Postdoc in Data modelling/Image analysis to investigate the molecular principles of heterosis: *how progeny outperforms parents?*

We open a postdoc position in the "Live-cell structural biology" group (UPF, Barcelona) to understand the general principles of heterosis: how the progeny of two parental organisms can surpass their progenitors in adaptation to life-threating environments.

Biological context: Heterosis is a phenomenon that happens when the progeny of two parental organisms acquires "superior" performance than the original parents. Although it has a massive impact on the adaptation of species to natural environments, the molecular principles that control heterosis remain unexplored. We will investigate heterosis in eukaryotic microorganisms that cannot control their "body" temperature, and therefore, are vulnerable to thermal fluctuations in the ambient. We aim to understand how species adapt their essential cellular processes to life-threating temperatures and to deliver mechanistic knowledge that aids the prediction of biodiversity loss caused by global warming.

The project: Together with a bioinformatician and two cell biologists, the researcher will exploit the diversity of non-conventional model organisms available in our laboratory and multidisciplinary microscopy. **The researcher is expected to lead the development of computational tools that allow us to extract quantitative models from super resolution and particle tracking data and to deliver insight about the fundamental principles that govern heterosis in the context of climate change.** The tasks of the candidate will include the implementation of image analysis for single molecule localization microscopy (SMLM) and particle tracking (Bayesian methods + machine learning) and to develop predictive models.

The Lab (www.gallegolab.org): Latest funding allowed us to gather a multidisciplinary team (50% computational + 50% experimentalist) that works in the frontier between evolutionary cell biology and structural biology. The lab is highly international, and it has all the necessary facilities and expertise for the cell biology, live-cell imaging, SMLM and computational modelling. As part of the UPF, we are located at the PRBB, one of the strongest scientific campuses in southern Europe.

If you are interested, please send a short cover letter, your CV and the contact for 2-3 referees to oriol.gallego@upf.edu.

Deadline: September 2023 or when the position is filled.

The position:
- Starting date no later than December 2023.
- Salary according to the researcher expertise
- 1+1 years position with the option to be extended.

Requirements:
- Strong expertise in bioimage analysis and/or data modelling.
- MSc or PhD degree in mathematics, computer sciences, physics, or related fields.