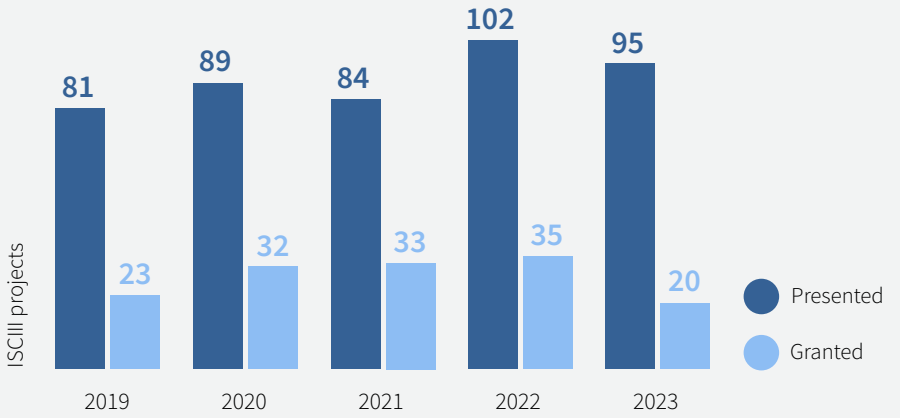


Competitive projects

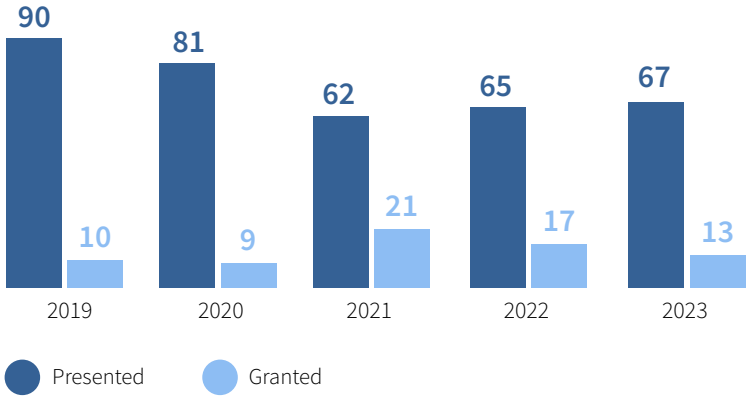
ACTIVE PROJECTS 2019-2023



ISCIII FUNDED PROJECTS 2019-2023



INTERNATIONALLY FUNDED PROJECTS 2019-2023



TOTAL SUBMITTED PROJECTS 2023

92	24	24	35
21	11	22	77

Others

Highlights

IGTP researchers were involved in a variety of ambitious projects. New initiatives such as EURONET-NF, aimed at improving genetic diagnostics for patients with neurofibromatosis and schwannomatosis, and InMaM, which focuses on innovative immunotherapies for treating breast cancer, were launched. Ongoing efforts like the COVICAT-CONTENT study were also continued.

Throughout the year, there were frequent announcements about new granted projects, some in collaboration with the institute's spin-offs, including nearly €2 million in state funding to develop advanced gene therapy for Friedreich's ataxia and a diagnostic tool for personalised management of colorectal cancer. Others were directly coordinated by IGTP, like the paediatric liver cancer research project which received €1.2 million from the Spanish Cancer Association, or involved in, such as a project exploring chrono-nutrition and cardiometabolic disorders from an epigenetic perspective, funded by La Marató de TV3.

Two noteworthy European projects IGTP will participate in are Hypiend and the THRIVE project, which are funded by European Union's Horizon Europe program and have big budgets of 7.1 and 12 million euros, respectively. Hypiend aims to comprehensively understand and prevent the impact of endocrine disruptors on sensitive populations, while the THRIVE project seeks to improve outcomes for both paediatric and adult liver cancer patients.

Another highlight was the awarding of two projects supported by the "la Caixa" Foundation, one featuring the first urine test that detects renal fibrosis as an alternative to renal biopsies, and another applying artificial intelligence to rapidly categorise stroke patients to enhance their recovery prospects. Last but not least, the Talents Program, partly funded by IGTP, continued to grant scholarships to nearly twenty professionals linked to Germans Trias.

Networks

Researchers from IGTP are actively involved in various networks, which help integrate their research efforts with others, fostering cooperation and advancing shared goals.

21

Groups accredited by the Government of Catalonia SGR-Cat 2021: The Generalitat de Catalunya recognises 21 IGTP groups as Consolidated or Emerging Research Groups

6

Groups within Centros de Investigación Biomédica en Red (CIBER), including the thematic areas CIBERESP, CIBEREHD, CIBERES, CIBERINFEC and CIBERCV

5

PIs within Redes Temáticas de Investigación Cooperativa en Salud (RETICS)

IGTP's Clinical Trials Unit (UPIC) participates in SCReN, ISCIII's Clinical Research Support Platform

Program of Advanced THerapies (PATH group) within Consorcio Estatal en Red para el desarrollo de medicamentos de TERapias Avanzadas (CERTERA)

European Commission ERIC (EATRIS)

eatris Expert Centre

IGTP was appointed as 'EATRIS Expert Centre'

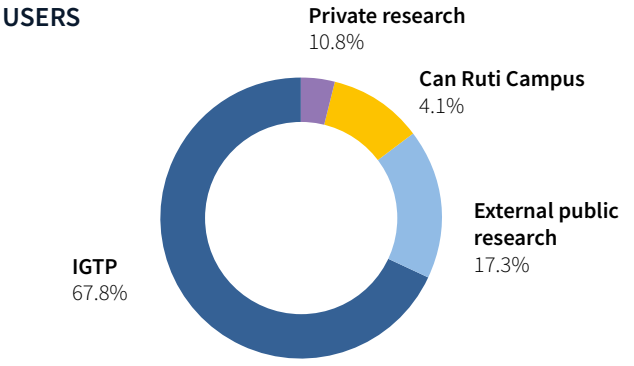
Core facilities

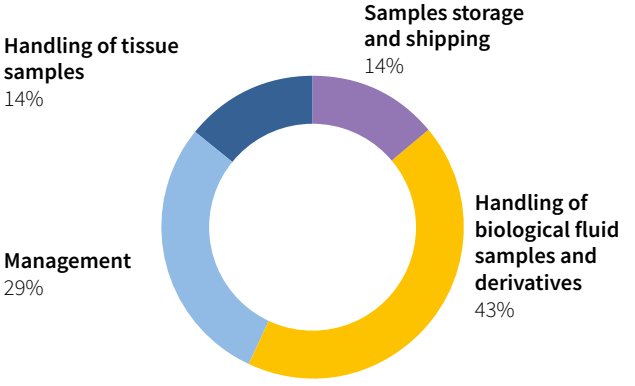
BIOBANK

6

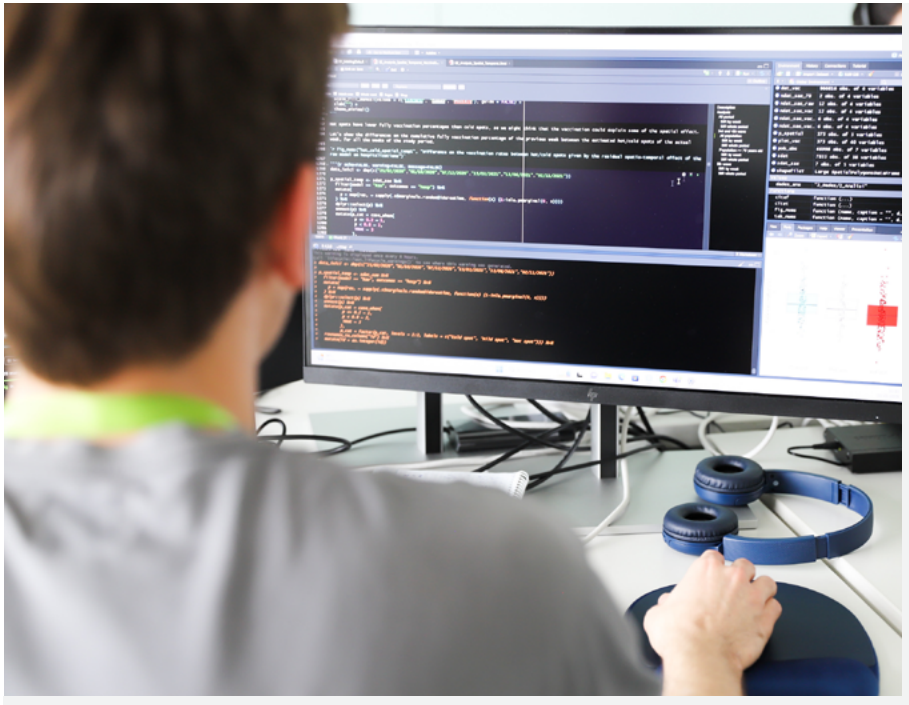
MEMBERS

- New robot for the extraction of nucleic acids: Chemagic 360 (@PKIGenomics), certified by in vitro diagnosis (IVD) with the European CE mark.
- Participation with 2 accepted communications (an oral presentation and a poster) at the XVIII SECAL Congress held in Santiago de Compostela in November.
- New Biobank facilities: on the second floor of the IGTP Muntanya Building (lab P2-7).
- Presence of the Biobank at the Support Platforms for I+D+I in Biomedicine and Health Sciences of the ISCIII, held in Cadiz in October.
- Celebration of 10 years since the Biobank's authorisation by the Department of Health on April 16, 2013.





BIOSTATISTICS

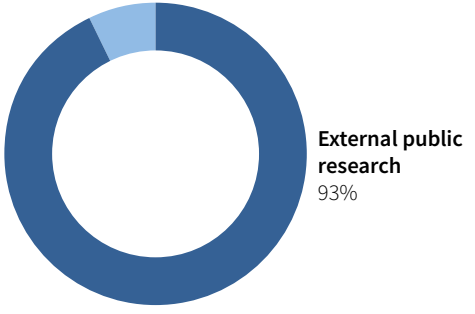


4

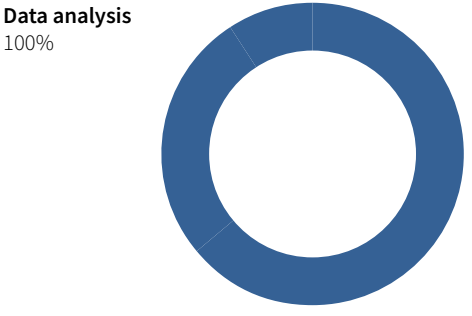
MEMBERS

- Constitution as a new platform of IGTP in May.
- Participation in a scientific article as co-authors: Mateu L et al. *Lancet Reg Health Eur.* September 2023. DOI: 10.1016/j.lanepe.2023.100724.
- Five oral communications presented at the National Biostatistics Congress (Vigo), and at the R Program (Barcelona).

USERS



SERVICES

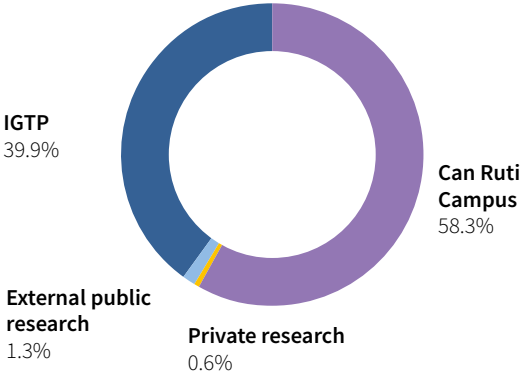


CRYOBIOLOGY

1

MEMBER

USERS



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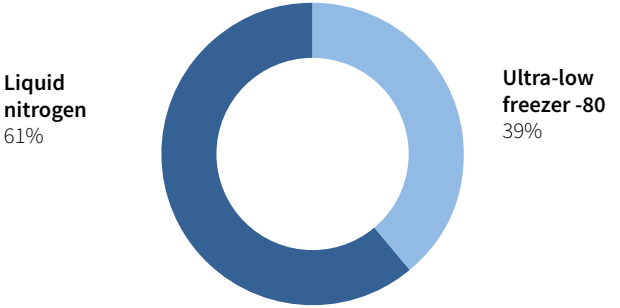
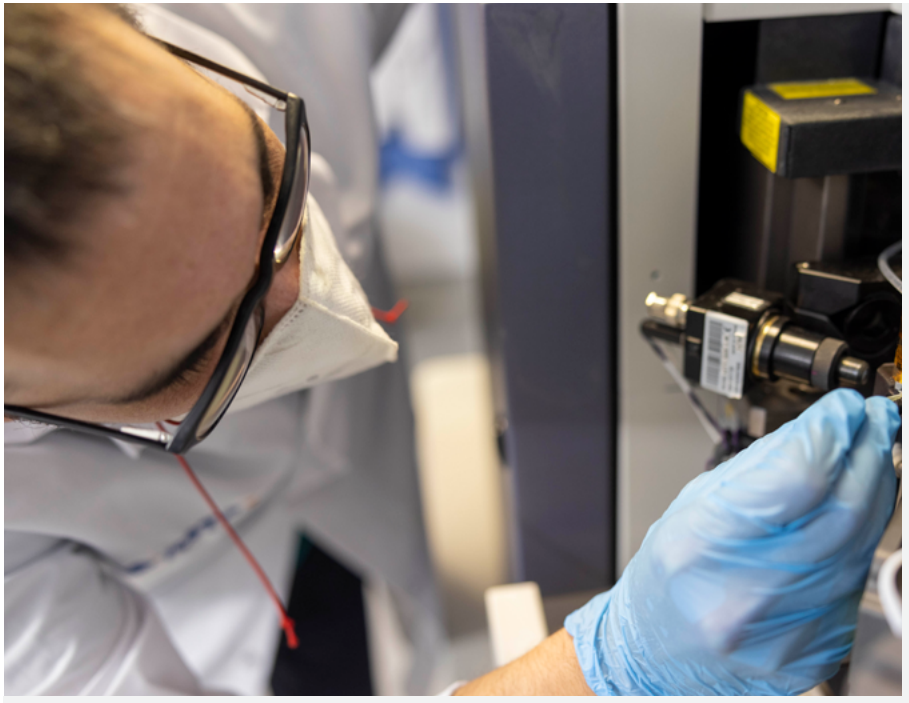


CYTOMETRY



3

MEMBERS

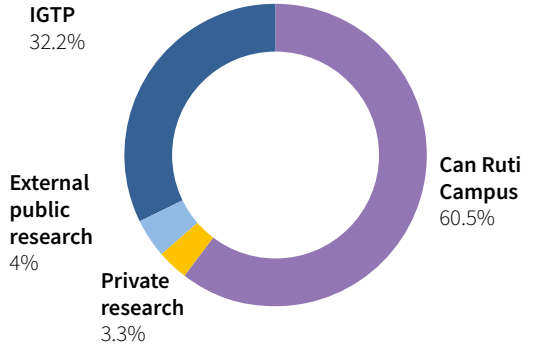
- Gerard Requena taught a session of the flow cytometry module of the Master of Advanced Immunology at the UAB entitled “Cellular separation. Isolation of rare populations” on February 21 at the Faculty of Biology.
- Participation in three scientific articles as co-authors:

  Álvarez-Sierra D et al. *J Autoimmun*. April 2023. DOI: 10.1016/j.jaut.2023.103013

  Magallón-Lorenz M et al. *iScience*. January 2023. DOI: 10.1016/j.isci.2023.106096

  Salvia R et al. *MethodsX*. February 2023. DOI: 10.1016/j.mex.2023.102057

USERS



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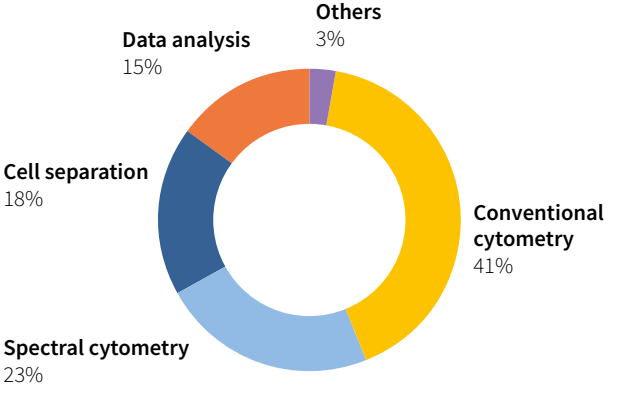
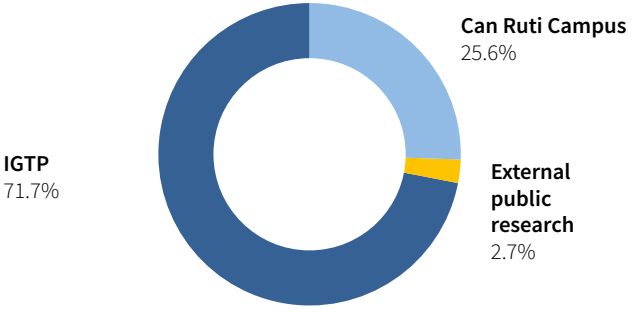


HIGH PERFORMANCE COMPUTING

1

MEMBER

USERS



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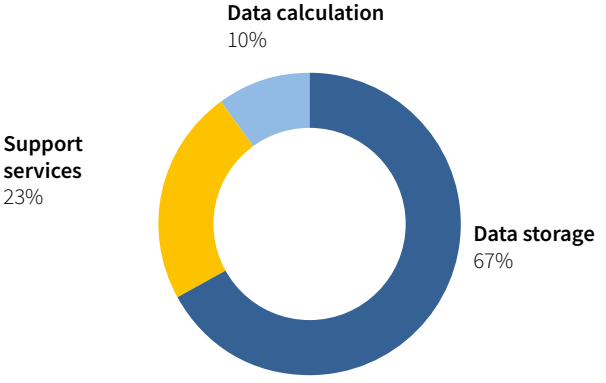


HIGH CONTENT GENOMICS AND BIOINFORMATICS

4

MEMBERS

- The scientific platform received funding from three competitive projects:

  Funding agency: ISCIII (PI22/01498). From: 2023 to: 2025. PI: Eugeni Domènech - co-PI: Lauro Sumoy.

  Funding agency: AGAUR (2021 SGR 01537), Generalitat de Catalunya. From: 2022 to: 2025. PI: Concepció Violan.

  HORIZON-INFRA-2021-EMERGENCY-02, INFRA-SERV Actions. Funding agency: EU. From: 2024 to: 2025. IGTP partner PI: Lauro Sumoy.

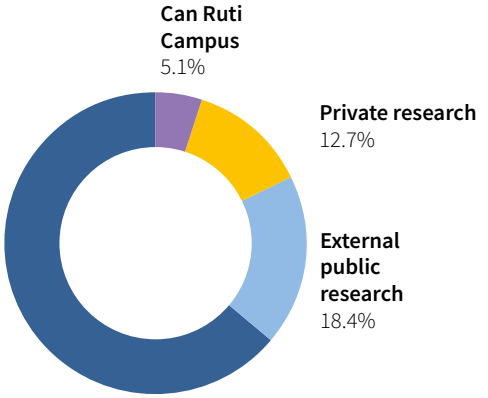
- Participation in three scientific articles as co-authors:

  Ferre A at al. *Int J Mol Sci.* October 2023. DOI: 10.3390/ijms242015436

  COVID-19 Host Genetics Initiative. Nature. September 2023. DOI: 10.1038/s41586-023-06355-3

  Larriba S et al. *Andrology.* May 2023. DOI: 10.1111/andr.13461

USERS



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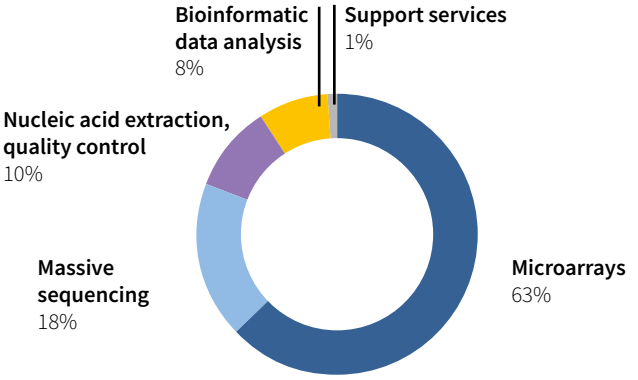


MICROSCOPY

1

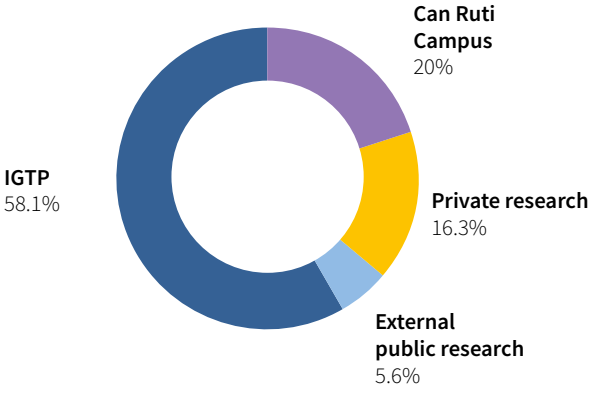
MEMBER

- Two new confocal microscopes introduced into the facility.

  CMCiB NCB3 Abberior Infinity microscope.

  Abberior STEDYCON workhorse confocal.
- Two seminars, half-yearly newsletter and Image of the Month and Year competition ensured a good level of communication with the users.

