Документ подписан простой электронной подписью
Информация о владельце:
ФИО: Стегний Кирилл Владимирович
Должность: И.о. ректора
Дата подписания: 22.06.2026 11:14:53
Уникальный программный ключ:
d59234ba928aea5c04c54eb9013e367220b6b2ae

Federal State Budget Educational Institution
of Higher Education
Pacific State Medical University
of the Ministry of Health of the Russian Federation

APPROVED BY

Head of the Department
_____ / Matveeva N.Yu./
"10th" of April 2025

SUBJECT GUIDE FOR TEACHERS AND STUDENTS FOR

Б1.О.12 Histology, embryology, cytology

(Name of discipline)

Specialty	**31.05.01 General Medicine for international students (in English)** (code, name)
Degree	Specialist's degree
Profile	02 "Healthcare" (in the field of providing primary health care to the population in medical organizations: polyclinics, outpatient clinics, inpatient/outpatient facilities of the municipal health care system)
Mode of study	**Full-time**
Period of mastering the BEP	**6 years** (nominal length of study)
Department	of Histology, Embryology and Cytology

Vladivostok, 2025

Subject guide for teachers and students for **Б1.О.12 Histology, embryology, cytology** is based on:

1) Federal State Educational Standard of Higher Education for the specialty approved by the Order No. 988 of Ministry of Science and Higher Education of the Russian Federation
dated August 12, 2020.

2) Curriculum for the specialty 31.05.01 General Medicine for international students (in English), profile 02 "Healthcare" (in the field of providing primary health care to the population in medical organizations: polyclinics, outpatient clinics, inpatient/outpatient facilities of the municipal health care system),
approved by the Academic Council of FSBEI HE PSMU of the Ministry of Health of Russia Report No. 8/24-25 dated March 31, 2025.

Subject guide for teachers and students for the discipline were developed by the writing team of the Department of Histology, Embryology and Cytology of the FSBEI HE PSMU of the Ministry of Health of Russia, under the guidance of the head of the department Doctor of Medical Sciences, Associate Professor Matveeva N.Yu.

Developed by:

Head of Department	Doctor of Medical Sciences, Associate Professor	Matveeva N.Yu.
(position held)	(academic degree, academic title)	(full name)
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1. GENERAL PROVISIONS

Subject guide for **Б1.О.12 Histology, embryology, cytology** is a set of recommendations and explanations that facilitate to optimal organization of mastering this discipline.

Regular analysis of lecture materials and work with end-of-the-text questions are necessary for better understanding of the material and systematization of knowledge of **Б1.О.12 Histology, embryology, cytology**. Particular attention should be paid to emerging questions, confusing terms, and conflicts of points of view during the independent review of the lecture material. If necessary, a student should contact the teacher for advice. Lecture material streamlines students' thinking, while practical classes provide deeper insight into the material of the discipline.

Special attention should be paid to the content of the main provisions and conclusions, explanation of phenomena and facts, and clarification of the practical application of theoretic aspects of topic when preparing for a practical class. During this process students should aim to understand and remember the main provisions of the material under consideration, examples provided, as well as understand the illustrative material.

Collections of assessment tools are used to organize independent study of topics (questions) of the discipline.

Independent work of students is facilitated by the following:

1. availability and accessibility of the necessary educational and reference material;
2. a system of regular quality control of completed independent work;
3. availability of teacher's advice.

Subject guides for self-study are presented as literary sources and visual aids (portfolios for different sections of the discipline, microscope slides, subject guides for the students). Subject guides for independent work of students include a list of library resources of the educational institution and other materials accessible to students.

Independent work is a type of in-person extracurricular work of teachers and students of **Б1.О.12 Histology, embryology, cytology**. Control of independent work is conducted by the leading teacher. Evaluation of independent work results is taken into account when conducting interim examination of students throughout the **Б1.О.12 Histology, embryology, cytology** course.

Continuous assessment during the **Б1.О.12 Histology, embryology, cytology** course is implemented in order to check indicators of achieving competencies, to stimulate students' academic work, and improve methods of mastering new knowledge. Continuous assessment during the **Б1.О.12 Histology, embryology, cytology** course is conducted during the semester to assess all types and sections of the academic discipline that encompass the competencies developed by the discipline: classroom questioning, conducting discussions, working with tests, business games, morphological analysis of situational tasks. Continuous assessment of students' knowledge and results of their preparation for practical classes is conducted during every class session.

Interim assessment aims to determine the level of mastery of competency indicators. It is conducted in the exam format after the student has mastered all sections of **Б1.О.12 Histology, embryology, cytology** and takes into account learning outcomes for all types of student work over the entire period of mastering the **Б1.О.12 Histology, embryology, cytology** course.

