ОЙТÚSTIК QAZAQSTAN MEDISINA АКАДЕМІАSY «Оңтүстік Қазақстан медицина академиясы» АҚ ОЙТÚSTIК QAZAQSTAN MEDICAL АСАДЕМУ АО «Южно-Казахстанская меди	ицинская академия»
Department of Microbiology, Virology and Immunology	50-11-
Methodological recommendations for student's independent work	1 of 12
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skma.edu.kl GUIDELINES FOR INDEPENDENT WORK OF STUDENTS KM8.edu.K skma.edu 78.edu.K2

na.edu.K2 skma.edu. **Discipline:** Structural organization of human physiological processes

Discipline code: SOFPCh 1203

Name of OP: 6B10115 "Medicine"

Volume of training hours/credits: 30 hours (1 credits)

Course – I, semester of study – I

skma.edu. Lecture length: 2 hours

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Department of Microbiology, Viro	logy and Immunology	50-11-
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Methodological recommendations for the student's independent work were developed in accordance with the work program of the discipline (syllabus) "Microbiology" and discussed at a department meeting.

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ОŃTÚSTIK QAZAQSTAN MEDISINA AKADEMIASY «Оңтүстік Қазақстан медицина академиясы» АҚ	SOUTH KAZAKHSTAN SKMA -5979- -1079-	ская медицинская академия»
Department of Microbiology, Vin	ology and Immunology	50-11-
Methodological recommendations for	student's independent work	3 of 12

<u>№</u>1

1. Topic: The concept of biotechnology. Microorganisms participating in biotechnological processes. Biological preparations obtained by genetic engineering. Genetics of bacteria and viruses. Genetic recombinations.

2. Goal:

1) Master the basics of biotechnology.

2) Study microorganisms, cells and processes used in biotechnology.

3. Tasks :

1) The essence of biotechnology.

- 2) Goals and objectives of biotechnology.
- 3) Brief history of the development of biotechnology.
- 4) Processes used in biotechnology.
- 5) Genetic engineering.
- 6) Biological preparations obtained by genetic methods

engineering.

7) Genetics of bacteria and viruses.

- 8) Genetic recombinations: transformation, transduction and conjugation.
- 4. Execution form: Abstracts, presentation, essay on the topic.
- 5. Performance criteria: Appendix № 1
- 6. Due date: 1 week
- 7. Literature: Appendix № 2
- 8. Control:
- 1. Goals of biotechnology.
- 2. Objectives of biotechnology.
- 3. Biotechnology products obtained in medicine.
- 4. Use of yeast in biotechnology.
- 5. Use of bacteria in biotechnology.
- 6.Use of animal and plant cell culture in

biotechnology.

<u>№</u> 2

1. Topic: Characteristics of the infectious process.

2. Goal: Master the methods of biological research, widely used in the diagnosis of infectious diseases and scientific experiments.

3. Tasks:

- 1) Forms of manifest infection.
- 2) Forms of asymptomatic infection.
- 3) Pathogenicity of microorganisms as a polydeterminate trait.

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Departmen	of Microbiology, Viro	logy and	Immunology	50-11-
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- 4) Virulence, units of its measurement.
- 5) Pathogenicity properties.
- 6) List the pathogenicity factors of bacteria and describe them.
- 7) Chemical nature, basic properties of exotoxins.
- 8) Basic properties and chemical nature of endotoxins.
- 9) Forms of infection and their characteristics.
- 10) Periods of infectious disease.
- 11) Main sources of infection.
- 12) Routes and methods of infection.
- 13) List and characterize the infectious properties of viruses, features of viral infections.
- 4. Execution form: Abstract, presentation, essay on the topic.

5. Performance criteria: Appendix № 1

- 6. Deadline: 5 week
- 7. Literature: Appendix № 2
- 8. Control:
- 1. Main sources of infection.
- 2. Ways and methods of infection.
- 3. List and describe the infectious properties of viruses, especially viral infections.
- 4. Methods, methods and purposes of experimental infection of laboratory animals.

