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**Federal State Autonomous Educational Institution of Higher Education  
PEOPLES' FRIENDSHIP UNIVERSITY OF RUSSIA**

**RUDN University**

**Institute of Medicine**

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educational division (faculty/institute/academy) as higher education programme developer

## **COURSE SYLLABUS**

Histology, Embryology, Cytology

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course title

**Recommended by the Didactic Council for the Education Field of:**

31.05.01 General Medicine

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field of studies / speciality code and title

**The course instruction is implemented within the professional education  
programme of higher education:**

General Medicine

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higher education programme profile/specialisation title

## 1. COURSE GOAL(s)

The aim of the course "Histology, embryology, cytology" is to acquire knowledge about the structure of living matter normally at different levels of its organization: molecular, subcellular, cellular, tissues, organ's systems, as well as the study of patterns of development of tissues, organs and organism as a whole based on modern achievements of histology and embryology.

## 2. REQUIREMENTS FOR LEARNING OUTCOMES

The mastering of the discipline "**Histology, embryology, cytology**" is aimed at the formation of the following competencies among students:

### **General Professional Competences- (GPC)-5**

(in accordance with the Federal State Educational Standard of Higher Education (FSES) 3++ 31.05.01 General Medicine).

*Table 2.1. The list of competencies formed by students during the development of the discipline (results of the mastering of the discipline)*

<b>Competence code</b>	<b>Competence</b>	<b>Indicators of competence formation</b> (within the framework of this discipline)
GPC-5	Able to assess morpho-functional, physiological states and pathological processes in the human body to solve professional problems	GPC-5.3. A student should be able to determine morpho-functional, physiological states and pathological processes of the human body

## 3. COURSE IN THE HIGHER EDUCATION PROGRAMME STRUCTURE

The course "**Histology, embryology, cytology**" refers to the Compulsory Disciplines of block B1 of the EP HE.

Within the framework of the Educational Program, students also master other disciplines and/or practices that contribute to expected learning outcomes of the course "Histology, Embryology, Cytology".

*Table 3.1. List of Higher Education Program disciplines that contribute to expected learning outcomes*

Code	Name of the competence	Previous Disciplines	Subsequent disciplines /modules, practices
<b>GPC-5</b>	Able to assess morphofunctional, physiological states and pathological processes in the human body to solve professional problems	Anatomy Biology	General pathology and pathologic physiology; Pathologic anatomy General and clinical pharmacology; Forensic medicine; Neurology; Obstetrics and gynecology

#### 4. THE DISCIPLINE WORKLOAD AND ACADEMIC ACTIVITIES

The total workload of the discipline "**Histology, embryology, cytology**" is equal to 7 credits.

*Table 4.1. Types of academic activities during the period of the HE program mastering*

Types of academic activities	TOTAL, academic hours (ac.h)	semesters		
		2	3	
		Classroom learning , <i>ac.h.</i>	<b>170</b>	<b>85</b>
Lectures ( <b>Lec</b> )	<b>34</b>	<b>17</b>	<b>17</b>	
Laboratory works ( <b>Lab</b> )	<b>136</b>	<b>68</b>	<b>68</b>	
Practical/seminar classes	-	-	-	
Self-studies, academic hours	46	14	32	
Evaluation and assessment (exam or pass/fail grading)	36	9	27	
<b>Total workload of the discipline</b>	ac.h.	<b>252</b>	<b>108</b>	<b>144</b>
	credits	<b>7</b>	<b>3</b>	<b>4</b>

#### 5. THE CONTENT of the DISCIPLINE

*Table 5.1. The content of the discipline by types of academic work*

Name of the discipline section	Content of the section (topic)	Type of academic activities
<b>Section 1</b> Introduction to the discipline. Research methods	<b>Topic 1.1.</b> Methods of histological, cytological and embryological studies	<b>Lec, Lab</b>
<b>Section 2</b> Cytology.	<b>Topic 2.1.</b> The doctrine of the cell. Cell structure	<b>Lec, Lab</b>
	<b>Topic 2.2.</b> Organelles and inclusions	<b>Lec, Lab</b>
	<b>Topic 2.3.</b> Nucleus: structure, functions. Cell cycle	<b>Lec, Lab</b>

