SYLLABUS

Name of the department / clinic providing the course: Department of Functional Genomics

Course title: Nutrigenomics

Course profile: molecular

Discipline: medical sciences

Level of course unit: international doctoral school
Course unit title: Nutrigenomics
Course unit code:-
Type of course unit: elective
Course aims: The aim of the course is to educate PhD students to the topic of nutrition in relation to genomics and associated fields of study (transcriptomics, proteomics, metabolomics), examining its involvement in pathological and physiological processes including cancer, obesity, and metabolic and cardiovascular diseases. Together with the individual/ethnic characteristics that affect the individual impact of dietary components on the genome and phenotype, the interaction between diet and genetic predispositions in lifestyle conditions will also be discussed. The course additionally attempts to offer PhD students the practical skills they need to independently explore different databases for gene polymorphisms or mutations that might influence how each individual interacts to various nutrients, so affecting their health and susceptibility to disease.

Form of study: on-line
Year and semester of study: summer semester
Types of educational activities and number of hours allocated:

Subject	Language course	Self-study	Lecture	Exercises	Laboratory	Seminar	Practical	e-learning	Profession practice	Other (what?)	ECTS points
						10					

Number of ECTS credits allocated and their structure according to students' form of learning: -

Names of course unit's faculty: Faculty of Biomedical Sciences, Faculty of Medicine

Prerequisites: molecular biology and genetics

Learning activities and teaching methods:
Seminars - verbal communication; multimedia presentation, practical part: analysis of scientific articles and SNP databases, discussion, demonstration, project

Course unit content:
The topics of the lectures will be related to the following issues:
1. The influence of dietary components on the expression of genetic information.
2. Bioactive ingredients in functional foods – occurrence, classification, and mechanisms of action.
3. Nutrigenomics and nutrigenetics in the prevention of metabolic diseases and cancer.
4. Dietary supplementation in individuals with genetic disorders.
5. Commercially available genetic tests in the field of nutrigenetics and nutrigenomics.
6. Mutations, gene polymorphisms, and their significance.
7. Databases of gene polymorphisms and mutations, such as NCBI RefSeq and GeneRIF, UniProtKB, SNPedi, COSMIC, ENSEMBL, OMIM, and dbSNP.

In the second practical part, the doctoral student will also acquire the skills to independently search for information from the gene polymorphism and mutation databases discussed earlier.

Course objectives:

Knowledge:
After graduating, the student knows and understands:
- theoretical and general issues in the field of nutrigenomics
- has knowledge about genetic disorders in diet-related diseases
- can justify the relationship between diet and gene expression

Skills:
After graduating, the student is able to:
- search, evaluate and use scientific information from medical databases and critically analyze the data included therein
- develop and present data and draw conclusions based on research results
- communicate, analyze and evaluate the possibilities of using the acquired knowledge

Attitudes and transferrable (generic) competencies:
After graduating, the student is ready to:
- critically assess the achievements within a given scientific or artistic discipline, critically assess one's contribution to the development of a given scientific or artistic discipline, recognize the importance of knowledge in solving cognitive and practical problems

Required and recommended learning resources (readings):

Required:
1. Savini, Isabella; Gasperi, Valeria; and Catani, Valeria M (July2016) Nutrigenetics. In: eLS. John Wiley & Sons, Ltd:Chichester.
2. Marco Malavolta, Eugenio Mocchegiani Molecular Basis of Nutrition and Aging - 1st Edition – Elsevier, Academic Press, ISBN: 978-0-12-801816-3
3. Nutrigenomics and the Future of Nutrition. Washington (DC): National Academies Press (US); 2018
4. Omar Ramos-Lopez , Fermín I Milagro, Hooman Allayee, Agata Chmurzynska, Myung Sook Choi, Rui Curi, Raffaele De Caterina, Lynnette R Ferguson, Leticia Goni, Jing X Kang, Martin Kohlmeier, Amelia Marti, Luis A Moreno, Louis Pérusse, Chandan Prasad, Lu Qi, Ram Reifen, Jose I Riezu-Boj, Rodrigo San-Cristobal, Jose Luis Santos, J Alfredo Martínez „Guide for Current Nutrigenetic, Nutrigenomic, and Nutriepigenetic Approaches for Precision Nutrition Involving the Prevention and Management of Chronic Diseases Associated with Obesity„ J Nutrigenet Nutrigenomics . 2017;10(1-2):43-62
6. Chmurzyńska A. Nutrigenomika PZWL Wydawnictwo Lekarskie , 2022
7. Catherine M. Phillips Nutrigenetics and Metabolic Disease: Current Status and Implications for Personalized Nutrition Nutrients 2013, 5, 32-57
8.Panczyk M. Nutrigenetyka i nutrigenomika – zastosowanie technologii „omics" w optymalizacji żywienia człowieka. Pediatric Endocrinology, Diabetes and Metabolism 2013, 19, 2, 70-77
9. Neelakanta Pillai Padmakumari Soumya, Saraswathy Mini, Shali Kochuvelickakathu Sivan, Sukanta Mondal Bioactive compounds in functional food and their role as therapeutics. Bioactive Compounds in Health and Disease 2021; 4(3): 24-39

Recommended:-
Assessment methods and criteria: Attendance at the seminar, active participation and completion of planned tasks during classes.

Additional information:
Contact person Elżbieta Płuciennik, associate professor
Department of Functional Genomics, Medical University of Lodz, e-mail: elzbieta.pluciennik@umed.lodz.pl

Statement and signature of the course leader:

I hereby state that the content of the curriculum included in the syllabus below is the result of my

individual work completed as part of a work contract/cooperation resulting from a civil law contract and that author rights to this title are not the property of a third party.



Signed by /
Podpisano przez:

Elżbieta Janina
Płuciennik

Date / Data: 2026-
07-15 09:33