



MODULE 1: TRANSVERSAL SKILLS FOR TRANSLATIONAL RESEARCH IN HUMAN PATHOLOGY

Code: 43643

Type: Compulsory

Credits: 9 ECTS

Language: English

Module's Coordinator: Josep Quer Sivila, PhD

✉ josep.quer@vhir.org

Schedule for mentoring: Fridays, from 11:00 to 13:00h.

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

OBJECTIVES

This module aims to approach the students to the functioning of research in a tertiary hospital, by showing the different medical states from diagnostic to care of diseases.

The aim of the module is to enable students to acquire the basic knowledge on the ethical, methodological, regulatory and logistical aspects used in translational and clinical research, to be able to plan experiments in human pathology based on Genomics, Proteomics, Cytomics and Metabolomics, to acquire the knowledge to identify the transferability of the results of their research to the market, and to understand the bases and the application of new diagnostic tools (massive sequencing, magnetic resonance imaging, microarrays, nanotechnology, etc.) and advanced therapies in human pathology.

SKILLS

E01. Identify and use the concepts, tools, techniques and methodologies for translational biomedical research

E01.10. Identify the organizations that regulate biomedical research in hospital environment, as well as, their structure and management organs.

E01.11. Recognize the major syndromes identifying their main physiopathological features, as well as, the methods for diagnostic and research.

E01.12. Learn the techniques and methodologies used for diagnosis of disease in clinical, pathological, imaging and nuclear medicine laboratories.

E01.13. Learn surgical techniques and experimental surgery used in animal models.

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

E02.1. Distinguish the processes used in preclinical research of new therapeutic agents.

E02.2. Suggest the use of preclinical animal models and cell models in advanced therapies.

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

E03.1. Understanding the changes and processes that underlie the major syndromes and their diagnosis and treatment.

E03.2. Apply the basis of molecular mechanisms underlying human disease for diagnosis in problem cases.

E05. Conceive, design and develop scientific projects in translational research aimed to develop new therapies, diagnostics and prevention methods that can be implemented in clinical practice.

E05.1. Design a scientific project in translational/clinical research by applying knowledge acquired in the module and taking into account legal and methodological frameworks for this type of research.

CONTENT

SECTION 1: INTRODUCTION TO CLINICAL PRACTICE IN THE HOSPITAL ENVIRONMENT.

- 1.1. Where are you? Introduction to Campus Vall d'Hebron and the Health System in Catalonia.
- 1.2. Module's Introduction. Open questions.
- 1.3 Diagnosis Units.
 - 1.3.1 Transversal Facilities/Services
 - 1.3.2 Anatomopathological diagnosis
- 1.4. Pharmacology and pharmacy
- 1.5. Research models in surgery

SECTION 2: CLINICAL RESEARCH AND CLINICAL TRIALS.

- 2.1. Methodologies for Clinical Research.
- 2.2. Operational aspects. How to manage with clinical trials. Most frequent problems
- 2.3. Observational epidemiologic studies: Design, advantages and disadvantages. Principal bias
- 2.4. Clinical trials. Legal and ethical issues of clinical research

SECTION 3: CORE FACILITIES FOR RESEARCH.

- 3.1. Visit to Core Facilities
- 3.2. Visit to Clinical Diagnosis Laboratories

SECTION 4: TOOLS FOR DIAGNOSIS IN HUMAN PATHOLOGY. GENOMICS.

- 4.1. NGS for Virus research and diagnosis (Hepatitis A, B, D & E virus)
- 4.2. HCV from basic research to the diagnosis. Example of translational research.
- 4.3. Massive Sequencing in Exosomes and Liver disease follow up
- 4.4. Use of sequencing technologies to investigate the human microbiome
- 4.5. Research tools in dementia and other neurodegenerative disorders
- 4.6. Biomarkers for the Diagnosis of Diseases

SECTION 5: TOOLS FOR ADVANCED THERAPIES. CELLS, PROTEOMICS & NANOPARTICLES.

- 5.1. Tools to study cellular organelle dysfunction
- 5.2. Proteomics, a general purpose tool for the biomedical research laboratory
- 5.3. Advanced Therapies. Gene Therapy. Stem Cells.
- 5.4. Therapies with mesenchymal cells

- 5.5. Immunotherapy
- 5.6. Cell therapy for fetal repair
- 5.7. General Introduction to Nanomedicine. Drug delivery systems
- 5.8. Inorganic Nanoparticles with applications in medicine
- 5.9. Clinical genetics. Cytogenetic Prenatal Diagnosis: past and present trends
- 5.10. Liquid biopsy for prenatal diagnosis

METHODOLOGY

Theoretical classes
Guided visits
Making reports/works
Autonomous study
Reading articles/reports of scientific interest
Presentation/ oral defence of works
Tutorials

EVALUATION

Writing a research project based on a clinical problem (team work)	30%
Oral defence of the research project (team work)	35%
Multiple choice test exam	35%

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

TEACHING STAFF

Ibane Abasolo Olaortua, PhD - ibane.abasolo@vhir.org
Principal Investigator in Drug Delivery and Targeting Research Group. CIBBIM-Nanomedicine. VHIR.

Diego Arango Corro, PhD - diego.arango@vhir.org
Head of Biomedical Research Group in Digestive Tract Tumors. CIBBIM-Nanomedicine. VHIR.

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Head of Cell and Gene Therapy Research Group. VHIR.

Ignacio Ferreira González, MD PhD - iferreir@vhebron.net
Specialist physician in Cardiology Departament. HUVH.
Principal Investigator in Cardiovascular Diseases Research Group. VHIR.

Josep Quer Sivila, PhD - josep.quer@vhir.org
Principal Investigador in Liver Diseases Research Group. VHIR.

Francisco Rodríguez Frías, PhD - frarodri@vhebron.net
Principal Investigador in Liver Diseases Research Group. VHIR.

Invited lecturers:

María Antolín Mate, PhD

Joan López Hellin, PhD

José María Balibrea, MD PhD

Chayshavanh Manichanh, PhD

Andrea Caballero Garralda

Ramon Martí Seves, PhD

Ernesto Casis Saenz, MD PhD

Mónica Martínez Gallo, MD PhD

Eva Colàs Ortega, PhD

Celia Perales Viejo, PhD

Anna Cueto González, MD PhD

Santiago Pérez-Hoyos, PhD

Albert Figueras Suñé, MD PhD

Alexis Rodriguez Gallego

Victor Franco Puentes, PhD

Marta Rosal Fontana

César García Fontecha, MD PhD

Agustin Ruiz Laza, MD PhD

Joan Genescà Ferrer, MD PhD

César Velasco, MD PhD

Javier Hernández Losa, PhD

Joaquim Vives Armengol, PhD

ACADEMIC SCHEDULE

Dates: from 26 September to 22 October 2018.

Exam dates: 5, 6 and 7 November 2018.

[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.