

Subject card

Subject name and code	Introduction to eukaryotic cell biology, PG_00082090						
Field of study	Chemistry						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
Education level	Bachelor's studies		Subject group		Obligatory subject group in the field of study Optional 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		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Agnieszka Żylicz-Stachula				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	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	The lecture aims to present selected aspects of the biology of a healthy, physiologically normal animal eukaryotic cell. It also covers disruptions of the cell cycle, DNA damage repair systems, and the mechanisms and factors leading to the transformation of a healthy cell into a cancerous one. Additionally, students will become familiar with the anticipated directions in the development of modern oncology and oncological diagnostics.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[CHEML3_W03] Explains the relationship between the structure of matter and its observed properties.	1. describes the structure of a physiologically healthy eukaryotic cell, 2. describes the structure and function of lipid membranes, 3. understands and describes the interdependencies between cells and the extracellular matrix in animal tissues, 4. understands and describes the cell cycle, 5. understands and describes the regulatory mechanisms of the cell cycle, 6. lists and discusses the characteristics of cancer cells, 7. understands and describes the process of cancer transformation, 8. understands and describes the classification of tumors,	[SW4] test/exam - oral or written
	[CHEML3_W01] Enumerates basic laws and theories in chemistry, physics, mathematics and biology.	1. understands and describes theories explaining the formation of cancer metastases, 2. understands and describes selected DNA repair mechanisms, 3. lists examples of mutator genes and oncogenes and explains their role in cancer transformation, 4. lists and characterizes biological, chemical, physical, and genetic factors leading to cancer transformation.	[SW4] test/exam - oral or written
	[CHEML3_K01] Identifies the level of her/his own knowledge and skills and the need for continuous learning and personal development.	1. understands the need for continuous education, 2. exercises caution and critical thinking when expressing opinions, 3. acquires the skill of scientific discussion	[SK1] oral statement/conversation/discussion [SK2] presentation/project/paper/report
Subject contents	The lecture covers the following topics: • structure of the eukaryotic cell, • selected aspects of eukaryotic cell biology (cell membranes, membrane transport, apoptosis, complex cellular structures, and interdependencies), • DNA structure and replication, types of DNA damage, and repair mechanisms, • cell cycle and regulation of cell division, • stem cells • oncogenes, tumor suppressor genes, mutator genes (definitions, examples) • characteristics of cancer cells, • genetic and environmental factors leading to cancer transformation, • malignant tumors in Poland and Europe (statistical data; geography of cancer mortality), • classification of tumors; stages of tumor development; angiogenesis and metastasis, • selected diagnostic methods and cancer therapies; personalization of medicine.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	activity in scientific discussion	0.0%	40.0%
	test	51.0%	60.0%
Recommended reading	Basic literature	Hopkin, K., Alberts, B., Walter, P., Johnson, A., Roberts, K., Raff, M., Morgan, D. Podstawy biologii komórki, PWN, Warszawa, 2019	
	Supplementary literature	Alberts, B., Hopkin, K., Johnson, A., Morgan, D., Roberts, K., Walter, P. Essentials of cell biology 6 edition, 2023. Weinberg, R.A. The biology of cancer. 3 edition), W. W. Norton & Company, 2023. Pecorino, L. Biologia molekularna nowotworów w praktyce klinicznej. Edra Urban & Partner, Wrocław, 2018. Buckingham, M.L. Molecular diagnostics: Fundamentals, Methods and Clinical Applications. F.A. Davis Company, 2019.	
	eResources addresses		

Example issues/ example questions/ tasks being completed	The green fluorescent protein (GFP) is used for: a) monitoring the localization of various cellular proteins b) as a marker during the creation of transgenic organisms c) visualizing different cellular structures d) all of the above Complete the sentence: "The main microtubule-organizing center of the mitotic spindle in an animal cell is the"
Work placement	Not applicable

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