ANNUAL REPORT 2021

Josep Carreras
LEUKAEMIA
Research Institute

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FOREWORD

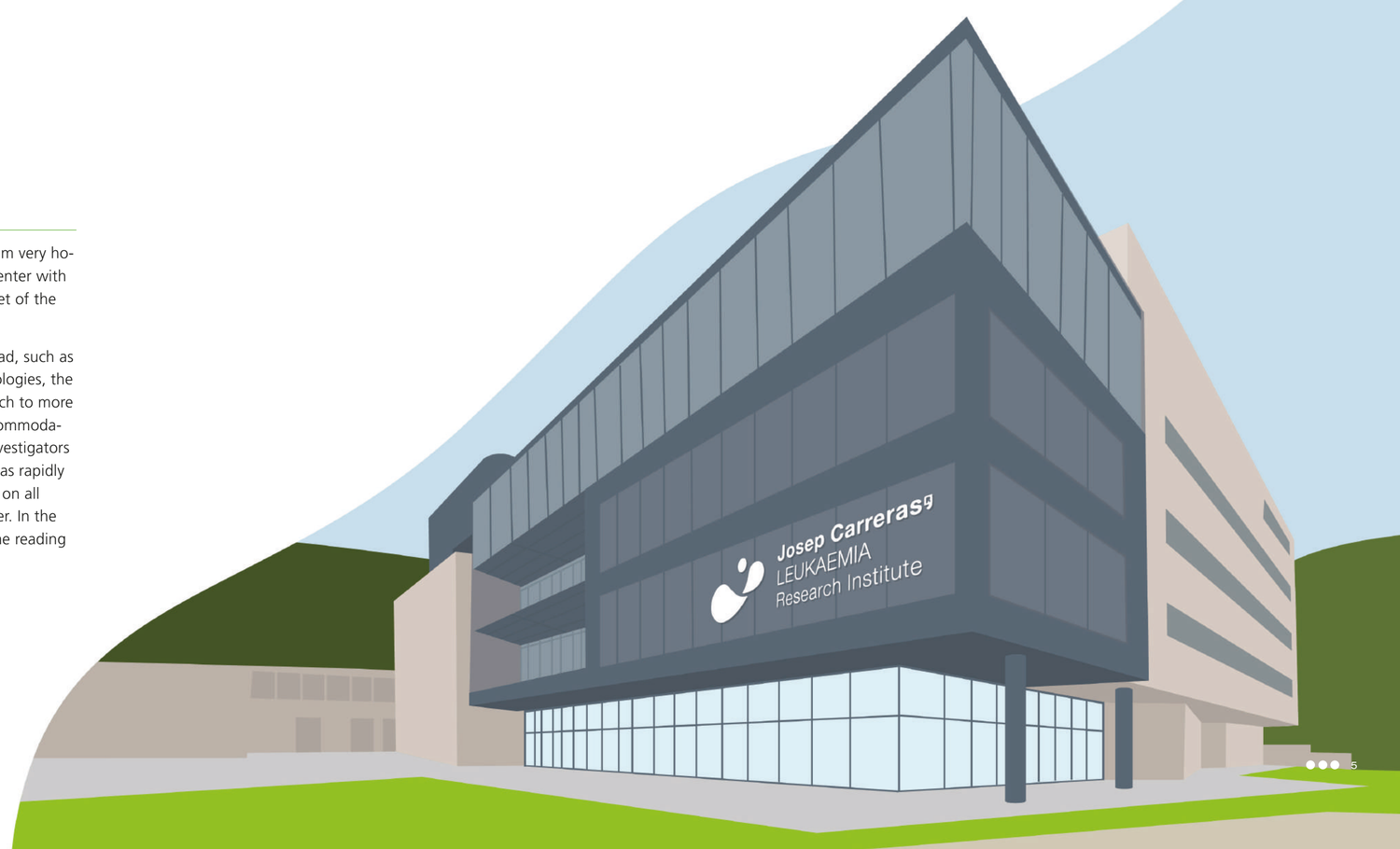
Dr. Manel Esteller
Director

2021 has been a great year for the Institute. Entering the second and half year as Director of the center, I feel proud of all our personnel. In the fight against terrible diseases, such as some forms of leukemia, lymphoma and other blood disorders, the effort of all is required. This endeavor is possible because modern research involves not only devoted scientists, but also hard-working technicians and management staff.

Our Institute has experienced an excellent growth thanks to all the discoveries made, which are translated into many and highly relevant publications, but also into a significant increase in the competitive funding received and greater outreach to society. I am very honored to serve as Director of the center with all of you as the most precious asset of the institution.

We will have many challenges ahead, such as the implementation of new technologies, the trend to move from wet-lab research to more bioinformatic approaches, the accommodation of newly recruited talented investigators and the goal to bring our findings as rapidly as possible to the patients. I count on all of you in the combat against cancer. In the meantime, take a rest and enjoy the reading of this annual report.

With gratitude,



ABOUT US

WHO WE ARE

The Josep Carreras Leukaemia Research Institute is a non-profit research institute based in Badalona (Barcelona), **dedicated to biomedical research and personalized medicine in leukemia and other malignant blood diseases.** It conducts excellent research into the basic, epidemiological, preventive, clinical and translational aspects of leukemia and other hematopoiesis malignancies.

The Josep Carreras Leukaemia Research Institute, **directed by Dr. Manel Esteller, was launched in 2010 by the Josep Carreras Foundation,** together with the Catalan government, **and is the first European research center devoted exclusively to leukemia and other malignant blood diseases.**

Research efforts are imperative to provide **patients with high-quality healthcare,** and our specialists combine their extensive knowledge to focus on patients' needs. **Our aim is to understand the origins and development of leukemia and other malignant hematopoiesis pathologies with a view to their prevention, and our efforts are directed towards identifying new therapeutic targets and developing effective treatments** with fewer side effects through cutting-edge research.

Given our efficient governance, the Josep Carreras Leukaemia Research Institute is a Catalan Research Center of Excellence and forms part of the Catalan government's current research center network. It is also accredited by the Spanish Ministry of Health as a Health Research Center of Excellence and by the Spanish Association Against Cancer. The Institute also holds the HR Excellence in Research Award from the European Commission.

The ultimate goal of our interdisciplinary **team is to ensure that leukemia is a curable disease in all cases,** and we won't stop until we have achieved this.

The Josep Carreras Institute is a collaborative hub for basic and translational researchers who work together on the fundamental biological and clinical aspects of leukemia at our state-of-the-art facilities, which provide an excellent work environment and serve as a magnet for outstanding researchers from all over the world.

It is home to 35 research groups and an increasing number of associated clinicians from five independent, coordinated scientific campuses: Hospital Clínic-UB Campus, Sant Pau Campus, Can Ruti Campus, Mar Campus and the **Trueta Campus.** Our laboratories on those clinical campuses allow us to collaborate closely with clinicians from the five associated hospitals: Hospital Clínic, Hospital de Sant Pau, Hospital Germans Trias i Pujol, Hospital del Mar and Dr. Josep Trueta Hospital.

ABOUT US

MISSION, VISION AND VALUES

MISSION

The Josep Carreras Leukemia Research Institute's mission is to carry out research into the epidemiological, preventive, clinical, translational and basic aspects of leukemia and other malignant blood diseases through innovation, with the ultimate aim of finding a cure.

VISION

The vision of the Josep Carreras Leukaemia Research Institute is to be a world-class reference and excellent research multicampus that contributes to the improvement of results, and the cure of patients affected by leukemia and other malignant hemopathies, through innovation, sustainability, social responsibility, talent, and professional experience.

VALUES

- Altruism
- Patient orientation
- Professional commitment
- Coexistence
- Respect
- Campus - Foundation alignment
- Scientific Leadership
- Collaboration
- Research - Assistance Integration
- Perseverance
- Continuous Improvement
- Methodological, scientific, and technological Innovation
- Environmental sustainability
- Austerity
- Transparency
- Social commitment.

ABOUT US

GOVERNING BODIES

The highest governing body is the Board of Trustees, which is represented by the Josep Carreras Foundation, the Catalan government's Ministry of Business and Knowledge, the Catalan government's Ministry of Health, the Autonomous University of Barcelona (UAB), the University of Barcelona (UB), Badalona Town Council, the Directorate General for Health Research and Planning, the Catalan Institute of Oncology, the Northern Metropolitan Territorial Area Administration, the Catalan Foundation for Research and Innovation, Hospital Clínic / the August Pi i Sunyer Biomedical Research Institute (IDIBAPS), the UB Hospital Coordination Committee and the Research Centres of Catalonia Institution Foundation (iCERCA).

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Mr. Lluís Rovira Pato
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Dr. Evarist Feliu
Ombudsman at the Josep Carreras Institute

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Mr. Armand Sánchez i Bonastre
Dean for Research and Technology at the Universitat Autònoma de Barcelona (UAB)

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Until 09.07.2021. General Director for Health Research and Innovation of Health, Generalitat, Government of Catalonia

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Sub-Director General for Research and Innovation, Ministry of Health, Generalitat, Government of Catalonia

Mr. Antoni Garcia i Prat
Managing Director, International Josep Carreras Foundation

Mr. Jordi Garcia Fernández
Vice-Rector for Research at the University of Barcelona

Mr. Lluís Rovira i Pato
Director of the Institution CERCA of the Generalitat, Government of Catalonia

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Dr. Jordi Sierra Gil
Hospital de la Santa Creu de Sant Pau

Dr. Álvaro Urbano-Ispizúa
Hospital Clínic de Barcelona

Dr. Josep Mª Campistol Plana
Hospital Clínic de Barcelona

Mr. Josep Lluís Lafarga Traver
Lawyer

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Director of the Instituti Toscani de Tumori in Florence

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Titular Professor and Director of the General Cytometry Service of University of Salamanca

Prof. Brigitte Schlegelberger
Professor and Director of Hannover Medical School Genetics Institute

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Research Professor at the Higher Council for Scientific Research (CSIC) at the Severo Ochoa Molecular Biology Center (CBMSO)

Prof. Christoph Plass
Head of Division of Cancer Epigenomics in German Cancer Research Center (DKFZ)

Prof. Teresa Palomero
Pathology and Cell Biology Associate Professor at CUMC (Columbia University Medical Center)

Prof. Francesco Bertroni
Head of Lymphoma Genomics Group at the Institute for Oncological Research in Bellinzona, Switzerland

Prof. Iannis Ainfatis
Pathology Department of the NYU School of Medicine

Prof. Pura Muñoz-Cánoves
ICREA Research Professor and Cell Biology Professor in the Department of Experimental and Health Sciences at the UPF

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CLÍNIC-UB CAMPUS

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Internal Scientific Committee Cordinator

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Campus Coordinator

Dr. Jordi Esteve Reyner
Campus Coordinator

Dr. Armando López Guillermo

Dr. Joan Bladé Creixentí

Dr. Francisco Cervantes Requena

ICO-GERMANS TRIAS I PUJOL CAMPUS

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President of the Delegate Committee

Dr. Francesc Solé Ristol
Campus Coordinator

Prof. Josep Mª Ribera Santasusana

Dr. Lurdes Zamora Plana

Dr. José Tomás Navarro

Dr. Juan Manuel Sancho Cía

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Prof. Jordi Sierra Gil

Dr. Javier Briones Mejide
Campus Coordinator

Dr. Josep Nomdedeu Guinot

Dr. Joan Carles Souto Andrés

Dr. Ramon Mangues Bafalluy

Dr. Carol Moreno Anastasio

ABOUT US

DIRECTOR

Dr. Manel Esteller is Chairman of Genetics at the University of Barcelona's Faculty of Medicine and an ICREA Research Professor. Since May 2019, Dr. Esteller has been the Director of the Josep Carreras Leukaemia Research Institute. Dr. Esteller is considered to be among the top 0.1% of world scientists based on impact by Stanford University (METRICS). He is also a member of numerous international scientific societies and his work has been recognized by numerous awards, including the World Health Summit Award (2010), the Rey Jaime I Research Award (2013), the National Award in Oncology (2014), the Dr. Josep Trueta Medal from the Catalan government (2015), the National Research Award from the Catalan government (2015), the Gold Medal from the Parliament of Catalonia (2016), the International Award of Catalonia (2016), the Innovation in Healthcare Oncology Award (2018), the Narcís Monturiol Medal from the Catalan government (2020) and the Fernández-Cruz Award for excellence in biomedical research (2021).

Prof. Manel Esteller

Director

Prof. Evarist Feliu

President of the Delegate Committee

Dr. Josep Maria Ribera

Clinical Research Deputy Director

Dr. Albert Oriol

Applied Research Director

Dr. Jordi Esteve Reiner

UB Clinical Campus Coordinator

Mrs. Ana Garrido Anglada

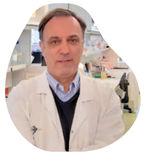
Strategy Director and Acting Managing Director

Dr. Anna Bigas

Basic Research Deputy Director

Dr. Rafael Marcos

Epidemiological Research Director



Dr. Javier Briones Mejide

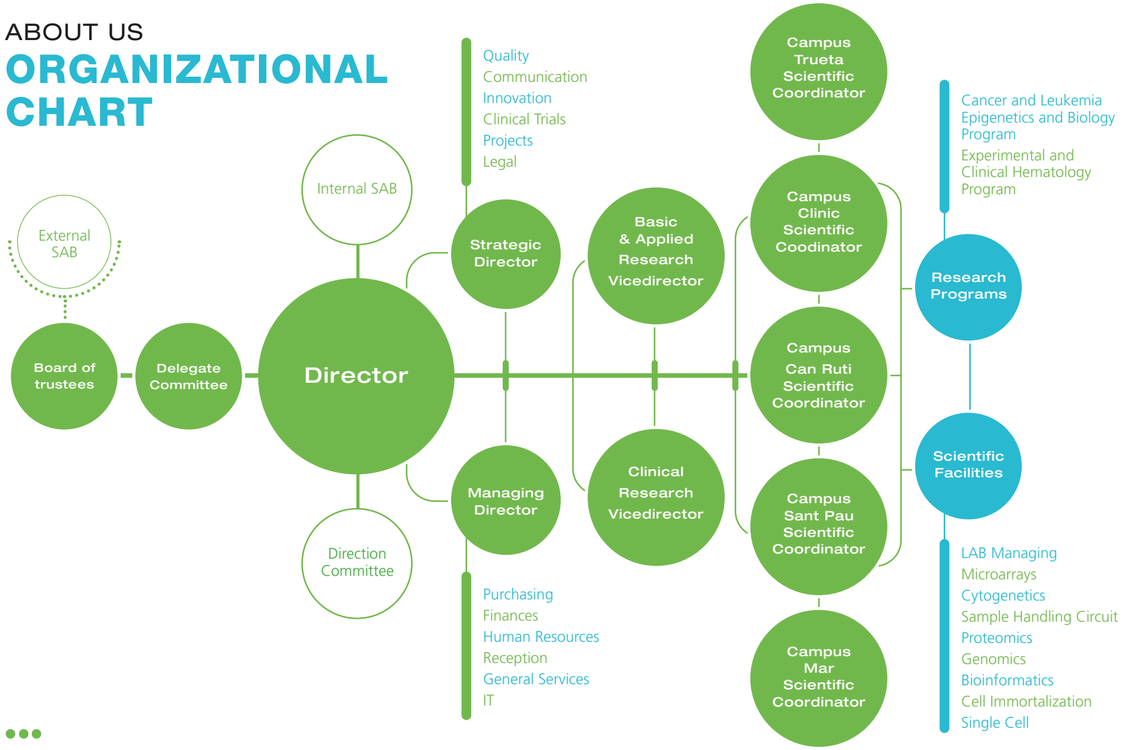
Sant Pau Campus Coordinator

Dr. Francesc Solé Ristol

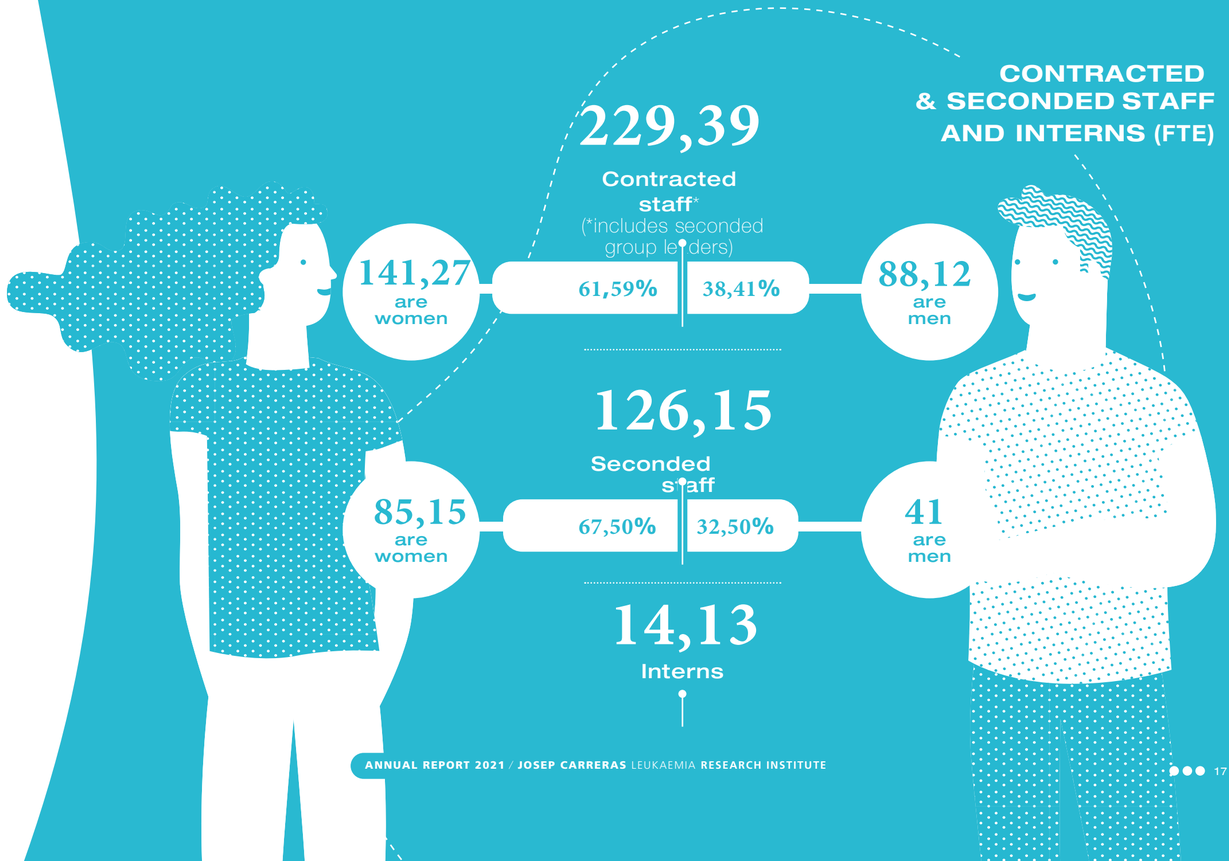
Can Ruti Campus Coordinator

ABOUT US

ORGANIZATIONAL CHART



CONTRACTED & SECONDED STAFF AND INTERNS (FTE)



ABOUT US

OUR STAFF

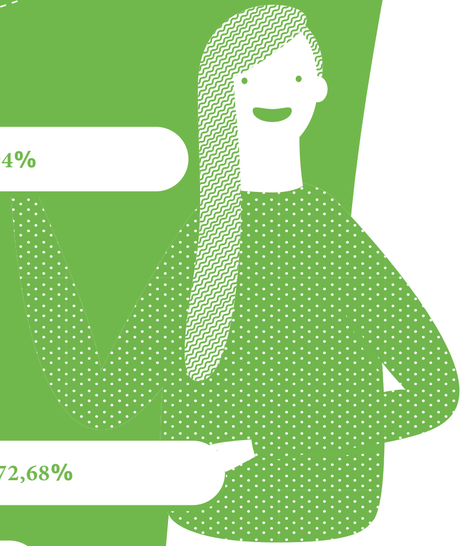
ADMINISTRATION VS. RESEARCH BREAKDOWN (FTE)

229,39
Contracted staff*
(*includes seconded group leaders)

- **146,67** research staff — 63,94%
- **37,73** Research support staff — 16,45%
- **44,99** Administration staff — 19,61%

14,13
Internships

- **10,27** Research Internships — 72,68%
- **7** Administration Internships — 27,32%



ABOUT US / **OUR STAFF**

CAMPUS STAFF BREAKDOWN (FTE)

229,39
Contracted staff*
(*includes seconded group leaders)

- **200,16** Staff in IJC Can Ruti — 87,26%
- **19,17** Staff in IJC Clinic — 8,36%
- **7,06** Staff in IJC Sant Pau — 3,08%
- **2** Staff in IJC Trueta — 0,87%
- **1** Staff in IJC Mar — 0,43%

126,15
Seconded staff

- 4,62% — **5,83** Staff in IJC Campus Trueta
- 8,69% — **10,96** Staff in IJC Campus Sant Pau
- 17,42% — **21,98** Staff in IJC Campus Clinic
- 26,16% — **33** Staff in IJC Campus Trueta
- 43,11% — **54,38** Staff in IJC Can Ruti

ABOUT US

RESEARCH PROGRAMS

CANCER AND LEUKEMIA EPIGENETICS AND BIOLOGY PROGRAM (PEBCL)

1. Cancer Epigenetics led by Manel Esteller
2. Cancer Genetics led by Montse Sanchez-Cespedes
3. Chromatin Biology Laboratory led by Alex Vaquero
4. Chromatin, Metabolism and Cell Fate led by Marcus Buschbeck
5. 3D Chromatin Organization led by Biola M. Javierre
6. Epigenetics and Immune Disease led by Esteban Ballestar
7. Lymphocyte Development and Disease led by Maribel Parra
8. Regulatory Genomics led by Tanya Vavouri
9. Regulatory RNA and Chromatin led by Sònia Guil
10. Epigenetic Control of Hematopoiesis led by José Luis Sardina
11. Transcriptional Dynamics in Leukemia led by Sergi Cuartero
12. Cancer Immunogenomics led by Eduard Porta
13. Cancer Heterogeneity and Hierarchies led by Verónica Rodilla
14. Leukemia and Immuno-Oncology led by Laura Belver
15. Cellular Systems Genomics led by Elisabetta Mereu
16. Stem Cells and Cancer led by Anna Bigas
17. Endothelial Pathobiology and Microenvironment led by Mariona Graupera
18. T-Cell Lymphoma led by Laura Mondragón

EXPERIMENTAL AND CLINICAL HEMATOLOGY PROGRAM (PHEC)

19. Acute Lymphoblastic Leukemia (ALL) led by Josep Mª Ribera
20. Barcelona Endothelium Team (BET) led by Enric Carreras
21. Functional Cytomics led by Jordi Petriz
22. Myeloid Neoplasms led by Lurdes Zamora and Blanca Xicoy
23. Immunohematology and Glycobiology led by Fumiichiro Yamamoto
24. Leukemia Stem Cell led by Ruth Risueño
25. Lymphoid Neoplasms led by Tomás Navarro
26. Multiple Myeloma led by Albert Oriol
27. Myelodysplastic Syndromes led by Francesc Solé
28. Stem Cell Biology, Developmental Leukemia and Immunotherapy led by Pablo Menéndez
29. Cellular Immonotherapy and Gene Therapy led by Javier Briones
30. Stem Cell Transplantation and Cellular Immunotherapy led by Álvaro Urbano-Ispizua
31. Epigenetic Therapies led by María Berdasco
32. Lymphoma Translational led by Gaël Roué
33. Descriptive and Analytical Epidemiology of Cancer led by Rafael Marcos Gragera
34. Oncogenesis and Antitumor Drugs led by Ramon Mangues
35. Chronic Lymphocytic Leukemia led by Carolina Moreno
36. Hematology Research led by David Gallardo
37. Myeloid Neoplasms (Clínic) led by Jordi Esteve
38. Hematological Diseases, Transplant and Cell Therapy led by Jordi Sierra
39. Hematological Diagnosis led by Josep Nomdedéu

ABOUT US

RESEARCH GROUPS

1. CANCER EPIGENETICS LED BY MANEL ESTELLER

GROUP MEMBERS

ESTELLER BADOSA, MANEL
Group Leader

SETIÉN BARANDA, ESTEBAN FERNANDO
Associate Researcher

DÁVALOS VEGA, MARIA VERÓNICA
Associate Researcher

MUSULÉN PALET, EVA
Associate Researcher

BLECUA CARRILLO ALBORNOZ, PEDRO
Associate Researcher

FERRER AGUILAR, GERARDO
Postdoctoral Researcher

PONTEL, LUCAS BLAS
Postdoctoral Researcher

JANIN, MAXIME HENRI
Postdoctoral Researcher

VILLANUEVA LEGARDA, LOREA
Postdoctoral Researcher

JOSHI, RICKY
Postdoctoral Researcher

CAMPILLO MARCOS, IGNACIO
Postdoctoral Researcher

ORŠOLIC, INES
Postdoctoral Researcher

CARRIER, ARNAUD
Postdoctoral Researcher

ROSSELLÓ TORTELLA, MARGALIDA
PhD Student

BUENO COSTA, ALBERTO
PhD Student

ORTIZ BARAHONA, VANESSA
PhD Student

MARTINEZ VERBO, LAURA
PhD Student

GARCIA PRIETO, CARLOS ANTONIO
PhD Student

POPOV, ANTON
PhD Student

CASADO PELAEZ, MARTA
PhD Student

PARRA PARRA, JERONIMO
PhD Student

GOMEZ PEREIRA, CRISTINA
PhD Student

COLL SAN MARTÍN, LAIA
Lab Technician

SOLER RIERA, MARTA
Lab Technician

OVERVIEW

Malignant cells behave differently to the rest of the tissue; they present capacities reserved for stem cells, such as proliferation. Since all cells in an organism share the same genetic information, the difference between any cell type, including malignant cells, lies in the subset of information to which they have access. The term epigenetics refers to the many control layers that limit a cell's access to only those parts of the genome relevant to its organic function.

OUR RESEARCH

Our group aims to understand the fundamental epigenetic and epitranscriptomic mechanisms that act in living cells, such as DNA methylation and histone modification patterns and gene expression regulation through microRNAs. These mechanisms do not affect the cell's genetic information, only its availability, and its alteration may mark the beginning of abnormal behaviour. Malfunction of epigenetic control is one of the most poorly understood causes of human tumors and knowledge of this phenomenon is key to developing new strategies against tumor formation and cancer.

OUR GOALS

To shed light on this emerging field, the Cancer Epigenetics group focuses on:

1.
Defining the epigenome of cancer cells.

The ability to identify the epigenetic differences, either on DNA or RNA, between a healthy cell and a transformed cell represents the starting point for our research. Knowledge of this area is fairly limited and our lab is currently carrying out intense research in this field.

2.
Study of the epigenetic machinery and mechanisms.

We are interested in understanding the role and function of DNA methyltransferases, the large group of proteins directly responsible for interacting with DNA and shaping the open or closed transcriptional state.

3.
Use of epigenetic markers to predict response to antitumor therapies.

Our group has a long-standing interest in translating the use of epigenetic knowledge gained from research into biomarkers to predict clinical outcomes.

4.
Preclinical testing of epigenetic compounds.

We are interested in the development and study of new epigenetic drugs that target DNA methylation and histone modification writers, readers and erasers, and that could exert an anti-cancer effect.

OUR CHALLENGES

Cancer remains a horrible disease, and all new biomarkers and innovative approaches to treat the disorder are necessary and welcome additions. Our research has had an impact on the clinical outcome of several tum our types, from brain tumors to cancer of unknown primary, including subsets of leukemia and lymphoma patients. Discovering the particular epigenetic and epitranscriptomic characteristics of each cancer type may help deliver personalized therapies to oncology patients.

Through our research, we hope to answer the following questions:

1. Will the epigenome map lead to a better understanding of cancer and guide global research to make this disease curable?
2. How can we transfer epigenetics research to prevent cancer and improve clinical management with a view to improving patients' quality of life?
3. Is there an ultimate epigenetic signalling pathway and context that can explain any cancer?

KEYWORDS

Cancer epigenetics; DNA methylation; RNA epitranscriptomics; histone modification; epigenetic gene silencing

ABOUT US

RESEARCH GROUPS

2. CANCER GENETICS LED BY MONTSE SANCHEZ-CESPEDES

GROUP MEMBERS

SANCHEZ-CESPEDES, MONTSE
Group Leader

ROMERO FERRARO, OCTAVIO ALFREDO
Senior Researcher

SAIGÍ MORGUÍ, MARIA
Postdoctoral Researcher

ALBURQUERQUE BEJAR, JUAN JOSÉ
Postdoctoral Researcher

FERRERO ANDRÉS, ANA
Postdoctoral Researcher

VILARRUBÍ PORTA, ANDREA
PhD Student

NAVAJAS CHOCARRO, PABLO
PhD Student

MORILLAS VIÑUALES, JUAN
PhD Student

PROS SIMÓN, EVA
Lab Technician

BARTOLESSIS ARIAS, ISABEL
Lab Technician

OVERVIEW

Lung cancer causes over 1.3 million deaths annually and remains the deadliest type of cancer worldwide. Although efforts in recent years to fully characterize human cancer on a genetic and molecular level have provided important insights to increase our understanding of the gene alteration profile underlying the development of Lung Cancer, the impact of this knowledge in the survival of patients remains modest. Our group is devoted to the genetic, epigenetic and molecular study of the mechanisms that drive LC development. Ultimately, our purpose is to implement the clinical management of cancer patients and to design novel therapeutic strategies.

