



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Biomedicina, Neuroscienze e Diagnostica avanzata		
ACADEMIC YEAR	2023/2024		
MASTER'S DEGREE (MSC)	MEDICINE AND SURGERY		
INTEGRATED COURSE	GENERAL PATHOLOGY AND IMMUNOLOGY - INTEGRATED COURSE		
CODE	21803		
MODULES	Yes		
NUMBER OF MODULES	2		
SCIENTIFIC SECTOR(S)	MED/04		
HEAD PROFESSOR(S)	CACCAMO NADIA ROSALIA	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)	MERAVIGLIA SERENA CACCAMO NADIA ROSALIA	Professore Associato Professore Ordinario	Univ. di PALERMO Univ. di PALERMO
CREDITS	11		
PROPAEDEUTICAL SUBJECTS	03347 - PHYSIOLOGY		
MUTUALIZATION			
YEAR	3		
TERM (SEMESTER)	Annual		
ATTENDANCE	Mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	<p>CACCAMO NADIA ROSALIA Tuesday 9:00 12:00 Dipartimento Bi.N.D., Corso Tukory 211. Il docente riceve per appuntamento previo contatto per email con un certo anticipo.</p> <p>MERAVIGLIA SERENA Monday 12:00 14:00 Cladibior AOUP Wednesday 12:00 14:00 Cladibior AOUP</p>		

DOCENTE: Prof.ssa NADIA ROSALIA CACCAMO

PREREQUISITES	Basic knowledge in the following disciplines is mandatory: Biology and Genetics, Histology, Anatomy, Chemistry and Biochemistry, Microbiology, are necessary for understanding the functioning of the immune system in physiology and its role in the pathogenetic mechanisms of diseases.
LEARNING OUTCOMES	<p>Knowledge and understanding: Discuss appropriately the role of the main functioning mechanisms of the Immune System in physiological and/or pathological conditions, discuss clinical cases for their immunological implications, and be aware of the experimental methods and approaches for the study of the immune system. Acquisition of tools for understanding the etiopathogenetic and pathophysiological mechanisms of the disease. Ability to use the specific language of these disciplines.</p> <p>Judgment autonomy. Ability to integrate the knowledge acquired for a critical approach and a research-oriented attitude, demonstrating the ability to formulate personal judgments to solve analytical problems and knowing how to autonomously search for scientific information and to be able to evaluate the results of studies aimed at clarifying the etiopathogenetic and pathophysiological mechanisms of diseases for future diagnostic and therapeutic implications.</p> <p>- Communication skills. Ability to illustrate, in a simple, immediate, and exhaustive way even to a non-expert audience, the knowledge acquired as well as knowing how to interface with colleagues, healthcare personnel, the individual patient, and family members.</p> <p>Learning skills: Continuous updating skills by consulting the scientific publications of the disciplines in question. Ability, using the knowledge acquired in the course, to adopt the contents of the subsequent teaching courses of the Degree Course, and to profitably participate in continuous updating initiatives in the professional field.</p>
ASSESSMENT METHODS	<p>Assessment is based on an oral test. The student will have to answer at least 4-6 questions, two, three for each of the two modules, which focus on different parts of the program, concerning the recommended texts. The final verification aims to evaluate if the student has knowledge and understanding of the topics, he has acquired interpretative competence and independent judgment. Moreover, to facilitate the learning process, at the end of the first period of lessons, a written test is foreseen.</p> <p>The evaluation is out of thirty, as shown in the diagram below:</p> <p>30-30 and praise: excellent knowledge of the contents of the lesson, the student demonstrates high analytical-synthetic skills and can apply knowledge to solve complex problems.</p> <p>27-29: excellent knowledge of teaching content and excellent language skills, the student demonstrates analytical-synthetic skills and can apply knowledge to solve problems of medium/high complexity.</p> <p>24-26: good knowledge of the content of teaching and good language skills, the student can apply knowledge to solve medium-complexity problems.</p> <p>21-23: sufficient knowledge of the content of teaching, in some cases limited to the main topics, acceptable ability to use the specific language of the discipline and to apply the acquired knowledge independently.</p> <p>18-20: minimum/limited knowledge of the content of the teaching, often limited to the main topics, modest ability to use the specific language of the discipline and apply the acquired knowledge independently.</p> <p>Insufficient: the student does not have an acceptable knowledge of the main contents of the teaching, very little or no ability to use the specific language of the discipline and to apply the acquired knowledge independently.</p>
TEACHING METHODS	Teaching will be based on formal lectures

