

*MEDICAL-PHARMACEUTICAL
BIOTECHNOLOGY*

TOXICOLOGY MODULE

4 CFU + 1 CFU Laboratory activities

Prof. Ernesto Fedele

(ernesto.fedele@unige.it; 0103532659)

Dr. Carola Torazza

(carola.torazza@unige.it; 0103532002)

PHARMACOLOGY & TOXICOLOGY SECTION
DEPARTMENT OF PHARMACY (DIFAR)

SCHOOL OF MEDICAL & PHARMACEUTICAL
SCIENCES

SYLLABUS

INTRODUCTION TO TOXICOLOGY

Definition of xenobiotic, toxin and toxic agent.
General and specialist areas of toxicology.

TOXICOKINETICS

Factors influencing toxicity: absorbed dose, route of exposure, duration and frequency of exposure, toxication and detoxication processes, elimination rate. Other factors (species, ethnicity and inter-individual differences, genetic alterations, etc).

TOXICODYNAMICS

Reaction with the biological target: target attributes, types of reaction with the target, effects on the target. Major cellular toxicity mechanisms: structural damage or dysfunction. Oxidative stress, mitochondrial toxicity, alteration of calcium homeostasis.

Cell death: necrosis, apoptosis, autophagy and regulated necrosis. Cellular and tissue repair mechanisms. Genotoxicity, chemical carcinogenesis and developmental toxicity.

SYLLABUS

DRUG INTERACTIONS

Introduction. Pharmacokinetic and pharmacodynamic mechanisms of interaction. Drug-drug, drug-herb and drug-food interactions. Databases for consultation.

ORGAN TOXICITY: NEUROTOXICITY

Neuronopathies, axonopathies, myelinopathies, neurotransmission toxicity.

Glutamate excitotoxicity: toxic effects of monosodium glutamate and of natural occurring agonists of glutamate receptors.

Glutamate excitotoxicity and its role in neurodegenerative disorders.

Adult neurogenesis: a mechanism of cell replacement and neurorepair.

TOXICITY TESTS

Acute toxicity test and LD_{50} (TD_{50}) determination of the therapeutic index and margin of safety. Subacute, subchronic and chronic toxicity tests. Short and long-term carcinogenesis tests. Genotoxicity tests. Developmental toxicity test.

LABORATORY ACTIVITIES

LOCATION

Laboratories of the Pharmacology and Toxicology Section, Department of Pharmacy, Viale Cembrano 4, Genova-Sturla.

2 laboratory activities/group

9, 10, 11 e 12 December, 14:00-18:00

1 Laboratory video: 5 December, 14:00,
Biology classroom

AULAWEB PASSWORD: TOXOGY2425

TEAMS CODE: pqw4xqk

RECOMMENDED TEXTBOOKS

Galli, Corsini, Marinovich

Tossicologia

Ed. Piccin

Cantelli Forti, Galli, Hrelia, Marinovich

Tossicologia molecolare e cellulare

Ed. UTET

Klaasen, Watkins III

Casarett & Doull Elementi di

Tossicologia (also in English)

Ed. Ambrosiana

EXAM

Oral exam of a total duration of approximately 20-30 min during which the examination committee will evaluate: the student's competence on the different topics of the course program, the use of appropriate scientific terminology and capability of scientific reasoning.