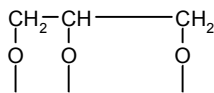
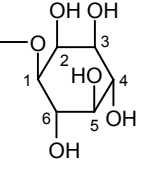


Tabla 7.12. Estructura General y Clasificación de Lípidos

Lípidos Derivados de Glicerol

GLICEROL

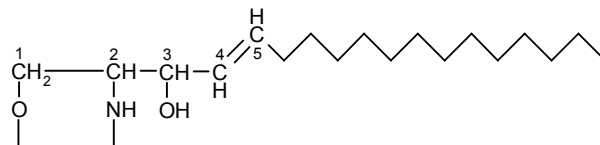


	$\begin{array}{c}   \\ \text{R} \\   \end{array}$	$\begin{array}{c}   \\ \text{R} \\   \end{array}$	$\begin{array}{c}   \\ \text{R} \\   \end{array}$		<b>TRIAcilGLICÉRIDOS</b>
<b>FOSFOGLICÉRIDOS</b>	$\begin{array}{c}   \\ \text{R} \\   \end{array}$	$\begin{array}{c}   \\ \text{R} \\   \end{array}$	$\begin{array}{c}   \\ \text{O}=\text{P}-\text{O}^- \\   \\ \text{O}^- \end{array}$		<b>ÁCIDO FOSFATÍDICO</b>
	$\begin{array}{c}   \\ \text{R} \\   \end{array}$	$\begin{array}{c}   \\ \text{R} \\   \end{array}$	$\begin{array}{c}   \\ \text{O}=\text{P}-\text{O}^- \\   \\ \text{O}^- \end{array}$	$\begin{array}{c} \text{CH}_3 \\   \\ -\text{O}-\text{CH}_2\text{CH}_2\text{N}^+-\text{CH}_3 \\   \\ \text{CH}_3 \end{array}$	<b>FOSFATIDILCOLINAS</b> Lecitinas
	$\begin{array}{c}   \\ \text{R} \\   \end{array}$	$\begin{array}{c}   \\ \text{R} \\   \end{array}$	$\begin{array}{c}   \\ \text{O}=\text{P}-\text{O}^- \\   \\ \text{O}^- \end{array}$	$\begin{array}{c} -\text{O}-\text{CH}_2\text{CH}_2\text{NH}_3^+ \\ \text{Etanolamina} \end{array}$	<b>FOSFATIDILETANOLAMINAS</b> Cefalinas
	$\begin{array}{c}   \\ \text{R} \\   \end{array}$	$\begin{array}{c}   \\ \text{R} \\   \end{array}$	$\begin{array}{c}   \\ \text{O}=\text{P}-\text{O}^- \\   \\ \text{O}^- \end{array}$	$\begin{array}{c} -\text{O}-\text{CH}_2\text{CH}(\text{NH}_3^+)-\text{C}(=\text{O})-\text{O}^- \\ \text{Serina} \end{array}$	<b>FOSFATIDILSERINAS</b> Cefalinas
	$\begin{array}{c}   \\ \text{R} \\   \end{array}$	$\begin{array}{c}   \\ \text{R} \\   \end{array}$	$\begin{array}{c}   \\ \text{O}=\text{P}-\text{O}^- \\   \\ \text{O}^- \end{array}$		<b>FOSFOINOSITIDOS</b> Inositidos
	$\begin{array}{c}   \\ \text{R} \\   \end{array}$	$\begin{array}{c}   \\ \text{R} \\   \end{array}$	$\begin{array}{c}   \\ \text{O}=\text{P}-\text{O}^- \\   \\ \text{O}^- \end{array}$	$\begin{array}{c} \text{OH} \\   \\ -\text{O}-\text{CH}_2\text{CH}-\text{CH}_2 \\   \\ \text{OH} \end{array}$	<b>FOSFATIDILGLICEROLES</b>
	$\begin{array}{c}   \\ \text{R} \\   \end{array}$	$\begin{array}{c}   \\ \text{R} \\   \end{array}$	$\begin{array}{c}   \\ \text{O}=\text{P}-\text{O}^- \\   \\ \text{O}^- \end{array}$	$\begin{array}{c} \text{OH} \\   \\ -\text{O}-\text{CH}_2\text{CH}-\text{CH}_2 \\   \quad   \\ \text{O} \quad \text{O} \\   \quad   \\ \text{O}^- \text{P} = \text{O} \\   \\ \text{O} \\   \\ \text{CH}_2\text{CH}-\text{CH}_2 \\   \quad   \\ \text{O} \quad \text{O} \\   \quad   \\ \text{O}=\text{C} \quad \text{C}=\text{O} \\   \quad   \\ \text{R} \quad \text{R} \end{array}$	<b>DIFOSFATIDILGLICEROLES</b> Cardiolipinas
	$\begin{array}{c}   \\ \text{CH} \\    \\ \text{CH} \\   \\ \text{R} \end{array}$	$\begin{array}{c}   \\ \text{R} \\   \end{array}$	$\begin{array}{c}   \\ \text{O}=\text{P}-\text{O}^- \\   \\ \text{O}^- \end{array}$	$\begin{array}{c} -\text{O}-\text{CH}_2\text{CH}_2\text{NH}_3^+ \\ \text{Etanolamina} \\ -\text{O}-\text{CH}_2\text{CH}_2\text{N}^+(\text{CH}_3)_3 \\ \text{Colina} \end{array}$	<b>PLASMALÓGENOS</b>

