Testi del Syllabus

Resp. Did.	**CESCA FABRIZIA**	**Matricola: 031484**

Docenti	**CESCA FABRIZIA, 3 CFU** **LEGNAME GIUSEPPE, 3 CFU** **MORETTI RITA, 3 CFU**

Anno offerta:	**2018/2019**
Insegnamento:	**897SM - NEUROPATOLOGIA**
Corso di studio:	**SM54 - NEUROSCIENZE**
Anno regolamento:	**2018**
CFU:	**9**
Settore:	**BIO/09**
Tipo Attività:	**B - Caratterizzante**
Anno corso:	**1**
Periodo:	**Secondo Semestre**
Sede:	**TRIESTE**

🇮🇹 Testi in italiano

Lingua insegnamento	English
Contenuti (Dipl.Sup.)	The Neuropathology course combines core teaching of fundamental aspects of major neuropathological diseases, with emphasis on the cellular and molecular causes of neurodegeneration and their clinical presentation, and on the role of glial cells in neurodegenerative pathologies and disorders of cognition. The course will also address how hypotheses can be tested in relevant model systems and utilised to develop novel therapeutic strategies. The course contents will be organized as follows: Glial Neuropathology(dr. F.Cesca): Classification and evolution of glia and astroglia; membrane channels, receptors and transporters; ion signaling; gliotransmission; functions of astroglia. Glial pathology: A1/A2 activated astrocytes, glial scar, Alexander disease, epilepsy, Huntington's disease. Improved in vivo calcium imaging techniques; pre-synaptic processes (PAPs), astrocyte-to-neuron communication in synaptic plasticity and neural circuit activity. Humanized mice; astrocytes and cognitive disorders: Rett syndrome, MDD. Molecular Neuropathology (prof. G. Legname): Molecular events in neurodegeneration; Prion diseases; Prion-like events in major neurodegenerative diseases; Proteinopathies; Protein changes in physiological and pathological conditions: Prion protein, alpha-synuclein and Lewy bodies, TDP-43, Beta-amyloid, Tau protein; Alzheimer's Disease; Parkinson's Disease; Creutzfeldt-Jakob Disease, Multiple Sclerosis; Bovine Spongiform Encephalopathy; Drug screening Clinical Neuropathology (prof. R. Moretti): Alzheimer's Disease: clinical presentation and diagnostic criteria; neuronal loss, amyloid cascade hypothesis, tau hyperphosphorilation, APOE4, altered glutamate, calcium theory; neuroinflammation; genetic hypotheses; Vascular and subcortical dementias; Movement disorders, Parkinson's disease: clinical presentation and diagnostic criteria; dopaminergic pathways; dopamine depletion: pathological and therapeutic implications; Reward

	mechanisms: neural circuits and neurotransmitters involved; Addiction mechanisms: neural circuits and neurotransmitters involved; Sleep and sleep disorders, dream theory; ARAS system: mono- and polysynaptic pathways; Brain death; Brain Metabolism, ischemia and its relevance in clinical practice: Apoptosis and neuroinflammation; endothelium damage; Seizure and Epilepsy.
Testi di riferimento	Verkhratsky A. and Butt A. "Glial Psysiology and Pathophysiology", Wiley-Blackwell, ISBN: 978-0-470-97853-5 (2013) Kandel E.R et al., Principles of Neural Science, 5th Edition McGraw Hill Medical. Aminoff. MJ .Neurology and General Medicine, Churchill and Livingsotne, 7 Ed. Scientific articles and reviews on specific topics will also be provided during classes. CD-ROM with slides could be provided
Obiettivi formativi	The course seeks to provide the basic tools for the understanding of the physiopathological, symptomatological, diagnostic and therapeutic aspects of some of the most important neurodegenerative diseases, and their modeling in animals. The feasibility of these models and the potential for translating the arising experimental data into sound clinical practice, will be addressed. The lab's models will be developed in clinical practice, showing the major common sharing points and the most important differences in clinical context. 1.Knowledge and understanding: main brain pathologies starting from basic neurophysiological up to cellular and animal models arriving to clinical context, focusing on both the neuronal and glial contribution to the onset and development of the various diseases 2. Applying knowledge and understanding: the students should be able to understand and implement experimental strategies in order to investigate specific mechanisms of different pathologies 3. making judgments: the students should be able to develop critical capacities to read and understand or criticize scientific papers, to organize and implement strategies to obtain or critically analyze scientific data 4. communication skills: students should be able to employ technical language, in order to write with major supervision a scientific paper or organize a scientific oral communication 5. learning skills: students should be able to organize, implement and carry on a scientific knowledge, in order to begin an experiment and with major supervision begin their steps in lab experimental sessions.
Prerequisiti	Basic knowledge in subjects such as chemistry, biochemistry, anatomy and physiology is required
Metodi didattici	Lectures and frontal lessons. Neuroimaging, as well as electroencephalograpy will be displayed
Modalità di verifica dell'apprendimento	Students will undergo a final oral examination (mandatory), where the various issues covered in the course will be addressed and discussed. The exam may also entail the critical presentation of a scientific paper (in the form of a Journal Club) chosen by the candidate
Programma esteso	The Neuropathology course combines core teaching of fundamental aspects of major neuropathological diseases, with emphasis on the cellular and molecular causes of neurodegeneration and their clinical presentation, and on the role of glial cells in neurodegenerative pathologies and disorders of cognition. The course will also address how hypotheses can be tested in relevant model systems and utilised to develop novel therapeutic strategies. The course contents will be organized as follows: Glial Neuropathology(dr. F.Cesca): Classification and evolution of glia and astroglia; membrane channels, receptors and transporters; ion signaling; gliotransmission; functions of astroglia: neurogenesis and gliogenesis, neuronal guidance, synaptogenesis, neurovascular units, neuronal metabolism, extracellular ion, ROS, water and neurotransmitter homeostasis, synaptic transmission, systemic homeostasis. Neuroglia in

pathology: reactive astrogliosis, Wallerian degeneration, excitotoxicity, microglia activation, A1/A2 activated astrocytes, glial scar. Astroglia in neuropathologies: Alexander disease, epilepsy, Huntington's disease. Improved in vivo calcium imaging techniques; pre-synaptic processes (PAPs), astrocyte-to-neuron communication in synaptic plasticity and neural circuit activity. Humanized mice; astrocytes and cognitive disorders: Rett syndrome, MDD.

Molecular Neuropathology (prof. G. Legname): Molecular events in neurodegeneration; Prion diseases; Prion-like events in major neurodegenerative diseases; Proteinopathies; Protein changes in physiological and pathological conditions: Prion protein, alpha-synuclein and Lewy bodies, TDP-43, Beta-amyloid, Tau protein; Alzheimer's Disease; Parkinson's Disease; Creutzfeldt-Jakob Disease, Multiple Sclerosis; Bovine Spongiform Encephalopathy; Drug screening

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🇬🇧 Testi in inglese

	English
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