

**Academic programme
component**

**31.05.01 General Medicine
(in a foreign language)
programme**

**B1.O.24
discipline code**

SYLLABUS

Discipline Immunology

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Clarification

Discipline volume: 4 credit points

- 1. Discipline (module) training results** correlated with the indicators of competencies achievement determined by the educational programme

Competency	Indicators of competency achievement	Discipline (module) training results
<p>ПК-2 Can diagnose a patient</p>	<p>ПК-2.1. Collects complaints, the patient's medical history, and their complete physical examination.</p> <p>ПК-2.2. Formulates a preliminary diagnosis and draws up a plan for laboratory and instrumental examinations of the patient, directs him to laboratory and instrumental examinations in accordance with current clinical recommendations (treatment protocols) and standards of medical care</p> <p>ПК-2.3. Taking into account the examination data, performs a differential diagnosis of the disease, establishes a diagnosis in accordance with the ICD, if necessary, directs the patient to provide specialized medical care in a hospital.</p> <p>ПК-2.4. Conducts the necessary types of examinations, analyzes their results, formulates a diagnosis for children patients.</p>	<p>To know:</p> <p>1. Methods of assessing various parts of the immune system, indications and principles of assessing the immune status; age-related features of the immune system of children.</p> <p>2. The main forms of immunopathology (immunodeficiency, autoimmune, allergic, lymphoproliferative diseases), the main methods of immunodiagnostics.</p> <p>To be able to:</p> <p>1. Substantiate the need for clinical and immunological examination of the patient, to interpret the results of the assessment of the immune status according to the tests of the 1st level. Interpret the results of the main diagnostic allergological tests.</p>

<p>ПК-3 Can treat patients with various nosological forms</p>	<p>ПК-3.1. Develops a treatment plan for diseases and injuries in accordance with current medical care procedures (treatment protocols, standards of medical care), including for children's patients; ПК-3.2. Prescribes medications, non-drug treatment, medical devices and therapeutic nutrition, taking into account the diagnosis, age (children, the elderly) and the clinical picture of the disease, evaluates the effectiveness and safety of the treatment</p>	<p>2. Substantiate the nature of the immunopathological process, clinical manifestations, principles of pathogenetic therapy; to justify the need for clinical and immunological examination To have: 1. Skills in collecting immunological and allergological anamnesis, analyzing and interpreting the results of laboratory indicators of the assessment of the immune system according to level 1 tests. 2. Skills in making a preliminary diagnosis based on the results of laboratory and instrumental examination of patients.</p>
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2. Discipline contents

Topic 1. The history of the development of immunology. The subject, tasks, achievements of immunology. Mechanisms of innate immunity

Introduction to the subject. Types and forms of immunity. Innate immunity. Humoral factors. Phagocytosis. The complement system. Acute phase proteins. The immune system: organization and functions.

Topic 2. Antigens: classification, nature, properties

Antigens. Humoral immune response. Antibodies. Cellular immune response. Antigen-presenting cells, intercellular cooperation.

Topic 3. The immune system, its structure and functions. The main variants of the immune response. Cells of the immune system

Cellular immune response. Antigen-presenting cells, intercellular cooperation.

Topic 4. Humoral immune response. Properties and functions of antibodies. Age-related dynamics of the maturation of humoral immunity. Immunological memory. Primary and secondary immune responses. Immunological tolerance

Serological methods of diagnosis of diseases (agglutination test, hemagglutination test, coagglutination test). Serological methods of diagnosis of diseases (precipitin test, neutralization test, complement fixation test). Serological methods of disease diagnosis (immunofluorescence assay, enzyme-linked immunosorbent assay, radioimmunoassay, immunoblotting).

Topic 5. Hormones and the immune system mediators. Features of antibacterial, antitoxic, antiviral, antiparasitic, and antitumor immunity. Theories of immunity

Hormones and mediators of the immune system. Cytokines. The main human histocompatibility complex (MHC) and methods of its study.

Topic 6. Mechanisms of immediate hypersensitivity and delayed hypersensitivity. Allergic diseases

Allergies and their development mechanisms.

Topic 7. Immune system pathologies

Topic 8. Immunological reactions in the diagnosis of infectious and non-communicable diseases. The concept of immune status. Assessment of the immune status of an adult and a child

Immunity status and methods of its study. Immunopathological conditions. Autoimmune diseases and the mechanisms of their development. HIV infection.

