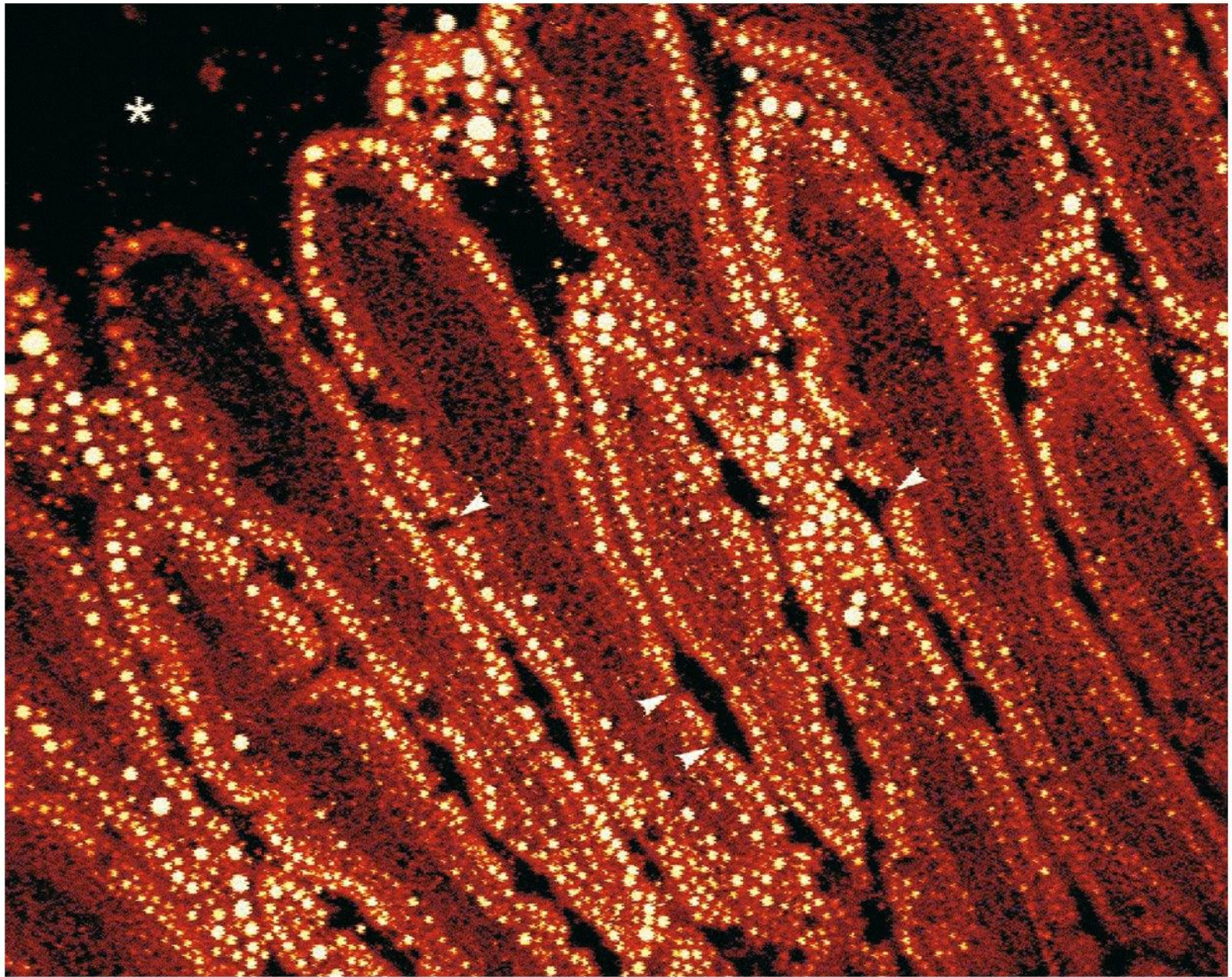


# Lipids

**Dr. Hadi Ansarihadipour**

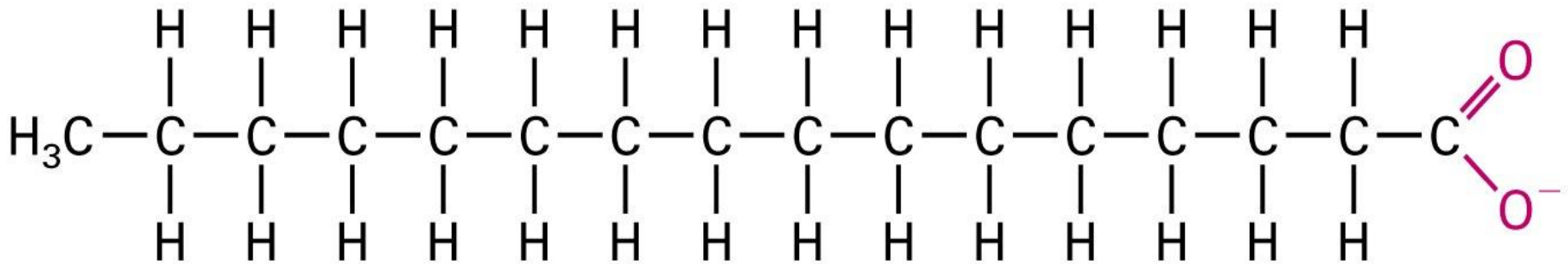
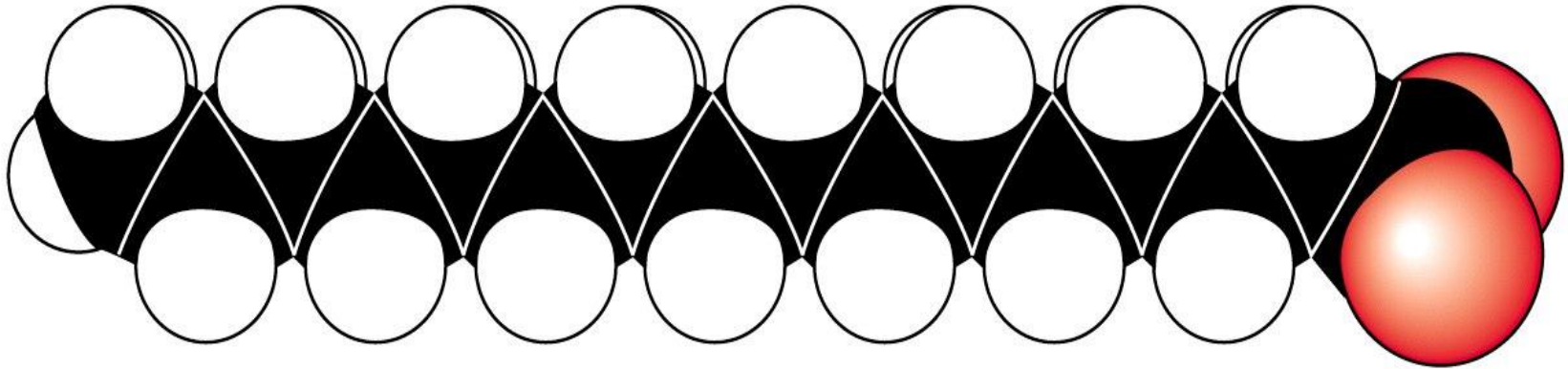


# **Lipids: Alcohol+ Fatty acid**

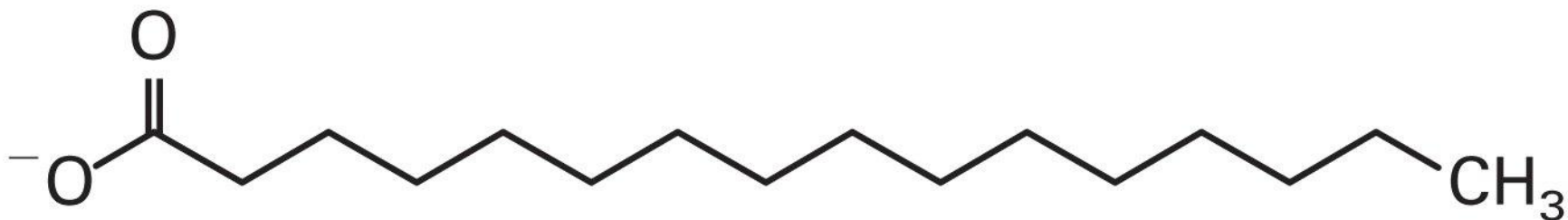
- 1. Glycerol:** Acylglycerol, glyceride
- 2. Sphingosine:** Sphingolipids
- 3. Fatty Alcohols:** Wax
- 4. Cholesterol:** Cholesterol esters

