

**Subject card**

<b>Subject name and code</b>	Molecular biology of Eukaryota, PG_00203425						
<b>Field of study</b>	Medical Biology						
<b>Date of commencement of studies</b>	October 2026	<b>Academic year of realisation of subject</b>			2027/2028		
<b>Education level</b>	Bachelor's studies	<b>Subject group</b>			Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>			at the university		
<b>Year of study</b>	2	<b>Language of instruction</b>			Polish		
<b>Semester of study</b>	4	<b>ECTS credits</b>			2.0		
<b>Learning profile</b>	academic	<b>Assessment form</b>			credit		
<b>Conducting unit</b>							
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		prof. dr hab. Anna Herman-Antosiewicz				
	<b>Teachers</b>						
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	0.0	0.0	15.0	0.0	0.0	15
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	<b>Number of study hours</b>	15		4.0		31.0	50
<b>Subject objectives</b>	<ol style="list-style-type: none"> <li>1. Understanding the synthesis of proteins and the regulation of this process in eukaryotic cells</li> <li>2. Familiarization with the main mechanisms of intracellular protein transport</li> <li>3. Learning and understanding the processes related to the variability of genetic material and its consequences</li> <li>4. Familiarization with the most important signaling pathways for DNA damage or stopping DNA replication</li> <li>5. Acquiring the ability to use laboratory methods and techniques for studying the biology of eukaryotic cells</li> </ol>						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BIOLMEDL3_W16] has an advanced knowledge of the experimental methods and the most important techniques of biological sciences that can be applied to medical biology and diagnostics	knows the most important techniques for material testing genetic - its expression, variability and cell response to disorders these processes, which may have applications in medical biology and diagnostics	[SW4] test/exam - oral or written [SW2] presentation/project/paper/report
	[BIOLMEDL3_W12] has an advanced understanding of the development and current state of knowledge and the latest trends in medical biology; indicates their relationship with other disciplines of natural or medical sciences	is familiar with the current state of knowledge and the latest trends in molecular biology of eukaryotic cells and indicates their relationship with other scientific disciplines natural or medical sciences, especially in the field of medical biology	[SW4] test/exam - oral or written
	[BIOLMEDL3_W06] at an advanced level: describes, explains and compares systemic control mechanisms in animal and human organisms (including onto- and phylogenetic points of view) and the neurobiological and genetic basis of different disorders	describes the molecular mechanisms of expression and variability of genetic information and the importance of these processes in the functioning of cells and entire organisms	[SW4] test/exam - oral or written
	[BIOLMEDL3_U01] uses basic apparatus and research tools and, maintaining the correct sequence of operations, performs simple physical, biological or chemical observations and measurements in laboratory work in the biological or medical sciences	uses basic equipment and research tools in cell manipulation and, maintaining the correct the sequence of activities, performs simple experiments with the use of eukaryotic cells	[SU1] oral statement/conversation/discussion [SU8] observation of student's independent or team work
	[BIOLMEDL3_K01] understands the need for lifelong learning and to update his/her knowledge of medical biology and related disciplines	understands the need for lifelong learning and updating knowledge regarding the molecular basis of the functioning of eukaryotic cells and having application in medical biology	[SK2] presentation/project/paper/report [SK8] observation of student's independent or team work
[BIOLMEDL3_K07] Is responsible for the equipment/materials entrusted to him and his own work and respects the work of others	is responsible for and respects the entrusted equipment/materials and his/her own work, and the work of others	[SK8] observation of student's independent or team work	
Subject contents	Eukaryotic cell culture methods, viability/metabolic activity tests, methods for testing the mutagenic potential of chemical agents, methods for examining the course of the cell cycle or apoptosis of human cells.		
Prerequisites and co-requisites	Basic knowledge of cell biology, molecular biology, biochemistry, genetics		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	the final grade is determined on the basis of points obtained from partial tests and exercise reports	51.0%	100.0%
Recommended reading	Basic literature	1. Molecular Cell Biology, Lodish H., Berk A., Zipursky S.L., Matsudaira P., Baltimore D., Darnell J.E.; W.H. Freeman and Company, 2016 2. Molecular Biology of the Cell, Alberts B., Johnson A., Lewis J., Raff M., Roberts K., Walter P.; 2014 3. Genes VIII, Lewin B., Benjamin Cummings, 2004	

	Supplementary literature	<p>materials indicated by the lecturer, e.g.</p> <p>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</p> <p>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> 6:1249-61</p> <p>Herman-Antosiewicz A, Lew KL, Xiao H, Singh SV. (2007) Induction of p21 protein protects against sulforaphane-induced mitotic arrest in LNCaP human prostate cancer cell line. <i>Mol Cancer Ther.</i> 6: 1673-81.</p> <p>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</p> <p>Słominska-Wojewodzka M, Gregers TF, Walchli S, Sandvig, K. (2006) EDEM Is Involved in Retrotranslocation of Ricin From the Endoplasmic Reticulum to the Cytosol. <i>Mol Biol Cell,</i> 17: 1664-75.</p> <p>Słominska-Wojewodzka M, Sandvig, K. (2015) The Role of Lectin-Carbohydrate Interactions in the Regulation of ER-Associated Protein Degradation. <i>Molecules,</i> 20: 9816-46.</p> <p>Nowakowska-Gołacka J, Sominka H, Sowa-Rogozińska N, Słomińska-Wojewódzka M. (2019) Toxins Utilize the Endoplasmic Reticulum-Associated Protein Degradation Pathway in Their Intoxication Process. <i>Int J Mol Sci,</i> 20 (6).</p>
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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