

Course Unit Descriptor

Study Programme: Doctoral Academic Studies in Biochemistry
Course Unit Title: Cell cultures in medicinal chemistry
Course Unit Code: DSB-624
Name of Lecturer(s): Professor Suzana Jovanović-Šanta
Type and Level of Studies: PhD degree
Course Status (compulsory/elective): elective
Semester (winter/summer): summer
Language of instruction: English
Mode of course unit delivery (face-to-face/distance learning): Face-to-face
Number of ECTS Allocated: 15
Prerequisites: -
<p>Course Aims:</p> <p>The aim of the course is to acquire integrated knowledge about the possibilities of applying cell model-systems, as well as the ability of scientifically interpreted experimental data in the field of <i>in vitro</i> testing of the biological activity of potential therapeutics.</p>
<p>Learning Outcomes:</p> <p>After successfully completing the course, students should be able to use the methods and techniques necessary to perform <i>in vitro</i> tests on cell cultures as model systems, and have the ability to critically analyze scientific papers, scientific hypotheses, and experimental results in <i>in vitro</i> assays on cell cultures, and independently know how to perform an experiment related to the given area and process and discuss the results obtained.</p>
<p>Syllabus:</p> <p><i>Theory</i></p> <p>Maintenance of cell lines. Biology of cell cultures, primary and continuous cell lines. Culture of tumor and control cells (healthy tissue cells). Physical methods for cell separation. Quantification and characterization of cell growth. <i>In vitro</i> tests with cell cultures: measurement of cell viability, antiproliferative and cytotoxic activity; methods for detecting and quantifying cell death and cell cycle phases; studying changes in cell morphology by specific colors: changes on the membrane, DNA, organelles, identification of proteins characteristic of individual signal pathways by modern molecular methods; use of cell cultures to assess the genotoxic effects of compounds or extracts.</p> <p><i>Practice</i></p> <p>Preclinical studies of the pharmacological potential of compounds by qualitative and quantitative <i>in vitro</i> methods: Measurement of cell viability, morphological changes using specific color dyes, cell cycle changes, apoptosis measurement, necrosis and membrane potential of mitochondrial by flow cytometry, genotoxicity testing (SCE, MN and other tests). Study of available data and development of a mini-project to investigate the pharmacological potential of substances or mixtures in cell cultures as a model system.</p>
<p>Required Reading:</p> <ol style="list-style-type: none"> 1. . Freshney R. I. (ed) (2005) Culture of animal cells: a manual of basic technique. 5th ed. Wiley-Liss. New York, USA. 2. D.A. Gewirtz, S.E. Holt, S. Grant (2007) Apoptosis, Senescence, and Cancer, Humana Press Inc (Eds) 3. C. Avendano, J.C. Menendez (2008) Medicinal chemistry of anticancer drugs, Elsevier 4. Review and original scientific articles from selected research areas

Weekly Contact Hours: 10	Lectures: 5	Practical work: 5	
Teaching Methods: Lectures, laboratory work, discussion of original research articles, study projects			
Knowledge Assessment (maximum of 100 points): 100			
Pre-exam obligations	points	Final exam	points
Active class participation		written exam	
Project presentation	50	oral exam	50
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.			