



## MODULE 8: IMMUNOLOGIC, RESPIRATORY AND ENDOCRINE DISEASES

Code: 43375

Type: Elective

Credits: 6 ECTS

Language: English / Spanish

**Module's Coordinator:** M<sup>a</sup> Jesús Cruz

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**Schedule for mentoring:** Tuesday and Wednesday, from 11 to 12h

*Although having this timetable proposal, the **students have to arrange an appointment with the teacher by e-mail.***

## OBJECTIVES

This module aims to show the principal respiratory, immune-mediated and endocrine system diseases and the experimental approaches used for understanding the pathophysiological processes underlying these diseases.

## SKILLS

E01. Identify and use the tools, techniques and methodologies of translational clinical research to solve problems in human health.

E01.26. Know the laboratory techniques and methodologies used in respiratory disease research and their applicability.

E01.27. Know and apply molecular techniques to detect antibodies and diagnosis of immune mediated diseases

E01.28. Develop new therapeutic targets against endocrine diseases.

E03. Analyze the pathophysiology at the molecular level using the scientific method and identify its relationship with the clinical process of different diseases.

E03.11. Deepen the fundamentals of respiratory diseases in terms of epidemiology, physiopathology, clinic and diagnostic.

E03.12. Improve the understanding of the immune system function and identify disturbances causing diseases.

E03.13. Understanding the mechanisms of action and regulation of endocrine processes.

E03.14. Deepen into the main endocrine pathologies from a clinical and therapeutic point of view.

## CONTENT

### SECTION I: RESPIRATORY DISEASES

- 1.1. New advances in the pathology of asthma and COPD
- 1.2. Occupational and environmental respiratory diseases
- 1.3. Laboratory techniques for research in respiratory diseases
- 1.4. Environmental studies in respiratory research
- Practicum: Laboratory techniques and environmental studies for research in respiratory diseases: Laboratory practices.
- 1.5. Non-invasive methods for studying pulmonary inflammation
- 1.6. Lesson Animal models for research in respiratory diseases

### SECTION II: ENDOCRINE SYSTEM DISEASES

- 2.1. Overview of endocrine related diseases: basic concepts and clinical features
- 2.2. Diabetes and its complications: the clinical point of view
- 2.3. Different sex development (DSD): Genetic and hormonal regulation of sex development during fetal life, genetic diagnosis and functional studies
- 2.4. Type 1 diabetes: Beta cell replacement and regeneration for the treatment of Type 1 Diabetes Mellitus
- 2.5. Obesity: etiology and therapeutic strategies
- 2.6. Brown adipose tissue and energy homeostasis: a new therapeutic target for metabolic diseases.
- 2.7. Etiology of type 2 diabetes and insulin resistance: lipotoxicity
- 2.8. Etiology of type 2 diabetes and insulin resistance: Inflammation
- 2.9. Etiology of type 2 diabetes and insulin resistance: role of mitochondrial dysfunction.
- 2.10. New therapeutic target against obesity. Introduction to sex hormone-binding globulin (SHBG) and sex steroids
- 2.11. New functions of SHBG in human physiology
- 2.12. Practicum

### SECTION III: IMMUNE SYSTEM DISEASES

- 3.1. Review of the immune response in healthy individuals. Overview of the immune-mediated diseases
- 3.2. Mechanisms of tolerance and autoimmunity. Key aspects of autoimmune diseases
- 3.3 Etiology of primary immunodeficiencies. Laboratory techniques for the research in inborn errors of immunity.
- 3.4. Mechanisms of hypersensitivity and allergy. Laboratory techniques for research in molecular allergy.

## METHODOLOGY

Lectures  
Solving problems / case study  
Making reports/works  
Autonomous study  
Reading articles/reports of scientific interest  
Presentation/ oral defence of works  
Tutorials

## EVALUATION

Theoretical exam	50%
Oral presentation	50%

**A minimal note of 4.5 in each exam is required to pass.**

### Note that:

- This module does not include a single evaluation system.
- Attending a minimum of 80% of the classes is required for taking the exam and passing the course.

Unexcused absence of 20% or more mean failing the subject.

### Second-chance examination:

- Students who fail the course (grade lower than 5), will be entitled to a second evaluation, provided that they have participated in all the evaluation activities and have a final average grade equal to or higher than 3.5.
- Second-chance evaluation will consist on a multiple choice exam related to the topics failed.
- The maximum grade of the second-chance evaluation will be a pass mark (5).

## TEACHING STAFF

**María Jesús Cruz Carmona, PhD** - [mj.cruz@vhir.org](mailto:mj.cruz@vhir.org)

Head of Pneumology Research Group. VHIR.

**Laura Viñas, PhD** - [laura.vinas@vallhebron.cat](mailto:laura.vinas@vallhebron.cat)

Specialist in Immunology. VHIR.

**Josep A Villena Delgado, PhD** - [josep.villena@vhir.org](mailto:josep.villena@vhir.org)

Principal Investigator in Diabetes and Metabolism Research Group. VHIR.

## ACADEMIC SCHEDULE

**Timetable:** From January 7<sup>th</sup> to January 23<sup>rd</sup> 2025, every afternoon from 3 to 7 pm.

**Exam date:**

- February 4<sup>th</sup>, from 9 am to 1 pm (oral presentations).
- February 7<sup>th</sup>, from 9 am to 11 am (exam).

[See the Master's Degree Schedule for academic year 2024-2025](#)

**Classroom:** Teaching Pavilion UAB-HUVH.

Please, check the information board at the Academic Office of the Teaching Pavilion in order to confirm the classroom before the class starts.