
Testi del Syllabus

Resp. Did.	FLORIO CHIARA	Matricola: 004090
Docenti	FLORIO CHIARA, 3 CFU MARCUZZI ANNALISA, 3 CFU STOCCO GABRIELE, 1 CFU	
Anno offerta:	2019/2020	
Insegnamento:	779SM - NEUROANATOMIA E NEUROFARMACOLOGIA	
Corso di studio:	SM54 - NEUROSCIENZE	
Anno regolamento:	2019	
CFU:	7	
Settore:	BIO/16	
Tipo Attività:	B - Caratterizzante	
Anno corso:	1	
Periodo:	Primo Semestre	
Sede:	TRIESTE	



Testi in italiano

Lingua insegnamento

English

Contenuti (Dipl.Sup.)

The course is composed of three parts:
PART 1 (Prof. Annalisa Marcuzzi): NEUROANATOMY
Development of the Nervous System. Nervous tissue. Receptors. Spinal cord: organization of the gray matter and of the white matter. Brainstem. Intrinsic nuclei and nuclei of the cranial nerves. Reticular formation. Diencephalon and telencephalon. Cerebral hemispheres. Basal ganglia. Cerebral cortex. Cerebellum. Morphological, functional and phylogenetic description. Cerebellar cortex. Deep nuclei. Functional connections. Limbic System. Hippocampus. Amygdala. Circuits and connections of the limbic system. Encephalic meninges, venous sinuses of the dura mater. Subarachnoid space and cisterns. Cerebrospinal fluid. Sensory Systems. Types of sensation. System of the dorsal columns-medial lemniscus and anterolateral system. Somatosensory cortex. Motor systems. Medial and lateral pathways. Categories of spinal reflexes. Sympathetic and parasympathetic divisions of the Autonomic Nervous System.
PART 2 (Prof. Chiara Florio): NEUROPHARMACOLOGY
PHARMACOKINETIC: ADME (drug absorption, distribution, metabolism and excretion). Distribution volume, Renal clearance, Elimination half-time. Bioavailability and Bioequivalence. Pharmacokinetic models: linear and non-linear.
PHARMACODYNAMIC: Drug molecular target: classification. Affinity and intrinsic efficacy. Gradual and quantal dose-response curves. Allosteric modulation.
THE AUTONOMIC NERVOUS SYSTEM: Anatomical and functional aspects. Cholinergic transmission: nicotinic and muscarinic receptors, classification and pharmacological features. Adrenergic transmission: receptor classification and pharmacological features.
DRUGS OF THE CENTRAL NERVOUS SYSTEM:
ENDOGENOUS OPIOIDS: Alkaloids in opium. Effects of morphine. Endogenous opioids: synthesis and degradation. Opioid receptors

classification and distribution. The pain pathways. Molecular mechanisms of tolerance, abuse and dependence
ANTIDEPRESSANT DRUGS: etiopathogenesis of depression. The monoaminergic, neuroendocrine and neurotrophic theories. Antidepressant drugs classifications and mechanisms of action
ANTIPSYCHOTIC DRUGS: etiopathogenesis of psychosis. The dopaminergic and neurodevelopmental theories. Typical and atypical antipsychotic drugs and mechanisms of action. ANXIOLYTIC DRUGS. Neuronal circuits of anxiety. Anxiolytic drugs: classification and mechanisms of action
ANTI-EPILEPTIC DRUGS: etiopathogenesis of epilepsy. Antiepileptic drugs: classification and mechanisms of action
PART 3 (Prof. Gabriele Stocco): PHARMACOGENOMICS
Elements of human genetic variation - basis on genetic variants affecting protein function and epigenetic effects of pharmacological relevance

Testi di riferimento

Part 1: Computer-aided teaching material will be supplied
Parts 2 and 3: Rang, Ritter, Flower, Henderson "Rang & Dale's Pharmacology" Eighth Edition, Elsevier 2016

Obiettivi formativi

The aim of the part 1 is to provide students with a basic understanding of the structural organization of the human central nervous system in sufficient depth to form the basis for further clinical or research studies of the nervous system.

