Environmental Microbiology (ENVIMIC)



Explore this IDIL Master's track in detail, including its academic objectives, curriculum, research opportunities, admission requirements and career prospects.

TRACK OVERVIEW & LEARNING OBJECTIVES

The Environmental Microbiology (ENVIMIC) track is a two-year international Master's programme within the IDIL (InterDisciplinary & In-Lab) Graduate Programme at the University of Montpellier, taught entirely in English. It gives students direct access to a very active and internationally connected scientific community in environmental microbiology, built on a dense network of Montpellier research units (including DGIMI, IHPE, MIVEGEC, PHIM, MARBEC, ISEM, HSM, IPSiM, IRIM or CEFE). Students are trained through research from day one — two six-month laboratory immersions (M1 and M2), "In-Lab" units delivered by research teams, and continuous mentoring by a scientist and an academic tutor.

The programme takes a genuinely interdisciplinary, multi-scale approach: from molecular and cellular mechanisms of microbial physiology and host–microbe interactions, to community-level ecology and biogeochemical cycles, to evolutionary dynamics (co-evolution, symbiosis, virulence) — combining functional (experimental, omics) and theoretical/computational (phylogenomics, biostatistics) perspectives.

Educational objectives

- Build a solid foundation in fundamental environmental microbiology and the full diversity of biotic interactions, including a variety of non-model hosts like insects, plants or animals, in both terrestrial and aquatic environments.
- Provide hands-on mastery of modern methodologies (high-throughput sequencing, multi-omics, bioinformatics, biostatistics);
- Foster interdisciplinarity through units shared with other IDIL tracks and a multidisciplinary M2 project;

Prepare graduates for research careers, in academia or industry, in France and internationally.

KNOWLEDGE, SKILLS & COMPETENCIES

Scientific knowledge

- Microbial diversity, physiology and biogeochemical cycles; host–microbe interactions (symbiosis, virulence, co-evolution, eco-immunology); microbial phylogeny, metagenomics and virology.

Methodological and technical know-how

- Laboratory research from hypothesis to data analysis (two 6-month internships); bioinformatic and biostatistical analysis of sequencing/omics data; wet-lab techniques acquired in In-Lab units; scientific writing and project management.

Transversal skills and professional attitude

Autonomy built through early lab immersion; teamwork in multidisciplinary/international settings; scientific communication in English; critical thinking and research ethics; ability to lead a personalised research project with mentor support.

DETAILED CURRICULUM

Semester 1 (S7) — 30 ECTS

- Core Teaching Units — 12 ECTS: Microbial Ecology (3) · Integrative Biology of Microbial Interactions 1 (3) · Microbial Phylogeny and Metagenomics (3) · Biostatistics (3)
- Personal Project — 10 ECTS · In-Lab Unit — 2 ECTS · Transversal Unit — 2 ECTS · Non-Core Unit — 4 ECTS

Semester 2 (S8) — 30 ECTS

- Long Laboratory Internship M1 — 30 ECTS (6-month lab immersion, mentored)

Semester 3 (S9) — 30 ECTS

- Core Teaching Units — 12 ECTS: Microbial Ecology 2 (3) · Integrative Biology of Microbial Interactions 2 (3) · Virology (3) · Phytobiome Thematic School (3)
- Multidisciplinary Team Project — 10 ECTS · Experimental Approaches (In-Lab) — 4 ECTS · Transversal Unit — 4 ECTS · Non-Core Unit — 2 ECTS

Semester 4 (S10) — 30 ECTS

- Long Laboratory Internship M2 — 30 ECTS (6-month lab immersion, typically January–July)

Non-Core & In-Lab Units (examples, may vary by year)

- Non-Core: Mediterranean Ecosystems, One Health and Eco-Epidemiology, Sustainable Management Basics, and other units from the IDIL catalogue; a microbiology-themed unit is being developed.

In-Lab: metabarcoding analysis, nematode microbiota, amoeba–Vibrio cellular ecology, yeast two-hybrid, Scientific Writing from experimental data to publication.

ADMISSION REQUIREMENTS & STUDENT PROFILE

- Bachelor's degree (or equivalent, 180 ECTS) in Biology, Life Sciences, Microbiology, Ecology or a related field, with solid foundations in microbiology, cell biology, host defense, genetics and ecology;
- Genuine interest in research and interdisciplinary approaches, from the molecular and cellular scales to ecology and evolution, and willingness to be immersed in a laboratory team from year one;
- English proficiency (B2 or above), as the whole track is taught in English;

Autonomy and motivation: limited intake (8 students/year in M1) for close, individualised mentoring..

CAREER OPPORTUNITIES

This master's degree prepares graduates for professional opportunities or doctoral studies, in academic or industrial settings, in France and internationally:

- PhD studies and research careers in academics, in microbiology, ecology or evolutionary biology;
- R&D positions in biotech, pharmaceutical, agri-food or environmental industries (biocontrol, bioprocesses, microbial biotechnology);
- Environmental consultancy, biomonitoring, public health / One Health and eco-epidemiology;

Sequencing and bioinformatics platforms, science communication or policy roles related to biodiversity.

RESEARCH LABORATORIES & ACADEMIC PARTNERS

Academic and research partners

Dense network of Montpellier-based joint research units including DGIMI, IHPE, MIVEGEC, PHIM, MARBEC, ISEM, HSM, IPSiM, IRIM or CEFE, covering microbiology, host–pathogen interactions and microbial/environmental ecology.

IDIL network

Shared teaching units and the M2 multidisciplinary project connect ENVIMIC students with all other IDIL tracks (BAPT, BIAPE, Food Sciences, IBION-Tec, ICOA, IMHE, IPM, MEV, Plant-WISE).

International openness

Regular seminars from international experts (USA, Canada, Brazil, Germany).