Université Paris-Saclay
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M2 Fundamental Microbiology

Master's degree
Specialisation Microbiologie
Enrolment type
Formation initiale
Formation continue
Language(s) of instruction
English

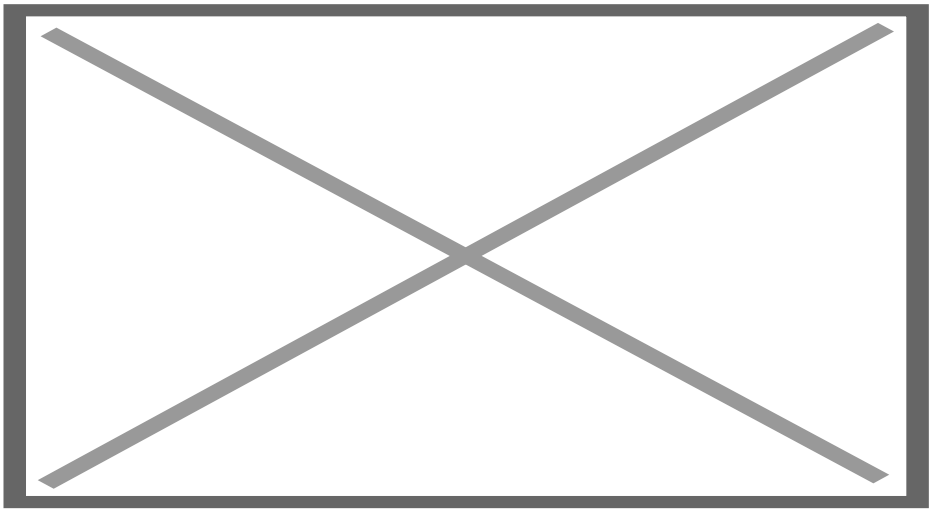
"Shaping the future of Microbiology: explore, understand, innovate"

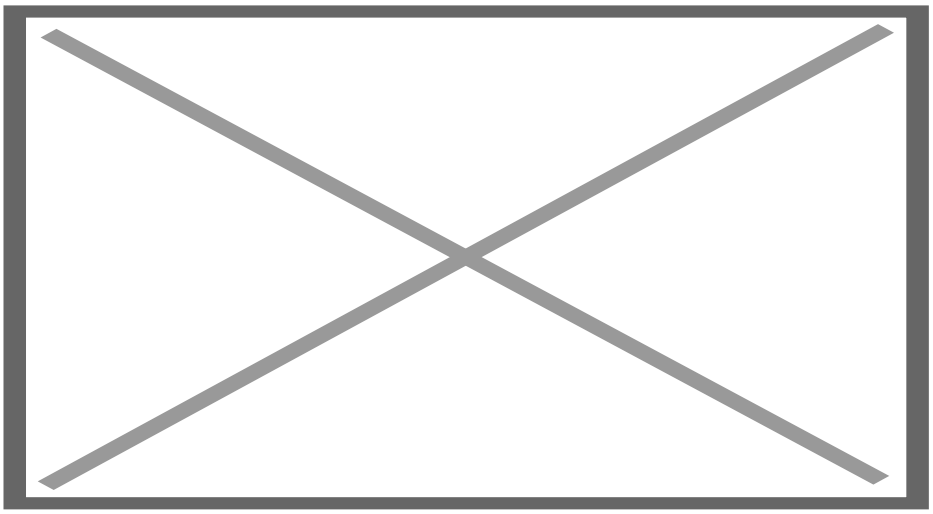
Fundamental Microbiology program is designed to inspire and train the next generation of researchers in microbiology offering multidisciplinary, research-driven training built on cutting-edge discoveries in genetics, genomics, cell biology, and microbial physiology. The program spans a wide array of models and topics to explore the microbial diversity using molecular, cellular, or integrated analysis scales (communities, hosts).

