

Subject card

Subject name and code	Medical aspects of cell signalling, PG_00153635						
Field of study	Biotechnology						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
Education level	Master's studies		Subject group				
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Kamila Kitowska				
	Teachers		dr hab. Kamila Kitowska				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	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		5.0		15.0	50
Subject objectives	The aim of a 5-day block of practical classes is to present the methods of testing and evaluating cell signaling, the functioning of cellular receptors (FGFR family, EGFR, PR, ER) and their specific ligands / inhibitors. The function and importance of cellular signaling in physiology and pathophysiology as well as targeted therapies will be presented. During the course accurately designed experiments will be carried out to examine processes such as: - Activation of signaling pathways by cell stimulation with specific ligands for the receptors: EGFR, FGFR, PR, ER. - Signal transmission regulation through the use of specific agonists and antagonists for particular receptors - importance in anti-cancer therapies. - Analysis of activation / inhibition of signaling pathways through the evaluation of phosphorylation level of receptors and effector proteins, polymerization of actin fibers and formation of focal adhesions (by fluorescence microscopy) - Assessment of the effects of ligands, receptor inhibitors (EGFR, FGFR) and effector protein inhibitors (MAPK, Src) on cell proliferation, adhesion and migration processes						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BIOTECHMU2_W04] The graduate has in-depth knowledge of selected biotechnology problems currently discussed in the literature.	Students are able to interpret the obtained results and analyze data from scientific publications	[SW4] test/exam - oral or written
	[BIOTECHMU2_W03] The graduate knows and understands concepts of therapy and diagnostic methods of human diseases, including the mechanisms of action of selected drugs, immunotherapy and gene therapy.	Students know the specialized techniques and research tools necessary to assess the involvement of individual proteins in the processes of cell migration, adhesion, and proliferation.	[SW4] test/exam - oral or written
	[BIOTECHMU2_W01] The graduate has in-depth knowledge of complex biological phenomena at the molecular level and knows their importance for biotechnology.	Student have the basic skills necessary for laboratory work in sterile conditions, have the skills to analyze the activation of proteins involved in signal transduction.	[SW4] test/exam - oral or written
Subject contents	The aim of a 5-day block of practical classes is to present the methods of testing and evaluating cell signaling, the functioning of cellular receptors (FGFR family, EGFR, PR, ER) and their specific ligands / inhibitors. The function and importance of cellular signaling in physiology and pathophysiology as well as targeted therapies will be presented. During the course accurately designed experiments will be carried out to examine processes such as: - Activation of signaling pathways by cell stimulation with specific ligands for the receptors: EGFR, FGFR, PR, ER. - Signal transmission regulation through the use of specific agonists and antagonists for particular receptors - importance in anti-cancer therapies. - Analysis of activation / inhibition of signaling pathways through the evaluation of phosphorylation level of receptors and effector proteins, polymerization of actin fibers and formation of focal adhesions (by fluorescence microscopy) - Assessment of the effects of ligands, receptor inhibitors (EGFR, FGFR) and effector protein inhibitors (MAPK, Src) on cell proliferation, adhesion and migration processes		
Prerequisites and co-requisites	Bachelor's degree. Knowledge in eukaryotic cell biology and biochemistry. Participation in the subject: Cell signaling - medical aspects (lecture)		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written test	51.0%	100.0%
Recommended reading	Basic literature	Materials provided by the lecturer - original script prepared by Kamila Kitowska. Materials included in lectures: Cell signaling - medical aspects	
	Supplementary literature	-	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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