

## ESR 9 – GENOMIC INSIGHTS INTO GREEN MICROALGAE AND THEIR INTERACTIONS WITH VIRUSES AND BACTERIA

<b>Research project</b>	Marine phytoplankton produces half of the oxygen we breathe and their astounding diversity is just starting to be unravelled. Many microbial phytoplankton are thought to be phototrophic, depending solely on inorganic sources of carbon and minerals for growth rather than preying on other planktonic cells. However, there is increasing evidence that symbiotic associations, to a large extent with bacteria, are required for vitamin or nutrient uptake for many eukaryotic microalgae. The main objective of this ESR is to obtain an overview of the diversity of photosynthetic eukaryotes from the Mamiellophyceae class and their interactions with viral and bacterial partners. This will be achieved by integrating single cell data obtained from TARA-oceans with knowledge about marine assemblages and publicly available “omics” sequence data. Bioinformatic approaches will enable common genes and functions between different associations to be identified. In silico analysis will be combined to experimental and modelling approaches to test predicted types of interactions between partners.
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<b>Host institution</b>	Observatoire Oceanologique de Banyuls sur mer (OBS Banyuls-CNRS) Banyuls, France
<b>PhD program</b>	Doctoral School ED 227 ‘ Diversity of Life’, University Pierre and Marie Curie, and Natural History Museum
<b>Expected results</b>	Genome annotations of new marine phytoplanktonic eukaryotes and their bacterial and viral partners. Estimation of the proportion of virus-infected cells in natural populations of microalgae. Experimental inference of nature of interactions within natural communities of phytoplankton.
<b>Planned secondments</b>	VIB - Month 16 (3 m) - Bioinformatic analysis for genome annotation and comparative genomics CSIC-ICM - Month 28 (3 m) - Sharing expertise on network analysis of gene content GS - Months 12, 24 and 36, one month each (3 m) - Biotechnological applications for phytoplankton growth
<b>Required profile</b>	Student with a strong interest in evolutionary biology and bioinformatics, with experience in genome biology, virology or microbiology