Integrative Animal Biology (IAB)



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 IDIL graduate program **Integrative Animal Biology** (**IAB**) offers a comprehensive and interdisciplinary training on how organisms respond and adapt to environmental changes such as climate change, pollution, and anthropogenic pressures. Through a blend of theoretical courses and technical workshops, students will explore mechanisms of acclimation, adaptation, phenotypic plasticity, and stress responses across diverse taxa.

Students will engage deeply with cutting-edge topics including functional genomics, integrative physiology, metabolism, developmental biology, and dynamic energy modeling. The program emphasizes both fundamental biological concepts and applied case studies, preparing students to tackle pressing ecological and conservation challenges.

With a strong focus on research, students will collaborate across disciplines, learn to develop scientific projects and gain practical experience through two six-month research internships in Montpellier's renowned laboratories. Students will also have the possibility to take part in immersive, hands-on laboratory workshops, gaining practical experience with standard and innovative approaches in animal biology. These sessions will provide a unique opportunity to engage directly with researchers at the Montpellier University, fostering scientific exchange and offering valuable insights into current research practices. The **IAB** program equips future scientists with the critical knowledge and skills to innovate in ecophysiology, evolution, conservation biology, and environmental sciences.

KNOWLEDGE, SKILLS & COMPETENCIES

- Integrate molecular, physiological, and organismal approaches in animal biology ;
- Understand the concepts of phenotypic plasticity, adaptation, and evolution under ecological constraints ;
- Examine the relationships between animal phenotypes and (epi)genotype ;
- Understand the ethical standards that apply in animal experimentation;
- Interpret gene, protein data through holistic approaches (omics);
- Apply field and laboratory tools to study aquatic animal biology.
- Analyze physiological and behavioral adaptations to environmental changes ;
- Design, conduct and analyze biological experiments ;
- Present scientific projects through oral and written communication ;

DETAILED CURRICULUM

- **Semestre 1 (S7)**
- From Metabolism to Modeling (2 ECTS)
- Integrative Animal Biology 1 (4 ECTS)
- Global Change Ecology-Overview (2 ECTS)
- Evolution (4 ECTS)
- Study of Variability (2 ECTS)
- In-Lab (2 ECTS)
- Personal Project (10 ECTS)
- Non-Core (2 ECTS)
- Transversal Training Unit (2 ECTS)

- **Semestre 2 (S8)**
- Research Internship IAB (30 ECTS)

- **Semestre 3 (S9)**
- Organisms in a Changing World (2 ECTS)
- Methodological workshop in aquatic and integrative biology (4 ECTS)
- Current topics in Developmental Biology (2 ECTS)
- Functional Genomics and Epigenomics in an Environmental Context (4 ECTS)
- Integrative Animal Biology 2 (2 ECTS)
- Non-Core (2 ECTS)
- Multidisciplinary team project (10 ECTS)
- Transversal Training Unit (4 ECTS)

- **Semestre 4 (S10)**
- Research Internship IAB (30 ECTS)

ADMISSION REQUIREMENTS & STUDENT PROFILE

This program is open to students who hold a bachelor's degree in biology, ecology, or evolution.

Students must demonstrate a strong interest in integrative approaches in animals ranging from genes to the organism. The course will teach comparative and evolutionary physiology and ecotoxicology, developmental biology, conservation biology with many strong interdisciplinary connections among those disciplines.

A good scientific English level is required.

CAREER OPPORTUNITIES

This program prepares students for a career as a researcher. IDIL programs are well-suited for students who wish to pursue a Ph.D.

RESEARCH LABORATORIES & ACADEMIC PARTNERS

Marine Biology, Ecology, Ecotoxicology and EcoPhysiology :
- MARBEC : Marine Biodiversity Exploitation and Conservation

Evolutionary Biology and Genomics :
- ISEM : Institute of Evolutionary Science of Montpellier

Functional Ecology :
- CEFE : Center of Functional and Evolutionary Ecology

Epigenetics, Molecular Mechanisms, Micro-Evolution
- IHPE : Host-Pathogen-Environment Interactions

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For more information: https://idil.edu.umontpellier.fr/en/master-idil/les-parcours/