# Immunology

Educational subject description sheet

## Basic information

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|---|---|
| **Organizational unit**<br>Faculty of Medicine<br>**Field of study**<br>Dentistry, Program in English<br>**Study level**<br>long-cycle master's degree program<br>**Study form**<br>full-time<br>**Education profile**<br>general academic<br>**Disciplines**<br>Medical science<br>**ISCED classification**<br>0912 Medicine<br>**Subject related to scientific research**<br>Yes<br>**USOS code**<br>LE.LDE.JS.2o0590 | **Didactic cycle**<br>2023/24<br>**Realization year**<br>2024/25<br>**Lecture languages**<br>english<br>**Block**<br>obligatory for passing in the course of studies<br>**Mandatory**<br>obligatory<br>**Examination**<br>graded credit<br>**Standard groups**<br>B. SCIENTIFIC BASIS OF MEDICINE, E. NON-SURGICAL CLINICAL SCIENCES |

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|---|---|
| **Subject coordinator** | Krzysztof Bryniarski |
| **Lecturer** | The full list of lecturers is available on the website usosweb.uj.edu.pl in the tab Directory → Courses. |

| | | |
|---|---|---|
| **Period**<br>Semester 4 | **Examination**<br>graded credit<br><br>**Activities and hours**<br>e-learning lecture: 4<br>seminar: 13<br>classes: 8 | **Number of ECTS points**<br>2.0 |

## Goals

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| C1 | The course aims at presenting the general concepts of immunological processes and mechanisms underlying human immunity, with the sepcial emphasis on those, which understanding is important in the dental profession. |

## Subject's learning outcomes

| Code | Outcomes in terms of | Effects | Examination methods |
|---|---|---|---|
| **Knowledge – Student knows and understands:** | | | |
| W1 | etiopathogenesis and symptomatology of respiratory, circulatory, hematopoietic, genitourinary, immune, digestive, motor and endocrine glands diseases, with particular regard to disease entities whose symptoms occur in the oral cavity | E.W3 | oral answer, multiple choice test |
| W2 | symptoms of hepatitis, HIV infection and acquired immune deficiency syndrome (AIDS) in infectious and parasitic diseases | E.W8 | oral answer, multiple choice test |
| W3 | immunological aspects of transplantation and blood therapy | E.W16 | oral answer, multiple choice test |
| W4 | basic methods of medical examination and the role of additional examinations in the diagnosis, monitoring, prognosis and prevention of organ and systemic disorders, with particular emphasis on their impact on oral tissues | E.W2 | oral answer, multiple choice test |
| W5 | relationship between morphological abnormalities and the function of changed organs and systems, as well as clinical symptoms and possibilities of diagnostics and treatment | E.W1 | oral answer, multiple choice test |
| W6 | life-threatening conditions | E.W18 | oral answer, multiple choice test |
| W7 | issues in the field of medicine and natural sciences – in the basic scope | O.W1 | oral answer, multiple choice test |
| W8 | health education issues | O.W3 | oral answer, multiple choice test |
| W9 | the role and importance of body fluids, including saliva | B.W6 | oral answer, multiple choice test |
| **Skills – Student can:** | | | |
| U1 | interpret the results of laboratory tests | E.U4 | classroom observation, oral answer |
| U2 | qualify the patient for vaccination | E.U7 | classroom observation, oral answer |
| U3 | plan the management of exposure to blood-borne infections | E.U6 | classroom observation, oral answer |
| U4 | recognize the risk of life threat | E.U8 | classroom observation, oral answer |
| U5 | apply knowledge of genetics and molecular biology in clinical work | B.U5 | classroom observation, oral answer |
| **Social competences – Student is ready to:** | | | |

| Code | Outcomes in terms of | Effects | Examination methods |
|---|---|---|---|
| K1 | perceive and recognize own limitations, self-assess educational deficits and needs | O.K5 | classroom observation, oral answer |
| K2 | promote health-promoting behaviors | O.K6 | classroom observation, oral answer |
| K3 | use objective sources of information | O.K7 | classroom observation, oral answer |
| K4 | formulate conclusions from own measurements or observations | O.K8 | classroom observation, oral answer |

## Calculation of ECTS points

| Activity form | Activity hours* |
|---|---|
| e-learning lecture | 4 |
| seminar | 13 |
| classes | 8 |
| preparation for classes | 20 |
| preparation for examination | 15 |
| | |
| **Student workload** | **Hours**<br>60 |
| **Workload involving teacher** | **Hours**<br>25 |
| **Practical workload** | **Hours**<br>8 |