USERS



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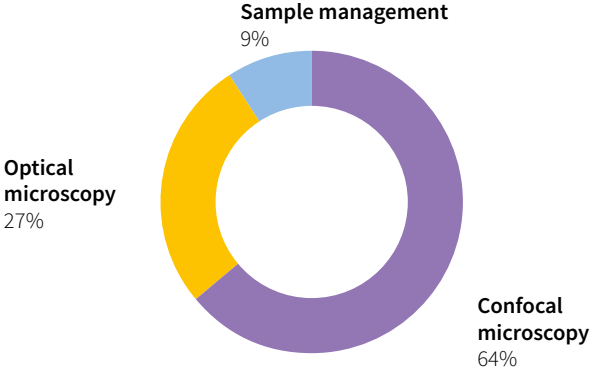
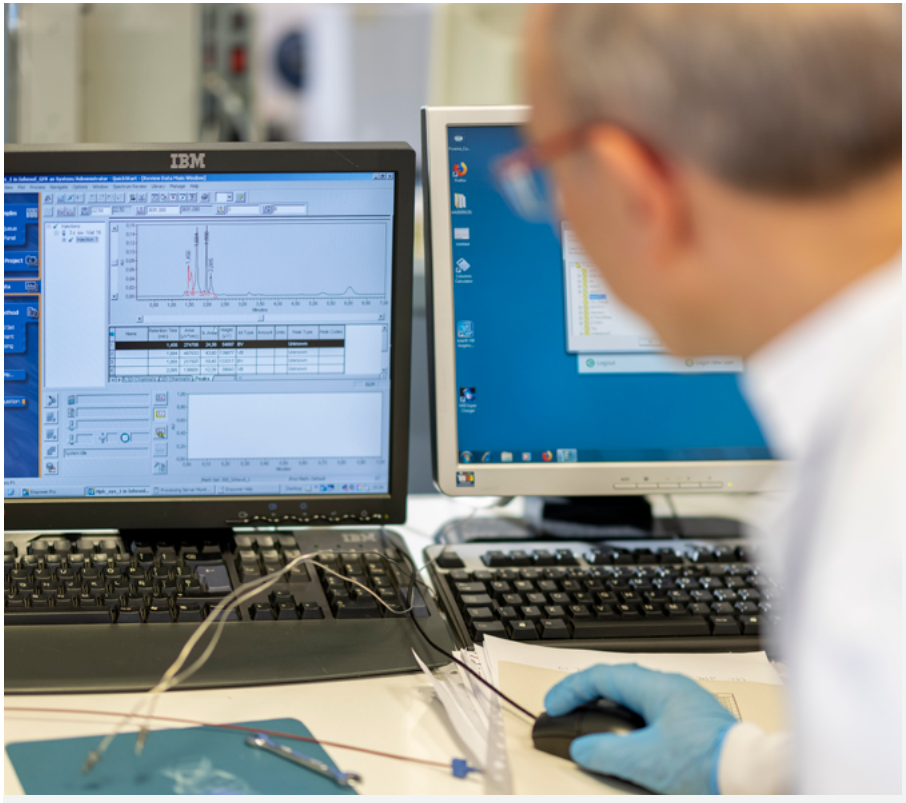


PROTEOMICS AND METABOLOMICS

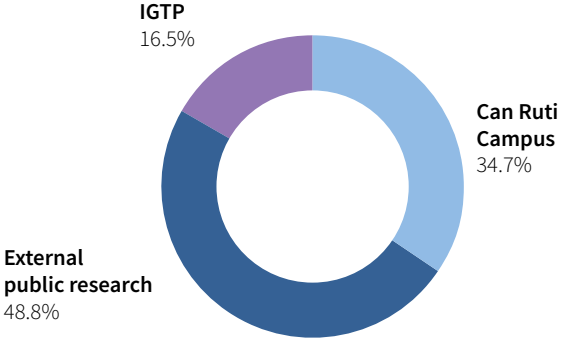


2

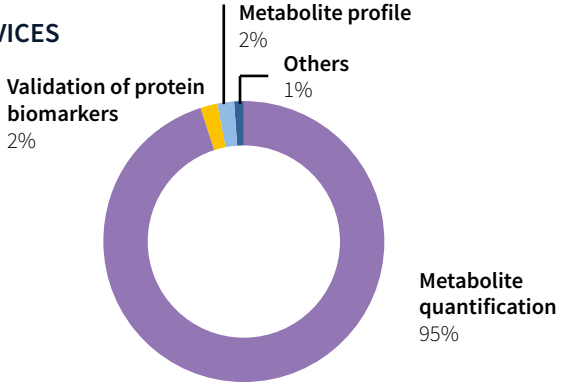
MEMBERS

- New service for detecting bile acids in different tissues, which until now was only analysed in urine and serum.

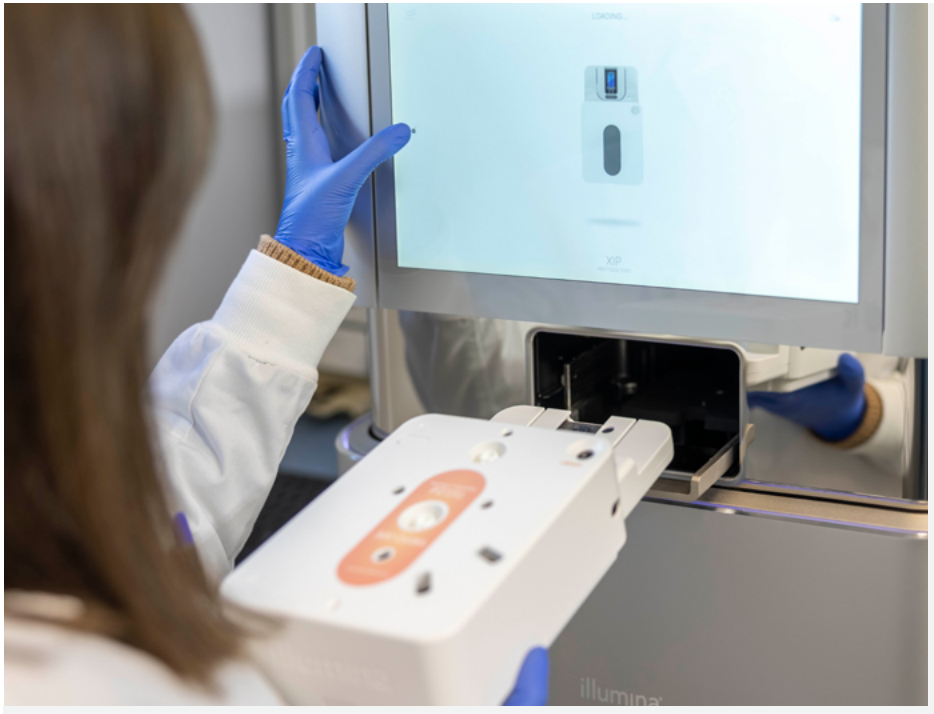
USERS



SERVICES



TRANSLATIONAL GENOMICS

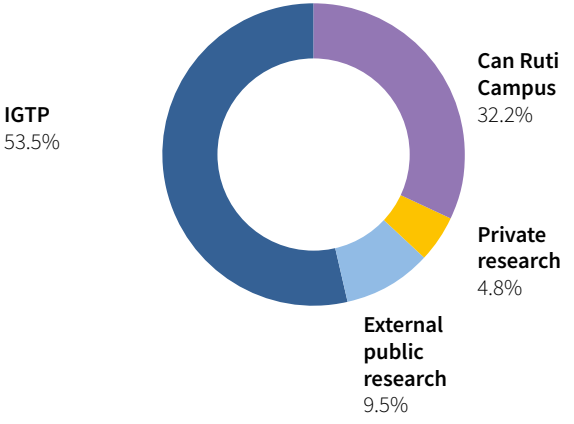


3

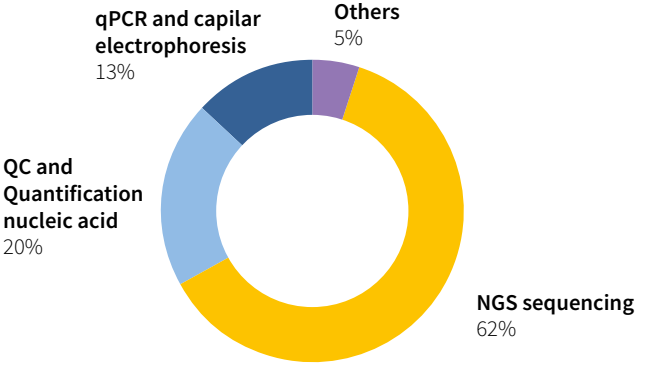
MEMBERS

- Participation in a scientific article as co-authors: Gomez-Muñoz L et al. *Noncoding* RNA. February 2023. DOI: 10.3390/ncrna9020017
- The scientific platform received funding from one competitive project in collaboration with ICO Badalona-Translational Genomics IGTP-Illumina SL, FOR Methodological standardization for the detection of mutations in the BCR-ABL translocation involved in CML using NGS.
- First phase of the Q1 CERCA-GINYS accreditation achieved.

USERS



SERVICES



	PROJECTS SERVED	PIS SERVED
Biobank	75	60
Biostatistics	8	8
Cryobiology	51	44
Cytometry	39	35
High Performance Computing	18	14
High Content Genomics and Bioinformatics	17	16
Microscopy	36	26
Proteomics and Metabolomics	9	9
Translational Genomics	50	39

Fundraising

AMICS DE CAN RUTI

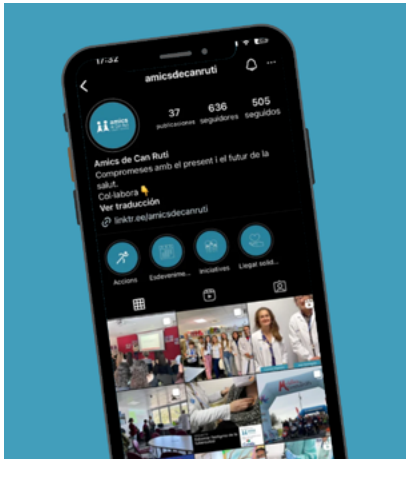
764

Amics de Can Ruti members

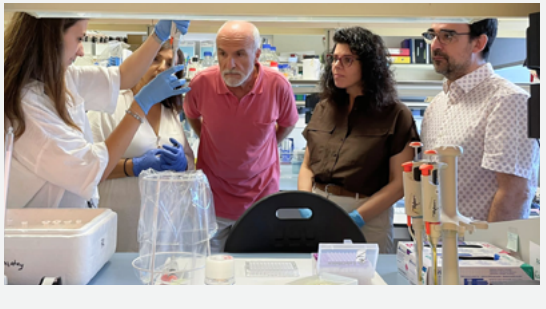
€368,025

In donations received in 2023

FOLLOW US ON INSTAGRAM



2023 HIGHLIGHTED ACTIONS



- 5th Face to Face fundraising campaign to acquire new donors
- Donations for research grants
- Development of strategic plan for Amics de Can Ruti program
- Stand with charitable products at Sant Jordi Fair in Badalona
- Charity race and gala to raise awareness and funds for rare diseases
- 4th charity golf tournament for research in thyroid cancer
- Visits to IGTP laboratories for Amics de Can Ruti members
- Science talks in schools, libraries, museums and companies
- Campaign in 150 stores of Badalona to promote the work of Amics de Can Ruti
- Ad campaign on buses to attract new donations

Training and events

Training and events

Doctoral theses

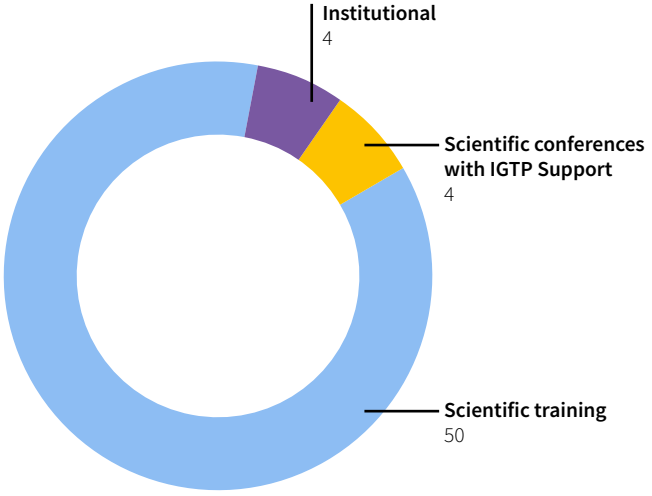
49

Number of theses read in the academic year 2022-2023

Activities

Women in Science symposium	1
CARE workshop	1
EATRIS Meeting	1
IGTP Scientific Retreat	1
Can Ruti Campus PhD Day	1
GEIVEX workshop	1
Group Leaders Meeting	2
BioinfoTalks	15
Core Facility Seminars	8
CMCiB 3Rs Training	8
Coffee Talks	32
ITS Seminars	2
TOTAL	**73**

IGTP EVENTS 2023



> 2,500

People attending

65%

Women attending (ranging from 30-86%)

54%

Women organisers and speakers

Highlighted events

In 2023, IGTP organised events and initiatives that underscored its commitment to advancing translational research and community engagement.

On 25 October, IGTP and EATRIS held the "Translational Research and Innovation through EATRIS" workshop to strengthen collaborative efforts across Spain and Europe, focusing on the role of EATRIS's infrastructure in advancing patient-centric research.

The 14th Research Conference of the Catalan Institute of Health (ICS), organised jointly with IGTP as part of the 40th anniversary of the Germans Trias i Pujol University Hospital, took place on 13 November. It highlighted the transformative potential of artificial intelligence and advanced therapies in healthcare, emphasizing the integration of AI and data into future clinical practices.

The third IGTP Scientific Retreat – Research and Networking on the Can Ruti Campus, held on 1 December, was a two-day event that successfully brought together professionals and researchers. This gathering was designed to share the latest advances and foster new connections in medical research. Key objectives included showcasing ground-breaking research, discussing future directions aligned with the IGTP Strategic Plan, and enhancing networking opportunities focused on ageing and patient-centric approaches.

The campus also celebrated another year of academic and community spirit on 9 June with the 5th PhD Day and the Summer Partywhich brought together more than 100 PhD students.

Through these events, IGTP demonstrated its dedication to fostering a collaborative environment that not only advances scientific research, but also engages the community through various initiatives.

IGTP community events 2023

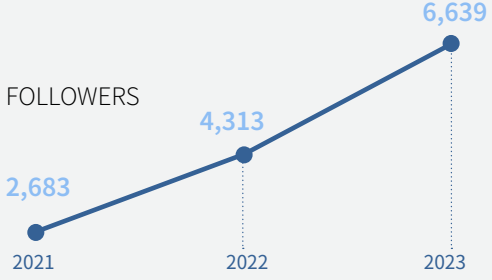
Communication and outreach

Communication and outreach

GROWING ON SOCIAL MEDIA

LINKEDIN

145
POSTS



X

871
POSTS

9,987
FOLLOWERS

GENERATING CONTENT

72
NEWS STORIES

15
NEWS PUBLISHED IN THE WRITTEN PRESS

113
INTERNAL COMMUNICATIONS

55
NEWSLETTERS AND *ACTIVITIES THIS WEEK* BULLETINS

211
NEWS PUBLISHED IN DIGITAL MEDIA

29
NEWS IN AUDIOVISUAL MEDIA

195
DAILY NEWS CLIPPING

181,886
WEBSITE VISITS

TRAINING

31 May

How can we communicate research results?

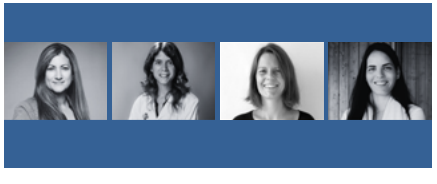
Núria Jar, freelance science journalist

MOST RELEVANT NEWS

Check the latest IGTP news

MARCH
IGTP premieres the podcast 'Un bri de ciència'

MARCH
IGTP receives the visit of Cristóbal Belda, director of the Instituto de Salud Carlos III

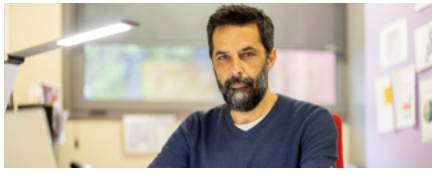


APRIL
Four IGTP spin-offs selected in the WomenTechEU call

JUNE
The Catalan Minister Nadal highlights "the uniqueness" of facilities like the Comparative Medicine and Bioimage Centre in the research system that promotes "biomedical innovation"

JULY
IGTP's latest platform: the Biostatistics Unit

JULY
IGTP's Innovation Unit receives AENOR's R&D&I Certification



SEPTEMBER
New research identifies 28 genetic regions linked to susceptibility and severity of COVID-19

OCTOBER
Two projects from IGTP funded by "la Caixa" Foundation to transition their innovative research from the laboratory to patients

NOVEMBER
High school students visit the Can Ruti Campus in a new edition of the Science Week in Badalona

DECEMBER
The third IGTP Scientific Retreat proves a success

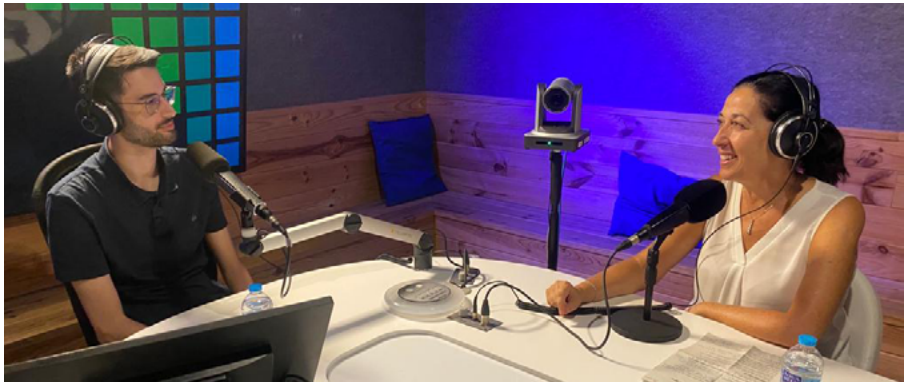
OUTREACH

As noted in IGTP's strategy, the centre is committed to promoting communication, visibility, and social impact. In addition to disseminating researchers' work through conventional media, the institute has initiatives that bring science closer to society, especially young people, and encourage their participation.

#100tífiques 2023

Can Ruti Open House

Visita la recerca - La Marató de TV3



Un bri de ciència

Research areas and groups

Research areas and groups

The research activity at IGTP is conducted within nine scientific areas, to which the various research groups belonging to the institute are affiliated.

- Cancer
- Cardiovascular and Respiratory Disease
- Community Health
- Diseases of the Liver and Digestive Tract
- Endocrine and Diseases of the Metabolism, Bones and Kidneys
- Immunology and Inflammation
- Infectious Diseases
- Neuroscience
- Science of Behaviour and Substance Abuse

The research is also organized into two transversal programs that are being developed to create a more coordinated strategy among the different Can Ruti Campus stakeholders.

- Translational Program in Cancer Research (CARE)
- Transversal Program in Public Health and Primary Healthcare (CORE)

Cancer

Badalona Applied Research Group in Oncology (B·ARGO)
Ricard Mesia Nin
Anna Martínez Cardús

Cancer Genetics and Epigenetics (CGE)
Sergio Alonso Utrilla

Cancer Mechanisms and Pathways
Miguel Ángel Peinado

Childhood Liver Oncology Group (c-LOG)
Carolina Armengol Niell

Clinical Genomics Unit (UGC)
Elisabeth Castellanos Pérez
Ignacio Blanco Guillermo

Endocrine Tumours
Mireia Jordà Ramos

Hereditary Cancer
Eduard Serra Arenas

Molecular and Translational Pathology
Pedro Luis Fernández Ruiz

Oncology Translational Research (OTR)
Jordi Barretina Ginesta

Resistance, Chemotherapy and Predictive Biomarkers (RCPB)
Eva Martínez Balibrea

Badalona Applied Research Group in Oncology (B·ARGO)

Group leaders: Ricard Mesía Nin, Anna Martínez Cardús

Research lines

- **IMMUNOLUNG: Identification of immunotherapy-associated biomarkers in lung cancer**
- **iPARPResist: Identification of biomarkers of resistance to PARP inhibitors in gynecological cancer and other tumours**
- **Precision oncology un urologic tumours: identification of resistance biomarkers**
- **RESIST: Overcoming resistance mechanisms to CDK4/6 inhibitors in breast cancer**
- **Resistance to target therapy in BRAF-mutated melanoma: selection of the best therapeutic option in front of immunotherapy in advanced disease and adjuvant setting**
- **INSPECTA project: Implementation of a comprehensive translational research platform for early clinical trials**
- **VAL-GLIO-THERINT: Validation of genomic alterations in glioblastoma: looking for weak spots for therapeutic intervention**
- **Deciphering the STAT3 signalling: Identification of predictive biomarkers for selecting the best immunotherapy-based therapeutic strategy in head and neck tumours**
- **ONCODRIVERS: monitoring biomarkers along treatment to detect biomarkers of resistance acquisition to targeted therapy in a pancancer setting.**
- **INTRIGA project: INtegrative Translational Research In Gastric cAncer**
- **Effect of microenvironment in therapeutics of colorectal cancer.**
- **BTC-CROMA: Study of biomarkers associated to treatment outcome in cholangiocarcinoma.**

Featured publications

Wildsmith S, Li W, Wu S, Stewart R, Morsli N, Raja R, Zhang Q, Ye J, He P, Shetty J, Yovine A, Holoweckyj N, Real K, Walker J, Wrona M, de Los Reyes M, Barker C, Whiteley J, Haddad R, Licitra L, Ferris R, Fayette J, Zandberg DP, Siu LL, Mesía R. **Tumor Mutational Burden as a Predictor of Survival with Durvalumab and/or Tremelimumab Treatment in Recurrent or Metastatic Head and Neck Squamous Cell Carcinoma.** *Clin Cancer Res.* 2023 Jun 1;29(11):2066-2074. DOI: 10.1158/1078-0432.CCR-22-2765

Capdevila J, Hernando J, Teule A, Lopez C, Garcia-Carbonero R, Benavent M, Custodio A, Garcia-Alvarez A, Cubillo A, Alonso V, Carmona-Bayonas A, Alonso-Gordoa T, Crespo G, Jimenez-Fonseca P, Blanco M, Viudez A, La Casta A, Sevilla I, Segura A, Llanos M, Landolfi S, Nuciforo P, Manzano JL. **Durvalumab plus tremelimumab for the treatment of advanced neuroendocrine neoplasms of gastroenteropancreatic and lung origin.** *Nat Commun*. 2023 May 23;14(1):2973. DOI: 10.1038/s41467-023-38611-5

Gutiérrez-Chamorro L, Felip E, Bernat-Peguera A, Ezeonwumelu IJ, Teruel I, Martínez-Cardús A, Clotet B, Riveira-Muñoz E, Romeo M, Margelí M, Ballana E. **SAMHD1 expression modulates innate immune activation and correlates with ovarian cancer prognosis.** *Front Immunol*. 2023 Feb 9;14:1112761. DOI: 10.3389/fimmu.2023.1112761

Highlights

B·ARGO was recognised as Consolidated Group TransICOBAD - SGR01330 on 10 February 2023 by Agency for Management of University and Research Grants (AGAUR) of the Government of Catalonia.

The group actively participated in the activity of IGTP's Translational Program in Cancer Research (CARE). Its members Mireia Margelí and Anna Martinez Cardús are co-director and networking coordinator of the program respectively.

In the context of CARE, fortnightly educational sessions were held for health professionals from all over the Can Ruti Campus working in the field of oncology, in which Vicenç Ruiz de Porras is co-coordinator. The purpose of these sessions was to learn about the clinical problems that arise in current oncology and the advances in translational research, as well as to strengthen the research lines and establish new synergies on the campus. Moreover, the group participates in different networks established in the scenario of the CARE Program.

B·ARGO demonstrated a great activity in the organisation of events. During 2023, the members of the group organised 5 specialised courses or seminars and 3 scientific outreach events:

- II Jornades de greixos i càncer: Exercici i càncer (2 March)
- VI Translational Meeting of GEM Group (4 May)
- Translational Research in Lung Cancer B·ARGO III Edition (14 June)
- II Jornades B·ARGO sobre inhibidors de PARP: present i futur (16 June)
- Xerrada divulgativa barcelonès nord-maresme. Junts avancem en el càncer de mama (19 September)
- VI Curs B·ARGO d'immunoteràpia: camí de la immunoteràpia personalitzada (4-5 October)
- Dia mundial de la recerca en càncer (24 November)
- III B·ARGO-BREAST Scientific meeting: From knowledge to challenges in triple negative breast cancer (15 December)

Cancer Genetics and Epigenetics (CGE)

Group leader: Sergio Alonso Utrilla

Research lines

- **Epigenetic dysregulation of pericentromeric and subtelomeric regions: association with telomere dysfunction and endoreduplication in the first steps of gastrointestinal carcinogenesis**
- **Epigenetic determinants of enhanced tumour immunogenicity in colorectal cancer: towards targeted therapies to improve immunotherapy response**
- **Development of cost-efficient and scalable 3D co-culture models for immuno-oncology studies**

Highlights

CGE's collaboration with an international network of scientists led to the European patent EP27786834 for the clinical application of the biliary cancer biomarker that the group published in 2022, currently under review by the US patent office.

The group partnered with the School of Sciences at University of Lisbon to welcome Master's students into their laboratory, covered by the Erasmus+ fellowship program. The first student to be accepted, Catarina Ferreira Violante, will defend her Master's project in July 2024.

A summer fellowship from Asociación Española Contra el Cáncer (AECC) was awarded to Marta Chica from Universitat Autònoma de Barcelona (UAB), to work on the development of novel 3D models for immuno-oncology.

