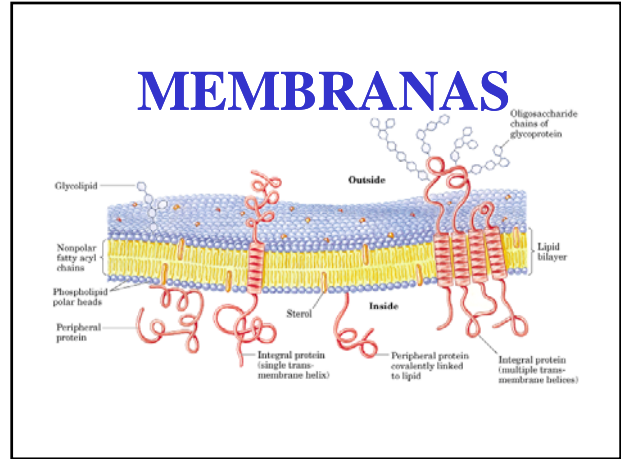
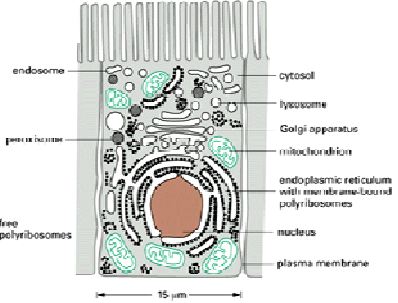




Universidad de Chile
Programa Académico de Bachillerato

Introducción a la Biología Celular

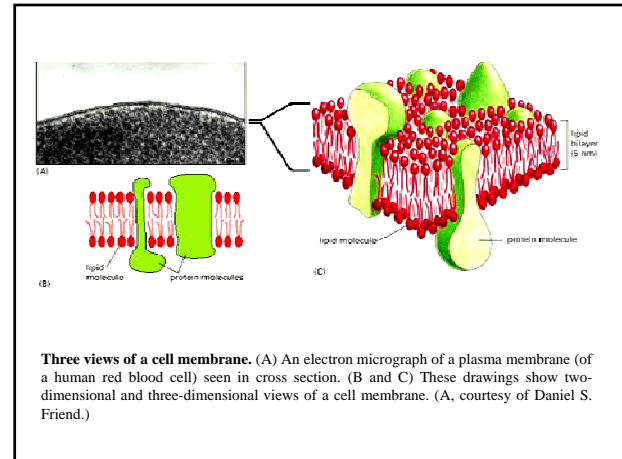
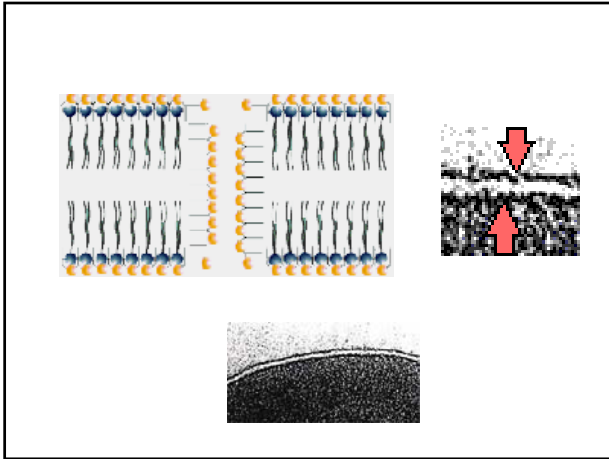
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 ekessi@uchile.cl

The major intracellular compartments of an animal cell. The cytosol (*gray*), endoplasmic reticulum, Golgi apparatus, nucleus, mitochondrion, endosome, lysosome, and peroxisome are distinct compartments isolated from the rest of the cell by at least one selectively permeable membrane.

