

# CELL TRANSPORT

## Chapter 7.3

## CELL TRANSPORT

2 ways for a cell to move junk in/out of the cell

PASSIVE TRANSPORT

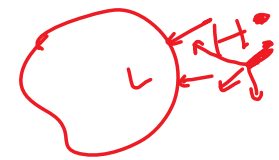
ACTIVE TRANSPORT

### Passive Transport:

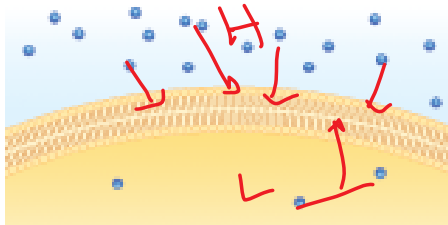
- Movement of materials across the cell membrane **without** the use of cellular **energy (ATP)**.
- 3 Types:
  1. **DIFFUSION**. Process by which materials move from an area of **HIGH** concentration to an area of **LOW** concentration. This movement is due to random molecular movement and collision.   
*Handwritten note: Salts, Sugar, H<sub>2</sub>O, A.A, gases O<sub>2</sub>, CO<sub>2</sub>*

Major Cell Organelle Involved?

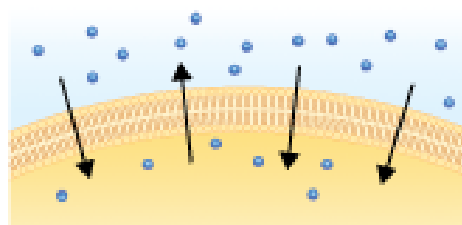
Cell Membrane  
"Gate Keeper"



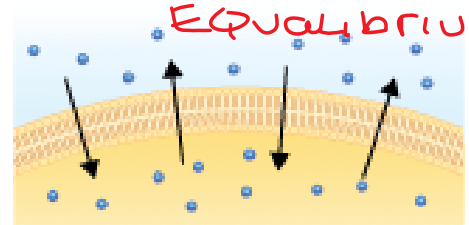
Net movement



There is a higher concentration of solute on one side of the membrane than on the other.



Diffusion causes a net movement of solute particles from the side of the membrane with the higher solute concentration to the side with the lower solute concentration.



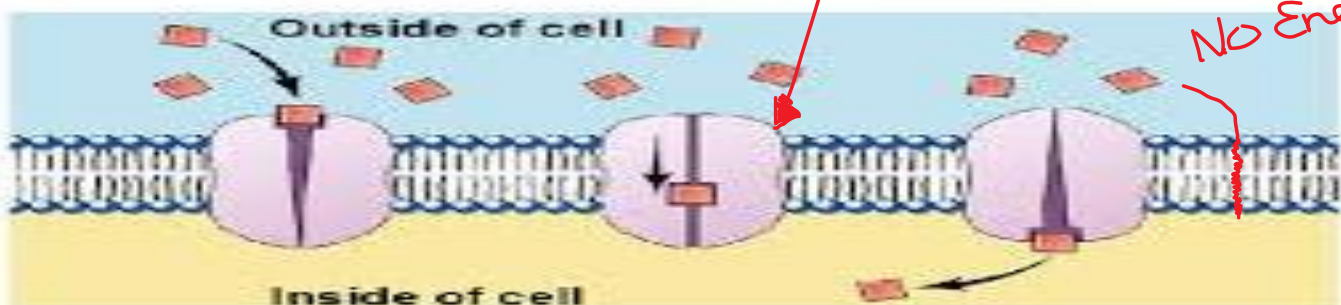
Equilibrium

Once equilibrium is reached, solute particles continue to diffuse across the membrane in both directions but at approximately equal rates, so there is no net change in solute concentration.

