Academic Year/course: 2024/25

27112 - Immunology

Syllabus Information

Academic year: 2024/25
Subject: 27112 - Immunology
Faculty / School: 100 - Facultad de Ciencias
Degree: 446 - Degree in Biotechnology
ECTS: 6.0
Year: 2
Semester: Second semester
Subject type: Compulsory
Module:

1. General information

This is a compulsory subject of the fundamental module of the degree. The general objective of is to provide the student with the fundamental knowledge about the immunological response and immunochemical methods.

It is recommended to have taken General Biology and to have taken or to be enrolled in Biochemistry and Microbiology

2. Learning results

The student, in order to pass this subject, must demonstrate that he has achieved the following results:

- Use and understanding of the basic terminology used in Immunology.

- Use of immunology and immunochemistry methodology.

- Understanding of the mechanisms involved in the immune response.

- Understanding of the functioning of the immune system in physiological and some pathological situations.

Importance of these learning results.

- For almost the first time, they give the biotechnology student the keys to the biological processes that occur in whole organisms.

- They allow to put into context knowledge acquired in Microbiology, Biochemistry, Physiology and Biology, , allowing the acquisition of transversal competences.

- For the first time, students are introduced to biotechnological applications in Biomedicine and Public Health.

- The skills acquired in immunochemical methods will be useful for future biotechnologists in whatever discipline they are involved in.

3. Syllabus

1.- General properties of the immune system

2.- Immune system cells

3.- Immune system tissues

4.- Antigens and immunogens

5.- Immunoglobulin classes and structure

6.- Antibody production

7.- Applications of antibodies.

8.- Generation of the diversity of antibodies

9.- The T-cell receptor

10.-Major histocompatibility complex

11.-Antigenic presentation to T cells

12. T-cell activation

13.-Cytokines and their receptors.

14.-Activation of B cells.

15.-The complement system

16.-Action of cytotoxic lymphocytes

17.-Central and peripheral tolerance

18.-Integration of the immune response.

19.- Immune response against infectious agents. COVID-19

4. Academic activities

The program offers the students help to achieve the expected results and comprises the following activities:

1. Participative master classes. 3,5 ECTS

2. Types of problems and questions. 1 ECTS

3. Laboratory practices. 1.5 ECTS.

Program of practical classes:

1st session. Immune regulation. Activation-induced death.

2nd session. Immunochromatography assay. Cell death assay result

3rd session. ELISA method.

4th session. Isolation of peripheral blood mononuclear cells. Determination of cell populations by flow cytometry.

5. Assessment system

The student must demonstrate achievement of the intended learning results through the following assessment activities:

1. The achievement of the learning results will be verified in an exam that will consist of exercises similar to those performed in the problem classes, and, eventually, of some short development questions. The result of this evaluation will account for 70% of the grade. In order for the exam grade to average with the rest of the evaluation activities, it will be necessary to have at least a 4 out of 10 in this part.

2. Assessment of problem solving and question solving by students in the classroom during the term. The result of this evaluation will account for 15% of the grade

3. The remaining 15% will be contributed by the results obtained in the practices and the report/summary presented at their end..

In addition to the assessment system indicated in the previous items, the student will have the possibility of being assessed by a global test, which will judge the achievement of the learning results indicated above.

6. Sustainable Development Goals

3 - Good Health & Well-Being
4 - Quality Education
5 - Gender Equality