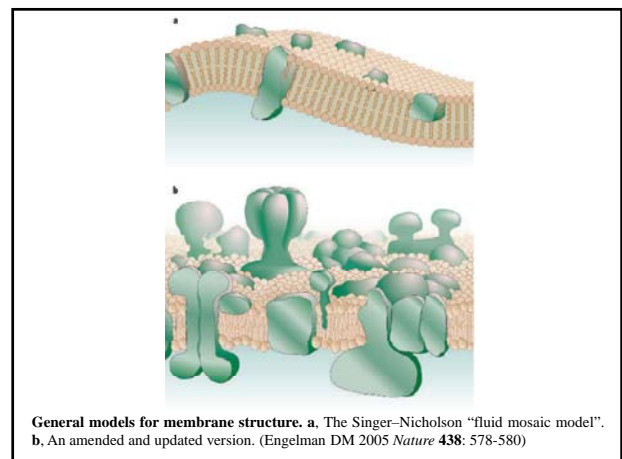
Membranas Biológicas { **Bicapa lipídica**

{ **Proteínas**



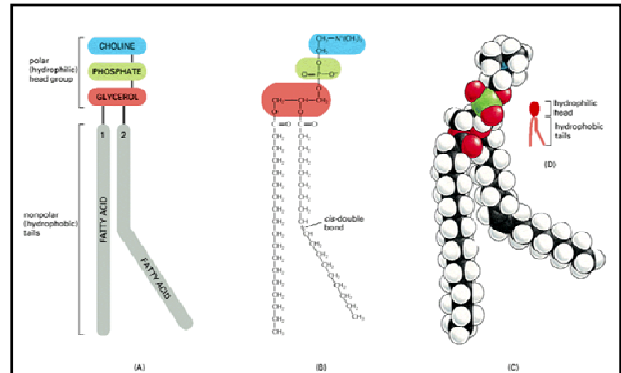
BICAPAS

Los lípidos de membrana son moléculas anfipáticas y la mayor parte de ellos forman bicapas de manera espontánea. Las bicapas proveen la estructura básica de las membranas.

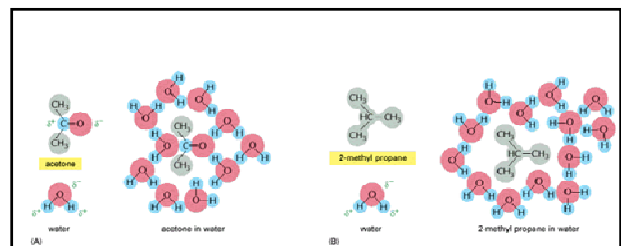
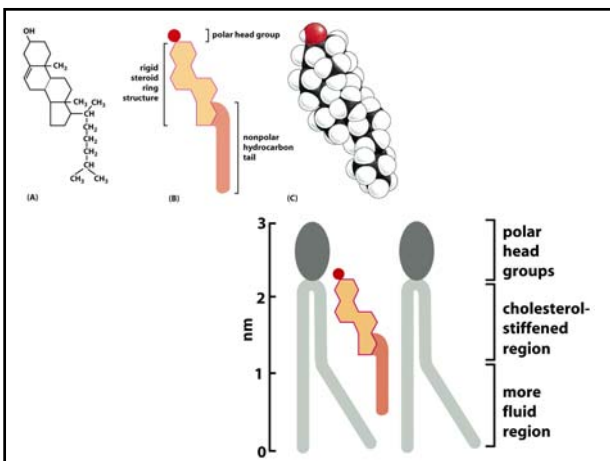


Lipid molecules constitute about 50% of the mass of most animal cell membranes, nearly all of the remainder being protein. There are approximately 5×10^6 lipid molecules in a $1 \mu\text{m}^2$ area of lipid bilayer, or about 10^9 lipid molecules in the plasma membrane of a small animal cell.

