BIOCHEMISTRY

2nd year - DENTISTRY - *winter semester 2017/2018*

Lectures

Doc. MUDr. Jaromír Kotyza, CSc.

Friday 8 00 – 9 40 PAV-B

Week
No:

1. Digestion of proteins, essential amino acids. Amino acid degradation, ammonia detoxification, the formation of urea. Metabolic reactions of aliphatic amino acids I. One-carbon units, the role of THFA.

2. Metabolic reactions of amino acids II. The formation of catecholamines and thyroid hormones. Arginine, NO.

3. Formation and degradation of purine and pyrimidine nucleotides. Uric acid and gout. Conversion to deoxynucleotides. DNA structure.

4. Replication and transcription of DNA. DNA repair. Structure of RNA (rRNA, tRNA).

5. Processing of mRNA, genetic code, proteosynthesis. Posttranslational modifications and sorting of proteins. Proteolytic systems.

6. DNA organization in chromatin, regulation of gene expression. Hormones and other regulatory molecules, signaling pathways. Programmed cell death (apoptosis).

7. Analysis of DNA and mRNA in diagnostics, PCR, restriction enzymes. Recombinant technologies.

8. DNA and RNA viruses. Retroviruses, HIV.

9. Porphyrin biosynthesis, heme and its degradation, hemoglobin. RBCs and oxygen radicals. Blood plasma proteins. Genesis of immunoglobulins. Biochemistry of blood clotting and clot dissolution.

10. Biochemistry of connective tissue, the formation of collagen, adhesive proteins. Metabolism of bone and tooth tissue.

11. Biology of the oral cavity, dental caries, calculus and paradentosis.

12. Biochemistry of nervous tissue. Biochemistry and energetics of the muscle activity. Liver functions. Nutrition, malnutrition, starvation.

Recommended literature:

Murray R. K., et al.: Harper´s Illustrated Biochemistry, 29th Edition
Ferrier D. R. et al.: Lippincott´s Illustrated Reviews: Biochemistry, 6th Edition