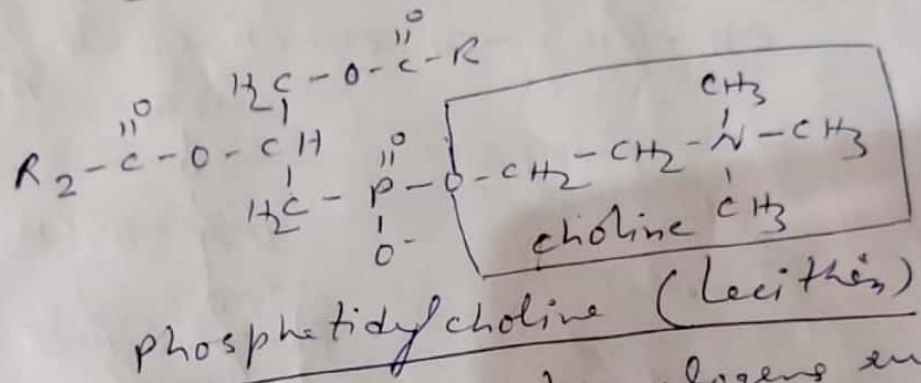
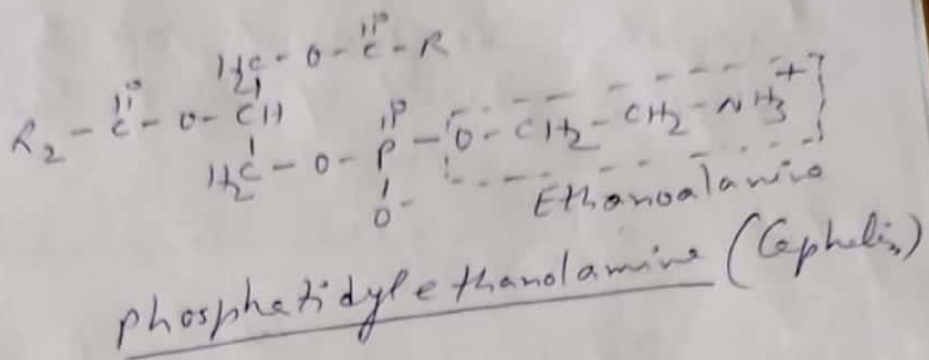
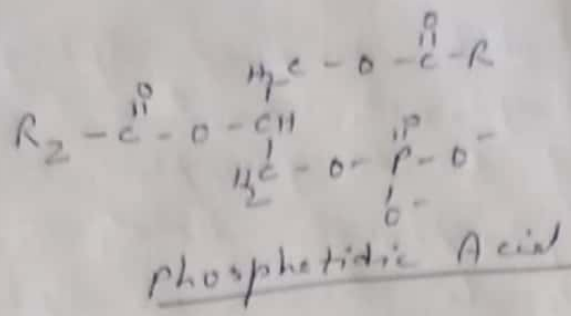


Classification of lipids (Control.)

B Compound fats or lipids - Compound esters of fatty acids with glycerol or sphingosine (a long chain unsaturated amino alcohol). They also possess other compounds, such as phosphate, along with an N-containing base or serine or inositol. Some other compound lipids possess monosaccharides or their derivatives in place of phosphate. The compound lipids has been classified into four classes -

(i) Phospholipids - Phospholipids are derivatives of phosphatidic acid, a basic phospholipid which possesses fatty acid forming ester bonds with C-1 and C-2 and a phosphoric acid forming a phosphoester bond with C-3. There are different constituents, such as ethanolamine, choline, serine or inositol linked to phosphate of phosphatidic acid forming different phosphatidyl derivatives. In some others, fatty acid linked to either C-1 or C-2 is removed forming lysophospholipids. Structure of phospholipids are -

