



MODULE 3: NERVOUS SYSTEM DISEASES

Code: 43645

Type: Elective

Credits: 6 ECTS

Language: English

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
- 1.3 Neuropathology (theory and practicum)

Lesson 2. Neurodegenerative diseases

2.1 Alzheimer's Disease

- 2.1.1 Clinical aspects of Alzheimer's diseases
- 2.1.2 *In vivo* and *in vitro* models of Alzheimer's Disease
- 2.1.3 Death receptors in Alzheimer's Disease

2.2 Parkinson's Disease

- 2.2.1 Clinical aspects and current treatments for Parkinson Disease.

2.2.2 Parkinson's Disease: Molecular mechanism of neurodegeneration

2.2.3 Role of autophagy in neurodegenerative diseases

2.2.4 Biomarkers in Parkinson's disease

Lesson 3. Mitochondrial diseases

3.1 Mitochondrial diseases. McArdle Disease and others glycogen storage diseases

3.2 Mitochondrial diseases. Experimental models

Lesson 4. Psychiatric diseases

4.1 Understanding ADHD across lifespan *in vitro* and *in vivo* models for drug addiction.

4.2 *In vitro* and *in vivo* models of drug addiction

Lesson 5. Paroxysmal diseases

5.1 Neuronal Channelopathies and synaptopathies.

5.2 Headache and Neuropathic pain

Lesson 6. Neuromuscular diseases

6.1 Myasthenia Gravis and related disorders

6.2 Duchenne muscular dystrophy and Spinal Muscular Atrophy: Novel therapeutic options.

6.3 McArdle Disease and other glycogen storage diseases

Lesson 7. Neurovascular diseases

7.1 Stroke: cerebral vascularization, physiopathology and etiology. Stroke diagnosis and treatment.

7.2 Discovery techniques for stroke biomarkers. *In vitro* models of cerebrovascular pathology.

7.3 *In vivo* models: physiopathological mechanisms of stroke and new treatments for stroke.

Lesson 8. Neuroimmunological diseases

2.1 Role of environmental factors, Epstein-barr virus and vitamin D in Multiple Sclerosis

2.2 Genetics of Multiple Sclerosis

2.3 Pathology of Multiple Sclerosis

2.4 Clinical and diagnostic aspects of Multiple Sclerosis.

2.5 Overview drugs currently registered for Multiple Sclerosis

2.6 Future treatment in Multiple Sclerosis

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 Hernández 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 14th to 29th October 2019.

Exam date: 18th November, from 9 to 11 am.

[See the Master's Degree Schedule for academic year 2019-2020](#)

Classroom:

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