2027 Call for the IRB Barcelona International IRB-DRIVE Fellowships Programme (ref.01/27.2/IRB)

TERMS & CONDITIONS

Section II, article 6, letters c) and q) of the Articles of Association of the *Fundació Institut de Recerca Biomèdica (IRB Barcelona)* (hereafter referred to as IRB Barcelona or the Institute) establish that the Institute will promote activities that address collaboration and knowledge transfer and also launch fellowship calls and subsequent granting of these awards.

Accordingly, this document is to announce a fellowship call included in the IRB Barcelona International PhD Programme. The fellowships are assigned to students enrolled on a PhD programme who perform and defend their PhD theses under the supervision of group leaders at IRB Barcelona.

I. Objective

These Terms and Conditions serve to regulate the award of PhD fellowships for the **academic year 2027-2028**.

II. Fellowship Call

All candidates applying to the IRB International PhD Fellowship Programme will be considered for all fellowships offered as part of said international PhD call.

Included in the present call are **6 fellowships co-funded by the European Union's Horizon Europe Marie Skłodowska-Curie Actions Work Programme under grant agreement No. 101217394** (herein referred to as IRB-DRIVE fellowships).

Details of funding and requirements for the IRB-DRIVE fellowships are provided in Annex 1.

All fellowship awardees will be contracted by IRB Barcelona. Fellowships will be renewable on a yearly basis and up to **4 years** from the date of signature of the employment contract by the awardee, provided that he/she complies with all the requirements of point X of this call.

The awardee's supervisor will be the group leader at IRB Barcelona previously assigned and agreed with the awardee before the signature of the fellowship. This group leader will oversee that the duties assigned to the awardee are fulfilled and will notify IRB

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Barcelona's Academic Office and the Chair of the Academic Advisory Committee of any incident, alterations in the fulfilment of the allocated duties, or other pertinent circumstances so that corrective measures can be applied and/or proceedings can be started to withdraw the fellowship.

III. Requirements and Selection Criteria

IRB-DRIVE will recruit doctoral candidates of any nationality, gender, culture, religion, sexual orientation or age to undertake a PhD in biomedicine.

To be eligible for an IRB-DRIVE fellowship, applicants must:

- **Comply with the mobility rule**: meaning that they must not have resided or carried out their main activity (work, studies, etc.) in Spain for more than 12 months in the 36 months immediately before the deadline of the call.
- **Not be in possession of a doctoral degree at the deadline of the call.** Any candidate that has successfully defended their doctoral thesis will not be considered eligible, even if they have not formally been awarded a doctoral degree.
- **Fulfil one of the following options** by **September 2027** (mandatory requirements according to the Bologna Process to be able to enrol in a doctoral programme leading to the award of a doctoral degree at the time of the effective recruitment):
    - Completion of studies that lead to an official Spanish (or from another country of the European Higher Education Area) university degree awarding 300 ECTS credits, of which at least 60 must correspond to master level.
    - Completion of a degree in a non-Spanish university not adapted to the European Higher Education Area that gives access to doctoral studies in Biology, Chemistry, Biochemistry, Pharmacy, Physics, Medicine, or related fields in Spain.
- **Submit a complete application before the established deadline** through the IRB-DRIVE electronic application platform. Applicants will be asked to upload the following information:
    - Personal information such as first and last name, gender, nationality and contact details. This section will also ask about applications for or intention to apply for other fellowships.
    - Curriculum vitae, including summary of work experience and career breaks.
    - Motivation letter (maximum 2 pages) highlighting their research experience and academic achievements and explaining why they are interested in IRB Barcelona and in a particular research group.
    - A scanned copy of their certified academic record. These documents must show the grades attained in exam periods and evidence that the required degree will be obtained by the expected time of recruitment, if it has not already been awarded.
    - Any additional files considered relevant to the application.
    - At least two recommendation letters from university lecturers or scientists who are familiar with their academic work and who can judge their potential as a doctoral researcher.

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- A summary of any work experience and a maximum of three research cluster(s) and/or group(s) in which they are interested.

Applicants should indicate the Research Cluster(s) and/or Research Group(s) to which they wish to apply (up to 3, in total). Details of the projects available for the IRB-DRIVE fellowships are provided in Annex 2.
Candidates will be selected exclusively on merit, on the basis of their curricula. The academic grades and curriculum vitae of each applicant will be evaluated, as well as recommendation letters and a motivation letter. No selection criteria for positive or negative discrimination will be applied.

IV. Application Procedure

1. Applications can be made online at http://phd.irbbarcelona.org/. The application deadline 15:00 CET on 7 January 2027.

The tentative calendar for this call is as follows:

Call opening: 9 November 2026
Deadline for applications: 7 January 2027, 15:00 CET
Deadline for referee submissions: 10 January 2027, 15:00 CET
Remote evaluation: 1-5 February 2027
Interviews and Group Leader Panel presentations at IRB Barcelona: 9-10 March 2027
Notification to candidates: TBC March 2027
Fellowships start date: from September 2027

If the application deadline is extended, the updated information will be available on the IRB Barcelona's website.

2. For more information, applicants can consult IRB Barcelona's webpage or contact IRB Barcelona's Academic Office at academicoffice@irbbarcelona.org.

V. Applications

Applicants should send a completed online application form, together with the following documents:

1. Curriculum vitae specifying education and experience, including career breaks, and supported by pertinent documents.
2. A motivation letter (maximum 2 pages) highlighting their research experience and academic achievements and explaining why they are interested in IRB Barcelona and in a particular research group.
3. A scanned copy of their certified Academic Record. These documents must show the grades attained in exam periods. If the certified academic records are not in Spanish, Catalan or English, applicants should also attach a translation in one of the above-mentioned languages.

