

**Supervisors:**

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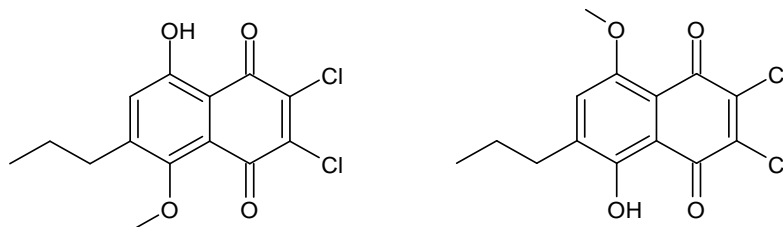
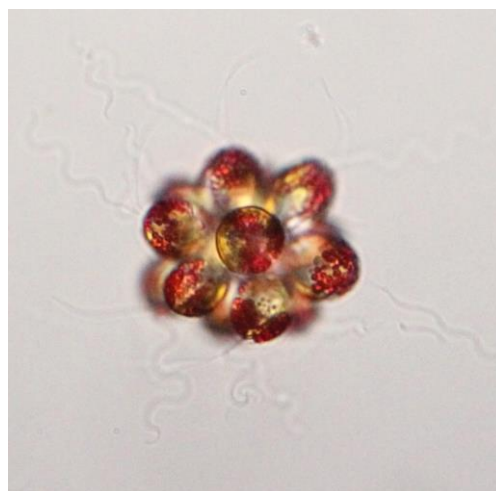
**Project title:**

## The colorful secret of *Synura (Chrysophyceae)*: Eco-physiological implications of novel halogenated pigments

**Students count:** 1-2

**Project description:**

Microalgae play a key role in aquatic ecosystems by contributing to primary production and biogeochemical cycles. The *Chrysophyceae* are common class of algae especially during spring blooms in clean freshwater ecosystems. The important chrysophyte genus *Synura* is certainly one of the most beautiful algae, forming typical motile, oval-shaped colonies, and their cells are covered with ornamental silica scales. Furthermore, some species of this genus produce distinctive red droplets within their cells. These droplets have been known for decades, but their chemical composition was only recently described in our laboratory. Surprisingly, the color of the droplets is not from carotenoids, as is usual for algae, but by unique pigments that has not been recorded in any other organism so far. We call these pigments Synurins; biochemically, they are halogenated naphthoquinones.



The biological functions of Synurins are unknown; however, we hypothesize that they may influence ecological interactions through their redox activity, potential toxicity, and light-absorbing and fluorescent properties. Our ongoing project aims to elucidate their functions using various experimental approaches. During the Summer school project, the student will cultivate selected *Synura* strains under various culture conditions (medium composition; temperature; light intensity;

presence of a stressor such as predators, oxidative agents, etc.). During cultivation, the student will monitor the growth rate and Synurins production. To quantify them, the student will extract the biomass and perform HPLC analyses.

**Requirements:**

The student is expected to be comfortable in speaking and writing in English. Previous laboratory experience is an advantage not a necessity. However, a significant part of the project will be performed in the wet lab, so the student should be comfortable with handling glassware and performing other tasks that require fine motor skills. A certain degree of computer analytical work (processing results, creating graphs, and making presentations) will be required; personal notebook is highly recommended. A study degree is not essential, although there is a slight preference for an advanced student.