

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

Scientific Area/eas, Field/ds of Science	Medical and Health Sciences (M 000): Medicine (M001)			
Faculty, Institute, Department/Clinic	Faculty of Medicine Institute of Clinical Medicine Clinic of Rheumatology, Orthopaedics Traumatology and Reconstructive Surgery			
Course unit title (ECTS credits, hours)	Autoimmune Process in Rheumatology 8 credits (212 hours)			
Study method	Lectures	Seminars	Consultations	Self-study
Number of ECTS credits	-	-	2	6
Method of the assessment (in 10 point system)	<p>Preparation of presentation and its evaluation: the presentation is on a relevant topic, which is coordinated with the consulting lecturers (the doctoral student must analyse and present the latest scientific literature related to the topic). <u>Criteria for evaluating the presentation (minimum – 5 points):</u></p> <p>a) relevance, novelty of the material, and compliance with the submitted topic (2 points), b) general structure and amount, rationale, conciseness, and specificity of the presentation (2 points), c) summary, presentation, and justification of conclusions (1 point), d) emphasis on problematic issues, presentation of knowledge application in the dissertation (3 points), e) use of visual measures, ability to participate in a discussion, answering questions, oratory skills (2 points).</p>			
PURPOSE OF THE COURSE UNIT				
<p>To provide theoretical and practical knowledge about human immunity, autoimmunity, the characteristics of physiological and pathological processes related to immunity and autoimmunity, and their clinical manifestations in inflammatory joint, systemic connective tissue diseases, vasculitides, and other rheumatic diseases. To promote an interdisciplinary, holistic approach to health, a healthy environment, and changes in today's lifestyle in order to personalize healthcare, ensuring a high quality of life and maximum life expectancy.</p>				
THE MAIN TOPICS OF COURSE UNIT				
<p>Autoimmunization, understanding of its mechanism, autoantigens, autoantibodies, and their physiological significance. Autotolerance and the mechanism of its formation. Clonal deletion (destruction of autoreactive cells), clonal anergy (deactivation of autoreactive cells). Tolerance to autoantigens. Elimination of autoreactive T-clones. Positive selection and survival of T lymphocytes. Negative selection of B lymphocytes, the significance of T helper cells co-stimulation. Impaired regulation of the immune system. Theories of the development of autoimmune pathology: selection of clones (the forbidden clone theory), destructive effects of autoantibodies and sensitized lymphocytes, loss of self-tolerance to autologous components of the organism. Cross-reactivity between antigens, immunodeficiency, genetic control of the immune response, regulatory networks of immune system cells (changes in idiotypic and anti-idiotypic response), feedback loops.</p> <p>The spectrum of autoimmune diseases. Organ-specific autoimmune diseases (endocrine, haematological, dermatological, neuromuscular), assumed</p>				

autoimmune diseases, systemic autoimmune diseases. Immune complex diseases. Autoimmune rheumatic diseases. Autoimmune theory of rheumatic diseases. Disruption of immunological processes in rheumatic diseases. Enhanced B cell activation. Diagnostic and prognostic significance of autoantibody detection in rheumatology. The role of cytokines in the autoimmunization. Genetic aspects of autoimmune diseases - association between HLA and rheumatic diseases. Inflammatory process as one of the main pathogenic factors. The process of autoimmunization in rheumatoid arthritis and other inflammatory arthropathies. Pathogenesis of rheumatoid arthritis. Imbalance in T and B lymphocytes. Impaired regulation of the immune response. T lymphocyte deficiency, insufficient control of antibody synthesis, autoantibody synthesis. Formation of immune complexes. Complement activation. Cell damage, development of inflammatory process. Synovitis. Local inflammation, pro-inflammatory cytokines. Synovial hyperplasia, cartilage degradation. The process of autoimmunization in systemic lupus erythematosus, systemic sclerosis, inflammatory myopathies, Sjogren's syndrome, mixed connective tissue disease, and overlap syndrome. Genetically induced pathology. Imperfection of immunoregulatory processes. Uncontrolled production of antibodies against the tissues, cells and individual components of the body, the development of chronic autoimmune and immune complex-mediated inflammation. Association with HLA, genetic heterogeneity. Development of the immune response characteristic of systemic lupus erythematosus. Hyperactivation of B lymphocytes. T cell dysfunction. Activation of autoantibody synthesis against nuclear components, anti-double-stranded deoxyribonucleic acid antibodies. Induction of autoimmunity. The role of anti-nuclear antibodies in the formation of immune complexes. Circulation of immune complexes and their deposition in tissues in systemic lupus erythematosus, vasculitides and other diseases. Impaired clearance of immune complexes. Relationship between immune complex-mediated and autoimmune processes. The role of cytokines in the development of the inflammatory process. Genetic defects of complement, changes in complement components, their role in the development of immune complex-mediated response.

RECOMMENDED LITERATURE SOURCES

1. M. C. Hochberg, A. J. Silman, S. Smolen. Rheumatology, 2-Volume Set, 6th Edition, 2015.
2. J.WJ.Bijlsma 2018 EULAR Textbook on Rheumatic Diseases 1-th ed. BMJ group.
3. Csernok E, Bossuyt X. Investigations in systemic vasculitis. The role of the laboratory. Best Pract Res Clin Rheumatol. 2018 Feb;32(1):52-62.
4. Patel L, Gizinski AM. A Primer on Rheumatologic Laboratory Tests: What They Mean and When to Order Them. Prim Care. 2018 Jun;45(2):181-191.
5. Dörner T, Fleck M. Laboratory diagnostics in rheumatology. Z Rheumatol. 2016 May;75(4):354-5.
6. Willis R, Lakos G, Harris EN. Standardization of antiphospholipid antibody testing – historical perspectives and ongoing initiatives. Semin Thromb Hemost 2014;40:172–7.
7. Choi MY, Fritzler MJ. Progress in understanding the diagnostic and pathogenic role of autoantibodies associated with systemic sclerosis. Curr Opin Rheumatol 2016;28:586–94.
8. Mandl P, Navarro-Compán V, Terslev L, et al. European League Against Rheumatism (EULAR). EULAR recommendations for the use of imaging in the diagnosis and management of spondyloarthritis in clinical practice. Ann Rheum Dis. 2015 Jul; 74(7):1327-39.
9. Rider LG, Ruperto N, Pistorio A et al. International Myositis Assessment and Clinical Studies Group and the Paediatric Rheumatology International Trials Organisation. 2016 ACR-EULAR adult dermatomyositis and polymyositis and juvenile dermatomyositis response criteria-methodological aspects. Rheumatology
10. G. S. Firestein, R. C. Budd, S. E. Gabriel, I. B. McInnes, J.R. O'Dell. Firestein & Kelley's Textbook of Rheumatology, 2-Volume Set, 11th Edition, 2020. p 273-494.

11. H. M. Moutsopoulos, E. Zampeli, P. G. Vlachoyiannopoulos. Rheumatology in Questions, 2018. p 3-36.

CONSULTING LECTURERS

1. Coordinating lecturer: Irena Butrimienė (Prof. Dr.).

2. Sigita Stropuvienė (Assoc. Prof. Dr.).

3. Rita Rugienė (Assoc. Prof. Dr.).

4. Dalia Miltinienė (Assist. Prof. 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