

# Master's Degree in Experimental Biomedical Research

## Experimental models in biomedical research (6 ECTS)

- Animal models: development of transgenic rodents (Cre-Lox; CRISPR).
- *Drosophila*, *C.elegans*, organoids, zebrafish, Lab/Organ-on-a-chip
- How to work with them? Practical lessons.
  - *10h in the lab*

## Advanced methodologies in experimental research and data analysis (6 ECTS)

- Advanced therapies in human pathology: nanotechnology, gene therapy, microarrays, Next Generation Sequencing, OMICs
- Statistic and bioinformatics tools for dealing with high-throughput data generated with these methodologies
  - *10h in the lab*

## Scientific path and research integrity (4 ECTS)

- Research path: national and international programs, type of grants
- Knowledge and tools to develop a look-for-funding strategy. Basic concepts and strategies about write a grant
- Conducting research in such a way that allows others to have confidence and trust in the methods and the findings of the research

## Research in CNS-related diseases (4 ECTS)

- Critical vision of **problems and challenges** that appear in the disease and the **approaches** to overcome those issues
- Molecular **basis** of the disease, **experimental models**, and **translation** into the clinic
- Identification of diagnostic and/or prognostic **markers** and potential therapeutic **targets**

*10h in the lab*

## Research in Cardiovascular diseases (4 ECTS)

- Critical vision of **problems and challenges** that appear in the disease and the **approaches** to overcome those issues

- Molecular **basis** of the disease, **experimental models**, and **translation** into the clinic
- Identification of diagnostic and/or prognostic **markers** and potential therapeutic **targets**

*10h in the lab*

#### **Research in Obesity and Diabetes (4 ECTS)**

- Critical vision of **problems and challenges** that appear in the disease and the **approaches** to overcome those issues
- Molecular **basis** of the disease, **experimental models**, and **translation** into the clinic
- Identification of diagnostic and/or prognostic **markers** and potential therapeutic **targets**

*10h in the lab*

#### **Infectious diseases (4 ECTS)**

- Critical vision of **problems and challenges** that appear in the disease and the **approaches** to overcome those issues
- Molecular **basis** of the disease, **experimental models**, and **translation** into the clinic
- Identification of diagnostic and/or prognostic **markers** and potential therapeutic **targets**

*10h in the lab*

#### **Research in Rare Diseases (4 ECTS)**

- Critical vision of **problems and challenges** that appear in the disease and the **approaches** to overcome those issues
- Molecular **basis** of the disease, **experimental models**, and **translation** into the clinic
- Identification of diagnostic and/or prognostic **markers** and potential therapeutic **targets**

*10h in the lab*

#### **Research in Cancer (4 ECTS)**

- Critical vision of **problems and challenges** that appear in the disease and the **approaches** to overcome those issues

- Molecular **basis** of the disease, **experimental models**, and **translation** into the clinic
- Identification of diagnostic and/or prognostic **markers** and potential therapeutic **targets**

*10h in the lab*

#### **Research in Regenerative Medicine (4 ECTS)**

- Critical vision of **problems and challenges** that appear in the disease and the **approaches** to overcome those issues
- Molecular **basis** of the disease, **experimental models**, and **translation** into the clinic
- Identification of diagnostic and/or prognostic **markers** and potential therapeutic **targets**

*10h in the lab*

#### **Internship (Practicum) (20 ECTS)**

- Development of a **research project in the lab** aimed at consolidating, perfecting and complete the learning and skills acquired during the 1<sup>st</sup> semester in a host lab (**national or international**)
- Preparation of **working hypotheses** based on bibliographic and experimental precedents.
- Implication in the **research activities** of the host group/institution
- Acquisition of **experimental skills and maturity** in the lab for future career in public/private entities
- **Written report and a public defense** of the project and results.

#### **Master's degree final project (8 ECTS)**

- Development of a **research project in the lab** aimed at consolidating, perfecting and complete the learning and skills acquired during the 1<sup>st</sup> semester in a host lab (**national or international**)
- Preparation of **working hypotheses** based on bibliographic and experimental precedents.
- Implication in the **research activities** of the host group/institution
- Acquisition of **experimental skills and maturity** in the lab for future career in public/private entities
- **Written report and a public defense** of the project and results.