



2023 Master internship at UBO



LAB & PEOPLE

- **Name of the hosting lab:** Laboratoire de Biotechnologie et Chimie Marines, Quimper site.
General activities of the lab: Marine biofilm dynamic and bioprotection
Website: <https://www-lbcm.univ-ubs.fr/fr/laboratory-presentation/thematic-of-research.html>
- **Number of staff / PhD:** 25 permanent/9CDD/21PhD
- **Supervisor name and contact:** Patrick Le Chevalier, patrick.lechevalier@univ-brest.fr and Kjetil Korsnes, kjetil.korsnes@nord.no

TOPIC OF THE INTERNSHIP

- **Scientific context of the internship** (max 20 lines)

The Theory of holobiont considers the host and its microbiota as a permanent association (Guerrero et al., 2013). The black sea cucumber, *Holothuria forskali*, local species in Brittany, is a perfect example of this cohabitation. Moreover, the interior fluid of this animal (called coelomic fluid), contains cells involved in immunity (called coelomocytes) **and** bacteria (Laguerre, 2021) together. They seem to cohabit in a permanent way, without rejection of bacteria by the coelomocytes.

In order to know more about the relationship between the coelomocytes and the bacteria present in the coelomic fluid, the first step is to identify and quantify simultaneously all these cells: eukaryote and prokaryote. To this end, we plan to collect sea cucumbers and to sample coelomic fluid. These samples will then be analysed by microscopy and flow cytometry at LBCM Quimper. In addition, a flow cytometers manufacturer proposed us to evaluate the capabilities of his new machine, able to count and visualize the cells.

The master student that we could host will investigate these several aspects. If these experiences succeed, the trainee could go further and test the effects of adding several bacterial strains to the coelomic fluid. This is another research topic in links with the other one : the LBCM Quimper members are working on isolation of bacterial strains from marine organism in order to use them as “probiotics”. We are in touch with Kjetil Korsnes, PhD, from Bodø Nord University, in Norway, to start a collaboration dealing with the future use of these strains in aquaculture for immune homeostasis and health maintenance of his fishes. The first step of this collaboration could consist in testing the strains *in vitro*, with the help of a master student of his university. The skills (microbiology, flow cytometry) acquired by the student could be then export to the Norwegian lab for a future co-supervised thesis project.

Keywords

Immunity, bacteria, sea cucumber, aquaculture, microbiology

Bibliography



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Guerrero R, Margulis L, & M Berlanga . (2013) Symbiogenesis: the holobiont as a unit of evolution, Int Microbiol. doi: 10.2436/20.1501.01.188.(213)

Laguerre H (2021) "Microbiote des Echinodermes: Spécificité et plasticité des microbiotes chez *Holothuria forskali* (Echinodermata, Holothuroidea)", thèse d'université UBO soutenue le 17 décembre 2021.

- **Tasks and duties entrusted to the student:** sea cucumber stabulation, coelomic fluid sampling, coelomocytes microscopic observations, coelomic fluid flow cytometry analysis (and if time enough, microbiology and bacterial challenges)
- **Skills to be acquired or developed:** coelomic fluid sampling , flow cytometry analysis, microscopy and microbiology

PROFILE OF THE DESIRED STUDENT

- **Minimum level of study required:** Master
- **Field(s) of study:** marine biology, cell biology
- **Scientific skills :** biochemistry, cell biology, bacteriology (if possible)
- **Language skills required :** english

THE INTERNSHIP ASSIGNMENT:

Desired duration of the internship (in months): 5

Desired Starting date of the mission: between 15th of January and 15 of February

Indicative weekly schedule: 35h / week

Remuneration: 600€/month, paid on French SEA-EU funds for a maximum of 5 months; additional Erasmus grant could be asked to your own university.

Internship agreement: *an internship agreement will be signed.*

To SEA-EU students:

If you're interested please send your CV and letter of motivation to the scientist in charge, patrick.lechevalier@univ-brest.fr before the date 15/01/2023.