BIOMEDICAL SCIENCE FOR THE BENEFIT OF SOCIETY

Research trainee in Mitochondrial Biology
Centre for Genomic Regulation (CRG)

The Institute

The Centre for Genomic Regulation (CRG) is an international biomedical research institute of excellence, based in Barcelona, Spain, with more than 400 scientists from 44 countries. The CRG is composed by an interdisciplinary, motivated and creative scientific team which is supported both by a flexible and efficient administration and by high-end and innovative technologies.

In April 2021, the Centre for Genomic Regulation (CRG) received the renewal of the 'HR Excellence in Research' Award from the European Commission. This is a recognition of the Institute's commitment to developing an HR Strategy for Researchers, designed to bring the practices and procedures in line with the principles of the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers (Charter and Code).

Please, check out our Recruitment Policy

The role

The successful candidate will join the Mitochondrial Dynamics Group. They will gain research experience by investigating fundamental aspects of mitochondrial biology, with particular emphasis on the regulation of mitochondrial DNA and its integration with cellular physiology. This research is crucial not only for advancing our basic understanding of the molecular mechanisms of life but also for developing new treatments for mitochondrial diseases, which affect approximately 1 in 5,000 births and currently have no effective therapies. This position is ideal for candidates who have just finished their master's degree, want to gain laboratory experience while working on groundbreaking projects, and learn cutting-edge techniques that will be valuable for future applications both inside and outside academia.

About the lab

Group leader: Luis-Carlos Tábara, Ph.D

Mitochondria, as the primary providers of cellular energy through oxidative phosphorylation (OXPHOS), are essential for metabolism and sustaining life. Throughout evolution, most genes from the ancestral mitochondrial genome have either been lost or relocated to the nuclear genome. As a result, only a compact mitochondrial DNA (mtDNA) molecule remains. In mammals, mtDNA is a circular, double-stranded molecule of 16.6 kb. This genome is inherited exclusively from the mother because paternal mtDNA is degraded and not transmitted to offspring. Despite its small size, mtDNA encodes 37 genes: 13 essential subunits of the OXPHOS system, 2 ribosomal RNAs (rRNAs), and 22 transfer RNAs (tRNAs) required for mitochondrial protein synthesis. While these mtDNA-encoded proteins represent only a fraction of the more than 90 proteins that make up the OXPHOS machinery, they are indispensable and mitochondrial energy production collapses in their absence.

Unlike diploid nuclear DNA, mtDNA exists as a multicopy genome. mtDNA replicates independently of the cell cycle, a process known as "relaxed replication," resulting in a high mtDNA copy number (CN) ranging from hundreds to thousands of molecules. Factors such as ATP demand and nucleotide availability are proposed to influence mtDNA content. However, the mechanisms by which cells sense and regulate mtDNA levels remain poorly understood. Understanding this process is crucial as altered mtDNA levels are associated with various human diseases, including rare inherited primary mitochondrial disorders and common age-related diseases such as neurodegeneration and cancer. Additionally, because mtDNA is continuously replicated, it is particularly prone to mutations. This results in heteroplasmy, a condition where both wild-type and mutant mtDNA coexist within the same cell. Some mutations are pathogenic and can

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disrupt mitochondrial function, causing mitochondrial diseases. However, how cells detect the presence of mutant mtDNA and prevent its accumulation and detrimental effects remains largely unknown.

Based on this, our laboratory aims to address three fundamental questions in the coming years: (1) What mechanisms dictate the mtDNA CN of each individual cell? (2) How do cells detect the presence of damaged or mutant mtDNA molecules? and (3) What cellular adaptations result from altered mtDNA homeostasis, and how do maladaptations contribute to disease pathophysiology?

To tackle these questions, we will employ a multidisciplinary approach combining high-resolution microscopy, genomics, and high-throughput screening coupled with a wide range of biochemical techniques to measure mitochondrial function. We will use both cellular and novel pre-clinical models of mitochondrial diseases, with the ultimate goal of identifying new therapeutic strategies for patients suffering from mitochondrial dysfunction.

Whom would we like to hire?

Professional experience

Must Have

- Experience in any aspect of molecular or cellular biology
- Enthusiastic about science and discovery, with a keen willingness to learn

Desirable but not required/ Nice to have

- Previous experience with microscopy or other cell-biology techniques (tissue culture, qPCR, immunoblot, etc)
- Experience in some aspect of mitochondrial research

Education and training

- MSc in Molecular Biosciences (or related).
- BSc in Biology, Biotechnology, or any research-oriented degree

Languages

- Fluency in English
- Spanish is a plus

Technical skills

- Familiarity with cell and molecular biology techniques
- Advanced MS office skills

Competences

- Strong analytical, interpersonal, and communication skills
- Curiosity, initiative and critical thinking

The Offer – Working Conditions

- **Contract duration:** 6 months (extendable for other 6 months)
- **Estimated annual gross salary:** Salary is commensurate with qualifications and consistent with our pay scales
- **Target start date:** As soon as possible

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We provide a highly stimulating environment with state-of-the-art infrastructures, and unique professional career development opportunities. To check out our training and development portfolio, please visit our website in the training section.

We offer and **promote a diverse and inclusive environment** and welcomes applicants regardless of age, disability, gender, nationality, ethnicity, religion, sexual orientation or gender identity.

The **CRG is committed to reconcile a work and family life** of its employees and are offering extended vacation period and the possibility to benefit from flexible working hours.

Application Procedure

All applications must include:

1. A motivation letter addressed to Dr Luis-Carlos Tábara Rodríguez.
2. A complete CV including contact details.
3. Contact details of two referees (desirable, no mandatory)

All applications must be addressed to Dr. Luis-Carlos Tábara Rodríguez.and be submitted online on the CRG Career site - http://www.crg.eu/en/content/careers/job-opportunities

Selection Process

- **Pre-selection**: The pre-selection process will be based on qualifications and expertise reflected on the candidates CVS. It will be merit-based.
- **Interview**: Preselected candidates will be interviewed by the Hiring Manager of the position and a selection panel if required.
- **Offer Letter**: Once the successful candidate is identified the People department will send a Job Offer, specifying the start day, salary, working conditions, among other important details.

Deadline: Please submit your application by 13/11/2025

Suggestions: The CRG believes in **ongoing improvement** and promotes a **culture of feedback**. This is one of the reasons we have in place, at your disposal as a candidate, a mechanism to gather your suggestions/complaints concerning your candidate experience in our recruitment processes. Your feedback really matters to us in our aim at creating a **positive candidate journey**. You can make a difference and help us improve by letting us know your suggestions through the following form.

HR EXCELLENCE IN RESEARCH

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