Study program: REPRODUCTIVE BIOLOGY

Course title: Cellular signaling in reproduction

Teachers: Tatjana Kostić, Silvana Andrić

Course status: elective

ECTS: 3

Requirements: Biochemistry, Basic medical/animal physiology

Course objectives

The objective of the course is to acquire knowledge about information transmission and signaling pathways that regulate and synchronize the functions of cells within the reproductive system. Also, students should acquire the ability to scientifically interpret the experimental data in the field of cellular signaling in reproduction.

Learning outcomes

After successfully completing the course, students should be able to describe the general characteristics of intracellular signaling pathways and ways of forming a network for detection, transduction, transmission, propagation and amplification of information in order to achieve an adequate reproductive biological response, as well as to gain the ability to critically analyze and discuss scientific papers in area of cellular signaling in reproduction.

Syllabus

Lectures

A general overview of the types of cellular communication, as well as the basic pathways of signal transduction in reproductive biology. Receptors and signal pathways coupled to triple G-proteins (GPCR). Receptors that are enzymes-related enzymes and receptors. Signaling of membrane phospholipids. Signal pathways that regulate cell proliferation. Receptors and signaling pathways that include proteolysis. Intracellular receptors. Functional organization of proteins in membranes. Signaling that regulates cell adhesion. Programmed cell death. Molecular basics of biological watch role in reproductive homeostasis regulation. The role of mitochondrial dynamics in reproductive homeostasis regulation. Fall on a small scientific project in the field of cellular communication mechanisms in the regulation of reproductive homeostasis.

Literature

1. Andrić S, Kostić T (2007): *Mehanizmi ćelijske komunikacije.* WUS Austria.
2. Berridge MJ (2012): *Cell signalling biology*. Biochemical Journal. Portland Press.
3. Bradshaw RA, Dennis EA (2004): *Handbook of cell Signaling, three volume set 1-3.* Academic Press.
4. Conn MP, Means AR (2000): *Principles of Molecular Regulation*. Humana Press.
5. Gomperts BD, Kramer IM, Tatham PER (2003): *Signal Transduction.* Elsevier Academic Press
6. Hancock JT (2005): *Cell Signaling.* Oxford University Press.
7. Krauss G (2005): *Biochemistry of Signal Transduction and Regulation.* WILEY-VCH.
8. Reviewed papers from the field, as well as original scientific papers related to certain problems in the field.

Weekly teaching load	**Lectures:** 2	**Practical lectures:** 0+0+0

Teaching methods

Lectures, consultations, *"flip-flop"* presentations, seminar (presentation of 10-15 minutes on the topic of cellular signaling in reproductive biology which is related to master's thesis), work with students on a small scientific project in the field of cellular communication mechanisms in regulation of reproductive homeostasis.

Evaluation of knowledge (maximum score 100)

Pre-exam obligation	Points	**Final exam**	Points
Seminar	10		
Work on the project and presentation of the project	30	Oral exam	60