Topic 33. Enzymes and molecular mechanisms of translation. Antibiotics - inhibitors of transcription and translation.

Theoretical questions:

1. Recognition and activation of amino acids, formation of aminoacyl-tRNA. Characteristics of aminoacyl-tRNA synthetases (ARS-ase). An adapter function of tRNA.
2. Stages of translation:
• initiation (sites of translation, protein factors, the energy supply)
• elongation (peptide bond formation, translocation, the role of protein factors, the energy supply).
• termination (site of termination, protein factors, energy supply).
3. Post-translational modifications of proteins. Examples.
4. Antibiotics - inhibitors of transcription and translation in prokaryotes and eukaryotes, their biomedical usage.
5. Effects of toxins on the processes of matrix synthesis.
6. Interferons: mechanism of action and biomedical applications.

Study Questions and Tasks

1. Recognition and activation of amino acids, formation of aminoacyl-tRNA.

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2. Stages of translation:

Initiation

Elongation

Termination

3. Post-translational modifications of proteins. Examples.

4. Antibiotics - inhibitors of translation in prokaryotes and eukaryotes, their biomedical usage.

N	Antibiotics - inhibitors of translation	Mechanism of action and biomedical usage
1	Streptomycin	
2	Tetracycline	
3	Erythromycin	
4	Puromycin	

5. Effects of toxins on the processes of matrix synthesis.

N	Toxins	Mechanism of action
1	**α- amanitin**	
2	**Ricin**	
3	**diphtheria toxin**	

6. Interferons: mechanism of action and biomedical applications.

Textbooks:

1. David Nelson, Michael Cox. Lehninger Principles of Biochemistry. — W. H. Freeman. — 2021. — 1248 p.
2. Yu.I. Gubsky, I.V. Nizhenkovska, M.M. Korda et al. Biological and Bioorganic Chemistry. Book 2. — Kyiv : AUS Medicine Publishing. — 2021. — 544 p.
3. Yu.I. Gubsky et al. Biological Chemistry. — Kyiv : Nova Kniga, 2020. — 488 p.
4. Denise R. Ferrier. Lippincott Illustrated Reviews: Biochemistry. — Wolters Kluwer. — 2017. — 1716.
5. Prasad R Manjeshwar. Textbook of Biochemistry for Medical students. Revised Fourth Edition. – 2016. – 640 p.

Information resources

1. https://www.labster.com/
2. https://vlab.amrita.edu/