



UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Immunology II

2526-2-H4102D011-H4102D034M

Aims

The Immunology II course provides students with the theoretical knowledge of some basic cell and molecular immunology laboratory techniques. At the end of the course the student will be able to understand how some laboratory techniques work.

Contents

- Isolation of leukocytes from blood samples
- Monoclonal and polyclonal antibody production. Monoclonal antibodies and their applications.
- Antigen-antibody interaction, direct and indirect immunofluorescence.
- Immunoassays: immunoblotting, immunoprecipitation, agglutination and haemagglutination, enzyme-linked immunosorbent assay (ELISA).

Detailed program

Agglutination reactions: Hemagglutination and blood typing, The Coombs direct and indirect tests, Hemolytic disease of the newborn (HDN), pretransfusion compatibility tests.

Immunoassays: enzyme-linked immunosorbent assay (ELISA), ELISA detection of ADAMTS-13 and anti-ADAMTS-13 antibodies in thrombotic thrombocytopenic purpura, ELISA assay for detection of heparin-induced PF4 antibodies and their functional characterization: a case description.

Isolation of leukocytes from blood samples: Cluster of differentiation, isolation of peripheral blood lymphocytes and polymorphonuclear leukocytes by density-gradient fractionation, lymphocyte isolation using antibody coated magnetic beads, leukapheresis and CAR-T production.

Flow cytometry and FACS analysis: principles and applications: immunophenotyping of leukocytes,

immunophenotyping of platelets for rare bleeding disorders, lymphocyte subpopulations in peripheral blood samples, lymphocyte subpopulations in bronchoalveolar lavage fluid, fetal hemoglobin detection, HLA-B27 typing. **Precipitation reactions** : Antibody titration in serum, Flocculation Assays and VDRL, Precipitation in agar and The Ouchterlony test, Radial immunodiffusion (RID) and its application to antithrombin measurement in plasma. **Immunoblotting (western blotting)**: principles and applications, Western Blot assay for HIV proteins.

Prerequisites

Knowledge related to basic immunology

Teaching form

10 exercises of 1-hour carried out in person.
10 exercises of 2-hour carried out in interactive mode in person.

Textbook and teaching resource

Scientific publications, power point presentations and educational videos prepared by the teacher.

Semester

Second semester.

Assessment method

The knowledge acquired will be the subject of ongoing tests of IMMUNOLOGY-I. There are tests consisting of 13 multiple choice quizzes and 1 open question. The level of general knowledge of the topics covered during the exercises will be assessed. Passing the tests will take place according to the methods described in the General Syllabus of "Basic Pathology".

Office hours

The appointment for students will be set by email to the Prof at: mmarchetti@asst-pg23.it

Sustainable Development Goals

