University of Gdańsk

Subject card

Subject name and code	Biotechnology of plants and algae, PG_00147099		
Field of study	Genetics and Experimental Biology		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
Education level	undergraduate studies	Subject group	Obligatory subject group in the field of study
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish polish
Semester of study	4	ECTS credits	2.0
Learning profile	academic	Assessment form	
Conducting unit	Katedra Biologii Eksperymentalnej i Biotechnologii Roślin -> Faculty of Biology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Wojciech Pokora	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	30.0	0.0	0.0	30

E-learning hours included: 0.0

Additional information:
Performing experiments

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	2.0	18.0	50

Subject objectives

Knowledge of and ability to apply basic plant and algal biotechnology techniques.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[GBEL3_K01] The utilization of theoretical knowledge in laboratory and production practice.	The graduate is ready to apply theoretical knowledge in laboratory and production practice	[SK8] observation of student's independent or team work
[GBEL3_U01] Independently perform practical tasks in the field of biological sciences and related disciplines, formulate research problems, analyze their results, and draw conclusions.	The graduate can independently perform simple practical tasks in the field of plant and algal biotechnology	[SU6] demonstration of practical skills [SU8] observation of student's independent or team work

Subject contents

Basic methods for growing plants/tissues/cells in in vitro culture. Isolation and identification of selected secondary metabolites/recombinant proteins/enzymes from plants. Isolation of nucleic acids from plant tissues. Transformation of plants in the Agrobacterium tumefaciens system. Identification of transformed plants. Somatic hybridisation of plant cells - generation of new species.

Prerequisites and co-requisites

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Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
completion of the credit work - completion of specific practical work	51.0%	50.0%
determination of a pass mark on the basis of partial marks received during the semester	51.0%	50.0%

Recommended reading	Basic literature	Malepszy S. (red.). 2009. Biotechnologia Roślin, PWN, Warszawa. Kopcewicz J. (red.). 2007. Fizjologia Roślin, PWN, Warszawa. Michalik B. (red. 2009. Hodowla roślin z elementami genetyki i biotechnologii. PWRiL. Stewart CN, Jr. (Ed) 2008. Plant Biotechnology and Genetics: Principles, Techniques, and Applications. John Wiley & Sons, Inc., Hoboken, New Jersey. Naukowe publikacje przeglądowe z zakresu biologii eksperymentalnej i biotechnologii roślin
	Supplementary literature	Cole C. [Ed]. 2014-2020. Compendium of Plant Genomes. Springer Loyola-Vargas V.M., Vázquez-Flota F. (red.). 2006. Plant Culture Protocols. W: Methods in molecular Biology. Humana Press, Totowa, New Jersey. Pokora, W., Aksmann, A., Baścik-Remisiewicz, A., Dettlaff-Pokora, A., Rykaczewski, M., Gappa, M., Tukaj, Z. Changes in nitric oxide/hydrogen peroxide content and cell cycle progression: Study with synchronized cultures of green alga Chlamydomonas reinhardtii. Journal of Plant Physiology (2017) 208, 8493. Rojek J, Tucker MR, Rychłowski M, Nowakowska J, Gutkowska M. 2021. The Rab Geranylgeranyl Transferase Beta Subunit Is Essential for Embryo and Seed Development in Arabidopsis thaliana. International Journal of Molecular Sciences. 22(15):7907. https://doi.org/10.3390/ijms22157907 Rojek J, Tucker MR, Pinto SC, Rychłowski M, Lichocka M, Soukupova H, Nowakowska J, Bohdanowicz J, Surmacz G, Gutkowska M. 2021. Rab dependent vesicular traffic affects female gametophyte development in Arabidopsis. Journal of Experimental Botany. 72(2): 320-340. doi: 10.1093/jxb/eraa430 Chincinska I.A., Kapusta M., Zielińska E., Miklaszewska M., Błażejewska K., Tukaj Z. Production of recombinant human deoxyribonuclease I in Lua cylindrica L. and Nicotiana tabacum L.: evidence for protein secretion to the leaf intercellular space. Plant Cell, Tissue and Organ Culture (2019) 136 (1), 5163. Miklaszewska M., Banaś A., Królicka A. Metabolic engineering of fatty alcohol production in transgenic hairy roots of Crambe abyssinica. Biotechnology and Bioengineering (2017) 114(6), 1275-1282. Chincinska, Izabela Anna. "Leaf infiltration in plant science: old method, new possibilities." Plant Methods 17.1 (2021): 1-21.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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