

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 names and contacts:** Patrick Le Chevalier, patrick.lechevalier@univ-brest.fr and Fanny Gaillard, fanny.gaillard@univ-brest.fr

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 aim is to identify and to quantify simultaneously all these cells: eukaryote and prokaryote. First of all, we plan to collect sea cucumbers and to sample coelomic fluid. These coelomocytes will be analysed by microscopy and flow cytometry at LBCM Quimper and the microbiota will be studied using both cultural methods and molecular techniques: thus, a collection of marine bacteria will be established.

Then, from this collection, the master student will screen the antimicrobial activities of selected bacterial strains *in vitro*.

The master student could even initiate cellular culture of coelomocytes from the black sea cucumber, *H. forskali*.

The skills (microbiology, flow cytometry) acquired by the student could be then export to the SEA-EU laboratory for a future co-supervised thesis project.

Keywords

Immunity, bacteria, anti-microbial activity, sea cucumber, aquaculture, microbiology

Bibliography

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.

Offret, C., Jégou, C., Mounier, J., Fleury, Y., & P. Le Chevalier (2019) New insights into the haemo- and coelo-microbiota with antimicrobial activities from Echinodermata and Mollusca. J Appl Microbiol 126, 1023–1031. <https://doi.org/10.1111/jam.14184>

- **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 INTERSHIP ASSIGNMENT:

Desired duration of the internship (in months): 5

Desired Starting date of the mission: between 1st november 2023 and 15th of February 2024

Indicative weekly schedule: 35h / week

Remuneration: 600€/month, paid on national SEA-EU funds for a maximum of 5 months

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, email before the date 02/11/2023.