Introduction to Clinical Immunology

1. IMPRINT

Academic Year	2024/2025
Department	Faculty of Dental Medicine
Field of study	English Dentistry Division
Main scientific discipline	Medical Science
Study Profile	General academic
Level of studies	Uniform MSc
Form of studies	Full-time studies
Type of module / course	Obligatory
Form of verification of learning outcomes	Completion
Educational Unit / Educational Units	Department of Immunology 5 Nielubowicza St. 02-097 Warsaw Phone: 22 599 21 99 Laboratory of Experimental Medicine 5 Nielubowicza St. 02-097 Warsaw Phone: 22 599 21 89
Head of Educational Unit / Heads of Educational Units	Prof. Jakub Golab, MD, PhD (Department of Immunology) Prof. Dominika Nowis, MD, PhD (Laboratory of Experimental Medicine)
Course coordinator	Prof. Dominika Nowis, MD, PhD; dominika.nowis@wum.edu.pl
Person responsible for syllabus	Prof. Dominika Nowis, MD, PhD; dominika.nowis@wum.edu.pl
Teachers	Prof. Jakub Golab, MD, PhD; jakub.golab@wum.edu.pl Prof. Dominika Nowis, MD, PhD; dominika.nowis@wum.edu.pl

2. BASIC INFORMATION

Year and semester of studies	2nd year, 1st semester	**Number of ECTS credits**	2.00

FORMS OF CLASSES / **Contacting hours with academic teacher**	**Number of hours**	**ECTS credits calculation**
Lecture (L)	10 (9 as e-learning)	0.33
Seminar (S)	15	0.67
Classes (C)		
e-learning (e-L)		
Practical classes (PC)		
Work placement (WP)		
Unassisted student's work		
Preparation for classes and completions	30	1

3. COURSE OBJECTIVES

O1	To familiarize students with the structure and functioning of the human immune system
O2	To familiarize the student with the basic mechanisms of induction and development of the immune response and the processes underlying the development of allergic diseases, autoimmune diseases, cancer, transplant rejection and primary and secondary immunodeficiencies
O3	To familiarize the student with the use of antibodies, cytokines and cells belonging to the immune system for diagnostic and therapeutic purposes

4. STANDARDS OF LEARNING – DETAILED DESCRIPTION OF EFFECTS OF LEARNING

Code and number of the effect of learning in accordance with standards of learning	**Effects in the field of:**
Knowledge – Graduate* knows and understands:	

C.W7.	structure of the immune system and its role
C.W8.	humoral and cellular mechanisms of innate and acquired immunity and mechanisms of hypersensitivity reactions and autoimmune processes
C.W10.	principles of immunodiagnostics and immunomodulation
C.W11.	pathomechanism of allergic diseases, selected hypersensitivity, autoimmune and immunodeficiency diseases
E.W3.	etiopathogenesis and symptomatology of respiratory, circulatory, hematopoietic, urogenital, immune, digestive, locomotor and endocrine diseases, with particular emphasis on diseases manifesting in the oral cavity
E.W16.	immunological aspects of transplantation and hemotherapy
Skills– Graduate* is able to:	
E.U4.	interpret the results of laboratory tests

5. ADDITIONAL EFFECTS OF LEARNING

Number of effect of learning	**Effects in the fields of:**
Knowledge – Graduate knows and understands:	
W1	the concept of health and disease, mechanisms of the formation and development of the disease process at the molecular, cellular, tissue and systemic levels, clinical symptoms of the disease, prognosis and complications of the disease
Skills– Graduate is able to:	
U1	-
Social Competencies – Graduate is ready for:	
K1	-

6. CLASSES

Form of class	**Class contents**	**Effects of Learning**
Lectures	Lecture 1 - Lecture topic: Introduction to immunology. Organization of the immune system. Educational content: main functions of the immune system; innate and adaptive immunity, humoral and cellular immune responses; the most important molecules of the immune system.	C.W7., C.W8.
	Lecture 2 - Lecture topic: Mucosal immunity. Learning content: structure and function of the mucosa-associated immune system, role of IgA antibodies, M cells, and defensins.	C.W7., C.W8.
	Lecture 3 - Lecture topic: Anti-infectious immunity - part 1.	C.W7., C.W8., E.W3.

