

## 2-year post-doc position on algal-bacterial interactions



**Location:** « Laboratory of integrative biology of marine models » (C. Boyen), in the « Algal Biology and Interactions with the environment team » (C. Leblanc), Station Biologique de Roscoff, France.

**Starting date:** ideally in September 2018 with a gross **salary** between 2582 and 3512 EUR per month, depending on experience. **Application deadline is June 15th.**

**Project:** Host-microbe interactions have a strong impact on host fitness and beneficial interactions are frequently based on metabolic complementarities between the organisms living together. These metabolic complementarities can be predicted *in silico* via the analysis of genome-scale metabolic models. The successful candidate will be working on a CNRS-funded project with two main objectives. First, to establish a laboratory holobiont model using the brown alga *Ectocarpus* as a host, and to predict mutualistic host-microbiome interactions based on metabolic complementarities and to test these predictions; second, to elucidate the processes that occur when the equilibrium between host and microbiome is disturbed by an increase in temperature. A detailed project description is available on request.

### Key tasks:

- Analysis of an existing bacterial culture collection, sequencing of bacterial genomes (cultivation, DNA extraction, sequencing), isolation of new bacterial strains.
- Analysis of bacterial genomes (assembly, automatic annotation, reconstruction metabolic networks, prediction of metabolic complementarities using a pipeline developed by our collaborators at the IRISA Rennes)
- Axenic algal cultures (*Ectocarpus*) and algal-bacterial co-culture experiments. Acclimation experiments to increased temperature.
- Gene expression analysis (metatranscriptomics) for selected co-culture experiments (mapping, read counts, statistical analysis...)
- Interpretation and valorization of results (publication(s), conferences)

**Required skills/techniques:** Microbiology; Molecular biology (nucleic acid extraction, PCRs, ideally library preparation and metabarcoding); experience in the analysis of large datasets (ideally use of bioinformatics tools in command line / R; gene expression analysis); an interest in metabolism / metabolic pathways as well as first experience in genome annotation would be a bonus. Training can be provided regarding specific molecular biological techniques and bioinformatics analyses, especially the analysis of metabolic networks. Personal qualities: team spirit (interactions with other team members, the sequencing and bioinformatics platforms, as well as our collaborators in Rennes), diligence, perseverance, curiosity, and an open mind to try new approaches.

**About the lab:** The Laboratory of Integrative Biology of Marine Models [LBI2M CNRS-UPMC] is a multidisciplinary research unit (biology/chemistry/ecology), whose interests are focused on a large range of marine organisms, such as metazoans, macroalgae, and marine bacteria that are in general qualified as emerging biological models. It is located at the Station Biologique de Roscoff, a marine research station with a little more than 300 employees situated in a small village on the coast of north Finistere, Brittany. Work will be carried out within the team “Algal Biology and Interactions with the Environment (ABIE)” led by Catherine Leblanc, which is particularly interested in algal responses to biotic and abiotic stressors as well as chemical interactions between algae (*Ectocarpus*, *Laminaria*, *Saccharina*) and herbivores as well as endophytes. By studying the biology of the holobiont, i.e. the algae and their microbiome, we are also aiming to decipher the impact of associated bacteria on algal physiology. In parallel, genome sequences obtained for model algae and bacteria enable us to explore the function of specific and original metabolic pathways via functional genomics approaches.

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