APPROVED
at the Chair meeting of 22/01/2024, minute no. 9,
Head of the Biochemistry and Clinical Biochemistry Chair,
MD, PhD., prof., Olga TAGADIUC _____

PLAN OF THE THEORETICAL AND PRACTICAL CLASSES
IN BIOCHEMISTRY, FACULTY MEDICINE II, FIRST YEAR, 2023-2024 ACADEMIC YEAR, SPRING SEMESTER

Spring (1st) semester, first year			
Nr	**Data**	**Theoretical classes**	**Practical lessons**
1	05-09.02.24	Lipids: structure, properties. Biologic role of lipids. Digestion and absorption of lipids. Disorders of digestion and absorption of lipids. Re-synthesis of lipids in the intestinal epithelium. Triglyceride metabolism.	The biological role of lipids. Digestion and absorption of lipids. Lipid re-synthesis. Transport of dietary lipids (chylomicrons) Metabolism of reserve lipids. Oxidation of glycerol. Bile acids identification.
2	12-16.02.24	Metabolism of fatty acids and ketone bodies.	Metabolism of fatty acids. Beta-oxidation and biosynthesis of fatty acids. Biosynthesis and use of ketone bodies. Ketone bodies identification.
3	19-23.02.24	Metabolism of structural lipids: biosynthesis and catabolism of cholesterol, phosphoglycerides, sphingolipids. Tissue lipidosis.	Metabolism of structural lipids: biosynthesis and catabolism of cholesterol, phospholipids, sphingolipids. Tissue lipidosis. Notions relating to the blood transport of lipids. Plasma lipoproteins: structure, separation methods, fractions (chylomicrons, VLDL, LDL and HDL), chemical composition (lipids and apoproteins), functions. Dosage of cholesterol. Determination of beta-lipoproteins.
4	26.02-01.03.24	Metabolism of simple proteins. The dynamic state of proteins. The nitrogen balance. Digestion and absorption of proteins. Decarboxylation of the amino acids.	**Concluding test 1: “Lipid Structure and Metabolism”**
5	04-07.03.24	General ways of amino acid metabolism: deamination, transamination. The final products	Metabolism of simple proteins. Digestion and absorption of proteins. Putrefaction of amino acids in the intestine. Decarboxylation of

		of nitrogen metabolism. Ammonia detoxification. Ureagenesis.	amino acids. Gastric juice acidity assay.
6	11-15.03.24	Peculiarities of the metabolism of some amino acids.	Intermediary metabolism of amino acids in the tissues. End products of nitrogen metabolism. Dosage of urea in urine.
7	18-22.03.24	Metabolism of chromoproteins.	Specific features of some amino acid metabolism. Biosynthesis of non-essential amino acids. Regulation and pathology of simple proteins metabolism. Creatinine and homogentisic acid assay in urine.
8	25-29.03.24	Metabolism of purine nucleotides. Metabolism of pyrimidine nucleotides.	Metabolism of purine and pyrimidine nucleotides. Metabolism of porphyrins. Bilirubin assay in blood serum.
9	01-05.04.24	Genetic regulation. Replication. Transcription. Induction. Repression.	**Concluding test 2 :"Metabolism of simple and conjugated proteins”**
10	08-12.04.24	Biochemical bases of translation. Protein post-translational changes.	DNA replication in prokaryotes – template, substrates, enzymes and protein factors. Biochemical mechanism and stages of DNA biosynthesis. Inhibitors of replication – the mechanism of action and the biomedical role (acyclovir, foscarnet, doxorubicin). Biochemical mechanisms of DNA repair. Enzymes involved. Biochemical mechanisms and role mutations. Pathologies caused by mutations (sickle cell anemia, phenylketonuria). Transcription to prokaryotes: substrates, enzymes, biochemical mechanism. Transcription inhibitors (rifampicin, nalidixic acid, α-amanitin). Peculiarities of replication and transcription in eukaryotes. Post-transcription changes of mRNA. Quantitative determination of DNA and RNA.
11	15-19.04.24	Hormones – structure, classification and biological role. Regulation of hormone synthesis and secretion. Mechanisms of action.	Protein biosynthesis in prokaryotes. Stages of protein biosynthesis regulation in prokaryotes and eukaryotes. Translation inhibitors (tetracycline, chloramphenicol, erythromycin, streptomycin, diphtheria toxin). The medical role. Polymorphism of proteins

			(variants of hemoglobin, blood groups). Biochemical bases of hereditary pathologies. Biochemical methods of diagnosis. Determination of serum proteins (biuretic method).
12	22-26.04.24	Hypothalamic-pituitary hormones. Hormones of the pancreas and adrenal glands medulla. Hormones that regulate the metabolism of calcium and phosphates (parathyroid hormone, calcitonin and calcitriol).	Hormones – structure, classification and biological role. Regulation of hormone synthesis and secretion. Mechanisms of action. Proteic hormones and hormones that are amino acid derivatives: metabolic effects. Adrenaline identification.
13	29.04-03.05.24	Hormones of steroid and thyroid nature (T_3 and T_4).	Cytosolic - nuclear mechanism of hormones action of steroid and thyroid nature (T_3 and T_4). Effects of hormones: glucocorticoids; sexual; thyroid (T_3 and T_4). Vitamins A and D: structure, properties; metabolic role; hypo- and hypervitaminosis (causes, metabolic and clinical manifestations). Eicosanoids. Classification, general notions of structure, synthesis, mechanism of action, effects. Identification of 17-ketosteroids in the urine. Dosage of calcium in blood serum.
14	14-17.05.24	Vitamins A and D. Eicosanoids.	**Concluding test 3: "Genetic and Hormonal Regulation of Metabolism"**
15	20-24.05.24		**Evaluation of students individual work**

Note:

- Olga Tagadiuc, MD, PhD, professor, is responsible for the theoretical classes at the Faculty of Medicine no 2.
- Duration of the theoretical class - 2 hours, practical lesson - 3 hours.