University of Gdańsk

Subject card

Subject name and code	Genomics and our health, PG_00179582		
Field of study	Chemistry		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
Education level	Master's studies	Subject group	Optional 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	1.0
Learning profile	academic	Assessment form	credit
Conducting unit	Laboratory of Bionanotechnology -> Department of Molecular Biotechnology -> Faculty of Chemistry -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Agnieszka Żylicz-Stachula	
	Teachers		

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	5.0	10.0	30

Subject objectives	
	To familiarize students with the fundamentals of genomics and its applications in modern medicine and public health. To demonstrate how genetic and genomic information is used in: • identifying the risk of disease development, • early detection and prevention of disorders, • personalized therapy (including pharmacotherapy), • interpretation of genetic and epigenetic tests, • supporting patients and healthcare professionals in making informed health decisions.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[CHEMMU2_U02] Critically assesses the results of conducted, performed observations and theoretical calculations and discusses errors.	Can analyze and interpret selected genomic and epigenetic data in the context of individual disease risk. Applies acquired knowledge to propose preventive and therapeutic actions tailored to a patient's genetic background. Is able to apply ethical and practical principles in genetic counseling.	[SU5] implementation of a problem task [SU8] observation of student's independent or team work
[CHEMMU2_W05] Has extended knowledge in the field of the specialisation studied.	The student demonstrates in-depth knowledge of the structure, function, and regulation of the human genome and the mechanisms of inheritance. Understands the classification and molecular basis of genetic disorders, as well as methods for their detection and monitoring. Has advanced understanding of epigenetics, gene expression regulation, and their implications for health and disease. Possesses detailed knowledge of pharmacogenomics and precision medicine in the treatment of chronic and oncological diseases. Is familiar with current genomic technologies (e.g., next-generation sequencing) and principles for interpreting genetic test results.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[CHEMMU2_K01] Knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so.	Understands the need for continuous learning in the field of genomics and health. Demonstrates responsibility when using genetic data in clinical and research contexts.	[SK1] oral statement/conversation/ discussion

Subject contents

Overview of key concepts in genetics and genomics, along with their applications in medicine and public health. Fundamentals of human genome structure and function, as well as the principles of inheritance and genetic variation.
Major categories of genetic disorders - monogenic, chromosomal, and multifactorial - and explores the role of environmental and epigenetic factors in their development.
Practical use of genomic knowledge in healthcare, including:
genetic testing (diagnostic, screening, predictive),
the principles and ethics of genetic counseling,
pharmacogenomicstailoring treatment based on an individuals genetic profile,
the use of precision medicine in the prevention, diagnosis, and treatment of chronic and oncological diseases.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Engagement and preparation for classes	0.0%	51.0%
written exam	0.0%	49.0%

Recommended reading

Basic literature	Genetyka medyczna. Lynn B. Jorde, John C. Carey, Michael J. Bamshad, red. wyd. pol. M. Borowiec, wyd. 6, Edra Urban & Partner (2021) Genetyka medyczna i molekularna. Jerzy Bal, PWN, (2023)
Supplementary literature	Wybrane publikacje naukowe i prace przeglądowe w j. angielskim (corocznie aktualizowane, dostępne online), podawane przez prowadzącego w trakcie semestru, w którym realizowany jest kurs.
eResources addresses	

Example issues/ example questions/ tasks being completed	Which of the following statements best describes the significance of a genetic variant known as an SNP (single nucleotide polymorphism) in population studies? A. SNPs are rare mutations that are not used in association studies B. SNPs are the main cause of mitochondrial disorders C. SNPs are common variants that can influence disease susceptibility D. SNPs occur only in coding sequences What is pharmacogenomics? Describe how information about genetic variants can influence the efficacy and safety of drug therapy.
Work placement	Not applicable

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