<u>№</u> 3

1. Topic: Mid-term № 1

2. Purpose: Checking and assessing the level of residual knowledge of students.

3. Main questions of the topic:

- 1. Basic instruments and equipment used in microbiological laboratories.
- 2. Morphological features of bacteria.
- 3. Basic principles of classification of microorganisms.
- 4. Technique for preparing a smear. Painting technique (simple painting method).
- 5. Steps and mechanisms of Gram staining.
- 6. Classification of bacteria by type of nutrition and energy sources.
- 7. Classification of bacteria by type of respiration.
- 8. Growth and reproduction of bacteria.
- 9. Phases of reproduction of a bacterial population in a liquid nutrient medium.
- 10. The main groups of bacterial enzymes and their classification.
- 11. Morphology and structure of fungi. Biological characteristics of mushrooms.
- 12. Morphology and structure of protozoa. Biological features of protozoa.
- 13. Define the term "antibiotic". Classification of antibiotics by origin, by the mechanism
- of antimicrobial action.
- 14. Classification of antibiotics according to their spectrum of action on microorganisms.

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15. Drug resistance of bacteria and ways to overcome it.

16. Methods for determining the sensitivity of bacteria to antibiotics.

17. Define the terms "infection", "infectious process", "infectious disease". Periods of infectious disease.

18. Forms of infection and their characteristics.

19. Main sources of infection. Routes and methods of infection.

20. Features of the genetics of bacteria are one of the main conditions for their preservation as a species in nature.

21. Genetic recombinations.

22. Genetic engineering in medical microbiology.

23. Types of virus-cell interaction.

24.Stages of virus-cell interaction.

25. Virus cultivation methods. Cultivation of viruses in chicken embryos.

26. Methods for identifying (typing) viruses.

27.Biological features of bacteriophages (phages), their forms.

28. Microflora of soil, water and air.

29. The concept of normal microflora of the human body.

30.Dysbacteriosis (dysbiosis) and the causes of its occurrence.

4. Type of performance/assessment: Colloquium: oral survey (ticket tasks)

5. Performance criteria: Appendix № 1

6. Due date: 3 week

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ASSESSMENT CRITERIA INDEPENDENT WORK OF STUDENTS UNDER THE GUIDANCE OF THE TEACHER

Preparation and defense of the abstract

Form control	Grade	Criteria for evaluation
Preparation and defense of the abstract	Great A +(4 , 0; 95-100%) A-(3.76; 90-94%)	The abstract was completed carefully and submitted on time, written independently on at least 15 pages of typewritten text, using at least 7 literary sources. Diagrams, tables and figures corresponding to the topic of the abstract are provided. When defending an abstract, the text is not read, but narrated. Confidently and accurately answers all questions asked.
AU.K. St. SKING	Fine B+(3.33;85-89%) B-(2.67; 75-79%) C+(2.33;70-74%)	The abstract was completed carefully and submitted on time, written independently on at least 10 pages of typewritten text, using at least 6 literary sources. Diagrams, tables and figures corresponding to the topic of the abstract are provided. When defending an abstract, the text is not read, but narrated. When answering questions, he makes unprincipled mistakes.
Kule skina.edu.	Satisfactorily C (2.0;65-69%) C-(1.67;60-64%) D+(1.33;55-59%) D(1.0;50-54%)	The abstract was completed carefully and submitted on time, written independently on at least 7 pages of typewritten text, using at least 4 literary sources. When defending an abstract, the text is read. Answers questions uncertainly and makes fundamental mistakes.
edu. K. Skilling	Unsatisfactory FX (0.5; 2 5 -49%) F (0; 0- 2 4%)	The abstract was not completed neatly and was not submitted on time, it was written independently on less than 5 pages of typewritten text, using less than 3 literary sources. When defending an abstract, the text is read. When answering questions, he makes gross mistakes and does not understand the material.