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4. Any additional files considered relevant to the application
5. Two recommendation letters from university lecturers or scientists with whom they have studied or worked. Candidates are responsible for ensuring that referees submit these letters. Applications not supported by these letters will not be eligible. If the applicant has previously worked with a researcher at IRB Barcelona, any letter of reference from said person cannot be included as one of the two reference letters requested. However, it can be sent to provide additional support for the application.

Applicants will be asked to upload the following documents in English. Please note that all the documents provided should be in PDF format.

VI. Selection

An Evaluation Committee will appraise eligible. This committee will have representatives of group leaders at IRB Barcelona. The evaluation will be independent, impartial, objective, and free of conflicts of interest, and the selection will be open, efficient, transparent, fair, and merit-based. The Academic Advisory Committee and Academic Office will oversee the remote and interview stages of the selection process.

Applicants will receive continuous support from the Academic Office through the helpdesk (email, phone), which will notify them of the outcome of the preselection. Candidates with the highest scores will be invited for an online interview. Those who do not pass the threshold established will be excluded from further consideration and will be informed.

Short-listed candidates will receive an invitation to a two-day interview process held at IRB Barcelona. Teleconference interviews will be used only for candidates with prior commitments that cannot be rearranged and that thus prevent them from travelling to Barcelona.

Offers of admission will be made to the successful candidates shortly after the interview period. Candidates positively evaluated but with an insufficient score to receive a fellowship will be put on a reserve list to cover possible renunciations and future positions.

The list of awardees will be published on the IRB-DRIVE section of IRB Barcelona's website. Awardees will receive a formal invitation letter.

The following **evaluation criteria** will be used by the Evaluation Committee during the pre-selection phase:

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Evaluation criteria	Score (points)	Sub criteria	Weight	Threshold
Academic record and CV	1–10	Academic and/or professional curriculum in relation to the stage of the candidate's career (graduate studies, grades, institution), including career breaks.	50%	60%
		Research experience (diverse fields /sectors, publications, participation in projects).		
		International mobility (studies abroad, secondments, etc).		
		Scientific-technological quality (courses, workshops).		
		Fellowships/awards received, supervision, knowledge transfer, communication and other relevant merits.		
Motivation Letter	1–10	Strength and relevance of the candidate's motivation towards the research conducted at IRB Barcelona.	20%	50%
		Interest in any specific IRB Barcelona research group.		
Letters of reference	1–10	Reference letters supporting the candidacy will be assessed taking into account the relevance of the content and the person who signs the letter in relation to the candidate's DRIVE research groups.	30%	50%

The overall score of the pre-selection phase will be calculated by multiplying the score obtained for each criterion (1–10 points) by the weight assigned to each one (as seen in the table in %). Only applications that are above the thresholds established for all criteria will be considered. This procedure will lead to a score out of 10. A ranking will be obtained in a consensus meeting. In case of a draw in the total score between applications, candidates will be prioritized on the basis of the weight of each criterion. If two candidates have the same scores for all evaluation criteria, both will be invited to interviews.

During the Candidate's Presentation Panels and Interview phases, additional criteria (see below) will be taken into consideration:

Evaluation criteria	Score (points)	Sub criteria	Weight	Threshold
Candidate's potential	1–10	Ability to present complex reasoning in English.	40%	50%
		Independent thinking, creativity, and organisation capacity.		
		Leadership skills, team working capacity, and maturity.		
Motivation	1–10	Strength and relevance of motivation for applying to IRB Barcelona.	30%	50%

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		Motivation towards the research lines offered by the different research clusters.		
Academic background and theoretical fundamentals	1-10	Suitability of the candidate's academic background to undertake the research lines offering projects in the call.	30%	50%

The overall score in the interview phase will be calculated by multiplying the score obtained for each criterion (0-10 points) by the weight assigned to each one (as seen in the table in %). This procedure will lead to a total score out of 10. A ranked list of candidates will be drawn up. In the event of a draw in the total score, candidates will be prioritized on the basis of the weight of each criterion. When scores on all evaluation criteria are still the same, preference will be given to candidates from under-represented groups (e.g. on the basis of gender, disability or refugee backgrounds).

On 9 December 2014, IRB Barcelona was awarded the "HR Excellence in Research" logo. This recognition reflects the commitment of the Institute to continuously improving its human resources policies in line with the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers. More information about our OTM-R (Open, Transparent, Merit-based Recruitment) policy can be found at the following link.

VII. Documentation

Each candidate selected during the interviews must present the following documents to complete the selection procedure.

1. Degree certificate or official notification of degree award.
Non-Spanish nationals must present: 1) a certified copy and sworn translation of the degree certificate or equivalent obtained in a university abroad; and 2) a certified copy and sworn translation of the certificate showing the subjects studied.

If the certified academic records are not in Spanish, Catalan or English applicants should also attach a sworn translation in one of the above mentioned languages.

2. A sworn statement expressing intention to enroll in a university doctoral programme.

3. A sworn statement stating that he or she does not receive any other funding or fellowship grant.

(Non-compliance with points 2 and 3 will automatically lead to withdrawal of the fellowship and the awardee must return any amounts received to IRB Barcelona).

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VIII. Communication of Fellowship Award

The Head of Human Resources and Academic Affairs department will officially inform successful candidates of the fellowship award.

