Computational PhD position in the design of regulatory proteins and modelling their impact on dynamic biological systems.

Job description

As part of a VUB strategic research project for 'Synthetic biology for the development of microbial cell factories', we are offering a PhD position where the **(re-)design of regulatory proteins** is combined with **modelling their impact on regulation** in dynamic biological systems. The position is associated with two computational groups at the VUB: i) the Bio2Byte group led by Prof. Dr. Wim Vranken, with focus on predicting biophysical protein characteristics and interpreting these predictions in relation to life science problems such as molecular causes of human diseases or protein design (see https://bio2byte.be/) and ii) the group of Prof. Dr. Sophie de Buyl (see https://aphy.research.vub.be/prof-dr-sophie-de-buyl), with interest in gaining a fundamental understanding of the physical principles that control the emergent properties of biological systems.

The project will assist in designing synthetic circuits to regulate *E. coli* metabolism, especially fatty acid production pathways. The computational work will be closely linked to experimental validation in the laboratory of Prof. Dr. Eveline Peeters (https://micr.research.vub.be/), with expertise in developing dynamical pathway regulation through biosensors. Approaches relying on both transcriptional (DNA) and post-transcriptional (RNA) levels will be developed and intertwined in iterative computation/experiment cycles. The project relies both on developing approaches in **bioinformatics**, where regulatory protein data is collected and analysed in relation to DNA/RNA binding, and in **mathematical modelling**, where the combined effect of introducing such regulatory proteins is studied. The end goal is to create general strategies for the efficient production and regulation of metabolites in *E. coli*.

The three groups have an extensive international network of collaborations within and outside of Europe. We offer an open, dynamic and rewarding research environment, focused on teamwork and collaborations, that stimulates initiative taking, discussion and originality.

Profile

Applicants must hold a master's degree in physics, mathematics, chemistry, (bio)engineering or equivalent. Experience with biological and/or dynamical modelling is an advantage. Applicants must be proficient in both written and oral English. Personal and relational qualities will be emphasized.

What we offer

The position is immediately available and funded for the full duration of the PhD. You will be mainly located at the $(IB)^2$ Interuniversity Institute of Bioinformatics in Brussels (http://ibsquare.be/), Etterbeek VUB/ULB campus, which provides an interdisciplinary environment across sciences and (bio-)engineering.

Applications and further information

Please contact Wim.Vranken@vub.be and Sophie.de.Buyl@vub.be for additional information. To apply, please fill in and submit this online form: https://bit.ly/phd_compsynbio, or scan the QR code on the right. You have to include 1) a motivation letter detailing your interest and suitability for this position and 2) a copy of your Master's degree and 3) a CV including at least 1 contact for reference. Additional information can be uploaded via the application form. The position is open until filled.