University of Gdańsk

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_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_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_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

<table>
<tr><td>Subject contents</td><td>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</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Basic knowledge of genetics and medical biotechnology.</td></tr>
<tr><td>Assessment methods and criteria</td><td><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>written test</td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>Publications recommended by the instructor regarding the topics of individual meetings.

Review and original publications on specific research topics.</td></tr><tr><td>Supplementary literature</td><td>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.</td></tr><tr><td>eResources addresses</td><td></td></tr></table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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