University of Gdańsk

Subject card

Subject name and code	Personalized genetics, PG_00147832		
Field of study	Genetics and Experimental Biology		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2026/2027
Education level	undergraduate 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	3	Language of instruction	Polish
Semester of study	6	ECTS credits	1.0
Learning profile	academic	Assessment form	
Conducting unit	Pracownia Molekularnych i Komórkowych Podstaw Strategii Nutr -> Katedra Biologii i Genetyki Medycznej -> Faculty of Biology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Marta Moskot	
	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	3.0	7.0	25

Subject objectives
1. Understanding the goals of personalized medicine. 2. Understanding the mechanisms underlying personalised medicine. 3. Studies of the therapeutic possibilities of personalized medicine. 4. Studies of the treatment forms based on personalized medicine.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[GBEL3_K07] Lifelong learning and updating knowledge in the field of molecular genetics and other disciplines.	The student understands the importance of biological processes in the functioning of cells and whole eukaryotic organisms; understands the need for lifelong learning and updating knowledge about genetics and the molecular basis of eukaryotic cell function	[SK1] oral statement/conversation/ discussion [SK4] test/exam - oral or written [SK5] implementation of a problem task
[GBEL3_W03] The molecular mechanisms of genetic information transmission and gene expression, as well as the molecular and genetic basis of human physiology and diseases, including infectious diseases.	The student describes the molecular mechanisms underlying selected diseases; understands the importance of biological processes in the functioning of cells and whole eukaryotic organisms; recognises the relationship between the patient's genetic predisposition and the therapy used	[SW4] test/exam - oral or written [SW5] implementation of a problem task
[GBEL3_W05] the principles of research planning based on achievements in biological sciences and related fields, the potential application of their results in practice, the principles of 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 and practical activities, with consideration for sustainable use of biological diversity.	The student has knowledge of the most important techniques for studying the response of a eukaryotic cell to factors damaging the genetic material or cytoskeleton	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion [SW5] implementation of a problem task
[GBEL3_W10] principles of research commercialization, intellectual property protection, and technology transfer.	The student understands the basic principles of conducting and commercializing research, intellectual property protection and technology transfer	[SW2] presentation/project/paper/ report [SW5] implementation of a problem task
[GBEL3_W01] Understanding the structure and properties of basic types of biological macromolecules, molecular mechanisms of metabolic pathways and genetic information flow, as well as sources of genetic variability in organisms and mechanisms of evolution; explaining the rules of inheritance, elucidating differences in the structure and functioning of prokaryotic and eukaryotic cells, and understanding the structure and functional relationships at the cellular and tissue levels.	The student describes the molecular mechanisms underlying selected diseases; recognises the relationship between the patient's genetic predisposition and the therapy used	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report [SW5] implementation of a problem task
[GBEL3_W06] the development and current state of knowledge, as well as the latest trends in molecular genetics and related fields; indicating their relationship with other disciplines in the natural or medical sciences and the possibilities of their practical application.	The student is familiar with the current state of knowledge and the latest trends in molecular biology, indicates their relationship with other disciplines of natural or medical sciences	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report [SW5] implementation of a problem task
[GBEL3_U04] Capable of reading scientific texts in English and Polish with comprehension, synthesizing the knowledge contained within them, preparing well-documented studies on biological issues, as well as those related to research commercialization.	The student is able to read with comprehension and analyze scientific texts in English and Polish, synthesizes the knowledge contained therein, prepares well-documented studies of biological problems	[SU2] presentation/project/paper/ report [SU5] implementation of a problem task
[GBEL3_W11] legal, organizational, and ethical considerations in conducting and implementing research in the field of genetics and experimental biology.	The student knows the legal, organizational and ethical conditions of conducting and implementing research in the field of molecular genetics	[SW5] implementation of a problem task

Subject contents	Goals of personalized medicine. Types of variables that affect the disease. Genetic background and the development of the disease. Molecular and cellular mechanisms involved in the process of cancer. Mechanisms responsible for the different course of the disease (example: cancer, RA, psoriasis, infectious diseases, hepatitis B, hepatitis C) in different patients. Mechanisms related to drug response and resistance. Molecular biology in diagnostics and clinical practice. Research aimed at selecting targeted therapy. Conditions necessary to make a therapeutic decision. A model of adapting therapy to the patient. Personalized therapies available.
Prerequisites and co-requisites	Basic knowledge about molecular and cell biology, genetics and medicine.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Colloquium	51.0%	75.0%
Presentation	51.0%	25.0%

Recommended reading

Basic literature	1. Molecular Cell Biology, Lodish H., Berk A., Zipursky S.L., Matsudaira P., Baltimore D., Darnell J.E.; W.H. Freeman and Company, 2000 2. Medical Genetics Summaries, Pratt V, McLeod H, Dean L, et al., 2012 3. Enabling Precision Medicine: The Role of Genetics in Clinical Drug Development: Proceedings of a Workshop, 2017 4. Molecular Cell Biology, Lodish H., Berk A., Zipursky S.L., Matsudaira P., Baltimore D., Darnell J.E.; W.H. Freeman and Company, 2000 5. Molecular Biology of the Cell, Alberts B., Johnson A., Lewis J., Raff M., Roberts K., Walter P., 2002 6. Genes VXX, Lewin B., Jocelyn E. Krebs; Elliott S. Goldstein; Stephen T. Kilpatrick, 2018
Supplementary literature	NaN
eResources addresses	Podstawowe http://pkmp.org.pl/ - Polish Coalition for Personalized Medicine Association https://www.fda.gov/ - Food and Drug Administration https://www.clinicaltrials.gov/ - A place to learn about clinical studies from around the world https://euapm.eu/ - The European Alliance for Personalised Medicine https://pacjentwbadaniach.abm.gov.pl/pwb/ - Patient in clinical trials Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	I. A presentation including a case study of selected clinical trial describing a personalized therapeutic approach. II. Colloquium - issues: 1. What is a therapeutic window? 2. What steps should be taken to choose the right form of cancer treatment (from initial diagnosis throughout the treatment period)? 3. What is stratification in personalized medicine?
Work placement	Not applicable

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