Gisela de Miguel García (UAB) and Marta Pérez López (UPF) successfully defended their Master's projects.

Maria Navarro Jiménez successfully defended her PhD project on 15 December, obtaining her PhD in Biochemistry, Molecular Biology, and Biomedicine from UAB.

Cancer Mechanisms and Pathways

Group leader: Miguel Ángel Peinado

Research lines

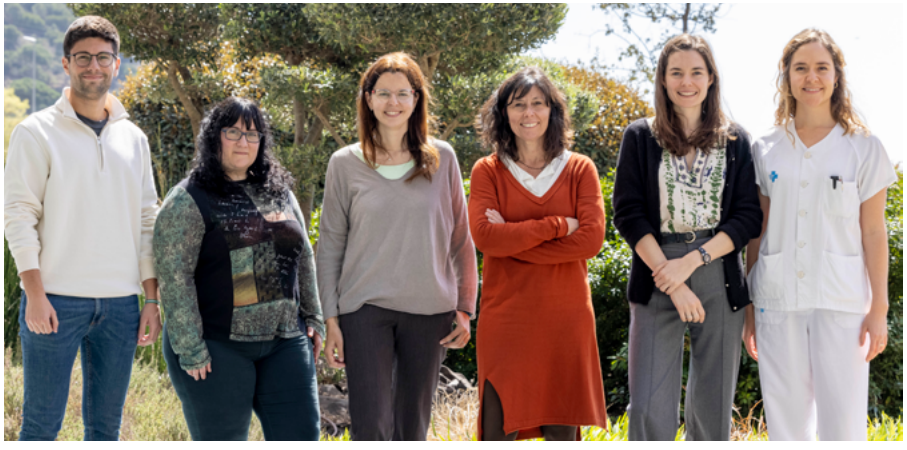
- Chromatin architecture in cell differentiation and cancer
- The role of repeat elements in genome structure and function
- Clinically oriented research on the epigenetic changes involved in human cancer

Featured publications

Díez-Villanueva A, Martín B, Moratalla-Navarro F, Morón-Duran FD, Galván-Femenía I, Obón-Santacana M, Carreras A, de Cid R, Peinado MA, Moreno V. **Identification of intergenerational epigenetic inheritance by whole genome DNA methylation analysis in trios.** *Sci Rep.* 2023 Dec 2;13(1):21266. DOI: 10.1038/s41598-023-48517-3

de Homdedeu M, Sanchez-Moral L, Violán C, Ràfols N, Ouchi D, Martín B, Peinado MA, Rodríguez-Cortés A, Arch-Sisquella M, Perez-Zsolt D, Muñoz-Basagoiti J, Izquierdo-Useros N, Salvador B, Matllo J, López-Serrano S, Segalés J, Vilaplana C, Torán-Monserrat P, Morros R, Monfà R, Sarrias MR, Cardona PJ. ***Mycobacterium manresensis* induces trained immunity in vitro.** *iScience.* 2023 Jun 16;26(6):106873. DOI: 10.1016/j.isci.2023.106873

Childhood Liver Oncology (c-LOG)



Group leader: Carolina Armengol Niell

Research lines

- **Consolidation of a unique European biorepository of childhood liver cancer**
- **Understanding the molecular biology of childhood liver cancer**
- **Identification and validation of diagnostic and prognostic biomarkers to improve quality of life and survival of paediatric patients with liver cancer**
- **Moving forward precision medicine in childhood liver cancer through the identification of the best drugs for each tumour type**

Featured publications

Mario Failli, Salih Demir, Álvaro Del Río-Álvarez; Juan Carrillo-Reixach; Laura Royo, Montserrat Domingo-Sàbat, Margaret Childs, Rudolf Maibach, Rita Alaggio, Piotr Czauderna, Bruce Morland, Roland Kappler, Carolina Armengol, Diego di Bernardo. **Computational drug prediction in hepatoblastoma by integrating pan-cancer transcriptomics with pharmacological response.** *Hepatology*, 2023 Sep 20. DOI: 10.1097/HEP.0000000000000601

Alex Clavería-Cabello, Jose Maria Herranz, Maria Ujue Latasa, Maria Arechederra, Iker Uriarte, Antonio Pineda-Lucena, Felipe Prosper, Pedro Berraondo, Cristina Alonso, Bruno Sangro, Jose Juan García Marin, Maria Luz Martinez-Chantar, Sergio Ciordia, Fernando José Corrales, Paola Francalanci, Rita Alaggio, Jessica Zucman-Rossi, Emilie Indersie, Stefano Cairo, Montserrat Domingo-Sàbat, Laura Zanatto, Pau Sancho-Bru, Carolina Armengol, Carmen Berasain, Maite García Fernandez-Barrena, Matias Antonio Avila. **Identification and experimental validation of druggable epigenetic targets in hepatoblastoma.** *J Hepatol.* 2023 Jun 9:S0168-8278(23)00405-1. DOI: 10.1016/j.jhep.2023.05.031

Abril-Fornaguera J, Torrens L, Andreu-Oller C, Carrillo-Reixach J, Rialdi A, Balaseviciute U, Pinyol R, Montironi C, Haber PK, Del Río-Álvarez Á, Domingo-Sàbat M, Royo L, Akers NK, Willoughby CE, Peix J, Torres-Martin M, Puigvehi M, Cairo S, Childs M, Maibach R, Alaggio R, Czauderna P, Morland B, Losic B, Mazzaferro V, Guccione E, Sia D, Armengol C, Llovet JM. **Identification of IGF2 as Genomic Driver and Actionable Therapeutic Target in Hepatoblastoma.** *Mol Cancer Ther.* 2023 Feb 10:MCT-22-0335. DOI: 10.1158/1535-7163.MCT-22-0335

Highlights

The Childhood Liver Oncology Group (c-LOG) continued to lead the first European biorepository and the biomarker validation study associated to the first Paediatric Hepatic International Tumour Trial (PHITT), solidifying its position at the forefront of paediatric liver cancer research.

The group had a total of 9 active projects, including 2 EU grants awarded in 2023. The EU iPC project, concluded the same year, resulted in the development of cloud-based virtual-patient models and the identification of novel molecular drivers, biomarkers and therapies to be applied for precision paediatric oncology. The group obtained another EU project, THRIVE, led by IDIBAPS.

c-LOG currently coordinates 3 projects: i) the BT4ChildLC project focused on defining an integrative molecular, pathological and clinical patient stratification of childhood liver cancer and identifying novel therapies for children with liver tumours refractory to current treatments; ii) the PMed4HB project, with the goal of establishing the biological foundations for future personalised medicine for children with hepatoblastoma, aiming to improve their quality of life and overall survival, and iii) the CIBER INTRAMURAL that, together with the PMEd4HB project, is focused on better understanding the molecular mechanisms involved in tumour aggressiveness and lack of response to drug therapy with the ultimate goal of offering more effective therapies.

Carolina Armengol continued leading the CB06/04/0033CIBER research group, with major achievements in the field of acute-on-chronic liver failure among cirrhotic patients.

Up to 6 research papers published throughout the year further cemented the group's contributions to the scientific community. Key achievements include the validation of a novel computational drug prediction tool and the identification of druggable epigenetic targets for hepatoblastoma such as IGF2, CDK9, G9a and CD5L.

c-LOG members participated in different national, European and international scientific meetings. Invited talks and presentations, including those at the international SIOPEL meetings in Utrecht and Paris and the Paediatric Liver Tumour Research Meeting, organised by Dana Farber Cancer Institute in Boston. Additional conferences and webinars of the national societies such as Sociedad Española de Hematología y Oncología Pediátricas (SEHOP), Societat Catalana de Digestologia (SCD) and Asociación Española para el Estudio del Hígado (AEEH), provided opportunities to disseminate the group's findings and to engage not only with scientific community, but also patients and their families.

Overall, 2023 was a year of notable achievements underscoring c-LOG's dedication to improve outcomes and quality of the liver in paediatric patients with liver cancer.

Clinical Genomics Unit (UGC)

Group leaders: Elisabeth Castellanos Pérez, Ignacio Blanco Guillermo

Research lines

- **Increase of the cost-effectiveness of genetic testing and our knowledge of the genetic basis of some diseases (mostly hereditary diseases with a predisposition to develop tumours, as well as renal diseases)**
- **Development of personalised medicine for neurofibromatoses and schwannomatosis patients, which include the discovery of new prognostic biomarkers, understanding the role of patient's genomic alterations in the development of disease-associated lesions and the implementation of different gene therapy strategies as a potential treatment for these group of diseases**
- **Improvement of the management of phakomatoses patients considering not only clinical diagnosis but also emotional, social, religious and physical dimensions that could impact patients with these rare diseases**
- **Development of strategies to evaluate genetic individual susceptibility to illness**

Featured publications

Maroto AF, Borrajo M, Prades S, Callejo À, Amilibia E, Pérez-Grau M, Roca-Ribas F, Castellanos E, Barrallo-Gimeno A, Llorens J. **The vestibular calyceal junction is dismantled following subchronic streptomycin in rats and sensory epithelium stress in humans.** *Arch Toxicol*. 2023 Jul;97(7):1943-1961. DOI: 10.1007/s00204-023-03518-z

Magallón-Lorenz M, Terribas E, Ortega-Bertran S, Creus-Bachiller E, Fernández M, Requena G, Rosas I, Mazuelas H, Uriarte-Arrazola I, Negro A, Lausová T, Castellanos E, Blanco I, DeVries G, Kawashima H, Legius E, Brems H, Mautner V, Kluwe L, Ratner N, Wallace M, Fernández-Rodriguez J, Lázaro C, Fletcher JA, Reuss D, Carrió M, Gel B, Serra E. **Deep genomic analysis of malignant peripheral nerve sheath tumor cell lines challenges current malignant peripheral nerve sheath tumor diagnosis.** *iScience.* 2023 Jan 31;26(2):106096. DOI: 10.1016/j.isci.2023.106096

Highlights

Ignacio Blanco is the coordinator of a CSUR (reference unit) of the Sistema Nacional de Salud and the national coordinator of the European Network of Reference Centers (ERN) GENTURIS, a network for all patients with any of the rare syndromes of genetic predisposition to the development of tumours (GENTURIS). In addition, he is a member of the Advisory Committee on Minority Diseases (CAMM) from the Government of Catalonia and advisor to the Spanish Ministry of Health in the area of Genetics.

Elisabeth Castellanos co-leads together with Scott Plotkin (Massachusetts General Hospital, USA) the Neurofibromatoses and Schwannomatosis Variant Curation Expert Panel (NF-SWN VCEP) at ClinGen-NIH, aimed at establishing clinical guidelines for classifying genetic variants of these diseases. The panel was funded by the National Institutes of Health (NIH) with a U24 grant. Castellanos also coordinates the international consortium EURO-NET-NF, which has the objective of improving diagnostic molecular testing for this group of disorders. She collaborates closely with Children's Tumor Foundation (CTF) and was invited to serve as a session co-chair at the CTF 2023 NF Conference in Scottsdale, USA, to update on the advances of the NF-SWN VCEP and also to the 2024 NF Global Conference to chair a gene therapy session. In 2023, Castellanos renewed her P-FIS grant and also got a Sara Borrell fellowship for the 2024-2026 period. Finally, she is collaborating with Plotkin to develop new genetic therapies for neurofibromatosis type 2.

Endocrine Tumours

Group leader: Mireia Jordà Ramos

Research lines

- **Understanding the molecular pathogenesis, with special focus on epigenetic mechanisms, of thyroid cancer progression and therapy resistance**
- **Study of epigenetic biomarkers and tools for diagnosis, prognosis and monitoring of thyroid cancer**
- **Understanding the role of DNA methylation in somatotroph pituitary neuroendocrine tumours (acromegaly)**
- **Study of biomarkers and tools for diagnosis, prognosis and response to treatment of pituitary neuroendocrine tumours**

Featured publications

Gil J, Marques-Pamies M, Valassi E, Serra G, Salinas I, Xifra G, Casano-Sancho P, Carrato C, Biagetti B, Sesmilo G, Marcos-Ruiz J, Rodriguez-Lloveras H, Rueda-Pujol A, Aulinas A, Blanco A, Hostalot C, Simó-Servat A, Muñoz F, Rico M, Ibáñez-Domínguez J, Cordero E, Webb SM, Jordà M, Puig-Domingo M. **Molecular characterization of epithelial-mesenchymal transition and medical treatment related-genes in non-functioning pituitary neuroendocrine tumors.** *Front Endocrinol* (Lausanne). 2023 Mar 22;14:1129213. DOI: 10.3389/fendo.2023.1129213

Marques-Pamies M, Gil J, Jordà M, Puig-Domingo M. **Predictors of Response to Treatment with First-Generation Somatostatin Receptor Ligands in Patients with Acromegaly.** *Arch Med Res.* 2023 Dec;54(8):102924. DOI: 10.1016/j.arcmed.2023.102924

Highlights

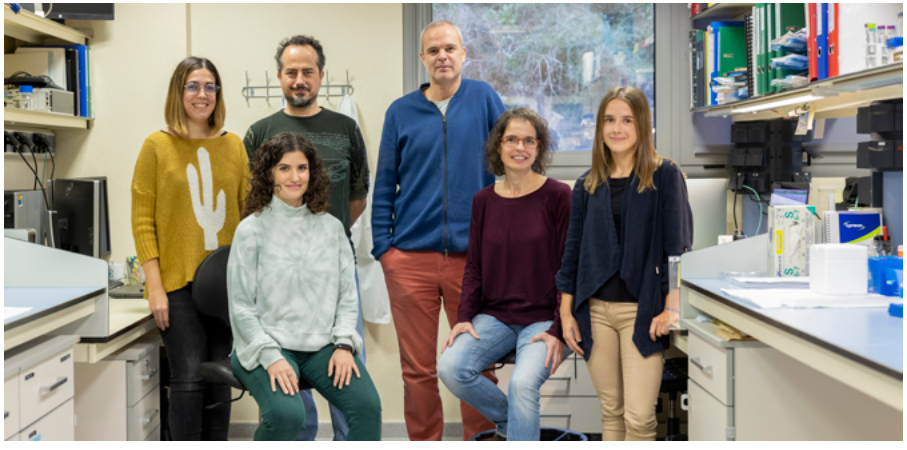
The group incorporated 3 PhD students: Helena Rodríguez Lloveras (awarded with a PFIS predoctoral contract from Instituto de Salud Carlos III - ISCIII), Anna Rueda Pujol (awarded with a FI Joan Oró predoctoral contract from the Agency for Management of University and Research Grants - AGAUR), and Paula de Pedro.

The members demonstrated a great dissemination activity: 3 invited conferences, 4 oral communications, 4 poster presentations in national and international events, and an award for the Best Oral Communication at the XXXI Congreso Nacional de la Sociedad Española de Anatomía Patológica (SEAP).

In January, a project in which the group participates, "ACROMICS: next-generation precision medicine in the diagnosis and treatment of Acromegaly", kicked off. It is led by Manel Puig Domingo and funded with €1,300,000 by ISCIII (PMP22/00021).

The group, along with Germans Trias i Pujol University Hospital's Endocrinology Service and the research group of Pituitary Diseases (U747 CIBERER) at Hospital de la Santa Creu i Sant Pau, received accreditation as a Consolidated Research Group by AGAUR (2021 SGR 0092).

Hereditary Cancer



Group leader: Eduard Serra Arenas

Research lines

- **Molecular pathogenesis of neurofibromatosis type 1**
- **Primary and iPSC-based models for cancer and regeneration**
- **Cancer genomics and integrative biology of tumours of the peripheral nervous system, other neural crest-derived tumours, and sarcomas**
- **Applied cancer genomics for translation into clinics**

Featured publications

Magallón-Lorenz M, Terribas E, Ortega-Bertran S, Creus-Bachiller E, Fernández M, Requena G, Rosas I, Mazuelas H, Uriarte-Arrazola I, Negro A, Lausová T, Castellanos E, Blanco I, DeVries G, Kawashima H, Legius E, Brems H, Mautner V, Kluwe L, Ratner N, Wallace M, Fernández-Rodriguez J, Lázaro C, Fletcher JA, Reuss D, Carrió M, Gel B, Serra E. **Deep genomic analysis of malignant peripheral nerve sheath tumor cell lines challenges current malignant peripheral nerve sheath tumor diagnosis.** *iScience.* 2023 Jan 31;26(2):106096. DOI: 10.1016/j.isci.2023.106096

Mazuelas H, Uriarte-Arrazola I, Fernández-Rodríguez J, Magallón-Lorenz M, Villanueva A, Lázaro C, Gel B, Serra E, Carrió M. **Generation of human iPSC-derived neurofibromaspheres for in vitro and in vivo uses.** *STAR Protoc*. 2023 Mar 27;4(2):102198. DOI: 10.1016/j.xpro.2023.102198

Staedtke V, Topilko P, Le LQ, Grimes K, Largaespada DA, Cagan RL, Steensma MR, Stemmer-Rachamimov A, Blakeley JO, Rhodes SD, Ly I, Romo CG, Lee SY, Serra E. **Existing and Developing Preclinical Models for Neurofibromatosis Type 1-Related Cutaneous Neurofibromas.** *J Invest Dermatol.* 2023 Aug;143(8):1378-1387. DOI: 10.1016/j.jid.2023.01.042

Highlights

The Hereditary Cancer Group developed a new cell-based model system for NF1-related peripheral nervous system tumors based on iPSCs. The idea was to create a human model, unperishable and amenable to gene editing, able to generate developmental-stage cell identities. From NF1(-/-) iPSCs, a 3D model called neurofibromaspheres was developed that upon sciatic nerve engraftment formed genuine human neurofibroma-like tumours in mice. This work was financed by two grants from the Neurofibromatosis Therapeutic Acceleration Program - Johns Hopkins University (NTAP). Associated scientific publication

The group also performed a thorough genomic characterisation of malignant peripheral nervous system tumours (MPNST) and their cell lines, consisting of whole genome sequencing, RNA-seq, methylome analysis and others. Results from the cell line characterisation allowed obtaining a genomic definition of classic MPNST cell lines and discovered that several of them were misdiagnosed. This work was funded by different FIS projects, La Marató de TV3 and Fundación Proyecto Neurofibromatosis. Associated scientific publication

The team was awarded with three international grants:

- "Combining the inhibition of the Ras/MAPK pathway and the activation of the cAMP/PKA pathway as a therapeutic strategy for cutaneous neurofibroma" (IP: Eduard Serra) funded by Neurofibromatosis Therapeutic Acceleration Program (NTAP)-Johns Hopkins University. The group will test new therapeutic strategies for cutaneous neurofibromas in vitro and in vivo with the collaboration of Dr Piotr Topilko's lab (Institut Mondor of Biomedical Research, Paris).
- "Nanopore-based genomic analysis of minimally invasive biopsies of ANNUBP and MPNST for better diagnostics and management" (IP: Bernat Gel) funded by the Children's Tumor Foundation (CTF) for the development of a new nanopore-based diagnostics strategy for ANNUBP and MPNST.
- "Identification of drugs targeting epigenetic regulators in an iPSC-based 3D MPNST model" (IP: Eduard Serra) funded by the Children's Tumor Foundation (CTF) and in collaboration with Dr. Marc Ferrer at NCATS (NIH), to perform a high-throughput drug screening of epigenetic-related compounds using an iPSC-based 3D MPNST model.

And a national grant:

- "Estudio del cáncer secundario en pacientes con retinoblastoma hereditario; diseño de una estrategia basada en biopsia liquida para un diagnóstico temprano y adecuado seguimiento - proyecto RET-LB" (IP: Eduard Serra) financed by FEDER, promoted by the lay association "Nineta dels ulls" and in collaboration with 6 clinical sites from Spain and Argentina.

In July, Miriam Magallón Lorenz successfully defended her doctoral thesis "Integrative genomic analyses of Malignant Peripheral Nerve Sheath Tumors" and received an Excellent Cum Laude recognition.

Molecular and Translational Pathology

Group leader: Pedro Luis Fernández Ruiz

Research lines

- Breast and genitourinary neoplasms
- Lymphoid and mesenchymal neoplasms
- Respiratory tract, head and neck neoplasms
- Digestive and hepatobiliary tract neoplasms
- Nervous and endocrine system neoplasms, and neurodegenerative disorders
- Skin neoplasms
- Nefropathology and fetal pathology
- Molecular pathology
- Paleopathology
- Confocal microscopy

Featured publications

Pons L, Hernández L, Urbizu A, Osorio P, Rodríguez-Martínez P, Castella E, Muñoz A, Sanz C, Arnaldo L, Felip E, Quiroga V, Tapia G, Margelí M, Fernandez PL**. Pre- and Post-Neoadjuvant Clinicopathological Parameters Can Help in the Prognosis and the Prediction of Response in HER2+ and Triple Negative Breast Cancer.** *Cancers (Basel).* 2023 Jun 6;15(12):3068. DOI: 10.3390/cancers15123068

Koyuncu C, Janowczyk A, Farre X, Pathak T, Mirtti T, Fernandez PL, Pons L, Reder NP, Serafin R, Chow SSL, Viswanathan VS, Glaser AK, True LD, Liu JTC, Madabhushi A. **Visual Assessment of 2-Dimensional Levels Within 3-Dimensional Pathology Data Sets of Prostate Needle Biopsies Reveals Substantial Spatial Heterogeneity.** *Lab Invest.* 2023 Dec;103(12):100265. DOI: 10.1016/j.labinv.2023.100265

Notario L, Cucurull M, Cerdà G, Sanz C, Carcereny E, Muñoz-Mármol A, Hernández A, Domènech M, Morán T, Sánchez-Céspedes M, Costa M, Mate JL, Esteve A, Saigí M. **Characterization of a cohort of metastatic lung cancer patients harboring KRAS mutations treated with immunotherapy: differences according to KRAS G12C vs. non-G12C.** *Front Oncol.* 2023 Oct 17;13:1239000. DOI: 10.3389/fonc.2023.1239000

Highlights

The group finished two research projects financed by Instituto de Salud Carlos III (ISCIII) through FIS and La Marató de TV3, focusing on the genomics and transcriptomics of HER2-positive and triple-negative breast cancers treated with neoadjuvant therapy to identify predictive biomarkers. The final results of these projects are currently under analysis, although two publications have already been released, and one doctoral thesis is nearing completion.

Another ongoing project, funded by ISCIII and led by Dr Cristina Carrato, is related to the genomics of brain tumours. The team have also initiated a collaborative project with the Department of General Surgery at Germans Trias i Pujol University Hospital to investigate the potential usefulness of ex-vivo confocal microscopy in managing breast cancer surgical specimens. Additionally, they are beginning a project to evaluate the applicability of genomics on plasma samples (liquid biopsy) from breast cancers.

Regarding collaborations, the group supports numerous clinical trials initiated by various departments within the Germans Trias Hospital, primarily Medical Oncology. The members' publication output in 2023 includes 23 research papers and 19 congress communications.

