

Confirmed by the Chair session
 Protocol No. 1 dated «31» August 2022
 The Head of the department _____ Prof. Lesia KOBYLINSKA

THEMATIC SCHEDULE OF LECTURES
on biological chemistry for the 2nd year students of dentistry faculty
during the autumn term of 2022 – 2023 academic year

No	Topics and contents of lectures	Number of hours	Lecturer	Date
<i>Thematic modules 2. “Enzymes and coenzymes. Regulation of metabolism”</i>				
1.	Biochemistry as a science. Enzymes. Regulation of enzymatic processes. Enzymology.	2	Prof. Iryna Fomenko	12.09
<i>Thematic module 4. “Carbohydrate metabolism and its regulation”</i>				
2.	Carbohydrate metabolism and its regulation. Pathology of carbohydrate metabolism.	2	Prof. Iryna Fomenko	10.10
<i>Thematic module 5. “Metabolism of lipids”</i>				
3.	Lipid metabolism and its regulation. Pathology of lipid metabolism.	2	Prof. Iryna Fomenko	7.11
<i>Thematic module 4. “Amino acids metabolism and its regulation”</i>				
4.	General pathways of amino acid metabolism. Metabolism of specific amino acids, its regulation. Pathology of amino acid metabolism.	2	Prof. Iryna Fomenko	5.12
Totally:		8		

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THEMATIC SCHEDULE
of practice and laboratory studies on biological chemistry for the 2nd year students of
dentistry faculty during the autumn term of 2022 – 2023 academic year

No	The topic	Number of hours	Date
<i>Thematic module 1. "Introduction to Biochemistry"</i>			
1.	Biochemistry as a science, objects of study and tasks of biochemistry, methods of biochemical research.	2	7.09
<i>Thematic module 2. "Enzymes and coenzymes. Regulation of metabolism"</i>			
2.	Investigation of physicochemical properties and structure of enzyme proteins. Mechanism of action and kinetics of enzymatic catalysis.	2	14.09
3.	Regulation of enzymatic processes. Medical enzymology.	2	21.09
4.	Study of the role of cofactors and coenzyme vitamins. The role of water- and fat-soluble vitamins in the metabolism of living organisms.	2	28.09
<i>Thematic module 3. "Molecular basis of metabolism. Tricarboxylic acid cycle"</i>			
5.	Basic patterns of metabolism. Research on the functioning, regulation and energy value of the tricarboxylic acid cycle.	2	5.10
6.	Molecular basis of bioenergetics.	2	12.10
<i>Thematic module 4. "Carbohydrate metabolism and its regulation"</i>			
7.	Anaerobic glucose oxidation research.	2	19.10
8.	Investigation of aerobic oxidation of glucose and alternative ways of monosaccharide metabolism.	2	26.10
9.	Study of glycogen metabolism. Biosynthesis of glucose – gluconeogenesis.	2	2.11
10.	Study of mechanisms of metabolic and hormonal regulation of carbohydrate metabolism. Diabetes mellitus.	2	9.11
<i>Thematic module 5. "Metabolism of lipids"</i>			
11.	Investigation on the metabolism of triacylglycerols and complex lipids. Lipolysis and its regulation.	2	16.11
12.	β -Oxidation and biosynthesis of fatty acids. Exchange of ketone bodies.	2	23.11
13.	Study of biosynthesis and biotransformation of cholesterol. Pathologies of lipid metabolism.	2	30.11
<i>Thematic module 4. "Amino acids metabolism and its regulation"</i>			
14.	General pathways of amino acid transformations in tissues.	2	7.12
15.	Study of the processes of ammonia detoxification and urea biosynthesis. Synthesis of glutathione and creatine.	2	14.12
16.	Investigation of specialized pathways of amino acid metabolism in tissues.	2	21.12
Totally:		32	

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THEMATIC SCHEDULE of individual work on biological chemistry for the 2nd year students of dentistry faculty during the autumn term of 2022– 2023 academic year

No.	Topic	hours
1.	History of biochemistry; development of biochemical research in Ukraine.	2
2.	Connection of biochemistry with other biomedical sciences. Medical biochemistry. Clinical biochemistry. Biochemical laboratory diagnostics.	1
3.	Structural and functional components of cells, their biochemical functions. Classes of biomolecules. Their hierarchy and origin.	2
4.	Contribution of scientists of the Department of Biochemistry of the Lviv National Medical University to the development of biological chemistry.	1
5.	Principles of collection and preservation of material for laboratory research. Errors in research.	2
6.	Salivary enzymes: their specificity and role.	2
7.	Levels of structural organization of enzymes. Multienzyme complexes, enzymatic ensembles, multifunctional enzymes, their advantages.	1
8.	Principles and methods of detecting enzymes in biological objects. Units of activity and amount of enzymes.	2
9.	Vitamins as irreplaceable biologically active components necessary for the human body. The history of the discovery of vitamins. Development of vitaminology in Ukraine.	3
10.	Causes of exo- and endogenous hypo- and vitamin deficiency.	1
11.	Use of water- and fat-soluble vitamins in dental practice.	1
12.	Provitamins, antivitamins. Mechanism of action and application in practical medicine.	2
13.	Vitamin-like substances, their structure and role.	2
14.	Methods of studying metabolism.	1
15.	Intracellular localization of metabolic pathways, compartmentalization of metabolic processes in the cell.	2
16.	The structure of NAD ⁺ and NADPH ⁺ . Their importance in oxidation and reduction reactions. The structure of FAD and FMN. Their role in oxidation and reduction reactions.	1
17.	Hereditary enzymopathies of digestive processes (insufficiency of disaccharidases, violation of membrane transport of hexoses, absorption of glucose and galactose).	1
18.	The Pasteur effect.	0,5
19.	Glucose-alanine cycle.	0,5
20.	The pentose phosphate pathway of glucose oxidation: the reaction scheme of the process.	2
21.	The role of adrenaline, glucagon and insulin in the hormonal regulation of glycogen metabolism in muscles.	2
22.	Characteristics of normo-, hyper-, hypoglycemia and glucosuria, their causes.	1
23.	Biological functions of simple and complex lipids in the human body (reserve, energy, participation in thermoregulation, biosynthetic).	1
24.	Participation of lipids in the construction and functioning of biological membranes of cells. Liquid-mosaic model of biomembranes.	1
25.	Disorders of lipid digestion in the digestive tract (steatorrhea, its types).	1
26.	Liposomes, their structure and vectors of use in medicine.	1
27.	Lysosomal diseases: causes, clinical and biochemical characteristics.	1
28.	Pathological processes of lipid metabolism that lead to the development of obesity.	1
29.	Disorders of lipid metabolism in diabetes mellitus.	1
30.	Formation mechanism and role of hydrochloric acid. Acidity of gastric juice and forms of its expression. Quantitative indicators in normality and pathology by the pH-metry method. Mechanisms of stimulation of release of hydrochloric acid.	2
31.	Decay of proteins in the large intestine.	1
32.	Transaminases. Localization of transaminases in organs and tissues. The clinical and diagnostic value of determining the activity of transaminases.	1