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LEVEL: 200

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1) **Metabolism of pyridoxine (B6)**

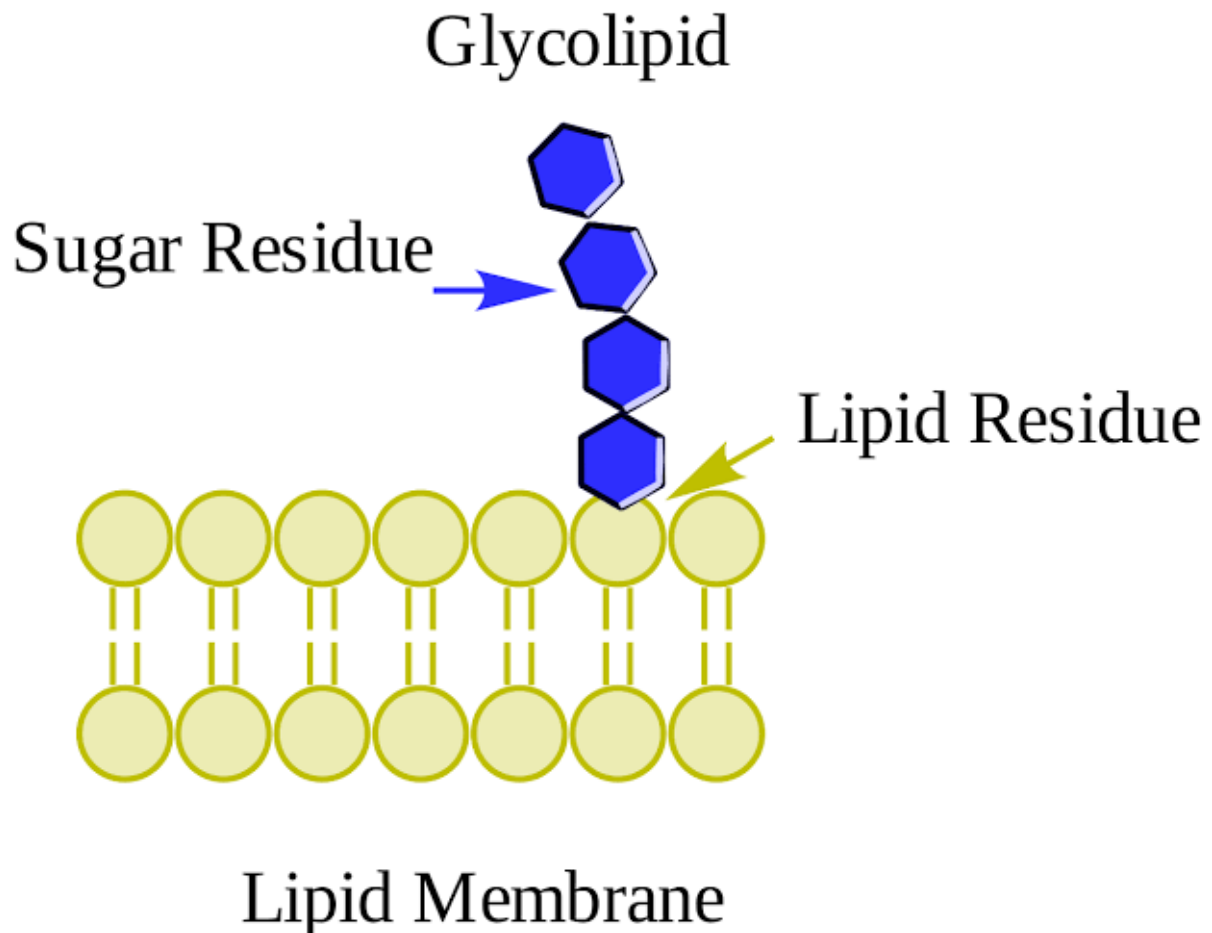
The liver is the site for metabolism of pyridoxine.

- **Amino acid metabolism:** transaminases break down amino acids with PLP as a cofactor. Serine racemase which synthesizes the neuromodulator d-serine from its enantiomer is a PLP-dependent enzyme.
- **Glucose metabolism:** PLP is a required coenzyme of glycogen phosphorylase the enzyme necessary for glycogenolysis to occur. PLP can catalyze transamination reactions that are essential for providing amino acids as substrate for gluconeogenesis.
- **Lipid metabolism:** PLP is an essential component of enzymes that facilitate the biosynthesis of sphingolipid. Particularly, the synthesis of ceramide requires PLP. Serine is decarboxylated and combined with palmitoyl co-A to form sphinganine, which is combined with fatty acyl-co-A to form dihydroxeramide. Dihydroxeramide is then further de-saturated to form ceramide.

Active form of pyridoxine

The active form of pyridoxine is **PYRIDOXAL PHOSPHATE (PLP)**.

2) Glycolipids are lipids with a carbohydrate attached by a glycosidic (covalent) bond. The basic structure of a glycolipid consists of a mono or oligosaccharide group attached to a sphingolipid or a glycerol group (can be acetylated or alkylated) with one or two fatty acids.



3) Cell is a basic membrane bound unit that contains the fundamental molecule of life and of which all living things are composed. These are cooperated with other specialized cells and become the building block of large multicellular organisms such as humans and other animals.

Function of important cells organelles

1. Plasma membrane: organelles that encapsulates the contents of the cell.
2. Nucleus/DNA: the nucleus houses DNA (the hereditary material) as well as various proteins and the nucleolus.
3. Ribosome: within the cell, they are directly involved in the manufacture of proteins by using their RNA and amino acids.
4. Mitochondria: powerhouse of the cell where they generate ATP from substrate in the presence of oxygen.
5. Vacuoles: store various molecules including enzymes, waste products of the

cell, water and even food material depending on the type of cell.

6. Cytoskeleton: help maintain the shape of the cell while also ensuring its elasticity.
7. Plastids: membrane –bound organelles that contain nucleoids.
8. Endoplasmic reticulum: organelle that forms an interconnected network of flattened sacs (listernae).
9. Centriole: contain tube-shaped molecule known as microtubules that help separate chromosomes and move them during cell division.
10. Lysosome: membranous organelles that contain acidic enzymes (hydrolase enzymes) that serve to digest various macromolecules in the cells.
11. Golgi apparatus: involved in the manufacturing, storage as well as transportation of products from the ER (Endoplasmic reticulum).