



Subject card

Subject name and code	Medical Chemistry, PG_00053523						
Field of study	Biomedical Engineering						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2025/2026		
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	3		Language of instruction		Polish		
Semester of study	6		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Department of Pharmaceutical Technology and Biochemistry -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. inż. Ryszard Andruszkiewicz				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	0.0	0.0	45
	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	45		5.0		50.0	100
Subject objectives	The aim of the subject is to familiarize the student with the basic issues of modern medical chemistry						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U53] can apply equipment used in biomedical diagnostics		The student is able to indicate the molecular targets of drugs and the type of interactions between the drug molecule and the molecular target. The student knows the sources of compounds with potential biological activity and knows general principles of research on structure-activity relationships. The student recognizes the types of molecular targets of drugs - receptors, enzymes, nucleic acids. The student knows the basic mechanisms of information transduction by receptors. The student is able to determine the structure of potential drug metabolites by theoretical considerations. and knows the basics of laboratory methods used in research on finding a lead compound. The student knows the stages of clinical trials. The student is able to present the new trends in medicinal chemistry		[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_W02] knows and understands, to an advanced extent, selected laws of physics and physical phenomena as well as methods and theories explaining the complex relationships between them, constituting the basic general knowledge in the field of technical sciences related to the field of study		The student knows the basic issues of pharmacokinetics and pharmacodynamics of biologically active compounds. The student knows the basic biochemical processes occurring in the human body and has basic knowledge of organic chemistry.		[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge		

Subject contents	Drug-general informations. Naming of drugs. Drug targets. Structure and function of enzymes. Structure and functions of receptors. Structure i functions of nucleic acids. Receptors and signal transduction. G-protein-coupled receptors. Kinase receptors. Intracellular receptors. Enzymes as drug targets. Receptors as drug targets. Nucleic acids as drug targets. Miscellaneous drug targets (structural proteins, cell membrane). Drug metabolism (phase I and phase II metabolism). Drug excretion and metabolites. Choosing a disease. Choosing a drug target. Identifying a bioassay. Finding a lead. Screening of natural products. Medical folklore. Existing drugs. Combinatorial and parallel synthesis. Computer-aided design of lead compound. Enhancing a side effect. Finding a pharmacophore. Optimizing target interactions. Structura-activity relationship. Binding role of functional groups. Functional group exchange. Chain extension/contraction. Ring extension/contraction. Simplification of the structure. Rigidification of the structure. Isosteres. Optimizing access to the target. Getting the drug to market. Clinical trials		
Prerequisites and co-requisites	Organic chemistry and elements of Biochemistry is required		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	oral presentation	60.0%	20.0%
	writing exam	60.0%	80.0%
Recommended reading	Basic literature	"Chemia Medyczna. Podstawowe zagadnienia" G.L. Patrick. Wydawnictwa Naukowo-Techniczne. Warszawa 2005 "An itroduction to medicinal chemistry" G.L. Patrick. Oxford University Press. Nowy Jork 2017	
	Supplementary literature	"Wybrane zagadnienia z metod poszukiwania i otrzymywania środków leczniczych" Pod redakcją Katarzyny Kieć-Kononowicz. Wydawnictwo Uniwersytetu Jagiellońskiego. Kraków 2006	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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