



2024 Annual Report

Research

In 2024, IRB Barcelona produced transformative discoveries across cancer, ageing, neuroscience, and drug resistance, leveraging AI, single-cell technologies and evolutionary insights. These breakthroughs reflect our interdisciplinary ethos and relentless drive to translate fundamental knowledge into real-world impact.



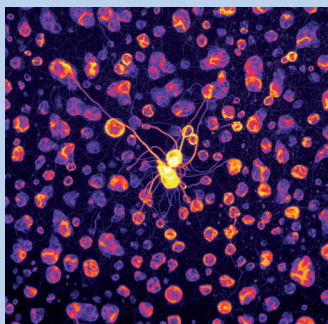
178
Total publications



97.7%
Q1 Publications



78.4%
D1 Publications



CPEB4 Condensates Drive Autism

Researchers have discovered that the lack of a fraction of the CPEB4 protein creates rigid aggregates and affects neural development. The study links it to autism and highlights condensate states as key regulators of brain development and disease.

Published in Nature



Five Factors Guide Immunotherapy Success

The study identifies five variables predicting response to checkpoint-blockade immunotherapy. The model simplifies biomarkers, may help avoid unnecessary side effects, and suggests new tumour types that could benefit from treatment.

Published in Nature Genetics

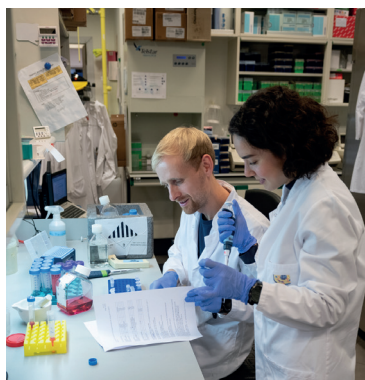


Algorithm Predicts Best Therapies

RTDetective, a machine-learning tool, predicts which of six drugs best restores uncomplete proteins caused by “false stop signs” (premature stop codons). These predictions could guide treatment for 20% of monogenic diseases and certain cancers, accelerating new therapies.

Published in Nature Genetics

Research



Clocks Sync to Prevent Ageing

Back-to-back studies show that synchrony between the brain's master clock and peripheral clocks preserves vital functions. Disruption accelerates tissue ageing, while restoring alignment protects muscle, skin, and metabolism—highlighting circadian coordination as a therapeutic target.

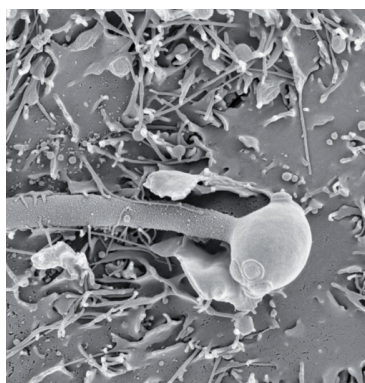
Published in Science and Cell Stem Cell



Drug Overcomes Protein Degradation Resistance

A study describes RBS-10, a small molecule that selectively kills cells resistant to targeted protein degraders. Exploiting this vulnerability may overcome resistance, sustain anti-tumour effects, and expand the therapeutic scope of degrader-based treatments.

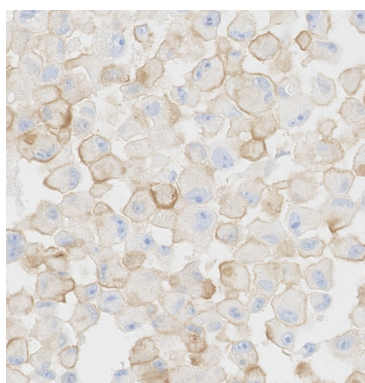
Published in Angewandte Chemie



Candida Evolution Illuminates Drug Resistance

A paper compares ~2,000 genomes from six *Candida* species, identifying genes under positive selection and resistance variants to seven antifungals. These insights may help guide drug development, track emerging strains, and improve antifungal therapy and stewardship strategies.

Published in Nature Microbiology



Clearing Senescence Boosts Chemotherapy

Research shows that cells that received chemotherapy upregulate PD-L2 to evade immune clearance. In mice, anti-PD-L2 treatment eliminates these cells and boosts chemotherapy efficacy, suggesting PD-L2 blockade as a promising adjuvant.

Published in Nature Cancer

Scientific Projects

In 2024, IRB Barcelona secured significant funding, including the renewal—for the fourth consecutive time—of Spain's most prestigious scientific distinction: the Severo Ochoa Centre of Excellence recognition.



Severo Ochoa Distinction Renewed

IRB Barcelona has received its fourth consecutive Severo Ochoa Centre of Excellence accreditation, securing €1 M annually for four years. The award reinforces the Institute's leadership in cancer and ageing research.



ERC Grant Fuels pancreatic cancer research

Dr. Dìrena Alonso-Curbelo has received an ERC Consolidator Grant to lead the IGNITE project, exploring how inflammation and epigenetics trigger pancreatic cancer. The work aims to help identify therapies that reprogram tumour-promoting environments.



"la Caixa" Backs Cancer Breakthroughs

Three IRB Barcelona researchers — Drs. Roger Gomis, Eduard Batlle, and María J. Macías — have received funding from "la Caixa" Foundation to study metastasis and recurrence in breast, colorectal, and endometrial cancers, accelerating diagnostic and therapeutic advances.



AECC Boosts IRB Barcelona Cancer Research

The Spanish Association Against Cancer (AECC) has awarded €2.4 M to five IRB Barcelona projects led by Drs. Gomis, Posas, Mayor-Ruiz, Blasco, and Domostegui. This support accelerates cancer research from basic mechanisms to precision therapies.

