Université Paris-Saclay
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M2 Biomolecular Engineering and Chemistry

Master's degree
Specialisations Chemistry | Biologie moléculaire et cellulaire
Enrolment type
Formation initiale
Formation continue
Language(s) of instruction
English
French

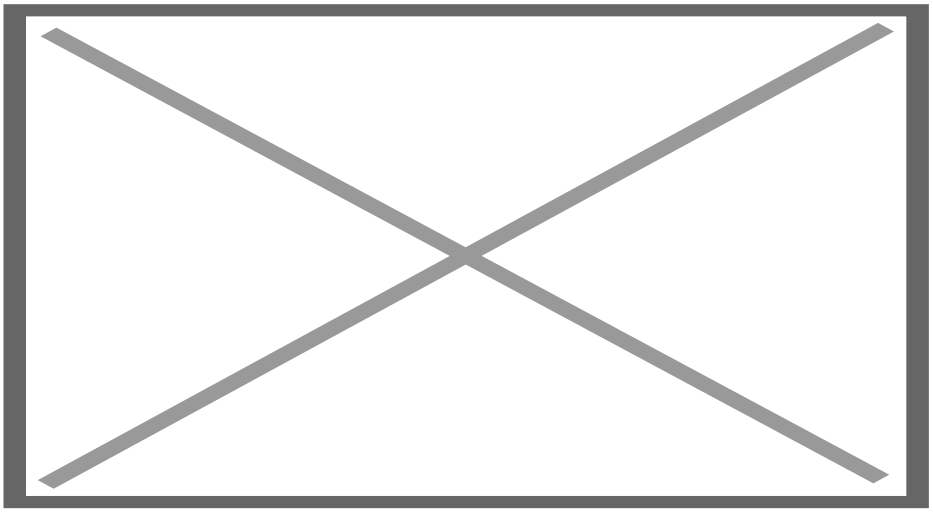
This program provides an in-depth study of biological processes and scientific innovation at the Biology–Chemistry interface. Designed for students passionate about understanding life at the molecular level, it prepares them to tackle the major scientific challenges of the future. The curriculum integrates structural biology, proteomics, bioinformatics, biomolecular engineering, and chemical biology, reflecting the latest advances in science and technology.

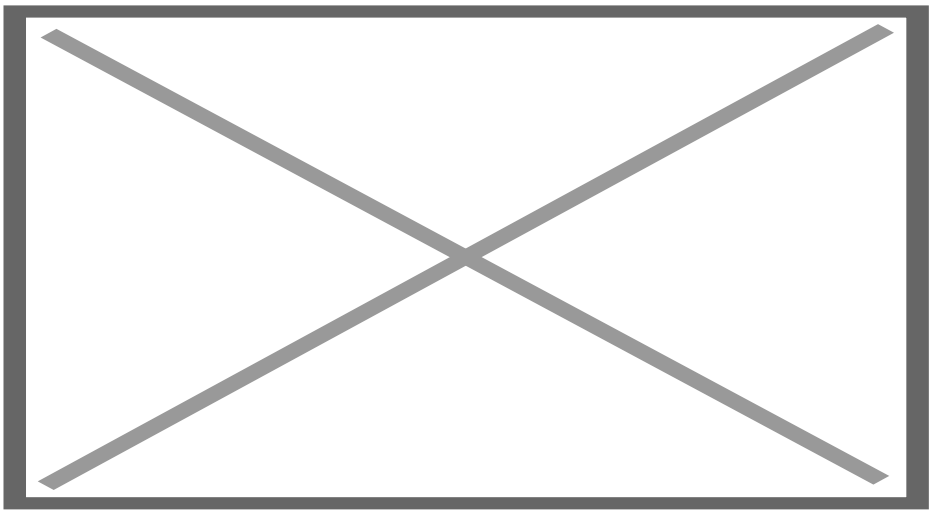
- Possible to choose 100% English modules