**Fatty acid derivatives:** Eicosanoids, Terpens,

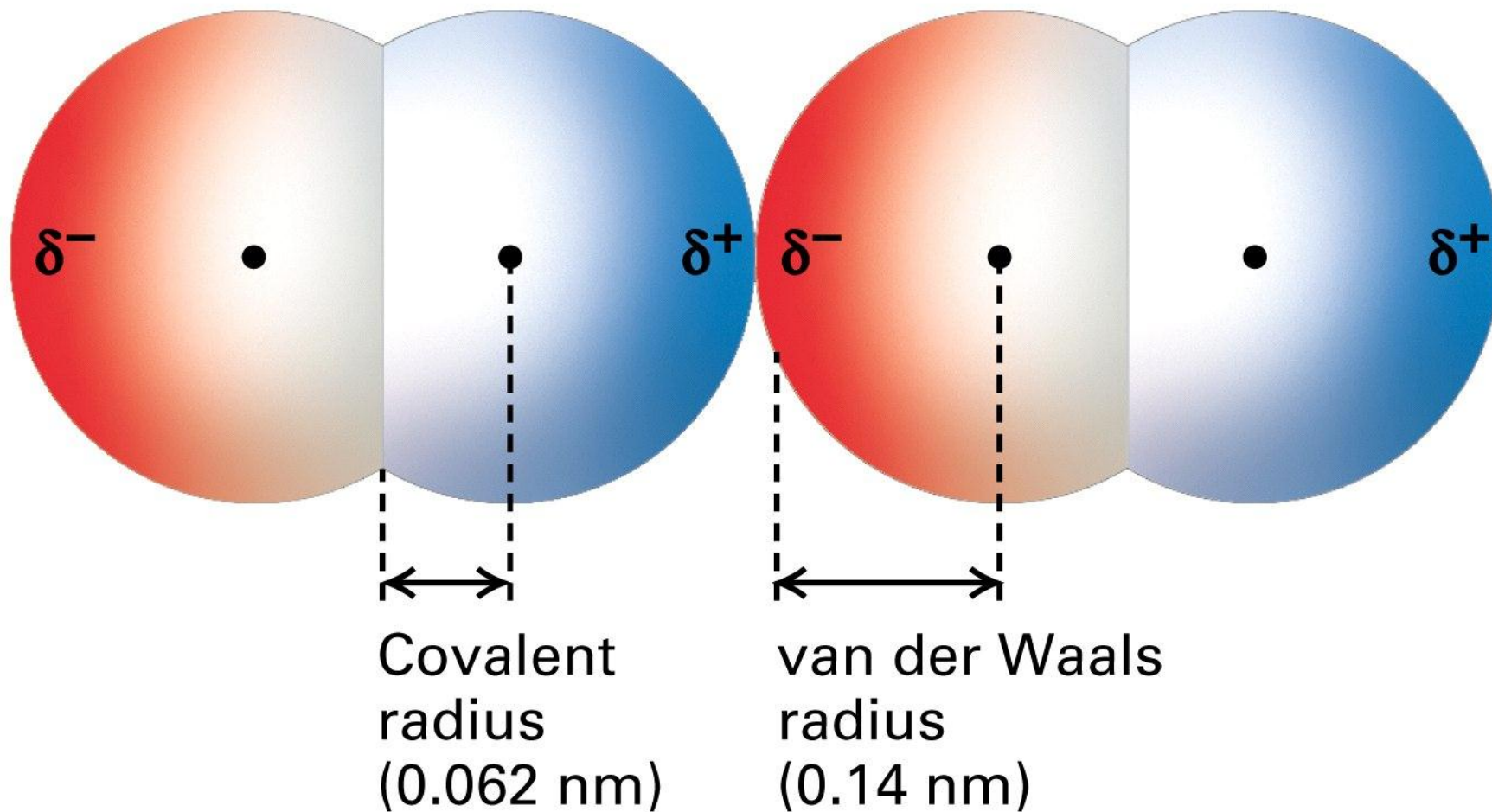




**Palmitate**  
**(ionized form of palmitic acid)**



**Fatty acid  
(palmitate)**



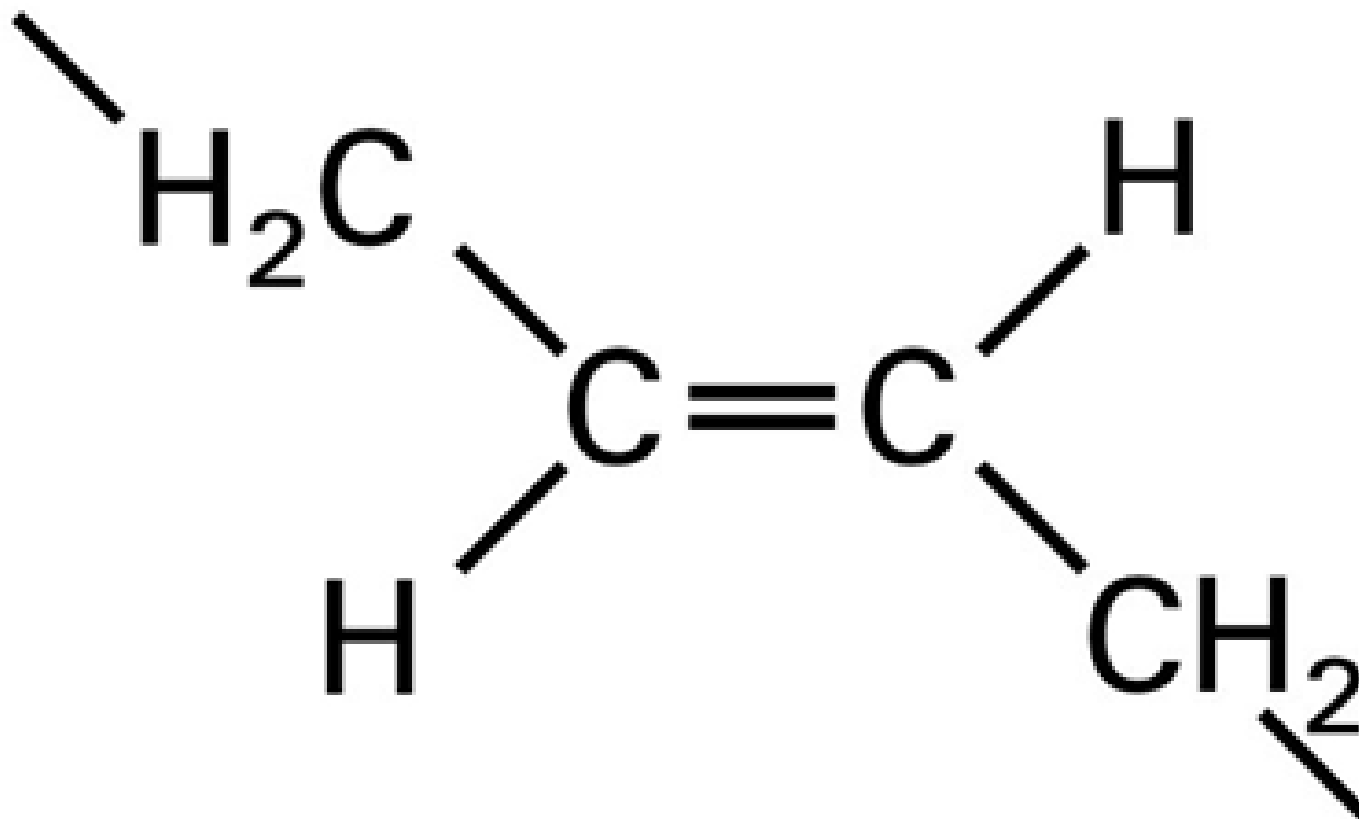
# SATURATED FATTY ACIDS

	Abbreviation	Chemical Formula
Myristic	C14:0	$\text{CH}_3(\text{CH}_2)_{12}\text{COOH}$
Palmitic	C16:0	$\text{CH}_3(\text{CH}_2)_{14}\text{COOH}$
Stearic	C18:0	$\text{CH}_3(\text{CH}_2)_{16}\text{COOH}$

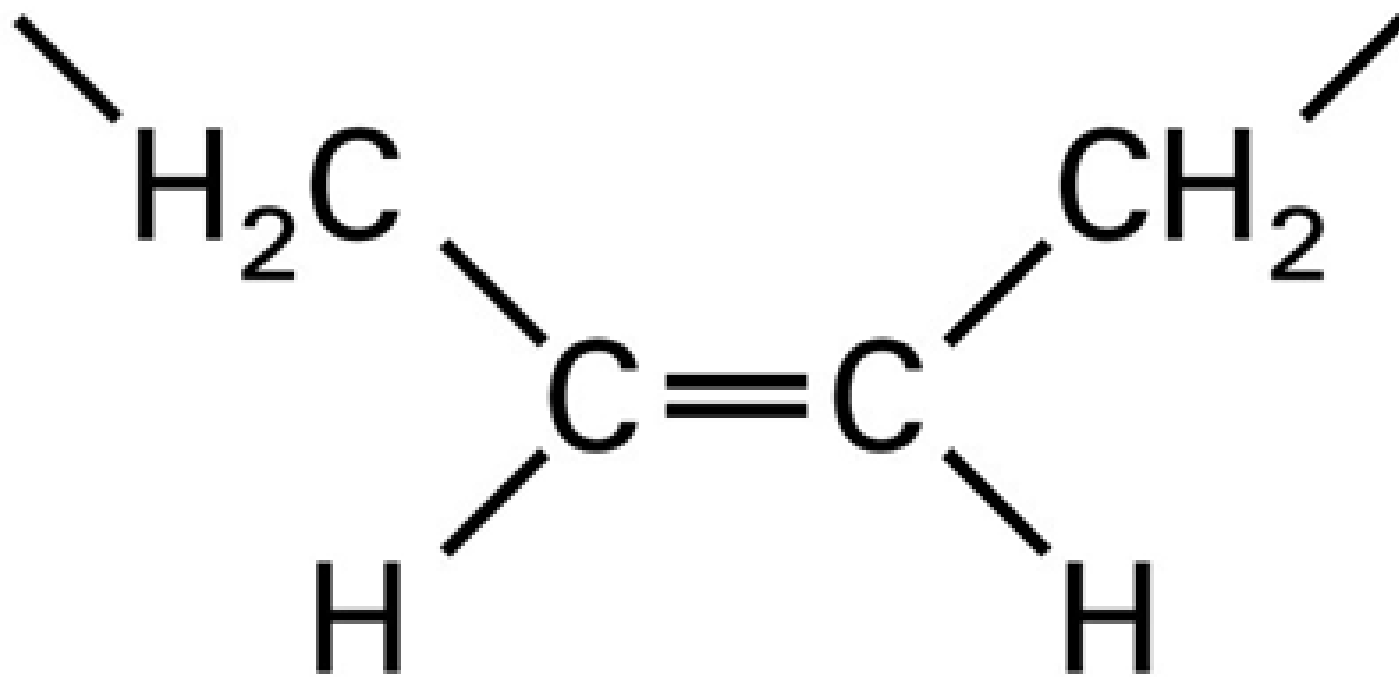
## UNSATURATED FATTY ACIDS

Abbreviation	Chemical Formula	
Oleic	C18:1	$\text{CH}_3(\text{CH}_2)_7\text{CH}=\text{CH}(\text{CH}_2)_7\text{COOH}$
Linoleic	C18:2	$\text{CH}_3(\text{CH}_2)_4\text{CH}=\text{CHCH}_2\text{CH}=\text{CH}(\text{CH}_2)_7\text{COOH}$
Arachidonic	C20:4	$\text{CH}_3(\text{CH}_2)_4(\text{CH}=\text{CHCH}_2)_3\text{CH}=\text{CH}(\text{CH}_2)_3\text{COOH}$

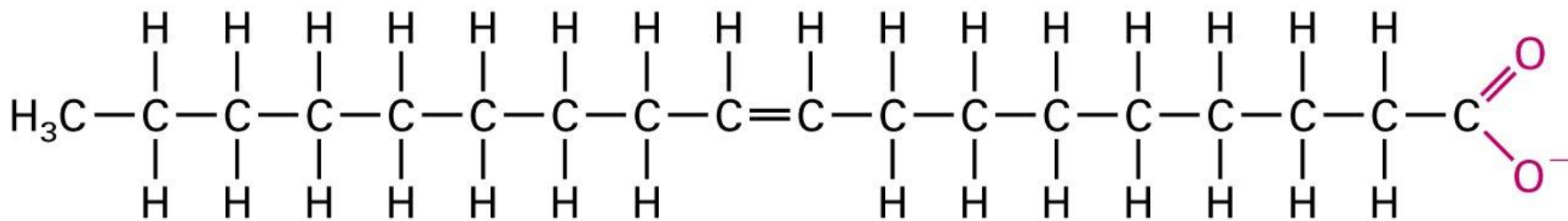
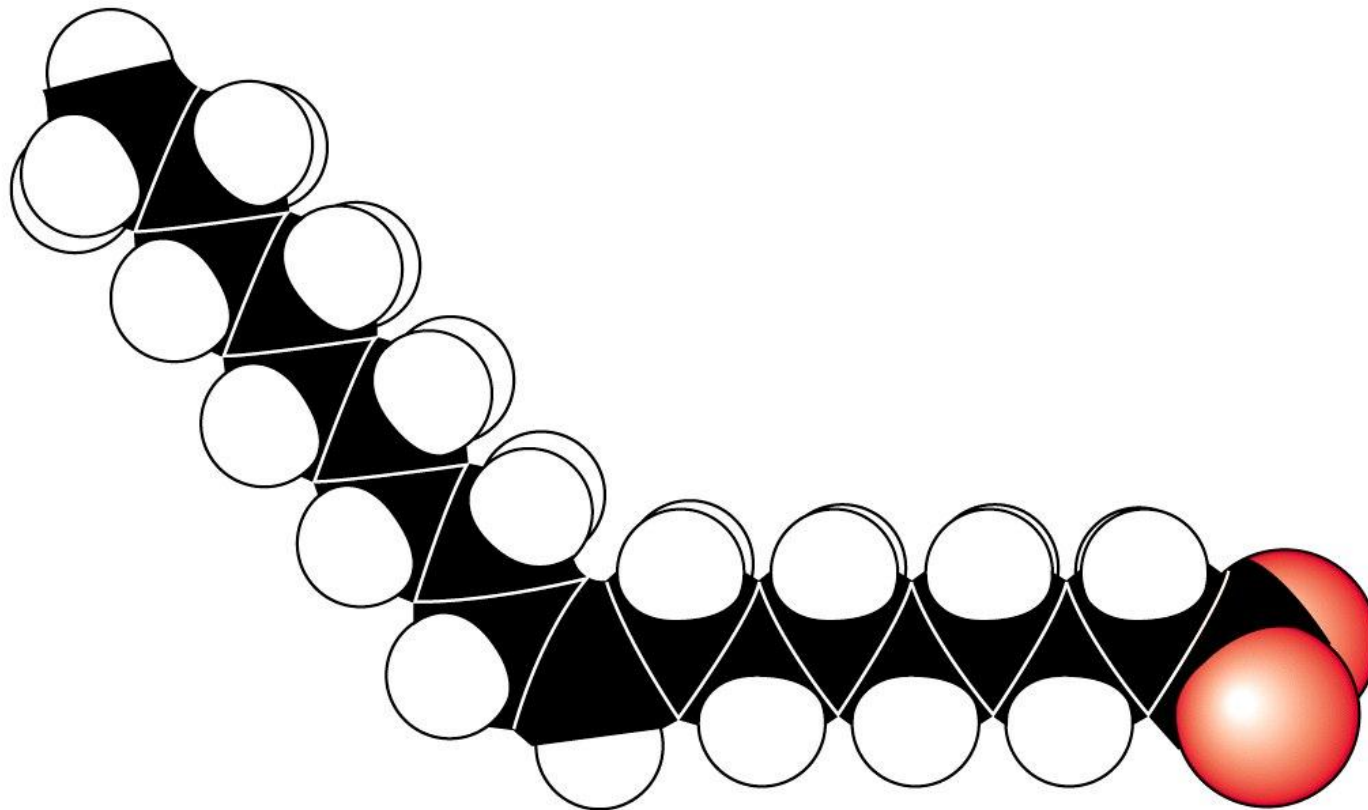




