8 Doctoral Candidate Positions

CIC bioGUNE (http://www.cicbiogune.es/) opens applications for Doctoral Candidates (DC). Eight FPI contracts, funded by the AEI (State Agency for Research, Spain) are open for applications from August 2nd. The positions will hold 4 years contract, social security, and health insurance.

CIC bioGUNE is a research center in biosciences located in Bilbao (Spain), where fundamental research goes hand in hand with oriented and applied perspectives. It offers an international, multidisciplinary scientific environment, hosting over 200 researchers working on chemical biology, cancer, genomics, biophysics, immunology, and many more. CIC bioGUNE is also equipped with state-of-the-art facilities for metabolomics, proteomics, genomics, structural biology (CryoEM, X-Ray, 800 MHz and 1 GHz NMR, computing cluster), and animal facilities.

CIC bioGUNE is recognized with the Severo Ochoa Excellence Accreditation (2023-2027).

We welcome applications from **motivated young scientists** who wish to get their PhD degree in an international scientific environment in one of our laboratories awarded with a predoctoral grant, carrying out cutting-edge research in the frontiers between chemistry, biology, and biomedicine within a highly collaborative environment. More than 80 doctoral candidates are currently developing their PhD Thesis with us.

Candidates should hold a degree in Biology, Biochemistry, Biotechnology, Chemistry, Pharmacy, Medicine, or a related topic. They should have completed their MsC degree at the time of incorporation (expected last quarter 2024/first quarter 2025).

Research topics for the applications include:

- Prof. Mauro D'Amato (*Gastrointestinal Genetics Lab*)
- Dr. Ana M. Gimeno (*Chemical Glycobiology Lab*)
- Dr. Urko M. Marigorta (*Integrative Genomics Lab*)
- Dr. Rosa Barrio (*Ubiquitin-likes And Development Lab*)
- Dr. Malu Martínez Chantar (*Liver Disease Lab*)
- Prof. José M. Mato (*Precision Medicine and Metabolism Lab*)
- Dr. María Vivanco (*Cancer Heterogeneity Lab*)
- Prof. Antonio del Sol (*Computational Biology Lab*)

Prof. Mauro D'Amato (Gastrointestinal Genetics Lab):

Biobank-scale and functional genomic studies of gut motility, towards improved therapeutic precision in IBS (iGutGenes)

Irritable bowel syndrome (IBS) affects 5-10% of people (women more than men) with recurrent abdominal pain, bloating, constipation and diarrhea. The etiology is unknown, but increasing hope has been put in genetic research for the identification of actionable underlying molecular mechanisms. With the international iGutGenes program we aim to study IBS and gut motility via GWAS meta-analyses in more than 1.8 million individuals of multiple ethnicities. Computational and functional follow-up is also planned in silico, in vitro and in vivo (zebrafish) model systems, while polygenic scores (PGS) will be developed to identify individuals at increased risk of IBS. The iGutGenes study warrants important contributions towards improved prevention, treatment and therapeutic precision in IBS.

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Dr. Ana M. Gimeno (Chemical Glycobiology Lab):

Navigating Through Complexity: Understanding the Functional Landscape of Glycosylation in Cancer (CancerGlycoLand)

Altered protein glycosylation is a hallmark of cancer. The project aims to understand, from the chemistry perspective, how tumor-associated glycoproteins modulate tumor-host interactions and therefore, cellular functions. With this key goal in the horizon, a multidisciplinary approach will be employed. In particular, metabolic sugar processing, gene editing, and chemo-enzymatic synthesis will be exploited to highlight precise glycan signatures with specific labels on the surface of glycoproteins and living cells, while NMR techniques will be employed to study their interactions at the atomic level. The ultimate goal of this bottom-up approach is to unravel the chemical features of the cancer glyco-code, advancing glycan-specific diagnostic tools and therapies for precision medicine.

Dr. Urko M. Marigorta (Integrative Genomics Lab):

Gearing omic insights into preclinical stages to propose new ways of precision medicine in inflammatory bowel disease (PreclinomicsIBD)

Our lab, focused on the field of genomics of preclinical disease, combines statistical genomics and multi-omic profiling to develop innovative methods for integrating genomics into precision medicine. For this project, we have generated multi-omic profiles from individuals who, over time, receive a diagnosis of inflammatory disease. Datasets will be analyzed and integrated with large-scale biobank initiatives to refine a multi-omic signature for identifying high risk of developing inflammatory disease within a 10-year window. Lifestyle interventions that can mitigate this risk will be identified. Background in complex trait genomics, computational skills, and proficiency in a scripting language, are encouraged. Highly collaborative environment: quantitative genetics, regulatory genomics, human immunology, and clinical gastroenterology.