Topic 9. Immunocorrective therapy and vaccination. Immunomodulators

Immunobiological preparations. Immunomodulators.

3. Training support materials

- multimedia presentations on the discipline are available on MAU LMS Moodle;
- practical training manuals are available on MAU LMS Moodle;
- learning materials are available on MAU official website at [«Информация по образовательным программам, в том числе адаптированным»](#).

4. Discipline assessment materials

Discipline assessment materials is a separate document within the educational programme, it includes:

- a list of competencies indicating the stages of their formation in the process of mastering the discipline;
- current assessment tasks;
- interim assessment tasks;
- tasks for internal assessment of education quality.

5. The list of main and supplementary literature (printed, electronic and (or) electronic library resources)

Main literature:

1. Хаитов Р. М.- Иммунология : учебник для использования в образовательных учреждениях, реализующих основные профессиональные образовательные программы высшего образования специалитета 31.05.01 "Лечебное дело". – 4-е изд., перераб. и доп. – Москва : ГЭОТАР-Медиа, 2021. – 518, [1] с. : ил., табл. – Предм. указ.: с. 501-518. – ISBN 978-5-9704-6398-7 [Гриф].

2. Khaitov R. M.-Immunology : Textbook (in English) : Recommended for medical schools/universities. – Updated Second Edition. – Moscow : GEOTAR-Media, 2022. – 263, [7] p. : il. – На англ. яз. – ISBN 978-5-9704-7089-3.

Supplementary literature:

3. Иммунология и клиническая иммунология : учебное пособие / Р. И. Сепиашвили, Е. А. Левкова, Т. А. Славянская, Р. А. Ханферьян. - Москва : ГЭОТАР-Медиа, 2023. - 160 с. - ISBN 978-5-9704-7377-1, DOI: 10.33029/9704-7377-1-IMN-2023-1-160. - Электронная версия доступна на сайте ЭБС "Консультант студента" : [сайт]. URL: <https://www.studentlibrary.ru/book/ISBN9785970473771.html>

6. Professional databases and information reference systems

- 1) University Library Online <https://biblioclub.ru/>
- 2) Electronic library "Student Consultant" <https://www.studentlibrary.ru/>
- 3) Electronic library system "Lan" <https://e.lanbook.com/>

7. The list of licensed and openly distributed software, including domestic software

- 1) Microsoft Office 2007 Package
- 2) ABBYY FineReader Optical text recognition system

8. Ensuring mastering the discipline for people special needs

Students with special needs are provided with printed and (or) electronic educational resources in forms adapted to their needs.

9. The material and technical support of the discipline (module) is presented in the appendix to the academic programme "Material and technical conditions for the implementation of the educational programme" and includes:

- classrooms for conducting training sessions provided for by the specialty programme, fitted with technical equipment;

- spaces for self-study work fitted with computer equipment with the Internet connection and access to MAU LMS Moodle.

It is allowed to replace the equipment with its virtual counterparts.

10. Study load distribution by type of educational activity

Table 1 – Study load distribution

Educational activity	The discipline (module) study load distribution by the forms of training		
	Semester		In total
	3	4	144
Lectures	12	12	24
Seminars	24	24	48
Self-study work	36	36	72
Total hours for the discipline / in the form of seminars	72	72	144
	24		24
Interim and formative assessment			
Credit	-	+	+

The list of seminar topics on the forms of education

№	Seminar topics
1	2
1	History of immunology development
2	Mechanisms of innate immunity
3	Antigens: classification, nature, properties

4	The immune system, its structure and functions. The main variants of the immune response. Cells of the immune system
5	Humoral immune response. Properties and functions of antibodies. Age-related dynamics of the maturation of humoral immunity. Immunological memory. Primary and secondary immune responses. Immunological tolerance
6	Hormones and mediators of the immune system. Features of antibacterial, antitoxic, antiviral, antiparasitic, and antitumor immunity. Theories of immunity
7	Mechanisms of immediate hypersensitivity and delayed hypersensitivity. Allergic diseases
8	The immune system pathology. Immunofluorescence assay, enzyme-linked immunosorbent assay, radioimmunoassay, immunoblotting
9	Immunological reactions in the diagnosis of infectious and non-communicable diseases. The concept of immune status. Assessment of the immune status of an adult and a child
10	Immunocorrective therapy and vaccination. Immunomodulators