GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	ANTIMICROBIAL CHEMOTHERAPEUTICS, PG_00065571		
Field of study	Biotechnology		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	Optional subject group Specialty 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	2	Language of instruction	Polish None
Semester of study	3	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Pharmaceutical Technology and Biochemistry -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Piotr Szweda	
	Teachers	dr hab. inż. Piotr Szweda dr inż. Andrzej Skwarecki	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	0.0	0.0	30

E-learning hours included: 0.0

eNauczanie source address: https://enauczanie.pg.edu.pl/2025/course/view.php?id=1249

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	5.0	25.0	60

Subject objectives

The aim of the course is to familiarize students with currently used antimicrobial chemoterpeutics in terms of their chemical structure, methods of production, molecular mechanisms of their biological activity and the mechanisms of drug resistance that microorganisms develop.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_K01] understands the need to constantly update knowledge based on the state of the art in accordance with the latest scientific literature, improve professional skills and the importance of teamwork	Students understand the mechanisms of drug resistance developed by microorganisms. Students understand the procedures involved in the search for new antimicrobial drugs and their introduction into clinical practice.	[SK5] Assessment of ability to solve problems that arise in practice
[K7_W02] explains the structure and function of biomolecules and the methods and instruments for determining their quantity and activity	The student knows the basic groups of antimicrobial chemotherapeutics. The student understands the molecular mechanisms of action of the most important antimicrobial .chemotherapeutics.	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>Course content – lecture

1. Historical Overview, Current Situation 2 hours
2. Main Pathogens of Infectious Diseases Molecular Targets 2 hours
3. Antimicrobial Activity Testing 2 hours
4. Synthetic Antimicrobial Drugs 2 hours
5. Antibacterial Antibiotics
5.1. β-Lactam Antibiotics: Penicillins, Cephalosporins, Others 4 hours
5.2. Tetracyclines and Aminoglycosides 3 hours
5.3. Polypeptide Antibiotics 2 hours
5.4. Non-Polyene Macrolides and Rifamycins 2 hours
5.5. Other Antibacterial Antibiotics and Disinfectants 2 hours
6. Antifungal Chemotherapeutics
6.1. Inhibitors of the Ergosterol Biosynthesis Pathway 2 hours
6.2. Echinocandins and Polyenes 2 hours
7. Antiviral Drugs 1 hour
8. Protozoa 2 hours
9. Proposing New Strategies for Combating Microbial Infections Metal Nanoparticles, Autolysins, Bacteriophages, Bacteriocins (Probiotics) 2 hours</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Basic knowledge in the area of organic chemistry, biochemistry and microbiology.</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>Oral exam</td><td>60.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>An Introduction to medicinal chemistry. Graham L. Patrick, Oxford University Press 2016, ISBN 978-0-19-874969-1

Biotechnologia i Chemia Antybiotyków. Aleksander Chmiel i Stefan Grudziński, PWN, ISBN 83-01-12787-2

Bakterie Antybiotyki Lekooporność. Zdzisław Markiewicz i Zbigniew Kwiatkowski, PWN, ISBN 83-01-13564-6</td></tr><tr><td>Supplementary literature</td><td>Antimicrobial Chemotherapy. Seventh Edition, Peter Davey, Mark H. Wilcox, William Irving, and Guy Thwaites, Oxford University Press, ISBN: 9780199689774</td></tr><tr><td>eResources addresses</td><td></td></tr></table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>Explain the meaning of the terms MIC and MBC and explain how to determine the values of these parameters.
What are the molecular targets of beta-lactam antibiotics?
Characteristics of the two most important polyene macrolide antibiotics with antifungal activity.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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