R = Grupo Acilo-. R-CH=CH- = Aldehído Graso

## Lípidos Derivados de Esfingosina

### ESFINGOSINA



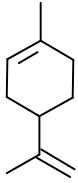
<b>ESFINGOLÍPIDOS</b>	 H	 R	<b>CERAMIDAS</b>	<b>GLICOLÍPIDOS</b>
	$\begin{array}{c}   \\ \text{O}=\text{P}-\text{O}^- \\   \\ \text{O}- \end{array}$	$\begin{array}{c}   \\ \text{R} \\   \\ \text{---O---CH}_2\text{CH}_2\text{N}^+\text{---CH}_3 \\   \\ \text{CH}_3 \end{array}$ <p style="text-align: center;">Colina</p>	<b>ESFINGOMIELINAS</b>	
	<p style="text-align: center;">Glucosa</p>	 R	<b>CEREBRÓSIDOS</b>	
	<p style="text-align: center;">Galactosa</p>	 R	<b>GANGLIÓSIDOS</b>	
	Oligosacáridos con Glc, Gal, derivados y ácido siálico	 R	<b>SULFOLÍPIDOS</b>	
	Glc ó Gal con SO <sub>3</sub> <sup>-</sup>	 R		

R = Grupo Acilo-. -SO<sub>3</sub><sup>-</sup> = Sulfonato

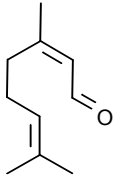
## Lípidos No Saponificables

### Terpenos

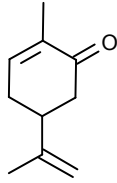
Monoterpenos (C10)



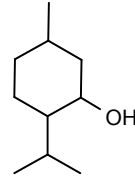
Limoneno



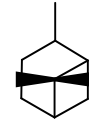
Citral



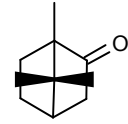
Carbena



Mentol

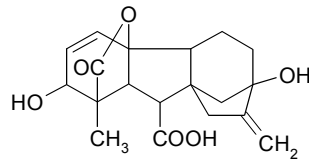


Pineno

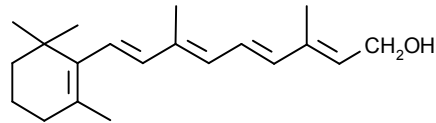


Alcanfor

Diterpenos (C20)

