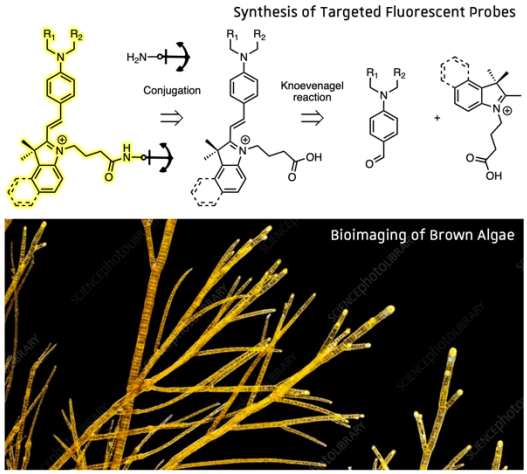
2024-2025 Master 2 Internship offer

Synthesis of New Fluorescent Probes to Study Dynamics in Living Cells of Brown Algae

Brown algae are marine photosynthetic multicellular organisms that have evolved independently of plants and animals. They are exciting organisms to study, as they enable environmental and cellular factors in development to be studied with a minimalist approach. The project led by **Bénédicte Charrier's team** (ERC awardee) aims at investigating which factors control the orientation of cell divisions in brown algae. However, several challenges in imaging remain to be tackled including the monitoring of 1) their growth over time, 2) changes in their shape, 3) changes in intracellular organisation during the different phases of the cell cycle and 4) the way in which cells are arranged together during tissue growth.



In brown algae, the introduction of genes coding for fluorescent proteins is not possible, so this shortcoming needs to be overcome by the development of **selective and bright fluorescent probes** that enable the observation of biological processes such as cell growth and division.

Objectives: The objective of this internship is to design and synthesize fluorescent probes that selectively target and brightly stain cellular compartments of the brown algae including the cell wall, the plasma membrane, the mitochondria as well as tubulin that constitutes microtubules and centrosomes, two intracellular structures that are essential for the formation of the mitotic spindle during cell division.

The M2 candidate will synthesise and characterize the fluorescent probes in the team "Chemistry of photoresponsive systems" led by Mayeul Collot at the Faculty of pharmacy in Illkirch (University of Strasbourg) and will be involved in testing the synthesized probes by microscopy imaging of the brown algae in Bénédicte Charrier's team at the Institut de Génomique fonctionnelle de Lyon (IGFL). The candidate should possess a great enthusiasm for multistep synthesis and analysis (NMR, mass spectrometry) and interest in bioimaging. Spectroscopy and microscopy will be taught on-site, thus offering a multidisciplinary training to the candidate.

Information:

- **Duration:** 5-6 months
- **Location:** Faculty of pharmacy, 74, route du Rhin, 67400 Illkirch, France
- **Contact:** Please contact Dr. Mayeul Collot mayeul.collot@unistra.fr
- **Webpage:** https://cbst.unistra.fr/en/teams/chemistry-of-photoresponsive-systems
  B. Charrier: http://igfl.ens-lyon.fr/equipes/b.-charrier-morphogenese-des-algues-brunes