Oncology Translational Research (OTR)

Group leader: Jordi Barretina Ginesta

Research lines

- **Understanding treatment response in ovarian cancer with new omics techniques**
- **Organoid-based treatment screening to optimize colorectal cancer management**

Featured publications

Tiedt R, King FJ, Stamm C, Niederst MJ, Delach S, Zumstein-Mecker S, Meltzer J, Mulford IJ, Labrot E, Engstler BS, Baltschukat S, Kerr G, Golji J, Wyss D, Schnell C, Ainscow E, Engelman JA, Sellers WR, Barretina J, Caponigro G, Porta DG. **Integrated CRISPR screening and drug profiling identifies combination opportunities for EGFR, ALK, and BRAF/MEK inhibitors.** *Cell Rep.* 2023 Apr 25;42(4):112297. DOI: 10.1016/j.celrep.2023.112297

Marin-Bejar O, Romero-Moya D, Rodriguez-Ubreva J, Distefano M, Lessi F, Aretini P, Liquori A, Castaño J, Kozyra E, Kotmayer L, Bueno C, Cervera J, Rodriguez-Gallego JC, Nomdedeu JF, Murillo-Sanjuán L, De Heredia CD, Pérez-Martinez A, López-Cadenas F, Martínez-Laperche C, Dorado-Herrero N, Marco FM, Prósper F, Menendez P, Valcárcel D, Ballestar E, Bödör C, Bigas A, Catalá A, Wlodarski MW, Giorgetti A. **Epigenome profiling reveals aberrant DNA methylation signature in GATA2 deficiency.** *Haematologica.* 2023 Sep 1;108(9):2551-2557. DOI: 10.3324/haematol.2022.282305.

Resistance, chemotherapy and predictive biomarkers (RCPB)

Group leader: Eva Martínez Balibrea

Research lines

- **Deciphering mechanisms of resistance to treatment in colorectal cancer**
- **Finding predictive biomarkers for treatment selection**
- **Development and implementation of in vitro and ex vivo models of acquired resistance to different anti-cancer therapies**

Featured publications

Hermsen MA, Lechner M, Oliveira Ferrer L, Trama A, Eriksen PRG, Martinez-Balibrea E, von Buchwald C. **EUSICA/COST IMMUNO-model workshop fostering collaboration to advance sinonasal cancer research: A meeting report.** *Oral Oncol.* 2023 Nov;146:106543. DOI: 10.1016/j.oraloncology.2023.106543

Moreta-Moraleda C, Queralt C, Vendrell-Ayats C, Forcales S, Martínez-Balibrea E. **Chromatin factors: Ready to roll as biomarkers in metastatic colorectal cancer?** *Pharmacol Res.* 2023 Oct;196:106924. DOI: 10.1016/j.phrs.2023.106924

Highlights

In May, Sara Cabrero presented her doctoral thesis and received the highest possible grade, *Magna Cum Laude.*

Eva Martínez Balibrea is involved in the IMMUNO-model COST Action as Chair, Grant Holder Scientific Representative and Management Committee Member. The first annual conference of the network was held on 1-2 June at Josep Carreras Leukaemia Research Institute (IJC). The conference was a success, gathering in person more than 100 researchers from 30 different countries. It focused on advances in pre-clinical model research in immuno-oncology and featured renowned keynote speakers.

The group's PhD student, Carla Vendrell, presented her work "Overexpression of CD73 is dependent on KRAS-mutations in colorectal cancer and can be targeted by MRTX1133" at the Targeting RAS symposium, held in Salamanca in September.

On 24 September, Martínez-Balibrea participated in a dissemination event dedicated to cancer research, organised by the Museum of Badalona, the city council of Badalona, Amics de Can Ruti and the Germans Trias i Pujol University Hospital.

The review entitled "Chromatin factors: Ready to roll as biomarkers in metastatic colorectal cancer?" was published in the prestigious journal *Pharmacological Research.* The article deals with the possible role of chromatin regulators as predictive biomarkers in colorectal cancer.

Cardiovascular and respiratory diseases

Heart Failure and Cardiac Regeneration (ICREC)
Antoni Bayés Genís

Lung Immunity Translational Research Group
Raquel Guillamat Prats

Heart Failure and Cardiac Regeneration (ICREC)

Group leader: Antoni Bayés Genís

Research lines

- Advanced therapies
- Heart Precision Medicine Platform (PMP-Heart)
- Translational animal models (mouse, rat and pig)
- Clinical Trials Support Area / Clinical Trials Unit – ASAC
- Cardiometabolism
- Innovation and technology transfer

Featured publications

Aimo A, Martinez-Falguera D, Barison A, Musetti V, Masotti S, Morfino P, Passino C, Martinelli G, Pucci A, Crisostomo V, Sanchez-Margallo F, Blanco-Blazquez V, Galvez-Monton C, Emdin M, Bayes-Genis A. **Colchicine added to standard therapy further reduces fibrosis in pigs with myocardial infarction.** *J Cardiovasc Med (Hagerstown).* 2023 Nov 1;24(11):840-846. DOI: 10.2459/JCM.0000000000001554

Ferrer-Curriu G, Rueda F, Revuelta-López E, García-García C, Codina P, Gálvez-Montón C, Roura S, Aimo A, Emdin M, Planavila A, Bayés-Genís A. **Meteorin-like protein is associated with a higher risk profile and predicts a worse outcome in patients with STEMI.** *Rev Esp Cardiol (Engl Ed).* 2023 Nov;76(11):891-900. DOI: 10.1016/j.rec.2023.03.015

Aranyó J, Martínez-Falguera D, Bazan V, Fadeuilhe E, Teis A, Sarrias A, Rodríguez-Leor O, Curiel C, Villuendas R, Bayés-Genís A, Gálvez-Montón C, Bisbal F. **Biophysical Tissue Characterization of Ventricular Tachycardia Substrate With Local Impedance Mapping to Predict Critical Sites.** *JACC Clin Electrophysiol.* 2023 Jun;9(6):765-775. DOI: 10.1016/j.jacep.2022.11.023

Highlights

Antoni Bayés-Genís was awarded with the Premi a la Trajectòria Investigadora als Hospitals de l'Institut Català de la Salut (ICS) 2023 at the 14th Jornada de Recerca de l'ICS. Read more

The group initiated VASCRAFT, a joint project with the Blood and Tissue Bank (BST) and the Vascular Engineering and Applied Biomedicine Group (GEAB) of IQS-URL to develop a vascular graft from donor veins that can be used for bypass surgery to restore blood flow. Read more

iCor received a €337,500 grant concession for the project "Organoids for cell therapy in a preclinical model of myocardial infarction (ONEIDA Study)" by Ministerio de Ciencia e Innovación (PID2022-1422190b-100).

Apart from the scientific publications highlighted in the previous section, the group published other noteworthy studies such as "Bone marrow adipocytes fuel emergency hematopoiesis after myocardial infarction", published in the journal *Nature Cardiovascular Research*, and "Evolocumab has no effects on heart failure with reduced ejection fraction injury biomarkers: The EVO-HF trial", published in the *European Journal of Heart Failure.* The team presented another two studies in conferences: "Manufacturing of Wharton's Jelly Mesenchymal Stromal Cells-derived Extracellular Vesicles for Clinical Application" at Mobility for Vesicle Research in Europe Symposium and "Efecto de empagliflozina y/o sacubitrilo/valsartán sobre el perfil lipoproteico, glicoproteico y lipídico en un modelo porcino de infarto de miocardio" at Congreso de las Enfermedades Cardiovasculares de la Sociedad Española de Cardiología.

NIMBLE Diagnostics, a spin-off from IGTP, the Polytechnic University of Catalonia – BarcelonaTech (UPC) and the University of Barcelona (UB) had a remarkable year. NIMBLE secured more than one million euros in a financing round led by Grow Ventures together with Namarel Ventures and Inveniam Group. Read more

The spin-off was also awarded with a 2.3 milions euros EIC Accelerator Grant by the European Innovation Council and SMEs Executive Agency. Read more

Lung Immunity Translational Research Group

Group leader: Raquel Guillamat Prats

Research lines

- **Characterisation of the endocannabinoid system and its possible therapeutic use for interstitial lung pathologies**
- **Identification of immune markers associated to the progression and response to antifibrotic treatments of pulmonary fibrosis patients**
- **Innate and adaptive immune response to infections, focusing on how certain co-morbidities, such as diet-associated obesity, impact the immune response**
- **Description of the genetic and molecular profiles of lung cancer in patients with chronic lung pathologies**
- **Functional analysis in 3D models of the genes altered in lung tumours of patients with previous interstitial pathology**

Featured publications

Valentin S, Lopez Padilla D, Nolasco S, Ranilović D, Guillamat-Prats R, Marín T, Ho S, Tang S, Papadopoulou E, Malone J, Leiva Agüero S, Cantero C, Patout M, Fisser C. **ERS International Congress 2022: highlights from the Respiratory Intensive Care Assembly.** *ERJ Open Res.* 2023 May 22;9(3):00532-2022. DOI: 10.1183/23120541.00532-2022

Saigí M, Mesía-Carbonell O, Barbie DA, Guillamat-Prats R. **Unraveling the Intricacies of CD73/Adenosine Signaling: The Pulmonary Immune and Stromal Microenvironment in Lung Cancer.** *Cancers (Basel).* 2023 Dec 4;15(23):5706. DOI: 10.3390/cancers15235706

Highlights

The group received funding from Instituto de Salud Carlos III (ISCIII) for its first national competitive project “Novel therapeutic target for pulmonary fibrosis: signaling via CB1/2-AG axis in alveolar cells and lung fibroblasts”.

In 2023, two PhD students started their projects in the group’s laboratory:

- Paula Goncalves Romeu, a biotechnologist with a Master’s Degree in Advanced Immunology; she will work on the signaling of cannabinoid receptors in respiratory diseases.
- Isabel Alfaya Fiaño, a clinician with pulmonology specialisation; she will study the synergistic mechanisms and interactions between lung cancer and pulmonary fibrosis

The team attended and presented their data at various national and international conferences: International Symposium on Infections in the Critically Ill Patient, European Respiratory Society Conference, Lung Science Conference, and the Catalan Society Scientific Journey in Respiratory Diseases.

Community Health

Centre for Epidemiological Studies on HIV/AIDS and STI of Catalonia (CEEISCAT)
Jordi Casabona i Barbarà

Innovation, Health Economics and Digital Transformation Research Group (INEDIT)
Oriol Estrada Cuxart

Maresme Study Group on Community-Acquired Pneumonia and COPD (GEMPAC)
Ramon Boixeda Viu
Maria del Carmen de la Torre
Maria Bartolomé

Nursing Research Group (NURECARE)
Cristina Casanovas Cuellar
Ariadna Huertas Zurriaga

Woman & Health
Inés Velasco López

Centre for Epidemiological Studies on HIV/AIDS and STI of Catalonia (CEEISCAT)

Group leader: Jordi Casabona i Barbarà

Research lines

- **Formal systems of epidemiological surveillance of HIV and other STIs**
- **Monitoring of the diagnosis and evaluation of new technologies and screening strategies for HIV and other STIs**
- **Antiretroviral treatment monitoring and study of the effect of comorbidities and aging in HIV positive patients**
- **Study and monitoring of the multilevel determinants of HIV transmission and other STIs**
- **Coverage and determinants of early diagnosis and healthcare linkage of hepatitis C**

Featured publications

Agustí C, Martínez-Riveros H, Hernández-Rodríguez À, Casañ C, Díaz Y, Alonso L, Martró E, Muñoz-Basagoiti J, Gallemí M, Folch C, Sönmez I, Adell H, Villar M, París de León A, Martinez-Puchol S, Pelegrin AC, Perez-Zsolt D, Raïch-Regué D, Mora R, Villegas L, Clotet B, Izquierdo-Useros N, Cardona PJ, Casabona J. **Self-sampling monkeypox virus testing in high-risk populations, asymptomatic or with unrecognized Mpox, in Spain.** *Nature Communications (United Kingdom)*. 2023 Oct 2;14(1):5998. DOI: 10.1038/s41467-023-40490-9

Martínez-Riveros H, Díaz Y, Montoro-Fernandez M, Moreno-Fornés S, González V, Muntada E, Romano-deGea P, Muñoz R, Hoyos J, Casabona J, Agustí C. **An Online HIV Self-Sampling Strategy for Gay, Bisexual and Other Men Who Have Sex with Men and Trans Women in Spain.** *Journal of community health (United Kingdom)*. 2023 Dec 23. DOI: 10.1007/s10900-023-01311-8

Bruguera A, Nomah D, Moreno-Fornés S, Díaz Y, Aceitón J, Reyes-Urueña J, Ambrosioni J, Llibre JM, Falcó V, Imaz A, Fanjul F, Navarro G, Pere D, León E, Mera A, Miró JM, Casabona J; PISCIS Cohort Group. **Cohort Profile: PISCIS, a population-based cohort of people living with HIV in Catalonia and Balearic Islands.** *International Journal of Epidemiology (United Kingdom)*. 2023 Jul 4:dyad083. DOI: 10.1093/ije/dyad083

Highlights

During 2023, CEEISCAT worked on its programmatic activity in the field of epidemiological surveillance on HIV and other STIs, as well as in different applied research projects funded through national and international calls.

In this context, CEEISCAT developed various projects addressing mpox. The group participated in the LIBEROPOX study, coordinated by Red Iberoamericana de Estudios sobre Hombres Gais (RIGHT Plus), a network of which it is a founding member. This study, conducted in the Ibero-American region, analysed the knowledge, attitudes and behaviours related to mpox in gay, bisexual and other men who have sex with men. Likewise, CEEISCAT participated in the MOVIE-CC study, which analysed the sexual networks and the epidemiological and behavioural characteristics of gay men, bisexuals and other men who have sex with men diagnosed and undiagnosed with mpox. The Stop Mpox study, another initiative CEEISCAT participated in, assessed the prevalence of asymptomatic monkeypox infections among gay, bisexual, and other men who have sex with trans men and transgender women. It revealed undiagnosed cases of mpox capable of transmission despite a low viral load, underscoring the importance of detection and prevention measures.

Another highlight of the year is the beginning of the second phase of the Sentinel Schools Network. Established in 2020 in response to COVID-19, the network has broadened its focus to include other health promotion aspects in schools, such as infectious diseases, mental health, and sexual health. Over twenty schools have remained active in the network, where several pilot studies have been conducted.

Innovation, Health Economics and Digital Transformation Research Group (INEDIT)

Group leader: Oriol Estrada Cuxart

Research lines

- Technological innovation
- Transformation and digital health
- Health economics

Featured publications

López Seguí F, Oyón Lerga U, Laguna Marmol L, Coll P, Andreu A, Meulbroek M, Lopez Casasnovas G, Estrada Cuxart O, Ara Rey J, Quiñones C, Perez F, Fernandez J, Rivero A, Ricou Rios L, Clotet B. **Cost-effectiveness analysis of the daily HIV pre-exposure prophylaxis in men who have sex with men in Barcelona.** *PLoS ONE*. 2023 Jan 17;18(1):e0277571. DOI: 10.1371/journal.pone.0277571

Guillamet GH, Seguí FL, Vidal-Alaball J, López B. **CauRuler: Causal irredundant association rule miner for complex patient trajectory modelling.** *Comput Biol Med.* 2023 Feb 9;155:106636. DOI: 10.1016/j.compbiomed.2023.106636

Mas MÀ, Miralles R, Ulldemolins MJ, Garcia R, Gràcia S, Picaza JM, Navarro Fernández M, Rocabayera MA, Rivera M, Relaño N, Torres Asensio M, Laporta P, Morcillo C, Nadal L, Hervás R, Fuguet D, Alba C, Miralles Banqué N, Jiménez Panés S, Moreno Moreno M, Nogueras C, Manjón Navarro H, López R, Hernández G, López-Seguí F, Ríos LR, Pons A, Prat N, Ara Del Rey J, Estrada O. **Evaluating Person-Centred Integrated Care to People with Complex Chronic Conditions: Early Implementation Results of the ProPCC Programme.** *International Journal of Integrated Care*, 2023 Dec 13; 23(4): 18, 1-12. DOI: 10.5334/ijic.7585

Highlights

The group made significant strides in expanding the team and securing vital funding, demonstrating its commitment to leading health research and innovation. The addition of two members notably enhanced the team's research capabilities and interdisciplinary expertise, laying the groundwork for breakthroughs in addressing health challenges.

The year saw substantial achievements in funding, notably for the ASSIST and MoniK projects. The ASSIST project, in partnership with the Cardiology team at Germans Trias i Pujol University Hospital and IGTP, aims to harness artificial intelligence for predicting myocardial infarction, highlighting the INEDIT's drive to tackle critical health issues with cutting-edge technology. Additionally, the group secured support from the Spanish government for the MoniK project, an ambitious endeavour to develop a device for continuous monitoring of potassium in sweat for patients with chronic renal disease. This project underscores the INEDIT's focus on creating innovative solutions that cater to the specific needs of chronic disease patients, further establishing its role in advancing health technology.

Active engagement in the national research community also marked 2023, with numerous oral communications and poster presentations at conferences. These activities provided platforms for showcasing the group's latest findings, enhancing collaborative efforts, and spreading their innovative research initiatives.

The activities of INEDIT in 2023 were defined by a robust focus on collaboration and innovation. Through establishing strategic partnerships across academia, industry, and healthcare institutions at local, national, and European levels, the group not only extended the reach of its research but also facilitated a vibrant exchange of knowledge and expertise. These collaborative efforts have been pivotal in pushing forward the research agenda of Germans Trias Hospital and exploring new frontiers in health and medicine.

Reflecting on the year, the group's success in expanding its team, securing funding for pivotal projects like ASSIST and MoniK, and its active participation in the research community underline a year marked by progress and impactful contributions to health research and innovation.

Maresme Study Group on Community-Acquired Pneumonia and COPD (GEMPAC)

Group leaders: Ramon Boixeda i Viu, Maria del Carmen de la Torre, Maria Bartolomé

Research lines

- **Population study on COPD (misdiagnosis and comorbidity)**
- **Study of risk factors for exacerbation of COPD**
- **Study of risk factors for pneumonia**
- **Study of the aetiology and treatment of patients admitted to the hospital for pneumonia**
- **Study of risk factors for pneumonia in patients with respiratory conditions (asthma and COPD)**
- **Definition of a diagnostic algorithm for aspiration pneumonia**
- **Study of patients admitted to a general hospital for acute COPD**
- **Study of infectious comorbidity in patients admitted to the hospital for acute COPD**
- **COVID-19**

Featured publications

Gálvez-Barrón C, Pérez-López C, Villar-Álvarez F, Ribas J, Formiga F, Chivite D, Boixeda R, Iborra C, Rodríguez-Molinero A. **Machine learning for the development of diagnostic models of decompensated heart failure or exacerbation of chronic obstructive pulmonary disease.** *Sci Rep.* 2023 Aug 5;13(1):12709. DOI: 10.1038/s41598-023-39329-6

Riera J, Barbeta E, Tormos A, Mellado-Artigas R, Ceccato A, Motos A, Fernández-Barat L, Ferrer R, García-Gasulla D, Peñuelas O, Lorente JÁ, Menéndez R, Roca O, Palomeque A, Ferrando C, Solé-Violán J, Novo M, Boado MV, Tamayo L, Estella Á, Galban C, Trenado J, Huerta A, Loza A, Aguilera L, García Garmendia JL, Barberà C, Gumucio V, Socias L, Franco N, Valdivia LJ, Vidal P, Sagredo V, Ruiz-García ÁL, Martínez Varela I, López J, Pozo JC, Nieto M, Gómez JM, Blandino A, Valledor M, Bustamante-Munguira E, Sánchez-Miralles Á, Peñasco Y, Barberán J, Ubeda A, Amaya-Villar R, Martín MC, Jorge R, Caballero J, Marin J, Añón JM, Suárez Sipmann F, Albaiceta GM, Castellanos-Ortega Á, Adell-Serrano B, Catalán M, Martínez de la Gándara A, Ricart P, Carbajales C, Rodríguez A, Díaz E, de la Torre MC, Gallego E, Cantón-Bulnes L, Carbonell N, González J, de Gonzalo-Calvo D, Barbé F, Torres A; CIBERESUCICOVID Consortium. **Effects of intubation timing in patients with COVID-19 throughout the four waves of the pandemic: a matched analysis.** *Eur Respir J.* 2023 Mar 2;61(3):2201426. DOI: 10.1183/13993003.01426-2022

Méndez R, González-Jiménez P, Latorre A, Mengot N, Zalacain R, Ruiz LA, Serrano L, España PP, Uranga A, Cillóniz C, Hervás D, Torres A, Menéndez R; NEUMONAC; RECOVID; Pablo España P, Borderías L, Rajas O, Almirall J, Zalacaín R, Vendrell M, Bello S, Mir I, Morales C, Molinos L, Ferrer R, Briones M, Malo R, Sayago Reza I, Almonte Batista W, Moreno Galarraga L, Sibila Vidal O, Luis Rodríguez Hermosa J, Vargas Centanaro

G, de Vega Sánchez B, Solís García E, Rodríguez Florez E, José M, Estaba C, Molina Molina M, Bordas J, Estela González Castro M, Badenes Bonet D, Domínguez Álvarez M, Pérez-Rodas EN, Marín Arguedas A, Román Bernal B, Estrada Trigueros G, Cuenca Peris S, Martín Royo M, Torres García M, Portillo Sánchez J, Lerenas Bernal F, Salome Ros Braquehais M, Alfonso García Guerra J, Dolores Martínez Pitarch M, Arroyo Fernández I, Guevara Velázquez V, Martínez Olondris P, Francisco Pereyra Barrionuevo M, Lázaro Sierra J, Clavería P, Luis Wangüemert Pérez A, Joel Ruiz Lacambra J, Fernández Ramos N, Guanche Dorta S, Macias Paredes A, de la Rosa Carrillo D, Palones Femenia E, Podzamczer Valls I, Peñacoba Toribio P, Muñoz Zara P, García García R, Del Mar Marrube Fernández M, Villar Aguilar L, de Jorge Domínguez Pazos S, Pereiro Brea T, Pando-Sandoval A, María García Clemente M, Alzueta Álvarez A, García Coya E, de Freitas González E, Pablo España Yandiola P, Uranga A, Raboso Moreno B, Panadero C, Abad A, Cano I, Pérez Orbis I, Gotera Rivera C, Ruiz Pérez C, Menéndez Villanueva R, Méndez R, Latorre A, González P, Ramírez Prieto T, Ángel Salvador Maya M, Valenzuela C, Cifrián Martínez JM, Marco Figueira Gonçalves J, Baeza Ruiz A, Expósito Marrero A, Gurbani N, Malo de Molina Ruiz R, Galdeano Lozano M, Villanueva Montes M, Toledo Pons N, Ramón Clar L, Esperanza Barrios A, Cejudo Ramos P, López Ramírez C, Gaboli M, Almadana Pacheco V, Eduard Barbé Illa F, Clara A, Gutiérrez González N, Cabrera César E. **Is the long-term mortality similar in COVID-19 and community-acquired pneumonia?** *Front Med (Lausanne).* 2023 Oct 10;10:1236142. DOI: 10.3389/fmed.2023.1236142

Highlights

The Maresme Study Group on Community-Acquired Pneumonia and COPD (GEMPAC) is a consolidated group recognised by the Agency for Management of University and Research Grants (AGAUR) of the Government of Catalonia. It is part of Group 14 of the CIBERES network, focused on research in aetiology, prognostic risk factors associated with community acquired lower tract respiratory infections (LRTI), and of the PREPARE project (Platform for European Preparedness Against (Re-)Emerging Epidemics) in its work packages 3 and 5.

The group has produced seven doctoral theses in recent years, with another three currently underway. Additionally, they currently have eight contracts with pharmaceutical companies to conduct clinical trials.

Throughout the years, the group has made important contributions in the areas of incidence, microbiology, prognostic risk factors, costing, diagnostic errors and the value of inflammatory markers for the prediction of pneumonia and aetiological orientation. GEMP@C has participated as partners in the European projects GRACE (Genomics to combat Resistance against Antibiotics in Community acquired LRTI in Europe), COMBACTE CLIN-Net and LAB net (Innovative Initiatives in Medicine). The group has also been awarded eight FIS grants in which different health professionals have taken part as principal investigators. Their work has been reflected in 40 publications in international journals and 30 more in Spanish ones, with a total impact factor of 204.

