

The Origin of Animals: A Cell Biological Approach.

The MultiCellGenome Laboratory (<https://multicellgenome.com>)

We are interested in deciphering how animals originated from their unicellular ancestor. This will only be accomplished if we analyze the closest unicellular relatives of animals. And this is what we do. We are generating several emerging model systems to understand the transition to multicellularity. We are an evolutionary biology, a genomics, a cell-biological, a protistologist lab, a developmental biology lab and a taxonomists laboratory! More importantly, we are an engaged team, a family that approaches science with an open mind, that joins forces with the best global partners when needed, and that commit to our values in everything we do.

Project Description

The origin of multicellular animals from their unicellular ancestor represent one of the most important evolutionary transitions in the history of life. However, and despite its importance, the mechanisms underlying this transition remain largely elusive. Our laboratory is at the forefront of addressing this fundamental question. Over the past 15 years, we have advanced considerably on our quest to unravel how animals originated. Our research has shown that the unicellular ancestor of animals was much more complex than previously thought. That ancestor already had the genetic raw material to evolve into a multicellular organism. Our hypothesis is the unicellular ancestor had a highly phenotypic plasticity and the capacity to differentiate into many different cell stages.

In this proposal, we aim to get additional data crucial to unravel the origin of animal cell types, and understanding the role of the phenotypic plasticity in transition towards a multicellular entity. We also aim to strengthen our experimental model systems so that we can create the best possible functional platform to analyze the origin of animals

The project and the results generated will have implications not only for evolutionary biologists, but also to protistologists, cell biologists, and developmental biologists.

We offer: A fully-funded four-year PhD contract to work on the recently funded from the Spanish Ministry of Science, Innovation and Universities research project: The origin of animals: a cell biological approach. PID2023-153273NB-I00, led by Elena Casacuberta and Iñaki Ruiz-Trillo.

Location: IBE, CMIMA building (Mediterranean Marine and Environmental Research Center), Passeig Marítim de la Barceloneta 37-49, Barcelona, Spain

Application deadline: November 30th, 2024. Interested candidates should e-mail (elena.casacuberta@ibe.upf-csic.es and inaki.ruiz@ibe.upf-csic.es), with the subject line "PhD student position" and (1) their CV, (2) a motivation letter describing their interest in the project, and (3) contact information of two potential references.

Relevant publications: *Ichthyosporea: a window into the origin of animals*. Shabardina V, et al. Commun Biol. 2024 doi: 10.1038/s42003-024-06608-5. *The Origin of Metazoan Multicellularity: a microbial black Swan event*, Iñaki Ruiz-Trillo et al. Ann. Rev. Microb. 2023. doi: 10.1146/annurev-micro-032421-120023. *Stable transfection in the protist *Corallochytrium limacisporum* allows identification of novel cellular features among unicellular relatives of animals*. Aleksandra Kożyczkowska et al. Curr Biology 2021 doi: 10.1016/j.cub.2021.06.061.