<b>Name of the discipline section</b>	<b>Content of the section (topic)</b>	<b>Type of academic activities</b>
<b>Section 3</b> Basic Histology.	<b>Topic 3.1.</b> The concept of tissues. Epithelia. Glands.	<b>Lec, Lab</b>
	<b>Topic 3.2.</b> The system of the internal environment tissues. Blood and lymph. Hematopoiesis.	<b>Lec, Lab</b>
	<b>Topic 3.3.</b> Connective tissues. Connective tissue proper. Connective tissues with special properties.	<b>Lec, Lab</b>
	<b>Topic 3.4.</b> Skeletal connective tissues. Cartilage. Bone tissues.	<b>Lec, Lab</b>
	<b>Topic 3.5.</b> Muscle tissues	<b>Lec, Lab</b>
	<b>Topic 3.6.</b> Nerve tissue	<b>Lec, Lab</b>
<b>Section 4</b> Histology of organs and organ systems	<b>Topic 4.1.</b> Nerve System	<b>Lec, Lab</b>
	<b>Topic 4.2.</b> Sensory system(Organs of special senses)	<b>Lec, Lab</b>
	<b>Topic 4.3.</b> Circulatory system	<b>Lec, Lab</b>
	<b>Topic 4.4.</b> System of organs of hematopoiesis and immune defense	<b>Lec, Lab</b>
	<b>Topic 4.5.</b> Endocrine system	<b>Lec, Lab</b>
	<b>Topic 4.6.</b> Digestive system	<b>Lec, Lab</b>
	<b>Topic 4.7.</b> Respiratory system	<b>Lec, Lab</b>
	<b>Topic 4.8.</b> Skin and its derivatives	<b>Lec, Lab</b>
	<b>Topic 4.9.</b> Urinary system	<b>Lec, Lab</b>
	<b>Topic 4.10.</b> Reproductive system	<b>Lec, Lab</b>
<b>Section 5</b> <b>Embryology</b>	<b>Topic 5.1.</b> Basic (Comparative) Embryology	<b>Lec, Lab</b>
	<b>Topic 5.2.</b> Bases of Human Embryology	<b>Lec, Lab</b>

## **6. MATERIAL and TECHNICAL SUPPORT of the DISCIPLINE**

*Table 6.1. Material and technical support of the discipline*

<b>Classroom for Academic Activity Type</b>	<b>Classroom Equipment</b>	<b>Specialized educational/laboratory equipment, software and materials for the mastering of the discipline</b>
Learning-and Research Lab	Medical Biotechnologies Lab equipped with a set of specialized furniture and lab equipment; (classrooms 316, 318)	Laboratory CO <sub>2</sub> - incubators Shellab, laminar-flow cabinet series Biowizard ,

Classroom for Academic Activity Type	Classroom Equipment	Specialized educational/laboratory equipment, software and materials for the mastering of the discipline
		<p>microscope “Leica Microsystem CMC»,  inverted microscope Leica DMi8,  automatic cell counter TC20,  laboratory microcentrifuge MiniSpin, abacterial box,  flow cytometer,  freezer compartment UF V 700,  cellular analyzer xCELLigence,  flatbed monochromator fluorimeter,  cytofluorimeter cell sorter,  the Lab of a full cycle of histological tissue processing..</p>
Specialized Lab work	<p>Classroom for lab work, individual consultations, self-studies equipped with a set of specialized furniture; whiteboard; light microscopes and a set of devices (classrooms 221, 223, 224, 228, 332).</p>	<p>Microscopes “МИКМЕД-5”, technical equipment: multimedia projector BenQ Projector MX 525, projection screen, laptop ASUS X515JP-BQ029T, computer Lenovo V530S-071CB with stable Internet connection.  Software: Microsoft Windows, MS Office / Office 365, MS Teams, Chrome (latest stable release), sets of histological preparations, microphotographs, a list of stands, tables, visual posters, etc</p>
For students self-studies	<p>Classroom for self-studies of students (can be used for seminars and consultations), equipped with a set of specialized furniture, microscopes and computers with stable wireless Internet connection. (classrooms 223, 332).</p>	<p>Microscopes “МИКМЕД-5”, technical equipment: multimedia projector BenQ Projector MX 525, projection screen, laptop ASUS X515JP-BQ029T, computer Lenovo V530S-071CB with stable Internet connection.  Software: Microsoft Windows, MS Office / Office 365, MS Teams, Chrome (latest stable release), sets of histological preparations, microphotographs, a list of stands, tables, visual posters, etc</p>