Presentation of the topic

1 S. KUL S. O. W. KI St.
on was completed independently, on aluma of at least 25 slides. At least 7
s were used. The slides are informative then defending, the author demonstrates ge of the topic. Does not make mistakes g questions during discussion.
on was completed independently, on
blume of at least 23 slides. At least 6
were used. The slides are informative
When defending, the author

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Department of Microbiology, Virology and Immunology50-11-Methodological recommendations for student's independent work7 of 12	«Оңтүстік Қазаі	ОŃTÚSTIK QAZAQSTAN MEDISINA AKADEMIASY қстан медицина академиясы» АҚ	SOUTH KAZAKHSTAN MEDICAL ACADEMY AO «Южно-Казахстанская	медицинская академия»
Methodological recommendations for student's independent work 7 of 12	Sh. Co. Contra	Department of Microbiology, Virology a	nd Immunology	50-11-
	Me	ethodological recommendations for student	t's independent work	7 of 12

en and shund services	unprincipled mistakes when answering questions, which he corrects himself.
Satisfactorily C (2.0;65-69%) C-(1.67;60-64%) D+(1 .33 ;5 5 -5 9 %) D(1.0; 50-54 %)	The presentation was completed independently, on time, with a volume of at least 20 slides. At least 5 literary sources were used. The slides are not meaningful. During the defense, the author makes fundamental mistakes when answering questions.
Unsatisfactory FX (0.5; 2 5 -49%) F (0; 0- 2 4%)	The presentation was not submitted on time, the volume is less than 20 slides. Less than 5 literary sources were used. The slides are not meaningful. During the defense, the author makes gross mistakes when answering questions. Does not understand his own material.

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Form control	Grade	Criteria for evaluation
Preparation of written creative work (essay)	Great A +(4 , 0; 95-100%) A-(3.76; 90-94%)	The content of the work is fully consistent with the topic: The topic is revealed in a deep and well-reasoned manner . With triple composition, logical and consistent presentation of thoughts . The problem of the essay is clearly formulated. There are no actual errors. The conclusion contains conclusions that logically follow from the content of the main part.
edu, w. R. Ski	Fine B+(3.33;85-89%) B-(2.67; 75-79%) C+(2.33;70-74%)	The topic is revealed quite fully and convincingly with minor deviations from it. A thesis statement corresponding to the topic of the essay is clearly formulated. In the main part, the thesis put forward is logically, coherently, but not fully proven; there are isolated factual inaccuracies.
Ma.edu.iu. SKMa.edu.iu. KI SKMa.edu.iu.	Satisfactorily C (2.0;65-69%) C-(1.67;60-64%) D+(1 .33 ;5 5 -5 9 %) D(1.0; 50-54 %)	A correct, but one-sided or insufficiently complete answer to the topic was given . There are no deviations from it or individual errors in the presentation of factual material. The material is presented quite logically, but there are some violations of the sequence of expression of thoughts. The conclusions do not fully correspond to the content of the main part
BUNKL ST GK	Unsatisfactory FX (0.5; 2 5 -49%) F (0; 0- 2 4%)	the topic is not completely covered, which indicates superficial knowledge. Characterized by a random arrangement of material, lack of connection between parts. Characterized by the presence of gross speech errors.

Form	Grade	Criteria for evaluation
<u>control</u>	Wint stin	20. 60°
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No. Co. W.	Department of Microbi	ology, Virology and Immunology	50-11-
	Methodological recommend	lations for student's independent work	8 of 12
Drawing up situational problems	Great A +(4 , 0; 95- 100%) A-(3.76; 90-94%)	The student showed original thinking, knowledge of the material, and interdis- were used when drawing up a situati scientific terminology. Identified the m disease, microbiological laboratory data a	demonstrated a deep ciplinary connections ional problem. Used ain symptoms of the are correct.
Runa.edu.kz	Fine B+(3.33;85-89%) B-(2.67; 75-79%) C+(2.33;70-74%)	The student, when composing the problem inaccuracies, which were corrected by during the analysis of the proble terminology. Identified the main symp microbiological laboratory data are corre	m, made unprincipled the student himself m. Used scientific toms of the disease, ct.
1.KL SKIND. SKIND.	Satisfactorily C (2.0;65-69%) C-(1.67;60-64%) D+(1.33;55-59%) D(1.0;50-54%)	the student made inaccuracies and unprin scientific terminology. I experienced systematizing the material. I was able symptoms of the disease; microbiologica indicated with minor inaccuracies.	cipled errors and used great difficulties in to identify the main al laboratory data are
na.edu.ku	Unsatisfactory FX (0.5; 2 5 -49%) F (0; 0- 2 4%)	The student created a situational fundamental errors and inaccuracies. V task, I was unable to identify the main syn and also indicated incorrect microbiologi	problem and made When composing the nptoms of the disease, cal laboratory data.

