Course Unit Descriptor

Study Programme: Doctoral Academic Studies in Biochemistry

Course Unit Title: Selected Topics of Medicinal Chemistry

Course Unit Code: DSB602

Name of Lecturer(s): Full professor Velimir Popsavin, Assistant professor Ivana Kovačević

Type and Level of Studies: PhD degree

Course Status (compulsory/elective): elective

Semester (winter/summer): winter

Language of instruction: English

Mode of course unit delivery (face-to-face/distance learning): Face-to-face

Number of ECTS Allocated: 15

Prerequisites: None

Course Aims:

Acquaintance with advanced chemical, biochemical and biomedicinal methods for the development, processing and in vitro testing of new pharmacologically active molecules as potential drugs.

Learning Outcomes:

The student will be acquainted with modern methods of drug design and production, and will become able to understand the mechanism of their action on the molecular level. The basic practical skills on experimental techniques for testing of antitumour activity in vitro will also be acquired.

Syllabus:

Theory

Current strategies for the development of new pharmacologically active molecules. Development of enzyme inhibitors as drugs: rational selection of suitable target enzyme and inhibitor; selectivity and toxicity; rational design of enzyme inhibitors (including computer-aided methods); development of a drug candidate from the bench to the marketplace. Enzyme inhibitor examples for the treatment of breast and prostate cancer. HIV-1 protease drug development examples. Analogues, derivatives and mimetic of monosaccharides as potential drugs.

Practice

Current biological methods for evaluation of antitumor activity in vitro. Molecular docking.

Required Reading:

1. H. J. Smith, C. Simons: *Development of Enzyme Inhibitors as Drugs*, in Enzymes and Their Inhibition: Drug Development, CRC Press, 2005.
2. B. Ernst, H. C. Kolb, O. Schwardt: *Carbohydrate Mimetics in Drug Discovery*, in The Organic Chemistry o f Sugars, D. E. Levy, P. Fügedi, Eds, Taylor & Francis Group LLC, Boca Raton, 2006, p. 811–869.
3. C. K. Hattotuwagama, M. N. Davies, D. R. Flower: Receptor-Ligand Binding Sites and Virtual Screening, *Curr. Med. Chem*. **2006**, *13*, 1283–1304.
4. V. Vyas, A. Jain, A. Jain, A. Gupta: Virtual Screening: A Fast Tool for Drug Design, *Sci Pharm*. **2008**; *76*, 333–360.
5. C. Viegas-Junior, A. Danuello, V. da Silva Bolzani, E. J. Barreiro, C. A. M. Fraga, Molecular hybridization: a useful tool in the design of new drug prototypes, *Curr. Med. Chem*. **2007**, *14*, 1829–1852.

Weekly Contact Hours: 150	**Lectures:** 75	**Practical work:** 75

Teaching Methods:

Lectures, seminar(s)

Knowledge Assessment (maximum of 100 points): 100

Pre-exam obligations	points	**Final exam**	points
Active class participation		written exam	60
Practical work		oral exam	20
Preliminary exam(s)		…….	
Seminar(s)	20		
The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.			