Postdoc position for a (bio)physicist, engineer or computational scientist

Hyperspectral imaging methods to study cell states in tissues and tumors

Institut Pasteur, Paris France

The Imaging and Modeling Unit at Institut Pasteur is looking for a highly motivated postdoc to develop advanced microscopy and image reconstruction techniques in order to characterize cellular states and trajectories within complex tissues in physiology and disease.

During development, cells with identical genomes undergo state changes that are essential to the formation of organs and entire organisms. When derailed, cellular state changes can lead to pathologies including cancer and neurodevelopmental disorders. Characterizing cell states at the molecular level in complex multicellular tissues requires advanced imaging-based technologies that overcome traditional limits of spatial and temporal resolution, imaging depth and number of simultaneously imaged molecular species or colors.

To address this challenge, we aim to develop an imaging method able to record a large number of molecular species (including proteins and RNAs) simultaneously or quasi-simultaneously in mm- or cm-thick samples such as brain organoids. For this purpose, we will develop 'hyperspectral' light-sheet imaging approaches with computational reconstruction methods based on AI (deep learning) and/or compressed sensing. The envisioned imaging system will be based on a hybrid open-top light sheet microscope recently implemented in our lab in collaboration with J. Liu (Glaser et al. Nat Meth 2022).

We are now looking for a postdoc to lead the development and validation of this system and its application to hyperspectral imaging of biological samples in collaboration with partner teams.

Expected profile:

- Physicist, engineer or computational scientist
- Strong motivation to work at the interface of physics/engineering/computer science and biology
- Ability to work both autonomously and in collaboration, excellent team spirit
- Good communication skills, fluency in English

The postdoc will be embedded in the Imaging and Modeling Unit, an interdisciplinary team with long-standing expertise in advanced microscopy, computational modelling and AI methods and a solid network of collaborations.

This project is part of the national PEPR Cell-ID (Cellular identities and destinies) program, funded by the French National Research Agency (ANR). Cell-ID brings together a multidisciplinary consortium of laboratories from biophysics to developmental biology and clinical medicine around a common goal: understanding how cells acquire and maintain their identity during development and why some deviate from their normal trajectory to give rise to pathologies such as pediatric brain tumors.

Interested candidates please send a CV, letter of motivation with statement of research interests, and the contact details of at least 3 references to: mickael.lelek@pasteur.fr and czimmer@pasteur.fr