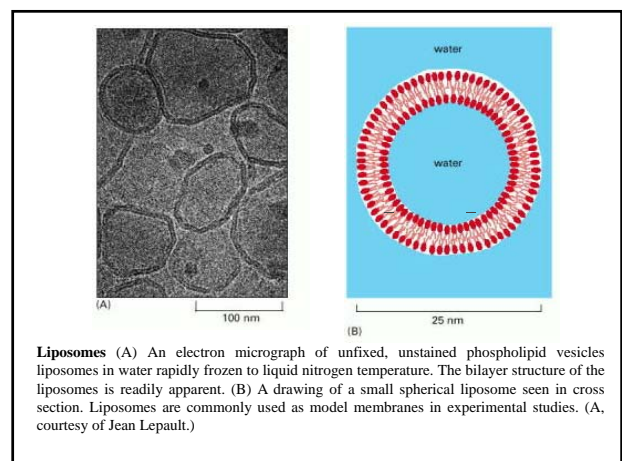
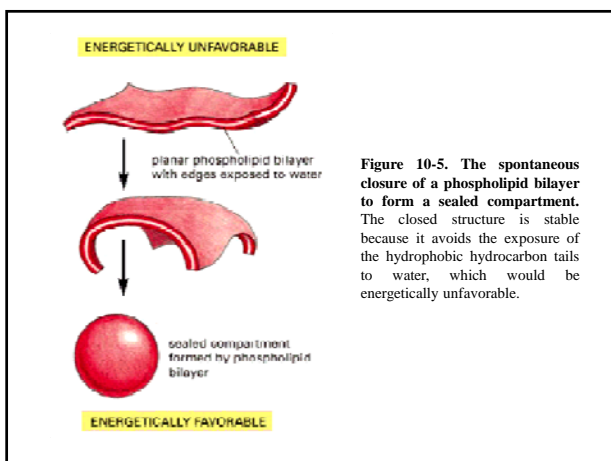
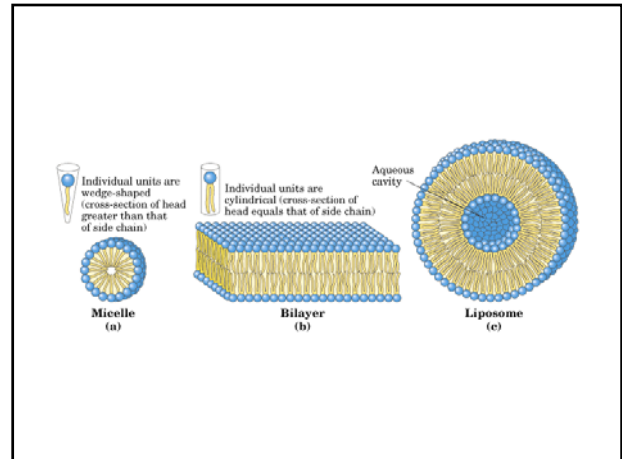
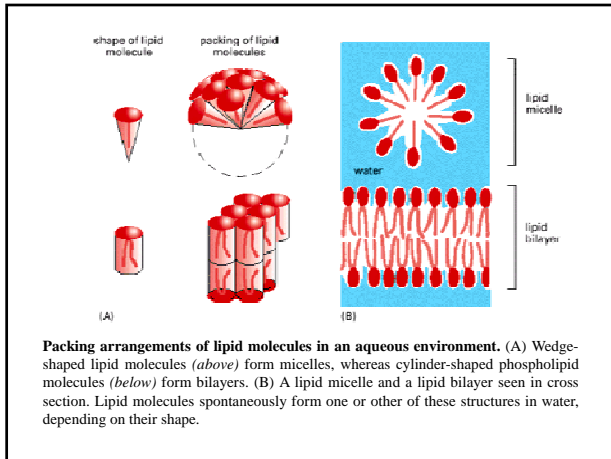
The most abundant membrane lipids are the phospholipids



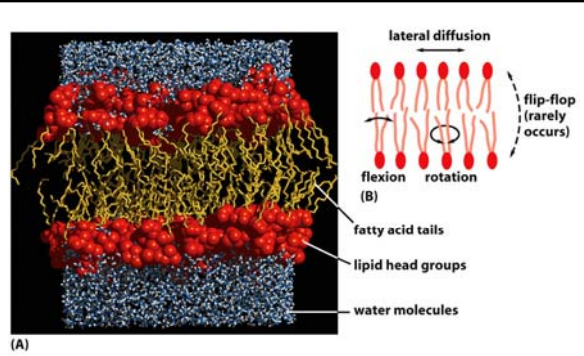
The parts of a phospholipid molecule. This example is phosphatidylcholine, represented (A) schematically, (B) by a formula, (C) as a space-filling model, and (D) as a symbol. The kink resulting from the *cis*-double bond is exaggerated for emphasis.