**Trans**



**Cis**

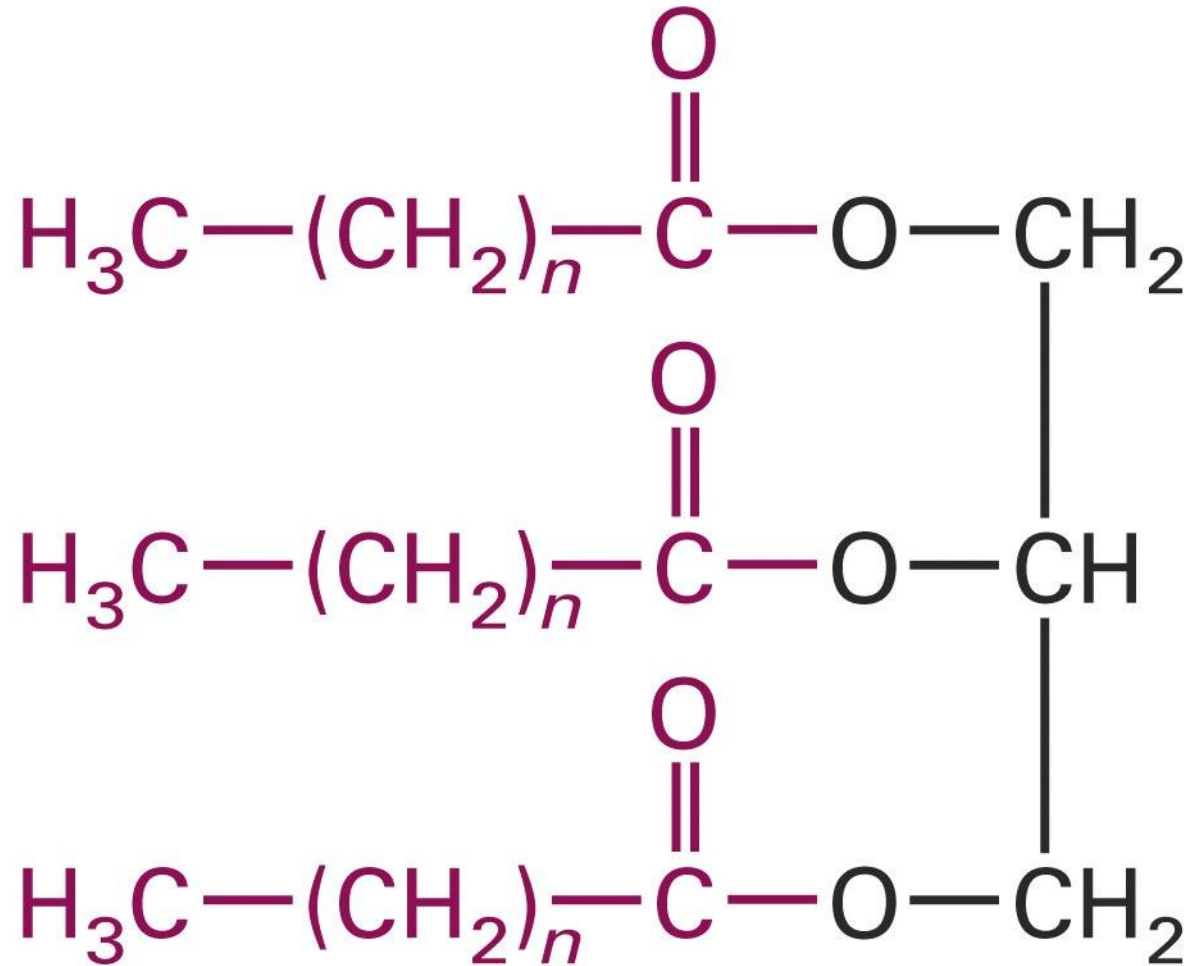


**Oleate**  
**(ionized form of oleic acid)**

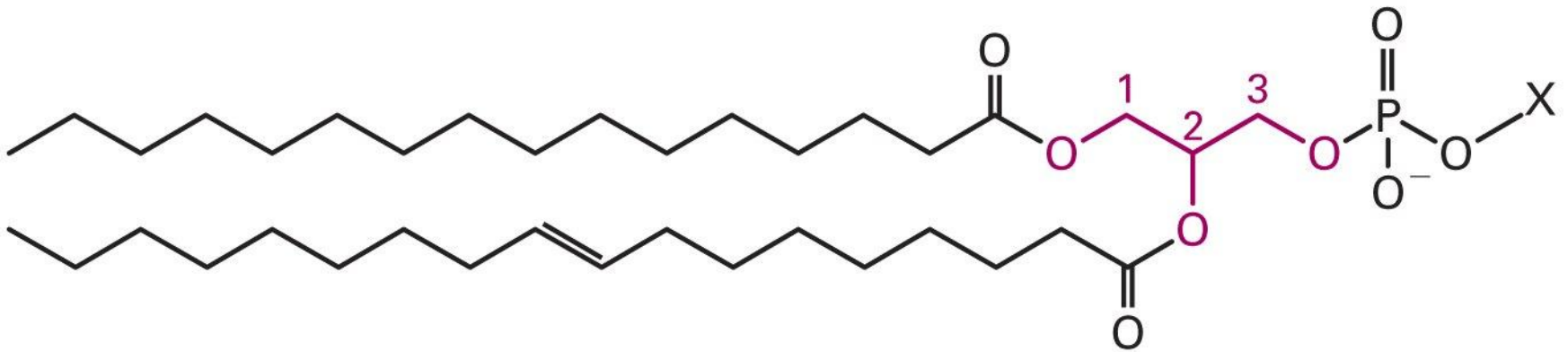
آسیدل گلیسرول، گلیسرید

Acylrol, Glyceride

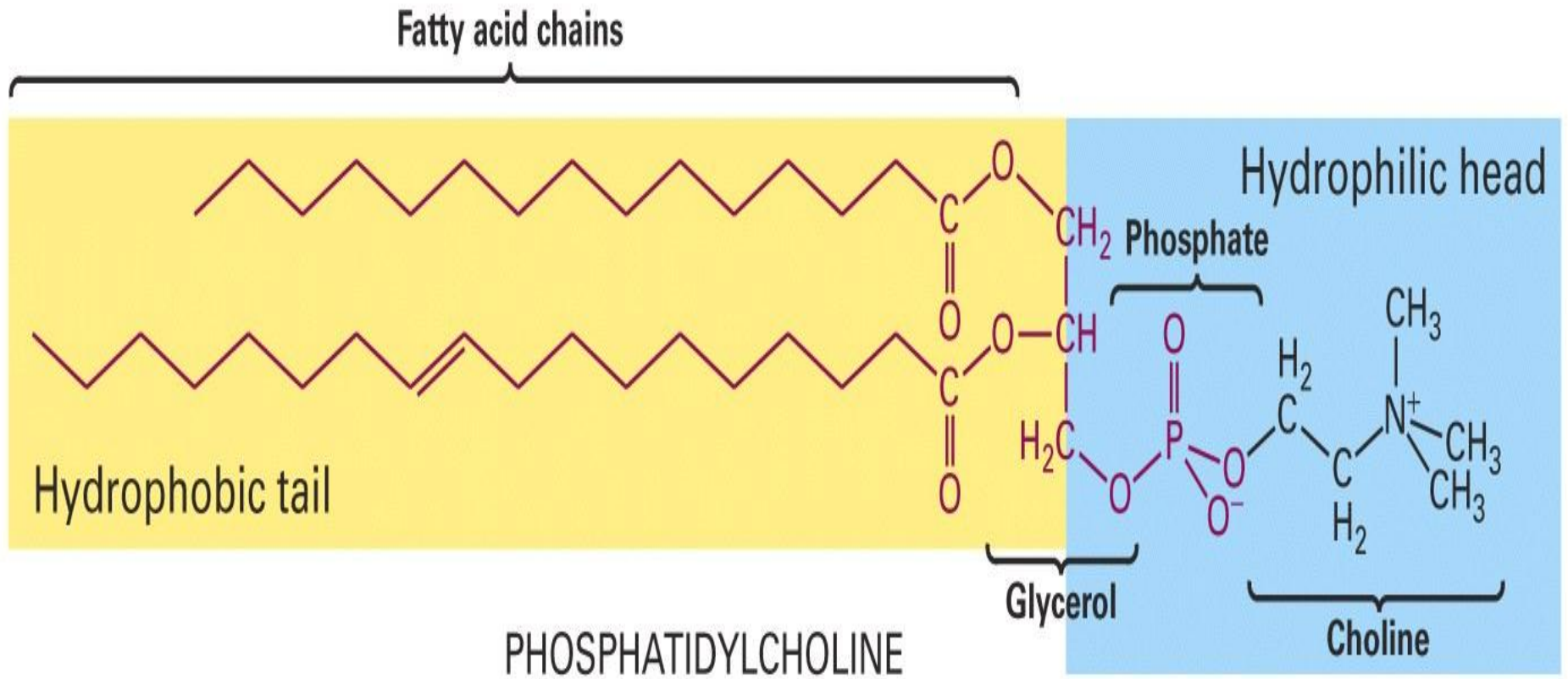


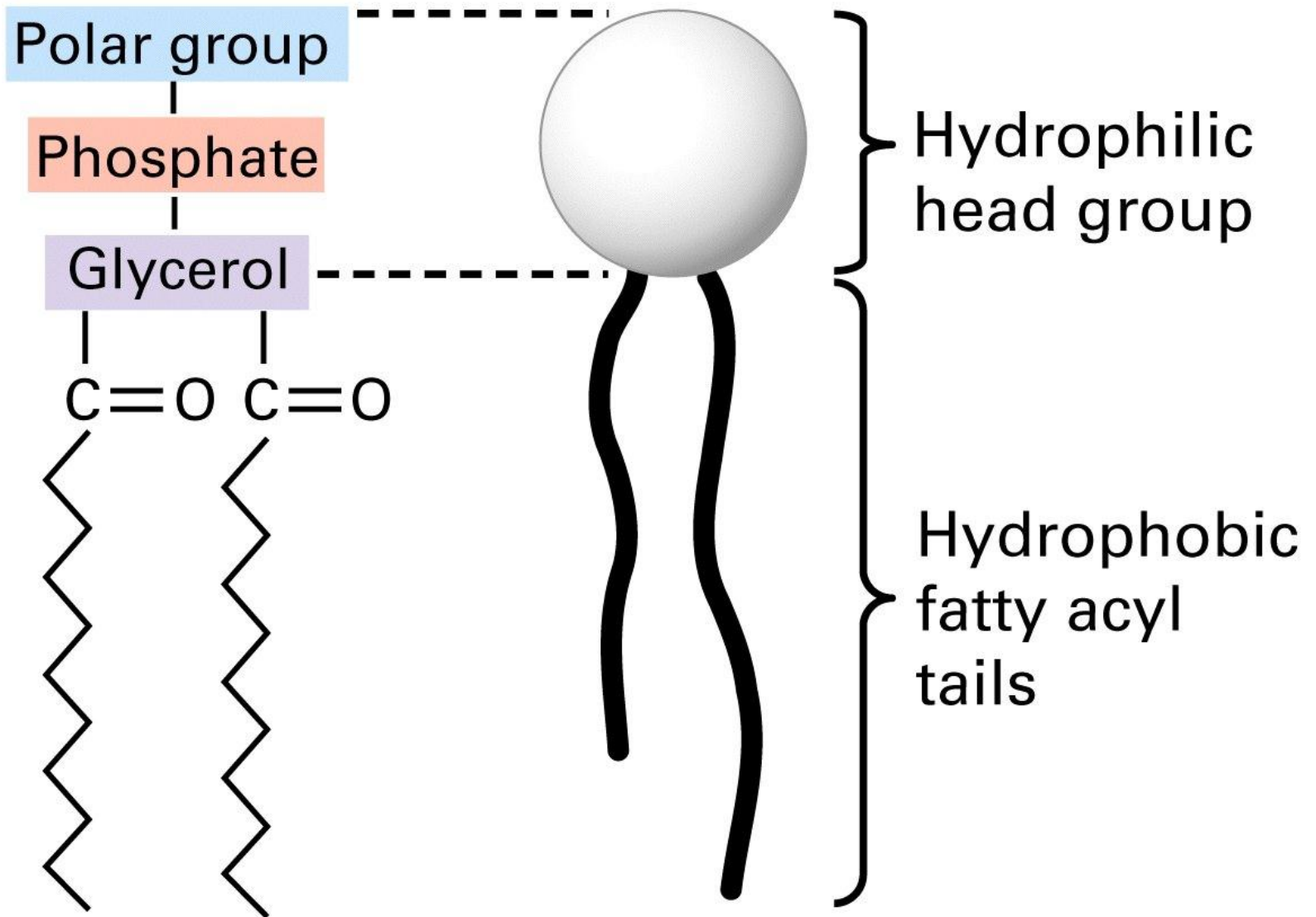


# Triacylglycerol



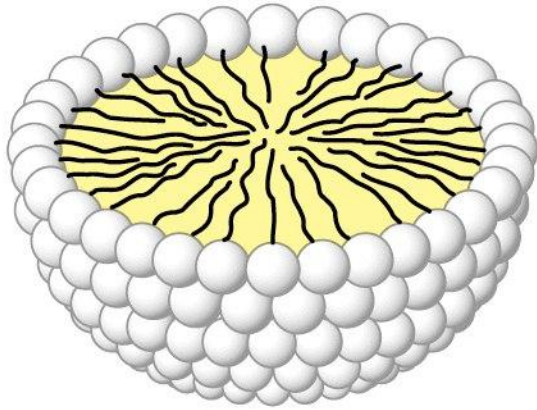
**Phospholipid  
(glycerol phospholipid)**



