University of Gdańsk

Subject card

Subject name and code	Selected aspects of toxicology of natural substances and ethnopharmacology, PG_00196953						
Field of study	Biotechnology						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2028/2029			
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	2.0			
Learning profile	academic		Assessment form	credit			
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Kamila Kitowska				
	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 course is to learn about specific groups of organic compounds present in nature, their chemical structure, properties and functions. Students have the opportunity to obtain information about the biological activity of selected compounds, their importance in biotechnology. Students will also learn about the possibilities of using natural compounds for therapeutic purposes. During the course the student will gain knowledge about the basic concepts and terminology used in the chemistry of organic compounds of natural origin, their use in biotechnology and other areas of human activity. Students will gain knowledge in the field of chemistry, botany and toxicology necessary to understand the functions of many groups of natural compounds originated from plants and animals.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOTECHL3_W03] The graduate possesses structured and advanced knowledge of organism-environment relationships and their importance for understanding biological processes and biotechnological applications.	Students know the possibilities of using natural compounds for therapeutic purposes, they also know the concepts and terminology used in the chemistry of organic compounds of natural origin and their use in biotechnology. Students have advanced knowledge of chemistry, botany and toxicology necessary to understand the functions of many groups of natural compounds originated from plant and animal.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report
[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.	Students know the groups of organic compounds present in nature, their chemical structure, properties and function. They also know the biological activities of selected compounds, their importance for the organism and applications in biotechnology.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report

Subject contents

The subject includes multimedia and conversational lectures on the following topics: 1. Natural lipophilic compounds. Waxes, phospholipids, cerebrosides, sphingomyelins. Liposomes - composition, structure and application. Lipid microdomains in biological membranes. Are the lipophilic compounds toxic? 2. Selected peptide hormones. Structure of neuropeptides - potential therapeutic agents. Peptide antibiotics, peptide toxins of various species.
3. Toxic substances from plants/ animal organisms. 4. Selected oligosaccharides common in nature. Glycosides. Glycoproteins, antigenic determinants and blood groups. 5. Alkaloids - selected compounds from plants and animals. Plant metabolites and their use in medicine. Alkaloids - drugs or poisons? Neurotoxins from plants and fungi. 6. Psychoactive compounds (narcotic alkaloids, opioid peptides). 7. Selected steroid compounds and their biological roles (vitamin D, cholesterol, steroid hormones, natural contraceptive compounds, anabolic steroids, anticancer drugs). 8. Isoprene compounds. Terpenes and terpenoids. Selected terpene fragrance compounds. Vitamins A, E and K. 9. Pheromones.
10. Photoreactive compounds occurring in nature, natural dyes, pigment disorders. 11. Bioluminescence. Phototoxicity

Prerequisites and co-requisites

Competencies and skills specified for Modules 01-04 are required

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Written exam	51.0%	100.0%

Recommended reading

Basic literature	Materials provided by lecturer. Aleksander Kołodziejczyk. 2015. Naturalne związki organiczne. Wydawnictwo Naukowe PWN Stanley E. Manahan. 2018. Toksykologia środowiska. Aspekty chemiczne i biochemiczne Donald G. Barceloux. 2009. Medical Toxicology of Natural Substances. Foods, Fungi, Medicinal Herbs, Plants, and Venomous Animals. John Wiley & Sons, Inc
Supplementary literature	-
eResources addresses	

Example issues/ example questions/ tasks being completed

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Work placement

Not applicable

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