University of Gdańsk

Subject card

Subject name and code	Elements of bacterial genetics, PG_00146050						
Field of study	Biology						
Date of commencement of studies	October 2024		Academic year of realisation of subject	2026/2027			
Education level	undergraduate studies		Subject group	Obligatory subject group in the field of study Optional subject group			
Mode of study	full-time studies		Mode of delivery	at the university			
Year of study	3		Language of instruction	Polish			
Semester of study	6		ECTS credits	1.0			
Learning profile	academic		Assessment form				
Conducting unit	Katedra Mikrobiologii -> Faculty of Biology -> Rektor						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Iwona Mruk					
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	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	15		2.0		8.0	25
Subject objectives	- understanding the processes related to the genetic biodiversity of microorganisms and knowledge of gene transfer between bacteria species - understanding the horizontal gene transfers consequences for human life and the nature						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOLL3_W01] The graduate identify the constituent elements and explain the differences in the structure and function of prokaryotic and eukaryotic cells	.	[SW4] test/exam - oral or written
[BIOLL3_K01] The graduate is prepared to evaluate their own knowledge, understand the need for continuous learning and development, and is open to new ideas	.	[SK4] test/exam - oral or written
[BIOLL3_U07] The graduate should be able to independently search for and use available sources of biological information, including electronic sources	.	[SU4] test/exam - oral or written
[BIOLL3_U01] The graduate will be able to use basic apparatus and research tools and follow the correct sequence of operations in laboratory and field work	.	[SU8] observation of student's independent or team work
[BIOLL3_W02] The graduate knows the structure and properties of biological macromolecules, the molecular mechanisms of basal metabolic pathways and genetic information flow and the sources of variation in organisms; the rules of inheritance	.	[SW4] test/exam - oral or written

Subject contents

Mechanisms of horizontal gene transfer in prokaryotic organisms;Main routes of this transfer; Methods of its detection based on genomic DNA analysis; The course and differences in conjugation of Gram-positive and Gram-negative bacteria; Mechanisms of natural transformation and its functions; Regulation of competence state on the example of Streptococcus pneumoniae; Regulation of conjugation in Enterococcus faecalis with the participation of pheromones; Bacteria-bacteriophage interaction (mechanisms and strategies of defense/ attack, the so-called "arms race"); The structure and function of CRISPR; its application in the so-called gene editing technology; Toxin-antitoxin systems; Examples of control of bacterial gene expression by antisense RNA;

Prerequisites and co-requisites

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Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
kolokwium 2	51.0%	50.0%
kolokwium 1	51.0%	50.0%

Recommended reading

Basic literature	Lewin B. Genes VII. Oxford University Press, USA, 1999; dostępne on line; Lodish H. I wsp. Molecular Cell Biology. W.H.Freeman &Co., New York, 2004 (wydanie V) lub 2002 (wydanie IV dostępne online). Węgleński P. Genetyka molekularna. Wyd. Naukowe PWN, Warszawa, 2008 Baj i Markiewicz. Biologia molekularna bakterii. Wyd. Naukowe PWN, 2006 Turner P.C. i wsp. Biologia molekularna. Krótkie wykłady. Wyd. Naukowe PWN, Warszawa, 2007 Materiały wskazane przez prowadzącego zamieszczone w portalu edukacyjnym
Supplementary literature	.
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed

Work placement

Not applicable

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