

66022 - Funtional genomics

Teaching Plan Information

Academic year: 2024/25

Subject: 66022 - Funtional genomics

Faculty / School: 100 - Facultad de Ciencias

Degree: 537 - Master's in Molecular and Cellular Biology

ECTS: 6.0

Year: 1

Semester: Second semester

Subject type: Optional

Module:

1. General information

The general objective of the subject is to present the advances and controversies in this area of knowledge and to develop technical skills through theoretical classes and experimental work. It is expected that students deepen their previous knowledge and acquire additional competencies through personal work that includes information search and critical analysis, writing and communication of scientific content, among other aspects.

2. Learning results

The students, in order to pass this subject, must demonstrate they are able to:

1. Assess the relevance of advances in the field of Molecular and Cellular Biology.
2. Search and analyse specific information in the area of Molecular and Cellular Biology.
3. Make presentations of topics and results derived from research work related to Molecular and Cellular Biology.
4. Acquire the capacity and technical skills necessary for the analysis and resolution of experimental problems in any biomedical and biotechnological research laboratory.

3. Syllabus

1. Transgenesis methods.
2. Genomic editing. CRISPR system and its associated enzymes.
3. Stem cells: Transcriptomics. Mesenchymal stem cells and therapeutic possibilities in animals. In vitro models for the study of human pathologies (neuroinflammation, cancer). Epigenetic analysis and pluripotency. Chemical genomics and drugs for cell therapy and regenerative medicine.
4. Gene therapy vectors for neurodegenerative diseases.
5. Mitochondrial DNA, OXPHOS system and molecular diagnosis of mitochondrial diseases.
6. Animal models in human diseases. (Cancer, ALS, Atherosclerosis, Fatty liver). Omic studies.
7. Linear models for statistical analysis of gene expression data.

4. Academic activities

Theoretical classes. Face-to-face, 3 ECTS. Participative sessions with presentation of theoretical contents by the teaching staff.

Presentation and exhibition of a work. Face-to-face, 0.9 ECTS. Students will collect information on a specific topic, assisted by the teacher. The papers are presented and discussed in class.

Tutoring. 1 ECTS of tutoring.

Experimental work. Face-to-face, 1 ECTS. Culture and manipulation of mouse embryos.

Performance of an objective test for non-face-to-face students. Classroom, 0.1 ECTS. At the end of the term, students will take an objective test to evaluate the acquisition of basic concepts, procedures and other knowledge.

5. Assessment system

In order to pass this subject, the student must achieve an overall minimum grade of 5 out of a total of 10 points. The criteria described below will be adopted, with their level of requirement.

1. Active participation in the theoretical classes of the subject

Students will prepare a summary of a lecture in a maximum of 200 words in English. The lecture assigned to a student will be randomly assigned after the term is completed and it will be different for each student.

The following will be evaluated: clarity, effectiveness in showing the aspects presented, the selection of the final message, and the presentation of alternative proposals to those explained by the teacher when considering other sources of information.

It will contribute 20% to the final grade.

2. Presentation of an individual paper. The works will deal with a subject related to the subject, which each student will specify with the teacher. The teacher will supervise the student's personal work, guiding them in the search for information and in its evaluation. The work must be presented in writing and will be mandatory to pass the subject

It will contribute 40% to the final grade.

3. Public exhibition of individual work. The selected work will be presented and discussed in class and it will be mandatory to do it in order to pass the subject.

It will contribute 40% to the final grade.

Tests for non-face-to-face students

For those students who do not attend the classes, tests 2 and 3 will be carried out.

6. Sustainable Development Goals

4 - Quality Education

5 - Gender Equality

8 - Decent Work and Economic Growth