

BIOMOLECULES - I

Biochemistry- Bio molecules: Structure, Classification and biological significance of carbohydrate, Protein and Lipid

Dear, Students, for this unit I am giving you some outlines and some study material (book chapters) in WhatsApp. You have already studied about biomolecules in your higher secondary course; So go through the study materials and refresh your knowledge. If you face any problem, I am standing behind you

CARBOHYDRATE

Carbohydrate is an organic compound composed of C, H, O, where the ratio between hydrogen and oxygen is 2:1. For example, Glucose is $C_6H_{12}O_6$, can be express as $C_6(H_2O)$.

The sugar molecules are the building block of carbohydrate. Depending on the number of sugar molecules they **can be classified as** –

- i) **Monosaccharide-** (containing one sugar molecule). eg.- Glucose, fructose and etc.
- ii) **Oligosaccharide-**(contain number of sugar molecules) eg.- Lactose, sucrose and etc.
- iii) **Polysaccharide-** Containing more than number of sugar molecule) eg.- Cellulose, Starch and etc.

► Monosaccharide may be further divided on the basis of carbon molecule as

► Polysaccharides can be grouped on the basis of

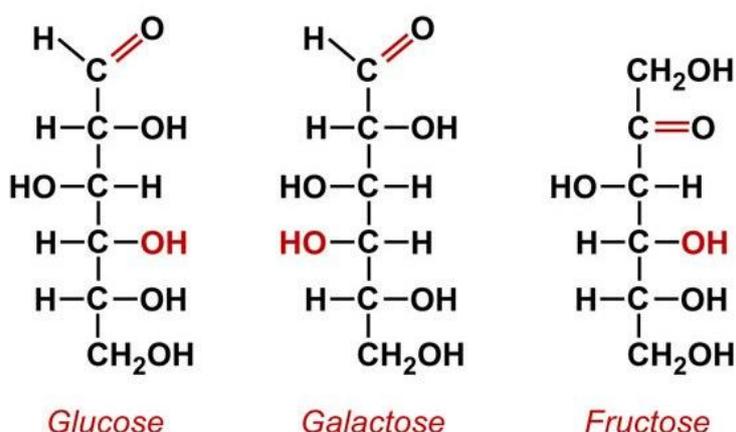


Fig- Open chain structure of three monosaccharide

Mucopolysaccharides can be considered as derived polysaccharides. They contain amino sugar, uronic acid and some of their derivatives. They are gelatinous in nature.. Egs. are.....

Biological significance of carbohydrates-

- i) Ideal fuel.....
- ii) Structural role.....
- iii) Storage product.....
- iv) Present in exoskeleton.....
- v) Anticoagulant..... so on.

PROTEIN

They are organic substance with C,H,O and N. Some protein also contains sulphur. Amino acids are the building block of protein. An amino acid is as shown below, composed an α - carbon atom at the centre , attached to it one H, one Carboxyl group, one amino group and a radical one side. For twenty amino acids this R is different. For eg. simplest amino acid is glycine where R=H. Being amino acid contain both acidic and basic group they may act as weak alkali and weak acid. Therefore, they are called amphoteric.

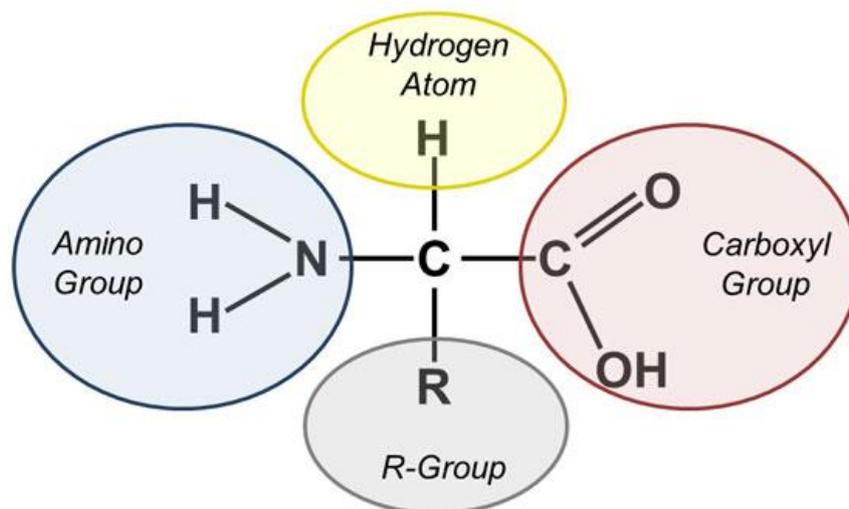


Fig- Structure of a typical amino acid

Classification of protein-

Proteins can be classified as –

- i) **Simple protein-** They are exclusively made up of eg- Albumin, Fibrin. Andetc.
They can be further divided on solubility---- as-----
- ii) **Conjugated protein-** On hydrolysis they give and
eg.- Haemoglobin, Nucleoprotein..... etc.
- iii) **Derived protein-** They are normally not found in nature,but.....
Eg- Protean ,.....amino acid.

Structure of protein-

- a) **Primary structure-**..... only peptide bond.....
- b) **Secondary structure-** peptide + hydrogen
- c) **Tertiary structure-**Peptide + Hydrogen + S-S + Ionic / Electrostatic....
- d) **Quarternary structure-** more than one polypeptide.....

Biological significance of protein-

- i) Structural role.....
- ii) Respiratory pigment-.....
- iii) Exo-skeletal support
- iv) Enzymes-.....
- v) Hormone.....
- vi) Immunity.....
- vii) Xxxxx
- viii) XXX