University of Gdańsk

Subject card

Subject name and code	Unicellular organisms - Methods, PG_00153677						
Field of study	Biotechnology						
Date of commencement of studies	October 2024		Academic year of realisation of subject	2025/2026			
Education level	undergraduate studies		Subject group				
Mode of study	full-time studies		Mode of delivery	at the university			
Year of study	2		Language of instruction	Polish			
Semester of study	3		ECTS credits	4.0			
Learning profile	academic		Assessment form				
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Katarzyna Węgrzyn				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	0.0	0.0	30.0	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		20.0	40.0	90	
Subject objectives	The aim of the course is to prepare students for the theoretical development of advanced laboratory methods and procedures used, among others, in molecular biology. Under the teachers supervision and based on available literature, students prepare, present, and discuss selected advanced techniques in molecular biology. The course assumes both individual and students group work in preparation for the classes. During the course, students have the opportunity to learn and improve their presentation skills and will become familiar with the professional terminology related to the discussed topics.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOTECHL3_W09] The graduate knows and understands the basic concepts and terminology used in biological and medical sciences as well as concepts from related scientific disciplines	Student is able to prepare a theoretical elaboration on advanced laboratory methods and procedures used, among others, in molecular biology. Student is familiar with the professional terminology related to the discussed topics.	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report
[BIOTECHL3_U07] The graduate is able to prepare and present a short oral presentation in Polish and/or English, covering detailed issues in the field of biotechnology, using scientific language, including specialist terminology and conceptual apparatus appropriate for biotechnology; conduct discussions	Student is able to prepare, present, and discuss selected advanced techniques in molecular biology based on available literature.	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report
[BIOTECHL3_U05] The graduate is able to use the English language in the scope enabling the understanding of statements and reading with comprehension of literature and simple scientific studies in the fields of science and scientific disciplines relevant to biotechnology; prepare a short written study and an oral presentation in English on specific issues of biotechnology	The student, based on available English-language literature, is able to prepare and present a presentation on selected advanced techniques in molecular biology.	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report
[BIOTECHL3_U02] The graduate is able to plan and organise work effectively, independently or as part of a team, in particular work in a laboratory	Student, individually and as part of a team, is able to prepare, present, and discuss selected advanced techniques in molecular biology based on available literature.	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report [SU8] observation of student's independent or team work

Subject contents

The curriculum includes topics related to advanced methods in molecular biology, descriptions of the methods, principles of application, stages of laboratory procedures, and their theoretical foundations. The classes will cover the following topics:

- EMSA
- Footprinting
- SPR, BLI, MST
- 2H system, BiFC
- Microarrays technology
- Mass Spectrometry
- Antibodies and their application (ELISA, IP, ChiP)
- Microscopy (fluorescent/confocal/TIRF/ EM/cryo-EM/AFM)
- Fluorescence-based methods (FRET, FRAP, FROS, FISH)
- Magnetic/Optical tweezers

Prerequisites and co-requisites

It is required to acquire the knowledge and competencies specified for the courses Module01_B2, Module02_B1, Module02_B2.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Activity	0.0%	20.0%
Presentations	50.0%	80.0%

Recommended reading

Basic literature	• Materials prepared by the teacher • Materials independently researched and selected by students for the classes using library resources and electronic information sources • Selected publications (review and experimental) • *Handbook of Surface Plasmon Resonance* by Richard B. M. Schasfoort, Anna J. Tudos 2008 • *Introduction to Atomic Force Microscopy: Theory, Practice, Applications* by Paul E. West 2006 • *DNA-protein Interactions: A Practical Approach* by Andrew Arthur Travers, Malcolm Buckle - 2000
Supplementary literature	-
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed

Work placement

Not applicable

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