UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Pathology and Medicine

2425-2-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
Tumor 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). 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.

Tumor Immunology: Tumor Antigens. Immune Responses to Tumors. Evasion of immune responses by tumors. Tumor immunotherapy.

Prerequisites

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

Teaching form

25 frontal lessons of 2 hours in attendance

Textbook and teaching resource

Robbins e Cotran: The pathological bases of diseases. 10th edizione. Elsevier

Semester

II semester

Assessment method

The knowledge acquired will be evaluated with an in itinere test consisting of 45 multiple choice questions and 1 open question. The questions will evaluate the knowledge depth achieved by the student. In the specific case of GENERAL PATHOLOGY, questions covering all the fundamental aspects of each individual topic of the course will be assessed. The test will also include an open-ended question that will evaluate the ability to connect the different topics. The tests will be considered passed according to the indications described in the General Syllabus of "Basic Pathology"

Office hours

The professor receives by appointment upon agreement by e-mail (maria.foti@unimib.it).

Sustainable Development Goals

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