Nursing Research Group (NURECARE)

Group leaders: Cristina Casanovas Cuellar, Ariadna Huertas Zurriaga

Research lines

- Innovation and evidence-based care
- High complexity care for people in acute, chronic and maternal-child situations
- Care management and models: care based on quality, safety and efficiency

Featured publications

Cabrera Jaime S, Martinez C, Gonzalo Bachiller V, Zarza Arnau N, Martin Maldonado L, Belén Manrique Palles A, Artiga Sarrion I, Tierno Sanchez N, Julià Torras J, Sancho JM, Cabrera Jaime L. **Participatory action research intervention for improving sleep in inpatients with cancer.** *J Clin Nurs.* 2023 Apr;32(7-8):1218-1229. DOI: 10.1111/jocn.16279

López Salas R, Reina Sarrió D, Castellà Fabregas L, García Quesada MJ, Casas García I, Valera Paloma J. **Uso y conocimiento de la asepsia en la inserción del catéter venoso periférico.** *Evidentia.* 2023 Nov;21:e14606. Available from: https://ciberindex.com/c/ev/e14606

Blasco MC, Huertas A, Casanovas C, Janeiro E, Muñoz P, Perpiñan M, Castellá M. **Impacto de la pandemia por COVID-19 en la implantación de una Guía de Buenas Prácticas sobre las lesiones por presión.** *Gerokomos.* 2023 Dec;34. Available from: http://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S1134-928X2023000400009&lng=es&tlng=es

Highlights

Since its recent establishment, the NURECARE research group has achieved significant recognition and success in the field of healthcare. The group's accomplishments underscore its commitment to advancing nursing practice and healthcare through innovative research, evidence-based practices, and a focus on improving patient outcomes.

In 2023, the group was awarded €20,000 by Agency for Management of University and Research Grants (AGAUR) of the Government of Catalonia for an innovative project led by Marc Jante aimed at optimizing the evaluation, diagnosis, and treatment of pressure injuries. This grant underlined the project's potential to significantly improve patient care in this critical area.

Four projects led by nurses from the NURECARE group were awarded in the Col·legi Oficial d'Infermeres i Infermers de Barcelona (COIB) Annual Call for Nursing Research Projects 2023. These included three multicentric projects by nurses from Institut Català d'Oncologia in Badalona, receiving €12,419, and one project by a nurse from Institut Català de la Salut - Germans Trias i Pujol University Hospital, awarded €6,435.

An article by Cabrera-Jaime S et al., discussing the approach to vascular access by an infusion therapy team for safety and quality of care, was awarded the Best Publication by the journal *Metas.*

Laura Cabrera Jaime received the 1st Research Prize in the Hospital Field from Consejo General de Enfermería de España for her doctoral thesis project focused on improving nosocomial infection in haematological patients through participatory action intervention. Additionally, Jordi Puig was honoured with the best doctoral thesis award by the University of Barcelona-Official Nursing College of Barcelona and for the best doctoral thesis written in Catalan, highlighting the excellence and depth of their research endeavours. Cristina Casanovas's project was awarded by Programa de ayudas a doctorandos y realización de tesis of Consejo General de Enfermería de España.

Projects led by Beatriz Diez and Isabel Granados were awarded at Beca Talents Infermeria Awards, "La Pedrera- Consolidació y Llavor".

The team's presentation on oncological pain management after the implementation of Best Practice Guidelines in Hospitalized Patients was awarded Best Oral Communication at the XIX National-III International Sociedad Española de Enfermería Oncológica (SEEO) Congress in Pamplona.

Woman & Health

Group leaders: Inés Velasco López

Research lines

- Epigenetics
- Metabolism and pregnancy
- Nutrition
- Prenatal diagnosis
- Gynaecological cancer
- Breast cancer

Featured publications

Velasco I, Rueda-Etxebarria M, Trak-Fellermeier MA, Taylor P, Rabassa Bonet M, Rueda JR, Chi Y, Janka H. **Iodine supplementation for preventing iodine deficiency disorders in children and adolescents.** *Cochrane Database Syst Rev.* 2023 Apr 28;2023(4):CD014475. DOI: 10.1002/14651858.CD014475

Soldevila B, Velasco I, Muñoz C, Díaz Y, Egea-Cortés L, Ferrer-Escopiñan L, Pérez-Montes de Oca A, Martínez-Mondejar R, Casabona J, Puig-Domingo M. **Longitudinal trajectories of maternal TSH in healthy pregnant women in Catalonia.** *Eur Thyroid J.* 2023 Aug 11;12(5):e230016. DOI: 10.1530/ETJ-23-0016

Villegas- Alvarez MC, Arias-Borrego A, Velasco I, García-Barrera T. **Ultrasound-assisted three-phase hollow fiber microextraction-based method for untargeted metabolomics.** *Microchemical Journal.* 2023 Oct;195:109473. DOI: 10.1016/j.microc.109473

Diseases of the Liver and Digestive Tract

Childhood Liver Oncology Group (c-LOG)
Carolina Armengol Niell

Inflammatory Bowel Diseases Research Group (GReMII)
Eugeni Domènech Morral
Josep Manyé Almero

Innate Immunity
Maria Rosa Sarrias Fornés

Oropharyngeal Dysphagia and Neurogastroenterology
Pere Clavé Civit

Translational Research in Hepatic Diseases
Rosa M. Morillas Cunill
Ramon Bartolí Solé

Inflammatory Bowel Diseases Research Group (GReMII)

Group leaders: Eugeni Domènech Morral, Josep Manyé Almero

Research lines

- **Ageing and obesity in IBD**
- **Therapeutic efficacy and safety in IBD: Biological agents & JAK inhibitors**
- **Utility of fecal calprotectin in predicting IBD complications**
- **Epitranscriptomic biomarkers for ulcerative colitis corticorefractoriness and postoperative recurrence in Crohn's disease**
- **Development of cutting-edge therapies using acellular strategies targeting adipose tissue for Crohn's disease**

Featured publications

Ferrante M, Pouillon L, Mañosa M, Savarino E, Allez M, Kapizioni C, Arebi N, Carvello M, Myrelid P, De Vries AC; 8th Scientific Workshop of the European Crohns and Colitis Organisation; Rivière P, Panis Y, Domènech E. **Results of the Eighth Scientific Workshop of ECCO: Prevention and Treatment of Postoperative Recurrence in Patients With Crohn's Disease Undergoing an Ileocolonic Resection With Ileocolonic Anastomosis.** *J Crohns Colitis.* 2023 Nov 24;17(11):1707-1722. DOI: 10.1093/ecco-jcc/jjad053

Suau R, Garcia A, Bernal C, Llaves M, Schiering K, Jou-Ollé E, Pertegaz A, Garcia-Jaraquemada A, Bartolí R, Lorén V, Vergara P, Mañosa M, Domènech E, Manyé J. **Response Variability to Drug Testing in Two Models of Chemically Induced Colitis.** *Int J Mol Sci.* 2023 Mar 29;24(7):6424. DOI: 10.3390/ijms24076424

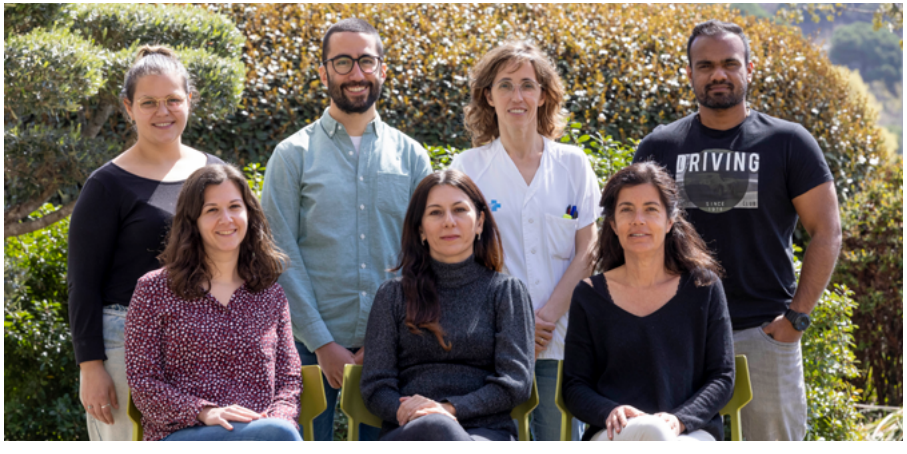
Mañosa M, Fernández-Clotet A, Nos P, Martín-Arranz MD, Manceñido N, Carbajo A, Hinojosa E, Hernández-Camba A, Muñoz-Pérez R, Boscá-Watts M, Calvo M, Sierra-Ausín M, Sánchez-Rodríguez E, Barreiro-de Acosta M, Núñez-Alonso A, Zabana Y, Márquez L, Gisbert JP, Guardiola J, Sáinz E, Delgado-Guillena P, Busquets D, van Domselaar M, Girona E, Lorente R, Casas-Deza D, Huguet JM, Maestro S, Cabello MJ, Castro J, Iborra M, Cañete F, Calafat M, Domènech E; ENEIDA registry by GETECCU. **Ustekinumab and vedolizumab for the prevention of postoperative recurrence of Crohn's disease: Results from the ENEIDA registry.** *Dig Liver Dis.* 2023 Jan;55(1):46-52. DOI: 10.1016/j.dld.2022.07.013

Highlights

GReMII secured a PFIS grant associated with the project “Assessment of isomiR profiles in IBD and their potential as biomarkers of corticosteroid response and postsurgical recurrence” for PhD student Roger Suau. Additionally, the group received an Odisea grant from GETECCU, which supported a two-month fellowship for Margalida Calafat at Massachusetts General Hospital (Boston, USA) to further her research on frailty. Moreover, Blanca Oller defended her doctoral thesis, which focused on the role of serial calprotectin in the long-term monitoring of Crohn’s patients post-ileocecal resection.

The group completed a randomized, controlled trial investigating the efficacy of adding three high-dose pulses of methylprednisolone to a conventional course of prednisone for moderate active ulcerative colitis (ClinicalTrials.gov ID NCT02921555). This multicentre trial, sponsored by GETECCU and led by principal investigators Jordina Llaó and Eugeni Domènech, also incorporated the collection of biological samples for validating a miRNA panel designed to predict steroid refractoriness in ulcerative colitis. The validation process is still ongoing, with final results expected in 2024.

Innate Immunity



Group leader: Maria Rosa Sarrias Fornés

Research lines

- **Role of innate immunity in liver disease**
- **Role of macrophage protein CD5L in infection**
- **Novel cancer immunotherapy strategy targeting macrophages**

Featured publications

Sanchez-Moral L, Paul T, Martori C, Font-Díaz J, Sanjurjo L, Aran G, Téllez É, Blanco J, Carrillo J, Ito M, Tuttolomondo M, Ditzel HJ, Fumagalli C, Tapia G, Sidorova J, Masnou H, Fernández-Sanmartín MA, Lozano JJ, Vilaplana C, Rodriguez-Cortés A, Armengol C, Valledor AF, Kremer L, Sarrias MR. **Macrophage CD5L is a target for cancer immunotherapy.** *EBioMedicine.* 2023 May;91:104555. DOI: 10.1016/j.ebiom.2023.104555

Sanjurjo L, Castelblanco E, Julve J, Villalmanzo N, Téllez É, Ramirez-Morros A, Alonso N, Mauricio D, Sarrias MR. **Contribution of Elevated Glucose and Oxidized LDL to Macrophage Inflammation: A Role for PRAS40/Akt-Dependent Shedding of Soluble CD14.** *Antioxidants (Basel).* 2023 May 11;12(5):1083. DOI: 10.3390/antiox12051083

de Homdedeu M, Sanchez-Moral L, Violán C, Ràfols N, Ouchi D, Martín B, Peinado MA, Rodríguez-Cortés A, Arch-Sisquella M, Perez-Zsolt D, Muñoz-Basagoiti J, Izquierdo-Useros N, Salvador B, Matllo J, López-Serrano S, Segalés J, Vilaplana C, Torán-Monserrat P, Morros R, Monfà R, Sarrias MR, Cardona PJ. **Mycobacterium manresensis induces trained immunity in vitro**. *iScience*. 2023 Jun 16;26(6):106873. DOI: 10.1016/j.isci.2023.106873

Highlights

The research group had a productive year, publishing four articles and securing funding to advance the team's research and innovation projects. They actively disseminated their findings by attending key conferences, including the CIBER-Rehd and SMA-TB consortium annual meetings, as well as national conferences of the Societat Catalana de Digestologia and the Asociación Española para el Estudio del Hígado.

Tony Paul and Maria Rosa Sarrias actively participated in Short Term Scientific Missions (STSMs) and meetings of the MyeInfobank COST Action, contributing to the discovery of new myeloid cell markers in inflammation and cancer. The group also hosted an STSM at IGTP, bringing together seven scientists from across Europe. In collaboration with the Pathology Department at Germans Trias I Pujol University Hospital, they organized a symposium on "Macrophage Markers in Cancer and Inflammation" during the STSM.

Sarrias demonstrated her commitment to bridging the gap between clinicians and translational researchers. She co-organized the 9th Course of Basic Research during the XXXIII conference of the Societat Catalana de Digestologia (the Catalan Society of Gastroenterology) and co-coordinated an eight-hour module on Basic Research Fundamentals within the IGTP-Hospital de Mataró Postgraduate course on research and innovation in health sciences.

The group's dedication to fostering scientific interest also extended to the next generation. Sarrias participated in the "Women in Science" event, inspiring high school students at Institut Pau Claris with her talks.

Oropharyngeal Dysphagia and Neurogastroenterology

Group leader: Pere Clavé Civit

Research lines

- Oropharyngeal dysphagia, complications and compensatory interventions
- Oropharyngeal dysphagia, pathophysiology, neurophysiology and new treatments
- Oropharyngeal dysphagia, rheology and texture of alimentary fluids and texture modified diets
- Big data and artificial intelligence tools for massive screening of prevalent pathologies
- Gastro-oesophageal motility
- Gastrointestinal basic studies

Featured publications

Bolivar-Prados M, Hayakawa Y, Tomsen N, Arreola V, Nascimento W, Riera S, Kawakami S, Miyaji K, Takeda Y, Kayashita J, Clavé P. S**hear-Viscosity-Dependent Effect of a Gum-Based Thickening Product on the Safety of Swallowing in Older Patients with Severe Oropharyngeal Dysphagia.** *Nutrients.* 2023 Jul 24;15(14):3279. DOI: 10.3390/nu15143279

Viñas P, Martín-Martínez A, Cera M, Riera SA, Escobar R, Clavé P, Ortega O. **Characteristics and Therapeutic Needs of Older Patients with Oropharyngeal Dysphagia Admitted to a General Hospital.** *J Nutr Health Aging*. 2023;27(11):996-1004. DOI: 10.1007/s12603-023-1996-8

Martin-Martinez A, Miró J, Amadó C, Ruz F, Ruiz A, Ortega O, Clavé P. **A Systematic and Universal Artificial Intelligence Screening Method for Oropharyngeal Dysphagia: Improving Diagnosis Through Risk Management.** *Dysphagia*. 2023 Aug;38(4):1224-1237. DOI: 10.1007/s00455-022-10547-w

Highlights

Part of the team was actively involved in organising and serving on the scientific committee of the first Jornada Científica PECT Mataró-Maresme, which was held on November 9 at TecnoCampus. This event encompassed a variety of scientific, outreach, and citizen science activities, attracting over 300 attendees from across the Maresme and Metropolitana Nord regions.

Several team members were awarded at two international conferences. At NeuroGASTRO 2023 in Bucharest, they were honoured with Posters of Distinction for their work on “A randomized clinical trial on the effect of two weeks of treatment with capsaicin in older patients with oropharyngeal dysphagia” and “Biomechanical and neurophysiological characterization of the pathophysiology of oropharyngeal dysphagia in older patients.” Additionally, at the 31st Annual Meeting of the Dysphagia Research Society in San Francisco, the team won 2nd Place for their Oral Presentation and 3rd Place for their Poster Presentation on topics related to the biomechanics and neurophysiology of swallowing in various phenotypes of oropharyngeal dysphagia.

AIMS Medical SL, a spin-off emerged from the group, was distinguished as one of the APTE top 100 Startups of 2023, marking a significant recognition of their innovative contributions to the medical field.

In March, several team members visited the laboratory of David Julius, the 2021 Nobel Laureate in Physiology or Medicine, at the University of California San Francisco. This visit provided an invaluable opportunity for collaboration and learning, highlighting the team’s commitment to advancing their scientific and medical knowledge.

Translational Research in Hepatic Diseases

Group leaders: Rosa M. Morillas Cunill, Ramon Bartolí Solé

Research lines

- **Chronic hepatitis**
- **Metabolic dysfunction-associated steatotic liver disease (MASLD)**
- **Cirrhosis and portal hypertension complications**
- **Hepatocellular carcinoma**

Featured publications

Serra-Burriel M, Juanola A, Serra-Burriel F, Thiele M, Graupera I, Pose E, Pera G, Grgurevic I, Caballeria L, Piano S, van Kleef L, Reichert M, Roulot D, Pericàs JM, Schattenberg JM, Tsochatztis EA, Guha IN, Garcia-Retortillo M, Hernández R, Hoyo J, Fuentes M, Expósito C, Martínez A, Such P, Madir A, Detlefsen S, Tonon M, Martini A, Ma AT, Pich J, Bonfill E, Juan M, Soria A, Carol M, Gratacós-Ginès J, Morillas RM, Toran P, Navarrete JM, Torrejón A, Fournier C, Llorca A, Arslanow A, de Koning HJ, Cucchietti F, Manns M, Newsome PN, Hernáez R, Allen A, Angeli P, de Knegt RJ, Karlsen TH, Galle P, Wong VW, Fabrellas N, Castera L, Krag A, Lammert F, Kamath PS, Ginès P; LiverScreen Consortium Investigators. **Development, validation, and prognostic evaluation of a risk score for long-term liver-related outcomes in the general population: a multicohort study.** *Lancet.* 2023 Sep 16;402(10406):988-996. DOI: 10.1016/S0140-6736(23)01174-1

Díaz-González Á, Hernández-Guerra M, Pérez-Medrano I, Sapena V, Riveiro-Barciela M, Barreira-Díaz A, Gómez E, Morillas RM, Del Barrio M, Escudé L, Mateos B, Horta D, Gómez J, Conde I, Ferre-Aracil C, El Hajra I, Arencibía A, Zamora J, Fernández A, Salcedo M, Molina E, Soria A, Estévez P, López C, Álvarez-Navascúes C, García-Retortillo M, Crespo J, Londoño MC; ColHai Registry. **Budesonide as first-line treatment in patients with autoimmune hepatitis seems inferior to standard predniso(lo)ne administration.** *Hepatology.* 2023 Apr 1;77(4):1095-1105. DOI: 10.1097/HEP.0000000000000018

Masnou H, Aguilar A, Iborra I, Sala M, Torner M, Clos-Parals A, Ardèvol A, Giménez M, Fortuny M, Sarrias MR, Morillas RM, Domènech E. I**ncidence, risk factors and clinical outcomes of multidrug-resistant microorganism infections among patients admitted for decompensated cirrhosis: A prospective study.** *Gastroenterol Hepatol*. 2023 Apr;46(4):288-296. DOI: 10.1016/j.gastrohep.2022.09.001

Endocrine and Diseases of the Metabolism, Bones and Kidneys

Diabetes Research Group
Núria Alonso Pedrol

Endocrine, Thyroid and Obesity
Manel Puig Domingo

Innovation in Vesicles and Cells for Application in Therapy (IVECAT)
Francesc Enric Borràs Serres
Marcel·la Franquesa Bartolomé

Research Group on Sarcopenia, Frailty and Dependency (GRESFD)
Mateu Serra Prat

Research in Kidney Affecting Diseases Group (REMAR)
Jordi Bover Sanjuán
Marcel·la Franquesa Bartolomé

Diabetes Research Group

Group leader: Núria Alonso Pedrol

Research lines

- **Study of atherosclerosis and other complications associated with diabetes**
- **Epidemiological studies of diabetes: studies with real-life practice databases**

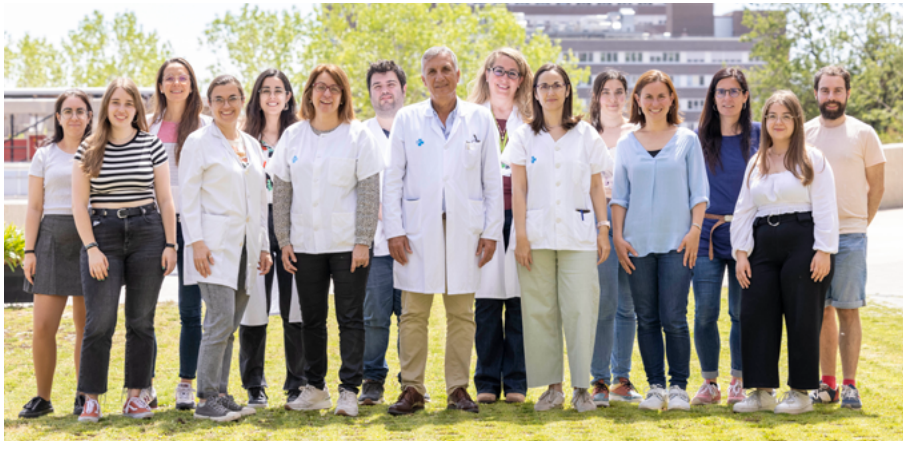
Featured publications

Giannella A, Castelblanco E, Zambon CF, Basso D, Hernandez M, Ortega E, Alonso N, Mauricio D, Avogaro A, Ceolotto G, Vigili de Kreutzenberg S. **Circulating Small Noncoding RNA Profiling as a Potential Biomarker of Atherosclerotic Plaque Composition in Type 1 Diabetes.** *Diabetes Care*. 2023 Mar 1;46(3):551-560. DOI: 10.2337/dc22-1441

Rodríguez-Calvo R, Granado-Casas M, Pérez-Montes de Oca A, Julian MT, Domingo M, Codina P, Santiago-Vacas E, Cediel G, Julve J, Rossell J, Masana L, Mauricio D, Lupón J, Bayes-Genis A, Alonso N. **Fatty Acid Binding Proteins 3 and 4 Predict Both All-Cause and Cardiovascular Mortality in Subjects with Chronic Heart Failure and Type 2 Diabetes *Mellitus*.** *Antioxidants (Basel)*. 2023 Mar 4;12(3):645. DOI: 10.3390/antiox12030645

Sanjurjo L, Castelblanco E, Julve J, Villalmanzo N, Téllez É, Ramirez-Morros A, Alonso N, Mauricio D, Sarrias MR. **Contribution of Elevated Glucose and Oxidized LDL to Macrophage Inflammation: A Role for PRAS40/Akt-Dependent Shedding of Soluble CD14.** *Antioxidants (Basel).* 2023 May 11;12(5):1083. DOI: 10.3390/antiox12051083

Endocrine, Thyroid and Obesity



Group leader: Manel Puig Domingo

Research lines

- **Molecular phenotyping of pituitary tumors and its application to personalised medicine**
- **Thyroid pathology**
- **Obesity**

Featured publications

Gil J, Marques-Pamies M, Valassi E, Serra G, Salinas I, Xifra G, Casano-Sancho P, Carrato C, Biagetti B, Sesmilo G, Marcos-Ruiz J, Rodriguez-Lloveras H, Rueda-Pujol A, Aulinas A, Blanco A, Hostalot C, Simó-Servat A, Muñoz F, Rico M, Ibáñez-Domínguez J, Cordero E, Webb SM, Jordà M, Puig-Domingo M. **Molecular characterization of epithelial-mesenchymal transition and medical treatment related-genes in non-functioning pituitary neuroendocrine tumors.** *Front Endocrinol (Lausanne)*. 2023 Mar 22;14:1129213. DOI: 10.3389/fendo.2023.1129213

