University of Gdańsk

Subject card

Subject name and code	Receptors and cell signaling, PG_00121249		
Field of study	Chemical Business, Chemistry, Environmental Protection		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
Education level	Master's studies	Subject group	Optional subject group
Mode of study	full-time studies	Mode of delivery	e-learning
Year of study	2	Language of instruction	Polish
Semester of study	3	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_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
[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_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

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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