

**Subject card**

<b>Subject name and code</b>	Marine Natural Products - laboratory classes, PG_00201679						
<b>Field of study</b>	Marine Biotechnology						
<b>Date of commencement of studies</b>	October 2026	<b>Academic year of realisation of subject</b>			2026/2027		
<b>Education level</b>	Master's studies	<b>Subject group</b>			Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>			at the university		
<b>Year of study</b>	1	<b>Language of instruction</b>			English		
<b>Semester of study</b>	1	<b>ECTS credits</b>			1.0		
<b>Learning profile</b>	academic	<b>Assessment form</b>			credit		
<b>Conducting unit</b>	Laboratory of Marine Biotechnology -> Department of Marine Biology and Biotechnology -> Faculty of Oceanography and Geography -> Rector						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr Robert Konkul				
	<b>Teachers</b>						
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	0.0	0.0	15.0	0.0	0.0	15
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	<b>Number of study hours</b>	15		2.0		8.0	25
<b>Subject objectives</b>	Acquiring knowledge on the pharmacological potential of marine bioproducts and technologies used to assess their medicinal properties, including: research biological tests, preclinical tests, and clinical trials. Understanding the ethical challenges and dilemmas associated with in vivo research						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[MBMU2-KK03] Is ready to apply the principles of occupational health and safety, especially in the laboratory and at sea; is responsible for their own and others' safety; can recognize hazards and take appropriate action	The student will be able to discuss and evaluate the ethical risks and dilemmas associated with the pharmacological development of marine products, including ethical risks and dilemmas related to preclinical and clinical trials.	[SK1] oral statement/conversation/discussion [SK8] observation of student's independent or team work
	[MBMU2-KU01] Can plan and conduct research in the laboratory and at sea, and to document procedures and results. Independently or under the supervision of an authorized staff member, carries out work using specialized equipment. Complies with occupational health and safety regulations.	The student will acquire knowledge about the potential pharmacological use of natural marine products. They will be able to describe the stages of development of marine bioproducts as potential drugs, including product acquisition, in vitro tests, preclinical and clinical trials. The student will be able to list examples of marine-derived drugs. They will understand and be able to describe the operation of advanced methods used to assess the pharmacological potential of natural marine products, including toxicity tests, stability tests, activity assays, enzymatic tests, cell culture techniques, organoid culture, work with <i>C. elegans</i> , and various stages of preclinical and clinical trials.	[SU4] test/exam - oral or written [SU8] observation of student's independent or team work
Subject contents	Basics of marine bioproduct development as potential drugs. Justification for the use, advantages, and disadvantages of various in vitro tests, cell culture tests, organoids, and model organisms. Objectives and stages of preclinical tests and clinical trials. Examples of marine-derived drugs.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	The written response.	51.0%	80.0%
	report	51.0%	20.0%
Recommended reading	Basic literature	Schumacher Alexander, Hinder Markus, Gassmann Oliver, 2016. Value Creation in the Pharmaceutical Industry: The Critical Path to Innovation, Wiley-VCH, ISBN-10: 3527339132; ISBN-13: 9783527339132; Graham Patric., 2018. An Introduction to medicinal chemistry. Oxford University Press, UK, ISBN: 9780198796589	
	Supplementary literature	Selected scientific articles, for example: Marine Drugs (MDPI), Marine Biotechnology (Springer)	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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