



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Biomedicina, Neuroscienze e Diagnostica avanzata		
ACADEMIC YEAR	2021/2022		
MASTER'S DEGREE (MSC)	NEUROSCIENCE		
INTEGRATED COURSE	PSYCOBIOLOGY AND CLINICAL BIOCHEMISTRY - INTEGRATED COURSE		
CODE	21876		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)	M-PSI/02, BIO/12		
HEAD PROFESSOR(S)	GIGLIO ROSARIA VINCENZA	Ricercatore a tempo determinato	Univ. di PALERMO
OTHER PROFESSOR(S)	GIGLIO ROSARIA VINCENZA OLIVERI MASSIMILIANO	Ricercatore a tempo determinato Professore Ordinario	Univ. di PALERMO Univ. di PALERMO
CREDITS	8		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	2		
TERM (SEMESTER)	1° semester		
ATTENDANCE	Mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	<p>GIGLIO ROSARIA VINCENZA Monday 10:00 12:00 Sezione di Biochimica Clinica, Medicina Molecolare Clinica e Medicina di Laboratorio. Dipartimento di Biomedicina, Neuroscienze e Diagnostica avanzata. Wednesday 15:00 17:00 Sezione di Biochimica Clinica, Medicina Molecolare Clinica e Medicina di Laboratorio. Dipartimento di Biomedicina, Neuroscienze e Diagnostica avanzata.</p> <p>OLIVERI MASSIMILIANO Friday 10:00 12:00 Stanza TEAMS con codice alx3rxb</p>		

DOCENTE: Prof.ssa ROSARIA VINCENZA GIGLIO

PREREQUISITES	The student will know the biochemistry and physiology of major organ systems that constitute the human body and know the pathophysiology of major diseases.
LEARNING OUTCOMES	<p>Knowledge and understanding: Acquiring the basic knowledge of the Clinical Biochemistry through lectures and personal study of texts and scientific publications, and the ability to use the specific language of discipline. Know and understand the different functional aspects of a neurophysiological and psychobiological nature. Knowing the molecular, cellular, biochemical and physiological involved both in the body's homeostasis and neurodegenerative diseases. Understanding the main laboratory tests and their correlations with the neurodegenerative diseases. This knowledge will be acquired through lectures and theoretical-practical activities and, it will be verify through oral exam.</p> <p>Applying knowledge and understanding: Demonstrating the ability to apply the acquired knowledge and understanding through the use of diagnostic strategies, performed with biotechnologies of the field of Clinical Biochemistry, and even based on both knowledge acquired in clinical pathophysiology and choose and use of appropriate equipment and biomolecular methods, identifying individual problems, advantages and limitations. These skills will be assessed through theoretical and practical exercises.</p> <p>Making judgments: Being able to assess the implications of biotechnological choices of the disciplines and the results obtained, by considering the data of the international bibliography.</p> <p>Communication skills: Being able to describe in an appropriate and suitable manner to the other health care professionals a critical interpretation of the obtained results of laboratory tests. Being able to describe to other health care professionals the presence of a laboratory result and its complications.</p> <p>Learning skills: Consolidating the knowledge of Clinical Biochemistry in the field of neurodegenerative diseases. Being able to deepen the study of laboratory tests for in cognitive or neurological deficits in order to perform a continuous and regular updating of scientific knowledge progressively in developing. Being able to perform a literature research, in order to correctly and periodically update the scientific knowledge. Acquiring the ability to improve the knowledge with Masters of Science of the I and II level. Knowing the application and limitations of biomedicine biotechnology.</p>
ASSESSMENT METHODS	The learning assessment consists in itinere evaluations, an oral examination and a multiple choice test with 30 questions covering all the topics of the program. The test will be evaluated by assigning 1 point to each correct response. Oral examination consists in a conversation, order to check competences and subject knowledge required from the course; the evaluation is expressed in thirtieths. The questions will tend to test the learning achieved by assessing a) the knowledge captured in the many fields of neurosciences b) the processing capacity, c) possession of adequate exhibition capacity in relation to the diagnosis and in particular in the field of neurodegenerative diseases. The sufficient threshold will be reached when the student shows knowledge and understanding of the issues at least in general terms, and has minimal application knowledge in order to solve concrete cases; the student will also have presentation skills and of argument as to allow the transmission of his knowledge to the examiner. Below this threshold, the examination will be insufficient.
TEACHING METHODS	The didactic activity takes place through lectures and laboratory activities.