IX. Rights of Awardees

1. Awardees will have the following general rights:

    a) To be provided with the necessary assistance to perform their studies and research activities.
    b) To become a member of the research programme in which they will be undertaking PhD studies.
    c) To participate in bodies governing and representing the student community.
    d) To participate in complementary calls for funding to attend scientific congresses or to spend training periods in other centres upon approval of their supervisors and the director of IRB Barcelona.
    e) To have their intellectual and industrial property rights regulated in the employment contract with IRB Barcelona.

2. Awardees will have employment and Social Security rights derived from the employment contract with IRB Barcelona.

3. Awardees will be able to exercise intellectual property rights derived from their training activity in accordance with their contribution, as established in the Intellectual Property Law, Royal Decree 1/1996, 12 April. These rights will be independent, compatible, and accumulable with other rights that may arise from the research developed, without negatively affecting the rights of the joint effort when the awardees participate in or are associated with a joint research project.

4. Regarding possible industrial property rights of the awardees, these will be regulated by Law 24/2015, of July 24, 2015, on Patents, and Royal Decree 55/2002, of January 18, 2002, governing the exploitation and license of rights on discoveries made in public research organisations.

    Said rights will not be linked to salary.

X. Responsibilities of Awardees

1. To fulfil the terms and conditions established in this call.

2. To enroll in a university doctoral programme.

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3. To perform their research activity under the supervision of a group leader at IRB Barcelona for the duration of the fellowship. In addition, they must perform the activities foreseen in the research training and specialisation programmes of the Institute, as well as satisfactorily fulfil the objectives of the training programme.

4. To comply with the internal regulations of IRB Barcelona, particularly regarding working conditions and the prevention of occupational risks.

5. To prepare a report each year informing on the scientific progress of their theses. Moreover, they will present this report to their Thesis Advisory Committee, designated by the Institute.

6. To request approval from the group leader supervising their activity prior to the submission for publication or disclosure of any abstracts and/or publications based on research carried out at IRB Barcelona.

7. To undertake the duties that correspond to them as a result of being contracted by IRB Barcelona, as well as those associated with inclusion in the Social Security System.

8. To defend their theses and obtain the respective PhD degree by the end of the fourth year after the start of the fellowship. In exceptional cases, an extension of one year may be given for the defense of the thesis.

XI. Termination of Fellowships

The fellowship will be revoked if the awardee has withheld or falsified information.
The fellowship will also be revoked if the awardee does not fulfil the responsibilities described in point X.

XII. Incompatibility

Awardees will be devoted exclusively to the research or technical training and specialisation activities defined in this call. The fellowships included in this call are not compatible with any other type of grant or fellowship from other public or private organisations.

XIII. Legal Regime

Awardees will be subjected to the legal regime applicable to PhD fellowships according to the law in force at the time of drawing up the contract.

XIV. Data Protection

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In accordance with Regulation (EU) 2016/679 (General Data Protection Regulation), Organic Law 3/2018 of December 5, and other applicable regulations governing personal data protection, any personal data provided by applicants will be incorporated into the Academic file of IRB Barcelona, for which the Institute is the data controller. The purpose of keeping such data is to manage the relationship of the Institute with applicants. Applicants may exercise the rights of access, rectification deletion, opposition, transfer and expiry, as well as limitation in data processing of said information by contacting the Institute at the following e-mail address: dataprotection@irbbarcelona.org, or by writing to the following postal address: C/ Baldiri Reixac, 10, 08028, Barcelona.

XV. Dissemination

Any information regarding this fellowship call will be placed on the announcement board on IRB Barcelona's website.

XVI. Clarification

The Director of IRB Barcelona or a designated representative will be responsible for clarifying queries regarding these terms and conditions.

Barcelona, 9 November 2026



Maribel Labrid
Head of Human Resources and Academic Affairs

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ANNEX 1. Specific regulations for IRB-DRIVE fellowships

Co-funded by the European Union's Horizon Europe Marie Skłodowska-Curie Actions Work Programme under grant agreement No. 101217394, IRB-DRIVE is offering **5 four-year fellowships for the academic year 2026-2027 for researchers interested in carrying out their PhD projects.**

Programme description

IRB-DRIVE will offer **10 four-year fellowships** (in two separate calls) to exceptional doctoral candidates who will have the opportunity to build a strong research project within one of the interdisciplinary research groups established at IRB Barcelona. The selection and recruitment process will build on best practices implemented institution-wide through lessons learned in MSCA-funded COFUND and ITN projects and endorsed by the HRS4R award held by the Institute since 2014.

The IRB-DRIVE doctoral programme, an MSCA-COFUND initiative that succeeds IRB-DRIVE, is designed to implement a fellow-centric, impact-oriented training itinerary. Through two separate calls, IRB-DRIVE will offer 10 four-year fellowships to outstanding doctoral candidates who will obtain their degree from the University of Barcelona (UB) or University Pompeu Fabra (UPF).

IRB-DRIVE is aimed at talented young researchers wishing to undertake their PhD theses in one of the 19 Institute's cutting-edge research groups participating in this call. These groups include ERC grant awardees and tackle frontier topics in personalized medicine, advanced therapies, cancer/metastasis, ageing, and AI-driven tools for healthcare, among others.

This innovative training programme provides a comprehensive itinerary, piloting a novel career-driven specialized track approach to prepare fellows for rewarding academic and extra-academic careers in biomedicine. Furthermore, IRB-DRIVE offers holistic support mechanisms that include a tailor-made mentoring agenda, extensive onboarding, and dedicated mental health support, facilitating the attraction, training, and career-readiness of highly qualified research professionals.

