
Testi del Syllabus

Resp. Did.	LORENZON PAOLA	Matricola: 005762
Docenti	BERNAREGGI ANNALISA, 2 CFU LORENZON PAOLA, 3 CFU SCIANCELEPORE MARINA, 3 CFU	
Anno offerta:	2017/2018	
Insegnamento:	901SM - NEUROFISIOLOGIA MOLECOLARE	
Corso di studio:	SM54 - NEUROSCIENZE	
Anno regolamento:	2017	
CFU:	8	
Settore:	BIO/09	
Tipo Attività:	B - Caratterizzante	
Anno corso:	1	
Periodo:	Primo Semestre	
Sede:	TRIESTE	



Testi in italiano

Lingua insegnamento

English

Contenuti (Dipl.Sup.)

Contents of the course will be discussed in the light of recent theoretical concepts and experimental data about mechanisms regulating signal transduction, electrical membrane properties of excitable cells and the organization of central and peripheral synapses.

The course consists of three Parts and the contents are illustrated hereafter.

Part 1 (Prof. Paola Lorenzon): Signal transduction.

Intracellular receptors. Receptor tyrosine kinases. G protein-coupled receptors. Signaling through second messengers. Regulation of the intracellular Ca²⁺ homeostasis. Spatial and temporal organization of intracellular Ca²⁺ signalling: oscillations and waves. Spatial organization of the intracellular cAMP signalling. Experimental approaches to study the signal transduction in living cells: fluorescent probes and imaging techniques.

Part 2 (Prof. Annalisa Bernareggi): Basic principles of synaptic transmission.

The neuromuscular junction: anatomic organization, role of trophic factors in neuromuscular junction development (agrin, MusK and rapsyn), properties of neuromuscular nicotinic cholinergic receptors (fetal and adult). Disorders in the neuromuscular junction: myasthenia gravis, the Lambert-Eaton myasthenic syndrome, the congenital myasthenic syndrome and the muscular dystrophies.

Part 3 (Prof. Marina Sciancalepore): Synaptic transmission in CNS.

Characterization of ion channels, intrinsic membrane electrical properties of neurons, pacemaker mechanisms. Principles of chemical and electrical synaptic transmission: quantal release, neurotransmitters, synaptic receptors, integration of synaptic potentials, synaptic plasticity, dendritic spines and their remodelling.

Testi di riferimento	B. Hille, "Ion Channels of Excitable Membranes", Sinauer Associate Inc. Part I: Chapter 1-5 (third edition). L. R. Squire et al., "Fundamental Neuroscience", Academic Press. Selected scientific papers or other didactical material could be provided.
Obiettivi formativi	The purpose of this course is to provide a sound basis of membrane biophysics, ion channels and receptors to understand the fundamental molecular processes responsible for chemical and electrical cell communication. In particular, the course will focus on the mechanisms responsible for cellular excitability, in both central and peripheral nervous systems.
Prerequisiti	Knowledge of fundamental cell biology.
Metodi didattici	Lectures and practical experiences.
Altre informazioni	None.
Modalità di verifica dell'apprendimento	Students are required to take a final oral examination (compulsory). The oral examination consists in a discussion of 30 min, during which the student is invited to describe and comment on topics covered in the course. In itinere, one written test (optional) is organised to check the acquisition of knowledge.
Programma esteso	<p>Contents of the course will be discussed in the light of recent theoretical concepts and experimental data about mechanisms regulating signal transduction, electrical membrane properties of excitable cells and the organization of central and peripheral synapses.</p> <p>The course consists of three Parts and the contents are illustrated hereafter.</p> <p>Part 1: Signal transduction. Intracellular receptors. Receptor tyrosine kinases. G protein-coupled receptors. Signaling through second messengers. Regulation of the intracellular Ca²⁺ homeostasis. Spatial and temporal organization of intracellular Ca²⁺ signalling: oscillations and waves. Spatial organization of the intracellular cAMP signalling. Experimental approaches to study the signal transduction in living cells: fluorescent probes and imaging techniques.</p> <p>Part 2: Basic principles of synaptic transmission. The neuromuscular junction: anatomic organization, role of trophic factors in neuromuscular junction development (agrin, MusK and rapsyn), properties of neuromuscular nicotinic cholinergic receptors (fetal and adult). Disorders in the neuromuscular junction: myasthenia gravis, the Lambert-Eaton myasthenic syndrome, the congenital myasthenic syndrome and the muscular dystrophies.</p> <p>Part 3: Synaptic transmission in CNS. Characterization of ion channels, intrinsic membrane electrical properties of neurons, pacemaker mechanisms. Principles of chemical and electrical synaptic transmission: quantal release, neurotransmitters, synaptic receptors, integration of synaptic potentials, synaptic plasticity, dendritic spines and their remodelling.</p>



Testi in inglese

	English
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Knowledge of fundamental cell biology.

Lectures and practical experiences.

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