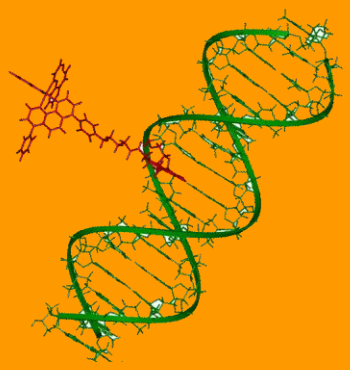
# Master in Chemistry

# Chemistry for Life Sciences

## WHY THIS MASTER ?

**The program *Chemistry for Life Sciences* (CLS) of the Master in Chemistry provides students with the knowledge and skills in bioorganic and bioinorganic chemistry required to understand and probe biological systems. It benefits from the expertise of the UGA research laboratories in the field of chemical biology.**



➢ **Fields of expertise**

Synthesis and Engineering of Biomolecules
Metals in Biology and in Medicine
Biocatalysis and Biomimetic Chemistry
Biotechnologies
Engineering of Macromolecules
Medicinal Chemistry

➢ **Job opportunities**

This Master's program prepares students for a career as R&D engineers in the pharmaceutical or biotechnical industries or in research academic institutes, and its well adapted for students planning to pursue a doctorate.

**A 2-year program with a progressive specialization to participate in projects at the chemistry biology interface**

## APPLICATION

**In 1st year of Master (M1)**

Registration in first year of the Master in Chemistry is possible for students with a Bachelor's degree in Chemical Sciences. Enrolment is based on cursus records and interview.

**In 2nd year of Master (M2)**

For students who have validated a first year of another Master (60 ECTS), enrolment is also based on cursus records and interview.

Online application on the Université Grenoble Alpes website:
**www.univ-grenoble-alpes.fr** Programs > Applications and enrolment.

## INFORMATIONS


**Head of the Program**

Sabine Chierici

Master.Chemistry
@univ-grenoble-alpes.fr

**Administrative Office**

ufrchimiebiologie-formation@
univ-grenoble-alpes.fr

**Université Grenoble Alpes**
**UFR de Chimie et Biologie**
Service Formation
Bat E, 470 rue de la Chimie
CS 40700, 38058 Grenoble
Cedex 9


UFR de Chimie et de Biologie
UNIVERSITÉ Grenoble Alpes

# Program

# Chemistry for Life Sciences

The 1st year of the Master program has a solid core in organic and analytic chemistry, plus optional courses related to the second year specialization (i.e. for the M2 CLS: Cellular Biochemistry, Bioorganic and Bioinorganic Chemistry, Engineering of Macromolecules, Biotechnical Processes) and a 2-month research internship. The second year (program below) is a strengthening of the chosen specialization, and includes a 6-month internship in a research laboratory in France or abroad.

## 1st SEMESTER (30 ECTS)

**Mandatory courses**:

**Bio-targeted Chemistry 1&2 (6 ECTS)** Methods for synthesis and engineering of peptides, carbohydrates and nucleic acids and their applications for therapeutics, diagnostics and nanotechnologies

**Bioinorganic Chemistry (6 ECTS)** Principles used to understand and mimic the metal binding sites naturally found in biological systems and to anticipate interactions of toxic metals or metal-based drugs in living organisms

**Current Topics in Biological Chemistry (3 ECTS)** Advanced knowledge on biological therapeutic targets to facilitate understanding of projects at chemistry biology interface

**Medicinal Chemistry (3 ECTS)** Introduction to medicinal chemistry, major classes of drugs

**Elective courses (12 ECTS** to choose):

**Molecular Modelling (3 ECTS)** An overview of different theoretical methods used to model and simulate molecular systems

**Heterocyclic Chemistry (3 ECTS)** Essential in industrial context, synthesis and reactivity of heterocycles

**Green Chemistry (3 ECTS)** Reaction media, supported synthesis, clean processes, bio-transformations, …

**Biomaterials (3 ECTS)** Selected aspects of polymers designed for use with living tissues and/or biological fluids, and of natural polymers

**High Throughput Biology (6 ECTS)** Basic methodology and advanced techniques used for in vitro small molecule drug discovery

**Structure Determination of Biological Macromolecules (6 ECTS)** Practical and theoritical aspects of the approaches using X-ray and NMR

## 2nd SEMESTER (30 ECTS)

**Resarch internship** From January to June

**Insertion preparation** and **Foreign Language** Taught during the 1st semester

***A training program in Biological Chemistry***

***From the synthesis to the biological application.***

***From the biocatalysis to the biomimetic chemistry.***

## AN EXCEPTIONAL SITE

**Renowned research institutes (CNRS, INSERM, CEA…)**
DCM, CERMAV, DPM, LMB, LCIB…

**An international training program**
Courses in English, possibility of interships abroad

**A dynamic working environment**
The Gières-Saint Martin d'Hères-Grenoble campus and surroundings offer outstanding outdoors, sports and cultural activities