

**DESCRIPTION OF COURSE UNIT FOR DOCTORAL STUDIES
AT VILNIUS UNIVERSITY**

Scientific Area/eas, Field/ds of Science	Medical and Health Sciences (M 000): Medicine (M 001); Dentistry (M 002); Public Health (M 004) Natural Sciences (N 000): Biology (N 010)			
Faculty, Institute, Department/Clinic	Faculty of Medicine Institute of Biomedical Sciences Department of Physiology, Biochemistry, Microbiology and Laboratory Medicine			
Course unit title (ECTS credits, hours)	Clinical Immunology 7 credits (189 hours)			
Study method	Lectures	Seminars	Consultations	Self-study
Number of ECTS credits	-	-	1	6
Method of the assessment (in 10 point system)	<p>Presentation and evaluation of the report: the report is presented on a target topic, which is coordinated with the coordinating lecturers (the doctoral student must analyze, review and present the latest scientific publications related to the respective topic).</p> <p>Criteria for evaluating the report (minimum readable score - 5):</p> <ol style="list-style-type: none"> 1) relevance, novelty and relevance of the submitted material to the chosen topic (2 points); 2) general structure and scope of the report, clear presentation of knowledge, argumentation, conciseness and specificity (2 points); 3) organization of visual aids, ability to participate in discussion, question management, oratory skills (2 points); 4) summary, presentation and justification of conclusions (1 point); 5) raising problematic issues, presenting the application of the reviewed knowledge in the dissertation (3 points). 			
PURPOSE OF THE COURSE UNIT				
<p>To provide knowledge about the essence of immune reactivity, molecular and genetic mechanisms, cell interactions in the realization of the body's immune defense. To acquire systemic knowledge of immunology in order to understand the mechanisms of the immune response and its consequences and significance in the immunopathogenesis of diseases, immune mechanisms of tissue damage and their outcome. To get acquainted with modern methodologies of clinical immunology and their practical application in scientific and clinical work.</p>				
THE MAIN TOPICS OF COURSE UNIT				
<p><u>Basic part.</u> Phylogeny and embryogenesis of immune reactivity. Peculiarities of the immune response: innate and acquired immunity. Immunogenicity and antigenicity; antigens and haptens. Primary and secondary lymphatic organs; immune system cells, their functions, superficial markers. T and B lymphocyte response. NK cells and their response. Antigen-recognizing B and T lymphocyte surface molecules. Mucosal immune system. Tissue Compatibility Complex (MHC); antigen presentation by MHC I and MHC II pathways. Immunoglobulins: structure, function, antigenicity, biological functions. Complement: proteins of the complement system, their activators and inhibitors; methods of complement activation and biological effects. Inflammation - acute inflammation, chronic inflammation; cellular stress proteins, free radicals and antioxidant mechanisms, phagocytosis. Cytokines: general properties, classification and biological significance. Interaction of the</p>				

neuroendocrine and immune systems. Tolerance and autoimmune response: predisposing factors for autoimmune reactions and mechanisms of autoimmune response.

Medical immunology. Type I - IV hypersensitivity reactions and related disorders (atopic diseases, anaphylaxis, diseases caused by immune complexes and cellular immunity). Drug allergy. Immunopathogenesis and laboratory diagnosis of rheumatic diseases (systemic lupus erythematosus, rheumatoid and juvenile arthritis, Sjogren's syndrome, systemic scleroderma, Wegener's granulomatosis). Immunopathogenesis and laboratory diagnosis of thyroid autoimmune diseases. Immunological mechanisms and laboratory diagnosis of haematological diseases (autoimmune haemolytic anemia, neonatal haemolytic anemia, cold agglutination syndrome). Phospholipid syndrome and its laboratory diagnosis. Immunopathogenesis and laboratory diagnosis of diseases of the digestive system (celiac disease, Crohn's disease, ulcerative colitis, hepatitis). Immunopathogenesis and laboratory diagnosis of renal diseases (glomerular basement membrane diseases, glomerulonephritis caused by immune complexes). Skin diseases caused by the immune system (bullous pemphigoid, herpetiform dermatitis). Immunopathogenesis and laboratory diagnosis of neurological diseases (multiple sclerosis, Gullian-Barre syndrome, myasthenia gravis). Antibody - induced eye diseases. Respiratory immune disorders (sarcoidosis, eosinophilic pneumonia, Goodpasture's syndrome, allergic asthma) - pathogenesis, laboratory diagnosis. Immune response during pregnancy. Immunity to tumors: Ways to escape antitumor immunity from immune surveillance. Transplant immunology: effector mechanisms of allograft rejection. Primary and secondary immunodeficiency: mechanisms, clinical manifestations. Immunity to infectious diseases: antiviral and antibacterial, antifungal and antiparasitic immunity. Immunotherapy: immunomodulators, immunization, immunosuppressive therapy. Transfusion of blood components and immunological mechanisms of post-transfusion reactions.

