Name of the subject: CELL DETERMINATION AND DIFFERENTIATION

Teacher(s): Dr. Jelena Marković

Status of the subject: Elective

Number of ECTS points: 15

Condition: Course of Cell Biology and Histology with embryology

Goal of the subject

This course has goal to provide detailed insight in mechanisms of animal cell determination and differentiation.

Outcome of the subject

Acquiring knowledge about mechanisms of cell determination and differentiation, that will contribute to biological education of students and provide theoretical basis to students who decide to conduct scientific research in this area.

Content of the subject

Theoretical lectures

Principles of cell determination and differentiation. Potency of embryonic cells. Extracellular matrix. Integrins. Effects of cell comunication, cytosceleton and extracellular matrix on cell differentiation. Mechanisms of cell differentiated stage maintenance. Determination of zygote division plan. Coordination of cell proliferation and determination of cell fate. Differentiation of liver cells. Differentiation and renewal of epithelial cells. Differentiation of blood cells. Differentiation of germe cells. Differentiation and regeneration of sceletal muscle. Determination of vertebrate body axis. Stem cells. Application of stem cells in medicine (stem cell engineering). Tumor-releated genes. Mitogen proteins.

Practical lectures

Seminar papers representing themes presented during lectures; literature - research and review papers.

Recommended literature

1. Kalthoff, K. Anlysis of Biological Development McGrow Hill, New York, 2001.
2. Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., Walter, P. Molecular Biology of the Cell. Garland Science, 2002.
3. Carlson, B. M. Human Embryology and Developmental Biology. Elsevier Health Sciences, 2014.

Number of active classes	Theory: 5	Practice: 5

Methods of delivering lectures

Lectures, seminar

Evaluation of knowledge (maximum number of points 100)

Pre-exam obligation

Seminar 30 points

Final exam

Oral exam 70 points