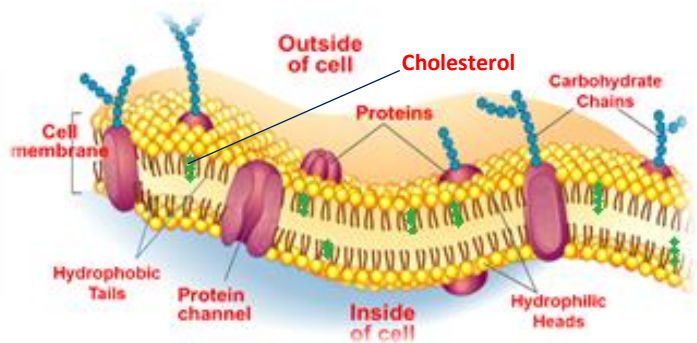


# Unit 8 Notes: Cell Membrane, Types of Transport, Solutions, & Cell Specialization

## Functions of Cell Membrane:

- Provides \_\_\_\_\_
- Regulates:
  - What \_\_\_\_\_ and \_\_\_\_\_ the cell
  - Takes in \_\_\_\_\_ & \_\_\_\_\_
  - Holds \_\_\_\_\_ within the cell
  - Eliminates wastes to maintain \_\_\_\_\_



## What is Homeostasis?

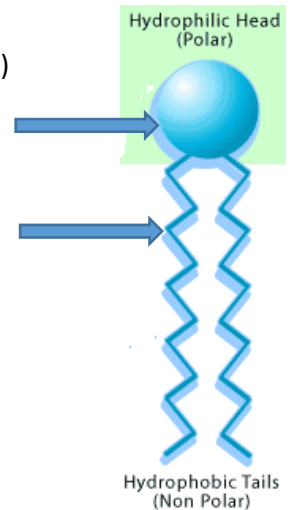
- An organism's ability to keep a \_\_\_\_\_ internal environment

## Structure of Cell Membrane/Lipid Bilayer

- \_\_\_\_\_ embedded in lipid bilayer
  - Forms \_\_\_\_\_ and \_\_\_\_\_ to move \_\_\_\_\_ (large molecules) \_\_\_\_\_
- Carbohydrate chains for \_\_\_\_\_ other cells, determining self from non-self.
  - \*Can be a problem for organ transplants
- \_\_\_\_\_ in-between hydrophobic tails gives the cell membrane more support, and prevents water-soluble molecules from moving across the membrane

## Hydrophilic Heads/Hydrophobic Tails

- Composed of \_\_\_\_\_ (also called a phospholipid)
- Top and bottom of layer has \_\_\_\_\_
  - Has a charge and can attract water (\_\_\_\_\_)
- Middle has a \_\_\_\_\_
  - Has no charge, and does not mix with water (\_\_\_\_\_)
- Head and tail are important in forming the \_\_\_\_\_

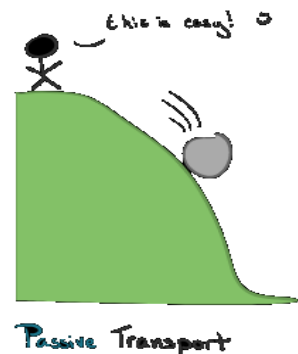


## Purpose of Cell Transport

- Cells must move \_\_\_\_\_ across the \_\_\_\_\_ in order to \_\_\_\_\_
  - \_\_\_\_\_ must be able to move **into** the cell
  - \_\_\_\_\_ must be able to move **out** of the cell

## Passive transport – requires NO energy!

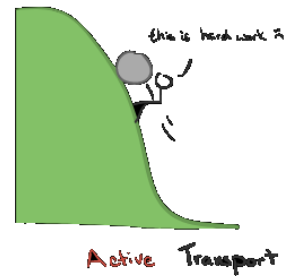
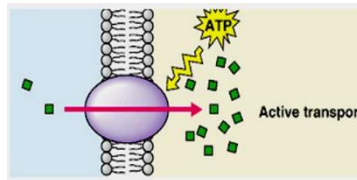
1. **Diffusion:** movement of \_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ concentration
2. **Facilitated Diffusion:** movement of \_\_\_\_\_ using transport \_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ conc.
3. **Osmosis:** movement of \_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_ concentration



- Diffusion
  - Molecules move from areas of \_\_\_\_\_ concentration to areas of \_\_\_\_\_ concentration
  - Molecules constantly collide back and forth to maintain \_\_\_\_\_
  - \_\_\_\_\_ !!!  
\*High to low, high to low... That's the way diffusion goes!
  - Molecules still move across cell membrane in \_\_\_\_\_, but NO CHANGE in concentration cell is in homeostasis (or equilibrium)
- Facilitated Diffusion
  - Diffusion of large molecules across the cell membrane through \_\_\_\_\_
  - \_\_\_\_\_ !!!  
Ex: Glucose
- Osmosis
  - Diffusion of \_\_\_\_\_ from areas of \_\_\_\_\_ concentration to areas of \_\_\_\_\_ concentration
  - \_\_\_\_\_ !!!

**Active Transport** – requires **ENERGY!**

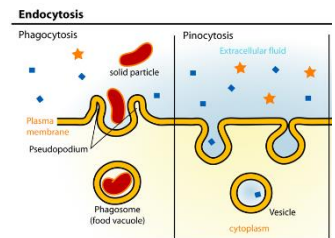
Movement of materials across cell membrane from an area of \_\_\_\_\_ concentration to \_\_\_\_\_ concentration with help of transport protein



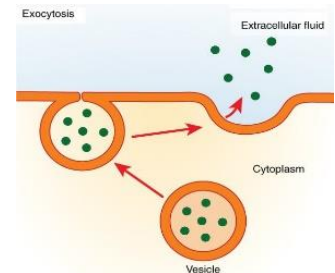
**Endocytosis** – Process of taking material \_\_\_\_\_ the cell by means of infoldings, or pockets, of the cell membrane.

