

Subject card

Subject name and code	Experimental medicine, PG_00192261						
Field of study	Biotechnology						
Date of commencement of studies	October 2025	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			at the university		
Year of study	2	Language of instruction			English		
Semester of study	3	ECTS credits			2.0		
Learning profile	academic	Assessment form			credit		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Aleksandra Markiewicz				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	0.0	0.0	30.0	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	<p>The aim of the course is to familiarize students with the research approach in the analysis and validation of molecular markers potentially useful in clinical practice.</p> <p>During classes, the student will:</p> <ul style="list-style-type: none"> - demonstrate knowledge of research models used to characterize biological and clinical significance of a molecular marker, terminology and conceptual apparatus for molecular diagnostics, precision medicine - acquire competences enabling planning of a research path aimed at demonstrating the biological significance and clinical utility of a molecular marker in precision medicine. 						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[BIOTECHMU2_W01] The graduate has in-depth knowledge of complex biological phenomena at the molecular level and knows their importance for biotechnology.		The student understands the relationship between the disturbance of the level of a molecular marker and the possibility of using this fact, e.g. to detect diseases and monitoring their course.		[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.		The student understands the relationship between the disorder of a given type of molecular marker and the possibilities of using it e.g. in targeted therapy or as a prognostic and predictive marker. Is able to design an experiment aimed at validating the usefulness of a molecular marker		[SW2] presentation/project/paper/report		

Subject contents	<p>1. Types of molecular markers.2. Research tools for the analysis of cells, RNA, DNA and protein.3. Preparation of samples for analysis.4. Methodology of working with clinical material.5. Research using in vitro tests.6. Research using animal models.7. Clinical trials.8. Assessment of the usefulness of molecular markers in medicine.9. Analysis of molecular test results.10. Statistical analysis.11. Molecular marker in medicine - the path from the laboratory to the patient.</p>		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Final exam - test and open questions	51.0%	80.0%
	Presentation of a research task by the student	51.0%	20.0%
Recommended reading	Basic literature	<p>Biologia molekularna w medycynie; Jerzy BałBiomarker Tests for Molecularly Targeted Therapies: Key to Unlocking Precision Medicine; Graig LA, Phillips JK, Moses HL,</p>	
	Supplementary literature	<p>Preclinical mouse solid tumour models: status quo, challenges and perspectives doi:10.1038/nrc.2017.92</p>	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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