

### ABSTRACT

Marine eukaryotic protists offer a huge but currently underexploited reservoir of metabolic pathways with biotechnological potential. Given their unique adaptations through symbiosis, endosymbiosis and organelle acquisition, the ecofunctionalities of protists present a hitherto untapped source to discover novel metabolic pathways and bioactivities whilst bearing a high chance of discovering different activities compared to those identified in other marine sources. The PROMiSE experimental workflow employs a comprehensive set of Omics methods. This approach spans the encoded metabolic potential to identify biosynthetic gene clusters which in turn guide the targeted metabolite profiling, merged with discovery-based metabolomics. The goal is to target identified candidate compound classes and their pathway-related metabolites and conjugations dereplicated from the Omics information. By linking these methods back to the source cell through single cell Omics methods, PROMiSE offers a unique way to recognize functional gene clusters and to understand how metabolism is partitioned across ecosystems. The vertically integrated extraction and analyses procedure within PROMiSE are supported by a comprehensive array of cutting-edge in vitro and in vivo bioassays for reliably assessing biological activities by High-Content profiling and antibacterial screening. Analytical chemistry, including high resolution mass spectroscopy and nuclear magnetic resonance spectroscopy approaches, will be used to elucidate compounds found in the bioactive fractions, which will tie back the molecular data to identify relevant enzymes, pathways, and compounds.



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#### Topic:

- Protist Metabolome Screening

#### Marine biomass:

- Protists

#### Source of marine biomass:

- Biobanks and repositories that are held within institutions/companies

#### Keywords:

Marine protists, metagenomics, bioprospecting

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*\* Exact amount may change after completion of national contracts*

### CONSORTIUM

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