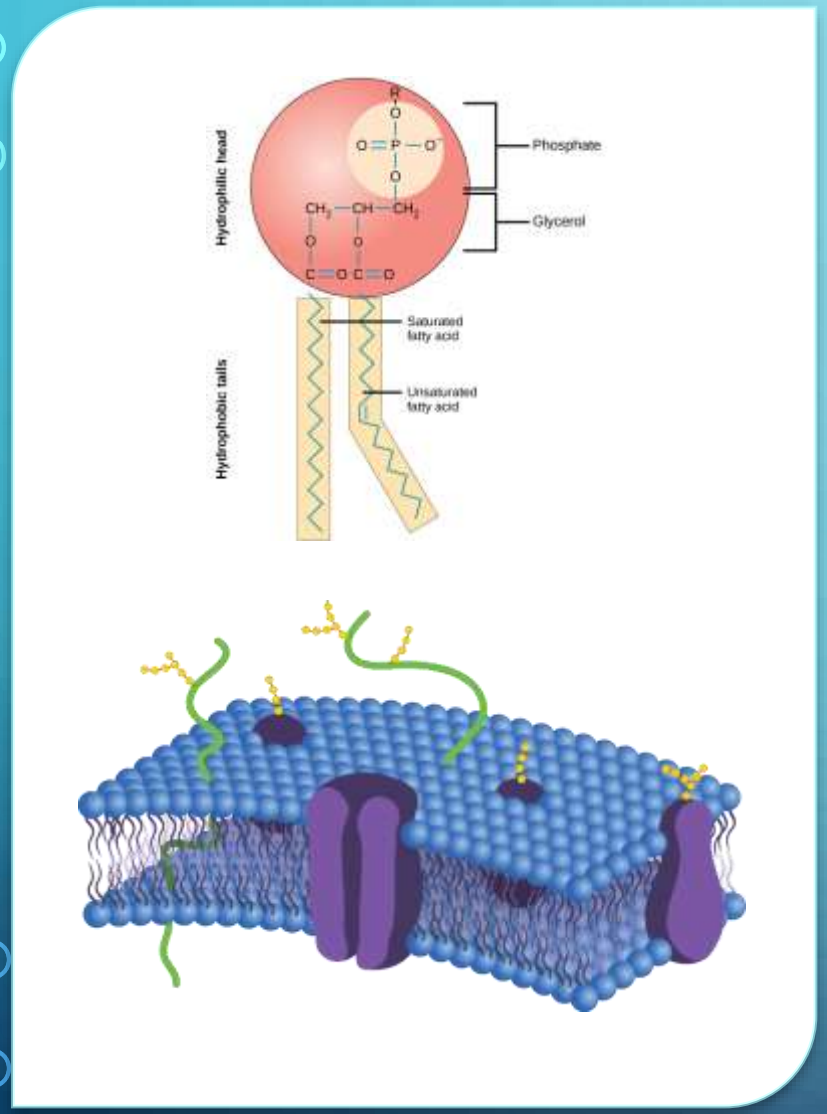
# GENERAL CHARACTERISTIC OF CELL MEMBRANE AND PASSIVE TRANSPORT ION THROUGH THE CELL MEMBRANE

# MEMBRANE STRUCTURE AND FUNCTION

Cells must contain a cell membrane, cytoplasm and genetic material.

The cell membrane is the edge, “boundary of life”, while the cytoplasm is the site of all the reactions of life and the genetic material is the information required for life.

Selectively permeable means that the cell membrane allows some substances across more easily than others… some it helps and some it inhibits or rejects all together.