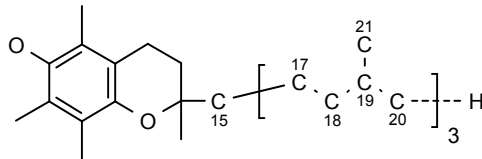


Ácido giberélico



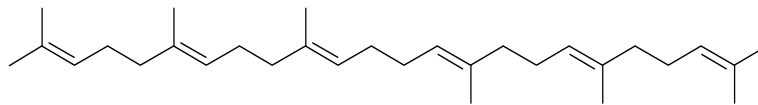
Retinol (vitamina A) (C20)

Sesquiterpenos

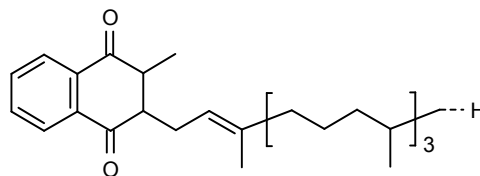


$\alpha$ -Tocoferol (vitamina E) (C25)

Triterpenos (C30)

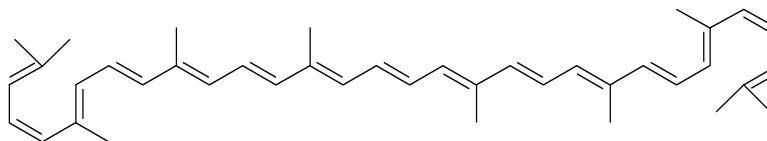


Escualeno

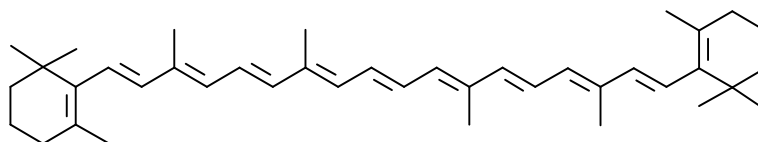


Filoquinona (vitamina K)

Tetraterpenos (C40)

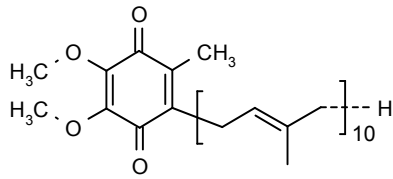


Licopeno

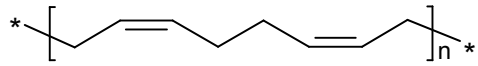


$\beta$ -Caroteno (pro-vitamina A)

Terpenos Mayores (Poliprenoles) (>C50)



Coenzima Q (Ubiquinona) (C60)

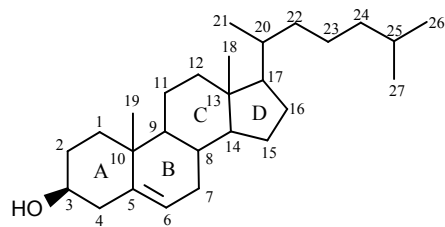


*cis*-Poliisopreno (Caucho Natural)

### Esteroides

Esteroles (C27)

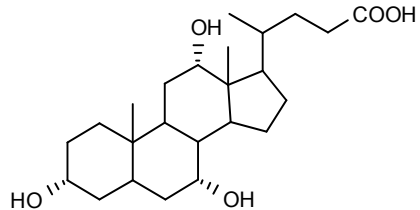
Colesterol



5-colesten-3β-ol

Acidos biliares (C24)

Ac. cólico



Ac. 3α, 7α, 12α-trihidroxicolan-24-oico

Isómeros:

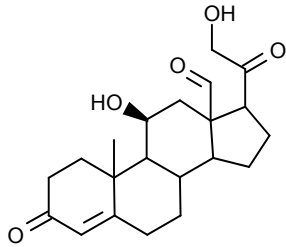
Ac. desoxicólico. Ac. 3α, 12α-dihidroxicolan-24-oico

Ac. quenocólico. Ac. 3α, 7α-dihidroxicolan-24-oico

Ac. litocólico. Ac. 3α-hidroxicolan-24-oico

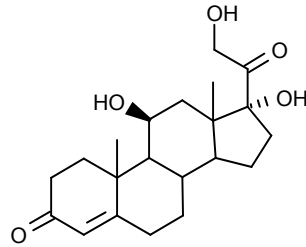
Corticoides (C21)