OUR RESEARCH

The complete genetic characterization of tumors is important to understand cancer development, promote the discovery of new drugs and improve the selection of patients that may benefit from a given cancer therapy. Our research uses the latest high-throughput sequencing technologies to create profiles and catalogues of the recurrently altered genes in cancer. We also have a keen interest in understanding the mechanisms by which the abnormal function of these genes contributes to cancer development.

OUR GOALS

Our laboratory is currently engaged in a number of important projects:

1.

Screening for factors that determine tumor immunoescape and the response to immunotherapy.

We have become increasingly interested in the study of those biological factors, which allow tumors to escape control of the immune system and determine the response to immunotherapy.

2.

Genomic and genetic profiling of lung tumors to identify novel targets for therapeutics and determinants for the primary and acquired response to tyrosine kinase inhibitors (TKIs).

We use high-throughput genomic sequencing technologies, such as whole exome and RNA-sequencing, to gather information about the genetic background and gene expression profiles of lung tumors from both smokers and non-smokers.

3.

Genetic alterations at epigenetic factors: biological understanding and opportunity for novel therapeutics.

Over the past 15 years, our group has provided key information to understanding cancer biology. Currently, we are using high-throughput technologies to understand tumor development and to identify molecular vulnerabilities that can be used therapeutically.

OUR CHALLENGES

Recent epidemiological data point to a worrying increase in the incidence of LC in those who have never smoked, particularly women. The reasons are not well understood, a fact that limits the design of prevention measures.

Through our research, we hope to answer the following questions:

1. What are the genetic and molecular abnormalities that trigger the development of cancer, particularly Lung Cancer?
2. How can we use genetic/molecular information to identify novel targets to implement Lung Cancer therapeutics?
3. What is the molecular basis for the lack of response to immunotherapyr?
4. How can we predict and prevent acquired resistance to targeted therapeutics?

KEYWORDS

Targeted therapeutics; immunotherapy; epigenetic regulation; SWI/SNF-complex; MYC/MAX-pathway

ABOUT US

RESEARCH GROUPS

3. CHROMATIN BIOLOGY LABORATORY LED BY ALEX VAQUERO

GROUP MEMBERS

VAQUERO GARCÍA, ALEJANDRO
Group Leader

LUIS PAÑOS MOLERO

VÁZQUEZ PRAT, BERTA NIEVES
Postdoctoral Researcher

ESPINOSA ALCANTUD, MARIA DOLORES
Postdoctoral Researcher

MARAZUELA DUQUE, ANA
Postdoctoral Researcher

FERNÁNDEZ DURAN, IRENE
Postdoctoral Researcher

IANNI, ALESSANDRO
Postdoctoral Researcher

GONZÁLEZ NIETO, JÈSSICA
PhD Student

CASTELLÓ GARCÍA, JOSE MANUEL
PhD Student

GÁMEZ GARCÍA - CERVIGÓN, ANDRES
PhD Student

SOLÉ GRÍFOL, MARINA
PhD Student

MORILLAS VIÑUALES, JUAN
PhD Student

GUITART SOLANES, ANNA
PhD Student

OVERVIEW

The members of the sirtuin family of NAD+-dependent enzymes are key coordinators of this response, as they play an important role in the crosstalk between the environment and the genome, at both cellular and physiological level. In particular, they play a key role in the maintenance of genome stability, epigenetics, metabolic homeostasis, and cell differentiation and development. The relevance of sirtuin function is highlighted by their involvement in some of the most common human pathologies, including cancer (such as blood malignancies), diabetes and other endocrine-related diseases, neurodegenerative diseases and ageing.

OUR RESEARCH

The chromatin biology lab's primary purpose is understanding the mechanisms of the stress response and their impact on cancer and ageing. Specifically, the group focuses its efforts on defining the contribution of sirtuins to this response in the maintenance of genome stability, epigenetics and metabolic homeostasis.

To fulfil this main objective, the group's work encompasses a wide range of research areas, from basic aspects of sirtuin biology to their contribution in the development of human pathologies such as leukemia and ageing.

OUR GOALS

We aim at the identification of novel mechanisms and factors involved in the onset and development of blood malignances, and the creation of tools that could be helpful for its diagnosis and treatment. In this regard, the group's main objectives are:

1.

To understand the enzymatic duality of sirtuins and their specific contribution to sirtuin function.

In particular, we focus our efforts on the poorly understood topic of ADPRT activity.

2.

To characterize sirtuin-dependent mechanisms of genomic stability,

including constitutive heterochromatin integrity, DNA damage signalling and repair, and cell cycle checkpoint control.

3.

To define the role of sirtuins in B-cell differentiation and characterize their functional implication in cancer,

particularly in the context of hematopoietic pathologies such as leukemia and lymphoma. Our main efforts are currently focused on two types of leukemia, pediatric B-ALL and AML.

4.

To understand the involvement of sirtuin function in the beneficial effects of nutrient restriction on ageing development.

5.

To develop a new methodology to measure the activity of sirtuins *in vivo*.

OUR CHALLENGES

Through our research, we seek to answer the following questions:

1

What is the physiological mechanism associated with the genotoxic and metabolic stress response?

2

What is the contribution of the sirtuin family of enzymes to the maintenance of genome stability after stress?

3

What is the implication of these mechanisms in the onset and development of blood cancers and ageing?

KEYWORDS

Stress response; sirtuins; epigenetics; leukemia; ageing

ABOUT US

RESEARCH GROUPS

4. CHROMATIN, METABOLISM AND CELL FATE LED BY MARCUS BUSCHBECK

GROUP MEMBERS

BUSCHBECK, MARCUS
Group Leader

URIBESALGO MICAS, IRIS
Project Manager

MALINVERNI, ROBERTO
Postdoctoral Researcher

DIESCH, JEANNINE
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OVERVIEW

We focus on understanding the molecular aspects of chromatin regulation and have a long-standing interest in the study of histone variants. We want to find ways to translate knowledge about chromatin regulation into therapeutic tools for the management of diseases such as blood cancers.

OUR RESEARCH

We seek to bridge the gap between basic molecular research and translational research by exploring chromatin regulation, in particular the molecular biology of histone variants. We aim to exploit this knowledge for the identification of novel intervention strategies for the treatment of blood cancers. We focus on the continuum of myeloid diseases, ranging from the premalignant expansion of altered clones to chronic myelodysplastic syndromes and acute myeloid leukemia.

OUR GOALS

Through our research, we aim to gain a better understanding of the epigenetic mechanisms that contribute to the development of blood cancers. By functionally mining the chromatin regulatory space, we further aim to provide new starting points by identifying novel drug targets. In this regard, our research focuses on two main lines:

1.
To mine the chromatin regulatory space to identify novel drug targets that can either help improve current treatments or intercept disease at an early asymptomatic stage.

2.
We study histones from the protein core of the nucleosome, particularly the variant macroH2A that led to two major discoveries: its major role in nuclear organization and its ability to bind metabolites through its mostly understood macrodomain, establishing a direct link between chromatin and metabolism.

OUR CHALLENGES

Through our research, we hope to answer the following questions:

1
How do epigenetic mechanisms operate on the molecular level?

2
How do chromatin and, in particular, histone variants contribute to cell fate transitions?

3
How can we exploit this knowledge for the development of novel therapeutic strategies?

KEYWORDS

myelodysplastic syndrome, acute myeloid leukemia, chromatin, nuclear organization, histone variants

ABOUT US

RESEARCH GROUPS

5. 3D CHROMATIN ORGANIZATION LED BY BIOLA M. JAVIERRE

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OVERVIEW

Our group combines cutting-edge experimental and bioinformatics approaches to understand the specific 3D chromatin organization of normal and malignant hematopoiesis and its interaction with non-coding determinants and trans-regulatory elements. Our long-term goal is to keep making progress in the fight against cancer. We will not stop until a cure is found.

OUR RESEARCH

Since 2018, our work is focused on the study of the molecular mechanisms driving healthy and malignant hematopoiesis under a three-dimensional perspective.
We are deeply interested in the unexplored noncoding DNA, which encompasses DNA that does not contain genes but that regulate the expression of remote genes, and the alterations of this.
For that, we are developing new methods to study the spatial genome architecture and integrating this data with different methods in epigenetics, biochemistry and functional genomics to provide fundamental insight on normal and malignant hematopoiesis.

OUR GOALS

Our lab's main research goals are as follows:

1.

To define the cell type-specific 3D chromatin organization in human hematopoietic cells.

we aim to investigate whether the dynamic changes in chromatin interactions between gene promoters and regulatory elements can shape transcription decisions controlling hematopoiesis.

2.

To identify the altered DNA topology in blood cancer.

Genome architecture plays a key role in genome expression regulation. Chromatin interactions are therefore crucial for cellular health, and errors in these interactions can give rise to the development of a broad range of diseases, including blood cancer.

3.

To prioritize new candidate genes and pathways related to blood cancer.

By studying the physical interactions between gene promoters and regulatory elements, we will be able to connect blood cancer determinants to putative target genes, thereby prioritizing new candidate genes and pathways and offering an insight into the genomic regulatory mechanisms underlying cancer.

OUR CHALLENGES

As in other complex diseases, most of mutations and epimutations associated with blood cancers lie in non-coding regions, frequently at enhancers, and potentially exert their roles by altering the regulation of the target genes. However, these non-coding determinants remain unexplored because the vast majority of regulatory elements that control transcriptional activity of each gene in each cell type are unknown.

Through our research, we hope to answer the following questions:

1. Can the dynamic changes in chromatin interactions shape the transcription decisions controlling hematopoiesis?
2. How does the altered genome architecture drive malignant transformation?
3. What is the role of non-coding determinants in cancer predisposition and development?

KEYWORDS

Genome architecture, spatial-temporal chromatin organization, hematopoiesis, blood cancer, cis non-coding determinants, enhancer-promoter interactions

ABOUT US

RESEARCH GROUPS

6. EPIGENETICS AND IMMUNE DISEASE LED BY ESTEBAN BALLESTAR

GROUP MEMBERS

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Lab Technician

OVERVIEW

We aim at understanding the mechanisms underlying the deposition and removal of epigenetic modifications in immune cells, the influence of genetic and environmental determinants, and the acquisition of epigenetic alterations in immune-mediated disease including primary immunodeficiencies, autoimmune and autoinflammatory diseases. We also investigate the impact of the epigenetic regulation of immune cells in the microtumor environment.

OUR RESEARCH

We started these lines of research more than 10 years ago, by studying the occurrence of DNA methylation alterations in the context of systemic lupus erythematosus (SLE), an archetypical systemic autoimmune disease. Later on, we performed new studies with MZ twins discordant for common variable immunodeficiency (CVID), the most prevalent symptomatic primary immunodeficiency.

More recently, our team also demonstrated the occurrence of DNA methylation alterations in monocytes in representative autoinflammatory syndromes. We have shown that alterations in the DNA methylome of peripheral blood monocytes reflect the disease activity in rheumatoid arthritis mediated by the elevated levels of inflammatory cytokines present in such state.

OUR GOALS

Our main lines of research and specific goals are:

1.

To understand the role of epigenetic control and its upstream determinants in relation with immune function.

We aim at understanding how immune cell-cell crosstalk, cytokines and other factors, cell signalling pathways and transcription factors determine epigenetic control and impact immune cell function.

2.

To identify epigenetic alterations in immune-mediated diseases and investigate their clinical relevance.

Our studies focus on different diseases including primary immunodeficiencies, such as common variable immunodeficiency (CVID) and hyper IgM type 2 syndrome, and autoimmune diseases, such as rheumatoid arthritis, systemic sclerosis and systemic lupus erythematosus.

3.

To investigate the effects of immunomodulators and epigenetic compounds in shaping the epigenome and responses of immune cells.

We dissect the molecular consequences of different immunomodulators as well as inhibitors of epigenetic enzymes in immune cells.

OUR CHALLENGES

The study of epigenetic dysregulation can help understand the determinants of immune dysregulation and can have an impact in the treatment of these diseases. Therefore, with our research we want to answer:

1

How do immune cells translate the surrounding information provided by the direct contact with other cells or the cytokines and other molecules into epigenetic profiles that determine their responses?

2

What is the relevance of the epigenetic alterations that are found in different immune mediated diseases in relation to the aberrant function of these cells?

3

How can we apply the knowledge on the epigenetic dysregulation in immune-mediated disease to the clinics?

KEYWORDS

Epigenetics, DNA methylation, Immune-mediated disease, autoimmune disease, primary immunodeficiency

ABOUT US

RESEARCH GROUPS

7. LYMPHOCYTE DEVELOPMENT AND DISEASE LED BY MARIBEL PARRA

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Lab Technician

OVERVIEW

B-cell lymphopoiesis is a complex developmental process that involves several cellular transitions, including cell commitment and early and late cellular differentiation. Proper transcriptional control at each cellular transition is essential for the correct development of B lymphocytes. How specific gene expression programmes are selected and maintained, thus resulting in the proper generation of B cells, remains a fundamental question in biology. Conversely, how the aberrant establishment of cell- and lineage-specific gene transcriptional programmes leads to the development of B-cell malignancies such as leukemia and lymphoma also requires extensive research.

OUR RESEARCH

Our current research focuses on four main lines:

- **Understanding the entire role of HDAC7 in early and terminal B-cell development.** HDAC7 is an epigenetic modulator that represses functional or lineage-inappropriate gene expression in B lymphocytes
- **Establishing HDAC7 as a novel biomarker and potential therapeutic target in pro-B acute lymphoblastic leukemia (pro-B-ALL) and diffuse large B-cell lymphoma (DLBCL).** We found that the deregulation of HDAC7 may be involved in the pathogenesis of acute lymphoblastic leukemia.
- **Working towards precision medicine against DLBCL heterogeneity using organoid culture systems.** We are investigating additional epigenetic regulators in normal and aberrant B-cell generation and implementing 3D organoid cultures from DLBCL sample patients.
- **Improving immunotherapy combinatorial therapy in DLBCL.** R-CHOP is the gold standard treatment for DLBCL patients. R-CHOP therapy combines anti-CD20 antibody (immunotherapy) with cyclophosphamide, doxorubicin, vincristine and chemotherapy.

OUR GOALS

Acute lymphoblastic leukemia (ALL) is the most common type of cancer in children under a year old. Even though the chances of survival in infants suffering from ALL have improved significantly in recent years, an exhaustive study of the mechanisms underlying this disease is still required to make further therapeutic advances. Therefore, our group focus on:

1.
To understand how gene silencing is established during normal and aberrant B-cell differentiation.

2.
To transfer our basic knowledge in the epigenetics and transcriptional control of B-cell development to the clinical setting for infant B-ALL and DLBCL patients.

- To identify small molecules aimed at HDAC7 targeted modulation for combinatorial and precision medicine in infant pro-B-ALL with MLL-AF4 rearrangement.
- To identify novel targets for the design of next-generation immunotherapies in DLBCL.

3.
To implement a 3D organoid platform for DLBCL patient samples to perform compound library screenings aimed at unveiling new drugs for use in combinatorial therapy with current immunotherapy in a personalized manner.

OUR CHALLENGES

Through our research, we aim to answer the following questions:

1
How do B lymphocytes decide their identity? How is gene silencing established?

2
Why does HDAC7 expression improve the prognosis of some hematopoiesis diseases?

3
Why is HDAC7 underexpressed in pro-B-ALLA and DLBCL?

4
How can we restore HDAC7 expression in pro-B-ALL and DLBCL to impair disease progression?

5
Can we implement 3D organoids from DLBCL patients aimed at drug screening towards a precision medicine strategy and immunotherapy improvement?

KEYWORDS

B lymphocyte development, Epigenetics and transcriptional regulation,HDAC7, B cell acute lymphoblastic leukemia (B-ALL), Diffuse large B-cell lymphoma (DLBCL)

ABOUT US

RESEARCH GROUPS

8. REGULATORY GENOMICS LED BY TANYA VAVOURI

GROUP MEMBERS

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OVERVIEW

Regulation of gene expression is the fine-tuning of the synthesis of the functional product of genes and is one of the most fundamental processes in life. It is the process that makes different cell types have different properties and differentiates unhealthy from healthy cells. Gene expression is regulated by internal signals (the activity of other genes, mutations, etc.) and by external signals (diet, temperature, pharmacological therapies, etc.).

OUR RESEARCH

Our research focuses on three main areas:

- Firstly, we study **the effect of the environment on gene expression** changes that are transmitted from parents to their offspring. We want to understand how information about our exposure to different environments may be encoded in molecules - other than DNA - inside germ cells that are transmitted between generations.
- Secondly, we work on **non-coding RNAs and other non-coding elements that influence gene expression.** We are interested in which non-coding elements affect gene expression and how.
- Finally, we want to **understand how epigenetic drugs affect gene expression and chromatin** in different genomic contexts. Epigenetic drugs currently used in the clinic include those for the treatment of patients with acute myeloid leukemia and myelodysplastic syndrome. A more in-depth understanding of the effects of these drugs and how they work may lead to improved or more personalized medicine in the future.

OUR GOALS

Our aim is to contribute to a better understanding of gene regulation and the consequences of drug treatments and inter-individual genetic variation in gene expression. Although most of our research is based on data from animal model organisms or cell lines, we hope that, in the long term, the knowledge acquired will increase our understanding about humans. Extensive aberrant gene expression and genome deregulation are extremely common in cancer, especially hematopoiesis forms, and treatments targeting gene regulation pathways are being used for hematopoiesis malignancies. Last, but not least, we hope that the data we generate and the analysis methods we develop serve as useful tools for the wider research community.

OUR CHALLENGES

We hope that our research sheds light on the following questions:

1. Which epigenetic mechanisms are involved in the transmission of acquired or variable traits between generations in humans and other animals?
2. Which non-coding DNA elements affect gene expression and therefore potentially phenotype?
3. How drugs (such as those used for the treatment of blood cancers) affect gene expression and the function of the non-coding parts of our genome?

KEYWORDS

Bioinformatics, gene regulation, epigenetic inheritance, germline, genomics

ABOUT US

RESEARCH GROUPS

9. REGULATORY RNA AND CHROMATIN LED BY SÒNIA GUIL

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OVERVIEW

We study the emerging roles of noncoding RNAs as key regulators of gene expression in physiological cellular programmes and at the onset or during progression of human diseases, with a major focus on tumorigenesis and neurodevelopmental diseases. The research carried out by our group combines biochemical, cellular and global genomic approaches to dissect mechanisms of gene expression regulation with the participation of ncRNAs, with the ultimate aim of revealing molecules of therapeutic/biomarker interest for clinical translation.

OUR RESEARCH

The lab focuses on a variety of RNA and RNA-binding protein functions in the context of changing cellular conditions. Our interest concentrates on the noncoding transcriptome, with the main aim of separating the wheat from the chaff to reveal true biologically relevant molecules and to understand how they are connected to broader gene regulatory networks.

Cancer research has led the way in the study of noncoding RNAs, but the abundance and key roles of the noncoding transcriptome in the human brain are being increasingly recognized. Importantly, common dysregulated mechanisms in different pathological contexts and with the involvement of ncRNAs, are emerging.

OUR GOALS

Our research aims to gain a better understanding of the biological relevance of ncRNAs for an informed use in therapeutic strategies. Recently, our group's research has taken advantage of state-of-the-art global transcriptomic approaches to identify ncRNA candidates that act as master regulators of oncofoetal genes, thereby revealing their validity as biomarkers in human cancer.

In addition to our work related to cancer, the group has been developing new experimental tools for research into Rett syndrome, a neurodevelopmental disorder usually caused by loss-of-function mutations in the epigenetic regulator MeCP2.

OUR CHALLENGES

Through our research, we hope to answer the following questions:

1. What is the precise contribution of the noncoding transcriptome to tumor biology?
2. How can we use RNA tools to improve treatment or diagnosis of human disease?
3. How can we better model neurodevelopmental diseases such as Rett syndrome to understand key initial changes in gene expression programmes?

KEYWORDS

Noncoding RNAs, cancer epigenetics, gene expression regulation, stem cells, Rett syndrome.

ABOUT US

RESEARCH GROUPS

10. EPIGENETIC CONTROL OF HEMATOPOIESIS LED BY JOSÉ LUIS SARDINA

GROUP MEMBERS

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OVERVIEW

DNA methylation-related genes are among the most frequently mutated in blood malignancies. Traditionally, studies aimed at understanding the effect of aberrant DNA methylation in cancer patients have focused on gene promoters. However, recent findings focus on enhancers as the most important regions in dynamic DNA methylation studies. We aim to understand how aberrant DNA methylation dynamics impact on the chromatin structure at enhancers during blood cancer onset and progression.

OUR RESEARCH

We study how aberrant DNA methylation at distal gene regulatory regions poisons the chromatin to trigger corrupted gene expression signatures in cells, thus eventually leading to the onset and progression of hematopoiesis neoplasms. This line of research has implications for a broad spectrum of patients suffering from blood diseases sharing an abnormal genome-wide DNA methylation landscape.

OUR GOALS

Our research aims to gain a better understanding of the biological relevance of ncRNAs for an informed use in therapeutic strategies. Recently, our group's research has taken advantage of state-of-the-art global transcriptomic approaches to identify ncRNA candidates that act as master regulators of oncofoetal genes, thereby revealing their validity as biomarkers in human cancer.

In addition to our work related to cancer, the group has been developing new experimental tools for research into Rett syndrome, a neurodevelopmental disorder usually caused by loss-of-function mutations in the epigenetic regulator MeCP2.

OUR CHALLENGES

There is an urgent need for novel therapies for acute myeloid leukemia, since barely any drugs introduced in the last decades have increased the overall survival its patients. Hence, our research aims to shed light on the following questions:

1. What is the interplay between DNA (hydroxy) methylation and chromatin dynamics at distal gene regulatory regions during hematopoietic cell fate decisions?

2. What are the molecular mechanisms underlying the role of TET2 in the epigenetic control of the chromatin at distal gene regulatory regions during leukemia onset and progression?

3. What is the role of mRNA methylation-mediated post-transcriptional control in myeloid cell differentiation?

KEYWORDS

NA methylation; TET enzymes; Chromatin; Hematopoiesis malignancies; Stem cells

11. TRANSCRIPTIONAL DYNAMICS IN LEUKEMIA LED BY SERGI CUARTERO

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RESEARCH GROUPS

OVERVIEW

Hematopoietic differentiation is a tightly regulated process that maintains blood production throughout life. The transcriptional changes that hematopoietic cells undergo during differentiation are controlled at multiple levels and an accurate integration of all of them is essential to ensure the production of sufficient numbers of blood cells at all stages of differentiation. However, most of the acute myeloid leukemia (AML) cases have mutations in transcriptional regulators and chromatin modifiers. These mutations alter transcriptional dynamics and can impair normal differentiation.

OUR RESEARCH

We study the mechanisms that regulate transcription during hematopoietic differentiation and investigate the leukemogenic potential of mutations in transcriptional regulators and epigenetic modifiers. We are also looking into the role of mutations in proteins that drive the three-dimensional organization of the genome.

OUR GOALS

Our main goals are:

1.

To understand the role of mutations in hematopoietic transcription factors and chromatin regulators in acute myeloid leukemia (AML).

Using genetic models to mimic these mutations, we aim to dissect their impact on gene expression and thus understand how they promote a selective advantage.

2.

To characterize the impact of inflammatory signalling on normal hematopoietic differentiation and during leukemic progression.

We want to understand the impact of inflammation on the progression of myeloid malignancies and how are they linked to the most common mutations.

OUR CHALLENGES

Acute myeloid leukemia (AML) is the one of the most aggressive forms of leukemia, and there is an urgent need to find new treatment options. While we now know **what** genes are recurrently mutated in AML, we still do not understand **why** these mutations are malignant. Through our research, we aim to answer the following questions:

1. What transcriptional mechanisms are deregulated in acute myeloid leukemia?
2. How do inflammatory signals influence leukemic progression?
3. Can we use inflammatory modulation to attenuate the severity of myeloid malignancies?

KEYWORDS

Hematopoiesis, chromatin, AML, MDS, cohesin, inflammation

ABOUT US

RESEARCH GROUPS

12. CANCER IMMUNOGENOMICS LED BY EDUARD PORTA

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OVERVIEW

Our research lies at the interface of artificial intelligence, molecular biology and medical oncology, and we bring together experts from all three fields. We use computational approaches to study the interaction between genetic variants in cancer genomes and multiple aspects of cancer, ranging from the immune response against tumors to the susceptibility of cancer cells to different treatments.

OUR RESEARCH

Over the last two decades, there has been an explosion of three main types of big data in cancer research. We use three types of data:

- Germline genotypes from cancer patients, this is, the base non-altered genome of individual people being diagnosed with cancer.
- Somatic tumor genomes, being the particular genomes of individual tumors, with its unique set of alterations.
- The amount and composition of cells in tumors coming from single-cell sequencing.

Until now, these three different aspects of tumor immunobiology have mostly been studied on an individual basis. However, it is now evident that the three factors are inextricably linked and should be studied as a whole.

OUR GOALS

Our main goal is to understand how genetic variation influences the immune response against cancer cells and vice versa. Specifically, we are working on the following lines:

1.
Understanding how inherited genetic variants change the immune response against cancer cells.

2.
Understanding how inherited genetic variants interact with biological sex to influence cancer predisposition. We are using the MareNostrum supercomputer to analyze genetic data from hundreds of thousands of cancer patients from this biological sex perspective, to identify genetic variants that predispose to cancer differently depending on gender.

3.
Integration of protein structure and genetic data to identify new cancer-associated mutations.

4.
Creating a molecular and cellular map of the tumor microenvironment in bladder cancer.

OUR CHALLENGES

Through our research, we hope to answer the following questions:

1
Is it possible to use a person's genetic data to predict whether he/she will develop cancer?

2
Which genes play a role in the development of cancer?

3
How do genetic variants change the immune response against cancer cells?

KEYWORDS

Computational biology, cancer genomics, big data, GWAS, bladder cancer

ABOUT US

RESEARCH GROUPS

13. CANCER HETEROGENEITY AND HIERARCHIES LED BY VERÓNICA RODILLA

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OVERVIEW

Our laboratory studies the key signals governing stem cell and cell fate specification during malignant progression and the mechanisms by which different signaling pathways control cell plasticity in cancer. Specifically, we use in vivo lineage tracing, live imaging, cytometry and expression profile analysis as experimental tools to achieve our goals. Our group combines murine transgenic models, patient-derived xenografts and 3D organoids to unravel cellular hierarchies within tumors, to gain a better understanding of cancer heterogeneity and drug resistance.

OUR RESEARCH

Cancer is a heterogeneous disease with a cellular hierarchical organization that is largely unexplored in many tumor subtypes. Moreover, in some cases hierarchical relationships among stem cells, progenitors and differentiated cells remain unsolved due to the high degree of cellular plasticity, which allows cells to switch between different cellular stages.

OUR GOALS

We are a newly created group passionate about cellular hierarchies and tumor heterogeneity. Our main lines of research and specific goals are:

1.
To illustrate cellular hierarchies within tumors.

We use a well-established hierarchical model to study multipotency in tumors. Now, we are separately monitoring three mammary epithelial compartments to measure the presence of multipotency within breast tumors. Our hypothesis is that breast tumors.

2.
To discover cytotoxic agents for specific cellular subpopulations.

A therapy based on a combination of several drugs to target different cellular populations could eradicate primary tumors, thereby preventing relapse and metastasis. We want to screen for natural compounds that selectively kill specific subsets of cells that are responsible for tumor maintenance and/or intrinsically resistant to current therapies.

3.
To target the tumor niche to prevent the spread of cancer.

One of our main objectives is to generate in vivo tools that will allow us to study new therapeutic targets to prevent relapses in hematological cancer. To that end, our lab works on different strategies, which include murine and human models, to test a panel of drugs currently used as a standard of care for non-Hodgkin's lymphoma (NHL) and explore the role of senescence in tumors cells, as well as in their microenvironment.

Our ultimate mission is to understand the tumor heterogeneity between different patients with a view to improving their treatment of choice by searching for novel and personalized therapeutic strategies.

OUR CHALLENGES

We hope to answer the following questions through our research:

1. How can cellular plasticity improve treatment for cancer patients?
2. Can we achieve truly personalized medicine by identifying single or combinatorial therapies to target different cellular populations at the same time?
3. Can we prevent metastasis and/or relapses by targeting the most frequently colonized tissues?

KEYWORDS

Cellular hierarchies, heterogeneity, cell plasticity, senescence, tumor microenvironment

14. LEUKEMIA AND IMMUNO-ONCOLOGY LED BY LAURA BELVER

GROUP MEMBERS

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OVERVIEW

Juvenile myelomonocytic leukemia (JMML) is a rare and aggressive type of pediatric blood cancer that affects mainly children under two years of age and occurs when bone marrow production of white cells becomes severely dysregulated. Hematopoietic stem cell transplantation (HSCT) is currently the only available treatment for patients, although just two out of three children affected by the disease survive.

OUR RESEARCH

Since 2020, our work has focused on the study of the molecular mechanisms driving JMML and the exploration of alternative therapeutic strategies specifically designed for these patients. To achieve this, we incorporate different methods into epigenetics, systems biology, functional genomics and biochemistry, to help address critical questions about the origin and progression of JMML and to identify new therapeutic targets for the treatment of this disease.

OUR GOALS

The specific goals of our research program are as follows:

1.

To create a centralized JMML sample repository and patient-derived xenograft (PDX) collection.

In collaboration with clinical teams at different hospitals around the country and with the endorsement of the Spanish Society of Pediatric Hematology and Oncology (SEHOP), we are creating a national JMML patient sample repository and PDX collection, that will be instrumental for the development of our research program.

2.

To develop a comprehensive molecular analysis of JMML patients to define accurate diagnostic and stratification criteria.

We aim to explore the non-coding genome of JMML patients to identify new genetic alterations that can drive JMML or contribute to the pathogenesis of the disease by other means. This information will help improve our knowledge of JMML and develop more accurate criteria for the diagnosis and management of JMML patients.

