

66022 - Funtional genomics

Información del Plan Docente

Academic Year	2016/17
Academic center	100 - Facultad de Ciencias
Degree	537 - Master's in Molecular and Cellular Biology
ECTS	6.0
Course	1
Period	Indeterminate
Subject Type	Optional
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

The learning process in this subject is based on:

Involvement of specialists who will show their different points of view and will broad student understanding.

Supervised by the Faculty, students will revise a topic using cutting-edge papers. This endeavor may facilitate the topic of research that better fits student' interests in order to choose their Doctoral Thesis.

5.2.Learning activities

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To obtain established goals, the following activities are planned:

Theoretical sessions. Presential. 3 ETCS. Designed to provide studets the knowledge of the subject.

Seminars . Presential, 0.9 ECTS. Students will chose a paper to critically read and discuss. Every student will be closely tutorized by a Faculty during the preparation. Eventually, students will present in public session.

Tutorials . 1 ETCS.

Experimental sesssions. Presential 1 ECTS. Focussed on culture and manipulation of mouse embryos.

Exam for non-presential students. Presential, 0,1 ECTS. These students will take an exam to prove their competence.

5.3.Program

A) Theoretical Lectures (40 hours)

Oral presentations by specialized researchers about commonly used applications of genomics methods in different research fields (1 or 2 hours each presentation).

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).
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).

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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).

B) Seminars (20 hours)

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

5.4.Planning and scheduling

Calendar of presential sessions and seminars

Theoretical sesions:

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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 de la Facultad de Ciencias

5.5.Bibliography and recomended resources