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A STUDY ON PROTEINS & AMINO ACIDS

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Abstract

Proteins are made up of monomers called amino acids. Amino acids are compounds made up of amine group as (NH2), with carboxylic acid at group (R-C=O-OH), and a variable side chain (often designated as R). An amino acid's primary constituents are carbon with hydrogen, oxygen, & nitrogen. Because amino acids are linked together in a protein chain by peptide bonds and disulfide links, proteins are also known as polypeptide chains. Amino acids are the building blocks of proteins. They have a crucial role in biochemistry, as term is typically used to refer to alpha-amino acids. Proteins are biochemical substances made up with one or even more polypeptides that are often folded into globular or fibrous shapes in a manner that is physiologically useful.

Keywords: Proteins, Amino Acids, Compound.

Introduction

There are many different bimolecular structures in human body. These biomolecules are referred to as macronutrients as well. In terms of macronutrients, there are three: protein, lipids, and carbohydrates. Calories, or energy, are provided by macronutrients. The term “macronutrients” refers to substances that the body needs in huge quantities to maintain life. Each biomolecule has a distinct and special role to play. molecules of lipids, proteins, carbohydrates, nucleic acids, and so on that are present in human bodies. Every biomolecule plays a specific role in the body.

One of the four distinct categories of macromolecules, along with carbohydrates, lipids or fats, alongwith nucleic acids like DNA and RNA, are proteins. Large molecules known as macromolecules carry out specific tasks inside living things. Depending on the function, a protein's structural configuration will change. Proteins are necessary for healthy bodily development. A macronutrient called protein is necessary for gaining muscle mass. Proteins and other nutrients can be found in animal products and, to a lesser extent, in plant items. Other foods, like nuts and legumes, also contain it.

Approximately 15% regarding the person's body weight is made up of protein. In order to restore damaged tissues and cells, proteins are crucial. Proteins are used by the human body for a variety of purposes, including hormone production, tissue growth and repair, enzyme activity, immune system support, and tissue building. A somewhat different kind of protein is necessary for each of these crucial processes. Although proteins differ in structure, they all have the same fundamental building blocks.

Review of Literature

A Mishra and others (2014) [3] One of the main causes of mortality and morbidity in the globe is acute coronary syndrome. Although recent improvements in currently available anti-platelet treatments have greatly decreased the burden of cardiovascular mortality, their clinical advantages are frequently constrained by bleeding risk due to their global influence on primary haemostasis. A important stage in the chain of events during arterial thrombosis is where platelet-collagen contact occurs, according to recent advances in our understanding of platelet biology. Because of this, there is a great deal of interest in creating new anti-platelet collagen receptor glycoprotein VI (GPVI) therapeutic approaches. Not only does GPVI's selective blockade or deficiency hold promise for a decreased risk of bleeding complications, as demonstrated in mice and humans, but it also offers to prevent the negative off-target effects of antithrombotic drugs due to its exclusive expression on platelets and megakaryocytes. In order to identify platelet GPVI as a novel antithrombotic therapeutic target, the current study

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outlines recent advances in our understanding of how platelets operate during arterial thrombosis. Additionally, it emphasises the creation of GPVI antagonists using a variety of experimental techniques as well as their potential application in cardiovascular illnesses.

Filippo Molica and others (2017) [2] The bone marrow produces all three of the main blood cell types: platelets, erythrocytes, and leukocytes. While white blood cells are the biggest and most abundant, platelets are minute fragments that make up a small percentage of blood volume. However, platelets perform a vital task by stopping bleeding. When an artery wall is damaged, platelets cling to the exposed extracellular matrix, activate, and form a platelet plug that stops bleeding. However, the same mechanism may result in acute thrombosis that causes significant ischemic events like myocardial infarction or stroke when platelet activation is amplified, as in the rupture of an atherosclerotic plaque. Significant advancements in our understanding of platelet function modulation have been accomplished during the last several years. Connexin- and/or pannexin-created membrane channels are of special relevance in this regard. While it is still unclear whether connexins act as gap junction channels or hemichannels to prevent platelet aggregation, there is unmistakable proof that pannexin channels have a specialised role in collagen-induced aggregation. This review's main objective is to outline current understanding of the role of connexins and pannexins in platelet aggregation. It also discusses potential pharmacological treatments, their drawbacks, and prospects for additional potential treatments in the future.

Proteins & Amino Acids

Proteins are made up of monomers called amino acids. Amino acids are compounds made up of amine group as (NH2), with carboxylic acid at group (R-C=O-OH), and a variable side chain (often designated as R). An amino acid's primary constituents are carbon with hydrogen, oxygen, & nitrogen. Because amino acids are linked together in a protein chain by peptide bonds and disulfide links, proteins are also known as polypeptide chains. Amino acids are the building blocks of proteins. They have a crucial role in biochemistry, as term is typically used to refer to alpha-amino acids. Proteins are biochemical substances made up with one or even more polypeptides that are often folded into globular or fibrous shapes in a manner that is physiologically useful.