# MEMBRANE STRUCTURE:

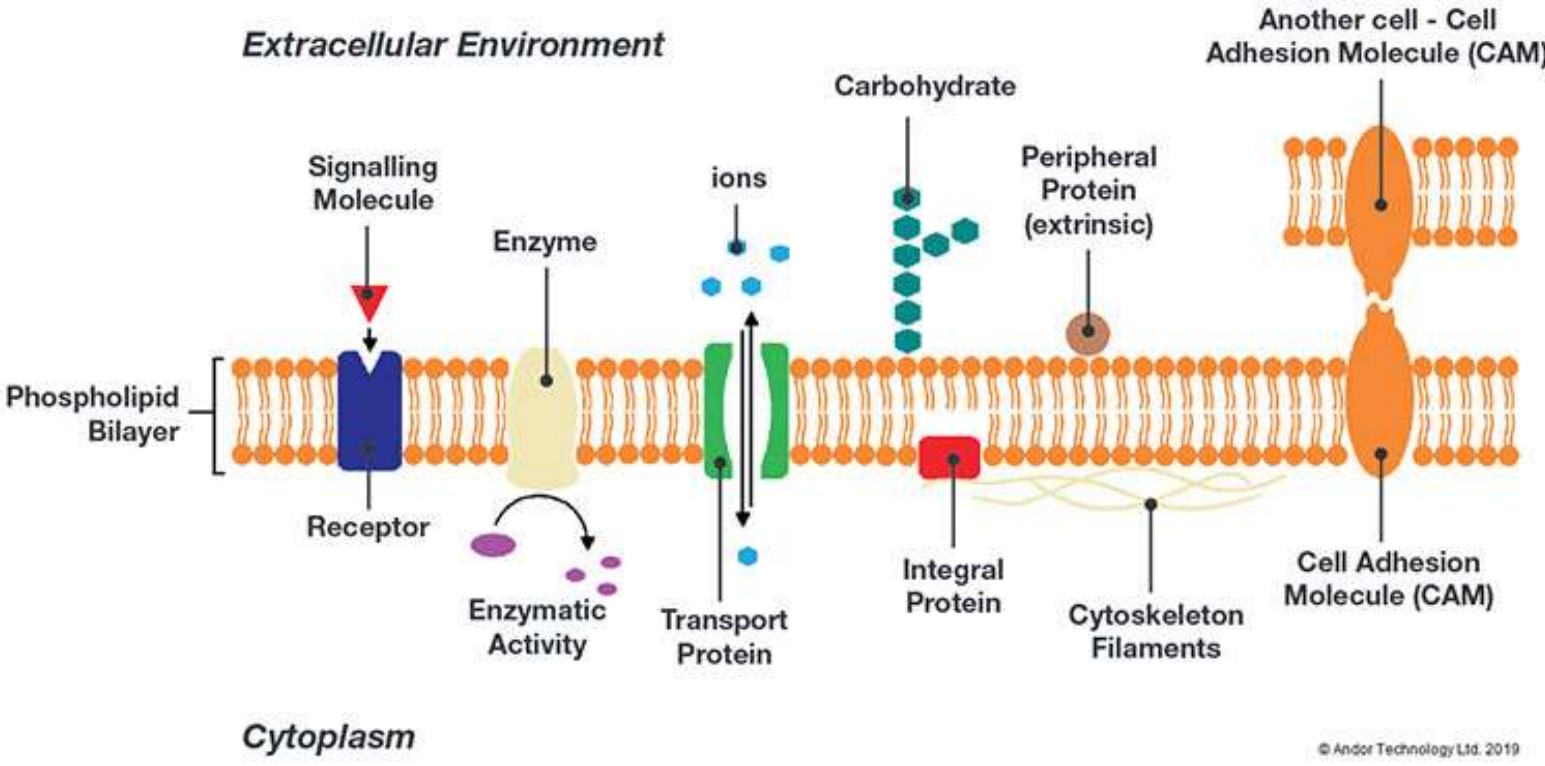
- **Phospholipids – phosphate and fatty acid tails**
  - **Hydrophilic phosphates**
  - **Hydrophobic fatty acid tails**
- **Two layers**
  - **With tails together**

1) Most structure of the cell
2) Phospholipids have glycerol backbones which is the hydrophilic (water soluble )heads and 2 fatty acids tails which are hydrophobic (water insoluble) the hydrophobic tails facing each other
3) The tails consist of both saturated and unsaturated fatty acids

1) Saturated fatty acid: single bond
2) Unsaturated : one or more double bonds

# Proteins : the responsible of most cell's function

- **Embedded throughout - integral**
- **Some just surface – peripheral**
- **Channel down concentration gradient ( high to low)**
- **Carrier proteins against concentration gradient ( low to high )**
- **Glycoprotein signaling**




Integral protein : are anchored to and embedded in the cell membrane through hydrophobic interaction and may span the cell membrane