3.

To identify new potential therapeutic targets and develop specific therapies for the treatment of JMML.

HSCT is currently the only effective therapy for the treatment of JMML. However, only two out of three children with this disease survive. Thus, new therapies specifically designed to treat JMML patients are needed. To achieve this, we are collaborating with other research groups and with biotechnology companies to identify specific JMML therapeutic targets and explore strategies for their clinical use for the treatment of JMML patients.

We are confident that our results will have an important impact on the diagnosis and treatment of JMML by increasing knowledge of the disease and expanding the therapeutic options open to these patients. Moreover, our close collaboration with clinical teams in the development of this project will guarantee that our most promising discoveries have a rapid and direct impact on JMML patients.

OUR CHALLENGES

We hope to answer the following questions through our research:

1. What is the relevance of non-coding somatic mutations in the generation and development of JMML?
2. Can non-coding mutations predict the prognosis of JMML patients?
3. What are the best therapeutic targets for the development of JMML-specific treatments?

RESEARCH GROUPS

KEYWORDS

Leukemia, JMML, PTPN11, experimental therapeutics, CAR-T cells, rare diseases, pediatric diseases, sequencing, diagnosis, therapeutic targets, preclinical models, drug discovery

15. CELLULAR SYSTEMS GENOMICS LED BY ELISABETTA MEREU

GROUP MEMBERS

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IÁÑEZ PICAZO, PABLO
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OVERVIEW

In the interface between genomics, digital pathology and artificial intelligence the **Cellular Systems Genomics** group aims to define the spatiotemporal organization of complex tissues in health and disease, by the identification of key regulatory mechanisms driving heterogeneity in cellular identity and function, particularly in the context of inflammation, inflammatory disorders and autoimmune diseases.

To address these questions, we will adopt a single-cell perspective, enabling the fine-grained and spatially resolved molecular profiling of tissues. We will develop new machine learning approaches and open source tools in order to unlock molecular mechanisms hidden in large-scale datasets. In a short-term perspective, these methods will help understand disease mechanisms, allowing the stratification of patients based on their molecular and cellular characteristics, ultimately providing new therapeutic targets for their treatments.

OUR RESEARCH

Single cell sequencing allows to profile thousands of individual cells per experiment, enabling the unbiased analysis of tissues, organs and even entire organisms at an unprecedented resolution. These data represent a powerful tool for cell biology, with relevant clinical applications including diagnosis and treatment of diseases. Despite the many advantages of this approach, data are noisy and sparse, making the computational analysis challenging. To address these challenges, we apply machine learning and other statistical methods to develop new analytical frameworks and open source tools to analyze, interpret and integrate data coming from single-cell and spatial genomics experiments.

As part of the Human Cell Atlas (HCA) consortium, which aims to create a catalogue of all cell types in our body, we have extensive experience on the systematic comparison of protocols in single cell RNA sequencing (scRNA-seq). In conjunction with the new Single Cell Unit of the Institute, which is equipped with the Chromium controller to perform the single-cell analysis, we will provide support to design new experiments and generate high-quality data and computational analysis.

Beyond transcriptomic profiling with scRNA-seq, different cellular modalities can now be measured, including single-cell epigenetics (scATAC-seq), spatial transcriptomics as well as the joint profiling of chromatin accessibility and transcription on the same cell.

However, the integration of multimodal data poses new analytical challenges and new benchmarking are needed to assess reproducibility and integrity of these methods. We are working on new mathematical frameworks for the integration of multimodal data, enabling the comprehensive characterization of cells in their identity and function.

OUR GOALS

In the European Pancreas Atlas consortium (ESPACE, https://www.espace-h2020.eu), we are working to build a first version of the Human Cell Atlas of the Pancreas, by profiling the transcriptome and epigenome of cells from distinct anatomical regions of the adult pancreas. The integration of distinct single-cell and spatial data types will allow the comprehensive transcriptional and epigenetic landscape of pancreas cell types within their spatial context.

Our experience in single-cell data analysis on healthy and diseased tissues allowed us to build a deep understanding of cell-type structure and plasticity in different research contexts. To accelerate biological discovery and advance science, our group will share user-friendly computational solutions, by promoting open science, diversity and supporting an inclusive and collaborative environment. We welcome proposals for interdisciplinary research collaborations, from both industry and academia.

KEYWORDS

Genomics, inflammation, autoimmunity, single cell, machine learning, computational analysis

ABOUT US

RESEARCH GROUPS

16. STEM CELLS AND CANCER LED BY ANNA BIGAS

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OVERVIEW

Our research group investigates how to generate and maintain the stem cells in the hematopoietic system under physiological conditions but also how these processes are mimicked by the tumors for their perpetuation. We constantly improve our research by implementing novel technology to understand the process of normal and malignant hematopoietic development. Our research includes basic studies at the molecular level to understand cellular processes in the context of mouse models and human patients.

OUR RESEARCH

Our research comprises from basic biochemical research to the analysis of animal models that reproduce the pathologies of interest and allow us to study the functional relevance of new hypothesis. The ultimate goal is to confirm the importance of the findings and study possible therapeutic applications through the analysis of patient samples. In this sense we have devoted special efforts to understand the regulation of hematopoietic stem cells, as a tool to understand the mechanisms that regulate leukemia initiation and maintenance.

OUR GOALS

The specific goals of our research program are as follows:

1.
Generation of hematopoietic stem cells.

Our current studies are focused on understanding the signals that the embryo uses to form these self-renewing cells that maintain the hematopoietic system throughout the life of the organism.

2.
Understanding T Acute Lymphoblastic Leukemia (T-ALL) development and T-cell lymphoma.

We study the signals that regulate the generation and maintenance of normal and leukemic cells, as well as leukemic stem cells (LSCS). With this aim we have developed in vitro and in vivo experimental models that complement the analysis of patient samples.

3.
GATA2 deficiency syndrome.

We are collaborating in an international consortium to understand the contribution of GATA2 mutations to pediatric Myelodysplastic syndrome and transformation to Acute Myeloid Leukemia (AML). We are developing humanized blood animal models of this syndrome.

4.
Understanding cell transformation.

We work closely with the Research Group for Molecular Mechanisms of Cancer and Stemness directed by Dr. Lluís Espinosa, and we take advantage of our discoveries in hematopoietic cells to understand epithelial tissues and vice versa.

OUR CHALLENGES

Through our research, we aim to understand the following:

1. What signals are imposed in embryonic HSCs that affect the adult hematopoietic system?
2. What are the molecular mechanisms that impose resistance to treatment in T-ALL cells?
3. What are the basic mechanisms that control cell transformation?

KEYWORDS

Embryonic hematopoiesis, T-ALL, CTCL, GATA2, Notch, NFkB, hematopoietic stem cell, leukemic stem cells

ABOUT US

RESEARCH GROUPS

17. ENDOTHELIAL PATHOBIOLOGY AND MICROENVIRONMENT LED BY MARIONA GRAUPERA

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OVERVIEW

Our research is devoted to study the biology of the endothelium and its role in disease towards the development of therapeutic strategies to target this compartment. Specifically, we aim to untackel the fundamental insigths of vessel growth and function in developmental setting as well as to identify the pathological contexts in which the vasculature plays a critical role either intrinsically, as in vascular anomalies, or extrinsically as in cancer.

OUR RESEARCH

Blood vessels are crucial components of every organ, as they maintain tissue homeostasis by ensuring: (i) transport of gases, nutrients, waste products and circulating cells, (ii) blood coagulation, and (iii) vascular tone and barrier. The endothelium lines the lumen of blood vessels and regulates the dynamic passage of materials and cells, whereas mural cells adhere to the abluminal surface of the endothelium and regulate vessel growth, permability and function. Both excessive and insufficient vascular network is deleterious for organisms and lead to a broad spectrum of pathologies. The overall aim of the Graupera lab is to understand the mechanisms that regulate the vasculature in development, homeostasis and disease. Most of our research has focused on the the endothelium that plays an active role in important physiological processes and diseases such congenital disorders, obesity and cancer. Over the past decade, we have taken advantage of the PI3K pathway as a paradigm to understand how intracellular roads regulate vessel morphogenesis, and how this knowledge can be translated into therapeutic opportunities for diseases with aberrant angiogenesis. For our research, our lab develops unique animal models including, established cell lines, and patient-derived samples. We apply a holistic approach utilising state-of-the-art techniques as high-throughput analysis, next-generation sequencing, single cell RNA sequencing, phospho/proteomics, and high-resolution imaging. Our lab closely collaborates with clinicians to translate our research into the clinic at both the diagnostic and therapeutic levels.

RESEARCH GROUPS

OUR GOALS

The Graupera lab is devoted to 5 main research lines:

1.
Insights on developmental vessel growth and function.

2.
Understanding oncoproteins-related developmental disorders.

3.
To study tumor-stroma interaction.

4.
Identify vascular therapies to treat metabolic disorders.

5.
To study endothelial and hematopoietic cell interface.

KEYWORDS

Endothelium, vascular compartment, homeostasis, next generation sequencing, single cell, high-resolution imaging

18. T-CELL LYMPHOMA LED BY LAURA MONDRAGÓN

GROUP MEMBERS

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BARBERA FERRANDO, LAURA
Lab Technician

OVERVIEW

Our research is focused on the better understanding of the molecular mechanisms leading to T cell lymphomas appearance. We will develop our research by determining possible defective mechanisms during thymopoiesis and, by developing preclinical mice models for the study of T cell lymphomas, such as angioimmunoblastic T cell lymphoma.

With this knowledge we expect to design and validate new therapeutic treatments more specific and effective than the ones currently available in order to improve patient's survival and quality of life.

OUR RESEARCH

T cell lymphomas can be defined as a group of malignancies caused by the uncontrolled proliferation of T cells. They constitute less than 15% of all Non-Hodgkin's lymphomas and within this group frequency can vary enormously. Despite all being caused by T cell defective cell growth little is known about its specific origin. Besides, they present a wide variety of symptoms and clinical characteristics ranging from highly aggressive (fast-growing) lymphomas to subtypes that can develop for years without endangering the patient's life (indolent); presence of enlarged spleen, liver and/or lymph nodes; eczema and skin rash appearance; age appearance and higher incidence in men than in women. As a result, it is often difficult to establish a correct diagnosis of the disease and even more difficult to design an appropriate therapy for its specific treatment.

In this sense, our line of research aims at improving our understanding of the molecular mechanisms leading to the defective behaviour of the T cells originating this type of lymphoma. To develop our objective we will employ immunology, functional genomics, molecular biology and medicinal chemistry techniques.

Specifically, we will make use of potential and already described genetically modified mice models as pre-clinical models for the study of different subtypes of T cell lymphomas and we will:

- Characterize their phenotype once the disease is developed in order to find the specific T cell population inducing its appearance.
- Study thymocytes maturation processes and mature T cells response to antigens to try to determine if lymphoma appearance can be already settled during thymopoiesis or once the T cells leave the thymus.
- Compare by genomic techniques like single cell sequencing the characteristics of defective thymocytes and T cells in mice models and try to find similarities in human patient's samples and databases.

With the information obtained, we aim at finding new therapeutic targets in order to:

- Develop chemical libraries screening assays for drug discovery to modulate the activity of these therapeutic targets.
- Perform structure-activity assays and possible administration in form of nanomedicines to optimize their biological activity and cellular uptake in vitro.
- Validate their use as new therapeutic strategies alone or in combination with other chemotherapeutics employing mice models of the disease.

OUR GOALS

To make available new therapies to treat angioimmunoblastic T cell lymphoma and reduce mortality in those patients. The most important one would be to improve life expectancy of patient's suffering from this type of disease. Although, we would like to apply our research to different types of T cell lymphomas, we are initially focused on the study of molecular mechanisms leading to angioimmunoblastic T cell lymphoma. This type of disease has no specific treatment and all the strategies chosen so far have not improved patient's survival in the last 3 decades. Finding new strategies will for sure improve their chances to recover from this disease and it will significantly improve their quality of life. To unveil the molecular mechanisms leading to T cell lymphoma appearance and to provide new therapeutic targets to design more specific and effective therapeutic treatments to fight these group of hematopoiesis diseases.

OUR CHALLENGES

In summary, our line of research will have the final objective to provide more specific and effective therapies to treat T cell lymphoma in order to find a cure or, if not, to improve the prognosis and quality of life of patients.

- Disease Knowledge deepening
- Drug development

There are some questions we are trying to answer with our research:

1. When does defects in T cells leading to T cell lymphoma appearance start?
2. Which are the specific T cell populations responsible for T cell lymphoma induction?
3. Can we design more specific and effective therapeutic treatments for this type of disease?

KEYWORDS

thymopoiesis, t cell lineage selection, T cell receptor, T cell activation, lymphoma

ABOUT US

RESEARCH GROUPS

19. ACUTE LYMPHOBLASTIC LEUKEMIA (ALL) LED BY JOSEP Mª RIBERA

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OVERVIEW

Our research focuses on analyzing the genomic and epigenomic landscape of patients with adult ALL (acute lymphoblastic leukemia) to find out genetic alterations that predict patients' response to treatment and to identify new alternative (targeted) therapies to apply to those patients. In this way, we aim to design more personalized treatments to increase the probability of survival of ALL patients.

OUR RESEARCH

The group's current research is divided into two main areas, according to the two main subtypes distinguished in ALL:

- **Precursor B-cell acute lymphoblastic leukemia (BCP-ALL):** BCP-ALL is the most prevalent ALL subtype and accounts for 75% of ALL cases. Although it is a highly heterogeneous disease at genetic level, different cytogenetic subtypes have been identified and, more importantly, their prognosis has been clearly established in many clinical trials. This has allowed clinicians to stratify patients according to their genetic profile to schedule intensive or less intensive treatments.
- **T-cell acute lymphoblastic leukemia (T-ALL):** T-ALL is the least common ALL subtype (25% of adult ALL cases), and the most complex and heterogeneous at genetic level, with a dismal prognosis. to improve the survival rate of patients with T-ALL, we first need to obtain detailed and relevant molecular information to accurately define the risk and thus decide on the treatment.

OUR GOALS

We are convinced that new treatments for ALL patients can be obtained only through basic research. Therefore, our goals are:

1.
To identify the genetic alterations leading to treatment resistance and disease recurrence in adult ALL.

2.
To accurately define the risk of ALL by genetic analysis at diagnosis and relapse in order to decide on the most appropriate treatment.

OUR CHALLENGES

Although ALL is a rare form of cancer, it has a huge impact on patients, their relatives and the health system. To find new therapies and provide new knowledge, our research hopes to:

1
Decipher the genetic complexity of ALL at both diagnosis and relapse.

2
Identify critical genetic lesions in ALL cells that could be targetable with new drugs.

KEYWORDS

Acute lymphoblastic leukemia, adults, genomic analyses, minimal residual disease, treatment resistance

ABOUT US

RESEARCH GROUPS

20. BARCELONA ENDOTHELIUM TEAM (BET) LED BY ENRIC CARRERAS

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OVERVIEW

Blood vessel endothelium crosses each and every tissue and presents unique structural and functional properties in each vascular bed. This cellular heterogeneity is reflected by the structural and functional heterogeneity of the whole endothelium as a complex system. Due to its location, the endothelium is exposed to all kinds of physiological and pathological stimuli and constitutes the first barrier to many drug interventions.

This organ has the capacity to constantly adapt to environmental changes by modulating vasomotor tone, haemostatic balance and inflammatory reactions, among other responses. Endothelial activation could lead to an irreversible state known as endothelial dysfunction that, in a broad sense, leads to various non-adaptive alterations of the functional phenotype that constitute a net liability to the host.

OUR RESEARCH

Our group has extensive experience in the study of the endothelial dysfunction that develops in association with different vascular pathologies, such as the early complications associated with hematopoietic cell transplantation, obesity, chronic kidney disease, thrombotic microangiopathies and sepsis.

We also explore strategies for the protection of this endothelial dysfunction to improve patient health. In this regard, one of our main interests is to evaluate different compounds that potentially exhibit the capacity to protect the endothelium and to decipher their mechanisms of action.

OUR GOALS

Our main lines of research are:

1.
o characterize the endothelial activation and dysfunction associated with cardiometabolic diseases through in vitro models.

2.
To elucidate the mechanisms that lead to endothelial dysfunction.

3.
To investigate agents with potential protective effects on the endothelium to prevent complications.

4.
To find soluble markers with prognostic and diagnostic value for vascular complications.

5.
To study complement pathways and complement deficiencies in thrombotic microangiopathies.

6.
To assess platelet physiology and alterations of haemostasis by using perfusion devices to explore adhesive and cohesive properties of platelets under flow conditions.

OUR CHALLENGES

Hematopoietic cell transplantation (HCT) has been the major curative therapy for several hematological, metabolic and neoplastic disorders. However, the efficacy of this procedure is limited by life-threatening complications, the most important of which is graft versus host disease (GvHD), which has a high mortality rate. Through our research, we aim to answer the following questions:

1
What are the pathophysiologic mechanisms that characterize endothelial dysfunction?

2
How can we avoid the vascular complications associated with hematopoietic cell transplantation?

3
Which is the role of the complement system in vascular complications?

KEYWORDS

Endothelium, Inflammation, Diagnostic and prognostic markers, Thrombotic microangiopathies (TMA), Drugs

ABOUT US

RESEARCH GROUPS

21. FUNCTIONAL CYTOMICS LED BY JORDI PETRIZ

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OVERVIEW

The ability to bridge large-scale and single-cell approaches at a functional level is key to identifying biomarkers expressed in rare cells, and particularly in cancer stem cells (CSCs). Our interdisciplinary group investigates and develops key experimental approaches to understand the principles underlying the emergence and prevention of tumorigenesis and cancer therapy resistance, with the aim of translating biomedical science to integrated clinical practice and public health through certified transfer processes in cooperation with trusted allies and partners.

OUR RESEARCH

Our current research projects use innovative approaches to study the expression of primitive stem cell markers during the origin, progression and maintenance of cancer and the management of cancer; the quality and safety of hematopoietic blood progenitor and stem cell grafts; the role of myeloid-derived suppressor cells in immunotherapy and targeted therapy for clinical decision-making; new cytomic strategies for whole blood and marrow immunostaining; the use of natural compounds for cancer treatment; and the accurate detection and significance of minimal residual disease in acute leukemia.

OUR GOALS

Our goal is to provide patients with a wide range of scientific support strategies, through precision, oversight and accuracy, to achieve:

1.
Clinical implementation of functional cytomic assays,
and precision/personalized high-quality assays for individual patients by integrating functional cytomics.

2.
Translation of functional screening to novel clinical strategies.
Measurement of the impact of exogenous interventions such as drug exposure on tumor cell phenotype.

3.
An understanding of drug resistance
and prediction of effective drug combinations.

4.
A reduction in costs.
by obtaining specialized instrumentation and personnel for the execution of cytomic screening in partnership with stakeholders and biotechnological partners.

5.
Functional and immunophenotyping datasets
aimed at understanding complex functional-to-phenotype correlations, thereby accelerating discovery of the biology of leukaemogenesis and the clinical implementation of novel therapies.

RESEARCH GROUPS

OUR CHALLENGES

Since personalized medicine aims to provide the right therapy, in the right dose, thereby improving patient stratification and disease prediction, we expect to achieve:

1

Better diagnosis and earlier intervention. Cytomic analysis could determine precisely whether patients are susceptible to drug toxicities and make it possible to choose the optimal treatment strategy.

2

Individualized drug selection. Here we consider which molecular and functional models best predict how a patient will respond to a therapy to develop accurate and cost-effective tests.

3

Drug development challenges. A better understanding of the clinical observations made during individualized drug development and conventional therapy will help identify new disease subtypes and their associated molecular pathways, and design drugs that target them with more efficient trials.

KEYWORDS

Cytometry, cancer stem cells, cytome, human cytome project.

ABOUT US

RESEARCH GROUPS

22 MYELOID NEOPLASMS LED BY LURDES ZAMORA AND BLANCA XICOY

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OVERVIEW

Genetic profiling for hematopoiesis malignancies involves chasing a moving target. Not so long ago, leukemias were stratified based on karyotype abnormalities. In recent years, however, knowledge of molecular genetics in hematology has increased significantly, thus offering new clinical opportunities. It has now been shown that gene expression, mutations and other genetic and epigenetic abnormalities also have diagnostic, prognostic and therapeutic implications.

OUR RESEARCH

Since 2004, our group has been studying MN, with a particular focus on characterizing genetic and epigenetic lesions to find new diagnostic, prognostic and therapeutic markers that could help us better diagnose and treat patients with these diseases. First, we started with karyotype and single nucleotide polymorphism arrays (SNP-A) to help us detect alterations at chromosome level, and we are currently performing studies at gene level (mutational profile studies) and analysing the impact that telomere size could have on the development of the disease.

OUR GOALS

The aim of our group is to apply our research to myeloid neoplasms (MN), specifically three distinct hematopoiesis diseases: chronic myelomonocytic leukemia, myelodysplastic syndromes and myeloproliferative neoplasms (PV, ET, MFP and CML), with a view to finding better tools for diagnosis and prognosis stratification and achieving individualized targeted therapies (personalized medicine). Therefore, our research focuses mainly on the following areas:

1.
Chronic myelomonocytic leukemia (CMML).

The aim of our research is to characterize the type, frequency and prognostic impact of mutations and cytogenetic alterations detected by SNP arrays in patients with low-risk CMML and, then, study its epigenetic changes (DNA methylation and miRNAs expression).

2.
The classification and prognosis of the group of diseases termed myelodysplastic syndromes (MDS).

This knowledge will also contribute to a better understanding of MDS biology and a better stratification of the prognosis of these patients, which would also help with the selection of the most appropriate treatment for each one.

3.
Chronic myeloid leukemia (CML).

The aim of our research is to determine whether or not we can find any genetic marker at CML diagnosis that could explain a patient's toxicity to tyrosine kinase inhibitors, or identify which patients will achieve a molecular response. We are also seeking a technique with higher sensitivity than QRT-PCR.

4.
BCR-ABL1 negative classic myeloproliferative neoplasms (MPNs).

We study several genomic changes in an attempt to associate them with cytological subtypes, laboratory parameters, clinical complications and probability of transformation to either MF or AML.

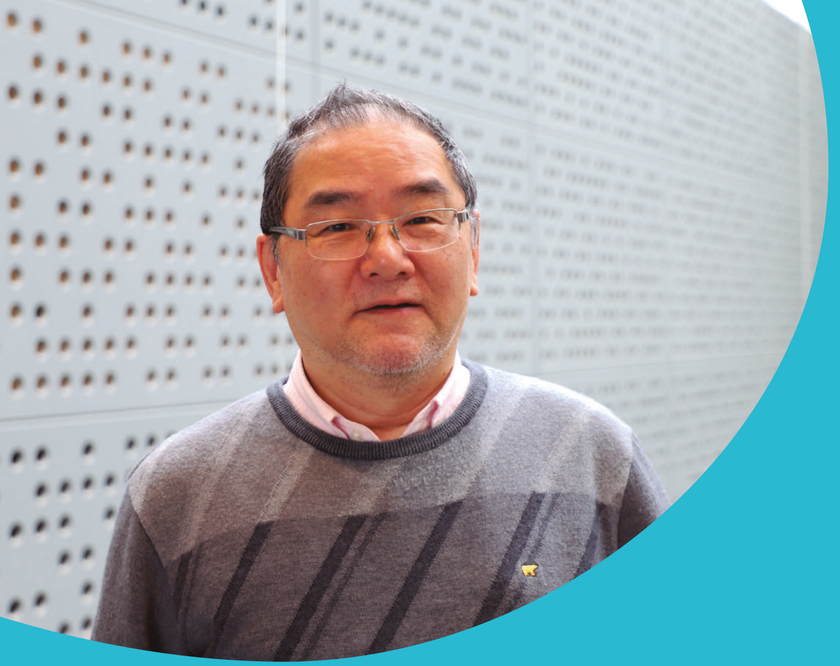
OUR CHALLENGES

Our research is highly socially relevant because we promote capacity building, advancing knowledge, help in making informed decisions and improve the health in general terms, with economic benefits for the whole society. Through our research, we aim to answer the following questions:

1. How can we improve diagnosis, prognosis stratification, treatment response and life expectancy in chronic myelomonocytic leukemia?
2. How can we improve diagnosis, prognosis stratification, treatment response and life expectancy in myelodysplastic syndromes?
3. How can we improve diagnosis, prognosis stratification, treatment response and life expectancy in myeloproliferative neoplasms?

KEYWORDS

Myeloproliferative neoplasms, chronic myeloid leukemia, myelodysplastic syndromes, MPN/MDS, acute myeloid leukemia



ABOUT US

RESEARCH GROUPS

23. IMMUNOHEMATOLOGY AND GLYCOBIOLOGY LED BY FUMIICHIRO YAMAMOTO

GROUP MEMBERS

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OVERVIEW

The ABO blood group system is one of the most important blood group systems in transfusion medicine. The ABO polymorphism consists of A and B glycan antigens on red blood cells (RBC) and antibodies against A and B antigens in the sera of individuals who do not express these antigens. In humans, A and B antigens are also present on epithelial and endothelial cells, depending on the ABO genotype/phenotype of the individual. Because of this, ABO matching is also crucial in cell, tissue and organ transplantation.

OUR RESEARCH

We study the molecular genetic mechanisms for the expression of genetically incompatible glycan antigens and have thus far revealed several potential mechanisms, including the appearance of FORS1 induced by the deletion of exon 3 or 4 of the AT mRNA. Because altered splicing is a hallmark of cancer, this mechanism may be responsible, at least partially, for FORS1 expression in group A and AB individuals.

We also investigate the potential mechanism by which incompatible A antigens appear in group O individuals through complementation by recombination of DNA or trans-splicing of RNA and also expression of FORS1 due to changes in specificity resulting from incorrect intra-Golgi localization of modified glycosyltransferases.

OUR GOALS

Cancer growth indicates that the cancer cell-killing activities of natural immunity against genetically incompatible and/or cryptic glycans are ineffective and insufficient. However, they can be improved through active and/or passive immunization. Therefore, our goals are:

1.
To investigate the use of genetically incompatible and/or cryptic glycan antigens as molecular targets for medical intervention.

2.
To explore the possibility of using forced expression of genetically incompatible glycans to make cancer cells susceptible to natural immunity.

OUR CHALLENGES

If successful, the active immunization we advocate for could revolutionize the cancer treatment landscape, thereby dramatically reducing the financial burdens on patients and society. Through our research, we aim to answer the following questions:

1
What is the molecular genetic/epigenetic basis of glycan alterations in cancer?

2
Can we use cancer-specific glycans as molecular targets for cancer detection and immunotherapy?.

3
Does the minitransfusion/injection of mismatched red blood cells expressing genetically incompatible and/or cryptic glycans improve humoural and cellular immunity against cancer cells expressing cancer-specific glycans?

KEYWORDS

Genetically incompatible glycan antigens, cryptic glycan antigens, cancer immunotherapy, disease susceptibility, ABO polymorphism

ABOUT US

RESEARCH GROUPS

24. LEUKEMIA STEM CELL LED BY RUTH RISUEÑO

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OVERVIEW

Many leukemias originate in a population of leukemic stem cells, which are responsible for initiating and maintaining the disease. Our group investigates the biology and sensitivity of stem cells that sustain tumors such as acute myeloid leukemia (AML), myelodysplastic syndromes (MDS), chronic myelomonocytic leukemia (CMML) and acute lymphoblastic leukemia T (ALL-T).

OUR RESEARCH

Our work focuses on searching new therapeutic targets for blood disorders enabling us to identify new biomarkers that can be used for prognostic and/or diagnostic purposes, thereby gaining greater insight into the biology behind leukemic processes. New knowledge will help us develop new drugs that specifically attack the population of leukemic stem cells.

Due to the similarities between leukemic stem cells and healthy hematopoietic stem cells, our research group is striving to develop therapies that trigger the terminal differentiation of the population of leukemic stem cells, which eliminates their capacity to initiate and maintain the disease and enhances its chemosensitivity.

OUR GOALS

Our main goal is to understand the biology of leukemic stem cells and identify pharmacological mechanisms that will enable us to modulate their functionality and eliminate them selectively. To achieve this, we adopt a dual approach: on the one hand, we study the underlying biological mechanisms responsible for these neoplasms and, on the other, we develop new therapeutic approaches with the potential for clinical application.

OUR CHALLENGES

Due to the biological properties of leukemic stem cells, understanding how they work and identifying the differences between these and healthy hematopoietic stem cells is essential to design new more efficient and selective therapies that can be personalized for each patient. Therefore, our research aims to:

1. Understand how leukemic stem cells work.
2. Identify therapeutic targets and develop new drugs for leukemic stem cells.
3. Determine the prognostic and diagnostic value of these therapeutic targets as biomarkers for leukemia.
4. Describe the differences between leukemic stem cells and healthy haemopoietic stem cells.

KEYWORDS

Leukemia, leukemic stem cell, drug development, hematopoiesis, differentiation therapies

ABOUT US

RESEARCH GROUPS

25. **LYMPHOID NEOPLASMS LED BY TOMÁS NAVARRO**

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OVERVIEW

Genetic profiling for hematopoiesis malignancies involves chasing a moving target. Not so long ago, leukemias were stratified based on karyotype abnormalities. In recent years, however, knowledge of molecular genetics in hematology has increased significantly, thus offering new clinical opportunities. It has now been shown that gene expression, mutations and other genetic and epigenetic abnormalities also have diagnostic, prognostic and therapeutic implications.

OUR RESEARCH

Our group focuses mainly on the research of AIDS-related lymphomas (ARLs). The most frequent ARLs are diffuse large B-cell lymphoma (DLBCL), Burkitt lymphoma (BL) and Hodgkin lymphoma (HL). Plasmablastic lymphoma (PBL) and primary effusion lymphoma (LEP) are less frequent, but typically present in immunosuppressed individuals. We also study other hematopoiesis disorders with an increased incidence in the HIV-positive population such as Castleman disease (CD).

