

Master in
Molecular & Cellular Biology
Field : Cell Biology, Development & Stem Cells "

M2 Cell Biology

Introduction

Cell Biology is a specialisation field with a variety of transverse aspects in both basic and applied sciences. This master 2 program provides students with state-of-the-art training through the acquisition of basic and experimental knowledge in cell biology with its various fields of application towards the understanding of pathologies (such as cancer, genetic diseases, pathogens) and the development of innovative therapeutic approaches.

Recent and rapid progresses in techniques and concepts in the field will be presented, with illustrations of cell fundamental mechanisms, such as proliferation, regulated death, motility, intracellular trafficking, assembly of supramolecular structures. Cell interaction with its micro-environment will also be discussed including fundamental and more technical aspects of 3D structures reconstruction and how mechanical constraints impinge on cellular behaviour. Applicants are expected to have a strong background in life/health sciences. English language proficiency (minimum B2 level or equivalent) is requested.

Formation

The program benefits from our partnership with several Institutes, both hosting internship projects and participating to the academic formation (I. Pasteur, I. Curie, Institut de Biologie Physico-Chimique, and Sorbonne Université Research Centers including Roscoff marine station). Teaching language is English.

The program in Cell Biology includes:

- Four academic units including seminars and practicals by specialists in the field (30 ECTS), with the aim to bring students at the leading edge of knowledge.
- A 6-month internship in a research laboratory (mostly academic but also private) in France or abroad (30 ECTS) that enables the students to conduct research in a stimulating environment.

- **Specialisation** (12 ECTS) allowing to communicate with participants and teachers from different domains of cell biology. The following two options are offered :

1 - Pasteur course "**Molecular Biology of the Cell**" (MU5BM012, organised and hosted by Institut Pasteur in partnership with Sorbonne Université)

<https://www.pasteur.fr/fr/enseignement/programmes-cours/cours-pasteur>

2 - Advanced course in "**Cell Biology**" (12 ECTS) organised and hosted by Institut de Biologie Physico-Chimique (**IBPC course** : Experimental et theoretical approaches to solve a scientific enigma MU5BM206 ; <http://www.ibpc.fr/UMR7141/>), Roscoff marine station (**Roscoff course** : Regulation of gene expression: translation and cell cycle (marine animal models) MU5BM232 ; <http://www.sb-roscoff.fr/>) and Sorbonne Université Faculty of Science and Faculty of Medicine ("**Proliferation and Cell death**" ; MU5BM285).

- **Scientific analysis** (MU5BM051, 6 ECTS)

The objective is to acquire a method for analyzing and interpreting experimental data, and to present key discoveries in their scientific context. The student will present orally in English a recent article related to a major issue in cell biology. The oral presentation will be followed by a discussion with the jury.

- **Scientific project** (MU5BM091, 6 ECTS)

This teaching unit is dedicated to the presentation of a fictitious PhD research program in the field of the master 2 laboratory internship. The student will give a written report and defend the project orally. The jury will assess the student's ability to initiate a project, to develop relevant scientific questions and to propose the appropriate experiments to answer these questions.

- **Open unit** (6 ECTS or 2 x 3 ECTS)

Students will choose one (6 ECTS) or 2 (3 ECTS) academic units from the list proposed by the master department 'Molecular and Cellular Biology' (BMC).

Recommended :

- Conferences on the biology of stem cells (MU5BM217, 6 ECTS), Sorbonne Université
- Advanced course in cell dynamics (MU5BM286, 3 ECTS), Institut Curie
- Cell Biology and cancer (MU5BM222- 3 ECTS), Institut Curie
- Cell image processing and numerical analysis (MU5BM203- 3 ECTS), Sorbonne Université

- **Laboratory internship** (MU5BMSO3, 30 ECTS)

This internship takes place in a host laboratory under the direction of a scientific supervisor and in agreement with the pedagogic team. The list of internship proposals is posted on the Moodle platform of the Master, with restricted access to students enrolled in the master 2 program. Internships taking place in other host laboratories are subjected to prior agreement by the pedagogic team. Duration of the internship is up to six months.

Audience

The master 2 program is open to national and international students having completed a first year of master (M1 or its equivalent) in life sciences, to health science students (from medical, pharmaceutical and veterinary science tracks) and to Engineer school students with a solid initial training in a related discipline (engineering sciences, physics, chemistry, ...) and having a strong motivation for life sciences.

Opportunities

This course is designed to train high-level specialists in the field of cell biology. It prepares graduates for doctoral studies or for industrial research and development positions. It also offers students the access to other professional careers in clinical research or consulting.

Scientific committee

Tounsia Ait-Slimane (SU, CRSA), Marta Garcia (SU, IFM), Olivier Gavet (SU, IGR), Anthi Karaïskou (SU, CRSA), Joëlle Sobczak-Thépot (SU, CRSA) ; Agnès Boutet, Patrick Cormier (SU, Station biologique de Roscoff) ; Stephan Eberhard, Katja Wostrickoff (SU, IBPC) ; Roberto Bruzzone, Chiara Zurzolo (Institut Pasteur), Philippe Chavrier, Stéphanie MISEREY-LENKEI (Institut Curie).

How to apply

Applications can be submitted exclusively online on the following website.

<https://sciences.sorbonne-universite.fr/formation/candidatures-et-inscriptions/master>

Contacts :

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For more information +

📄 : Molecular and Cellular Biology Web site

<https://sciences.sorbonne-universite.fr/formation/offre-de-formation/masters/master-biologie-moleculaire-et-cellulaire-bmc>

📄 : Cell Biology, Development and Stem Cells Track web site

<https://sciences.sorbonne-universite.fr/formation/offre-de-formation/masters/master-biologie-moleculaire-et-cellulaire-bmc/m2-parcours-1>