



Subject card

Subject name and code		Biology of a cancer cell, PG_00069251						
Field of study		Biotechnology						
Date of commencement of studies		February 2025	Academic year of realisation of subject			2025/2026		
Education level		second-cycle 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			3.0		
Learning profile		general academic profile	Assessment form			assessment		
Conducting unit		Department of Pharmaceutical Technology and Biochemistry -> Faculty of Chemistry -> Wydział Politechniki Gdańskiej						
Name and surname of lecturer (lecturers)		Subject supervisor		dr hab. Ewa Augustin				
		Teachers						
Lesson types and methods of instruction		Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
		Number of study hours	15.0	0.0	15.0	0.0	15.0	45
		E-learning hours included: 0.0						
		eNauczenie source address: <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=40491">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=40491</a>						
		Additional information: Lecture: 15 hours; multimedia presentation; Seminar: 15 hours; oral presentations by students; Laboratory: 15 hours, 5 practical laboratory classes performed independently by students;						
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	45	5.0	25.0	75		
Subject objectives		The aim of the course is to familiarize students with the process of transformation of a normal cell into a cancer cell and with theories explaining the complex relationships between them, as well as to acquire practical skills enabling them to understand the functioning of a cancer cell.						
Learning outcomes		Course outcome		Subject outcome		Method of verification		
		[K7_K01] understands the need to constantly update knowledge based on the state of the art in accordance with the latest scientific literature, improve professional skills and the importance of teamwork		The student understands the basic mechanisms of neoplastic transformation and improves knowledge in this area based on the latest scientific studies.		[SK1] Assessment of group work skills [SK2] Assessment of progress of work		
		[K7_U04] predicts the interaction of biomolecules and biologically active compounds on living organisms and the course of processes involving them based on knowledge in biology, biotechnology and related fields and computer methods of data analysis, modeling and simulation		The student knows the properties of biologically active compounds in terms of their anti-cancer mechanism of action.		[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		
		[K7_W02] explains the structure and function of biomolecules and the methods and instruments for determining their quantity and activity		The student is able to explain the signaling pathways involved in the process of carcinogenesis based on the biomolecules involved.		[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		

Subject contents	<p>Lecture: Phases of cancer development.</p> <p>Factors causing cancer,</p> <p>Epidemiology of cancer in Poland and worldwide.</p> <p>Oncogenes and suppressor genes.</p> <p>Metastasis and angiogenesis. T</p> <p>elomeres and telomerase.</p> <p>Disorders of cell cycle control.</p> <p>Cell death. Cellular senescence.</p> <p>Cancer stem cells. Cancer markers.</p> <p>Seminars:</p> <p>Cancer and evolution.</p> <p>Cancer family trees.</p> <p>Cancer in the nano network.</p> <p>Cancer blood vessels.</p> <p>New methods of treating some cancers.</p> <p>Laboratories:</p> <p>General principles of cancer cell culture.</p> <p>Studying changes in the life cycle under the influence of chemotherapeutic treatment.</p> <p>Changes in the structure of the cytoplasmic membrane of a cancer cell.</p> <p>Fluorescence microscopy for assessing changes in the structure of a cancer cell.</p>		
Prerequisites and co-requisites	Knowledge of cell biology, biochemistry, molecular biology, basic genetics and genetic engineering.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	lecture	60.0%	50.0%
	seminars	60.0%	25.0%
	laboratory	60.0%	25.0%

Recommended reading	Basic literature	L. Pecorino. Biologia molekularna nowotworów w praktyce klinicznej. Edra URBAN&PARTNER, 2018, 2024.  G. Drewa. Genetyka medyczna. Podręcznik dla studentów. 2011.  J. Bał. Biologia molekularna w medycynie. Elementy genetyki klinicznej. PWN 2011.
	Supplementary literature	L. Peccorino. Molecular biology of cancer. Mechanisms, targets and therapeutics. 2008.  R.A. Weinberg. The biology of cancer. 2014.
	eResources addresses	
Example issues/ example questions/ tasks being completed	The role of oncogenes and tumor suppressor genes in neoplastic transformation. Molecular basis of angiogenesis. telomerase as a target for anticancer therapy. What is replicative senescence and cellular senescence. Markers of the aging process	
Work placement	Not applicable	

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