Analysis of scientific articles

Form	Grade	Criteria for evaluation
Analysis of scientific articles	Great A +(4 , 0; 95- 100%) A-(3.76; 90-94%)	The work was completed carefully and submitted on time, written independently on at least 5 pages of printed text. Thoughts on the problem are presented in the form of brief theses, giving arguments. In the text of the work, references to the authors are indicated everywhere. When defending, he does not read the text, but tells it. Confidently and accurately answers all questions asked. For work, I used articles no more than 5 years old and with a high Impact factor.
KL S SKITE SU.KL SKITE B. Edu. KL SKI	Fine B+(3.33;85-89%) B-(2.67; 75-79%) C+(2.33;70-74%)	The work was completed carefully and submitted on time, written independently on at least 4 pages of printed text. Thoughts on the problem are presented in the form of brief theses, but without providing arguments. In the text of the work, references to the authors are indicated everywhere. When defending, he does not read the text, but tells it. When answering questions, he makes unprincipled mistakes. For work, I used articles no more than 5 years old and with a high Impact factor.

ОŃTÚSTIK QAZAQSTAN MEDISINA AKADEMIASY «Оңтүстік Қазақстан медицина академиясы» АҚ	медицинская академия»
Department of Microbiology, Virology and Immunology	50-11-
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2011. KL SKING SKING	Satisfactorily C (2.0;65-69%) C-(1.67;60-64%) D+(1 .33 ;5 5 -5 9 %) D(1.0; 50-54 %)	The work was completed carefully and submitted on time, written independently on at least 3 pages of printed text. Thoughts on the issue are presented scatteredly, without providing arguments. In the text of the work, references to authors are not indicated everywhere. When defending, the text is read. Answers questions uncertainly and makes fundamental mistakes. For work, I used articles more than 5 years old and with an average Impact factor.
18. C. edu.	Unsatisfactory FX (0.5; 2 5 -49%) F (0; 0- 2 4%)	The work is written on less than 3 printed pages. Thoughts are presented scatteredly. There are no references to the authors in the text of the work. There are no arguments. When defending, the text is read. When answering questions, he makes gross mistakes and does not understand the material. For work, I used articles that were more than 5 years old and with a low Impact Factor.

CRITERION FOR ASSESSMENT OF FOREIGN CONTROL

Midterm control is carried out in the form of an oral response to the ticket questions. Each ticket consists of 3 theoretical questions . Total maximum given **90-10 0** points.

Form	Grade	Criteria for evaluation
control	en 11. 12 2	LUNG BUILT STATE BUILT BUILT
Assessmen	Great	1) the contents of the ticket material are fully disclosed;
t of	A +(4, 0; 95-	2) the material is presented competently, in a certain logical
boundary	100%)	sequence, terminology is used accurately;
control	A-(3.76; 90-94%)	3) demonstrated the ability to illustrate theoretical principles
(oral	5. 1910 - 2.0 - 1	with specific examples and apply them in a new situation;
answer to	St flor es	4) answer independently, without leading questions;
ticket	I St. na	5) There were one or two inaccuracies in the coverage of
questions)	· 1 st no	secondary issues, which were corrected after comments or
dia. eu	when it at a	leading questions.
- ~ ~ e	Fine	The answer basically satisfies the requirements for an
X4, 20.	B+(3.33;85-89%)	"excellent" rating, but it has one of the shortcomings:
, Hin	B-(2.67; 75-79%)	1) there are small gaps in the presentation that do not distort
1 3. KU	C+(2.33;70-74%)	the essence of the content of the answer;
Kr S.	Une Sice You A	2) one or two shortcomings were made in covering the main
V.V. S	E Ma er wi	content of the answer, corrected after the examiner's
YN. KT	St. no ev y	comments;
2 N. V	st no el	3) an error or more than two shortcomings were made when
60 JU.	1 24 23.	covering secondary issues, which are corrected after the
(a. 602.1	1 1 2	examiner's comments.