Time allotted for interim assessment is indicated in the schedule.

Assignments given during practical classes, as well as assignments aimed to prepare students for continuous and interim assessment, are included in the collection of assessment tools for **Б1.О.12 Histology, embryology, cytology**. If necessary, students should contact the teacher for advice. It is necessary to thoroughly think over questions that need clarification before seeking teacher's advice.

2. SUBJECT GUIDES FOR LECTURE CLASSES

Table 1. Subject Guides for **Б1.О.12 Histology, embryology, cytology** Lectures

Topic No.1 Cell structure and function	
Duration of the lecture (in academic hours):	2
Purpose of the lecture: 1. tell students about the main forms of organization of living matter; to analyze the structure of the cytoplasm and cell nucleus, their chemical composition and significance; to discuss the classification, structure and functions of organelles and cellular inclusions; 2. define relevant terminology: adaptive forms of organization of living matter, cell derivatives (symplast, syncytium, intercellular substance); 3. examine the methods of studying the structure and function of the cell.	
Lecture plan, order of presentation of its sections: - The cell as a form of protoplasm organization - Symplast and syncytium as forms of cell adaptation - Intercellular substance, its significance - Main functions of the cell - Classification of cytoplasmic organelles - Cell surface and its functions - Synthetic apparatus of the cell: RER (Rough Endoplasmic Reticulum) system and membrane flow in the cell - Energy function of mitochondria - Regulation of protein synthesis in the cell	
Recommended reading: 1. Histology, Embryology, Cytology: textbook for universities / Yu. I. Afanasyev, B. V. Aleshin, N. P. Barsukov [et al.]; edited by Yu. I. Afanasyev, N. A. Yurina. - 7th ed., rev. and suppl. - M.: GEOTAR-Media, 2021. - 828, [4] p. 2. Histology, Embryology, Cytology: textbook [Electronic resource] / Danilov R.K., Borovaya T.G. / M.: GEOTAR-Media, 2020. - 528 p. URL: http://www.studentlibrary.ru 3. Histology, Embryology, Cytology: textbook [Electronic resource] / Yu. I. Afanasyev, B. V. Aleshin, N. P. Barsukov [et al.]; edited by Yu. I. Afanasyev, N. A. Yurina. - 7th ed., rev. and suppl. - M.: GEOTAR-Media, 2023. - 832 p. URL: http://www.studentlibrary.ru 4. Banin V.V., Cytology and General Histology: atlas [Electronic resource] / Banin V.V., Pavlov A.V., Yatskovsky A.N. - M.: GEOTAR-Media, 2019. URL: http://www.studentlibrary.ru 5. Bykov, V. L. Histology, Cytology and Embryology: atlas: textbook [Electronic resource] / V. L. Bykov, S. I. Yushkantseva. - M.: GEOTAR-Media, 2022. - 296 p. URL: http://www.studentlibrary.ru	

3. SUBJECT GUIDES FOR PRACTICAL CLASSES

Table 2. Subject Guides for Practical **Б1.О.12 Histology, embryology, cytology** Classes

Topic No.2 Cell structure and function. Cell response to damage	
Duration of the practical class (in academic hours):	4

