University of Gdańsk

Subject card

Subject name and code	Functional analysis of DNA sequences in Eukaryot, PG_00149276		
Field of study	Medical 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	6	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	4.0	6.0	25

Subject objectives

1. Familiarization with genetic sequence databases.

2. Acquisition of the ability to use methods and techniques for sequence analysis in Eukaryotes (programs GOrilla, DAVID, AmiGO, ShinyGO)

3. Identification of the role of a protein product based on molecular pathway analysis (KEGG database)

4. Functional DNA sequence analysis using results obtained from databases (GEO)

Learning outcomes

Course outcome	Subject outcome	Method of verification
[BIOLMEDL3_W12] is oriented in the development and current state of knowledge and the latest trends in medical biology; indicates their relationship with other disciplines of natural or medical sciences	Student is familiar with the current state of knowledge and the latest trends in molecular biology, indicates their relationship with other disciplines of natural or medical sciences.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[BIOLMEDL3_U06] reads with understanding scientific texts in Polish and simple texts in English in the field of medical biology; independently searches and uses available sources of information, including electronic sources	After familiarizing themselves with the presented content, the student expands their knowledge by familiarizing themselves with additional materials.	[SU5] implementation of a problem task
[BIOLMEDL3_U05] synthesises data from different sources and draws appropriate conclusions from them	Student makes a synthesis contained in the available sources of knowledge, preparing well-documented studies of biological problems.	[SU4] test/exam - oral or written
[BIOLMEDL3_K01] understands the need for lifelong learning and to update his/her knowledge of medical biology and related disciplines	Student gains knowledge about new databases and methods of analysis, and the possibilities of their application.	[SK4] test/exam - oral or written
[BIOLMEDL3_W02] describes the structure and properties of basic types of biological macromolecules, molecular mechanisms of the pathways of basal metabolism and flow of genetic information, and sources of variation in organisms; explains the rules of inheritance	Student understands the importance of biological processes in the functioning of cells and whole eukaryotic organisms.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion

Subject contents

Basic methods and research approaches of genetics. Ontology, annotation of the Eukaryota 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 papers describing the methodology of programs and databases used during classes.
eResources addresses	Uzupełniające Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed

1. Which database allows to trace the pathways of drug development?

2. List the genes belonging to: hsa00590 Arachidonic acid metabolism.

3. Which program would you use to search for genes belonging to a biological process for Glycine max?

4. Which program and type of analysis would you choose to perform an ontological analysis of a group of genes belonging to the Vibrio cholerae?

5. Which of the learned ontological analysis programs would you use in your own research and why?

Work placement

Not applicable

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