66022 - Funtional genomics

Información del Plan Docente

Academic Year	2017/18
Faculty / School	100 - Facultad de Ciencias
Degree	537 - Master's in Molecular and Cellular Biology
ECTS	6.0
Year	1
Semester	Indeterminate
Subject Type	Optional
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as: involvement of specialists who will show their different points of view and will broaden the students' understanding, revision of topics using cutting-edge papers. This endeavor may facilitate the selection of a research topic that better fits the student' interests in order to choose their Doctoral Thesis.

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5.2.Learning tasks

To obtain established goals, the following activies are planned:

The course includes the following learning tasks:

Lectures. Face-to-face sessions. 3 ETCS. Designed to provide students the knowledge of the course.

Seminars . Face-to-face sessions. 0.9 ECTS. Students will choose a paper to critically read and discuss. Every student will be closely supervised by a Faculty during the preparation. Eventually, students will present their work in a public session.

Tutorials . 1 ETCS.

Experimental sessions. Face-to-face sessions 1 ECTS. These are focused on culture and manipulation of mouse embryos.

Exam for students who cannot attend the sessions. Face-to-face sessions. 0.1 ECTS. These students will take an exam to prove the acquisition of contents and competences.

5.3.Syllabus

The course will address the following topics:

A) Lectures (40 hours)

The course will address the following topics through oral presentations by specialized researchers about commonly used applications of genomics methods in different research fields (presentations of 1-2 hours).

1. Introduction (J. Osada - Coordinator).
2. Background of functional genomics: The role for transgenesis (P. Muniesa).
3. Designing genetic constructs to generate DNA microinjection transgenics (J. Osada).
4. Generation of transgenics by DNA microinjection (P. Muniesa).
5. Designing genetic constructs to prepare transgenics by homologous recombination in ES cells (J. Osada).
6. Generation of transgenics by homologous recombination in ES cells. (P. Muniesa).

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7. Transgenics and reporters to understand the function of *Rex1/* Zfp42 in pluripotency of ES cells (J. Schoorlemmer).
8. Rex1 genetic regulation: transcriptomic analysis and genomic binding (J. Schoorlemmer).
9. Transcriptomic analysis ES cells (P. Meade).
10. Functional evaluation of conditional transgenic mice (I Giménez).
11. Exploring the universe of CRISP and related enzymes to edit genomes (J.A. Carrodeguas).
12. Genetic chemistry in ES cells. New tools in functional analyses and discovery of new drugs in cell therapy and regenerative medicine (J.A. Carrodeguas).
13. Characterization of animal models of human diseases (J. Miana).
14. The pathological analysis in phenotypic characterization of transgenics (C. Arnal).
15. Transcriptomics to evaluate nutritional responses in animal models (Dra. Navarro).
16. Factors influencing penetrance of pathological mtDNA mutations (E. Ruiz-Pesini).
17. Molecular diagnosis of a mitochondrial disease with targeted exome sequencing (P Bayona).
18. Search for factors involved in mtDNA maintenance (N. Garrido).
19. Functional genomics of OXPHOS system (R Moreno).
20. Lineal models for statistical analysis of gene expression data (L. Varona).
21. Search for biomarkers: transcriptomic analyses of motor neuron diseases, ELA and AME (R. Osta).
22. Genomic analyses to study spongiform encephalopathies (I. Martín-Burriel).
23. Generation of gene therapy vectors in neurodegenerative diseases (R. Osta).
24. Mesenchymal stem cells: characteristics and potential therapeutic use in veterinary medicine (C. Rodellar).
25. Interactions of genes with drugs, nutrients and functional foods and their effect of cardiovascular risk (M. Pocovi).
26. Functional genomics of OXPHOS system by using genome wide interference (P. Fernández-Silva).

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B) Seminars (20 hours)

Analysis of proposed scientific articles, oral presentation and group discussions.

5.4.Course planning and calendar

All dates and places for the different sessions will be confirmed to students in advance.

Lectures:

Dates: Two weeks from 10:00 to 14:00.

Place: Aula Master. Science School

Experimental work :

One day to be set during February.

Departament of Anatomía, Embriología y Genética, Facultad de Veterinaria, edificio Zootecnia, calle Miguel Servet 177, 50013-Zaragoza.

Seminars

Deadline for written assignments: Last week of course in February

Tutorials: Monday and Wednesday from 9:00 to 10:00

Public presentation of reading assignments: Last week of course in February

Written test for non-presentials : Last week of course in February at 10:00 am Aula master of the Faculty of Science.

5.5.Bibliography and recommended resources