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

Master Thesis project in the frame of the ERC grant TETHYS

Sexes in the rockpools: revealing the molecular basis of sex determination in the 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 focus on sex determination, 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 looking for a creative, enthusiastic and ambitious master student interested in unravelling the molecular basis and evolutionary processes underlying male versus female sex determination brown algae. We have isolated a partially sex-reversed algal mutant line that despite being genetically male presents a female phenotype. Using genetic and genomic analysis, we successfully isolated a candidate transcription factor responsible for the feminization phenotype. The aim of the Master Thesis project is to use several molecular and biochemistry approaches to identify the interactors of this transcription factor in order to understand the molecular pathway involved in male versus female sexual differentiation. The successful candidate, in collaboration with members of the Department, will use a range of approaches including heterologous protein expression for antibody production, cDNA library construction, yeast two hybrid system, pull down, DAP-seq and ChIP-seq.

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). 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 development and evolution, 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