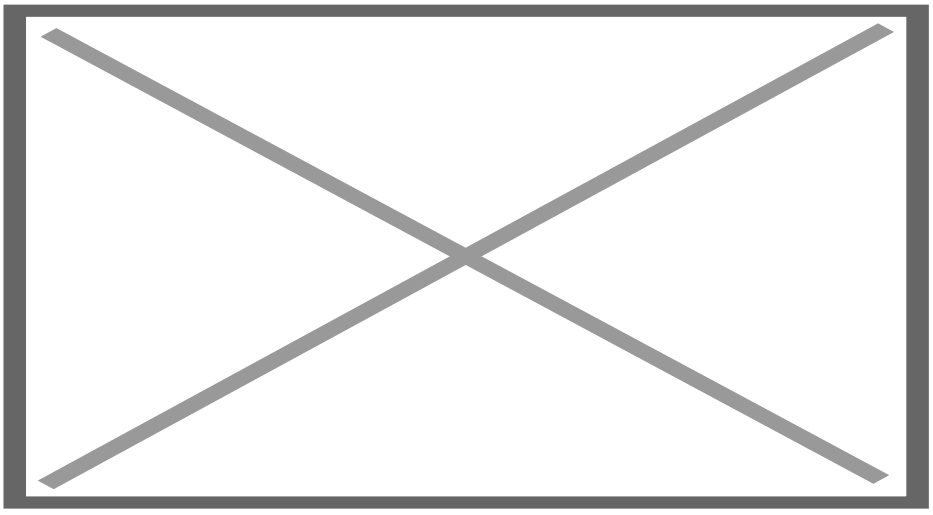
The Engineering and Chemistry of Biomolecules track offers:

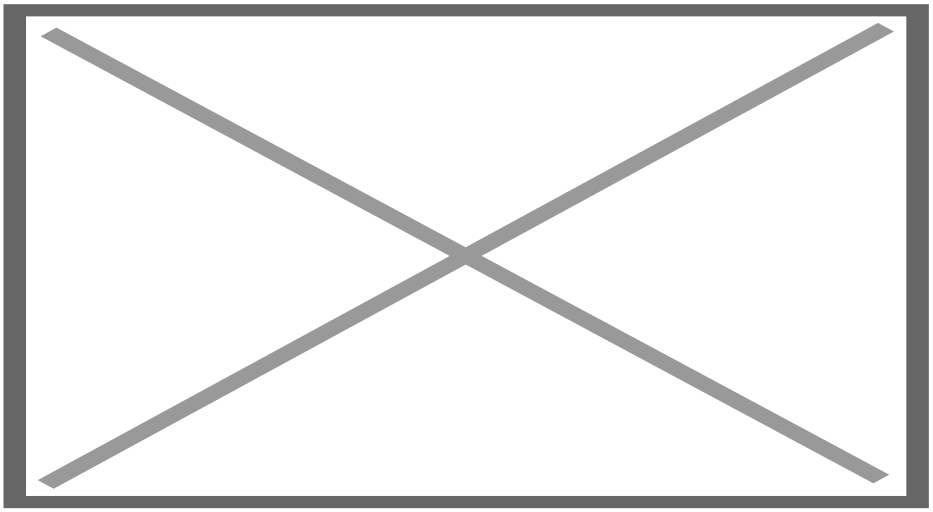
- **A leading program** in the study and engineering of biological macromolecules, in collaboration with prestigious institutions (research institutes, Paris-Saclay and Paris-Cité Universities, large-scale instruments such as the Synchrotron, and specialized technological platforms).
- **Flexible specialization options** in Biochemistry and Biotechnology, Structural Biology, Biophysics, Biomolecular Engineering, or Chemical Biology.
- **Advanced interdisciplinary training** at the Chemistry–Biology interface.
- **Rigorous and comprehensive education**, combining theoretical instruction with hands-on practice, led by experts from high-level research laboratories with access to state-of-the-art facilities.
- **Research immersion** through a full-time five-month internship primarily within the program's network of leading laboratories, while students retain the flexibility to conduct their internship at an external institution in France or abroad.

Télécharger la fiche détaillée
Apply Now









Information

- Overview
- Application requirements
- Schedule

Présentation

Skills

The first semester offers elective courses for progressive specialization, taught by experts from leading laboratories and state-of-the-art technological platforms, combining theoretical and practical instruction.

Students acquire a **comprehensive set of skills at the interface of biology and chemistry**. The training covers protein and nucleic acid biochemistry, structural biology, proteomics, nuclear magnetic resonance of proteins (NMR), cryo-electron microscopy (cryo-EM), X-ray crystallography, spectroscopic and imaging techniques, bioinformatics and molecular modeling, as well as protein engineering, including the use of bioorthogonal chemistry tools.

Integrative structural biology and chemobiology approaches are addressed in the form of lectures on current research in various fields such as microbiology, virology, cell biology and signaling or pathophysiologies.

