UAB
Universitat Autònoma de Barcelona

2021/2022

New Developments in Cytogenetics and Biology of Reproduction

Code: 42941
ECTS Credits: 6

Degree	Type	Year	Semester
4313782 Cytogenetics and Reproductive Biology	OB	0	1

The proposed teaching and assessment methodology that appear in the guide may be subject to changes as a result of the restrictions to face-to-face class attendance imposed by the health authorities.

Contact

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Teachers

Joan Blanco Rodríguez

Maria Oliver Bonet

Cristina Camprubí Sánchez

Jordi Camps Polo

Ester Anton Martorell

Use of Languages

Principal working language: catalan (cat)

External teachers

Cristina Hernando

Mariona Terradas

Prerequisites

The same prerequisites for admission to the Master

Objectives and Contextualisation

This is a compulsory course that aims to introduce the latest concepts and methodologies related to the fields of cytogenetics and reproductive biology for all students taking the Masters in Cytogenetics and Reproductive Biology.

The specific goals of the course are:

1.-Understand the structure, regulation and orgaització of the mammalian genome.

2.-Understand the process of differentiation and interaction of mammalian gametes that leads to the formation of an embryo.

Competences

- Apply the scientific method and critical reasoning to problem solving.
- Communicate and justify conclusions clearly and unambiguously to both specialist and non-specialist audiences.
- Continue the learning process, to a large extent autonomously.
- Identify the cellular and molecular bases of human pathologies linked to chromosome anomalies.
- Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
- Recognise the cellular and molecular bases of reproduction in mammals.
- Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
- Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.
- Use and manage bibliography or ICT resources in the master's programme, in one's first language and in English.

Learning Outcomes

1. Apply the scientific method and critical reasoning to problem solving.
2. Communicate and justify conclusions clearly and unambiguously to both specialist and non-specialist audiences.
3. Continue the learning process, to a large extent autonomously.
4. Describe the cellular and molecular processes of fertilisation and pre-implantation embryo development.
5. Describe the epigenetic regulation that conditions the function of centromeres and telomeres.
6. Describe the structure, dynamics and morphology of the eukaryote chromosome at any stage of the cell cycle and during meiosis.
7. Identify chromosome anomalies, understand the mechanisms that cause them and determine the risk of transmission to offspring.
8. Identify the cellular and molecular bases of human spermatogenesis and ovogenesis.
9. Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
10. Recognise the fundamental role of immunology in human reproduction
11. Recognise the influence of chromatin fibre in gene expression.
12. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
13. Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.
14. Use and manage bibliography or ICT resources in the master's programme, in one's first language and in English.

Content

Unit 1: Advanced Complements in Cytogenetics. Organization of chromatin fiber: in silico and in vivo studies. Chromosome territories, nuclear architecture and gene regulation in higher eukaryotes. Epigenetic regulation of chromosome function. Origin and recurrence of human diseases caused by chromosomal abnormalities.

Unit 2: Advanced Complements in Reproductive Biology. Cellular and molecular aspects of male and female gametogenesis. Acquisition of the fertilizing capacity of sperm. Mechanisms of interaction between male and female gametes. Immunology of male and female reproductive tract.

*Unless the requirements enforced by the health authorities demand a prioritization or reduction of these contents.

Methodology

The contents of this course include lectures, taught by academics and / or professionals, which will encourage student participation.

*The proposed teaching methodology may experience some modifications depending on the restrictions to face-to-face activities enforced by health authorities.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Lectures	32	1.28	4, 6, 7, 8, 9, 12, 3, 10, 11, 14
Type: Autonomous			
Study	104	4.16	4, 6, 5, 7, 8, 9, 3, 10, 11, 14

Assessment

The skills of this course will be evaluated in two sections:

1.-Written test (80% of grade): two multiple-choice test will evaluate the knowledge acquired by each student. The mark obtained in each test will represent 40% of the final mark. These tests will be performed at the end of the program contents.

2-Participation in class (20% of grade): An evaluation of student participation during lectures in the debates raised by professors will be performed.

In case of obtaining less than a 5 in the final grade, a multiple-choice exam will be carried out.

*Student's assessment may experience some modifications depending on the restrictions to face-to-face activities enforced by health authorities.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Participacition in the classroom	20%	10	0.4	1, 9, 12, 2, 13, 14
Written test	80%	4	0.16	1, 4, 6, 5, 7, 8, 9, 12, 3, 10, 11, 13, 14

Bibliography

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Software

No specific software is used in this module.