It includes ion channels and transport protein and receptor

Peripheral protein : not embedded in the cell membrane located at the surface

Transport – substance across membrane, specificity to substance, active pumps

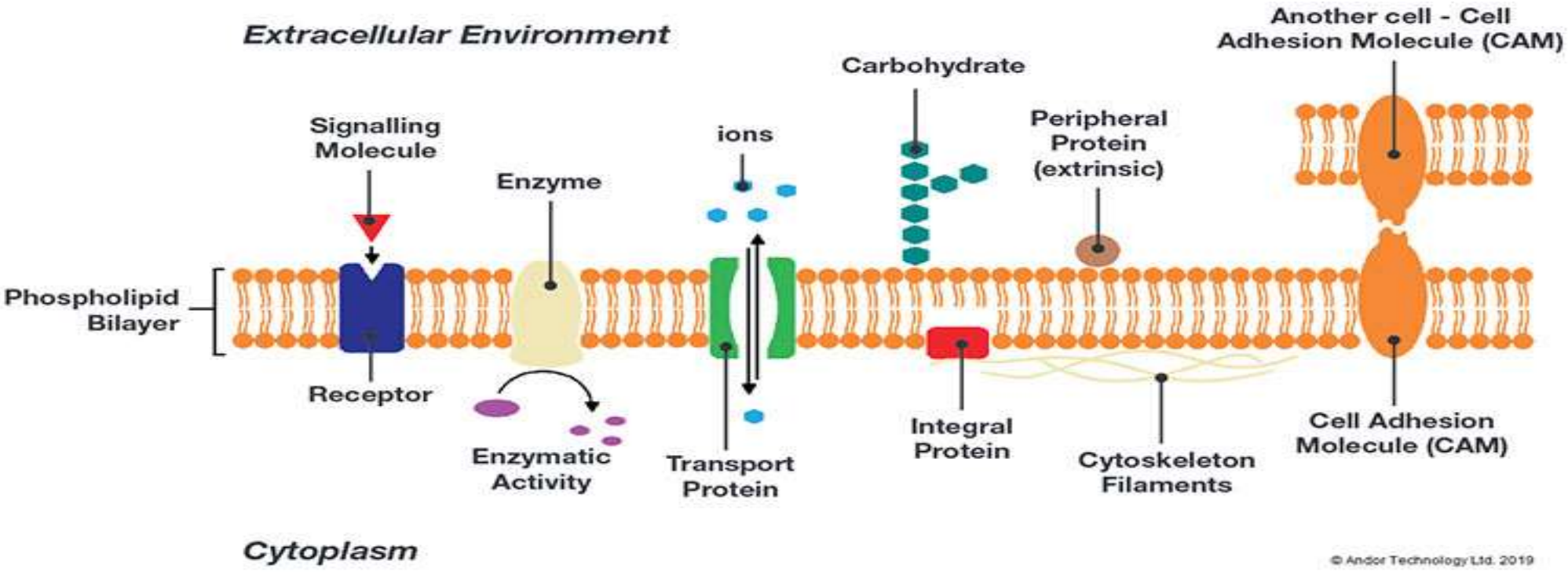
Enzymatic activity – sequence reactions

Attach to cytoskeleton – change shape of cell

Transmit signals – conformational change when with substrate = message.

