

KARTA PRZEDMIOTU**IMMUNOLOGY – EXTENDED COURSE****I. Dane podstawowe**

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| Nazwa przedmiotu | Immunologia - kurs rozszerzony |
| Nazwa przedmiotu w języku angielskim | Immunology – extended course |
| Kierunek studiów | Biotechnologia |
| Poziom studiów (I, II, jednolite magisterskie) | I |
| Forma studiów (stacjonarne, niestacjonarne) | stacjonarne |
| Dyscyplina | biologia |
| Język wykładowy | Grupy w języku polskim – język polski Grupy w języku angielskim – język angielski |

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| Koordinator przedmiotu/osoba odpowiedzialna | Dr hab. Anna Rymuszka |
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| Forma zajęć (<i>katalog zamknięty ze słownika</i>) | Liczba godzin | semestr | Punkty ECTS |
|--|---------------|---------|-------------|
| lecture | 30 | VI | 7 |
| classes | 30 | VI | |

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| Wymagania wstępne | basics of: cytophysiology and ontogenesis, biochemistry, general microbiology |
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II. Cele kształcenia dla przedmiotu

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| To get to know the basic terms related to immunological reactions, cells involved in immunological responses and their cooperation. Understand the mechanisms of immune reactions, immunomodulation and immunohomeostasis. |
| Knowing and presentation of the research tools used to analyze the mechanisms of immune response. |

III. Efekty kształcenia dla przedmiotu wraz z odniesieniem do efektów kierunkowych

| Symbol | Opis efektu przedmiotowego | Odniesienie do efektu kierunkowego |
|------------------|--|------------------------------------|
| KNOWLEDGE | | |
| W_01 | is able to define basic immunological concepts, explain the functioning of immune cells and and their interactions, the mechanisms of action of the immune system; | K_W01, |
| W_02 | identifies the main research methods used to assess the innate and adaptive immune responses; | K_W06, |
| W_03 | knows the safety principles associated with working in a biological laboratory; | K_W09, |
| SKILLS | | |
| U_01 | applies basic methods and techniques to assess the mechanisms of specific and nonspecific immune response; | K_U01, |

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|---------------------------|---|--------|
| U_02 | carry out the analysis to assess the basic parameters of cell-mediated immunity and humoral immunity; | K_U06, |
| U_03 | designs and performs the isolation of immune cells; | K_U05, |
| U_04 | independently verifies the obtained results with the reference values on the basis of the current literature and available databases; | K_U07, |
| U_05 | prepares a written elaboration on issues related with the functioning of immune cells, mechanisms of specific and nonspecific immunity; | K_U10, |
| SOCIAL COMPETENCES | | |
| K_01 | is open and understands the need to continuous learning and updating the knowledge and skills; learns new research techniques associated with immunobiotechnology; | K_K01, |
| K_02 | takes care of entrusted equipment; is able to cooperate in the group; | K_K02, |
| K_03 | possesses appropriate habits required to the work in scientific laboratories especially in aseptic conditions, proceeds according to work safety regulations, knows about behaviour in danger | K_K03, |

IV. Opis przedmiotu/ treści programowe

Lectures include:

an overview of the immune system, including activation, effector mechanisms, and regulation of antigen-antibody reactions;
the MHC molecules and peptide antigens on the target cell, the antigen specific T and B cell receptors and other immunologically important cell surface receptors;
cell-cell interactions, cell-mediated and humoral immunity;
regulation of immune responses and differentiation of leukocytes modulated by proteins (cytokines) secreted by both immune and non-immune cells;
examination of the function, expression, gene organization, structure, receptors, and intracellular signaling of cytokines;
regulatory and inflammatory cytokines, colony stimulating factors, chemokines, cytokine and cytokine receptor gene families, intracellular signaling through STAT proteins and tyrosine phosphorylation;
hypersensitivity reactions;
mechanisms of allergic reactions;
immune response to allergens;
immunodeficiency and autoimmune phenomena

Classes include:

Structure and functions of the major lymphatic organs.
Isolation of immune cells, assessment of viability and purity of cells.

Assessment :

- activity of phagocyte cells (phagocytosis, metabolic activity),
- functional activity of complement system
- the level of acute phase proteins,
- lymphocyte functions (proliferative activity, the production of antibodies, the activity of various subpopulations of lymphocytes).

Identification of blood groups using monoclonal antibodies.

