UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

General Pathology

2122-3-E0201Q067

Aims

The course aims to introduce the student to the knowledge of the causes of human diseases, the students will be able to understand the fundamental pathogenetic and pathophysiological mechanisms. During the course, topics for in-depth knowledge on the molecular mechanisms underlying the disease pathogenesis of diseases to identify potential diagnostic and therapeutic targets will be developed.

Knowledge and understanding
The student will gain knowledge on the fundamental pathogenetic and pathophysiological mechanisms; the student will be able to recognize the most common molecular pathways altered in arterioscleosis-related pathologies, in tumours, in pathologies related to the immune system; the student will know the most common methods applied to the study of human pathologies

Applying knowledge and understanding
At the end of the course the student must be able to apply the acquired knowledge
to methodologies applied in research or in molecular diagnostics.

Making judgements

The student must be able to elaborate what he/she has learned to contribute to the development of new knowledge in the field of molecular medicine in the context of multidisciplinary teams.

Communication skills
At the end of the course the student will be able to describe pathologies using an appropriate language.

Learning skills
At the end of the course the student will be able to make search in databases (es pubmed). The student will

develop skills in literature reading and understanding , and will be able to apply the knowledge acquired to pathophysiology, immune-pathology and molecular medicine research.

Contents

Introduction to general pathology. Tissue changes in response to acute and chronic pathological stimuli. The inflammatory process. The healing and repair process. Immunopathology. Neurodegenerative diseases. Tumors. Genetic pathologies.

Detailed program

ETIOLOGY AND PATHOGENESIS OF MOLECULAR DAMAGE

Intrinsic and extrinsic pathogenic factors: causes of physical, chemical, biological nature. Alterations of DNA, RNA, proteins.

CELLULAR PATHOLOGY ALTERATIONS OF CELL GROWTH AND DIFFERENTIATION

Atrophy, hypertrophy, hyperplasia, metaplasia, dysplasia. Cell aging. Necrosis and apoptosis. Other mechanisms of cell death

INFLAMMATION

Innate defensive responses and the triggering of the inflammatory response. Acute inflammation and chronic inflammation: phenomena (hyperemia, inflammatory exudate, leukocyte migration, infiltrate, tissue damage), mechanisms, cells, mediators, types, evolution. Defects and excesses of the inflammatory response. The reparative process and its alterations. Fibrosis. Atherosclerosis.

SYSTEMIC EFFECTS OF INFLAMMATION

Fever, iperthermia, acute phase proteins.

IMMUNOPATHOLOGY

Hypersensitivity. Allergies. Damage mediated by cytotoxic antibodies. Immune complex diseases.

NEURODEGENERATIVE DISEASES

Alzheimer. Parkinson. Prion diseases. Multiple sclerosis.

ONCOLOGY

Introduction, nomenclature, epidemiology. Molecular oncology: cell cycle and related control mechanisms; proto-oncogenes, oncogenes and oncoproteins; tumor suppressor genes and their products; alterations of DNA repair mechanisms; altered genetic control of apoptosis. Etiological factors: chemical carcinogenesis, carcinogenesis by physical agents, DNA and RNA oncogenic viruses, presence of carcinogens in the environment, tumor heredity. Immuno-surveillance mechanisms. Tumor-host interaction.

GENETIC PATHOLOGIES

Numerical and structural aberrations. Point mutations. Trinucleotide repeat disorders. Mitochondrial diseases. Imprinting diseases. Multifactorial diseases.

Prerequisites

Background: basics of biochemistry.
Specific prerequisites: Biochemistry.
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

Lectures.

Textbook and teaching resource

Resources distributed during the course by the teachers.

Recommended textbooks:
- Robbins e Cotran: The pathological bases of diseases. Elsevier
- Pontieri-Russo-Frati: General Pathology. Piccin.
- Abbas A.K.: Foundations of Immunology. Functions and alterations of the Immune System. Piccin

Semester

First semester

Assessment method

Oral examination.
Students are required to select and to present a topic chosen from the course content. Questions will follow about other course topics that require concise but comprehensive answers for the completion of the exam. The questions will assess the degree of understanding and comprehension of all fundamental aspects of the individual parts of the course content.

Office hours

By appointment (email request)