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TRANSPORT OF ENZYMES OF THE DIGESTIVE SYSTEM

Аннотация:Ферментлар ташқи муҳитдан тушган ва организмнинг ўзида ҳосил бўлган моддаларнинг ўзгаришини амалга оширади. Овқат моддаларнинг ўзлаштирилишини ва уларнинг кейинчалик ишлатилишини, юқори молекулали бирикмалардаги кимёвий энергиянинг биологик оксидланиш даврида ажралиши ва хужайра ҳамда тўқималарнинг уларнинг ривожланиши ва такомилланиши даврида структор элементларнинг хосил бўлиши ферментларнинг бевосита иштирокида боради.

Калит сўзлар: фермент, циркуляция, резорбция, адсорбция, энзимотерапия, пиноцитоз.

Аннотация:Ферменты осуществляют превращение веществ, поступающих из внешней среды и образующихся в самом организме. При непосредственном участии ферментов происходит усвоение пищевых веществ и их дальнейшее использование, выделение химической энергии в высокомолекулярных соединениях в период биологического окисления и образование структурных элементов в период развития и совершенствования клеток и тканей.

Ключевые слова: фермент, циркуляция, резорбция, адсорбция, энзимотерапия, пиноцитоз.

Abstract: Enzymes carry out the transformation of substances that come from the external environment and are formed in the body itself. The assimilation of food substances and their subsequent use, the release of chemical energy in high-molecular compounds during the period of biological oxidation, and the formation of structural elements during the development and improvement of cells and tissues take place with the direct participation of enzymes.

Keywords: enzyme, circulation, resorption, adsorption, enzyme therapy, pinocytosis.

The scientific study of the mechanisms of transport, circulation of enzymes of the digestive system is important not only in fundamental/theoretical terms, but also in terms of enzymotherapy [6].

In particular, the presence of the probability of resorption process of macromolecular substations in the intestine in this direction has determined the occurrence of a new direction of enzymotherapy in medical practice. In the 1930s, the American scientist Wolf M. it has been suggested that the absorption of hydrolytic enzymes received with food by macromolecules from the intestine in a form whose structure has not changed can have a therapeutic effect on the pathogenesis of certain diseases [6].

Although currently there is enough experimentally proven data in this area, however, complete clarification of the mechanisms of transport of macromolecules of enzymes of the digestive system from the intestinal wall is not included. It is also noted that the dynamics of adsorption of digestive enzymes depends on a large number of factors. When studies analyzed the intestinal absorption rates of radioactive "target" proteolytic enzymes using 14s, 3N isotopes, amylase was found to be absorbed ~39-44%, chymotrypsin, papain ~4-16% [2].

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Intestinal absorption of enzymes has also been confirmed in clinical studies. Enzymes are predicted to be transported to the blood in the intestine by a transepithelial vesicular mechanism, with transport flow of other substances [2].

It is estimated that the absorption of proteinases (but also other hydrolases) from the intestine into the blood is based on several mechanisms. Including endocytosis through the receptor (pinocytosis), pinocytosis that occurs without the participation of specific receptors, located in the intestinal wall

It is noted that it can be transported by M-cells in an endocytosis or paracellular diffusion mechanism [3].

It has been noted that in the process of pinocytosis, enzymes as ligands act on receptors that are activated by proteinases located on the apical basolaterial membrane of epithelocytes of the intestinal wall [4, 5].

It is also possible that enzyme macromolecules pass directly into the blood from the epithelial barrier, whose integrity is impaired by pathological/destructive changes from the intestinal wall [6].

Enzymes that have passed into the blood can exist in a solubilized state or in the form of shaped elements of the blood, adsorbed to the protein macromolecules contained in it. A significant amount of enzymes through the bloodstream can be adsorbed into the endothelial floor of capillary blood vessels.

Studies have also confirmed that digestive system enzymes can form affine bonds based on selective interaction with protein fractions present in blood plasma. In particular, it is estimated that the enzyme α-amylase of the pancreas binds mainly to albumins in blood plasma and is an enzyme in its description that is stored in the form of a reserve in the Blood [1].

Studies have analyzed the absorption of serine proteinases – trypsin and chymotrypsin enzymes-into the blood in the digestive system, complex transfusion processes in the blood. These enzymes form bonds with proteins known as whey inhibitors (antiproteases) of proteinases that make up ~10% of the total protein content in the blood after absorption into the blood. Antiproteases affect the activity of enzymes and modulate their specific properties. The main inhibitors of proteinases in the blood are proteinase inhibitors (α1) and macroglobulin (α2). the α1 proteinase inhibitor has been found to transfer pancreatic proteinases to a complete inactive state in the blood, while macroglobulin (α2) partially blocks [3].

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