

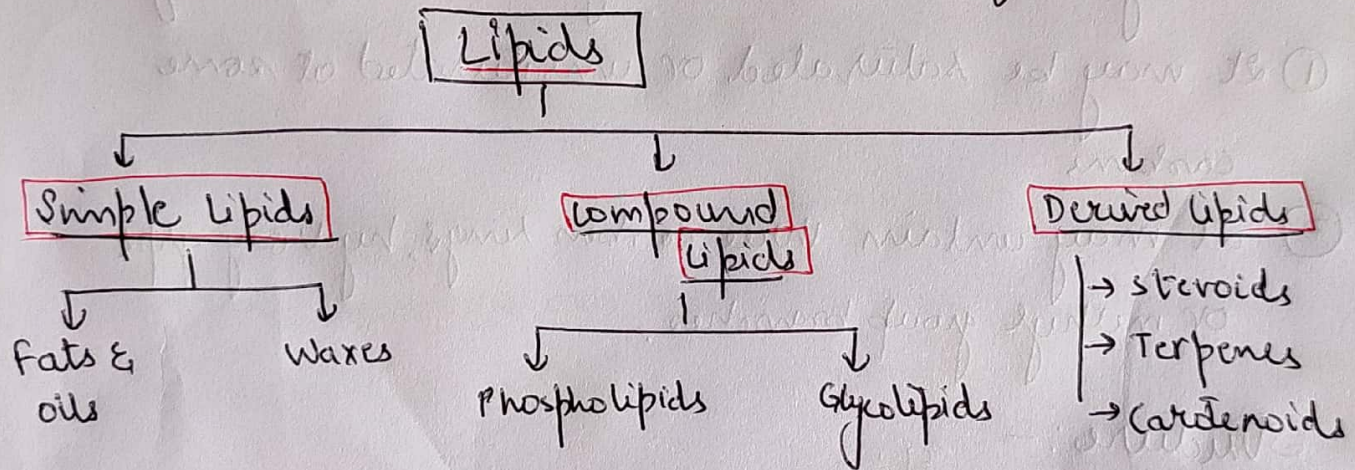
Lipids

①

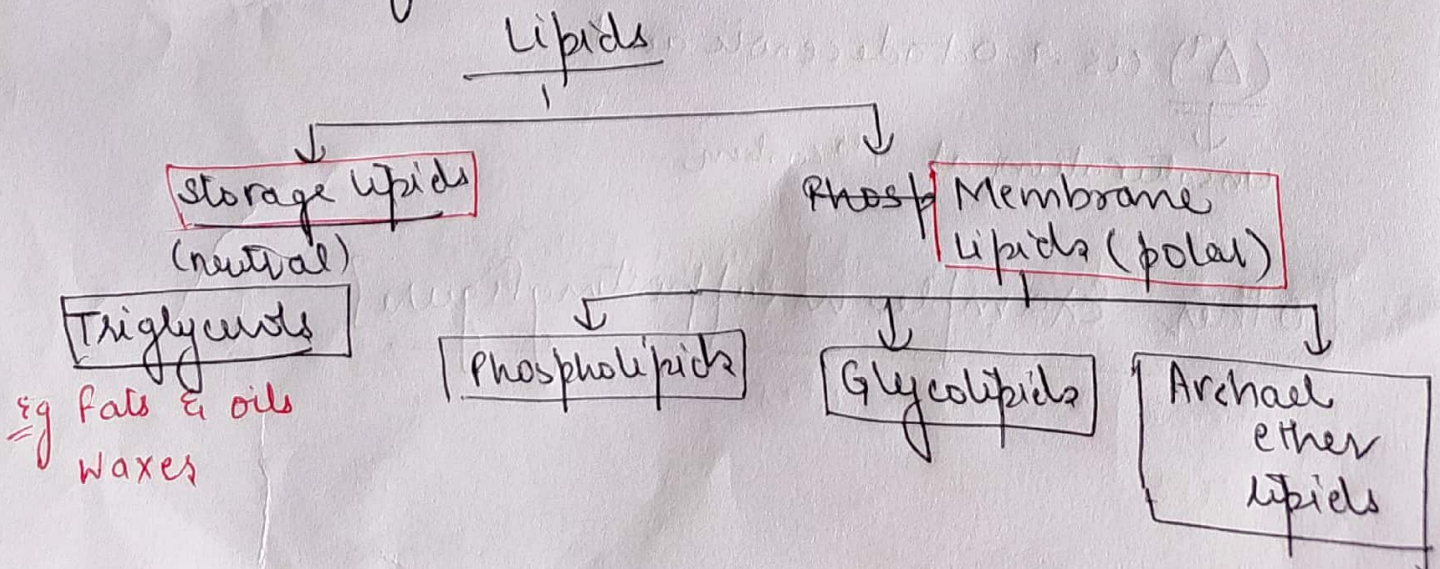
- Bio-organic molecules that are insoluble in water
- Extracted from different organic sources
- Lipids are major constituents of cell membranes, energy sources, vitamins, hormones, terpenes, fats, oils, waxes, steroids etc.

