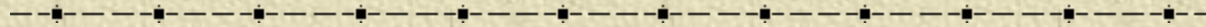
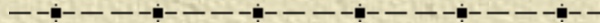




Macromolecules – Lipids



Chapter 5



Lipids

✦ NOT _____

✦ Include:

- ◆
- ◆
- ◆ Steroids
- ◆ Waxes
- ◆ Pigments

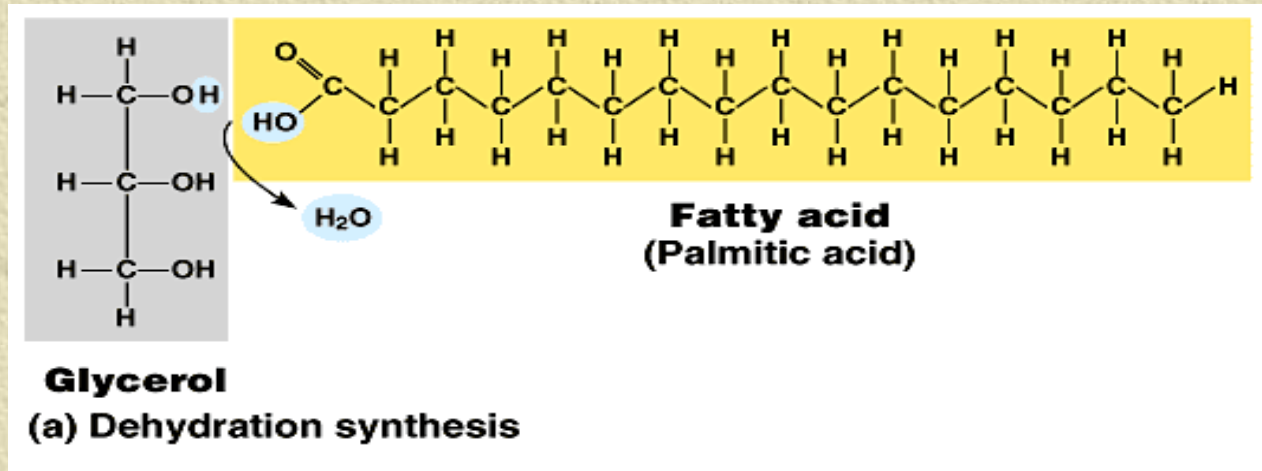
✦ _____ – due to
molecular structure

✦ Composed of H, C, & O – but mostly

FATS

✦ Glycerol + fatty acid

- ◆ Glycerol = 3C alcohol + 3 (_____) groups
- ◆ _____ = long chain of H & C (hydrocarbons) with a _____ group - COOH



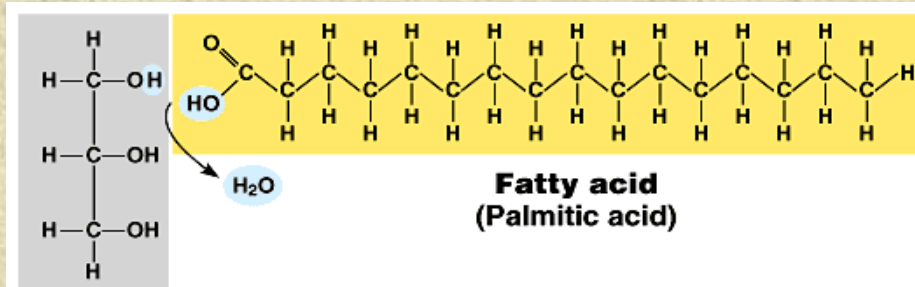
Triacylglycerol

✦ 3 fatty acids + glycerol
→ triacylglycerol

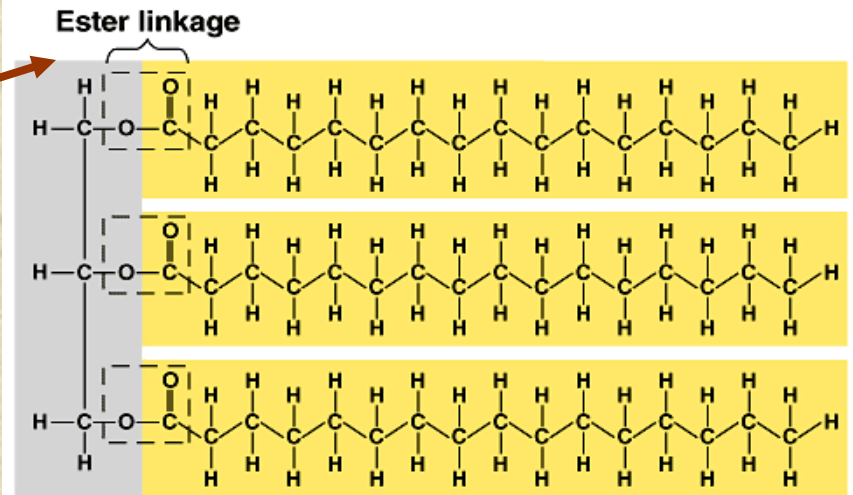
✦ Fatty acids are joined via the (-OH) and (-COOH) through dehydration synthesis

= _____

✦ One H₂O molecule is removed for every fatty acid added.



