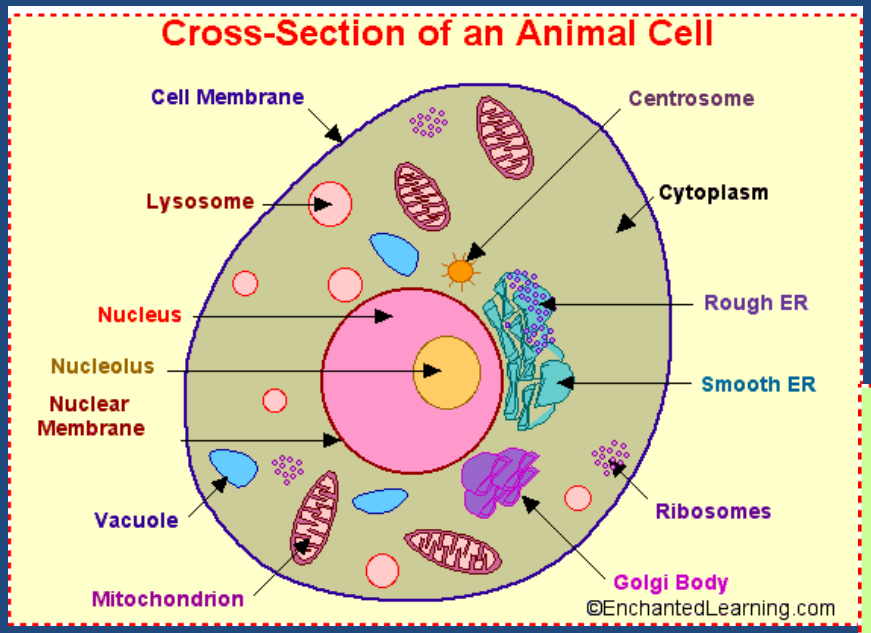
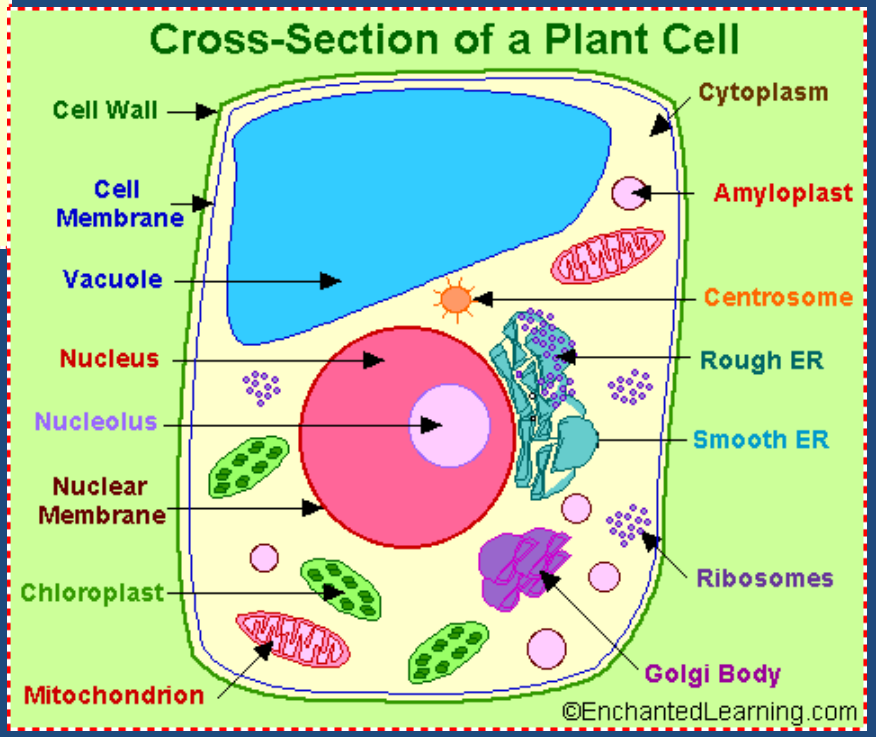
Cell Membrane

What does the cell membrane look like?





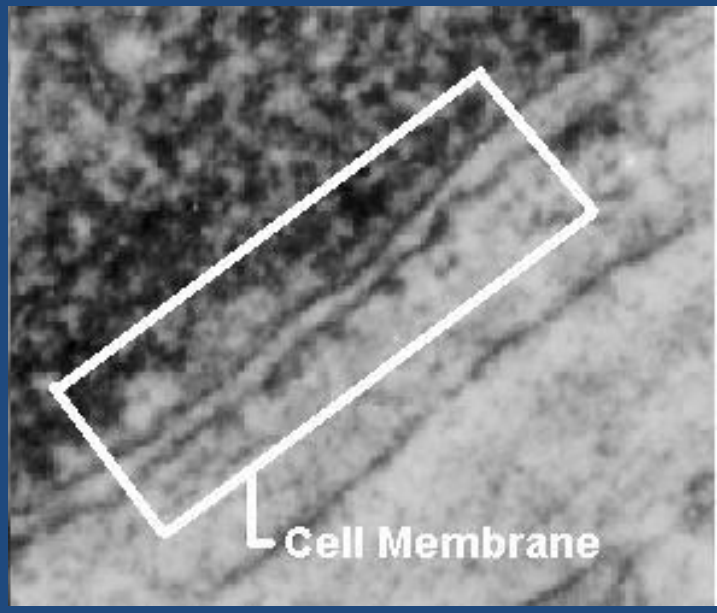
About Cell Membranes

All cells have a cell membrane

Functions:

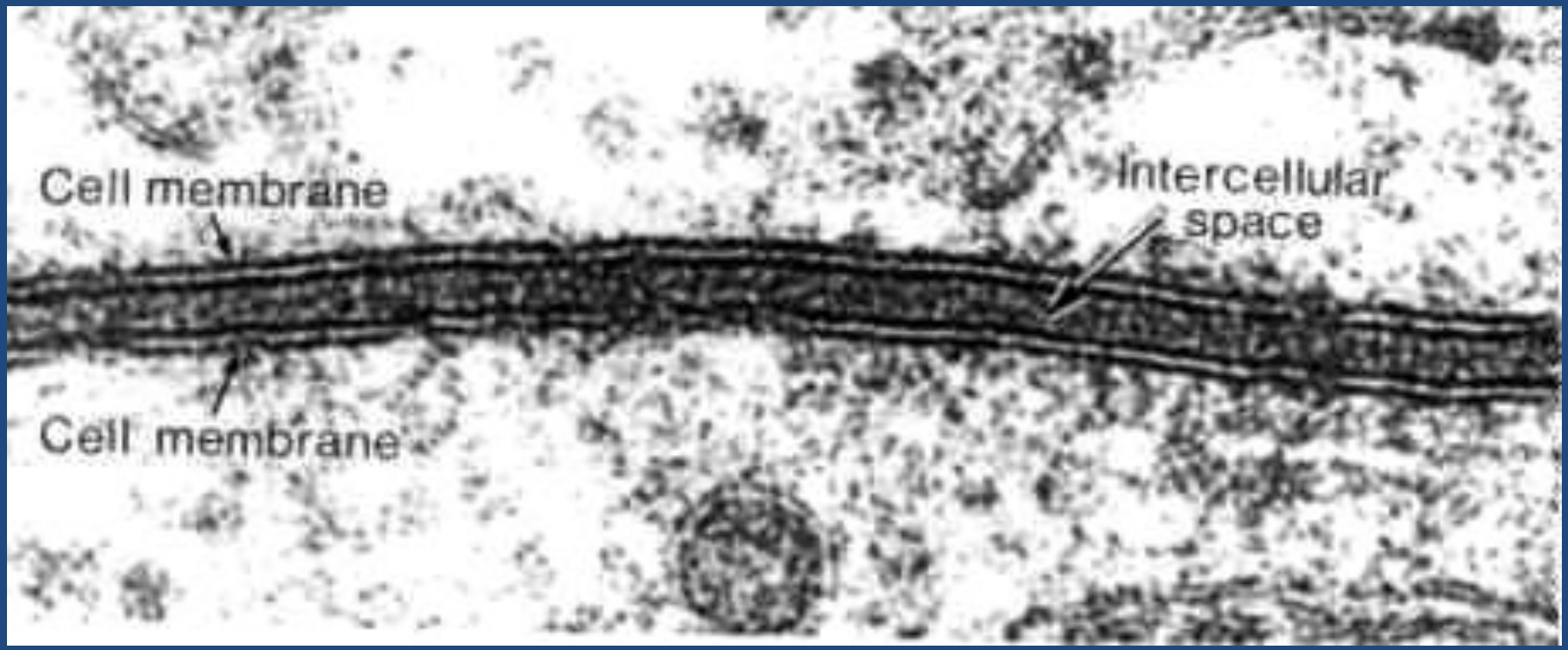
a. Controls what enters and exits the cell to maintain an internal balance called **homeostasis**

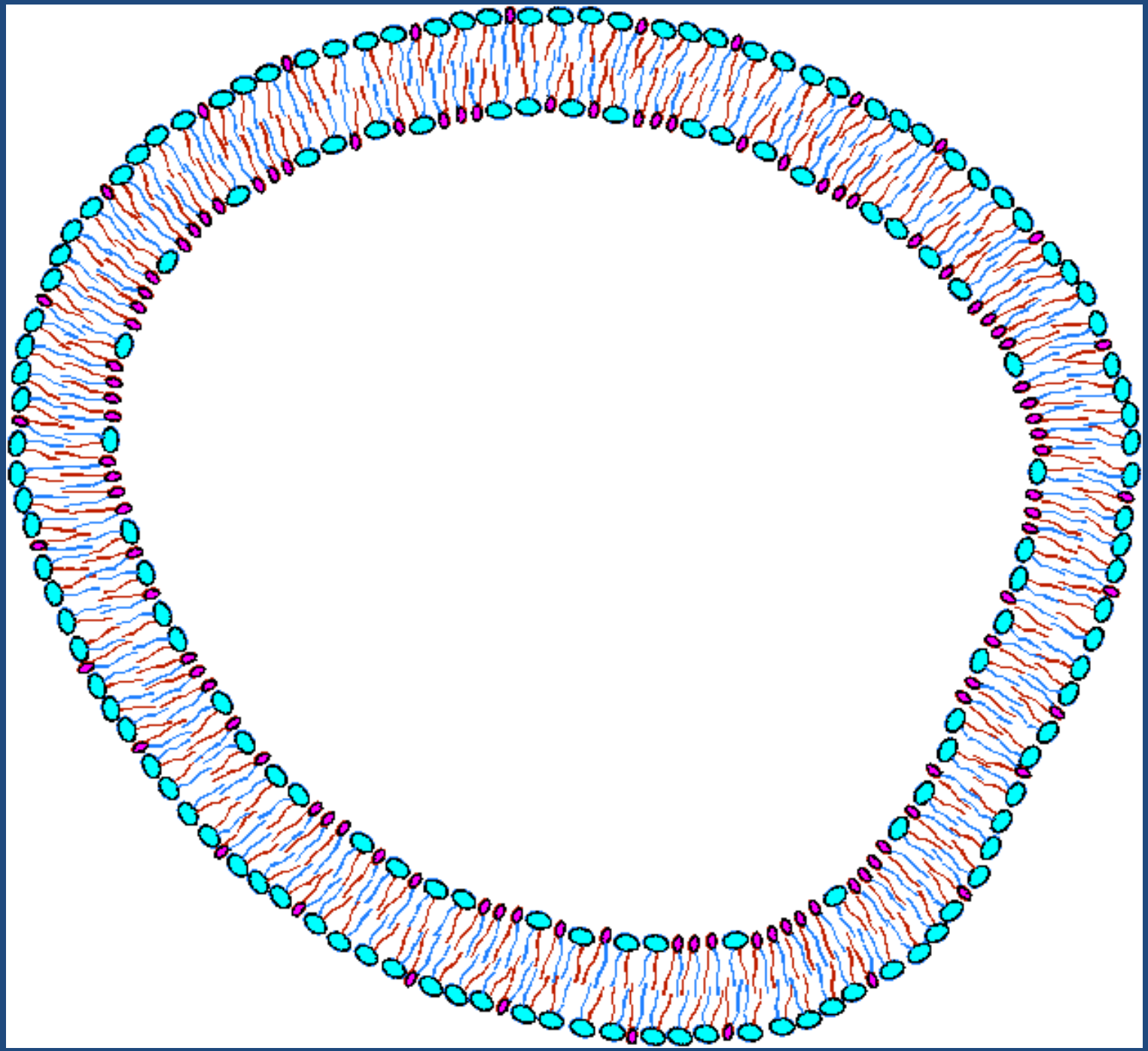
a. Provides protection and support for the cell



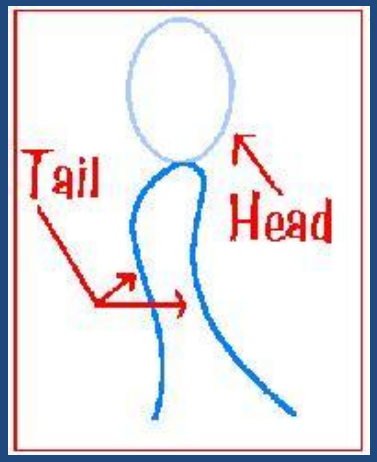
TEM picture of a real cell membrane.

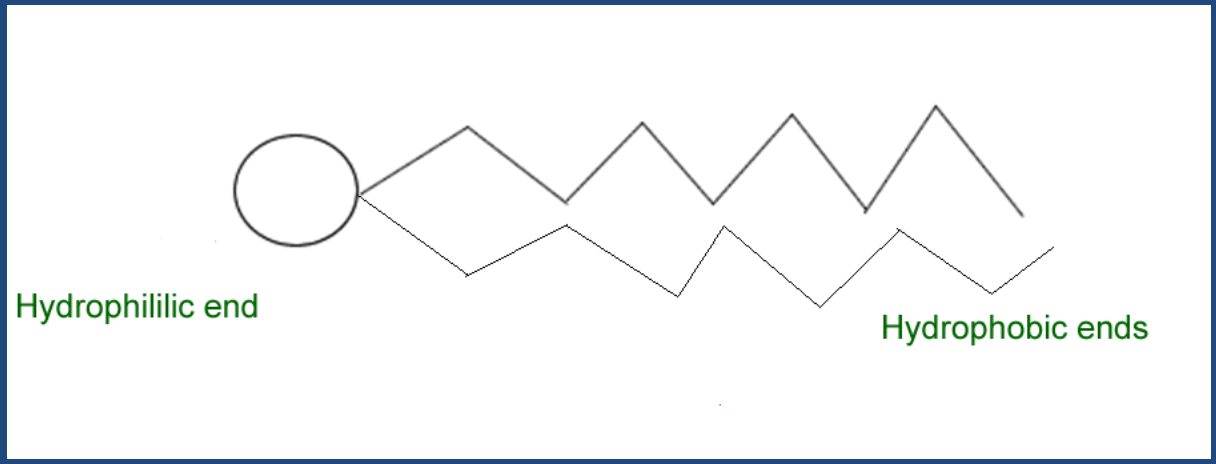
The cell membrane under an electron microscope

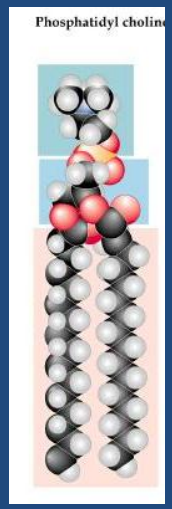




Cell membranes are composed of phospholipid molecules







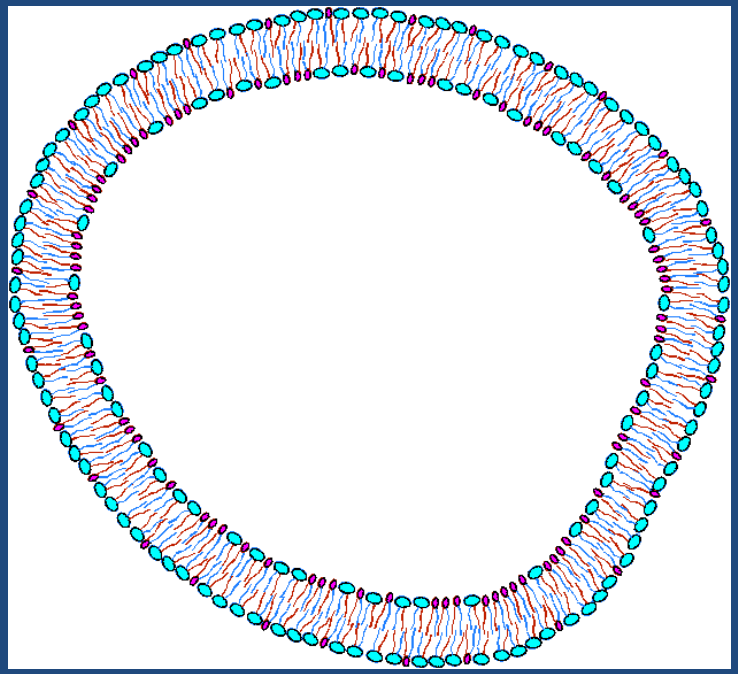
Phospholipids are biological macromolecules and consist of

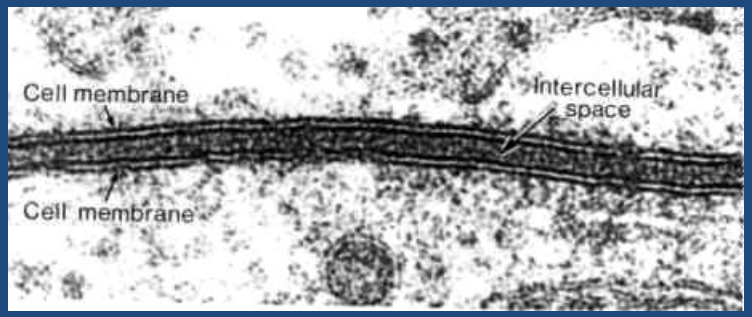
a. Phosphate head which is *polar* (water lovingor hydrophilic).

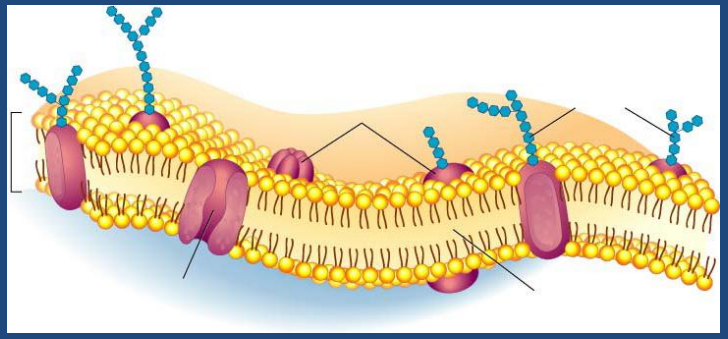
b. Fatty acid tails *non-polar* (water fearing or hydrophobic).

Cell Membranes are made of:

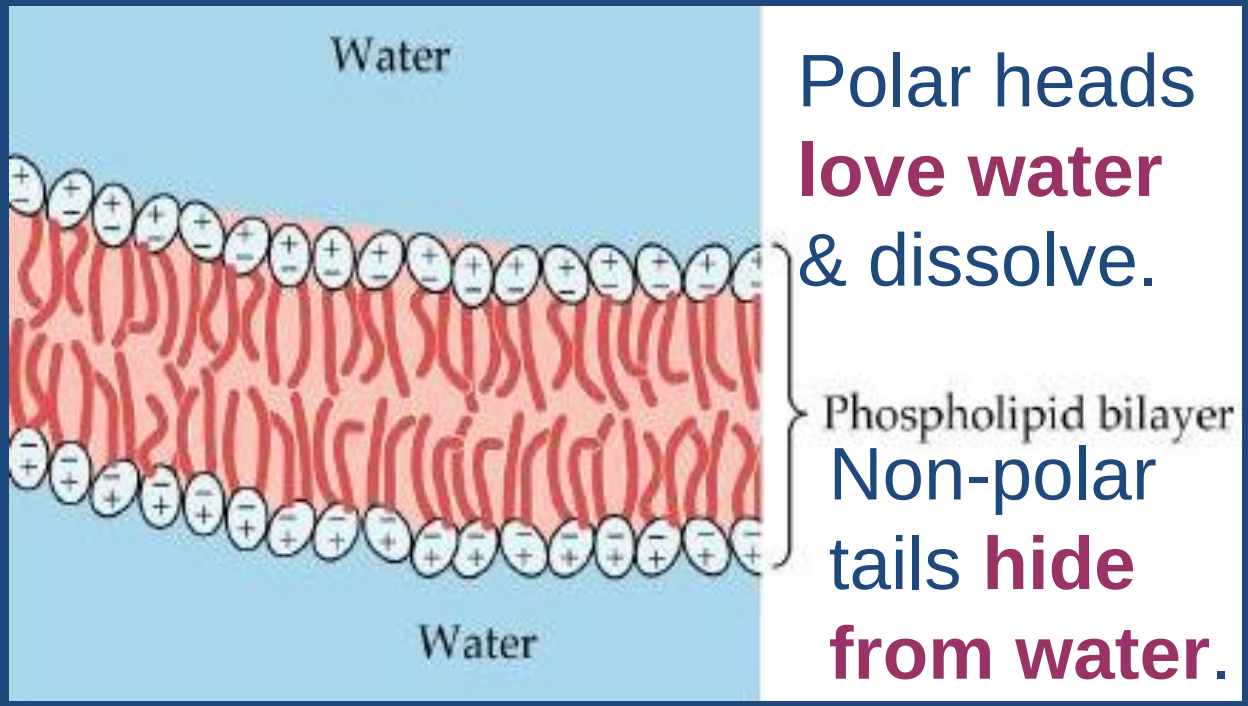
Two layers of phospholipid molecules. Known as a phospholipid bilayer.



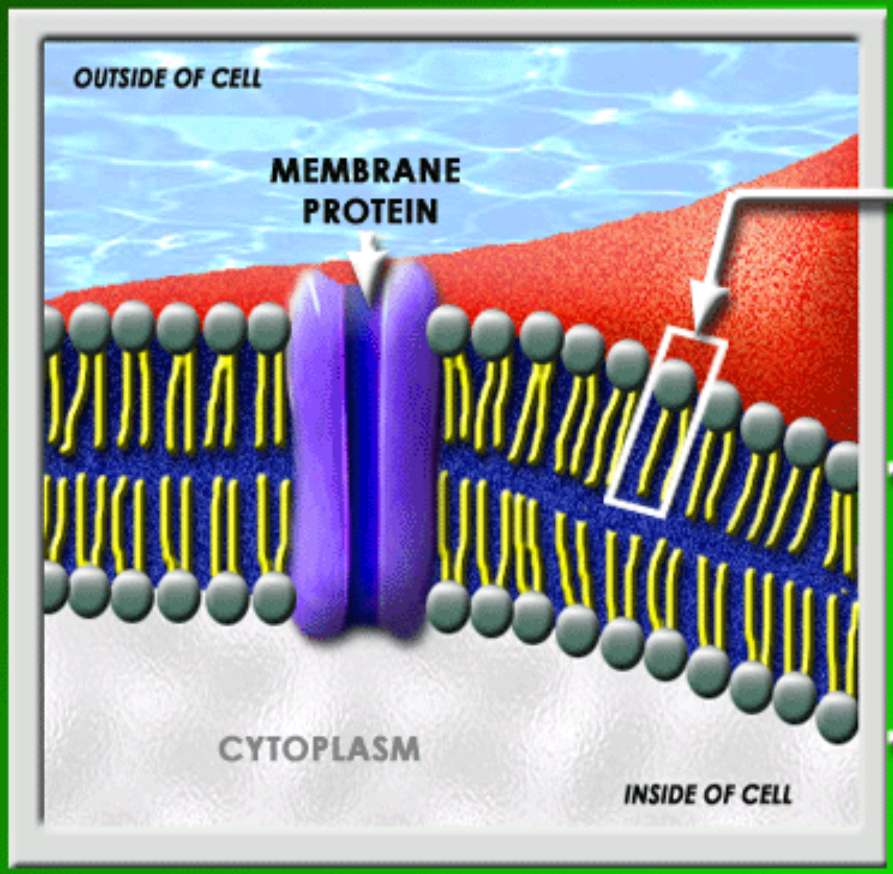




So when a membrane is in contact with a aqueous solution, the phospholipids line up with their hydrophobic tails pointing away from the solution (i.e. on the inside of the bilayer). This makes membranes impermeable to water soluble molecules.



CELL MEMBRANE



PHOSPHOLIPID:

