University of Gdańsk

Subject card

Subject name and code	Functioning of organisms at the molecular level, PG_00196847		
Field of study	Biology		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2028/2029
Education level	Bachelor's studies	Subject group	Obligatory subject group in the field of study 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	5	ECTS credits	1.0
Learning profile	academic	Assessment form	credit
Conducting unit			
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. Anna Herman-Antosiewicz	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	15.0	0.0	0.0	0.0	15

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	15	2.0	8.0	25

Subject objectives

Knowledge and understanding of processes related to the variability of genetic material and its consequences. Ability to select methods and techniques for examining the impact of genetic and epigenetic changes on cell biology and interpreting the results. Ability to give oral presentations and independently search for information.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOLL3_U10] The graduate is able to prepare oral presentations in Polish and a foreign language on specific topics in the field of biology	has the ability to give oral presentations in Polish on specific issues related to the molecular basis of the functioning of organisms	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report
[BIOLL3_U05] The graduate is able to synthesise data from a variety of sources and draw appropriate conclusions	synthesizes data from various sources and draws appropriate conclusions on this basis, which is used in the preparation of presentations	[SU2] presentation/project/paper/ report
[BIOLL3_K03] The graduate is able to organise the work of a small team and work effectively as part of a team	can organize the work of a small team and demonstrates the ability to work effectively in a team	[SK2] presentation/project/paper/ report
[BIOLL3_W14] The graduate has an advanced understanding of experimental methods and the most important techniques used in the biological sciences	explains the theoretical basis of experimental methods, lists the most important techniques for examining the genetic material and the response of cells to its changes	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report
[BIOLL3_W16] The graduate knows and understands the relationship between the achievements of a chosen field of science and discipline of natural sciences, and the possibilities of their use in socio-economic life, taking into account the sustainable use of biodiversity	explains the connections between the achievements of molecular biology and the possibilities of its use in socio-economic life	[SW2] presentation/project/paper/ report
[BIOLL3_W02] The graduate knows and uderstands at an advanced level the structure and properties of biological macromolecules, molecular mechanisms of basal metabolic pathways and the flow of genetic information, as well as the sources of variation in organisms; the rules of inheritance	knows the molecular mechanisms of variability of genetic information and its impact on the functioning of cells and entire organisms	[SW2] presentation/project/paper/ report [SW3] text preparation/written work
[BIOLL3_U06] The graduate can read with comprehension scientific biological texts in Polish and simple texts in English	reads and understands scientific texts in Polish and simple texts in English	[SU2] presentation/project/paper/ report

Subject contents

The following aspects are learned and discussed: principles of eukaryotic cell culture (passaging, counting, viability/metabolic activity tests), methods of examining signaling pathways in cells, methods of examining the mutagenic potential of physical and chemical factors, the importance and methods of examining the degree of DNA methylation, biology and the importance of stem cells, controversies related to the genetic modification of organisms

Prerequisites and co-requisites

Basic knowledge of the biology of nucleic acids and eukaryotic cells, understanding the relationship between genotype and phenotype

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Passing based on grades from presentations, active participation in discussions and grades from colloquiums	51.0%	100.0%

Recommended reading

Basic literature	Lewin B. Genes VIII. Oxford University Press, USA, 2004 Lodish H. i wsp. Molecular Cell Biology. W.H.Freeman &Co., 2016, New York Węgleński P. Genetyka molekularna, PWN, Warszawa, 2008 Alberts i wsp. Podstawy biologii komórki, PWN, Warszawa, 2009-2016
Supplementary literature	Materials indicated by the lecturer.
eResources addresses	

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable

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