Glycerol
(a) Dehydration synthesis



(b) Fat molecule (triacylglycerol)

Fats - General

✦ Long hydrocarbon (HC) chain:

- ◆ Hydrophobic or Hydrophilic ?
- ◆ Polar or Nonpolar ?

✦ Functions:

- ◆ _____ → 2x the amount available vs. carbs
- ◆ Cushion organs
- ◆ _____ body

Fat Types

✦ Based on HC tail

✦ **Saturated Fats:**

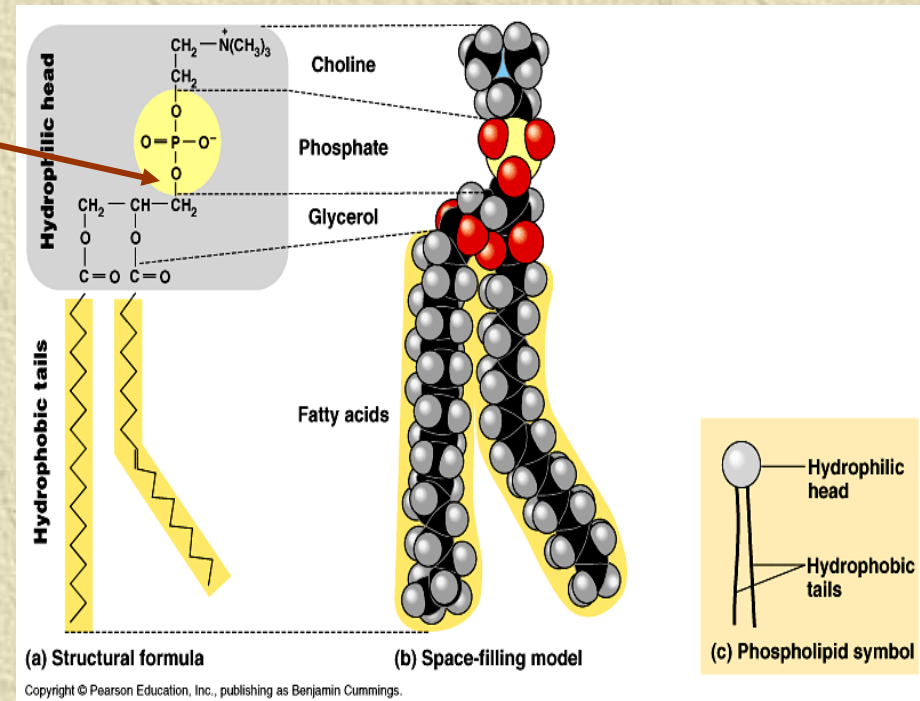
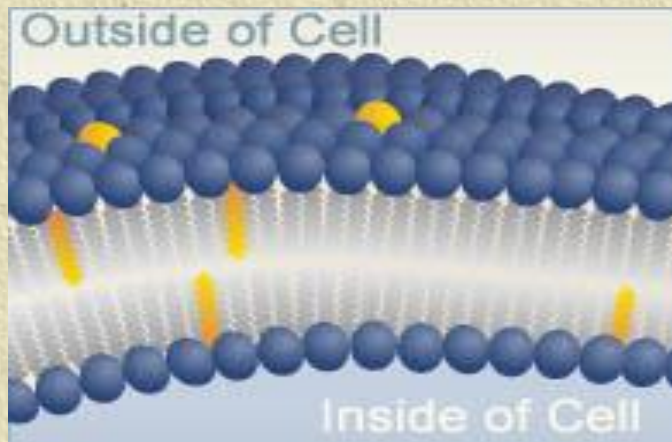
- ◆ All _____ between C atoms
- ◆ _____ at room temp
- ◆ Most animal fats – lard, butter, etc.
- ◆ Contribute to cardiovascular disease (atherosclerosis – plaques in blood vessel walls)

✦ **Unsaturated Fats:**

- ◆ Has 1 or > _____ between C atoms – results in a kink in the HC chain
- ◆ Usually _____ at room temp
- ◆ Fats of plants and fish – olive oil, cod oil,
- ◆ Kinks prevent fats from packing close together

Phospholipids

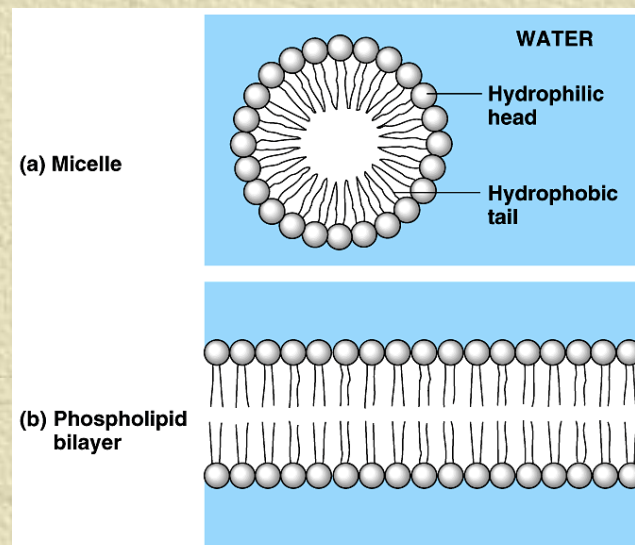
- ☀ _____ +
glycerol
- ☀ 3rd (-OH) joined to
(PO⁴⁻) group.
- ☀ Make up the boundary
of cell and external



