Universitat de Lleida

DEGREE CURRICULUM

MODEL ORGANISMS IN BIOMEDICINE

Coordination: DE LA TORRE RUIZ, M. ANGELES

Academic year 2022-23

MODEL ORGANISMS IN BIOMEDICINE 2022-23

Subject's general information

Subject name	MODEL ORGANISMS IN BIOMEDICINE
Code	14703
Semester	1st Q(SEMESTER) CONTINUED EVALUATION
Typology	

Degree	Course	Character	Modality
Master's Degree in Biomedical Research	1	COMPULSORY	Attendance-based

Course number of credits (ECTS)	4
Type of activity, credits, and groups	

Activity type	TEORIA
Number of credits	4
Number of groups	1

Coordination	DE LA TORRE RUIZ, M. ANGELES
Department	BASIC MEDICAL SCIENCES
Teaching load distribution between lectures and independent student work	40 hours on-site 60 hours autonomous work
Important information on data processing	Consult this link for more information.
Language	90% English 10% Catalan/spanish
Distribution of credits	3,6 ECTS Theory 0,2 ECTS Practices 0,4 ECTS External seminars

MODEL ORGANISMS IN BIOMEDICINE 2022-23

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
ABELLAN RODENAS, ANTONIO	antonio.abellan@udl.cat	,2	
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Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
PUJOL CARRION, NURIA	nuria.pujol@udl.cat	,2	
TORRES ROSELL, JORDI	jordi.torres@udl.cat	,3	

Learning objectives

1. Knowledge of the biochemical and cellular basis of unicellular and multicellular organisms employed as biological models
2. Knowledge of the methodologies for the molecular, biochemical, cellular and genetic analyses in studies with model organisms
3. Knowledge of the signalling mechanisms which regulate the biological functions of model organisms, and their evolutionary conservation
4. Knowledge of the biomedical implications of the studies with model organisms, by establishing relationships between alterations in such model organisms and human pathophysiological alterations
5. Acquisition of the ability to analyse and communicate scientific information

Competences

CB1 Acquire knowledge and understanding providing a basis or opportunity for originality in developing and / or applying ideas, often within a research context

CB3 Being able to integrate knowledge and handle complexity, and formulate judgments based on information that was incomplete or limited, including reflexion on social and ethical responsibilities linked to the application of their knowledge and judgments

CB4 Being able to communicate conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences in a clear and unambiguous language

CB5 Possessing learning skills to enable them to continue studying in a way that will be largely self-directed or autonomous

CG1 Knowing how to select and apply different analytical methods at the molecular, biochemical, cellular, genetic and phenotypic level for the diagnosis and study of the diseases.

CG4 Capacity for critical thinking and creative with the own work and that of other researchers

CG5 Ability to acquire, process and interpret the results rigorously and applying appropriate technologies

CE1 Being able to recognize and value the importance of studies in various unicellular and multicellular organisms as experimental models which are essential to the advancement of Medicine and Biomedical Sciences

CE7 To identify the molecules and processes important in the functioning of cells and recognize the mechanisms of integration of external signals that regulate complex functions such as differentiation, proliferation and survival

CT1 Having a correct oral and written expression

CT2 Mastering a foreign language

CT4 Respect the fundamental rights of equality between men and women, to the promotion of human rights and the values ??of a culture of peace and democratic values

Subject contents

1. *Saccharomyces cerevisiae* and *Schizossacharomyces pombe* as model organisms

-Cellular and molecular biology of *Saccharomyces cerevisiae*

-Mechanisms of genetic manipulation

-Genomic analyses in yeasts

-Signal transduction pathways and responses to stress

-Actin cytoskeleton and morphogenesis

-Redox regulation of cell functions

-Cellular homeostasis

-Control of cell cycle: comparative studies with higher eukaryotes

2. Chicken and mouse as model organisms

-Brain structure, basic functions and development in chicken and mouse

-Brain alterations related to human disorders and diseases

-Manipulating the mouse genome: applications in the study of the nervous system development, connectivity and disease

-Etiopathology and treatment of neurodegenerative diseases such as ELA: mouse and rat models

3. Other model organisms: *C. elegans*, *pig*

-Molecular biology and genetic manipulation

-Examples of studies with biomedical applications

Methodology

The teaching-learning process will be carried out by:

Master classes

Problem solving Seminars

Individual work of preparation and presentation of a scientific article

Oral presentation

Development plan

Training activities:

Theory classes: 30 hours with 100% face-to-face classes

Practices: 2 hours with 100% face-to-face classes

Autonomous work: 60 hours wit not in-person classes

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Evaluation

Ongoing assesment: Attendance and participation. 20% of the total grading

Oral test: Oral presentacion of a reasearch article. 30% of the total grading

Theory test: 50% of the total grading

Bibliography

- Saccharomyces Genome Database (www.yeastgenome.org)

- Dickinson JR and Schweizer M (eds) The Metabolism and Molecular Physiology of Saccharomyces cerevisiae. CRC Press (2004)

- Encyclopedia of Neuroscience, 10 volume set (http://www.sciencedirect.com/science/referenceworks/9780080450469) Larry R. Squire (ed.) Elsevier Ltd. (2009). ISBN: 978-0-08-045046-9