Dr. Rosa Barrio (Ubiquitin-likes And Development Lab):

Deciphering the role of Ubiquitin-Like modifiers in the etiology of rare diseases (RarE3)

Cutting-edge research on Protein Homeostasis in the Barrio Lab: Do you want to make a difference by studying rare disease mechanisms? In the Barrio Lab, we explore the complex world of protein homeostasis, specifically focusing on how ubiquitin pathway dysregulation can contribute to many rare disorders. Our team employs state-of-the-art biochemistry, genetics, and cell biology, including biotin-based proximity interactions and mass spectrometry, targeted protein degradation, gene editing, CRISPR, confocal microscopy, cloning, etc. Our goal is to unravel the mystery of selectivity for E3 ligases and deubiquitinases, paving the way for innovative therapies.

Dr. Malu Martínez Chantar (Liver Disease Lab):

Exploring Magnesium's Signaling Role in Type 2 Diabetes and Aging: Transformative Perspectives in Magnesium Research (MAGNIT2D)

Despite the well-known effects of intracellular Mg2+ concentrations, the intricate regulation of these concentrations by ion channels and transporters remains poorly understood. This project aims to illuminate the role of Mg2+ transporters, which exhibit significant dysregulation in metabolically compromised organs, in the development of Mg2+-related disturbances associated with "inflammaging" and Type 2 Diabetes (T2D), including mitochondrial dysfunction, genomic instability, and reactive oxygen species production. Specifically, our

objective is to unravel the systemic regulation of this essential "messenger cation" in metabolically compromised tissues such as the liver, adipose tissue, pancreas, and brain. By delving into this investigation, we aspire to enhance our understanding of the impact of Mg2+ and Mg2+ transporters on the onset and progression of T2D.

Prof. José M. Mato (Precision Medicine and Metabolism Lab):

Unveiling the Metabolic Diversity of Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD)

The liver must balance adapting to metabolic changes while maintaining stability in lipid metabolism. Metabolic dysfunction-associated steatotic liver disease (MASLD), formerly NAFLD, is linked to obesity, diabetes, and cardiovascular disease (CVD), with an estimated 45% prevalence in the European adult population. MAT1A deficiency in mice leads to spontaneous MASLD development, progressing to steatohepatitis, fibrosis, and HCC. Impaired MAT1A expression is also observed in MASLD patients, highlighting its significance. We identified distinct MASLD subtypes with varying VLDL secretion levels and CVD risks. This project aims to investigate metabolic alterations in MASLD-A, develop non-invasive diagnostic tests, and explore impaired VLDL secretion's role in hepatic tumorigenesis.

Dr. María Vivanco (Cancer Heterogeneity Lab):

Innovative tools against resistance to hormone therapy in breast cancer (NONRESISTANT)

Resistance to therapy in breast cancer remains an unmet clinical challenge. The development of effective new therapies, or combination of anticancer treatments is limited by a lack of realistic human models and a persistent underappreciation of the complexity of breast cancer. NONRESISTANT is a translationally oriented multidisciplinary project that aims to deliver a novel signature test as a prognostic tool and an innovative therapy, validated using a human biomimetic matrix, to enable enhanced treatment efficacy and reduce the risk of recurrence in breast cancer patients.

Prof. Antonio del Sol (Computational Biology Lab):

Computational framework to identify hierarchical cell identity TFs to generate committed progenitors for cell therapy in spinal cord injury (HIERARCHY)

Protocols for efficiently engineering desired cell subtypes for cell therapy are still scarce since the identity transcription factors of these cell subtypes are usually unknown. In this regard, we aim to develop a computational framework that identifies cell identity transcription factors at different levels of hierarchical organization, including cell type, subtype and phenotype, to design sequential induction protocols for cell conversion. We will apply the proposed computational framework to design a new experimental protocol for generating specific human V2a interneuron progenitors that can promote spinal cord regeneration upon transplantation into the site of injury.

Please, if you are interested send, before Sept 28th, your CV, your academic records, along with a motivation letter (1 page), and your preferred topic using the following **form** and indicating 44613 as reference.

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