UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Pharmacology

2122-1-I0101D005-I0101D015M-BG

Aims

Contents

The course will examine: the principles underlying pharmacodynamics and pharmacokinetics, and drug biotransformation, distribution, and elimination; the determinants of the variability of drug responses; the preclinical and clinical phases of drug development.

Detailed program

GENERAL PRINCIPLES – Concepts of drug, toxic, and placebo – Methods for the evaluation of toxicity risks and extrapolation of data from animal to human – Pharmacological anamnesis – Ways of communication to competent authorities of adverse drug reactions (pharmacovigilance) - Ethical and socio-economical aspects of pharmacovigilance.

PHARMACOKINETICS – Regulatory mechanisms of drug absorption through cell membranes – Routes of drug administration, their implications for therapy and concept of bioavailability – Drug distribution mechanisms in the organism, transfer of drugs across cell barriers, drug-protein binding, biotransformation and elimination processes

and their clinical relevance – Relevance of plasma half-life and clearance for drug dosing – Ways to reach and maintain plasma concentration of drugs at steady-state – Drug kinetics for single and repeated administration – Drug dosing adjustments according to physiological and pathological alterations of excretion and metabolism – Adverse drug reactions – Altered drug effects according to age and pregnancy.

MOLECULAR AND CELLULAR PHARMACOLOGY – Mechanisms of action of drugs, molecular targets and intracellular cascades mediating drug effects – Cellular basis of drug effects – Agonists and antagonists and structure/activity principles – Quantitative dose-response relationships – Definition of drug selectivity, specificity, toxicity, potency, and efficacy – Drug efficacy and potency according to dose-response curves – Therapeutic index and risk-benefit evaluation of a pharmacological therapy – Factors influencing drug response variability due to concomitant pathologies and therapies or being a risk subject – Pharmacogenetics, pharmacogenomics, and unpredicted drug.

Prerequisites

Knowledge acquired during all preparatory courses indicated in the medical degree course plan

Teaching form

Lessons will be provided in attendance, subject to any ministerial changes following the COVID pandemic situation

Textbook and teaching resource

Amico-Roxas M., Caputi A.P., Del Tacca M. (2021) Compendio di farmacologia generale e speciale. Torino, UTET Scienze mediche

Bertram G. Katzung Farmacologia generale clinica. XI Edizione italiana, Piccin Nuova Libraria, 2021.

- Derek G. Waller, Andrew G. Renwick e Keith Hillier Farmacologia medica ed elementi di terapia. III edizione,

Elsevier, 2011.

- Francesco Clementi, Guido Fumagalli Farmacologia generale e molecolare. IV edizione aggiornata, Edra, 2016.

- Goodman e Gilman, Le basi farmacologiche della terapia. XIII edizione, Zanichelli, 2019.

Semester

Second Semester of thr First Year

Assessment method

Office hours