



Course syllabus – part A Immunology

48SJO-IMMUN

2025

ECTS: 5.00

SUBJECT MATTER CONTENT:

Seminar

1. Serological diagnostics of infections, basic methods, sensitivity and specificity
2. Basic diagnostic methods: complement fixation test, hemagglutination test, ELISA, Western blot, IIF, PCR
3. Post-transfusion reactions, hematological disorders
4. Diagnostics of autoimmune diseases
5. Modern methods of allergy diagnostics

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. Lymphocytes maturation, immune tolerance and autoimmune reactions. Hypersensitivity. Immunology of infection. Congenital and acquired immune deficiencies. Nutrition and immunity. Immunology of metabolic disorders. Cancer immunology. Reproductive immunology. Transplantation immunology.

Classes

1. Diagnosis of *Borrelia burgdorferi* infection using ELISA and Western blot methods
2. Allergy diagnostics: prick tests, patch tests
3. Non-specific defense: immunological barriers and the complement system: cassette chromatographic tests for *Helicobacter pylori*, SARS CoV2, analysis of results and their clinical significance, cases
4. Specific defense: antigen-antibody reaction. CGRP immunohistochemical staining using the antigen/antibody reaction, analysis of results of tests for the level of various antibodies and their clinical significance, cases
5. Inflammation: Acute inflammation, examination with the CRP latex test, analysis of the causes and effects of inflammation on the example of acute pancreatitis. Chronic inflammation on the example of hyperuricemia and gout. Analysis of differences in the course of viral and bacterial pneumonia, blood morphology and cytometry, cases
6. 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 effect of the complement system and vaccinations and tuberculin test in hypersensitivity reactions, analysis of the causes of delayed hypersensitivity, analysis of the effects of autoantibody reactions to hormonal receptors. Cross-reaction: ASO testing with a latex test. Analysis of the effects of nutritional deficiencies, virus activity and genetic mutations in the defense system. Chromatographic testing of anti-HBV antibodies in the cassette test. Analysis of hypergamma-globulinemia in alcoholism. Cases

Legal acts specifying learning outcomes: 467/2024 (Medicine),
Status of the course: None
Group of courses: None
Discipline: Medical Sciences
Classes:
Lecture (20 h)
Seminar (5 h)
Classes (30 h)
Step: Kierunek lekarski drugi rok (oferta w jęz. angielskim dla obcokrajowców)
Program: Medicine
Form of studies: full-time
Level of studies: uniform master's studies

Introductory subject: medical biology, biophysics, biochemistry

Prerequisites: knowledge of human anatomy, biology, especially the biological bases of cytology, physiology and genetics, organic and inorganic chemistry, biophysics, biochemistry

Coordinators:

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7. Immunological tolerance, autoimmunity and diseases in the hematopoietic system. Studies and analyses of anti-blood cell antibody results using gel cards: ABO, RhD group antibodies, Coombs test (e.g. Kell, P, Lewis, MNS). Analysis of ABO Rh blood groups in relation to donor/recipient. Analysis of the effects of post-transfusion reaction. Analysis of microcytotoxic test results between donor and recipient of transplant. Selection of donor HLA based on recipient HLA in kidney transplantation, bone marrow transplantation, second transplantation, analysis of types of autoantibodies in autoimmunology. Cases

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_KO++++, M/NMA_P7S_KR+, M/NMA_P7S_UW++++, M/NMA_P7S_UW+++ , M/NMA_P7S_WG++++++

Symbols for outcomes related to the field of study:

K.5+, K.7+, K.8+, K.9+, KA7_KR1+, B.U12+, B.U8+, D.U4+, E.U30+, KA7_UW5+, KA7_UU1+, KA7_UK2+, D.U5+, C.W16+, C.W17+, C.W18+, C.W19+, C.W20+, C.W4+, C.W39+, C.W42+, C.W21+, C.W22+, C.W23+, C.W40+, C.W43.+

LEARNING OUTCOMES (Knowledge, Skills, 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
K.5. noticing and recognizing one's own limitations and making self-assessment of deficits and educational needs
K.7. using objective sources of information
K.8. formulating conclusions from one's own measurements or observations
K.9. implementing the principles of professional camaraderie and cooperation in a team, including with representatives of other medical professions, also in a multicultural and multinational environment
KA7_KR1 observe and apply the principles of academic and professional ethics and professional image, academic, social and professional professionalism
- 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
B.U12. use basic laboratory and molecular techniques
B.U8. use medical databases and correctly interpret the information contained therein needed to solve problems in the field of basic and clinical sciences
D.U4. demonstrate responsibility for improving one's qualifications and transferring knowledge to others
D.U5. critically analyze medical literature, including in English, and draw conclusions

