CALENDAR AND THEMATIC PLAN

"**Bioorganic chemistry**"

Lectures for the first year students

Medical Faculty

(Spring semester, 2021/2022 educational year)

№	Topic	Hours	Date
1	Bioorganic chemistry. Classification of the chemical reagents and reactions. Reactivity of the hydrocarbons. Hydroxy derivatives of the hydrocarbons. Thioles. Amines.	2	17.01
2	Carbonyl-containig compounds. Carboxylic acids. Heterofunctional compounds.	2	31.01
3	Lipids. Proteinogenous aminoacids. Peptides & proteins.	2	14.02
4	Carbohydrates.	2	28.02
5	Heterocyclic compounds. Alkaloids. Nucleic acids.	2	14.03
	Total hours	10	

Head of Pharmaceutical, Organic
& Bioorganic Chemistry Chair, prof. R. Lesyk

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"**Bioorganic chemistry"**

practical classesfor the first year students of the Medical Faculty

(Spring semester, 2021/2022 educational year)

№	Theme	Hours	Date
Part 1. Theoretical aspects of bioorganic chemistry. Hydrocarbons and their mono-functional derivatives			
1	Introduction. Classification and nomenclature of the bioorganic compounds. Classification of the chemical reactions and reagents. Structure of chemical bonds.	2	17.01-21.01
2	Structure of bioorganic compounds. Conjugated systems. Electron effects (mesomeric and inductive effects). Reactivity of hydrocarbons.	2	24.01-28.01
3	Acidic and basic properties of organic compounds. Reactivity of hydroxy derivatives of hydrocarbons, thiols, amines and carbonylic compounds.	2	31.01-4.02
4	Biologically important carboxylic acids and their derivatives. Control work "Theoretical aspects of bioorganic chemistry. Structure and properties of the hydrocarbons and their monofunctional derivatives"	2	7.02-11.02
Part 2. Heterofunctional bioorganic compounds. Biopolymers and bioregulators			
5	Heterofunctional bioorganic compounds.	2	14.02-18.02
6	Amino-acids, peptides, proteins.	2	21.02-25.02
7	Saponifiable lipids.	2	28.02-4.03
8	Nonsaponifiable lipids. Control work "Heterofunctional bioorganic compounds. Lipids".	2	7.03-11.03
Part 3. Structure and functions of carbohydrates			
9	Structure, chemical properties and functions of monosaccharides.	2	14.03-18.03
10	Structure, chemical properties and functions di- and polysaccharides.	2	21.03-25.03
11	Control work "Carbohydrates".	2	28.03-1.04
Part 4. Structure and biological properties of heterocyclic compounds, alkaloids, nucleotides, nucleosides and nucleic acids.			
12	Biologically active 5-membered heterocyclic compounds.	2	4.04-8.04
13	Biologically active 6-membered heterocyclic compounds.	2	11.04-15.04
14	Biologically active fused heterocyclic compounds. Alkaloids. Nucleic acids.	2	18.04-22.04
15	Control work "Heterocyclic compounds, alkaloids, nucleic acid".	2	25.04-29.04
Total		**30**	

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THEMATIC PLAN

"**Bioorganic chemistry"**

of out-classes work for the first year students of the

Medical Faculty

(Spring semester, 2021/2022 educational year)

№	Theme	Hours
Part 1. Theoretical aspects of bioorganic chemistry. Hydrocarbons and their mono-functional derivatives.		
1	Types of hybridisation of Carbon. Electronic structure of chemical bonds. Conjugated and aromatic systems. Reactivity of arens, alkanes, alkenes and cycloalkanes.	5
2	Reactions of polymerization and polycondensation of aldehydes and carboxylic acids.	5
Part 2. Heterofunctional bioorganic compounds. Biopolymers and bioregulators.		
3	Transformation of keto- and hydroxyacids (reactions of oxidation, reduction, decarboxylation, aldol condensation). Keto-enol tautomerism.	5
4	Simple and complex saponifiable lipids. Low-molecular weight bio-regulators – terpenes, carotenoids, steroids, prostaglandins.	7
Part 3. Structure and functions of carbohydrates.		
5	Stereo-isomerism and tautomerism of monosaccharides. D- & L-row of monosaccharides. Enantiomers and diastereomers. Anomers and epimers. Synthesis and hydrolysis of glicosides, ethers and esters of monosaccharides.	5
6	Reducing and nonreducing sugars. Structure and properties of homo- (starch, celulouse, inulin) and heteropolysacharides (Hyaluronic acid, chondroitin sulfate, heparin).	5
Part 4. Structure and biological properties of heterocyclic compounds, alkaloids, nucleotides, nucleosides and Nucleic acids.		
7	Biologically active 5-membered heterocyclic compounds. Aromaticity. Reaction of nucleophilic and electrophilic substitution. Lactam-lactim and azole tautomerisms.	5
8	Pyridine-carboxylic acids based drugs.	2
9	Alakoilds: structure, classification, properties.	6
10.	Nucleotides, nucleosides and nucleic acids.	5
Total hours		**50**

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