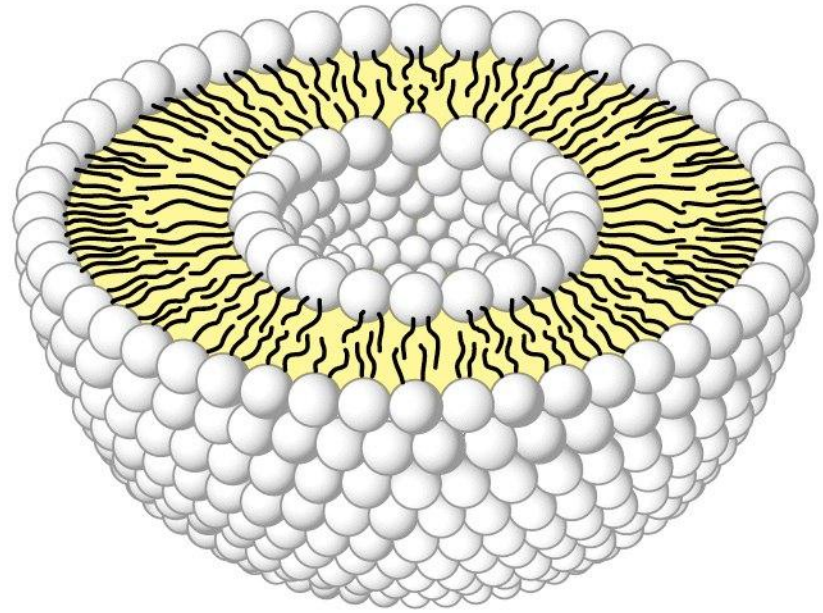


## Glycerophospholipid

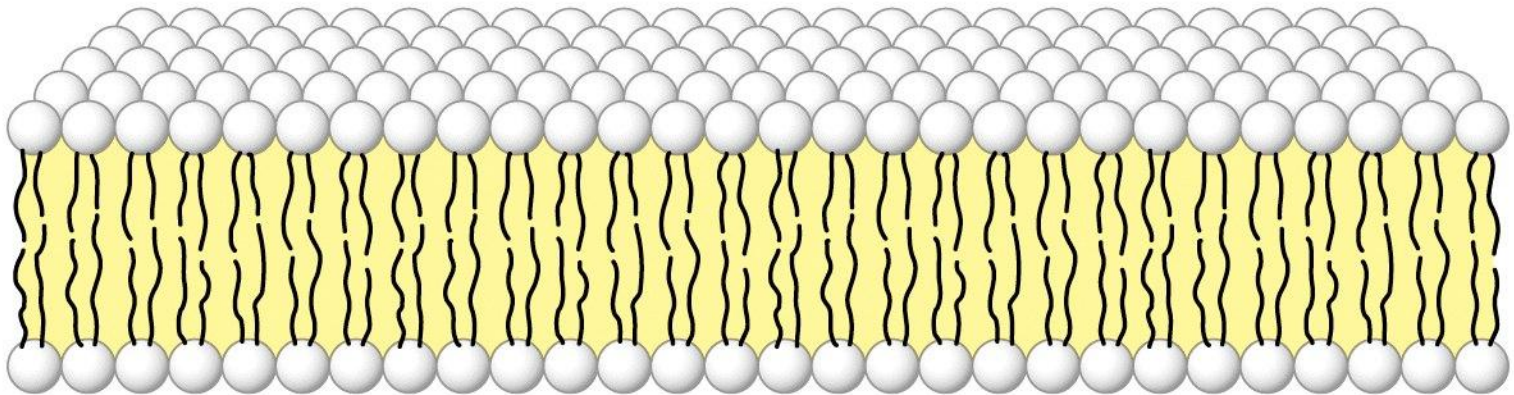




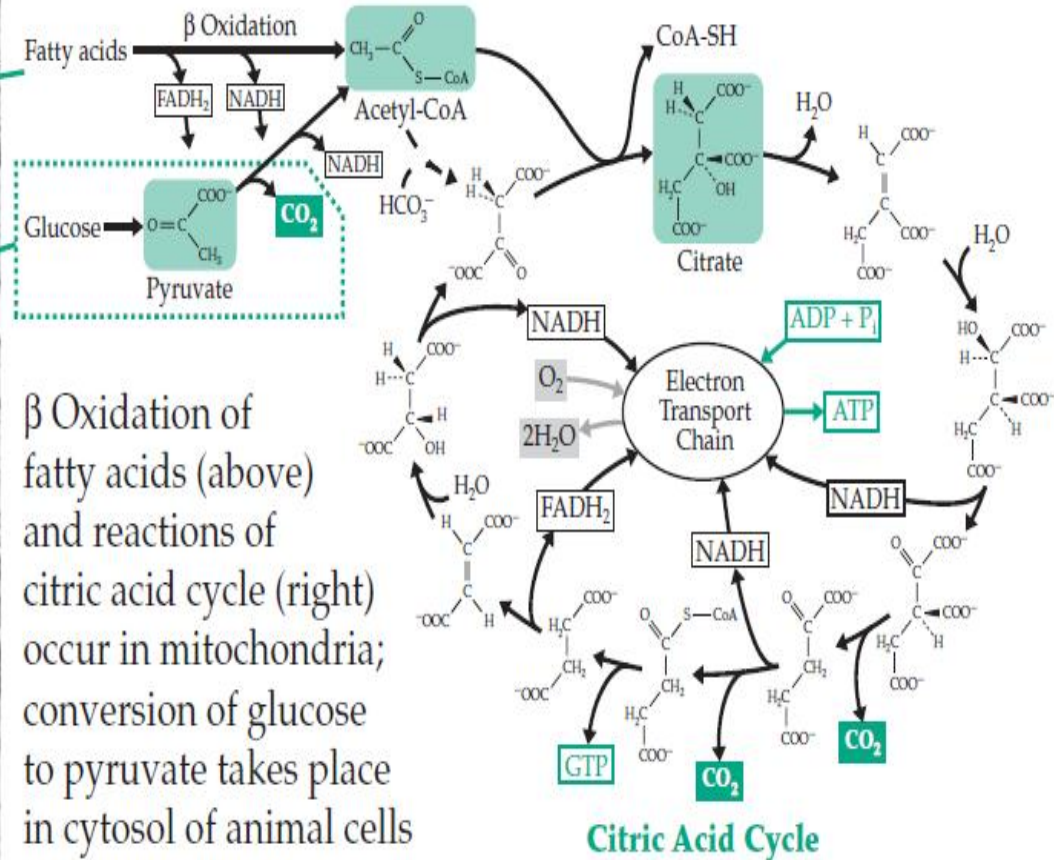
Micelle



Liposome

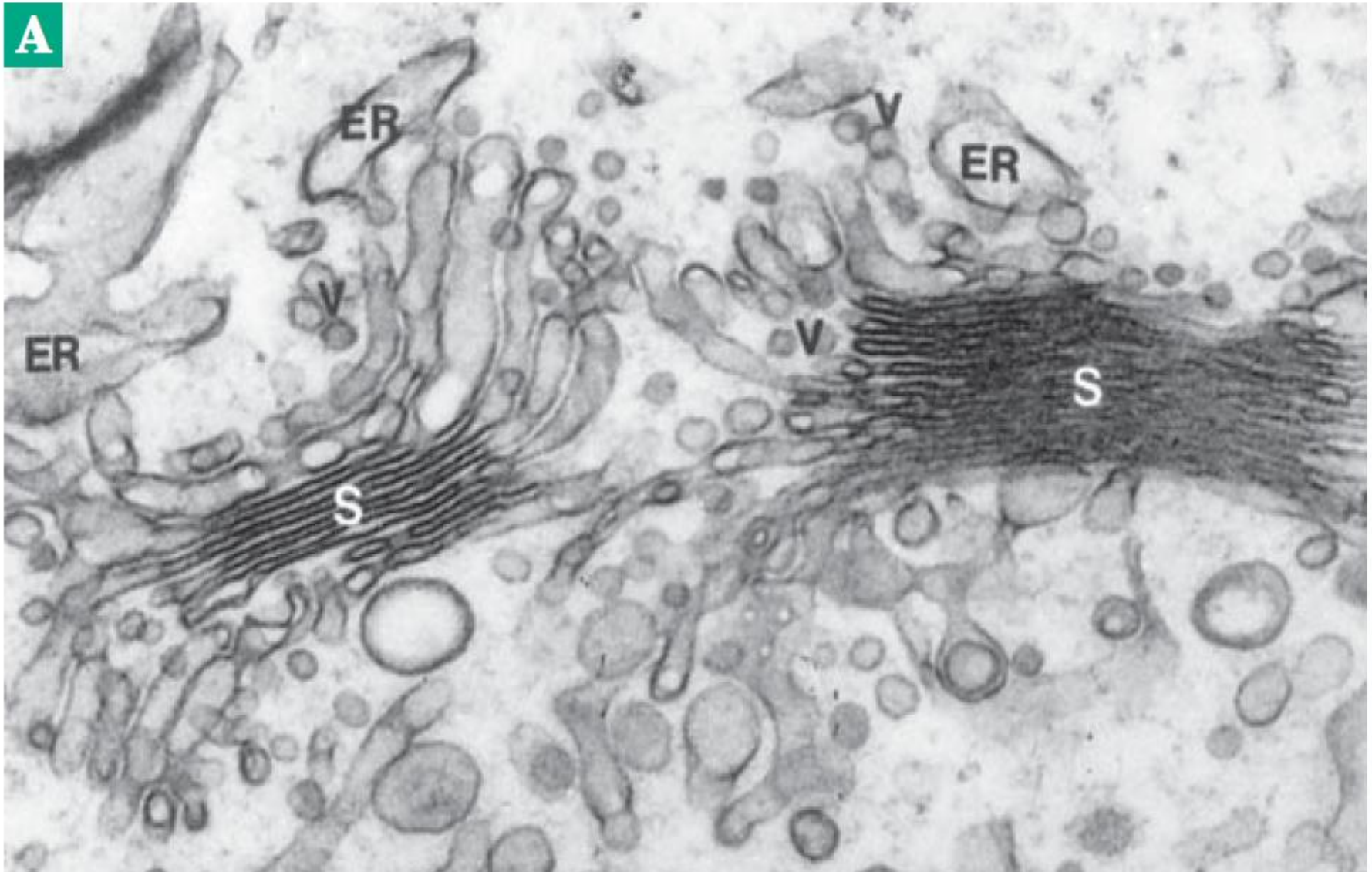


Phospholipid bilayer



β Oxidation of fatty acids (above) and reactions of citric acid cycle (right) occur in mitochondria; conversion of glucose to pyruvate takes place in cytosol of animal cells



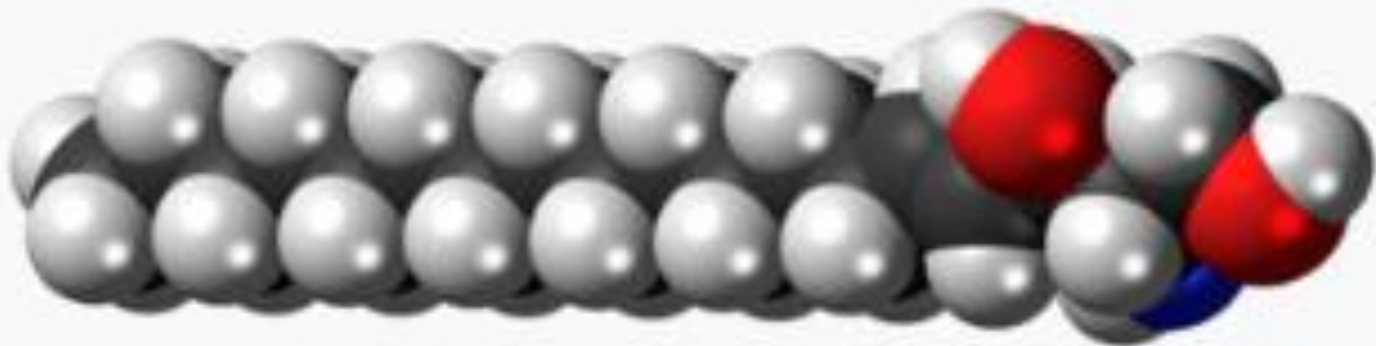
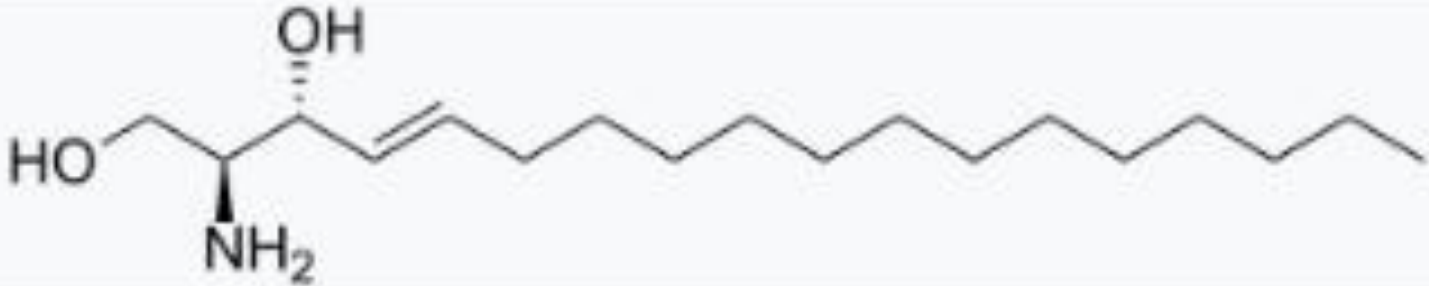


**Figure 20-8** (A) Electron micrograph showing a transverse section through part of the Golgi apparatus of an early spermatid. Cisternae of the ER, Golgi stacks (S), and vesicles (V) can be seen. Curved arrows point to associated tubules. Magnification X45,000.<sup>276</sup> Courtesy of Y. Clermont. (B) Scheme showing functions of endoplasmic reticulum, transfer vesicles, Golgi apparatus, and secretion vesicles in the metabolism of glycoproteins.

