

FIȘA DISCIPLINEI

NAME		Signalling processes in the nervous system					COD:	
MASTER DEGREE	STUDY YEAR I	SEMESTER I	STATUS OF THE DISCIPLINE (AP – MASTER DEGREE / CC – ABILITIES AP)			DISCIPLINE TYPE (OB-obligatory / OPT-optional / FAC-facultative) OB		
HOURS PER WEEK		HOURS PER SEMESTER	HOURS PER ACTIVITY*	NUMBER OF CREDITS	EVALUATION TYPE (P-ongoing C-colloquy, E-exam, M-both)	LIMBA DE PREDARE		
C	S	L	Pr.					
2			136.5	42	49	6	E	
HOLDER OF THE COURSE		TEACHING AND SCIENTIFIC DEGREE, FIRST NAME, NAME				DEPARTMENT		
		Associate Prof. PhD. CUCU DANIELA				ANATOMY, PHYSIOLOGY and BIOPHYSICS		
BACKGROUND		Biochemistry, Physiology						
OBJECTIVES		<p>Understanding the function and main features of biochemical processes of cellular signaling in the nervous system under the neurotransmitter action of neurotrophic factors, viruses, bacteria.</p> <p>Understand the processes by which different cells in the nervous system respond specifically to the same chemical stimuli. Acquiring laboratory abilities to study molecules involved in signaling processes cell.</p>						
GENERAL THEMES		<p>1. General presentation of biochemical signaling and cellular communication processes 2 hours</p> <p>2. Ontogenesis of the nervous system 2 hours Neurogenesis and migration of neurons 2 hours</p> <p>4. Dysfunction of cellular signaling between the nervous system and the immune system 2 hours</p> <p>5. Function of the blood-brain barrier in cell signaling between endothelial tissue and nervous system. Involvement of the blood-brain barrier in the protection of the nervous system against bacterial and viral infections 2 hours</p> <p>6. Traffic and signaling of receptors coupled to G-proteins in the nervous system. Possible therapeutic targets 2 hours</p> <p>7. Abnormalities of calcium signaling processes: convulsions, migraines and autism 2 hours</p> <p>9. Synaptogenesis and myelination processes 2 hours</p> <p>10. Cell signaling processes of insulin in the central nervous system and their implications for diseases neurodegenerative 2 hours</p> <p>11. Signaling by "receptors of death" in the central nervous system 2 hours</p> <p>12. Antiviral signaling in the central nervous system. Activation of Toll-like receptors, inducible RIG-1 gene, cytosolic sensors in the central nervous system neurodegenerative 2 hours</p>						
PRACTICALS		<p>1. Protocols for cultivation of immortalized cell lines for 4 hours</p> <p>2. Protocols for the cultivation of primary cell lines isolated from the nervous tissue for 4 hours</p> <p>3. Antigen detection in tissues by immunohistochemistry for 4 hours</p> <p>4. Methods of study of cell migration 2 hours</p> <p>5. Determination of cell viability for 2 hours</p> <p>6. DNA transfection methods 4 hours</p> <p>7. Methods for intracellular Ca²⁺ determination 4 hours</p> <p>10. Quantitate the images for 2 hours</p> <p>11. Statistical analysis of laboratory data 2 hours</p>						
TEACHING METHODS		Interactive courses. Illustrations and animations ("PowerPoint", "Smartboard"); Laboratory experiments. Analysis and statistical interpretation of data (ImageJ, Presentation and discussion of scientific literature (articles, papers).						

BIBLIOGRAPHY	<p>1. "Glial neurobiology" Alexei Verkhratsky, Arthur Butt, John Wiley & Sons, 2007 2. "The Blood-Brain Barrier and Drug Delivery to the CNS" Michael Bradbury (Editor), David Begley (Editor), Jorg Kreuter (Editor), 2000 3. "Purinerbic Signalling and the Nervous System" Burnstock, Geoffrey, Alexei, Verkhratsky 2012</p>	
EVALUATION	conditions	Presence to all practicals
	criteria	The theoretical and practical knowledge, the progress recorded by each student
	forms	<p>a) Examination testing (final assessment) b) Periodic testing during practical work and evaluation of the papers Optional: c) oral papers / reports / attendance at student conferences / project scientific conferences Research</p>
	Degree formula	$a \times 0.7 + (b+c) \times 0.3$
Abilities specific to the discipline		
1. Skills of knowledge and understanding	<p>Understanding the cellular mechanisms involved in cellular signaling Identification of cell signaling stages; reception, transduction and response. Ability to describe the relationship between the chemical nature of the signals and the location of cellular receptors. Ability to present and critically interpret literature data.</p>	
2. Critical thinking: interpretation, analysis, evaluation, inference, explanation	<p>Ability to provide specific examples of paracrine, synaptic, autocrine and endocrine signaling. Ability to shape and interpret data. Making connections between results.</p>	
3. Laboratory /research skills	<p>Ability to work in the cell culture lab. Ability to design experimental protocols to highlight signaling processes.</p>	
4. Attitude skills	<p>Participation to presentations, symposiums, scientific sessions, congresses. Labor discipline and compliance with laboratory standards. Consistent and responsible attitude in the development of experimental projects. Involvement in group projects.</p>	