Our main areas of research are:

- **Genetic studies on HIV-related lymphomas.** Although HIV-infected patients are treated with the same regimens as HIV-negative individuals, their survival rate is lower due to the higher susceptibility to infections and secondary neoplasms.
- **Liquid biopsy in aggressive lymphomas.** This technique could be useful to diagnose DLBCL earlier, and in a more comprehensive and accurate manner than with tissue biopsy alone.
- **Genetic studies on plasmablastic lymphoma.** Plasmablastic lymphoma (PBL) is a rare B-cell lymphoid neoplasm that especially affects immunocompromised individuals and has a poor.

OUR GOALS

We believe that genetic and epigenetic profiles will help clarify the mechanisms involved in lymphomagenesis and identify potential biomarkers, thus allowing cases to be classified more effectively. The possible diagnostic and/or prognostic impact of these markers could pave the way for the design of new targeted therapies, thus leading to new treatment approaches and improving the outcome of patients suffering from the lymphomas on which our research focuses, i.e. AIDS-related lymphomas, plasmablastic lymphoma and Castleman disease.

OUR CHALLENGES

We expect that the results of our studies will lead to changes in the management of these rare lymphoid neoplasms and improve the poor prognosis of some lymphoid malignancies, such as plasmablastic lymphoma. Through our research, we hope to answer the following questions:

1. What genetic and epigenetic mechanisms are involved in the development of HIV-related lymphomas?
2. Which biomarkers can be used for an earlier diagnosis of lymphoid neoplasms in populations at high risk of developing these disorders, such as HIV-infected and transplanted patients?
3. How can we apply liquid biopsy in the diagnosis and follow-up of aggressive lymphomas?

KEYWORDS

Non-Hodgkin's lymphoma, Hodgkin lymphoma, HIV, Epstein-Barr virus, diagnosis, prognosis, marker, treatment, targeted therapy, early detection

ABOUT US

RESEARCH GROUPS

26. MULTIPLE MYELOMA LED BY ALBERT ORIOL

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OVERVIEW

Multiple myeloma is a cancer of plasma cells, a type of white blood cell that accumulates in the bone marrow and interferes with normal blood precursors and bone remodelling, thus causing anemia, bone lesions, renal insufficiency and recurrent infections. Between four and five out of 100,000 people are diagnosed every year. Despite the fact that treatments and prognosis have greatly improved in recent years, multiple myeloma is not yet curable. It is a recurrent disease that can leave important sequelae after each relapse.

OUR RESEARCH

Our clinical research team participates in the main international collaborative phase I to phase III trials establishing the current standards of care, with a particular focus on the optimal combinations of agents with clinically relevant synergies.

Active trials are already focusing on the efficacy of next-generation combinations, including antibody-drug conjugates, T-cell engagers and CAR-T cells. We are interested in the identification of subjects unlikely to respond to optimized first-line strategies and, therefore, of ideal candidates for such trials with novel immunotherapeutic approaches.

OUR GOALS

We believe that the drug combinations currently being evaluated can cure a proportion of patients with multiple myeloma. Furthermore, we believe that it should be possible to predict patients in whom such combinations are not curative so that we can promote early interventions with alternative agents, mainly based on immunotherapeutic approaches to prevent the clinical consequences of full-blown relapse and maintain a symptom-free response in patients.

On this regard, our main goals are:

1.
To define standards of treatment that provide a long-lasting response in most individuals.

2.
To identify patients who will probably be cured and will safely remain treatment-free.

3.
To identify patients who are unlikely to be disease-free for long with current treatments and search for alternative treatment options that can be applied before recurring disease causes organic damage.

ABOUT US

RESEARCH GROUPS

OUR CHALLENGES

Full-blown multiple myeloma has devastating consequences that severely reduce patients' quality of life and autonomy and represent a huge burden for caregivers and families. Therefore, the diagnosis of multiple myeloma has a dramatic impact on individuals and society. Through our research, we hope to answer the following questions:

1
What patients are unlikely to obtain prolonged benefits from current standards?

2
Would they benefit from early intervention with alternative agents?

3
Can we identify patients who will potentially be cured or are unlikely to relapse and safely spare them the burden of continuous therapy?

KEYWORDS

Multiple myeloma, synergistic combinations, immuno-drug conjugates, T-cell engagers, CAR-T cells.

ABOUT US

RESEARCH GROUPS

27. MYELODYSPLASTIC SYNDROMES LED BY FRANCESC SOLÉ

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OVERVIEW

Myelodysplastic syndromes (MDS) are a heterogeneous group of hematopoiesis stem cell disorders that result in ineffective hematopoiesis, blood cytopenia, myelodysplasia and a significant risk of progression to acute myeloid leukemia (AML). MDS is one of the most common hematopoiesis malignancies in the elderly and the severity of the disease depends on a variety of biological factors that translate into a spectrum of symptoms with a profound impact on the patient's quality of life and survival; a third of MDS patients will progress to AML and the remaining two thirds will suffer from a combination of chronic anemia, recurrent infections and bleeding episodes.

OUR RESEARCH

Our research focuses on unravelling the heterogeneity of myelodysplastic syndromes (MDS), mainly using genomic techniques. We study MDS patients who harbor a specific cytogenetic alteration: the deletion of the long arm of chromosome 5. Our aim is to improve the genetic characterization of these patients by studying the impact of adjunct cytogenetic abnormalities on their prognostic stratification; how cytogenetics and mutations can influence the response to lenalidomide treatment; the molecular landscape of MDS through next-generation sequencing techniques; and, finally, intratumoral heterogeneity before and after lenalidomide treatment using single-cell techniques.

OUR GOALS

Through our research, we intend to contribute to a better understanding of MDS from a genomic point of view, contributing to refine the current criteria to diagnose this disease and predict patient outcomes to select the best possible treatment. Hence, our research addresses the following lines:

1.
Evaluating the feasibility of using peripheral blood samples to perform genetic analyses (SNP-A and NGS) in MDS.

2.
Monitoring mutational burden in low-risk MDS patients through the use of sequential peripheral blood samples to minimize invasive techniques on these patients.

3.
Genetic characterization of myelodysplastic syndromes / myeloproliferative neoplasms (MDS/MPN) to define the genetic changes that could contribute to the differential diagnosis and prognostic stratification of these patients.

4.
Genetic characterization of therapy-related myeloid neoplasms.

5.
Mechanisms of progression from clonal hematopoiesis to MDS.

OUR CHALLENGES

Our research can translate into a more efficient use of public healthcare resources and improve the quality of life for patients. Therefore, we want to shed light on the following questions:

1
How might genomic techniques contribute to refining the current criteria for MDS diagnosis, prognostic stratification and treatment response?

2
Can peripheral blood samples be useful to monitor MDS patients through next-generation sequencing?

3
Could single-cell studies help us better understand intratumoral heterogeneity and clonal evolution from CHIP to MDS and TRMN (therapy-related myeloid neoplasms)?

KEYWORDS

Myelodysplastic syndromes, chronic myelomonocytic leukemia, intratumoral heterogeneity, myelodysplasia, cytopenias, CHIP, TRMN

ABOUT US

RESEARCH GROUPS

28. STEM CELL BIOLOGY, DEVELOPMENTAL LEUKEMIA AND IMMUNOTHERAPY LED BY PABLO MENÉNDEZ

GROUP MEMBERS

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MARTINEZ MORENO, ALBA
Lab Technician

OVERVIEW

Our group is interested in understanding the cellular origin, etiology and pathogenesis of childhood leukemia. We aim to ascertain the cell in which mutations occur and we strive to discover which cells are responsible for triggering relapses. Furthermore, we work to identify new therapeutic targets and develop more targeted, less toxic therapies. To achieve this, our laboratory uses various approaches, including genetic studies, epigenetic techniques and animal models, as well as adoptive cell immunotherapy tools.

OUR RESEARCH

Given that acute childhood leukemia (including the B, T and myeloid variants), and childhood cancer in general, are relatively uncommon illnesses, with around 500 cases in Spain each year, it does not represent a priority target for the pharmaceutical industry. As a result, there is a serious lack of active programs that aim to identify medicines to target childhood cancer. Our group has been investigating the origin of this diseases in utero, as well as its etiological causes and physiopathological mechanisms. In 2016, we began researching non-toxic, targeted adoptive cellular immunotherapies for these children with the aim of preventing the long-term effects of current chemotherapy.

OUR GOALS

Our group is currently involved in various lines of research in pursuit of the following objectives:

1.

To understand the aetiology and pathogenesis of leukemia in breastfeeding infants.

To do so, we use primary samples taken from patients and develop different animal and cellular models based on prenatal (embryonic, foetal) and postnatal (neonatal and adult) stem cells.

2.

To gain a better understanding of the role of bone marrow (BM) stroma in chemoresistance in acute myeloid leukemia (AML)

and identify new therapeutic targets for AML, which is the most common form of leukemia in adults and whose prevalence increases with age.

3.

To improve adoptive cellular immunotherapies against ALL-B, ALL-T and AML.

To achieve this, we are searching for new therapeutic targets and developing new CARs (chimeric antigen receptors) for the different types of acute leukemia.

Our overall goal is to contribute towards curing 100% of childhood leukemias or convert them into chronic conditions, without generating lifelong toxicities.

OUR CHALLENGES

Childhood diseases have an enormous emotional impact on the patient's whole family and everybody around them. Moreover, we must not forget that children are the future of our society, so investing in their health will benefit the future of our society enormously. Through our research, we aim to:

1

Identify the cellular origin, cellular and molecular mechanisms, and the genetic and epigenetic composition of ALL-B in breastfeeding infants.

2

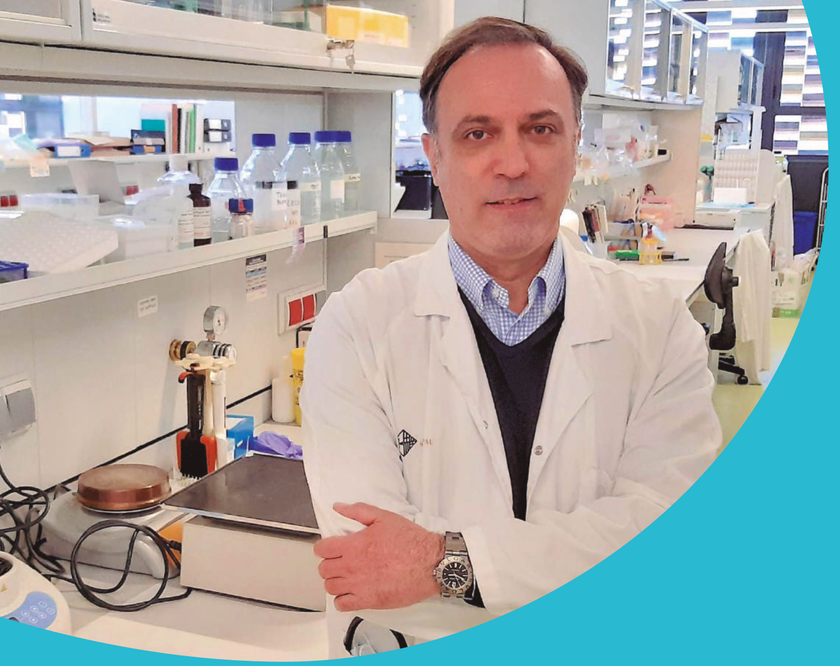
Contribute to the development of new therapeutic strategies in AML targeted towards reducing the resistance mediated through the BM microenvironment and that are particularly effective against LICs.

3

Develop adoptive cellular immunotherapies against ALL-B, ALL-T and AML using allogeneic T-cells without genome editing to eliminate TCR, CD3 and other molecules that play a role in immunological synapse.

KEYWORDS

Pediatric leukemia, stem cells, immunotherapy, MLL rearrangements, PDX models



ABOUT US

RESEARCH GROUPS

29. CELLULAR IMMUNOTHERAPY AND GENE THERAPY LED BY JAVIER BRIONES

GROUP MEMBERS

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CABALLERO GONZÁLEZ, ANA CAROLINA
PhD Student

OVERVIEW

The Cellular Immunotherapy and Gene Therapy Group is focused on the study of genetically modified T-cells expressing chimeric antigen-specific receptors (CARs) and their clinical application in patients with blood cancer.

OUR RESEARCH

Blood malignancies, like leukemia and lymphoma, are challenging diseases affecting one or more blood cell lineages. Traditional treatments include chemotherapy to deplete altered cells as much as possible, followed by bone marrow transplantation from a compatible donor, when appropriate.

The group currently focuses on studying T-cells genetically modified with chimeric antigen-specific receptors (CARs) and their clinical application in patients with blood cancer. Its current lines of research concentrate on the following aspects of cellular immunotherapy:

- Functional antitumor research into subtypes of memory T-cells.
- Study of the antitumor efficacy of memory stem T-cells genetically modified with CARs.
- Development of new CARs targeted against hematopoiesis malignancies.
- Development of clinical immunotherapy trials with CAR T-cells on patients with lymphoid neoplasms.

OUR GOALS

Recently, a new and powerful immune cell type has been discovered called memory stem T cells. These are scarce but very special and, despite being roughly a 1% of the cells in our blood, they can find, attack and destroy cancer cells very efficiently. We have developed mechanisms to expand memory stem T cells in the lab and grow them in greater numbers, to make their action more potent and long-lasting.

Also, the genetic modification of patient-derived memory stem T cells to make them express CAR receptors, the so-called CAR-T therapy, is proving an enhanced anti leukemic potential in the clinical trials.

KEYWORDS

PCAR-T; T-Cells; Lymphoid Neoplasms

ABOUT US

RESEARCH GROUPS

30 STEM CELL TRANSPLANTATION AND CELLULAR IMMUNOTHERAPY LED BY ÁLVARO URBANO-ISPIZUA

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OVERVIEW

We conduct research into cell immunotherapy treatments for patients with advanced malignant blood disorders, who tend to have a very short life expectancy. To treat such patients, we develop CAR-T and CAR-NK therapies based on adding chimeric antigen receptors (CAR) to cells of the immune system, such as T-lymphocytes and NK cells, respectively. CARs help recognize and attack tumor cells exclusively, specifically and effectively, thereby preventing an autoimmune response and reducing secondary effects on healthy cells.

OUR RESEARCH

Former research from our group focused on the cytotoxicity mechanisms of CB-NK cells when they come into contact with MM tumor cells, in order to fight them. We discovered that they were able to regulate the cytotoxic or attack mechanisms depending on the characteristics of each tumor cell.

Later on, we started developing CAR-T cells against BCMA to treat MM patients and achieved good results. We are currently improving cell immunotherapy treatments by combining CAR-T with CB-NK cells. Moreover, we are studying how and why some tumor cells develop resistance to these therapies, with the aim of suppressing this resistance capacity.

OUR GOALS

We are studying what happens at a molecular level between CAR-T and CB-NK cells throughout the process of recognizing, contacting and attacking tumor cells in order to identify which proteins and defence strategies are used by CAR-T, CB-NK and other cells in the immune system. Moreover, we are examining what happens within the environment of the cells when they meet tumor cells. This knowledge will help us develop better strategies to improve the efficacy of these therapies.

Through our research, we aim to achieve the best possible scenario: to cure patients and ensure that they do not relapse.

OUR CHALLENGES

If we manage to enhance the efficacy of the CAR-T therapy and its permanence in patients to protect them from relapses, this breakthrough could be applied to patients with types of cancer other than MM. Therefore, through our research we hope to answer the following questions:

1. How are tumor cell resistance mechanisms against immune cells developed?
2. How can these tumor cell resistance mechanisms against immune cells be avoided?
3. How can the persistence and efficacy of CAR-T cell treatment be increased?

KEYWORDS

Multiple myeloma, B-cell malignancies, chimeric antigen receptors, T lymphocytes, NK cells, cord blood-derived NK cells, hematopoiesis malignancies, B-cell maturation antigen

RESEARCH GROUPS

31. EPIGENETIC THERAPIES LED BY MARÍA BERDASCO

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OVERVIEW

Epigenetic therapies aim to modify the epigenome, the set of molecular processes that regulate gene expression without altering the DNA sequence and can change the course of a disease and its phenotype. There are now examples of epigenetic drugs for treating hematopoiesis malignancies approved by the United States Food and Drug Administration (FDA). However, the volume of promising preclinical evidence far exceeds the number of epigenetic research projects that have resulted in clinical applications to patients. Therefore, more translational studies that may lead to the development of more specific epigenetic drugs and more robust biomarkers are required.

OUR RESEARCH

Our research aims to ascertain the therapeutic benefit of targeting epigenetic alterations in cancer together with the epigenetic-based stratification of patients to predict therapy response. To achieve this, we develop research based on three specific aims:

- Identification of the epigenetic alterations that act as drivers of tumor progression ("druggable epigenetic alterations").
- Validation of epidrugs that can efficiently revert aberrant epigenomes in cancer.
- Stratification of patients based on their epigenetic profile to predict response to immunotherapy.

OUR GOALS

We aim to develop a translational research line that focuses on elucidating the epigenetic alterations that are druggable targets in a tumor, and the means to exploit them therapeutically within the framework of precision medicine.

OUR CHALLENGES

Through our research, we aim to help answer the following questions:

1

Which epigenetic alternations represent targets for drugs to treat cancer?

2

How can we efficiently treat tumors caused by epigenetic alternations?

3

Who could benefit from therapeutic strategies based on epigenetics?

KEYWORDS

Epigenetic drug, epigenetic editing, epidrug, hematopoiesis malignancies, targeted therapies

32. LYMPHOMA TRANSLATIONAL LED BY GAËL ROUÉ

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OVERVIEW

Our research is centered on the development of innovative preclinical models of B-cell lymphoma that can be used to unravel the complex role of tumor-lymphoma crosstalk during the development of the disease and the acquisition of refractoriness in current regimens. To that end, we intend to reproduce the original composition and architecture of tumors in the laboratory to carry out a complete transcriptomic and proteomic analysis and develop new pharmacological entities in collaboration with academic experts and clinical-level pharmaceutical companies, all with a view to fostering the bench-to-bedside transfer of new and tailored therapeutic strategies.

OUR RESEARCH

We develop in vitro and animal models with the intention of more accurately recreating the context of onset and progression of the lymphoma in each patient. In this regard, we take account of fundamental parameters that until now have been largely unexplored in preclinical research, such as the architecture of the original tumor, the components of the immune system that accompany it and the defects in the regulation of the proteins – not only of the genes – that characterize it.

OUR GOALS

Our main areas of research are

1.

Development of a patient-derived xenograft platform for the evaluation of new targeted therapies in aggressive B-cell lymphomas.

To confirm the efficacy, safety and translationality of these studies, we propose that standard in vitro assays be associated with innovative in vivo models (PDX) to allow us, firstly, to work directly with primary tumor cells to validate the most effective therapies and the most relevant biological effects while taking into account the role of the tumor microenvironment; and, secondly, to guarantee that these therapies can be translated into clinical trials with molecular and genetic determination of the factors that condition the response to the best therapies tested in each patient.

2.

Modulation of the lymphoid microenvironment by intrinsic protein homeostasis in aggressive B-cell lymphoma.

We will characterize the ubiquitome of malignant B cells through proteomic profiling and correlate these intracellular complexes with the immunological pattern of each tumor model to validate the impact of tumor protein homeostasis on the development of B-cell lymphoma and the intratumoral infiltration of immune cells.

OUR CHALLENGES

Through our research, we aim to understand the following:

1

To what extent intrinsic protein homeostasis can regulate the complex tumor-stroma crosstalk in different models of aggressive B-cell lymphoma.

2

How germinal center-derived lymphoma can be sensitized to immune checkpoint blockade therapy.

3

How multiomics analysis of paired treatment-naïve and therapy-refractory B-cell lymphoma can help in the design of efficient and personalized therapies.

KEYWORDS

B-cell non-Hodgkin's lymphoma (NHL), tumor modelling, proteostasis, tumor microenvironment, immunotherapy

ABOUT US

RESEARCH GROUPS

33. DESCRIPTIVE AND ANALYTICAL EPIDEMIOLOGY OF CANCER LED BY RAFAEL MARCOS-GRAGERA

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OVERVIEW

One of the main lines of research of the group is the epidemiology of hematological neoplasms, with the aim of determining the incidence, prevalence and survival of this type of cancer. The results obtained aim to provide useful and reliable information to design and/or improve the appropriate health resources and describe the population trends of this group of diseases.

OUR RESEARCH

Hematological neoplasms are a large group of diseases with a wide variability derived mainly from the type of cells that cause it. Also, the evolution and prognosis of each histological subtype of neoplasia is very diverse and it is necessary to deepen the knowledge of each of them. In this sense, population cancer records are a reference tool for establishing the incidence and survival of each type.

OUR GOALS

Specifically, our research objectives aim at:

1.
Establishing the prevalence, incidence and survival of myeloid, lymphoid and histiocytosis neoplasms globally and according to the respective subtypes.

2.
To analyze the temporal trend of the incidence and survival of hematological neoplasms in the context of the evolving therapeutic background.

3.
Determine epidemiological parameters based on sex and age.

4.
Carry out etiological studies of hematological neoplasms according to each of the histological subtypes.

5.
To study the genetic and environmental risk factors related to hematological neoplasms.

6.
Describe the risk factors and epidemiology of multiple myeloma based on its precursor cells.

7.
Analyze the associations between comorbidity and the survival of lymphoid and myeloid neoplasms.

8.
Evaluate the population effectiveness of new therapies in a real population and the impact on survival.

9.
dentify changes in the classification, definition and coding of hematological neoplasms and establish working protocols to have homogeneous tools that allow epidemiological comparisons at the international level.

OUR CHALLENGES

Through our research, we aim to understand the following:

1
What is the incidence of hematological neoplasms in the territory?

2
What is the survival of each of the histological subtypes of neoplasia?

3
How have changes in the coding of hematological neoplasms over time affected the epidemiological determinants of this group of diseases?

KEYWORDS

Incidence, survival, mortality, lymphoid neoplasms, myeloid neoplasms, histiocytosis, hematological neoplasms

ABOUT US

RESEARCH GROUPS

34. ONCOGENESIS AND ANTITUMOR DRUGS LED BY RAMON MANGUES

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OVERVIEW

Current treatments lack selectivity towards cancer cells, which induces insufficient anticancer activity and produces severe adverse effects that limit their dosage. We are developing self-assembling protein-based nanoparticles for the treatment of hematological and solid cancers that are highly selective in targeting receptors overexpressed in cancer stem cells. They display a wide therapeutic window by avoiding renal clearance while internalizing into and selectively eliminating cancer target cells and enhancing the uptake of the payload drug into cancer tissues, with negligible uptake or toxicity in normal tissues.

We have achieved high antitumor and antimetastatic effects using apoptotic, genotoxic or microtubule inhibitor drugs as payloads, and we are now testing novel payloads that use non-apoptotic cell death mechanisms.

OUR RESEARCH

We generate novel protein-based nanomedicines with a high therapeutic window that tackle unmet treatment needs in acute myeloid leukemia (AML), diffuse large B-cell lymphoma (DLBCL) and colorectal cancer (CRC) using preclinical models and clinical translation, through:

- The development of animal cancer models that are resistant to current therapy or disseminated for the study of the molecular mechanisms of cancer stem cell involvement in these processes, especially in cancer cells that overexpress the chemokine receptor CXCR4.
- The development of drug nanoconjugates or protein-only nanoparticles for intravenous injection that use receptor-mediated targeted delivery of cytotoxic agents to cancer stem cells and incorporate novel drugs or polypeptide domains that exploit the higher capacity for apoptotic induction, or the triggering of cell death mechanisms as an alternative to apoptosis.
- The development of artificial amyloid bodies for subcutaneous injection with capacity for the sustained release of therapeutic protein nanoparticles in the bloodstream that reach cancer tissues.

OUR GOALS

Our aim is to develop nanomedicines that can effectively render cancers that have disseminated or relapsed sensitive to therapy by acquiring resistance to current therapy. In doing so, we expect to increase the cure and complete response rates, thereby leading to longer survival times.

An additional goal is to ensure that the repeated administration of these novel nanomedicines induces potent anticancer activity, while maintaining low or absent toxicity in normal tissues, associated with a lack of, or tolerable, side effects.

Finally, we also aim to develop a formulation of amyloid structured inclusion bodies whose capacity for the sustained release of therapeutic nanoparticles into the blood could be subcutaneously administered once a month. Their development will circumvent the need to administer the nanoparticles twice a week by intravenous injection, thus allowing patients to stay at home during treatment and avoid hospitalization.

OUR CHALLENGES

Ninety percent of cancer patients die of metastases that do not respond to current treatments. Therefore, patients who develop metastases are considered incurable. Through our research, we aim to answer the following questions:

1

Is the selective elimination of cancer stem cells a relevant clinical target to improve therapy in different cancer types with acquired resistance and disseminated disease?

2

Will protein-based targeted nanoparticles that incorporate non-apoptotic and immunogenic cell death polypeptides increase cure, response and survival rates while reducing side effects once tested in patients?

3

What are the underlying mechanisms that dictate the highly selective accumulation of protein nanoparticles targeting the CXCR4 receptor we observe in cancer tissues?

KEYWORDS

Biotechnology, nanomedicine, targeted drug delivery, oncotherapy, metastases

ABOUT US

RESEARCH GROUPS

35. CHRONIC LYMPHOCYTIC LEUKEMIA LED BY CAROLINA MORENO

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CUELLAR GARCIA, CAROLINA
Postdoctoral Researcher

JARA BUSTAMANTE, PAOLA
Lab Technician

OVERVIEW

Chronic lymphocytic leukemia (CLL), the most common adult B-cell malignancy in Western countries. It is characterized by the accumulation of monoclonal CD5+ B cells with a characteristic immunophenotype in peripheral blood, bone marrow, and lymphoid tissues. The clinical course of the disease is extremely heterogeneous and, as a result, the individual life-expectancy ranges from a few years to a virtually normal lifespan. Despite the important progress in its therapy, CLL is still considered an incurable disease.

OUR RESEARCH

Our group is constantly making hard efforts to gain further insights into the characteristics of the leukemic compartment and deepen on the impact of the tumor microenvironment. This knowledge can contribute to better understand the biologic events involved in the disease development and be used to develop new strategies for clinical management and therapy and eventually to improve the quality of life of patients with CLL.

Our group has been involved in several pivotal clinical trials that led to the approval of new drugs for CLL therapy. Also, we are involved in several projects focused on the characterization of residual leukemic cells, autoimmunity and mechanisms at work in BCR signaling.

OUR GOALS

Our group is constantly making hard efforts to gain further insights into the characteristics of the leukemic compartment and deepen on the impact of the tumor microenvironment. This knowledge can contribute to better understand the biologic events involved in the disease development and be used to develop new strategies for clinical management and therapy and eventually to improve the quality of life of patients with CLL. Through our research, we aim to:

1.
Make available better diagnosis, prognosis and therapeutical strategies in CLL.

2.
Extend the knowledge of molecular and cellular events implicated in CLL development.

3.
Prevent clinical relapses in CLL.

4.
Design feasible approaches to monitor MRD in CLL.

5.
Find a cure to CLL patients.

OUR CHALLENGES

Inherent to the disease, CLL patients have a deregulated immune system, which predispose them to have disease complications, including recurrent infections and autoimmune phenomena. The understanding of how the immune cells of tumor microenvironment contribute to maintain the survival of leukemic cells is essential to design future therapeutic strategies aimed, not only at eradicating leukemic cells, but also at restoring the immune system.

In the last years our group has started some projects aimed at describing the immune status and functional characteristics of B and T cell populations during the evolution of the disease and after therapy with targeted therapies.

KEYWORDS

Chronic Lymphocytic Leukemia, B-cell receptor signaling, minimal residual disease, liquid biopsy, tumor microenvironment

ABOUT US

RESEARCH GROUPS

36. HEMATOLOGY RESEARCH LED BY DAVID GALLARDO

GROUP MEMBERS

GALLARDO GIRALT, DAVID
Group Leader

SANTOS CARVAJAL, NAZLY
Medical Doctor

DÍAZ SANTA, JOHANA
Medical Doctor

GONZÁLEZ MONTES, YOLANDA
Medical Doctor

CRUZ GARCÍA, DAVID
Medical Doctor

COLL JORDÀ, ROSA
Medical Doctor

LLOVERAS GUELQUE, NATÀLIA
Medical Doctor

RONCERO VIDAL, JOSEP Mª
Medical Doctor

TUSET ANDÚJAR, ESPERANZA
Medical Doctor

KELLEHER, NICHOLLAS
Medical Doctor

BUSTINS TARRATS, ANNA
Medical Doctor

ANGONA FIGUERAS, ANNA
Medical Doctor

VILA BOU, JORDI
Medical Doctor

BLANCO BLANCO, ANTONIO
Medical Doctor

MOSTACEDO MARASOVIC, SILVIA
Medical Doctor

SITGES ARRIAGA, MARTA
Medical Doctor

LLOPIS PUIGMARTÍ, XESCA
Nurse Case Manager

GONZÁLEZ BÁRTULOS, MARTA
Lab Technician

GONZÁLEZ BÁRTULOS, MARTA
Lab Technician, PhD Student

OVERVIEW

The research group in hematology is devoted to clinical and translational trials in hematology, focused on diagnosis, prognosis and the development of new therapies to treat hematological malignancies such as leukemias and myelomas.

OUR RESEARCH

The group uses a variety of approaches such as genetic studies of the immune response, pharmacogenomics in response to treatment, analysis of polymorphisms as disease predictors and the study of cell populations using flow cytometry for the characterization of residual disease.

