

Subject card

Subject name and code	Biochemical structure of proteins, PG_00080481						
Field of study	Strukturalna biochemia białek (Wykład)						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
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	1		Language of instruction		Polish		
Semester of study	2		ECTS credits		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Szymon Ziętkiewicz				
	Teachers		dr hab. Szymon Ziętkiewicz				
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		0.0		0.0	30
Subject objectives	To learn the basic concepts of protein structure, introduce the issues related to protein structural research, and analysss the structure-function relationship. Gaining knowledge about the mechanisms of protein functioning at the molecular level, the interactions that determine the folding process, application of experimental and computational methods for determining protein structures. The student will learn how to interpret structural data, become familiar with the potential problems and limitations of the methods used and with the ongoing development of research techniques.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[BIOTECHL3_W07] The graduate knows and understands basic techniques and research tools used in biotechnology.		Student knows the physical principles of the methods of structural biology (crystallography, NMR, cryo-EM), knows their limitations and quality criteria		[SW4] test/egzamin - ustny lub pisemny		
	[BIOTECHL3_K01] The graduate is willing to know the limitations of his/her own knowledge and skills; constantly improve, update knowledge, and raise qualifications in biotechnology in the sience and natural sciences, as well as medical sciences and health sciences		Student is aware of the progress in methodology and knowledge in structural biology and necessity of constant actualization of his/her own knowledge		[SK3] opracowanie tekstowe/ praca pisemna		
	[BIOTECHL3_W01] The graduate knows and understands basic biological phenomena at the molecular level, he/she is familiar with their significance for biotechnology.		The student is familiar with the physical interactions involved in the formation of protein structures, knows the aspects of the secondary, tertiary and quaternary structure and the basics of structure-function relationship of proteins		[SW4] test/egzamin - ustny lub pisemny		

Subject contents	1. Structural aspects in biochemistry, protein conformation, conformational space, Anfinsen paradox 2. Protein amino acids, peptide bond, physico-chemical basis of interactions involved in creation and stabilization of protein structurebiałkowych. 3. Structure levels, dynamics and thermodynamics of protein folding 4. Empirical and computatinal methods for protein structure determination 5. Structural elements of proteins, helices, sheets, structural motives, domains E 6. Dynamics of proteins, conformational changes 7. Discussion of chosen examples of protein mechanisms and structure-function relationships											
Prerequisites and co-requisites	not applicable											
Assessment methods and criteria	<table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>[BIOTECHL3_K01]</td><td>0.0%</td><td>6.7%</td></tr><tr><td>[BIOTECHL3_W01] , [BIOTECHL3_W07]</td><td>50.0%</td><td>93.3%</td></tr></table>	Subject passing criteria	Passing threshold	Percentage of the final grade	[BIOTECHL3_K01]	0.0%	6.7%	[BIOTECHL3_W01] , [BIOTECHL3_W07]	50.0%	93.3%		
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[BIOTECHL3_K01]	0.0%	6.7%										
[BIOTECHL3_W01] , [BIOTECHL3_W07]	50.0%	93.3%										
Recommended reading	Basic literature	1. Biofizyka dla biologów, red. M. Bryszewska, W. Leyko, 2. Introduction to Protein Structure, Branden C, Tooze J 3. Introduction to Protein Architecture, Lesk A										
	Supplementary literature	not applicable										
	eResources addresses											
Example issues/ example questions/ tasks being completed												
Work placement	Not applicable											

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