University of Gdańsk

Subject card

Subject name and code	Research at IFB, PG_00197609		
Field of study	Biotechnology		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2026/2027
Education level	Bachelor's studies	Subject group	Obligatory subject group in the field of study 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	2	Language of instruction	Polish
Semester of study	3	ECTS credits	1.0
Learning profile	academic	Assessment form	credit
Conducting unit	UG Institute of Biotechnology -> Intercollegiate Faculty of Biotechnology UG-MUG -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Andrea Lipińska	
	Teachers	dr hab. Andrea Lipińska	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	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

The aim of the course is to familiarise students with research projects carried out in the Faculty, allowing them to choose a research group in which to develop their scientific interests and prepare a research project.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOTECHL3_K01] The graduate is aware of the scope of their own knowledge and skills; demonstrates a willingness to continuously update them and pursue professional development.	Is able to identify areas of issues in the scope of scientific research conducted in individual IFB units, which require further deepening and supplementing of knowledge. Successfully uses this knowledge to select a research group in which to develop his/her scientific interests and prepare a research project, and can justify this choice in a written manner. Understands the need for continuous professional development and tracking scientific progress in biotechnology.	[SK3] text preparation/written work
[BIOTECHL3_K02] The graduate is willing to work in a team, in particular to carry out joint laboratory work.	Understands the importance of effective collaboration in a research team when planning and performing laboratory experiments. Knows how to position oneself in a specific MWB research team.	[SK3] text preparation/written work

<table>
<tr><td>Subject contents</td><td>Presentations of research projects by MWB UG and GUMed research teams on, among others:

- molecular and structural biology of chaperone proteins and nucleic acids.
- biochemistry and biotechnology of plant lipids
- application of molecular biology tools in the diagnosis of human metabolic, cancer and infectious diseases
- diagnostics and photodynamic therapy to combat bacterial infections and tumours
- use of beneficial (antagonistic) bacteria or substances produced by them to protect plants against bacterial and fungal pathogens
- the search for biologically active compounds of plant origin and other compounds (synthetic peptides, silver nanoparticles, etc.) to combat human and plant pathogens
- ecology, molecular biology and interaction of bacteriophages with host cells
- mechanisms determining the development of disease processes caused by bacteria on plants
- analysis of protein structure and function using advanced spectroscopic, biophysical and biochemical techniques
- analysis of protein structural changes and their impact on the activity and stability of these compounds
- use of molecular modelling techniques enabling research on the structure of molecules and their function by creating their computer models
- analysis of DNA metabolism, extrachromosomal genetic elements of bacteria, in particular the process of DNA replication in Escherichia coli bacteria
- analysis of functions performed in the cell and the mechanism of action of chaperone proteins; understanding the molecular mechanisms of the functioning of Hsp70 system proteins in the context of their role in important cellular processes.
- analysis of the impact of environmental factors such as temperature, metal ions, pH, ionic strength on the structure and biological activity of peptides and small proteins.
- explanation of the mechanisms of action of various mutagens and toxins, as well as drugs and substances with potential therapeutic effects.
- application of molecular biology methods in the construction of new generation antiviral vaccines by modifying the genetic material of viruses
- analysis of the structure and function of viral proteins, in particular proteins involved in the processes of virus penetration into cells,spreading in the body and modulation of the host's immune response
- analysis of the molecular mechanism of aggressive behavior of skin, breast and prostate cancer cells and searching for markers for diagnostics and therapy of these diseases
- identification of new markers for better prediction of the effectiveness of therapy used in cancer patients and for their better prognosis.
- practical familiarization with molecular biology methods related to the manipulation of Gram-negative and Gram-positive bacteria.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></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>Attendance</td><td>0.0%</td><td>50.0%</td></tr>
<tr><td>Written justification</td><td>0.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Publications by academic teachers of the faculty - literature independently searched by the student</td></tr>
<tr><td>Supplementary literature</td><td>None</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<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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