MEDICAL FACULTY UNIVERSITY OF NIŠ				
Study program: Medicine				
Course name: Basics of immunology				
Semester: fourth semester; year 2021/2022				
Year of studies: second				
CURRICULUM - THEORETICAL LECTURES – FOURTH SEMESTER				
week	date	Topic	Performer	No of classes
1.	February	**Introduction to immunology:** immunity, immune system, types of immunity, basic characteristics of innate and adaptive immunity, phases of the immune response. **Cells and tissues of the immune system:** innate cells, primary and secondary lymph organs: lymph node, spleen, lymph mucosal tissue.	M Kostić Assistant professor	2
2.	1.week in March	**Innate immunity:** components of innate immunity: epithelial barriers, monocyte-macrophage system, granulocytes, natural killer cells, complement, cytokines and chemokines of innate immunity. Innate immunity reactions: inflammation and antiviral response. The interactions between innate and adaptive immunity.	G Marjanović Professor	2
3.	2.week in March	**Antigens and antibodies:** types of antigens (antigenicity and immunogenicity), antibody, class and antibody class, antibody-response antibody (affinity and avidity).	G Marjanović Professor	2
4.	3.week in March	**Development of B lymphocytes:** B cell receptor complex, markers of B lymphocytes, differentiation of B lymphocytes in the bone marrow, rearrangement of the immunoglobulin gene.	G Marjanović Professor	2
5.	4.week in March	**MHC genes their products:** the structure of MHC class I and II molecules, allelic polymorphism, polygenia, peptide binding cleft structure. Antigen processing and presentation, and antigen presenting cells.	G Marjanović Professor	2
6.	5.week in March	**Development of T lymphocytes**: T cell receptor complex, markers of T lymphocytes, co-receptors, differentiation of T lymphocytes in thymus (control points of maturation).	T Džopalić Assistant professor	2
7.	1. week in April	**Activation of T lymphocytes:** biochemical mechanisms of signal transduction, co-stimulation, proliferation, differentiation of naive T lymphocytes into effector cells. Effector CD4+ (Th1, Th2, Th17) and CD8+ T lymphocytes.	T Džopalić Assistant professor	2
8.	2. week in April	**Cellular immune response:** migration of naive and effector T lymphocytes (homing), interaction of effector CD4+ lymphocytes and macrophages, cytotoxicity.	T Džopalić Assistant professor	2
9.	3. week in April	**Humoral immune response:** Generation of antibodies to thymus-independent and thymus-dependent antigens, co-operation of T and B lymphocytes, isotype switch, maturation of the antibody affinity.	T Džopalić Assistant professor	2
10.	4. week in	**Effector functions of antibody:**	T Džopalić	2

	April	neutralization, opsonization and phagocytosis, antibody-dependent cytotoxicity, antibody secretion into mucous, transplantation immunity. **Complement system:** Pathways of activation, biological functions, regulatory proteins.	Assistant professor	
11.	1. week in May	**Regulation of the** Immune Response: mechanisms for the establishment of immunological homeostasis - apoptosis, regulation of the immune response by cytokines, antibodies and regulatory lymphocytes. **Autotolerance:** mechanisms of central and peripheral autotolerance. **Autoimmunity:** Role of genetic factors and infection.	M Kostić Assistant professor	2
12.	2. week in May	**Atopy and hypersensitivity reactions**	M Kostić Assistant professor	2
13.	3 week in May	**Primary and secondary immunodeficiency:** acquired immunodeficiency syndrome (AIDS). Specificity of the immune response to extracellular and intracellular microorganisms.	M Kostić Assistant professor	2
14.	4.week in May	**Immunity to tumors:** basic characteristics of tumor antigens and anti-tumor immune response, tumor immunotherapy.	G Marjanović Professor	2
15.	1 week in June	**Reactions to transplanted tissues:** alloantigens, allopresentation, allograft rejection mechanisms, graft vs host disease.	G Marjanović Professor	2

CURRICULUM –PRACTICAL/SEMINARCLASSES - FOURTH SEMESTER				
Week	Date	Topic	Performer	No classes
1.	Feb	Innate immunity tests: basic characteristics of the innate immune response, leukocyte counts, chemotaxis of phagocytes (Boyden's chamber), respiratory burst testing (NBT test and chemiluminescence test).	M Kostić Assistant professor	2
2.	March	Immunoprecipitation: structure of antigens and antibodies, principles of immunoprecipitation and immunodiffusion in gel (RID plates).	M Kostić Assistant professor	2
3.	March	Agglutination: principles of agglutination tests, direct agglutination tests (blood grouping, Paul Bunnel reaction, Widal reaction, Weil-Felix probe, dense Coombs test), indirect agglutination tests (Waller-Rose and Latex test for RF, indirect Coombs test) agglutination inhibition tests (pregnancy test - βHCG).	M Kostić Assistant professor	2
4.	March	Protein separation in the electric field: zonal electrophoresis, immunoelectrophoresis and immunofixation.	M Kostić Assistant professor	2
5.	March	Detection of immune complexes: immune complexes and pathogenesis of immune complex diseases, methods of detection of	M Kostić Assistant professor	2

		immune complexes (PEG, methods with C1q and RF), cryoglobulinemia and methods of detection of cryoglobulin (determination of cryocrit), nephelometry, turbidimetry.		
6.	March	Detection of tissue antigens: direct and indirect immunohistochemistry (immunofluorescence and immunoenzyme techniques).	M Kostić Assistant professor	2
7.	April	Detection of soluble antigens: ELISA test (direct, sandwich, competitive), RIA test (competitive, noncompetitive), Western Blot.	M Kostić Assistant professor	2
8.	April	Cellular immunity tests: basic characteristics of cellular immune response, lymphocyte density gradient, ELISPOT, blast lymphocyte transformation test, cytotoxicity tests with radioactive Cr.	T Džopalić Assistant professor	2
9.	April	Evaluation of complement system: basic complement system characteristics, CH50 and AH50 test, complement fixation assays.	T Džopalić Assistant professor	2
10.	April	Immunization and skin tests: types of immunization, vaccinations (types of the vaccines and mechanisms of action), passive immunization, skin reactions (Prick test), delayed-hypersensitivity skin tests (Patch test and Mantoux probe).	T Džopalić Assistant professor	2
11.	May	Monoclonal antibodies: the technology of monoclonal antibody production, chimeric, humanized and human monoclonal antibodies, the use of monoclonal antibodies in diagnostics and therapy.	T Džopalić Assistant professor	2
12.	May	Flow cytofluorimetry and cell sorting: basic principles of flow cytofluorimetry (Scattering, immunophenotyping, cell cycle analysis, apoptosis analysis, FACS) and immunomagnetic sorting.	T Džopalić Assistant professor	2
13.	May	Immune basics of solid organ transplantation: basic characteristics of the immune response to transplanted tissues, preparation of the patient for transplantation and immunological testing - HLA typing (microlymphocytotoxicity test and PCR), Cross match tests (complement test and virtual cross match), mixed lymphocytic reaction.	T Džopalić Assistant professor	2
14.	May	Seminars	T Džopalić Assistant professor	2
15.	May	Nadoknada * prevod na engleski	T Džopalić Assistant professor	2