ОŃŦÚST. # «Оңтүстік Қазақстан медицина акад	IK QAZAQSTAN MEDISINA AKADEMIASY Lemuяcы» АҚ KALINA MEDICAL ACADEMY AO «Южно-Казахстанская мед	ицинская академия»
Department of Micr	obiology, Virology and Immunology	50-11-
Methodological recomm	endations for student's independent work	10 of 12
Satisfactorily C (2.0;65-69%) C-(1.67;60-64%) D+(1.33;55-59 %) D(1.0;50-54%)	 the content of the material is incompletely of disclosed, but a general understanding of the sufficient for further assimilation of the demonstrated; there were difficulties or mistakes were m concepts and using terminology, corrected after questions; with incomplete knowledge of theore insufficient development of competencies, ab has been identified; the student cannot apply new situation 	or inconsistently issue and skills e material are nade in defining r several leading etical material, ilities and skills the theory in a
Unsatisfactory FX (0.5; 2 5 -49%) F (0; 0- 2 4%)	 the main content of the educational redisclosed; ignorance or misunderstanding of most important part of the educational material is defining conceterminology, which were not corrected after questions. The answer to the question is completely material is completely material. 	material is not t or the most etected; pts and using several leading hissing.

CRITERIA FOR EVALUATING THE QUALITY OF A RESPONSE ABOUT A TICKET ACCOUNT AT BOARD CONTROL

The ticket consists of 3 questions. The first and second questions consist of a maximum of 30 points, the third question consists of a maximum of 40 points. Total maximum given **10 0** points.

Cuitoria for according at dout room and	Number	r of points fo question	or each
Criteria for assessing student responses	1 question	Question 2	Questio n 3
The student did not answer the question	0	0	102
The student did not show even superficial knowledge of	67	7	10
the essence of the question posed, giving an answer in	1 dt	~3· 600	M.L.
relation to any term and general concept thanks to the	VI at	N 2. 0	On the
examiner's leading question	1. Mr. 1 S	19. 3.	~~~~ A
The student, answering the question on the ticket, is poorly oriented in the required literature and makes gross mistakes in covering fundamental, key issues.	edu 15		20
When answering additional questions, the student makes	20	20 6	25
mistakes in the interpretation of individual, non-key points.	na eve		SKIMO
The student competently answers the question posed	25	25	30
within the framework of the required literature; minor	i the)· 00.	4 3
isolated inaccuracies are possible.	1 2	~3· ~d	Y YY

work Work Yirology and Immunology 50-11- Methodological recommendations for student's independent work 11 of 12 The student answers the question asked correctly, 30 30 40 completely, and uses additional literature. TOTAL max for each question: 30 30 40 TOTAL max per ticket: 100 	Corry vertice data Media Made Made Sala Art Corr North Corrective Media Media Made Made Sala Art Department of Microbiology, Virology and Immunology Solar Art Methodological recommendations for student's independent work 11 of 12 The student answers the question asked correctly, 30 30 40 30 40 TOTAL max for each question: 30 30 40 TOTAL max per ticket: 100	Corrycyta Redactar Mediuluna akuebuse by Ar, Q. y. and Immunology S0-11- 1 S0-11- Methodological recommendations for student's independent work S0-11- 1 10-12- The student answers the question asked correctly. 30 30 40 completely, and uses additional literature. 30 30 40 TOTAL max for each question: 30 30 40 TOTAL max per ticket: 100 100	OŃTÚSTIK QAZAQSTAN MEDISINA AKADEMIASY JU, ACADEMY				
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The student answers the question asked correctly, completely, and uses additional literature. 30 30 40 TOTAL max for each question: 30 30 40 TOTAL max per ticket: 100	The student answers the question asked correctly, 30 30 40 Completely, and uses additional literature. TOTAL max for each question: 30 30 40 TOTAL max per ticket: 100	The student answers the question asked correctly. 30 30 40 completely, and uses additional literature. 30 30 40 TOTAL max for each question: 30 30 40 TOTAL max per ticket: 100 100	Methodological recommendation	s for student's independ	lent work		11 of 12
The student answers the question asked correctly, completely, and uses additional literature. 30 30 40 TOTAL max for each question: 30 30 30 40 TOTAL max per ticket: 100 100	The student answers the question asked correctly, or completely, and uses additional literature. 30 30 40 TOTAL max for each question: 30 30 40 TOTAL max per ticket: 100	The student answers the question asked correctly, and uses additional literature. 30 30 40 TOTAL max for each question: 30 30 40 TOTAL max per ticket: 100				001.14	1 3 15
TOTAL max for each question: 30 30 40 TOTAL max per ticket: 100	TOTAL max for each question: 30 30 40 TOTAL max per ticket: 100	TOTAL max for each question: 30 30 40 TOTAL max per ticket: 100	The student answers the question completely, and uses additional literatu	asked correctly, re.	30	30	40
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The student answers the question asked correctly,	30	30	40
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Departme	ent of Microbiology, Viro	logy and	Immunology	50-11-
Methodological recommendations for student's independent work				12 of 12