Biagetti B, Iglesias P, Villar-Taibo R, Moure MD, Paja M, Araujo-Castro M, Ares J, Álvarez-Escola C, Vicente A, Guivernau ÈÁ, Novoa-Testa I, Perez FG, Cámara R, Lecumberri B, Gómez CG, Bernabéu I, Manjón L, Gaztambide S, Cordido F, Webb SM, Menéndez-Torre EL, Díez JJ, Simó R, Puig-Domingo M. **Mortality in Acromegaly Diagnosed in Older Individuals in Spain Is Higher in Women Compared to the General Spanish Population.** *J Clin Endocrinol Metab.* 2023 Aug 18;108(9):2193-2202. DOI: 10.1210/clinem/dgad141

Marques-Pamies M, Gil J, Valassi E, Hernández M, Biagetti B, Giménez-Palop O, Martínez S, Carrato C, Pons L, Villar-Taibo R, Araujo-Castro M, Blanco C, Simón I, Simó-Servat A, Xifra G, Vázquez F, Pavón I, García-Centeno R, Zavala R, Hanzu FA, Mora M, Aulinas A, Vilarrasa N, Librizzi S, Calatayud M, de Miguel P, Alvarez-Escola C, Picó A, Sampedro M, Salinas I, Fajardo-Montañana C, Cámara R, Bernabéu I, Jordà M, Webb SM, Marazuela M, Puig-Domingo M. **Revisiting the usefulness of the short acute octreotide test to predict treatment outcomes in acromegaly.** *Front Endocrinol (Lausanne)*. 2023 Oct 31;14:1269787. DOI: 10.3389/fendo.2023.1269787

Innovation in Vesicles and Cells for Application in Therapy (IVECAT)

Group leaders: Francesc Enric Borràs Serres, Marcel·la Franquesa Bartolomé

Research lines

- **Development of new strategies for the improvement in the objective diagnosis of diseases/pathologies**
- **Research in the field of Cell & "Cell-free" advanced therapies for immunomodulation and regenerative medicine**

Featured publications

Clos-Sansalvador M, Monguió-Tortajada M, Grau-Leal F, Ruiz de Porras V, Garcia SG, Sanroque-Muñoz M, Font-Morón M, Franquesa M, Borràs FE. **Agarose spot migration assay to measure the chemoattractant potential of extracellular vesicles: applications in regenerative medicine and cancer metastasis.** *BMC Biol*. 2023 Oct 26;21(1):236. DOI: 10.1186/s12915-023-01729-5

Llorens-Revull M, Martínez-González B, Quer J, Esteban JI, Núñez-Moreno G, Mínguez P, Burgui I, Ramos-Ruíz R, Soria ME, Rico A, Riveiro-Barciela M, Sauleda S, Piron M, Corrales I, Borràs FE, Rodríguez-Frías F, Rando A, Ramírez-Serra C, Camós S, Domingo E, Bes M, Perales C, Costafreda MI. **Comparison of Extracellular Vesicle Isolation Methods for miRNA Sequencing.** *Int J Mol Sci.* 2023 Jul 29;24(15):12183. DOI: 10.3390/ijms241512183

Miguez A, Gomis C, Vila C, Monguió-Tortajada M, Fernández-García S, Bombau G, Galofré M, García-Bravo M, Sanders P, Fernández-Medina H, Poquet B, Salado-Manzano C, Roura S, Alberch J, Segovia JC, Allen ND, Borràs FE, Canals JM. **Soluble mutant huntingtin drives early human pathogenesis in Huntington's disease.** *Cell Mol Life Sci.* 2023 Aug 3;80(8):238. DOI: 10.1007/s00018-023-04882-w

Research Group on Sarcopenia, Frailty and Dependency (GRESFD)

Group leader: Mateu Serra Prat

Research lines

- **Evaluation of the pathophysiology and risk factors of sarcopenia, frailty and functional decline in the elderly**
- **Evaluation of the effectiveness and safety of interventions aimed at preventing and/or reversing frailty and disability in the elderly**
- **Assessment of the impact of frailty on the health and quality of life of the elderly and assessment of the economic impact of frailty**
- **Development and validation of electronic and automatic instruments for mass screening of frailty and/or disability to generate information at population level, useful for health planning and management**

Featured publications

Lavado À, Serra-Colomer J, Serra-Prat M, Burdoy E, Cabré M. **Relationship of frailty status with health resource use and healthcare costs in the population aged 65 and over in Catalonia.** *Eur J Ageing.* 2023 Jun 7;20(1):20. DOI: 10.1007/s10433-023-00769-8

Moreno-Carmona MR, Serra-Prat M, Riera SA, Estrada O, Ferro T, Querol R. **Effect of frailty on postoperative complications, mortality, and survival in older patients with non-metastatic colon cancer: A systematic review and meta-analysis**. *J Geriatr Oncol.* 2023 Oct 6;15(2):101639. DOI: 10.1016/j.jgo.2023.101639

Serra-Prat M, Lorenzo I, Martínez J, Palomera E, Pleguezuelos E, Ferrer P. **Relationship between Hydration Status and Muscle Catabolism in the Aged Population: A Cross-Sectional Study.** *Nutrients.* 2023 Nov 8;15(22):4718. DOI: 10.3390/nu15224718

Highlights

The group created the Frailty Observatory, a tool for generating, sharing and disseminating objective and rigorous information for the general population as well as professionals, managers and health planners. The observatory is useful for making decisions about prevention, care and treatment of frailty and its complications in people aged 65 and over.

Additionally, the team edited a clinical guideline for frailty prevention.

Research in Kidney Affecting Diseases Group (REMAR)

Group leaders: Jordi Bover Sanjuán, Marcel·la Franquesa Bartolomé

Research lines

- Bone and mineral metabolism
- Cardiorenal axis
- New approaches in transplantation
- POCUS (Point of Care Ultrasound)
- Novel non-invasive urinary biomarkers
- Advanced cell-based and EV Therapies

Featured publications

Clos-Sansalvador M, Monguió-Tortajada M, Grau-Leal F, Ruiz de Porras V, Garcia SG, Sanroque-Muñoz M, Font-Morón M, Franquesa M, Borràs FE. **Agarose spot migration assay to measure the chemoattractant potential of extracellular vesicles: applications in regenerative medicine and cancer metastasis.** *BMC Biol*. 2023 Oct 26;21(1):236. DOI: 10.1186/s12915-023-01729-5

Fusaro M, Pereira L, Bover J. **Current and Emerging Markers and Tools Used in the Diagnosis and Management of Chronic Kidney Disease-Mineral and Bone Disorder in Non-Dialysis Adult Patients.** *J Clin Med.* 2023 Sep 30;12(19):6306. DOI: 10.3390/jcm12196306

Immunology and Inflammation

Immunology of Diabetes
Marta Vives Pi

Immunopathology
Eva Mª Martínez Cáceres

Immunology of Diabetes

Group leader: Marta Vives Pi

Research lines

- **Immunotherapies for the prevention and cure of type 1 diabetes and other autoimmune diseases**
- **Biomarkers of spontaneous remission in type 1 diabetes**
- **Pathogenic mechanisms of autoimmunity**

Featured publications

Almenara-Fuentes L, Rodriguez-Fernandez S, Rosell-Mases E, Kachler K, You A, Salvado M, Andreev D, Steffen U, Bang H, Bozec A, Schett G, Le Panse R, Verdaguer J, Dalmases M, Rodriguez-Vidal S, Barneda-Zahonero B, Vives-Pi M. **A new platform for autoimmune diseases. Inducing tolerance with liposomes encapsulating autoantigens.** *Nanomedicine.* 2023 Feb;48:102635. DOI: 10.1016/j.nano.2022.102635

Gomez-Muñoz L, Perna-Barrull D, Murillo M, Armengol MP, Alcalde M, Catala M, Rodriguez-Fernandez S, Sunye S, Valls A, Perez J, Corripio R, Vives-Pi M. **Immunoregulatory Biomarkers of the Remission Phase in Type 1 Diabetes: miR-30d-5p Modulates PD-1 Expression and Regulatory T Cell Expansion.** *Noncoding RNA.* 2023 Feb 28;9(2):17. DOI: 10.3390/ncrna9020017

Gomez-Muñoz L, Dominguez-Bendala J, Pastori RL, Vives-Pi M. **Immunometabolic biomarkers for partial remission in type 1 diabetes mellitus.** *Trends Endocrinol Metab*. 2024 Feb;35(2):151-163. DOI: 10.1016/j.tem.2023.10.005

Highlights

The group started a project funded by Instituto de Salud Carlos III (ISCIII), titled "Immunoregulatory MicroRNAs in Type 1 Diabetes. Biomarkers and Therapeutic Targets of Autoimmunity and Beta Cell Recovery in Partial Remission". The project aims to demonstrate the immunoregulatory potential of PR-miRNAs for therapeutic development.

The team participates in a public-private collaboration project titled "Valorization of an Antigen-Specific Therapy for the Disruptive Treatment of Type 1 Diabetes; Multiple Sclerosis, Myasthenia Gravis, Celiac Disease, and Rheumatoid Arthritis", led by Ahead Therapeutics. The consortium aims to conclude the preclinical phase of selected indications to induce immune tolerance.

The group also initiated a new project, "Immune Checkpoints as Predictive and Diagnostic Biomarkers for Remission in Type 1 Diabetes", funded by the Sociedad Española de Diabetes, with Laia Gómez-Muñoz as principal investigator.

The spin-off of the group, Ahead Therapeutics SL, took the final steps to advance to the clinical trial phase for testing PS-liposomes in autoimmune diseases. Ahead Therapeutics is also participating in the European Consortium "TOLERATE: An Integrated Approach to Restore Tolerance in Autoimmune Disease", aimed at developing immunotherapies for immune-mediated thrombotic thrombocytopenic purpura. Daniela Greco will develop her PhD thesis within a research training program of the consortium.

David Perna-Barrull was awarded the Extraordinary Doctoral Award for his PhD thesis by Universitat Autònoma de Barcelona.

The group, along with the Immunology Department, has been recognized and funded by the Agency for Management of University and Research Grants (AGAUR) of the Government of Catalonia, as experts in Advanced Immunotherapies for Autoimmunity.

The group's outreach efforts in 2023 include:

- An interview in Diario Médico.
- A podcast by IGTP titled "Type 1 diabetes: when your defences attack you".
- A dissemination article in Revista Diabetes on the honeymoon phase in type 1 diabetes and its immunological implications.
- Participation in a World Diabetes Day event, which was featured in interviews on local radio and television news media.

Immunopathology

Group leader: Eva Mª Martínez Cáceres

Research lines

- Innovation and diagnostic immunology
- Clinical epidemiology research
- Immune therapies inducing tolerance
- Neuroimmunology: cellular tolerance therapy in multiple sclerosis

Featured publications

Iglesias-Escudero M, Arias-González N, Martínez-Cáceres E. **Regulatory cells and the effect of cancer immunotherapy**. *Mol Cancer.* 2023 Feb 4;22(1):26. DOI: 10.1186/s12943-023-01714-0

Quirant-Sánchez B, Plans-Galván O, Lucas E, Argudo E, Martinez-Cáceres EM, Armés-tar F. **HLA-DR Expression on Monocytes and Sepsis Index Are Useful in Predicting Sepsis.** *Biomedicines.* 2023 Jun 26;11(7):1836. DOI: 10.3390/biomedicines11071836

Mansilla MJ, Hilkens CMU, Martínez-Cáceres EM. **Challenges in tolerogenic dendritic cell therapy for autoimmune diseases: the route of administration.** *Immunother Adv.* 2023 Jul 18;3(1):ltad012. DOI: 10.1093/immadv/ltad012

Infectious Diseases

Clinical and Environmental Infectious Diseases Study Group (CEID)
Maria Luisa Pedro Botet
Noemí Párraga Niño

Clinical and Experimental Microbiology Unit (UMCiE)
Pere-Joan Cardona Iglesias

Experimental Tuberculosis Unit (UTE)
Cristina Vilaplana Massaguer

Innovation in Respiratory Infections and Tuberculosis
José Domínguez Benítez

Pathogen Diagnostics and Genomic Epidemiology (DxEpiPath)
Elisa Martró Català

***Plasmodium vivax* and Exosome Research Group (PvREX)**
Hernando A. Del Portillo
Carmen Fernández Becerra

Clinical and Environmental Infectious Diseases Study Group (CEID)

Group leaders: Maria Luisa Pedro Botet, Noemí Párraga Niño

Research lines

- *Legionella*
- **Community-acquired pneumonia**
- **Nosocomial pneumonia outside the ICU**
- **Immunocompromised Unit**
- **One Health**
- **Intestinal microbiota**

Featured publications

Grillo S, Pujol M, Miró JM, López-Contreras J, Euba G, Gasch O, Boix-Palop L, Garcia-País MJ, Pérez-Rodríguez MT, Gomez-Zorrilla S, Oriol I, López-Cortés LE, Pedro-Botet ML, San-Juan R, Aguado JM, Gioia F, Iftimie S, Morata L, Jover-Sáenz A, García-Pardo G, Loeches B, Izquierdo-Cárdenas Á, Goikoetxea AJ, Gomila-Grange A, Dietl B, Berbel D, Videla S, Hereu P, Padullés A, Pallarès N, Tebé C, Cuervo G, Carratalà J; SAFO study group. **Cloxacillin plus fosfomycin versus cloxacillin alone for methicillin-susceptible Staphylococcus aureus bacteremia: a randomized trial.** *Nat Med.* 2023 Oct;29(10):2518-2525. DOI: 10.1038/s41591-023-02569-0

Quero S, Serras-Pujol M, Párraga-Niño N, Torres C, Navarro M, Vilamala A, Puigoriol E, de Los Ríos JD, Arqué E, Serra-Pladevall J, Romero A, Molina D, Paredes R, Pedro-Botet ML, Reynaga E. **Methicillin-resistant and methicillin-sensitive Staphylococcus aureus in pork industry workers, Catalonia, Spain.** *One Health.* 2023 Apr 7;16:100538. DOI: 10.1016/j.onehlt.2023.100538

Sopena N, Isernia V, Casas I, Díez B, Guasch I, Sabrià M, Pedro-Botet ML. **Intervention to reduce the incidence of non-ventilator-associated hospital-acquired pneumonia: A pilot study**. *Am J Infect Control.* 2023 Dec;51(12):1324-1328. DOI: 10.1016/j.ajic.2023.06.001

Highlights

Alba Romero undertook a fellowship in infections in solid organ transplantation and oncology haematology at the Ajmera Transplant Centre, Toronto General Hospital. During her fellowship, she collaborated with globally recognised professionals such as Shahid Husain, Atul Humar, and Deepali Kumar, and initiated joint research projects on Pneumocystis and varicella-zoster virus.

A Functional Unit for the management of septic orthopaedic trauma (COT) patients was established to optimize the management of septic patients. Coordinated by the Department of Orthopaedic Surgery and Traumatology, this unit also involves shared support from the Department of Infectious Diseases, represented by Esteban Reynaga, with the addition of Javier Díez de los Ríos.

Under the leadership of Nieves Sopena, the group began a project related to nosocomial pneumonia outside the ICU, funded by Instituto de Salud Carlos III (ISCIII). The project aims to understand the pathogenesis of nosocomial pneumonia by examining risk factors for oropharyngeal colonization by multi-resistant bacteria, determining the aetiology using molecular diagnostic techniques on respiratory samples, and finally evaluating ICTs as a method for detecting nosocomial pneumonia.

The *Legionella* research line, led by Maria Luisa Pedro-Botet, established a collaboration agreement with Menarini to study the effect of Delafloxacin against *Legionella* infecting alveolar macrophages. Roger Cortès joined this project, and Lluc Vinyeta, a fifth-year medical student, received a Promising Talent scholarship by Universitat Autònoma de Barcelona (UAB).

The group's extensive experience with primary immunodeficiency has naturally extended to understanding secondary immunodeficiency due to antibody synthesis deficits. Hypogammaglobulinemia, the most prevalent secondary immunodeficiency, is currently managed similarly to primary immunodeficiencies in the absence of controlled studies. This insight led to the creation of the Immunocompromised Unit in 2022, focusing on infection prevention, early diagnosis, and appropriate treatment of infectious complications in the context of immunosuppression. A specialised outpatient clinic has been established for prevention, and several multidisciplinary working groups have been formed to optimally address infections in patients with solid organ transplants, oncology-haematology patients, and patients with inflammatory diseases treated with selective immunosuppressors.

Clinical and Experimental Microbiology Unit (UMCiE)

Group leader: Pere-Joan Cardona Iglesias

Research lines

- **SARS-CoV-2**
- **Viral hepatitis (B and C)**
- **Genomic Epidemiology of *Mycobacterium tuberculosis* Complex (MTBC)**
- **Study of M. tuberculosis virulence**
- **Control of environmental *mycobacteria* outbreaks**
- **Molecular epidemiology of syphilis**
- **Study of quinolone resistance mechanisms in *Mycoplasma genitalium***
- **Determination of pAmpC plasmid in sepsis**
- **Diagnosis of meningitis**
- **Interaction between P*seudomonas aeruginosa* and *Staphylococcus aureus***
- **Impact of fecal microbiota on the selection of multiresistance**
- **Study of the dissemination of multidrug-resistant bacteria**

Featured publications

Suñer C, Ubals M, Tarín-Vicente EJ, Mendoza A, Alemany A, Hernández-Rodríguez Á, Casañ C, Descalzo V, Ouchi D, Marc A, Rivero À, Coll P, Oller X, Miguel Cabrera J, Vall-Mayans M, Dolores Folgueira M, Ángeles Melendez M, Agud-Dios M, Gil-Cruz E, Paris de Leon A, Ramírez Marinero A, Buhiichyk V, Galván-Casas C, Paredes R, Prat N, Sala Farre MR, Bonet-Simó JM, Farré M, Ortiz-Romero PL, Clotet B, García-Patos V, Casabona J, Guedj J, Cardona PJ, Blanco I; Movie Group; Marks M, Mitjà O. **Viral dynamics in patients with monkeypox infection: a prospective cohort study in Spain.** *Lancet Infect Dis*. 2023 Apr;23(4):445-453. DOI: 10.1016/S1473-3099(22)00794-0

de Homdedeu M, Sanchez-Moral L, Violán C, Ràfols N, Ouchi D, Martín B, Peinado MA, Rodríguez-Cortés A, Arch-Sisquella M, Perez-Zsolt D, Muñoz-Basagoiti J, Izquierdo-Useros N, Salvador B, Matllo J, López-Serrano S, Segalés J, Vilaplana C, Torán-Monserrat P, Morros R, Monfà R, Sarrias MR, Cardona PJ. ***Mycobacterium manresensis* induces trained immunity in vitro.** *iScience*. 2023 Jun 16;26(6):106873. DOI: 10.1016/j.isci.2023.106873

Arch M, Vidal M, Fuentes E, Abat AS, Cardona PJ. **The reproductive status determines tolerance and resistance to *Mycobacterium marinum* in *Drosophila melanogaster.*** *Evol Med Public Health*. 2023 Sep 6;11(1):332-347. DOI: 10.1093/emph/eoad029

Highlights

The Clinical and Experimental Microbiology Unit (UMCiE) is addressing the challenge of emerging infectious diseases by providing immediate diagnostic tools to detect monkeypox, in collaboration with the Infectious Diseases Department (IDD) at Germans Trias i Pujol University Hospital. It is also monitoring variants of SARS-CoV-2 and influenza as part of the RELECOV.2 consortium, in collaboration with the hospital's Preventive Department.

The group is developing the InfraRed Biotyper to control nosocomial outbreaks of MDR pathogens, such as ESBL-producing Klebsiella pneumoniae. This innovative technology provides fast information that parallels next-generation sequencing (NGS), enabling immediate interventions to halt the spread of these outbreaks.

Elisa Martro, as principal investigator, received a FIS project grant for detecting hepatitis C and tuberculosis in vulnerable populations. The group is actively collaborating in the hepatitis C eradication initiative through active detection in the hospital's Emergency Unit, supported by a grant from Gilead. Additionally, it is involved in detecting chronic schistosomiasis in the North Metropolitan Region, in collaboration with IDD.

After two years, the optimization of the TB-SEQ strategy, funded by CIBERESP, is underway in partnership with the Catalan Public Health Agency (ASPCAT). Approximately 1400 strains of *M. tuberculosis* from across Catalonia have been sequenced and epidemiologically linked. This effort will culminate in a real-time surveillance strategy to help curtail the spread of tuberculosis in Catalonia. UMCIE received funding from the European Health and Digital Executive Agency (HADEA) and is now part of the ITHEMYC consortium. The project "Novel Immunotherapies for Tuberculosis and Other Mycobacterial Diseases" aims to discover new treatments. The team is contributing by screening candidates using a new experimental model in *Drosophila melanogaster* and the active TB model in C3HeB/FeJ mice.

Isabel Nogueira, from the Radiology Department, earned her PhD under the supervision of Pere-Joan Cardona. Her research focused on the significance of daughter micronodules in the expansion of *M. tuberculosis* lesions in the lung. This data, derived from Computed Tomography Scan of experimentally infected macaques provided through a collaboration with the UK Health Security Agency, builds on previous group findings from experiments in mice and mini-pigs, conceptualized by an in silico model: the "bubble model".

Recent data on the RUTI vaccine, tested in an experimental model of active TB in C3HeB/Fe mice, showed its efficacy in reducing pathology and bacillary load when administered therapeutically at the onset of active TB. This effect can be demonstrated whether administered alone or in combination with the standard of care therapy (RHEZ). This finding, challenging the Koch phenomenon, marks a significant advancement in immunotherapy for tuberculosis and was published in the new journal Frontiers in *Tuberculosis.*

Experimental Tuberculosis Unit (UTE)

Group leader: Cristina Vilaplana Massaguer

Research lines

- **Study of biomarkers and tools for monitoring TB disease course and prognosis**
- **Study of health dimensions and quality of life in the context of infectious diseases**
- **Evaluation of new prophylactic and therapeutic strategies against TB**

Featured publications

Roure S, Vallès X, Sopena N, Benítez RM, Reynaga EA, Bracke C, Loste C, Mateu L, Antuori A, Baena T, Portela G, Llussà J, Flamarich C, Soldevila L, Tenesa M, Pérez R, Plasencia E, Bechini J, Pedro-Botet ML, Clotet B, Vilaplana C. **Disseminated tuberculosis and diagnosis delay during the COVID-19 era in a Western European country: a case series analysis.** *Front Public Health.* 2023 May 18;11:1175482. DOI: 10.3389/fpubh.2023.1175482

Arias L, Otwombe K, Waja Z, Tukvadze N, Korinteli T, Moloantoa T, Fonseca KL, Pillay N, Seiphetlo T, Ouchi-Vernet D, Siles A, Carabias L, Quiñones C, Vashakidze S, Martinson N, Vilaplana C. **SMA-TB: study protocol for the phase 2b randomized double-blind, placebo-controlled trial to estimate the potential efficacy and safety of two repurposed drugs, acetylsalicylic acid and ibuprofen, for use as adjunct therapy added to, and compared with, the standard WHO recommended TB regimen.** *Trials.* 2023 Jun 28;24(1):435. DOI: 10.1186/s13063-023-07448-0

Wong KLM, Gimma A, Coletti P; CoMix Europe Working Group; Faes C, Beutels P, Hens N, Jaeger VK, Karch A, Johnson H, Edmunds W, Jarvis CI. **Social contact patterns during the COVID-19 pandemic in 21 European countries - evidence from a two-year study.** *BMC Infect Dis.* 2023 Apr 26;23(1):268. DOI: 10.1186/s12879-023-08214-y

Highlights

The Experimental Tuberculosis Unit (UTE) achieved significant milestones underscoring the group's commitment to advancing TB research, diagnosis, and treatment in both local and international contexts.

