

Proteins

Proteins are the primary constituents of all living matter as they are found in all living cells. They are ^{the} most abundant organic molecules in animals. Proteins perform several important biological functions.

- 1.) Proteins serve as structural material
- 2) Proteins act as enzymes
- 3) Few proteins function as hormones
- 4) Proteins are responsible for many physiological functions
- 5) Protective proteins act as antibodies giving protection against a disease.
- 6) Proteins are also associated with hereditary characters
- 7) Cell secretions like mucus are glycoproteins
- 8) Spider and Silkworm secrete a thick solution of protein fibroin, which solidifies into thread of high tensile strength and is used for weaving web or cocoon. We get silk from the cocoon.
- 9) Proteins are stored as reserve food.

Classification of Proteins on the basis of their shape

- 1) Fibrous Proteins
- 2) Globular Proteins

1) Fibrous Proteins:-

They are tough and usually insoluble in water and aqueous solutions of acids and bases. Fibrous proteins have long and thread like structure and tend to lie side by side to form fibres. Fibrous proteins serve as the chief structural material of animal tissues.

a) Keratins: α -keratins are found in outer layer of skin, in hair and wool. They consist of α -helices that are twisted together like the strands of a rope.

β -Keratins are found in hard tissues such as nails, horns, hooves and bird feathers. They have β -pleated sheet structure

- ② Collagens:- Collagens proteins are found in white fibrous connective tissue, which constitute tendons. These are also main components of bone, teeth and cartilage.
- ③ Elastins:- They are found in yellow elastin tissue like ligaments and blood.
- ④ Fibrin:- This protein is present in silk fibres.

Globular Proteins :-

Globular proteins are soluble in water or aqueous solutions of acid, bases or salts. These solutions are colloidal in nature due to the large size of protein molecules. Globular proteins are folded into roughly spherical shapes.

Globular proteins serve a variety of functions that require mobility. They usually function as enzymes, hormones or transport proteins. Examples of globular proteins are insulin, haemoglobin, ribonuclease and fibrinogen, which is converted into the insoluble fibrous protein, fibrin and causes the clotting of blood.

Structure of Proteins

Primary structure :-

The primary structure of a protein refers to linear sequence of amino acids in its polypeptide chain and location of disulfide bridges, if any. It represents the number, nature and sequence of amino acid molecules in the polypeptide chain. All the properties of a protein molecule are determined, directly or indirectly, by primary structure. Any folding or catalytic activity of the protein molecule depends on the proper primary structure. In primary structure the peptide bonds form the backbone and the side chain of amino acid project outside the peptide backbone.

