

Course code	BUM201		
Course title	MOLECULAR BIOTECHNOLOGY		
General information			
Study programme	Graduate study „Drug research and development“, Graduate study „Biotechnology in medicine“	Academic year	
Lecturer	Doc. Dr. Sc. Elitza P. Markova Car		
Status	Required		Elective
ECTS system			3
Course objectives			
To introduce students to the basic principles of molecular biotechnology and its applications particularly in “red biotechnology” and biopharmaceutical technology			
Course description			
<p>The lecture will encompass the following:</p> <ul style="list-style-type: none"> - Basics of recombinant technology (needs to be adjusted with other courses to avoid overlap) - Producer organisms (bacteria, yeasts, fungi, insect cells, mammalian cells, plant cells), and their advantages/disadvantages (glycosylation/folding) - Principles of Protein production (vectors, promoters, tags) - basics of protein structure (alpha helix, β-sheet, turns) - architecture of protein modules composed of these - architecture of protein domains composed of modules - selected examples of tertiary structure and correlation with the function (e.g. transcription factors, immunoglobulins, dehydrogenases and oxidases, hydrolases, viral coat proteins) - Protein engineering - Case examples of overproduced proteins of pharmaceutical use - Downstream processing of proteins and quality assessment - Enzyme overproduction, and their importance for medicine/pharmacy, e.g. biosensors, enzymatic analysis and others - Recombinant and classical strategies for secondary metabolite production - Survey about modern antibiotic production - Recombinant strain improvements in other areas of biotechnology (selected examples from white biotechnology, green biotechnology, environmental biotechnology) 			