The SMA-TB project, coordinated by the UTE and funded by the EC-program Horizon Europe, made substantial progress. Notably, despite significant challenges posed by the COVID pandemic and budget constraints, the SMA-TB Clinical Trial (CT) has enrolled 223 patients so far, reaching 63% of the recruitment goal and surpassing the European Commission's milestone of more than 50% patient recruitment. Additionally, consortium partners collected, handled, and processed a remarkable 15,179 samples.

Collaborative efforts in clinical-translational research led to the publication of the Roure et al. (2023) article, which stemmed from prospective patient cohorts established in 2018. This research focused on biomarker investigation and TB prognosis monitoring tools, laying the foundation for developing the Plan for TB management at Germans Trias i Pujol University Hospital (HUGTIP), coordinated by Cristina Vilaplana. The plan extends to Barcelona and Maresme territories under Institut Català de la Salut (ICS), in coordination with the Primary Care Directorate and the Epidemiological Surveillance Service (SEV) of Agència de Salut Pública de Catalunya (ASPCAT).

Achievements in training activities include Arantxa Romero Tamarit successfully defending her PhD thesis on 11 December, titled "Avaluació d'eines per a un maneig assistencial més personalitzat, integral i eficaç per a les persones amb tuberculosi" (Evaluation of tools for a more personalized, comprehensive, and effective care management for individuals with tuberculosis) at Universitat Autònoma de Barcelona (UAB). Additionally, the group welcomed Natasha Pillay from the PeriNatal HIV Unit in Johannesburg, South Africa, for a secondment, fostering international collaboration and knowledge exchange in the field of tuberculosis research and care.

Innovation in Respiratory Infections and Tuberculosis

Group leaders: José Domínguez Benítez

Research lines

- **Microbial interactions**
- **Immune response characterisation**
- **Impact of external factors**
- **Diagnostic technology innovation**
- **New therapeutic approaches**

Featured publications

Domínguez J, Boeree MJ, Cambau E, Chesov D, Conradie F, Cox V, Dheda K, Dudnyk A, Farhat MR, Gagneux S, Grobusch MP, Gröschel MI, Guglielmetti L, Kontsevaya I, Lange B, van Leth F, Lienhardt C, Mandalakas AM, Maurer FP, Merker M, Miotto P, Molina-Moya B, Morel F, Niemann S, Veziris N, Whitelaw A, Horsburgh CR Jr, Lange C; TBnet and RESIST-TB networks. **Clinical implications of molecular drug resistance testing for Mycobacterium tuberculosis: a 2023 TBnet/RESIST-TB consensus statement.** *Lancet Infect Dis.* 2023 Apr;23(4):e122-e137. DOI: 10.1016/S1473-3099(22)00875-1

Hamada Y, Gupta RK, Quartagno M, Izzard A, Acuna-Villaorduna C, Altet N, Diel R, Dominguez J, Floyd S, Gupta A, Huerga H, Jones-López EC, Kinikar A, Lange C, van Leth F, Liu Q, Lu W, Lu P, Rueda IL, Martinez L, Mbandi SK, Muñoz L, Padilla ES, Paradkar M, Scriba T, Sester M, Shanaube K, Sharma SK, Sloot R, Sotgiu G, Thiruvengadam K, Vashishtha R, Abubakar I, Rangaka MX. **Predictive performance of interferon-gamma release assays and the tuberculin skin test for incident tuberculosis: an individual participant data meta-analysis.** *EClinicalMedicine.* 2023 Jan 5;56:101815. DOI: 10.1016/j.eclinm.2022.101815

Pittet LF, Messina NL, Orsini F, Moore CL, Abruzzo V, Barry S, Bonnici R, Bonten M, Campbell J, Croda J, Dalcolmo M, Gardiner K, Gell G, Germano S, Gomes-Silva A, Goodall C, Gwee A, Jamieson T, Jardim B, Kollmann TR, Lacerda MVG, Lee KJ, Lucas M, Lynn DJ, Manning L, Marshall HS, McDonald E, Munns CF, Nicholson S, O'Connell A, de Oliveira RD, Perlen S, Perrett KP, Prat-Aymerich C, Richmond PC, Rodriguez-Baño J, Dos Santos G, da Silva PV, Teo JW, Villanueva P, Warris A, Wood NJ, Davidson A, Curtis N; BRACE Trial Consortium Group. **Randomized Trial of BCG Vaccine to Protect against Covid-19 in Health Care Workers.** *N Engl J Med.* 2023 Apr 27;388(17):1582-1596. DOI: 10.1056/NEJMoa2212616

Highlights

In 2023, the group published 12 papers in international peer-reviewed journals, with most of them involving collaborations with national and international partners.

The COST (European Cooperation in Science and Technology) Action ADVANCE-TB consortium was consolidated. Chaired by Alícia Lacoma, the consortium includes 169 members from 45 countries as of March 2024. In June 2023, a successful joint meeting between ADVANCE-TB and INNOVA4TB (another European project of the group) was held in Utrecht, Netherlands, attended by over 80 health professionals from various countries.

The group has also initiated a new research line under the leadership of Alícia Lacoma, in collaboration with PhD student Iris Romero. This research focuses on using 2D and 3D mini-lung infection models to assess the impact of micro and nanoplastics on the respiratory immune response. This study is supported by Alberto Zambrano from Instituto de Salud Carlos III (ISCIII) in Madrid.

Sergio Díaz completed a six-month predoctoral stage at the Texas Medical Research laboratories in the United States, under the supervision of Jordi Torrelles. His research focuses on the immune response against *Mycobacterium tuberculosis* in in-vivo mouse models and is part of the research line led by Irene Latorre. Finally, Guillem Safont was granted with a predoctoral grant from the Agency for Management of University and Research Grants (AGAUR) to develop his thesis on the study of the humoral and cellular immune responses against SARS-CoV-2.

Pathogen Diagnostics and Genomic Epidemiology (DxEpiPath)

Group leader: Elisa Martró Català

Research lines

- **Viral hepatitis**
  - **Hepatitis C**
  - **Hepatitis B**
- **Molecular diagnostics and genomic epidemiology of other infectious diseases**
  - **Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)**
  - **Tuberculosis (TB)**
  - **Antimicrobial resistant bacteria**
  - **Sexually Transmitted Infections (STI)**

Featured publications

Saludes V, Bordoy AE, Yela E, Turú E, Not A, López-Corbeto E, Egea-Cortés L, González-Candelas F, Casabona J, Group for the Study and Control of Infectious Diseases in Prison (GRUMIP), Marco A, Martró E. **Incidence and molecular epidemiology of hepatitis C virus reinfection in prisons in Catalonia, Spain (Re-HCV study).** *Sci Rep.* 2023 Sep 25;13(1):16012. DOI: 10.1038/s41598-023-42701-1

Reyes-Urueña J, Costell-González F, Egea-Cortés L, Ouaarab H, Saludes V, Buti M, Majó I Roca X, Colom J, Gómez I Prat J, Casabona J, Martró E, HepClink Study Group. **Implementation of the HepClink test-and-treat community strategy targeting Pakistani migrants with hepatitis C living in Catalonia (Spain) compared with the current practice of the Catalan health system: budget impact analysis.** *BMJ Open*. 2023 Aug 21;13(8):e068460. DOI: 10.1136/bmjopen-2022-068460

Not A, Saludes V, Gálvez M, Miralpeix A, Bordoy AE, González N, González-Gómez S, Muntané L, Reyes-Urueña J, Majó X, Colom J, Forns X, Lens S, Martró E. **Usefulness of dried blood spot samples for monitoring hepatitis C treatment outcome and reinfection among people who inject drugs in a test-and-treat program.** *J Med Virol.* 2023 Feb;95(2):e28544. DOI: 10.1002/jmv.28544

Highlights

The DxEpiPath Group has been actively promoting the elimination of hepatitis C and B virus (HCV and HBV) infections among vulnerable populations. This is achieved through decentralizing diagnostics using innovative testing strategies such as dried blood spots and point-of-care tests, which facilitate easier access to care and treatment.

In multidisciplinary collaborations with other groups, the Centre for Epidemiological Studies on HIV/AIDS and STI of Catalonia (CEEISCAT), civil society and the Public Health Agency of Catalonia (ASPCAT), Elisa Martró has led pioneering new models of care that have also contributed to the characterisation of the local HCV and HBV epidemiology in men who have sex with men, sex workers, people who inject drugs (in harm reduction services and community pharmacies -new project-), people in prisons, and migrants from endemic countries. Regarding the latter, the HepB*Clink* model of care in migrants was included in the international compilations of best practices "Stories to Inspire" (ACHIEVE Coalition, 2023) and "Barriers and solutions to increasing access to point-of-care HCV testing" (INHSU, 2023). Additionally, it led to a PhD thesis defence in collaboration with ISGlobal ("Feasibility and acceptability of new models of hepatitis B virus care among African populations: implications for achieving the WHO viral hepatitis elimination targets" by Camila Picchio). Martró has been actively involved in the "Plan for the Prevention and Control of Hepatitis C in Catalonia" (ASPCAT) since 2017.

The group also specialises in the genomic epidemiology and surveillance of relevant pathogens. Throughout the COVID-19 pandemic, the entire team engaged in SARS-CoV-2 genomic sequencing to identify circulating variants and investigate transmission outbreaks, with findings directly reported to infection control teams and Public Health services. Supported by funding from Fundació La Marató de TV3, the team implemented rapid nanopore-based sequencing at the Microbiology Service for outbreak investigation and weekly surveillance. Additionally, this initiative extended to full 16S rRNA gene sequencing from clinical samples for rapid bacterial infection diagnosis and bacterial microbiota studies, featuring a postdoctoral researcher "Margarita Salas", Miquel de Hom-dedeu.

The group also conducted genomic epidemiology studies of multi-drug resistant bacteria associated with nosocomial outbreaks. Moreover, Martró led a multicentre genomic epidemiology study of Mycobacterium tuberculosis complex (MTBC) strains in Catalonia as part of CIBERESP intramural projects call, with the entire group involved in the implementation of genomic sequencing within the tuberculosis control activities of ASPCAT.

Plasmodium vivax and Exosome Research Group (PvREX)

Group leaders: Hernando A. Del Portillo, Carmen Fernández Becerra

Research lines

- **Exosome-mediated mechanisms of non-hypnozoite cryptic infections in *P. vivax* malaria**
- **Functional analysis of spleen and bone marrow dependent genes**
- **Reticulocyte-derived exosomes (Rex) vaccines against *P. vivax***
- **Extracellular vesicles (EVs) as potential new biomarkers in parasitic infections**
- **Hypnozoite biomarker discovery**

Featured publications

Fernandez-Becerra C, Xander P, Alfandari D, Dong G, Aparici-Herraiz I, Rosenhek-Goldian I, Shokouhy M, Gualdron-Lopez M, Lozano N, Cortes-Serra N, Karam PA, Meneghetti P, Madeira RP, Porat Z, Soares RP, Costa AO, Rafati S, da Silva AC, Santarém N, Fernandez-Prada C, Ramirez MI, Bernal D, Marcilla A, Pereira-Chioccola VL, Ronalte Alves L, Del Portillo H, Regev-Rudzki N, Correia de Almeida I, Schenkman S, Olivier N, Torrecilhas AC. **Guidelines for the Purification and Characterization of Extracellular Vesicles of Parasites.** *Journal of Extracellular Biology.* 2023 Oct 19;2:e117. DOI: 10.1002/jex2.117

Esteves S, Lima C, Costa I, Osório H, Fernandez-Becerra C, Santarém N, Cordeiro-da-Silva A. **Characterization and Proteomic Analysis of Plasma EVs Recovered from Healthy and Diseased Dogs with Canine Leishmaniosis**. *Int J Mol Sci.* 2023 Mar 13;24(6):5490. DOI: 10.3390/ijms24065490

Neuroscience

Badalona Neuromuscular Research Group (GRENBA)
Gisela Nogales Gadea
Mònica Suelves Esteban

Cellular and Molecular Neurobiology (CMN)
Teresa Gasull Dalmau
Octavi Martí Sistac

Genomics and Transcriptomics of Synucleinopathies (GTS)
Katrin Beyer

Neurogenetics Research Unit
Antoni Matilla Dueñas
Ivelisse Sánchez Díaz

Neurovascular Research Group
Mònica Millán Torné
Natalia Pérez de la Ossa Herrero

Psychiatry and Mental Health
Alba Toll Privat

Psychoneuroendocrinology and Stress in Psychosis (PSICPNEC)
Javier Labad Arias

Badalona Neuromuscular Research Group (GRENBA)

Group leaders: Gisela Nogales Gadea, Mònica Suelves Esteban

Research lines

- **Myotonic dystrophy type 1: registries, diagnosis, pathological mechanisms, phenotype modulation, biomarkers, and new therapies**
- **McArdle disease: registries, diagnosis, pathological mechanisms, phenotype modulation, biomarkers, and new therapies**
- **Duchenne muscular dystrophy: fibrosis, fatty deposition, inflammation, muscle regeneration, metabolism, HDAC11, new therapeutic targets**
- **Sarcopenia: muscle atrophy, stem cell exhaustion, mitochondrial dysfunction, metabolism, HDAC11, new therapeutic targets**

Featured publications

Mütze U, Gleich F, Barić I, Baumgartner M, Burlina A, Chapman KA, Chien YH, Cortès-Saladelafont E, De Laet C, Dobbelaere D, Eysken F, Gautschi M, Santer R, Häberle J, Joaquín C, Karall D, Lindner M, Lund AM, Mühlhausen C, Murphy E, Roland D, Ruiz Gomez A, Skouma A, Grünert SC, Wagenmakers M, Garbade SF, Kölker S, Boy N. **Impact of the SARS-CoV-2 pandemic on the health of individuals with intoxication-type metabolic diseases-Data from the E-IMD consortium.** *J Inherit Metab Dis.* 2023 Mar;46(2):220-231. DOI: 10.1002/jimd.12572

Launay N, Ruiz M, Planas-Serra L, Verdura E, Rodríguez-Palmero A, Schlüter A, Goicoechea L, Guilera C, Casas J, Campelo F, Jouanguy E, Casanova JL, Boespflug-Tanguy O, Vazquez Cancela M, Gutiérrez-Solana LG, Casasnovas C, Area-Gomez E, Pujol A. **RINT1 deficiency disrupts lipid metabolism and underlies a complex hereditary spastic paraplegia**. *J Clin Invest*. 2023 Jul 17;133(14):e162836. DOI: 10.1172/JCI162836

Schlüter A, Vélez-Santamaría V, Verdura E, Rodríguez-Palmero A, Ruiz M, Fourcade S, Planas-Serra L, Launay N, Guilera C, Martínez JJ, Homedes-Pedret C, Albertí-Aguiló MA, Zulaika M, Martí I, Troncoso M, Tomás-Vila M, Bullich G, García-Pérez MA, Sobrido-Gómez MJ, López-Laso E, Fons C, Del Toro M, Macaya A; HSP/ataxia workgroup; Beltran S, Gutiérrez-Solana LG, Pérez-Jurado LA, Aguilera-Albesa S, de Munain AL, Casasnovas C, Pujol A. **ClinPrior: an algorithm for diagnosis and novel gene discovery by network-based prioritization.** *Genome Med.* 2023 Sep 7;15(1):68. DOI: 10.1186/s13073-023-01214-2

Highlights

In collaboration with Vincent Mouly and Anne Bigot, the group generated three immortalised Myotonic dystrophy type 1 (DM1) muscle lines derived from patients with different DM1 subtypes and clinical backgrounds, characterising them at the genetic, epigenetic, and molecular levels. Notably, the new lines exhibit a high level of heterogeneity in both the size of the CTG expansion and the DM1 molecular alterations. Importantly, these DM1 immortalised cells also respond to previously tested therapeutics. Overall, the group has developed three new human DM1 cellular models, suitable for studying the pathophysiological heterogeneity of DM1 and testing new therapeutic options (Núñez-Manchón et al, under revision in iScience).

The group is actively working on the identification of biomarkers. This year, they secured national and international funding for the identification of biomarkers of heart disease in DM1. 80% of patients with DM1 are likely to suffer from heart problems, which are the second leading cause of death in these patients. Identifying biomarkers that can predict early cardiac complications in patients could significantly improve their quality of life. Another set of markers they are attempting to identify are those that can help determine the best treatment for a patient. In this regard, they are developing deep sequencing techniques to ascertain if genomics can aid them in this endeavour.

Duchenne muscular dystrophy is a fatal disease with no cure, and the group has investigated whether reducing HDAC11 levels could ameliorate DMD. Remarkably, their results have shown that dystrophic mice deficient in HDAC11 (D2-mdx/HDAC11-/- mice, referred to as dKO mice) have a longer lifespan, smaller necrotic areas, larger cross-sectional area of regenerating myofibers, less inflammation, and decreased fibrosis and fatty deposition in dKO muscles. Importantly, dKO mice exhibit a globally improved muscle performance with increased fatigue resistance and muscle strength, indicating that lack of HDAC11 ameliorates the dystrophic phenotype (Odria et al, manuscript in preparation).

Ageing is an inevitable physiological process involving the decline of muscle mass and function (known as sarcopenia), which has a devastating effect on the quality of life of older people. The group has explored the functional consequences of HDAC11 deficiency in old mice, in homeostasis and during muscle regeneration. Remarkably, their results have shown that mice lacking HDAC11 exhibit reduced age-associated muscle atrophy, increased muscle function, and longer life expectancy, pointing to HDAC11 as a novel target for the treatment of sarcopenia (Odria et al, manuscript in preparation).

Cellular and Molecular Neurobiology (CMN)

Group leaders: Teresa Gasull Dalmau, Octavi Martí Sistac

Research lines

- **Novel glutamate-related targets for neuroprotection**
- **Ferroptosis in neuronal death and antiferroptotic neuroprotective compounds**
- **Experimental modelling of stroke in rodents and swine**
- **Discovery of new biomarkers to improve stroke treatment**
- **Computational biology: machine/deep learning assessment of behaviour in in vivo stroke models**

Featured publications

García-Serran A, Ordoño J, DeGregorio-Rocasolano N, Melià-Sorolla M, Odendaal K, Martí-Sistac O, Gasull T. **Targeting Pro-Oxidant Iron with Exogenously Administered Apotransferrin Provides Benefits Associated with Changes in Crucial Cellular Iron Gate Protein TfR in a Model of Intracerebral Hemorrhagic Stroke in Mice.** *Antioxidants (Basel).* 2023 Oct 31;12(11):1945. DOI: 10.3390/antiox12111945

Dortez S, DeGregorio-Rocasolano N, Millán M, Gasull T, Crevillen AG, Escarpa A. **Paper-Based Analytical Devices for Accurate Assessment of Transferrin Saturation in Diagnosed Clinical Samples from Ischemic Stroke Patients.** *Anal Chem.* 2023 Aug 22;95(33):12391-12397. DOI: 10.1021/acs.analchem.3c01982

Castaño C, Melià-Sorolla M, García-Serran A, DeGregorio-Rocasolano N, García-Sort MR, Hernandez-Pérez M, Valls-Carbó A, Pino O, Grífols J, Iruela-Sánchez A, Palomar-García A, Puig J, Martí-Sistac O, Dávalos A, Gasull T. **Establishment of a reproducible and minimally invasive ischemic stroke model in swine**. *JCI Insight.* 2023 Apr 24;8(8):e163398. DOI: 10.1172/jci.insight.163398

Highlights

Apotransferrin emerges as a promising early treatment option for all types of strokes, according to recent findings by the research team. In experiments conducted on mice models afflicted with intracerebral haemorrhage, the administration of human apotransferrin demonstrated the ability to mitigate the adverse effects of this severe form of stroke. Notably, apotransferrin administration led to improved neurobehavioral performance, along with reductions in the levels of the oxidative marker 4-hydroxynonenal and the second-generation ferroptosis marker transferrin receptor. These results, coupled with prior findings showcasing the benefits of apotransferrin in ischemic stroke cases, underscore the potential of apotransferrin as a frontline treatment option for stroke patients in the crucial pre-hospital and pre-triage stages. Importantly, this treatment approach could prove beneficial regardless of the stroke's nature, whether ischemic or haemorrhagic.

Furthermore, a paper-based analytical device developed by the team offers promising prospects for future point-of-care testing to investigate iron-related mechanisms implicated in neurodegenerative damage. Mounting evidence suggests that iron-generated reactive oxygen species and ferroptosis play key roles in the pathogenesis of ischemic stroke and various neurodegenerative diseases. In stroke and other brain disorders, disruptions in the blood-brain barrier allow blood compounds, including iron and its carriers like transferrin, to gain sudden access to brain tissue. To address this, the team designed a cost-effective and rapid paper-based device capable of directly assessing blood transferrin saturation. This innovative tool holds significant potential for facilitating point-of-care testing and advancing our understanding of iron's involvement in neurodegeneration.

Additionally, the team has developed a reproducible and minimally invasive stroke model in pigs using an endovascular approach. This novel model aims to pave the way for the development of new therapeutic compounds and devices to treat stroke patients in the future. Recognizing the need for preclinical research using animal models with brain characteristics more akin to humans, the team turned to the porcine brain due to its suitability. By introducing a guide catheter and guide wire through the femoral artery to the left Rete Mirabile (LRM), and deploying Squid-12 embolization material to occlude the left circle of Willis wing, the team successfully induced reproducible infarcts in the pigs. Longitudinal multimodal cerebral MRI assessments revealed consistent brain damage growth patterns and cerebral blood supply changes, indicating translational features akin to human stroke. The model's reproducibility in targeting specific brain regions is crucial for evaluating the true neuroprotective effects of new molecules in brains that closely resemble those of humans.

Genomics and Transcriptomics of Synucleinopathies (GTS)

Group leader: Katrin Beyer

Research lines

- **Molecular characterisation of dementia with Lewy bodies. Identification of subtypes**
- **Biomarker research. Identification and characterisation of peripheral biomarkers**
- **Establishment of cell and animal models suitable for testing of results**

Featured publications

Urbizu A, Arnaldo L, Beyer K. **Obtaining miRNA from Saliva-Comparison of Sampling and Purification Methods.** *Int J Mol Sci.* 2023 Jan 25; 24(3), 2386. DOI: 10.3390/ijms24032386

Gonzalez MC, Tovar-Rios DA, Alves G, Dalen I, Williams-Gray CH, Camacho M, Forsgren L, Bäckström D, Lawson RA, Macleod AD, Counsell CE, Paquet C, DeLena C, D'Antonio F, Pilotto A, Padovani A, Blanc F, Falup-Pecurariu C, Lewis SJG, Rejdak K, Papuc E, Hort J, Nedelska Z, O'Brien J, Bonanni L, Marquié M, Boada M, Pytel V, Abdelnour C, Alcolea D, Beyer K, Tysnes OB, Aarsland D, Maple-Grødem J. **Cognitive and Motor Decline in Dementia with Lewy Bodies and Parkinson's Disease Dementia.** *Mov Disord Clin Practice.* 2023 May 5; 10(6):980-986. DOI: 10.1002/mdc3.13752

Arnaldo L, Urbizu A, Serradell M, Gaig C, Anillo A, Gea M, Vilas D, Ispierto L, Muñoz-Lopetegi A, Mayà G, Pastor P, Álvarez R, Santamaria J, Iranzo A, Beyer K. **Peripheral α-synuclein isoforms are potential biomarkers for diagnosis and prognosis of isolated REM sleep behavior disorder.** *Parkinsonism Relat Dis.* 2023 Oct; 115:105832. DOI: 10.1016/j.parkreldis.2023.105832

Highlights

In January 2023, the GTS-group embarked on a significant collaborative project in personalized medicine entitled “Validation of liquid and imaging biomarkers for the diagnosis of prodromal dementia with Lewy bodies.” Led by Pau Pastor, with Katrin Beyer serving as the Co-PI, and involving twelve hospitals and research centres from six Spanish Autonomous Communities, the project aims to address the severely underdiagnosed condition of dementia with Lewy bodies. Supported by a grant of €1,099,000 from the Spanish Ministry of Health, the project seeks to provide solutions to improve diagnosis and prognosis in this condition.