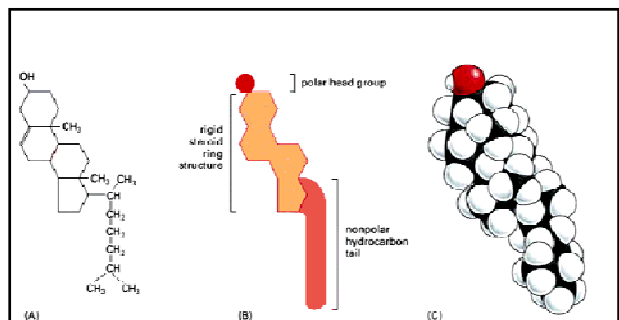
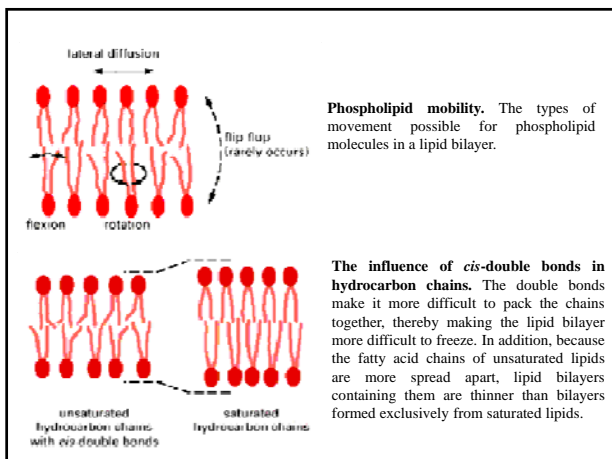
How hydrophilic and hydrophobic molecules interact differently with water. (A) Because acetone is polar, it can form favorable electrostatic interactions with water molecules, which are also polar. Thus, acetone readily dissolves in water. (B) By contrast, 2-methyl propane is entirely hydrophobic. It cannot form favorable interactions with water and it would force adjacent water molecules to reorganize into icelike cage structures, which increases the free energy. This compound therefore is virtually insoluble in water. The symbol δ^- indicates a partial negative charge, and δ^+ indicates a partial positive charge. Polar atoms are shown in color and nonpolar groups are shown in gray.



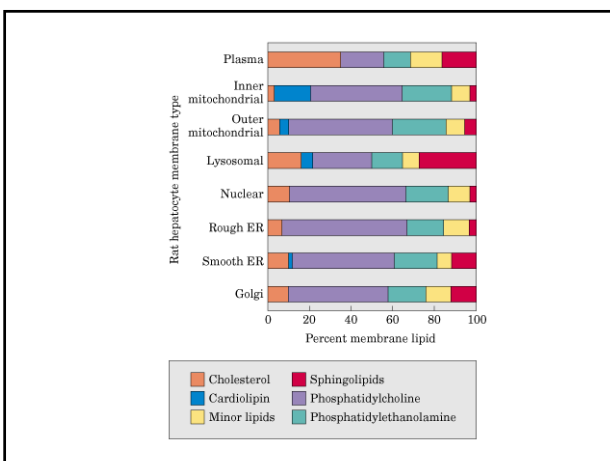
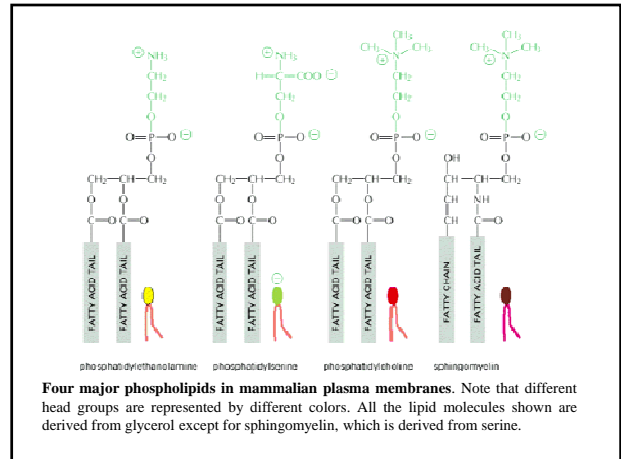
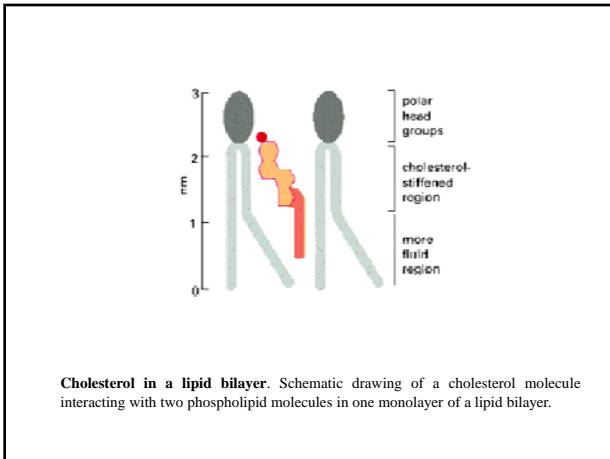
Las bicapas se consideran fluidos bidimensionales y su fluidez depende de su composición



