University of Gdańsk

Subject card

Subject name and code	Molecular basis of medical biology, PG_00203341						
Field of study	Medical Biology						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2027/2028		
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	4		ECTS credits		3.0		
Learning profile	academic		Assessment form		exam		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr Sylwia Barańska				
	Teachers						
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		4.0		41.0	75
Subject objectives	Knowledge and understanding of the processes involved in the replication and expression of genetic material. Knowledge of a range of molecular biology techniques and their applications.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOLMEDL3_W16] has an advanced knowledge of the experimental methods and the most important techniques of biological sciences that can be applied to medical biology and diagnostics	The student explains the theoretical basis of selected experimental methods and lists the most important techniques of molecular biology.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[BIOLMEDL3_W02] has an advanced knowledge and understanding of the structure and properties of basic types of biological macromolecules, molecular mechanisms of the pathways of basal metabolism and flow of genetic information, and sources of variation in organisms; explains the rules of inheritance	The student describes the structure and characteristics of nucleic acids, how genes are expressed and regulated, the sources of genetic variation in organisms, the rules of inheritance and the molecular mechanisms of DNA recombination. Explains genetic recombination in vivo and in vitro.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[BIOLMEDL3_U05] synthesises data from different sources and draws appropriate conclusions from them	The student describes the results of the experiments presented, synthesises the data from the various experiments presented and the theoretical knowledge and draws appropriate conclusions on this basis.	[SU1] oral statement/conversation/ discussion [SU4] test/exam - oral or written

Subject contents

Structure of DNA and RNA; Organisation and replication of genetic material of viruses, bacteria and eukaryotic cells;Structure of the gene and structure of the transcription unit; DNA replication - replication of prokaryotic, eukaryotic genomes and plasmid DNA; DNA recombination. Stages of gene expression in prokaryotic and eukaryotic cells: transcription, mRNA splicing and editing.Examples of regulation of gene expression at different stages: operon, regulon models, catabolic repression, stringent responsel, RNA interference. Principles of genetic engineering.

Prerequisites and co-requisites

Chemistry courses taken as part of the study course.

Chemistry knowledge and lab skills (preparation of solutions and buffers, work safety)

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
questions asked by the trainer during the lecture	0.0%	0.0%
test and open questions	51.0%	100.0%

Recommended reading

Basic literature	Biologia molekularna. McLennan, Turner, Bates, White. 2021 PWN Warszawa Biologia molekularna bakterii. Baj, Markiewicz. 2015 PWN Warszawa Genomy. Brown 2019 PWN Warszawa
Supplementary literature	Gene XII (2017) Lewin's. Jocelyn E. Krebs, PhD; Elliott S. Goldstein, PhD; Stephen T. Kilpatrick, PhD
eResources addresses	

Example issues/ example questions/ tasks being completed

Work placement

Not applicable

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