

Course code	IRL104		
Course title	MOLECULAR PHARMACOLOGY, TOXICOLOGY AND PHARMACOKINETICS		
General information			
Study programme	Graduate study „Drug research and development“, Graduate study „Medical chemistry“	Academic year	
Lecturer	Prof. Dr. Sc. Vesna Eraković Haber		
Status	Required		Elective
ECTS system			6
Course objectives			
<p>To introduce students to molecular mechanisms and principles of drug therapy and give an insight into biological effects caused by externally administered chemicals (xenobiotics). In addition, students will learn about fate of the drugs once they have entered the body, their absorption, distribution, metabolism and excretion. Structure-activity thinking will be encouraged.</p>			
Course description			
<p>Pharmacology is the study of drugs dealing with their effects on biological systems (Pharmacodynamics), their fate in the organism (Pharmacokinetics) and their unwanted effects on the body (Toxicology). Modern pharmacology is a basic biomedical science which explores the molecular and cellular mechanisms involved in the therapeutic effects of drugs on diseases, in physiological mechanisms affected by drugs and in the biological effects of xenobiotics. The processes and events in the human body are essentially chemical. Communication by chemical substances within cells and between cells is essential for healthy homeostasis, disturbance of which often results in disease. Drugs, being chemicals themselves, are utilized to interact with endogenous molecules and signal transduction pathways, in order to rebalance or re-establish homeostasis. The course, therefore, will start with an introduction to pharmacotherapy and focus on targets, associated pathways and chemical classes used in therapeutics.</p> <p>In addition, the human body contains molecular systems that not only regulate the absorption and tissue distribution of chemicals, but also provide protective mechanisms to metabolise and eliminate xenobiotics. These will be covered in detail during this course.</p> <p>Structure- activity relationship (SAR) illustrations will be given.</p> <p>Students will perform team SAR exercises/case studies and present them to the class.</p>			
Learning outcomes			
<p>Knowledge of molecular mechanisms in pharmacology, toxicology and pharmacokinetics, as well as basic principles of structure activity relationship concepts.</p>			