Appendix No. 2

Recommended literature Basic literature

1. Murray P. R., Rosenthal K. S., Pfaller M. A.Medical Microbiology. - Mosby, 2015

2. W. Levinson McGraw-Hill. Review of Medical Microbiology and Immunology, 2014 Additional literature

1. Saparbekova A.A. Microbiology and virology : educ. manual. - Second Edition. -Almaty : ЭСПИ, 2023. - 188 c

 Gladwin Mark T. Clinical microbiology made ridiculously simple / Mark T. Gladwin, William Trattler, Scott C. Mahan . - 7th ed. - Miami :MedMaster, Ins, 2016. - 413 p.
 Usmle Step 1. Immunology and microbiology : Lecturer notes / Alley Tiffany L. [et.

al.]. - New York, 2019. - 511 p. - (Kaplan Medical)

Electronic textbooks

1. B. T. Seytkhanova, Sh. Zh. Kurmanbekova, Sh.T. Polatbekova, Sh.Zh. Gabdrakhmanova, A.N. Tolegen. CAUSATIVE AGENTS OF ACUTE RESPIRATORY VIRAL INFECTIOUS DISEASES (influenza virus, adenovirus, coronavirus) (I part) http://lib.ukma.kz/wp-content/uploads/2022/10/Illustrated-teach.-material-eng-2.pdf

2. B.T. Seytkhanova, Sh. Zh. Kurmanbekova, Sh.T. Polatbekova, Sh.Zh. Gabdrakhmanova, A.N. Tolegen. Pathogens of children's viral infections (measles, rubella, chickenpox and mumps virus) (Part II) http://lib.ukma.kz/wp-content/uploads/2022/10/illustrated-textbook.pdf

3. B.T. Seytkhanova, A.A. Abdramanova, A.N. Tolegen, P. Vinoth kumar Lecture compolex on the subject "Microbiology and immunology " (General Microbiology) http://lib.ukma.kz/wp-content/uploads/2022/10/Lecture-complex-General-Microbiology-2022.pdf

4. B.T. Seytkhanova, A.A. Abdramanova, A.N. Tolegen, P. Vinoth kumar LECTURE COMPLEX ON THE SUBJECT "MICROBIOLOGY AND IMMUNOLOGY"(Private Microbiology) http://lib.ukma.kz/wpcontent/uploads/2022/10/Lecture-complex-Private-Microbiology-2022.pdf Electronic base

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1	Electronic library SKMA	http://lib.ukma.kz/repository
2	Republican interuniversity electronic library	https://online.zakon.kz/Medicine
3	«Aknurpress» Digital library	https://www.aknurpress.kz/
4	«Epigraph» Electronic library	http://www.elib.kz/
5	Epigraph - portal of multimedia textbooks	https://mbook.kz/ru/index/
6	ABS IPR SMART	https://www.iprbookshop.ru/auth
7	"Law" base of normative legal acts	https://zan.kz/ru
8	Cochrane Library	https://www.cochranelibrary.com/