**MODULE
PSYCHOBIOLOGY**

Prof. MASSIMILIANO OLIVERI

SUGGESTED BIBLIOGRAPHY

The Cognitive Neurosciences, Sixth Edition
Edited by David Poeppel, George R. Mangun and Michael S. Gazzaniga
ISBN: 9780262043250

AMBIT	20879-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	51
COURSE ACTIVITY (Hrs)	24

EDUCATIONAL OBJECTIVES OF THE MODULE

Promote the ability to analyze the relations between behavior, mental functions and brain structure, through the integration of biology, physiology and psychology.

SYLLABUS

Hrs	Frontal teaching
3	Psychobiology of Vision
4	Motivation
4	Neural correlates of emotions
4	Brain rhythms and sleep
3	Cognitive control and executive functions
3	Psychobiology of memory
3	Psychobiology of Language

**MODULE
CLINICAL BIOCHEMISTRY**

Prof.ssa ROSARIA VINCENZA GIGLIO

SUGGESTED BIBLIOGRAPHY

Molecular Mechanisms of Dementia: Biomarkers, Neurochemistry, and Therapy. 1st Edition, Kindle Edition. ISBN-13: 978-0128163474
ISBN-10: 012816347X

AMBIT	50505-Discipline del settore biomedico
INDIVIDUAL STUDY (Hrs)	81
COURSE ACTIVITY (Hrs)	44

EDUCATIONAL OBJECTIVES OF THE MODULE

Acquisition of basic and applied concepts of clinical biochemistry in order to evaluate methods and clinical applications of laboratory tests critically. Specific aim of the course is to be able to identify the correct tests in relation to clinical conditions of the patients and to be able to understand them in relation to the diagnosis and in particular in the field of neurodegenerative diseases.

Particularly, the students must:

- know the main laboratory tests and the biological, molecular and pathological basis for their use in medicine;
- interpret lab results in the field of neurodegenerative diseases with regard to the uncertainty of measurement and biological variability; evaluate the diagnostic accuracy of laboratory investigations.
- have information on the characteristics and limitations of the most important methods used in Clinical Biochemistry and Molecular Biology in the field of neurodegenerative diseases.

SYLLABUS

Hrs	Frontal teaching
4	Laboratory tests: definition, types, requests. Pre-analytical phase: preparation of the patient, collection of biological samples, processing and identification of biological samples.
3	Analytical phase: the biochemical and clinical analytical process: general laboratory techniques. Post-analytical phase: data collection, calculation, automatic processing.
4	Metabolism of lipids: Lipoprotein. Dyslipidemia. Hypercholesterolemia. Laboratory evaluation of the lipoprotein metabolism. Clinical Diabetes: biochemistry of DMT1 and DMT2. Neurodegenerative disease, obesity and Diabetes Mellitus.
3	Cerebrospinal fluid (CSF) analysis. Quantitative and qualitative CSF parameters in inflammatory process of the central nervous system (CNS).
3	Neuroinflammation and pathophysiology of myelination in Multiple Sclerosis. Biochemical basis of neurodegeneration disease.
3	Common molecular and cellular mechanisms in neurodegeneration. Physiology and pathology of amyloid precursor protein and of microtubule associated protein tau.
4	Biomarkers of neurodegeneration disease: β -amyloid peptides ($A\beta$ 1-40, $A\beta$ 1-42), t-TAU, p-TAU, alfa synuclein, neurogranin.
3	The role of vitamin D on neurodegenerative disease. The effects of vitamin D on cell growth, neurogenesis, neuroprotection, immune function, and inflammatory processes.
3	Physiology of the cholinergic system and Alzheimer's disease and Down Syndrome.
2	Vitamin D deficiency and Alzheimer's disease (AD); Vitamin D and Parkinson's disease (PD); Vitamin D and Sclerosis Multiple; Vitamin D and Amyotrophic Lateral Sclerosis (ALS).
Hrs	Workshops
12	Extraction of DNA and RNA from biological sources (peripheral blood cells). Neurofilament Light (NF-L) and neurofilament Heavy (NF-H) ELISA. Genotyping APOE.