RESEARCH GROUPS

OUR GOALS

Through our research, we aim to:

1.
Investigate biological, clinical, and epidemiological aspects of hematological diseases.

2.
Carry out translational research projects focused on finding prognostic factors or treatment response predictors.

3.
Carry out clinical research, promoting participation in clinical trials for hematological diseases and participating in national and international cooperative groups.

KEYWORDS

Hematology, myeloblastic leukemia, multiple myeloma, chronic lymphatic leukemia, residual disease

ABOUT US

RESEARCH GROUPS

37. MYELOID NEOPLASMS (CAMPUS CLINIC) LED BY JORDI ESTEVE

GROUP MEMBERS

ESTEVE REYNER, JORDI
Group Leader

OVERVIEW

Myeloid neoplasms are a group of diseases in which the bone marrow produces an abnormal quantity of precursors for red blood cells, platelets or certain types of white blood cells. This leads to a variety of symptoms and from fatigue to bones fragility and, eventually, to a higher risk of developing Acute Myeloid Leukemia (AML).
Despite the advances produced during the last decades, not all those diagnosed benefit from efficient therapies. Advancing in the knowledge of myeloid neoplasms is, therefore, paramount to increase both prognosis and survival of patients.

OUR RESEARCH

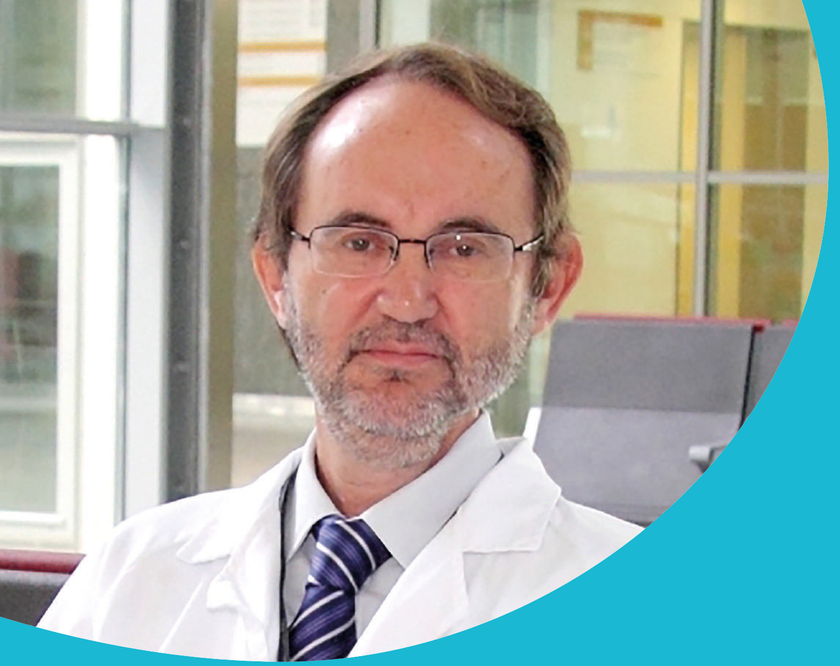
Our research group is searching for key molecular features of myeloid neoplasms that could be used as therapeutic targets. In particular, we are focusing our efforts towards:

- Myeloma and other monoclonal gammopathies
- Mechanisms of progression in monoclonal gammopathies
- Myeloid neoplasmas
- Lymphoid neoplasms

Also, we are seeking to improve the overall knowledge of the neoplasm microenvironment, the conditions where malignant cells live and proliferate, as well as how the body defenses respond to it.

KEYWORDS

Pediatric leukemia, stem cells, immunotherapy, MLL rearrangements, PDX models



ABOUT US

RESEARCH GROUPS

38. HEMATOLOGICAL DISEASES, TRANSPLANT AND CELL THERAPY LED BY JORDI SIERRA

GROUP MEMBERS

SIERRA SIERRA, JORDI
Group Leader

ALVAREZ FERNANDEZ, CARMEN
Postdoctoral Researcher

ESCRIBA GARCIA, LAURA
Postdoctoral Researcher

GRANELL GORROCHATEGUI, MIQUEL
Postdoctoral Researcher

BRUNET MAURI, SALUT
Postdoctoral Researcher

MIQUELEIZ ALAMOS, SARA
Postdoctoral Researcher

GARRIDO DIAZ, ANA
PhD Student

ESQUIROL SANFELIU, ALBERT
Lab Technician

ABOUT US

RESEARCH GROUPS

OUR RESEARCH

Our research focuses on the molecular and cellular physiopathology of blood cancers, particularly on acute myeloid leukemia (LMA) and chronic lymphatic leukemia (CLL) where we seek to find new treatment options targeting molecular features. Also, we study the prognostic value of clinical and biological features in malignant hemopathies, like LMA and CLL.

We study the transplant of hematopoietic progenitors and its complications and develop new academic CAR-T cells enriched in T-memory stem cells to treat T and B Hodgkin lymphomas.

OUR GOALS

The main goals of our research are:

1.
Identify new prognostic parameters for risk and therapeutic stratifications.

2.
Molecularly characterize acute myeloid leukemia and determine the prognostic value of known genes and other genes of uncertain significance.

3.
Evaluate targeted therapy in cell lines and animal models (together with Dr. Mangues' group).

4.
Reduce toxicity and increase the availability of allogeneic transplants.

5.
Preclinical (mouse) and clinical studies on immunotherapy for lymphoproliferative diseases. Development of non-commercial CAR-T cell therapies.

Our overall goal is to contribute towards curing 100% of childhood leukemias or convert them into chronic conditions, without generating lifelong toxicities..

OUR CHALLENGES

It is paramount that we improve the prognosis of hematological patients by using new more precise therapies, and less toxic. Therefore, through our research, we aim to:

1
Improve the genotypic and immunophenotypic characterization of AML and CLL, to identify new prognostic factors and administer targeted therapy.

2
Improve the safety and effectiveness of hematopoietic transplantation and expand the number of patients who can benefit from it.

3
Develop new CAR-T products that enhance the currently commercially available ones.

KEYWORDS

Hematopoietic transplantation, CAR-T cells, Immunotherapy, Acute Myeloid Leukemia, Chronic Lymphocytic Leukemia

ABOUT US

RESEARCH GROUPS

39. HEMATOLOGICAL DIAGNOSIS LED BY JOSEP NOMDEDÉU

GROUP MEMBERS

JOSEP NOMDEDÉU
Group Leader

ABOUT US

RESEARCH GROUPS

OUR RESEARCH

In our lab, we focus on both malignant and non-malignant hemopathologies to offer better diagnostics, understand its biological characteristics, and develop new treatments. We study acute leukemias multi-omics and platelet pathologies like thrombocytopenias, thrombocytopathies and thrombosis.

MALIGNANT HAEMOPATHOLOGIES

- Diagnostic activities: morphological, immunophenotyping, cytogenetic and molecular characterization of acute leukemias).
- Biological characteristics responding to therapy.
- New treatments using cell line models aimed at molecular targets.
- Genomic (microarrays) and proteomic platforms for diagnosis.
- Murine models development.

NONCANCEROUS HAEMOPATHOLOGIES

- Diagnosis and characterization of thrombocytopenia, thrombocytopathies and other platelet pathologies.
- n the framework of the GAIT-2 project (genetic analysis of idiopathic thrombophilia, phase 2), to seek new phenotypes that favor the development of thrombosis, specifically related to the structure and function of platelets and other blood cells.

OUR CHALLENGES

Through our research, we aim to:

1. Consolidate the characterization of hemato-logical tumors and complex, rare, and genetic noncancerous hematopathology's.
2. Include the results of mass-analysis genomic and proteomic platforms in diagnostic algo-rithms and establish prognostic factors for hematological disorders.
3. Develop functional cell culture and animal (murine) models.
4. Consolidate cooperation with the GAIT-2 project, especially regarding platelet and other blood cell participation in thrombosis generation.

KEYWORDS

Malignant hemopathologies, thrombocytopathies, thrombosis

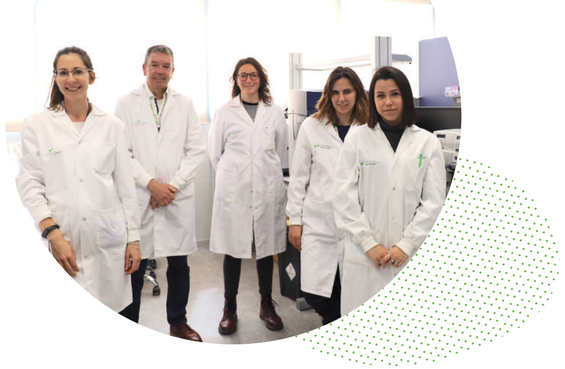
ABOUT US

CORE FACILITIES

MICROARRAYS UNIT

UNIT MANAGER:
Francesc Solé

STAFF:
Mar Mallo, Nuri de Haro, Jessica Tijero, Aida Silverio



The Microarrays Unit (UM) is a service focused on DNA and RNA microarray solutions towards a personalized medicine and participates in the Cytogenetic European Quality Assessment (CEQA).

MOLECULAR CYTOGENETICS

Microarray studies can offer various solutions for cytogenetic applications:

- Detection of whole genome gains and losses at a high resolution.
- Analysis of whole genome absences of heterozygosity.
- SNPs genotyping and genome-wide association studies.
- RNA Analysis Solution
- Gene expression profile studies on either human or mouse are suitable for:
- Detection of genes and pathways involved in diseases, treatment responses and biological processes.
- Predictive models based on gene expression profiles.
- Pharmacogenomics and toxicogenomics studies.
- Alternative splicing detection.
- Classification of samples on gene signatures.
- Analysis of miRNA.
- Microarray analysis on compromised samples with degraded and/or low quantity samples.
- Quality sample analysis

In addition, to the microarray procedure we also offer DNA and RNA quantification and quality control analysis.

HIGH THROUGHPUT QPCR

The Biomark HD system is a high throughput qPCR that runs IFCs in either real-time or end-point read modes, bringing PCR solutions to a range of applications. The 48x48 Dynamic Array combines up to 48 samples and 48 assays, generating 2304 different assays in one single run. The 96x96 Dynamic Array combines up to 96 samples and 96 assays, generating 9216 different assays. In addition, the FLEXsix IFC incorporates six 12x12 partitions that can be organized in any configuration, in up to six separate experimental runs.

Applications

- Genotyping
- Targeted Gene expression
- Digital PCR

Equipment

- Affymetrix Research Platform: GCS3000 with autoloader
- Agilent Bioanalyzer 2100
- NanoDrop 2000 Spectrophotometer

ABOUT US

CORE FACILITIES

CYTOGENETICS UNIT

UNIT MANAGER:
Francesc Solé

The Cytogenetics Unit is responsible for analytical tests belonging to Special Hematology from samples of whole blood, serum, plasma, urine, body fluids, bone marrow, lymph nodes, spleen, and tumor masses. The available analysis include: Special Hemostasis, Erythropathology, Special Cytology, Immunophenotype, Cytogenetics and Molecular Biology.

The Cytogenetics Unit at Josep Carreras Leukaemia Research Institute includes the Laboratory of Cytogenetics of the Institut Català d'Oncologia (ICO).

Services

- Conventional cytogenetics culture and karyotype performance
- Fluorescence in situ hybridization (FISH) with commercial probes
- QF-PCR

SAMPLE HANDLING CIRCUIT UNIT

UNIT MANAGER:
Francesc Solé

STAFF:
Rocío Ruíz, Jessica Aranda, Aida Silverio

The Josep Carreras Leukaemia Research Institute (IJC) Campus ICO-GTP houses the Germans Trias I Pujol Hospital and Institute (IGTP-HUGTP) Sample Handling Circuit Unit, which manages the processing and storage of voluntarily donated samples of hematopoiesis neoplasms. The samples are stored in the collection entitled "IJC Leukemia and other blood disease Sample Collection'. The IGTP-HUGTP Sample Handling Circuit Unit receives the bulk of its samples from the Catalan Institute of Oncology at the Germans Trias i Pujol Hospital (ICO-HUGTP). Samples received from other hospitals are processed in an identical way.

The technical staff of the IJC have created a database of patients, donors and samples received and processed according to required specifications for the tracking of each sample in the collection. The staff verify the quality, security and tracking of the data and samples throughout the process and starting at extraction.

ABOUT US

CORE FACILITIES

PROTEOMICS UNIT

UNIT MANAGER:
Carolina de la Torre

STAFF:
Joan Josep Bech,
Bernat Cucurull

The Proteomics Unit of the Josep Carreras Leukaemia Research Institute, part of the Carlos III Health Institute (ISCIII) and the Proteomics Network ProteoRed, offers mass spectrometry services to the academic and to the private sector under request.

The unit's main activity is to promote the incorporation of proteomics as a key tool for the development of clinical and basic projects at our institution. Our main work consists of offering innovative, high-quality proteomic and peptidomic services that allow the best therapeutic and human health solutions to be selected.

HOW DO WE SUPPORT YOU?

- By providing scientific and technological support to high-level research projects in the field of proteomics according to international standard procedures.
- By providing researchers with scientific advice, from the project's planning and experimental design stage to the execution phase, processing of samples and interpretation of results, and support during presentations and writing of results for publication.
- Through dissemination and training for researchers on the methodology and applications of the techniques offered.
- By contributing to the promotion of innovation in health technologies and the transfer of the knowledge generated to the public health service, and supporting genetic, epigenetic and pharmacogenetic diagnosis.

OUR SERVICES:

Proteomic analysis is a very powerful approach to addressing key challenges in clinical and health research. This approach can be used for different aspects of clinical and health sciences, such as biomarker discovery, drug target identification and food technology.

Biomarker discovery from a wide range of samples to improve precision medicine at different levels: a) early diagnostic, and b) prognosis to predict disease progression and guide treatment selection.

ABOUT US

CORE FACILITIES

GENOMICS UNIT

UNIT MANAGER:
Damiana Álvarez-Errico

STAFF:
Carles Arribas,
Laila Aledón

The Genomics Unit aims to provide the IJC community and external researchers with scientific services. Several state-of-the-art technologies have been implemented in the unit to assess relevant genomic and epigenomic features and thus unravel basic molecular mechanisms of disease and contribute to the discovery of therapeutic targets and biomarkers.

The Unit is equipped with cutting-edge technology to offer solutions for both basic and translational epigenomic and genomic studies on many sample types (primary cells, cell lines, frozen and paraffin-embedded tissues). We have long-standing experience in array-based genome-wide DNA methylation analysis and pyrosequencing. We use next-generation sequencing (NGS) technology to investigate subsets of genes or specific genome regions with Illumina's MiSeqDx System.

The applications provided by the Genomics Unit at IJC are:

- Infinium MethylationEPICTM BeadChip technology (Illumina)
- MiSeqTMDx NGS sequencer (Illumina)
- PyroMarkTMQ48 (Qiagen)

BIOINFORMATICS UNIT

UNIT MANAGER:
Angelika Merkel

STAFF:
Izar de Villasante

The Bioinformatics Unit at IJC provides both internal and external researchers with high-quality computational analysis services to cover all aspects of research projects related to clinical and biological data.

The Bioinformatics Unit offers a wide range of services, including experimental design for NGS or microarray experiments, statistical consulting, NGS and microarray data analysis and integration, scientific database management and software design and implementation. It also provides training on different bioinformatics topics and the use of HPC (high-performance computing) resources.

OUR SERVICES:

- Bioinformatics data analysis, including consulting, experimental design advice, technology selection, final report generation and interpretation.
- Support for project proposal writing, data provider selection and budget planning.
- Custom bioinformatic analyses and tailored software development.
- Clinical software development compliant with ISO-13485.
- Large-volume data storage, management and submission to public repositories.
- Bioinformatics analysis training.

BIOINFORMATICS ANALYSIS:

- Epigenomics and epitranscriptomics: 5mC and 5hmC DNA methylation arrays (infinium methylation 450K and EPIC), whole-genome bisulfite sequencing (WGBS), reduced-representation bisulfite sequencing (RRBS), bsRNA-Seq, m6A and m1A RNA methylomes by NGS and array.
- Genomics: whole-exome sequencing (WES), WGS, SNP and CNV arrays, ChIP-seq, Hi-C.
- Transcriptomics: RNA-Seq, Ribo-seq, RIP-seq, iCLIP, CLIP-seq, single-cell transcriptomics.
- Metagenomics: 16s rRNA.

ABOUT US

CORE FACILITIES

CELL IMMORTALIZATION UNIT

UNIT MANAGER:
Carolina de la Torre

STAFF:
Fernando Setien

The Cell Immortalization Unit of the Josep Carreras Leukaemia Research Institute offers Infection of B-cells with Epstein–Barr virus (EBV) leads to more and subsequent immortalization. This is considered as the method of choice for generating lymphoblastoid cell lines (LCLs). Cell culture is an essential tool to study the fundamentals of genetic background variables. With the development of personalized medicine, this applies increasingly to the development and safety testing of drugs. Infection of B-cells with Epstein–Barr virus (EBV) leads to more and subsequent immortalization. This is considered as the method of choice for generating lymphoblastoid cell lines (LCLs). After successfully production of LCLs, different parameters including temperature, serum concentration, type of culture medium, and CO2 concentration have to be evaluated on EBV-transformed B-cells. Our unit are able to produce LCLs and optimize condition.

APPLICATIONS:

- This immortalization technology enables rapid, efficient, and reliable production of unlimited numbers of personalized cells.
- To produce control material for rare genetic disorders.
- Lymphocyte Immortalization technique let to preserve of DNA, RNA and proteins samples, that appears to be a valid strategy for further studies.
- To determine optimized condition for reliable and reproducible LCLs from different sources.
- Testing drugs analysis.
- Allows us to have enough biological sample without having to access the patient again

SINGLE CELL UNIT

UNIT MANAGER:
Regina Antoni Alandes

The Single Cell Unit aims to provide scientific services to the Josep Carreras Institute community and is equipped with cutting-edge technology to apply single-cell technology to basic and translational genomic and transcriptomic studies. Single Cell approaches can reveal the cellular heterogeneity of tumors and help identify cells resistant to standard treatments or more prone to proliferate.

The Single Cell Unit is equipped with a ChromiumTM Controller (10x Genomics), a Mission Bio Tapestri Platform and the C1 system (Fluidigm). These technologies provide a comprehensive, scalable solution for cell characterization, gene expression profiling and DNA sequencing of up to tens of thousands of cells.

SERVICES:

ChromiumTM Controller (10x Genomics):

- Single-cell RNA-seq (gene expression)
- Single-cell RNA-seq (gene expression) + Feature Barcoding
- Single-cell immune profiling (gene expression + TCR/BCR)
- Single-cell ATAC-seq

Tapestri Platform (Mission Bio):

- Single-cell targeted DNA-seq (mutation analysis)
- Single-cell targeted DNA-seq (mutation analysis + CNV analysis)
- Single-cell DNA-seq + cell-surface protein analysis

C1 System (Fluidigm):

- Single-cell mRNA sequencing
- Single-cell targeted gene expression
- Single-cell miRNA expression profiling

ABOUT US

MANAGEMENT UNITS

STRATEGY DIRECTOR AND MANAGING DIRECTOR

Garrido Anglada, Ana

Together with Dr. Manel Esteller, Ana Garrido is part of the management team and contributes to the development of general policy and strategic planning, enabling and translating scientific vision and strategic objectives into a clearly articulated operational strategy.

The main objectives of the Strategic and Managing Director are:

- Strategic and operational organization of the Institute.
- Management, in accordance with the marked guidelines of the governing bodies, human resources, hiring staff, incidents, separation and termination of employment contracts, HR organizational policies, as well as the management of scholarships and grants, encouraging policies of Corporate Social Responsibility and attracting and retaining talent.
- Detection of the needs derived from the activity of the Institute Research Groups and the rest of the units from the economic and management point of view.
- Implementation of an agile model focused on researchers that favours their performance and the best concentration in scientific activity.

ABOUT US

MANAGEMENT UNITS

Research Grants Unit

Its objective is the attraction of public and private competitive funding, both nationally and internationally, as well as the proactive management of research projects granted.

We support researchers throughout the life cycle of projects, from the detection of opportunities, the preparation of proposals and the training of research consortiums, to the management of projects in all areas beyond the economic.

Group members

MORALES CUÑADO, CRISTINA
Project Manager

PADIAL MELIÁN, VERÓNICA
Project Manager

LAGUNAS VILA, LAIA
Project Manager

EL BOUHALI EL MALLEM, SANAE
Project Manager

GIL GUIÑON, ESTEL
Project Manager

MAURI SÀNCHEZ, SARA
Project Manager

VILLANUEVA DELGADO, ANAÍ NOEMÍ
Project Manager

DOLSET VILLALOBOS, SARAI
Projects Support

MORAL ROS, MARC
Projects Support

ALLUÉ SANCHEZ, MÓNICA
Projects Support

BEN FATINA, OMAR
Projects Assistant

GARCIA MONTERO, ADRIÀ
Projects Assistant

FERNANDEZ CAMBRAS, DANIEL
Projects Assistant

EL-GHAUCHE EL-HALLAK, RANIA
International Business Development Manager

Innovation Unit

The aim is to promote and boost innovation to improve the quality of life of society from the transfer of knowledge and developed technologies.

Group members

RIERA GUERRA, ANNA
Innovation Manager

FARRÉS ÀLVAREZ, CLARA
Innovation Officer

Enocomic Management Unit

The Economic Development Manager manages and coordinates the financial control of the Institute. Its main functions are linked to the control and supervision of finances and, ultimately, it acts as a link between the Institute's management and accounting.

Group members

BOIX MONTEMAYOR, HEURA
Economic Development Manager

Human Resources Unit

Its mission is to plan, organize and execute all processes relative to the professional development of the staff and their commitment with the organization, within the framework of current regulations, including training opportunities and occupational risk prevention.

Group members

JANÉ MORALES, NÚRIA
HR Manager

PEREZ RODRIGUEZ, FERNANDO ROBERTO
HR Manager

CARMONA FERNÁNDEZ, CAROLINA
HR Officer

BODAS LOZANO, ANTHONY
HR Support

ESCOBAR LÓPEZ, MAJDEL KAROLINA
HR Assistant

ABOUT US

MANAGEMENT UNITS

Finance Unit

Its mission is to keep track of the actual finance situation of the Institute, rigorously and transparently, to support data driven strategic decision making in the short, medium and long run.

Group members

CALONGE CORTÉS, MARIA CRISTINA
Financial Manager

FINESTRES MARTINEZ, XAVIER
Finance Officer

VILANOVA CUADRA, YAIZA
Finance Officer

MURE FERNANDEZ, MIREIA
Finance Officer

MATOS SILVA, AWILDA
Finance Support

LAMATA SALVA, MARC
Finance Support

Purchasing Unit

The unit's aim is to optimize purchasing at the institutional level according to the legal framework for public research bodies, to be more efficient, fast and agile, avoid unnecessary costs and save resources for research.

Group members

JIMENEZ FERRER, NEUS
Purchasing Manager

VERGÉS COLOMINAS, ANNA
Purchasing Officer

REYES IBORRA, LAIA
Purchasing Officer

GARCIA ESCODA, ALBERT
Purchasing Officer

GERBOLÉS LÓPEZ, ANNA
Purchasing Officer

MONTSERRAT SANCHEZ, QUIQUE
Purchasing Officer

NIUBÓ BALCELLS, NURIA
Purchasing Support

DESPRETZ SANZ, YANN
Purchasing Assistant

IT Unit

The unit's objective is to support the Institute's staff in the use and purchasing of IT components -hardware, software and systems- and keep the institutional IT systems online and secure while ensuring its efficiency.

Group members

JUBANY LÓPEZ, MARC
Manager

GALLIGANI, DAVID
IT Officer

CONTRERAS PEÑA, FRANCISCO
IT Officer

SALA MOLAS, ELISENDA
IT Officer

GALLARDO PEREZ, DIANA
IT Support

DIAZ LOPEZ, SERGI
IT Assistant

Data Management Unit

Aimed at delivering and maintaining all necessary infrastructure to efficiently keep institutional data available at all levels: strategic, technical, administrative and for transparent accountability in front of local or international management bodies.

Group members

CARRIO REIG, MARTA
Data Manager

DE HIGES ALBERICH, PAU TADAYUKI
Data Technician

Communication Unit

Passionate about spreading the latest discoveries of our scientists and bring their research efforts closer to society, in any form. The unit strives to keep our partners closer and updated, and to foster the staff's sense of belonging.

Group members

DÍAZ LÓPEZ, HELENA
Communication Manager

BADAL SOLER, MARTI
Communication Officer

BERZOSA FERNÁNDEZ, BEA
Communication Assistant

ABOUT US

MANAGEMENT UNITS

Lab Management Unit

The aim is to support researchers in their daily work in laboratories so that their research can be carried out with the best equipment, in the best state and with maximum safety.

Group members

PEREZ LADAGA, ALBERT
Lab Manager

RODRIGUEZ DE GUZMÁN GALLEGO, NOELIA
Lab Management Assistant

SAEZ GONZALEZ, CARLOS
Lab Management Technician

GARCIA FERRAN, ALBA
Lab Management Technician

Legal Services

Its mission is to support the Institute in all legal matters, particularly in establishing the collaboration framework with partner institutions, ongoing clinical trials and innovation aspects in biomedical research.

Group members

LAFARGA TRAVER, JOSEP LLUIS
Legal Servicies

Facilities Unit

The aim is to support as a facilitator, manager, and organizer for the proper functioning of all the sites of the Institute in terms of their resources and associated with the development of our activity.

Group members

ARQUÉ COMAS, CARLES
Facilities Manager

Support Unit

The Support Unit supports the governing bodies of the Institute in daily administrative tasks, agendas as well as in travel procedures.

Group members

MARIN MANZANERA, ESPERANZA
Management Assistant

IZQUIERDO SÁNCHEZ, IRMA
Management Administrative

AMADO BALLANO, ERIKA
Management Assistant

COMMUNICATION

SELECTED PRESS RELEASES

JANUARY:

New epigenetic targets identified for the potential treatment of multiple myeloma. Researchers at the Josep Carreras Leukaemia Research Institute have identified epigenetic alterations in multiple myeloma and have tested a compound that reverse those alterations, opening the door to a new therapeutic drug in the treatment of multiple myeloma.

FEBRUARY

Myelodysplastic Syndrome heterogeneity revealed using single cell technology. Researchers from the Myelodysplastic Syndrome group at Josep Carreras Leukaemia Research Institute describe the diversity of cancer cell populations coexisting in patients of the disease, using single cell resolution for the first time.

COMMUNICATION

SELECTED PRESS RELEASES

FEBRUARY

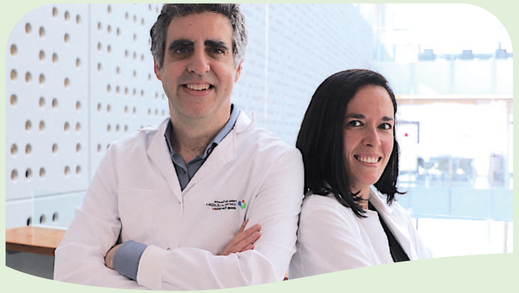
Researchers from Josep Carreras Institute participate in the program 100tífiques aimed at fostering science careers among school girls. Four young women researchers will talk about their research at 6th course in primary school or 1st ESO to bring the science research world closer to kids and offer relevant female roles in the science and technology field.

MARCH

Sant Pau administers the first CAR-T of its own production for Hodgkin and non-Hodgkin lymphoma T in Europe. The first CAR-T immunotherapy drug produced entirely in Sant Pau (academic) and administered to the first patient is part of a pioneering clinical trial in Europe of CAR-T phase I / II immunotherapy for the autologous treatment of classical Hodgkin lymphoma and relapsed / refractory CD30 + non-Hodgkin T CD30 + lymphoma, funded by the Carlos III Health Institute and the Josep Carreras Leukaemia Foundation.

MARCH

The Josep Carreras Leukaemia Research Institute, new Member Institution at the International Cancer Proteogenome Consortium of the National Cancer Institute. The Josep Carreras Leukaemia Research Institute signs a memorandum of understanding with the National Cancer Institute of the National Institutes of Health (NIH).



MAY

Manel Esteller and Laura Belver elected as new International Members of the American Society of Hematology. Dr. Manel Esteller and Dr. Laura Belver, Director and Group Leader of the Josep Carreras Leukaemia Research Institute, have been elected as International Members of the American Society of Hematology (ASH) by vote of the Executive Committee, the governing body of the Society. This membership is granted to researchers outside North America that have made a contribution to the field of hematology.

COMMUNICATION

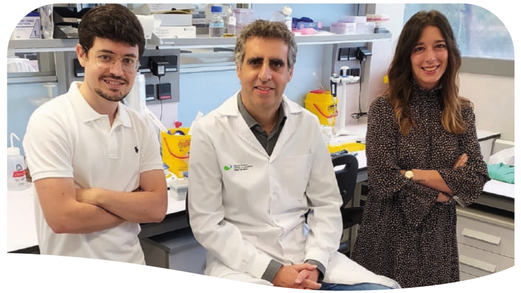
SELECTED PRESS RELEASES

JUNE

Dr. Josep Maria Ribera coordinates the 4th ALL PETHEMA Workshop to update knowledge about Acute Lymphoblastic Leukemia. Most of the Spanish experts in acute lymphoblastic leukemia (ALL) met on May 26 and 27 at the 4th Workshop dedicated to this disease organized by the PETHEMA group, belonging to the Spanish Society of Hematology and Hemotherapy (SEHH).

SEPTEMBER

REDECAN publishes the latest data on the incidence of hematological neoplasms in Spain. Dr. Rafael Marcos-Gragera, member of the Josep Carreras Leukaemia Research Institute and leader of the Girona Cancer Registry group of the Institut Català d'Oncologia / Pla director d'oncologia, has coordinated the report published by the Spanish Network of Cancer Registries (REDECAN) on the incidence of hematological neoplasms that predicts the diagnosis of 26,000 new cases in 2021.



