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Research Article

COMMON PATHWAYS OF PROTEIN AND AMINO ACID METABOLISM IN THE BODY

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ABSTRACT

Protein exchange is crucial for the life of the whole organism, each of its tissues and organs, some cells and subcellular components. Biochemical activity of the cell and all metabolic reactions occurring in it are related to the exchange of proteins

KEYWORDS

Protein, element, amino acid, biosynthesis, metabolic change, autotrophic organism, plant, organic matter, amino acid, photosynthesis, carbohydrate, inorganic nitrogen, synthesis.

INTRODUCTION

Although protein metabolism goes in specific ways in different classes of organisms, the structural elements of the proteins involved in this exchange play an important role in the biosynthesis of amino acids, their consumption for protein synthesis and other metabolic changes. In plants that are an autotrophic organism, among all organic substances, amino acids and proteins are also synthesized anew by the absorption of inorganic nitrogen on the basis of carbohydrate compounds formed during photosynthesis.

Once amino acids appear, their participation in intracellular metabolism and protein synthesis passes along almost the same general pathway and mechanism for all organisms.

Since animals and humans are heterotrophic organisms, they cannot synthesize the chemical

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compounds necessary for the structure of their body by themselves, but are constantly required to be injected with food.

Protein substances taken from the outside in the form of plant and animal products are digested in the gastrointestinal tract and broken down to amino acids, which are its components. It is in this form that they are absorbed into the blood and from the blood into the cell. The participation of amino acids in intracellular metabolism, end products and protein synthesis in the animal and human body is practically indistinguishable. But this only looks like this when you take a general look at the process.

Looking deeper into nitrogen metabolism, one can undoubtedly see that in the metabolism of certain amino acids there is a sharp difference between plant cells and animal cells, and even between different tissues of one organism. But this difference, most often, belongs to the metabolism of certain amino acids, and does not apply to the mechanism of metabolism, in particular, protein synthesis.

The general pathways of amino acid metabolism are as follows: amino acids absorbed from the intestine into the blood come to the liver through the vein as free acids. Although the amount of amino acids in the blood in the venous system that comes to the liver varies depending on the food spread, the amount of amino acids in the circulation is maintained at a certain limit. This is due, firstly, to the fact that the liver is able to retain and cover excess amino acids from the vein, and secondly, to the fact that other organs also cough amino acids from the blood according to their needs. The liver has the ability to accumulate amino acids much faster, this property is due to the fact that it is very high in terms of all-round metabolic activity of the organ. It is not for nothing that the liver is the "chemical laboratory" of the body. Amino acids are partially broken down in this organ, partially spent on the synthesis of other compounds (plasma proteins, carbohydrates). The amount of different amino acids in the blood plasma is handled by their balance of entry into the blood and absorption from the blood.

Peptides are practically not found in body fluids and tissues, except for some of their special representatives (for example, glotation).

They do not have any significance as a nutrient in the cell plane or as a free intermediate in protein synthesis. The main importance of amino acids that enter the circulation is to ensure the structure and catalytic functions of living cells. In this sense, their first function is to spend on the synthesis of proteins, including enzymes, hormones and other compounds of important biological importance.

If food proteins, as is usually the case, have reached more than the required amount of aninocyclote to perform this basic and most specific task, the Over-

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received amino acids are broken down, which can be used as an energy source, but this is not a necessary function for them. The part of amino acids that break down completely and become end products depends largely on the composition of the food. But when protein substances are not introduced with food, even in hunger, a certain amount of nitrogenous substances is isolated and netted with urine, in which the body is on a negative nitrogen balance.

The body, under such conditions, will decide why not consume the amino acids resulting from the breakdown of its own proteins for the synthesis of new proteins necessary for other tissues, leaving nitrogen out "in vain". This is because each protein synthesis requires a certain set of amino acids. Since all proteins have a strict amino acid composition, it is impossible to synthesize a protein even if there is no one of the necessary amino acids. So all the remaining amino acids are broken down.

Their nitrogen is excreted in the urine, while the carbon skeleton decomposes with energy separation to its final products, SO2 and N2O. In addition, a number of amino acids are spent on the synthesis of various biologically active compounds. For example, adrenaline and thyroid hormones from phenylalanine, and creatine in muscles from arginine and methionine are formed.

So, some of the amino acids that are not exchanged are always used to compensate for needs other than protein synthesis. The resulting lack of non-exchangeable amino acids also leaves other amino acids unnecessary for protein synthesis. It should also be mentioned that proteins of a number of tissues, such as hair, nails, skin epidermis, disappear in an irrevocable form during the life process and cannot participate in novel organism-NNG exchange reactions.

Other exchange pathways than the expenditure of amino acids in the synthesis of proteins and a number of biologically active substances consist of their degradation (degradation) reactions. A number of degradation reactions are common to most amino acids. These consist of deamination with protein, pereaminization and decarboxylation with protein. Other reactions involve a large number of individual degradation steps specific to each amino acid.

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