Universitat Pompeu Fabra Barcelona | Master in Bioinformatics for Health Sciences

Master project 2020-2021

Personal Information

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Project

Computational systems biology

Project Title:

Creating the framework for a multidimensional understanding of signal transduction

Keywords:

signal transduction, multidimensional, molecular, spatial, and temporal level

Summary:

Remarkably, signal transduction systems use a relatively limited repertoire of intracellular signaling components. This small number of effector proteins nevertheless enables a cellular signaling apparatus that is flexible and versatile. Versatility is achieved by modulation at the molecular, spatial, and temporal levels of the macro-molecular interactions at each node in the pathway. In effect, a limited number of nodes, each with several alternative downstream pathways, can give rise to a vast number of distinct signaling pathways. Although versatile and complex, the biological role of signal transduction demands specificity and precision in signaling. In this respect, many questions remain open about the interplay of the molecular, spatial, and temporal levels of the macro-molecular interactions. This knowledge gap is tackled by the European Research Network on Signal Transduction (ERNEST) which counts currently more than 400 researchers with different expertise in the field. We are looking for a motivated student who is interested in supporting the endeavor of ERNEST. The Master student will have the unique opportunity to interact with known researchers across Europe. The student will be in charge of developing a framework for collecting, organizing and visualizing diverse signaling data. He/she should have knowledge in HTLM/CSS, web page design, MySQL 5.5, database design, Python. C/C++ and JavaScript is a plus. An important benefit of this projects is that the master student will be introduced to a wide European network in signal transduction which provides with valuable contacts and diverse opportunities for future job openings.

References:

Sommer et al. The European Research Network on Signal Transduction (ERNEST): Toward a Multidimensional Holistic Understanding of G Protein-Coupled Receptor Signaling (2020) (https://pubs.acs.org/doi/pdf/10.1021/acsptsci.0c00024)

Expected skills::

He/she should have knowledge in HTLM/CSS, web page design, MySQL 5.5, database design, Python. C/C++ and JavaScript is a plus.

Possibility of funding::

To be discussed

Possible continuity with PhD: :

To be discussed