Universitat Autònoma de Barcelona

2020/2021

Development, Cell Potency and Differenciation

Code: 42944
ECTS Credits: 6

Degree	Type	Year	Semester
4313782 Cytogenetics and Reproductive Biology	OT	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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Use of Languages

Principal working language: catalan (cat)

Other comments on languages

Lectures in Unit 1 will be in English

Teachers

Carme Nogués Sanmiquel

Josep Santaló Pedro

Pere Jordi Fábregas Batlle

External teachers

Josep Maria Canals

Prerequisites

An intermediate-advanced English level is recommended. Lectures in Unit 1 will be in English.

Objectives and Contextualisation

This is a theoretical compulsory module in the Reproductive Biology specialization of the master.

The objective of this module is to provide the students with a solid knowledge of preimplantational and postimplantational embryo development and fetal development in mammals, as well as of the processes of totipotency and cell differentiation that occur during development. This knowledge will allow the students to understand the basis of the pathologies associated with reproduction and of the assisted reproduction and cell therapy techniques. The module will also cover the main legal and ethical aspects related with the application of these technologies.

Competences

- Communicate and justify conclusions clearly and unambiguously to both specialist and non-specialist audiences.
- Continue the learning process, to a large extent autonomously.
- Design experiments, analyse data and interpret findings.
- Identify the ethical dilemmas and apply current laws governing the area of knowledge of the master's degree.
- 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 current laws on reproductive and regenerative biology.
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 bases of cell totipotency and differentiation processes.
5. Design experiments, analyse data and interpret findings.
6. Identify the cellular bases of normal and pathological embryonic and foetal development.
7. Identify the ethical dilemmas associated with research and clinical practice in reproductive and regenerative biology
8. Integrate knowledge and use it to make judgements in complex situations, with incomplete information, while keeping in mind social and ethical responsibilities.
9. Solve problems in new or little-known situations within broader (or multidisciplinary) contexts related to the field of study.
10. Use acquired knowledge as a basis for originality in the application of ideas, often in a research context.
11. Use and manage bibliography or ICT resources in the master's programme, in one's first language and in English.

Content

Unit 1. Preimplantation embryo development.

Unit 2. Postimplantation embryo and fetal development in humans.

Unit 3. Stem cells.

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

Methodology

The module will consist of theoretical classes and a practical session on image observation (corresponding to Unit 2). Class attendance is compulsory and will be monitored.

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

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Classroom practical session	2	0.08	6
Theoretical classes	28	1.12	1, 4, 7, 6, 8, 9, 2, 10
Type: Autonomous			
Individual study	94	3.76	1, 4, 5, 7, 6, 8, 9, 3, 10, 11
Literature searching and reading	20	0.8	5, 6, 8, 9, 3, 10, 11

Assessment

Assessable activities will consist of multiple-choice tests for the contents of Units 1 and 3 (one test for each Unit) and an objective written exam for the contents of Unit 2. Assessable activities are mandatory, and each will have a weight of 30% in the final grade of the module. The aim of these activities is to assess that the students have acquired the conceptual knowledge of each unit and that they have understood and know how to integrate this information.

Class attendance and participation will also be considered in the assessment (10% of the final grade). Any absence should be properly justified by the student. Non-justified absences will affect the final mark of the module as follows: 1 absence -0.5 points; 2 absences -1 point. If the number of non-justified absences is higher than 2, the student will not be able to pass the module.

To pass the module, students must obtain an overall grade equal or higher than 5 points. If the grade is lower than 5, students will need to retake the failed assessable activity/activities. Reassessment tests and exams will be similar to those of the continuous assessment.

To be eligible for reassessment, students should have been previously evaluated in a set of activities equaling at least two thirds of the final grade of the module.

Students will be graded as "No Avaluable" if the weighting of all conducted assessment activities is less than 67% of the final mark.

**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
Class attendance and participation	10%	0	0	1, 4, 5, 7, 6, 8, 9, 2, 3, 10, 11
Multiple-choice test Unit 1	30%	2	0.08	4, 5, 6, 8, 9, 2, 3, 10, 11
Multiple-choice test Unit 3	30%	2	0.08	1, 4, 5, 7, 6, 8, 9, 2, 3, 10, 11
Written exam Unit 2	30%	2	0.08	4, 5, 6, 8, 9, 2, 3, 10, 11

Bibliography

Basic bibliography:

Carlson BM. Embriología humana y Biología del desarrollo. 5ª edición. Elsevier Science. 2014.

Gilbert SF and Barresi MJF. Developmental Biology. 11th Edition. Sinauer Associates. 2016.

Johnson MH (Eds.). Essential Reproduction. 7th Edition. Wiley-Blackwell. 2013.

Knobil E and Neill JD (Eds.). Encyclopedia of Reproduction. Vol 1-4. Academic Press. 1998.

Atala A and Lanza R (Eds.). Handbook of Stem Cells. Vol 1 and 2. Elsevier Academic Press. 2012.

**Access to electronic versions of some of these books is possible through the links available in Campus Virtual.*

Specific bibliography:

Research papers recommended in class