University of Gdańsk

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

<table>
<tr><td>Subject contents</td><td>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: Bacillus anthracis, Salmonella typhimurium, Yersinia pestis, Mycobacterium tuberculosis, Listeria monocytogenes, Legionella pneumophila, Helicobacter pylori, Trypanosoma cruzi, West Nile virus, HIV virus will be presented.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>written exam</td><td>51.0%</td><td>100.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>N/A</td></tr>
<tr><td>Supplementary literature</td><td>Gołąb J. i wsp. Immunologia, 2007, PWN, Warszawa
Rosenberger CM, Finlay BB, Nat. Rev. Mol. Cell. Biol. 2003, 4:385-396
Gruenberg J, van der Goot FG, Nat. Rev. Mol. Cell. Biol. 2006, 7:495-504
Turk BE, Biochem J. 2007, 402:405-417
Haraga A, Ohlson MB, Miller SI, Nat. Rev. Microbiol. 2008, 6:53-66
Cornelis GR, Nat. Mol. Cell. Biol. 2002, 3:742-752
Hamon M, Biere H, Cossart P, Nat. Rev. Microbiol. 2006, 4:423-434
Baldari CT, Lanzavecchia A, Telford JL, TRENDS Immunol. 2005, 26:199-207
Mueller P, Pieters J, Immunobiol. 2006, 211:549-556
Abramovitch RB, Anderson JC, Martin GB, Nat. Rev. Mol. Cell. Biol. 2006, 7:601-611</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>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?</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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