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Информация о владельце:

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MINISTRY OF SCIENCE AND HIGHER EDUCATION

RUSSIAN FEDERATION

Federal State Autonomous Educational Institution of Higher Education

NORTH-CAUCASUS FEDERAL UNIVERSITY

APPROVED

Assoc. Prof. Kubanov S.I.

PhD in Medical Sciences

Dean Faculty of Medicine and Biology

ASSESSMENT TOOLS FUND FOR THE DISCIPLINE

Biology:Cytology

- Specialty: 31.05.01 General Medicine
- Mode of training: Full-time
- Year of commencement of studies: 2026
- Delivered in Semester 1

Introduction

1. Intended for carrying out current control of academic performance progress and intermediate attestation in the discipline of Biology:Cytology for students of the specialty (majoring in) 31.05.01 General Medicine.
2. The ATF is an appendix to the program of the discipline (module) Biology:Cytology

Developer(s):

Kukharuk Maksim Jurievich Head of the Department of Botany, Plant Physiology and Biochemistry

Denyak Andrey Konstantinovich Assistant of the Department of Botany, Plant Physiology and Biochemistry

3. Expert examination of the ATF has been completed.

Expert group:

Chairperson: Pahomova Tatyana Aleksandrovna Docent of the Department of Anatomy and Histology

Committee members:

Aulova Anna Victorovna Docent of the Department of Botany, Plant Physiology and Biochemistry

Likhovid Natalya Genndievna Professor of the Department of Botany, Plant Physiology and Biochemistry

Employer organization representative: Vilensky I.L., Chief Physician of Independent CDL, LLC

Expert conclusion – the ATF allows evaluating the level of competency levels and is recommended to be employed in the educational process.

4. The validity period for the ATF shall be determined by the period of implementation of the educational program.

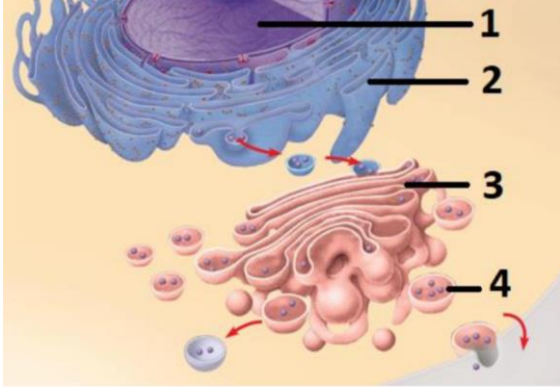
1. Description of Evaluation Criteria at Various Stages of Their Formation, Description of Evaluation Scales

Levels of formation of competence(s), indicator(s)	Descriptors			
	Minimum level not achieved (Unsatisfactory) 2 points	Minimum level (Satisfactory) 3 points	Intermediate level (Good) 4 points	High level (Excellent) 5 points
Competency GPC-5. Capable of assessing morphofunctional, physiological states and pathological processes in the human body to solve professional tasks.				
Learning outcomes for the discipline (module): Development of clinical thinking. <i>Indicator: ID-1 GPC-5 Assesses morphofunctional and physiological states and processes in the human body at individual, group, and population levels to solve professional tasks.</i>	Does not assess morphofunctional and physiological states	Assesses morphofunctional and physiological states	Assesses morphofunctional and physiological states and processes in the human body at individual, group, and population levels	Assesses morphofunctional and physiological states and processes in the human body at individual, group, and population levels to solve professional tasks
Learning outcomes for the discipline (module): Development of clinical thinking. <i>Indicator: ID-2 GPC-5 Identifies pathological states and processes in the human body to solve professional tasks</i>	Does not identify pathological states	Identifies pathological states	Identifies pathological states and processes in the human body	Identifies pathological states and processes in the human body to solve professional tasks

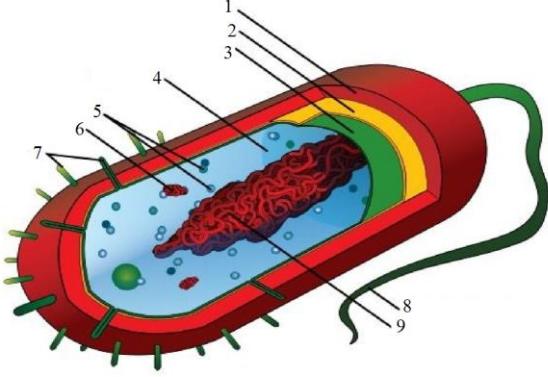
The evaluation of the competency formation level in the discipline is carried out on the basis of the Regulations on conducting current control of academic progress and intermediate attestation of students in higher education educational programs – Bachelor’s programs, Specialist’s programs, Master’s programs – at the Federal State Autonomous Educational