## 7. EDUCATIONAL, METHODOLOGICAL and INFORMATION SUPPORT of the DISCIPLINE

### *Main reading*

1. Kierszenbaum A. L. Histology and Cell Biology. An Introduction to Pathology / A.L. Kierszenbaum, L.L. Tres. - Fourth Edition ; - Philadelphia : Elsevier, 2016. - 734 p. : ill. - ISBN 978-0-323-31330-8 : 8893.12.
2. Kuznetsov S. L.. Histology, Cytology and Embriology : (a course of lectures) / S.L. Kuznetsov, T.V. Boronikhina, V.L. Goryachkina ; edited by Babchenko E.V. - 2nd edition ; - Moscow : Medical Informational Agency, 2019. - 240 p. - ISBN 978-5-907098-08-4: 798.00.
3. Lowe James S.Stevens & Lowe Human Histology / J.S. Lowe, P.G. Anderson. - Fourth Edition ; Philadelphia : Elsevier, 2015. - 429 p. : il. - ISBN 978-0-723-43502-0 : 8070.94.
4. Botchey V.M., Savrova O.B., Eremina I.Z. Basic Cytology: the course of lectures / M.: PFUR, 2022. – 56 p. - ISBN 978-5-209-11049-1.
5. Botchey V.M., Savrova O.B., Eremina I.Z. Embryology: the course of lectures / M.: PFUR, 2022. – 44 p. - ISBN 978-5-209-11050-7.
6. Botchey V.M., Savrova O.B., Eremina I.Z. Basic Histology: the course of lectures / M.: PFUR, 2022. - 64 p.: il. - ISBN 978-5-11048-4.
7. Savrova O.B., Eremina I.Z., Botchey V.M. Histology: Organ Systems. - M.: PFUR, 2019. - 168 c. - ISBN 978-5-209-08576-8.
8. Savrova O.B., Botchey V.M Eremina I.Z. Systemic Histology. Part 1 - M: PFUR, 2018. – 79 p. – Appl. - ISBN 978-5-209-08540-3.
9. Savrova O.B., Botchey V.M Eremina I.Z. Systemic Histology. Part 2. - M: PFUR, 2018. – 88 p. – Appl. - ISBN 978-5-209-08539-3.

### *Additional reading:*

#### ***Electronic full-text materials:***

1. Savrova O. B., Eremina I.Z. Cytology. Embryology: the course of lectures[Electronic resource] / ; - M. : PFUR, 2016. - 76 p. : il. - ISBN 978-5-209-07391-8.
2. O.B.Savrova, V.M.Botchey, I.Z Eremina. Basic Cytology [Electronic resource] = Цитология: Course of lectures for students of English-media groups / M.: PFUR, 2019.
3. Savrova O.B., Botchey V.M., Eremina I.Z. Systemic histology: course of lectures for students of English-media groups. P. 1 / O.B. Savrova, V.M. Botchey, I.Z. Eremina. - M.: PFUR, 2018. - 81 p. : и. - ISBN 978-5-209-08539-3. - ISBN 978-5-209-08540-9 (P. 1).
4. Savrova O.B., Botchey V.M., Eremina I.Z. Systemic histology : course of lectures for students of English-media groups. P. 2 / O.B. Savrova, V.M. Botchey, I.Z. Eremina. - [Electronic resource] . - M. : PFUR, 2018. - 80 p.. - ISBN 978-5-209-08539-3. - ISBN 978-5-209-08812-7 (P. 2).