Junctions – glue cells into tissues

Recognition – glycoproteins act as targets or ID

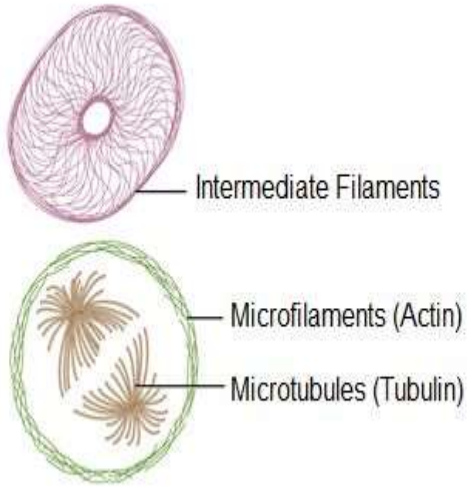


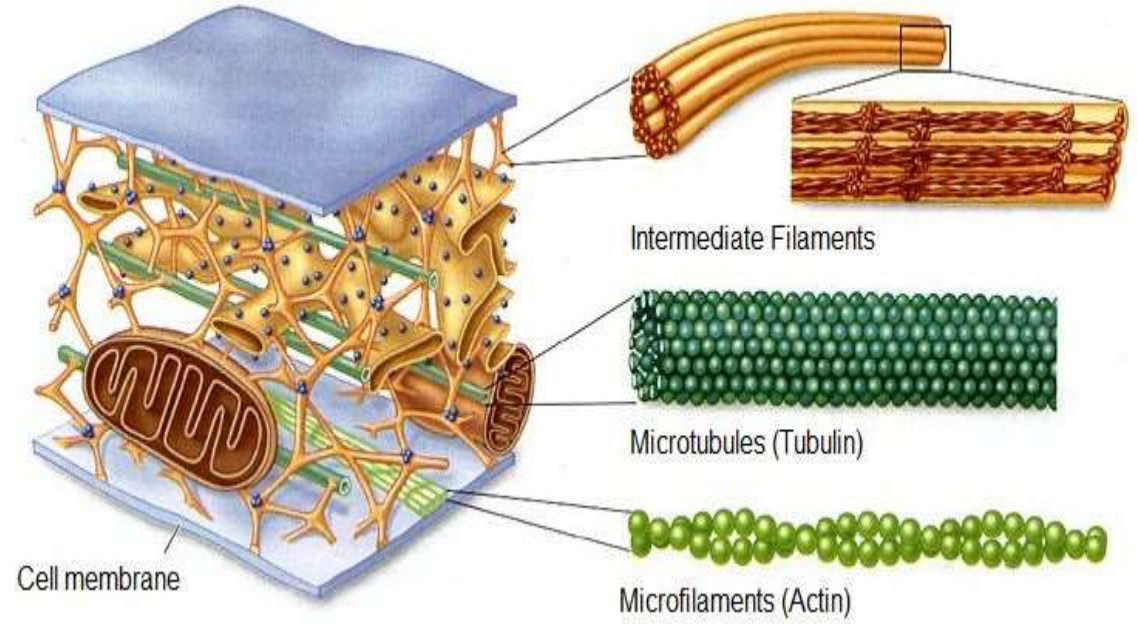

**Some glycoproteins serves as identification tags that are specifically recognized by other cells**

The cytoskeleton : is a network of fibrillar proteins organized into filaments or tubules

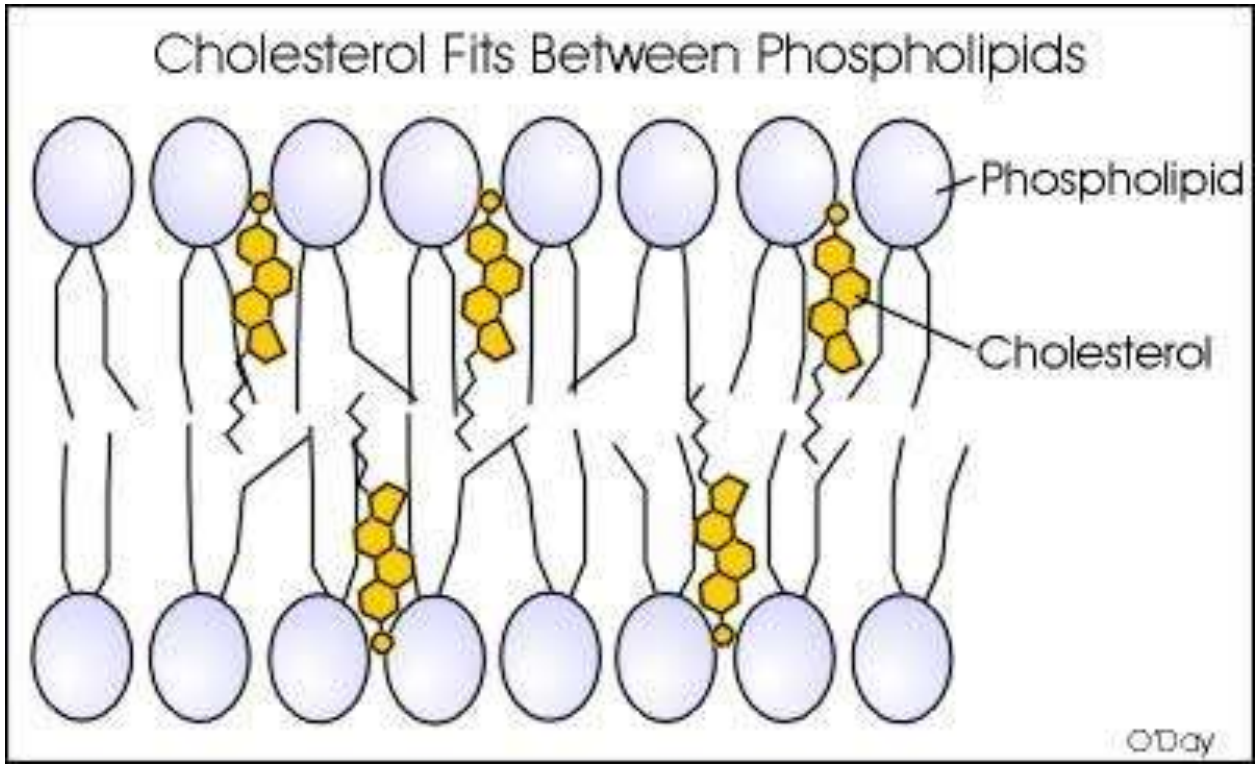
Function :

