

PhD opportunity in symbiotic nutrient cycling in cnidarian photosymbioses EPFL

The Laboratory for Biological Geochemistry at EPFL directed by Prof. Anders Meibom is looking for a motivated PhD student to work on cnidarian symbiosis and holobiont nutrient cycling.

Motivation and mission:

Tropical coral reef ecosystems are in global decline due to the effects of global environmental change. At the center of this ecosystem collapse is the breakdown of symbiotic interactions within the coral holobiont, the ecological unit comprising the cnidarian host and its microbial associates. While the efficient uptake, transformation, and exchange of nutrients in these symbioses has underpinned the evolutionary success of photosymbiotic cnidarians, this metabolic dependence proves to be their achilles heel in times of climate change. This project, funded by the Swiss National Science Foundation, seeks to advance our understanding of the molecular and spatial dynamics of symbiotic nutrient cycling and its role for cnidarian holobiont functioning.

The candidate will use state-of-the-art OMICS and imaging tools to visualize, localize, and quantify nutrient exchange in the intact cnidarian holobiont. Ultimately, this will permit studying how environmental conditions affect cnidarian holobionts in light of the underlying metabolic interactions.

The Laboratory for Biological Geochemistry of Prof. Anders Meibom investigates biological processes at the subcellular level using cutting-edge micro-analytical tools. To this end, we use a suite of isotopic labeling techniques in combination with micro- to nano-scale analytical instruments, including transmission electron microscopy (TEM), secondary electron microscopy (SEM), and ion microprobe secondary ion mass spectroscopy (NanoSIMS). Among the diverse range of projects in our laboratory, we use these technologies to study metabolic interaction between cnidarians (e.g. corals, sea anemones, and jellyfish) and their symbiotic partners, such as microalgae and bacteria.

The successful candidate will be supervised by Prof. Anders Meibom and Jr. Prof. Claudia Pogoreutz (CRIOBE; University of Perpignan Via Domitia, France).

Keywords and concepts:

- Laboratory experiments combining cnidarian model system and fieldwork approaches
- Characterization of symbiotic interactions using genomics and metabolomics
- Quantification and visualization of symbiotic interactions using novel cryogenic and conventional correlative SEM and NanoSIMS imaging applications

Your Profile:

- A Master Degree in a relevant discipline (Marine Biology/Zoology, Microbiology, or related)
- Experience with molecular biology benchwork
- Experience with histological sample preparation

- Experience with, or a strong interest in, optical imaging techniques and/or NanoSIMS analyses
- Experience with coral husbandry and/or manipulative aquarium experiments is an asset
- Basic knowledge or experience with data analysis and biostatistics
- Excellent oral and written English skills
- French skills are an asset
- International experience in an asset

We offer:

- Opportunity to work on multidisciplinary and cutting-edge projects using different imaging techniques, including (cryo-)NanoSIMS analysis
- Opportunity to access *state-of-the-art* research facilities and laboratory resources
- A competitive Swiss PhD student salary
- EPFL is an international and top ranking engineering university, offers a dynamic, stimulating, interdisciplinary, international and friendly working environment, a broad range of scientific training and networking events, and also hosts a vibrant entrepreneurial community
- EPFL is an equal-opportunity employer. Candidates will be recruited based on merit

Start date:

As soon as possible; applications will be reviewed starting at the end of May.

Important note: The chosen candidate will have to be accepted into the Doctoral School for Environmental Engineering at EPFL before the work-contract can start.

(<https://www.epfl.ch/education/phd/edce-civil-and-environmental-engineering/edce-how-to-apply/#faq-item-9f6d40ca008c1f1c03b8364e16993e3f>)

Term of employment:

Fixed-term (CDD)

Work rate:

100 %

Duration:

4 years

Your application should include:

- Motivation letter
- Full CV including publication record
- Contact information of at least 2 people who can provide letters of reference.

Contact: Please submit your application to Mme Michelle Wälti (michelle.waelti@epfl.ch).