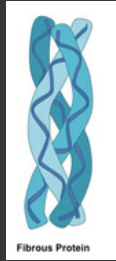


FIBROUS PROTEIN

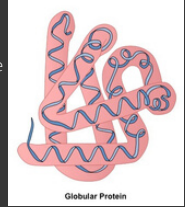
- parallel along a single axis
- consist of long fibers or large sheets
- mechanically strong
- insoluble in water and dilute salt solutions
- important structural role in nature
- have only one type of secondary structure
- Examples:
 - 1) α keratin : found in hair, fingernails, claws, horns, beaks and wool
 - 2) Silk fibrion : in silk fibres
 - 3) Collagen : component of connective tissues such as tendons, bones, cartilage and teeth



- The folding of a polypeptide chain in 3-D
- Primarily determined by interactions of aa side chains with each other and the backbone atoms
- stabilize by hydrophobic interactions, hydrogen bonds, electrostatic interactions and chemical crosslinking
- Examples : fibrous or globular

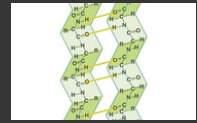
GLOBULAR PROTEIN

- folded to a more or less spherical shape
- soluble in water and salt solutions
- most of their polar side chains are on the outside and interact with the aqueous environment by hydrogen bonding and ion-dipole interactions
- most of their non-polar chains are buried inside
- nearly all have substantial sections of α -helix and β -sheet
- Examples : Myoglobin, Haemoglobin

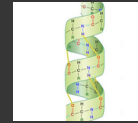


Tertiary

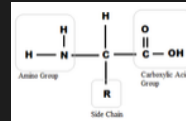
β -sheet



α -helix



AMINO ACIDS

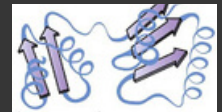


Primary

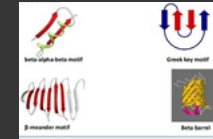
Secondary

Quaternary

Domains



Motif

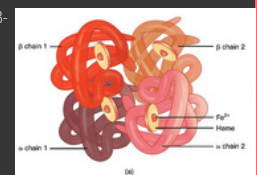


- The ordered 3-dimensional arrangements of localized regions of polypeptide chain
- Formation depends only on interactions of the peptide backbone: NH and C=O
- Formation of interactions depends on the allowed rotations around the planer peptide bond
- held together by hydrogen bonds

- arrangement of several protein chains or subunits into a closely packed arrangement
- the subunits consists of different polypeptide chains
- subunits interact via non-covalent interactions
- proteins with more that one subunits : oligomers
- Two types : myoglobin and haemoglobin
- built on a common structural motif
- polypeptide chains fold around a prosthetic group : heme
- oxygen binds to heme group
- carbon monoxide, nitrogen monoxide and hydrogen sulfide can bind to Fe(II) -heme complex and have higher binding affinity than oxygen, therefore toxic

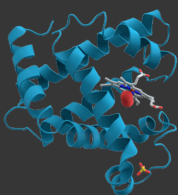
HAEMOGLOBIN

- A tetramer of two α -chains and two β -chains
- Each chain has one heme group
- bind up to four molecules of oxygen
- Function as oxygen storage and transport protein in blood vessels
- 100% saturated in lungs
- 50% saturated in tissues



MYOGLOBIN

- Monomer
- Has one binding site for oxygen
- Function as an oxygen storage and transport protein in muscles
- 100% saturated in lungs
- 100% saturated in tissues



- linear sequence of amino acid in a peptide or protein
- held together by peptide bonds made during protein biosynthesis
- begins from the amino-terminal end to the carboxyl-terminal end
- determined by the gene corresponding to the protein
- Example : hormone insulin

