University of Gdańsk

Subject card

Subject name and code	Smal molecules – big activity, PG_00170424						
Field of study	Chemical Business, Chemistry						
Date of commencement of studies	October 2024		Academic year of realisation of subject	2026/2027			
Education level	Bachelor's studies		Subject group	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	5		ECTS credits	2.0			
Learning profile	academic		Assessment form	credit			
Conducting unit	Laboratory of Structural Research of Biopolymers -> Department of Organic Chemistry -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Emilia Iłowska				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	0.0	0.0	30
	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	30		10.0	20.0	60	
Subject objectives	The purpose of the course is to familiarize students with basic compounds that exhibit biological activity such as peptides, proteins, lipids, antibiotics. To determine the relationship between structure (structure) and activity. To indicate the application potential of active compounds and to familiarize students with basic techniques to determine activity and structural studies. The goal is to introduce students to the possibilities and potential that molecules have as a basic building block.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[CHEML3_W03] Explains the relationship between the structure of matter and its observed properties.	Students know the basic relationships between the structure of proteins, peptides and their biological activity. They are able to identify the strengths of a compound affecting their potential activity. know on which factors changes in activity can depend. They are able to design new compounds with specific functions.	[SW1] oral statement/ conversation/discussion
	[CHEML3_U06] Uses basic application software packages to solve problems from the field of science.	Students know and use basic data analysis software. They are able to handle and analyze data from basic and necessary equipment used in the study of biological activity of chemical compounds	[SU6] demonstration of practical skills
	[CHEML3_K08] Formulates opinions in the field of science with caution and criticism in their expression.	The student independently draws conclusions on the basis of the collected data. He compares them to the set values and evaluates them against their applicability in practice.	[SK2] presentation/project/paper/ report
	[CHEML3_U08] Presents in an understandable way the basic facts about chemistry using a scientific language typical of chemical sciences.	The student can independently generate basic graphs, structures based on data collected in experiments. Develops and presents data, critically evaluates them against reference values and in terms of application.	[SU2] presentation/project/paper/ report
	[CHEML3_K02] Works individually demonstrating initiative and independence of activity and cooperates in a team fulfilling various roles in it.	The student independently or with the help of a group evaluates the application potential of selected biologically active compounds. Evaluates the collected data against general data. Compares them with literature data.	[SK8] observation of student's independent or team work
	[CHEML3_U02] Performs analyses using experimental methods and draws conclusions based on them.	The students performs basic analyses on stability and antimicrobial activity studies using HPLC and spectrophotometry. Independently compiles data and draws conclusions based on the collected data.	[SU2] presentation/project/paper/ report
	[CHEML3_W05] Has basic knowledge of the chemical specialisation studied.	Students have advanced knowledge in the chemistry of peptides, proteins and small molecules with specific biological activities such as antimicrobial properties, anticancer properties, use as drug delivery systems, nanotechnology. His knowledge is focused on the use and applicability of the compounds he has learned.	[SW2] presentation/project/paper/ report
	[CHEML3_W04] Characterises the basic methods of chemical compound analysis.	Students know and can appropriately identify analytical/ diagnostic methods for evaluating the properties of biologically active compounds. Distinguish between techniques used to determine structures and functional groups. Know and distinguish techniques for evaluating antimicrobial, anticancer activity and stability of compounds.	[SW1] oral statement/ conversation/discussion
	[CHEML3_K05] Observes established procedures in laboratory work and is responsible for the safety of her/his and others' work.	Students know the basic principles of working in a chemical and biological laboratory. Know how to handle waste, basic laboratory equipment. They know and apply the principles of safe work.	[SK8] observation of student's independent or team work
Subject contents	During the course, students will independently perform experiments to evaluate the antimicrobial potential and stability of compounds such as peptides. They will learn techniques and research methods that allow them to evaluate the relevant properties of molecules with well-defined biological activity. They will learn about the possibilities of their real and applied use in modern medicine and nanotechnology.		
Prerequisites and co-requisites	Completed course in organic chemistry and biochemistry		

<table>
<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>activity on the class</td><td>51.0%</td><td>20.0%</td></tr>
<tr><td>class presentation - report</td><td>51.0%</td><td>80.0%</td></tr>
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<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">Materials in the form of prepared laboratory instructions</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">1. Peptide-Based Drug Discovery: Challenges and New Therapeutics

Wydawca: Royal Society Of Chemistry</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">1. discuss the structure of your chemical compound. 2. discuss the biological activity results of your chosen chemical compound.3. discuss the results of stability tests of your chemical compound4. suggest a method of using the compound in practice</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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