

# 66162 - Biotechnology of monoclonal antibodies applied to cancer immunotherapy

## Syllabus Information

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**Academic year:** 2024/25

**Subject:** 66162 - Biotechnology of monoclonal antibodies applied to cancer immunotherapy

**Faculty / School:** 104 - Facultad de Medicina

**Degree:** 637 - Masters degree in Tumor Immunology and Cancer Immunotherapy

**ECTS:** 3.0

**Year:** 1

**Semester:** Second semester

**Subject type:** Optional

**Module:**

### 1. General information

This is an elective subject of the master's program. The general objective of the subject is to provide the student with the fundamental knowledge about monoclonal antibodies, as well as their application in cancer immunotherapy.

In order to take this subject it is advisable that the student has previously taken the compulsory subjects of the first four-month period.

### 2. Learning results

The student, in order to pass this subject, must demonstrate the following results:

- Use and understanding of basic terminology used in monoclonal antibody biotechnology.
- Understand the main characteristics of monoclonal antibodies.
- Understand the methods of monoclonal antibodies production.
- Understand the rationale for the use of monoclonal antibodies in cancer immunotherapy.
- Present and explain works related to the subject, produced individually.

Monoclonal antibodies were the first therapeutic tool used as cancer immunotherapy and are still the main immunotherapeutic strategy in cancer today. Monoclonal antibodies directed against tumour antigens, which have been developed over the years, have recently been joined by anti-"immune checkpoint" antibodies, which have brought about a conceptual change in the use of monoclonal antibodies against cancer. Therefore, a better understanding of the main aspects of the biotechnology of these therapeutic monoclonal antibodies is of great interest.

### 3. Syllabus

1. Production of antibodies by the immune system.
2. Production of polyclonal antibodies.
3. History of monoclonal antibodies.
4. Chimeric, humanized and fully human antibodies.
5. Application of polyclonal and monoclonal antibodies in diagnostic and screening tests.
6. Application of monoclonal antibodies in the treatment of autoimmune diseases and in organ transplantation and prevention of immune rejection.
7. Antibodies directed against tumour antigens.
8. Antibodies directed against immune checkpoints.
9. New possibilities for anti-tumour treatment based on antibodies.

### 4. Academic activities

- Participative master classes. Acquisition of basic knowledge through participative lectures. 1.8 ECTS.
- Preparation of problems and exercises by students to be solved in the classroom. 0.2 ECTS.
- Presentation and exposition of a work by the students in a seminar. 1 ECTS

The teaching and assessment activities will be conducted in face-to-face sessions.

### 5. Assessment system

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

- Practical problem solving: 25% of the grade
- Seminars to be presented by the students: 50% of the grade
- Active participation in master classes: 25% of the grade.

## **6. Sustainable Development Goals**

- 3 - Good Health & Well-Being
- 4 - Quality Education
- 8 - Decent Work and Economic Growth