University of Gdańsk

Subject card

Subject name and code	Introduction to eukaryotic cell biology, PG_00082090		
Field of study	Chemistry		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2024/2025
Education level	undergraduate studies	Subject group	Obligatory subject group in the field of study
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish During the course, elements in English are used (animations reinforcing the program content, schemes, excerpts from lectures/ statements by experts in the field, and educational films).
Semester of study	2	ECTS credits	2.0
Learning profile	academic	Assessment form	
Conducting unit	Faculty of Chemistry -> Rektor		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Agnieszka Żylicz-Stachula	
	Teachers	dr hab. Agnieszka Żylicz-Stachula	

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_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
[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_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

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
test	51.0%	60.0%
activity in scientific discussion	0.0%	40.0%

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	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	The green fluorescent protein (GFP) is used for:a) monitoring the localization of various cellular proteinsb) as a marker during the creation of transgenic organismsc) visualizing different cellular structuresd) all of the aboveComplete 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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