UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

General Pathology

2425-2-I0303D007-I0303D028M

Aims

The student will be able to:

- Classify and illustrate cell damage and cell death mechanisms (necrosis and apoptosis)
- Describe and classify high temperature damage
- Describe the effects and pathogenic mechanisms of radiation
- Illustrate the general and vascular phenomena associated with acute inflammation.
- Describe the pathogenetic mechanisms of chronic inflammation.
- Illustrate the typical pathogenetic mechanisms of granulomatous inflammation
- Describe the systemic phenomena of acute inflammation
- Describe the processes of tissue repair and regeneration
- List and illustrate the molecular and cellular factors involved in atherogenesis
- Describe the mechanisms underlying the cell-mediated immune response
- Describe the mechanisms underlying the humoral immune response.
- Illustrate the general characteristics of immunodeficiencies and autoimmune reactions
- Classify and explain the phenomena that cause hypersensitivity reactions
- Describe the characteristics and mechanisms underlying hypertrophies, hyperplasias, atrophies and metaplasias
- Describe and classify precancerous lesions
- Illustrate the process of neoplastic growth by distinguishing the phenomena involved in benign growth and malignant growth.
- Illustrate the mechanism of metastatic spread of malignant tumors
- Illustrate the mechanism of action of tumor suppressor genes and oncogenes
  -Illustrate the chemical and physical factors involved in the etiology of tumors and their pathogenetic mechanisms.
- Illustrate the mechanisms of viral carcinogenesis

Contents

At the end of the course the student must have acquired the main knowledge on the causes of disease as well as the fundamental pathogenetic mechanisms; have learned the mechanisms responsible for the onset and evolution of the inflammatory response and neoplastic transformation, know the physiological defense mechanisms of the organism and the consequences of an altered functioning of the immune system.

Detailed program

2.729 / 5.000
Etiology and Pathogenesis of diseases. Concept of homeostasis and disease. Onset and course of diseases. Acute and chronic diseases. General etiology
Response of the cell to damage. Hypoxia damage. Irreversible damage. Cell death: necrosis and apoptosis. Extrinsic causes of disease. Physical causes: radiation, heat.

Immunology
Tissue response to damage. General properties of the immune system. Innate immunity and acquired immunity. The cells of the immune system. Soluble mediators. Antigens.
Immune response. Humoral immunity. Cell-mediated immunity.
Cells, tissues and organs of the immune system. Cells of the innate immunity. Cells of acquired immunity. Primary lymphoid organs and tissues. Secondary lymphoid organs and tissues.
Antibodies and the antibody response. Immunopathology. Immunodeficiencies. Autoimmune diseases. Immediate hypersensitivity reactions. Type I hypersensitivity reactions. IgE. Allergens. Type II hypersensitivity reactions. Damage mechanism. Reactions against platelets and blood cells. ABO system.
Delayed hypersensitivity reactions. Type III hypersensitivity reactions. Immune complex diseases. Type IV hypersensitivity reactions. Contact hypersensitivity. Granulomas.

Inflammation
Acute inflammation: Cardinal signs of inflammation. Phases of inflammation. Inflammatory cells. Cell migration: Phagocytosis. Examples of acute inflammation I. serous, I. serofibrinous, I. catarrhal, I. purulent, I. hemorrhagic.
Chronic inflammation. Foreign body granuloma. Tuberculous granuloma. Examples of chronic inflammation: Atherosclerosis.
Systemic effects of inflammation Acute phase proteins. Fever. Febrile hyperthermia: pathogenesis of fever, exogenous pyrogens and endogenous pyrogens, course of fever. Types of fever.

Tissue repair process
Granulation tissue. Wound repair: Repair by primary intention; Repair by second intention. Evolution: Restitutio ad integrum, Cicatrization.

Pathology of cell growth and differentiation
Adaptation. Hypertrophy, Hyperplasia, Hypotrophy, Hypoplasia, Metaplasia, Leukoplakia

General oncology
Precancerous lesions, dysplasia.
Tumors. Benign, malignant tumors. Invasiveness and metastasis. Histogenetic classification. Clinical classification criteria: gradation and staging.
Carcinogenesis. Carcinogenesis from chemical agents. Carcinogenesis from physical agents. Ionizing radiations. Ultraviolet radiation. Carcinogenesis by biological agents. Oncogenic viruses: DNA and RNA.
Oncogenes and Antioncogenes.

Prerequisites

Teaching form

8 frontal lessons of 2 hours carried out in attendance

Textbook and teaching resource

- G.M. Pontieri ELEMENTI DI PATOLOGIA GENERALE E FISIOPATOLOGIA GENERALE IV° ed. PICCIN
- V. Del Gobbo IMMUNOLOGIA (per le Lauree sanitarie) IV° ed. PICCIN

Semester

Second year, first semester

Assessment method

Oral test consisting of an interview on topics covered in class to verify scientific reflective and communication skills

Office hours

making an appointment

Sustainable Development Goals

GOOD HEALTH AND WELL-BEING | QUALITY EDUCATION