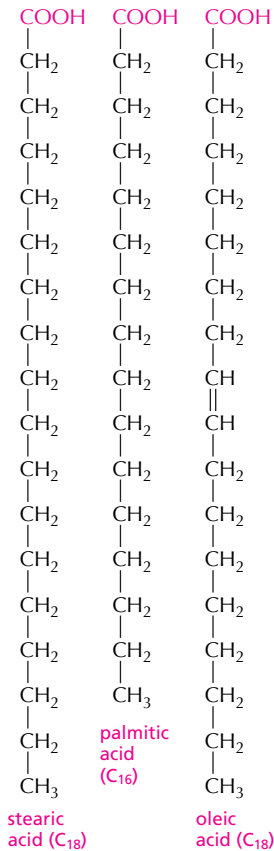


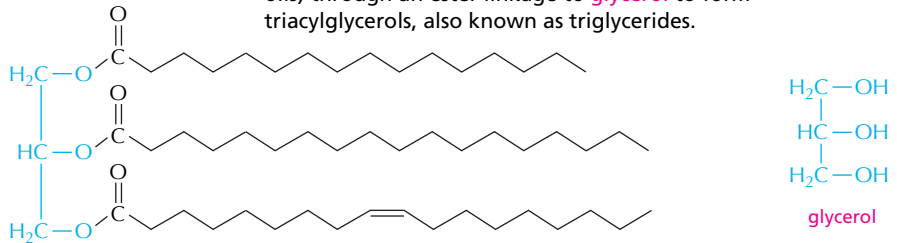
COMMON FATTY ACIDS

These are carboxylic acids with long hydrocarbon tails.

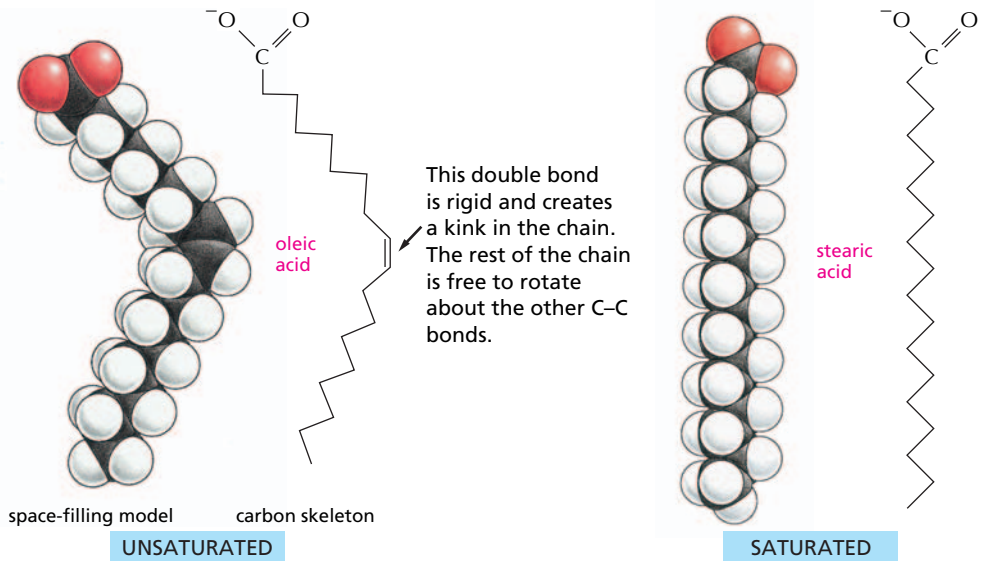


TRIACYLGLYCEROLS

Fatty acids are stored as an energy reserve (fats and oils) through an ester linkage to **glycerol** to form triacylglycerols, also known as triglycerides.



Hundreds of different kinds of fatty acids exist. Some have one or more double bonds in their hydrocarbon tail and are said to be **unsaturated**. Fatty acids with no double bonds are **saturated**.

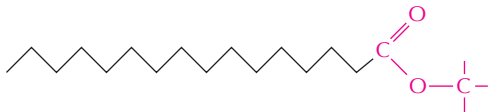


CARBOXYL GROUP

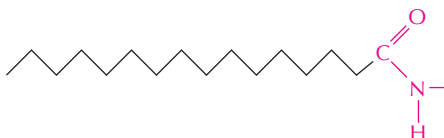
If free, the carboxyl group of a fatty acid will be ionized.



