

Subject card

Subject name and code	Pathogenic microorganisms - molecular basis of pathogenesis, PG_00197656						
Field of study	Biotechnology						
Date of commencement of studies	October 2025	Academic year of realisation of subject			2027/2028		
Education level	Bachelor's studies	Subject group			Obligatory subject group in the field of study Optional subject group 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	3	Language of instruction			Polish		
Semester of study	5	ECTS credits			1.0		
Learning profile	academic	Assessment form			credit		
Conducting unit	Intercollegiate Faculty of Biotechnology UG-MUG -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Adam Iwanicki				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	16.0	0.0	0.0	0.0	0.0	16
	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	16	5.0	29.0	50		
Subject objectives	The aim of the education is to present the molecular mechanisms of pathogenesis of pathogenic microorganisms. Particular emphasis is placed on the phenomena of interaction of pathogens with host cells and the mechanisms of changes in the signaling pathways occurring in these cells. General mechanisms of the functioning of the immune system are discussed, in particular in response to infection with pathogenic microorganisms, as well as the main strategies used by pathogens to avoid triggering an immune response.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[BIOTECHL3_W05] The graduate understands at an advanced level the mechanisms of vital function disorders and knows the causes, symptoms and methods of assessing selected disorders and pathological changes in the field of pathophysiology, biochemical disorders, and neoplasia; knows the methods of assessing these disorders in the field of medical biotechnology and molecular diagnostics.		The student knows the basic immune mechanisms functioning in the human body. The student knows how the pathogenesis process occurs in the event of infection with selected pathogenic microorganisms.		[SW4] test/exam - oral or written		
	[BIOTECHL3_W02] The graduate knows and understands at an advanced level selected processes at the cell, tissue and organism level, important from the biological point of view		The student knows and understands the importance of cellular processes, as well as those functioning at the level of organs and the entire organism. involved in the response to infection with pathogenic microorganisms.		[SW4] test/exam - oral or written		

Subject contents	During individual lectures, students learn about the elements of the pathogenesis of various diseases caused by pathogenic microorganisms, as well as the mechanisms of the immune system and their role in combating infecting pathogens. Elimination mechanisms and defense strategies against the immune system used by pathogenic microorganisms such as: <i>Bacillus anthracis</i> , <i>Salmonella typhimurium</i> , <i>Yersinia pestis</i> , <i>Mycobacterium tuberculosis</i> , <i>Listeria monocytogenes</i> , <i>Legionella pneumophila</i> , <i>Helicobacter pylori</i> , <i>Trypanosoma cruzi</i> , West Nile virus, HIV virus will be presented.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written exam	51.0%	100.0%
Recommended reading	Basic literature	N/A	
	Supplementary literature	<p>Gołab J. i wsp. Immunologia, 2007, PWN, Warszawa</p> <p>Rosenberger CM, Finlay BB, Nat. Rev. Mol. Cell. Biol. 2003, 4:385-396</p> <p>Gruenberg J, van der Goot FG, Nat. Rev. Mol. Cell. Biol. 2006, 7:495-504</p> <p>Turk BE, Biochem J. 2007, 402:405-417</p> <p>Haraga A, Ohlson MB, Miller SI, Nat. Rev. Microbiol. 2008, 6:53-66</p> <p>Cornelis GR, Nat. Mol. Cell. Biol. 2002, 3:742-752</p> <p>Hamon M, Biere H, Cossart P, Nat. Rev. Microbiol. 2006, 4:423-434</p> <p>Baldari CT, Lanzavecchia A, Telford JL, TRENDS Immunol. 2005, 26:199-207</p> <p>Mueller P, Pieters J, Immunobiol. 2006, 211:549-556</p> <p>Abramovitch RB, Anderson JC, Martin GB, Nat. Rev. Mol. Cell. Biol. 2006, 7:601-611</p>	
	eResources addresses		
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 1. Specify functions of the innate immune system. 2. What is the role of macrophages in the course of infection with pathogenic microorganisms. 3. Which pathogens use strategy of blocking phagosome maturation? 		
Work placement	Not applicable		

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