Metabolomic Fingerprinting to Understanding the Effects of Global Climate Change on Seagrasses

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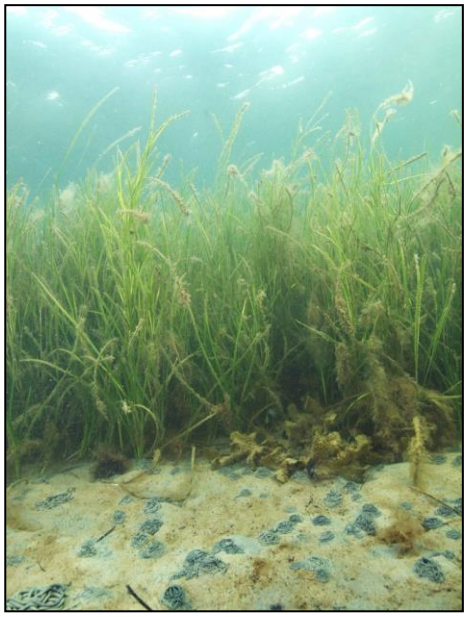

Metabolomics is a new and young technique that measures 100s to 1000s of metabolites in a specimen in one single analysis. Metabolomics is the youngest of the so called 'omics sciences (Genomics, Transcriptomics, Proteomics and Metabolomics). The metabolome is the sum of all metabolites in an organism, similar to the genome which is the sum of all genes present in an organism.

Seagrasses are under constant environmental and biological stress. This stress is reflected in the metabolites of the organisms in form of a specific stress response. Unfortunately we have a poor understanding of how specific stressors are precipitated by the plant. One aim of our research is to identify stress characteristic and specific metabolomic fingerprints. We will use this fingerprints to assess the status of seagrass ecosystems.

Your project:
Your project will be 50% experimental and 50% analytical.
The goal is to understand what metabolomics is, how it is done and how we can use it in marine ecology. In this practical "hands-on" project you will actively learn how to design, conduct, sample and analyze a metabolomics experiment in the field of marine ecology. This includes representative sampling, sample preparation, mass-spectrometry analysis (GC and HPLC), and interpretation of mass-spectra and bio-informatical analysis to understand the interactions between environment and metabolism.
At the end of the project you will be able to understand how metabolomics can expand our understanding in marine ecology, but also to design, conduct and analyse basic metabolomics experiments in the field of marine ecology.
To this end you will perform one or two laboratory experiments where seagrasses are exposed to a specific biological/environmental stress reflecting future climate scenarios. E.g. temperature, oxygen and light stress.
The plants from this experiments will be metabolomically analysed this includes the analysis on the Mass-spectrometer and the data analysis and interpretation.
This project offers you to learn a new cutting-edge technique that is used in various filed of aplications ranging from clinical research to agriculture to forensics to marine ecology.