

## **MSc IN MOLECULAR AND CELLULAR BIOLOGY**

### **Presentation**

This master's Degree is aimed to provide students with a solid theoretical-practical experience in Molecular and Cellular Biology which will allow them to begin a research career by entering the Doctorate program and to be trained as molecular scientists in the skills required for research work or related professional activities.

The Master program and its development is organized by the Biochemistry and Molecular and Cellular Biology Department (**BM CBD**, established in the University of Zaragoza in 1977 and composed by 6 different research groups (see below)), with the collaboration of researchers from other Departments and Institutes of our University, and with invited scientists from other Universities and research centres from Spain and abroad.

In order to be admitted in this Master program, students must hold a degree in Biochemistry, Biotechnology, Biology, Pharmacy, Microbiology, Chemistry, Veterinary Science, Medicine or Food Science and Technology. Applicants (excluding Biochemistry and Biotechnology graduates) must have background knowledge in molecular biology and/or biotechnology.

The Master is developed throughout one academic year comprising 60 ECTS divided in two modules. A theoretical-practical module covers 30 ECTS (5 subjects of 6 ECTS each, 3 of which are mandatory and 2 selected out of 4 options) and the other 30 ECTS will consist of an experimental research project (Master's Dissertation, MD) to be carried out in one of the research groups affiliated to the postgraduate program (see below).

**Duration:** 1 year full time. 60 ECTS.

**Language:** Spanish.

### **Program aims:**

The main objectives for the Master's degree in Molecular and Cellular Biology are:

- 1) To provide students a systematic, rigorous and up-to-date knowledge and a critical vision of the main topics in the discipline of Molecular and Cellular Biology (including protein structure, molecular basis of genetic diseases, functional genomics, apoptosis, etc.).

2) To offer students a deeper understanding of the molecular and cellular mechanisms underlying cell function as well as the physiopathology of human diseases.

3) To enable students to acquire and practice the basic skills required to conduct experimental work in the laboratory in the fields of Molecular and Cellular Biology. It is also aimed to teach the students how to analyse and interpret the experimental data obtained and take decisions for the development of a given project.

4) To familiarize students with some of the most important technologies currently used in research in Molecular and Cellular Biology and with the search tools to obtain relevant biological information.

5) To ensure that students acquire the knowledge and ability they will need to identify problems, and find practical and creative solutions, as well as to apply them in a research or professional context in the fields of Molecular and Cellular Biology.

6) To develop their ability to present scientific work in a clear and concise manner, orally and in writing, both to the specialist as well as to a general audience, understanding the ethical and social implications involved.

## Structure

Students must enroll in the following modules:

Module	ECTS	Semester
66030 - Advanced methods in Molecular and Cellular Biology <sup>ELF</sup>	6	S1
66029 - Advanced methods in Biophysics <sup>ELF</sup>	6	S1
66028 - Quality control and legislation in biotechnological processes <sup>ELF</sup>	6	S1
66017 – Master's Dissertation <sup>ELF*</sup>	30	YL

They must also enroll in two modules from the list of optional modules:

Module	ECTS	Semester
66022 - Functional Genomics <sup>ELF</sup>	6	S2

66023 - Advanced Immunology <sup>ELF</sup>	6	S2
66026 - Cell separation and viability analysis <sup>ELF</sup>	6	S2
66018 - Advances in molecular Pathology <sup>ELF</sup>	6	S2

**\*Master's Dissertation**

The Master's Dissertation is a 750 hour experimental project on any of the subjects of the Master's program to be carried out at the end of the course. The student will have to prepare a written report of its MD that will be presented and defended orally in before a committee made up of three members. The committee will evaluate both the structure and contents of the written report as well as the student communication skills and mastering of the project's research field.