27118 - Cell Culture

Información del Plan Docente

Academic Year	2018/19
Subject	27118 - Cell Culture
Faculty / School	100 - Facultad de Ciencias
Degree	446 - Degree in Biotechnology
ECTS	6.0
Year	3
Semester	Annual
Subject Type	Compulsory
Module	---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures, laboratory classes,

Students are expected to participate actively in class throughout the semester. This is an essentially practical course. Students are expected to acquire basic skills for the maintenance and use of cell cultures.

Further information regarding the course will be provided on the first day of class.

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4.2.Learning tasks

The course includes the following learning tasks:

- 1) Lectures on the basis and uses of cell culture and fundamentals of the techniques used in laboratory sessions.
- 2) Laboratory sessions (11 sessions, 4 hours/session) will allow the student to develop the ability to plan experiments and analyze results, as well as to solve practical questions.
- 3) Elaboration of a written report describing and discussing the results obtained in practical sessions.
- 4) Oral presentation and discussion of a technique and the results obtained in the laboratory sessions.

4.3.Syllabus

The course will address the following topics:

- Topic 1. Introduction to cell culture. Usefulness and applications of cell cultures. Limitations. Cell inspection with the (inverted) microscope. Cell viability and counting. Light microscope, phase-contrast microscope, fluorescence microscope. Freezing and thawing cells. Liquid nitrogen storage.
- Topic 2. Culture of animal cells. Basic techniques of cell culture. Cell isolation and purification. Maintenance of cell cultures. Characterization and cryopreservation. Cell immortalization techniques and their problems. Security in biological laboratories.
- Topic 3. Engineering cells. Introduction. Marker genes. DNA-transfection techniques. Primary cultures and cell lines. Transduction. Infection. Techniques to introduce exogenous proteins into cells.
- Topic 4. Tissue biotechnology, Strategies. Stem cell culture *versus* specialized cell cultures. Purification and culture of stem cells. Cell differentiation techniques. Primary co-cultures.
- Topic 5. Applications of cell cultures: Cells as protein factories: generation of monoclonal antibodies by hybridomas, recombinant proteins, vaccines, etc.
- Topic 6. Contaminations: Detection and elimination.
- Topic 7. Methods for the analysis of viability and cell proliferation.

4.4.Course planning and calendar

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the Facultad de Ciencias website https://ciencias.unizar.es/grado-en-biotecnologia.

Introductory lectures will take place in the first weeks of the semester. Laboratory classes will be held in Laboratory 1 (Dpt. Biochemistry, Molecular and Cell Biology, Building A, 2nd Floor).

Students will be assigned to a group at the beginning of the semester. Session dates for each group will be communicated in the Moodle platform. Dates for oral exposition and deadlines for laboratory reports will also be communicated in this platform.

4.5.Bibliography and recommended resources