① Classification of Lipids

Based on their composition, lipids are classified as



② depending upon the nature lipids are classified as:-



① Storage lipids / Simple lipids

→ Fats & oils used almost universally as stored forms of energy in living organisms are derivatives of fatty acids.

Q What are fatty acids?

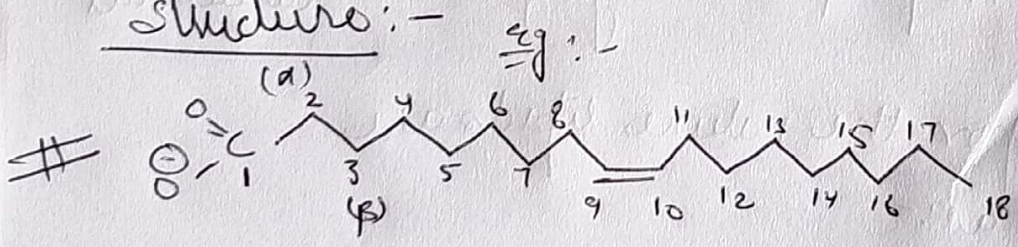
⇒ Fatty acids are carboxylic acids with ~~linear~~ hydrocarbon chains ranging from 4 to 36 carbons long (C₄ to C₃₆)

⇒ It may be noted that the hydrocarbon chain may:-

① It may be saturated or unsaturated at some carbons

② It may contain three-carbon rings, hydroxyl groups or methyl group branches.

Structure:-



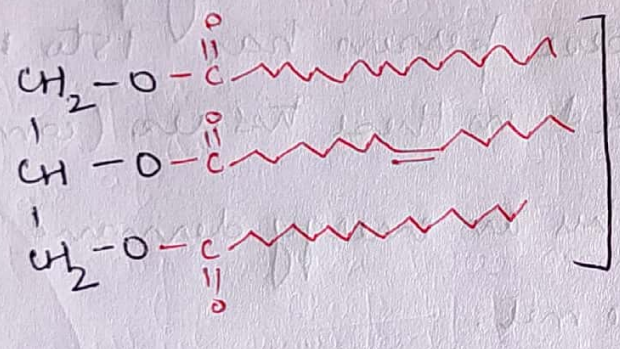
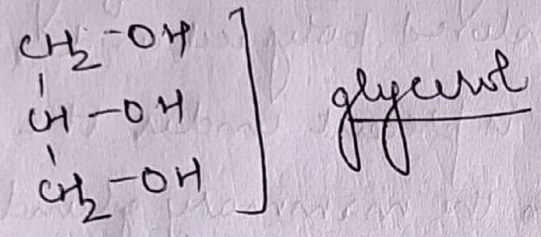
(Δ^9) cis-9-octadecenoic acid
↓
unsaturation at 9th carbon

[Other examples in supporting figure]

Triacylglycerols or Triglycerids

The simplest lipid constructed from fatty acid is triglyceride

structure:- (derived from glycerol)



three fatty acids each in ester linkage with glycerol is Triglyceride

Most naturally occurring triglycerols are mixed i.e. they contain 2 or 3 different fatty acids.

Properties:-

- 1) ~~is~~ Non-polar; hydrophobic, insoluble in water
- 2) Low specific gravity than oil & water thus oil floats in aqueous phase.

Biological Importance

- 1) Used as a source of energy even larger than polysaccharides such as glycogen & starch because:-
- 2) Carbon atoms of fatty acids are more reduced than

① Those of sugars & oxidation of triglycerides yields more than twice as much energy as the oxidation of carbohydrates.

② ⇒ because triglycerols are hydrophobic & therefore unhydrated, the organism that carries fat as fuel doesn't have to carry extra weight of water of hydration that is associated with stored polysaccharides.

the fat tissue in humans is present under the skin, the abdominal cavity & in the mammary glands.

A moderately ~~obese~~ obese person has 15 to 20 kg of triglycerides deposited in these tissues (composed of adipocytes). With this an energy demand of about 4 months can be met.

Also the fat molecules can provide insulation against low temperatures. seals, walruses, penguins & other warm-blooded polar animals are amply padded with triglycerides.

In hibernating species such as polar bears it helps in insulation & also as an energy reserve.

Q What is the fate of pyruvate in biological system?

↳ Ques from previous notes