

Subject card

Subject name and code	Mechanisms of pathogenesis of microorganisms, PG_00147112						
Field of study	Genetics and Experimental Biology						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2025/2026		
Education level	Bachelor's 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		credit		
Conducting unit	Department of Molecular Genetics of Bacteria -> Faculty of Biology -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. Agnieszka Szalewska-Pałasz				
	Teachers		prof. dr hab. Agnieszka Szalewska-Pałasz				
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		3.0		17.0	50
Subject objectives	To familiarize students with the processes involved in the acquisition of pathogenic traits by bacteria. To understand the genetic mechanisms underlying the expression of virulence factors. To understand the risks associated with emerging pathogens and antibiotic resistance. To familiarize students with the hosts defense mechanisms. To provide knowledge of methods for combating pathogens. Ability to work with microorganisms and identify pathogenic factors.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[GBEL3_K05] Responsibility for the safety of one's own work and others.	Is responsible for his own safety and that of others	[SK6] demonstration of practical skills [SK8] observation of student's independent or team work
	[GBEL3_K01] The utilization of theoretical knowledge in laboratory and production practice.	Is ready to apply his theoretical knowledge in laboratory and production settings	[SK1] oral statement/conversation/discussion [SK5] implementation of a problem task [SK6] demonstration of practical skills [SK8] observation of student's independent or team work
	[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.	Understands 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	[SW4] test/exam - oral or written
	[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.	Uses basic research equipment and tools and, following the correct sequence of steps, performs simple physical, biological, or chemical observations and measurements in laboratory work in the field of biological sciences	[SU4] test/exam - oral or written
	[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.	Understands the principles of research planning based on advances in the biological sciences and the potential practical applications of their findings, 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 work and practical activities, taking into account the sustainable use of biological diversity	[SW1] oral statement/conversation/discussion [SW3] text preparation/written work [SW5] implementation of a problem task
	[GBEL3_U01] Independently perform practical tasks in the field of biological sciences and related disciplines, formulate research problems, analyze their results, and draw conclusions.	Is able to independently perform simple practical tasks in the field of biological and related sciences	[SU1] oral statement/conversation/discussion [SU3] text preparation/written work [SU5] implementation of a problem task [SU8] observation of student's independent or team work
Subject contents	Mechanisms of bacterial genetic variability, the evolution of pathogenic bacteria, and virulence factors. Terminology related to pathogenic microorganisms. Interactions between the pathogen and the host organism, mechanisms of colonization. Fundamentals of the immune system. Mechanisms of expression and action of virulence factors. Intracellular pathogens. Epidemics, pandemics, chronic infections. Emerging pathogens, methods of infection prevention, the search for new drugs, phage therapy.		
Prerequisites and co-requisites	A. Formal Requirements General microbiology, biochemistry, molecular genetics of bacteria, chemistry B. Prerequisites Basic knowledge of biochemistry and microbiology, ability to perform aseptic techniques and maintain bacterial cultures, ability to ensure workplace safety		

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		0.0%	0.0%
	Assessment: Report on completed assignments, observation of the student's work during the practical sessions	51.0%	100.0%
Recommended reading	Basic literature	A. Required reading for final course completion (passing the exam): A.1. Used during class Materials specified by the lecturer Salyers, A. A. and D. D. Whitt. 2002. *Bacterial Pathogenesis: A Molecular Approach*. 2nd ed. ASM Press. Washington, D.C. Infectious Diseases, Jonathan Cohen, William G Powderly, Steven M. Opal, 4th Edition - June 10, 2016, Elsevier A.2. To be studied independently by the student Materials indicated by the lecturer Medical Microbiology. Short Lectures by Will Irving, Tim Boswell, and Dlawer Aldeen. PWN, 2008 Translated with DeepL.com (free version)	
	Supplementary literature	Bacterial biofilms Romeo T. Springer, 2008 Bacterial Pathogenesis: Molecular and Cellular Mechanisms Caister Academic Press 2012	
	eResources addresses		
Example issues/ example questions/ tasks being completed	Molecular mechanisms underlying the pathogenesis of diseases caused by specific groups of bacteria Common viral diseases Emerging diseases		
Work placement	Not applicable		

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