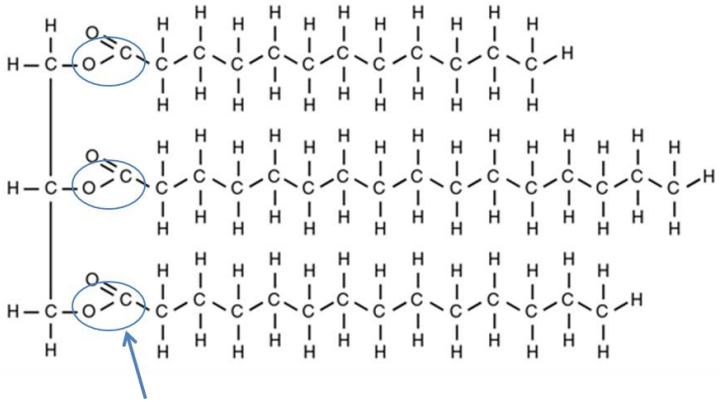
science

biology

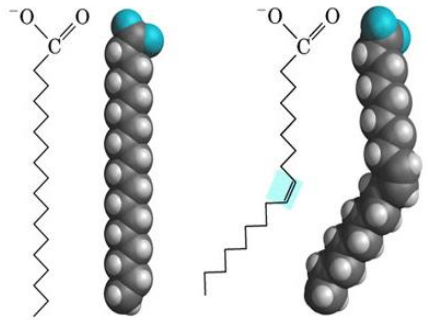
A-Level Lipids

Triglycerides and **phospholipids** are two examples of **lipids.**

Triglycerides are formed by the condensation of one molecule of glycerol and three fatty acid molecules

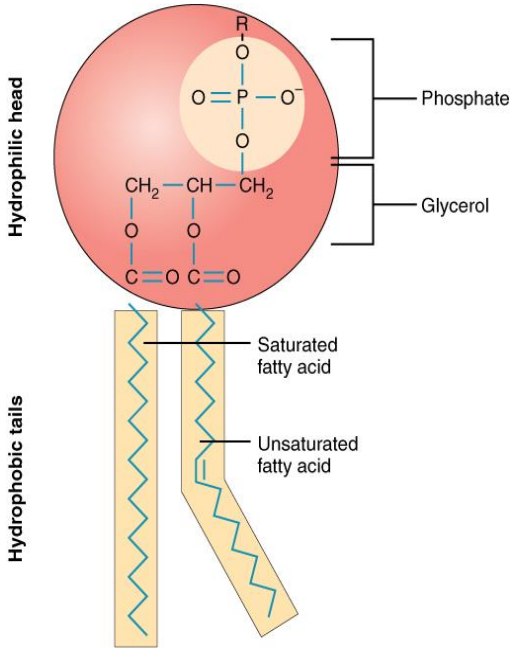


An ester bond is formed between the glycerol molecule and each fatty acid. This results in the formation of THREE water molecules.

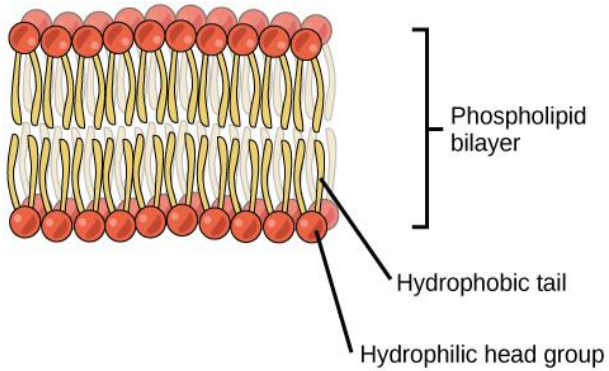


The R group of the fatty acid (hydrocarbon tail), may be saturated (no C=C) or unsaturated (one or more C=C).

Phospholipids are formed when a phosphate group replaces one of the fatty acids in a triglyceride. The phospholipid molecule consists of a **hydrophilic** 'head' and **hydrophobic** fatty acid 'tails'.



These properties allow phospholipids to form a bilayer which make up cell membranes.

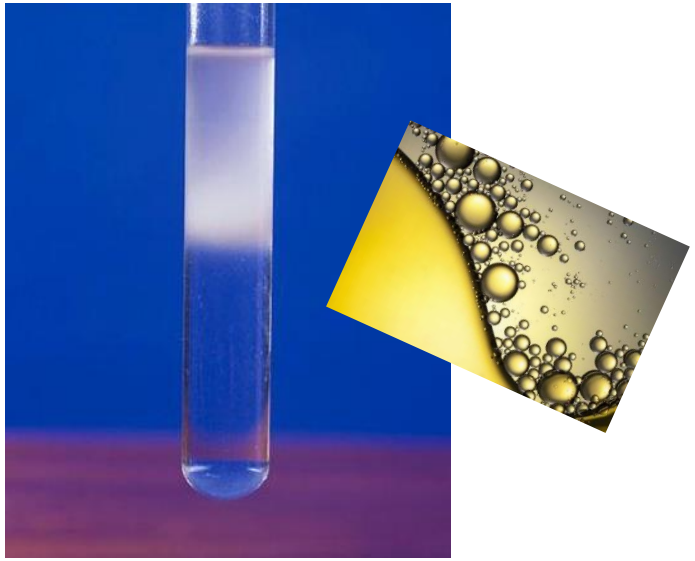


Testing for lipids

The **emulsion** test is used to test for lipids:

- Add the test substance to 2cm^3 of ethanol.
- Shake well.
- Allow to settle.
- Decant into a test tube containing 2cm^3 of water.
- A milky-white emulsion will appear if lipid is present.

Because lipids are insoluble in water, they form tiny droplets which are then suspended in the water. This is called an **emulsion** and it forms because lipids are **non-polar** molecules whilst water is a **polar** molecule**.** The importance of this property of water is explained later. A non-polar molecule like triglyceride will only dissolve in a non-polar solvent e.g. an organic solvent such as ethanol.



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