University of Gdańsk

Subject card

Subject name and code	Multicellular organisms - Human body organisation and physiology Methodology (M04_B2), PG_00146295						
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	4		ECTS credits	5.0			
Learning profile	academic		Assessment form				
Conducting unit	Intercollegiate Faculty of Biotechnology UG-MUG						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Adam Iwanicki				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	45.0	30.0	0.0	0.0	75
	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	75		28.0	48.0	151	
Subject objectives	The program block provides detailed knowledge about the principles of cell organization into higher-order structures in the human body, biological processes related to cell functioning, and the mechanisms of differentiation and specialization of human cells, tissues and organs in connection with their functions. During the exercises, students will become familiar with the basic techniques and research tools used in the study of cellular processes and imaging of the morphological structure of tissues and organs.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOTECHL3_W02] The graduate knows and understands selected processes at the cell, tissue and organism level, important from the biological point of view	The student knows the principles of cell organization into higher-order structures in the human body, biological processes related to cell functioning and the mechanisms of differentiation and specialization of human cells, tissues and organs in connection with their functions.	[SW4] test/exam - oral or written
[BIOTECHL3_W04] The graduate knows and understands the structure and functions of the body in terms of anatomy, histology, physiology relevant from the point of view of medicine	The student possesses the knowledge about human embryonic development, as well as the proper features of the morphological structure and functioning of tissues and individual organs and systems of the human body, important from the point of view of medicine	[SW4] test/exam - oral or written
[BIOTECHL3_U01] The graduate is able to do basic laboratory work; document activities and results; use basic techniques under the supervision of the supervisor in laboratory work and research tools necessary in biotechnology, with particular emphasis on the analysis of methods of isolation, modification, selection and analysis of organisms, tissues, cells and molecules; handle basic laboratory equipment.	The student is able to recognize and describe the histological structures of organs and tissues. The student has basic skills in operating laboratory equipment, such as efficient operation of a light microscope, including the use of immersion.	[SU8] observation of student's independent or team work
[BIOTECHL3_K04] The graduate is willing to understand the importance of work safety rules, in particular laboratory work; apply the principles of work safety; be responsible for his/her own safety and that of others; be able to act in emergency situations.	The student is aware of the importance of safety rules, possible threats and responsibility for the safety of others.	[SK8] observation of student's independent or team work
[BIOTECHL3_W07] The graduate knows and understands basic techniques and research tools used in biotechnology.	The student knows the basic techniques and research tools used in researching cellular processes and imaging the morphological structure of tissues and organs.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[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	The student is able to express himself and participate in discussions, using scientific language, including specialized terminology and conceptual apparatus specific to biotechnology.	[SU1] oral statement/conversation/ discussion
[BIOTECHL3_W08] The graduate knows and understands occupational health and safety regulations; the dangers of working in a laboratory; the dangers of working with infectious material, GMOs and GMMs	The student is able to work in the laboratory in accordance with the principles of occupational health and safety, knows the risks of working with infectious material, GMO and GMM.	[SW4] test/exam - oral or written
[BIOTECHL3_U08] The graduate is able to learn independently in a targeted manner	The student has the ability to learn independently from the materials and literature sources indicated by the instructor.	[SU4] test/exam - oral or written
[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	The student knows and is be able to skillfully apply concepts and terminology used in cell biology and used to describe the structure of cells, tissues and organs, their functioning and interactions.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion

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<tr><td>Subject contents</td><td>M1. Auditorium exercises:
Methods of analyzing the mechanisms of differentiation and specialization of human cells/tissues/organs: - Methods of proliferation analysis; methods of cell death analysis; adhesion, shape, cell movement and their analysis; single cell analysis (genome and transcriptome sequencing). - Methodology of research on the embryonic development of mammals and other animals, methods of isolation, cultivation and analysis of the potential, self-renewal and differentiation of cells
embryonic and reprogrammed pluripotent cells.

M2. Auditorium exercises in human anatomy:
Upper and lower limbs. - Spine and back. - Chest. - Abdomen - abdominal wall and its spaces. - Head and neck.

M3. Auditorium exercises on animal cell culture:
Hybrid e-learning classes (B-learning). - History of cell/tissue culture. Applications, advantages and limitations of cell culture in biotechnology, medicine, pharmacy. - Risk factors. Safety of work in a breeding laboratory, including genetically modified cell lines, and levels of biological safety. - Equipping the breeding laboratory. Cell culture materials. - Basic methods of aseptic work with cell cultures in vitro. - Types of farm infections prevention, detection, treatment. - Cytotoxic/proliferative tests. Application of cytometry in cell culture. - Presentation of issues developed by students related to the methodology of cell culture research based on scientific publications. Discussion of the methods and results of the publication.

M4. Laboratory exercises in histology:
Application of light microscopy techniques. - Subcellular structures in light microscopy. Karyokinesis and cytokinesis. - Epithelial tissue.Glands. - Connective tissue. - Skeletal connective tissue. Ossification. - Muscle tissue. - Nervous tissue and nervous system. - Peripheral blood.Bone marrow. Blood formation. - Lymphatic system</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>M4: presentation</td><td>0.0%</td><td>5.0%</td></tr>
<tr><td>M1: testy</td><td>0.0%</td><td>20.0%</td></tr>
<tr><td>M4: practical evaluation</td><td>0.0%</td><td>22.0%</td></tr>
<tr><td>M2: test</td><td>0.0%</td><td>20.0%</td></tr>
<tr><td>M4: entry tests</td><td>0.0%</td><td>18.0%</td></tr>
<tr><td>M4: test</td><td>0.0%</td><td>15.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Materials provided by the teacher Teaching materials on anatomy placed on the electronic educational platform of the Medical University of Gdańsk Teaching materials on animal cell culture placed on the electronic educational platform of the University of Gdańsk Histologia, W. Sawicki, PZWL, 2012 Animal Cell Culture R.I. Freshney 4th ed. Hodowla komórek i tkanek S. Stokłosa wyd. 1.</td></tr>
<tr><td>Supplementary literature</td><td>N/A</td></tr>
<tr><td>eResources addresses</td><td>Podstawowe
https://www.atcc.org/ - American Type Culture Collection home page
https://sivb.org/ - Society for In Vitro Biology home page
Adresy na platformie eNauczanie:</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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