

CSIC-UIMP Master in Molecular and Cellular Integrative Biology

What is MCIB?

- MCIB is a research school co-organized by the *Spanish Research Council (CSIC)* and the *International University Menéndez Pelayo (UIMP)* to provide **advanced training in molecular and cellular life sciences to graduate students in a cutting-edge scientific environment**.
- MCIB is a **pioneer in-house research training experience at CSIC centers**, stem from the *Centro de Investigaciones Biológicas (CIB)* - the hub of MCIB - as a **collective higher-education action of CSIC scientists**, bringing together a wide range of expertise and know-how.
- This training portfolio has recently been fostered by the active participation of scientists from other CSIC centers, for example, the *Rocasolano Phys. Chem. Institute (IQFR)* and the *Institute of Food Science, Technology, and Nutrition (ICTAN)*.
- This novel concept will allow the students to be exposed to the **scientific activities developed in-house**, based on the synergies among research programs on **structural, molecular, cellular, chemical and synthetic biology**, that apply **front-line technologies** to study **essential processes and systems with environmental and/or medical relevance**. This integrated research program aims at elucidating fundamental principles of biological function and at providing novel tools to improve quality of life.
- MCIB is inspired in the *Max Planck International Research School for Molecular Life Sciences* established at the MP campus nearby Munich (<https://imprs-ls.opencampus.net/>).

MCIB Program Structure and Timing

- MCIB will run during 3 academic semesters, starting in October until March of the second year. It comprises **90 ECTS credits**, organized in **3 academic modules (60 ECTS)** and a **master research project (30 ECTS)**. MCIB will adopt an **innovative format** in which the students will progress rapidly from intensive course instruction to research in their projects. Most of MCIB activities will be in **English**.

MCIB modules	ECTS	S1	S2	S3
M1 – MCIB FUNDAMENTALS				
M1A: Research Topics	15			
M1B: Advanced Methods	10			
<ul style="list-style-type: none"> • 3DMOLBIOCHEM: Structural, Molecular & Chemical Biology • CELLBIOMED: Cell Biology and Biomedicine • BIOTEC: Molecular and Systems Biotechnology 				
M1C: Lab Rotations . 3 one-week rotations in labs working on the 3 MCIB research programs (M1AB)	5			
M2 – MCIB FRONTIERS				
<ul style="list-style-type: none"> • Advanced seminars and workshops 	15			
M3 – MCIB EXTENSION				
<ul style="list-style-type: none"> • Lectures / workshops on scientific writing and presentation, career development, technology transfer, leadership and communication 	15			
M4 – MCIB MASTER RESEARCH PROJECT (TFM)				
<ul style="list-style-type: none"> • TFM: The general interdisciplinary training provided by M1-M3 will be completed with a degree of specialization at the master research project 	30			
Total	90			

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MCIB III (2018-20) Abbreviated Program

October - November 2018

M1 – MCIB FUNDAMENTALS: Research Topics / Advanced Methods / Lab Rotations (part 1)

- **3DMOLBIOCHEM: Structural, Molecular & Chemical Biology.** Protein science: structural biochemistry; molecular interactions; macromolecular machines and self-organization. Synthesis, modification and turnover of biological macromolecules. Integrated structural biology and biophysics: NMR, crystallography and EM. Computational biology. Chemical biology: molecular recognition; combinatorial chemistry. Journal club sessions.
- **3DMOLBIOCHEM lab rotations**

M2 – MCIB FRONTIERS: Advanced seminars. TBA: to be announced at the beginning of the academic course.

December 2018

- **M1: EXAM 3DMOLBIOCHEM**
- **M2: MCIB FRONTIERS** - Advanced seminar + **workshop 1** (TBA)

January - February 2019

M1 – MCIB FUNDAMENTALS: Research Topics / Advanced Methods / Lab Rotations (part 2)

- **CELLBIOMED: Cell Biology and Molecular Biomedicine.** Internal organization of the cell: bioenergetics; membrane traffic; cell cycle and division; autophagy; cell death. Physiology and pathophysiology: model systems in biomedicine; cancer; neurodegenerative diseases. Immunity and infection: Host-pathogen interactions. Medicinal chemistry and drug design. Journal club sessions.
- **CELLBIOMED lab rotations**
- **EXAM CELLBIOMED** (second half Feb)

M2 – MCIB FRONTIERS: Advanced seminars (TBA)

February - March 2019

M1 – MCIB FUNDAMENTALS: Research Topics / Advanced Methods / Lab Rotations (part 3)

- **BIOTEC: Molecular and Systems Biotechnology.** Environmental biotechnology: bioremediation and biodegradation. Synthetic (micro)biology and metabolic engineering. Bioreactors and applied microbiology. Protein biotechnology: strategies for protein production. Nano-biotechnology. Biomimetics. Applied plant biology. Journal club sessions.
- **BIOTEC lab rotations**
- **EXAM BIOTEC** (end March).

M2 – MCIB FRONTIERS: Advanced seminars (TBA).

April - June 2019

- **TFM: lab selection** (first half April; immediate incorporation), **writing of mini-review** on TFM research topic (as part of M2 / M3; to be submitted in June).
- **M2 – MCIB FRONTIERS:** Advanced seminars + **workshops 2 and 3** (TBA).
- **M3 – MCIB EXTENSION:** Scientific writing and presentation. Career development. Leadership and communication. Computer-based workshops.

July 2019 - March 2020

- **TFM research project**
- **TFM dissertation** (ordinary call: Feb 2020; extraordinary call: June 2020)