1) stability (rigid physical structure )
2) Cell shape
3) Directs the movement of organelles
4) Covering




Cholesterol : lipid molecules are dissolved in the bilayer of the cell membrane , keep moving around , cholesterol controls much of the fluidity of the membrane

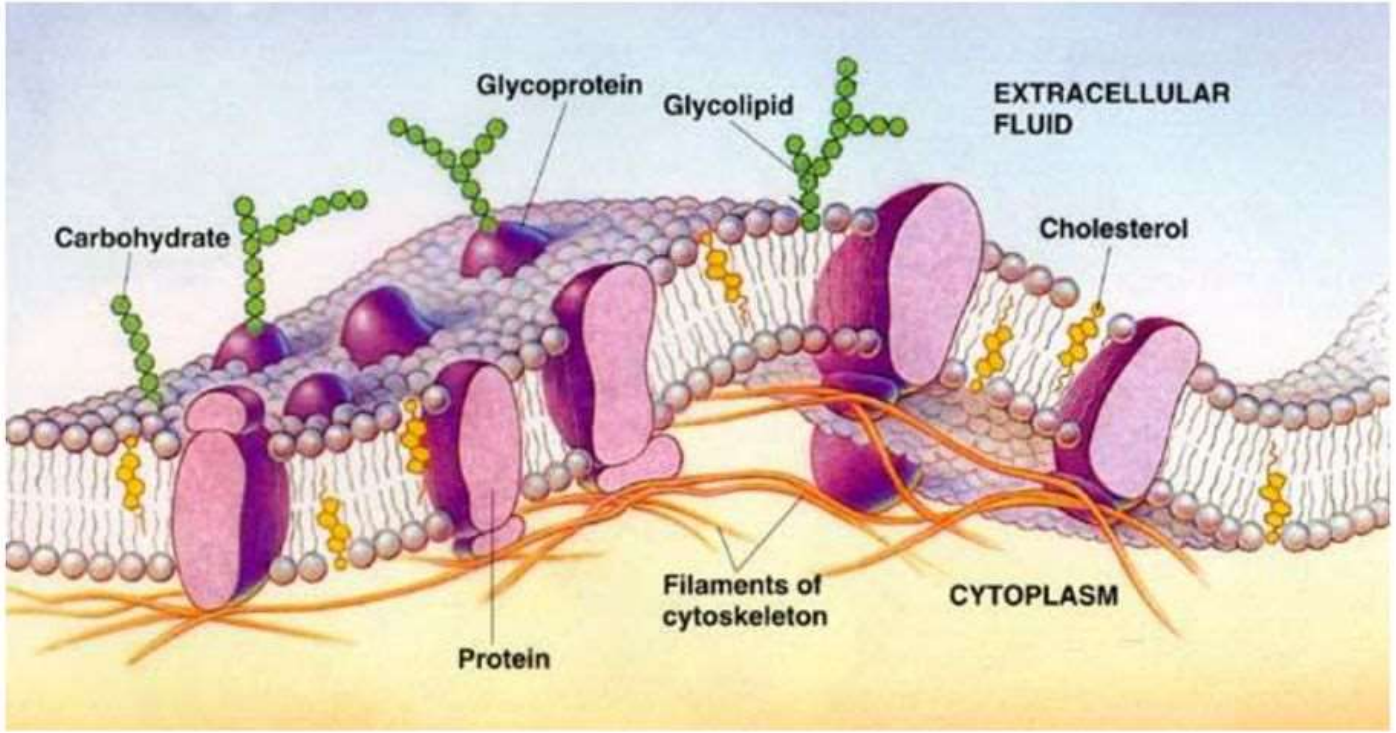


Discovered in 1972

Cholesterol molecules as a buffer prevent membrane from becoming 'crispy' increasing fluidity as temp decrease and decreasing fluidity as temp increase