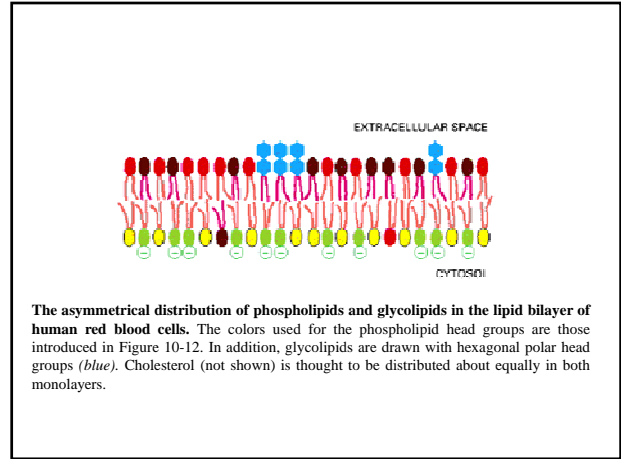
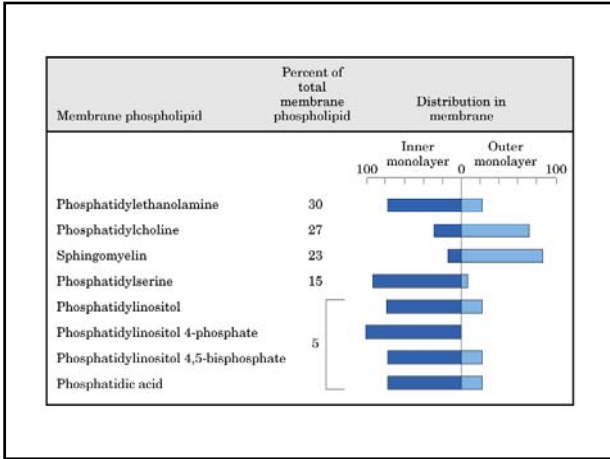
The mobility of phospholipids molecules in an artificial bilayer



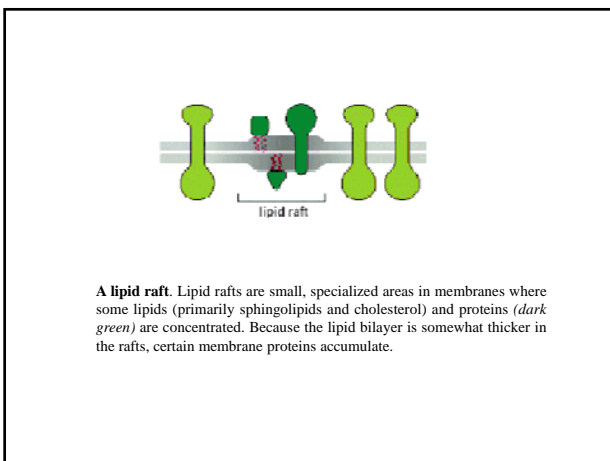
The structure of cholesterol. Cholesterol is represented (A) by a formula, (B) by a schematic drawing, and (C) as a space-filling model.



