

Subject card

Subject name and code	Molecular genetics of bacteria, PG_00147106						
Field of study	Genetics and Experimental Biology						
Date of commencement of studies	October 2024	Academic year of realisation of subject				2025/2026	
Education level	undergraduate studies	Subject group				Obligatory subject group 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				2.0	
Learning profile	academic	Assessment form					
Conducting unit	Katedra Genetyki Molekularnej Bakterii -> Faculty of Biology						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. Katarzyna Potrykus				
	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		4.0		16.0	50
Subject objectives	<p>- To familiarize students with the course and regulation of basic processes related to the replication and protection of the integrity of bacterial genetic material as well as expression of the genetic information contained therein</p> <p>- To familiarize students with the latest trends and concepts in molecular genetics of bacteria</p> <p>- To familiarize students with classic and novel research tools used in bacterial genetics</p>						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	<p>[GBEL3_U07] Work in a team and organize work while adhering to occupational health and safety principles and ergonomics.</p> <p>[GBEL3_K01] The utilization of theoretical knowledge in laboratory and production practice.</p> <p>[GBEL3_K02] Critical assessment of one's own knowledge and methods in the field of molecular biology and related disciplines, as well as the commercialization of research.</p> <p>[GBEL3_K08] Responsibility for entrusted equipment/materials and respect for the work of others.</p> <p>[GBEL3_U03] Proficient in using research equipment and tools, while following the correct sequence of procedures, to conduct basic physical, biological, or chemical observations and measurements in laboratory work within the field of biological sciences.</p> <p>[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.</p> <p>[GBEL3_W04] applied knowledge in microbiology and plant biotechnology.</p> <p>[GBEL3_U01] Independently perform practical tasks in the field of biological sciences and related disciplines, formulate research problems, analyze their results, and draw conclusions.</p> <p>[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.</p>	<p>Student is able to work in a team and organize their work</p> <p>Student is ready to use their theoretical knowledge in laboratory and production practice</p> <p>Student is ready to critically evaluate methods in the field of molecular biology</p> <p>Student is responsible for the entrusted equipment/materials, their own work and respects the work of others</p> <p>Student uses basic research equipment and tools and, maintaining the correct sequence of activities, performs simple physical, biological or chemical observations and measurements in laboratory work in the field of science.</p> <p>Student knows the principles of planning research based on the achievements of bacterial genetics and the possibilities of using their results in practice, the principles of operation of equipment and apparatus used in research in the field of molecular genetics of bacteria and the principle of interpreting phenomena and processes taking place in bacterial cells based on empirical data in research and practical activities</p> <p>Student has basic knowledge of microbial biotechnology</p> <p>Student is able to independently perform simple practical tasks in the field of biological and related sciences</p> <p>Student describes the structure and properties of basic types of biological macromolecules, molecular mechanisms of basic metabolism pathways and the flow of genetic information in bacterial cells, and sources of variability of bacterial cells; explains the rules of reproduction and inheritance of genetic material</p>	<p>[SU8] observation of student's independent or team work</p> <p>[SK5] implementation of a problem task [SK8] observation of student's independent or team work</p> <p>[SK1] oral statement/conversation/discussion [SK6] demonstration of practical skills [SK8] observation of student's independent or team work</p> <p>[SK8] observation of student's independent or team work</p> <p>[SU5] implementation of a problem task [SU6] demonstration of practical skills [SU8] observation of student's independent or team work</p> <p>[SW5] implementation of a problem task</p> <p>[SW1] oral statement/conversation/discussion [SW5] implementation of a problem task</p> <p>[SU5] implementation of a problem task [SU6] demonstration of practical skills [SU8] observation of student's independent or team work</p> <p>[SW1] oral statement/conversation/discussion [SW5] implementation of a problem task</p>
Subject contents	<ul style="list-style-type: none"> - DNA structure and organization of the bacterial chromosome, DNA replication in bacterial cells, bacterial DNA isolation methods, plasmids - Basics of genetic engineering, including: PCR, restriction enzymes, cloning, alpha-complementation - Gene expression, transcription regulation, reporter genes 		

Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written report	51.0%	20.0%
	test on each laboratory class	51.0%	80.0%
Recommended reading	Basic literature	Snyder L., Peters J.E., Henkin T.M., Champness W., Molecular Genetics of Bacteria, 4th Edition, ASM Press 2013 Henkin, T.M., Peteres J.E., Snyder & Champness Molecular Genetics of Bacteria, 5th Edition, ASM Press 2020	
	Supplementary literature	Materials selected by the instructor from current literature available on a given topic.	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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