Phospholipids

✦ Self assemble into _____
in aqueous solutions that shield hydrophobic tails
from water.

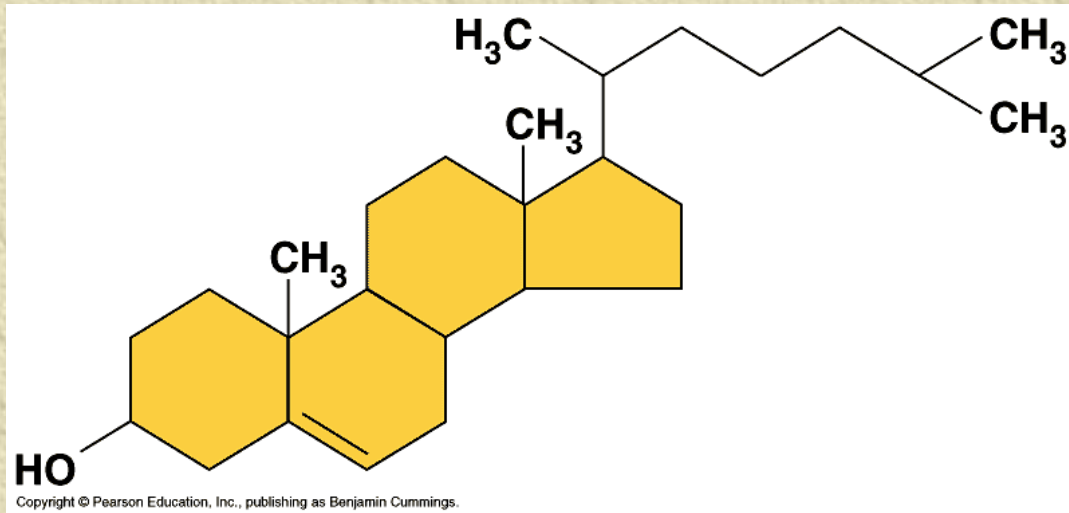
- ✦ 'Tails' hydrophobic; 'heads' hydrophilic
- ✦ _____ - (phospholipid droplet in water)



Steroids

✦ Lipids composed of carbon skeleton of _____

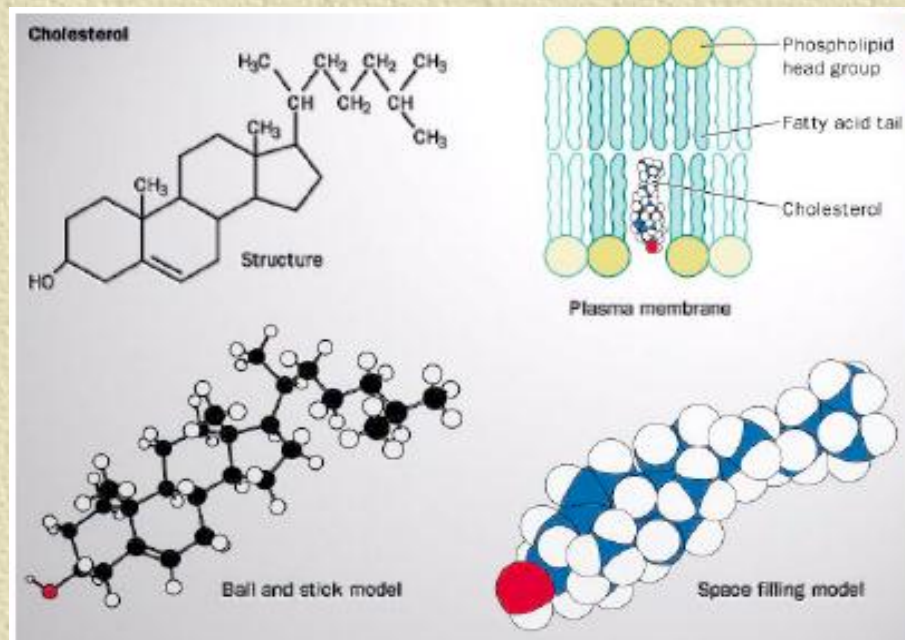
✦ Vary based on _____
attached to rings



Steroids - Cholesterol

✦ Component of animal cell membranes

✦ Helps _____



Steroids - Cholesterol

- ✦ Precursor to sex hormones such as estrogen and testosterone.
- ✦ Cholesterol → _____