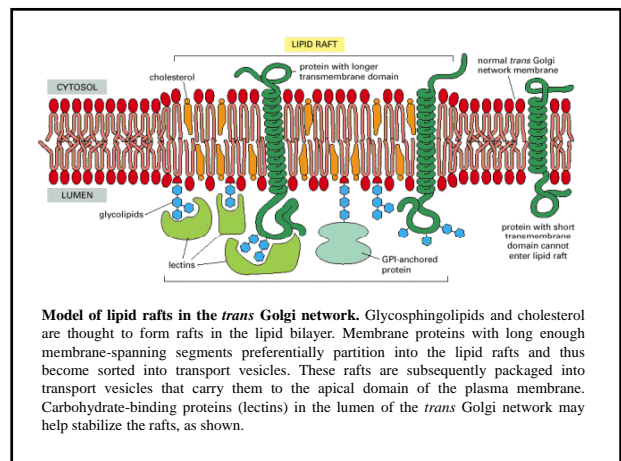
La distribución asimétrica de los lípidos en las bicapas que estructuran las membranas biológicas tiene consecuencias funcionales



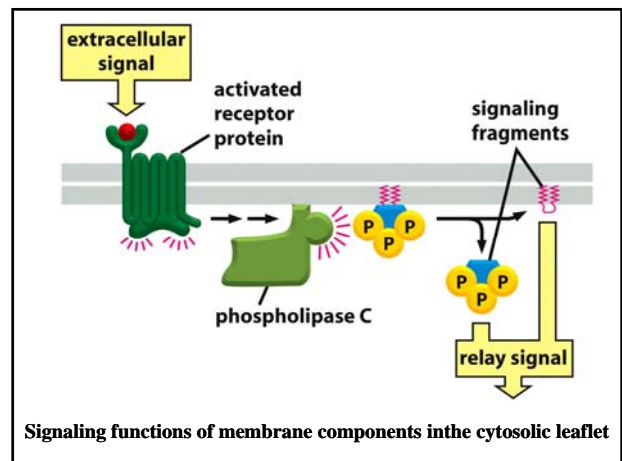
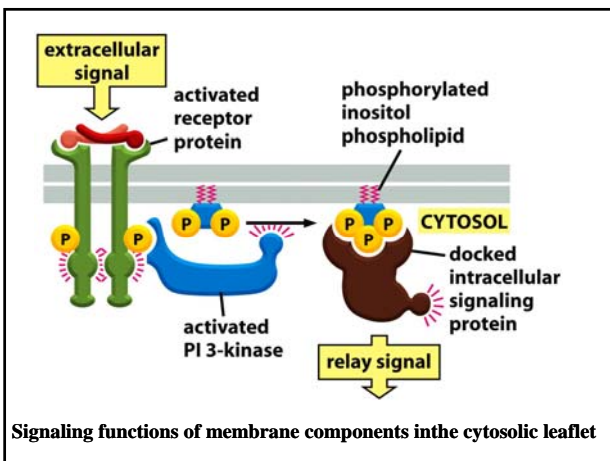
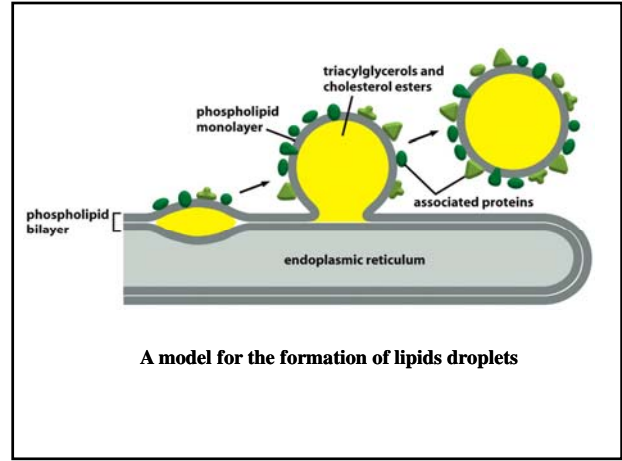
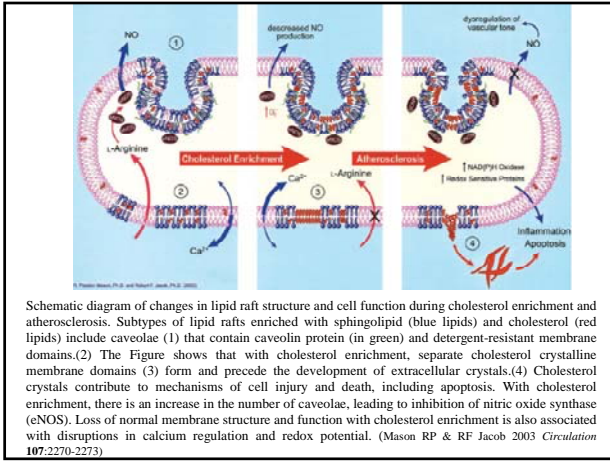
The asymmetrical distribution of phospholipids and glycolipids in the lipid bilayer of human red blood cells. The colors used for the phospholipid head groups are those introduced in Figure 10-12. In addition, glycolipids are drawn with hexagonal polar head groups (blue). Cholesterol (not shown) is thought to be distributed about equally in both monolayers.

