UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN
Faculty of Medicine

Course sylabus – part A
Immunology

48SJ-IMM
ECTS: 5.00
CYCLE: 2023Z

SUBJECT MATTER CONTENT

LECTURE
Introduction to immunology. Elements of the immune system and their functions. Innate and acquired response. Humoral and cellular response. Specific and nonspecific cellular response. Humoral immunity. Immune tolerance and autoimmune reactions. Hypersensitivity. Immunology of infection. Congenital and acquired immune deficiencies. Revitalization and immunity. Immunology of metabolic disorders. Cancer immunology. Reproductive immunology. Transplantation immunology.

SEMINAR
Serological diagnosis of infection, basic methods, sensitivity and specificity. Basic diagnostic methods: complement fixation test, hemagglutination test, ELISA, Western blot, IIF, PCR. Post-transfusion reactions, hematological disorders. Diagnostics of autoimmune diseases. Modern methods of allergy diagnosis

CLASSES
Diagnosis of Borrelia burgdorferi infection by ELISA and Western blot. Allergological diagnosis: prick tests, patch tests. Non-specific defense: barriers and complement system; ELISA test for C1-INH, analysis of results and their clinical significance; Specific defense: antigen-antibody reaction in immunohistochemical staining, analysis of test results for the level of various antibodies and their clinical significance; Inflammation: Acute inflammation, cassette tests, agglutination and precipitation tests, CRP test, analysis of the causes and effects of inflammation on the example of acute pancreatitis; Cross-reaction: ASO test; Chronic inflammation on the example of hyperuricemia and gout; Analysis of differences in the course of viral and bacterial pneumonia; Blood count and cytometry; Hypersensitivity and immune deficiency: Analysis and recognition of different types of hypersensitivity, comparison of IgE and prick test results and environmental influences in allergy; Analysis of the influence of the complement system, vaccinations and tuberculin test on hypersensitivity reactions, analysis of the causes of delayed type hypersensitivity, analysis of the effects of autoantibody reactions to hormonal receptors; immune complexes in hypersensitivity; Analysis of the effects of nutritional deficiencies, the effects of viruses and genetic mutations on the defense system; Analysis of hypergammaglobulinemia in alcoholism. Immunological tolerance, autoimmunity and diseases in the hematopoietic system: tests and analyzes of anti-blood cell antibody results using gel cards: antibodies of AB0, RhD groups, Coombs test (e.g. Kell, P, Lewis, MNS); AB0Rh blood group analysis in relation to donor/recipient; Analysis of the effects of post-transfusion reaction; Analysis of microcytotoxic test results between transplant donor and recipient. Determining the recipient's HLA based on the donor's HLA in kidney transplant, bone marrow transplant, second transplant; Analysis of types of autoantibodies in autoimmunity; Analysis of clinical cases of diseases related to the defense system

Legal acts specifying learning outcomes: 3112022
Disciplines: medical sciences
Status of the course: Obligatoryjny
Group of courses: A - przedmioty podstawowe
Code: ISCED 0912
Field of study: Medicine
Scope of education:
Profile of education: General academic
Form of studies: full-time
Level of studies: uniform master's studies
Year/semester: 2/3

Types of classes: Lecture, Seminar, Classes
Number of hours in semester: Lecture: 20.00, Seminar: 10.00, Classes: 30.00
Language of instruction: English
Introductory subject: biologia medyczna, biofizyka, biochemia
Prerequisites: knowledge of human anatomy, biology, especially the biological bases of cytology, physiology and genetics, organic and inorganic chemistry, biophysics, biochemistry

Name of the organisational unit conducting the course: Katedra Fizjologii i Patofizjologii Człowieka
Person responsible for the realization of the course: dr hab. n. med. Joanna Haraźna, prof. UWM, prof. dr hab. wet. Mariusz Majewski
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Additional remarks:

TEACHING OBJECTIVE

mastery of knowledge by students of the structure, functions and mechanisms of the immune system, the participation of this system in the prevention, treatment and pathogenesis of diseases, as well as the application of laboratory immunological methods in diagnostics, therapy and research. Students learn the basics of laboratory work with research material such as blood and its derivatives and tissue sample

DESCRIPTION OF THE LEARNING OUTCOMES OF THE COURSE IN RELATION TO THE DESCRIPTION OF THE CHARACTERISTICS OF THE SECOND LEVEL LEARNING OUTCOMES FOR QUALIFICATIONS AT LEVELS 6-8 OF THE POLISH QUALIFICATION FRAMEWORK IN RELATION TO THE SCIENTIFIC DISCIPLINES AND THE EFFECTS FOR FIELDS OF STUDY:

Symbols for outcomes related to the discipline:	M/NMA_P7S_WG+++
Symbols for outcomes related to the field of study:	F.U3.+, C.W22.+, C.W50.+, C.W25.+, D.U16.+, C.W6.+, K.9.+, C.W48.+, C.W24.+, C.W23.+, C.W21.+, K.5.+, K.8.+, K.7.+, D.U17.+

LEARNING OUTCOMES:

Knowledge:

