

DESCRIPTION OF THE SUBJECT

Degree/Master in: Master's in MOLECULAR AND CELLULAR BIOLOGY by the University of Málaga
Centre: Faculty of Sciences
Subject: EXPERIMENTAL TECHNIQUES IN CELLULAR AND MOLECULAR BIOLOGY I
Code: 107
Type: Optional
Materia: EXPERIMENTAL TECHNIQUES IN CELLULAR AND MOLECULAR BIOLOGY I
Module: EXPERIMENTAL TECHNIQUES
Modality: Theoretical
Language: Spanish
Year: 1
Semester: 1
Nº of ECTS: 3
Nº of hours of work by student: 75
Size of the Big Group: 0
Size of the Reduce Group: 0
Website of the subject: -

TEACHERS

Department: CELLULAR BIOLOGY, GENETICS AND PHYSIOLOGY
Area: CELLULAR BIOLOGY

Name	Mail	Work phone	Office	Tutoring hours
ALICIA RIVERA RAMIREZ	arivera@uma.es	952131963	DBCGFb0 Dpto. Biología Celular, Genética y Fisiología (Módulo de Biología, planta 0) - FAC. DE CIENCIAS	During the entire course: Mondays 09:30 - 10:30, Fridays 09:30 - 11:30, Thursdays 13:30 - 14:30, Wednesdays 12:30 - 14:30

RECOMMENDATIONS AND ORIENTATIONS

Basic knowledge of cellular and molecular biology.

CONTEXT

The general objective of this subject is the practical training of students in different research techniques in the field of Cellular Biology. This course will review some of the existing methodologies in this field. The application of these techniques in the study of different pathologies (diagnosis, after pharmacological modifications, etc.) will be studied in depth. We will also look at the analysis of results and the drawing of conclusions, integrating the information obtained from different experiments.

1. To become familiar with different immunohistochemical marking techniques.
2. Acquire the basic knowledge, both theoretical and practical, for initiation in the use of the main immunohistochemical techniques.
3. Acquire the ability to choose and apply basic immunohistochemical techniques on different biological samples.
4. To have specialised scientific training in the latest advances in the field of immunohistochemistry and its application in the different areas of cellular biology.
5. To know different autoradiographic techniques applied to the study of receptors: saturation experiments, competition.

This subject is developed in a total of 3 ECTS credits and is structured in two fundamental activities:

A. The first activity will be eminently practical and will be based on the performance of simple immunohistochemical techniques and image analysis in the laboratory. General knowledge of the processing of samples for these techniques and for microscopic observation will be taught beforehand, after which they will be carried out. Finally, microscopic observations will be made.

The results of competition and saturation experiments applied to the study of receptors will also be analysed, using different image analysis, results and statistical programmes.

Experimental work in the laboratory: 20h.

Total activity A: 2 ECTS credits

B. The second activity will consist of the preparation by the student of a scientific report on the experimental techniques developed in the laboratory, including a summary of the results obtained and a discussion of them.

Scientific report: 10h.

Total activity B: 1 ECTS credit

COMPETENCES

Specific Competences

- 2.1 Know and understand the details of the experimental protocols of advanced immunohistochemical techniques.
- 2.2 Know and understand the details of the experimental protocols of transmission electron microscopy techniques
- 2.3 Development of the ability to handle the instruments used in these techniques (microtome, ultramicrotome, optical microscope, confocal microscope, electron microscope).
- 2.4 Development of the ability to apply advanced immunohistochemical techniques for optical microscopy (including spectral and multi-channel confocal microscopy).
- 2.5 Development of the ability to apply techniques for the ultrastructural analysis of cells and tissues by transmission electron microscopy.

CONTENT OF THE SUBJECT

1. Introduction to Experimental Techniques
2. Ligand binding techniques: competition.
3. Autoradiography techniques: saturation.
4. Autoradiography techniques: G-protein activity.
5. Immunolocalization techniques

TRAINING ACTIVITIES

Face-to-face activities

Laboratory practices

Masterclass

ASSESSMENT ACTIVITIES

As this is a small group of students, there will be personalised monitoring of the student's work in the laboratory.

Assessment will be carried out by a final test or by submitting an assignment. The choice of one or the other type of assessment will depend on the number of students enrolled in the subject.

LEARNING RESULTS / ASSESSMENT CRITERIA

Continuous assessment based on the information obtained through active participation and the skills and interest shown in face-to-face lectures.

The technical skills acquired, as well as the ability to interpret and discuss the results, will be especially valued.

The assessment will be carried out by means of a final test or by means of the evaluation of a report prepared by the student.

ASSESSMENT PROCEDURE

Assessment procedure

As this is a small group of students, there will be personalised monitoring of the student's work in the laboratory.

Assessment will be carried out by a final test or by submitting an assignment. The choice of one or the other type of assessment will depend on the number of students enrolled in the subject.

BIBLIOGRAPHY AND OTHER SOURCES

Basic

<http://webs.uvigo.es/mmegias/6-tecnicas/5-inmuno.php>

http://www.jhu.edu/iic/PDF_protocols/EM/Animal_Perfusion_protocol.pdf Immunohistochemistry: Basics and methods. Igor B. Buchwalow, Werner Böcker. 2010 Principles and techniques of electron microscopy. Biological Applications (Third edition); M.A. Hayat www.laboratorioysalud.com

Complementary

Scientific articles related to the techniques learned

DISTRIBUTION OF STUDENT'S WORK

FACE-TO-FACE TRAINING ACTIVITIES

Description	Hours	Big Group	Reduced Group
Laboratory practices	20	Yes	No
Masterclass	2.5	Yes	No
TOTAL OF HOURS FACE-TO-FACE TRAINING ACTIVITIES	22.5		

NON-FACE-TO-FACE TRAINING ACTIVITIES

TOTAL OF HOURS NON-FACE-TO-FACE ACTIVITIES	45
TOTAL OF HOURS OF EVALUATION ACTIVITIES	7.5
TOTAL OF HOURS OF STUDENT'S WORK	75

ADAPTATION TO VIRTUAL MODE DUE TO COVID19

Training activities

Scenario A:

The number of students enrolling in the assignment and the size of the laboratory where the assignment is odd allows for teaching onsite, maintaining the safety distance between the students.

Suppose it is not possible to maintain certain security conditions. In that case, the subgroups will be carried out, which will assist in-person laboratory at different times on the same days assigned by the coordinators of the Master.

Scenario B:

If it is not possible to impart classes in person, it will be done synchronously using the Microsoft Teams platform in the established days and schedules. Theoretical ones will replace those that are exclusively practical.

Assessment procedure

There is no alternative in the evaluation procedure in the case of scenario B since the evaluation will be carried out upon delivery by a report related to the contents provided so that no presence is required in any case.

Contents

90% of the contents given in the signature have an easy adaptation to the synchronous mode online.

10% of the contents, which implies the realization of an experimental technique in the laboratory, will be replaced by theoretical contents.

Tutorials

The attention to the students will take place through the forums of the signature on the virtual Campus or through synchronous sessions scheduled in the tutoring schedule with the teacher.