Doctoral training & guidance programme

The IRB-DRIVE programme is built on a robust and personalized framework designed to actively manage your doctoral journey and future career. This approach starts with the assignment of a dedicated Career Advisor (CA) who provides continuous one-on-one coaching every six months. This support guides you in developing your Personalized Career Development Plan (PCDP), ensuring your training is fully aligned with your research project, personal strengths, and long-term career goals.
Beyond your supervisory team, you will benefit from a comprehensive Mentoring Programme that significantly expands your professional network. You will be matched with an IRB Academic Mentor (an experienced postdoc) and can select a Specialisation

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Mentor from our extended network in Clinics, Industry, or Research Management. This structured guidance, along with a compulsory 125 hours of specialized training (including career-driven tracks in Valorisation, Clinical Translation, or Management), prepares you for a successful transition to either academia or the private sector.

Promotion of Well-Being

The IRB-DRIVE programme considers your well-being and personal development as a key factor in achieving both research excellence and career objectives. We offer a holistic support structure that includes continuous personal guidance from the Talent Officer, Career Advisor (CA), and mentors. A structured Frame Setting Session helps ensure proper integration after the initial six-month onboarding period. Crucially, we provide robust Mental Health Support, which includes training sessions on topics like burnout, impostor syndrome, mindfulness, and anxiety management. Additionally, fellows have access to up to two free mental health sessions with a selection of seven specialized psychologists, available in five languages (English, Catalan, Spanish, German, and French), ensuring comprehensive and accessible personal support throughout your PhD journey.

Supervision, career guidance, and career development

Each fellow has the support of the following actors in the implementation and revision of their PCDP: the Group Leader and the co-supervisor(s), including in the secondment lab(s); the Thesis Advisory Committee (TAC); and the Career support team.

Employment and working conditions

IRB-DRIVE fellows will be employed by IRB Barcelona in compliance with Spanish legislation and regulations. IRB Barcelona received the HRS4R award in 2014 and its commitment to the principles of this recognition was acknowledged through its renewal in 2022, thus guaranteeing the alignment of the Institute with the values of the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers.

Doctoral contracts are regulated by the Trainee Research Staff Statute (EPIF, acronym in Spanish). All fellows will be hired through a **48-month employment contract**, and the employment conditions related to this contract will be the same as those that apply to all IRB Barcelona employees:

- (i) 37.5-hour working week;
- (ii) affiliation to the Spanish Social Security system covering sickness, maternity leave, and injuries at work, while also providing entitlement to a pension and unemployment benefit;
- (iii) a free full medical check-up each year and a private Health Insurance (MC Mutual), which covers accidents in the workplace;
- (iv) maternity and paternity leave according to Spanish law;

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- (v) special leave for particular circumstances such as breastfeeding, serious illness/accident of a relative, house move, death of a relative, birth and adoption, parental care, and unavoidable public or private duty;
- (vi) holiday leave of 23 working days per year and 9 additional working days per year to attend to personal affairs, upon approval of the direct supervisor;
- (vii) discounts, including private health insurance, in-house yoga lessons, physiotherapy sessions, nearby day-care providers;
- (viii) training on health & safety provisions and courses aimed at preserving the fellows' mental health and well-being; and
- (viii) a UB membership card (Som UB) that gives free access to university facilities and discounts in training and leisure activities).

The amount allocated to cover the salary of the fellows includes:

- The fellowship amounts to **€31.000,00 gross per year** (Spanish tax and social security deductions will be applied). The fellowship will also provide additional funds to cover travel and networking (costs derived from secondments/short stays and/or international conferences, workshops or other networking events), university enrolment and other academic fees.

- The fellowship also includes a family allowance, to be added to the total amount only if the candidate is eligible (for all fellows with dependent family members, including researchers whose family status changes during the project, in agreement with HE MSCA standards).

In addition, the fellows will receive:

- A single payment for "relocation" will be provided to fellows (linked to prior location, not nationality of the fellow).

Partner institutions

IRB-DRIVE has secured the support of a broad range of International partners that have already committed to host fellows in secondment at their premises and open their training activities to them. See the list below:

- University of Barcelona, Spain.
- Hfp Consulting, Germany.
- Scienseed, Spain.
- Fundación Científica Asociación Española Contra el Cáncer, Spain
- Nostrum Biodiscovery S.L., Spain.
- SOLTI, Spain.
- Nuage Therapeutics, Spain.
- Barcelona Institute of Science and Technology (BIST), Spain.
- Fundació Clínic Barcelona, Spain.

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- Vall d'Hebron Institute of Oncology (VHIO), Spain.
- Sant Joan de Déu Institut de Recerca, Spain.
- Flomics, Spain.
- NBD, Spain.
- University of Copenhagen (UCPH), Denmark.
- Università di Torino (UNITO), Italy.

Horizon Europe Marie Sklodowska-Curie Actions

The Marie Skłodowska-Curie actions (MSCA) provide grants for all stages of researchers' careers—be they doctoral candidates or highly experienced researchers—and encourage transnational, intersectoral and interdisciplinary mobility. The MSCA enable research-focused organisations (universities, research centres, and companies) to host talented foreign researchers and to create strategic partnerships with leading institutions worldwide.

The MSCA aim to equip researchers with the necessary skills and international experience for a successful career, either in the public or private sector. The programme responds to the challenges faced by researchers, offering them attractive working conditions and the opportunity to move between academia and other settings.

The MSCA are open to all domains of research and innovation, from fundamental research to market take-up and innovation services. Research and innovation fields are chosen freely by the applicants (individuals and/or organisations) in a fully 'bottom-up' manner.

