

Postdoc “Smart microscopy for single-cell biology”, Institut Pasteur and Inria, Paris

We are looking for a highly motivated biophysicist or engineer with a strong interest for interdisciplinary research to join our team. We combine quantitative systems biology with control theory and applied mathematics for cell engineering. Our long-term goal is to develop integrated, model-driven hardware/software/lifeware platforms for the rational engineering of microbial cell populations.

Keywords: fluorescence microscopy, optogenetics and digital micromirror devices, microfluidics, optimal experimental design and reactive microscopy, synthetic biology.

The Project

Our group is developing a design/build/test/learn approach for strain engineering. Models play a central role and are iteratively used, in combination with learning, to guide the design and construction of engineered yeast strains and the design of maximally-informative experiments.

The main tasks of the postdoctoral candidate will be to (i) develop a reactive microscopy platform that integrates the optimal experimental design algorithms, (ii) use them to characterize at the single cell level engineered cells constructed in the lab, and (iii) orient model developments. The candidate will have a pivotal role to showcase the effectiveness of design, build, test and learn strategies.

Qualifications

Candidates should have a PhD in physics or engineering with expertise in microscopy and quantitative biology. He or she should be capable of developing an advanced microscopy platform combining hardware and software for reactive experiments. So, good programming skills are essential. Knowledge of microfluidics or of quantitative, mechanistic mathematical modeling in systems biology will be appreciated. Given the high interdisciplinarity of the lab, the will to exchange knowledge (transmit and learn) with other lab members will be an essential asset.

Work environment

Our group, InBio, is a joint initiative between Inria and Institut Pasteur. Inria is a French national institute dedicated to research in computer science, control and applied mathematics, and promoting scientific excellence and technology transfer. The Institut Pasteur is a world-renowned non-profit private foundation dedicated to biomedical research and the fight against infectious diseases. It offers access to top-notch experimental platforms and strong support for innovation.

InBio is an interdisciplinary research group, combining experimental and computational biology in the same lab. We combine systems and synthetic biology approaches with control and active learning methods and stochastic and statistical modeling frameworks. Current applications include (i) the real-time control of gene expression using optogenetic and chemical stimulations in various systems (e.g. gene expression in yeast and bacteria, toggle switch in bacteria), (ii) the optimization of protein production through the preservation of host cell physiology or through engineered cell specialization, and (iii) the characterization of collective antibiotic resistance in ESBL-producing bacteria. We also develop platforms to automate experiments.

The group consists of scientists with diverse backgrounds (mathematics, physics, computer science, and biology) and nationalities (French, German, Spanish, Montenegrin, and Indian). The spoken language is English. We are located on the vibrant campus of Institut Pasteur in the heart of Paris. Team's website: <http://bit.ly/InBioPasteur>

Applications are accepted immediately and candidates will be considered until the position is filled. The successful applicant will be hired on a two-year contract with possible extensions. Salary will be based on experience.

Contact

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Applications should include a CV, a brief text describing your current research and career goals and how you could contribute to our research program, and contact information of references.