# Sphingolipid اسفنگولیپیدها

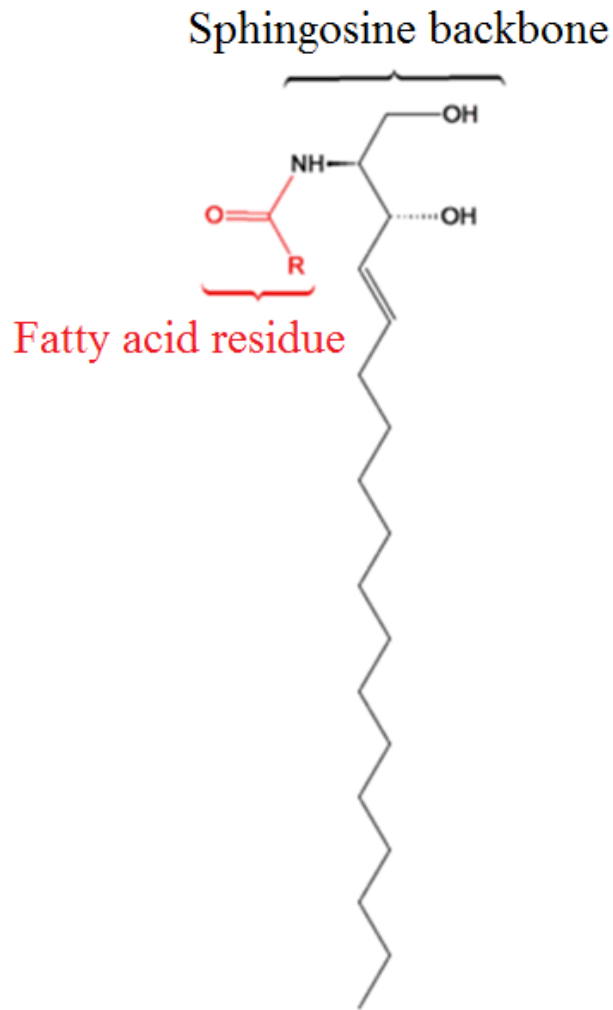


# Sphingosine

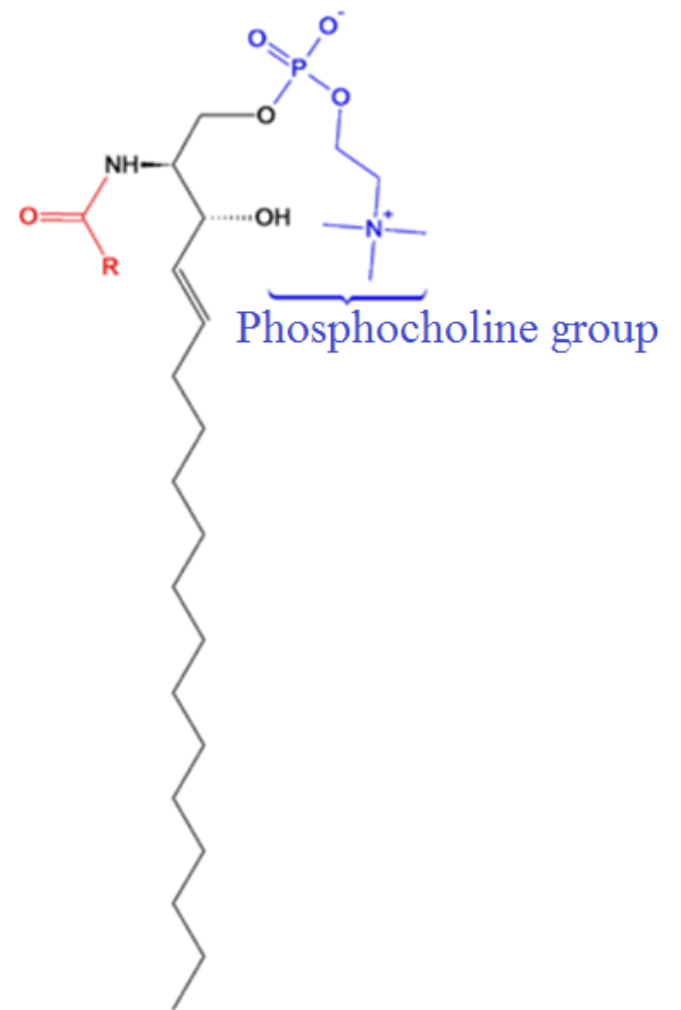




**Sphingosine**

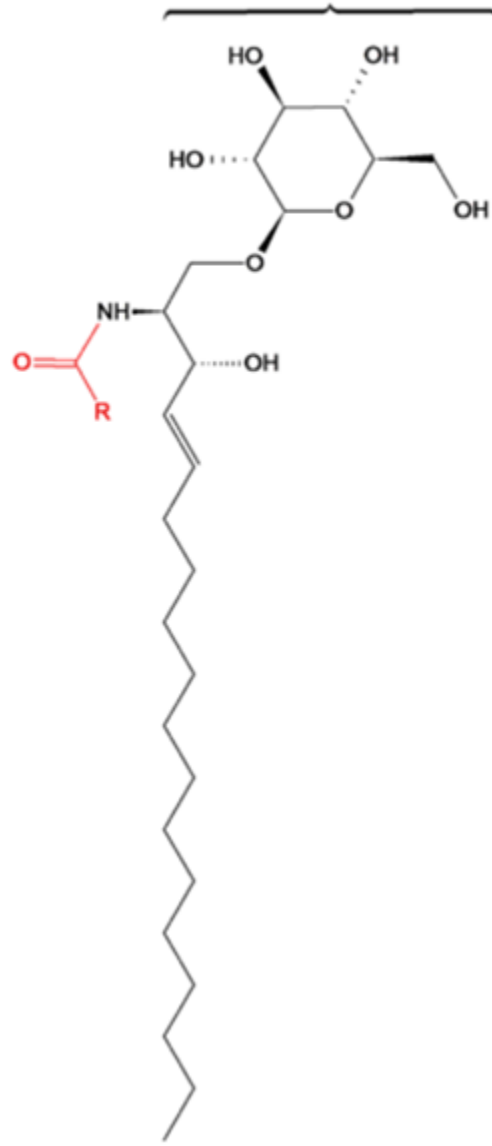


**Ceramide**



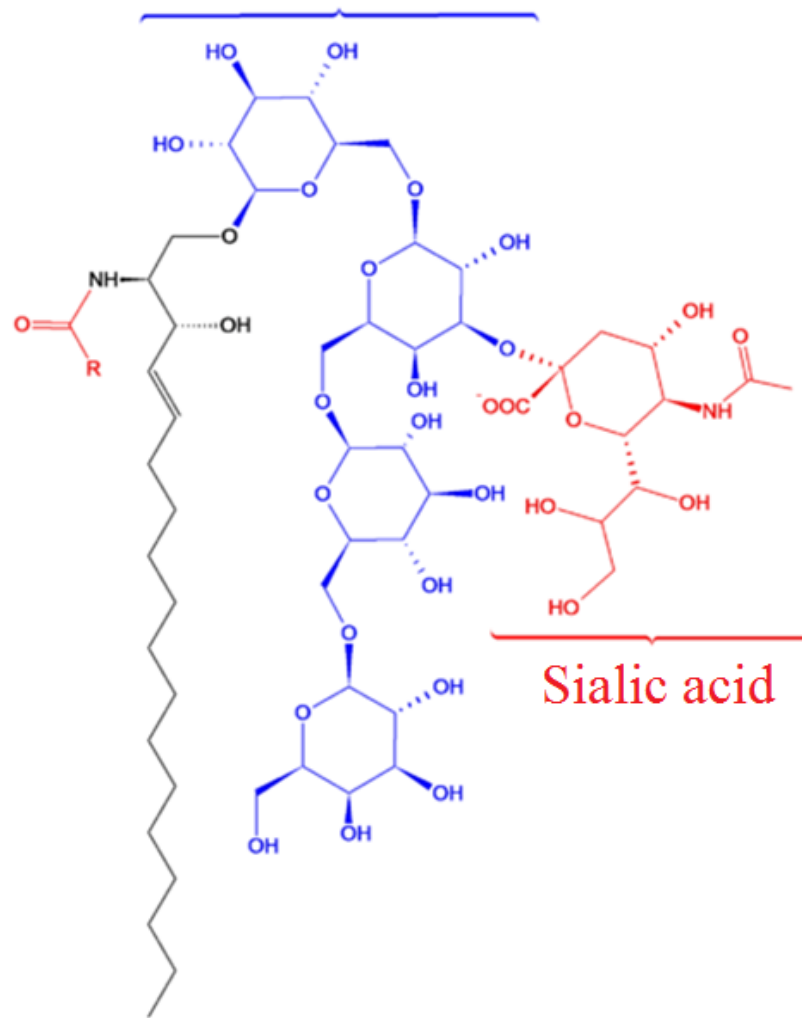
**Sphingomyelin**

Single suger residue



**Cerebroside**

## Oligosaccharide residue



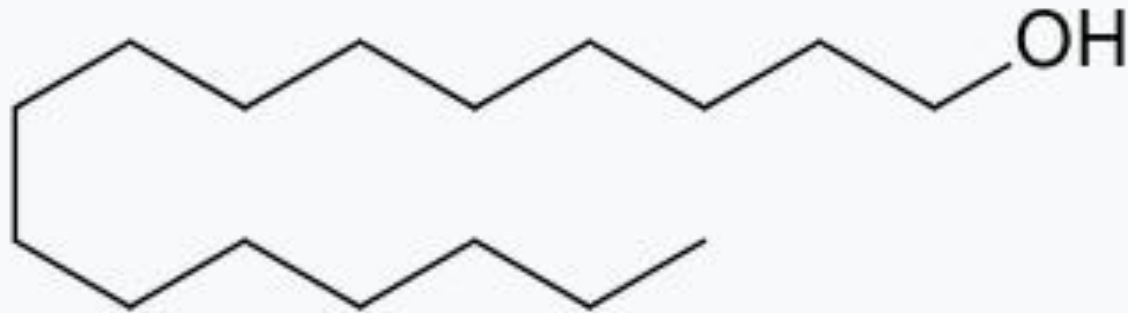
## A ganglioside

Hadi Ansarihadipour deazazma.com

Wax

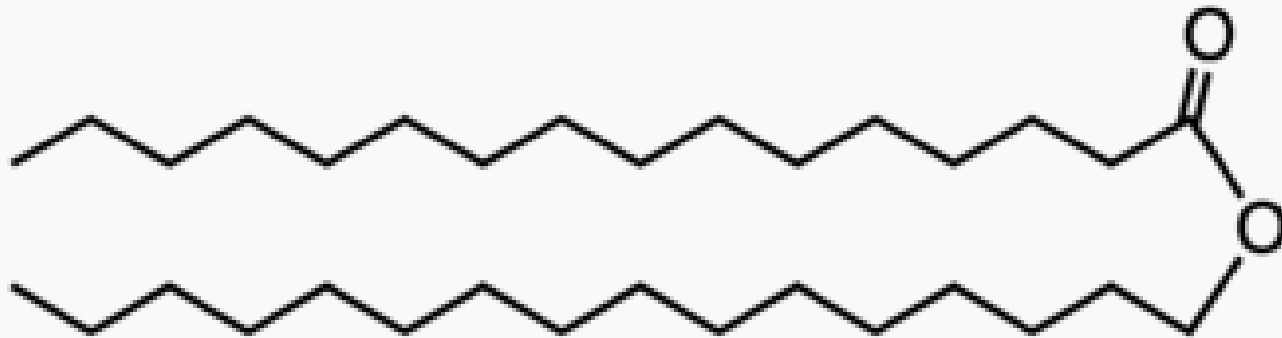
موم

# Cetyl alcohol

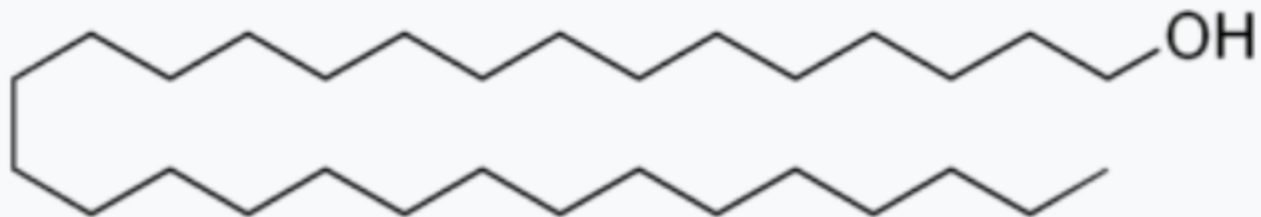




# Cetyl palmitate



# Triaccontanol



## Names

### IUPAC name

Triaccontan-1-ol

### Other names

1-Triaccontanol

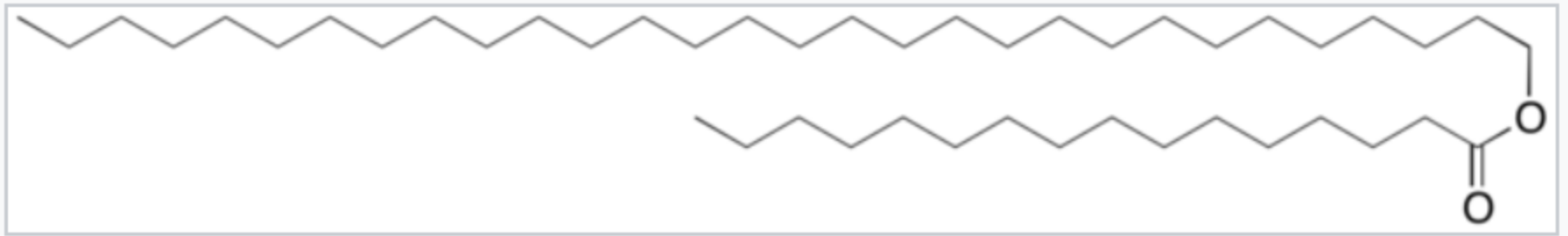
*n*-Triaccontanol

Melissyl alcohol

Myricyl alcohol

Beeswax

موم زنبور عسل

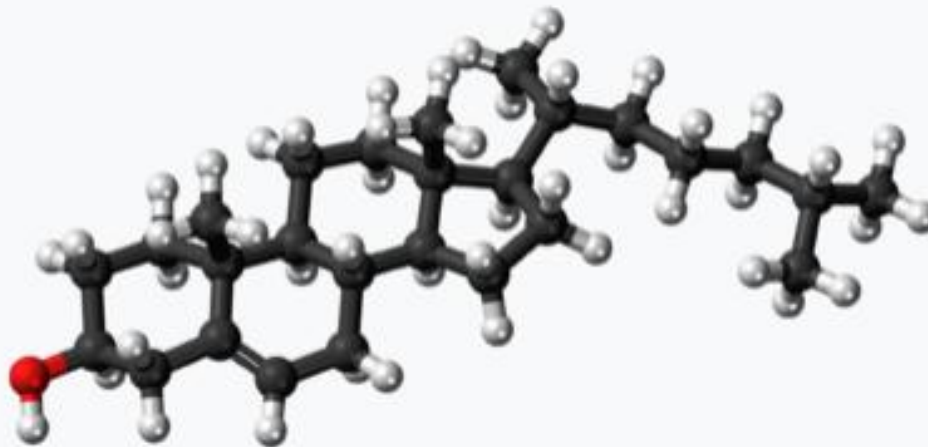
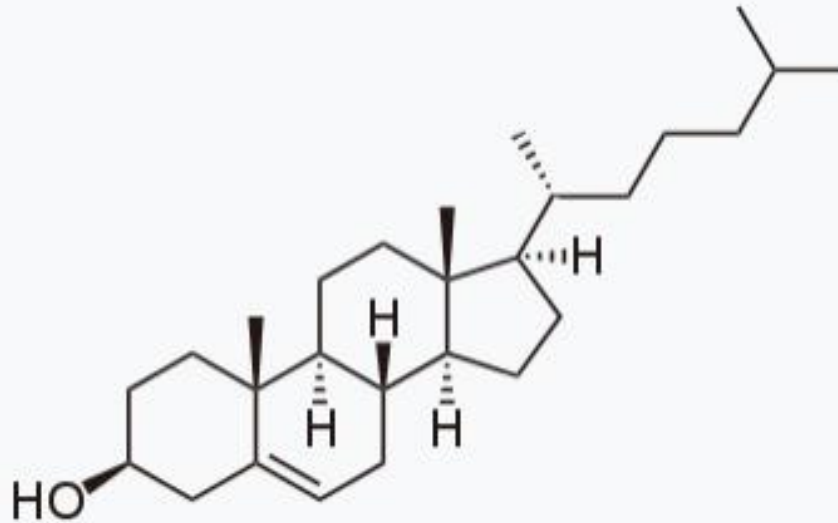


