



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΕΘ.Α.Α.Ε.
ΕΘΝΙΚΗ ΑΡΧΗ ΑΝΩΤΑΤΑΤΗΣ ΕΚΠΑΙΔΕΥΣΗΣ

HELLENIC REPUBLIC
H.A.H.E.
HELLENIC AUTHORITY FOR HIGHER EDUCATION

UNIVERSITY OF WEST ATTICA

FACULTY: HEALTH AND CARING SCIENCES

DEPARTMENT: BIOMEDICAL SCIENCES

Postgraduate/Master Program

“Biomedical Methods and Technology in Diagnosis”

Course Outline

MOLECULAR PHARMACOLOGY-PHARMACOKINETICS



ATHENS 2023

(1) GENERAL

FACULTY	HEALTH AND CARING SCIENCES		
DEPARTMENT	BIOMEDICAL SCIENCES		
COURSE LEVEL	POSTGRADUATE/MASTER		
COURSE CODE	IA6	SEMESTER	B
COURSE TITLE	MOLECULAR PHARMACOLOGY-PHARMACOKINETICS		
INDEPENDENT TEACHING ACTIVITIES	PERIODS PER WEEK	ECTS	
LECTURES AND LAB EXERCISES	4	7	
COURSE TYPE	BACKGROUND SPECIALIZATION AND GENERAL KNOWLEDGE		
COURSE PREREQUISITES:			
TEACHING AND EXAM LANGUAGE:	GREEK		
ERASMUS STUDENTS PROVIDED COURSE	YES		
COURSE ELECTRONIC PLATFORM(URL)	https://eclass.uniwa.gr/courses/DML115/		

2. ΜΑΘΗΣΙΑΚΑ ΑΠΟΤΕΛΕΣΜΑΤΑ

Learning outcomes

The purpose of the course is to provide modern approaches to the interpretation of the desired and/or unwanted effect of drugs. By studying the mechanisms of action at the molecular/kinetic level, a more complete understanding is possible for the more rational use of drugs. The background of modern molecular techniques comes to contribute to the above objective of diagnostics used for the diagnosis of. Postgraduate students are trained in laboratory molecular and kinetic methodologies, related to pharmacodynamic, pharmacokinetic and pharmacogenetic parameters, in order to evaluate personal genetic data, to limit the limitation of adverse effects from pharmacotherapy.

Postgraduate students will be able to use their knowledge for the successful laboratory diagnosis and evaluation of kinetic and genetic parameters, related to the absorption, distribution, metabolism and elimination of the drug from the body, in relation to the genetic background of the patient.

Aim and objectives

Taking into account the general skills that the graduate must have acquired (as listed in the Diploma Appendix and listed below) which / which of them is the course aimed at:

Search, analysis and synthesis of data and information, using the necessary technologies

Project planning and management

Adaptation to new situations

Respect for diversity and multiculturalism

Decision making

Respect for the natural environment

Autonomous work

Demonstrating social, professional and ethical responsibility and sensitivity to gender issues

Team work

Exercise criticism and self-criticism

Work in international environment

Promotion of free, creative and inductive thinking

Work in interdisciplinary environment

Other...

Generating new research ideas

3. COURSE CONTENT

Topics Lectures:

1. General introductory concepts. Clinical pharmacology. Clinical drug trials. Toxicity. Therapeutic index
2. Absorption of drugs. Routes of drug administration. Ionization. Drug diffusion. Bioavailability-bioequivalence. Applications
3. Distribution of medicines. Protein binding. Plasma proteins. Displacement. Pharmacokinetic models. Apparent volume of distribution. Applications
4. Metabolism of drugs. Metabolic pathways. CYP isoforms. Polymorphisms. Pharmacogenetics/pharmacogenomics
5. Excretion. Clearance. Half-life time. Unwanted actions. Drug classes for Pharmacokinetic/Pharmacogenetic testing
6. Laboratory methods for the determination of drugs and metabolites in biological fluids. Nonlinear pharmacokinetics
7. Object of Molecular Pharmacology. Generally about receptors. Drug-receptor

- interactions. Mechanisms of action of agonists, antagonists and allosteric modifiers
8. A) Receptors that regulate ion channels Pharmacological approaches: analgesics, anesthetics, cardiovascular, anxiolytics, antiepileptics, drugs for neurodegenerative diseases and smoking cessation
 9. B) Receptors coupled to G proteins, GPCRs (ions, amino acids, monoamines, lipids, purines, neuropeptides, hormones, cytokines) and transduction of the message
 10. C) Receptors with catalytic action (tyrosine kinase, guanylate cyclase). Intracellular receptors as drug targets. Pharmacological approaches to inhibition of the above
 11. DNA or RNA as a drug target. General Mechanisms of Action of Anticancer Drugs
 12. Enzymatic and non-enzymatic antioxidant systems, oxidative stress and oxidative agents in pathological conditions.