Students gain hands-on experience with advanced laboratory instruments, research platforms, and bioinformatics tools based on recent developments in artificial intelligence applied to proteins (AlphaFold, protein design).

They develop skills in experimental design, data analysis, and independent project execution.

Objectives

The Master’s in Engineering and Chemistry of Biomolecules, offered by the Biology-Health and Chemistry departments of Université Paris-Saclay, sits at the interface of Biology and Chemistry. It trains future researchers—academic or industrial—capable of understanding biological processes at the molecular and structural level and designing innovative molecular engineering approaches. Graduates are prepared to pursue a doctoral program or join a research team directly as engineers.

The program combines theoretical and practical training at the forefront of scientific and technological advances, integrating biological and chemical approaches to study structure-function relationships of macromolecules. The first semester offers elective courses for progressive specialization, followed by a multi-month research internship in a leading laboratory.

Beyond theoretical and methodological knowledge, the program fosters an interdisciplinary scientific culture, essential for tackling major contemporary challenges in the life sciences.

The primary objective of the Master’s in Engineering and Chemistry of Biomolecules is to prepare students for doctoral studies. Upon completion of the program, graduates may also pursue careers as research engineers within academic teams, R&D engineers in the biotechnology or pharmaceutical sectors, or engineers in bio-industries related to the environment and sustainable development.

Débouchés

Career prospects

After a Master's + PhD: researcher or lecturer
Design engineer in the research / scientific sector
Design engineer industry / public research
After Master and PhD : reseacher or assistant professor or professor

Further Study Opportunities

PhD in Chemistry / Biology
PhD
Engineering, research and development

Admission

Admission Route

Chemistry
Life Sciences
Health sciences

Capacity

Available Places

20

Target Audience and Entry Requirements

The Master’s in Engineering and Chemistry of Biomolecules is intended for students with a strong interest in protein and nucleic acid biochemistry, structural biology and bioinformatics, and approaches at the interface of Chemistry and Biology. Applicants are therefore expected to have a prior background in biochemistry, biotechnology, or chemistry/biology. Other backgrounds, such as pharmacy or engineering schools, are also suitable if the student’s project aligns with these directions.

Période(s) de candidature

Inception Platform

From 02/03/2026 to 30/06/2026

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

Letter of recommendation from a trainee.

Certificate of English level (compulsory for non-English speakers).

Certificate of French (compulsory for non-French speakers).

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).

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	distal learn cou
Stage en laboratoire	30	Semestre 2							

Charger le détail

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practica class
RMN biologique	6	Semestre 1	40	6	4			

Charger le détail

Protéomique	6	Semestre 1	35	12	3			

Charger le détail

Antibiotic transporter: purification, functional and structural analysis by CryoEM	6	Semester 1	16	10	24			

Charger le détail

Cristallographie et microscopie électronique	6	Semestre 1	42	8				

Charger le détail

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
Biologie structurale intégrative et chemobiologie: exemples et applications	6	Semestre 1	40					
Charger le détail								
Bioinformatique structurale	6	Semestre 1	12	6	28			
Charger le détail								
Apports de la biochimie et de la cryo-EM à l'étude des mécanismes de traduction	6	Semestre 1	11		64			
Charger le détail								
Structures, mécanismes et fonctions des protéines - UPSay	6	Semestre 1	40					
Charger le détail								
Biomolécules : synthèse et propriétés	6	Semestre 1	30	10				
Charger le détail								
Techniques spectroscopiques appliquées aux biomolécules	6	Semestre 1	13	3	36			
Charger le détail								
Initiation au Drug Design - PCité	3	Semestre 1	3		21			
Charger le détail								

Subjects	ECTS	Semester	Lecture	directed study	practical class	Lecture/directed study	Lecture/practical class	directed study/practical class
Développement Industriel du médicament : de la molécule au médicament - PCité	3	Semestre 1	25					

Charger le détail

Teaching Location(s)

ORSAY
GIF SUR YVETTE
PARIS 15
PALAISEAU

Academic Partner(s)

Ecole polytechnique, Université Paris-Cité, CNRS Gif sur Yvette

Contact

- **Dominique GUIANVARC'H**
- **Agathe Urvoas**
- **Thierry TOUZE**

http://www.universite-paris-saclay.fr/formation/master/chimie/m2-ingenierie-et-chimie-des-biomolecules