

Subject card

Subject name and code	Receptors and cell signaling, PG_00121249						
Field of study	Chemical Business, Chemistry						
Date of commencement of studies	February 2026		Academic year of realisation of subject		2026/2027		
Education level	Master's studies		Subject group		Optional subject group		
Mode of study	full-time studies		Mode of delivery		e-learning		
Year of study	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		1.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Laboratory of Molecular Modeling -> Department of Theoretical Chemistry -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Magdalena Ślusarz				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	E-learning hours included: 15.0						
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	15		2.0		8.0	25
Subject objectives	Familiarize the student with the structure and function of receptors and cell signaling pathways.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[CHEMMU2_U04] Applies acquired knowledge of chemistry and related scientific disciplines.		The student uses the issues learned in the lecture and knowledge of biochemistry, cell biology and computer science to solve tasks.		[SU4] test/exam - oral or written		
	[CHEMMU2_W02] Has extended and in-depth knowledge in the field of basic chemistry.		The student knows the concepts of cell signaling, understands the mechanisms of signal transmission, recognizes the relationship between the structure and function of receptors.		[SW4] test/exam - oral or written		
	[CHEMMU2_K05] Understands the need for independent search of information in scientific literature and popular science magazines.		The student independently searches for and uses selected information available in the literature to perform tasks and answer the questions.		[SK4] test/exam - oral or written		
Subject contents	Structure and function of membrane receptors. G-protein coupled receptors (GPCR) - classification, structure. Mechanism of action of the GPCR: ligands (agonists, antagonists, reverse agonists, biased agonists, bivalent ligands). Primary and secondary messengers. Selected examples of the GPCR. Protein G - division, structure, function and mechanism of action. Other membrane proteins: ion channels and membrane enzymes. Different signal transmission pathways. Selected conditions resulting from malfunctioning of the reporting mechanism. Drugs acting through the receptors.						
Prerequisites and co-requisites	Organic chemistry course						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Partial grades of the lectures are issued on the basis of tests carried out in the UG Educational Portal.		51.0%		100.0%		
Recommended reading	Basic literature		None				

	Supplementary literature	Patrick G. An Introduction to Medicinal Chemistry
	eResources addresses	
Example issues/ example questions/ tasks being completed	• Interaction of the opioid receptors with biased ligands. • Oligomerization of GPCRs and its influence on the receptor biological activity.	
Work placement	Not applicable	

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