

**Subject card**

<b>Subject name and code</b>	Pathogenic microorganisms - molecular basis of pathogenesis, PG_00196952						
<b>Field of study</b>	Biotechnology						
<b>Date of commencement of studies</b>	October 2026	<b>Academic year of realisation of subject</b>			2028/2029		
<b>Education level</b>	Bachelor's studies	<b>Subject group</b>			Obligatory subject group in the field of study Optional subject group Subject group related to scientific research in the field of study		
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>			at the university		
<b>Year of study</b>	3	<b>Language of instruction</b>			Polish		
<b>Semester of study</b>	5	<b>ECTS credits</b>			2.0		
<b>Learning profile</b>	academic	<b>Assessment form</b>			credit		
<b>Conducting unit</b>	Intercollegiate Faculty of Biotechnology UG-MUG -> Rector						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr hab. Adam Iwanicki				
	<b>Teachers</b>						
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	16.0	0.0	0.0	0.0	0.0	16
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM		
	<b>Number of study hours</b>	16	5.0	29.0	50		
<b>Subject objectives</b>	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.						
<b>Learning outcomes</b>	<b>Course outcome</b>		<b>Subject outcome</b>		<b>Method of verification</b>		
	[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; proposes advanced methods of assessing these disorders in the field of medical biotechnology and molecular diagnostics.		The student knows the principal 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 test	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"> <li>1. Specify functions of the innate immune system.</li> <li>2. What is the role of macrophages in the course of infection with pathogenic microorganisms.</li> <li>3. Which pathogens use strategy of blocking phagosome maturation?</li> </ol>		
Work placement	Not applicable		

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