ASSESSMENT TOOLS FOR CHECKING THE LEVEL OF COMPETENCY DEVELOPMENT

Task Number	Correct Answer	Content of the Question	Competency
1.	c	The passage of water through a semipermeable membrane toward a region of higher solute concentration is called ... a. Diffusion b. Facilitated diffusion c. Osmosis d. Active transport e. Passive transport	GPC-5
2.	a, b	Receptor-mediated phagocytosis occurs with respect to a. Lipoproteins b. Insulin c. Metal ions d. Amino acids e. Polysaccharides	GPC-5
3.	a	A metaphase chromosome consists of: a. 2 chromatids b. 1 chromatid c. 4 chromatids d. 2 centromeres e. a bivalent	GPC-5
4.	d	Membrane-bound organelles include: a. Mitochondria and ribosomes b. Lysosomes and the centrosome c. Mitochondria, ribosomes, and plastids d. Mitochondria, endoplasmic reticulum (ER), and lysosomes e. Microtubules and mitochondria	GPC-5
5.	b	Glycogen belongs to ... inclusions. a. Pigment b. Trophic (nutrient) c. Secretory d. Non-specific e. Specific	GPC-5
6.	d, e	At what level(s) of organization of living matter does energy metabolism occur in the common amoeba (<i>Amoeba proteus</i>)? a. Biosphere b. Biogeocenotic (ecosystem) c. Population-species d. Cellular e. Organismal	GPC-5
7.	a	Chitin is a component of fungal cells. Which cellular structure does it belong to? a. Supramembrane complex (cell wall)	GPC-5

		b. Submembrane complex (cortex) c. Inclusions d. Heterochromatin e. Euchromatin	
8.	b	Which groups of substances freely penetrate through biological membranes? a. Proteins, polysaccharides, and ions b. Water and oxygen c. Glucose and sucrose d. vitamins B e. Fatty acids and glycerol	GPC-5
9.	A) 1 B) 4 C) 3 D) 1 E) 2 F) 3	 Establish the correspondence between the characteristics and the cell structures indicated by numbers 1–4 in the figure. A) Replication B) Exocytosis C) Addition of carbohydrate components to glycoproteins D) Transcription E) Synthesis of the primary structure of proteins F) Phosphorylation of proteins	GPC-5
10.	A) 4 B) 1 C) 5 D) 2 E) 4	Match each organelle (1–5) with its function (A–E). 1. Mitochondria 2. Rough ER 3. Smooth ER 4. Golgi apparatus 5. Nucleus A) Lipid synthesis and detoxification B) Energy production and ATP synthesis C) Storage and transmission of genetic information D) Protein synthesis on ribosomes E) Modification, sorting, and packaging of proteins	GPC-5
11.	A) 3 B) 4 C) 1 D) 5 E) 2	Match each transport type (1–5) with its description (A–E). 1. Simple diffusion 2. Facilitated diffusion 3. Active transport 4. Osmosis 5. Phagocytosis A) Ion transport against a gradient using ATP B) Water movement through aquaporins	GPC-5

		C) Movement of small nonpolar molecules through the lipid bilayer D) Uptake of large particles by formation of a phagosome E) Transport through carrier proteins down a concentration gradient	
12.	A) 4 B) 3 C) 1 D) 2 E) 5	Match each cytoskeletal component (1–5) with its characteristic (A–E). 1. Microtubules 2. Microfilaments 3. Intermediate filaments 4. Actin filaments 5. Myosin filaments A) Involved in muscle contraction B) Form the nuclear lamina, provide mechanical strength C) Involved in cell division and movement of cilia/flagella D) Diameter 7–9 nm; involved in phagocytosis and cell movement E) Provide contractile force in sarcomeres	GPC-5
13.	A) 2 B) 3 C) 1 D) 4 E) 5	Match each type of inclusion (1–5) with its example (A–E). 1. Trophic (nutrient) inclusions 2. Pigment inclusions 3. Secretory inclusions 4. Mineral inclusions 5. Excretory inclusions A) Melanin B) Zymogen granules C) Glycogen D) Calcium oxalate crystals E) Lipid droplets	GPC-5
14.	A) 2 B) 3 C) 1 D) 4 E) 5	Match each cell cycle phase (1–5) with the process that occurs during it (A–E). 1. G₁ phase 2. S phase 3. G₂ phase 4. Mitosis (M phase) 5. Cytokinesis A) DNA replication B) Preparation for mitosis; synthesis of tubulin C) Cell growth; synthesis of proteins and organelles D) Nuclear division; chromosome segregation E) Division of the cytoplasm	GPC-5
15.	A) 2 B) 1 C) 4 D) 5 E) 3	Match each organelle (1–5) with its correct structural description (A–E). 1. Mitochondria 2. Lysosomes 3. Nucleus 4. Golgi apparatus 5. Peroxisomes	GPC-5