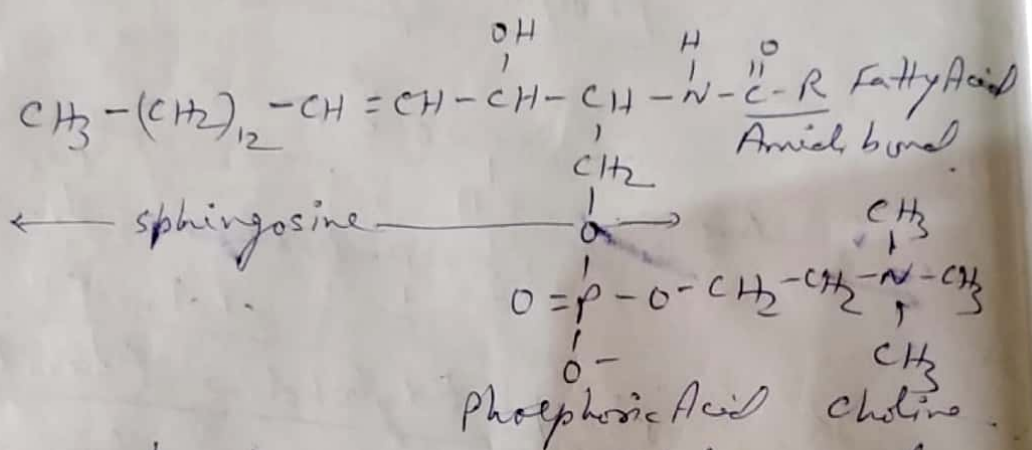


There are some other plasmalogens such as phosphatidylcholine, phosphatidylserine, and phosphatidylinositol.

B. Phosphoceramides - In phosphoceramides, instead of glycerol, there is a long chain unsaturated aminoalcohol named sphingosine. The carbonyl group of fatty acid is bonded to amino group of sphingosine by an amide bond forming a ceramide. The phosphoric acid is linked

to the alcoholic group of Sphingosine by a phosphoester bond and choline is linked to the phosphoric acid by another phosphoester bond. The resulting final molecule known as Sphingomyelin is present richly in the myelin sheath of myelinated nerves.

← Ceramide →

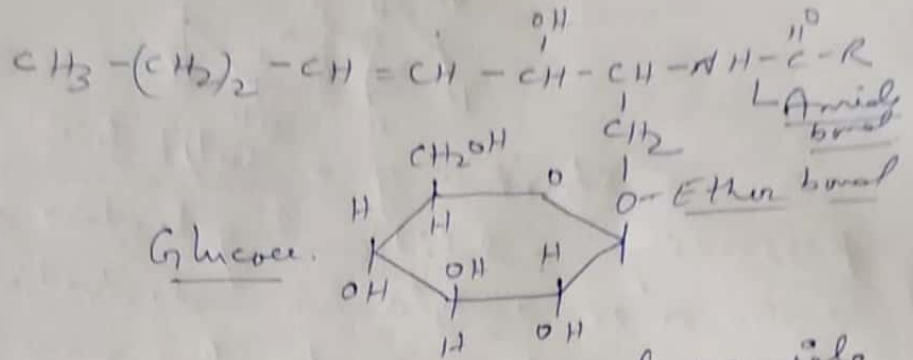


Structure of a sphingomyelin found in myelin sheath

Glycosylceramides (Glycosphingolipids)

Glycosylceramides are Ceramides linked to monosaccharides such as glucose and galactose, thus forming two types of glycosylceramides - galactosylceramides. Phosphoric Acid is absent. They are mainly found in nerve tissue or brain and are found in little in other tissue.

(i) Glycosyl Ceramides or Glucosyl Ceramides - These are Ceramides linked to glucose in place of galactose. They are mostly present in non-neural tissues.