OCTOBER

Epigenetics predicts CAR-T efficacy. *Epigenetics predicts the efficacy of T-lymphocyte treatments in hematological malignancies.* One in five cancers affects blood cells and lymph nodes, causing leukemias and lymphomas, respectively. Although their treatment with drugs has led to a great advance in their cure, there are cases where there is no clinical response or resistance to them is generated.

NOVEMBER

Manel Esteller receives the Narcís Monturiol Medal for scientific and technological merit from the Generalitat de Catalunya. Manel Esteller, Director of the Josep Carreras Leukaemia Research Institute, ICREA Researcher and Professor of Genetics at the University of Barcelona, has received the Narcís Monturiol Medal at the scientific and technological merit from the Generalitat de Catalunya.

COMMUNICATION
SCIENTIFIC DISSEMINATION

Excellence is the basis of our Institute and encourages us to seek new initiatives to disseminate the results and impacts of our research to society. It is precisely for this reason that bringing the research of the Josep Carreras Institute closer to the public is one of the fundamental objectives of the strategic plan.

During the year 2021, and still under Covid-19 restrictions, the Institute deploys a whole range of dissemination actions. These actions are designed both to bring research closer to the public, and to position the Josep Research Institute as a pole of scientific excellence among the public.

In this spirit, we created a new informative video content called "Young researcher, what's up?", published on our YouTube channel, in which our young scientists explain their research projects in Catalan, Spanish and English.

In addition, we participate in the main scientific dissemination events of Barcelona and Catalonia through talks and workshops. These actions are indicated in the list below:

- **Barcelona Science Festival,** organized by the City Council through the Barcelona Institute of Culture (ICUB): talk by Dr. Gerardo Ferrer and Epigenetics workshop by members of the Cancer Epigenetics group.
- **UB Science Festival** (online), organized by the University of Barcelona, where Dr. Esteller is a professor: we presented a video about the different levels of organization of information in a cell, done by several researchers.
- **European Research Night,** organized by the Catalan Association for Scientific Communication with funding from the European program MSCA: talks in schools by various researchers and Workshop on Epigenetics at Cosmocaixa by the Dissemination Specialist of the Institute.
- **Science Week 2021,** organized by the Catalan Foundation for Research and Innovation (FCRi): round table on new strategies in the fight against leukemia at the headquarters of the FCRi, with researchers from the Institute.
- **#100tifiques,** organized by the FCRi and the BIST: networking and talks in schools by researchers from the center on the day of Women and Girls in Science, February 11th.

In addition, all the Conferences and Seminars organized by the Institute have been virtualized and streamed online, either for free on our channels or under registration. These talks are delivered by national and international speakers and have the aim to facilitate access to the latest developments in leukemia research.

The Josep Carreras Leukaemia Research Institute has maintained its collaboration with the Josep Carreras Foundation, with whom we have close ties. Every year, the Josep Carreras Foundation celebrates the Unstoppable Day and the Week against Leukemia and they organize many different activities for patients, relatives and civil society. Due to the COVID-19, those events were delivered fully online as TV shows and IJC researchers participated with a rich program of presentations, experiences, testimonials and other online activities through their social networks.

This year, the Institute could not open its doors in the Can Ruti Open Day, organized annually at the same time as the National Science Week. We have instead participated in the online Can Ruti Open Day with micro-talks on Cancer Epigenetics, Aging and Leukemia, and also delivered an online class for High-School students on cancer research.

Finally, in the light of the new single cell analysis technologies emergence, the Institute has decided to open a specific channel on Twitter to disseminate the actions of the professionals of the center who exploit these new tools in the fight against leukemia. In this channel we also look at the benefits of the single cell analysis technologies and how they can complement classical methodologies.

FACTS & FIGURES

INNOVATION

The **Josep Carreras Institute** is committed to bringing the cure of leukemia and other hemotological malignances to patients. To do so and contribute to society and country's progress, it fosters the generation of new knowledge together with the development of new therapies and technologies.

In 2021, the results of our research in terms of innovation were as follows:

INDICATORS 2021

68
Active Innovation Projects

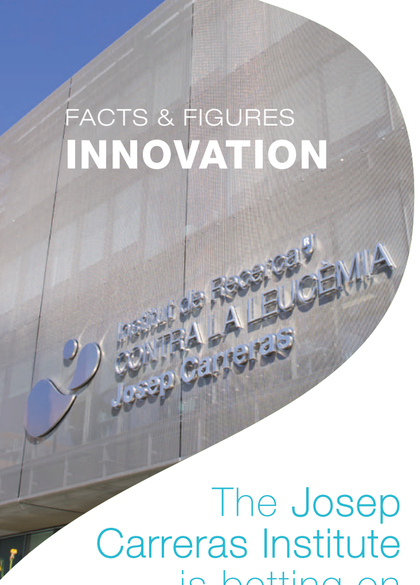
2
Active Spin-Offs: Leukos Biotech and One Chain Immunotherapeutics

68
Patent families Portfolio (40% Licensed)

7
Proof of Concept Competitive calls granted:
Caixalmpulse Validate; Líneas estratégicas (MICIN); IP BOOSTER (EC), Ginjol (i-CERCA), IESE-Tech Transfer Group

10
349k€ in granted PoC calls

106
New Agreements signed in 2021



FACTS & FIGURES

INNOVATION

The Josep Carreras Institute is betting on an innovative sponsorhip tool

In 2021 The Josep Carreras Institute has made a bold proposal of Industrial sponsorhip through a very uncommon tool in public research institutions of tax lease. Thanks to the collaboration with the company "Andamur" and the firms "AdastraVentures" and "LKS Next", the Institute has raised more than 300.000€ in 2021 (in a research project valued for more than 1M€) with the idea to consolidate and reinforce this sponsorhip structure through the next years. The Institute has generate a new stable way of fundraising in order to reinforce their own research.

Regarding innovation, the great goal to be completed during 2021 is the implementation of the anointed Agrupacions d'Interès Econòmic (AIE), with the patronage of the company Andamur and the collaboration between AdastraVentures and LKS Next. In this way, the Institute has allocated more than €300,000 for the METILPIK21 project: "Study of the methylome in overgrowth syndromes caused by oncogenic mutations in PIK3CA", led by Dr. Mariona Graupera and Dr. Manel Esteller.

As far as technology transfer is concerned, the Institute has executed a license for the commercialization of a diagnostic kit.

During the year 2021, the Institute has managed 68 innovation projects, 10 families of patents and 2 spin-offs: Leukos Biotech, which is part of the research of the group of Dr. Ruth Muñoz Risueño and OneChain Immunotherapeutics, of the research of the group Dr. Pablo Menéndez. Overall, the set of actius innovation projects has resulted in the signing of 106 agreements worth 1.3 million euros. Additionally, during 2021, they have only tendered 50 competitive adjustments for the identification innovation projects, for a total value of 11 million euros, of which they face 14 pending resolutions and 9 of grants with a value of €600,000.

In 2021, specific financing has been obtained for valorization and concept proofs: CaixaImpulse Validate; R&D projects in strategic lines, in public-private collaboration; Intellectual Property Booster; I-Cerca, call for CERCA Gínjol patents fund, IESE-Tech Transfer Group.

International congresses

In 2021, the Institute organized and participated in 4 international congresses, which were adapted to the global situation and virtualized.

March 15-19th, 2021
"The Immune System: in Sickness and in Health" Congress.

April 7-9th April 2021
"Personalized and Precision Medicine" Congress, (Participation of IJC).

Sept. 22-24th, 2021
"Physiology and Function of Histone Variants" Congress.

Oct. 6-8th, 2021
"Vascular Malformations: from Fundamental Biology to Therapeutic opportunities" Congress.

FACTS & FIGURES

TEACHING AND TRAINING

Distinguished and Invited lectures

Twice a month the Institute has the pleasure to receive national and international well-renowned researchers in the cancer research-related field. They deliver a 1-hour lecture on their research, career and findings, which is open to all the Institute and the scientific community

LECTURES at the Josep Carreras Leukaemia Research Institute

1st SEMESTER 2021

JAN 29, IGNACIO VARELA
Invited Lecture
Instituto de Biomedicina y Biotecnología de Cantabria (IBBTEC), Spain
"Molecular characterization of the role of SWI-SNF alterations in lung cancer development"

FEB 26, KAREN VOUSDEN
Distinguished Lecture
The Francis Crick Institute, United Kingdom
"The manifold functions of p53 in tumor suppression and beyond"

APRIL 16, DAN LANDAU
Distinguished Lecture
Cancer Genomics & Evolutionary Dynamics at Weill Cornell Medicine and the New York Genome Center, USA
"Charting normal and malignant differentiation topologies via single cell multi-omics"

FEB 12, SÒNIA GUEDAN
Invited Lecture
Clinic Hospital and IDIBAPS, Catalonia, Spain
"CAR-T cell therapy: engineering immune cells to fight cancer"

FEB 19, HANS CLEVERS
Distinguished Lecture
Hubrecht Institute for Developmental Biology and Stem Cell Research and at the Princess Máxima Center for Pediatric Oncology, The Nederlands
"Organoids to model human disease"

MARCH 5, MARISOL SOENGAS
Invited Lecture
Spanish National Cancer Research Centre (CNIO), Spain
"Immune suppressive pathways in cancer identified by live imaging of metastatic niches"

MAY 28, CAROLINE DIVE
Distinguished Lecture
Cancer Research UK Manchester Institute, United Kingdom
"Liquid biopsies in lung cancer for improved patient outcomes"

LECTURES at the Josep Carreras Leukaemia Research Institute

2nd SEMESTER 2021

SEP 10, LEE KRAUS
Distinguished Lecture
UT Southwestern Medical Center. Texas, USA
"PARPs and ADP-ribosylation in Cancer: From Nucleosomes to Ribosomes"

SEP 17, NÚRIA MONTSERRAT
Invited Lecture
Institute for Bioengineering of Catalonia (IBEC). Barcelona, Spain
"Engineering human pluripotent stem cells to understand human development and disease"

OCT 1, ANDRÉS HIDALGO
Invited Lecture
Centro Nacional de Investigaciones Cardiovasculares (CNIC). Madrid, Spain
"Immune trafficking and the bone marrow"

OCT 22, SALVADOR MACIP
Invited Lecture
Department of Molecular and Cell Biology, University of Leicester, UK
Faculty of Health Sciences, Universitat Oberta de Catalunya, Barcelona
"Understanding resistance and relapse in B cell malignancies: a tale of mutation, oxidation and senescence"

NOV 19, MARK DAWSON
Distinguished Lecture
Peter MacCallum Cancer Centre. Melbourne, Australia
"Cancer Epigenetics: Concepts, Challenges and Therapeutic Opportunities"

NOV 19, IANNIS AIFANTIS
Distinguished Lecture
NYU School of Medicine. New York, USA
"Mitochondrial dynamics in leukemia drug response and the acquisition of therapy resistance"

DEC 17, IDO AMIT
Distinguished Lecture
Weizmann Institute of Science. Rehovot, Israel
"The power of ONE: Immunology in the age of single cell genomics"

TEACHING AND TRAINING

YOUNG RESEARCHERS SEMINARS (39)

The Young Researchers Seminars are 20-min talks given by our PhD Students and young Postdoctoral Investigators, in which they explain an aspect of their research to their IJC fellows and respond to their questions. This is the perfect opportunity for them to practice an activity that they will have to face not only in their thesis defense, but also on numerous occasions throughout their research career.

THESIS READ (12)

CURRENT DOCTORAL THESIS (141)

TRAINING COUSES

Researchers from the Institute periodically offer highly-specialized sciences courses.

FEBRUARY 24-25TH

- Cytogenetics and Molecular Genetics of Hematopoiesis Neoplasms

MAY 17-19TH

- Next Generation Diagnosis in Leukemia

NOVEMBER 19-20TH

- Preceptorship. Advances in Acute Lymphoblastic Leukemia

FACTS & FIGURES

TEACHING AND TRAINING

COURSES AND SEMINARS

JANUARY

- **"Determinants of immunological evasion and immuno checkpoint inhibition response in cancer: the genetic front"** Montse Sanchez-Cespedes. Cancer Genetics Group, IJC
- **"Distinctive biomarker features in the endotheliopathy of covid-19 and septic síndromes"** Marta Palomo. Barcelona Endothelium Team (BET)
- **"Molecular characterization of the role of SWI-SNF alterations in lung cancer development"** Ignacio Varela, Instituto de Biomedicina y Biotecnología de Cantabria (IBBTEC), Spain

FEBRUARY

- **"The germline genome shapes the immune response and somatic landscape in human tumors."** Eduard Porta. Cancer Immunogenomics Group, IJC
- **"The manifold functions of p53 in tumor suppression and beyond"** Karen Vousden, The Francis Crick Institute, United Kingdom
- **"Charting normal and malignant differentiation topologies via single cell multi-omics"** Dr. Dan Landau, Cancer Genomics & Evolutionary Dynamics at Weill Cornell Medicine and the New York Genome Center, USA
- **"Application of personalized medicine in patients with adult T-cell acute lymphoblastic leukemia (T-ALL)."** Eulalia Genesca. Acute lymphoblastic Leukemia (ALL) Group, IJC
- **"CAR-T cell therapy: engineering immune cells to fight cancer"** Sònia Guedan, Clinic Hospital and IDIBAPS, Catalonia, Spain

MARCH

- **"Organoids to model human disease"** Dr. Hans Clevers, Hubrecht Institute for Developmental Biology and Stem Cell Research and at the Princess Máxima Center for Pediatric Oncology, Nederland
- **"Effects of mutations, environmental exposures and drug interventions on gene expression"** Tanya Vavouri. Regulatory Genomics Group Leader, IJC
- **"Symposium: The Immune System: in sickness and in Health"** International emerging leaders in the fields of immunology and leukemia

APRIL

- **"New therapeutic approaches for acute leukemias"** Ruth Risueño, Leukemia stem cell Group, IJC
- **"PEMED 2020 Scientific Committee"** CHAIRMAN Prof. Manel Esteller, Director, Josep Carreras Leukaemia Research Institute (IJC), Spain STEERING COMMITTEE Prof. Ann K. Daly, University Medical School, United Kingdom; Prof. Matthias Schwab, IKP and Dept of Clinical Pharmacology, Univ Hospital of Tuebingen, Germany; Prof. Anne-Marie Caminade, Coordination Chemistry Lab of Toulouse and University of Toulouse, France
- **"Immune suppressive pathways in cancer identified by live imaging of metastatic niches".** Marisol Soengas, Spanish National Cancer Research Centre (CNIO), Spain
- **"The Genome in the Fourth Dimensional Context: Deciphering the role of Noncoding Mutations in Blood Diseases"** Biola M. Javierre, 3D Chromatin Organization Group, IJC
- **"A New Horizon in Precision Oncology – Proteogenomics"** Director, Office of Cancer Clinical Proteomics Research. National Cancer Institute, National Institutes of Health.

MAY

- **"ABO blood groups: from basics to molecular genetics/genomics, enzymology, evolution and disease association"** Fumiichiro Yamamoto, Immunohematology and Glycobiology Group, IJC
- **"Next Generation Diagnosis in Leukemia"** Online Platform
- **"Insights in endothelial cell biology"** Mariona Graupera. Endothelial Pathobiology and Microenvironment Group, IJC
- **"Mechanisms of disease progression in chronic lymphocytic leukemia"** Francesc Bosch. Vall d'Hebron Institut d'Oncologia (VHIO)
- **"Liquid biopsies in lung cancer for improved patient outcomes"** Caroline Dive, Cancer Research UK Manchester Institute, United Kingdom

JUNE

- **"Clinical translation of AML genomics"** Jordi Esteve, Myeloid Neoplasms Group. IJC
- **"Tissue-specific and time-dependent mechanisms of metastasis"** Roger Gomis, Growth Control and Cancer Metastasis, IRBBarcelona.

SEPTEMBER

- **"PARPs and ADP-ribosylation in Cancer: From Nucleosomes to Ribosomes"** Lee Kraus. UT Southwestern Medical Center.
- **"Engineering human pluripotent stem cells to understand human development and disease"** Prof. Nuria Montserrat. Institute for Bioengineering of Catalonia (IBEC)

FACTS & FIGURES

TEACHING AND TRAINING

COURSES AND SEMINARS

OCTOBER

- **"Immune trafficking and the bone marrow"** Prof. Andrés Hidalgo, Centro Nacional de Investigaciones Cardiovasculares (CNIC)
- **"Understanding resistance and relapse in B cell malignancies: a tale of mutation, oxidation and senescence"** Prof. Salvador Macip. University of Leicester, UK and Universitat Oberta de Catalunya, Barcelona.
- **"Cytokines, Cell Crosstalk & Epigenetic Dysregulation in Immune Disease"** Prof. Esteban Ballestar, Epigenetics and Immune Disease Group, IJC.

NOVEMBER

- **"Different approaches to understand T-ALL chemotherapy resistance: a role for b-catenin"** Prof. Anna Bigas, Stem Cells and Cancer, Josep Carreras Institute
- **"Cancer Epigenetics: Concepts, Challenges and Therapeutic Opportunities"** Prof. Mark Dawson. Peter MacCallum Cancer Centre, Melbourne, Australia
- **"Mitochondrial dynamics in leukemia drug response and the acquisition of therapy resistance"** Prof. Iannis Aifantis. NYU School of Medicine
- **"Novel markers and prognostic factors in HIV-related lymphomas"** Prof. Tomàs Navarro, Lymphoid Neoplasms group, IJC

DECEMBER

- **"Transcriptional control of B cell development and associated malignancies"** Prof. Maribel Parra, Lymphocyte Development and Disease Group, IJC.
- **"Metabolic heterogeneity as a driver of stem cell fate and tumorigenesis"** Prof. Carlos Sebastian, Metabolic Dynamics in Cancer, UB
- **"The power of ONE: Immunology in the age of single cell genomics"** Prof. Ido Amit. Weizmann Institute of Science.

INSTITUTIONAL EVENTS

MANAGEMENT RETREAT
25TH NOVEMBER 2021

The Josep Carreras Institute's Management Retreat served to create a shared vision among all staff categories within the organization. At this retreat, which was held at the Masia Cal Riera, our management staff collaborated with colleagues, engaged in meaningful leadership activities and built management team excellence.

SCIENTIFIC RETREAT
27TH NOVEMBER 2021

The Institute's Scientific Retreat was held at the Montanyà Hotel & Lodgen, and participants talked about the past, present and future of the Josep Carreras Institute. It was the perfect opportunity for our researchers to share their insights about the work done during the year and gain a deeper knowledge of the projects of their closest colleagues.

FINANCIAL DATA

The Institute's pioneering mixed-funding model is partially financed by the Josep Carreras Foundation. It also receives core funding from the Catalan government and is reliant on competitive funding for its research activities.
In 2021, there was a **71,91%** increase in income from public funds and the provision of services.
With respect to spending, this increased by **74,95%** compared to the previous year.

	2020	2021	
INCOMES	**11.716.754**	**16.292.754**	**71,91%**
CONTRIBUTIONS FROM THE GENERALITAT	3.644.424	3.587.060	
OTHER TRANSFERS (FIJC)	870.000	750.000	
SERVICES	1.037.549	3.033.238	
PROJECT	5.109.269	7.417.512	
OVERHEADS	1.055.512	1.504.945	
OPERATIONAL EXPENSES	**10.755.270**	**14.349.820**	**74,95%**
STAFFING COSTS	3.806.854	4.026.115	
INFORMATION TECHNOLOGIES SERVICES	155.850	161.536	
COMMUNICATION	9.211	31.938	
BUILDING MAINTENANCE	720.273	949.738	
LABORATORIES MAINTENANCE	114.049	214.312	
RESEARCH SUPPORT	277.880	26.273	
PROJECT	5.109.269	7.846.698	
SCIENTIFIC-TECHNICAL SERVICES (Platforms)	197.975	363.967	
BIOBANK	15.308	16.565	
MANAGEMENT SUPPORT SERVICES	225.595	263.925	
OTHER	81.482	67.841	
VAT PRORATA	26.812	80.454	
EXPENDITURE ON INVESTMENTS PENDING ACTIVATION			
HERITAGE		2.342	
REIMBURSEMENT OF SUBSIDIES AND OTHER MANAGEMENT LOSSES	14.711	298.116	
RESULT OF THE ACTIVITY	**961.484**	**1.942.934**	
EXTRAORDINARY RESULT	**7.494**	**0**	
OPERATING INCOME	**968.978**	**1.942.934**	
FINANCIAL PERFORMANCE	**-39.386**	**-1.107.638**	
RESULT BEFORE AMORTIZATION	**929.592**	**835.296**	
Amortization	-1.468.728	-1.527.277	
RESULT	**-539.136**	**-691.982**	

Dr. Josep Maria Ribera

Dr. Manel Esteller

Dr. Laura Belver

Appointment

of **Dr. Josep Maria Ribera** as **Corresponding Academician of the Royal Academy of Medicine of Catalonia.** In the presentation, Dr. Ribera reviewed his academic and professional career in the field of acute lymphoblastic leukemia as a member of the Spanish Hematology Treatment Program (PETHEMA), and described the progress made in recent decades in the diagnosis and treatment of this disease, in both pediatric and adult patients.

Appointment

of **Dr. Manel Esteller** and **Dr. Laura Belver as International Members of the American Society of Hematology (ASH) by the vote of the Executive Committee**, the governing body of the Society. This affiliation is awarded to researchers outside of North America who have made significant contributions to the field of hematology.

Appointment

of **Dr. Manel Esteller** as a **member of the European Academy of Sciences,** for his important contributions to the Biomedical Sciences. Particularly due to his discoveries in the epigenetics of cancer, which have advanced the knowledge of this disease and opened the door to the application of new diagnostic tests and the development of new treatments for it.

Award

of the **Fernández-Cruz Award** for **Excellence in Biomedical Research,** from the Fernández-Cruz Foundation, to **Dr. Esteller.**

Recognition

of **Dr. Esteller** as **Highly Cited Researcher 2021 for Clarivate Web of Science.** Dr. Esteller received this honor for his work in Epigenetics, a field that studies all chemical modifications in biological material (DNA, RNA, and proteins) that, by regulating gene activity, provide cellular, tissue, and organic identity.

Award

of the **Narcís Monturiol Medal for scientific and technological merit from the Generalitat de Catalunya to researcher Manel Esteller**, director of the Josep Carreras Leukaemia Research Institute, and leader of the Cancer Epigenetics group. The research of Dr. Esteller has made it possible to understand the contribution of epigenetic alterations to human disease, especially cancer, and to develop biomarkers of it as well as new treatments.

COMPETITIVE GRANTS AWARDED AND ACTIVE PROJECTS

CANCER AND LEUKEMIA EPIGENETICS AND BIOLOGY PROGRAM (PEBCL)

1. Cancer Epigenetics

2019 European Commission, MSCA-RISE-2019 Marie Skłodowska-Curie Actions – Innovative Training Networks

PI: ESTELLER BADOSA, MANEL
Reference: 872391
Title: DevelOpmeNt of Cancer RNA TherapEutics
Period: 01/05/2020 - 30/04/2024

2019 Instituto de Salud Carlos III, Contratos Sara Borrell

PI: ESTELLER BADOSA, MANEL
Reference: CD19/00272
Title: Desarrollo de la isobutyl-deoxynyboquinone en Glioma Pontino Intrinseco Difuso: una oportunidad terapéutica en oncología pediátrica
Period: 15/03/2020 - 14/03/2023

2019 Fundación Privada Olga Torres, Beques de recerca postdoctorals

Researcher: JOSHI, RICKY
Title: Studying the Clinical Impact of the Epitranscriptome for Colorectal Cancer Initiation, Progression and Treatment
Period: 01/01/2020 - 31/12/2021

2018 Agència de Gestió d'Ajuts Universitaris i de Recerca, Ajuts per a la incorporació de personal investigador postdoctoral al sistema català de ciència i tecnologia

PI: ESTELLER BADOSA, MANEL
Reference: 2018 BP 00250
Title: Senescence as a key factor in leukemogenesis and bone marrow homeostasis in aging
Period: 03/12/2019 - 31/08/2021

2019 European Commission, H2020 - MSCA - IF-2019 Marie Skłodowska-Curie Actions - Individual Fellowship

PI: ESTELLER BADOSA, MANEL
Reference: 896403
Title: Senescence as a key factor in leukemogenesis and bone marrow homeostasis in aging
Period: 01/09/2021 - 31/08/2023

2016 Fundació La Marató de TV3, Marató 2016: Ictus i lesions medul·lars i cerebrals traumàtiques

PI: ESTELLER BADOSA, MANEL
Reference: 201711.31
Title: Proyecto EPIGENESIS: Estudio epigenético y genético combinado con integrómica de datos y análisis funcional para encontrar genes asociados con el deterioro neurológico después de un ictus isquémico

FACTS & FIGURES

COMPETITIVE GRANTS AWARDED AND ACTIVE PROJECTS

Period: 01/06/2019 - 31/12/2021

2018 Ministerio de Ciencia, Innovación y Universidades , Acciones de dinamización "Redes Investigación"

PI: ESTELLER BADOSA, MANEL

Reference: RED2018-102471-T

Title: Metalofármacos Multifuncionales para Diagnosis y Terapia

Period: 01/01/2020 - 31/12/2021

2018 Fundación Científica de la Asociación Española Contra el Cáncer, Accelerator Award 2018

PI: ESTELLER BADOSA, MANEL

Reference: A29372/GEACC19003CED

Title: PREDICT-Meso: PRE-malignant Drivers Combined with Target-Drug validation in Mesothelioma

Period: 01/04/2020 - 30/03/2025

2017 Fundación Científica de la Asociación Española Contra el Cáncer, Accelerator Award 2017

PI: ESTELLER BADOSA, MANEL

Reference: A26825/GEACC18004TAB

Title: ACRCelerate: Colorectal Cancer Stratified Medicine Network

Period: 02/08/2019 - 31/10/2023

2017 Fundación Científica de la Asociación Española Contra el Cáncer, Investigador AECC

PI: ESTELLER BADOSA, MANEL

Reference: INVES208DAVA

Title: EPINMUNE: Identificación de biomarcadores epigenéticos de predicción de respuesta a inmunoterapia

Period: 01/06/2019 - 30/11/2021

2018 Ministerio de Educación, Cultura y Deporte, Ayudas para la formación de profesorado universitario (FPU)

PI: ESTELLER BADOSA, MANEL

Reference: FPU2017-02423

Title: Epigenética y Epitranscriptómica del cáncer: el papel de las modificaciones del ARN en cáncer

Period: 01/07/2019 - 31/07/2022

2018 MINISTERIO DE CIENCIA INNOVACIÓN Y UNIVERSIDADES, Retos Investigación

PI: ESTELLER BADOSA, MANEL

Reference: RTI2018-094049-B-I00

Title: Epigenetic and Genetic Disruption of RNA Modifications in Cancer (EPIRNA)

Period: 01/01/2019 - 31/12/2021

2017 Agència de Gestió d'Ajuts Universitaris i de Recerca, Grups de Recerca de Catalunya (SGR)

PI: ESTELLER BADOSA, MANEL

Reference: 2017 SGR 1080

Title: Acreditación como "Grupo Consolidado Reconocido" al Grupo de Epigenética del Cáncer

Period: 01/01/2017 - 30/09/2021

2019 Ministerio de Ciencia, Innovación y Universidades , Retos Colaboración

PI: ESTELLER BADOSA, MANEL

Reference: RTC2019-006951-1

Title: Immunotherapeutic Approach to the Treatment of Non-Hodgkin Lymphoma Through Preclinical Development and First Clinical Trials of a Selective HDAC6 Inhibitor

Period: 01/01/2020 - 31/12/2022

2019 Ministerio de Ciencia, Innovación y Universidades , Ayudas para contratos predoctorales para la formación de doctores (FPI)

PI: ESTELLER BADOSA, MANEL

Reference: PRE2019-089958

Title: Disrupción epigenética y genética de las modificaciones del RNA en cáncer

Period: 01/08/2020 - 31/07/2024

2020 Instituto de Salud Carlos III, Infraestructura de Medicina de Precisión asociada a la Ciencia y Tecnología (IMPaCT)

PI: ESTELLER BADOSA, MANEL

Reference: IMP/00009

Title: Infraestructura de Medicina de Precisión asociada a la Ciencia y Tecnología

Period: 01/01/2021 - 31/12/2023

2021 Fundación Uno Entre Cien Mil , VIII Beca "Fundación Unoentrecienmil" 2021 para la investigación en el àrea de la leucèmia infantil

PI: ESTELLER BADOSA, MANEL

Title: B-ALL troubling epigenetic dysregulation might represent a new opportunity for therapy

Period: 15/07/2021 - 14/07/2023

2020 Ministerio de Universidades, Ayudas complementarias destinadas a beneficiarios de ayudas de Formación del Profesorado Universitario

Researcher: BUENO COSTA, ALBERTO

Reference: EST21/00361

Title: Estancia en el Well Cornell Medicine Center, Department of Pathology and Laboratory Medicine (Dr Dan Landau), de Nueva York

Period: 09/11/2021 - 10/01/2022

2021 Departament de Salut, Generalitat de Catalunya, Subvencions per a la contractació de Personal de Suport als Grups de recerca

PI: ESTELLER BADOSA, MANEL

Reference: SLT017/20/000218

Title: Contractació d'un tècnic especialista para realitzar protocols de seqüenciació de cél·lula única

Period: 19/07/2021 - 31/12/2023

2021 Fundació La Marató de TV3, Marató TV3: COVID-19

Researcher: FERRER AGUILAR, GERARDO

Reference: 202131-32

Title: Multisystemic inflammatory syndrome associated with COVID-19 in children (MIS-C): genetic, epigenetic and immunopathogenic bases

Period: 23/09/2021 - 22/09/2024

2020 Agència de Gestió d'Ajuts Universitaris i de Recerca, Ajuts a Doctorats Industrials

PI: ESTELLER BADOSA, MANEL

Reference: 2020 DI 20

Title: Novel algorithms for disruptive 3D microscopy data processing, visualization and analysis, using massive GPU parallelization and Artificial Intelligence (AI) applied to cancer epigenetics

Period: 01/11/2020 - 31/10/2023

2019 Departament de Salut, Generalitat de Catalunya, Fons Europeus desenvolupament 2019

PI: ESTELLER BADOSA, MANEL

Reference: IU16-016723

Title: Construcció, habilitació i adquisició d'equipaments d'edificacions singulars de recerca centrades en la cura de les leucèmies i d'altres hemopaties malignes

Period: 01/01/2018 - 31/03/2023

2021 IESE Business School, 2021 IESE Technology Transfer Group

Title: Creation of an independent, non-profit biomedical research center dedicated to the study of the human genome through the immortalization of lymphocytes.

