



# UNIVERSITÀ DEGLI STUDI DI PALERMO

<b>DEPARTMENT</b>	Biomedicina, Neuroscienze e Diagnostica avanzata
<b>ACADEMIC YEAR</b>	2021/2022
<b>MASTER'S DEGREE (MSC)</b>	MEDICAL BIOTECHNOLOGIES AND MOLECULAR MEDICINE
<b>SUBJECT</b>	MOLECULAR IMMUNOLOGY
<b>TYPE OF EDUCATIONAL ACTIVITY</b>	B
<b>AMBIT</b>	50644-Discipline biotecnologiche comuni
<b>CODE</b>	14687
<b>SCIENTIFIC SECTOR(S)</b>	MED/04
<b>HEAD PROFESSOR(S)</b>	MERAVIGLIA SERENA Professore Associato Univ. di PALERMO
<b>OTHER PROFESSOR(S)</b>	
<b>CREDITS</b>	6
<b>INDIVIDUAL STUDY (Hrs)</b>	102
<b>COURSE ACTIVITY (Hrs)</b>	48
<b>PROPAEDEUTICAL SUBJECTS</b>	
<b>MUTUALIZATION</b>	
<b>YEAR</b>	1
<b>TERM (SEMESTER)</b>	2° semester
<b>ATTENDANCE</b>	Mandatory
<b>EVALUATION</b>	Out of 30
<b>TEACHER OFFICE HOURS</b>	<b>MERAVIGLIA SERENA</b> Monday 12:00 14:00 Cladibior AOUP Wednesday 12:00 14:00 Cladibior AOUP

DOCENTE: Prof.ssa SERENA MERAVIDGLIA

<b>PREREQUISITES</b>	Basic knowledge in the following discipline is required: Biology, Anatomy and Cell Physiology, Microbiology.
<b>LEARNING OUTCOMES</b>	<p>Knowledge and understanding To know the cellular and molecular mechanisms of the immune response, and their role in the defense against infectious agents and in the pathogenesis of immune mediated reactions. To know biotechnology mechanisms involved in the creations of new vaccine and new immunological drugs. To know the immunological web platform and the epidemiological and statistical software to use in immunological field.</p> <p>Applying knowledge and understanding To discuss and translate the mechanisms of the immune response to more general physiological and/or pathological condition; to design immunological experiments, to perform statistical analysis, to discuss clinical cases for their immunological implications.</p> <p>Making judgments To integrate acquired knowledge with a critical approach, to prove to be able to formulate personal judgments to solve analytical problems</p> <p>Communication skills To know how to clearly communicate immunological knowledge and to develop an appropriate scientific language</p> <p>Learning ability To update knowledge by consulting scientific literature, based on the knowledge acquired during the course and with individual study.</p>
<b>ASSESSMENT METHODS</b>	<p>Exams consist of two parts: in the first one we evaluate the general knowledge of the subjects and in the second one we evaluate the ability obtained during the practical activity in the lab.</p> <p>Oral examinations consist of two or three questions to evaluate either the basic and general knowledge of the topics discussed during the course and well described in the programme and the ability of the students to connect different topics and to show an appropriate language.</p> <p>In the second part of the exams, the student must design an experimental project using the technologies studied in order to evaluate the ability to reason about the topics and to solve easy-intermediate-difficult problems.</p> <p>The valuation of the overall interview is expressed in thirty as follows: Basic knowledge of the subject of the examination and the ability of synthesis and exposure from 18 to 23; In-depth knowledge of the subject with good synthesis and exposure skills from 24 to 27; Excellent knowledge of the subject matter and appropriate correlation with other relevant topics and excellent synthesis and exposure from 28 to 30 cum laude.</p>
<b>EDUCATIONAL OBJECTIVES</b>	<p>To know the basic mechanism of immune response either in physiological and in pathological conditions.</p> <p>To Know the immune response against alloantigens and mechanisms of transplant rejection.</p> <p>To know the mechanism of immune response against tumoral cells and the new therapeutical approaches that involved immunotherapy, immunomodulation therapy, use of anti tumoral vaccine either prophylactic and therapeutical and the adoptive cellular transfer approach.</p> <p>To know the modern therapy using monoclonal antibody: production, efficacy and limit.</p> <p>To know the modern approach in order to formulate and test new vaccines i.e reverse technology.</p>
<b>TEACHING METHODS</b>	Lessons, laboratory practical activities.
<b>SUGGESTED BIBLIOGRAPHY</b>	<p>- Abul K. Abbas, Andrew H. Lichtman, Shiv Pillai. Immunologia cellulare e molecolare- Ed. Elsevier srl; Edizione 9, ISBN: 8821447375.</p> <p>- Casey Weaver, Kenneth Murphy: Janeway's Immunobiology, Ed.9°, Garland Science, ISBN:9780815345510</p> <p>- Materiale didattico usato in aula/ Scientific articles and reviews recommended by the teacher.</p>

## SYLLABUS

Hrs	Frontal teaching
2	Introduction of immunology: lymphoid organs, innate immune system and phagocytosis
3	Acquired immune system: dendritic cells, T lymphocytes (CD4, CD8, NKT, $\gamma\delta$ , Treg), B cells
1	Cytokines and chemokines: receptors and their clinical applications
1	Major Histocompatibility Complex: genes and functions.
2	Immunological tolerance, autoimmunity. Rheumatoid arthritis and LES.
2	Immune response against viruses and bacteria

## SYLLABUS

Hrs	Frontal teaching
3	Congenit immunodeficiencies (Bruton agammaglobulinemia, common variable ipogammaglobulinemia, IgA deficit, ipogammaglobulinemia with iper IgM, SCID, congenit deficiency of phagocytes, congenit deficit of complement.Acquired immunodeficiencie) AIDS.
4	Classification of immunopathogenic reactions, I,II,III,IV type hypersensitivity.
2	Responses to alloantigens and transplant rejection
4	Anti tumoral immune response: immunotherapeutic approaches, immunomodulations, prophylactic vaccines and adoptive cellular therapy, role of immunological checkpoint
4	Mono and policlonal antibodies:production and clinical use
4	Vaccines
Hrs	Practice
4	Cellular cultures
6	Antigen antibody reactions in laboratory: precipitation, agglutination, ELISA, ELISPOT, Luminex and the use in biomedicine
6	The application of flow cytometry to biomedical research and diagnosis