

<b>Study Programme:</b> Reproductive biology
<b>Course Unit Title:</b> CELLULAR SINGALING IN REPRODUCTIVE BIOLOGY
<b>Course Unit Code:</b> RB20
<b>Name of Lecturer(s):</b> prof. dr Silvana Andric
<b>Type and Level of Studies:</b> Master's studies
<b>Course Status (compulsory/elective):</b> elective
<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> 3
<b>Prerequisites:</b> Basic medical/animal physiology
<p><b>Course Aims:</b></p> <p>The aim of the course is to acquire knowledge about transfer of information and signaling pathways synchronizing cellular functions within the reproductive system. Also, students should acquire the ability to scientifically-based interpretation of experimental data in the field of cellular signaling in reproduction.</p>
<p><b>Learning Outcomes:</b></p> <p>After successfully completed the course students should be able to describe describe the characteristics of the intracellular signaling pathways and ways of forming networks for detection, transduction, transmission, propagation and amplification of information in order to achieve adequate reproductive biological response, as well as to acquire the capacity for critical analysis and discussion of scientific papers in field of cellular signaling in reproduction.</p>
<p><b>Syllabus:</b></p> <p><i>Theory</i></p> <p>Review of basic types of cellular communications, as well as basic signal transduction pathways in reproductive biology. The receptors and signaling pathways related to trimeric G-proteins. Receptors that are enzymes and receptors that are linked with enzymes. Signaling of membrane phospholipids. Signaling pathways that regulate cell proliferation. Receptors and signaling pathways that involve proteolysis. Intracellular receptors. Functional organization of the protein in the membranes. Signaling regulating cell adhesion. Cell death. Molecular basis of the role of biological clock in regulation of reproductive homeostasis. The role of mitochondrial dynamics in regulation of reproductive homeostasis.</p> <p><i>Research activities</i></p> <p>Students will be trained to perform the basic approaches and methods for the study of communication between cells. Practical classes will include the following analysis: RT-PCR; Western blot; stimulation / inhibition of signaling elements; up (overexpression) / down (siRNA, dsRNA, antisense); Control elements of the signaling pathway; Analysis of phosphorylation of signaling elements. Independent scientific work on a small project in the field of cell communication mechanisms in the regulation of reproductive homeostasis.</p>
<p><b>Required Reading:</b></p> <p>Andrić S &amp; Kostić T (2007): Mehanizmi ćelijske komunikacije. WUS Austria.</p> <p>Berridge MJ (2012): Cell Signalling Biology. Biochemical Journal. Portland Press.</p> <p>Bolander FF (2004): Molecular Endocrinology. Elsevier Academic Press.</p> <p>Bradshaw RA &amp; Dennis EA (2004): Handbook of Cell Signaling, three volume set 1-3. Academic Press.</p> <p>Conn MP &amp; Means AR (2000): Principles of Molecular Regulation. Humana Press.</p> <p>Gomperts BD, Kramer IM &amp; Tatham PER (2003): Signal Transduction. Elsevier Academic Press</p>

Hancock JT (2005): Cell Signaling. Oxford University Press.  
 Krauss G (2005): Biochemistry of Signal Transduction and Regulation. WILEY-VCH.  
 Wilson J & Hunt T (2002): Molecular Biology of the Cell Problems Approach Book 4th ed. Garland Science.  
 Review papers from the field of Cellular signaling in reproductive biology and ctive physiology.

<b>Weekly Contact Hours:</b>	<b>Lectures: 2</b>	<b>Research activities: 4</b>
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**Teaching Methods:**

Lectures; consultations; seminar - presentation (10 - 15 min) on the topic of cell signaling in reproductive biology; research activities - participation in the planning and execution of experiments, as well as in the analysis of results.

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

<b>Pre-exam obligations</b>	points	<b>Final exam</b>	points
Active class participation		written exam	20
Practical work		oral exam	40
Preliminary exam(s)		Research activities	30
Seminar(s)	10		

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