

JOB OPENING AT IRB BARCELONA

POSTDOCTORAL FELLOW on BIOINFORMATICS (ref. PD/20/05)

Created in 2005 by the Generalitat de Catalunya (Government of Catalonia) and the University of Barcelona, IRB Barcelona is a Severo Ochoa Centre of Excellence—a seal that was awarded in 2011.

The institute is devoted to conducting research of excellence in biomedicine and to transferring results to clinical practice, thus improving people's quality of life, while simultaneously promoting the training of outstanding researchers, technology transfer, and public communication of science. Its 25 laboratories and seven core facilities address basic questions in biology and are orientated to diseases such as cancer, metastasis, Alzheimer's, diabetes, and rare conditions.

IRB Barcelona is an international centre that hosts 400 members and 30 nationalities. It is located in the Barcelona Science Park. IRB Barcelona forms part of the Barcelona Institute of Science and Technology (BIST) and the "Xarxa de Centres de Recerca de Catalunya" (CERCA).

IRB Barcelona is seeking a talented and highly motivated **Postdoctoral Researcher** to join the **Structural Bioinformatics and Network Biology group** (<https://sbnb.irbbarcelona.org>), led by **Dr. Patrick Aloy**, to work on **Personalized Medicine**. The candidate will work on the project "Cluster Emergente del Cerebro Humano" (CECH) funded by the Secretariat of Universities and Research of the Ministry of Business and Knowledge (Government of Catalonia) and by the European Regional Development Fund (FEDER) with reference number 001-P-001682 (codi IC).

The amount and complexity of the biological data generated in the last years, due to the popularization of high-throughput pipelines, is virtually flooding biomedical research. Indeed, the growth of biological databases is steeper than ever before, and the repertoire of possible read-outs spans all levels of biology. However, the nature of biological data is remarkably complex, and dealing with diversity, inconsistency and incompleteness, among other issues, demands heavy specialist processing, and prevents a widespread *predictive* approach to disease biology. Indeed, this deluge of data has not spurred the development of truly precision therapies, and the inherent limitations of the prevailing reductionist approaches have highlighted the need of moving away from the 'one disease, one target, one drug' paradigm and consider the complexity of human pathologies and physiological responses.

The current project builds on the hypothesis that the disease-causing perturbations leave detectable traces at different - and variable - levels of biological complexity (i.e. activation/inhibition of signaling pathways, transcriptional changes, etc) that capture both the direct effect of the perturbation and a global reaction of the system. Accordingly, the main aim of the project is to collect genuinely heterogeneous datasets, and offer a generic and intuitive means to bridge the gap between biological big data repositories and state-of-the-art machine-learning tools. Besides, we shall develop a generalized connectivity mapping, as a form of virtual phenotypic screening, to discover novel chemical or genetic modulators able to *revert* the specific signatures of disease and 'cancel out' the phenotypic traits of the disorder.

DUTIES

The successful candidate shall be responsible for the implementation of a pipeline to collect and process biological big data, and to encapsulate it in the form of heterogeneous biological embeddings. Overall, we shall develop a novel strategy to integrate the deluge of biological data in a format that is readily suitable for modern machine learning. Additionally, he/she will develop a General Connectivity Mapping (GCMaP) strategy to link biological and chemical signatures from the Chemical Checker (<https://chemicalchecker.org>), so that the biological context of each small molecule can be incorporated



IRB BARCELONA endorses the Requirements and Principles of the *European Charter for Researchers*, the *Code of Conduct for the Recruitment of Researchers*, and Open, Transparent, Merit-based recruitment promoted by the European Commission and follows Equal Opportunities policies.

On 9th December, 2014, IRB Barcelona was awarded the "HR Excellence in Research" logo. This recognition reflects the commitment of the Institute to the continuous improvement of its human resources policies in line with the *Charter & Code*. The Institute works to ensure fair and transparent recruitment and appraisal procedures.

as a descriptor. We shall then explore the added value of these biological descriptors to identify therapeutic opportunities to treat complex diseases.

EXPERIENCE, KNOWLEDGE, SKILLS & SELECTION CRITERIA

Must Have - Required

- **Education:** Bachelor in Biosciences, or Engineering degree in Computer Sciences. PhD in Bioinformatics, or related areas.
- **Experience:** previous experience in the processing and integration of multi-Omics data. Strong publications record according to his/her career stage.
- **Skills:**
 - o Excellent programming and scripting skills, with deep knowledge of Python.
 - o Competent knowledge of databases management (e.g. postgresSQL and Neo4j).
 - o Competent in the use of HPC queue systems, virtual machines (OpenNebula) and Grid Containers (Docker, Singularity).
 - o Excellent interpersonal and communication skills. Highly motivated. Fluency in English.

Desirable

- **Experience:** Previous experience working on complex diseases and in an international environment.
- **Skills:**
 - o Machine learning (including embedding techniques)

WORKING CONDITIONS & ENTITLEMENTS

- **Working conditions:** Employed in compliance with Spanish legislation and regulations under a full-time contract. Employees receive the benefits of the Spanish Social Security system covering sickness, maternity/paternity leaves and injuries at work.
- **Training and Career:** Postdoctoral researchers joining IRB Barcelona gain access to the Institute's advanced research training and career development opportunities, all within in a competitive international environment. Courses and workshops on themes of particular interest to postdocs are offered regularly by the Institute.
- **International environment:** Nearly 90 Postdoctoral researchers (more than a half non-Spanish nationals) are currently working at IRB Barcelona.

HOW TO APPLY & SELECTION PROCESS

Applications for the above opening should include a CV and a letter of interest and should be sent by e-mail to: irbjobs@irbbarcelona.org with the Reference: **PD/20/05**

- **Deadline for applications:** 31/03/2020
If no suitable candidate is found, the deadline will be extended.
- **Number of positions available:** 1



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- Selection process

- **Pre-selection:** Will be based on CV, motivation letter and experience.
- **Interviews:** Short-listed candidates will be interviewed.
- **Job offer:** Will be sent to the successful candidate after the interview.

For more information please visit our website at: www.irbbarcelona.org

Note: The strengths and weaknesses of the applications will be provided upon request.

If you, as an applicant, have any suggestion or wish to make a complaint regarding the selection process, please contact us at the following email address: irbrecruitment.suggestions@irbbarcelona.org You will receive a response within a month.



HR EXCELLENCE IN RESEARCH

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