

66160 - Liquid biopsy and NGS techniques applied to cancer immunotherapy

Teaching Plan Information

Academic year: 2024/25

Subject: 66160 - Liquid biopsy and NGS techniques 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

The general objective of the subject is to provide the student with the fundamental knowledge about NGS and minimally invasive techniques such as liquid biopsy, as well as their application in cancer immunotherapy. Theoretical classes will help the students acquire the basic knowledge and skills. The preparation and solving of the problems and exercises is intended for students to put into practice the knowledge acquired, and to gain additional skills related to the integration of information and its critical analysis. It will also help them to develop competencies in the solving of specific problems related to NGS and the use of minimally invasive techniques such as LB applied to cancer immunotherapy.

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

2. Learning results

Upon completion of this subject, the student will be able to:

1. Apply and understand the basic terminology used in next-generation sequencing (NGS) and other diagnostic techniques such as liquid biopsy (LB).
2. Understand the main characteristics of NGS.
3. Understand the main characteristics of minimally invasive techniques such as LB.
4. Understand the rationale for the use of these techniques (NGS, LB) to assess the efficacy and toxicity of different cancer immunotherapy treatments.
5. Present and explain works related to the subject, produced individually.

3. Syllabus

1. Introduction to sequencing techniques.
2. Traditional DNA sequencing techniques.
3. Hybridization-based genomic techniques.
4. Massive or next generation sequencing (NGS).
5. NGS sequencing with semiconductor technology.
6. NGS sequencing of transcriptome and whole exome with semiconductor technology.
7. NGS sequencing of epigenome.
8. Liquid biopsy.
9. Specific immunotherapy applications of NGS sequencing.
10. Genetic diagnosis. Ethical and legal considerations. Biobanks

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** and a **PRESENTATION** on the problems and cases developed in the problem and case sessions, including 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