Triacontanyl palmitate

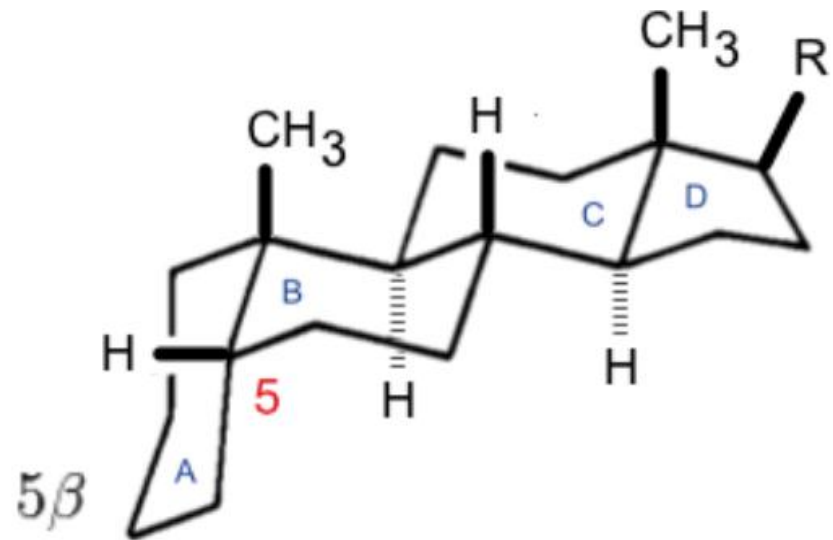
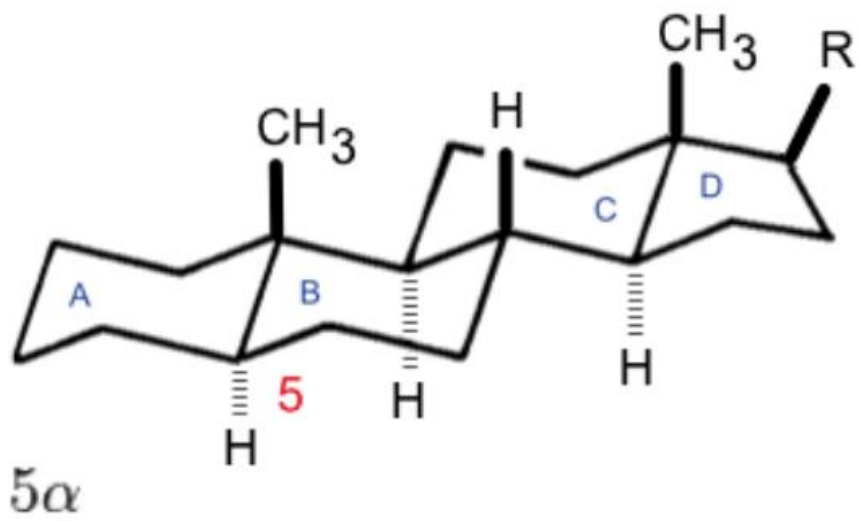
Cholesterol esters

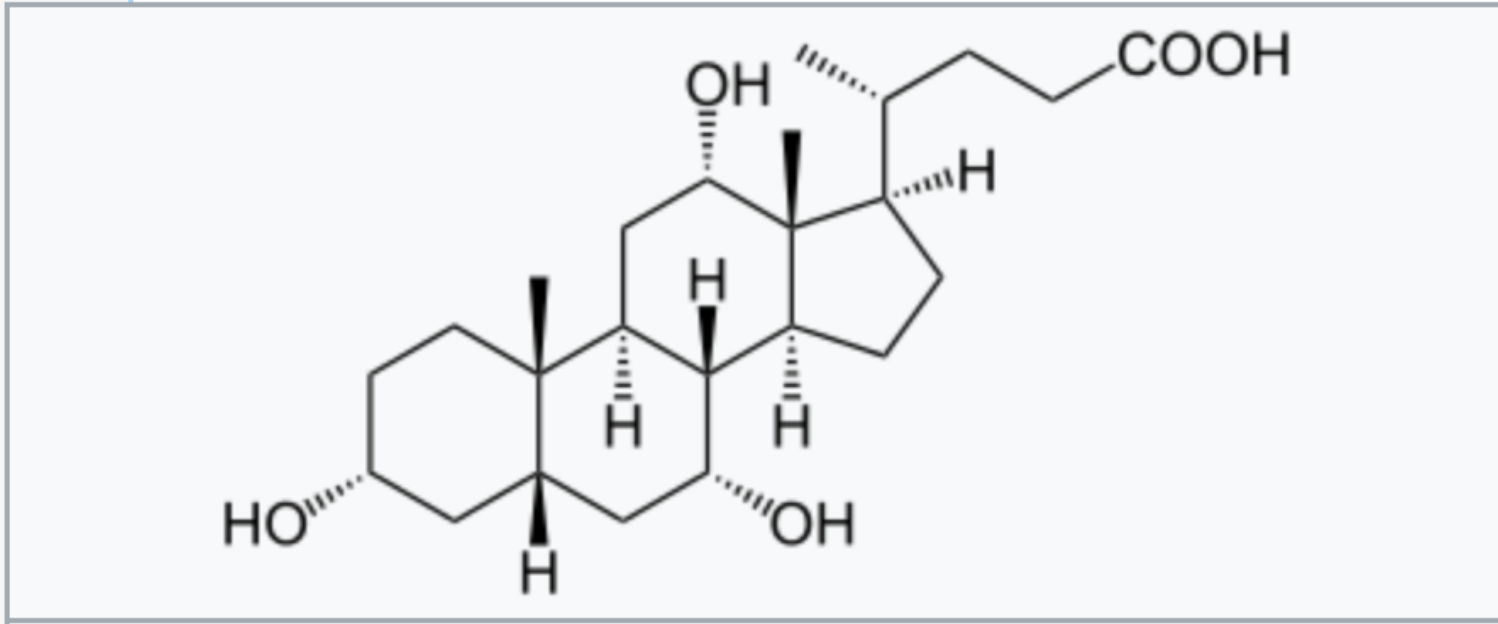
کلسترول استرها

# Cholesterol

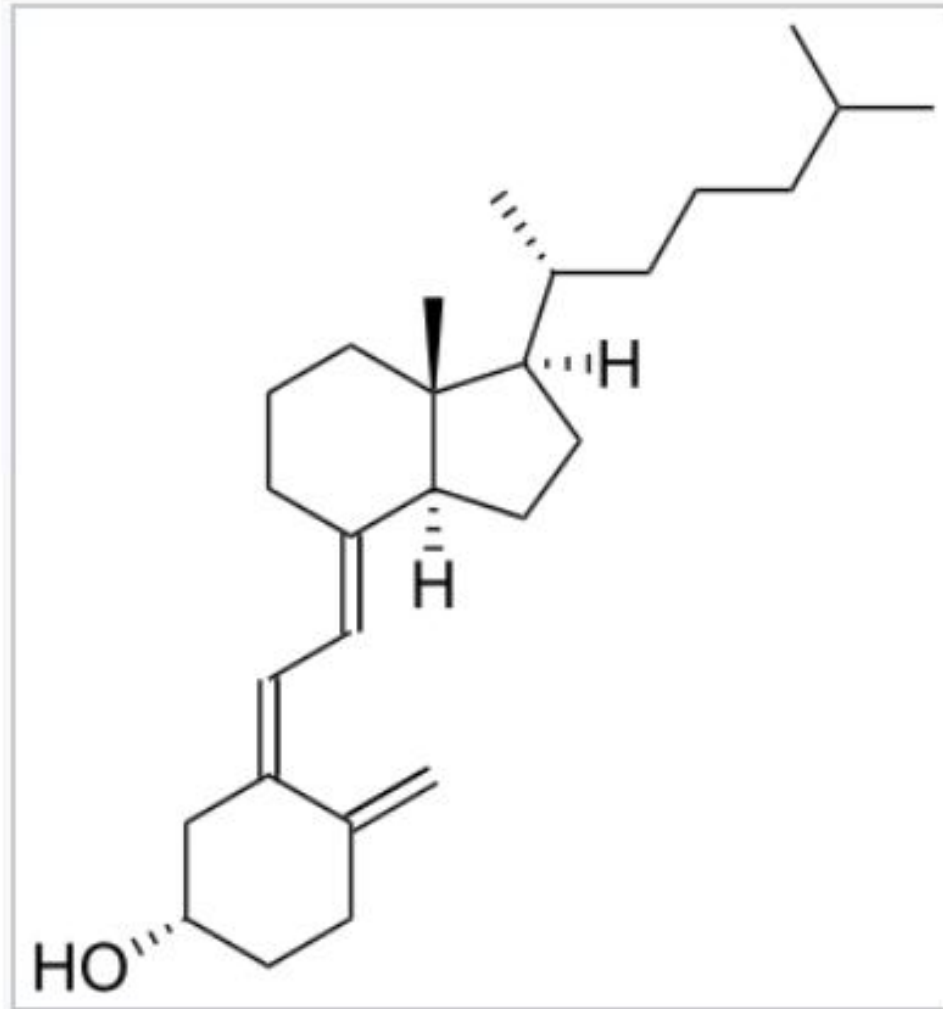




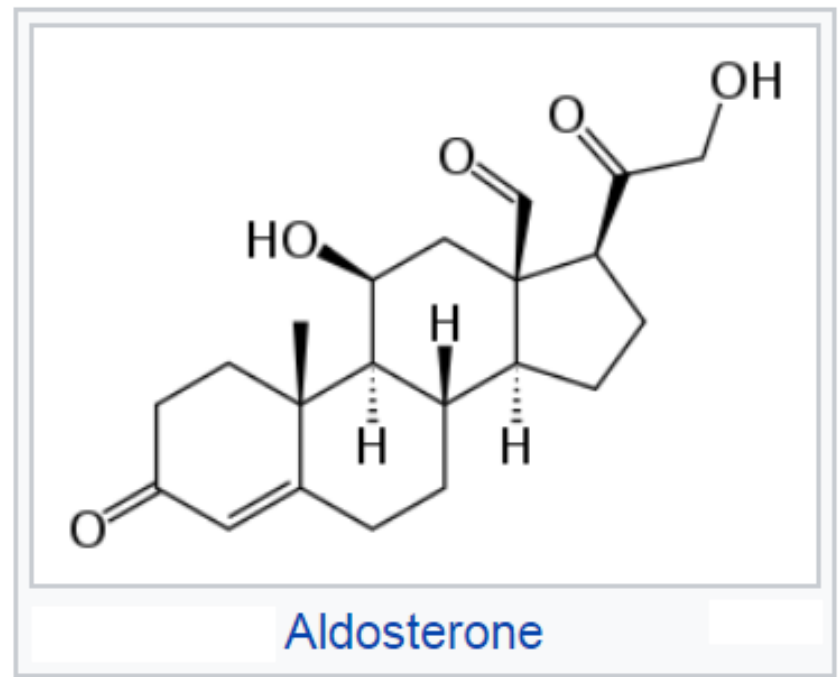
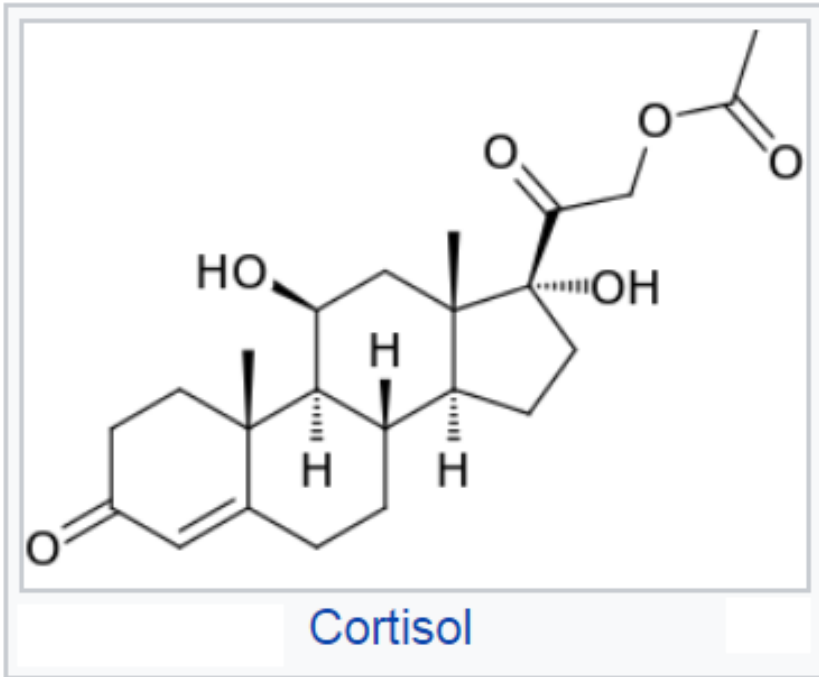


