



Subject card

Subject name and code	Basic Pharmacology, PG_00037514						
Field of study	Biotechnology						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2023/2024		
Education level	first-cycle studies	Subject group			Optional subject group Subject group related to scientific research in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	4	Language of instruction			Polish		
Semester of study	7	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Pharmaceutical Technology and Biochemistry -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Agnieszka Potęga					
	Teachers	dr inż. Agnieszka Potęga					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours		Self-study	SUM	
	Number of study hours	30	2.0		18.0	50	
Subject objectives	Extending the knowledge of pharmaceutical substances in the field of pharmacology, with particular emphasis on pharmacokinetics and pharmacodynamics. Understanding the fate of the drug in the body and the relationship between the dose and the pharmacological effect of the drug. Getting to know the form of the drug and methods of creating the form of the drug.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_U02	The student is able to use his knowledge of basic subjects to predict the behavior of medicinal substances in biological systems.			[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject		
	K6_W05	The student acquires knowledge of pharmacokinetics, pharmacodynamics and side effects of medicinal substances, is able to present the basic mechanisms of action of drugs, describes the stages of drug research, and characterizes various forms of drugs and methods of their preparation.			[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge		

Subject contents	<ul style="list-style-type: none"> • Introductory information - definitions (active substance, drug, poison, potency, efficacy, pharmacology), drug action (pharmaceutical phase, pharmacokinetic phase, pharmacodynamic phase), methods and places of drug administration. • Drug absorption and transport across membranes - barriers to be crossed during absorption, absorption and transport mechanisms (passive diffusion, facilitated diffusion, active transport, pinocytosis, phagocytosis, persorption), transport proteins (for medicinal substances). • Distribution of the drug in the body - compartments, protein binding, distribution factors. • Biotransformation - phase I reactions (oxidation, reduction, hydrolysis, decarboxylation), phase II reactions (conjugation with endogenous substrates), induction of drug transporting and metabolizing proteins, first pass effect, inhibition of enzymatic activity, bioinactivation and bioactivation, factors influencing biotransformation. • Excretion. • Pharmacokinetics - pharmacokinetic parameters (bioavailability, bioequivalence, elimination half-life, minimal therapeutic concentration and minimal toxic concentration) and pharmacokinetic models (one-compartment model, two- or multi-compartment model, changes in plasma concentration after intravenous and oral administration, pharmacokinetics in special situations - pathological conditions, the elderly). • Pharmacodynamics - mechanisms of drug action, pharmacological action through receptors (the concept of a receptor, types and subtypes of receptors, receptor reserve, agonists and antagonists, ion channels). • Dosage and drug action dependence on dose or concentration - dependence curves, indices and pharmacological values. • Adverse drug reactions - drug allergic reactions, side effects, drug dependence, drug interactions. • Gene and antisense therapy. • Searching for and testing new drugs - preclinical and clinical trials, placebo action, types of drug testing. • Applied pharmacy - drug forms and methods of preparation (powders, granules, tablets, capsules, liposomes, microspheres, medicinal aerosols, syrups, ointments, creams, parenteral drugs), drug administration routes, injection drug form technology (ampoules, vials). 											
Prerequisites and co-requisites	Basic knowledge of biochemistry and enzymology.											
Assessment methods and criteria	<table border="1"> <thead> <tr> <th>Subject passing criteria</th> <th>Passing threshold</th> <th>Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td>Written test, part 2 - lecture material 6 - 9.</td> <td>60.0%</td> <td>50.0%</td> </tr> <tr> <td>Written test, part 1 - lecture material 1 - 5.</td> <td>60.0%</td> <td>50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Written test, part 2 - lecture material 6 - 9.	60.0%	50.0%	Written test, part 1 - lecture material 1 - 5.	60.0%	50.0%
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Example issues/ example questions/ tasks being completed	<p>Sample questions:</p> <ol style="list-style-type: none"> 1. Define the terms: AUC and drug bioavailability - show how these kinetic parameters can be determined. 2. List the mechanisms of transport and absorption through biological membranes. Characterize active transport. 3. List the main enzymes of phase I and II metabolism. Characterize the physiological function of one family of isoenzymes from each group, also giving examples of catalyzed reactions. 											
Work placement	Not applicable											