



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Immunologia Applicata

2021-1-F0601Q071

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#### Aims

The aim of the course is to provide the basis for the application of immunology to the study of human pathologies, discussing the mechanisms that the immune system uses to protect against pathogens and how dysfunctional immunological and cellular responses can lead to pathologies. In particular, autoimmune diseases, immunodeficiency diseases, allergies, tumors and diseases associated with infections will be considered. It will also be explained how dysfunctional immunological responses can be manipulated through the development of targeted therapies.

The basis to understand how the changes accompanying immunological disease can be measured for diagnostic, prognostic or predictive purposes will also be provided

The immunological knowledge will be applied and integrated with knowledge deriving from other disciplinary fields in order to understand the experimental approaches currently used in basic and translational research. This includes knowledge of major animal models for the study of human diseases.

In this context, experimental data collection, analysis, and interpretation will be addressed, as well as a the critical evaluation of the current literature.

The general objective is the acquisition of broad skills transferable skills both scientific research and corporate jobs. This includes the writing of reports, the presentation of a scientific topic and the basis for the development of a project

## Contents

### Synthetic contents:

- Inflammation and termination of the inflammatory process. Sepsis
- Immune responses in infections and diseases: HIV disease and COVID-19. Vaccines.
- Autoimmune and auto-inflammatory diseases.
- Chronic inflammatory diseases and atherosclerosis
- Hypersensitivity reactions and allergic diseases; allergic asthma, food allergies.
- Immunodeficiency disorders.
- Transplantation
- Tumor immunology.
- Tumor immunotherapy. Development and clinical studies on the effectiveness of checkpoint inhibitors
- Emerging immunotherapies.

## Detailed program

### Lectures

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

**Lecture 2:** Sepsis

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**Lecture 6:** SARS-Cov-2 infection and COVID-19 pathology

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**Lecture 8:** Vaccine production and new strategies

**Lecture 9:** Autoimmune and autoinflammatory diseases

**Lecture 10:** Systemic and organ specific autoimmune diseases: Lupus erythematosus

**Lecture 11:** Scleroderma and rheumatoid arthritis

**Lecture 12:** Multiple sclerosis, type I diabetes and vasculitis

**Lecture 13:** Chronic inflammatory diseases: inflammatory bowel diseases

**Lecture 14:** Psoriasis and atherosclerosis

**Lecture 15:** Hypersensitivity reactions and allergic diseases: Allergic asthma, allergic rhinitis and food allergies

**Lecture 16:** Immunodeficiency disorders and Transplantation

**Lecture 17:** Cancer Immunology

**Lecture 18:** Immunotherapy

**Lecture 19:** Emerging immunotherapies

**Lecture 20:** Presentation of scientific articles

**Lecture 21:** Presentation of scientific articles: Notes on the construction of an experimental research project.

## **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. Textbook: ImmunoBiology, The immune system in health and disease- Janeway, Traves.

## **Semester**

Second semester

## **Assessment method**

Students will prepare a review and discuss with the Lecturer the content of the review.

## **Office hours**

Appointment by email to set up a date for the meeting.

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