

Subject card

Subject name and code	Functioning of organisms at the molecular level, PG_00048687						
Field of study	Molekularne podstawy funkcjonowania organizmów (Ćw. audytoryjne)						
Date of commencement of studies	October 2023	Academic year of realisation of subject				2025/2026	
Education level	Bachelor's studies	Subject group					
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		0.0		0.0	15
Subject objectives	<p>Knowledge and understanding of processes related to the variability of genetic material and its consequences.</p> <p>Ability to select methods and techniques for examining the impact of genetic and epigenetic changes on cell biology and interpreting the results.</p> <p>Ability to give oral presentations and independently search for information.</p>						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BIOLL3_U10] the graduate is able to prepare oral presentations in Polish and in 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] wypowiedź ustna/rozmowa/dyskusja [SU2] prezentacja/projekt/referat/raport
	[BIOLL3_K03] the graduate is ready to organise the work of a small team and to 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] prezentacja/projekt/referat/raport
	[BIOLL3_U06] the graduate can read with comprehension simple scientific biological texts in Polish and simple texts in English	reads and understands scientific texts in Polish and simple texts in English	[SU2] prezentacja/projekt/referat/raport
	[BIOLL3_U05] the graduate is able to synthesise data from various sources and draw appropriate conclusions on this basis	synthesizes data from various sources and draws appropriate conclusions on this basis, which is used in the preparation of presentations	[SU2] prezentacja/projekt/referat/raport
	[BIOLL3_W16] the graduate knows and understands the relationship between the achievements of the 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] prezentacja/projekt/referat/raport
	[BIOLL3_W14] the graduate knows the theoretical basis of experimental methods and the most important techniques of the biological sciences	explains the theoretical basis of experimental methods, lists the the most important techniques for examining the genetic material and the response of cells to its changes	[SW4] test/egzamin - ustny lub pisemny [SW2] prezentacja/projekt/referat/raport
[BIOLL3_W02] the graduate has an advanced understanding of the structure and properties of biological macromolecules, the molecular mechanisms of the basal metabolic pathways and genetic information flow and the sources of variation in organisms; the rules of inheritance	knows the molecular mechanisms of the variability of genetic information and its impact on the functioning of cells and entire organisms	[SW4] test/egzamin - ustny lub pisemny [SW2] prezentacja/projekt/referat/raport	
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; wydanie VII jest dostępne online; Lodish H. i wsp. Molecular Cell Biology. W.H.Freeman &Co., 2016, New York, (wydanie IV z 2002 r. jest dostępne online). Węgleński P. Genetyka molekularna, PWN, Warszawa, 2008 Alberts i wsp. Podstawy biologii komórki, PWN, Warszawa, 2009-2016	

	Supplementary literature	<p>Materials indicated by the lecturer and necessary for preparing the presentation, as well as:</p> <ul style="list-style-type: none"> - Herman-Antosiewicz A, Stan SD, Hahm ER, Xiao D, Singh SV. (2007) Activation of a novel ataxia-telangiectasia mutated and Rad3 related/ checkpoint kinase 1-dependent prometaphase checkpoint in cancer cells by diallyl trisulfide, a promising cancer chemopreventive constituent of processed garlic. <i>Mol Cancer Ther.</i> 6:1249-61. - Herman-Antosiewicz A, Kim Y-A, Kim S-H, Xiao D, Singh SV. (2010) Diallyl trisulfide-induced G2/M chase cell cycle arrest In DU145 cells is associated with delayed nuclear translocation of cyclin-dependent kinase 1. <i>Pharm. Res.</i> 27: 1072-1079. - Hać A., Brokowska J., Rintz E., Bartkowski M., Węgrzyn G., Herman-Antosiewicz A. (2019) Mechanism of selective anticancer activity of isothiocyanates relies on differences in DNA damage repair between cancer and healthy cells. <i>Eur J Nutr.</i> 59(4):1421-1432 - Zdrowowicz M, Spisz P, Hać A, Herman-Antosiewicz A, Rak J. (2022) Influence of Hypoxia on Radiosensitization of Cancer Cells by 5-Bromo-2'- deoxyuridine. <i>Int J Mol Sci.</i> 2022 Jan 27;23(3):1429
Example issues/ example questions/ tasks being completed	eResources addresses	
Work placement	Not applicable	

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