Aldosterona



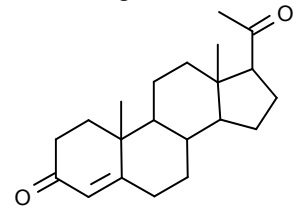
11β, 21-dihidroxi-3,20-dioxo-4-pregnen-18-ol

Cortisol



11β, 17α, 21-trihidroxi-4-pregnen-3,20-diona

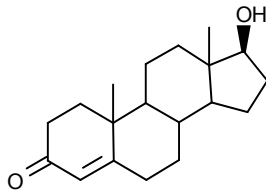
Progesterona



4-pregnen-3,20-diona

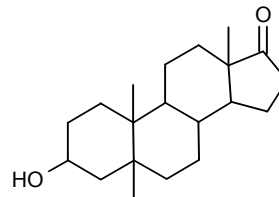
Andrógenos (C19)

Testosterona



17β-hidroxi-4-androsten-3-ona

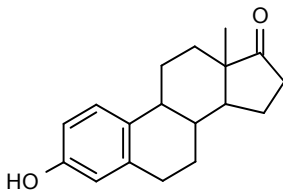
Androsterona



3α-hidroxi-17α-androstan-17-ona

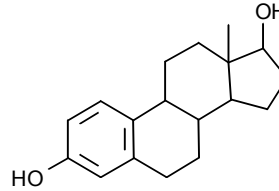
Estrógenos (C18)

Estrona



1,3,5(10)-estratrien-3-ol-17-ona

Estradiol

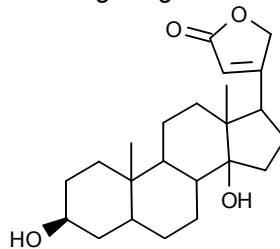


1,3,5(10)-estratrien-3,17β-diol

Otros Esteroides de Interés

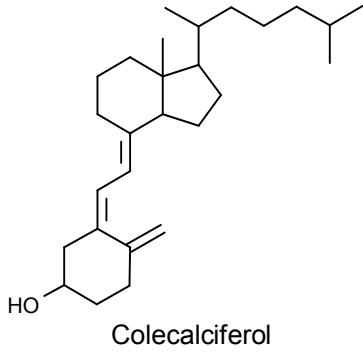
Geninas (C23)

Digitoxigenina

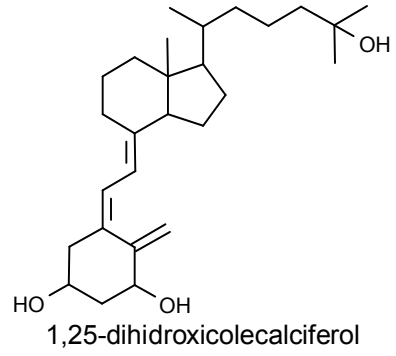


5β, 14β-androstan-3β, 14-dihidroxi-17β-butenolactona

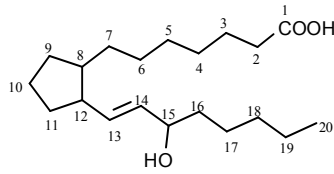
Seco-esteroide (C27)



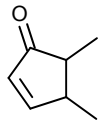
Vitamina D



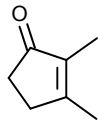
Prostaglandinas



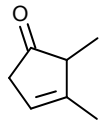
Estructura Básica. ( $PG_2 \Delta^{5c,13}$ ,  $PG_3 \Delta^{5c,13,17c}$ )



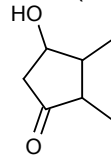
PGA



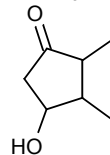
PGB



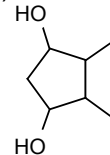
PGC



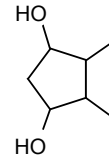
PGD



PGF



PGE $\alpha$



PGE $\beta$