University of Gdańsk

Subject card

Subject name and code	Molecular basis of medical biology, PG_00203340						
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		credit		
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	0.0	0.0	30.0	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		6.0		39.0	75
Subject objectives	Knowledge and understanding of the processes involved in the replication and expression of genetic material. Knowledge of a variety of molecular biology techniques and the ability to use them in practice. Ability to work in a molecular biology laboratory using appropriate research tools and to analyse and process results.						

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	explains the theoretical basis of selected experimental methods and lists the most important techniques of molecular biology molecular biology.	[SW3] text preparation/written work
[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	Describes the structure and properties of nucleic acids; describes the molecular mechanisms responsible for the various steps of gene expression and its regulation; explains the causes of variation in organisms; explains the rules of inheritance; describes the molecular mechanisms of DNA recombination; explains genetic recombination in vivo and in vitro	[SW2] presentation/project/paper/ report [SW3] text preparation/written work
[BIOLMEDL3_K07] Is responsible for the equipment/materials entrusted to him and his own work and respects the work of others	He is responsible for the equipment and laboratory materials entrusted to him as well as for his own work and the work of those in the team.	[SK2] presentation/project/paper/ report [SK8] observation of student's independent or team work
[BIOLMEDL3_U05] synthesises data from different sources and draws appropriate conclusions from them	Describes the results of experiments, synthesizes data from different experiments and draws appropriate conclusions on this basis	[SU2] presentation/project/paper/ report [SU3] text preparation/written work
[BIOLMEDL3_U01] uses basic apparatus and research tools and, maintaining the correct sequence of operations, performs simple physical, biological or chemical observations and measurements in laboratory work in the biological or medical sciences	applies the basic apparatus and experimental tools and, following the correct sequence of operations, following the procedural protocols provided, performs simple physical, biological and chemical observations and measurements in laboratory work in the field of molecular biology	[SU2] presentation/project/paper/ report [SU8] observation of student's independent or team work
[BIOLMEDL3_U14] is able to prioritize and organize the work of a small team and work effectively as part of a team	is able to prioritize and organize the work of a small team and is able to work effectively in a small team, being willing to respect the rules of teamwork and to take responsibility for shared tasks	[SU2] presentation/project/paper/ report [SU8] observation of student's independent or team work

Subject contents

In silico cloning. Basic DNA manipulation techniques: DNA isolation methods, gene amplification by PCR, use of restriction enzymes and ligases, and transformation of bacterial strains. Examples of regulation of gene expression. Determination of promoter activity using reporter genes. Expression systems in bacteria.

Prerequisites and co-requisites

Completed chemistry courses as part of the program of study.

Knowledge of chemistry and ability to apply it in the laboratory (preparation of solutions and buffers, work safety)

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
a test to pass each class	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 Biochemia. Stryer, Berg, Tymoczko. PWN 2019 Techniki laboratoryjne w biologii molekularnej. Lewandowska-Ronnegren, 2018
Supplementary literature	Biologia molekularna w medycynie. J. Bal
eResources addresses	

Example issues/ example questions/ tasks being completed	
Work placement	Not applicable

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