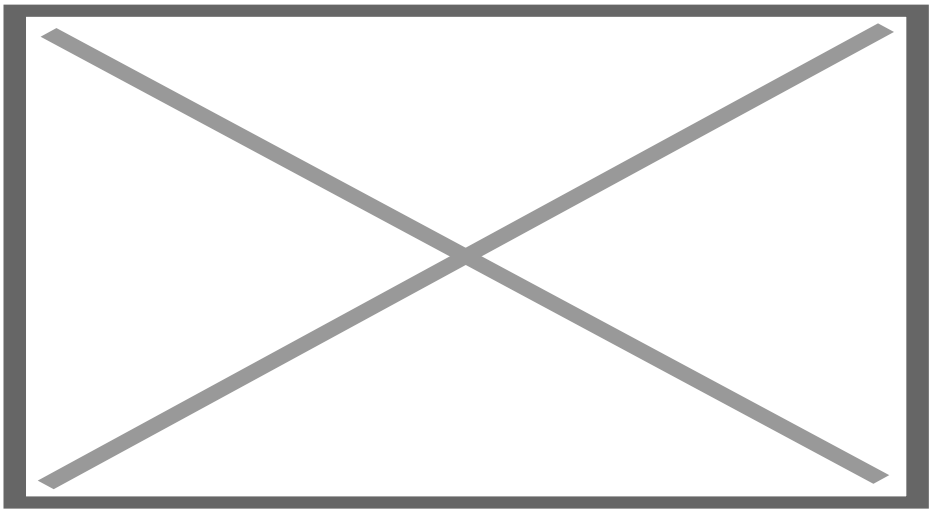
The program is organized into two tracks, “Molecular and Cellular Microbiology” and “Virology,” consisting of core courses in functional genomics, synthetic microbiology and data exploration using bioinformatics tools, specific courses tailored to each track, and a wide range of elective courses allowing students to acquire skills in microbial cell biology, microbial interactions, eukaryotic and prokaryotic virology, among other topics.

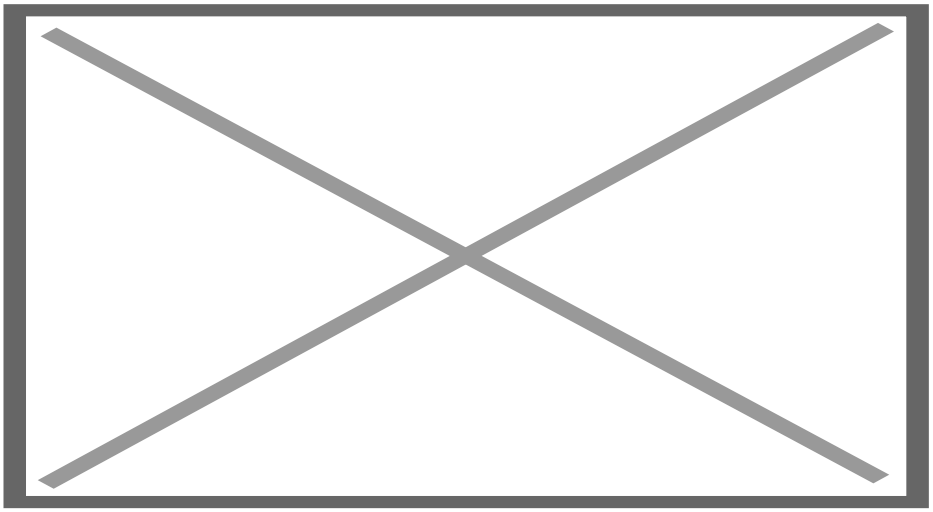
To complement these theoretical foundations by a hands-on experience, a two-week practical course in Integrative Microbiology is offered. Awarded the “Paris-Saclay” initiative label, this course is structured around flagship themes of the Paris-Saclay microbiology community and is primarily conducted in I2BC or MICALIS laboratories. It immerses students in real-world research settings, where courses are held within research institutes and researchers are directly involved in the training.

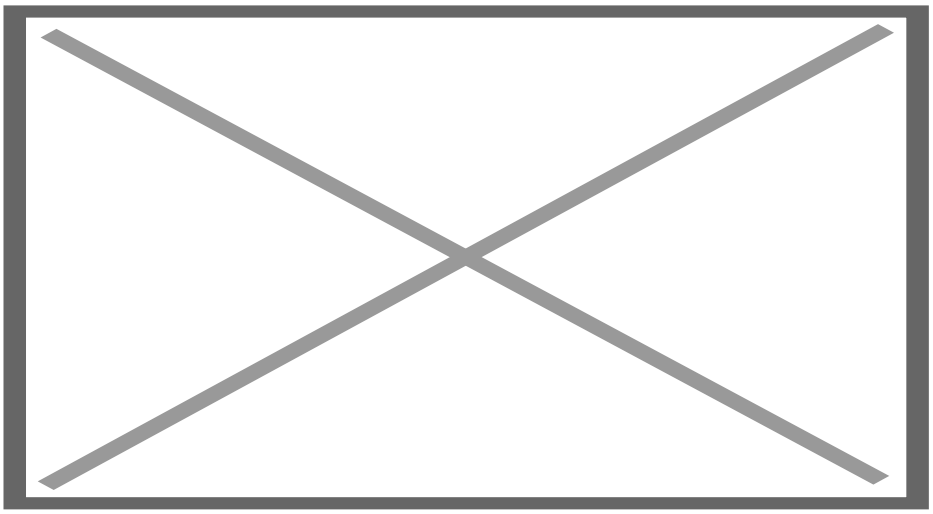
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Information