Period: 01/09/2021 - 31/12/2021

2016 Instituto de Salud Carlos III, Incorporación de nuevas áreas temáticas y nuevos grupos CIBERR

PI: ESTELLER BADOSA, MANEL

Reference: CB16/12/00312

Title: Center for the Biomedical Research Network in Oncology

Period: 01/01/2017 - 31/12/2022

FACTS & FIGURES

COMPETITIVE GRANTS AWARDED AND ACTIVE PROJECTS

2. Cancer Genetics

2017 Agència de Gestió d'Ajuts Universitaris i de Recerca, Grups de Recerca de Catalunya (SGR)

PI: SANCHEZ CESPEDES, MONTSE
Reference: 2017 SGR 721
Title: Grup de Gens i Càncer, Grup de Recerca Consolidat
Period: 01/01/2017 - 30/09/2021

2019 Fundación Científica de la Asociación Española Contra el Cáncer, Investigador AECC

PI: SANCHEZ CESPEDES, MONTSE
Reference: INVES19045ROME
Title: The CESAR Therapeutic Strategy (Cancer Epigenetic Short-circuit Adapted Response)
Period: 01/12/2019 - 30/11/2023

2017 Ministerio de Ciencia, Innovación y Universidades , Programa Estatal de I+D+i Orientada a los Retos de la Sociedad

PI: SANCHEZ CESPEDES, MONTSE
Reference: SAF2017-82186-R
Title: Functional disection of the MYC/MAX and SWI/SNF pathways regulation to bost the design of novel epigenetic cancer therapeutics
Period: 01/06/2019 - 30/09/2021

2018 Ministerio de Ciencia, Innovación y Universidades , Ayudas para contratos predoctorales para la formacion de doctores (FPI)

PI: SANCHEZ CESPEDES, MONTSE
Reference: PRE2018-084624
Title: Disección funcional de las vias moleculares MYC/MAX y SWI/SNF para potenciar el desarrollo de nuevas terapias epigenéticas en cancer
Period: 01/05/2020 - 30/06/2023

2020 Agència de Gestió d'Ajuts Universitaris i de Recerca, Ajuts per a la contractació de personal investigador novell (FI-2021)

PI: SANCHEZ CESPEDES, MONTSE
Reference: 2021 FI_B 00315
Title: Inactivación genética de moléculas involucradas en represión transcripcional: análisis funcional y rol en el desarrollo del cáncer de pulmón
Period: 01/05/2021 - 30/04/2023

2020 Asociación Española de Afectados de Cáncer de Pulmón, Convocatorias Becas Dulce López – Fabrizio Faccchini

PI: SANCHEZ CESPEDES, MONTSE
Title: Disección de los mecanismos genéticos y moleculares subyacentes a la recaída a los tratamientos basados en inhibidores de RET en pacientes con cáncer de pulmón
Period: 01/01/2021 - 31/12/2021

2020 Ministerio de Ciencia e Innovación, Retos Investigación 2021

PI: SANCHEZ CESPEDES, MONTSE
Reference: PID2020-114541RB-I00
Title: Inactivation of molecules involved in transcriptional repression: functional analysis and role in lung cancer development. (TRARECAN)
Period: 01/09/2021 - 31/08/2024

2021 European Commission, Intellectual Property Booster 2021 - 1

PI: SANCHEZ CESPEDES, MONTSE
Title: KDM Subfamily 6 Protein Inhibitor for Use in the Treatment of Cancer
Period: 22/03/2021 - 22/06/2021

2021 Asociación para la Investigación del Cáncer de Pulmón en Mujeres, becas ICAPEM 2021 Pros Simón, Eva

Title: Disección de los mecanismos genéticos y moleculares de resistencia a los inhibidores tirosina quinasa en adenocarcinomas de pulmón de mujeres no fumadoras portadores de reordenamientos de ret
Period: 16/11/2021 - 31/12/2023

3. Chromatin Biology Laboratory

2019 European Commission, H2020 - MSCA - IF-2019 Marie Skłodowska-Curie Actions - Individual Fellowship

PI: VAQUERO GARCÍA, ALEJANDRO
Reference: 895979
Title: Mechanisms of Sirtuin-dependent regulation of immunity and leukemogenesis
Period: 01/12/2020 - 30/11/2022

2017 Worldwide Cancer Research, April 2017 grant round

PI: VAQUERO GARCÍA, ALEJANDRO
Reference: 18-0404
Title: Dissecting the specific contribution of Sirtuin ADP-ribosyltransferase and deacetylase activities in tumorigenesis
Period: 01/08/2019 - 31/10/2021

2017 Ministerio de Ciencia, Innovación y Universidades , Programa Estatal de I+D+i Orientada a los Retos de la Sociedad

PI: VAQUERO GARCÍA, ALEJANDRO
Reference: SAF2017-88975-R
Title: Protección de la estabilidad del genoma por sirtuinas en condiciones de estrés y sus implicaciones en cáncer y envejecimiento
Period: 01/06/2019 - 30/06/2021

2017 Agència de Gestió d'Ajuts Universitaris i de Recerca, Grups de Recerca de Catalunya (SGR)

PI: VAQUERO GARCÍA, ALEJANDRO
Reference: 2017 SGR 00148
Title: Grupo de Biología de la Cromatina, Grup de Recerca Consolidat
Period: 01/01/2017 - 30/09/2021

2020 Agència de Gestió d'Ajuts Universitaris i de Recerca, Ajuts per a la contractació de personal investigador novell per a l'any 2020. FI-DGR 2020

PI: VAQUERO GARCÍA, ALEJANDRO
Reference: 2020 FI_B 00293
Title: "Sirtuin-dependent protection of genome stability under stress and its implications in cancer and aging"
Period: 01/04/2020 - 31/03/2023

2020 Fundación Científica de la Asociación Española Contra el Cáncer, Proyectos Estratégicos AECC 2020

PI: VAQUERO GARCÍA, ALEJANDRO
Reference: PROYE20042VAQU
Title: Deciphering the role of SIRT7 in B-cell development and Leukemia formation
Period: 01/12/2020 - 30/11/2023

2018 Ministerio de Ciencia, Innovación y Universidades , Ayudas para contratos predoctorales para la formacion de doctores (FPI)

PI: VAQUERO GARCÍA, ALEJANDRO
Reference: PRE2018-084435
Title: Protección de la estabilidad del genoma por sirtuínas en condiciones de estrés y sus implicaciones en cáncer y envejecimiento
Period: 01/05/2020 - 31/08/2023

2020 Ministerio de Ciencia e Innovación, Retos Investigación 2021

PI: VAQUERO GARCÍA, ALEJANDRO
Reference: PID2020-117284RB-I00
Title: Role of Sirtuins in Epigenetic Regulation and Genome Integrity in Stress Response and their implication in Cancer and Aging (Sirepinome)
Period: 01/09/2021 - 31/08/2024

2020 European Commission, European Proteomics Infrastructure Consortium providing Access

PI: VAQUERO GARCÍA, ALEJANDRO
Title: Study of Sirtuins' enzymatic duality in cancer

FACTS & FIGURES

COMPETITIVE GRANTS AWARDED AND ACTIVE PROJECTS

Period: 01/03/2021 - 28/02/2022

2021 Deutsche Forschungsgemeinschaft, Walter Benjamin Abroad Fellowship 2021

PI: VAQUERO GARCÍA, ALEJANDRO

Reference: 493080688

Title: Role of the SIRT7/NPM pathway in lung cancer progression

Period: 01/11/2021 - 31/10/2023

4. Chromatin Metabolism and Cell Fate

2016 Instituto de Salud Carlos III, Proyectos integrados de excelencia

PI: BUSCHBECK, MARCUS

Reference: PIE16/00011

Title: Biomarkers and combinatorial drug targets for a personalized therapy for three major cancers.

Period: 01/01/2017 - 30/06/2021

2017 Agència de Gestió d'Ajuts Universitaris i de Recerca, Grups de Recerca de Catalunya (SGR)

PI: BUSCHBECK, MARCUS

Reference: 2017 SGR 00305

Title: Modalitat GRPRE (Pre-Consolidats). Chromatin, Metabolism and Cell Fate.

Period: 01/01/2017 - 30/09/2021

2018 MINISTERIO DE CIENCIA INNOVACIÓN Y UNIVERSIDADES, Retos Investigación

PI: BUSCHBECK, MARCUS

Reference: RTI2018-094005-B-I00

Title: Regulation of 3D chromatin architecture by histone variants and their metabolite binding capacity.

Period: 01/01/2019 - 30/09/2022

2019 Fundació La Marató de TV3, Marató 2019: Càncer

PI: BUSCHBECK, MARCUS

Reference: 201907

Title: Exploring and exploiting histone variants as drug targets in acute myeloid leukamia

Period: 20/01/2021 - 19/01/2024

2018 European Commission, COST Actions 2018

PI: BUSCHBECK, MARCUS

Reference: CA18127

Title: International Nucleome Consortium

Period: 13/05/2019 - 12/05/2023

2016 Ministerio de Ciencia, Innovación y Universidades , Ayudas para contratos predoctorales para la formacion de doctores (FPI)

PI: BUSCHBECK, MARCUS

Reference: BES-2016-077251

Title: MacroH2A histone variants link genome architecture to metabolism

Period: 18/04/2017 - 17/04/2021

2018 Deutsche José Carreras Leukämie Stiftung, Forshungsprojekte (R 18) 2018

PI: BUSCHBECK, MARCUS

Reference: DJCLS 14R/18

Title: Understanding and targeting epigenetic alterations in the hematopoietic stem cell niche for MDS therapy

Period: 01/05/2019 - 30/04/2022

2020 European Commission, H2020_MSCA_ ITN-2020 Marie Skłodowska-Curie Actions – Innovative Training Networks

PI: BUSCHBECK, MARCUS

Reference: 953407

Title: Exploring cell-to-cell heterogeneity and exploiting epigenetic regulation for the interception of myeloid disease cells.

Period: 01/01/2021 - 31/12/2024

2019 Ministerio de Ciencia, Innovación y Universidades , Ayudas para contratos predoctorales para la formacion de doctores (FPI)

PI: BUSCHBECK, MARCUS

Reference: PRE2019-088529

Title: Regulacion de la arquitectura tridimensional de la cromatina por parte de las variantes de histona macroh2a y su capacidad de unir metabolitos

Period: 01/10/2020 - 30/09/2024

2019 European Molecular Biology Organization, EMBO Workshop 2019

PI: BUSCHBECK, MARCUS

Reference: w20/08

Title: Physiology and functions of histone variants

Period: 22/09/2021 - 24/09/2021

2020 Deutsche José Carreras Leukämie Stiftung, Forshungsprojekte (R 20) 2020

PI: BUSCHBECK, MARCUS

5. 3D Chromatin Organization

2018 Fundació "La Caixa", "La Caixa" postdoctoral Fellowships Junior Leader - Incoming

PI: JAVIERRE MARTINEZ, BIOLA M

Reference: LCF/BQ/PI19/11690001

Title: Dynamic 3D Chromatin Organization in Human Hematopoiesis: revealing the contributions of non-coding genetic variants and mutations in blood malignancies with the aim of identifying novel disease-associated genes.

Period: 30/09/2019 - 29/09/2022

2018 MINISTERIO DE CIENCIA INNOVACIÓN Y UNIVERSIDADES, Retos Investigación

PI: JAVIERRE MARTINEZ, BIOLA M

Reference: RTI2018-094788-A-I00

Title: Dynamic 3D Chromatin Organization in Human Hematopoiesis: description of novel genes associated with hematopoiesis disorders.

Period: 30/09/2019 - 29/09/2022

2019 Agència de Gestió d'Ajuts Universitaris i de Recerca, Ajuts per a la contractació de personal investigador novell per a l'any 2019. FI-DGR 2019

PI: JAVIERRE MARTINEZ, BIOLA M

Reference: 2019 FI_B 00017

Title: Desxifrant noves dianes moleculars per a teràpies contra la leucèmia Limfoblàstica aguda infantil

Period: 01/04/2019 - 31/03/2022

2019 European Hematology Association, EHA Advanced Research Grant

PI: JAVIERRE MARTINEZ, BIOLA M

Reference: 4823998

Title: Dissecting the Role of Non-coding Genome in B-precursor Acute Lymphoblastic Leukemia under the THREE-DIMENTIONAL Genome Architecture Point of View

Period: 01/09/2021 - 31/08/2023

2019 Deutsche José Carreras Leukämie Stiftung, Forshungsprojekte (R 19) 2019

PI: JAVIERRE MARTINEZ, BIOLA M

Reference: DJCLS 08R/2019

Title: Deciphering the Oncogenic Role of the PRC1 Complexes through Integration of Functional and Spatial Genomics in Diffuse Large B-cell Lymphoma

Period: 01/09/2020 - 28/02/2023

FACTS & FIGURES

COMPETITIVE GRANTS AWARDED AND ACTIVE PROJECTS

2019 Ministerio de Ciencia, Innovación y Universidades , Ayudas para contratos predoctorales para la formacion de doctores (FPI)

PI: JAVIERRE MARTINEZ, BIOLA M

Reference: PRE2019-088005

Title: Organización dinámica 3D de la cromatina en la hematopoyesis humana: descripción de nuevos genes asociados a enfermedades hematológicas

Period: 01/08/2020 - 31/07/2024

2020 Wellcome LEAP Inc, Human Organs, Physiology, and Engineering (HOPE)

PI: JAVIERRE MARTINEZ, BIOLA M

Reference: HOPE-2021-2754490174

Title: Engineering human B cells: accelerating modelling of disease, drug screenings and translation of cancer immunotherapy

Period: 01/04/2021 - 31/03/2024

2021 Fundación Científica de la Asociación Española Contra el Cáncer, LAB AECC 2021

PI: JAVIERRE MARTINEZ, BIOLA M

Reference: LABAE21981JAVI

Title: Multi-omics approach to improve therapeutic management of T-cell acute lymphoblastic leukemia

Period: 01/04/2021 - 31/03/2024

6. Epigenetics and Immune Disease

2017 Ministerio de Ciencia, Innovación y Universidades , Programa Estatal de I+D+i Orientada a los Retos de la Sociedad

PI: BALLESTAR TARIN, ESTEBAN

Reference: SAF2017-88086-R

Title: Myeloid cells and Epigenetic Plasticity: Mechanisms and Implications in Autoimmune and other Inflammatory Processes

Period: 01/06/2019 - 30/09/2021

2017 Agència de Gestió d'Ajuts Universitaris i de Recerca, Grups de Recerca de Catalunya (SGR)

PI: BALLESTAR TARIN, ESTEBAN

Reference: 2017 SGR 00720

Title: Grup de Cromatina i Malaltia Grup de Recerca Consolidat

Period: 01/01/2017 - 30/09/2021

2019 Ministerio de Ciencia, Innovación y Universidades , Ayudas Juan de la Cierva - Formación 2019

PI: BALLESTAR TARIN, ESTEBAN

Reference: FJC2019-040868-I

Title: Unravelling the molecular mechanisms of CAR-T cell activation in vivo on B-ALL patients

Period: 01/01/2021 - 18/04/2022

2018 Ministerio de Ciencia, Innovación y Universidades , Ayudas para contratos predoctorales para la formacion de doctores (FPI)

PI: BALLESTAR TARIN, ESTEBAN

Reference: PRE2018-083544

Title: Células mieloides y plasticidad epigenética: Mecanismos e implicaciones en procesos autoinmunes e inflamatorios

Period: 01/05/2020 - 30/06/2023

2018 Instituto de Salud Carlos III, Acciones complementarias de programacion conjunta internacional

PI: BALLESTAR TARIN, ESTEBAN

Reference: AC18/00057

Title: Integrative Multi-Omics Analysis of Primary Antibody Deficiency (PAD) Patients for Stratification According to Cellular Pathways (E-RARE)

Period: 01/04/2019 - 31/12/2021

2017 Instituto de Salud Carlos III, Contratos predoctorales de formación en investigación en salud. Modalidad Contratos i-PFIS: doctorados IIS-empresa en ciencias y tecnologías de la salud

PI: BALLESTAR TARIN, ESTEBAN

Reference: IFI17/00034

Title: Papel de los glucocorticoides, y otros fármacos relacionados, en la remodelación epigenètica asociada a la adquisición telerogénesis en células mieloides: Implicaciones en el tratamiento de enfermedades autoinmunes.

Period: 15/01/2018 - 14/01/2022

2020 Ministerio de Ciencia e Innovación, Retos Investigación 2021

PI: BALLESTAR TARIN, ESTEBAN

Reference: PID2020-117212RB-I00

Title: Understanding the Role of Immune cell-cell Crosstalk in Epigenetic Dysregulation in Inflammation (InflaEpiTalk)

Period: 01/09/2021 - 31/08/2024

7. Lymphocyte Development and Disease

2017 Agència de Gestió d'Ajuts Universitaris i de Recerca, Grups de Recerca de Catalunya (SGR)

PI: PARRA BOLA, MARIA ISABEL

Reference: 2017 SGR 00149

Title: Grup de Diferenciació Cel·lular, Grup de Recerca Pre-Consolidat

Period: 01/01/2017 - 30/09/2021

2019 Ministerio de Ciencia e Innovación, Acciones de dinamización «Europa Investigación€

PI: PARRA BOLA, MARIA ISABEL

Reference: EUR2019-103835

Title: B cell differentiation; unraveling gene silencing mechanisms€

2017 Ministerio de Ciencia, Innovación y Universidades , Programa Estatal de I+D+i Orientada a los Retos de la Sociedad

PI: PARRA BOLA, MARIA ISABEL

Reference: SAF2017-87990-R

Title: Transcriptional repressive mechanisms in early and terminal B cell differentiation

Period: 01/06/2019 - 30/09/2021

2020 Fundación Científica de la Asociación Española Contra el Cáncer, Postdoctorales AECC 2020

PI: PARRA BOLA, MARIA ISABEL

Reference: POSTD20024DEBA

Title: Targeted Modulation of the Transcriptional Repressor Hdac7; towards Precision Medicine in MII-Af4-Rearranged Infant Pro-B-All

Period: 01/12/2020 - 30/11/2022

2020 Federation of European Biochemical Societies, Beques de curta durada de la Federation of European Biochemical Societies (FEBS)

Researcher: AZAGRA RODRIGUEZ, ALBA

Title: Towards personalized medicine in Diffuse Large B Cell Lymphoma (DLBCL) using 3D organoids

Period: 05/04/2021 - 04/06/2021

2018 Ministerio de Ciencia, Innovación y Universidades , Ayudas para contratos predoctorales para la formacion de doctores (FPI)

PI: PARRA BOLA, MARIA ISABEL

COMPETITIVE GRANTS AWARDED AND ACTIVE PROJECTS

Reference: PRE2018-083183
Title: Mecanismos de represión transcripcional en la diferenciación temprana y terminal de linfocitos B
Period: 01/05/2020 - 30/06/2023

2021 European Commission, Intellectual Property Booster 2021 - 2

PI: PARRA BOLA, MARIA ISABEL
Title: Mechanisms of transcriptional repression in early and terminal B cell differentiation (HDAC7-BLYM)
Period: 07/06/2021 - 22/09/2021

8. Regulatory Genomics

2019 Ministerio de Ciencia, Innovación y Universidades , Generación del Conocimiento

PI: VAVOURI, TANYA SOULTANA
Reference: PID2019-111676GB-I00
Title: Evolution of new PIWI-interacting RNAs in a mammal (ASliceOfPi)
Period: 01/06/2020 - 31/05/2023

9. Regulatory RNA and Chromatin

2017 Agència de Gestió d'Ajuts Universitaris i de Recerca, Grups de Recerca de Catalunya (SGR)

PI: GUIL DOMÈNECH, SÒNIA
Reference: 2017 SGR 00722
Title: RNA regulador i cromatina, Grup de Recerca Consolidat
Period: 01/01/2017 - 30/09/2021

2019 Ministerio de Ciencia, Innovación y Universidades , Retos Investigación

PI: GUIL DOMÈNECH, SÒNIA
Reference: PID2019-111658RB-I00
Title: Pseudogenes as long noncoding oncofetal RNAs: functional characterization and implications for anticancer therapy.
Period: 01/06/2020 - 31/05/2023

2020 Sarcoma Foundation of America, 2020 Funding Opportunity Announcement

PI: GUIL DOMÈNECH, SÒNIA
Reference: SFA20-06
Title: The Role of Pseudogenes as Regulators of the Igf2bp2/Igf1r/Ras Axis in Rhabdomyosarcoma: Functional Characterization in Myogenesis and Implications for Anticancer Therapy
Period: 01/07/2020 - 31/12/2021

2017 Instituto de Salud Carlos III, Contratos predoctorales de formación en investigación en salud. Modalidad Contratos i-PFIS: doctorados IIS-empresa en ciencias y tecnologías de la salud

PI: GUIL DOMÈNECH, SÒNIA
Reference: IFI17/00006
Title: Development of new personalized treatments against non Hodgkin lymphoma based on the inhibition of the epigenetic target HDAC6 and the obtention of new biomarkers for this target. Regeneración hematopoyética a partir de células madre pluripotentes.
Period: 01/01/2018 - 31/12/2021

10. Epigenetic Control of Hematopoiesis

2019 Worldwide Cancer Research, April 2019 grant round

PI: SARDINA ORTEGA, JOSÉ LUIS
Reference: 20-0269
Title: Uncovering the regulation of chromatin structure by TET2 during leukemic cell fate decisions
Period: 01/03/2020 - 28/02/2023

2019 Instituto de Salud Carlos III, Contratos Miguel Servet - Tipo 1

PI: SARDINA ORTEGA, JOSÉ LUIS
Reference: MS19/00176
Title: Role of TET2 in chromatin structure regulation during the onset and development of mieloid malignancies
Period: 01/01/2020 - 31/12/2024

2019 Ministerio de Ciencia, Innovación y Universidades , Retos Investigación

PI: SARDINA ORTEGA, JOSÉ LUIS
Reference: PID2019-111243RA-I00
Title: Unveiling TET2 impact on chromatin structure at the leukemic onset
Period: 01/06/2020 - 31/05/2023

2020 Ministerio de Ciencia, Innovación y Universidades , Ayudas para contratos predoctorales en el marco del Plan Estatal de I+D+i (FPI)

PI: SARDINA ORTEGA, JOSÉ LUIS
Reference: PRE2020-093881
Title: Descifrando el impacto de tet2 sobre la estructura de la cromatina en el inicio leucemico
Period: 01/08/2021 - 31/07/2025

11. Transcriptional Dynamics in Leukemia

2019 Jerome Lejeune Foundation, Cycle 2019b-Down syndrome research

PI: CUARTERO BETRIU, SERGI
Reference: #1902
Title: Myeloid leukemia in Down syndrome: exploring the interplay between transcriptional regulation and immune signalling
Period: 01/04/2020 - 06/01/2023

2020 Leukemia Research Foundation, Hollis Brownstein Research Grants Program

PI: CUARTERO BETRIU, SERGI
Reference: 02/2020
Title: Identifying novel transcriptional vulnerabilities in MDS with cohesin mutations
Period: 01/09/2020 - 31/12/2021

2019 Fundació ""La Caixa"", Junior Leader 2020

PI: CUARTERO BETRIU, SERGI
Reference: LCF/BQ/PI20/11760002
Title: The role of inflammation in myeloid malignancies
Period: 01/09/2020 - 31/08/2023

2020 Ministerio de Ciencia e Innovación, Retos Investigación 2021

PI: CUARTERO BETRIU, SERGI
Reference: PID2020-117950RA-I00
Title: Deciphering the role of cohesin mutations and the 3D genome structure in myeloid leukemia (MYELO-3D)
Period: 01/09/2021 - 31/08/2024

12. Cancer Immunogenomics

2020 Fundación Científica de la Asociación Española Contra el Cáncer, LAB AECC 2020

PI: PORTA PARDO, EDUARD
Reference: LABAE20038PORT
Title: A cellular and molecular map of bladder cancer to guide neoadjuvant treatment
Period: 01/12/2020 - 30/11/2023

FACTS & FIGURES

COMPETITIVE GRANTS AWARDED AND ACTIVE PROJECTS

2019 Ministerio de Ciencia, Innovación y Universidades , Subprograma de ayudas para contratos Ramon y Cajal
PI: PORTA PARDO, EDUARD
Reference: RYC2019-026415-I
Title: RYC Eduard Porta
Period: 01/09/2021 - 31/08/2026

13. Cancer Heterogeneity and Hierarchies

2018 Ministerio de Economia y Competitividad, Ramón y Cajal
PI: RODILLA BENITO, VERÓNICA
Reference: RYC2018-024099-I
Title: In vivo models to study cellular hierarchies and cancer
Period: 01/05/2020 - 30/04/2025

2020 Ministerio de Ciencia e Innovación, Retos Investigación 2021
PI: RODILLA BENITO, VERÓNICA
Reference: PID2020-114647RA-I00
Title: Lineage tracing studies to unravel mammary epithelial hierarchies and cellular plasticity in breast cancer
Period: 01/09/2021 - 31/08/2024

2020 Asociación Española de investigación sobre el Cáncer , ASEICA
PI: RODILLA BENITO, VERÓNICA
Reference: AJT-PRJ2100397
Title: Monitoring senescence upon chemotherapy (MonSen)
Period: 01/12/2020 - 31/05/2022

2021 Departament de Salut, Generalitat de Catalunya, Subvencions per a la contractació de personal investigador en formació (PIF-SALUT)
PI: RODILLA BENITO, VERÓNICA
Reference: SLT017/20/000140
Title: Estudis clonals per entendre les jerarquies i plasticitat c
el·lular en el càncer de mama
Period: 15/07/2021 - 31/12/2024

2021 Fundación de Investigación Oncológica, III PROYECTO FERO-GHD en Cáncer de Mama 2021
PI: RODILLA BENITO, VERÓNICA
Reference: PFERO2021.01
Title: Tumor heterogeneity comprehension for an improved diagnosis and treatment choice for breast cancer
Period: 01/06/2021 - 31/05/2023

2021 Fundación Científica de la Asociación Española Contra el Cáncer, LAB AECC 2021
PI: RODILLA BENITO, VERÓNICA
Reference: LABAE211626RODI
Title: Tumor heterogeneity comprehension for an improved diagnosis and treatment choice for breast cancer.
Period: 01/12/2021 - 30/11/2024

14. Leukemia and Immuno-Oncology

2020 Fundación Fero, BECA FERO EN INVESTIGACIÓN ONCOLÓGICA TRASLACIONAL 2020
PI: BELVER MIGUEL, LAURA
Reference: BFERO2020.03
Title: Molecular pathways and targeted therapies in Juvenile Myelomonocytic Leukemia
Period: 01/12/2020 - 30/11/2022

2020 Govern d'Andorra, Ajuts de tercer cicle de l'any 2020 - Modalitat 1 - Nous ajuts
PI: BELVER MIGUEL, LAURA
Reference: AJT-PRS2000176
Title: Oncogenic mechanisms and target therapiesin JMML
Period: 02/01/2021 - 01/01/2024

2020 Ministerio de Ciencia e Innovación, Retos Investigación 2021
PI: BELVER MIGUEL, LAURA
Reference: PID2020-117645RA-I00
Title: Functional impact of enhancer-associated noncoding mutations in Juvenile Myelomonocytic Leukemia (JMML_ENH)
Period: 01/09/2021 - 31/08/2024

15. Cellular Systems Genomics

2019 Ministerio de Ciencia, Innovación y Universidades , Ayudas Juan de la Cierva - Incorporación 2019
PI: MEREU, ELISABETTA
Reference: IJC2019-041346-I
Title: Juan de la Cierva Inc_Elisabetta Mereu
Period: 01/05/2021 - 30/04/2024

16. Endothelial Pathobiology and Microenvironment

2020 European Commission, H2020_MSCA_ITN-2020 Marie Skłodowska-Curie Actions – Innovative Training Networks
PI: GRAUPERA GARCIA - MILA, MARIONA
Reference: 955951
Title: Deconstructing the evolution of metastasis
Period: 01/03/2021 - 28/02/2025

2020 Worldwide Cancer Research, March 2020 grant round
PI: GRAUPERA GARCIA - MILA, MARIONA
Reference: 21-0159
Title: Identifying properties of tumor suppressive pericytes for cancer therapy
Period: 01/03/2021 - 31/08/2024

2021 Fundació ""La Caixa"", Immunoepigenetics Research Program
PI: GRAUPERA GARCIA - MILA, MARIONA
Title: Estudi de l'activació de la via de la PI3K en malformacions vasculars oncogèniques
Period: 01/03/2021 - 30/06/2022