W1 – The student acquires the knowledge of lectures, classes and seminars, learns the structure, functions and mechanisms of the immune system. Learns about the mechanisms of the defense system in the prevention, treatment and pathogenesis of diseases and the application of laboratory immunological methods in diagnostics, therapy and research. The student describes the main histocompatibility system, determines the genetic basis for selecting a donor and transplant recipient, learns about the immunological consequences of improper nutrition, especially nutrient deficiency, and the immunological consequences of these deficiencies M / NM_C.W21. the basics of development and mechanisms of the immune system, including specific and non-specific mechanisms of humoral and cellular immunity; M / NM_C.W22. major histocompatibility complex; M / NM_C.W23. types of hypersensitivity reactions, types of immunodeficiency and basics of immunomodulation; M / NM_C.W24. issues in the field of cancer immunology; M / NM_C.W25. genetic bases of donor and recipient selection and basics of transplant immunology; M / NM_C.W48. the consequences of a deficiency of vitamins or minerals and their excess in the body; M / NM_C.W50. the consequences of improper nutrition, including prolonged starvation, excessive eating and the use of an unbalanced diet, and disorders of digestion and absorption of digestive products; M / NM_C.W6. genetic conditions of human blood groups and serological conflict in the Rh system

Skills:

U1 – The student learns various immunological diagnostic techniques, is able to perform them and interpret the result, also in the thematic analysis of a clinical case and applies the principles of sepsis and antiseptics in working with blood and its derivatives U12. analyze reactive, defensive and adaptive phenomena as well as regulatory disturbances caused by the etiological factor; C.U8. use the antigen-antibody reaction in current modifications and techniques for the diagnosis of infectious, allergic, autoimmune and neoplastic diseases and blood diseases; D.U16. demonstrate responsibility for improving their qualifications and transferring knowledge to others; D.U17. critically analyze medical literature, including in English, and draw conclusions; F.U3. follow the rules of asepsis and antisepsis;

Social competence:

K1 – The student knows the rules of professionalism, especially in laboratory work with infectious material, uses objective sources of information, understands the rules of teamwork M / NM_K.7. use of objective sources of information; M / NM_K.8. formulating conclusions from own measurements or observations; M / NM_K.9. implementation of the principles of professional camaraderie and cooperation in a team of specialists, including representatives of other medical professions, also in a multicultural and multinational environment; K.5. noticing and recognizing own limitations and self-assessment of deficits and educational needs

TEACHING FORMS AND METHODS:

Lecture(W1;):Lecture with presentations
Seminar(W1;U1;K1;):presentations, discussion of prepared issues, discussion
Classes(W1;U1;K1;):laboratory classes include: individual performing of experiments and diagnostic tests as well as analysis and interpretation of results; filling in thematic reports prepared by the teacher, discussing clinical cases illustrating the issue

FORM AND CONDITIONS OF VERIFYING LEARNING OUTCOMES:

Lecture (Written exam) - The topics of the lectures may fall within the scope of the partial test necessary to complete the semester course, the material carried out during lectures, seminars and exercises is included in the thematic scope of the immunology exam. The conditions for admission to the exam is passing the classes and seminars and obtaining at least a satisfactory written exam evaluation. -
Seminar (Evaluation of the work and cooperation in the group) - Evaluation of the work and cooperation in the group - The topics discussed at the seminars fall within the scope of 2 tests. Passing both tests and a positive assessment of the work and cooperation in the group - students will be assessed individually - determine the evaluation of the seminars. The final evaluation for the seminars will be calculated as the mean grade for individual work at seminars, averaged with the grade from 2 tests. -
Classes (Colloquium test) - Topics discussed during classes and seminars fall within the scope of 2 tests. Passing two tests and a positive assessment of the work and cooperation in the group during the classes - students will be assessed individually - determine the passing of the classes. The final grade for the exercises will be calculated as the average grade for individual work during the exercises, averaged with the grade from 2 tests -

BASIC LITERATURE:

1. Abul K. Abbas, Andrew H. Lichtman, Shiv Pillai,, *Basic Immunology: Functions and Disorders of the Immune System.*, Wyd. Elsevier, R. 2019
2. Abul K. Abbas, Andrew H. Lichtman, Shiv Pillai,, *Cellular and Molecular Immunology*, Wyd. Elsevier, R. 2021

SUPPLEMENTARY LITERATURE:

1. Vinay Kumar, Abul K. Abbas, Jon Aster,Robbins, *Basic Pathology*, Wyd. Elsevier, R. 2017

Detailed description of ECTS credits awarded - part B

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Immunology

The number of ECTS credits awarded consists of:

1. Contact hours with the academic teacher:

- participation in: Lecture	20.0 h
- participation in: Seminar	10.0 h
- participation in: Classes	30.0 h
- consultation	5.0
	Total: 65.0 h.

2. Independent work of a student:

Preparation for classes, tests, examinations, preparation of reports for the completion of exercises, consultations	60.00 h

Total: 60.0 h

contact hours + independent work of a student Total: 125.0 h

1 ECTS credit = 25-30 h of an average student’s work, number of ECTS credit = 125.0 h : 25.0 h/ECTS = 5.00 ECTS on average: 5.0 ECTS

- including the number of ECTS credits for contact hours with the direct participation of an academic teacher: 0,00 ECTS points,

- including the number of ECTS credits for hours of independent work of a student: