



MODULE 7: MICROBIOLOGY, INFECTIOUS DISEASES AND CRITICAL CARE

Code: 43376

Type: Elective

Credits: 6 ECTS

Language: Spanish / English

Module's Coordinator: Tomàs Pumarola

✉ tpumarola@vhebron.net

Schedule for mentoring: It is necessary to arrange an appointment with the module's coordinator by e-mail.

OBJECTIVES

The objectives of this module are:

- a) to introduce the main technologies available for the aetiological diagnosis of infectious diseases and the detection of antimicrobial resistance;
- b) the study of infectious diseases in the immune suppressed patient; and
- c) the study of different pathologies in the critically ill patient

SKILLS

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

E01.15. Use new techniques of mass spectrometry and next generation sequencing, being able to extract and interpret the results.

E01.16. Be able to conduct the microbiological diagnosis of different infectious diseases.

E01.17. Understand the importance of synergy between clinical and basic research groups for the successfully treatment of infectious diseases.

E02. Use of modification techniques in living organisms (or part of them) to improve pharmaceutical and biotech processes or to develop new products.

E02.7. Study experimental animal models in infectious diseases and critical pathology.

E02.8. Develop new pharmacological and non pharmacological therapeutic strategies for the treatment of infectious diseases and critical pathology.

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

E03.9. Know the basis and physiopathological disturbances involved in infectious diseases and critical pathologies.

E03.10. Study and characterization of infectious diseases biomarkers. Learn different techniques and new approaches for biomarkers analysis.

CONTENT

SECTION I: CRITICAL CARE

Lesson 1. HIV Pathogenesis and treatment

General concepts; viral reservoirs; new antiviral targets

Lesson 2. Microbiological diagnosis in immune suppressed patients

Solid organ transplant and haematological patients

Lesson 3. Resistance to Antimicrobials

Antimicrobial drugs; mechanisms of action and resistance; methods for the study of bacterial resistance; multidrug resistance in the hospital setting; methods for the detection and characterization of an outbreak.

Lesson 4. Microbiological Surveillance of Infectious Diseases

General concepts; arboviral infections; tuberculosis; Chagas disease.

Lesson 5. Emerging viral pathogens. Role of the Microbiology Laboratory

General concepts; Influenza; Ebola; coronaviruses.

SECTION II: MICROBIOLOGY AND INFECTIOUS DISEASES

Lesson 6. Point of Care Testing

Applications in Clinical Microbiology

Lesson 7. Precision Medicine in Critical Care:

- a) Optimization of antibiotic dosing in patients with sepsis.
- b) Considerations in Children, Burns, Transplant and Other Immunocompromised Patients

Lesson 8. Biomarkers in sepsis: a systemic review.

Lesson 9. Pathogenesis, molecular targets and advanced therapy

- a) Sepsis and Septic shock
- b) Acute Respiratory Failure
- c) Multiorgan Dysfunction

Lesson 10. Personalized Medicine in Sepsis & Pneumonia

- a) Definitions; biomarkers; new therapeutic targets and Research Agenda
- b) Hands On: How to Convince a Journal Editor to publish your paper

Lesson 11. Clinical Trials & Bioethical principles in critically ill patients

Lesson 12. Knowledge translation in sepsis:

- a) Quality improvement interventions in sepsis and severe infections. Local, national and international perspective.
- b) Optimal workflow in the microbiology lab for time-dependent infections.
- c) Sepsis code: Fast-track sepsis management.

METHODOLOGY

Theoretical classes
Solving problems / case study
Making reports/works
Autonomous study
Reading articles/reports of scientific interest
Presentation/ oral defense of works
Tutorials

EVALUATION

Theoretical exam	40-50%
Oral presentation	40-50%
Attendance and participation in class	10-20%

Attending a minimum of 80% of the classes is required for taking the exam and passing the course.

TEACHING STAFF

Tomàs Pumarola, MD PhD tpumarola@vhebron.net
Jordi Rello, MD PhD jrello@crips.es

ACADEMIC SCHEDULE

Timetable: From October 31 to November 19 2018. Every afternoon from 16 to 20h.

Exam date: December 3 2018, from 9 to 12h

[See the Master's Degree Schedule for academic year 2018-2019](#)

Classroom: 112. 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.