For more information, please visit the following web pages:
https://ec.europa.eu/research/mariecurieactions/
https://www.mariecuriealumni.eu/

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ANNEX 2. Research projects

IRB Barcelona research group	Group Leader	Research Cluster	Description of the research project
Quantitative Stem Cell Dynamics	Alejo Rodríguez-Fraticelli	Aging and Metabolism	**How does a blood stem cell's history shape its future?** In the Quantitative Stem Cell Dynamics lab at IRB Barcelona, we develop tracking tools to follow individual cells and their descendants over time. We offer two possible PhD projects. 1. Can blood stem cells remember past experiences? You'll investigate whether a brief exposure during development leaves an epigenetic memory that changes which blood cells a stem cell produces as it ages. Using barcoding mice, human stem cell expansion cultures, and single-cell perturbation multi-omics, you'll trace individual clones and test which memories persist, which fade, and which can be rewritten. This project builds on our work tracing blood aging through naturally occurring epigenetic marks (Nature, 2025). 2. What makes a leukemia stem cell dangerous? Our work showed that the state of a blood stem cell can shape how it responds to a leukemia-driving mutation (Cell Stem Cell, 2025). You'll use single-cell lineage tracing, genetic mouse models, and human leukemia models to discover which cells sustain disease, what they depend on, and whether those dependencies can be targeted. Life in the lab. We are a highly collaborative group, typically with 4-5 young fellows, 3-4 postdocs, and 3-4 technicians with diverse expertise, including computational analysis support. Since our lab was established in 2021, four PhD students have graduated from our group, with a typical time to graduation of 4-5 years. We like to bring the team together frequently for lab activities and lab/program retreats, and we strongly embrace diversity, mutual respect, collegiality, and professionalism as core lab ideals. Collaborations. In addition to work in the lab, we also collaborate with groups at the Arc Institute, Cambridge Stem Cell Institute, VHIO, Carreras Leukemia Research Institute, CaixaResearch, the Centre for Genomic Regulation (CRG), the University of Pennsylvania, and Harvard University, among many others, and there are always opportunities for secondments with our collaborators. Support and recognition. Our research is supported by the European Research Council (ERC), the Cris Cancer foundation, the Spanish Association for Cancer Research (AECC), Caixa Foundation, as well as the Spanish Ministry of Science/AEI. Translational potential. We are constantly looking for students with an entrepreneurial mindset to contribute to translational projects on reprogramming aged blood and immune cells, identifying

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			vulneratibilities in metastasis-seeding cells, and developing immunotherapies for targeting blood cancers.
Mitochondrial Biology and Tissue Regeneration	Ana Victoria Lechuga-Vieco	Aging and Metabolism	**Mitochondrial genetic diversity in cancer evolution** Mitochondria play essential roles in cellular metabolism, signalling and adaptation to environmental stress. Beyond their metabolic functions, mitochondria contain their own genome, which can harbour distinct genetic variants within and between cells, generating mitochondrial genetic diversity. Emerging evidence suggests that this diversity may influence cellular adaptation, yet its contribution to cancer progression remains poorly understood. This PhD project will investigate how mitochondrial genetic diversity shapes tumour evolution. We aim to understand whether mitochondrial genetic variation contributes to tumour cell survival under metabolic and immune pressures, and whether these adaptations create vulnerabilities that could be exploited therapeutically. The successful candidate will combine advanced cellular and molecular biology approaches with mitochondrial genetics, genome editing, immunometabolism and preclinical cancer models. The project will integrate in vitro experimental systems, in vivo mouse models, high-dimensional cellular profiling and functional metabolic analyses, providing opportunities to develop expertise across several complementary disciplines.
Signalling and Cell Cycle Laboratory	Angel R. Nebreda	Cancer Science	This project will investigate the molecular mechanisms that determine cancer cell dependency on the protein kinase p38α, with a particular focus on triple-negative breast cancer. Building on candidate genes and pathways identified through genetic screens and gene expression analyses, the project will combine molecular, cellular and functional approaches to uncover how p38α supports cancer cell fitness and shapes responses to therapy. The ultimate goal is to identify vulnerabilities that could be exploited for the development of improved therapeutic strategies.
Targeted protein degradation and drug discovery	Cristina Mayor-Ruiz	Computational, Chemical and Structural Biology	**Project: Molecular glue degraders as a generalizable therapeutic solution** Description: At the interface of chemical biology and cancer research, our lab is interested in enabling and studying the chemical rewiring of E3 ubiquitin ligases as a therapeutic approach. Specifically, we focus on pushing the boundaries of targeted protein degradation as a powerful approach to widen the druggable proteome and to tackle fundamental questions of cancer and E3 biology. Our approach to science is multi-disciplinary and highly collaborative, leveraging high-throughput technologies like chemical screening, quantitative proteomics, and functional genomics. We firmly believe in the potential of "molecular glue degraders": compounds that orchestrate direct interaction between target proteins and E3 ubiquitin ligases, driving the proteasomal degradation of otherwise undruggable proteins. In this PhD project, you will help build platforms for the rational discovery of molecular glue degraders against cancer-relevant targets.
Inflammation, Tissue Plasticity &	Direna Alonso-Curbelo	Cancer Science	Our lab investigates how genetic alterations and environmental cues interact to shape cancer initiation, evolution, and immune escape, focusing on pancreatic and liver cancers—two diseases in urgent need of better strategies for early detection and treatment. Because tumors can exploit