V. Metody realizacji i weryfikacji efektów kształcenia

| Symbol efektu | Metody dydaktyczne (lista wyboru) | Metody weryfikacji (lista wyboru) | Sposoby dokumentacji (lista wyboru) |
|---------------------------|--|---|--|
| KNOWLEDGE | | | |
| W_01 | Conventional lecture, Work with text, Laboratory analysis, Discussion, Guided practice | Report, Written test, Exam/ Written test | Report file, Evaluated written test, Evaluated written exam, |
| W_02 | Conventional lecture, Work with text, Laboratory analysis, Discussion, Guided practice | Report, Written test, Exam/ Written test | Report file, Evaluated written test, Evaluated written exam, |
| W_03 | Conventional lecture, Work with text, Laboratory analysis, Discussion, Guided practice | Report, Written test, Exam/ Written test | Report file, Evaluated written test, Evaluated written exam, |
| SKILLS | | | |
| U_01 | Laboratory classes, Practical classes, Group Work, Socratic method | Report, Written test, | Report file, Evaluated written test, |
| U_02 | Laboratory classes, Practical classes, Group Work, Socratic method | Report, Written test, | Report file, Evaluated written test, |
| U_03 | Laboratory classes, Practical classes, Group Work, Socratic method | Report, Written test, | Report file, Evaluated written test, |
| U_04 | Laboratory classes, Practical classes, Group Work, Socratic method | Report, Written test, | Report file, Evaluated written test, |
| U_05 | Laboratory classes, Practical classes, Group Work, Socratic method | Report, Written test, | Report file, Evaluated written test, |
| SOCIAL COMPETENCES | | | |
| K_01 | Laboratory classes, Socratic method | Report, Written test, | Report file, Evaluated written test, |
| K_02 | Laboratory classes, Socratic method | Report, Written test, | Report file, Evaluated written test, |
| K_03 | Laboratory classes, Socratic method | Report, Written test, | Report file, Evaluated written test, |

VI. Kryteria oceny, wagi...

Grades from the written examination, colloquium and reports are taken into account. The indicated level of knowledge of the educational content applies to each of the assessed elements.

| Ocena | Kryteria oceny | |
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| Note (5) | student accomplishes the assumed learning outcomes to a very good | demonstrates knowledge of the education content at the level of 91-100% |

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| | degree | |
| Note (4,5) | student accomplishes the assumed learning outcomes to an extent over good | demonstrates knowledge of the education content at the level of 86-90 % |
| Note(4) | student accomplishes the assumed learning outcomes to a good degree | demonstrates knowledge of the education content at the level of 71-85% |
| Note (3,5) | student accomplishes the assumed learning outcomes to a quite good degree | demonstrates knowledge of the education content at the level of 66-70% |
| Note (3) | the student accomplishes the assumed learning outcomes to a sufficient degree | demonstrates knowledge of the education content at the level of 51-65% |
| Note (2) | the student accomplishes the assumed learning outcomes to an insufficient degree | demonstrates knowledge of the education content at the level below of 51% |

VII. Obciążenie pracą studenta

| Forma aktywności studenta | Liczba godzin |
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| Liczba godzin kontaktowych z nauczycielem | 60 |
| Liczba godzin indywidualnej pracy studenta | 115 |

VIII. Literatura

Grupy w języku polskim

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| Literatura podstawowa |
| 1. Gołąb J., Jakóbisiak M., et al. Immunologia, PWN, 2017 |
| 2. Lydyard P.M., Whelan A., Fanger M.W., Krótkie wykłady: Immunologia, PWN, 2012 |
| Literatura uzupełniająca |
| 1. Kowalski M.L. Immunologia kliniczna, Mediton, 2000 |
| 2. Male D., Brostoff J., Roth D.B., Roit I., Immunologia, Elsevier Urban & Partner, 2008 |
| 3. Stefańska J. Immunologia : materiały dydaktyczne dla studentów kierunku biotechnologia, specjalność biotechnologia medyczna, Uniwersytet Medyczny w Łodzi. Biuro Promocji i Wydawnictw Uniwersytetu Medycznego, 2010 |

Grupy w języku polskim

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| Literatura podstawowa |
| 1. Delves P.J., Martin S.J., Burton D.R., Roitt I.M.: Roitt's Essential Immunology, Wiley-Blackwell, 2011 |
| Literatura uzupełniająca |
| Abbas A.K., Lichtman A.H.H., Pillai S.: Cellular and molecular immunology, Elsevier/Saunders, 2015 |