The purpose of the parts 2 and 3 is to provide robust basis of Neuropharmacology, discussing the principles at the basis of the pharmacokinetic, pharmacodynamics and pharmacogenomics properties of drugs, particularly of those acting at the peripheral and central nervous system

1) Knowledge and understanding: at the end of the course, the students should have acquired the basic notions for the comprehension of the pharmacokinetic and pharmacodynamics properties of drugs and of their mechanism of action, with particular reference to drugs acting at the central nervous system.

2) Applying knowledge and understanding: at the end of the course, the students should be able to use the knowledges acquired (see point 1) for a proper use of drugs in experimental set-ups (in vivo as well as in vitro) as tools to validate hypothesis regarding the involvement of endogenous neurotransmitters in controlling physio-pathological conditions

3) Making judgements: at the end of the course, the students should be able to apply their pharmacokinetic and pharmacodynamics knowledges for a critical consideration of experimental results aimed at investigating the involvement of signaling molecules in physiological and pathological processes

4) Communication skills: at the end of the course, the students should be able to discuss clearly and with appropriate scientific terms pharmacological concepts

5) Learning skills: at the end of the course, the students should have a well-build background that should enable them to continue to enlarge autonomously and critically their knowledges about the pharmacokinetic and pharmacodynamics properties of drugs

Prerequisiti

Part 1: Knowledge of the fundamentals of cytology, biology, histology.
Parts 2 and 3: Knowledge of principles of synaptic transmission and of mechanisms of intracellular signaling transduction pathways

Metodi didattici

Part 1: frontal lectures
Parts 2 and 3: Computer-aided frontal lectures (slides with images and short texts reassuming the essential aspects of the lessons)

Altre informazioni

Part 1: Computer-aided teaching material will be supplied
Part 2 and 3: Students are provided by the slides used during the frontal lessons thought Moodle. For further information, students are invited to contact dott. Florio by mail (florioc@units.it) using their institutional E-mail address

Modalità di verifica dell'apprendimento

Part 1: Students are required to take a final oral examination.
Parts 2 and 3: At the end of the course, students are required to take a final oral examination of 20-40 min consisting on three different topics covering the course program (1. Basic Pharmacology (pharmacokinetic

and pharmacodynamics) or Autonomous nervous system, 2. Pharmacogenomics and 3. Drugs acting at the Central Nervous System). The student should demonstrate to be able to link together different topics of the program and to communicate the acquired knowledges in a precise and efficacious manner. The mark/30 must be equal or higher than 18.

The final mark/30 is the arithmetic mean of Part 1 (Neuroanatomy) and Parts 2-3 (Neuropharmacology and Pharmacogenomics)

Programma esteso

The course is composed of three parts:

PART 1 (Prof. Annalisa Marcuzzi): NEUROANATOMY

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PART 2 (Prof. Chiara Florio): NEUROPHARMACOLOGY

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ANTIPSYCHOTIC DRUGS: etiopathogenesis of psychosis. The dopaminergic and neurodevelopmental theories. Typical and atypical antipsychotic drugs and mechanisms of action. **ANXIOLYTIC DRUGS.** Neuronal circuits of anxiety. Anxiolytic drugs: classification and mechanisms of action

ANTI-EPILEPTIC DRUGS: etiopathogenesis of epilepsy. Antiepileptic drugs: classification and mechanisms of action

PART 3 (Prof. Gabriele Stocco): PHARMACOGENOMICS

Elements of human genetic variation - basis on genetic variants affecting protein function and epigenetic effects of pharmacological relevance



Testi in inglese

English

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Diencephalon and telencephalon. Cerebral hemispheres. Basal ganglia. Cerebral cortex. Cerebellum. Morphological, functional and phylogenetic description. Cerebellar cortex. Deep nuclei. Functional connections. Limbic System. Hippocampus. Amygdala. Circuits and connections of the limbic system. Encephalic meninges, venous sinuses of the dura mater. Subarachnoid space and cisterns. Cerebrospinal fluid. Sensory Systems. Types of sensation. System of the dorsal columns-medial lemniscus and anterolateral system. Somatosensory cortex. Motor systems. Medial and lateral pathways. Categories of spinal reflexes. Sympathetic and parasympathetic divisions of the Autonomic Nervous System.

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Neuronal circuits of anxiety. Anxiolytic drugs: classification and mechanisms of action

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