BIOMOLECULES

Glucose

Preparation:-

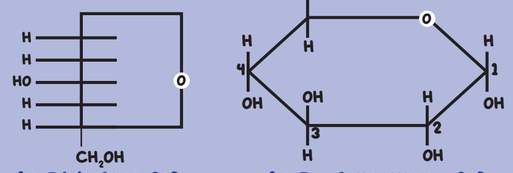
$$\text{Sucrose} \xrightarrow{H^+} \text{Glucose} + \text{Fructose}$$

$$\text{Starch} + NH_2O \xrightarrow{H^+} \text{Glucose}$$

Chemical properties:-

Glucose → (Δ, HI; NH_2OH; Br_2/water; Acetic anhydride)

- Limitation of the open chain structure glucose penta-acetate does note react with hydroxyl amine thus indicating the absence of free-CHO group.
- Cyclic Structure of glucvose

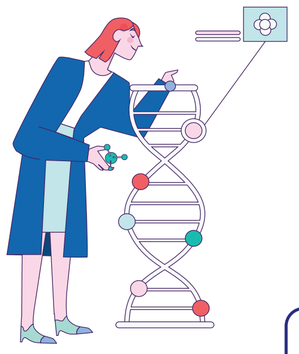


(α-D(+)- Glucose)

(Fisher Formula)

(α-D - Glycopyranose)

(Fisher Formula)



Mono Saccharides

Can't be hydrolysed further (Simple sugar)

Ex: Glucose, Fructose, Ribose

Oligo Saccharides

Yield two to ten mono saccharides

Ex: Sucrose, Maltose, Lactose

Poly Saccharides

Yield a large number of mono saccharides units.

Ex: Starch, Cellulose, Glycogen

Polyhydroxy aldehyde (aldose) or ketone (ketose) containing at least one chiral center

CARBOHYDRATE

Starch	Cellulose	Glycogen
Polymer of d-glucose with two components anylase and amylopectin.	Polyhydroxy aldehyde (aldose) or ketone (ketose) containing at least one chiral center	Known as animal starch. Present in liver, muscle and brain

HORMONES

Molecules that specialised glands synthesis generate to control and regulate the functioning of specific cells r organs.

- Steroids
- Polypeptides
- Amino Acids

Polymer of α-amino acids contain $-NH_2$ and -COOH group

PROTEINS

Classification

On the basis of number of $-NH_2$ and -COOH gp

- Neutral: equal No. of NH_2 and COOH gp.
- Basic: More No. of $-NH_2$ then -COOH gp.
- Acidic: more No. of-COOH than-NH_2 gp

On the basis of Place of Synthesis

- Essential cann't be synthesized in the body.
- Non-essential synthesized in the body

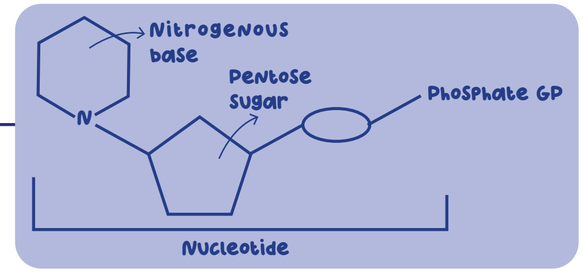
On the basis of Shape

- Fibrous: fibre like structure
- Globular- Spherical

$$H_2N - CH_2 - \underbrace{CO - NH - CH}_{\text{Peptide linkage}} - COOH$$
$$|$$
$$CH_3$$

When a protein in its native form is subjected to physical change, globules unfold, and proteins loses it's biological activity.

NUCLEIC ACID



DEOXYRIBONUCLEIC ACID (DNA)

Particles of nucleus of the cell responsible for heredity are called chromosomes

Compound of Sugar β-D-2 deoxyribose

Composed of nucleotides base as follows

- Adenine (A)
- Gwanine (G)
- Cytosine (C)
- Thymine (T)
- Uracil (U)

RIBONUCLEIC ACID (RNA)

Compound of Sugar β-D-ribose

Types of RNA
m-RNA, r-RNA, t-RNA

Nucleotide
Structure

Base | Base | Base
Sugar - Phosphate - (Sugar - Phosphate)-Sugar
Phosphodiester linakge

VITAMINS

Organic compounds required in diet in small amounts to perform specific biological functions for maintenance and growth.

CLASSIFICATION

Fat Soluble: Soluble in fats and oils but insoluble in water (Vitamins A, D, E and K)

Water- Soluble: B group and vitamin C are soluble in water.

ENZYME

Globular proteins specific for particular reaction and for particular substrate.

Mechanism of enzyme action

Substrate → Enzyme → Product