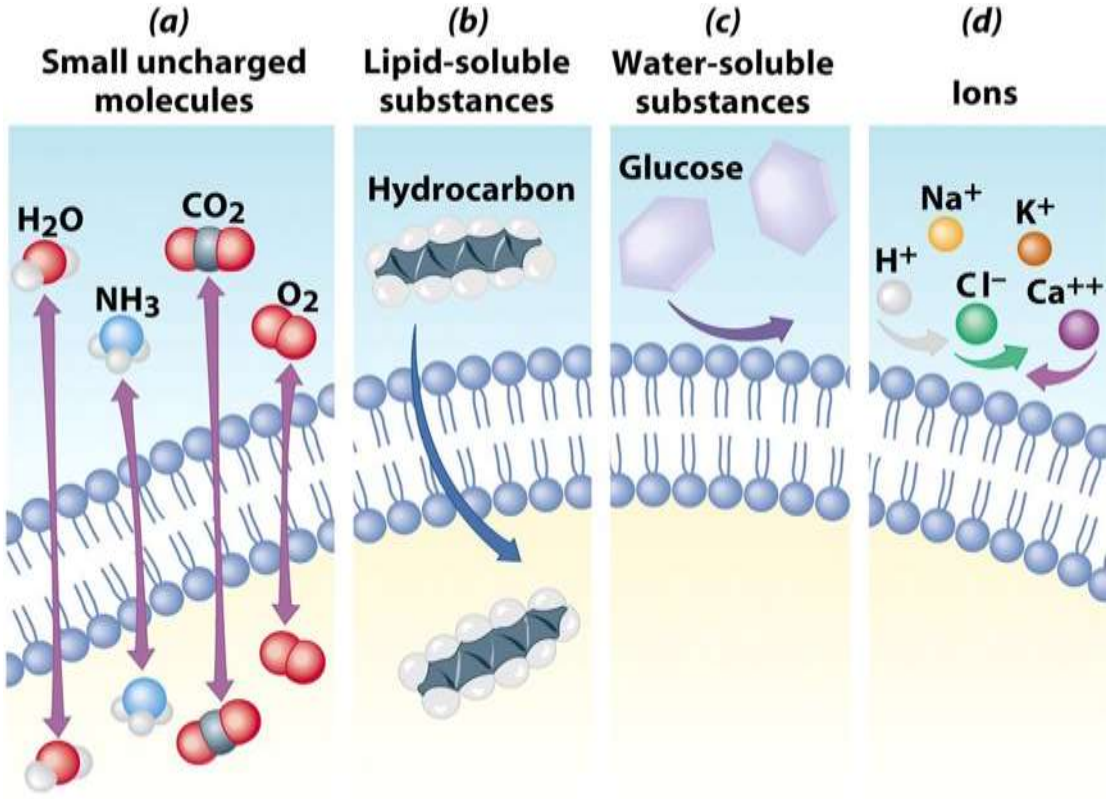
Increasing unsaturated fatty acids increasing fluidity

