

PhD in Image analysis/Data modelling for single molecule localization microscopy (Barcelona)

The group of Oriol Gallego (UPF) opens a 4-year PhD position funded with a HFSP project. With the co-supervision of the group of Carlo Manzo (UVic-UCC), the PhD student will contribute to an interdisciplinary project by analyzing biological measurements from Single Molecule Localization Microscopy (SMLM) and live-cell imaging by using machine learning and data modelling.

In the past, we combined cell engineering and advanced live-cell imaging to develop PICT, a new method that can resolve molecular architectures *in vivo* with unprecedented detail (Picco *et al*, 2017, *Cell*; Irastorza-Azcarate *et al*, 2019, *Structure*). In collaboration with the groups of Daniel Castaño-Díez (Univ. Basel, Switzerland) and Alex de Marco (Monash Univ., Australia), we received a HFSP grant to continue pushing the limits of microscopy to investigate molecular structures *in situ*. **The PhD student will develop computational tools that allow us to extract quantitative models from advanced microscopy data and to deliver mechanistic insight about the 3D organization of the cell machinery.** 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 and live-cell imaging (Košūta *et al*, 2020).

The researcher will join an international team developing imaging techniques at the frontier between cell biology, engineering and physics. The project is truly interdisciplinary, and it will be carried out together with biologists, microscopists, bioinformaticians and physicists. The PhD student, who will be based on our laboratory at the Pompeu Fabra University (UPF, Barcelona), will have all the necessary facilities and expertise available. As part of the UPF, the lab is located at the PRBB, one of the strongest scientific campus in south Europe. With state-of-the-art research facilities, PRBB offers an ideal scientific and international environment.

If you are interested, please send a short cover letter, your CV and the contact for 3 referees to oriol.gallego@upf.edu

Deadline: February 15th, 2021

Starting date: It is flexible but no later than June 2021.

Requirements

- Expertise in at least one of the following: Bioimage analysis, data modelling, statistics or optics applied to light microscopy.
- Bs or MSc in computer sciences, (Bio-)physics, (Bioscience) engineering, biotechnology, or related disciplines.
- Basic knowledge of computer programming (Python, R, Matlab, Julia).
- Expertise in SMLM will be valued, although it is not a requirement.

References:

- Picco, A., Irastorza-Azcarate, I., ..., Gallego, O., (2017) *Cell* 168, 400-412.e18.
- Irastorza-Azcarate, I., ..., Gallego, O., (2019) *Structure* 27, 886-892.
- T. Košūta, T. ..., Manzo, C. (2020) *Physical Chemistry Chemical Physics* 22, 1107-1114.