-*Phagocytosis* – Cytoplasm surrounds a \_\_\_\_\_ and packages it \_\_\_\_\_ a vacuole – cell engulfs it

-*Pinocytosis* – Tiny pockets form along the cell membrane, fill with \_\_\_\_\_, and pinch off to form a vacuole

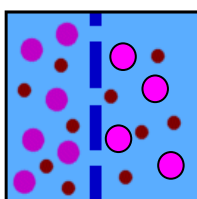


**Exocytosis** – Process of releasing materials \_\_\_\_\_ of the cell. The membrane of the vesicle surrounding the material fuses with the cell membrane forcing the contents \_\_\_\_\_ of the cell

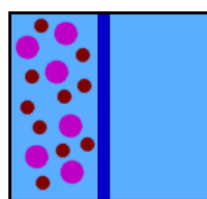


**Types of Membranes**

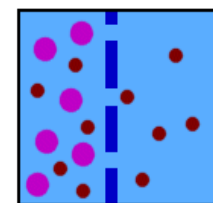
- \_\_\_\_\_ Membrane - \_\_\_\_\_ substance can move across.
- \_\_\_\_\_ Membrane - \_\_\_\_\_ substance can move across.
- \_\_\_\_\_ Membrane - \_\_\_\_\_ substances can & some cannot move across, possibly due to size of molecule



**Permeable**



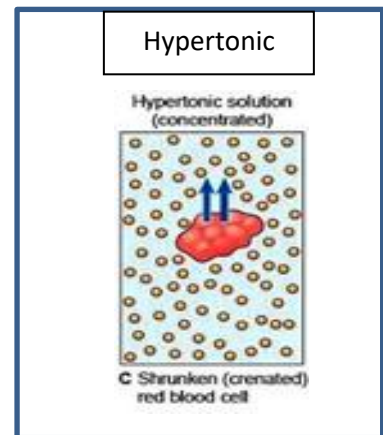
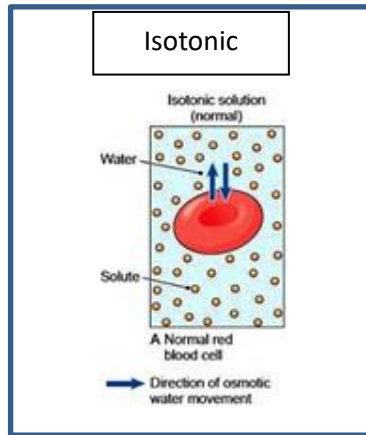
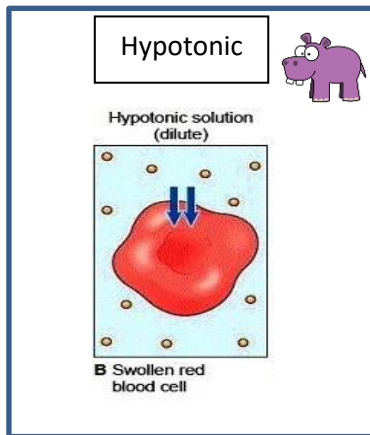
**Impermeable**



**Selectively Permeable**

## Tonicity & Types of Solutions

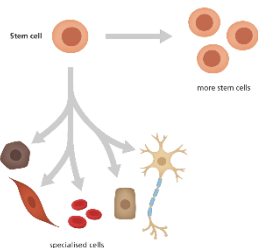
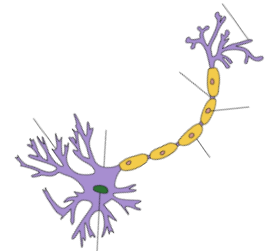
- A. \_\_\_\_\_ Solution - concentration of solutes same inside & outside cell –  
 \_\_\_\_\_
- Ex: blood
- B. \_\_\_\_\_ Solution- higher solute concentration outside than in the cell  
 Water moves out, cell \_\_\_\_\_
- Ex: Salt water
- C. \_\_\_\_\_ Solution – lower solute concentration outside than inside the cell  
 Water moves in, cells \_\_\_\_\_
- Ex: Distilled or fresh water



## Cell Specialization

-Cells become efficient at one process and are \_\_\_\_\_ on other cells for the necessities of life

Ex: Neuron (Nerve) cells specialize in processing and transmitting information



-Stem Cells are \_\_\_\_\_ cells that have the ability to develop into many specialized cell types

## Limits to Cellular Growth

-Remember that \_\_\_\_\_

\_\_\_\_\_ for cell growth!

-A cell's surface area \_\_\_\_\_ to meet the demands of the internal volume of the cell

**\*The cell is not able to bring in nutrients & get rid of wastes fast enough to survive.**

Ratio of Surface Area to Volume in Cells			
Cell Size	1 cm 1 cm 1 cm	2 cm 2 cm 2 cm	3 cm 3 cm 3 cm
Surface Area (length x width x 6)	1 cm x 1 cm x 6 = 6 cm <sup>2</sup>	2 cm x 2 cm x 6 = 24 cm <sup>2</sup>	3 cm x 3 cm x 6 = 54 cm <sup>2</sup>
Volume (length x width x height)	1 cm x 1 cm x 1 cm = 1 cm <sup>3</sup>	2 cm x 2 cm x 2 cm = 8 cm <sup>3</sup>	3 cm x 3 cm x 3 cm = 27 cm <sup>3</sup>
Ratio of Surface Area to Volume	6 / 1 = 6 : 1	24 / 8 = 3 : 1	54 / 27 = 2 : 1