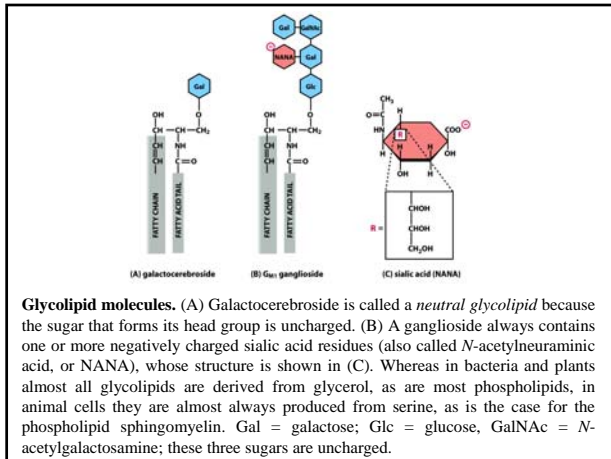


A lipid raft. Lipid rafts are small, specialized areas in membranes where some lipids (primarily sphingolipids and cholesterol) and proteins (dark green) are concentrated. Because the lipid bilayer is somewhat thicker in the rafts, certain membrane proteins accumulate.



Model of lipid rafts in the trans Golgi network. Glycosphingolipids and cholesterol are thought to form rafts in the lipid bilayer. Membrane proteins with long enough membrane-spanning segments preferentially partition into the lipid rafts and thus become sorted into transport vesicles. These rafts are subsequently packaged into transport vesicles that carry them to the apical domain of the plasma membrane. Carbohydrate-binding proteins (lectins) in the lumen of the trans Golgi network may help stabilize the rafts, as shown.





Approximate Lipid Compositions of Different Cell Membranes						
PERCENTAGE OF TOTAL LIPID BY WEIGHT						
LIPID	LIVER CELL*	RBC* MYELIN	MIT**	ER	<i>E. coli</i>	
Cholesterol	17	23	22	3	6	0
Phosphatidylethanolamine	7	18	15	25	17	70
Phosphatidylserine	4	7	9	2	5	trace
Phosphatidylcholine	24	17	10	39	40	0
Sphingomyelin	19	18	8	0	5	0
Glycolipids	7	3	28	trace	trace	0
Others	22	13	8	21	27	30

* Plasma membranes; ** Inner and Outer membranes