UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Pharmacology

2627-3-E1301Q069

Aims

The aim of the course is to teach students an approach to the study of pharmacologic agents through the analysis of the drug actions on living systems. The course explores drug actions at levels ranging from the single molecule to the whole organism. Further aim is to detail the distribution of drugs in human body (pharmacokinetic) as well as the relationship efficacy-toxicity. Trough the recent scientific literature, students examine both the actions of current drugs and the development of new drugs. In particular:
Knowledge and understanding: at the end of the course the student will have acquired the knowledge about the mechanism of action of drugs and the ability to properly understand the relationship between the molecular mechanism and therapeutic effect;
Applying knowledge and understanding: the student will be able to propose alternatives to the current pharmacological strategies;
Making judgements: the student will be able to propose alternatives to the current pharmacological strategies on the basis of the knowledges acquired during the course;
Communication skills: at the end of the course the student will have acquired adequate pharmacological language throught which he'll be able to describe the pharmacology;
Learning skills: the student will have expertise useful to be applied in other pharmacological studies or in research project.

Contents

Topics covered include: mechanisms of drug action, dose-response relations, pharmacokinetics, drug delivery systems, drug metabolism, toxicity of pharmacological agents, drug interaction and substance abuse. Selected agents and classes of drugs are examined in detail.

Detailed program

1) General pharmacology:
research and development of new drugs
pharmacokinetics (absorption, distribution, metabolism and elimination of drugs)
bioequivalent drugs
receptor theories and the study of drug-receptor interaction
dose-effect curves and therapeutic index
drug tolerance
2) Molecular pharmacology:
mechanism of action of different classes of drugs starting from their main targets: Some classes will be taught to all students, while in dedicated lessons, drugs of particular interest to biology, biotechnology, and optometry students will be covered.

Prerequisites

Background: Biochemistry, Physiology, Anatomy.
Specific prerequisites: none.
General prerequisites: Students can take the exams of the third year after having passed all the exams of the first year of the course.

Teaching form

There are 19 lessons as frontal lessons and 2 lessons that will be given with the direct involvment of the student. The lessons will be video recorded and made available to students on a weekly basis.
Teaching language: italian.

Textbook and teaching resource

Learning material (slides of the lessons, scientific papers) is available at the e-learning web page of the course.

Recommended textbook (for consultation):
- Le basi della Farmacologia Karen Whalen Zanichelli

Semester

Second semester

Assessment method

Written plus oral examination. For students of Biological Sciences and Biotechnology:

The exam consists of a written section on General Pharmacology and an oral section on Special Pharmacology. The exam is a single unit; therefore, it is not possible to take the written part in one examination session and the oral part in another.

Written exam: 15 questions worth 2 points each, plus a 16th question for honors (cum laude). Of the 15 questions, 10 will be multiple-choice and 5 will require short answers (definitions, calculations, graphs). Incorrect answers are worth 0 points.

For students of Optics:

The exam will be written and divided into two parts. The first part, on General Pharmacology, consists of 15 multiple-choice questions (1 point each) and 2 short-answer questions (definitions, calculations, graphs) worth 2.5 points each. Incorrect answers are worth 0 points.

The second part, on Special Pharmacology, consists of 2 open-ended questions worth 5 points each. The second part will only be graded if the student passes the first part with a minimum score of 12 points. The questions aim to assess the acquisition of the basic knowledge and to evaluate the concepts comprehension, the ability to connect the different issues and the ability to discuss about a pharmacological problem.

Office hours

Contact: on demand, upon request by mail to lecturer.

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING