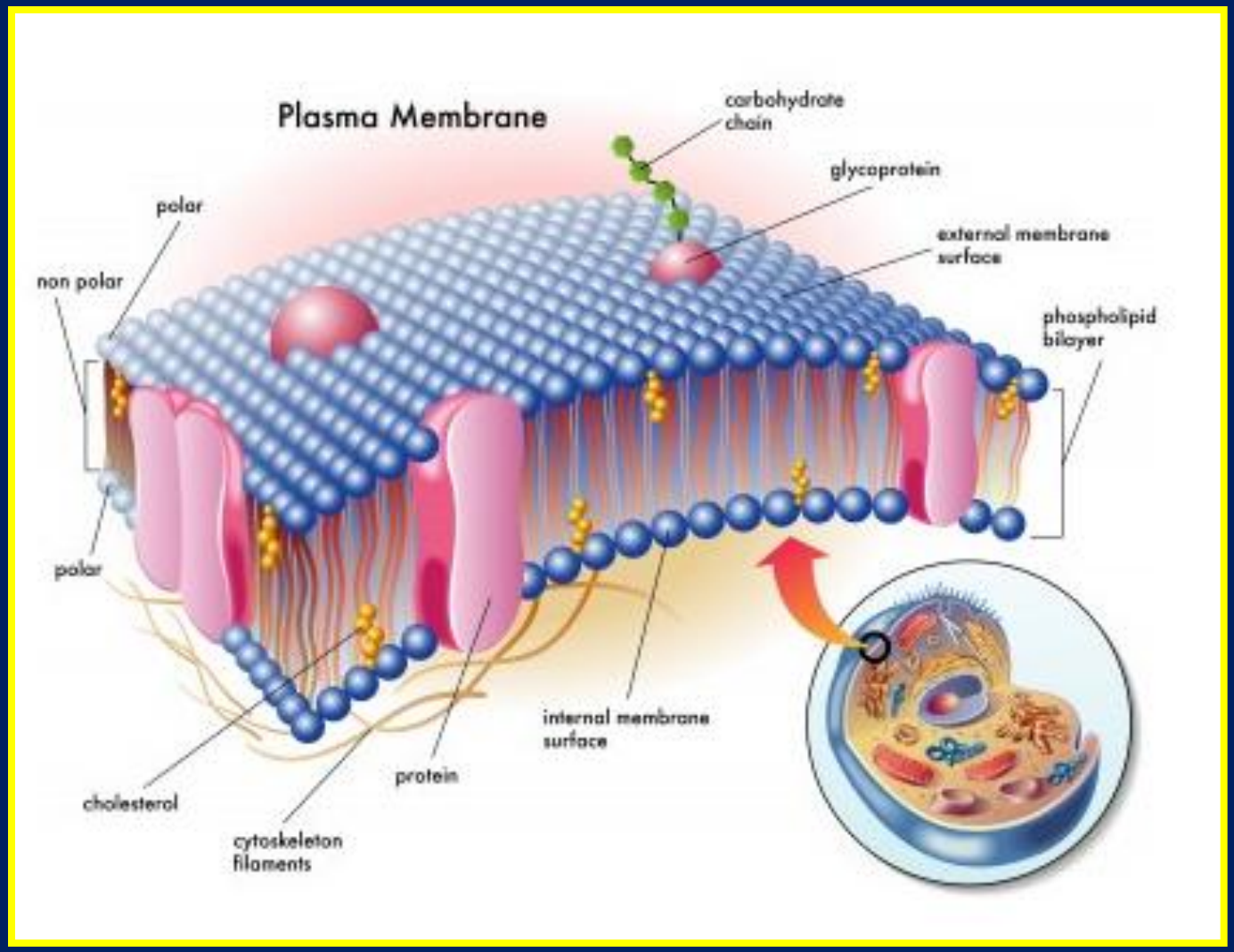
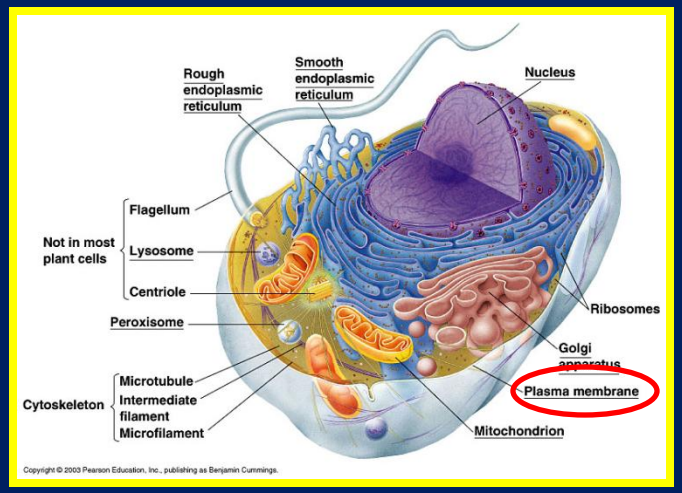
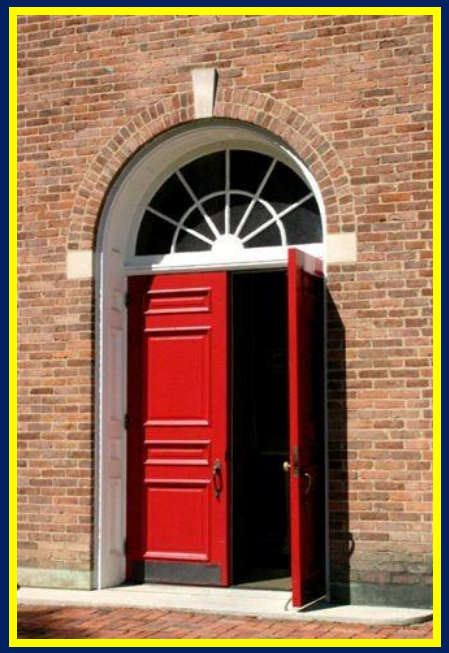
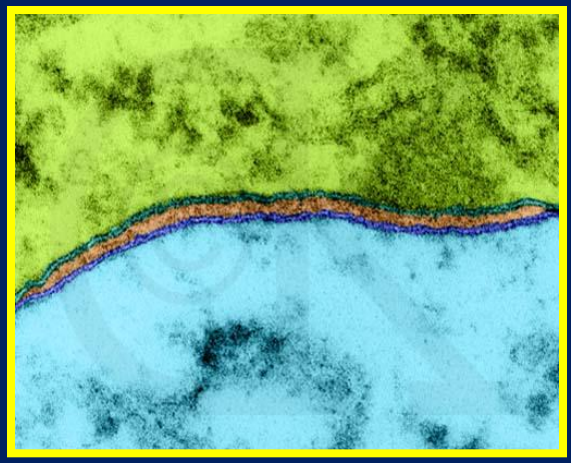
The Plasma Membrane



All cells must maintain a stable internal environment, or homeostasis, regardless of conditions outside of the cell.

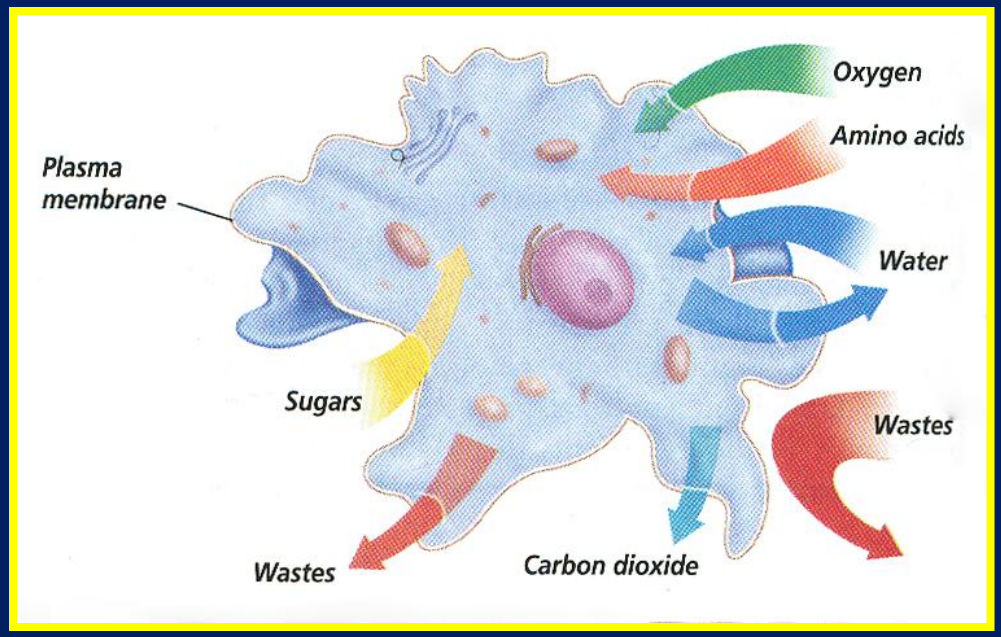






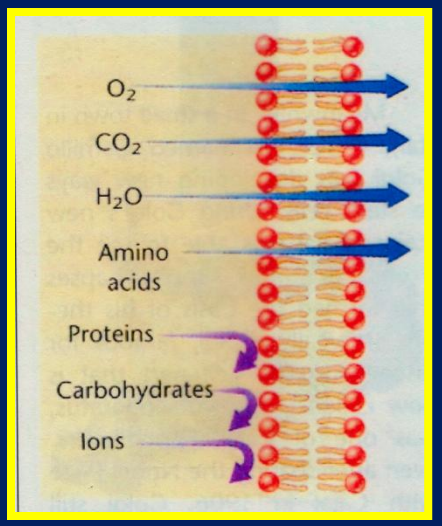
It is the job of the plasma membrane to maintain homeostasis within the cell

When cells need nutrients, like glucose, water, or oxygen, the plasma membrane allows a steady supply of these nutrients to enter the cell.



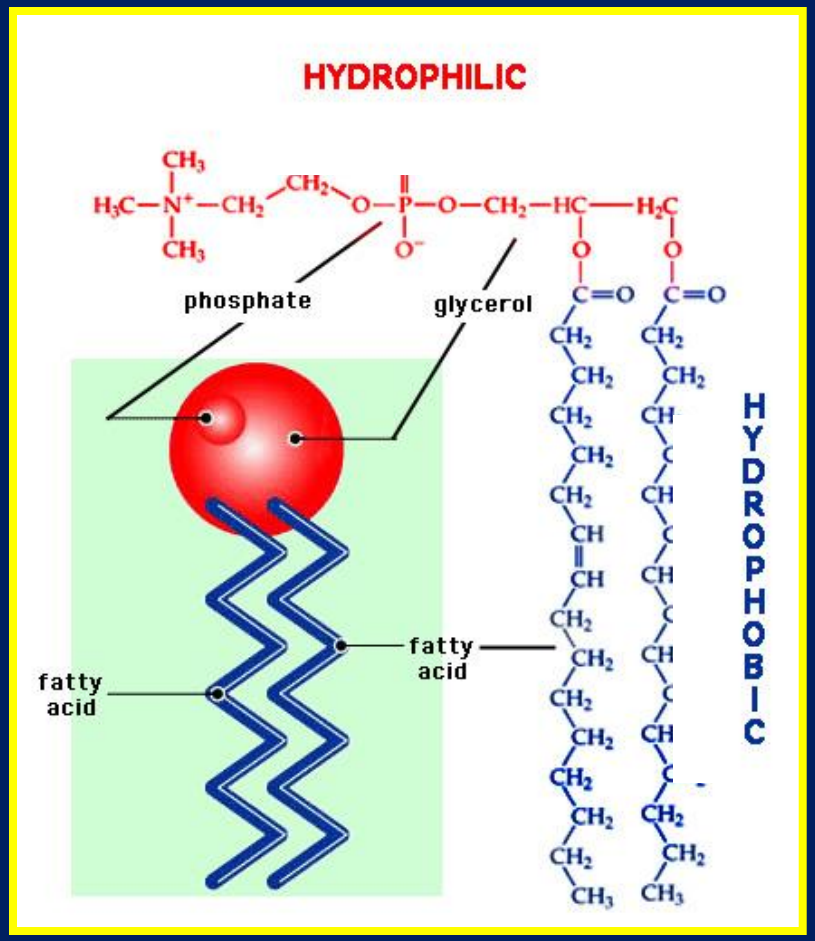
When levels become too high, the plasma membrane allows the same things to leave the cell.

Although the plasma membrane allows gases, water, and small molecules to pass through easily, large molecules and charged molecules, ions, cannot pass through easily.



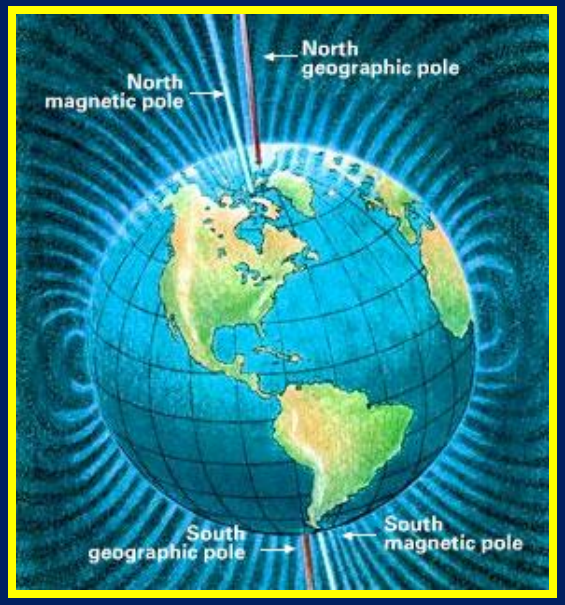
Selective permeability is the ability to allow some materials through while keeping other materials out.

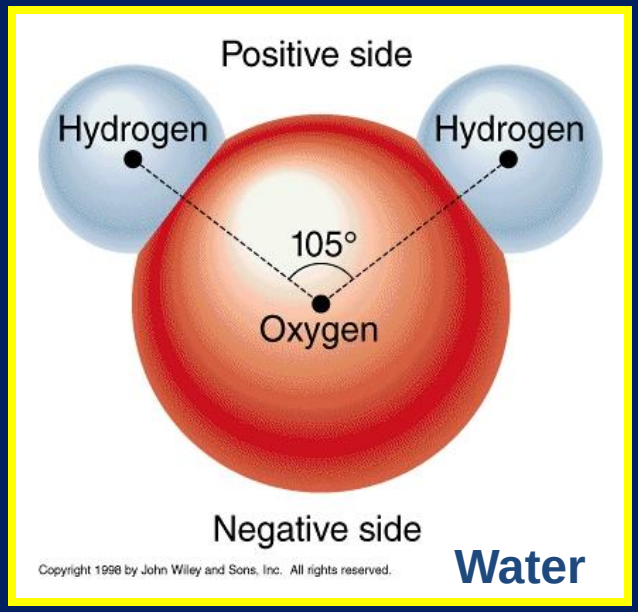
Most of the plasma membrane consists of special type of lipid, called a phospholipid, that is insoluble in water.

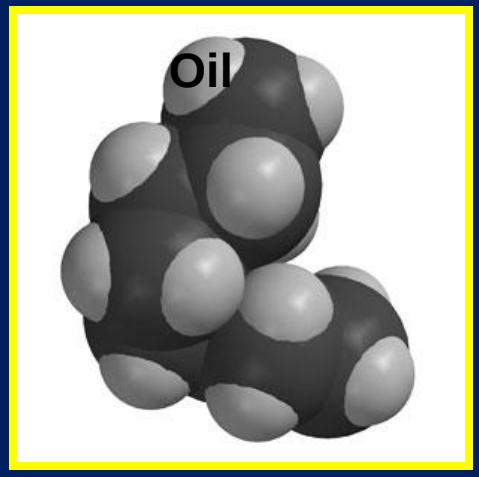


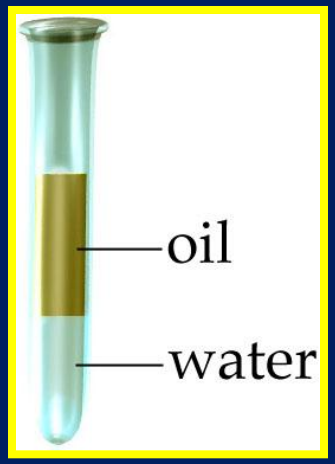
Phospholipids have a phosphate head and two fatty acid tails

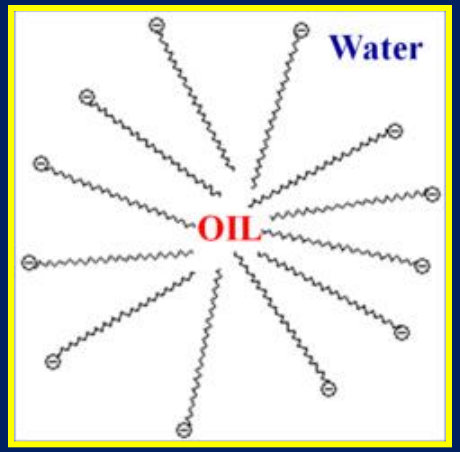
Polar molecules have opposite charges on opposite sides of the molecule.



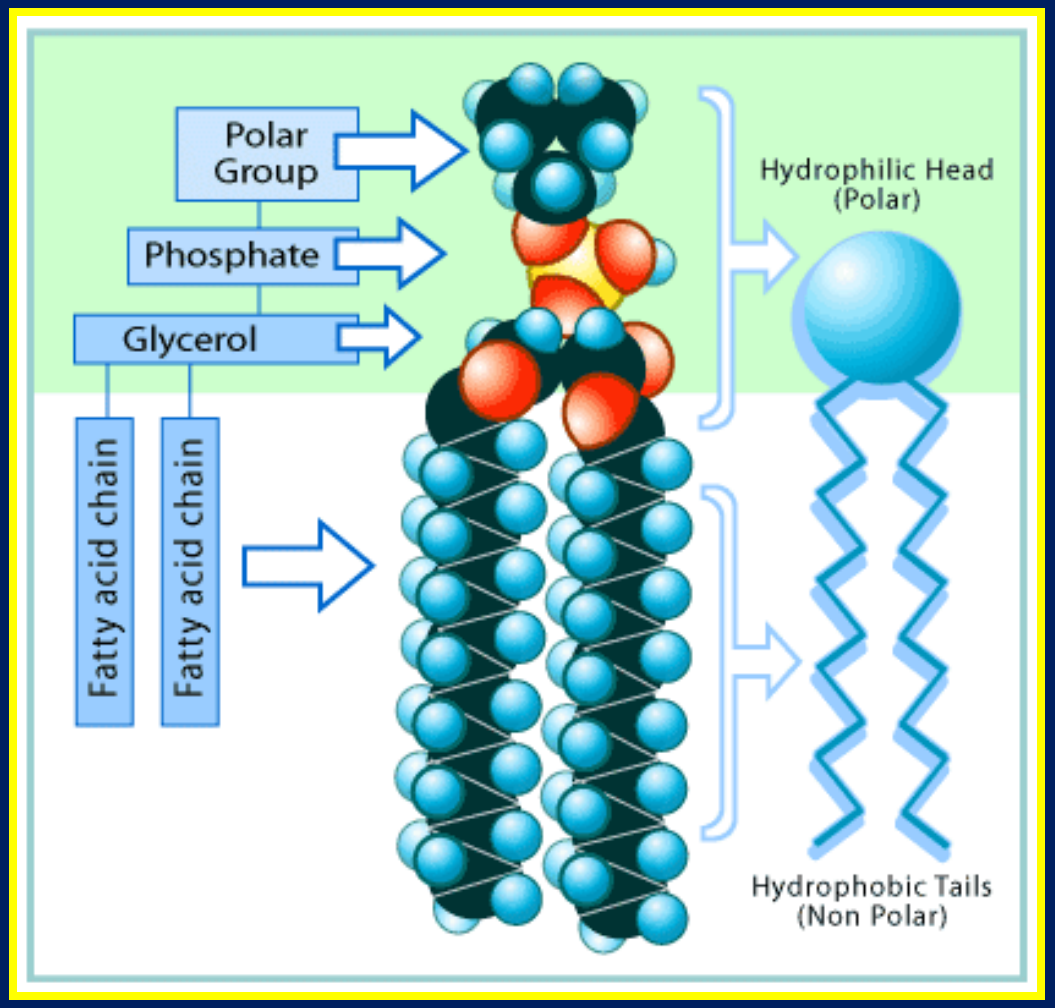








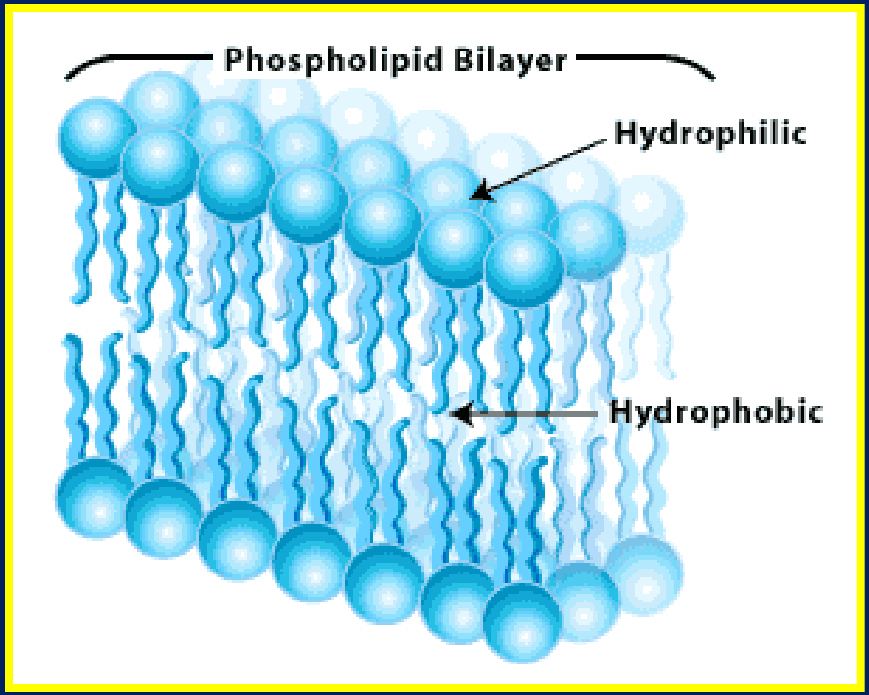
The phosphate head is polar and “likes” water, while the two lipid tails are non-polar and “avoid” water.

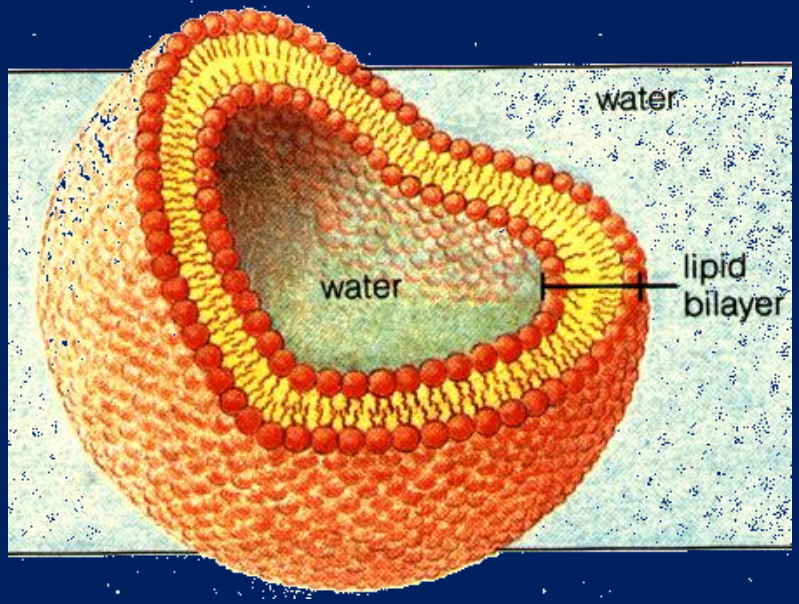


Hydrophilic
“Likes Water”

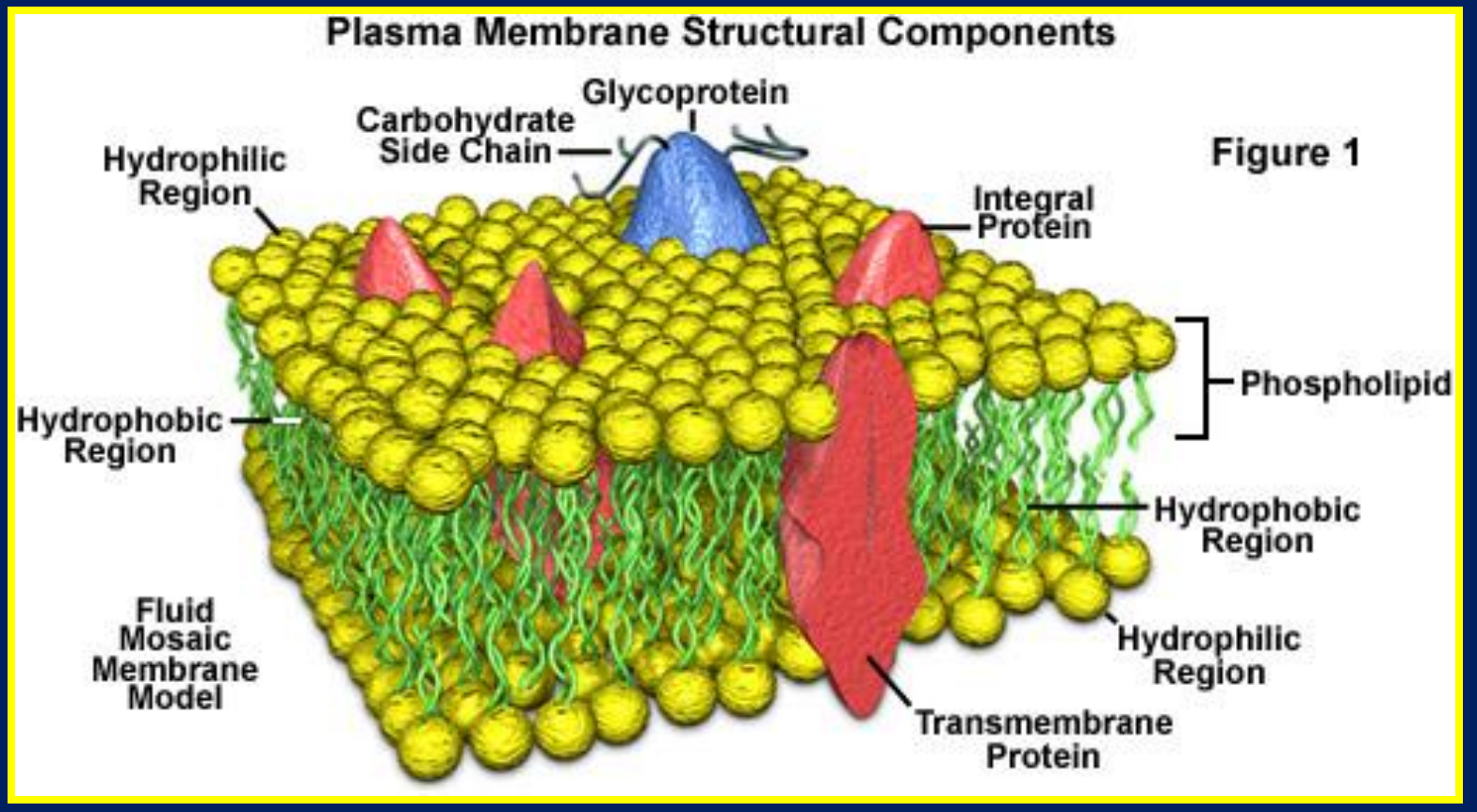
Hydrophobic
“Fears Water”

When phospholipids come in contact with water, the lipid tails turn away from the water to form a bi-layer of phospholipids.



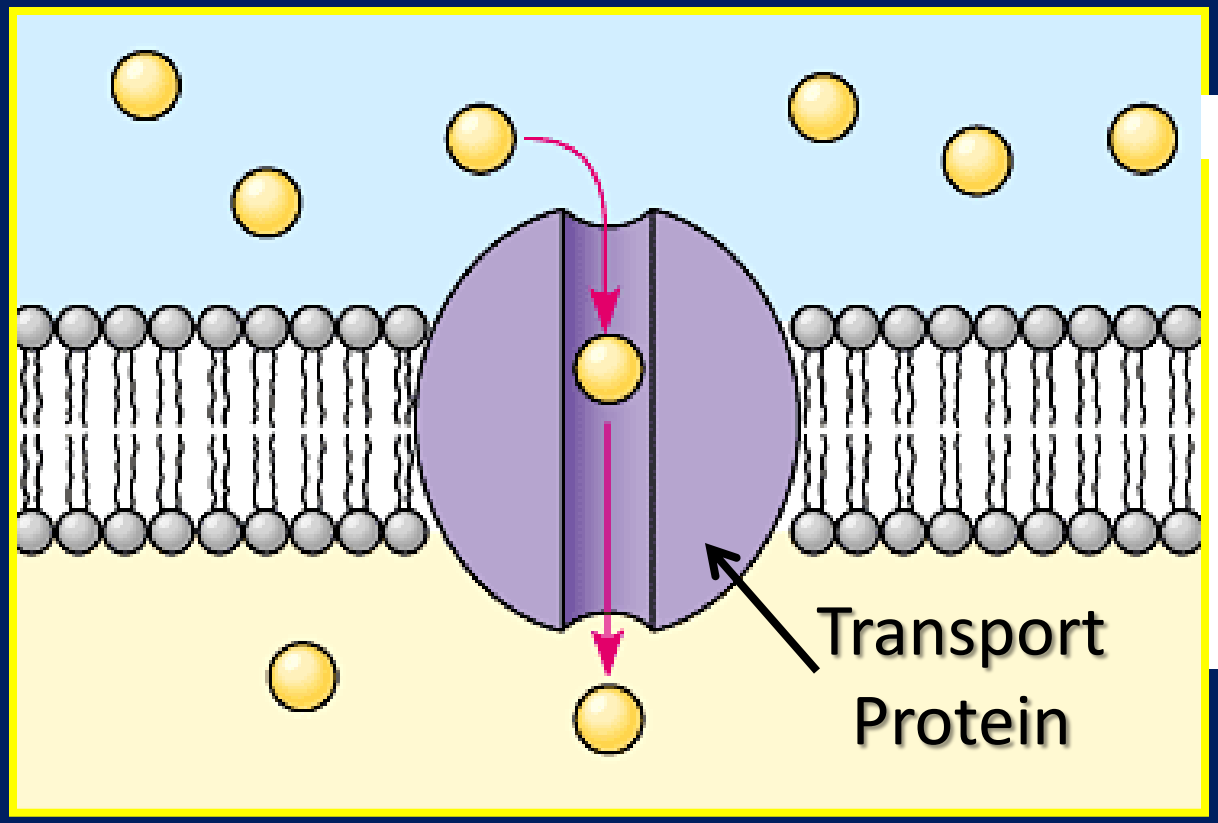


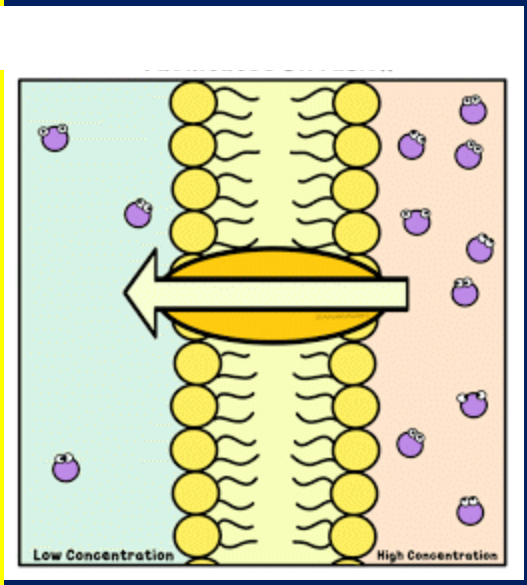
Embedded within this fluid-like membrane are proteins that move among the phospholipids, like boats floating on water.



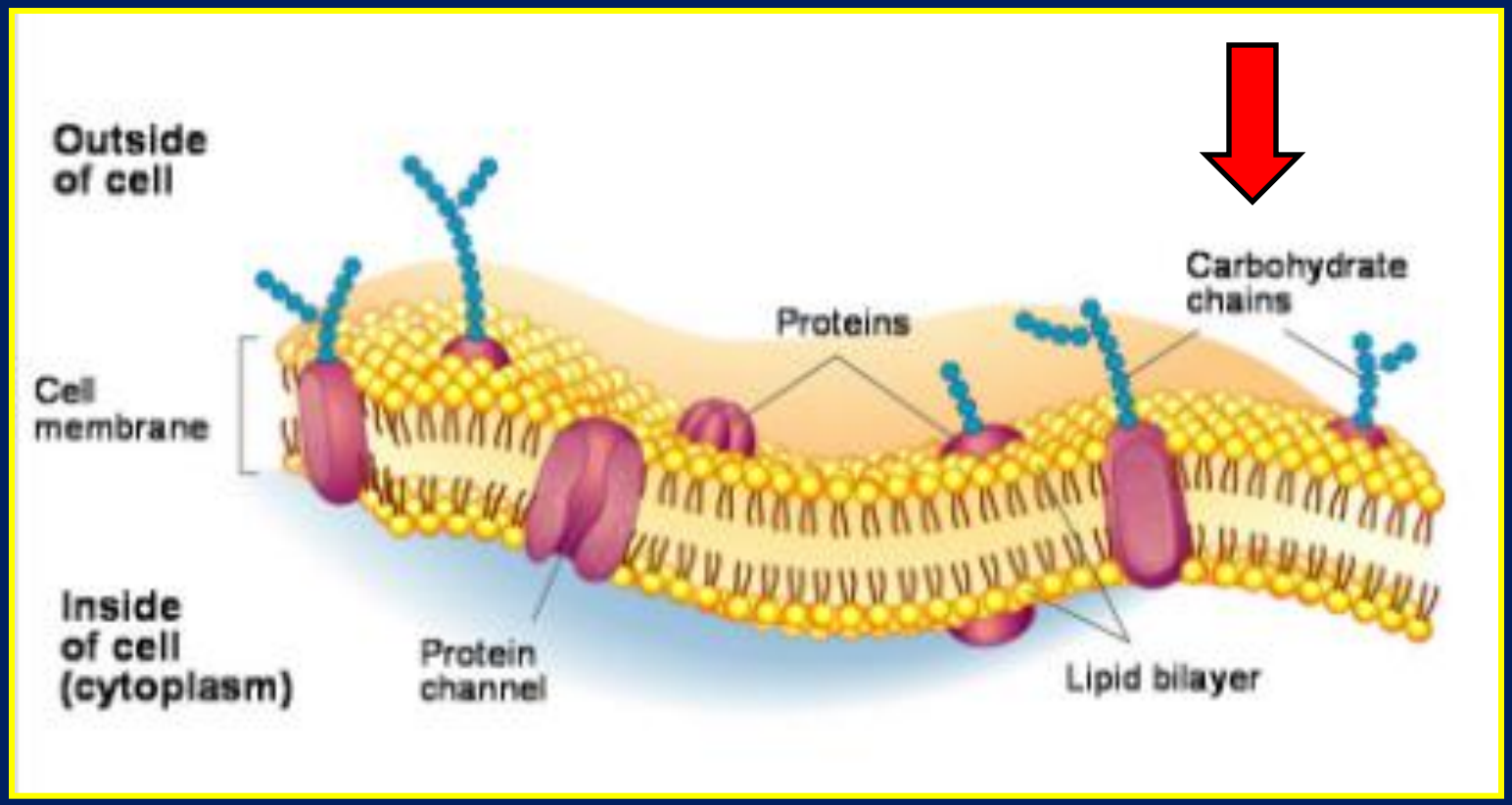
"Fluid Mosiac Model"

Some proteins help transport material in and out of the cell



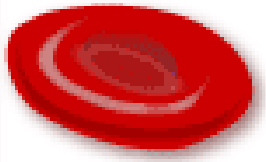
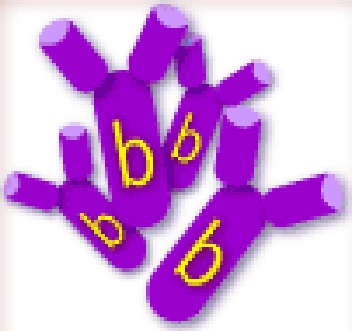
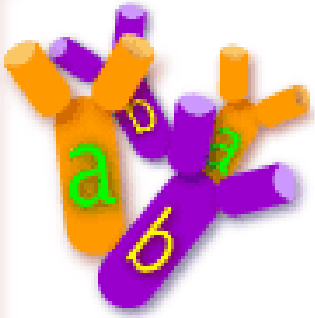


Other proteins have carbohydrate chains attached to them.

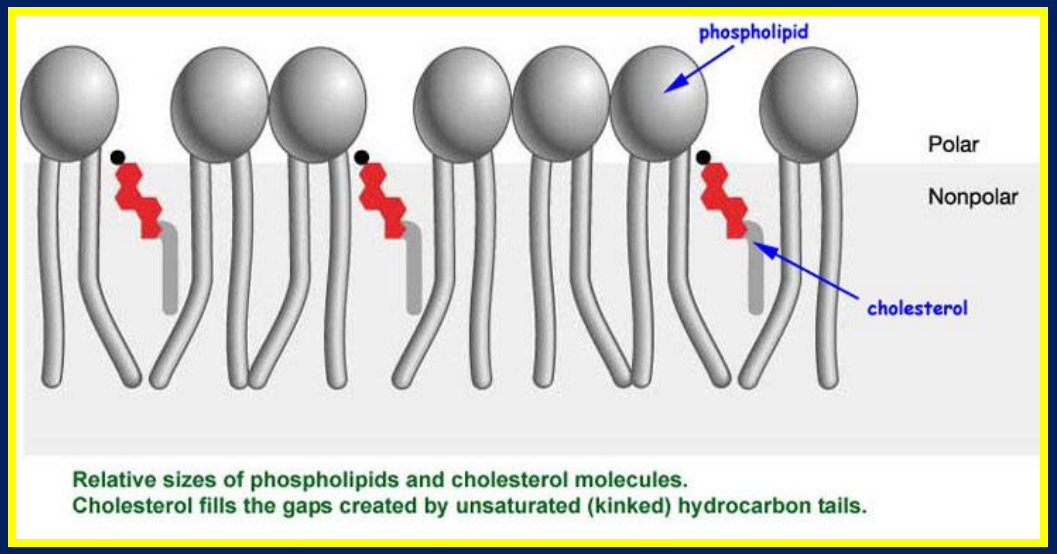


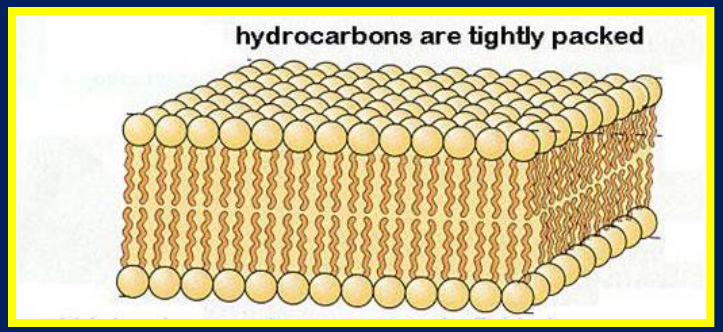
These proteins help identify the cell to other cells

The ABO Blood System

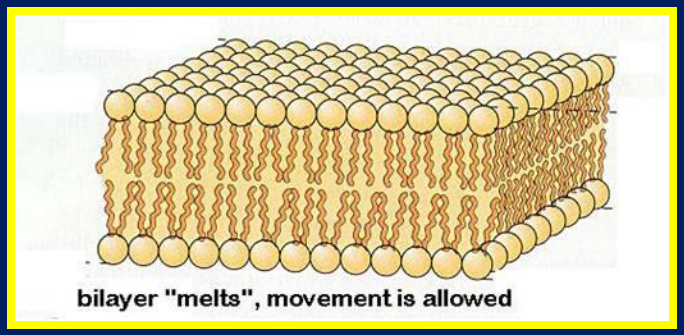
Blood Type (genotype)	Type A (AA, AO)	Type B (BB, BO)	Type AB (AB)	Type O (OO)
Red Blood Cell Surface Proteins (phenotype)	 A agglutinogens only	 B agglutinogens only	 A and B agglutinogens	 No agglutinogens
Plasma Antibodies (phenotype)	 b agglutinin only	 a agglutinin only	 No agglutinin	 a and b agglutinin

Cholesterol molecules, dispersed throughout the membrane, prevent the lipids from solidifying under cold temperatures.



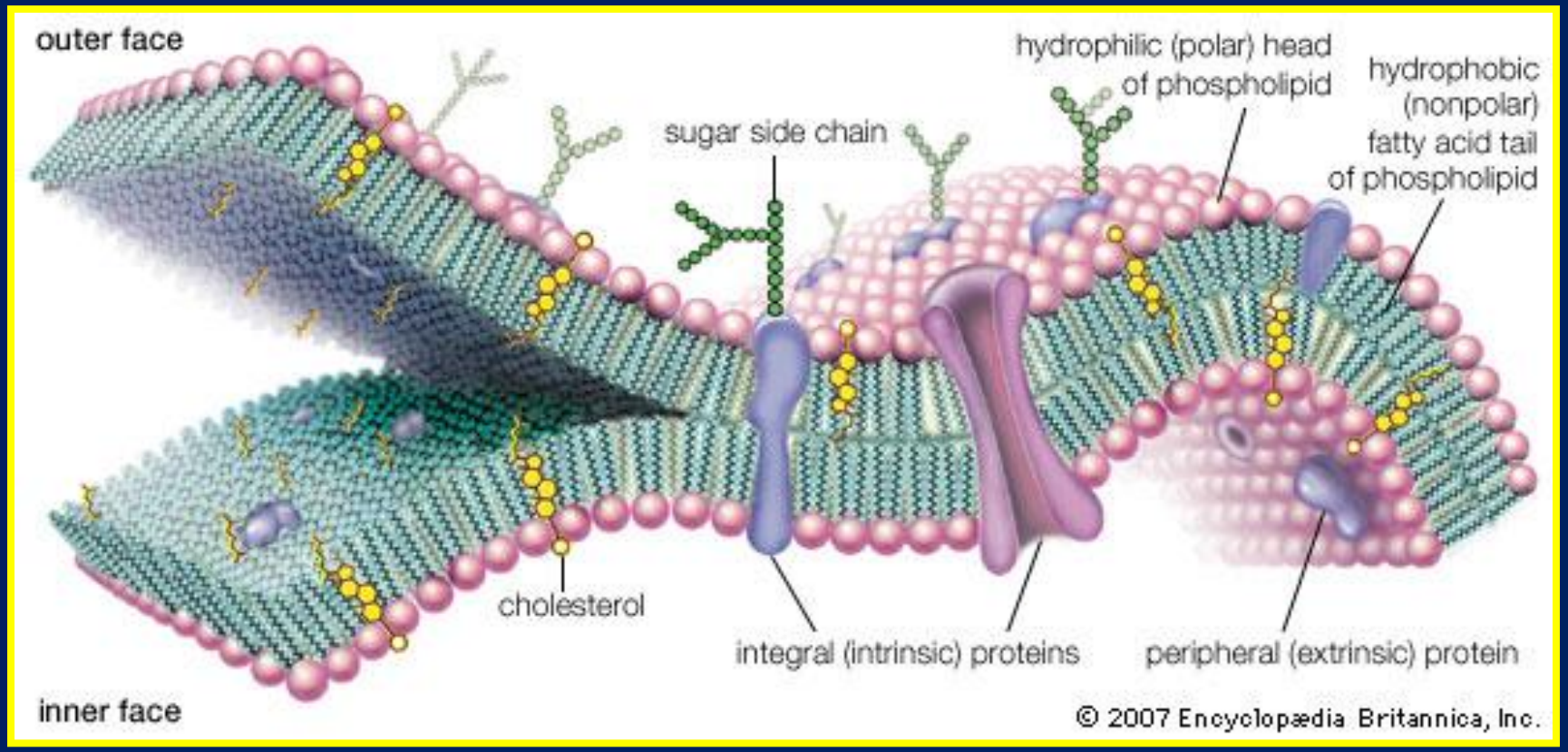


Cold Temperatures



Warm Temperatures

The End


outer face
hydrophilic (polar) head of phospholipid
hydrophobic (nonpolar) fatty acid tail of phospholipid
sugar side chain
cholesterol
integral (intrinsic) proteins
peripheral (extrinsic) protein
inner face
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