

Subject card

Subject name and code	Production of therapeutic proteins in plants, PG_00207350						
Field of study	Biology						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2026/2027		
Education level	Master'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		1.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Laboratory of Plant Biotechnology -> Department of Experimental Biology and Plant Biotechnology -> Faculty of Biology -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Izabela Chincinska				
	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	To familiarize students with the production of therapeutic recombinant proteins using higher plants. To understand the advantages and disadvantages of plant expression systems and their potential practical applications.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[BIOLMU2_W04] has in-depth knowledge of the chosen specialization in the biological sciences		The graduate has in-depth knowledge of the production of biopharmaceuticals in plants.		[SW4] test/exam - oral or written		
	[BIOLMU2_U07] is able to critically compare biological information from various sources and draw justified conclusions on this basis		The graduate critically compares biological information from various sources on the use of transgenic plants in the biopharmaceutical industry and draws justified conclusions on this basis.		[SU4] test/exam - oral or written [SU8] observation of student's independent or team work		
	[BIOLMU2_K07] is ready to systematically update biological knowledge and information on its practical applications		The graduate systematically updates biological knowledge in the field of the use of transgenic plants in the biopharmaceutical industry and information on its practical applications		[SK8] observation of student's independent or team work		

Subject contents	Plants as a Natural Source of Therapeutic Proteins (lectins, ribosome-inactivating proteins)		
	Expression Systems for Recombinant Protein Production		
	Plant-Based Production Platforms		
	Genetically Modified Plants		
	Optimizing Heterologous Expression in Plants		
	Isolation, Purification, and Glycoengineering of Recombinant Plant Proteins		
	Overview of Plant Biopharmaceuticals		
Prerequisites and co-requisites	Basic knowledge of genetics and medical biotechnology.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written test	51.0%	100.0%
Recommended reading	Basic literature	Publications recommended by the instructor regarding the topics of individual meetings. Review and original publications on specific research topics.	
	Supplementary literature	Malepszy S. (2009). Biotechnologia roślin. Wydawnictwo Naukowe PWN, Warszawa. Chincinska, Izabela Anna. "Leaf infiltration in plant science: old method, new possibilities." Plant Methods 17.1 (2021): 1-21. Chincinska, Izabela Anna, et al. "Production of recombinant human deoxyribonuclease I in Luffa cylindrica L. and Nicotiana tabacum L.: evidence for protein secretion to the leaf intercellular space." Plant Cell, Tissue and Organ Culture (PCTOC) 136.1 (2019): 51-63. Błażejewska, Kamila, et al. "Mature luffa leaves (Luffa cylindrica L.) as a tool for gene expression analysis by agroinfiltration." Frontiers in plant science 8 (2017): 228.	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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