Aprobat
la şedinţa catedrei de biochimie şi biochimie clinică
din 28.08.2025. Proces verbal N .
Şef catedră, d.ş.m., prof. universitar
_____ Tagadiuc Olga

P L A N U L
tematic al cursurilor şi al lucrărilor de laborator la Biochimia farmaceutică (semestrul de toamna) pentru studenţii facultăţii Farmacie anul III, limba engleza, anul universitar 2025-2026

		Semestrul 5	
N	**Data**	**Curs, denumirea temei**	**Lucrare de laborator, denumirea temei**
1	**01-05.09**	**1. Digestion and absorption of lipids in the digestive tract.** **2. Resynthesis of lipids in the intestinal epithelium (enterocytes).** **3. Transport of resynthesized lipids.** **4. Biosynthesis of saturated and unsaturated (monoenic) fatty acids.** **5. Biosynthesis of triacylglycerols (TAG).** **1. Catabolism of triacylglycerols:** **2. Oxidation of fatty acids. Location. Stages.** **3. Utilization of glycerol.** **4. Metabolism of ketone bodies.**	**THEME 16. DIGESTION AND ABSORPTION OF LIPIDS. RESYNTHESIS AND TRANSPORT OF ABSORBED LIPIDS. BIOSYNTHESIS OF FATTY ACIDS AND TRIACYLGLYCEROLS.** Identification of bile acids - Pettenkofer reaction. Determination of the content of β-lipoproteins in blood serum.
2.	08-12.09		**THEME 17. CATABOLISM OF TRIACYLGLYCEROLS. CATABOLISM OF FATTY ACIDS AND GLYCEROL. METABOLISM**

			OF KETON BODIES. **Identification of ketone bodies in urine.**
3	**15-19.09**	**1. Cholesterol metabolism.** **2. Glycerophospholipid metabolism.** **3. Sphingolipid metabolism – sphingomyelins and glycolipids.**	**THEME 18. METABOLISM OF STRUCTURAL LIPIDS. SYNTHESIS AND CATABOLISM OF CHOLESTEROL, GLYCEROPHOSPHOLIPIDS AND SPHINGOLIPIDS.** Determination of cholesterol in blood serum
4	22-26.09		**THEME 19. TOTALIZARE LA CAPITOLUL 4 „METABOLISMUL LIPIDELOR”**
5	**29.09-** **03.10**	**1. Proteins in food.** **2. Biochemical mechanisms of protein digestion and assimilation of digestion products – amino acids.** **3. Fate of unabsorbed amino acids. Putrefaction of amino acids in the large intestine.** **4. Catabolism of tissue proteins.** **5. Transamination of amino acids.** **6. Deamination of amino acids.** **7. Decarboxylation of amino acids.** **1. Mechanisms of ammonium toxicity (NH4+). Examples of reactions characterizing its toxic effect.** **2. Detoxification of ammonium (NH4+).** a) Urea synthesis (ureogenetic cycle). Reactions, enzymes, clinical importance of urea determination. b) Glutamine synthesis. The role of glutamine and glutaminase in the kidneys. Elimination of NH3 in the form of ammonium salts **3. Particularities of metabolism and use of some**	**THEME 20. METABOLISM OF SIMPLE PROTEINS I. DIGESTION OF FOOD PROTEINS. CATABOLISM OF TISSUE PROTEINS. COMMON POOL OF AMINO ACIDS. TRANSAMINATION, DEAMINATION AND DECARBOXYLATION OF AMINO ACIDS.** Determination of the acidity of gastric juice. Identification of pathological compounds of gastric juice.

		amino acids of pharmaceutical interest. a) Glycine and serine metabolism. b) Glutamic acid metabolism. c) Phenylalanine and tyrosine metabolism. d) Methionine and cysteine metabolism. e) Tryptophan metabolism.	
6	06-10.10		**THEME 21. METABOLISM OF SIMPLE PROTEINS II. METABOLISM AND DETOXIFICATION OF AMMONIUM. SYNTHESIS OF UREA.** **PARTICULARITIES OF THE USE AND METABOLISM OF SOME AMINO ACIDS OF PHARMACEUTICAL INTEREST** Dosing of urea in urine. Determination of creatinine in urine (Folin method).
7	**13-17.10**	**1. Nucleoprotein metabolism.** **2. Chromoprotein metabolism.**	**THEME 22. METABOLISM OF CONJUGATED PROTEINS. METABOLISM OF NUCLEOPROTEINS** **Determination of uric acid in urine**
8	20-24.10		**THEME 23. METABOLISM OF CONJUGATED PROTEINS. METABOLISM OF CHROMOPROTEINS**
9	**27-31.10**	**1. Biochemical basis of biosignaling.** a) Definition of biosignaling and molecular signal transduction. b) Biosignaling molecules: endocrine, paracrine and autocrine hormones. c) Biomedical and pharmaceutical role of biosignaling. **2. Endocrine hormones.** a) Definition b) Properties c) Structural classification - by chemical nature and synthesis method	**THEME 24. TOTALIZARE LA CAPITOLUL 5 „METABOLISMUL PROTEINELOR SIMPLE ȘI CONJUGATE”**

		3. **Substances with hormonal paracrine and autocrine action. Peculiarities of structure and synthesis (general notions). Biochemical effects.** a) Eicosanoids (prostaglandins, thromboxanes, leukotrienes, lipoxins, resolvins) b) Cytokines (chemokines, interferons, interleukins, lymphokines, tumor necrosis factor) c) Growth factors **4. Mechanisms of action of endocrine hormones (signaling or transduction pathways of hormonal signals)** **5. Biochemical effects of some endocrine hormones:** a) pancreatic – insulin and glucagon. Pharmaceutical preparations based on insulin synthesized in the laboratory. b) thyroid gland – iodothyronines and thyrocalcitonin c) medullary adrenal – adrenaline and noradrenaline d) adrenal corticosteroid – gluco- and mineralocorticoids e) sexual – androgens and estrogens. Anabolic steroids as active pharmaceutical preparations.	
10	03-07.11		**THEME 25. BIOCHEMICAL BASES OF BIOSENALLING. HORMONES AND OTHER RELATED SUBSTANCES: CLASSIFICATION, STRUCTURAL AND SYNTHETIC FEATURES,** Adrenaline identification reactions
11	**10-14.11**	**1. Biochemical basis of pharmacokinetics.** 2. Membrane transport. 3. Biochemical basis of drug absorption. 4. Biochemical basis of drug distribution in tissues. 1. Biotransformation and metabolism of drugs in the body.	**THEME 26. MECHANISMS OF ACTION AND BIOCHEMICAL EFFECTS OF HORMONES** Reaction for the identification of 17-ketosteroids in urine (Zimmermann reaction)

		2. Phase I of drug biotransformation. a) Drug oxidation reactions and the respective enzymes. i. Microsomal oxidation of drugs. a. Cytochrome P450 (CYP). General description. b. Classification and structural-functional features of human cytochromes P450 involved in the biotransformation of drugs and other xenobiotics. c. Examples of drugs biotransformed by CYP and the respective reactions.	
12	17-21.11		**THEME 27. BIOCHEMICAL BASES OF PHARMACOKINETICS. PRINCIPLE OF A.D.M.E.** **TYPES OF MEMBRANE TRANSPORT.** **ABSORPTION AND DISTRIBUTION OF DRUGS IN THE ORGANISM**
13	**24-28.11**	**ii. Non-microsomal oxidation of drugs.** b) Drug reduction reactions and their enzymes. c) Hydrolysis reactions and their enzymes. **3. Phase II drug biotransformation.** a) Glucuronidation. b) Sulfonation. c) Acetylation. N-acetyl transferases NAT-1 and NAT-2. d) Methylation. N, O and S-methyltransferases. e) Amino acid conjugation. Glycine and glutamate conjugation. N-acyltransferases. f) Glutathione conjugation. **4. Drug excretion or phase III.** i. Efflux transporters: ii. Non-ATP-dependent pumps	**THEME 28. BIOTRANSFORMATION AND METABOLISM OF DRUGS IN THE ORGANISM. PHASES OF BIOTRANSFORMATION OF DRUGS AND OTHER XENOBIOTICS. ELIMINATION OF BIOTRANSFORMATION PRODUCTS FROM THE ORGANISM**
14	01-05.12		**THEME 29. TOTALIZARE LA CAPITOLUL 6 „BIOCHIMIA HORMONILOR. BAZELE BIOCHIMICE ALE FARMACOCINETICII.**

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15	08-12.12		**THEME 30. EVALUAREA LUCRULUI INDIVIDUAL AL STUDENŢILOR**

N O T A: Cursul este ţinut integral de d.ș.b., lector univ., Simionică Eugeniu;
Durata prelegerilor – 2 ore, lucrărilor practice – 3 ore.