CLASSIFICATION OF PROTEINS

Proteins have been classified on following bases:

I. Shape of the Proteins:

(a) Fibrous: Thread-like or sheet-like, water-insoluble molecules whose polypeptide chains extend along"Examplesê Albumins— Ovalbumin (egg white), Serum albumin (blood plasma), Lactalbumin (milk), Myoalbumin(muscles) Serum globulin; Crystallin (in crystaline lens of eye); Fibrinogen (in blood plasma)|
Histones— Globin (in haemoglobin); Protein part of—nucleoprotein; in thymus gland.
They function as structural materials. Ex. scleroproteins (fibroin, collagen, etc.).

(b) Globular: Globular molecules soluble in aqueous system. Their polypeptide chains are tightly-folded into a compact, globular shape. Most of them are mobile and dynamic in function. Ex. globulins, albumins, nearly all enzymes, blood transport proteins, antibodies, nutrient-storage proteins, etc.

II. Biological Functions:

(a) Structural proteins: fibrous proteins. Ex. fibroin, elastin, collagen, keratin. cartilage,bone,etc.
(b) Regulatory proteins: hormones (eg., insulin, etc.), repressors, etc.
(c) Enzymes: lipase, ribonuclease, ligase, etc.
(d) Defense proteins: antibodies (immunoglobulins), blood-clotting proteins (fibrinogen, thrombin), snake venom, some bacterial toxins, etc.
(e) Contractile proteins: in muscles (actin, myosin), in cilia and flagella - tubulin (in mibules) and dynein.
(f) Transport proteins (mobile proteins): haemoglobin, lipoprotein, etc.
(g) Nutrient and storage Protamines Salmin (in sperm of salmon); Sturin (in sperm of ovalbumin of egg white, casein of milk, ferritin stores iron,etc.
(h) Other proteins: Monellin (a sweetener), antifreeze proteins of arctic fishes, resilin of hinges of wings in insects.

III. Certain other Properties:

(a) Simple proteins: made up exclusively of amino acids.These are of following types on the basis of their solubility in water and coagulability by heat:

(b) Derived proteins: They are not natural proteins but are obtained by partial hydrolysis or by desaturation of natural proteins in following manner: Significance:
1. As structural components: Bone, cartilage, collagen etc.
2. Integumentery derivatives:As keratin found in skin, nail, hoof, hair, etc.
3. As Enzymes: They help to catalyze several biochemical reactions important for liife e.g., endonuclease, ligase, lipase, ribonuclease, etc.
4. As hormones: They repress and provoke certain reactions at required time e.g., insulin, glucagon, ATH.
5. Growth of body and repair of worn out tissues. 6. As antibodies e.g., immunoglobulins. 7. As carriers.
8. As receptor molecules. 9. As contractile protein: In muscles (as actin and myosin), tubulin and dynein in cilia and flasturgeon)Scleroproteins Keratin (epidermal derivatives of skin); Elastin(elastic tissues, ligaments, cartilage); Collagen (white fibrous tissue, bones, cartilages, tendons); Ossein(bone, teeth), Fibroin (silk fibre).
(f) Transport proteins (mobile proteins): haemoglobin, lipoprotein, etc.
(g) Nutrient and storage proteins: ovalbumin of egg white, casein of milk, ferritin stores iron,etc.
(h) Other proteins: Monellin (a sweetener), antifreeze proteins of arctic fishes, resilin of hinges of wings in insects.

III. Certain other Properties:

(a) Simple proteins: made up exclusively of amino acids. These are of following types on the basis of their solubility in water and coagulability by heat:

(b) Conjugated proteins: This class includes a non-amino acid part (prosthetic group) in adition to the amino acids. They are classified on the basis of the chemical nature of their prosthetic groups: