University of Gdańsk

Subject card

Subject name and code	Monographic lecture - Medical biotechnology, PG_00080869		
Field of study	Chemistry		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
Education level	Master'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	2	Language of instruction	Polish During the course, elements in English are used (animations reinforcing the program content, excerpts from lectures/statements by experts in the field, scientific publications, and educational films).
Semester of study	4	ECTS credits	3.0
Learning profile	academic	Assessment form	credit
Conducting unit	Faculty of Chemistry -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Agnieszka Żylicz-Stachula	
	Teachers	dr hab. Agnieszka Żylicz-Stachula	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	0.0	0.0	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	5.0	40.0	75

Subject objectives

The aim of the course is to provide students with comprehensive theoretical knowledge, enabling them to understand and utilize the latest advancements in the field of biomedical chemistry and medical biotechnology. The course is designed to prepare students for conducting scientific research and working in the biotechnology industry, taking into account the ethical, economical and social aspects of this rapidly evolving field.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[CHEMMU2_W05] Has extended knowledge in the field of the specialisation studied.	The student provides examples of applications of recombinant nucleic acids, biomaterials, and proteins in medical biotechnology. The student knows and understands the relationship of medical biotechnology to other scientific disciplines. The student recognizes the significant role and wide range of issues related to contemporary medical biotechnology.	[SW4] test/exam - oral or written
[CHEMMU2_K01] Knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so.	The student critically evaluates his/her knowledge of medical biotechnology and understands its limitations. The student understands the need for continuous education and expansion of his/her knowledge and skills in the dynamically developing field of medical biotechnology. The student understands the need to popularise knowledge on current trends in medical biotechnology.	[SK2] presentation/project/paper/report
[CHEMMU2_W11] Demonstrates general knowledge about the current trends in the development of chemistry as a science and the latest discoveries in this field.	The student is familiar with the latest developments and current trends in biomedical chemistry and medical biotechnology.	[SW4] test/exam - oral or written [SW1] oral statement/conversation/discussion
[CHEMMU2_W01] Uses knowledge of spectroscopic methods of chemical compound analysis.	The student knows and understands examples of how spectroscopic methods are applied in the analysis of chemical compounds in medical biotechnology.	[SW4] test/exam - oral or written

Subject contents

Definition and history of medical biotechnology; Overview of biotechnology applications in medicine; Tissue engineering and regenerative medicine; Application of stem cells in medical biotechnology; Methods for obtaining new biomaterials; Pharmacogenetics, pharmacogenomics, and personalized medicine; Nanobiotechnology in medicine; Recombinant vaccines; Examples of gene and cell therapies; Examples of biotechnology applications in molecular diagnostics; Microarrays; Use of antibodies in biotechnology and immunotherapy; Future of medical biotechnology, ethical and social challenges.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
activity during scientific discussion	0.0%	20.0%
test	0.0%	28.0%
presentation	0.0%	52.0%

Recommended reading

Basic literature

Kristiansen, B., Ratledge, C. Podstawy biotechnologii. Wydawnictwo Naukowe PWN, wyd. 1, 2011, Warszawa, 2024

Buckingham, M.L.; Molecular diagnostics: Fundamentals, Methods and Clinical Applications. F.A. Davis Company, 2019

Bal, J. Genetyka medyczna i molekularna. Wydawnictwo Naukowe PWN, wyd. V, Warszawa, 2023

	Supplementary literature	Selected scientific publications and review papers in Polish and English (updated annually and available online), provided by the instructor during the semester in which the course is conducted.
	eResources addresses	
Example issues/ example questions/ tasks being completed	Stem cells capable of giving rise to cells of all types of embryonic and extra-embryonic tissues are called: a) multipotent b) pluripotent c) totipotent d) unipotent Fill in the following sentence: Genetically determined variants of the TPMT enzyme affect the bioavailability and toxicity of	
Work placement	Not applicable	

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