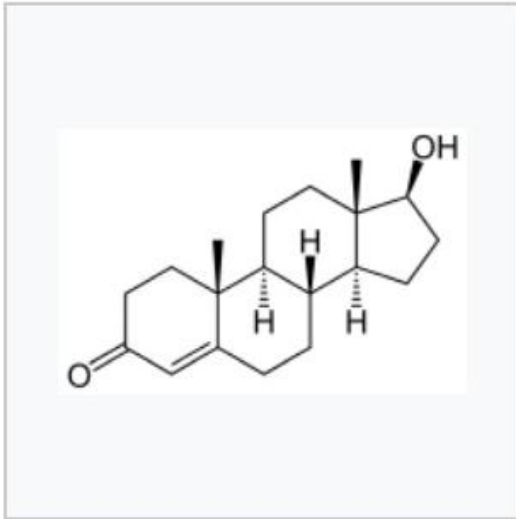


## Cholic acid

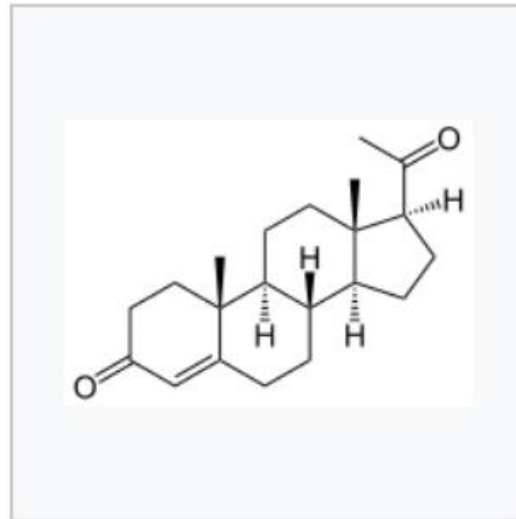


Cholecalciferol (vitamin D<sub>3</sub>)

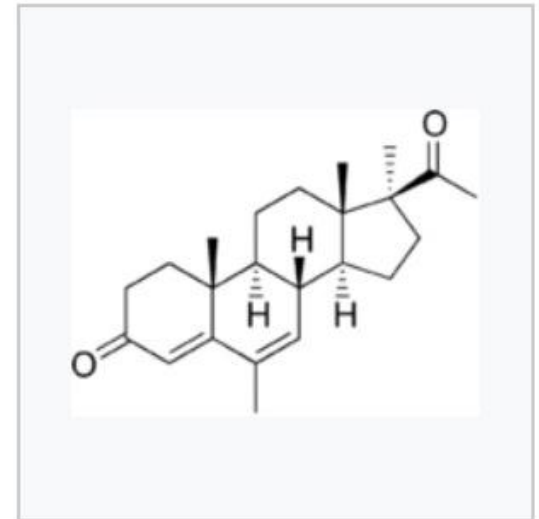




Testosterone, the

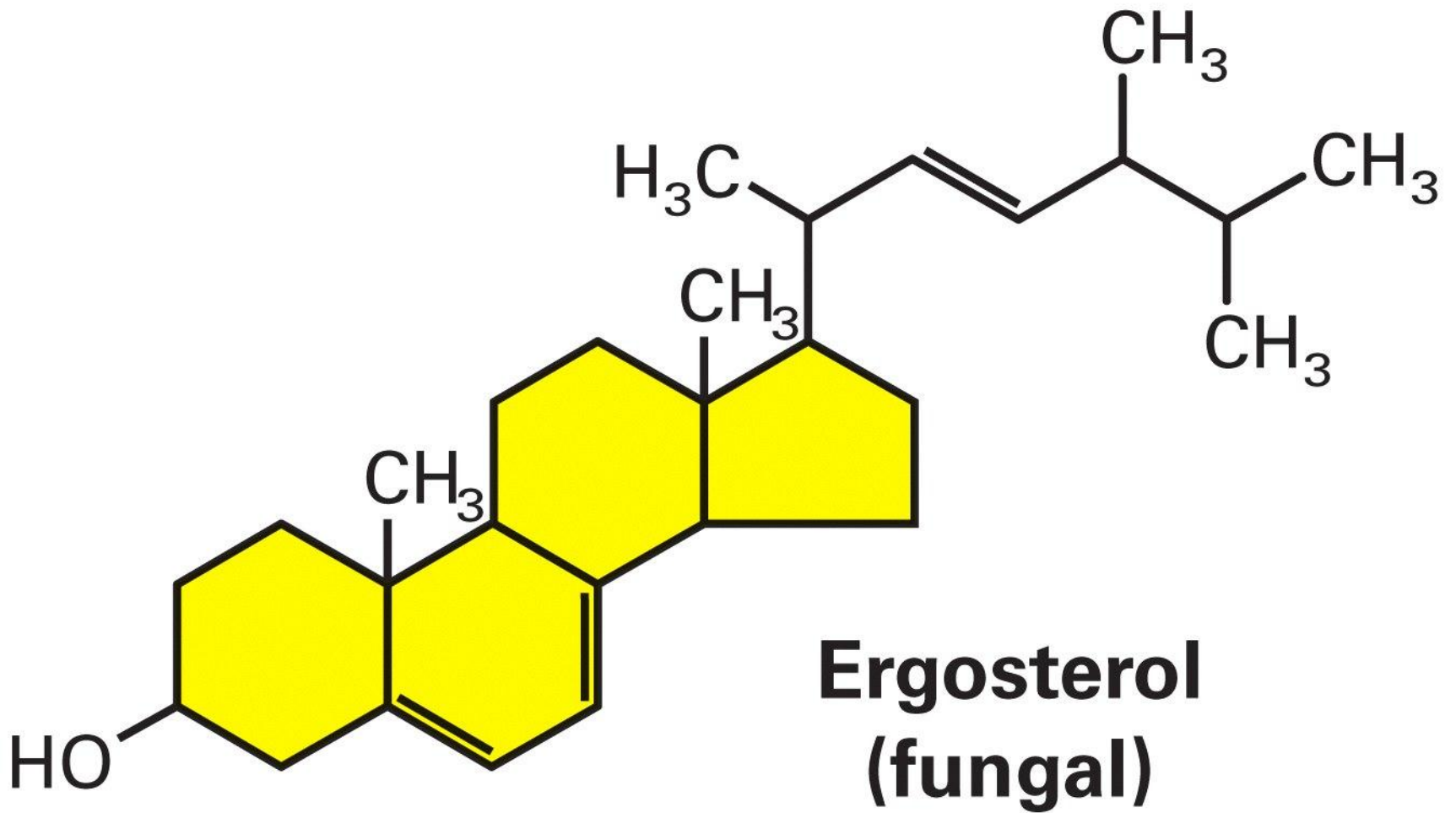


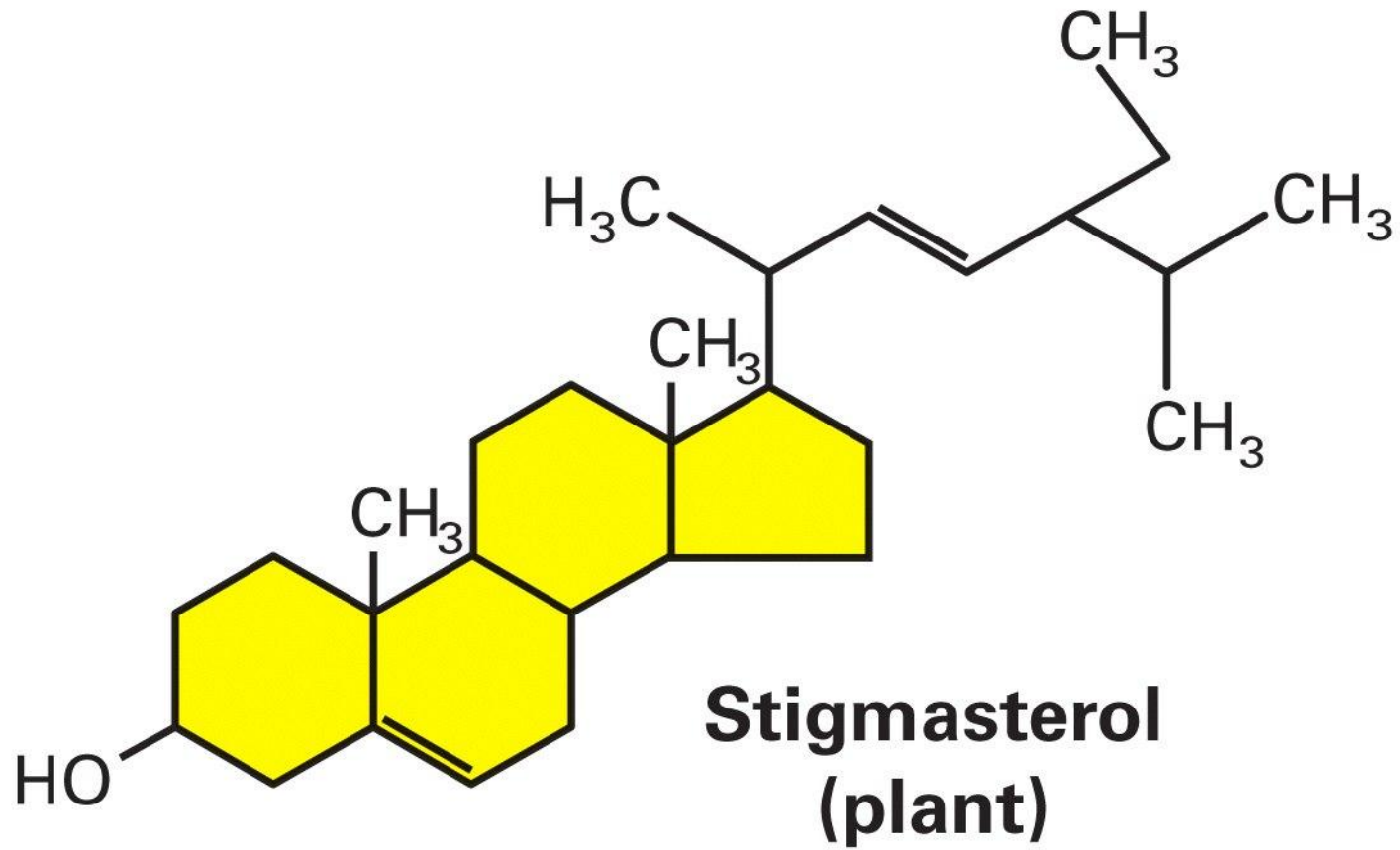
Progesterone, a steroid hormone involved in the female menstrual cycle, pregnancy, and embryogenesis

