

**COURSE OF MEDICINE AND SURGERY
STUDENT HANDBOOK a.y. 2015-2016**

IMMUNOLOGY AND IMMUNOPATHOLOGY

II° YEAR	Scientific Field	DISCIPLINE	TUTOR
IMMUNOLOGY and IMMUNOPATHOLOGY CFU 7 Coordinator Florence Malisan	MED/04	<i>Immunology and Immunopathology</i>	Florence Malisan
	MED/04	<i>Immunology</i>	Roberto Testi
	MED/38	<i>Immunopathology</i>	Paolo Rossi

Specific aims This course provides a comprehensive overview of immunology beginning with the innate immune responses, followed by a study of the main aspects of adaptive immunity. Antigen specific-T cell receptors, specific interactions between target cells and T cells, regulated by the MHC molecules and peptide antigens, are studied. The generation and molecular structure of B and T cell antigen receptors, and signaling through immune receptors are covered in detail. Additionally, the development of antigen specific T and B cells, and specific roles for some cytokines are also explored. T and B cell-mediated immunity and topics of clinical relevance, such as microbial immunity, allergy, autoimmunity, tumor immunology, congenital and acquired immunodeficiencies, and transplantation immunology are also examined.

PROGRAM
Immunology

General characteristics of the immune response:
Immune system organization. Innate immunity and adaptive immunity: humoral and cellular components. Antigen specific lymphocyte receptors.

Innate immunity:
Functions of granulocytes (neutrophils, basophils, eosinophils), dendritic cells, NK cells, monocytes and macrophages. Pattern Recognition Receptors (PRR) recognizing Pathogen-associated Molecular Pattern (PAMP) and Damage-associated Molecular Pattern (DAMP).

Cells and tissues of the immune system:
Role of primary lymphoid organs (bone marrow and thymus) and secondary lymphoid tissues (lymph nodes, spleen, MALT: Mucosa-Associated Lymphoid Tissues) in the immune response.

Leukocyte migration:
Adhesion molecules. Homing and migration of leukocytes into tissues.

Antigens:
Definition and properties. Superantigens. Mitogens.

Antibodies and repertoire diversity:
Structure and effector functions of immunoglobulins. Classes/isotypes of immunoglobulins. Immunoglobulin gene organization and somatic recombination.

Monoclonal antibodies:
Production and application

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B lymphocyte development and humoral immunity: B cell development and maturation. B cell receptor (BCR).

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Activation, proliferation and differentiation of B lymphocytes. Response to T-dependent and T-independent antigens. Primary and secondary immune response. Germinal center reaction: somatic hypermutation, isotype switch, selection and memory B cells generation.

Complement:

Classical, alternative, and lectin pathway. Functions of complement.

Major Histocompatibility Complex and Antigen presentation to T lymphocytes:

Gene Organization. Structure and functions of MHC molecules. Antigen presenting cells (APC). Antigen processing.

T lymphocyte cell-mediated immunity:

T cell receptor (TCR). TCR gene organization and somatic recombination. T cell development and thymic selection. Activation and differentiation of T cells into effector T cells. Functions of T helper subsets, regulatory T cells and cytotoxic T cells. Effector mechanisms of cell-mediated cytotoxicity.

PROGRAM
Immunopathology

Hypersensitivity disorders, IgE-dependent immune responses and allergic disease, immunologic tolerance and autoimmunity, transplantation immunology, immunity to tumors, congenital and acquired immunodeficiencies.

TEXTBOOK

CELLULAR AND MOLECULAR IMMUNOLOGY - Abbas, A.K. - Elsevier, 7th Edition

IMMUNOLOGY AND IMMUNOPATHOLOGY

EXAMINATION

ORAL EXAM

EXAMINATION COMMISSION

La commissione per gli esami di profitto del corso integrato è composta dai titolari delle discipline afferenti.

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E' necessario indicare il Presidente della Commissione. Le qualifiche altri componenti se presenti sono:
MD: Modulo didattico

Dr. Florence Malisan (President)	
Prof. Roberto Testi (Immunology and Immunopathology)	

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Tutor

Florence Malisan (<i>Coordinator</i>)	malisan@med.uniroma2.it	06 7259 6501
Roberto Testi	roberto.testi@uniroma2.it	06 7259 6503
Paolo Rossi	paolo.rossi@opbg.net	