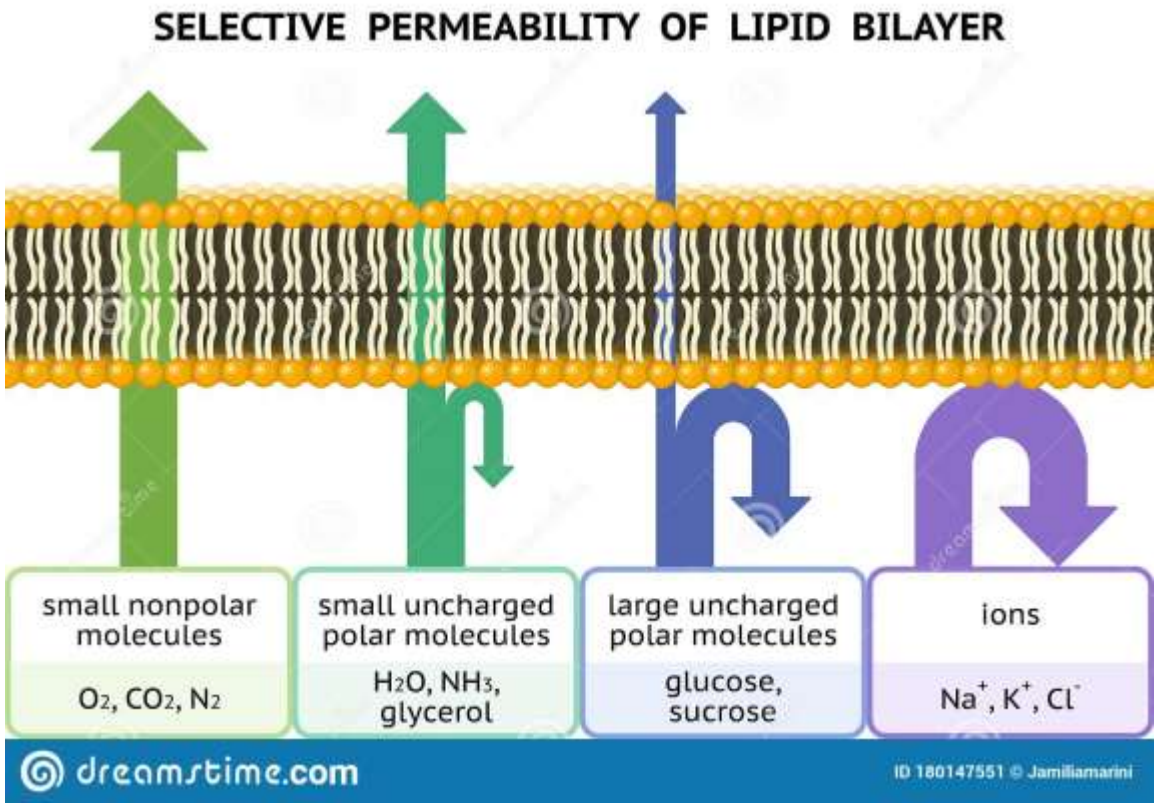
# Fluid Mosaic Model




In high temp the fluidity will increase and to control that: cholesterol molecules decrease …… small spaces between phospholipids ….. Low fluidity

In low temp the fluidity will decrease and to control that: cholesterol molecules increase …… many spaces between phospholipids ….. High fluidity




# Moving across the membrane

- Small nonpolar molecules like CO2 and o2 can dissolve in lipid layer (hydrophobic ) steroid hermons
- Small polar molecules like water can pass slowly
- Large but nonpolar like benzene can pass the cell membrane used in labs to wash the hands
- Large and polar like glucose can't pass the cell membrane
- ion charged molecules can't pass the cell membrane

**1. What is NOT TRUE about the cell membrane :**

1) It controls what enters and leaves the cell
2) Semipermeable
3) Phospholipid bilayer
4) Contains digestive enzymes

(4)

**2. What is embedded in the phospholipid bilayer?**

1) proteins
2) salt
3) Water

(1)

**2. What forms the channels and pumps in the phospholipid bilayer?**

1) carbohydrates
2) proteins
3) hydrophilic heads
4) Lipids

(2)

**4. What is the function of cholesterol in the cell membrane?**

1) transport ions into the cell
2) allows the fatty acids not to stick together
3) communication between cells
4) keeps polar molecules out of the cell

(2)

**5. Most of the cell membrane is made of...**

1) Lipids
2) Carbohydrates
3) Proteins
4) Nucleic acids

(1)

**6. The function of the plasma membrane is....**

1) to regulate what enters and leaves the cell.
2) fight bacteria and viruses that enter the cell.
3) provide rigid support and protection to the cell.
4) make sure each cell can move

(1)

**7. What is a fluid mosaic model?**

1) organization of the plasma membrane
2) allows substances to pass through plasma membrane
3) maintaines balance in a cells survival
4) Move among tails of phospholipids

(1)

**8. Cholesterol is an important component of the cell membrane because**

1) It makes the membrane more fluid and adds to its flexibility
2) It aids in diffusion
3) It aids in cell recognition
4) It transports large, polar molecules

**9. membrane is permeable to hydrogen but impermeable to sodium ions. Which molecule cannot move into the cell?**

1) Hydrogen
2) Sodium ions
3) Both hydrogen and sodium ions
4) Neither