



UNIVERSITY OF
PATRAS
ΠΑΝΕΠΙΣΤΗΜΙΟ ΠΑΤΡΩΝ

DEPARTMENT OF PHARMACY

SCHOOL OF HEALTH SCIENCES

UNIVERSITY OF PATRAS
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POSTGRADUATE PROGRAM: **DRUG DESIGN AND DEVELOPMENT**

COURSE TITLE: MOLECULAR TARGETS OF DRUG ACTION
CODE: DPHA_C01

**MOLECULAR TARGETS OF DRUG ACTION
COURSE OUTLINE**

1. GENERAL

SCHOOL	HEALTH SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF PHARMACY		
PARTICIPATING INSTITUTIONS	-		
TITLE of POSTGRADUATE PROGRAM	DRUG DESIGN AND DEVELOPMENT		
LEVEL	POSTGRADUATE		
COURSE CODE	DPHA_C01	SEMESTER	B'
COURSE TITLE	MOLECULAR TARGETS OF DRUG ACTION		
INDEPENDENT TEACHING ACTIVITIES	WEEKLY TEACHING HOURS	CREDITS	
Courses	3	5	
COURSE TYPE	<i>Scientific field:</i> In-depth understanding of the theoretical and experimental approaches and methods in Molecular Pharmacology. <i>Development of skills</i> in critical evaluation of experimental approaches and design of experiments to study molecular targets of drug action.		
PREREQUISITE COURSES	Not required but recommended to have ATTENDED PRECLINICAL AND CLINICAL DRUG EVALUATION in the 1 st semester.		
LANGUAGE of INSTRUCTION and EXAMINATIONS	Greek. However, a large part of lecture material, scientific articles and final exam questions is in English. If there are Erasmus or other students that are no fluent in Greek, the course is totally in English.		
COURSE OFFERED to ERASMUS STUDENTS	Yes		
COURSE (URL)	http://www.pharmacy.upatras.gr/images/DS/DPHA_A01_EN.pdf		

2. LEARNING OUTCOMES

Learning Outcomes
<p>Understanding of concepts and experimental approaches related to the identification and study of molecular targets of drug action.</p> <p>Develop critical thinking skills to evaluate literature, methodologies, approaches, results, and conclusions.</p> <p>Independent analysis and synthesis of experimental and other data (e.g., from research/scientific publications) to draw conclusions.</p>

Development of oral and written presentation of experimental data and argumentation, based on experimental and/or clinical data.

Acquiring the ability to design an appropriate experimental methodology and approach to evaluate drug action through a specific molecular target (problem solving).

General Competences

- Search, analysis and synthesis of data and information, using the necessary technologies
- Adaptation to new situations
- Decision making
- Autonomous work
- Teamwork
- Work in an international environment
- Work in an interdisciplinary environment
- Generating new research ideas
- Respect for diversity and multiculturalism
- Respect for the natural environment
- Demonstrating social, professional, and ethical responsibility and sensitivity to gender issues
- Exercise criticism and self-criticism
- Promotion of free, creative, and inductive thinking

3. SYLLABUS

Lectures and presentations on the following:

- Cellular, biochemical, and molecular pharmacology.
- Drugs that act on receptors. Molecular structure of drug receptors.
- Pharmacological targeting of ion channels.
- Pharmacological targeting of G-protein coupled receptors.
- Pharmacological targeting of receptors with endogenous catalytic actions (tyrosine and serine/threonine kinase, phosphatase, guanylate cyclase).
- Pharmacological targeting of transcription factors.
- Enzymes as drug targets.
- Pharmacological targeting of secreted proteins (growth factors, cytokines).
- Antisense oligonucleotides, siRNAs, aptamers, and microRNAs as drugs.
- Pharmacological targeting of signaling molecules.
- Methods of identifying new drug targets.
- Cell and gene therapies.
- Optimization of production, stability, and activity of protein drugs through biotechnological methods.
- Development of experimental disease models with biotechnological / genetic methods in experimental animals.

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Extensive use of e-class to share archives and lectures, to communicate with students and to organize the lecture schedule. Lectures and presentations are all done using information and communications technologies (ICT) and information retrieval is done through bio-medical databases.	
USE of INFORMATION and COMMUNICATIONS TECHNOLOGY	Extensive use of e-class to share archives and lectures, to communicate with students and to organize the lecture schedule. Lectures and presentations are all done using information and communications technologies (ICT) and information retrieval is done through bio-medical databases.	
TEACHING METHODS	Activity	Semester Workload
	Lectures	39
	Literature study and analysis	39
	Elaboration of a study	34
	Writing assignment / assignments	56
	Course Total (25 hours of work-load per ECTS credit)	125
STUDENT PERFORMANCE EVALUATION	<p><i>Oral presentation</i> of a research paper related to the course. The understanding of the problem and the scientific approach to solving it, is discussed with all students in the class through questions and discussion.</p> <p>The <i>written examination</i> is based on questions on understanding research problems and analysis of research results. The exam and answers are given in Greek or English, and the source material of the problems is in English (data from research publications). During the exam, students have access to all the scientific material (lectures, publications/articles, assignments) that they have used throughout the semester. During the exam, students may have access to the internet.</p> <p>The grade is derived from both oral presentation and written examination at a rate of 50% from each.</p> <p>The method of evaluating the graduate students in the course is described in eclass (https://eclass.upatras.gr/courses/PHA1813/) and is visible to all students who register for the course.</p>	

5. RECOMMENDED BIBLIOGRAPHY

Access / use of scientific journals, preferably wide-circulation ones including (non-exhaustive list):

- Nature and all Nature journals
- Science and all Science journals
- Cell and all Cell journals
- Annual Reviews series
- Journal of Clinical Investigation
- PNAS
- Molecular Pharmacology