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Importance of biochemistry in enzyme diagnostics and determining the properties of proteins

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Annotation: The article provides information about the functions of biochemistry, its role in medicine, the composition and structure of proteins, their use in the laboratory.

Keywords: static, specific, albumin, globulin, protamine, glutenin.

Introduction:

Biochemistry is one of the fastest growing branches of modern biological sciences, which deals with the structure and function of substances in living organisms, their metabolic processes, as well as the functions of organs and tissues. It follows from this definition that biochemistry is made up of three independent parts. The studying of the analysis of the chemical composition of living organisms, mainly from static biochemistry. - Studying all the complexes of metabolism in the body - dynamic biochemistry. - Examining the manifestation of chemical processes and their specific functions that underlie the vital activity of individual tissues and organs - functional biochemistry. The study of living matter from a chemical point of view dates back to ancient times. Associated with the need to do. Medicine has a great influence on the development of biochemical research in the field of flora and fauna. At the beginning of the 16th century, Paracelsus argued that the onset of the disease was related to the disruption of chemical processes in the patient's body and that it was necessary to use chemicals to treat them. Later, biochemistry was enriched with important discoveries. In the twentieth century, some progress has been made in the field of biochemistry. With the help of an electron microscope, ultrastructural structures in living cells have been shown to perform special biochemical functions, especially in the nucleus of the cell, nucleotides, that is, compounds responsible for the transmission of genetic information. For example, synthesized insulin (protein hormone) helps in the treatment of patients with diabetes. The main task of clinical biochemistry is the early detection of various diseases and the study of the mechanisms of their occurrence. Biochemical diagnostic methods are important in the prevention and treatment of diseases. In recent years, a variety of express methods and automatic devices have been widely used in clinical biochemistry, which allows to check the blood composition in a very short time (sometimes, 30 seconds) and make a diagnosis in this way. Biochemical changes are the basis of the disease and are its secondary feature. In any case, biochemical analysis helps to make an accurate diagnosis. In serum, urine, as well as the method of determining the activity of leukocytes, erythrocytes, fibroblasts and enzymes in biochemistry, special attention is paid to enzymodiagnostics; Some of them allow to determine 30-40 types of biochemical analysis very quickly (about 3000 tests per hour) and transmit the obtained results by teletype. Only 40 of the

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more than 100 chemical elements found in the earth's crust have been found in living organisms. In addition, the interaction of these elements in living organisms is completely different from that in the earth's crust. For example, the dry matter of a living cell is 50-60% carbon, 8-10% nitrogen, 25-30% oxygen and 3-4% hydrogen. At the same time, the carbon, hydrogen, and nitrogen in the earth's crust are all the same, accounting for less than 1% of the total mass of the earth's crust. Biochemistry is associated with several other disciplines: organic, inorganic, chemical, zoological. Botany, physiology, genetics, biophysics, microbiology, immunology, molecular biology. Methods used in biochemistry. Chromatography, electrophoresis, spectrophotometry, X-ray diffraction analysis, separation of substances by gravitational ultracentrifugation. Proteins play a fundamental role in the formation and development of living organisms. "Life," wrote F. Engels is the way of life of protein bodies. ” Proteins are quantitatively superior to all other macromolecules in the living cell and make up more than half of the dry weight of most organisms. Proteins are not only the most numerous, but also the most diverse macromolecules in terms of their functions. Each type of organism contains thousands of different proteins, and the number of species itself is more than 10 million. For example, the E. coli cell contains about 3,000 different proteins, and the human body contains more than 50,000 different proteins. The most amazing thing is that all natural proteins are made up of 20 different amino acids, but in nature there are so many types. These amino acids can combine in different sequences to form a large number of different proteins. For example, two amino acids can theoretically produce 24 isomers, and 20 amino acids can produce 2, 4 .1018 different proteins. It should be noted that as the number of repeating amino acid residues in a protein molecule increases (300-400), the number of possible isomers (number of proteins) reaches an astronomically infinite number. Albumins are well soluble in water and weakly soluble salts. In saturated saline solutions, for example, in a saturated solution of ammonium sulfate salt. Aqueous solutions easily precipitate when heated. Albumins are found in milk, eggs, whey, wheat, barley, peas. Globulins are insoluble in water. It dissolves well in a weak solution of salts, and at high concentrations it precipitates, and when heated it precipitates. Unlike albumin, it does not contain glycine or is present in very small amounts. Proteins are abundant in whey, muscle, milk, eggs, and plant seeds. Protamine are found only in animals. It is abundant in fish. Protamine contain the most common amino acids, arginine, lysine and vagistidins. Prolamins are insoluble in water, one of the properties of which is 70% ethyl alcohol. Prolamins are found in legumes. Due to the high content of proline amino acids (about 14%) in these proteins, it is called Prolamins. Wheatgrass contains donidagliadin, arpadonidagordeine, corn cornidonide. Glycoproteins are widely distributed complex proteins and contain carbohydrates. Carbohydrates in glycoproteins are high-molecular compounds. When hydrolyzed, they break down into galactose, hexosamines, glucuronic acid, and others. Glycoproteins are found mainly in animals and plants. Widespread representatives: mucin - salivary glycoprotein; chondromucoid - glucoprotein of connective tissue; osteomucoids - occurs in bone marrow; Interferons are inhibitors of the multiplication of many viruses. There are (α,β,γ) types of them; Immunoglobulins - or antibodies, perform a protective function. In order to separate the protein from the cell, it is necessary to break down the cell wall, which maintains the integrity of the cell. The necessary style and conditions for the implementation of this process will be provided depending on the nature of the object. For