Purpose of the practical class: 1. consolidate acquired knowledge about the cell cycle, morphology of mitotic phases, structure and functional significance of chromosomes; 2. during the discussion, outline the main stages of the cell life cycle and its regulation; 3. thoroughly go over definitions and concepts of physiological and pathological cell dystrophy, parnecrosis, necrosis and apoptosis of cells; 4. study patterns of cell death; 5. develop concept of the sequence of morphological changes in the cell and the significance of early diagnosis in identifying hereditary and somatic diseases.
Practical classes requirements: classrooms equipped with multimedia equipment (laptop, projector, screen), video camera, PC, video and DVD players, monitors; blackboards, laboratory equipment including microscopes with automatic illumination, subject guides for the discipline, visual aids, microscope slides, discs with educational programs, microtomes, cryostat, thermostats, centrifuge, distiller.
Independent work of the student: writing a research paper, preparation of a report, working with study materials, writing library-research papers, analysing microscope slides.
Methods of evaluation of acquired knowledge and skills: discussions of the reports, debates, classroom questioning, working with tests, working with case studies, making a diagnosis based on the histological specimens.
Recommended reading: 1. Histology, Embryology, Cytology: textbook for universities / Yu. I. Afanasyev, B. V. Aleshin, N. P. Barsukov [et al.]; edited by Yu. I. Afanasyev, N. A. Yurina. - 7th ed., rev. and suppl. - M.: GEOTAR-Media, 2021. - 828, [4] p. 2. Histology, Embryology, Cytology: textbook [Electronic resource] / Danilov R.K., Borovaya T.G. / M.: GEOTAR-Media, 2020. - 528 p. URL: http://www.studentlibrary.ru 3. Histology, Embryology, Cytology: textbook [Electronic resource] / Yu. I. Afanasyev, B. V. Aleshin, N. P. Barsukov [et al.]; edited by Yu. I. Afanasyev, N. A. Yurina. - 7th ed., rev. and suppl. - M.: GEOTAR-Media, 2023. - 832 p. URL: http://www.studentlibrary.ru 4. Banin V.V., Cytology and General Histology: atlas [Electronic resource] / Banin V.V., Pavlov A.V., Yatskovsky A.N. - M.: GEOTAR-Media, 2019. URL: http://www.studentlibrary.ru 5. Bykov, V. L. Histology, Cytology and Embryology: atlas: textbook [Electronic resource] / V. L. Bykov, S. I. Yushkantseva. - M.: GEOTAR-Media, 2022. - 296 p. URL: http://www.studentlibrary.ru 6. Histology. Atlas for practical sessions: textbook [Electronic resource] / N.V. Boychuk, R.R. Islamov, S.L. Kuznetsov, Yu.A. Chelyshev. - M.: GEOTAR-Media, 2014. - 160 p. URL: http://www.studentlibrary.ru 7. Histology. Diagrams, tables and situational tasks on special human histology: textbook [Electronic resource] / S.Yu. Vinogradov, S.V. Dindyaev, V.V. Krishtop et al. - M.: GEOTAR-Media, 2012. - 184 p. URL: http://www.studentlibrary.ru 8. Danilov, R.K. Histology, Embryology, Cytology: textbook [Electronic resource] / Danilov R.K., Borovaya T.G. - M.: GEOTAR-Media, 2020. - 528 p. URL: http://www.studentlibrary.ru

4. GUIDELINES FOR CONTINOUS AND INTERIM ASSESSMENT

Table 3. Guidelines for Conducting Continuous and Interim Assessment during the **Б1.О.12 Histology, embryology, cytology** Course

Type of assessment	Assessment format

Continuous assessment	- conducting and evaluating oral or written quizzes during lectures and practical classes; - assessment and evaluation of completion and results of assignments given during practical classes; - assess and evaluate completion and results of individual assignments and exam tasks given during practical classes; - assessment and evaluation of lecture notes quality.
Interim certification	is conducted in exam format (test on a computer); it allows to assess the development of students' competencies correlating with types of professional activity.

5 ASPECTS OF THE IMPLEMENTATION OF THE COURSE FOR STUDENTS WITH DISABILITIES AND SPECIAL NEEDS

5.1. Availability of accessible environment

For students with disabilities and special needs, if a written application is submitted, lectures and practical classes are carried out taking into account health limitations, individual capabilities and medical status (hereinafter referred to as individual characteristics) of the student. Compliance with the following general requirements is ensured: teaching aids for collective and individual use are provided, required technical assistance is provided by an assistant, buildings and premises where lectures and practical classes are taking place meet accessibility requirements, other arrangements lack of which makes it impossible or difficult to master the discipline are made.

5.2. Compliance with general requirements

When lectures and practical classes are carried out at the written application of the student, the following general requirements are met: lectures and practical classes for students with disabilities and special needs take place at the same location as for students who do not have disabilities, if this does not cause difficulties for students; an assistant (assistants), who provide(s) students with the necessary technical assistance taking into account individual characteristics of the student, is (are) provided; necessary teaching aids are provided, taking into account individual characteristics of the student.

5.3. Availability of the internal policies and procedures of FSBEI HE PSMU of the Ministry of Health of Russia to students with disabilities in a form accessible to them.

All internal policies and procedures of FSBEI HE PSMU of the Ministry of Health of Russia concerning the discipline are made available to students with disabilities in a form accessible to them.

5.4. Increase in the duration of interim assessment of students with disabilities and special needs in relation to the established duration

Format of the interim assessment of academic performance within the scope of the discipline for students with disabilities and special needs is selected taking into account individual characteristics (orally, by writing on paper, by typing on a computer, as a test, etc.). The duration of the interim assessment in relation to the established duration is increased at the written application of the student with disabilities. Time limit for the student's preparation for the test is increased by at least 0.5 hours

6. STAFFING REQUIREMENTS OF THE DISCIPLINE

Academic teaching personnel that ensure the implementation of the discipline education process meet the requirements of the Federal State Educational Standard of Higher Education for the 31.05.01 General Medicine specialty; list of the aforementioned personnel is available on the website of the educational organization.