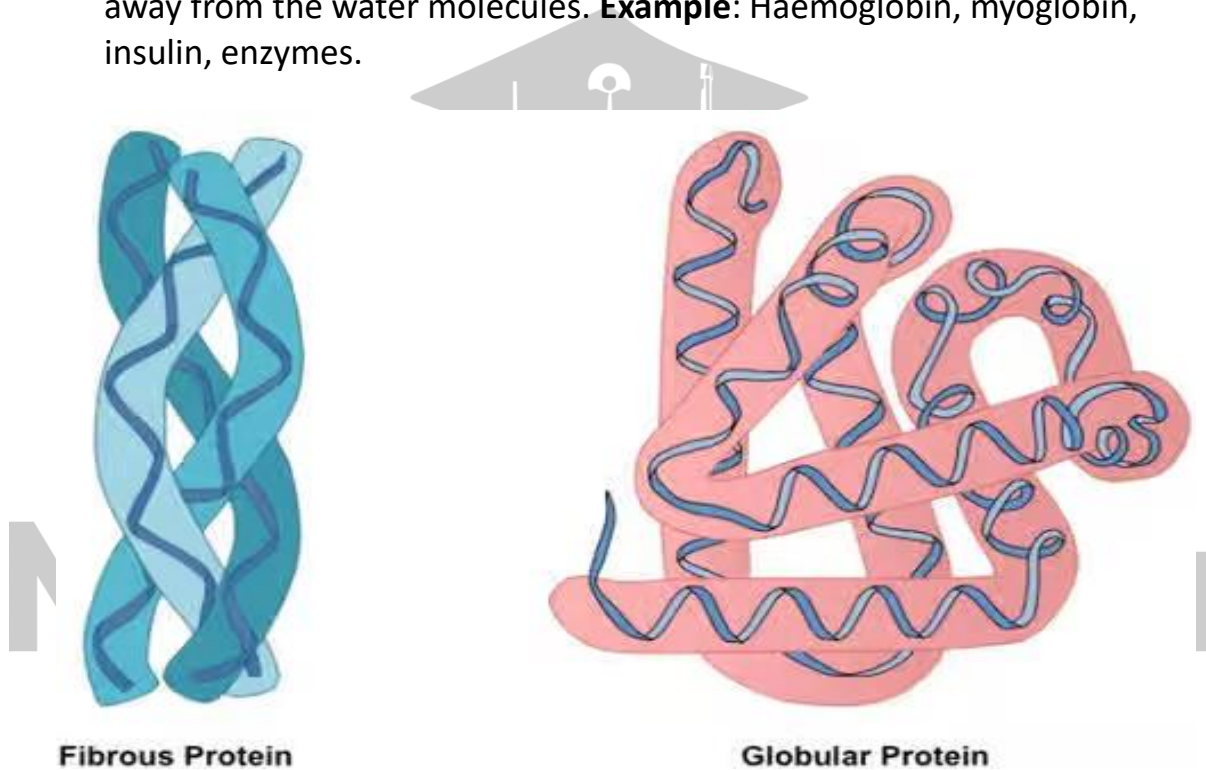


CSIR NET Life Science Unit 2

Comparison between Collagen and Keratin

On the basis of shape and solubility, Proteins are classified into two categories – Fibrous proteins and globular proteins.

- **Fibrous proteins are long and thread-like. They** help in maintaining cell shape by providing a framework hence are structural in nature. Typically, insoluble in water since their hydrophobic R groups are exposed.
Example: Keratin, collagen, elastin, fibrin
- **Globular proteins** are spherical. They carry out specific metabolites and chemical processes in the body hence are functional in nature. Typically, soluble in water since their hydrophobic R groups are located in the core, away from the water molecules. **Example:** Haemoglobin, myoglobin, insulin, enzymes.



Difference between Collagen and Keratin:

Despite being a type of fibrous protein, they have the following differences:

Collagen

Keratin

- It made up of three polypeptide chains forming a helical structure linked by a covalent bond
- The molecular structure of keratin is that of an alpha helix or beta-sheet to which various N and C-terminal groups become attached, and several disulfide bonds are present.
- The most abundant amino acid: glycine, proline, and hydroxyproline.
- The most abundant amino acid: cysteine

- It is important as part of connective tissues such as ligaments and tendons and part of the dermis of the skin.
- It is an important part of the skin, hair, and nails; and forms the claws, feathers and hoofs of other animals.

- The collagen is made in cells called **fibroblasts**.
- The keratin is made in living cells called **keratinocytes**.
- Polypeptide chain are left-handed fashion
- The polypeptide chain is Right-handed
- Not involved in cortification process
- Involved in cortification process of epithelial cells
- Out of 28 types of collagen, type 1 is most abundant (90%) in human
- Type I and type II are described in human

