New Developments in Cytogenetics and Biology of Reproduction

Code: 42941
ECTS Credits: 6

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<th>Degree</th>
<th>Type</th>
<th>Year</th>
<th>Semester</th>
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<td>4313782 Cytogenetics and Reproductive Biology</td>
<td>OB</td>
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Contact

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Teachers

Joan Blanco Rodríguez
Maria Oliver Bonet
Cristina Camprubí Sánchez
Jordi Camps Polo
Ester Anton Martorell

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 organtzació 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.

Methodology

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

Activities

<table>
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<tr>
<th>Title</th>
<th>Hours</th>
<th>ECTS</th>
<th>Learning Outcomes</th>
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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.

Assessment Activities

<table>
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<tr>
<th>Title</th>
<th>Weighting</th>
<th>Hours</th>
<th>ECTS</th>
<th>Learning Outcomes</th>
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<td>Participation in the classroom</td>
<td>20%</td>
<td>10</td>
<td>0.4</td>
<td>1, 9, 12, 2, 13, 14</td>
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<tr>
<td>Written test</td>
<td>80%</td>
<td>4</td>
<td>0.16</td>
<td>1, 4, 6, 5, 7, 8, 9, 12, 3, 10, 11, 13, 14</td>
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Bibliography


Editorial i articles inclosos a Mol Hum Reprod. 2010. 16 (1):1-56