E.U30. apply the principles of providing feedback (constructive, non-evaluative, descriptive) within the framework of team cooperation
 KA7_UK2 communicate in a team and share knowledge
 KA7_UW5 plan one's own educational activity and continuously improve one's knowledge in order to update it
 KA7_UU1 inspire the learning process of others

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. immunological tolerance, learns about the immunological consequences of improper nutrition, especially the deficiency of nutrients and the immunological consequences of these deficiencies, learns the basics of immuno-oncology, understands the mechanisms of immunity and the role of protective vaccinations
 C.W16. Principles of diagnosing infectious, allergic, autoimmune and neoplastic diseases and blood diseases based on the antigen-antibody reaction
 C.W17. Principles of disinfection, sterilization and aseptic procedure
 C.W18. Specific and non-specific mechanisms of humoral and cellular immunity
 C.W19. Major histocompatibility complex
 C.W20. Types of hypersensitivity reactions, types of immunodeficiencies and the basis of immunomodulation
 C.W4. Genetic determinants of human blood groups and serological conflict in the Rh system
 C.W39. Consequences of deficiency and excess of vitamins and minerals
 C.W42. Molecular basis of neoplastic diseases and issues in the field of tumor immunology
 C.W21. Issues in the field of tumor immunology and immunological diseases and principles of immunotherapy
 C.W22. Genetic basis of donor and recipient selection and the basis of transplantation immunology

TEACHING FORMS AND METHODS:

Seminar-['W1', 'U1', 'K1']-presentations, discussion of prepared issues, discussion

Lecture-['W1']-Lecture with presentations

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:

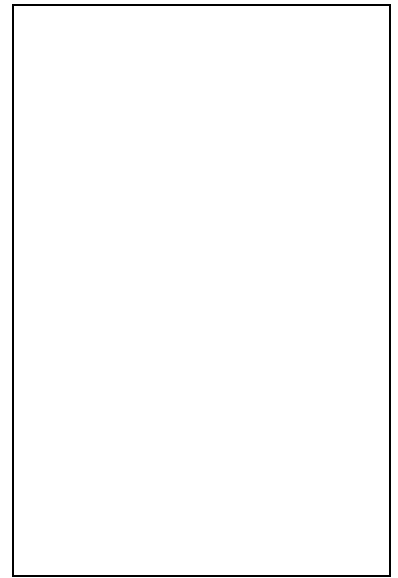
Classes-(Colloquium test)-['U1', 'K1']-Passing the tutorial topics includes 2 tests and entrance pretests before each classes. The entrance pretests note is averaged with the assessment of the tutorial work and with the report assessment. A positive assessment of two tests and a positive assessment of individual tutorials - students will be assessed individually - are necessary to pass the classes. The final assessment of the tutorials will be calculated as the average of the assessments of the individual tutorial work and the assessments of the 2 tests.

Lecture-(Written exam)-['W1']-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)-['U1', 'K1']-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.

Literature:

1. **Basic Pathology**, Vinay Kumar, Abul K. Abbas, Jon Aster, Robbins, Elsevier, 2022, Strony: 1-227, Tom:1 (literatura uzupełniająca)
2. **Basic Immunology: Functions and Disorders of the Immune System.**, Abul K. Abbas, Andrew H. Lichtman, Shiv Pillai,, Elsevier, 2023, Strony: 1-352, Tom:1 (literatura podstawowa)
3. **Cellular and Molecular Immunology**, Abul K. Abbas, Andrew H. Lichtman, Shiv Pillai,, Elsevier, 2021, Strony: 1-489, Tom:1 (literatura podstawowa)





Detailed description of ECTS credits awarded - part B
Immunology

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ECTS: 5.00

The number of ECTS credits awarded consists of:

1. Contact hours with the academic teacher:

- participation in: Lecture	20 h
- participation in: Seminar	5 h
- participation in: Classes	30 h
- consultation	4 h
Total: 59 h	

2. Independent work of a student:

Preparation for classes, tests, examinations, preparation of reports for the completion of exercises, consultations	66.00 h
Total: 66.00 h	

Total (contact hours + independent work of a student): 125.00 h

1 ECTS credit = 25-30 h of an average student's work, number of ECTS,
ECTS Points = 125.00 h : 25 h/ECTS = **5.00** ECTS

Average: 5.00 ECTS

- including the number of ECTS credits for contact hours with the direct participation of an academic teacher	2.36 ECTS
- including the number of ECTS credits for hours of independent work of a student	2.64 ECTS