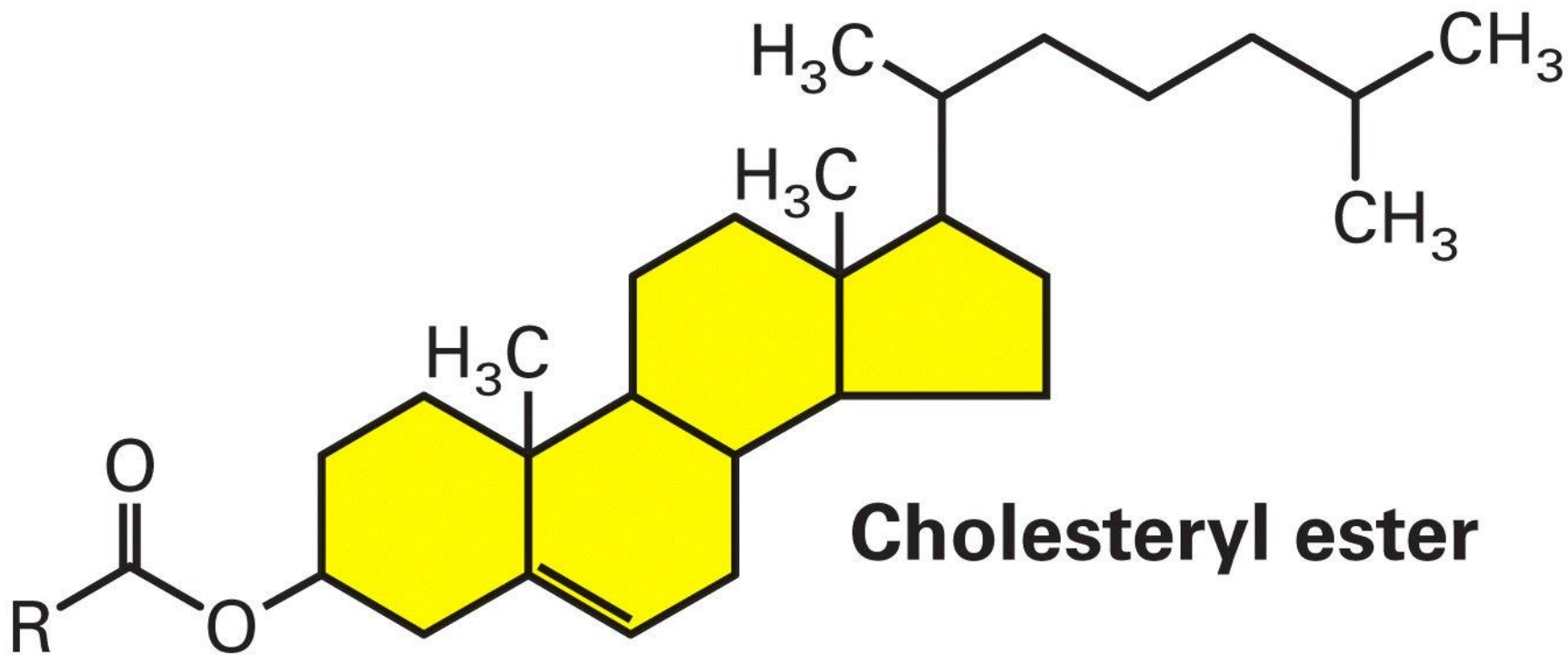


Medrogestone, a synthetic drug with effects similar to progesterone

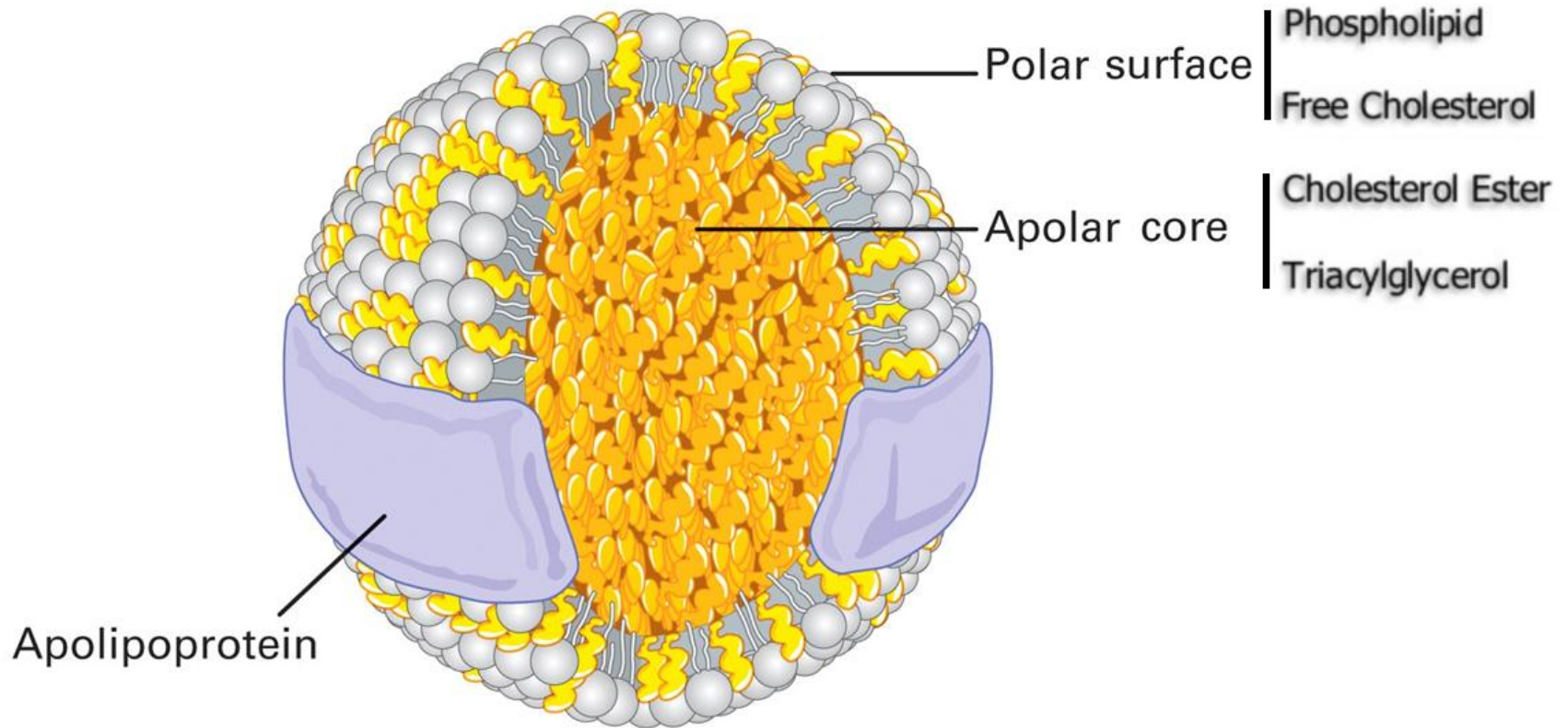








# Lipoproteins

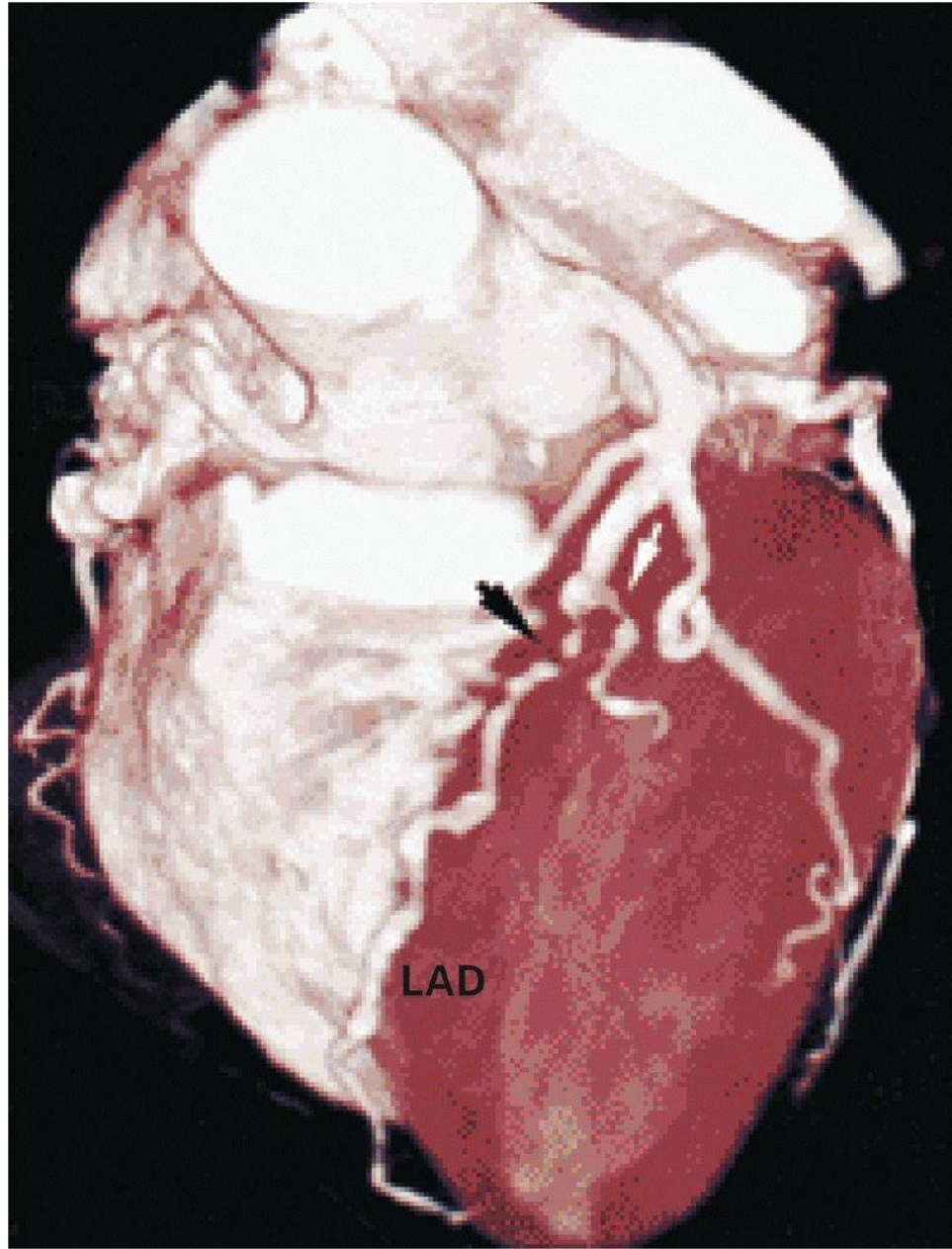


# Lipoproteins:

1. **Chylomicron**
2. **VLDL** (Very Low Density Lipoprotein)
3. **IDL** (Intermediate Density Lipoprotein)
4. **LDL** (Low Density Lipoprotein)
5. **HDL** (High Density Lipoprotein)

<b>Class</b>	<b>Density (g/mL)</b>	<b>Diameter (nm)</b>	<b>Protein (%)</b>	<b>Cholesterol (%)</b>	<b>Phospholipid (%)</b>	<b>Triacylglycerol &amp; Cholesterol ester (%)</b>
<b>VLDL and Chylomicron</b>	0.95–1.006	30–80	10	22	18	50
<b>IDL</b>	1.006–1.019	25–50	18	29	22	31
<b>LDL</b>	1.019–1.063	18–28	25	46-50	21-22	8-10
<b>HDL</b>	>1.063	5–15	33	30	29	4-8





**Eicosanoid**

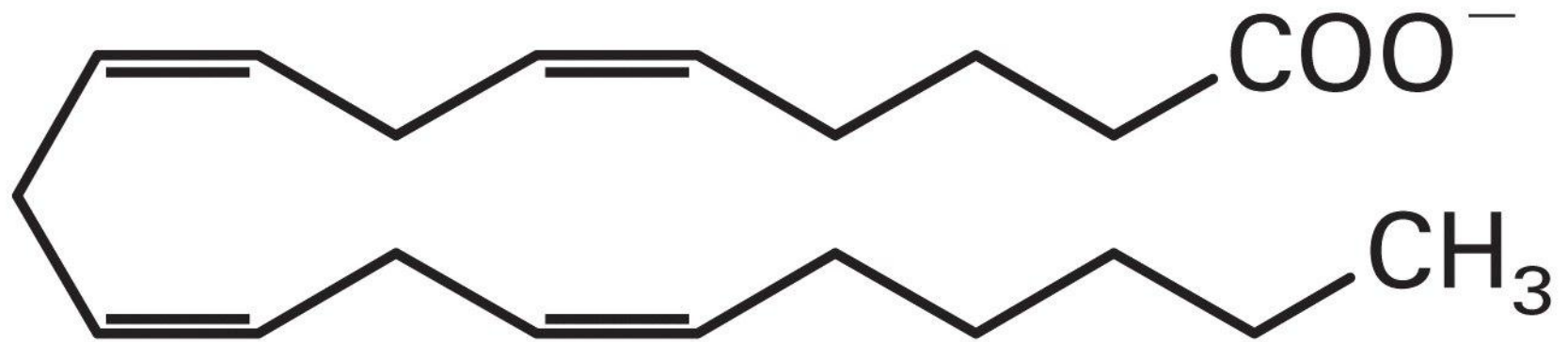
**ایکوزانوئیدها**

## UNSATURATED FATTY ACIDS

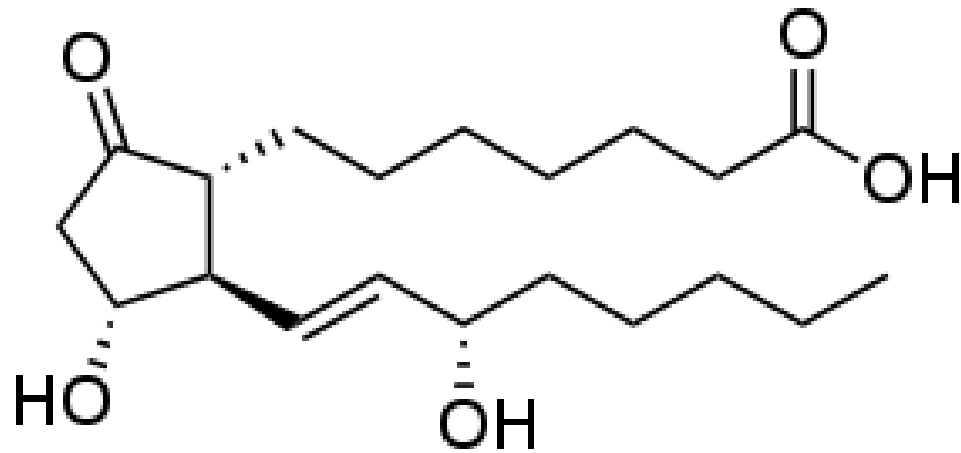
Abbreviation

Chemical Formula

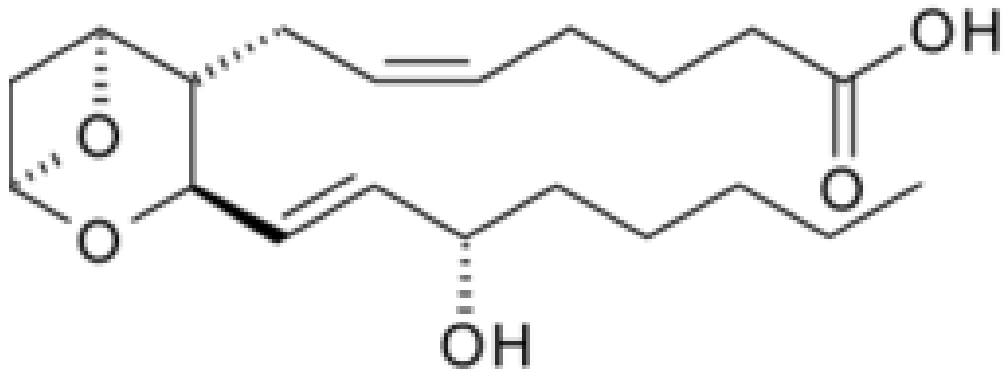
Oleic	C18:1	$\text{CH}_3(\text{CH}_2)_7\text{CH}=\text{CH}(\text{CH}_2)_7\text{COOH}$
Linoleic	C18:2	$\text{CH}_3(\text{CH}_2)_4\text{CH}=\text{CHCH}_2\text{CH}=\text{CH}(\text{CH}_2)_7\text{COOH}$
Arachidonic	C20:4	$\text{CH}_3(\text{CH}_2)_4(\text{CH}=\text{CHCH}_2)_3\text{CH}=\text{CH}(\text{CH}_2)_3\text{COOH}$



# Arachidonate



Prostaglandin



# Thromboxane