- Overview
- Application requirements
- Schedule

Présentation

Skills

- Master fundamental knowledge of microbial diversity and the fields of genetics and genomics, with a particular focus on microbial cell biology for the Molecular and Cellular Microbiology track, and a greater emphasis on understanding viral cycles in eukaryotic and prokaryotic cells for the Virology track. Both tracks provide an integrated view of molecular mechanisms and cellular interactions.
- Develop experimental expertise and proficiency in targeted and comprehensive approaches in microbiology (including experimental design, cloning, microbial culture or analysis of viral cycles, extraction and quantitative analysis of nucleic acids or proteins, and analysis and representation of data sets).
- Develop know-how in data exploration and representation (including basic use of R).

- Communicate effectively in English within a scientific context (understand seminars, follow instructions, present scientific background and experimental results, and engage in scientific discussion).
- Independently conduct a scientific project and communicate a critical analysis of the results, both orally and in writing, in accordance with international standards in microbiology.
- Develop teamwork skills through collaborative bibliographic and experimental projects related to microbiology.

Objectives

The program is international and with emphasis on research to prepare students for modern challenges in microbiology. It covers a variety of models (bacteria, archaea, eukaryotic microorganisms, viruses) and multiple scales of analysis from molecules to genomes, cells and communities.

During the first semester the students acquire knowledge in genomics and life engineering through core curriculum ”Explore and Innovate” completed by the practical courses and elective teaching units in the field of molecular and cellular microbiology, eukaryotic and prokaryotic virology, microbial interactions, and critical thinking using artificial intelligence among others.

During the second semester students undertake a six-month internship in a laboratory, providing hands-on research training in a microbiology-related field. This allows students to enhance their experimental and project-writing skills, and gives them ample opportunities to practice oral scientific communication. Internships can be completed in Paris-Saclay laboratories [e.g. Institute for Integrative Biology of the Cell (I2BC), “MICrobiologie de l'ALImentation au Service de la Santé Humaine” (MICALIS), “L'Institut Diversité, Écologie et Évolution du Vivant” (IDEEV), Laboratory of Biology and Applied Pharmacology (LBPA, ENS Paris-Saclay)], or other renowned research institutions (e.g., Institut Pasteur, Institut Jacques Monod, Ecole Polytechnique) in France or abroad.

The success rate of students enrolled in the M2 Fundamental Microbiology program is 94% (2015-2025). The average rate of M2 graduates continuing on to doctoral studies is 61% (2015-2025). Of these PhD theses, 55% are completed in a laboratory at Paris-Saclay University (UPSaclay), 33% in a French laboratory outside UPSaclay, and 12% abroad. Approximately 13% of graduates move directly into employment with a Bac+5 degree (as engineers, certified teachers, or communications officers at a research institute), and approximately 20% continue their studies (ENS curriculum, medical field, clinical research assistant, etc.).

Débouchés

Career prospects

After a Master's or Master's + PhD: engineer (R&D, control, production, etc.)

After a Master's or Master's + PhD: engineer (research and development, control, production, etc.) in the fields of health, pharmaceuticals, agri-food, biotechnologies, instruments and reagents, cosmetics, pollution control and the environment.
Sectors of activity: fundamental or applied research in Biology, Health or Ecology in academia or the private sector
Fields: health, pharmaceuticals, agri-food, biotechnologies, instruments and reagents, cosmetics, pollution control and the environment.
After a Master's + PhD: researcher or lecturer
After a Master's or Master's + PhD: engineer (Research & Development, control, production, etc.)
Design/research engineer in an R&D department in the ophthalmic industry
R&D Engineer
R&D Project Manager
R and D Project Manager
Project Manager
Design engineer in the industrial sector
Design engineer in the research / scientific sector
Design engineer industry / public research
Subject to successfully completing a civil service competitive exam, graduates will be eligible for positions as design engineers or researchers in national research organisations.
Academic staff
Design Engineer
Research & Development Engineer
Research and Innovation Manager
Project Manager
• Chargé·e de communication scientifique, veille technologique ou transfert de technologie
Project manager in biotechnologies, biotherapies or healthcare innovation