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Cancer			programs essential to normal tissue homeostasis, including wound healing, regeneration, and immune surveillance, we combine advanced experimental models and human samples with bulk, single-cell, and spatial omics to identify specific cellular states and tissue ecosystems associated with neoplastic transformation and progression. We then use functional genomics (RNAi/CRISPR), functional perturbation **screens**, and synthetic biology approaches to uncover underlying mechanisms and explore strategies to limit cancer progression and restore anti-tumor immunity. Potential PhD projects will investigate how tumor cell plasticity shapes interactions with the immune system and how these interactions influence the balance between tumor promotion and immune recognition and control. Particular interests include how stress-associated states, such as cellular senescence, alter cells' ability to sense and respond to immune signals, and how such changes can be harnessed therapeutically to enhance anti-tumor immunity. Building on our work on tumor-initiating epigenetic plasticity (Alonso-Curbelo et al., *Nature* 2021; Burdziak*, Alonso-Curbelo* et al., *Science* 2023; Matar et al., *CMGH* 2026) and **tumor immunosurveillance** (Chen et al., *Cancer Discovery* 2023), students will gain interdisciplinary training in cancer and immune biology through complementary experimental and computational approaches. Projects may combine in vivo cancer modeling, functional genomics, cell-state tracing, organoid and primary immune-cell cultures, and single-cell and spatial analyses, alongside experimental design and data interpretation. Students will work closely with cancer biologists, biotechnologists, and computational scientists, benefit from cross-disciplinary collaborations, and join **a stimulating, collaborative research environment**.
Colorectal Cancer Laboratory	Eduard Batlle	Cancer Science	
Cell Signaling	Francesc Posas & Eulàlia de Nadal	Mechanisms of Disease	
Microtubule organization in cell proliferation and differentiation	Jens Lüders	Mechanisms of Disease	**Deciphering the molecular and cellular mechanisms underlying Cohen syndrome.** Cohen Syndrome is a rare disease caused by mutations in VPS13B, encoding a giant, poorly characterized lipid transport channel at the Golgi. While the function of VPS13B and how its loss causes disease is unknown, our previous work suggests an involvement of defective primary cilia. This project aims to elucidate how impaired lipid transport by VPS13B may be linked to ciliary and other cellular defects, and identify potential future therapeutic avenues.
Gene Translation Laboratory	Lluís Ribas	Aging and Metabolism	**Project: Somatic mutagenesis of the translation apparatus in human ageing and cancer** Human ageing and cancer are both characterized by the loss of proteome quality.

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			Transfer RNAs are central components of the protein synthesis machinery, and their genes accumulate large amounts of somatic mutations as we get older. However, the accumulation dynamics of these mutations, their tissue-dependent distribution, and their functional consequences remain poorly understood. Our laboratory uses duplex sequencing, an error-corrected method that detects very rare mutations, to study somatic mutagenesis in tRNA genes and other components of the translation machinery. The PhD student will develop and apply computational approaches to analyse these datasets, to determine mutation rates, signatures and selection patterns across tissues, ages and tumour types, and to predict the functional impact of the variants identified. We are looking for a bioinformatician interested in the analysis of somatic mutagenesis data in the context of cancer or human ageing.
Chemical Biology and Therapeutics Discovery	Luke Lairson	Computational, Chemical and Structural Biology	The Lairson laboratory uses small molecules and chemical biology approaches to identify and study mechanisms associated with human disease biology. Cell-based phenotypic screening, involving high-throughput microscopy or flow cytometry, is combined with quantitative proteomic methods to discover new protein-ligand interactions that induce desired changes in cell fate or state. Cell biology studies are used to elucidate mechanisms of action, and medicinal chemistry is combined with in vivo pharmacology to evaluate the relevance of identified mechanisms at the organismal level. The laboratory is highly interdisciplinary, with expertise in organic chemistry, analytical biochemistry, immunology, and glial cell neuroscience. Current research applies this approach to the cGAS-STING pathway, the regenerative process of remyelination, and cell-type-selective targeting of therapy-resistant tumor cells.
Development and Growth Control Laboratory	Marco Milán	Mechanisms of Disease	**Aneuploidy in Development**: Aneuploidy—the gain or loss of whole chromosomes or chromosomal regions—causes severe developmental harm and is the primary driver of human miscarriages. In this PhD project, the candidate will generate full-organism monosomies and trisomies across all Drosophila chromosomes. By coupling these genetic models with a multi-omic framework (bulk and single-cell transcriptomics, proteomics, and functional genetics), the candidate will identify the shared and chromosome-specific molecular pathways responsible for aneuploidy's deleterious impact on embryonic development.
Structural Bioinformatics and Network Biology	Patrick Aloy	Computational, Chemical and Structural Biology	**Blending Biology, Chemistry and AI to Enable Personalized Systems Pharmacology** Biological data is accumulating at an unprecedented rate, escalating the role of data-driven methods in computational drug discovery. The urge to couple biological data to cutting-edge machine learning has spurred developments in data integration and knowledge representation, especially in the form of heterogeneous, multiplex and semantically-rich biological networks. Today, thanks to the propitious rise in knowledge embedding techniques, these large and complex biological networks can be converted to a vector format that suits the majority of machine learning