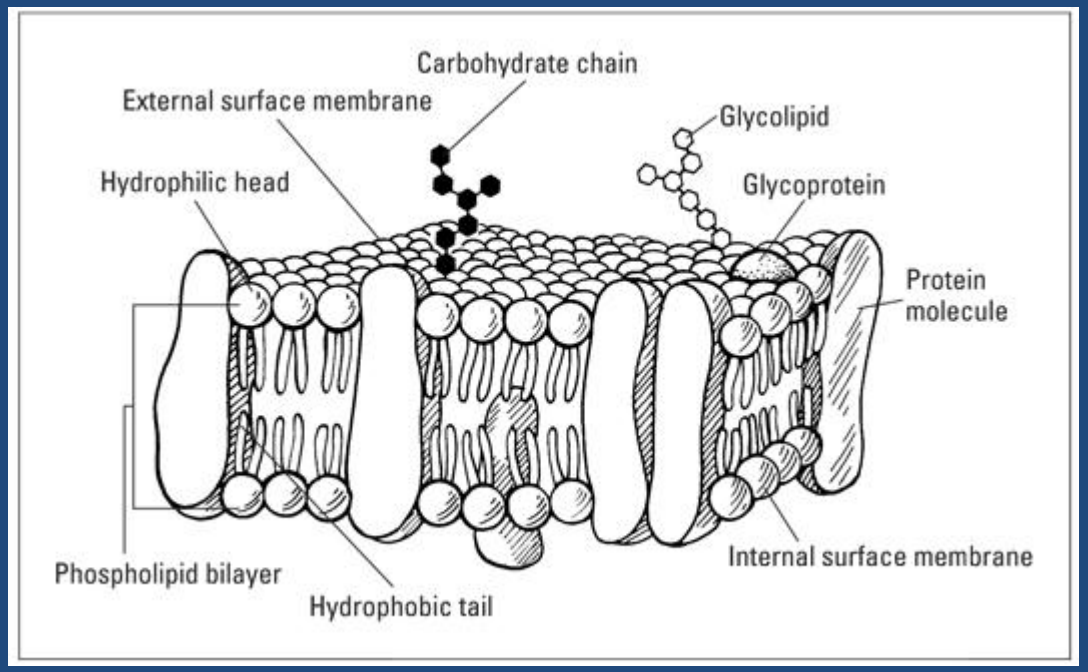
a) hydrophilic head

b) hydrophobic tails

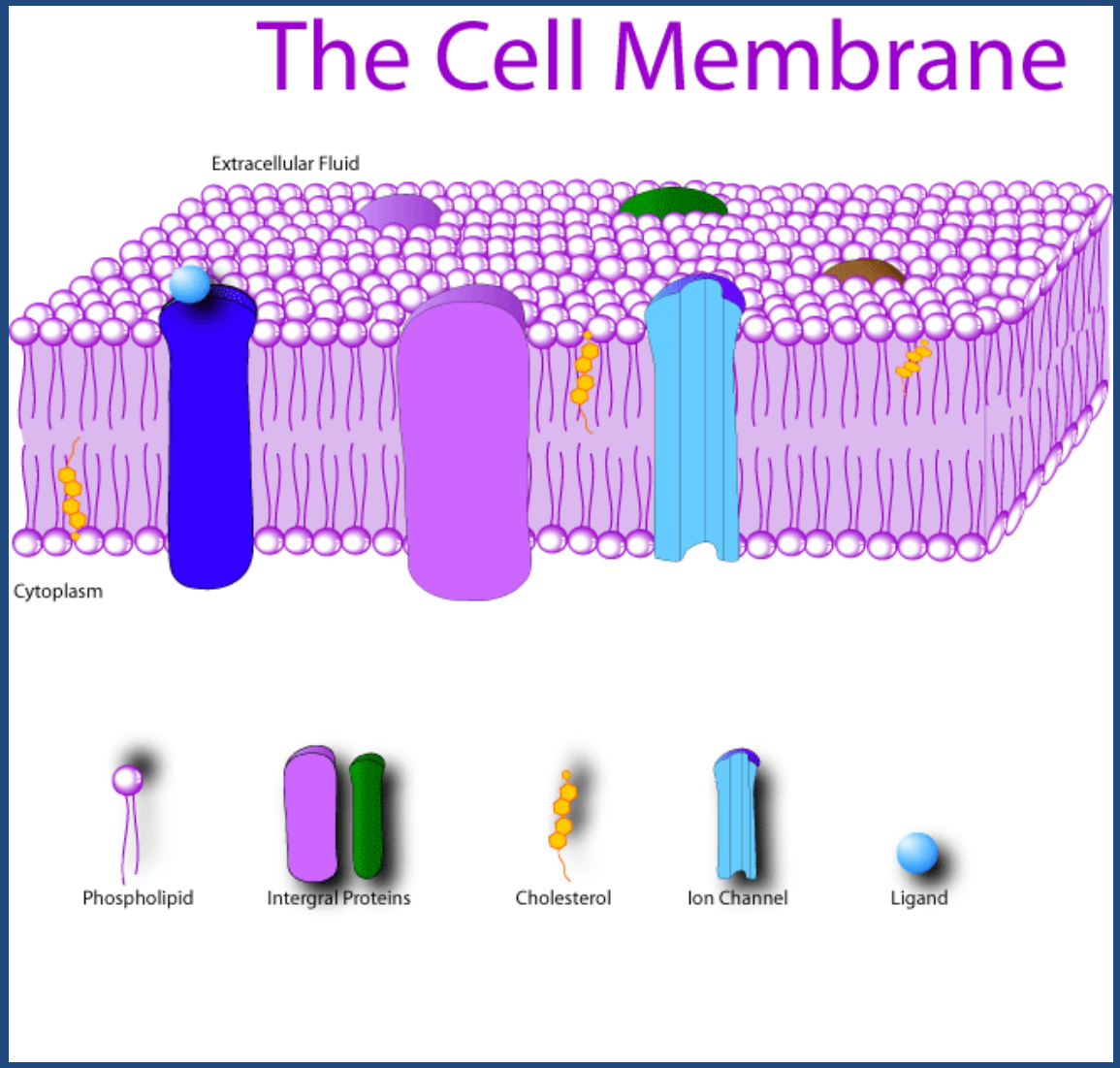
PLASMA MEMBRANE

The Fluid Mosaic Model

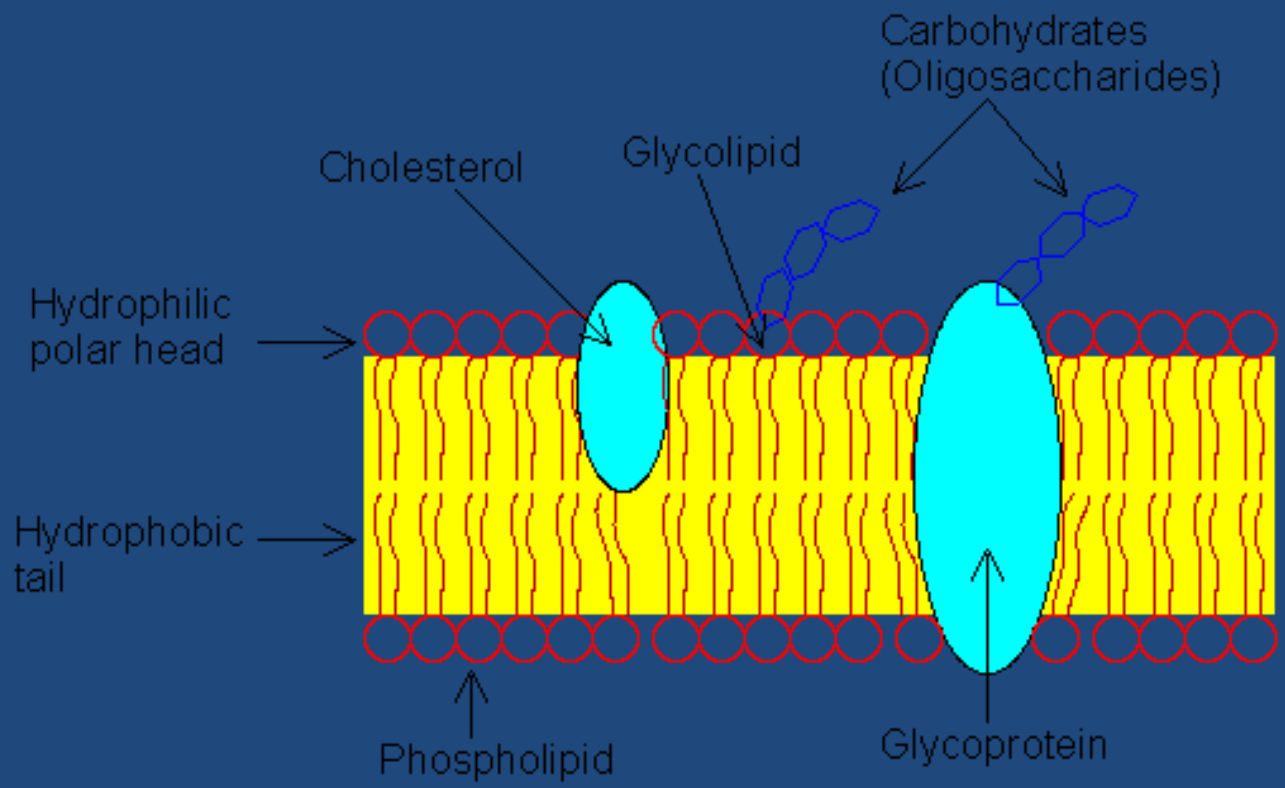
Cell membranes are made of a lipid bilayer but are also embedded with proteins, Carbohydrates and cholesterol.



Different type of proteins embedded in the cell membrane



Cholesterol, Glycoproteins and Glycolipids



The Fluid-Mosaic Model of the Cell Membrane consists of:

- Phospholipids which makes the cell membrane impermeable to aqueous solutions.
- Cholesterol which gives the membrane stability without reducing the permeability of the membrane to small water based molecules. Without cholesterol the membrane would rapidly break down and release its contents.
- Proteins which carry out most of the other cell activities. Different proteins such as Channel proteins, Carrier proteins, exist that carry out different roles.
- Carbohydrates can be found attached to lipids (called glycolipids) or proteins (called glycoproteins).

The function of cell membranes is to:

- control the type of molecules that can enter and leave the cells and cell components.
- create active environments in which many essential chemical reactions of life occur.
- establish compartments within the cell that separate hereditary material (DNA), lysosmal enzymes, secretory products of cells, cytosol and energy processing materials in mitochoindria and chloroplasts.
- to restrict the movement of substances between one part of a cell and another, thereby permitting the regulation of many enzymatic processes that take place within the cell.
- have receptors involved in intercellular communication (directly between adjacent cells and by hormones and nerves).
- be involved in the recognition of cells by other cells.
- produce electrical activity in excitable cells (nerve and muscle).

Biozone

The Structure of Membranes pp 61-62

Text

Chapter 4.2