**IMMUNOLOGY**

***CU characterization:***

***CU name:***

Immunology

***Scientific area acronym:***

I

***Duration:***

Semiannual

***Working hours:***

85 h

***Contact hours:***

31 h

***ECTS:***

3

***Observations:***

T: 9.5 h

TP: 1.5 h

P: 7 h

OT: 11 h

A: 2 h

***Teacher in charge and respective teaching load in the CU:***

Professor - Gabriela Santos-Gomes – 0.6 h

***Other teachers and respective teaching load in the CU:***

Ana Armada 0.17

Henrique Silveira 0.08

Claudia Moreno 0.17

***Intended learning outcomes (knowledge, skills and competences to be developed by the students):***

*At the end of this curricular unit, students should:*

*• Recognize the composition of the immune system and the importance of immune homeostasis;*

*• Understand the interactions between the different elements that make up the immune system and pathogens;*

• *Identify the mechanisms used by pathogens to invade, evade, and subvert the activity of the immune system;*
• *Recognize the immune parameters suitable for evaluating vaccines;*
• *Develop working methods in the laboratory;*
• *Understand the principles and perform techniques of cellular and molecular immunology;*
• *Identify the application universe of the different analytical methodologies applied to the study of immune system mechanisms*

***Syllabus:***

1. Theoretical content

1.1 Innate immune response of the vertebrate host. Complement system. Polymorphonuclear cells, monocytes/macrophages and dendritic cells. Chemotaxis. Oxidative stress and degranulation. Apoptosis. Antigen-presenting cells. Major histocompatibility complex.

1.2 Acquired immune response of the infected host. B cells. Classes of immunoglobulins. Antigen-antibody binding. Lymphocyte activation. T helper lymphocytes (CD4+) and cytotoxic T lymphocytes (CD8+). Co-stimulatory molecules. Cytokines and chemokines.
Th1, Th2 and Th17 responses.

1.3. Regulation of the effector response. Differentiation and activation of regulatory T cells (CD4+CD25+FOXP3+). Immune homeostasis. Immune tolerance. Immune memory. Vaccines.

2. Practical content

2.1 Laboratory methodologies.

***Evidence of the syllabus coherence with the CU intended learning outcomes:***

*The contents of this curricular unit aim to adapt learning about the response of the mammalian immune system to infection by pathogens through the composition and functioning of the immune system. It also covers the survival strategies of pathogens and the development of infection or disease. In addition, practical laboratory skills can be developed in the field of parasite immunology.*

*Teaching methodologies (including assessment):*

Lectures in theoretical classes
▪ Application of knowledge in theoretical-practical classes
▪ Problem-solving in practical classes
▪ Tutorial support available

***Assessment method:***

*The assessment of learning will be continuous and formative, considering:*
*1. participation and intervention in theoretical, theoretical-practical and practical classes;*
*2. final summative assessment*

***Evidence of the teaching methodologies coherence with the CU intended learning outcomes:***

The lectures aim to provide basic concepts and promote the systematization of acquired knowledge. Practical classes focus on the acquisition of laboratory skills based on contextualized situations. These methodologies involve the students in the teaching learning process and are centered on the methodologies, results, and further application, as well as access to laboratory instruments, enabling a formative assessment. The final summative assessment estimates the level of knowledge attained and makes it possible to understand the extent to which the learning objectives have been covered.

*References for consultation / mandatory existence:*

Experimental and review scientific articles available (open access) in biomedical literature database