

Job Title: Post Doctoral position - **PARASITISM IN MARINE ENVIRONMENTS DURING ALGAL BLOOMS: THE PARTICULAR CASE OF PHAEOCYSTIS**

Location: Laboratory of Oceanography and Geosciences, LOG- UMR, 8187, Wimereux, France.
<http://log.cnrs.fr>

Resp. of the position: Pr Urania Christaki

Duration: 12 months (prolongation possible for another 12 months)

Application Deadline: 25 November 2017 or until the suitable candidate is retained

Date of start of the contract: 01 January 2018

Salary: net salary ~ 1700 Euros/month

Context and objectives of the project: Parasitism increases the complexity of planktonic trophic networks by means of extending food chains. This in turn, increases connectivity and the efficiency of carbon transfers, since parasites have relatively complex life cycles and are known to infect organisms at various trophic levels. The eastern English Channel (EEC) is a meso-eutrophic coastal system characterized by strong repeating patterns in phytoplankton succession, with for example, periodical *Phaeocystis globosa* blooms that can represent up to 90% of the phytoplankton biomass.

Until now, there has been no record of any toxic bloom. Previous experimental and microscopic studies in the area have identified heterotrophic dinoflagellates as the major predators of diatoms and *P. globosa* colonies. These same studies, have suggested that the top-down control on dinoflagellates by copepods – which cannot graze on *P. globosa* colonies – favors the accumulation of *P. globosa* biomass during the blooms. More recently high-throughput sequencing studies have shown that 42 % of the detected OTUs belong to potentially parasitic taxa or decomposers such as Syndiniales (MALV – MARine ALveolates) followed by Fungi, Cercozoa, and Perkinsea. MALV are the most abundant and most diversified members of the parasitic community. They have shown a clear succession at the year time-scale and several significant relations between heterotrophic dinoflagellates and other planktonic taxa have been observed with the exception of *Phaeocystis*. Parasites, and in particular MALV, have attracted particular attention as 'terminators' of toxic blooms. The aim of this project is to better understand their ecological implications in a 'non toxic blooms' system, and consequently it will focus on planktonic eukaryotic parasites. The hypothesis is, that the accumulation of *P. globosa* colonies might be further favored by parasitism on potential *P. globosa* grazers and competitors.

This project is funded by the University of Littoral (<http://www.univ-littoral.fr/>) and the CPER MARCO (2015-2020).

Several technologies will be combined to answer these question, including: enrichment and isolation of algae in co-cultures with their parasites; optical and electronic microscopy; molecular biology tools; flow cytometry and statistical analyses of the dataset.

The samples will be collected at the national SOMLIT station (outputs programmed at a bi-monthly frequency) and at high frequency (2-3X/week) around the bloom periods. Flow cytometry will allow the measurement of the density of viruses, bacteria, and phytoplankton, but also to sort putative interesting 'host cells' such as dinoflagellates, *Phaeocystis*, and diatoms, either for isolation and algae-parasite co-culture, or to sequence the 18S rRNA gene of sorted cells to precisely identify the symbionts and their parasites. The culture approach is crucial in order to reveal the life cycles of the parasites and their morphology during the different stages. The project will also benefit from the samples collected in the Southern

Ocean during the 'Mobydick' campaign, which will be carried out during January-February 2018. (Funded by INSU/CNRS and ANR 2018-2021)

Qualifications: Candidates have to be qualified (PhD level) in aquatic microbial ecology. Skills in isolation, culturing and identification of autotrophic and heterotrophic protists are required. Knowledge of molecular techniques (DNA extraction, PCR) and basic bioinformatics of sequencing data will be also appreciated. Candidates have to demonstrate their motivation for laboratory work and the setting of experimental protocols. The candidate will participate to the numerous field trips. Full CV/résumé, accompanied by a covering letter; names and e-mails of 2-3 references; and any request for additional information are to be sent to Urania Christaki (urania.christaki@log.cnrs.fr).

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