

Ministry of Health of the Republic of Belarus
Educational institution
"Gomel State Medical University"

Department of Biological Chemistry

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METHODOLOGICAL RECOMMENDATIONS

for a practical lesson in the academic discipline "Biological Chemistry"
for 2nd year **students** of the Faculty of Foreign Students
majoring in 1-79 01 04 "Medical Care"

Topic: Preparatory class. Introduction to biochemistry. Modern biochemical research methods

Duration 4 hours

Approved at the meeting of the Department of Biological Chemistry
(Protocol No. 10 dated 29.08.2025)

Gomel, 2025

1. TRAINING AND EDUCATIONAL OBJECTIVES, MOTIVATION FOR COMPLETION THE TOPIC, REQUIREMENTS FOR THE INITIAL LEVEL OF KNOWLEDGE

A comprehensive understanding of biological chemistry is crucial for success in two key areas of biomedical sciences: preserving human health and identifying causes of diseases and effective treatments. From a biochemical perspective, an organism is considered healthy when thousands of reactions occurring within cells and in the extracellular environment proceed under optimal conditions to maintain physiological normalcy.

The **purpose** of this class is to introduce students to the internal regulations of the Department of Biological Chemistry, laboratory work and safety rules, and primary methods of biochemical research. Additionally, the class aims to instill a sense of pride in students' chosen profession and cultivate a culture of health respect.

Class objectives:

The student should know:

1. Internal regulations at the Department of Biological Chemistry, laboratory work rules, and safety precautions.
2. The primary biochemical research methods utilized in clinical and experimental settings.
3. Significant milestones in the history of biochemistry as a science and its role in medicine.

The student should be able to:

1. Work with micropipettes.
2. Work with a photoelectric colorimeter.

2. CHECKLIST OF QUESTIONS FROM RELATED SUBJECTS

- 2.1 Guidelines for working with pipettes (bioorganic chemistry).
- 2.2 Guidelines for utilizing photoelectric colorimeter and refractometer (physics).

3. CHECKLIST OF CONTROL QUESTIONS FOR THE LESSON

- 3.1 Introduction to biochemistry. The subject and tasks of biochemistry. Objects and methods of biochemical research in the clinic and experiment. The importance of biochemistry for the physician, examples. Overview of catabolism scheme. The pathways of anabolism, catabolism, and metabolism.
- 3.2 Stages of the history of biochemistry. The role of domestic and foreign scientists in the development of biochemistry.
- 3.3 Characteristics of the main biochemical objects and methods used in the experiment and clinic:
 - at the level of the whole organism,
 - at the level of organs, tissues and cells,
 - at the level of cellular organelles and molecules.

4. PRACTICAL PART OF THE LESSON

Laboratory work No. 1. Devices and utensils in biochemical laboratory and rules to operate them.

Laboratory work is carried out according to the publication “Biological chemistry: workbook for 2nd year students faculty for International students of medical higher educational institutions: in 2 parts” / Gritsuk A.I. [and etc.]. - Gomel: GomSMU, 2021. -- Part 1. -- 76 p.

5. PROCESS OF THE LESSON

5.1 Introduction.

5.2 Briefing on health and safety. Features of work in a biochemical laboratory.

5.3 The theoretical part of the lesson: control questions are considered.

5.4 Practical part of the lesson: laboratory work is performed using a workbook on biological chemistry.

5.5 Controlling the assimilation of the topic.

5.6 The final part of the lesson. Summing up, checking the protocols, announcing assignments for the next lesson.

6 QUESTIONS FOR KNOWLEDGE SELF-CONTROL

6.1 *Give an example for the term “biochemistry”.*

6.2 *Bring examples, which explain the meaning of biochemistry for doctors.*

7. LIST OF REFERENCES:

1. Harper's Illustrated Biochemistry / Victor W. Rodwell [and oth.]. — 30th edit. -New York[and oth.] : McGraw-Hill Education, 2015. — 817 p.

2. Meisenberg, G. Principles of medical biochemistry / G. Meisenberg, W. H. Simmons. — 4th ed. -Philadelphia: Elsevier, [2017]. — xii, 617 p.

3. Vasudevan, D. M. Textbook of biochemistry for medical students / DM Vasudevan, S Sreekumari. — 5th ed. — New Delhi : Jaypee brothers medical publishers, 2009. — xvi, 535 p.

4. Gritsuk, A. I. Biochemistry. P. 1 : lectures, notes / A. I. Gritsuk, A. N. Koval ; Gomel State Medical University, Department of biochemistry. — Gomel, 2016. — 380 p.