GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Cell Cultures, PG_00054770		
Field of study	Biotechnology		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2026/2027
Education level	first-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	6	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	prof. dr hab. Ewa Augustin	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	30.0	0.0	0.0	45

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	45	3.0	27.0	75

Subject objectives

The aim of the course is to familiarize students with the basic aspects of in vitro culture of plant and animal cells.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_W08	understands the basic aspects of in vitro cultivation of plant and animal cells.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
K6_W06	knows the structure of plant and animal eukaryotic cells, the basic mechanisms of cell signaling pathways and has the knowledge about nucleic acids.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
K6_U06	is able to set up plant and animal culutre in vitro. The student is able to subculture cells, isolate DNA from the cells, and determine the biological activity of biologically active substances.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment

Subject contents	Course content – lecture Cell culture vs. tissue culture. Conditions for in vitro cell culture. Types of culture media, their composition, and their role. Advantages of 2D and 3D in vitro cultures. Cultures of normal and cancer cells. Stem cells: types, culture conditions, and applications. Basic immunocytochemical techniques. Course content – laboratory Establishing in vitro animal cell cultures. Freezing and thawing cells – fundamentals of cryopreservation. Immunocytochemistry in the study of apoptosis. Isolation of DNA from animal cells. Determining the cytotoxic activity of compounds using various methods.
Prerequisites and co-requisites	Knowledge of cell biology, biochemistry, general biotechnology.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
lecture - written exam	60.0%	60.0%
laboratory- quizzes and reports	60.0%	40.0%

Recommended reading

Basic literature	1. S. Malepszy. Plant biotechnology. PWN 2001. 2. S. Stokłosowa. Cell and tissue culture. PWN 2004. 3. E. Augustin. Selected aspects of plant and animal cell culture. Group work. Gdańsk, 2010.
Supplementary literature	1. B. Alberts et al. Fundamentals of cell biology. Introduction to molecular biology. PWN 1999, 2005. 2. W. Sawicki. Histology. PZWL Medical Publishing House 2000. 3. R.I. Freshney. Culture of animal cells. 5th edition. Wiley-Liss, 2005.
eResources addresses	

Example issues/ example questions/ tasks being completed	How to establish an in vitro animal cell culture? Basic composition of culture media for in vitro animal cell culture. The role of serum in the culture medium. List the methods for determining the biological activity of chemotherapeutic agents. Describe the individual steps involved in isolating DNA from an animal cell. List the fundamental characteristics of an apoptotic cell.
Practical activites within the subject	Not applicable

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