

## Master thesis project: 'Exploring *Symbiodiniaceae* diversity and stress tolerance on the single-cell level'

### Master thesis background

Coral reefs are among the most biodiverse and productive aquatic ecosystems on the planet, with many of them currently in danger from anthropogenic global change. Most of the energy needed by coral reef organisms is produced by unicellular microalgae (dinoflagellates, family *Symbiodiniaceae*), symbionts within coral tissues that absorb light and perform photosynthesis. These microalgae are crucial for the health of coral reefs and can affect the coral's susceptibility to changing ocean temperatures. Thus, exploring the diversity, ecology and stress tolerance of *Symbiodiniaceae* strains can help us to understand how to protect reef ecosystems from global change.

### Master thesis project description and aims

In this project, you will use (i) quantitative phase microscopy and (ii) a MATLAB-based image analysis tool to determine the single cell dry mass variation in different *Symbiodiniaceae* strains during their life cycle (i.e. 'weighing' the cells). If time permits, you will then (iii) use the same system to determine the effects of different stressors on *Symbiodiniaceae* strains and their dry mass distribution. If you are interested, (iv) the MATLAB code for image analysis can also be further optimised and refined by you to suit the project aims.

### Methods

In this project, you will learn the following methods:

- Basic microbiology
- Quantitative phase microscopy
- Image and data analysis
- Potentially: Microfluidics

You should be a master-level student with some experience in e.g. image analysis, microscopy and/or phytoplankton culturing and a keen interest for interdisciplinary science.

Students from all walks of life and backgrounds are welcome to apply!

Have a look at what else we are up to: <https://behrendtlab.com/>

**Interested?** Please contact Saskia Rughöft ([saskia.rughoft@ebc.uu.se](mailto:saskia.rughoft@ebc.uu.se)) or Lars Behrendt ([lars.behrendt@scilifelab.uu.se](mailto:lars.behrendt@scilifelab.uu.se)). The scope of the project is a 30-45 hp master thesis.