2019 Fundació ""La Caixa"", Junior Leader 2020
PI: GRAUPERA GARCIA - MILA, MARIONA
Reference: LCF/BQ/PR20/1177002
Title: Pathogenic and pharmacologic study of cutaneous capillary malformations and Sturge-Weber syndrome
Period: 01/03/2021 - 29/12/2023

2019 European Molecular Biology Organization, EMBO Workshop 2019
PI: GRAUPERA GARCIA - MILA, MARIONA
Reference: w20/44
Title: Vascular malformations: From fundamental biology to therapeutic opportunities
Period: 06/10/2021 - 08/10/2021

2021 Cloves Syndrome Community, 2021 Research Grant Program
Researcher: ANGULO URARTE, ANA
Title: Identifying the molecular impact of PIK3CA variants in PROS towards stratification of patients and personalized medicine.
Period: 01/09/2021 - 31/08/2022

FACTS & FIGURES

COMPETITIVE GRANTS AWARDED AND ACTIVE PROJECTS

2020 European Commission, H2020_MSCA_ITN-2020 Marie Skłodowska-Curie Actions – Innovative Training Networks

PI: GRAUPERA GARCIA - MILA, MARIONA

Reference: 955534

Title: IPI3K/PTEN-related monogenic disease to understand cancer

Period: 01/07/2021 - 30/06/2025

2019 PTEN Research Foundation, 2020 call

PI: GRAUPERA GARCIA - MILA, MARIONA

Reference: IJC-21-001

Title: Preclinical investigation of vascular malformations in PTEN hamartoma tumor syndrome

Period: 01/05/2021 - 01/08/2024

2019 Fundación BBVA, Ayudas Fundación BBVA Equipos de Investigación Científica 2019

PI: GRAUPERA GARCIA - MILA, MARIONA

Reference: PR(19)BIO_MET_0061

Title: Endothelial molecular alterations induced by excessive energy intake - a new concept in obesity and metabolic disorders

Period: 01/02/2021 - 30/04/2023

2018 Fundación Científica de la Asociación Española Contra el Cáncer, GRUPOS TRASLACIONALES AECC

PI: GRAUPERA GARCIA - MILA, MARIONA

Reference: GCTRA18006CARR

Title: Vulnerabilities of Tumor and Stroma Interactions in Castration-Naïve Metastatic Prostate Cancer

Period: 01/04/2021 - 30/09/2023

2019 Agència de Gestió d'Ajuts Universitaris i de Recerca, Ajuts per a la contractació de personal investigador novell per a l'any 2019. FI-DGR 2019

PI: GRAUPERA GARCIA - MILA, MARIONA

Reference: 2021 FI_B1 00219

Title: Estudi patogènic i farmacològic de les malformacions capil·lars cutànies i del síndrome Struge-Weber

Period: 01/05/2021 - 30/04/2023

2020 Fundació ""La Caixa"", Health Research 2021

PI: GRAUPERA GARCIA - MILA, MARIONA

Reference: HR21-00046

Title: Decoding the paracrine control of metabolic fitness by endothelial nutrient signaling

Period: 01/12/2021 - 30/11/2024

2021 Fundación Científica de la Asociación Española Contra el Cáncer, Investigador AECC

PI: GRAUPERA GARCIA - MILA, MARIONA

Reference: INVES211084VILL

Title: Mapping stromal molecular programs that govern tumor aggressiveness in Prostate Cancer

Period: 01/07/2021 - 30/06/2023

2018 Fundació ""La Caixa"", Health Research 2018

PI: GRAUPERA GARCIA - MILA, MARIONA

Reference: HR18-00120

Title: Mapping the pathogenesis of vascular malformations

Period: 01/03/2021 - 01/11/2022

2020 Ministerio de Ciencia e Innovación, Retos Investigación 2021

PI: GRAUPERA GARCIA - MILA, MARIONA

Reference: PID2020-116184RB-I00

Title: PIK3CA variants in PROS: cracking the Code of pathogenesis

Period: 01/09/2021 - 31/08/2024

2018 Ministerio de Ciencia, Innovación y Universidades , Ayudas para contratos predoctorales para la formacion de doctores (FPI)

PI: GRAUPERA GARCIA - MILA, MARIONA

Reference: PRE2018-084283

Period: 01/11/2021 - 30/06/2023

17. T-Cell Lymphoma

2020 Ministerio de Ciencia e Innovación, Retos Investigación 2021

PI: MONDRAGÓN MARTÍNEZ, LAURA

Reference: PID2020-116049RA-I00

Title: Role of Apaf-1 IN tcr- thymoCytes maturatiOn and lymphomA developmenT - RAINCOAT

Period: 01/09/2021 - 31/08/2024

2019 Ministerio de Ciencia, Innovación y Universidades , Subprograma de ayudas para contratos Ramon y Cajal

PI: MONDRAGÓN MARTÍNEZ, LAURA

Reference: RYC2019-026522-I

Period: 01/04/2021 - 31/03/2026

18. Acute Lymphoblastic Leukemia (ALL)

2017 Agència de Gestió d'Ajuts Universitaris i de Recerca, Ajuts per a la contractació de personal investigador novell per a l'any 2018. FI-DGR 2018

Researcher: GENESCÀ FERRER, EULÀLIA

Reference: 2018 FI_B 00970, 2019 FI_B100224, 2020 FI_B2 00210

Title: Estudio de la resistencia al tratamiento en la leucemia linfoblástica aguda de subtipo T (LAL-T) del adulto. Búsqueda de nuevas alternativas terapéuticas

Period: 01/06/2018 - 30/10/2021

2019 Instituto de Salud Carlos III, Proyectos de investigacion en Salud

Researcher: GENESCÀ FERRER, EULÀLIA

Reference: PI19/01828

Title: Use of Next Generation Sequencing (NGS) as a unique genomic technique to apply to improve diagnosis, prognosis and treatment of adult T-cell Acute Lymphoblastic Leukemia patients

Period: 01/01/2020 - 31/12/2022

2016 Fundación Científica de la Asociación Española Contra el Cáncer, Grupos Coordinados Estables de Investigación

PI: RIBERA SANTASUSANA, JOSEP MARIA

Reference: GC16173697BIGA

Title: Exploring Mechanisms of Resistance in Adult and Pediatric T-Acute Lymphoblastic Leukemia

Period: 01/11/2016 - 31/10/2022

2015 European Commission, H2020 JTI-IMI2 2015-06

PI: RIBERA SANTASUSANA, JOSEP MARIA

Reference: 116026

Title: Healthcare Alliance for Resourceful Medicines Offensive against Neoplasms in hematology

Period: 01/01/2017 - 30/06/2023

2019 European Commission, IMI2-2019-19-01

PI: RIBERA SANTASUSANA, JOSEP MARIA

Reference: 945406

Title: Healthcare Alliance for Resourceful Medicines Offensive against Neoplasms in Hematology - PLUS

Period: 01/10/2020 - 30/09/2023

FACTS & FIGURES

COMPETITIVE GRANTS AWARDED AND ACTIVE PROJECTS

EXPERIMENTAL AND CLINICAL HEMATOLOGY PROGRAM (PHEC)

19. Barcelona Endothelium Team (BET)

2019 Deutsche José Carreras Leukämie Stiftung, Forshungsprojekte (R 19) 2019

PI: CARRERAS PONS, ENRIC

Reference: DJCLS 03R/2019

Title: Enhancement of endothelial regeneration and endothelial function during GVHD

Period: 01/01/2020 - 30/04/2022

2020 Fundació La Marató de TV3, Malalties Minoritàries

Researcher: PALOMO DE UDAETA, MARTA

Reference: 202026-10

Title: Analysis of the complement systema as therapeutical target in severe pre-eclampsia and hellp syndrome

Period: 19/03/2021 - 18/03/2024

20. Myeloid Neoplasms

2016 Instituto de Salud Carlos III, Proyectos de investigacion en Salud

PI: ZAMORA PLANA, LURDES

Reference: PI16/01200

Title: Biological predictive factors for achieving deep molecular response and relapse after tyrosine kinase inhibitor discontinuation in patients with Chronic Myeloid Leukemia

Period: 01/01/2017 - 30/09/2021

21. Leukemia Stem Cell Group

2019 Fundació La Marató de TV3, Marató 2019: Càncer

PI: MUÑOZ RISUEÑO, RUTH

Reference: 201930-30

Title: Lysosomal impairment-based therapeutic approach for leukemia

Period: 30/07/2020 - 29/07/2023

2019 Agència de Gestió d'Ajuts Universitaris i de Recerca, Ajuts destinats a l'obtenció de prototipus i a la valorització i transferència dels resultats d'investigació generada per equips de recerca de Catalunya (PRODUCTE)

PI: MUÑOZ RISUEÑO, RUTH

Reference: 2019PROD00031

Title: Teràpies basades en CADs com a nou mecanisme autofàgic per a leucèmia

Period: 23/07/2020 - 22/04/2022

2016 Deutsche José Carreras Leukämie Stiftung, Forshungsprojekte (R 17) 2017

PI: MUÑOZ RISUEÑO, RUTH

Reference: DJCLS08/R2017

Title: CARs for Treatment of Pediatric T-Cell Acute Lymphoblastic Leukemia

Period: 08/08/2017 - 31/10/2021

2019 Ministerio de Ciencia, Innovación y Universidades , Retos Investigación

PI: MUÑOZ RISUEÑO, RUTH

Reference: PID2019-111348RB-I00

Title: Chemosensitizers as a new therapeutic approach for acute myeloid leukemia (ChemoLeuko)

Period: 01/06/2020 - 31/05/2023

22. Lymphoid Neoplasms

2019 Instituto de Salud Carlos III, Proyectos de investigacion en Salud

PI: NAVARRO FERRANDO, JOSE TOMAS

Reference: PI19/01588

Title: Comprehensive epigenomic analysis of plasmablastic lymphoma: Identifying epigenetic features to improve diagnosis and patient outcomes

Period: 01/01/2020 - 31/12/2022

2019 Gilead Sciences, SL, 7ª Convocatoria de Becas Gilead a la investigación Biomédica en VIH, Enfermedades hepáticas y Hemato-oncología

PI: NAVARRO FERRANDO, JOSE TOMAS

Reference: GLD19_00121

Title: Disclosing the transcriptome of HIV-DLBCL for targeted therapy

Period: 01/01/2020 - 31/12/2021

23. Myelodysplastic Syndromes

2017 Agència de Gestió d'Ajuts Universitaris i de Recerca, Grups de Recerca de Catalunya (SGR)

PI: SOLE RISTOL, FRANCESC

Reference: 2017 SGR 00288

Title: Modalitat GRC (Reconegut i Consolidat).

Period: 01/01/2017 - 30/09/2021

2018 Instituto de Salud Carlos III, Acciones complementarias de programacion conjunta internacional

PI: SOLE RISTOL, FRANCESC

Reference: AC18/00002

Title: An integrated European platform to conduct translational studies in myelodysplastic syndromes based on the EuroBloodNet infrastructure

Period: 01/01/2019 - 31/12/2021

2017 Instituto de Salud Carlos III, Proyectos de investigacion en Salud

PI: SOLE RISTOL, FRANCESC

Reference: PI17/00575

Title: Aplicación de la secuenciación masiva (NGS) en el diagnóstico y pronóstico de síndromes mielodisplasicos/neoplasias mieloproliferativas.

Period: 01/01/2018 - 30/06/2022

2018 Fundación Científica de la Asociación Española Contra el Cáncer, Ayudas a proyectos de investigacion en cáncer TRANSCAN (Translational Research on Rare Cancers)

PI: SOLE RISTOL, FRANCESC

Reference: TRNSC18003SOL

Title: An integrated European platform to conduct translational studies in myelodysplastic syndromes based on the EuroBloodNet infrastructure

Period: 01/12/2018 - 31/03/2022

FACTS & FIGURES

COMPETITIVE GRANTS AWARDED AND ACTIVE PROJECTS

2020 Instituto de Salud Carlos III, Proyectos de investigación en Salud (FIS)

PI: SOLE RISTOL, FRANCESC

Reference: PI20/00531

Title: Caracterización genética de las neoplasias mieloides asociadas a tratamiento (Therapy related myeloid neoplasms, TRMN)

Period: 01/01/2021 - 31/12/2023

2020 Deutsche José Carreras Leukämie Stiftung, Forshungsprojekte (R 20) 2020

PI: SOLE RISTOL, FRANCESC

Reference: DJCLS 01R/2021

Title: Dissecting the mechanisms of clonal expansion in del(5q) myelodysplastic syndrome to selectively target the disease-initiating hematopoietic stem cells

Period: 01/10/2021 - 30/09/2024

22. Stem Cell Biology, developmental leukemia and immunotherapy

2017 Agència de Gestió d'Ajuts Universitaris i de Recerca, Grups de Recerca de Catalunya (SGR)

PI: MENÉNDEZ BUJÁN, PABLO

Reference: 2017 SGR 00221

Title: Modalitat GRC (Consolidat). Concedit a IJC

Period: 01/01/2017 - 30/09/2021

2017 Ministerio de Economia y Competitividad, Retos-Colaboracion

PI: MENÉNDEZ BUJÁN, PABLO

Reference: RTC-2017-6367-1

Title: Obtención de hematíes in vitro a partir de IPSCs de donantes con fenotipos eritrocitarios seleccionados y optimizados mediante edición genómica, como alternativa a los paneles de hematíes actuales

Period: 01/09/2018 - 31/03/2022

2018 European Commission, H2020-SC1-BHC-2018-2020 (Topics 2018)

PI: MENÉNDEZ BUJÁN, PABLO

Reference: 825749

Title: Childhood Leukemia: Overcoming distance between South America and Europe Regions

Period: 01/01/2019 - 31/12/2023

2017 Ministerio de Economia y Competitividad, Ayudas Juan de la Cierva - Incorporación 2017

PI: MENÉNDEZ BUJÁN, PABLO

Reference: IJCI-2017-33172

Title: Recreación de traslocaciones cromosómicas asociadas a leucemia pediatrica en progenitores humanos

Period: 01/02/2019 - 16/01/2022

2019 Fundación Científica de la Asociación Española Contra el Cáncer, Ideas Semilla AECC

PI: MENÉNDEZ BUJÁN, PABLO

Reference: IDEAS19005MENE

Title: Redirecting CAR T-Cells to the Bone Marrow: Improved CAR T-Cell Persistence and Anti-Leukemia Effects while Alleviating related Toxicity

Period: 01/10/2019 - 30/09/2021

2018 Fundació "La Caixa", Health Research 2018

PI: MENÉNDEZ BUJÁN, PABLO

Reference: HR18-00069

Title: Next-generation CAR-DOT cells for allogeneic adoptive cancer immunotherapy

Period: 15/09/2019 - 31/12/2022

2019 Instituto de Salud Carlos III, Contratos Sara Borrell

PI: MENÉNDEZ BUJÁN, PABLO

Reference: CD19/00013

Title: Towards a clinical Translation of the CD1A-directed car for relapse/refractory cortical T-cell acute Leukemia and Langerhans cell histiocytosis: Feasibility, efficacy and Safety

Period: 01/01/2020 - 31/12/2022

2014 European Commission, ERC-2014-CoG

PI: MENÉNDEZ BUJÁN, PABLO

Reference: 646903

Title: Genomic, cellular and developmental reconstruction of infant MLL-AF4+ Acute Lymphoblastic Leukemia

Period: 01/01/2016 - 30/06/2021

2017 European Cooperation in Science and Technology (COST), COST Actions 2017

PI: MENÉNDEZ BUJÁN, PABLO

Reference: CA16223

Title: Leukemia GENe Discovery by data sharing, mining and collaboration

Period: 26/10/2017 - 25/10/2021

2020 European Commission, Proof of Concept Grants 2020 (ERC-2020-PoC)

PI: MENÉNDEZ BUJÁN, PABLO

Reference: 957466

Title: Clinical translation of a novel CD1a-directed CAR for relapse/refractory cortical T-cell Acute Lymphoblastic Leukemia: feasibility, efficacy and safety

Period: 01/01/2021 - 30/06/2022

2019 Deutsche José Carreras Leukämie Stiftung, Forshungsprojekte (R 19) 2019

PI: MENÉNDEZ BUJÁN, PABLO

Reference: 19R2019

Title: Healthy Versus Non-Healthy Aging: Identifying Metabolic and Epigenetic Vulnerabilities of Single Leukemic Stem Cells in Acute Myeloid Leukemia Patients

Period: 01/01/2021 - 31/12/2022

2020 Instituto de Salud Carlos III, Proyectos de investigación en Salud (FIS)

Researcher: BUENO UROZ, CLARA

Reference: PI20/00822

Title: TIM3, una nueva y prometedora diana inmunoterapéutica en lla-b de novo y en recaída

Period: 01/01/2021 - 31/12/2023

2019 Fundación Uno Entre Cien Mil , VI Beca Unoentrecienmil. Fundación para la investigación en el área de la leucemia aguda infantil del 2019

PI: MENÉNDEZ BUJÁN, PABLO

Reference: 1entre100mil

Title: Towards a clinical translation of the CD1a-directed CAR for relapse/refractory cortical T-cell Acute Lymphoblastic Leukemia and Langerhans Cell Histioscytosis: feasibility, efficacy and safety

Period: 01/06/2019 - 31/05/2021

2020 Fundación Científica de la Asociación Española Contra el Cáncer, Investigador AECC 2020

Researcher: BUENO UROZ, CLARA

Reference: INVES20011LÓPE

Title: Innovative Therapeutic Strategies for Infant Mixed Lineage Leukemiarearranged B-cell Acute Lymphoblastic Leukemia: NG2 and CD22 as therapeutic targets

Period: 01/09/2020 - 31/08/2022

2019 Ministerio de Ciencia, Innovación y Universidades , Retos Investigación

PI: MENÉNDEZ BUJÁN, PABLO

Reference: PID2019-108160RB-I00

Title: IM3, a promising novel immunotherapeutic target for de novo and relapsed B-cell acute lymphoblastic leukemia

Period: 01/06/2020 - 31/05/2023

2019 Ministerio de Universidades, Ayudas para la formación de profesorado universitario (FPU)

PI: MENÉNDEZ BUJÁN, PABLO

Reference: FPU19/00039

Title: Explorando células efectoras alogénicas para inmunoterapia en leucemia aguda

Period: 01/11/2020 - 31/03/2024

2021 Fundación Científica de la Asociación Española Contra el Cáncer, Investigador AECC

PI: MENÉNDEZ BUJÁN, PABLO

Reference: INVES211226MOLI

Title: Contribution of chromosome instability to the outcome of aneuploid childhood B-cell acute

FACTS & FIGURES

COMPETITIVE GRANTS AWARDED AND ACTIVE PROJECTS

lymphoblastic leukemia.
Period: 01/12/2021 - 30/11/2023

2021 Fundación Científica de la Asociación Española Contra el Cáncer, Proyectos generales AECC
Researcher:BUENO UROZ, CLARA
Reference: PRYGN211192BUEN
Title: Next Generation Universal T-cell Redirected ImmunoTherapy for Acute Leukemia
Period: 01/12/2021 - 30/11/2024

2021 Fundación Científica de la Asociación Española Contra el Cáncer, PRÁCTICAS VERANO AECC
PI: MENÉNDEZ BUJÁN, PABLO
Reference: PPLAB211825BURG
Title: Prácticas Laboratorio Verano AECC 2021 FRANCISCO JAVIER BURGOS RETAMAR
Period: 01/07/2021 - 31/08/2021

2021 Fundació "La Caixa", CaixaImpulse Validate 2021
PI: MENÉNDEZ BUJÁN, PABLO
Reference: LCF/PR/HR18/00069
Title: Tailored adoptive CAR T-cell Immunotherapy for Ewing Sarcoma
Period: 16/06/2021 - 16/06/2023

2021 Ministerio de Ciencia e Innovación, Proyectos de I+D+i en líneas estratégicas, en colaboración público-privada 2021
Researcher:BUENO UROZ, CLARA
Reference: PLEC2021-007518
Title: Recreating the Embryonic Niche for Hematopoietic Stem Cell Production and Derivatives in Human Gastruloids
Period: 01/12/2021 - 30/11/2024

2020 Ministerio de Ciencia, Innovación y Universidades , Ayudas para contratos predoctorales en el marco del Plan Estatal de I+D+i (FPI)
PI: MENÉNDEZ BUJÁN, PABLO
Reference: PRE2020-092778
Title: TIM3, una nueva y prometedora diana inmunoterapeutica en leucemia linfoblastica aguda bde novo y en recaida
Period: 01/08/2021 - 31/07/2025

23. Lymphoma Translational Group

2019 INTERREG POCTEFA, 3ª convocatoria de proyectos POCTEFA 2014-2020
PI: ROUÉ, GAËL
Reference: EFA360/19
Title: Red cooperativa franco-española para el análisis de proteinopatías y el desarrollo de terapias individualizadas en cánceres hematológicos
Period: 01/06/2019 - 31/05/2022

019 Gilead Sciences, SL, 7ª Convocatoria de Becas Gilead a la investigación Biomédica en VIH, Enfermedades hepáticas y Hemato-oncología
PI: ROUÉ, GAËL
Reference: GLD19_00058
Title: Modulation of lymphoid microenvironment by intrinsic protein homeostasis in aggressive B-cell lymphoma
Period: 01/01/2020 - 31/12/2021

2018 Instituto de Salud Carlos III, Proyectos de Investigación en Salud (AES 2018). Modalidad proyectos en salud
PI: ROUÉ, GAËL
Reference: PI18/01383
Title: Development of a patient-derived xenografts platform for the evaluation of new targeted therapies in aggressive B-cell lymphomas
Period: 01/02/2020 - 31/12/2021

24. Chronic Lymphocytic Leukemia Group

PI: MORENO ATANASIO, CAROLINA
Reference: DJCLS 04 R/2021
Title: Definition of cellular components of the natural immune response in CLL
Period: 15/10/2021 - 14/10/2024

25. Proteomics Unit

2016 Fundació La Marató de TV3, Marató 2016: Ictus i lesions medul·lars i cerebrals traumàtiques
Manager: DE LA TORRE GÓMEZ, CAROLINA
Reference: 201719.32
Title: ITACAT:Impact of Thrombus Analysis in stroke patients in Catalonia
Period: 01/10/2019 - 31/01/2022

26. Communication Unit

021 Ajuntament de Barcelona, Convocatoria general de subvenciones del Ayuntamiento de Barcelona para el año 2021
Manager: DÍAZ LÓPEZ, HELENA
Reference: 21S00478-006
Title: InstiCIENCIA – Programa de divulgació i foment de vocacions científiques
Period: 01/04/2021 - 31/12/2021

FACTS & FIGURES

PUBLICATIONS

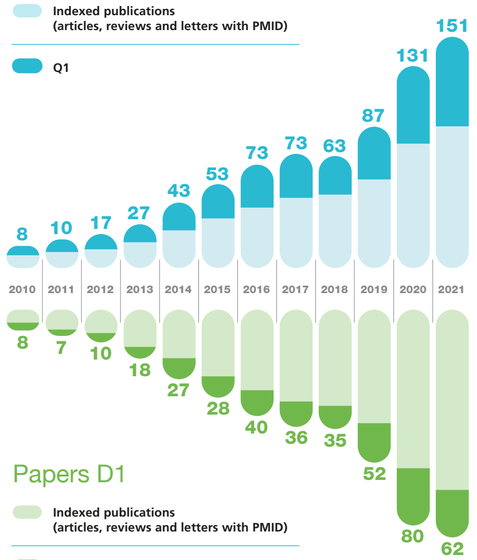
INDICATORS

Number of indexed articles published per year

Cumulative Impact Factor per year

19	2010	106.466
28	2011	115.787
33	2012	171.596
48	2013	300.66
68	2014	467.848
91	2015	597.706
107	2016	899.999
126	2017	1017.439
132	2018	803.175
157	2019	1110.148
219	2020	2027.723
249	2021	2777.58

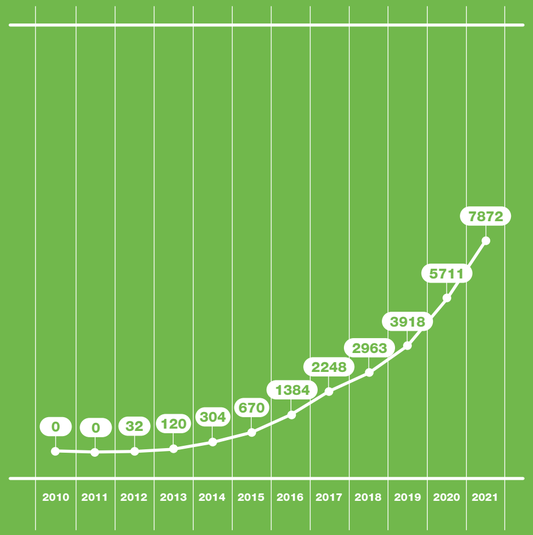
Papers Q1



Papers D1

Citations from Web of Science

13/07/2022



2021 PUBLICATIONS
(249)

Cancer and Leukemia Epigenetics and Biology Program (PEBCL)

1. Cancer Epigenetics

Alvarez-Palomo, AB; Requena-Osete, J; Delgado-Morales, R; Moreno-Manzano, V; Grau-Bove, C; Tejera, AM; Otero, MJ; Barrot, C; Santos-Barriopedro, I; **Vaquero, A**; Mezquita-Pla, J; Moran, S; Naya, CH; Garcia-Martinez, I; Perez, FV; Blasco, MA; **Esteller, M**; Edel, MJ
A synthetic mRNA cell reprogramming method using CYCLIN D1 promotes DNA repair generating improved genetically stable human induced pluripotent stem cells
Stem Cells. 2021 Jul;39(7):866-881. doi: 10.1002/stem.3358. Epub 2021 Mar 3.
Impact Factor: 5,8458 - Q1
PMID: 33621399
Citacions: 3 [27/07/2022]

Caballero-Camino, FJ; Rivilla, I; Herraez, E; Briz, O; Santos-Laso, A; Izquierdo-Sanchez, L; Lee-Law, PY; Rodrigues, PM; Munoz-Garrido, P; Jin, S; Peixoto, E; Richard, S; Gradilone, SA; Perugorria, MJ; **Esteller, M**; Bujanda, L; Marin, JJG; Banales, JM; Cossio, FP
Synthetic Conjugates of Ursodeoxycholic Acid Inhibit Cystogenesis in Experimental Models of Polycystic Liver Disease
Hepatology. 2021 Jan;73(1):186-203. doi: 10.1002/hep.31216. Epub 2020 Sep 22.
Impact Factor: 17,298 - Q1
PMID: 32145077
Citacions: 3 [27/07/2022]

Campillo-Marcos I; Monte-Serrano E; Navarro-Carrasco E; García-González R; Lazo PA.
Lysine Methyltransferase Inhibitors Impair H4K20me2 and 53BP1 Foci in Response to DNA Damage in Sarcomas, a Synthetic Lethality Strategy
Front Cell Dev Biol. 2021 Sep 3;9:715126. doi: 10.3389/fcell.2021.715126. eCollection 2021.
Impact Factor: 6,081 - Q1
PMID: 34540832
Citacions: 1 [27/07/2022]

Campillo-Marcos, I; Alvarez-Errico, D; Alandes, RA; Mereu, E; Esteller, M
Single-cell technologies and analyses in hematopoiesis and hematological malignancies
Exp Hematol. 2021 Jun;98:1-13. doi: 10.1016/j.exphem.2021.05.001. Epub 2021 May 9.
Impact Factor: 3,249 - Q3
PMID: 33979683
Citacions: 3 [27/07/2022]

Cappetta, M; Fernandez, L; Brignoni, L; Artagaveytia, N; Bonilla, C; **Lopez, M**; **Esteller, M**; Bertoni, B; **Berdasco, M**
Discovery of novel DNA methylation biomarkers for non-invasive sporadic breast cancer detection in the Latino population
Mol Oncol. 2021 Feb;15(2):473-486. doi: 10.1002/1878-0261.12842. Epub 2020 Nov 19.
Impact Factor: 7,4498 - Q1
PMID: 33145876
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Citacions: 25 [27/07/2022]

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The Josep Carreras Institute strives to establish continuing cooperation agreements and aims to broaden its strategic alliances and agreements with the pharmaceutical industry and other private organizations. The following organizations are currently associated with our Institute:

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WITH THE INSTITUTIONAL COLLABORATION OF

Ajuntament de Badalona

UAB Universitat Autònoma de Barcelona

Universitat de Barcelona

IN SCIENTIFIC ASSOCIATION WITH

CLÍNIC BARCELONA Hospital Universitari

IDIBAPS Institut D'Investigacions Biomèdiques August Pi i Sunyer

IMPPC Institut de Medicina Predictiva i Personalitzada del Càncer

Germans Trias i Pujol Hospital

institut de recerca sant pau Investigació Biomèdica | Barcelona

Banc de Sang i Teixits

ICO Institut Català d'Oncologia

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GELLC
Grupo Español de Leucemia Linfocítica Crónica

ERIC
european research initiative on CLL

HARMONY
Healthcare Alliance for Resourceful Medicines Offensive against Neoplasms in Hematology

IWG-PM
INTERNATIONAL WORKING GROUP FOR THE PROGNOSIS OF MDS

ELN European LeukemiaNet

GESMD GRUPO ESPAÑOL DE SÍNDROMES MIELODISPLÁSICOS

SEHH SOCIEDAD ESPAÑOLA DE HEMATOLOGÍA Y HEMOTERAPIA

PETHEMA

Special thanks to all the staff for your outstanding work.

Individually we are strong. **Together we are unstoppable!**

Coordination Helena Díaz and Bea Berzosa

Text, data and figures Josep Carreras Leukaemia Research Institute

Photography Josep Carreras Leukaemia Research Institute's archives

Design dadú estudio S.L.

Printing dadú estudio S.L.

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