

# MASTER STUDIES IN MARINE BIOLOGY AND BIORESOURCES AT SORBONNE UNIVERSITE

## MASTER BIP – MARINE BIOLOGY AND BIORESOURCES

Are you passionate about **marine organisms**? Would you like to learn how to better understand their particularities and how to study them to answer **various biological questions** (cellular, molecular, developmental, evolutionary, physiological, biotechnological, etc.)? This is what we propose in this program, which will offer you opportunities in both fundamental and applied research and which takes place on the Paris campus and for the most part in the **three marine stations of Sorbonne University**: Roscoff, Villefranche-sur-Mer, Banyuls-sur-Mer. The Master BIP-Marine Biology and Bioresources program trains students in all fields of Marine biology (except ecology).

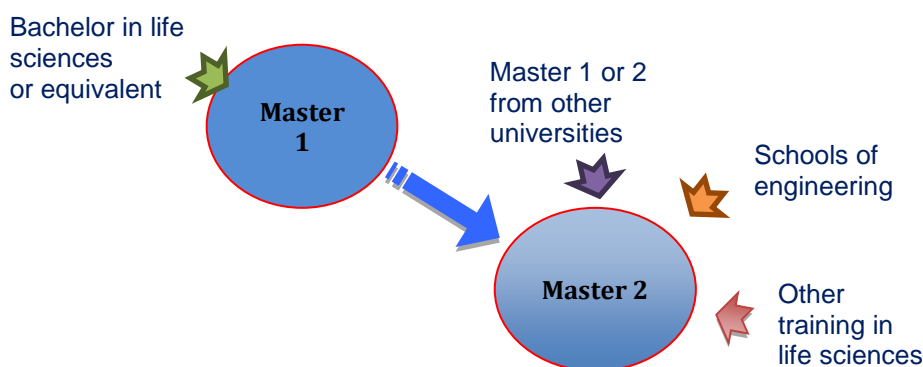
The objectives of the training are for the students:

- To understand the concepts and mechanisms that govern the functioning of marine organisms at different scales (from the cell or the molecule to the organism).
- To understand the integrative biology approaches that allow to approach the primordial aspects of the functional biology of organisms (omics, physiological, developmental, evolutionary, cellular and molecular approaches).
- To master the main methods of study and/or analysis of marine organisms and their specificity.
- To discover the research developed in the marine stations: located in Roscoff (Brittany), Villefranche-sur-Mer (Provence Alpes Côte d'Azur) and Banyuls-sur-Mer (Occitanie).
- To obtain a field of expertise that can be used in other areas of biotechnology.

The thematics, centered on marine organisms, studied in the program are:

- Cellular and Molecular biology
- Development
- Integrated systems physiology
- Comparative biology
- Neurobiology
- Genomics, Proteomics
- Applied systems
- Biotechnologies
- Ecophysiology

The program extends over **2 years** but can be integrated **directly in the 2nd year** depending on previous training.



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Our training in the multi-disciplinary field of marine biology is based on:

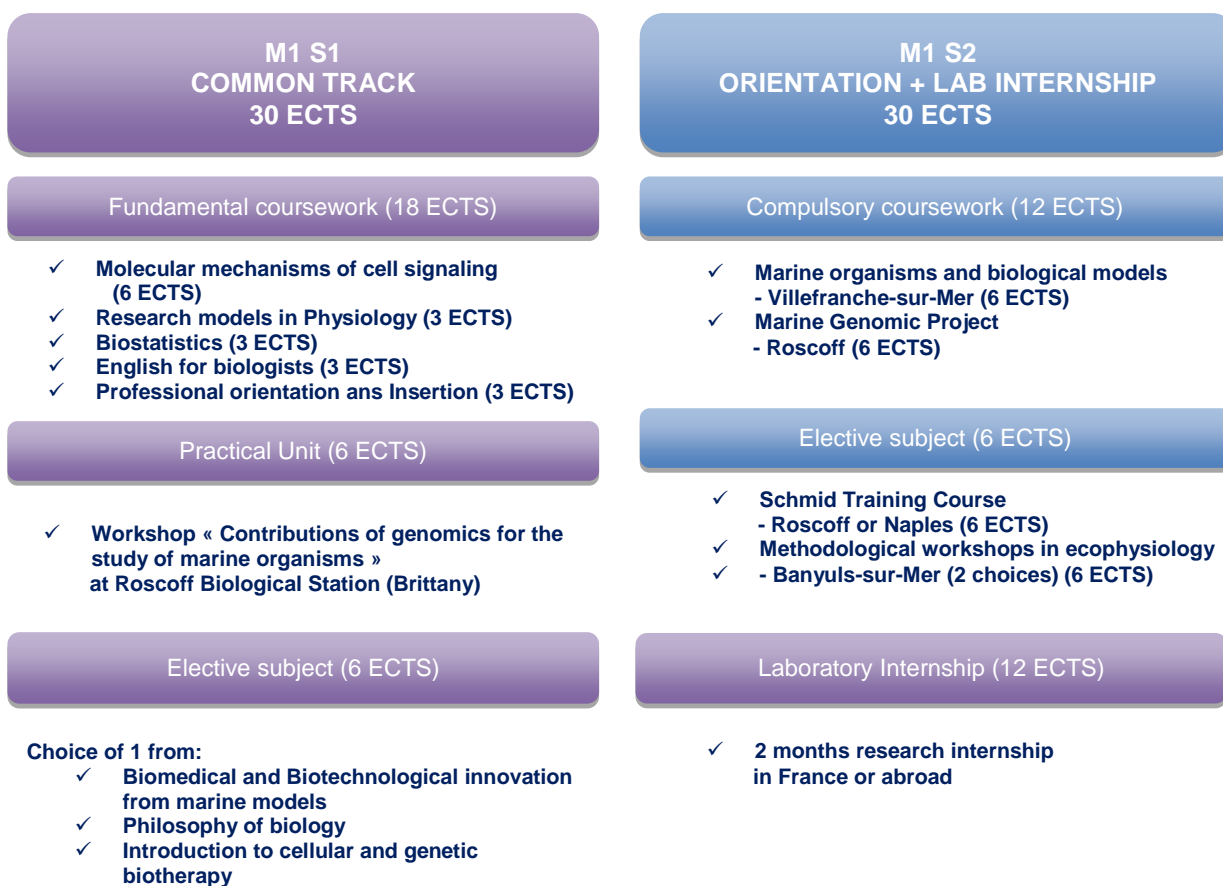
- Teaching modules delivered by recognised specialists in marine biology.
- French and international research teams, which routinely contribute to our program.
- Close collaboration, for teaching and research training, with Sorbonne Université centres of excellence: Institute of Biology – Paris Seine, Roscoff Biological Station (Brittany), Oceanological Observatory in Villefranche-sur-Mer (Nice), Arago Laboratory - Oceanological Observatory in Banyuls-sur-Mer (Perpignan).
- Ten months of internship in internationally recognised laboratories in France or abroad.

