

BIOPHARMACEUTICS

Code: ΝΠ18-42

Level of studies/Undergraduate

Semester: 6o

Type of subject

	Basic / Background knowledge
x	Scientific field (pharmacy)

Credit units (ECTS): 5

Theory (hours): 2

Tutorials (hours):

C) Laboratory classes (hours): 2 per week

Coordinator:

Kyriakos Kachrimanis, Associate Professor

Teaching staff

Ioannis Nikolakakis Associate Professor

Office 209, 2nd floor Biology building.

Students hours: Dailly, 2-3 pm and free Email contact

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Kyriakos Kachrimanis Associate Professor

Office 206, 2nd floor Biology building

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D. Fatouros Professor

Office 207A, 2nd floor Biology building

Students hours: Dailly, 2-3 pm and free Email contact

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Aims of the course:

The main objective is the complete presentation of the influence of formulation factors on the therapeutic efficacy and safety of pharmaceutical products. Also, the influence of the route of administration together with the physicochemical characteristics of the drugs on the efficacy and safety of the products.

Skills :

The students will be familiar with the meaning of pharmacokinetic parameters as they appear in the leaflets of the Summary of Product Characteristics of pharmaceutical products. Also, the journey of the drug in the body and the factors affecting the absorption, distribution, metabolism and elimination

Teaching methods: Direct lectures in theatre rooms using videos and modern education methods. Laboratory classes

Contents of the course:

The main objective is the complete presentation of the influence of formulation factors on the therapeutic efficacy and safety of pharmaceutical products. Also, the influence of the route of administration in combination with the physicochemical characteristics of the drugs, on the efficacy and safety of the product. Introductions-Definitions. Pharmacokinetic parameters and absorption,

distribution, metabolism and excretion models. Bioavailability and bioequivalence of pharmaceutical products and drug substances. Route of the drug from the dosage form to the gastric fluids (instant and modified dosage forms, mechanisms, equations and ways to study drug release). Movement of dosage forms in the gastro-intestinal tract (anatomy and physiology of GI tract, biologic barriers and mechanisms of transport and absorption of medicines, physiologic and formulation factors that affect the bioavailability of per os administered pharmaceutical products). Routes of drug administration other than per os (oral cavity, skin, intra-muscular injection, rectum, nasal cavity, lungs etc.) The drug after arrival in the systemic circulation (distribution, protein binding and elimination). Excretion and drug metabolism (renal and hepatic clearance, hepatocholic excretion and enterohepatic circulation). First pass metabolism (factors that affect its appearance and consequences for the bioavailability of drugs). Dosage scheme for specific medicines and diseases.

Practical classes in pharmacokinetic simulations and calculation of pharmacokinetic parameters using computers and interactive software for self-teaching. In vitro - in vivo correlation of pharmacokinetic behaviour of pharmaceutical products and drugs.

Proposed textbook:

Aulton's Pharmaceutical Technology

Educational activities :

Lectures and laboratory work.

Evaluation process:

Written examinations at the end of the semester. The duration of the exams is 2 hours. After the students finish their laboratory work, they prepare reports about their results.

Use of TPE / electronic distribution of the lectures.

Power point presentation is used in the lectures.

Teaching .

Teaching is accomplished through lectures and laboratory work.

a) Lectures are taking place once a week (3 hours per lecture) in theatre room in the Biology/Pharmacy building allocated by the responsible personnel.

Lecture	Title	Tutor
1	The journey of the drug in the body	K. Kachrimanis
2	Drug absorption	K. Kachrimanis
3	From the dosage form in the GI fluids	K. Kachrimanis
4	Drug in the GI, Permeability of GI epithelium	K. Kachrimanis
5	After entering the blood stream	K. Kachrimanis
6	Hepatic clearance, Hepatic metabolism	I. Nikolakakis
7	First pass metabolism, Pre systematic metabolism	I. Nikolakakis
8	Volume of distribution, Protein binding	I. Nikolakakis
9	Renal and hepatic clearance Biliary excretion & enterohepatic circulation	I. Nikolakakis
10	Rectal, vaginal, intramuscular administration	I. Nikolakakis
11	Renal administration	D.Fatouros
12	Ophthalmic administration	
13	Buccal administration	D.Fatouros
14	Intradermal administration	D.Fatouros
15	Other routes	D.Fatouros

B) Laboratory work

Lab exercise	Title	Demonstrator
1	Pharmacokinetic calculations	K. Kachrimanis
2	In-vitro simulation of drug absorption, elimination	K. Kachrimanis I.Nikolakakis D.Fatouros