

Subject card

Subject name and code	Plant in vitro cultures, PG_00198320						
Field of study	Genetics and Experimental Biology						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2026/2027		
Education level	Bachelor'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	Department of Experimental Biology and Plant Biotechnology -> Faculty of Biology -> Rector						
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	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 complexity and diversity of biological processes occurring in plant tissues grown in in vitro cultures. Providing knowledge in the field of planning specialized experimental work and knowledge of basic techniques of working with plant cultures in vitro.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[GBEL3_W05] A graduate has an advanced knowledge and understanding of: principles for planning research based on the achievements of biological sciences and related disciplines and the possibility of putting their results into practice, principles for the operation of equipment and apparatus used in molecular genetics research, and the principle of interpreting biological phenomena and processes based on empirical data in research work and practical action, taking into account the sustainable use of biodiversity.		The graduate knows the principles of planning research based on the achievements of biological sciences and the possibilities of using their results in practice, the principles of operation of equipment and apparatus used in research in the field of in vitro plant cultures and the principle of interpreting phenomena and biological processes based on empirical data in research work and practical actions, taking into account the sustainable use of biodiversity		[SW3] text preparation/written work		
	[GBEL3_K01] The graduate is prepared to: use of theoretical knowledge in laboratory and production practice		The graduate s ready to use theoretical knowledge in laboratory practice and production		[SK5] implementation of a problem task		

Subject contents	Basic methods of conducting plant in vitro cultures. Hormonal regulation of somatic variability of selected plant tissues. Elimination of plant bacteria and viruses through apical meristem cultures and thermo- and chemotherapy. Characterization of the physiological state of cell suspensions. Induction of biosynthesis, acquisition and identification of selected secondary plant metabolites. Obtaining haploid plants for further breeding work. Overcoming barriers to non-crossability through in vitro pollination. Culture of mature and immature hybrid embryos.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	final paper	51.0%	75.0%
	activity in classes	51.0%	25.0%
Recommended reading	Basic literature	Malepszy S. (red.). 2009. Biotechnologia Roślin, PWN, Warszawa. Michalik B. [red.] 2009. Hodowla roślin z elementami genetyki i biotechnologii. Michalczyk D. (red.) 2008. Wykłady i ćwiczenia z roślinnych kultur in vitro www.wbp.olsztyn.pl/~krist/skrypt/start.php Najnowsze naukowe publikacje przeglądowe z zakresu roślinnych kultur in vitro	
	Supplementary literature	Eckstein, A. (2017). Auksyny: wszechstronne cząsteczki sygnałowe. Poświadczenie. Eckstein, A., Zięba, P., & Gabryś, H. (2012). Sugar and light effects on the growth of Arabidopsis thaliana in vitro. Journal of Plant Growth Regulation, 31(1), 90-101. Loyola-Vargas V.M., Vázquez-Flota F. (red.). 2006. Plant Culture Protocols. W: Methods in molecular biology, 1065. Humana Press, New Jersey. Pokora W., Aksmann A. & Z. Tukaj Functional characteristics of green algal photosystems deficient mutants cultured under photoautotrophic, mixotrophic and heterotrophic conditions. Journal of Applied Microbiology, 106, 106-114. Rojek J, Tucker MR, Pinto SC, Rychłowski M, Lichocka M, Soukupova H. 2012. Sugar dependent vesicular traffic affects female gametophyte development in Arabidopsis thaliana. Plant Cell, 24, 320-340. doi: 10.1093/jxb/eraa430 Rojek J, Pawełko Ł, Kapusta M, Naczek A, Bohdanowicz J. 2015. Exogenous auxin promotes embryonic development in Arabidopsis thaliana. Acta Societatis Botanicorum Poloniae 84: 287-300. Rojek J, Kuta E, Kapusta M, Ihnatowicz A, Bohdanowicz J. 2013. The independent autonomous endosperm development in unfertilized ovules of Arabidopsis thaliana. Plant Cell Reports 32: 101-110.	
	eResources addresses		
	Example issues/ example questions/ tasks being completed		
Work placement	Not applicable		

Document generated electronically. Does not require a seal or signature.