Classification of aminoacids

1) Essential aminoacid - Aminoacids which are not synthesised by our body but required for proper health and growth are called essential aminoacid.
e.g, Valine (Val), Phenyl analine (Pha)

2) Nonessential aminoacid - Amino acids synthesised by our body are called nonessential aminoacids.
e.g, Glycine, Alanine..

~~Classification Protein~~

* Aminoacids have amphoteric behaviour due to $-NH_2$ and $-COOH$ gr.

Structural classification of protein

1) Fibrous protein - Polypeptide chains form large linear fibres held together by inter chain H-bonding. These are insoluble in water.
e.g, Keratin (Skin & hair protein)
Myosin (Muscles protein)

2) Globular protein - Polypeptide chains coiled to make compact spherical molecules. These are associated through itramolecular H-bonding. These are water soluble.
e.g, Enzymes, Haemoglobin.

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Compositional classification of protein

1) Simple protein - Proteins contain amino acid only.
   e.g, Egg albumin.
2) Conjugated protein - Protein in which amino acid combines with other biomolecules such as carbohydrate etc.
   e.g, Glycoprotein.
* Nonpeptide group (carbohydrate) in conjugated protein is called prosthetic group.
   e.g, Mucine in saliva.

Structure of protein

Proteins have complex three dimensional structure which studied at different levels

1) Primary structure - The sequence of amino-acid in the chain
2) Secondary structure - Arrangement of polypeptide chains which may be either linear or coiled to form spiral called α-helix. The spirals held together by H-bond between N–H and C=O groups.
3) Tertiary structure - Three dimensional shape of protein helix is called tertiary structure. Folding of a particular chain, it plays important role in function of enzymes.

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4) Quarternary structure - Some of the amino-acids are composed of two or more poly-peptide chain reffered as sub-units. The spatial arrangement of these sub units with respect to each other is known as quarter-nary structure.

* Destroy of 2° and 3° structure of protein by action of heat or acid is called denaturation of protein.