GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Biology of a cancer cell, PG_00069251		
Field of study	Biotechnology		
Date of commencement of studies	February 2026	Academic year of realisation of subject	2026/2027
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 -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Ewa Augustin	
	Teachers		

Lesson types

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

eNauczanie source address: https://enauczanie.pg.edu.pl/moodle/course/view.php?id=46496

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_W02] explains the structure and function of biomolecules and the methods and instruments for determining their quantity and activity	The student knowss and understands 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
[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 is able to analyze and evaluate the properties of biologically active compounds in the context of their anticancer activity.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools
[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 is ready to systematically deepen their knowledge of cancer transformation mechanisms by using up-to-date scientific literature.	[SK1] Assessment of group work skills [SK2] Assessment of progress of work

Subject contents	Course content – lecture Lecture: Phases of cancer development. Factors causing cancer, Eepidemiology of cancer in Poland and worldwide. Oncogenes and suppressor genes. Metastasis and angiogenesis. T elomeres and telomerase. Disorders of cell cycle control. Cell death. Cellular senescence. Cancer stem cells. Cancer markers. Course content – laboratory General principles of cancer cell culture. Studying changes in the life cycle under the influence of chemotherapeutic treatment. Changes in the structure of the cytoplasmic membrane of a cancer cell. Fluorescence microscopy for assessing changes in the structure of a cancer cell. Course content – seminar Cancer and evolution. Cancer family trees. Cancer in the nano network. Cancer blood vessels. New methods of treating some cancers.
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
laboratory	60.0%	25.0%
seminars	60.0%	25.0%
lecture	60.0%	50.0%

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. Bal. 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. elomerase as a target for anticancer therapy. What is replicative senescence and cellular senescence. Markers of the aging process	
Practical activites within the subject	Not applicable	

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