Marine Biology is fundamentally interdisciplinary, and our program is aimed at students from many different backgrounds – life sciences, engineering, computer sciences – who want to pursue a career in marine biology in the public or private sector.

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## COURSE ORGANIZATION

The **first-year program (M1)** provides fundamental knowledge necessary to develop scientific rigor, introduces marine biology and allows a first immersion in marine biological stations.



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The **second-year program (M2)** is designed to provide a unique opportunity for each student to acquire in-depth theoretical and practical knowledge in his/her field of interest and to work in marine laboratories. All the courses take place in the **marine stations** of Sorbonne Université that have accommodation for students. **The cost of train transportation and accommodation for students (except during the internship) is covered by the university.**

## M2 S1 COMMON TRACK 30 ECTS

Specialist units (24 ECTS)

- ✓ **Bioteests and bioresources in marine environment - Banyuls-sur-Mer (6 ECTS)**
- ✓ **Biorhythms – Banyuls-sur-Mer (6 ECTS)** Marine macroalgae biotechnology - Roscoff (6 ECTS)
- ✓ **Translational regulation in eukaryotes - Roscoff (6 ECTS)**
- ✓ **Project research (6 ECTS)**

Elective subject (6 ECTS)

Choice of 1 from:

- ✓ **Marine microorganisms and molecular tools – Roscoff (6 ECTS)**
- ✓ **Development of marine organism – Villefranche sur Mer (6 ECTS)**

## M2 S2 MASTER'S PROJECT AND THESIS 30 ECTS

- ✓ **5-6 months research internship in France or abroad. This internship is usually in a public research laboratory but can be in industry.**

### Examples of Master project:

- Physiological acclimation of two deep-sea coral species (*Dendrophyllia cornigera* and *Dendrophyllia ramea*) to temperature variations.
- Ecophysiology of smoltification and downstream migration of Atlantic salmon, *Salmo salar*. Study of the neuroendocrine axis corticoliberin brain-pituitary hormones.
- Comparative study of the caudal neurosecretory system in the zebrafish *Danio rerio* and the dogfish *Scyliorhinus canicula*
- Study of the regeneration mechanisms of the jellyfish *Clytia hemisphaerica*
- Evo-Devo of vertebrate enamel: expression of the genes ameloblastin, amelotin and ODAM during enamel formation in the salamander *Pleurodeles waltl*
- Study of the Cnidaria/Dinoflagellate symbiosis: stress response of animal cells in culture
- Production of proteins for the study of the physiology of *Tisochrysis lutea*, a microalga of biotechnological interest

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## RESEARCH TRAINING:

An important component of the training at the Master's level is in research, both in terms of methodology and practical laboratory experience.

## MASTER'S THESIS (30 ECTS)

- 5 to 6 months internship performed in an internationally recognized research laboratory in France or abroad (financial support is available from the Master and/or the University to assist student mobility).
- The M2 research project is a professional experience that allows students to acquire scientific and technical expertise in their speciality as well as general skills (ability to carry out a project, to research and analyse information, to work in a team, to display creativity and critical thinking, to present information in a written and/or oral form ...) which are also valuable in non-research contexts.
- A list of projects proposed by French and foreign laboratories participating in our training program is available on our website, but students can also apply to other research teams that work in their field of interest.
- At the end of the internship a written dissertation and oral presentation is evaluated by a jury at the end of June.

## CONTACTS :

<https://sciences.sorbonne-universite.fr/formation-sciences/masters/biologie-integrative-et-physiologie/parcours-biologie-et-bioressources>

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