Using peptide bonds between both the carboxyl alongwith amino regions of nearby amino acid residues, a polypeptide is a linear polymeric chain of amino acids. The sequencing regarding the gene, which would be contained in the genetic code, determines the arrangement of a protein's amino acids. A trigonal genetic code is used to represent each amino acid. There are 20 common amino acids, and the genetic coding differs for each one. The genetic coding of any two amino acids cannot be identical. The genetic code typically only defines the 20 conventional amino acids, but in some organisms it may also include selenocysteine and, in some archaea, pyrrolysine. Proteins are created by a central dogma-based sequential process, taking into account both the sort of function the protein will serve. DNA replication occurs during the production of any protein, creating a DNA replica for the cells producing the desired proteins. Following this transcription, DNA is converted into mRNA. Every information encoded by that of the DNA from which this mRNA molecule was produced is decoded by this mRNA molecule.

1. Protein Resources

We already discussed that protein aids in tissue healing, which is why including protein in the diet is so crucial. But which are the top protein sources? Do proteins come in a variety of forms? Let's investigate these queries. After that, you can assess if your diet is protein-rich or protein-poor by taking a look inside your refrigerator.

2. Different Proteins

All living things have proteins. Protein can come in a variety of forms and amounts in meals, but it's always present. The protein level of meats, cheeses, & nuts is typically higher than that of many plant-based foods. We must examine a food's nutrition label to ascertain its protein content. The human body has a variety of proteins, each of which serves a particular purpose. Some protein molecules are called in accordance with the biomolecule that they are connected to. Glycoprotein is an illustration of this.

3. Protein Conjugated

A protein that interacts with other chemical structures that are joined by covalent or other weak interactions is said to be conjugated. Many proteins are classified as simple proteins since they just have amino acids but no other chemical groups. However, some proteins, known as conjugated proteins, also produce some additional chemical component upon hydrolysis in additional to amino acids. A conjugated protein's nonamino portion is typically referred to as its prosthetic group. Vitamins are the main component of most prosthetic groupings. Based on the chemistry of their prosthetic groups, conjugated proteins are categorised.

4. Phosphoproteins

These are proteins that have a phosphoric acid-containing material chemically linked to them. The group of organic compounds that includes urocortins, K chips, Ulks, Calcineurins, and Fc receptors.

5. Metalloprotein

Metalloprotein is a type of protein that has a metal ion cofactor. Enzymes, transport & storage proteins, and proteins involved in signal transduction are just a few of the numerous roles that metalloproteases play in living organisms. In fact, between 25 and 30 percent of all proteins depend on metals to function. The nitrogen, oxygen, or sulphur atoms in the polypeptide chain's amino acids and/or another macrocyclic ligand present in the protein are typically responsible for coordinating the metal ion. The metal ion enables metalloenzymes to carry out tasks like redox reactions that are difficult for amino acids' finite number of functional groups to carry out.

Conclusion

We will come with collagen regularly, particularly in the lab. It is the protein that the body uses up the fastest. For instance, collagen makes up almost all of a tendon. Furthermore, it is prevalent throughout the body's extracellular spaces, which hold the body's cells together, including the skin, bone, and extracellular spaces. Frequently, a fibroblast is the cell that produces collagen.

The signal patterns are naturally eliminated once the three chains have each been synthesised independently. The three polypeptide chains then form the quaternary structure seen while intact in the endoplasmic reticulum. The only part of every polypeptide chain that develops this rigid, rod-like structure is the center. Each polypeptide chain has highly varied ratios of amino acids at its two ends. A strong rod-like arrangement in the centre and a tangled region at each end make up the early quaternary structure. Procollagen is the name of this relatively soluble structure. This is significant because the cell would undoubtedly die if the molecules gathered inside the cell.

The residues in a protein are frequently chemically altered by post-translational modification shortly following or even during synthesis, which modifies the physical and chemical characteristics, folding, durability, activity, and ultimately the function of the proteins. Non-peptide groups, often known as prosthetic groups or cofactors, are occasionally linked to proteins. Proteins can cooperate to carry out specific tasks, and they frequently join to form enduring complexes. Being capable of folding into a globular form, or "structure," is among the most distinctive qualities of polypeptides. Proteins can fold into a specific structure to various degrees. Some proteins, which are regarded as single structures, fold into a relatively rigid structure with minute changes. Other proteins suffer significant rearrangements when changing conformations. This conformational change frequently goes hand in hand with a signalling action. As a result, it is possible to control an enzyme's activity or a protein's function by modifying the protein's structure. Not all proteins need to fold in order to function; some work better when left unfolded.

The large molecules made of amino acids are called proteins. Long strands of amino acids make up proteins. The building components of protein are amino acids. Amino acids are comparable to the links of a chain, in other words. The protein molecule is represented by the chain itself. The resulting molecules are then made by carefully twisting and folding individual protein strands. A protein molecule is made up of a sequence of amino acids that has been wrapped into a sheet, twisted into such a helical shape, and then twisted once again into a complex globular shape. The conclusion that a functional group consists of primary, secondary, tertiary, and quaternary structures can be drawn from this.

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