Lab and tutor exercises

- Laboratory methods for determining drug and metabolite levels (immunofluorescence, high pressure liquid chromatography, LC-MS).
- Pharmacokinetic testing (TDM) of drugs with a narrow therapeutic range (Therapeutic Index).
- Clinical Pharmacokinetics Models (nomograms, Bayesian feedback, population pharmacokinetics).

4. TEACHING METHODS-EVALUATION

TEACHING MODE	In the classroom and in the lab face to face. Distance education (modern and asynchronous education and teaching) using electronic means of modern and asynchronous education, such as MS Teams, Zoom, Skype, etc.	
INFORMATION AND COMMUNICATION TECHNOLOGY USE	<ul style="list-style-type: none"> • Learning process support through the UNIWA Open e Class online process • Specialized laboratory equipment 	
TEACHING PLAN <i>The way and methods of teaching are described in detail.</i> <i>Lectures, Seminars, Laboratory Exercise, Field Exercise, Literature Study & Analysis, Tutorial, Internship (Placement), Clinical Exercise, Art Workshop, Interactive Teaching, Educational Visits, Study Preparation (Project), Writing</i>	Activities	Semester workload
	Lectures	30
	Lab and tutorial exercises	15
	Interactive teaching	15
	Ref. study and analysis	20

<i>Paper / Assignments, Artistic Creation, etc. etc. The student's study hours for each learning activity as well as unguided study hours according to ECTS principles are listed</i>	Writing paper	20
	Writing dissertation	20
	Educational visits	20
	Independent study	60
	Course total units	200
<p align="center">ΑΞΙΟΛΟΓΗΣΗ ΦΟΙΤΗΤΩΝ STUDENTS EVALUATION</p> <p><i>Description of the evaluation process Assessment Language, Assessment Methods, Formative or Deductive, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Report / Report, Oral Examination, Public Presentation, Laboratory Work, Clinical Patient Examination, Artistic Interpretation, Other / Others They are explicitly stated</i></p>	<p>1. Written final exam (60%) including:</p> <ul style="list-style-type: none"> • Multiple choice questions • Short analysis questions • Study of cases and/or clinical cases • Problem solving <p>2. Presentation of optional individual work (40%)</p>	

5. RECOMMENDED BIBLIOGRAPHY

Suggested Bibliography (in Greek and international translated into Greek)

1. «Σημειώσεις Μοριακής Φαρμακολογίας. Η μοριακή άποψη της δράσης φαρμάκων», Α. Κουρουνάκη, Πανεπιστήμιο Αθηνών, 2007
2. Επίκαιρα Θέματα Φαρμακολογίας. Μ. Βενετίκου, Γ. Ιατράκης, Γ. Α. Καρίκας, Εκδόσεις Ζεβελεκάκη, Β Έκδοση, 2020
3. Σημειώσεις Φαρμακοκινητικής, Γ. Α. Καρίκα 2019, Frederick University
4. Φαρμακολογία. 5η Έκδοση. Rang H.P. / Dale M. / Ritter J.M. / Moore P.K. Εκδόσεις Παρισιάνου, 2008
5. «Σημειώσεις Μεταβολισμού Φαρμάκων», Α. Κουρουνάκη, Πανεπιστήμιο Αθηνών, 2007
6. Μοριακή Φαρμακολογία. Ε. Παπαδημητρίου. Εκδόσεις Παρισιάνου 2010.
7. Κλινική Φαρμακολογία και Θεραπευτική. G A. McKay, J.L Reid, M.R. Walters. Εκδόσεις Παρισιάνου, 2014
8. Η Φαρμακοκινητική με απλά λόγια. D.J. Birkett. Εκδόσεις Παρισιάνου, 2005
9. Εγχειρίδιο Φαρμακολογίας. H. Lullmann, K. Mohr, A. Ziegler, D. Bieger. Εκδόσεις Λίτσας, 2005.