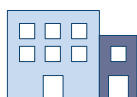


Grand Challenges Target Childhood Cancers

Dr. Cristina Mayor-Ruiz has joined the global PROTECT consortium, awarded up to \$25 M to develop degrader drugs for solid pediatric tumours. Her research on targeted protein degradation aims to design first-in-class treatments, addressing urgent unmet needs in childhood cancer.

Innovation

IRB Barcelona's innovation ecosystem expanded its global footprint as our spin-off extended the MAF diagnostic test into new markets and the foundation of Nuage Therapeutics earned the Catalan National Innovation Award.



6

Active spin-offs



3

Priority patent applications and extensions



22

Research Agreements with public and private entities



14

New technologies scouted



MAF Test Expands Global Reach

The IRB Barcelona spin-off Inbiomotion has secured exclusivity deals expanding the single-gene MAF Test® to the UK, Ireland, and Italy, potentially benefiting over 110,000 early-stage breast cancer patients annually. The assay guides bisphosphonate use, and aims to become a global standard for bone metastasis risk.



Winners of the Innovation Award

IRB Barcelona and ICREA have received the Catalan National Innovation Award for launching Nuage Therapeutics, a spin-off led by Dr. Xavier Salvatella targeting undruggable proteins in prostate cancer. Nuage's condensate-based approach exemplifies innovation in drug discovery and regional biotech development.



Gate2Brain Gains Orphan Drug Status

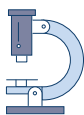
The IRB Barcelona spin-off Gate2Brain has received EMA Orphan Drug Designation for G2B-002, a peptide-shuttle therapy for aggressive pediatric brain tumours. The designation accelerates trials and validates a platform that could transform drug delivery for CNS disorders.

People & Talent



30

Research Groups



9

Core Facilities



60%

Women



40%

Men

542

Total
members

87

Administration

455

Scientific
Staff

55

Core Facilities

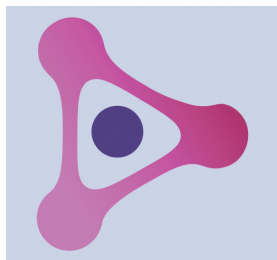
400

Research
Programmes



New Labs Advance Cancer & Regeneration.

IRB Barcelona has launched two labs: one with IRSJD on paediatric cancer epigenetics led by Dr. Avgustinova, and another on mitochondrial biology led by Dr. Lechuga-Vieco. Their work seeks to advance cancer personalized therapies, immunity, and ageing research.



ADAPTMET trains metastasis experts

IRB Barcelona is coordinating ADAPTMET, a €4.4M Horizon Europe network led by Dr. Roger Gomis. Combining research training with investigation into metastatic processes, ADAPTMET will prepare new strategies focused on the 90% of cancer deaths caused by metastasis.



Dr. Eduard Batlle Wins Catalan National Research Award

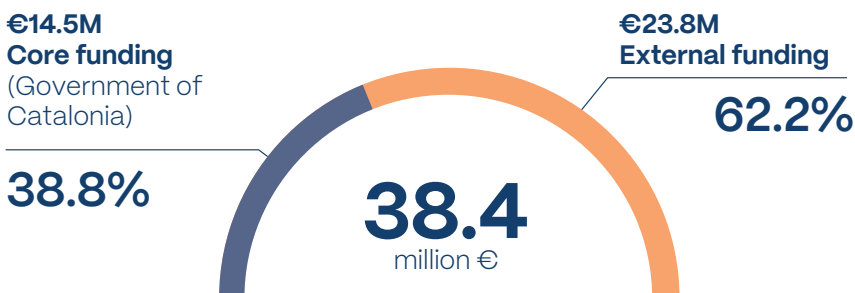
Dr. Eduard Batlle has been presented with the award for mapping colorectal tumour structure and dormant metastasis. His pre-surgical immunotherapy strategy may shape the future colon cancer treatments.



Other Recent Honours at IRB Barcelona

IRB Barcelona researchers have continued to receive numerous awards. Among them: Dr. Toni Gabaldón – American Academy of Microbiology Fellow; Dr. Cristina Mayor-Ruiz – Farmaindustria Young Researcher Award; and Dr. Núria López-Bigas – member of the Royal Academy of Sciences; and many others.

Funding



85.04%

of all expenses
devoted to research

222

EXTERNAL FUNDING

National and international research projects and networks



Communication & Fundraising

5,188

People reached
through outreach
activities

€3.7M

Raised since the
beginning of the
Metastasis Challenge

3,044

Media impacts

In Memoriam: Dr. Joan Guinovart (1947–2025)

An internationally renowned biochemist, Dr. Joan Guinovart stood out in the field of carbohydrate metabolism, diabetes and Lafora disease. In 2005, he led the creation of IRB Barcelona, serving as its director until 2018 and continuing as Professor Emeritus thereafter. His legacy will live on in all the research and discoveries we make, in every young person who decides to dedicate themselves to science, and in every life we change. Thanks for everything, Joan.



Thank you!

CENTRE



A MEMBER OF



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Departament
de Salut



Generalitat de Catalunya
Departament de Recerca
i Universitats



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BARCELONA

Fundación
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RECOGNIZED AS



EXCELENCIA
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OCHOA



PREMIOS
NACIONALS
DE RECERCA



fundación científica
asociación española
contra el cáncer
centro colaborador 2022 y 2023



HR EXCELLENCE IN RESEARCH

We would also like to thank all the people, companies and foundations that support our research.



IRB Barcelona
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2024