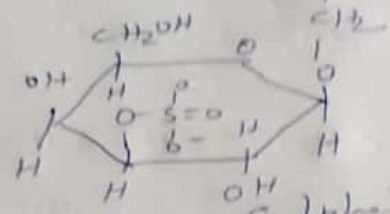
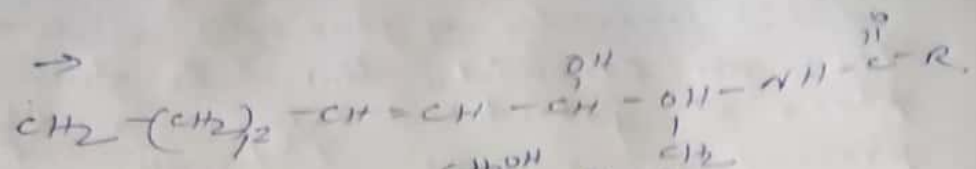


Structure of a glucosylceramide

(ii) Galactosyl Ceramides - In galactosyl fatty acid linked to sphingosine by amide bond may be Cerebronic Acid, nervonic acid, oxynervonic Acid or lignoceric Acid forming characteristic galactosylceramides namely Cerebron, Nervon, Oxynervonic, or Keratin respectively.

Sulfatides - Good amount of galactosylceramides present in myelin sheath possesses a sulfate linked to the third carbon of galactose, thus forming sulfatides.

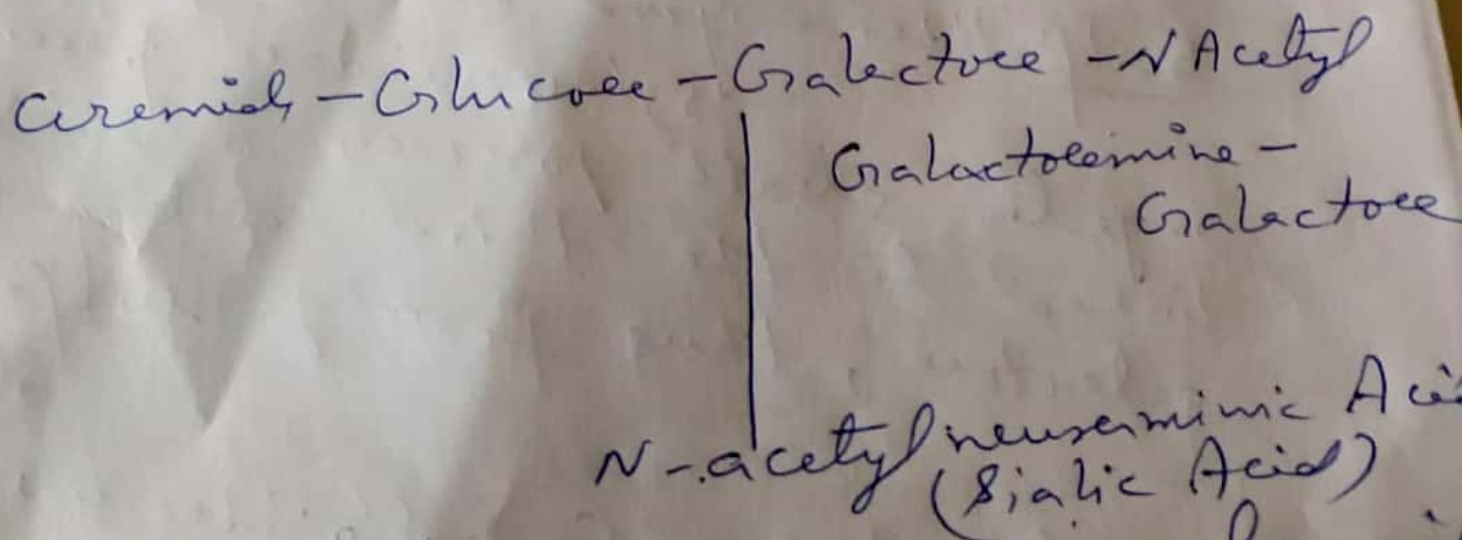
Grangliosides - Grangliosides are Sialic acid (N-acetylneuraminic acid) derivatives of glucosylceramides



Structure of a Sulphhydryl

possessing additional galactose or its amino- or N-acetylamino derivatives.

These complex molecules may become more complex after possessing repeat molecules of Sialic acid linked to galactose or its derivatives. Such molecules are termed monosialo-, disialo-, trisialo-, tetrasialo-gangliosides and so on, indicating the no. of Sialic acid present. The cholera toxin receptor is a monosialoganglioside - Ceramide.



Structure of a monosialoganglioside