

**Thematic plan of seminar-type classes
in the discipline "Biochemistry, biochemistry of the oral cavity"
for students of 2025 year of admission
under the educational programme
31.05.03 Dentistry,
specialisation (profile) Dentistry,
(Specialist's degree),
form of study full-time
for the 2025-2026 academic year**

№	Thematic blocks	
1	Introduction to Biological Chemistry. Regulations for biochemistry lab. Basic methods of separation and purification of proteins/	2
2	Structure and physicochemical properties of proteins.	2
3	Interaction of proteins with ligands. The structure and function of hemoglobin. The structure and function of immunoglobulins.	2
4	Enzymes. Biological role. Mechanism and features of enzymatic catalysis. Coenzyme function of vitamins .	2
5	Kinetics of enzymatic reactions. Principles for determining the activity of enzymes.	2
6	Regulation of enzyme activity. Inhibition of enzyme activity. The use of enzymes in medicine.	2
7	Colloquium "Proteins and enzymes".	2
8	Energy exchange. Tissue respiration. Ways of ATP formation. Structural organization of the electron transport chain.	2
9	Specific and general pathways of catabolism. Oxidative decarboxylation of pyruvate. Citrate cycle	2
10	Structure and biological role of carbohydrates. Digestion of carbohydrates. Synthesis and breakdown of glycogen.	2
11	Glucose catabolism. Anaerobic and aerobic glucose breakdown. Gluconeogenesis.	2
12	Regulation of glycogen synthesis and mobilization. Regulation of glycolysis and gluconeogenesis in the liver. Pentose phosphate pathway of glucose conversion.	2
13	Colloquium «Energy exchange. Chemistry, carbohydrate metabolism.»	2
14	Lipid chemistry. Digestion and absorption of lipids. Assimilation of dietary fats. Lipoproteins.	2
15	Synthesis of higher fatty acids and triacylglycerols.	2
16	Mobilization of fats. Oxidation of fatty acids. Participation of hormones in the regulation of fatty acid oxidation in the liver. Ketone bodies.	2
17	Eicosanoids. Synthesis of cholesterol in the liver. HDL metabolism. Bile acids. Lipid metabolism disorders.	2

18	Colloquim «Chemistry and lipid metabolism».	2
19	Nitrogen balance. Protein nutrition. Digestion of proteins. Transamination. Deamination. Neutralization of ammonia in tissues.	2
20	Synthesis of urea. Synthesis of nonessential amino acids. Phenylalanine and tyrosine metabolism. Amino acid decarboxylation. Biogenic amines, their functions.	2
21	Heme and iron metabolism. Hereditary disorders. Jaundice.	2
22	Toxic compounds. The enzymes of detoxication and antioxidant defense. Inactivation of xenobiotics in the body. Microsomal oxidation system.	2
23	COLLOQUIUM: amino acid metabolism; metabolism of heme and iron; inactivation of xenobiotics.	2
24	RNA biosynthesis (transcription). Post-translational RNA modifications. Protein biosynthesis (translation). Regulation of protein biosynthesis in eukaryotes.	2
25	Biological membranes. Structure, properties and function. Mechanisms of transport of substances through membranes, mechanisms of transmission of hormonal signals.	2
26	The role of hormones in the regulation of metabolism. Regulation of the metabolism of carbohydrates, lipids and amino acids.	2
27	Regulation of water-salt metabolism.	2
28	Biochemistry of the extracellular matrix and connective tissue. Glycosaminoglycans. Collagens. Elastin.	2
29	Bone biochemistry. Mineral composition of bone tissue. Bone proteins and their role in mineralization. Bone tissue remodeling.	2
30	Biochemistry of tooth tissue.	2
31	Biochemistry of the oral fluid. Regulation of saliva secretion. Inorganic components of saliva. Proteins and enzymes of saliva.	2
32	Biochemical changes in the oral cavity in some pathological conditions.	2
33	COLLOQUIUM: Biochemistry of the oral cavity. Biochemistry of connective tissue and extracellular matrix. Biochemistry of the bone tissue of the tooth. Biochemistry of saliva and oral fluid.	2

Considered at the meeting of the department of "29" _05_ 2025, protocol No 12

Head of the Department of Basic
and Clinical Biochemistry



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