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1. Is vitamin C a coenzyme? Justify your answer.
2. Describe the chemistry of phospholipids.
3. Differentiate between phospholipids and glycolipids To aid for read reading
4. Yes it is.

Vitamin C has plays many roles in your body such as a coenzyme, antioxidant, and immune system booster.  
Vitamin C, also known as ascorbic acid, acts as a coenzyme that is needed to synthesize and use certain amino acids. In particular, vitamin C is needed to make collagen, the most abundant protein in your body. Collagen is plentiful in your connective tissue, which supports and connects all your body parts, so this protein is needed for healthy bones, teeth, skin, and blood vessels. Thus, a vitamin C deficient diet would affect your entire body.  
  
Like beta-carotene and vitamin E, vitamin C acts an antioxidant that may help reduce the risk of chronic diseases such as heart disease and cancer. It also helps you absorb the iron in plant foods such as grains and cereals and break down histamine, the component behind the inflammation seen in many allergic reactions  
  
Vitamin C helps keep your immune system healthy by enabling your body to make white blood cells. These blood cells fight infections.

1. Phospholipids

**Definition**

In simple terms, the phospholipid can be called as one of the primary components of the cell membrane. In the cell membrane, these phospholipids will be organized into a “bilayer”, thereby, acting as the framework of the cell in which the other components of the cell membrane will be embedded. As the name suggests, these are the class of “lipids”, which are known to give structure, as well as protection to the cells.

**Structure**

When structurally seen, a phospholipid is found to be consisting of two fatty acids along with a phosphate group. In this, the two fatty acids would represent the “hydrophobic tails”, while the phosphate group representing the “hydrophilic head”. As such, the head and tail parts of the phospholipid structure will be joined together by the glycerol molecule.

**Making of the Cell Membrane**

The phospholipids are able to make the cell membrane in the cell due to its hydrophilic and hydrophobic properties of its components (mentioned above). As one might be aware, being hydrophilic means that the molecule is water-loving, whereas, being hydrophobic means that the molecule is water-hating in nature. Thus, the different components of phospholipids would align themselves in the pattern due to these properties, thereby, making the structure of the cell membrane. As such, the phospholipids would line up themselves next to one another with the heads on the outer side and the tails on the inner side. Also, one more layer of these phospholipids would line up with the heads pointing to the inner side of the cell and the tails the other side. Thus, the phospholipid bilayer is formed.

One could see the same kind of phospholipid bilayer organization in the membrane-bound organelles like nucleus and mitochondria.

**Types of Phospholipids**

It’s to be noted that not all phospholipids will be the same. They would differ in size, shape, and chemical structure. Thus, they can be grouped into different types based on the type of molecule that is attached to the phosphate group. As such, the phosphate group of the phospholipid can be altered by simple organic molecules. As such, the different types of phospholipids are as follows:

**Phosphatidylcholine**

This is the most abundant type of phospholipid found in cell membranes. In this form, choline will be bound to the phosphate group of the molecule. As such, the type of phospholipid is found to be structurally important to help maintain the shape of the cell membrane. In addition, it is also found to be important for the proper functioning of the liver, as well as in the absorption of lipids. This type of phospholipid is found to be one of the components of the bile and helps in the fat digestion. Moreover, this also helps in the transport of cholesterol and other lipids to various organs.

**Phosphatidylethanolamine**

As the name suggests, this phospholipid will have an ethanolamine unit attached to the phosphate group. This is found to be the second-most abundant type of phospholipid in the cell membrane. Its small head would make it easier for the proteins to be aligned within the membrane, thus, making membrane fusion and budding process feasible. Moreover, this is found to be an important component of the mitochondrial membrane.

**Phosphatidylserine**

In this phospholipid, the amino acid serine will be attached to the phosphate group, which is confined to the inner part of the cell membrane. This type of phospholipid is found to be playing a significant role in cell signaling processes. It’s to be noted that the presence of this phospholipid on the surface of the outer membrane of the dying cells would signal the macrophages to digest them. In the platelets, these phospholipids will aid in the clotting of blood.

**Phosphatidylinositol**

This is the least abundant type of phospholipid, which has inositol unit bound to it. This type can be seen in several types of cells and tissues and is especially abundant in brain cells. This type is found to be significant for the formation of cell signaling molecules. These would also help in the binding of proteins and carbohydrate units to the outer cell membrane.

**Phospholipid Functions and Uses**

As a vital component of the cell, this molecule has lots of roles to play. The important functions and uses of phospholipids are:

* Help cell membranes and organelle membranes to be flexible
* Allow for vesicle formation
* Enable endocytosis and exocytosis
* Act as binding sites for proteins
* Act as important constituents of various tissues and organs
* Important for the proper functioning of the nervous, digestive, as well as cardiovascular systems
* Help in cell to cell communications
* Involve in processes like apoptosis and blood clotting
* Help lubricate cells
* Used in drug delivery systems
* Act as emulsifiers

1. **Glycolipids contain a** [carbohydrate](https://www.differencebetween.com/difference-between-hydrocarbons-and-vs-carbohydrates/) **group attached to the** [lipid](https://www.differencebetween.com/difference-between-lipids-and-vs-fats/) **residue, whereas Phospholipids contain a** [phosphate](https://www.differencebetween.com/difference-between-phosphorus-and-vs-phosphate/) **group attached to the lipid residue.**