University of Gdańsk

Subject card

Subject name and code	Functional analysis of sequences in Eukaryot, PG_00147775		
Field of study	Genetics and Experimental Biology		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2026/2027
Education level	undergraduate studies	Subject group	Obligatory subject group in the field of study 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	1.0
Learning profile	academic	Assessment form	
Conducting unit	Pracownia Molekularnych i Komórkowych Podstaw Strategii Nutr -> Katedra Biologii i Genetyki Medycznej -> Faculty of Biology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr Marta Moskot	
	Teachers		

Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	15.0	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	3.0	7.0	25

Subject objectives
1. Familiarization with genetic sequence databases.2. Acquiring the ability to use methods and techniques for gene ontology analysis in Eukaryota (GOrilla, AmiGO, ShinyGO programs)3. Identification of the role of a protein product based on molecular pathway analysis (KEGG database)4. Functional analysis of DNA sequences using results obtained from databases (GEO).

Learning outcomes

Course outcome	Subject outcome	Method of verification
[GBEL3_U04] Capable of reading scientific texts in English and Polish with comprehension, synthesizing the knowledge contained within them, preparing well-documented studies on biological issues, as well as those related to research commercialization.	Student, expands acquired knowledge by familiarizing yourself with additional materials.	[SU1] oral statement/conversation/ discussion [SU4] test/exam - oral or written
[GBEL3_W03] The molecular mechanisms of genetic information transmission and gene expression, as well as the molecular and genetic basis of human physiology and diseases, including infectious diseases.	The student knows the mechanisms of genetic information transfer and gene expression, and is able to use gene ontology analysis (GO) to find and assign genes' their role and place in biological processes.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[GBEL3_W01] Understanding the structure and properties of basic types of biological macromolecules, molecular mechanisms of metabolic pathways and genetic information flow, as well as sources of genetic variability in organisms and mechanisms of evolution; explaining the rules of inheritance, elucidating differences in the structure and functioning of prokaryotic and eukaryotic cells, and understanding the structure and functional relationships at the cellular and tissue levels.	Student understands the role and importance of biological processes in the functioning of cells and whole eukaryotic organisms.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[GBEL3_W05] the principles of research planning based on achievements in biological sciences and related fields, the potential application of their results in practice, the principles of operation of equipment and apparatus used in molecular genetics research, and the principle of interpreting biological phenomena and processes based on empirical data in research and practical activities, with consideration for sustainable use of biological diversity.	The student makes a synthesis of knowledge contained in the available sources by preparing well documented studies biological problems.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[GBEL3_W06] the development and current state of knowledge, as well as the latest trends in molecular genetics and related fields; indicating their relationship with other disciplines in the natural or medical sciences and the possibilities of their practical application.	Student is able to find and verify the tools, and describe the results of performed analysis.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[GBEL3_K07] Lifelong learning and updating knowledge in the field of molecular genetics and other disciplines.	Student acquires knowledge about new databases and methods analysis, and the possibility of their applications.	[SK1] oral statement/conversation/ discussion [SK4] test/exam - oral or written

Subject contents

Basic methods and research approaches of genetics. Gene ontology, annotation of the eucariotic DNA sequence. Bioinformatics methods for the study of gene expression, function and regulation. Bioinformatics databases and their application in functional comparative analysis of organisms.

Prerequisites and co-requisites

Basic knowledge of cell biology, molecular biology, genetics.

Assessment methods and criteria

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

Recommended reading

Basic literature	The Gene Ontology Handbook, Christophe Dessimoz, Nives Škunca, 2017

	Supplementary literature	Scientific publications in the field of ontological analysis, with particular emphasis on taking into account the work describing the methodology used in the during classes, programs and databases
	eResources addresses	Uzupełniające Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	1.Which database traces the pathways of drug development?2.List genes belonging to: hsa00590 Arachidonic acid metabolism.3.Which program would you use to search for genes belonging to the biological process for Glycine max?4..What program and type of analysis would you choose to perform an ontological analysis of a group of genes belonging to Vibrio cholerae?5. Which of the learned programs for gene ontology analysis would you use in your own research and why?	
Work placement	Not applicable	

Document generated electronically. Does not require a seal or signature.