The GTS-group plays an active role in the European DLB (e-DLB) consortium, established to facilitate the identification of diagnostic and prognostic biomarkers in dementia with Lewy bodies. Ongoing collaboration includes partnerships with Zuzana Nedelska from Prague and Dag Aarsland from Stavanger, Norway. Additionally, the group collaborates with the Global Parkinson’s Genetics Program (GP2), resulting in co-authorship of significant collaborative papers (DOI: 10.1038/s41531-023-00533-w).

A highlight of 2023 was the collaboration with the plastic artist Alejandra Morales, who provided invaluable insights into dementia with Lewy bodies based on her first-hand experiences. Facilitated by ‘Amics de Can Ruti,’ they partnered with Morales to create an exhibition featuring composed photographs and an enormous 3D structure representing Lewy bodies invading the brain, showcased in a library in Badalona. In conjunction with the exhibition, they organized conferences for the general public and high school groups to raise awareness about dementia with Lewy bodies and its impact.

Neurogenetics Research Unit

Group leaders: Antoni Matilla Dueñas, Ivelisse Sánchez Díaz

Research lines

- **Identification of the genetic causative deficits and the molecular mechanisms underlying hereditary ataxias, spastic paraplegias and other neurodegenerative disorders**
- **Genetic diagnosis of over 400 neurological diseases**
- **Multiomics-based identification of biomarkers of disease progression in hereditary ataxias and other neurodegenerative disorders**
- **Defining clinical-genetic-molecular correlations implementing machine learning**
- **Identification of signaling targets and therapeutic strategies for neurological disorders in cellular and animal disease models**
- **Development of a gene therapy for Friedreich Ataxia and its evaluation in mouse models of the disease**

Featured publications

Martins S, Yahia A, P. D. Costa I, E. Siddig H, Abubaker R, Koko M, Corral-Juan M, Matilla-Dueñas A, Brice A, Durr A, Leguern E, P. W. Ranum L, Amorim A, E.O. Elsayed L, Stevanin G, Sequeiros J. **Machado-Joseph disease in a Sudanese family links West Africa to Portuguese families and allows reestimation of ancestral age of the Machado lineage.** *Human Genetics,* 2023 Dec; 142(12):1747-1754. DOI: 1007/s00439-023-02611-8

Highlights

Patent WO2019076973, titled “Vectors for the Treatment of Friedreich’s Ataxia,” represents a significant advancement in the field of neurodegenerative disorders. This invention, developed by Antoni Matilla-Dueñas, Ivelisse Sanchez, and Eudald Balagué, under the auspices of the Germans Trias i Pujol Research Institute, focuses on the development of vectors tailored for treating Friedreich’s Ataxia. With a priority date of 17/10/2017 (PCT/EP2018/078384), this patent has received grants in various countries, including China (2023: 111542612), the EU (2023: EP18786778), Japan (2023: JP2020-522345), and Russia (2023: RU2020115898). Currently, it is undergoing validation in the United Kingdom and examination in Australia (2018350774), Canada (3079107), India (202117039349), and the USA (20210189423).

Moreover, a divisional patent has been filed to extend the protection of the expression cassette containing the frataxin-expressing gene to additional vectors, both viral and non-viral. This extension, granted in Japan (2024: JP2022-127545), aims to further enhance the applicability and efficacy of the treatment. Furthermore, this divisional patent is under examination in the EU (EP22170787) and the USA (17/741024), showcasing ongoing efforts to expand the reach and impact of this ground breaking invention.

Neurovascular Research Group

Group leaders: Mònica Millán Torné, Natalia Pérez de la Ossa Herrero

Research lines

- **Therapies in patients with acute stroke**
- **Territorial organisation for stroke care**
- **Multimodal neuroimaging techniques (CT and MR in acute stroke)**
- **Diagnostic and prognostic clinical and biological markers of stroke and its complications**
- **Neurocardiology**
- **Brain recovery and post-stroke care**

Featured publications

Ramos-Pachón A, Rodríguez-Luna D, Martí-Fàbregas J, Millán M, Bustamante A, Martínez-Sánchez M, Serena J, Terceño M, Vera-Cáceres C, Camps-Renom P, Prats-Sánchez L, Rodríguez-Villatoro N, Cardona-Portela P, Urra X, Solà S, Del Mar Escudero M, Salvat-Plana M, Ribó M, Abilleira S, Pérez de la Ossa N, Silva Y; RACECAT Trial Investigators. **Effect of Bypassing the Closest Stroke Center in Patients with Intracerebral Hemorrhage: A Secondary Analysis of the RACECAT Randomized Clinical Trial.** *JAMA Neurol.* 2023 Oct 1;80(10):1028-1036. DOI: 10.1001/jamaneurol.2023.2754

Hernández-Pérez M, Werner M, Remollo S, Martín C, Cortés J, Valls A, Ramos A, Dorado L, Serena J, Munuera J, Puig J, Pérez de la Ossa N, Gomis M, Carbonell J, Castaño C, Muñoz-Narbona L, Palomeras E, Domenech S, Massuet A, Terceño M, Davalos A, Millán M. **Early and Delayed Infarct Growth in Patients Undergoing Mechanical Thrombectomy: A Prospective, Serial MRI Study.** *Stroke.* 2023 Jan;54: 217-225. DOI: 10.1161/STROKEAHA.122.039090

Silva Y, Sánchez-Cirera L, Terceño M, Dorado L, Valls A, Martínez M, Abilleira S, Rubiera M, Quesada H, Llull L, Rodríguez-Campello A, Martí-Fàbregas J, Seró L, Purroy F, Payo I, García S, Cánovas D, Krupinski J, Mas N, Palomeras E, Cocho D, Font MÀ, Catena E, Puiggròs E, Pedroza C, Marín G, Carrión D, Costa X, Almendros MC, Torres I, Colom C, Velasquez JA, Diaz G, Jiménez X, Subirats T, Deulofeu A, Hidalgo V, Salvat-Plana M, Pérez de la Ossa N. **Sex and gender differences in acute stroke care: metrics, access to treatment and outcome.** *Eur Stroke J.* 2023 Jun; 8(2):557-565. DOI: 10.1177/23969873231156260

Highlights

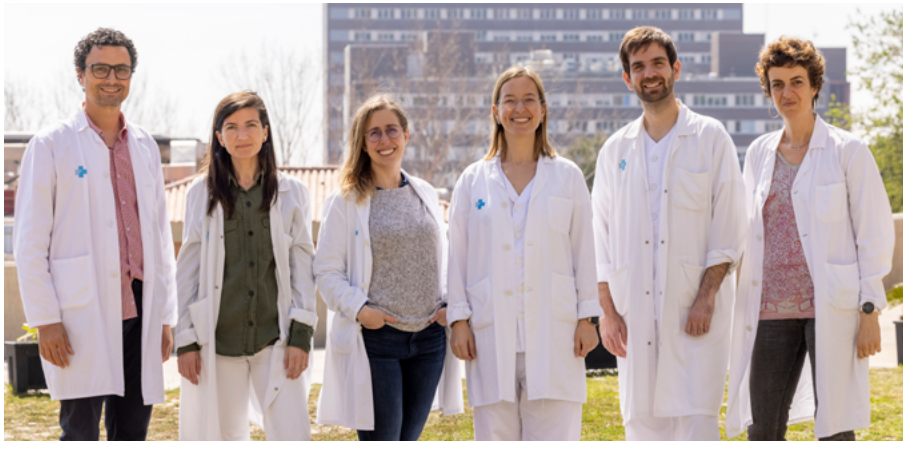
During 2023, the Neurovascular Research Group at IGTP published a total of 16 original articles, some in high-impact journals such as *JAMA Neurology* or *Stroke*. Additionally, the group participated in up to 15 collaborative articles. Two doctoral theses were directed by senior members of the group: "Determination of prognostic variables of mortality and functional recovery in intracerebral haemorrhage" (Anna Ramos) and "Characterization of post-contrast enhancement as a marker of inflammatory activity of intracranial atherosclerosis plaques: a Clinical-Basic study" (Beatriz Gómez Vicente).

Currently, the group leads 10 active academic projects in various areas of cerebral vascular pathology, including prehospital management, acute care of ischemic and haemorrhagic stroke, vascular neurosurgery, and medical complications post-stroke, with national and international competitive financing. Moreover, the group collaborates on more than 20 multicentric projects and clinical trials. Notable funding includes support from CaixaImpulse for the RACE-Plus project and funding for 5 R&D research projects from the Instituto Carlos III (ISCIII). The Neurovascular Research Group of the IGTP is part of the RICORS-ICTUS research group financed by the ISCIII as a consolidated clinical group and is accredited as a research group by the Agency for Management of University and Research Grants (AGAUR).

Regarding participation in other scientific activities, in 2023 two members of the group will be part of the scientific committee of the International Stroke Conference organized by the American Heart/Stroke Association, and other members work as editors of international scientific journals such as Frontiers in Neurology and the Vascular and Interventional Neurology (S:VIN) journals, as well as in international committees (International Cerebral Venous Thrombosis Consortium).

Additionally, the group received various recognitions: Alejandro Bustamante won the prize for young researchers from the Institut Català de la Salut, Natalia Pérez de la Ossa won a scientific prize from the Spanish Society of Neurology (SEN), and María Hernández received an intensification from the Germans Trias I Pujol University Hospital. The stroke unit team was also awarded the Quality Angels Initiative Award with the support of the European Stroke Organization.

Psychiatry and Mental Health



Group leader: Alba Toll Privat

Research lines

- **Consultation - Liaison psychiatry**
- **Innovation in acute psychiatric hospitalisation**
- **Psychosis**
- **Neurodevelopmental disorders and perinatal mental health**

Featured publications

Toll A, Pechuan E, Bergé D, Legido T, Martínez-Sadurní L, El-Abidi K, Pérez-Solà V, Mané A. **Factors associated with suicide attempts in first-episode psychosis during the first two years after onset.** *Psychiatry Res.* 2023 Jul;325:115232. DOI: 10.1016/j.psychres.2023.115232

Ibáñez-Caparrós A, Sánchez I, Granero R, Jiménez-Murcia S, Rosinska M, Thiel A, Zipfel S, de Pablo J, Camacho-Barcia L, Fernandez-Aranda F. **Athletes with Eating Disorders: Analysis of Their Clinical Characteristics, Psychopathology and Response to Treatment.** *Nutrients.* 2023 Jun 30;15(13):3003. DOI: 10.3390/nu15133003

Etxandi M, Baenas I, Mora-Maltas B, Granero R, Fernández-Aranda F, Tovar S, Solé-Morata N, Lucas I, Casado S, Gómez-Peña M, Moragas L, Pino-Gutiérrez AD, Tapia J, Valenciano-Mendoza E, Potenza MN, Gearhardt AN, Diéguez C, Jiménez-Murcia S. **Plasma concentration of leptin is related to food addiction in gambling disorder: Clinical and neuropsychological implications.** *J Behav Addict.* 2023 Oct 17;12(4):1019-1031. DOI: 10.1556/2006.2023.00051

Psychoneuroendocrinology and Stress in Psychosis (PSICPNEC)

Group leader: Javier Labad Arias

Research lines

- **Biomarkers of stress and risk of developing a psychotic disorder.**
- **Impact of hormones on the clinical expression of psychotic disorders.**
- **Neurocognition and social cognition in early psychotic disorders: prognostic and therapeutic implications.**
- **Psychopathological and biological consequences of abuse in adolescents and young adults**

Featured publications

Llorens M, Barba M, Torralbas-Ortega J, Nadal R, Armario A, Gagliano H, Urraca L, Pujol S, Montalvo I, Gracia R, Polo D, González-Riesco L, Matalí JL, Palao D, Pàmias M, Labad J. **Relationship between hair cortisol concentrations and cognitive functioning in adolescents with ADHD**. *Eur J Psychotraumatol.* 2023 Nov 21;14(2):2281752. DOI: 10.1080/20008066.2023.2281752

Tost M, González-Rodríguez A, Aguayo R, Álvarez A, Montalvo I, Barbero JD, Gabernet R, Izquierdo E, Merodio I, Monreal JA, Palao D, Labad J. **Switching from risperidone to paliperidone palmitate in schizophrenia: Changes in social functioning and cognitive performance.** *Prog Neuropsychopharmacol Biol Psychiatry.* 2023 Jan 10;120:110619. DOI: 10.1016/j.pnpbp.2022.110619

Gine-Serven E, Martinez-Ramirez M, Boix-Quintana E, Davi-Loscos E, Guanyabens N, Casado V, Muriana D, Torres-Rivas C, Cuesta MJ, Labad J. **Association between free thyroxine levels and clinical phenotype in first-episode psychosis: a prospective observational study.** *PeerJ.* 2023 Jun 2; 11:e15347. DOI: 10.7717/peerj.15347

Highlights

In 2023, PSICPNEC joined the Red Española de Investigación en Estrés/Spanish Network for Stress Research RED2022-134191-T financed by MCIN/AEI /10.13039/501100011033.

Science of Behaviour and Substance Abuse

Clinical Pharmacology of Substance Use Disorder
Magí Farré Albaladejo

Medical Complications of Substance Use Disorder
Robert Muga Bustamante

Clinical Pharmacology of Substance Use Disorder

Group leader: Magí Farré Albaladejo

Research lines

- **Evaluation of the acute effects of new psychoactive substances (synthetic cathinones such as methylone, pyrovalerone derivatives, and others), and classical psychostimulants (MDMA, amphetamines and cocaine). Including experimental and observational studies**
- **Evaluation of the acute effects of binge alcohol consumption in young people and its combination with other substances (cannabis, energy drinks). Including experimental and observational studies**
- **Evaluation of the effects of natural and synthetic cannabinoids, including cannabis and its components, and its therapeutic use (medicinal cannabis). Including experimental and observational studies**
- **Pharmacogenomics and substance use, including drug of abuse and medicines. Influence of genetic polymorphism in the effects and pharmacokinetics of drugs**

Featured publications

Poyatos L, Pérez-Mañá C, Hladun O, Núñez-Montero M, de la Rosa G, Martín S, Barriocanal AM, Carabias L, Kelmendi B, Taoussi O, Busardò FP, Fonseca F, Torrens M, Pichini S, Farré M, Papaseit E. **Pharmacological effects of methylone and MDMA in humans.** *Front Pharmacol.* 2023 Feb 17;14:1122861. DOI: 10.3389/fphar.2023.1122861

Di Giorgi A, Sprega G, Poyatos L, Papaseit E, Pérez-Mañá C, Di Trana A, Varì MR, Busardò FP, Pichini S, Zaami S, Lo Faro AF, Farré M. **Sweat Testing for the Detection of Methylone after Controlled Administrations in Humans.** *Int J Mol Sci.* 2023 Apr 17;24(8):7395. DOI: 10.3390/ijms24087395

Highlights

The group published studies on the pharmacological effects and pharmacokinetics of methylone (a synthetic cathinone) in blood and alternative biological matrices. These studies are unique and original, as no other groups in the world have published articles on methylone effects/pharmacokinetics in recreational users. In addition, they contributed to the evaluation of pharmacokinetics of other synthetic cathinones.

Medical Complications of Substance Use Disorder

Group leader: Robert Muga Bustamante

Research lines

- **Clinical consequences of Substance Use Disorder (SUD)**
- **Alcohol-associated morbidity and mortality**
- **Therapeutic interventions in Alcohol Use Disorder (AUD)**
- **Monitoring viral infections (HCV, HIV, HBV) in SUD**
- **Intestinal permeability and systemic inflammation in AUD**
- **Cardiometabolic alterations of AUD**
- **Alcohol-associated immune alterations**

Featured publications

García-Marchena N; Sanvisens A; Abellí-Deulofeu E; Blanes R; Torrens M; Miquel L; Rubio G; Bolao F; Muga R; CohRTA Study. **Sex differences in the comorbidity of patients seeking a first treatment for Alcohol Use Disorder.** *Int J Ment Health Addict.* 2023 Jul. DOI: 10.1007/s11469-023-01112-z

Hernández-Rubio A; Sanvisens A; Barbier-Torres L; Blanes R; Miquel L; Torrens M; Rubio G; Bolao F; Zuluaga P; Fuster D; Rodríguez-de-Fonseca F; Farré M; Muga R; CohRTA. **Associations of hypomagnesemia in patients seeking a first treatment of alcohol use disorder.** *Drug Alcohol Depend.* 2023 Apr 1;245:109822. DOI: 10.1016/j.drugalcdep.2023.109822

Navarro J; Curran A; Raventós B; García J; Suanzes P; Descalzo V; Álvarez P; Espinosa N; Montes ML; Suárez-García I; Amador C; Muga R; Falcó V; Burgos J; Spanish HIV Research Network (CoRIS). **Prevalence of non-alcoholic fatty liver disease in a multicentre cohort of people living with HIV in Spain.** *Eur J Intern Med.* 2023 Apr;110:54-61. DOI: 10.1016/j.ejim.2023.01.028

Highlights

Throughout 2023, the research group maintained a significant scientific output. Specifically, the group published 16 manuscripts in peer-reviewed journals, with three other manuscripts currently under the “revise and resubmit” stage. Additionally, the group authored two book chapters, one in a textbook titled “Drogodependencias,” featuring contributions from national leaders in the field, and another in the renowned Internal Medicine textbook in the Spanish language (Farreras-Rozman).

The group actively participated in both national and international meetings, delivering four oral communications. Moreover, Daniel Fuster, a group member, chaired two roundtables at the Spanish Society of Internal Medicine conference (SEMI).

Anna Hernández-Rubio, another member of the group, successfully defended her PhD dissertation thesis in October 2023. Subsequently, she secured grants from the Fundación Española de Medicina Interna and IGTP to pursue a post-doctoral fellowship at King's College London, School of Cardiovascular and Metabolic Medicine and Sciences, focusing on her interests in the cardiometabolic complications of unhealthy alcohol use.

Regarding research communication and dissemination, the group maintained an active presence through their official X account, and Daniel Fuster, was featured in various media outlets.

IGTP affiliated groups

Within the framework of IGTP's accreditation as a Centre of Excellence by Instituto de Salud Carlos III (ISCIII), IGTP has affiliation contracts with groups from various institutions.

Barcelona Institute for Global Health (ISGlobal)

Consorci Sanitari del Maresme (CSdM)

Fundació Lluita contra les Infeccions

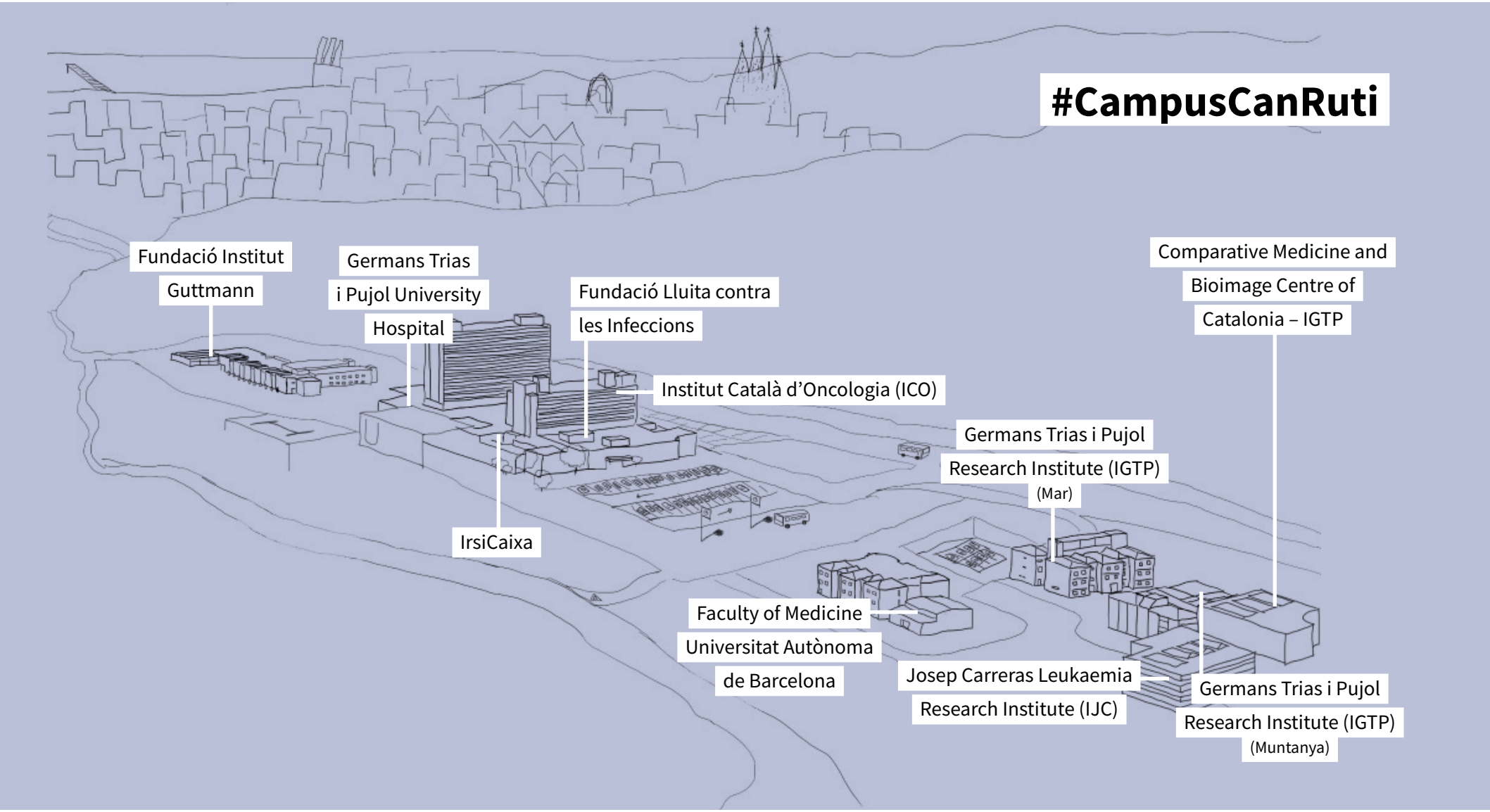
Fundació Institut Universitari per a la Recerca a l'Atenció Primària de Salut Jordi Gol i Gurina (IDIAPJGol)

Fundació Institut Guttmann

Institut Català d'Oncologia (ICO)

IrsiCaixa

Josep Carreras Leukaemia Research Institute (IJC)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Institut Català d'Oncologia (ICO)
IrsiCaixa
Comparative Medicine and Bioimage Centre of Catalonia – IGTP
Germans Trias i Pujol Research Institute (IGTP) (Mar)
Faculty of Medicine Universitat Autònoma de Barcelona
Josep Carreras Leukaemia Research Institute (IJC)
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