Position Offered: UNIVERSITY GRADUATE

Project: *BioGenIA: Generation of Predictive Models integrating Artificial Intelligence and Mechanistic Knowledge of Bioprocesses and Biosystems of interest in the Food Industry.*

Technological and scientific fields: Artificial intelligence, High performance computing, Digital Twins, Biotech, Computational Biology

Location: Vigo, Galicia, Instituto de Investigaciones Marinas, www.iim.csic.es

Research Group/PI: Bio2Eng Biosystems and Bioprocess Engineering, Eva Balsa-Canto, https://bio2eng.csic.es

PROJECT SUMMARY

In the food industry, bioprocesses and biosystems are essential. While experimental techniques help us analyze them in detail, we still face challenges in transitioning from description to a mechanistic understanding that can facilitate the automation of industrial process design. Computational biology modeling holds enormous potential in this regard, but it also presents challenges due to biological complexity, non-linearity, and limited real-time data availability. The BioGenIA project aims to tackle these challenges by developing and validating methods and software for generating predictive models automatically. Our goals include integrating mechanistic kinetic models with machine learning to enhance predictive capability and developing a streamlined approach to identify models using high-performance architectures and artificial intelligence. Finally, we will test these developments in industrial bioprocesses such as waste and by-product valorization, food fermentation, and integrated multi-trophic aquaculture.

PROFESSIONAL PROFILE

Minimum requirements:

BSc in Physics or Mathematics; MSc in Industrial Mathematics; Languages: Spanish & English; Programming skills: MATLAB, Latex

Merits to be considered:

Experience in dynamic modeling of bioprocesses and biological systems; preferably in the food industry. Experience in numerical optimization methods. Scientific contributions (publications, conferences) and research activities (fellowships, contracts) related to the topic of the project. Additional programming languages.

WHAT IS OFFERED

This project offers the opportunity to contribute to scientific and technological progress in the field of digital bioprocesses in the food industry and, in parallel, to professional development since it includes both transversal training (writing scientific papers, scientific communication, etc.) and training in the field of modeling of biological systems, artificial intelligence and high performance computing. It also offers two research stays with research groups at the University of A Coruña and another international one (in Slovenia or Italy).

Contract conditions:

Indefinite contract for a University Graduate associated with the Momentum Project of 4 years' duration according to Spanish science law. Gross annual salary (37.000 € - 41.000 €).

Start of contract: before 31 December 2024

PRINCIPAL INVESTIGATOR CONTACT

Email: ebalsa@iim.csic.es

Phone: 986231930