



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Basic Pharmacology

2122-2-H4102D012

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#### Aims

The objective of this course is to provide the general principles of pharmacology. Topics including pharmacokinetics and pharmacodynamics will be discussed. The course content emphasizes drug mechanisms, drug development and post-marketing surveillance.

#### Contents

The course will examine the general principles underlying the destiny of drugs within the organism and the mechanisms responsible of their therapeutic and toxic effects. In addition, the preclinical and clinical processes of drug research and development, the post-marketing surveillance, drug patenting and access will be discussed.

#### Detailed program

INTRODUCTION: Drug definition, Brief history of pharmacology, Routes of administration - PHARMACOKINETICS: Absorption, Bioavailability, Distribution, Body compartments, Volume of distribution, Phase 1 and 2 reactions, First-pass metabolism, Excretion, First- and zero-order kinetics, Therapeutic window – TARGETS OF DRUG ACTION: Common drug mechanisms, Receptors, enzymes, ion channels, and transporters, New drug mechanisms, Protein-based, gene-based, and cell-based therapies – PHARMACODYNAMICS: Receptor and ligand binding, Dose response relationships, Individual variation, Pharmacogenetics - DRUG TOXICITY: Toxic and lethal dosing, Mechanisms of drug toxicity, Drug interactions, Adverse drug reactions, Drug abuse and dependence - DRUG DISCOVERY AND DEVELOPMENT: Drug discovery and design, Preclinical drug development, Clinical drug development, Post-marketing surveillance, Chemical and biological drugs, Generics and biosimilars – PHARMACOECONOMICS: Drug patents and access

## **Prerequisites**

Knowledge of human anatomy, physiology, pathology, chemistry, biochemistry.

## **Teaching form**

Lectures will be in attendance, except for any ministerial changes following the COVID pandemic situation. They will be taught in English as formal lectures, exercises, and discussion of simple clinical cases related to pharmacological aspects.

## **Textbook and teaching resource**

(1) *Goodman & Gilman's: The Pharmacological Basis of Therapeutics, Thirteenth Edition*, McGraw Hill

(2) *Goodman & Gilman's Manual of Pharmacology and Therapeutics, Second Edition*, McGraw Hill

## **Semester**

First semester.

## **Assessment method**

The final evaluation will be performed in attendance, except for any ministerial changes following the COVID pandemic situation. It will consist in a written test with multiple choice quizzes, solution of mathematical calculations and equations, and open-ended questions on clinical cases. The student can specifically ask for an oral integration that will consist in the discussion of topics inherent to the written test.

## **Office hours**

On appointment.

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