* hour means 45 minutes

## Study content

| No. | Course content | Subject's learning outcomes | Activities |
|---|---|---|---|
| 1. | Organization and function of immune system. Primary and secondary lymphatic organs. Innate and acquired immunity. Cytokines. Recognition of pathogens by innate immune cells and lymphocytes. | W1, W5, K1, K2, K3 | classes, e-learning lecture |
| 2. | Antigens. Immunoglobulins. Complement. Immunoglobulin superfamily. Primary and secodary humoral response against T-dependent and T-indepenndent antigens. Monoclonal antibodies. Antisera. Human gammaglobulin. | W1, W2, W3, W4, W5, W6, W7, W8, W9, U3, U4, K1, K2, K3, K4 | classes, e-learning lecture |
| 3. | Induction of antigen-specific response, antigen presentation by APC cells. MHC complex. | W1, W2, W4, W5, U3, U4, K1, K2, K3 | e-learning lecture |

| No. | Course content | Subject's learning outcomes | Activities |
|---|---|---|---|
| 4. | Subpopulations of lymphocytes. Mechanism of humoral immune response. | W1, W2, W3, W5, W6, U1, U2, U3, U4, K1, K2, K3 | seminar, e-learning lecture |
| 5. | Allergic reactions based on humoral immunity (type I, II and III hypersensitivities). | W1, W2, W3, W4, W5, W6, U1, U2, U3, U4, K1, K2, K3, K4 | classes |
| 6. | Cellular response. Cells of innate and antygen-specific cellular immune response (phagocytes, NK cells, T tymphocytes). Toll-like receptors (TLR). Delayed-type hypersensitivity. Cytotoxic reactions involving CD8+ T lymphocytes. | W1, W2, W3, W4, W5, W6, U1, U2, U3, U4, K1, K2, K3, K4 | classes, seminar, e-learning lecture |
| 7. | Mucosa-associated lymphatic tissue (MALT), defense mechanisms of saliva, pathomechanism of peridontosis. | W1, W2, W3, W4, W5, W6, U1, U2, U3, U4, K1, K2, K3, K4 | classes, seminar, e-learning lecture |
| 8. | Active and passive immunization. Vaccinations. | W1, W2, W3, W4, W5, W6, U2, U3, K1, K2, K3 | classes |
| 9. | Immune tolerance and self-tolerance. Regulation of immune response. | W1, W2, W3, W4, W5, W6, U1, U2, U3, U4, K1, K2, K3, K4 | seminar |
| 10. | Immune mechanisms in bacteria, virus and parasite infections. | W1, W2, W3, W4, W5, W6, U1, U2, U3, U4, U5, K1, K2, K3, K4 | classes |

## Course advanced

### Teaching methods :

laboratories (labs), demonstration, discussion, e-learning, educational film, presentation, seminar, lecture

| Activities | Examination methods | Credit conditions |
|---|---|---|
| e-learning lecture | multiple choice test | Multiple choice test with one correct answer covering 30 questions, which verifies the learning outcomes in the terms of knowledge. To pass the exam, Student has to give a correct answer to at least 16 questions. Grade scale: 16-18 Satisfactory (3); 19-21 Satisfactory Plus (3+); 22-24 Good (4); 25-27 Fairly Good (4+); 28-30 Very Good (5) |
| seminar | classroom observation, oral answer | Oral answer, which verifies the learning outcomes in the terms of knowledge and skills. |
| classes | classroom observation, oral answer | Oral answer and observation, which verify the learning outcomes in the terms of skills and social competence. |

### Additional info

The presence on seminars and lab classes is mandatory.

## Entry requirements

WL-ED2.BioCH, WL-ED2.HumPhys;

# Literature

**Obligatory**


1. Janeway's Immunobiology. K. Marphy, P. Weaver C. Garland Science, New York


**Optional**


1. Abbas A.K., Lichtman A.H.: Cellular and molecular immunology. Elsevier Saunders, Philadelphia
2. Roitt's Essential Immunology, Dalves P, Martin SJ, Burton DR, Roitt IM, Wiley Blackwell Edition

## Effects

| Code | Content |
|---|---|
| O.K5 | The graduate is ready to perceive and identify one’s own limitations and perform self-assessment of deficits and educational needs |
| O.K6 | The graduate is ready to health promotion |
| O.K7 | The graduate is ready to use impartial sources of information |
| O.K8 | The graduate is ready to draw conclusions from own measurements or observations |
| O.W1 | The graduate knows and understands issues in the field of medicine and life sciences to a basic extent |
| O.W3 | The graduate knows and understands issues of health promotion education |
| B.U5 | The graduate can apply knowledge in genetics and molecular biology in clinical work |
| B.W6 | The graduate knows and understands role and importance of bodily fluids, including saliva |
| E.U4 | The graduate can interpret laboratory tests results |
| E.U6 | The graduate can plan the management of exposure to blood borne infection |
| E.U7 | The graduate can qualify the patient for vaccinations |
| E.U8 | The graduate can identify the risk of direct danger to life |
| E.W1 | The graduate knows and understands relationship of morphological abnormalities and the function of changed organs and systems, as well as clinical symptoms and diagnostics and treatment options |
| E.W2 | The graduate knows and understands basic medical examination methods and the role of additional tests and examinations in diagnosing, monitoring, prognosis and prevention of organ and systemic disorders, with particular focus on their impact on oral tissues |
| E.W3 | The graduate knows and understands aetiopathogenesis and symptomatology of the respiratory, circulatory, haematopoietic, genitourinary, immune, gastrointestinal, locomotor systems and endocrine glands diseases, with particular focus on disease with signs in the oral cavity |
| E.W8 | The graduate knows and understands symptoms of viral hepatitis, HIV infection and acquired immunodeficiency syndrome (AIDS) in infections and parasitic diseases |
| E.W16 | The graduate knows and understands immunological aspects of transplantation and haemotherapy |
| E.W18 | The graduate knows and understands life-threatening conditions |