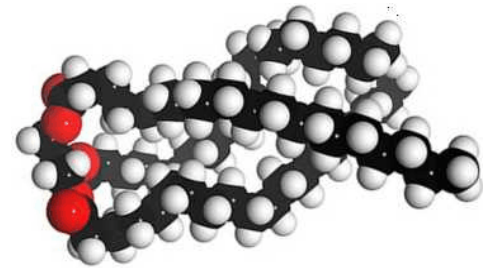


COMPLEX LIPIDS

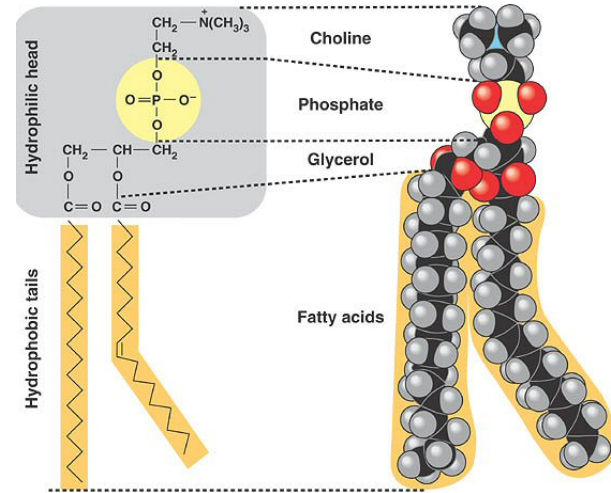
revised 16 September 2016

Campbell's 6th: 69-71, 7th: 75-77, Sadava: pp55-57, Campbell 9th: 74-77, Campbell 10th 74-75



TRIGLYCERIDES (page 54): **LEARN:** ester = condensation of alcohol with acid.
esters of **glycerol** and fatty acids (triacylglycerols) (**LEARN** generic rxn)
fats have high degree saturation, store energy, insulate, protect
oils are more unsaturated (**hydrogenation** makes them solid)

PHOSPHOGLYCERIDES: crucial membrane components (p 75)
 glycerol, PO_4 , fatty acids and certain low MW alcohols
phospholipids: L phosphatides: acids esterified to ROH: choline (lecithins) serine, ethanol amine



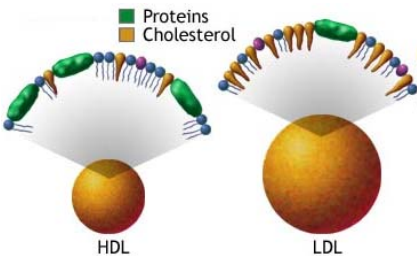
STEROIDS: (page 77). Illustrated in previous lecture.

1st found: cholesterol ("bile solids"), from gallstones, 1769. Synth. fr squalene = lanosterol in wool fat, a cholesterol standard numbering system (OH on carbon 3, side chain on 17)

Examples of steroid sources (LEARN):

- adrenal cortex: corticosteroids, anabolic steroid, aldosterone
- gonads: sex hormones: estrogen, progesterone, testosterone
- liver: bile salts
- skin: 7 dehydrocholesterol to calciferol (vit. D),

Lipoproteins:(page 913)



High Density Lipoprotein: (HDL) carry cholesterol fr peripheral tissues to liver
Low Density Lipoprotein: (LDL) carry cholesterol fr liver to peripheral tissues:

Increase HDL by:
 exercise

- ↑ intake of unsaturated fatty acids
- ↓ intake of saturated fats

(high blood triglycerides = heart disease risk factor)

EMULSIONS all appear milky. ("out, to milk"):

LEARN: Emulsion is an intimate suspension of a **hydrophobic material** in an **aqueous environment** with the assistance of an **emulsifier**. (Special case of a colloid)

emulsifier: an **amphipathic** ("both, suffer") molecule: contains both hydrophobic and hydrophilic regions

Soap: **LEARN:** "Na salt of a fatty acid" (amphipathic!)
 (illustrate **saponification:** triglyceride + NaOH) **FAT:**
 micelle: submicroscopic aggregate of molecules or ions

detergent:
 long chain hydrocarbon with mineral anionic group (PO_4^- for instance)

bile salts steroids with a SO_4^- attached by the liver, excreted in the bile.