But more usually it is linked to other groups to form either **esters**

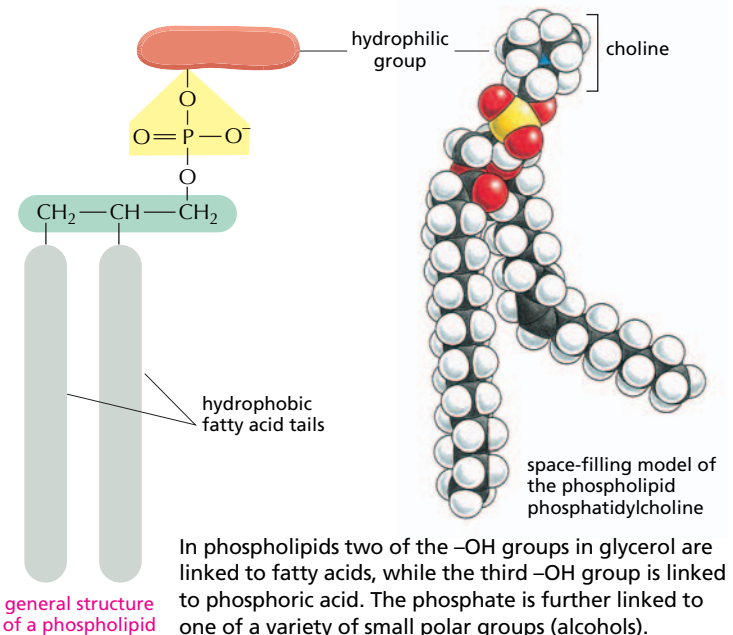


or **amides**.



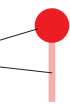
PHOSPHOLIPIDS

Phospholipids are the major constituents of cell membranes.

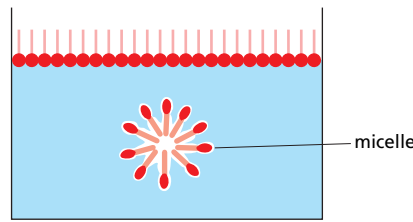


LIPID AGGREGATES

Fatty acids have a hydrophilic head and a hydrophobic tail.

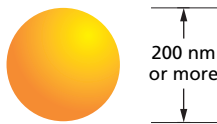


In water they can form a surface film or form small micelles.

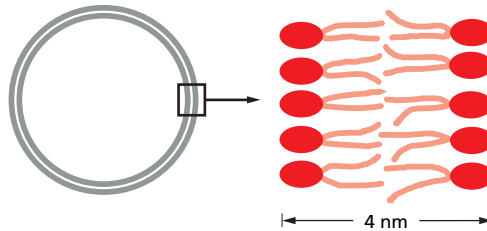


Their derivatives can form larger aggregates held together by hydrophobic forces:

Triglycerides can form large spherical fat droplets in the cell cytoplasm.

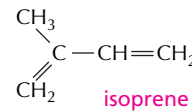


Phospholipids and glycolipids form self-sealing lipid bilayers that are the basis for all cell membranes.



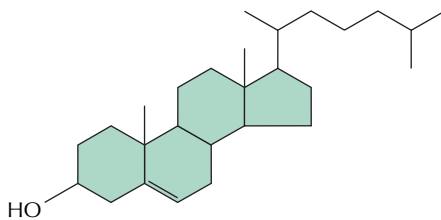
OTHER LIPIDS

Lipids are defined as the water-insoluble molecules in cells that are soluble in organic solvents. Two other common types of lipids are steroids and polyisoprenoids. Both are made from isoprene units.

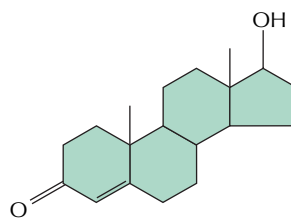


STEROIDS

Steroids have a common multiple-ring structure.



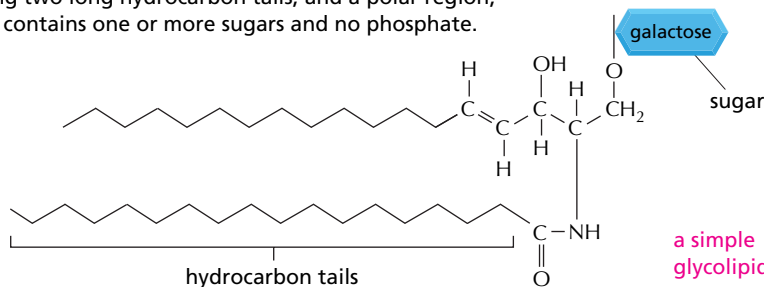
cholesterol—found in many membranes



testosterone—male steroid hormone

GLYCOLIPIDS

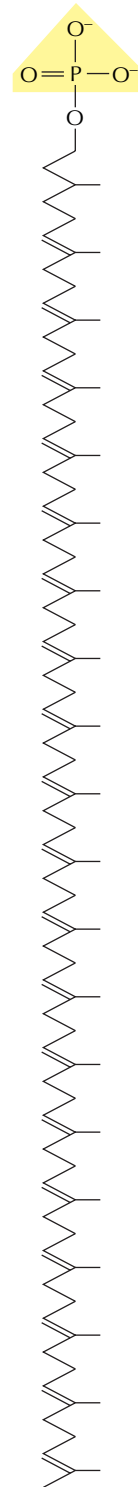
Like phospholipids, these compounds are composed of a hydrophobic region, containing two long hydrocarbon tails, and a polar region, which, however, contains one or more sugars and no phosphate.



a simple glycolipid

POLYISOPRENOIDS

long-chain polymers of isoprene



dolichol phosphate—used to carry activated sugars in the membrane-associated synthesis of glycoproteins and some polysaccharides