

**Subject card**

<b>Subject name and code</b>	Medical aspects of cell signalling, PG_00153635						
<b>Field of study</b>	Biotechnology						
<b>Date of commencement of studies</b>	October 2026	<b>Academic year of realisation of subject</b>			2026/2027		
<b>Education level</b>	Master's studies	<b>Subject group</b>			Obligatory subject group in the field of study Optional subject group Subject group related to scientific research in the field of study		
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>			at the university		
<b>Year of study</b>	1	<b>Language of instruction</b>			Polish		
<b>Semester of study</b>	2	<b>ECTS credits</b>			2.0		
<b>Learning profile</b>	academic	<b>Assessment form</b>			credit		
<b>Conducting unit</b>							
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr hab. Kamila Kitowska				
	<b>Teachers</b>						
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	0.0	0.0	30.0	0.0	0.0	30
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	<b>Number of study hours</b>	30		5.0		15.0	50
<b>Subject objectives</b>	<p>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:</p> <ul style="list-style-type: none"> <li>- Activation of signaling pathways by cell stimulation with specific ligands for the receptors: EGFR, FGFR, PR, ER.</li> <li>- Signal transmission regulation through the use of specific agonists and antagonists for particular receptors - importance in anti-cancer therapies.</li> <li>- 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)</li> <li>- Assessment of the effects of ligands, receptor inhibitors (EGFR, FGFR) and effector protein inhibitors (MAPK, Src) on cell proliferation, adhesion and migration processes</li> </ul>						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BIOTECHMU2_W03] The graduate has in-depth, specialized knowledge of therapy and diagnostic methods of human diseases, including the mechanisms of action of selected drugs, immunotherapy, cellular and gene therapy, understanding the ethical, legal and social dilemmas involved and being able to evaluate them from the perspective of the patient's well-being and the public interest.	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, is able to analyze them in an interdisciplinary approach and assess their ethical, social and environmental implications.	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
	[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
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Prerequisites and co-requisites	<p>Beachelor's degree.</p> <p>Knowledge in eukaryotic cell biology and biochemistry.</p> <p>Participation in the subject: Cell signaling - medical aspects (lecture)</p>		
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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