MODULE IMMUNOLOGY

Prof.ssa NADIA ROSALIA CACCAMO

SUGGESTED BIBLIOGRAPHY

-IMMUNOLOGIA CELLULARE E MOLECOLARE. Abbas-Lichtman- Pillai. Ed. Elsevier.
-IMMUNOBIOLOGIA. Murphy-Travers-Walport. Piccin-Nuova Libreria Ed.
Inoltre si raccomanda di utilizzare il materiale didattico (diapositive in formato Power Point) scaricabile gratuitamente dal sito Nature Reviews in Immunology all'indirizzo Web: <http://www.nature.com/nri> e le reviews in lingua inglese, su argomenti selezionati, fornite gratuitamente dal docente.

AMBIT	50401-Patologia generale e molecolare, immunopatologia, fisiopatologia generale, microbiologia e parassitologia
INDIVIDUAL STUDY (Hrs)	60
COURSE ACTIVITY (Hrs)	40

EDUCATIONAL OBJECTIVES OF THE MODULE

The aims of the course are to provide an understanding of core immunology and the immunological basis of some common diseases. The course will cover basic cellular and molecular aspects of immunology including innate immunity, antibodies, T cells, B cells, complement, antigen presentation and the cytokine network.

SYLLABUS

Hrs	Frontal teaching
2	Cells and tissues of the immune system. Leukocyte circulation and homing into tissues
3	Innate immunity. Cellular components of the innate immune system. Pattern recognition receptors and sensors of innate immunity, la fagocitosi.
2	Dendritic cells and antigen presentation. Functions of dendritic cells in particular districts of the organism.
2	The Major Histocompatibility Complex (MHC) : structure and functions. Classic and non classic MHC.
3	Cytokines, chemokines and their receptors
6	T lymphocytes: maturation, antigen recognition (TCR), functions. T lymphocyte populations (CD4, CD8, DN, NKT, MAIT, gamma/delta).
4	B lymphocytes: maturation, antigen recognition (BCR), functions. Marginal zone, B1 and B2 lymphocytes
2	Antibodies: structure, functions, interactions with cells and factors of innate and acquired immunity. The Fc receptors (FcR).
2	Phases of Immune Response: Recognition, Activation, Effector Functions, Memory, Apoptosis (AICD). Antibody production control.
2	Natural Killer lymphocytes and innate lymphoid cells (ILC)
2	Immunological tolerance. Regulatory T cells.
2	Transplant immunology. Alloreactivity and rejection. Role of NK lymphocytes in bone marrow transplantation. Immunosuppressive drugs.
2	Immunological memory and vaccines.
4	Tumor Immunology
2	Primary immunodeficiencies.

**MODULE
GENERAL PATHOLOGY**

Prof.ssa SERENA MERAUIGLIA

SUGGESTED BIBLIOGRAPHY

F. Mainiero, R. Misasi, M. Sorice, G.M. Pontieri - PATOLOGIA GENERALE – VI Edizione - Piccin, 2019, ISBN 978-88-299-2963-4
 Robbins e Cotran - LE BASI PATOLOGICHE DELLE MALATTIE - IX Edizione - Edra Masson, 2015, ISBN 978-1-4557-2613-4
 C. Caruso, G. Candore - LA MALATTIA: DAGLI SCIAMANI ALLA MEDICINA DI PRECISIONE. Un'introduzione alla Patologia generale - Medical Books, 2016, ISBN 978-88-8034-101-7
 L. Altucci, G. Berton, B. Moncharmont, L.A. Stivala - PATOLOGIA GENERALE - Idelson Gnocchi, 2019, ISBN 978-88-79476720

AMBIT	50401-Patologia generale e molecolare, immunopatologia, fisiopatologia generale, microbiologia e parassitologia
INDIVIDUAL STUDY (Hrs)	105
COURSE ACTIVITY (Hrs)	70

EDUCATIONAL OBJECTIVES OF THE MODULE

The aims of the module is to provide the basis of the etiological and pathogenesis of the diseases. This module provides a basic working knowledge of pathology and pathological conditions. The principal goal is to understand the mechanisms of disease (pathogenesis) and the basic mechanism of production of signs and symptoms of various diseases. The student will be able to identify molecular targets whose block or activation is able to modulate the carcinogenesis process but also environmental factors that can favor or prevent the onset of oncological pathologies. Furthermore, I will be acquired the basic knowledge to be able to approach the world of translational medicine which highlights the close connection between basic and applied research.

