

Subject card

Subject name and code	What can electrochemical methods offer in the study of biologically active compounds?, PG_00080777						
Field of study	Chemical Business, Chemistry, Environmental Protection						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2027/2028		
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		English		
Semester of study	6		ECTS credits		2.0		
Learning profile	academic		Assessment form				
Conducting unit	Department of Bioinorganic Chemistry -> Faculty of Chemistry -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		prof. dr hab. Mariusz Makowski				
	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		33.0	50
Subject objectives	Presenting how small molecules interact with the DNA chain is essential in pharmaceuticals research. Familiarize students with an electrochemical approach to the study of drug-biomolecule interactions, with particular emphasis on voltammetric techniques. Familiarize students with theoretical and practical aspects of electrochemical methods in the analysis of biomolecule interactions						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[CHEML3_K06] Raises her/his professional and personal competences by using information provided in various sources.		Students know: types of drug-DNA interactions, theoretical and practical aspects of electrochemical methods in the analysis of biomolecule interactions, principles of voltammetric methods		[SK4] test/exam - oral or written		
	[CHEML3_W10] Enumerates and describes the basic aspects of the construction, operation and use of measuring apparatus and equipment used in experimental works in the field of chemistry and related sciences.		Students understand the need of learning and update knowledge, the practical application of the acquired knowledge and skills in solving problems		[SW4] test/exam - oral or written		
Subject contents	Topics of the lecture: electrochemical methods consisting in electrolysis of the diffusion layer and current measurements, voltammetric methods, cyclic voltammetry, differential pulse voltammetry, electrochemical characteristics of biologically active compounds, redox potential in healthy cells and neoplastic cells, types of drug-DNA interactions, techniques used to describe the interactions principles of measurements with electrochemical techniques, types of electrodes and research approaches, the use of voltammetric methods to study drug-DNA interactions						
Prerequisites and co-requisites							

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Assessment criteria in accordance with the University of Gdańsk Study Regulations	51.0%	100.0%
Recommended reading	Basic literature	SCB de Oliveira, VC Diclescu, AM Chiorcea Paquim, AM Oliveira-Brett - Electrochemical Biosensors for DNADrug Interactions	
	Supplementary literature	A Mukherjee WD Sasikala - Advances in Protein Chemistry and Structural Biology	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Characterize the interaction plot of any particle with DNA based on measurements using the switchSense technique.		
Work placement	Not applicable		

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