University of Gdańsk

Subject card

Subject name and code	Xenobiotics, PG_00099393		
Field of study	Marine Biotechnology		
Date of commencement of studies	October 2025	Academic year of realisation of subject	2026/2027
Education level	Master's studies	Subject group	Optional subject group
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	English
Semester of study	4	ECTS credits	1.0
Learning profile	academic	Assessment form	credit
Conducting unit	UG Institute of Biotechnology -> Intercollegiate Faculty of Biotechnology UG-MUG -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Grzegorz Gołuński	
	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	10.0	27

Subject objectives

The course introduces several groups of the chemical compounds present in various forms in the environment. During the classes chemical structure, origin, metabolism and possible, positive as well as negative effects of xenobiotics are to be discussed. Short panel describing basic methods for xenobiotics detection and analysis is also included. Preparation and presentation of the short talk on the chosen subject will also promote searching and critical analysis of source materials and practice scientific discussion.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[MBMU2-KW04] Knows and deeply understands advanced research methods used in marine biotechnology and related sciences	The student knows and understands the basic methods of detection and analysis of xenobiotics in a variety of biological material	[SW2] presentation/project/paper/ report
[MBMU2-KW03] Knows and understands complex biological phenomena at the molecular level, understands their significance for an organism, marine environment and marine biotechnology	The student knows the chemical structure, origin, metabolism and possible positive and negative effects of xenobiotics, as well as basic methods of detection and analysis of xenobiotics	[SW2] presentation/project/paper/ report
[MBMU2-KK01] Is ready to critically evaluate his knowledge and continuously improve, update and upgrade his skills in the field of marine biotechnology	The student is able to prepare a presentation on a selected topic based on an independent and critical analysis of retrieved sources.	[SK2] presentation/project/paper/ report

Subject contents

1. Mutagens and mutagenesis compounds directly or indirectly interacting with/on DNA (reactive oxygen species generators, alkylating agents,benzene, furanocoumarins, aromatic amines, proflavine). Use of mutagens in biotechnology.2. Toxins and poisons where and how do we use them? potential threats. Biocides, aflatoxin, botulinum toxin, heavy metals, polycyclic aromatichydrocarbons, chosen biological and chemical weapons.3. Antimutagens Potential uses of methylxanthines, flavonoids and other antioxidants in protection from mutagens.4. Medicines origin, use, metabolism and side effects of chosen medicines (Nonsteroidal anti-inflammatory drugs, classic anticancer drugs,corticosteroids, beta blockers, inhibitors of cellular receptors, benzodiazepines).5. Psychoactive substances and drugs of abuse mechanism of action, influence on organism, use in medicine (amphetamine, cannabinoids,chosen opiates, LSD, alcohol, nicotine, designer drugs)6. Performance enhancing drugs (doping) bane of professional sports anabolic steroids, hormones, stimulants.7. Physicochemical methods for detection of discussed substances.8. Biological methods for analysis of discussed substances.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">Basic knowledge in biochemistry and molecular biology</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>presentation</td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">Curtis D. Klaasen, Casarett & Doulls Toxicology. The Basic Science of Poisons. 7thed. 2008, McGraw-Hill Medical Publishing Division Frank A. Barile, Clinical Toxicology. Principles and Mechanisms. 2nded. 2010 Informa Healthcare Pavel Anzenbacher, Ulrich M. Zanger, Metabolism of Drugs and Other Xenobiotics, 2012 Wiley-Vch Materials provided by the lecturer during course</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">VV Pilay, Modern Medical Toxicology, 4th ed. 2013, Jaypee Brothers Medical Publishers John A. Timbrell, Principles of Biochemical Toxicology, 4th ed. 2009, Informa Healthcare Ashraf Mozayani, Lionel Raymon, Handbook of Drug Interactions, 2nd ed., 2012, Humana Press</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">not applicable</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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