TOPICS AND BIBLIOGRAPHY OF THE COMPETITION FOR FILLING THE VACANCY OF **UNIVERSITY PROFESSOR POSITION 2**, DISCIPLINES - PHARMACEUTICAL BIOCHEMISTRY; MEDICINAL CHEMISTRY

Contest theme

1.Proteins. Amino acids. Peptides. Physicochemical properties. Protein structure and conformation. Reasons and areas. The main classes of protein. Collagen, muscle protein, hemoglobin, myoglobin, nuclear protein**,** plasma protein. Mechanisms for regulating biochemical and physiological function

2. Enzymes. Main classes of enzymes, structure. Enzymatic cofactors. Catalytic action. Isoenzymes. Enzymatic kinetics. Regulation of enzyme activity. Applications in medicine and pharmacy

3. Vitamins. Vitamin type cofactors

4. Metabolism. Anabolism and catabolism. Obtaining and using energy in the body. Forms of energy storage. Macroergic compounds. Krebs cycle. Respiratory chain. Energy balance

5. Carbohydrate metabolism. Structure and properties of carbohydrates. Digestion and absorption of carbohydrates. Pathways of monosaccharide metabolism. Oxidation of glucose in anaerobiosis. Oxidation of glucose in aerobiosis. Energy balance.

6. Carbohydrate metabolism. The pentose pathway of a-phosphates. Gluconeogenesis. Glycogen metabolism. Galactose and fructose metabolism. Metabolism of derived compounds. Adjustment paths. Relationships between carbohydrate metabolism and other metabolisms. Pathologies

7. Lipid metabolism. Lipid structure and properties. Digestion, absorption and transport of lipids in the body. Fatty acid metabolism. Triglyceride metabolism. Ketogenesis. Metabolism of glycerophospholipids.

8. Lipid metabolism Cholesterol metabolism. Plasma lipoprotein metabolism. Ways to regulate lipid metabolism. Pathologies

9. Protein metabolism. The body's protein needs. Essential amino acids. Nitrogen balance. Digestion and absorption of food proteins. Transaminases. Ureogenesis

10. Particular metabolism of amino acids. Pathologies. The role of amino acids in the synthesis of functional compounds containing nitrogen. Hemoglobin metabolism. Pathologies

11. Nucleic acids. Structure, properties, location, organization. Nucleotide metabolism. Therapeutic tumor suppressant agents

12. Transfer of cellular information. DNA replication. Reparative processes of DNA replication. Pathology of DNA repair defects

13. Cellular Information Processing. Use of cellular information. RNA biosynthesis - transcription. Protein biosynthesis – translation

14. Control of cellular information. Regulation of gene expression. Cell cycle. Changes in DNA structure. Reparatory mechanisms

15. Cell signaling. General characterization. Signal molecules. Classification. The main routes of intracellular signal transmission

16. Hormones. Generalities. General adjustment mechanism. Hypothalamic and pituitary hormones. Thyroid hormones. Tissue hormones derived from amino acids. Hormones involved

in the regulation of serum calcium. Blood glucose regulating hormones. Insulin. Glucagon. Hormones involved in nutrition. Gluco- and mineralocorticoid hormones
17. Sex hormones. Biochemistry of reproductive function
18. Eicosanoids. Cytokines. Neurotransmitters. Integrative metabolism. Relationships between the main classes of food compounds. Adaptation to stress, exercise, pregnancy, lactation, starvation.
19. Free radical metabolism
20. General anesthetics. Inhalation anesthetics. Intravenous anesthetics: derivatives of barbituric and thiobarbituric acid, anesthetics i.v.cu various structures. Hypnotics and sedatives. Barbiturate derivatives. Benzodiazepine derivatives. Cyclopyrrolone and imidazopiridine derivatives. Derivatives with diverse structures. Melatonin and melatonin agonists
21. Anxiolytics. Benzodiazepine derivatives. Derivatives with diverse structures.
22. Antipsychotics. Phenothiazine derivatives. Thioxanthene derivatives. Dibenzo-azepine derivatives. Fluorobutyrophenone derivatives. Benzamide derivatives. Aryl piperazine derivatives. Derivatives with diverse structures.
23.Antidepressants. Antidepressants with condensed tricyclic structure. Serotonin and noradrenaline reuptake inhibitors. Selective serotonin reuptake inhibitors.
24. Drugs used in Parkinson's disease. Dopaminergic and anticholinergic drugs. Drugs used in Alzheimer's disease. Inhibitors of acetylcholinesterase synthesis. NMDA receptor antagonists.
25. Antiepileptics. Barbiturate and hydantoin derivatives. Pyrrolidin-2,5-dione derivatives. Dibenzo-azepin derivatives. Valproic acid and derivatives. Analogues of gamma aminobutyric acid (GABA). Triazine derivatives. Benzodiazepine derivatives.
26. Opioid analgesics. Morphinan derivatives. Benzomorphan derivatives. Phenylpiperidine derivatives. Anilino-piperidine derivatives. Heptane-3-one derivatives. Cyclohexanol derivatives. Nonopioid, antipyretic analgesics. Salicylic acid derivatives. Para-aminophenol derivatives. Pyrazolone derivatives.
27**.** Nonsteroidal anti-inflammatory drugs. Salicylic acid derivatives. Anthranylic acid derivatives. Derivatives of aryl and heteroaryl acetic acid. Derivatives of aryl- and heteroaryl propionic acid. Enolic acids. Selective COX-2 blockers.
28. Medication of the vegetative nervous system.

References

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