		A) Single-membrane organelle containing digestive enzymes (acid hydrolases) B) Double-membrane organelle with cristae and a matrix C) Single-membrane network of flattened sacs involved in protein modification D) Single-membrane organelle containing catalase; involved in lipid metabolism and detoxification E) Double-membrane organelle containing chromatin, nucleolus, and nuclear pores	
16.	A) 9 B) 8 C) 2 D) 4 E) 3 F) 1 G) 7 H) 6 I) 5	 Match each organelle on the figure (1–9) with its correct name (A–I). A) Nucleoid B) Flagellum C) Cell wall D) Cytoplasm E) Membrane F) Capsule G) Pili H) Plasmid I) Ribosomes	GPC-5
17.	D B C E A	Arrange the following events of protein synthesis (translation) in the correct chronological order A Ribosome reaches a stop codon B tRNA carrying an amino acid binds to the A-site C Peptide bond forms between amino acids D Small ribosomal subunit binds to mRNA E Ribosome translocates to the next codon	GPC-5
18.	D E C A B	Arrange the following stages of mitosis in the correct chronological order A Anaphase B Telophase C Metaphase D Prophase E Prometaphase	GPC-5
19.	B D A E	Arrange the following phases of the eukaryotic cell cycle in the correct chronological order A G₂ phase B G₁ phase	GPC-5

	C	C Cytokinesis D S phase E Mitosis (M phase)	
20.	C D A B E	Arrange the following events of DNA replication in the correct chronological order A DNA polymerase synthesizes new strands B RNA primers are removed and replaced with DNA C Helicase unwinds the double helix D Primase synthesizes RNA primers E DNA ligase seals the gaps (Okazaki fragments)	GPC-5
21.	C B D A E	Arrange the following events of receptor-mediated endocytosis in the correct chronological order A Vesicle fuses with an endosome B Clathrin-coated pit forms C Ligand binds to the receptor on the cell surface D Clathrin-coated vesicle is released into the cytoplasm E Receptors and ligands are sorted and recycled or degraded	GPC-5
22.	B D C E A	Arrange the following substages of prophase I of meiosis in the correct chronological order A Diakinesis B Leptotene C Pachytene D Zygotene E Diplotene	GPC-5
23.	C D A E B	Arrange the following stages of aerobic respiration in the correct chronological order A Citric acid cycle (Krebs cycle) B Electron transport chain and oxidative phosphorylation C Glycolysis D Pyruvate oxidation (transition step) E Acetyl-CoA enters the Krebs cycle	GPC-5
24.	D B C A E	Arrange the following events of apoptosis in the correct chronological order A Cell breaks into apoptotic bodies B Activation of caspases (executioner proteases) C DNA fragmentation and nuclear condensation D Release of cytochrome c from mitochondria E Phagocytosis of apoptotic bodies by adjacent cells	GPC-5
25.	euchromatin	Write the term that characterizes the despiralized regions of chromosomes in the form of elementary deoxyribonucleoprotein (DNP) threads in the resting (interphase) nucleus...	GPC-5
26.	endocytosis	Indicate the name of the process by which substances are taken up from the extracellular space through invagination of the cytoplasmic membrane.	GPC-5

27.	pachytene	Indicate the substage of prophase I of meiosis in which chromatids are in intimate contact, enabling the exchange of identical segments between homologous chromosomes.	GPC-5
28.	hyaloplasm cytosol	Write the term that corresponds to the following definition: a structureless (non-structured) liquid medium filling the space between organelles.	GPC-5
29.	cell	Write the term that corresponds to the following definition: "The structural and functional unit of life, capable of self-reproduction and self-regulation, is..."	GPC-5
30.	molecular molecular- genetic	Indicate at which level of life organization reproduction is carried out on the basis of template synthesis	GPC-5

31. Description of the Evaluation Scale

Within the framework of the rating system, students' academic progress in each discipline is evaluated during current control and intermediate attestation. The rating system for assessing students' knowledge is based on the use of a combination of control activities to check the covered material (checkpoints), optimally located throughout the entire time interval of studying the discipline. The principles of the rating system for assessing students' knowledge are based on the requirements described in the Regulations on the organization of the educational process based on the rating system for assessing students' knowledge at NCFU.

32. Criteria for Evaluating Competencies

The grade **Excellent** shall be awarded to a student if the theoretical content of the course has been mastered completely, without gaps; the material is presented exhaustively, consistently, clearly, and logically; the student freely copes with tasks, questions, and other types of knowledge application; uses additional material in the answer; all tasks provided for by the program are completed, and the quality of their execution is evaluated by a number of points close to the maximum; analyzes the obtained results; demonstrates independence when performing tasks.

The grade **Good** is to be awarded to a student if the theoretical content of the course is mastered completely, the necessary practical competencies are mainly formed, all educational tasks provided for by the training program are completed, and the quality of their execution is sufficiently high. The student firmly knows the material, presents it competently and strictly on the merits of the matter, without allowing significant inaccuracies in answering the question.

The grade **Satisfactory** is awarded to a student in case the theoretical content of the course has been mastered in part only, but the gaps are not of a significant nature, most of the tasks provided for by the program are completed, but contain errors, the student allows inaccuracies and insufficiently correct wording when answering the question, and violations of logical sequence are observed in the presentation of the program material.

The grade **Unsatisfactory** is awarded to a student if they do not know a significant part of the program material, allow significant errors, perform practical works with great difficulty and uncertainty, the necessary practical competencies are not formed, most of the educational tasks provided for by the training program are not completed, and the quality of their execution is evaluated by a number of points close to the minimum.