	Educational content: basics of antiviral and antimicrobial response, mechanisms of immune response evasion by microorganisms.	C.W7., C.W8., E.W3.
	Lecture 4 - Lecture topic: Anti-infectious immunity - part 2. Educational content: basics of antiparasitic and antifungal response, mechanisms of immune response evasion by microorganisms, vaccines.	C.W7., C.W10.
	Lecture 5 - Lecture topic: Therapeutic and diagnostic applications of monoclonal antibodies. Educational content: biological functions of antibodies, methods of monoclonal antibodies generation, modifications of monoclonal antibodies for diagnostics and therapy, diagnostic techniques using antibodies (ELISA, Western blotting, immunoprecipitation, immunofluorescence microscopy, immunoelectron microscopy, immunohistochemistry), examples of applications of monoclonal antibodies in diagnosis and treatment of human diseases.	C.W7., E.W16., W1.
	Lecture 6 - Lecture topic: Transplantation immunology. Educational content: history and main achievements of transplantology, principles of tissue typing, induction of transplant response and effector mechanisms of graft rejection, goals and principles of immunosuppression, xenografts - history and prospects of application.	C.W7., C.W8., C.W11., E.W3., W1.
	Lecture 7 - Lecture topic: Hypersensitivity and allergic diseases. Educational content: pathogenesis of type I hypersensitivity, role of Th2 lymphocytes and IgE antibodies in allergies, mechanisms of mast cell activation and their effector functions, allergen immunotherapy, therapeutics strategies used in allergic diseases.	C.W7., C.W8., C.W10., W1.
	Lecture 8 - Immune tolerance and autoimmune diseases. Educational content: central and peripheral mechanisms of autoantigen tolerance, factors promoting development of autoimmune diseases, pathomechanisms of selected autoimmune diseases, basic introduction to the therapy of autoimmune diseases.	C.W7., C.W8., C.W11., W1.
	Lecture 9 - Lecture topic: Immunology and immunotherapy of cancer. Educational content: anti-tumor immunity, how cancer cells try to escape immune surveillance, cancer immunotherapy.	C.W7., C.W8., C.W11, E.W3., W1.
	Lecture 10 - Lecture topic: Secondary immunodeficiencies, HIV infection. Educational content: epidemiology of HIV infection, structure and life cycle of the virus, impact of HIV on the immune system, clinical manifestations of infection, antiretroviral therapy, status of HIV vaccine research.	
Seminars	Seminar 1 - Seminar topic: Basic definitions. The role of the immune system. Structure of lymphoid organs. Innate and adaptive immunity - basic differences, elements and role. Educational content - as above.	C.W7., C.W8., E.W3.
	Seminar 2 - Seminar topic: Structure and sources of diversity of antibodies and T cell receptors (TCRs). Application of monoclonal antibodies and their derivatives. Educational content - as above.	C.W7., C.W8., C.W10., E.W3., E.U4.

	Seminar 3 - Seminar topic: Major histocompatibility system. Presentation of antigens to T lymphocytes. Development of the immune response. Educational content - as above.	C.W7., C.W8., C.W10., E.W16., E.U4.
	Seminar 4 - Seminar topic: Innate immunity. Function of the complement system. Interferons. Functions of macrophages and granulocytes. Natural and antibody-dependent cell-mediated cytotoxicity. Mechanisms of lymphocyte cytotoxicity. Mechanisms of immunity in mucous membranes, with special emphasis on the oral cavity. Anti-infective immunity. Educational content - as above	C.W7., C.W8., C.W10., E.W3., W1.
	Seminar 5 - Seminar topic: Transplantation immunology. Mechanisms of allograft rejection. Basic characteristics of organ transplants. Dental problems in transplantology. Primary and secondary immunodeficiencies with dental aspects. Diagnostics of immunodeficiencies. Educational content - as above.	C.W7., C.W10., E.W16., E.U4., W1.
	Seminar 6 - Seminar topic: Hypersensitivity and allergies. Types of hypersensitivity with special emphasis on type I hypersensitivity. Allergen immunotherapy. Immune tolerance and self-tolerance. Natural protective mechanisms against autoimmunity. Selected mechanisms promoting autoimmunity. Autoimmune and autoinflammatory diseases with special emphasis on their cutaneous and mucosal manifestations. Educational content - as above.	C.W7., C.W8., C.W10., C.W11., E.W16., E.U4., W1.
	Seminar 7 - Seminar topic: Immunology of cancer. Tumor immune evasion. Anti-tumor immunity. Immunotherapy of cancer. Educational content - as above.	C.W7., C.W10., E.W16., W1.
	Seminar 8 - Credit Colloquium. Completion by students of the Questionnaire for Evaluation of Classes and Academic Teachers.	

7. LITERATURE

Obligatory

Kenneth M. Murphy, Casey Weaver, Leslie J. Berg. Janeway's Immunobiology (Tenth Edition), W. W. Norton & Company, 2022

Supplementary

-

8. VERIFYING THE EFFECT OF LEARNING

Code of the course effect of learning	Ways of verifying the effect of learning	Completion criterion
C.W7., C.W8., C.W10., C.W11., E.W3., E.W16., E.U4., W1.	Oral check of preparation for each seminar	Attendance at all seminars and lectures; familiarization with the content of lectures available through e-learning. Active participation in seminars.

	The test colloquium covers the content presented in lectures and seminars. The first term of the colloquium is a MCQ (25 questions - 13 single-choice and 12 multiple-choice). The second term of the colloquium is oral - answering 5 questions from a drawn set with your assistant. The committee colloquium can be held only in justified cases with the approval of the Head of the Department.	Obtaining more than 50% of the maximum number of points 2.0 (unsatisfactory) <12 pts. 3.0 (poor) 13-15 pts. 3.5 (satisfactory) 16-17 pts. 4.0 (good) 18-20 pts 4.5 (very good) 21-23 pts. 5.0 (excellent) 24-25 pts.

9. ADDITIONAL INFORMATION

Person responsible for teaching: Prof. Dominika Nowis, MD; email: dominika.nowis@wum.edu.pl

The first lecture is held in contact mode, the remaining lectures are held asynchronously in e-learning. Attendance and familiarization with the content of the lectures are mandatory and will be verified.

Seminars are held in contact mode. Attendance at all seminars is mandatory and will be verified by checking the attendance list. In exceptional situations, a Student who was absent from a seminar on a given topic and has a medical exemption for this time, must pass this seminar orally (answer 3 questions on the topic of a given seminar based on the list of applicable readings) with her/his assistant.

The program, the topics of the immunology classes and the list of chapters from the textbook “Immunobiology” required for a given seminar are available on the Department's website at: http://immunologia.wum.edu.pl

There is a Student Scientific Group at the Department of Immunology.
The supervisor of this group is Dr. Zofia Pilch; email: zofia.pilch@wum.edu.pl

ATTENTION

The final 10 minutes of the last class of the block/semester/year should be allotted for students to fill out the Survey of Evaluation of Classes and Academic Teachers