UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Applied Immunology

2324-1-F0601Q071

Aims

The aim of the course is to provide knowledge of the functioning of the immune system in different pathological contexts and at specific moments in the life of an individual.

Specifically, particular attention will be paid to the dysfunctions of the immune system that lead to chronic pathological contexts, such as auto-inflammatory diseases, tumors, autoimmune diseases and some diseases associated with infection, such as COVID19, in which the immune system is dysfunctional.

The course will provide the very latest knowledge relating to neuroimmunology and immune system dysfunctions in neuropathological contexts.

We will also discuss how dysfunctional immunological responses can be manipulated through the development of targeted therapies.

The basis for understanding the changes that accompany the immune system during the aging of individuals will be provided and recent theories in this field such as 'tissue tolerance' will be explained. Moreover, the immunological changes that occur during pregnancy, a particular stage of life, will also be discussed

Speaking of immunometabolism, it will also be understood how some cellular processes support immune functions and how their alteration can lead to pathologies.

The general objective is the acquisition of in-depth knowledge of the immune system in various pathological and non-pathological contexts.

Contents

Synthetic contents

- Inflammation and mechanisms for extinguishing the inflammatory process

- pathological contexts deriving from failure to extinguish inflammation and the onset of chronic inflammation: COVID19, chronic inflammatory diseases; intestinal and cutaneous.

-Allergies and hypersensitivity

-Concept of autoimmunity and autoimmune diseases

-Tumor immunology and tumor immunotherapy

-neuroimmunology and neuroinflamation during AD, parkinson, MS

- immunity during pregnancy

- aging of the immune system and tissue tolerance

- immunometabolism

Detailed program

Lectures program

Lecture 1: Introduction to the course. Inflammation and mechanisms for extinguishing inflammation

Lecture 2: Dysfunctions of the extinguishing mechanism: chronic inflammation

Lecture 3: SARS-Cov-2 infection and COVID-19 pathology, hints of other chronic viral infections

Lecture 4: chronic bacterial inflammation; sepsis

Lecture: chronic skin inflammations

Lecture 6: chronic inflammation of the intestine

Lecture 7:Tumor Immunology

Lecture 8: new molecular technologies applied to the study of the tumor microenvironment

Lecture 9: Tumor immunotherapy

Lecture 10: Hypersensitivity reactions and allergies

Lecture 11: Allergic asthma, allergic rhinitis and food allergies

Lecture 12: Autoimmunity

Lecture 13: Lupus and Rheumatoid Arthritis

Lecture 14: Neuroimmunology and neuroinflammation

Lecture 15: neuroinflammations in AD, Parkinson's and multiple sclerosis

Lecture 16: Immunity and Tolerance During Pregnancy

Lecture 17: Aging of the immune system

Lecture 18: Concept of 'Tissue Tolerance'

Lecture 19: Immunometabolism

Lecture 20: Discussion of scientific articles

Lecture 21: Discussion of scientific articles

Prerequisites

The knowledge of the basic mechanisms of functioning of the immune system is required.

Teaching form

Monographies and original paper discussion.

Textbook and teaching resource

PPT slides, original papers and review. Textbook: ImmunoBiology, The immune system in health and disease- Janeway, Traves.

Semester

Second semester

Assessment method

Students will be assessed with an oral exam or with the presentation of a scientific article (chosen by the student from a selection provided by the teacher) relating to one of the topics covered.

the presentations of articles by students will be considered *in itinere* tests

Office hours

Reception hours ON APPOINTMENT to be requested by email:

VENERDI 9:30-11:30

Sustainable Development Goals