

66161 - Microbiota and its relationship with cancer immunotherapy

Teaching Plan Information

Academic year: 2024/25

Subject: 66161 - Microbiota and its relationship with 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 subject will describe the different commensal microbial communities that coexist symbiotically in humans and how their composition regulates a healthy immune response. The types of microbes that form these communities will be described. The mechanisms that connect the dysregulation of the microbiota (dysbiosis) with carcinogenesis and immune surveillance against cancer as well as with the effectiveness and/or toxicity of immunotherapy will be explored. Finally, the different existing approaches, both in research and clinical application, to restore modulate the composition of the microbiota and to improve the effectiveness of immunotherapy will be discussed.

Sufficient computer resources with Internet access are required to access the online content.

2. Learning results

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

1. To know the main types of microorganisms that live symbiotically with humans.
2. To know the main differences of the microbiota of each part of the human body.
3. To know how the microbiota regulates the immune response.
4. To understand the main mechanisms by which our immune system creates tolerance to commensal microorganisms.
5. To understand the concept of dysbiosis and how it relates to the carcinogenic process.
6. To know the main mechanisms by which microorganisms can initiate the process of carcinogenesis.
7. To understand the relationship between dysbiosis, chronic inflammation and cancer.
8. To know the main causes of dysbiosis.
9. To know the main diseases related to dysbiosis that can lead to cancer.
10. To know the relationship between the composition of the microbiota and the efficacy and toxicity of immunotherapy treatments.
11. To know the different approaches in order to modify the microbiota as a treatment for cancer.
12. To understand the main limitations and risks of microbiota transplantation.
13. To know the ethical issues related to the analysis and modification of the microbiota.

3. Syllabus

- 1- Brief introduction to microbiology.
- 2- Antibiotics and other antimicrobials.
- 3- Microbiota and microbiome.
- 4- Introduction to the human microbiota.
- 5- Dysbiosis. Main causes and health effects.
- 6- Microbiota and cancer I. Effects of microbes and their components on the main molecular pathways of carcinogenesis.
- 7- Microbiota and cancer II. Influence on the immune response
- 8- Microbiota and cancer III. Examples of dysbiosis and cancer.
- 9- The microbiota and immune surveillance against cancer.
- 10- Microbiota and immunotherapy I. Microbiota and efficacy of different types of immunotherapy.
- 11- Microbiota and immunotherapy II. Microbiota and toxicity of immunotherapy
- 12- Microbiota and immunotherapy III. Modulation of the microbiota.

4. Academic activities

- **Theoretical classes:** one-hour lectures in which the necessary and general theoretical contents of the subject are presented in order to develop the competencies. It is in the general interest of the faculty to encourage participation.
- **Problem solving and case studies:** problem solving or discussion of practical cases related to the different approaches of immunotherapy in cancer with permanent attendance and supervision by teachers.
- **Visit to the Genomics Service of CIBA**
- **Incorporation of materials to the ADD (*Anillo Digital Docente*)** that are considered elements of consultation for all those involved in the subject.
- **Tutorials:** Students may request personal tutorials through the subject's internal email. For this purpose, a convenient time slot will be agreed upon at the beginning of the term.

5. Assessment system

A. Attendance and participation in the lectures:

Attendance to the master classes is MANDATORY. Minimum attendance shall be 80%.

It will have a weighting of 40% of the total final grade.

B. Problem solving and case studies:

The student will prepare a structured **REPORT** on the problems and cases developed in the problem and case sessions, which will include the answers to a questionnaire related to the activities carried out in those sessions. The reasoning capacity used to answer the different problems and cases will be assessed.

It will have a weighting of 60% of the total final grade.

6. Sustainable Development Goals

3 - Good Health & Well-Being

4 - Quality Education

9 - Industry, Innovation and Infrastructure