

Subject card

Subject name and code	Protein conformation - medical aspects, PG_00154722						
Field of study	Konformacja białek - aspekty medyczne (Ćw. audytoryjne)						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
Education level	Master'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		1.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Laboratory of Microbial Biochemistry -> Department of General and Medical Biochemistry -> Faculty of Biology -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. Ewa Laskowska				
	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		3.0		7.0	25
Subject objectives	Expanding knowledge on the structure and function of proteins, presenting the latest literature data on diseases related to abnormal protein conformation and the mechanisms responsible for proteostasis in the cell.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BIOLMU2_W01] the graduate has an in-depth knowledge and understanding of natural phenomena and processes at different levels of complexity	Understands the complex phenomena and processes that are the basis for the proper functioning of proteins.	[SW4] test/egzamin - ustny lub pisemny
	[BIOLMU2_K07] the graduate is ready to systematically update biological knowledge and information on its practical applications	Is able to systematically update his/her knowledge on the structure and function of proteins.	[SK4] test/egzamin - ustny lub pisemny
	[BIOLMU2_W05] the graduate understands the dynamic development of the biological sciences and is familiar with new research directions and disciplines	Recognizes the dynamic development of biological sciences, particularly new techniques and research strategies related to proteins.	[SW4] test/egzamin - ustny lub pisemny
	[BIOLMU2_K05] the graduate is prepared to use recognised sources of scientific and popular information in the biological sciences to further his or her knowledge	Is ready to use recognized sources of scientific and popular science information concerning the structure and function of proteins.	[SK4] test/egzamin - ustny lub pisemny
	[BIOLMU2_W04] the graduate has an in-depth knowledge of the chosen specialisation in the biological sciences	Has in-depth knowledge of protein structure and function.	[SW4] test/egzamin - ustny lub pisemny
	[BIOLMU2_U02] the graduate is able to make proficient use of the scientific literature of the biological speciality studied	He fluently uses scientific literature in the field of protein structure and function.	[SU4] test/egzamin - ustny lub pisemny
Subject contents	Protein structure and folding. Protein-based biomaterials. Molecular basis of diseases associated with abnormal protein structure and aggregation (cataracts, Alzheimer's, Parkinson's, Huntington's diseases; amyotrophic lateral sclerosis, prion diseases).		
Prerequisites and co-requisites	Basic knowledge about protein structure and synthesis.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Test with closed and open-ended questions	51.0%	100.0%
Recommended reading	Basic literature	C. Branden, J Tooze, Introduction to Protein Structure, Garland Publishing, 2nd ed. L. Stryer, J.M. Berg, J. L. Tymoczko, G. J. Gatto. Biochemia, PWN, 2019 Jayaraj GG, Hipp MS, Hartl FU. Functional Modules of the Proteostasis Network. Cold Spring Harb Perspect Biol. 2020 Jan 2;12(1):a033951. doi:10.1101/cshperspect.a033951. Dobson CM, Knowles TPJ, Vendruscolo M. The Amyloid Phenomenon and Its Significance in Biology and Medicine. Cold Spring Harb Perspect Biol. 2020 Feb 3;12(2):a033878. doi: 10.1101/cshperspect.a033878	

	Supplementary literature	Hipp MS, Kasturi P, Hartl FU. The proteostasis network and its decline in ageing. Nat Rev Mol Cell Biol. 2019 Jul;20(7):421-435. doi:10.1038/s41580-019-0101-y. Balchin D, Hayer-Hartl M, Hartl FU. In vivo aspects of protein folding and quality control. Science. 2016 Jul 1;353(6294):aac4354. doi: 10.1126/science.aac4354. Mogk A, Bukau B, Kampinga HH. Cellular Handling of Protein Aggregates by Disaggregation Machines. Mol Cell. 2018 Jan 18;69(2): 214-226. doi:10.1016/j.molcel.2018.01.004. PMID Mannini B, Chiti F. Chaperones as Suppressors of Protein Misfolded Oligomer Toxicity. Front Mol Neurosci. 2017 Apr 5;10:98. doi: 10.3389/fnmol.2017.00098 Dobson CM, Knowles TPJ, Vendruscolo M. The Amyloid Phenomenon and Its Significance in Biology and Medicine. Cold Spring Harb Perspect Biol. 2020 Feb 3;12(2):a033878. doi: 10.1101/cshperspect.a033878
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Work placement	Not applicable	

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