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			implementations. In this computational framework, complex connections between entities can be unveiled by means of simple arithmetic operations. Indeed, we demonstrate and experimentally validate that these descriptors can be used to reverse and mimic biological signatures of disease models and genetic perturbations in vitro and in vivo. However, only a tiny fraction of the possible chemical space has been so far explored, meaning that most compounds able to modulate biological activities (i.e. drugs) are yet to be discovered. Accordingly, the main objective of my laboratory is to couple bioactivity signatures and generative AI to design and synthetize new chemical entities (NCEs) with a desired functionality. In particular, we aim at generating NCEs to modulate the activity of a specific set of targets, selected from a combination of perturbagen profiles, to revert the pathological state induced by Alzheimer´s disease (AD) and other complex disorders. All in all, the incorporation of machine learning methods to the drug discovery process is triggering the development of thousands of novel compounds, finally enabling personalized pharmacology. References Rojas-Granado et al. Phenotypic AI-based design of cell-specific small molecule cytotoxics. 2026. Communications Chemistry, 9: 1-14. Comajuncosa-Creus et al. Integration of diverse bioactivity data into the Chemical Checker compound universe. 2025. Nat Protocols, 1-25. Comajuncosa-Creus et al. Comprehensive identification and characterization of druggable pockets thourgh binding site descriptors. 2024. Nat Commun. 15: 7917. Fernández-Torras et al. Integrating and formatting biomedical data in the Bioteque, a comprehensive repository of pre-calculated knowledge graph embeddings. 2022. Nat Commun. 13: 5304. Pauls et al. Identification and drug-induced reversion of molecular signatures of Alzheimer's disease onset and progression in AppNL-G-F, AppNL-F, and 3xTg-AD mouse models. 2021. Genome Med. 13:168. Bertoni et al. Bioactivity descriptors for uncharacterized chemical compounds. 2021. Nat Commun. 12: 3932. Duran-Frigola et al. Extending the small molecule similarity principle to all levels of biology with the Chemical Checker. 2020. Nat Biotechnol. 38: 1087-1096.
Translational Control of Cell Cycle and Differentiation	Raúl Méndez	Mechanisms of Disease	**TRANSLATIONAL CONTROL OF CELL CYCLE AND DIFFERENTIATION** (mRNA translational regulation in tissue health, ageing and cancer) MÉNDEZ LAB | IRB BARCELONA: How do cells remodel their proteome to adapt to changing conditions—and how does this capacity change during ageing and disease? Our laboratory investigates how cells regulate gene expression post-transcriptionally, controlling the fate and translation of messenger RNAs. We connect the molecular mechanisms that regulate

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			individual mRNAs to the programs that maintain tissue function, support adaptation to stress and shape cancer development. From molecular interactions to cellular organization: We study how mRNAs assemble with RNA-binding proteins, particularly the CPEB family, into messenger ribonucleoprotein complexes (mRNPs). We investigate how these complexes control mRNA stability, localization and translation, and how their organization into RNA-containing condensates influences when and where proteins are produced. From RNA-maps to tissue homeostasis: We combine mechanistic experiments with transcriptomics, epitranscriptomics, translatomics and proteomics to connect mRNA abundance and chemical modifications with protein production. A central question is how ageing and metabolic stress reshape these regulatory layers, determining whether cells adapt, enter quiescence or senescence, and whether tissues regenerate or progress towards chronic disease. The liver provides a major experimental setting for understanding these transitions. From tissue stress to the tumor–immune interface: We investigate how post-transcriptional regulation shapes inflammatory and fibrotic environments that can precede cancer, as well as tumor and premetastatic niches—changes in distant tissues that favor subsequent metastatic colonization. We are particularly interested in communication between tumor cells and immune cells, and how stress adaptation, quiescence and senescence influence these interactions, immune surveillance and tumor progression. A PROPOSAL FOR A PHD THESIS: How do mRNA modifications organize gene expression in the ageing liver? Our research offers the opportunity to connect fundamental RNA biology with questions in physiology and disease, combining molecular and cellular approaches with quantitative imaging, experimental models and computational analysis of multiomics data Can epitranscriptomic marks, alter where mRNA resides, how it moves and when it produces proteins—and thereby influence tissue health?: Chemical modifications of mRNA, collectively studied through epitranscriptomics, provide an additional layer of gene regulation. This project will investigate whether these modifications influence how mRNAs interact with RNA-binding proteins and partition into, exchange with or leave RNA-containing condensates. We will test how these behaviors organize translation across space and time, shaping the proteome in relation to circadian rhythms and cell polarity. The mechanistic question: We will examine how defined mRNA modifications affect mRNP assembly, condensate association and transitions between translationally repressed and active states. We will ask whether these mechanisms coordinate daily rhythms of protein production and the localized translation that supports the distinct functional domains of polarized hepatocytes. A central aim is to distinguish direct effects on RNA–protein interactions and condensate behavior from effects mediated by changes in mRNA stability or translation.