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example, animal organs, plant leaves are made into a homogeneous mass with the help of scissors and a knife. In the production of homogenates from the biomass of bacteria and other microorganisms, such methods as crushing in a mortar with small balls made of quartz or glass sand, special inert substances, ultrasonic impact press or milling are used. Hydrolytic enzymes are widely used to break down the strong cell wall of a microorganism. For example, the lysozyme breaks down the peptidoglycan that forms the cell wall, which does not damage the cell protoplast, and the integrity of the cell is preserved. The "wall less" cell can be diluted with distilled water to dissolve the cell protein. Distilled water enters the semiconducting membrane of the cell and increases the osmotic pressure there, causing the cell to rupture. Along with the components of the cell, cytoplasmic proteins are also dissolved. During the extraction, separation and purification of the protein, the temperature and pH of the solution medium are of great importance. This is because proteins can be partially denatured at room temperature, while enzymes can lose their activity. For this reason, all processes are carried out at low temperatures (from 20 s to + 40 s). The solution medium is selected according to the nature of the protein. Buffer solutions with a pH of -7 are mainly used, as most enzymes lose their activity in both highly alkaline and acidic media. Stabilizing agents such as EDTA, mercoptoethanol, and sucrose can be added to the buffer solution to increase enzyme stability during extraction and purification. When the cell wall is broken down and transferred to a protein solution, the homogenate is centrifuged. In this case, the cell membranes collapse and the substances dissolved in the solution, including proteins, pass through the supernatant. This is because the buffer is centrifuged 1-2 times by washing with the solution and the supernatant is added to the former. For further cleaning, a clear supernatant is used and the sediment is discarded.

Color reactions of proteins:
In an alkaline environment, proteins and polypeptides, which are the products of their hydrolysis, form a purple or reddish-purple color. The nature of the reaction depends on the amount of peptide bond. The outcome of the biuret reaction depends on the division of two peptide groups. The intensity of the color depends on the length of the peptide bond and ranges from blue-purple to red-purple.

Reagents:
a) Egg white.
b) Sodium bicarbonate - 10% solution.
c) 1% copper sulfate solution.
To do this: Take 1 test tube and fill it with 2 ml of egg white, then add the same amount of coarse sodium 1 and 1-2 drops of copper sulfate solution. This produces a blue-purple or reddish-purple color.

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Refrences

1. P. Igamnazarov. MM Adullaeva. Umarova GB "Methods of biochemical research" Tashkent 2003
2. Ë, H. Turakulov “BIOCHEMISTRY” Tashkent Uzbekistan 1996
3. M.N. Valikhonov., Dalimova SN, Umarova GB, Molecular biology. T., 2015
4. Berezov T. T., Korovkin B. F., Biological Chemistry. Moscow “” 1999