Laboratory methods. Clinical laboratory methods for the detection of antigens and antibodies (principles and clinical application of agglutination, immunodiffusion, immunofixing, immunofluorescence, immunocytochemistry, immunoenzymatic methods); clinical laboratory methods for the assessment of cellular immunity (NBT reduction test, phagocytosis, principles of lymphocyte blast transformation, flow cytometry method and clinical application). Detection of human leukocyte antigens (HLA), tissue compatibility study. Laboratory methods for the detection of erythrocyte antigens and antibodies (agglutination, Coombs, etc.), pre-transfusion studies.

RECOMMENDED LITERATURE SOURCES

1. David Male,R. Stokes Peebles,Victoria Male. Immunology. Elsevier, 9th edition, 2021: <https://www.clinicalkey.com/#!/browse/book/3-s2.0-C20170023029?indexOverride=GLOBAL>
2. Robert R. Rich,Thomas A. Fleisher,William T. Shearer,Harry W. Schroeder,Anthony J. Frew,Cornelia M. Weyand. Clinical Immunology: Principles and practice. Elsevier, 5th edition, 2019: <https://www.clinicalkey.com/#!/browse/book/3-s2.0-C20150003446>
3. I. Raul Badell,Andrew B. Adams,Christian P. Larsen. Transplantation Immunobiology and Immunosuppression (in Sabiston Textbook of Surgery) Elsevier, 2021: <https://www.clinicalkey.com/#!/content/book/3-s2.0-B9780323640626000256>
4. Lindsay A.L. Bazydlo,James P. Landers. Tietz Textbook of Laboratory Medicine. Elsevier, 7th edition, 2022: <https://www.clinicalkey.com/#!/browse/book/3-s2.0-C20190014963>
5. R. R. Rich, T. A. Fleisher, W. T. Shearer, H. W. Schroeder, A. J. Frew, C. M. Weyand. Clinical Immunology: Principles and Practice. Elsevier/Saunders, 5th edition, 2019.

6. A. K. Abbas, A. H. Lichtman, S. Pillai. Cellular and Molecular Immunology. Elsevier/Saunders, 9th edition, 2017.
7. Bradley J. Udem, Brendan J. Canning. Middleton's Allergy: principles and practice. Elsevier, 2021: <https://www.clinicalkey.com/#!/browse/book/3-s2.0-C20161002419>
8. P. J. Deives, S. J. Martin, D. R. Burton, I. M. Roitt. Roitt's Essentials Immunology. Willey-Blackwell Publ., 13th edition, 2017.
9. Ruchika Goel, Aaron A.R. Tobian. Transfusion Medicine and Hemostasis. Elsevier, 3th edition, 2019.
10. G. Spickett. Oxford Handbook of Clinical Immunology and Allergy (4 ed.)// Oxford University Press -2020.

CONSULTING LECTURERS

1. Coordinating lecturer: Loreta Bagdonaitė (Assoc. Prof. Dr.).
2. Dainius Characiejus (Prof. Dr. HP).
3. Vytautas Žėkas (Dr.)

APPROVED:

By Council of Doctoral School of Medicine and Health Sciences at Vilnius University:
29th of September 2022

Chairperson of the Board: Prof. Janina Tutkuvienė