**PRACTICAL LESSON 1**

**MECHANISM ACTIONS OF HORMONES**

**ADRENALINE. GLUCAGONE. INSULIN**

**The purposes of the lesson:**

-to characterize the mechanism actions of hormones;

-to obtain knowledge about biological effects of adrenaline;

- to learn biological effects of glucagon;

- to understand biological effects of insulin;

- to characterize the diabetes mellitus.

**Necessary initial level**

**To know:**

1. Glycolysis in details;
2. Glycogenolysis in details;
3. Glycogenogenesis in details;
4. Pentose phosphate pathway oxidation of glucose in details;
5. Gluconeogenesis in details;
6. Ketogenesis and ketolysis in details;
7. Lipolysis in details;
8. Biosynthesis of fatty acids in details;
9. Biosynthesis of cholesterol in details

**Key words:** hormones, adenyl cycle system, inositol phosphate system, adrenaline, glucagon, insulin, diabetes mellitus, metabolic syndrome

**Content of the lesson:**

1. Written control.

2 Recitation.

3. Decision of situation task.

**QUESTIONS FOR PREPARATION FOR THE LESSON:**

1. Definition of hormones. Classification of hormones.
2. Classification of receptors.
3. Adenyl cycle system.
4. Phosphotidyl inositol phosphate system.
5. Adrenaline. Biosynthesis. Mechanism action of adrenaline.
6. Glucagon. Biosynthesis and secretion. Physiological actions of glucagon.
7. Insulin. Biosynthesis of insulin. Secretion.
8. Structure of insulin receptors.
9. Biological actions of insulin.
10. Diabetes mellitus. Type 1. Type 2.
11. Metabolic syndrome.

**QUESTIONS FOR WRITTEN CONTROL:**

1. Give classification of hormones according mechanism of action.
2. Explain of biological effects of adrenaline.
3. Draw biosynthesis of glucagon scheme.
4. Numerate physiological actions of glucagon.
5. Draw biosynthesis of insulin scheme.
6. Explain the clinical presentation in diabetes mellitus.
7. Numerate acute metabolic complications in diabetes mellitus.
8. Numerate chronic complications of diabetes mellitus.
9. Explain the laboratory investigations in diabetes.
10. Numerate the managements of diabetes mellitus.

**RECOMMENDED BIBLIOGRAPHY**

a) Compulsory:

1. Lectures.

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b) Supplementary:

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2. Laurence A. Moran, H. Robert Horton, K. Gray Scrimgeour, Marc D. Perry. (2012) Principles of Biochemistry. Pearson Education, Inc.

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