

Course Unit Descriptor

<b>Study Programme:</b> BSc in Biology		
<b>Course Unit Title:</b> MECHANISMS OF CELL COMMUNICATION		
<b>Course Unit Code:</b> OB031		
<b>Name of Lecturer(s):</b> Prof. Dr Silvana Andric, Prof. Dr Tatjana Kostic		
<b>Type and Level of Studies:</b> Bachelor degree		
<b>Course Status (compulsory/elective):</b> Obligatory		
<b>Semester (winter/summer):</b> Winter		
<b>Language of instruction:</b> English		
<b>Mode of course unit delivery (face-to-face/distance learning):</b> face-to-face		
<b>Number of ECTS Allocated:</b> 5		
<b>Prerequisites:</b> -		
<p><b>Course Aims:</b></p> <p>Objective of this course is to enable students to understand and learn basic terms and principles of the communications between the cells and their environment, as well as the molecules and signaling transduction pathways involved in the transfers of the information in the cells till ultimate effectors systems.</p>		
<p><b>Learning Outcomes:</b></p> <p>At the end of this course students will be able to understand and describe the basic principles in the cellular communication realized via chemical signaling. In addition, students will be able to describe characteristics of intracellular signaling pathways and ways of formation of networks for detection, transduction, transmission, propagation and amplification of the information in order to realized adequate biological response of the cell.</p>		
<p><b>Syllabus:</b></p> <p><i>Theory</i></p> <p>Overview of different ways of cellular communications and basic signaling transduction pathways. Receptors and signaling pathways connected with trimeric G-proteins (G-Proteins Coupled Receptors – GPCRs). Receptors enzymes and receptors connected with enzymes. Receptors and signaling pathways involving proteolysis. Intracellular receptors. Functional organization of the proteins in membranes and their translocation. Basic signaling pathways in apoptosis.</p> <p><i>Practice</i></p> <p>Analysis of NO-cGMP signaling pathway will be used to present and learn basic methodological approach(s) required for studying communications between the cells. This will include: RT-PCR; Western blot; stimulation/inhibition of the signaling pathways elements; up (over-expression) and/or down regulation (siRNA, dsRNA, anti-sense) of the signaling pathway element(s); analysis of phosphorylation of the signaling pathway element(s).</p>		
<p><b>Required Reading:</b></p> <p>Andric S &amp; Kostic T (2007): Mechanisms of cellular communication (script). WUS Austria.  Hancock JT (2005): Cell Signaling. Oxford University Press.  Gomperts BD, Kramer IM &amp; Tatham PER (2005): Signal Transduction. Elsevier Academic Press  Krauss G (2005): Biochemistry of Signal Transduction and Regulation. Wiley-VCH.  Bolander FF (2004): Molecular Endocrinology. Elsevier Academic Press  Bradshaw RA &amp; Dennis EA (2004): Handbook of Cell Signaling, three volume set 1-3. Academic Press.  Wilson J &amp; Hunt T (2002): Molecular Biology of the Cell Problems Approach Book, 4th Ed. Garland Science.</p>		
<b>Weekly Contact Hours:</b>	<b>Lectures:</b> 2	<b>Practical work:</b> 4
<b>Teaching Methods:</b>		

Theoretical part - Lectures  
 Practical part – Combination of laboratory work and computer simulations  
 Seminars - Short presentation of the specified topics

**Knowledge Assessment (maximum of 100 points):**

<b>Pre-exam obligations</b>	points	<b>Final exam</b>	points
Active class participation		written exam	40
Practical work	40	oral exam	20
Preliminary exam(s)		.....	
Seminar(s)			

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.