

Topic: Protein; Structure

B.Sc. Botany Hons. III

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b. Beta pleated:

β means the second and the structure described below was the second discovery after α helix.

The salient features of this structure are-

- i. Here the chain is not helical but zigzag.
- ii. The distance between each turn is 7 Å.
- iii. Polypeptide chains are arranged side by side in the form of pleats.
- iv. There is inter-chain hydrogen bonding between the chains and each peptide group participates in hydrogen bonding.

The chains are anti-parallel to each other.

c. Reverse turn:

Folds back on itself in reverse direction of the chain.

Tertiary Structure of Proteins:

The helical form of polypeptide folds into spherical, globular, ellipsoidal or other conformation, which is called the tertiary structure of proteins. This folding is necessary for the biological activity of the proteins. e.g., enzymes, immunoglobulin's.

The tertiary conformation is maintained by four types of bonds-

1. Hydrogen bonds:

Formed between hydrogen and an electronegative atom like oxygen or nitrogen in the 'R' group of amino acids.

2. Ionic interactions:

Formed between acidic (glutamic and aspartic) and basic (arginine, lysine or histidine) amino acids.

3. Disulphide bonds:

This is a strong bond formed between the sulphahydryl groups of two cysteine amino acids. The resultant dimer structure formed is known as cystine (an amino acid found in proteins only and not in free form).

4. Hydrophobic interactions:

The 'R' groups of the hydrophobic amino acids aggregate together in the centre away from water, thereby developing a force of attraction between each "R" group and a force of repulsion from the water and these interactions are known as hydrophobic interactions.