SYLLABUS

Hrs	Frontal teaching
2	Concept of disease from Hippocratic medicine to EBM
4	Etiology and pathogenesis. Diseases due to intrinsic and extrinsic causes. Homeostasis.
4	Cellular responses to stress and toxic insults: adaptation, injury and death
4	Variation of blood count during inflammation: normal values and their alteration. Cytometric diagnosis of haematological diseases. Anemias: fisiopatological and laboratory classification.
4	Inflammation: definition and biological significance, the mediators of inflammation. Proinflammatory cytokines and the chemokines, haematopoietic cytokine and the role of interferons. Cytokines and chemokines and their role in inflammation. Various forms of exudates.
4	Chronic inflammation: principal causes of chronic inflammation, cells and mediators of chronic inflammation, phases of the process, causes and phases of granuloma formation and related human diseases.
2	Wound repair mechanisms and related defects.
4	The systemic effects of inflammation: acute phase proteins, erythrocyte sedimentation rate, leukocytosis, fever and the effect of the cytokines on the hypothalamus. Glucocorticoids and the systemic effects.
2	Amyloidosis diseases: classification, etiopathogenesis and physiopathology.
2	Hypersensitivity reactions, definition of allergy, atopy and anaphylaxis. Gell and Coombs classification: general criteria and pathogenetic mechanisms, Koch phenomenon and tuberculin reaction, vasculitis.
4	Aging and longevity: epidemiology of aging, theories of aging, stem cells, autophagy, biological and chronological age.
2	Aging and related diseases: Alzheimer and Atherosclerosis
2	Hemodynamic alterations, embolic thrombus disease, shock
4	INTRODUCTION TO THE STUDY OF CANCER: tumor definition and general features of the neoplastic development; stem cells; benign and malignant tumors; criteria of nomenclature and classification of tumors; gradation of tumors; clinical and pathological classification of tumors according to the TNM system; stadiazione tumor, cytological diagnosis of cancer; further diagnostic methods; tumors of laboratory animals and experimental tumors.
4	EPIDEMIOLOGY OF CANCER: epidemiological methodology; morbidity 'and mortality' for tumors; distribution of tumors by geographical areas; distribution of tumors by age; distribution of tumors by sex; survival; the risk oncogenic hereditary; the risk oncogenic occupational and environmental; the risk oncogenic food.
3	MORPHOLOGICAL ASPECTS OF CELL CANCER: morphological characteristics of tumors to light and electron microscopy.
4	ONCOGENES: definition of oncogene; the family of oncogenes and their products; oncogenes that encode growth factors; oncogenes that encode related proteins to the receptors of growth factors; oncogenes that encode for protein kinases cytoplasmic.

4	TUMOR SUPPRESSOR GENES: definition of tumor suppressor genes; the intuition of the existence of tumor suppressor genes; as it has' come to the identification of tumor suppressor genes; rb1 the gene and the main functions of the product; the p105rb protein; TP53 gene involved in a large number of human tumors and the main functions of the p53 protein product; The BRCA1 and BRCA2 genes involved in breast cancer; fap gene involved in familial adenomatous polyposis and the main functions of the product.
4	CELL PROLIFERATION, CELL DEATH AND DIFFERENTIATION PROGRAM IN CANCER: the cell cycle and its phases; factors enhancing cell cycle progression; growth factors favoring the arrest of the cell cycle; apoptosis and cancer.
4	METASTATIC CAPACITY: the avascular stage of neoplastic growth; the adhesiveness cell; changes adhesiveness' homotypic in cancer cells; locomotion of cancer cells; the chemotactic factors for cancer cells; modifications of the activity 'heterotypic; proteases that digest the constituents of the extracellular matrix; the vascular phase of neoplastic growth.
3	HORMONES AND CARCINOGENESIS: mammary adenocarcinoma; tumors of the endocrine system; endocrine paraneoplastic syndromes; the hormone-responsive tumors; hints of immunity and tumors. Cancer and aging: convergent and divergent mechanisms Cancer and inflammation