

PhD in Image analysis and Data modelling for advanced microscopy applied to biomolecular systems (Barcelona)

Have you ever wondered how organisms that do not control body temperature are able to preserve their molecular systems in the face of global warming? **The group of Oriol Gallego (UPF) opens a 4-year PhD position to investigate the physical principles that underlie the adaptation of molecular systems in cells exposed to climate change.** The student will contribute **to develop an image analysis** pipeline that extracts quantitative measurements from Single Molecule Localization Microscopy (SMLM), particle tracking and cryo-electron tomography (cryo-ET). The measurements will be integrated **using machine learning and data modelling.**

Our lab combines cell engineering and advanced live-cell imaging to resolve molecular architectures *in vivo* with up to 2 nm precision (Picco *et al*, 2017, Cell; Irastorza-Azcarate *et al*, 2019, Structure; Hernández *et al*, 2024, NAR GAB). In collaboration with the groups of Daniel Castaño-Díez (Biofisika Institute, Spain) and Alex de Marco (NYSBC, USA), we received a HFSP grant to continue pushing the limits of microscopy to investigate molecular systems *in situ*. **The PhD student will develop computational tools that allow us to extract mechanistic insight from advanced microscopy data and to deliver quantitative models describing the physical principles that rule the adaptation of cellular functions to environmental fluctuations associated with climate change.** In particular, the tasks of the PhD student will include the implementation of deep learning and Bayesian methods for the statistical analysis and quantification of images obtained through super resolution microscopy, live-cell imaging and cryo-ET. Importantly, during the first year of the PhD, the student tasks will include 3 months of teaching activities.

The student will join an international team (the group currently hosts 9 researchers from 4 different countries) developing imaging techniques at the frontier between cell biology and physics. Our lab is located at the PRBB, one of the strongest scientific campuses in south Europe with state-of-the-art research facilities.

If you are interested, please send a short cover letter, your CV and the contact details of 2 referees to oriol.gallego@upf.edu (until the position is filled or 30th June 2024)

Starting date: June-July 2024

Requirements

- Expertise in at least one of the following: Optics applied to light microscopy, bioimage analysis or data modelling.
- BSc or MSc in computer sciences, physics, math, (Bioscience) engineering, biotechnology, or related disciplines.
- Expertise in computer programming (Python, R, Matlab or Fiji).
- Excellent track-record of Graduate and Master degrees is highly valued ($\geq 8/10$ GPA for Spanish students).
- Expertise in SMLM, particle tracking or cryo-EM/cryo-ET will be valued, although it is not a requirement.