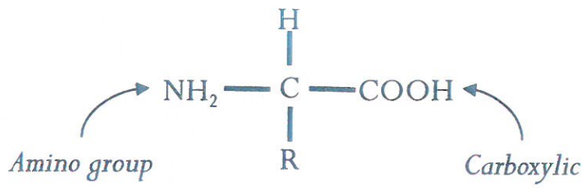
1.1 BIOLOGICAL MOLECULES

Proteins

C, H, O, N (S)

This is the structure of an amino acid



Amino Acid (monomer)

20 different R groups

Thousands of proteins

Carry out a range of activities

condensation reaction

Dipeptide

2x amino acids joined by a peptide bond

condensation reactions

Polypeptide (polymer)

1° structure. The type, number and sequence of amino acids linked by peptide bonds only

2° structure

Alpha Helix (most common)

2° structure

Beta Pleated sheet

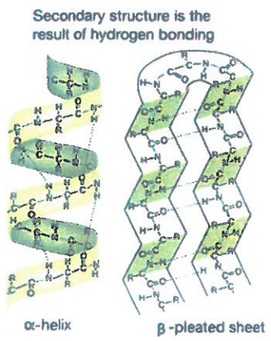
Linked with H bonds

Further folding

3° structure held by disulphide bridges, ionic bonds, H bonds and hydrophobic interactions between R groups making globular proteins with specific and precise 3d shapes

2 or more polypeptide chains

4° structure



Biuret Test

Positive + solution turns purple

Negative - solution remains blue

Haemoglobin

4 folded polypeptide chains (all having 3° structure) with a prosthetic group containing iron. Held together by disulphide bridges.

Transports oxygen in blood

See 2.3

Transport proteins

See 1.3 for transport proteins found in cell membrane

Antibodies

defence

Enzymes

See 1.4

Hormones

Insulin

Found in the pancreas

Regulates blood sugar

Small protein

2 polypeptide chains linked by disulphide bridges

Metabolic

Globular (globe shaped) soluble

Have 3° structure and often 4° structure

Structural

Fibrous (fibres) insoluble

No 3° structure

Polypeptides form long parallel chains with cross linkages to form fibres

Collagen

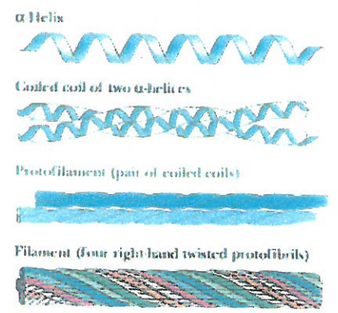
connective

main component of tendons

Keratin

Hair, nails, claws

Alpha helices coiled and cross linked to each other



3 polypeptide chains in secondary structure (alpha helix)

Twisted to make triple helix

Held with H bonds

Strong

Most abundant protein in animal kingdom