

7. Vitamins may be defined as organic compounds occurring in small quantities in different natural foods necessary for growth and maintenance of good health in human beings and experimental animals. Vitamins are classified into,

i) Fat-soluble and ii) Water-soluble.

Fat soluble vitamins ~~are~~ that are soluble in fat. These vitamins include vitamins A, D, E and K. Water-soluble vitamins are vitamins that are soluble in water. These vitamins include, vitamin B-complex, vitamin

B₁, B₂, B₃, B₅ and vitamin C
b) Vitamin B₃ [Niacin]

Niacin, also known as nicotinic acid, is an organic compound and a form of vitamin B₃, an essential human nutrient. It is converted by the body to its active coenzyme forms, nicotinamide adenine dinucleotide [NAD] and nicotinamide adenine dinucleotide phosphate [NADP]. ~~So~~ Niacin is a major component of NAD and NADP, two coenzymes involved in cellular metabolism as they participate as electron carriers in a multitude of redox reactions. Moreover, they act in life and death decisions on a cellular level in all known life forms.

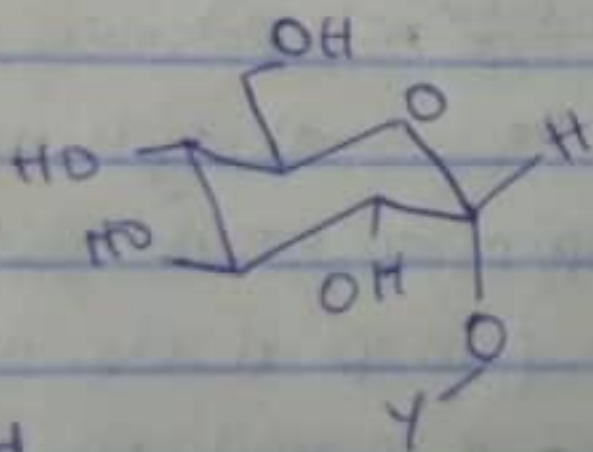
8. Glycolipids are carbohydrates that are covalently bound to a lipid. They are biomolecular structures in the phospholipid bilayer of the cell membrane whose carbohydrate component extends to the outside of the cell. They are essential in providing stability of plasma membrane, they are associated with all to all interactions. They also facilitate cellular recognition which is important in immunologic functions. Two forms of glycolipids exist;

1) Glycoglycolipids - ~~Composed~~ A type of glycolipid made up of an acetylated or non-acetylated glycerol and at least one fatty acid. It is often found as a component of biological membranes with photosynthetic functions. It includes galactolipids and sulfolipid.

- Galactolipid - Type of glycolipid that has galactose as the sugar component.

- Sulfolipid - glycerol^{glyco}lipid that has a carbohydrate moiety wherein the functional group contains sulphur.

2) Glycosphingolipids - A subclass of glycolipid found in the cell membranes of organisms [bacteria to humans]. It is mainly found in the cell membranes of the central nervous system.



Y = Lipid

Structure of Glycolipids.

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9. Cells are the basic building blocks of living things. The human body is composed of trillions of cells, all with their own specialized function. Cells provide structure for the body, take in nutrients from food and carry out important functions. They group together to form tissues which then group together to form organs such as the heart and brain. Our cells contain a number of functional structures called organelles. These organelles carry out tasks such as making proteins, processing chemicals and generating energy ^{for} the cell.

Some important organelles and their functions

- a) Nucleus - DNA maintenance, controls all activities of the cell and RNA transcription.
- b) Mitochondrion - energy production from the oxidation of glucose substances and the release of adenosine triphosphate [ATP]
- c) Golgi apparatus - sorting, packaging, processing and modification of proteins
- d) Endoplasmic reticulum - translation and folding of new proteins [rough ER], expression of lipids [smooth ER]
- e) Cell membrane - Separates the interior of all cells from the outside environment which protects the cell