



MODULE 3: NERVOUS SYSTEM DISEASES

Code: 43645

Type: Elective

Credits: 6 ECTS

Language: English/Spanish

Module's Coordinator: María José Pérez García, PhD

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Schedule for mentoring: Monday from 10:00 to 12:00h

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

OBJECTIVES

The goal of the module is to provide the students the knowledge of the physiological and pathological mechanisms responsible in the development of psychiatric and neurological diseases.

In addition, the module aims to generate in the students a critical vision of problems and challenges that appear in this field and the approaches to overcome those issues.

SKILLS

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

E01.14 Learn morphological, imaging, biochemical, genetic, molecular and cellular techniques used in neurological and psychiatric research.

E01.15 Learn the bases and methodologies that enable the identification and design of new therapeutic targets against neurological and psychiatric diseases.

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

E02.3 Apply cell and molecular biology techniques to produce diagnostic and therapeutic products for neurological and psychiatric diseases.

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

E03.3 Understand the basis that underlay the main neurological and psychiatric diseases from the point of view of epidemiology, physiopathology, clinics and diagnosis.

CONTENTS

Lesson 1. Introduction

1.1 Brain Neuroanatomy

1.2 Brain imaging techniques

Lesson 2. Pheripheral Nervous System

2.1 Regeneration and plasticity of the nervous System

Lesson 3. Neuropathology

3.1 Neuropathology (theory and practicum)

Lesson 4. Neurodegenerative diseases

Alzheimer´s Disease

4.1 Clinical aspects of Alzheimer´s diseases

4.2 *In vivo* and *in vitro* models of Alzheimer´s Disease

Parkinson's Disease

- 4.5 Clinical aspects and current treatments for Parkinson Disease.
- 4.6 Parkinson's Disease: Molecular mechanism of neurodegeneration
- 4.7 Role of autophagy in neurodegenerative diseases
- 4.8 Biomarkers in Parkinson's disease

Lesson 5. Mitochondrial diseases

- 5.1 Leigh syndrome due to mitochondrial disorders in children
- 5.2 Mitochondrial diseases I.
- 5.3 Mitochondrial diseases II.
- 5.4 Mitochondrial diseases III: Experimental models

Lesson 6. Paroxysmal diseases

- 6.1 Neuronal Channelopathies and synaptopathies.
- 6.2 Headache and Neuropathic pain

Lesson 7. Neuromuscular diseases

- 7.1 Myasthenia Gravis and related disorders
- 7.2 Duchenne muscular dystrophy and Spinal Muscular Atrophy: Novel therapeutic options.
- 7.3 McArdle Disease and other glycogen storage diseases

Lesson 8. Neurovascular diseases

- 8.1 Stroke pathophysiology diagnosis and treatment.
- 8.2 Experimental models of ischemic stroke.
- 8.3 Intracranial hemorrhage: etiology and pathophysiology.
- 8.4 What is the process of neurohabilitation? What scientific evidence is there?

Lesson 9. Neuroimmunological diseases

- 9.1 Role of environmental factors, Epstein-barr virus and vitamin D in Multiple Sclerosis
- 9.2 Genetics of Multiple Sclerosis
- 9.3 Pathology of Multiple Sclerosis and overview of drugs currently registered for Multiple Sclerosis

Lesson 10. Psychiatric diseases

- 10.1 Autism
- 10.2 Understanding ADHD across lifespan
- 10.3 An overview of approaches to study the genetics and epigenetics of psychiatric.

METHODOLOGY

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

EVALUATION

Theoretical exam	50%
Submission of reports/works	20%
Oral presentation	30%

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

TEACHING STAFF

Mar Henández Guillamon, PhD – mar.hernandez.guillamon@vhir.org
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Postdoctoral researcher in Neuromuscular and Mitochondrial Pathology Research Group. VHIR.

ACADEMIC SCHEDULE

Dates: from 19th October to 4th November 2020.

Oral presentation: 25th and 26th November, from 3 to 7 p.m.

Exam date: 27th November, from 5 to 7 p.m.

[See the Master's Degree Schedule for academic year 2020-2021](#)

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