

Proteins

Types of Proteins:

1. Fibrous proteins: insoluble in water, mainly used for structure
2. Globular proteins: mostly water soluble, non-structural
3. Glycoproteins: carbohydrate bonded proteins

Classification of Proteins:

- 2 amino acids = dipeptide
 - 3 amino acids = tripeptide
 - typically 30+ amino acids = polypeptide
- Polypeptides + proteins can be distinguished by size, however, many textbooks use the terms interchangeably.

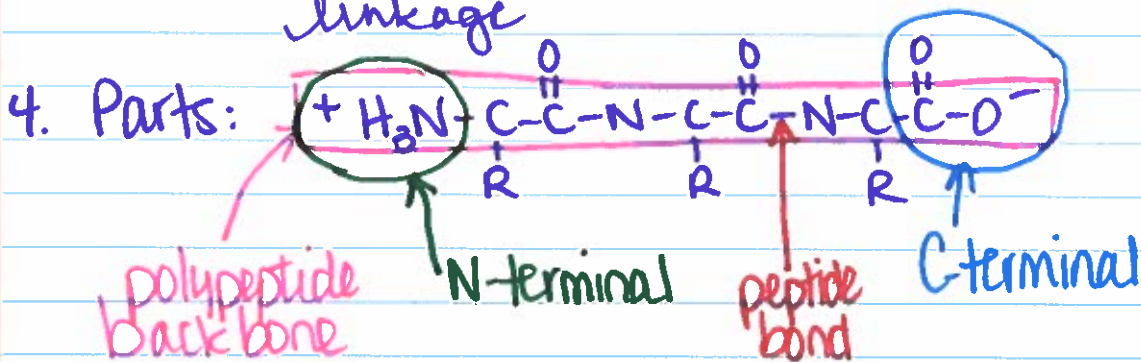
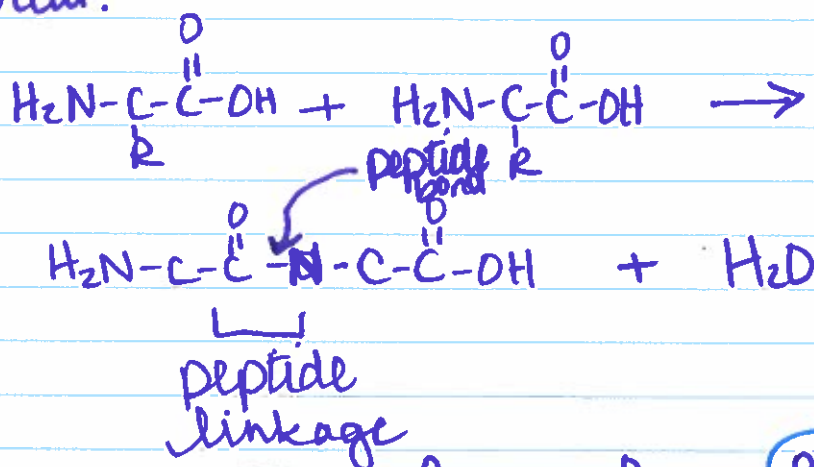
Protein Functions:

1. Structure - provide support: collagen, fibroin of silk + spider webs.
2. Transport - bind and carry ligand molecules: hemoglobin
3. Storage - ferritin (iron) casein (milk)
4. Catalysis - enzymes
5. Regulatory - hormones, genetics, transcription factors + enhancers.
6. Defense - antibodies, fibrinogen, thrombins, venoms.
7. Movement - contractile, change in shape
actin + myosin.
8. Nutrition

Protein Structure:

1. Proteins are macromolecules (polymers)
2. Chains of 200-300 amino acids, ranging from simple polypeptides to Titin proteins (found in skeletal & cardiac muscles)
3. Bound by peptide bonds (linkage) formed by dehydration synthesis of the HO- of one amino acid + the H₂N- of another amino acid.

The peptide bond exhibits rigidity similar to a double bond because of the resonance stabilization that can occur.



5. Primary Structure: linear sequence of amino acids

(3)

b. Secondary Structure: repeating patterns created by Intermolecular bonds.

a) alpha helix (coil)

b) beta pleated sheet (folded)

c) absence of pattern or random coil