#### ***Printed publications:***

1. Junquera's Basic Histology: Text and Atlas, 16<sup>th</sup> Ed by A.Mescher, 2019
2. Stevens A. Human Histology, 3d Edition /Elseiver – London
- 3, Johnson Ph.D, Kurt E. Histology and cell biology, 2-d Ed./ Harwal Publishing Company – Baltimore
4. Ross M.H., Pawlina W. Histology: A Text and Atlas, 7<sup>th</sup> Ed, 2018
5. Gartner L.P., Hiatt J.L. Color Atlas and Text of Histology
7. Paul R. Wheater, H. George Burkitt, Victor G. Daniels. Functional Histology: a text and colour atlas. - Churchill Livingstone Inc. - 1987.
8. Wheater, Paul R. Functional Histology: a text and colour atlas. - 5<sup>nd</sup> ed. Longman Group UK Limited.

9. Histology, Cytology, Embryology: manual to Laboratory Classes. P.1 / V.M. Botchey, O.B. Savrova, I.Z. Eremina, V.M. Grinberg; э - M.: PFUR, 2020. - 37 p. - ISBN 978-5-209-09801-0. - ISBN 978-5-209-09802-7 (ч. I).

10. Histology, Cytology, Embryology: manual to Laboratory Classes. P.2/ V.M. Botchey, O.B. Savrova, I.Z. Eremina, V.M. Grinberg, A.A.Lapshin; - M.: PFUR, 2023. - 55 p. - ISBN 978-5-209-11923-0. - ISBN 978-5-209-09802-7 (ч. IIII).

### *Internet (based) sources*

- 1. Electronic libraries with access for RUDN students:
  - Electronic library network of RUDN – ELN RUDN <http://lib.rudn.ru/MegaPro/Web>
  - ELN «University Library online» <http://www.biblioclub.ru>
  - ELN Urait <http://www.biblio-online.ru>
  - ELN «Student Advisor» [www.studentlibrary.ru](http://www.studentlibrary.ru)
  - ELN «Lan» <http://e.lanbook.com/>
  
- 2. Databases and search engines:
  - electronic fund of legal and regulatory and technical documentation <http://docs.cntd.ru/>
  - search system Yandex <https://www.yandex.ru/>
  - search system Google <https://www.google.ru/>
  - abstract database SCOPUS <http://www.elsevierscience.ru/products/scopus/>

### *Learning toolkits for self-studies during the development of the discipline*

1. Lectures Synopsis on the discipline "Histology, embryology, cytology".
2. Methodological guidelines for the implementation and execution of control and independent work on the discipline "Histology, embryology, cytology"

\* - All teaching materials for self-studying of students are placed in accordance with the current procedure on the discipline page in the RUDN LMS TUIS.

## **8. ASSESSMENT MATERIALS and POINT-RATING SYSTEM for ASSESSING the LEVEL of COMPETENCE FORMATION in the DISCIPLINE**

Assessment materials and a point-rating system for assessing the level of competence formation (part of competencies) based on the results of mastering the discipline "**Histology, embryology, cytology**" are presented in the Appendix to this Work Program of the discipline.

### **PROGRAM DEVELOPERS:**

Associate Professor of the  
Department of Histology, Cytology  
and Embryology

I.Z. Eremina

O.B.Savrova

Associate Professor of the  
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**HEAD of the Department:**  
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T.Kh. Fatkhudinov

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**HEAD of the EP HE**  
**Head of the Department of General Medical Practice:**

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**N.V.Sturov**

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