

## PhD candidate position opening

# Coordination mechanisms between the marine unicellular N<sub>2</sub>-fixing cyanobacterium UCYN-A and its algal symbiotic partner

**Reference:** PID2023-152110NA-I00

**PhD Supervisor:** Dr. Francisco M Cornejo Castillo

**Centre:** Institute of Marine Sciences (ICM), CSIC, Barcelona, Spain

## Project description

The evolution from prokaryotes to eukaryotes was possible due to the establishment of endosymbiotic relationships between microorganisms, yet the mechanisms behind are difficult to address since they happened millions of years ago.

A marine cyanobacterium called UCYN-A was recently found to have intriguing parallelisms with the evolution of organelles in eukaryotic cells. UCYN-A lives in obligate symbiosis with algae and, since they established their symbiotic relationship 100 million years ago, UCYN-A has experienced genome rearrangements, including a dramatic reduction of genes, in a similar way to what it could have happened with the cyanobacterial cells that gave rise to chloroplasts. Furthermore, UCYN-A has the ability to transform dinitrogen gas (N<sub>2</sub>) into nutrients, and its algal host takes advantage of it due to the fact that no eukaryotes are able to perform this chemical reaction. Therefore, this peculiar symbiosis may be seen as a model to study the acquisition of new organelle-derived functions in eukaryotes.

The PhD candidate will carry out a multidisciplinary project that includes a wide spectrum of techniques going from bioinformatics, molecular biology and microscopy approaches to try to get gain insights of the ecology and evolution of the UCYN-A symbiosis.

## Requirements of the candidate

- Degree in Biology, Microbiology, Biochemistry, Bioinformatics or similar.
- Be enrolled in a doctorate program (this can be formalized later).
- Very good academic record (university degree >8.0)
- High English level. Good writing abilities. Motivation to learn and to work in a team.

## Hosting research team

The PhD candidate will join the Department of Marine Biology of the Institute of Marine Sciences (ICM)-CSIC. Besides the training needed for accomplishing the tasks of the project, the student will be integrated in a multidisciplinary team of master students, PhD candidates, post-docs and senior scientists, which will provide a great opportunity to acquire multiple research skills and knowledge on marine microbial ecology and oceanography.

## How to apply

Interested candidates should submit the following

- Cover Letter
- Curriculum Vitae
- Statement of Research Interests
- Contact information for two references

to: [fmcornejo@icm.csic.es](mailto:fmcornejo@icm.csic.es)

Do not hesitate to reach out if you have questions.

## Deadline for Application:

- Until the position is filled

---

*Interested candidates, please contact the principal investigator:*

**Francisco M. Cornejo** - [fmcornejo@icm.csic.es](mailto:fmcornejo@icm.csic.es)

---