Helper

2. **FACILITATED DIFFUSION**. Uses **protein channels** in the cell membrane to move larger and/or charged molecules across the membrane quickly and efficiently. Each protein channel is specific to the molecule that it helps through the membrane

### Facilitated Diffusion

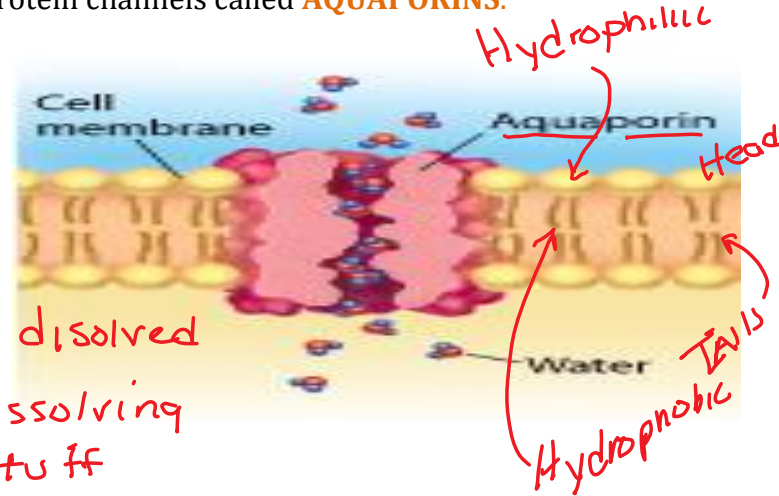


No Energy

3. **OSMOSIS**. (A type of <sup>Help</sup> facilitated diffusion) Simply understood as the diffusion of water through a **selectively permeable** membrane. Water has a hard time passing through the lipid bi-layer (because of the **hydrophobic** tails of the fatty acids), as a result water passes across the membrane through specific protein channels called **AQUAPORINS**.

### Think of it this way:

Water moves in a direction of **LOW SOLUTE** concentration to **HIGH SOLUTE** concentration



### Sum it up:

Solute = Thing being dissolved  
Solvent = Liquid dissolving the stuff

Salt  $H_2O$

Stop  $H_2O$

**ALL 3 TYPES ARE PASSIVE, REQUIRE NO ENERGY & MOVE FROM HIGH CONCENTRATION TO LOW CONCENTRATION!!**

### VOCAB:

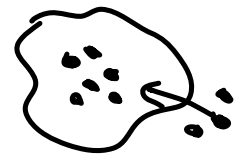
1. **ISOTONIC**
2. **HYPERTONIC**
3. **HYPOTONIC**

4. **OSMOTIC PRESSURE**
5. **CONCENTRATION GRADIENT**

### The Effects of Osmosis on Cells

Solution	Isotonic: The concentration of solutes is the same inside and outside the cell. Water molecules move equally in both directions.	Hypertonic: The solution has a higher solute concentration than the cell. A net movement of water molecules out of the cell causes it to shrink.	Hypotonic: The solution has a lower solute concentration than the cell. A net movement of water molecules into the cell causes it to swell.
Animal Cell <i>RBC</i>	<i>Same</i> <i>Stays Same size</i>  Water in and out	<i>Shrink / shrivel</i>  <i>cause dehydration</i> Water out	<i>Swell / Bigger / Burst</i>  Water in
Plant Cell	 Cell membrane Cell wall Central vacuole Water in and out	 Water out	 <i>Cell wall</i> Water in

**Active Transport:** Requires cellular energy (ATP).



✓ 3 Types:

Small

pumps

ions  $\rightarrow$   $Ca^{+}$ ,  $K^{+}$ ,  $Na^{+}$

Bulk Transport  
"Think" Big

1. **MOLECULAR TRANSPORT.** Moves materials **AGAINST** the concentration gradient, from **LOW** concentration to **HIGH** concentration. This occurs with smaller molecules and ions through "protein

