



European Research Council  
Established by the European Commission



**MAX PLANCK INSTITUTE**  
FOR DEVELOPMENTAL BIOLOGY



The Department for Algal Development and Evolution at the Max Planck Institute for Developmental Biology in Tübingen has an opening for a

**Master Thesis project in the frame of an ERC grant TETHYS**

## **Sexes in the rockpools: molecular basis and evolution of male versus female differentiation in brown algae**

The brown algae are a eukaryotic supergroup that has been evolving independently of animals and land plants for more than a billion years. During that time, they acquired multicellularity to become the third most developmentally complex lineage on the planet, rivalling land plants in terms of body size and complexity. We have recently identified several major developmental regulators and dissected the chromosomal basis of sex determination in this group (e.g. Ahmed et al., 2014; Cock et al., 2010; Coelho et al., 2018), providing a solid foundation for the future development of brown algal developmental biology and comparative molecular biology. Research in our department currently focus on the origin, evolution and regulation of sexual systems diversity and on the molecular and evolutionary mechanisms that underlie the complex developmental patterns and reproductive features in the brown algae.

We are now looking for a creative, enthusiastic and ambitious master student interested in unravelling the molecular basis and evolutionary processes underlying male versus female differentiation in brown algae. We have generated RNAseq datasets for male and females across several species of brown algae, and the master project involves producing more data from cultivated algae, analyzing and interpreting datasets using bioinformatic and molecular evolution approaches. During this project you will learn how to generate NGS libraries, analyse Illumina RNAseq data and how to use molecular evolution tools to understand the evolution of genes involved in the male versus female developmental programs.

We are an international research group, and during your stay you will interact with experienced researchers with a range of backgrounds, from bioinformatics to genetics, genomics, cell biology, ecology and physiology, who will provide supervision and ensure a productive training period. You will gain experience in cutting edge techniques and after an initial training period you will be able to work independently. This project may eventually turn into a PhD project. The project is set up and a preferable starting date is beginning of 2021.

If you are interested, please send your CV and a brief outline of your goals and interests to Susana Coelho (susana.coelho@tuebingen.mpg.de) and Aga Lipinska (alipinska@tuebingen.mpg.de). You can check our website (<https://www.eb.tuebingen.mpg.de/department-of-algal-development-and-evolution/>), and phone or visit for informal discussions. More projects are available if you are interested in seaweeds, genetics, evolutionary genomics and marine biology.

Ahmed S, 2014. A haploid system of sex determination in the brown alga *Ectocarpus* sp. *Curr Biol CB* **24**:1945–1957. doi:10.1016/j.cub.2014.07.042

Cock JM, 2010. The *Ectocarpus* genome and the independent evolution of multicellularity in brown algae. *Nature* **465**:617–621. doi:10.1038/nature09016

Coelho SM, 2018. UV chromosomes and haploid sexual systems. *Trends Plant Sci* **23**:794–807. doi:10.1016/j.tplants.2018.06.005