UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Pathology and Medicine

2223-2-H4102D011-H4102D035M

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 to identify potential therapeutic targets will be developed. The main immune mechanisms of pathogenetic relevance will be investigated.

Contents

Introduction to General pathology
Physical, chemical and biological agents as a cause of illness
Tissue changes in response to chronic and acute pathological stimuli
The inflammatory process
The healing and repair process
Pathological processes caused by alterations of the immune response
Transplant Immunology

Detailed program

Concepts of health, pathological process and disease. Etiology, pathogenesis, evolution, course, outcomes. 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. Cellular bases of aging; Reduction of cell replication; Accumulation of metabolic and genetic damage; Premature aging syndromes.

Molecular mechanisms of cell damage. Oxidative stress: origin of free radicals, lipid peroxidation, oxidation of proteins and DNA. Antioxidant defenses of the cell. Hypoxic damage. Reperfusion damage.
Necrosis. Causes of necrosis. Types of necrosis: simple, coagulative, colliquative. Apoptosis. Causes of apoptosis. Morphological, biochemical and molecular aspects of necrosis, apoptosis. Other types of cell death: ferroptosis, pyroptosis, autophagy.

Reaction to damage: inflammatory processes. Acute inflammation and chronic inflammation: phenomena (hyperemia, inflammatory exudate, leukocyte migration, infiltrate, tissue damage), mechanisms, cells, mediators, types, evolution. Inflammatory lesions: abscesses, ulcers, granulomas. Defects and excesses of the inflammatory response. Reaction to damage: the reparative process and its alterations.

Molecular pathology. Pathology of the extracellular matrix (amyloidosis, prion pathology, collagenopathies and elastopathies, fibrosis). Intracellular storage disorders (metabolic tesaurismosis and steatosis). Pathogenetic mechanisms underlying pathologies of membrane receptors (familial hypercholesterolemia).

Pathological processes caused by alterations in the immune response:
Hypersensitivity reactions: Anaphylactic, cytotoxic, immune complex and delayed hypersensitivity. Etiology, pathogenesis, main manifestations and evaluation methods. Tolerance and Autoimmunity: Natural and induced tolerance. Cellular and molecular mechanisms of T and B lymphocyte tolerance. Loss of tolerance: etiology, pathogenesis and genetics of autoimmune phenomena. Systemic and organ-specific diseases. Congenital and acquired immunodeficiencies: T compartment deficiency. B compartment deficiency. Combined B and T deficiencies. Phagocyte defects. Complement deficiency. Pathogenesis of HIV infection. Immune response to HIV. AIDS therapy and prevention.

Transplant immunology: Mechanisms of allogeneic transplant rejection. Transfusions and bone marrow transplant.

Prerequisites

Knowledge of the introductory courses indicated in the regulation of the degree course

Teaching form

Frontal lectures and support videos.

Textbook and teaching resource

Robbins e Cotran: The pathological bases of diseases. X edizione. Elsevier

Semester

I semester

Assessment method

The exam includes a written test with multiple choice questions on topics of General Pathology. The questions will assess the degree of depth achieved by the student. In the specific case of GENERAL PATHOLOGY, questions are asked on all the fundamental aspects of the individual parts of the Program above. The test will also include an open-ended question that will assess the ability to link the different topics covered.
The exam is considered passed only if at least 60% of the questions including exactly the open question are answered

Office hours

Monday morning by appointment

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION | GENDER EQUALITY