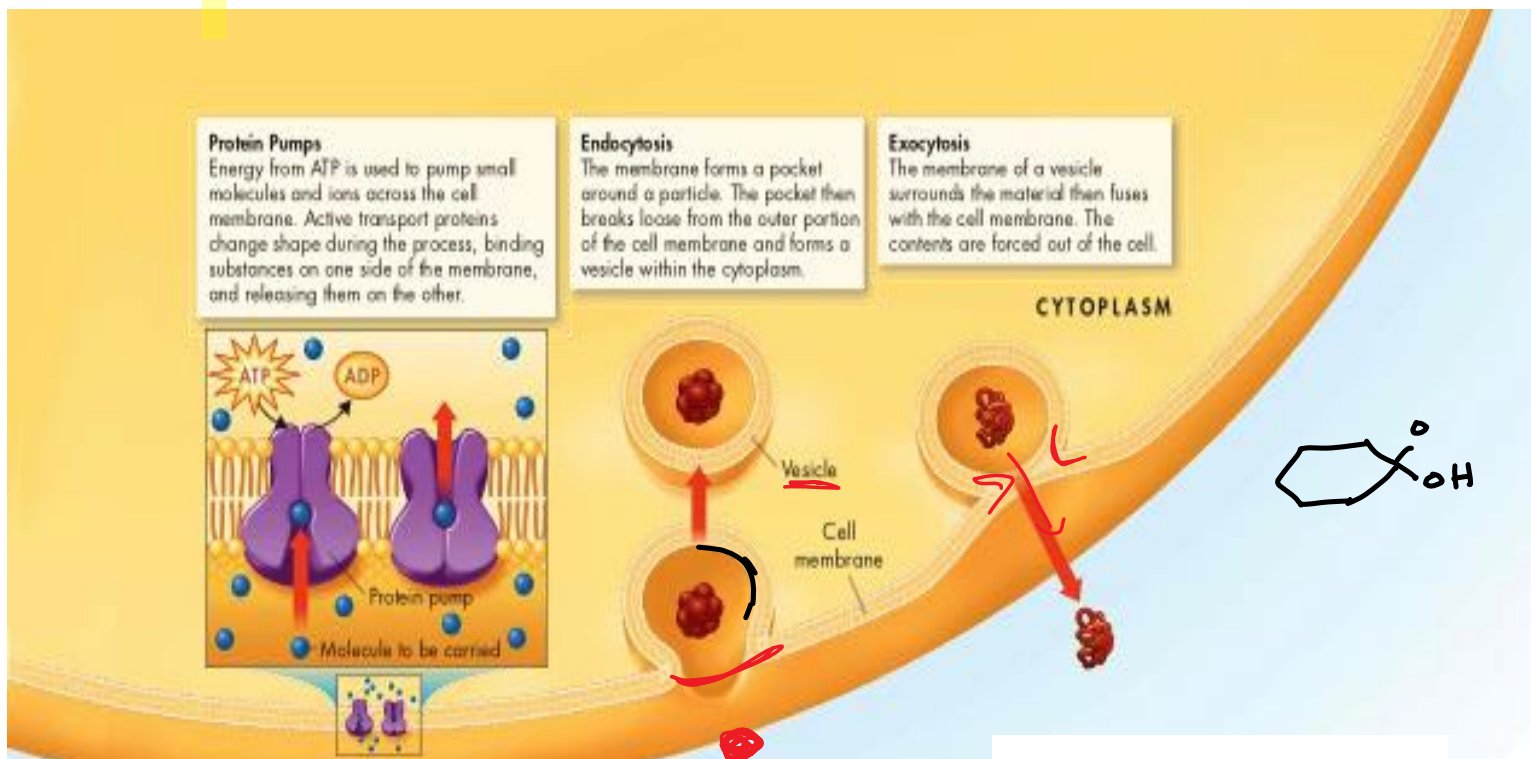
2. **ENDOCYTOSIS.** Movement of Larger materials **INTO** the cell. Occurs via the cell membrane forming "pockets" and surrounding the materials.

A. Phagocytosis. Cell membrane and cytoplasm extend, surround and engulf large materials into food vacuole.

B. Pinocytosis. Tiny pockets form to surround LIQUID and take it into the cell.

3. **EXOCYTOSIS.** Movement of Larger materials **OUT** of the cell.

**ALL 3 TYPES ARE ACTIVE & REQUIRE ENERGY!!!**



Mr. D Sells you on Cells..... All Parts :)





# HOMEOSTASIS 7 CELLS

## Chapter 7.4

### THE CELL AS AN ORGANISM

- ✓ Life on Earth exists in either UNICELLULAR OR MULTICELLULAR form.
- ✓ Both forms must be able to maintain HOMEOSTASIS.