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			The physiological context: Using the liver as a model, we will investigate how metabolic stress and ageing reshape these mechanisms. We will ask whether altered spatial and circadian regulation of translation supports adaptive responses or contributes to persistent inflammation, fibrosis and tissue environments that favor tumor development. The approach and opportunity: The project will integrate epitranscriptomic profiling with transcriptomics, ribosome profiling and proteomics, alongside quantitative imaging and targeted perturbation of RNA-modifying enzymes and selected mRNAs. Analyses across circadian time and cellular locations will connect molecular mechanisms to changes in protein production, hepatocyte polarity and communication among hepatocytes, immune cells and fibrosis-producing stromal cells. The goal is to determine whether modification-dependent control of mRNA condensate dynamics contributes causally to liver homeostasis and disease. For a student, the project offers a route from fundamental questions about RNA organization to the biology of ageing, chronic liver injury and cancer. Representative publications 1- Cárdenas et al. (2026). “CPEB4 deficiency promotes vasculogenic mimicry and resistance to anti-angiogenic therapy in hepatocellular carcinoma.” Gut. 2- Belloc et al. (2026). “Posttranscriptional reprogramming controls MASLD progression through chronic ER stress adaptation.” Science Advances. 3- Garcia-Cabau et al. (2025). “Mis-splicing of a neuronal microexon promotes CPEB4 aggregation in ASD.” Nature. 4- Fernández-Alfara et al. (2023). “Antitumor T-cell function requires CPEB4-mediated adaptation to chronic endoplasmic reticulum stress.” The EMBO Journal. 5- Duran-Arqué et al. (2022). “Comparative analyses of vertebrate CPEB proteins define two subfamilies with coordinated yet distinct functions in post-transcriptional gene regulation.” Genome Biology. 6- Pascual et al. (2020). “The RNA binding protein CPEB2 regulates hormone sensing in mammary gland development and luminal breast cancer.” Science Advances. 7- Parras et al. (2018). “Autism-like phenotype and risk gene mRNA deadenylation by CPEB4 mis-splicing.” Nature. 8- Maillo et al. (2017). “Circadian- and UPR-dependent control of CPEB4 mediates a translational response to counteract hepatic steatosis under ER stress.” Nature Cell Biology. 9- Bava et al. (2013). “CPEB1 coordinates alternative 3′-UTR formation with translational regulation.” Nature. 10- Ortiz-Zapater et al. (2012). “Key contribution of CPEB4-mediated translational control to cancer progression.” Nature Medicine.

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Stem Cells and Cancer	Salvador Aznar Benitah	Aging and Metabolism	We are seeking for a highly motivated PhD student to join the Stem Cell and Cancer group (Dr. Salvador Aznar Benitah). The project will involve studying the role of systemic metabolism in driving metastatic tropism and metastasis-induced cachexia (an energy-wasting state that depletes all the energy stores of the patient and which causes almost 40% of cancer-related deaths). The Stem Cell and Cancer group aims at understanding the molecular mechanisms underlying the spatiotemporal regulation of adult stem cells in the healthy tissue, and how these are deregulated during ageing and cancer. We have a particular interest in understanding how tissues communicate during homeostasis and how cancer cells systemically alter distant tissue function and metabolism to their own advantage as well as to modulate the immune system to their advantage. To do so, we combine high-throughput bulk, single cell, and spatial genomics, proteomic and metabolomic data with in vivo models. The successful candidate will be involved in the analysis of the data from different projects, but very importantly in contributing to the conceptual development of the project.
Innate Immune Biology	Stefanie Wculek	Aging and Metabolism	Harnessing the therapeutic potential of environmental (metabolic) adaptations of dendritic cells Dendritic cells (DCs) are key to instruct immunity, inflammation and tolerance in infectious and non-infectious diseases mainly by controlling T cell responses. DCs develop in the bone marrow and subsequently colonize various organs to sense and respond to insults. Hence, DCs experience distinct milieus that impose context-dependent biochemical challenges, which is further aggravated during conditions such as obesity and during aging. Yet, it is poorly known how DCs survive in and adapt to different environments and maintain or lose their functionality in disease settings. This project will uncover and characterize the relevance of context-dependent (metabolic) adjustments for the development and pro- or anti-inflammatory functions of DC subsets to environmental alterations (such as changes in micro-nutrient and ion availability, healthy versus obese or young versus aged tissues) and dissect the underlying molecular mechanisms. Independent innovative approaches and adapted cutting-edge techniques will be used for analysis of mouse models, primary tissue culture and human samples; including multicolour flow cytometry, (single-cell) RNA sequencing, multiplex microscopy and spatial analyses, metabolomics, epigenetic analyses and various metabolic assays. The details of the project will be designed based on the interests of the successful candidate within the research lines described here. The discovery of tissue-dependent adaptions by DCs that impact their functions will transform translational research to integrate the environmental context and reveal novel “innate immunotherapies” to combat non-infectious diseases such as obesity and aging.
Comparative Genomics	Toni Gabaldón	Computational, Chemical and Structural Biology	The comparative genomics group (www.cgenomics.org) is seeking motivated candidates to perform a PhD in the exciting area of emerging fungal human pathogens. The recruited PhD candidate will develop an interdisciplinary thesis within the project, aimed at understanding the evolutionary and molecular mechanisms that enable emerging Candida pathogens to colonize human-associated niches, acquire virulence-related traits, and evolve antifungal resistance. The thesis will be adapted to the candidate’s background and may follow a computational,

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			experimental, or hybrid direction. Computational work may involve comparative genomics, population genomics, transcriptomics, genotype–phenotype associations, and integration of public and newly generated datasets. Experimental work may include phenotypic characterization of clinical and environmental isolates, antifungal susceptibility testing, stress-response assays, adhesion and biofilm assays, in vitro infection models, experimental evolution, and functional validation of candidate genes or variants. In all cases, the candidate will work in close interaction with computational and experimental members of the group, with the goal of linking genomic variation to clinically and biologically relevant phenotypes in emerging Candida pathogens.
Laboratory of Molecular Biophysics	Xavier Salvatella	Computational, Chemical and Structural Biology	Biomolecular condensates are membraneless compartments that organise gene expression, signalling and the stress response. When they lose their fluidity, the result is linked to ageing. Evidence suggests that ATP-consuming processes continuously remodel condensates to keep them dynamic. In this project, the student will identify the molecular machines that preserve condensate dynamics, determine how they act, and test the consequences when this control fails. The work will combine biochemistry, biophysics, cell biology and quantitative imaging. The student will join an interdisciplinary team at the interface of physics, chemistry and biology. The project suits curious candidates with a background in biochemistry, biophysics, molecular or cell biology, or a related field.

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