

Study program: REPRODUCTIVE BIOLOGY			
Course title: Cell determination and differentiation			
Teacher: Jelena Marković			
Course status: elective			
ECTS: 4			
Requirements: -			
Course objectives Learning objective is to offer students a detailed insight into determination and differentiation mechanisms of animal cells, as well as insight into contemporary knowledge and research in the discipline. With regard to previously obtained knowledge on cell biology, embryology and genetics, this subject discusses determination and differentiation as specific mechanisms in morphogenesis and growth of animal cells, tissues and organs.			
Learning outcomes Upon successful completion of pre-examination and examination tasks students will be able to describe: - determination mechanism of embryo cells and influencing factors; - differentiation process of animal cells; - process of cell organisation into tissues; - ways to control cell differentiation; - ways to control growth of cells, tissues and organs.			
Syllabus <i>Lectures</i> Determination of embryonic cells. Fate maps. Cytoplasmic determinants. Principles of cell differentiation. Induction and intercellular communication. Cell adhesion. Cytoskeleton. Gene expression during differentiation. Differentiation of human embryonic stem cells. Cell differentiation control. Control of cell cycle. Cell proliferation. Organism growth mechanism. Hormones and growth factors. Cell migration. Cell organisation within tissues. Tissue culture. Cancer genesis. <i>Other forms of teaching</i> Seminar papers representing themes presented during lectures; literature - research and review papers.			
Literature 1. Kalthoff, K. Analysis of Biological Development McGraw Hill, New York, 2001. 2. Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., Walter, P. Molecular Biology of the Cell. Garland Science, New York, 2008. 3. Carlson, B. M. Human Embryology and Developmental Biology. Elsevier Health Sciences, 2014.			
Weekly teaching load		Lectures: 2	Practical lectures: 0+1+0
Teaching methods Lectures, seminar			
Evaluation of knowledge (maximum score 100)			
Pre-exam obligation	Points	Final exam	Points
Student engagement in lectures	5	-	
Seminar	25	Oral exam	70