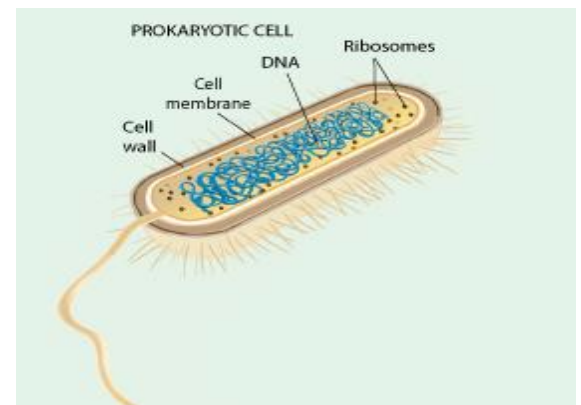
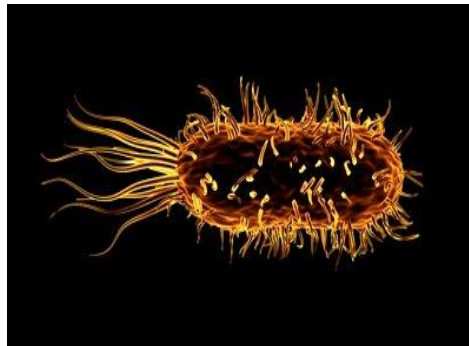
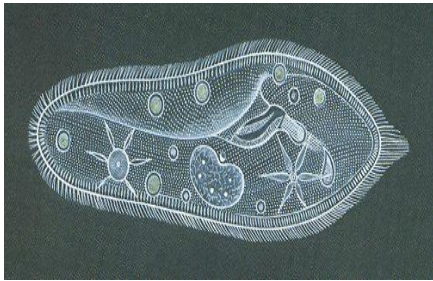
### UNICELLULAR LIFE

- Entire organisms that consist of only one cell.
- Single celled organisms can be either prokaryotic or eukaryotic.



### HOMEOSTASIS:

The ability of an organism to maintain a stable internal environment.



### MULTICELLULAR LIFE

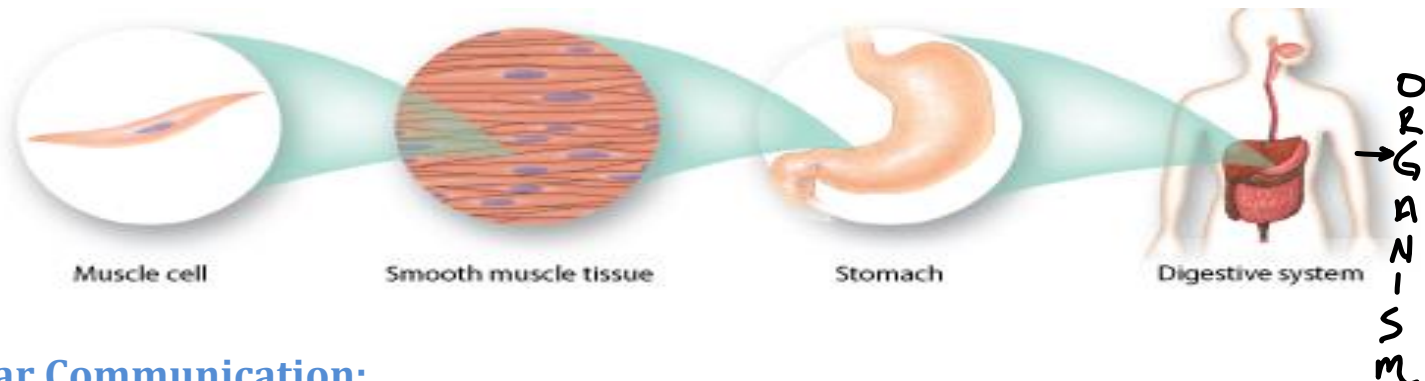
- ✓ Cells are interdependent, and become specialized.

### Cell Specialization:

- ✓ Multicellular organisms' cells have the ability to specialize or become different from one another.
- ✓ Humans have approx. 210 different cell types

Humans have MAD types of Cells!!

### Levels of Organization:



### Cellular Communication:

- ✓ Cells need and do communicate with each other in several ways. They can send chemical messages from cell to cell (hormones) in which specific **receptors** are needed, electrical messages as in the nervous system and from one cell to a neighboring cell via the cytoskeleton.

