Universitat Autònoma de Barcelona

2017/2018

Immunology

Code: 101981
ECTS Credits: 6

Degree	Type	Year	Semester
2500890 Genetics	OT	4	0

Contact

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Use of languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: Yes
Some groups entirely in Spanish: No

Teachers

Dolores Jaraquemada Pérez de Guzmán

Prerequisites

The students should have obtained the competences of the previous degree courses.

Objectives and Contextualisation

At the end of the course, students will have to:

- To know the components of the immune system: molecules, cells and lymphoid organs.

- To understand the innate and adaptive immune response, humoral and cellular; the phases of the immune response and the regulation and homeostasis of the immune system.

- To know the communication between components of the immune system through blood and lymphatic traffic, and the anatomical location of the immune response.

- To apply the knowledge of the immune response in infections for viruses, bacteria, protozoa, helminths and fungi.

- To know the cellular and molecular immunological techniques applicable to the different biological systems.

- To know how to apply the reactions of the immune system and its specificity to the study of biomolecules, diagnosis, vaccines and immunotherapy.

- To know the basics of immunopathology.

The 6 ECTS of the subject of Immunology will be divided into four thematic blocks with specific learning competences.

Block I. Basic immunology (2 ECTS)

- To know the components of the immune system: molecules, cells and lymphoid organs.

- To know the concepts of innate immunity and specific immunity.

- To identify the elements that intervene in both responses.

- To enumerate and explain the structural and functional characteristics of each molecular and cellular component of innate and adaptive immunity.

Block II. Organization of the Immune Response (2 ECTS)

- To integrate the elements of the immune system in the three phases of the immune response: 1) activation phase; 2) effectorphase; and 3) phase regulation and homeostasis of the immune response.

- To know the communication between components of the immune system through blood and lymphatic traffic; And the anatomical location of the immune response.

- To know the mechanisms that participate in the immune response against infections for viruses, bacteria, protozoa,helminths and fungi.

- To identify the evasion mechanisms used by pathogens against the immune system.

Block III. Applications of Immunology (1,5 ECTS)

- To know the cellular and molecular immunological techniques applicable to the different biological systems.

- To know how to apply the reactions of the immune system and its specificity to the study of biomolecules, diagnosis, vaccines and immunotherapy.

Block IV. Introduction to Immunopathology (0.5 ECTS)

- To know the basics of dysfunctions of the immune system that originate immunopathologies.

Content

Contents of the subject

Block I. Basic immunology (2 ECTS).

Block II. Organization of the Immune Response (2 ECTS).

Block III. Applications of Immunology (1,5 ECTS).

Block IV. Introduction to Immunopathology (0.5 ECTS).

Block I. Basic immunology: elements of the immune system (2 ECTS)

Introduction

UNIT 1: Introduction: general view of the immune system. Basic concepts.

UNIT 2: Introduction: general view of the immune system. Components and actions of the immune response.

Innate immunity

UNIT 3: Innate immunity: immediate and induced.

UNIT 4: The complement system.

UNIT 5: Cells of the innate immune response: macrophages and neutrophils.

Acquired Immunity - Specific Antigen Receptors and Antigen Recognition

UNIT 6: B cell antigen receptor (BCR): structure of immunoglobulins and rearrangement of immunoglobulin genes.

UNIT 7: Antigen-antibody interaction.

UNIT 8: T cell antigen receptor (TCR): structure and genetics.

UNIT 9: Major Histocompatibility Complex (MHC): structure and genetics.

Immune system cells

UNIT 10: T lymphocytes: Thymic selection and subpopulations of T lymphocytes.

UNIT 11: B lympocytes: Selection in bone marrow and subpopulations of B lymphocytes.

UNIT 12: Antigen-presenting cells (APCs): dendritic cells.

UNIT 13: Other cells: NK cells and mast cells, basophils and eosinophils.

Immune system mediator molecules

UNIT 14: Cytokines and chemokines.

UNIT 15: Recirculation of the lymphocytes: concept of homing. Co-stimulatory molecules. Membrane molecules.

Block II. Organization of the Immune Response (2 ECTS)

Organization of the immune response

UNIT 16: Organization of the organs of the immune system.

UNIT 17: Cellular immune response.

UNIT 18: Humoral immune response.

UNIT 19: Regulation of the immune response.

Immune response to pathogens and evasion mechanisms

UNIT 20: Immune response to bacteria.

UNIT 21: Immune response to fungi and parasites.

UNIT 22: Immune response to viruses.

Block III. Applications of Immunology (1,5 ECTS)

UNIT 23: Cellular techniques.

UNIT 24: Molecular techniques.

UNIT 25: Animal models.

UNIT 26: Immunotherapy. Vaccines.

Block IV. Introduction to Immunopathology (0.5 ECTS)

UNIT 27: Immunopathology associated with the immune response.

UNIT 28: Pathologies of the immune system.