**Control work on the topic: "Biochemistry of regulation"**

**Variant 1**

I. Draw a scheme:

Draw a scheme of the mechanism of action of hormones through intracellular receptors (cytosolic mechanism). Give examples of hormones that act according to this mechanism.

II. Solve case problems:

1) A child was brought to a pediatric dentist for an appointment, whose milk teeth are not being replaced, although the deadlines have already passed. Milk teeth appeared almost a year later than expected. The shape of the crowns is different from normal. Your conclusions and recommendations

2) Patients with liver diseases often have bruises on the body that occur with the slightest bruises, compression. How can this be explained, what can help correct the situation?

Answer the questions:

1. Insulin. Structure. Regulation of secretion. Mechanism of action. Effects.
2. Eicosanoids. Structure. Regulation of secretion. Mechanism of action. Effects.

**Variant 2**

I. Draw a scheme:

Draw a scheme of the mechanism of action of hormones through the receptors of plasma membranes: membrane-intracellular mechanism (an ion channel is connected to the receptor). Give examples of hormones that act according to this mechanism.

II. Solve case problems:

1) What is the biological significance of the fact that hormones are synthesized in the form of prohormones and preprohormones?

2) The student caught cold very often, easily picked up infectious diseases. He was pale, thin, grew poorly, got tired very quickly. His mother treated him very actively with all prescribed medicines. What is the possible reason for his condition and what should the mother pay attention to?

Answer the questions:

1. Glucagon. Structure. Regulation of secretion. Mechanism of action. Effects.
2. Testosterone. Structure. Regulation of secretion. Mechanism of action. Effects.

**Variant 3**

I. Draw a scheme:

Draw a scheme of the mechanism of action of hormones through the receptors of plasma membranes: membrane-intracellular mechanism (an enzyme is associated with the receptor). Give examples of hormones that act according to this mechanism.

II. Solve case problems:

1) One of the complications of acromegaly is diabetes mellitus. Why does it arise?

2) In the last trimester of pregnancy, the woman developed bone pain. A biochemical blood test showed an increase in calcium, a decrease in the concentration of phosphorus and an increased activity of alkaline phosphatase. What vitamin deficiency is associated with these clinical signs? What treatment should a gynecologist prescribe for a woman? What pathology should be prevented (especially carefully) by a pediatrician in this woman's child after childbirth?

 Answer the questions:

1. Catecholamines. Structure. Regulation of secretion. Mechanism of action. Effects.
2. Growth hormone. Structure. Regulation of secretion. Mechanism of action. Effects.

**Variant 4**

I. Draw a scheme:

Draw a scheme of the mechanism of action of hormones through calcium. Give examples of hormones that act according to this mechanism.

II. Solve case problems:

1) A patient was admitted to the clinic with the smell of acetone from the mouth. What pathology can be assumed?

2) During the influenza epidemic, doctors often recommend vitamin prophylaxis of the disease. What vitamins would you recommend, how would you justify these recommendations?

Answer the questions:

1. Thyroid stimulating hormone. Structure. Regulation of secretion. Mechanism of action. Effects.
2. Progesterone. Structure. Regulation of secretion. Mechanism of action. Effects.

**Variant 5**

I. Draw a scheme:

Draw a scheme of the mechanism of action of hormones via cAMP. Give examples of hormones that act according to this mechanism.

II. Solve case problems:

1) Patients with bronchial asthma are prescribed theophylline. What for?

2) With a deficiency in the body of vitamins C, PP and B6, fragility of the walls of blood vessels, increased bleeding, reduced skin elasticity, loosening and loss of teeth are observed. Explain all these manifestations of hypovitaminosis.

Answer the questions:

1. Adrenocorticotropic hormone. Structure. Regulation of secretion. Mechanism of action. Effects.
2. Estrogens. Structure. Regulation of secretion. Mechanism of action. Effects.

**Variant 6**

I. Draw a scheme:

Draw a scheme of the mechanism of action of hormones through intracellular receptors (cytosolic mechanism). Give examples of hormones that act according to this mechanism.

II. Solve case problems:

1) Why is hyperthyroidism usually not accompanied by diseases such as atherosclerosis and hypertension?

2) With influenza and acute respiratory infections, doctors often prescribe large doses of vitamin C to patients. Is it possible to use vitamin C in large doses for a long time? What can this lead to?

 Answer the questions:

1. Follicle stimulating hormone. Structure. Regulation of secretion. Mechanism of action. Effects.
2. Cortisol. Structure. Regulation of secretion. Mechanism of action. Effects.

**Variant 7**

I. Draw a scheme:

Draw a scheme of the mechanism of action of hormones via cGMP. Give examples of hormones that act according to this mechanism.

II. Solve case problems:

1) Why is insulin given to patients with diabetes in the form of injections, and not in the form of tablets?

2) Why is vikasol prescribed together with other drugs for intensive bleeding in the clinic?

 Answer the questions:

1. Prolactin. Structure. Regulation of secretion. Mechanism of action. Effects.
2. Calcitriol. Structure. Regulation of secretion. Mechanism of action. Effects.

**Variant 8**

I. Draw a scheme:

Draw a scheme of the mechanism of action of hormones through the receptors of plasma membranes: membrane-intracellular mechanism (an enzyme is associated with the receptor). Give examples of hormones that act according to this mechanism.

II. Solve case problems:

1) Will the intensity of the synthesis of ACTH and corticosteroids change in a patient who is given glucocorticosteroids for therapeutic purposes?

2) The child catches a cold very easily, is anemic, in the mouth - there is often a taste of blood, bruises appear at the slightest bruises. What vitamin should he urgently appoint and why - urgently?

Answer the questions:

1. Vasopressin. Structure. Regulation of secretion. Mechanism of action. Effects.
2. Testosterone. Structure. Regulation of secretion. Mechanism of action. Effects.

**Variant 9**

I. Draw a scheme:

Draw a scheme of the mechanism of action of hormones through the receptors of plasma membranes: local (membrane) mechanism. Give examples of hormones that act according to this mechanism.

II. Solve case problems:

1) Why should drugs that stimulate ß-adrenergic receptors not be used frequently during attacks of bronchial asthma? What should be prescribed if taking these drugs does not prevent the development of status asthmaticus?

2) Two patients with viral hepatitis and cirrhosis of the liver, respectively, were admitted to the infectious and gastroenterological department of the emergency hospital. Along with other complaints, both patients noted the recent appearance of large bruises on the body with the slightest bruises. A blood test showed an increase in blood clotting time and a 2-fold decrease in prothrombin levels in both. What vitamin metabolism is impaired in these patients?

Answer the questions:

1. Oxytocin. Structure. Regulation of secretion. Mechanism of action. Effects.
2. Aldosterone. Structure. Regulation of secretion. Mechanism of action. Effects.

**Variant 10**

I. Draw a scheme:

Draw a scheme of the mechanism of action of hormones via cAMP. Give examples of hormones that act according to this mechanism.

II. Solve case problems:

1) After surgery to remove a brain microadenoma, the patient began to show signs of hypothyroidism. What is the possible cause of the violations? How are the brain and thyroid related?

2) A patient was admitted to the surgical department after an injury. An express analysis revealed that he had severe decompensated acidosis and an increase in the concentration of lactate and pyruvate in the blood. What vitamins should the surgeon prescribe to this patient to normalize these parameters?

Answer the questions:

1. Iodothyronines. Structure. Regulation of secretion. Mechanism of action. Effects.
2. Luteinizing hormone. Structure. Regulation of secretion. Mechanism of action. Effects.