Scientific communication, technology watch or technology transfer Officer
Research & Development Engineer
Research or Design Engineer
Research professions
Lecturer (after a PhD)
Design Engineer
Research Engineer
Teacher (after the CAPES or 'agrégation' competitive exam)
Head of mission / projects
Design Engineer
Research Engineer
Consultant
HSE research (analysis, toxicology, microbiology)

Further Study Opportunities

Biology-Agrosciences
PhD in Chemistry / Biology
PhD in Bioinformatics
PhD
PhD thesis
Students with a 2nd year Master's degree have the possibility to pursue doctoral research.
Be open to related sectors, understand the environment of the healthcare professions, master the regulations applicable to healthcare products, and advise promoters of scientific projects to help them valorise their projects.
Students in this track can turn to research at the end of the 2nd year Master's.
Engineering, research and development
In particular, this track prepares students for applied research activities, usually undertaken after a PhD, whether in academia or in R&D.

R&D researcher or data modelling and analysis expert in leading-edge companies or laboratories.

Calendar

Start of programme (indicative date)
07/09/2026
Admission

Capacity

Available Places

16

Target Audience and Entry Requirements

Student profile: mainly students from scientific programs (universities or ENS), a few students from engineering schools, and more rarely students from medicine or pharmacy programs.

Approximately 50% of the class is made up of international students.

This program is tailored for students who have completed a master's degree in genetics and molecular biology and have theoretical and/or experimental knowledge in the field of microbiology sensu lato (bacteria, archaea, eukaryotic microorganisms, viruses).

For example, we recommend that M1 Microbiology students take, in addition to the core curriculum (which allows them to validate their skills in genetics, genomics, and cell biology, in particular), the teaching units (TUs) “Microbial Genetics and Physiology,” “Integrative Microbiology,” “Evolution and Diversity of Microorganisms” and/or “Functional Genomics”. For students wishing to follow the “Virology” track, a Virology teaching unit such as “Fundamental Virology” or “Integrative Virology” is strongly recommended.

Période(s) de candidature

Inception Platform

From 27/01/2026 to 20/07/2026

Supporting documents

Compulsory supporting documents

Motivation letter.

All transcripts of the years / semesters validated since the high school diploma at the date of application.

Curriculum Vitae.

Additional supporting documents

Detailed description and hourly volume of courses taken since the beginning of the university program.

VAP file (obligatory for all persons requesting a valuation of the assets to enter the diploma).

Recommendation letters.

Document indicating the list of local M2 choices available here : https://urlz.fr/i3Lo.

Supporting documents :
- Residence permit stating the country of residence of the first country
- Or receipt of request stating the country of first asylum
- Or document from the UNHCR granting refugee status
- Or receipt of refugee status request delivered in France
- Or residence permit stating the refugee status delivered in France
- Or document stating subsidiary protection in France or abroad
- Or document stating temporary protection in France or abroad.

Programme

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dis lea co
Core curriculum: Knowledge in genomics and life engineering "Explore and Innovate"	0	5	22,5	7,5					
Elective teaching units in the field of microbial interactions for Virology track	0	3	22,5	7,5					

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dis lea co
Elective teaching units of the Virology track	0	11	22,5	7,5					
Internship - Training through Research	0	2	22,5	7,5					

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class	dis lea co
Core curriculum	0	5	22,5	7,5					
Elective teaching units in the field of microbial interactions for MCM track	0	3	22,5	7,5					
Elective teaching units of the track MCM	0	10	22,5	7,5					
Internship - Training through Research	0	2	22,5	7,5					

Teaching Location(s)

GIF SUR YVETTE
PARIS 15
JOUY EN JOSAS
VERSAILLES

Academic Partner(s)

Collège de France

Contact

-

Solène FLORENTIN

secrétariat pédagogique

- **Olga SOUTOURINA**

  PR

- **Tamara BASTA-LE BERRE**

  MCF

- **Alessia ZAMBORLINI**

  PR

http://www.universite-paris-saclay.fr/formation/master/microbiologie/m2-microbiologie-fondamentale