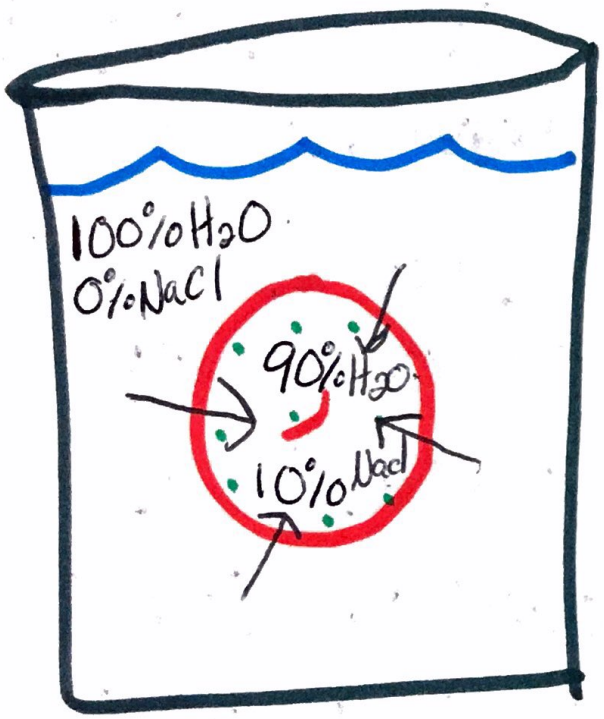
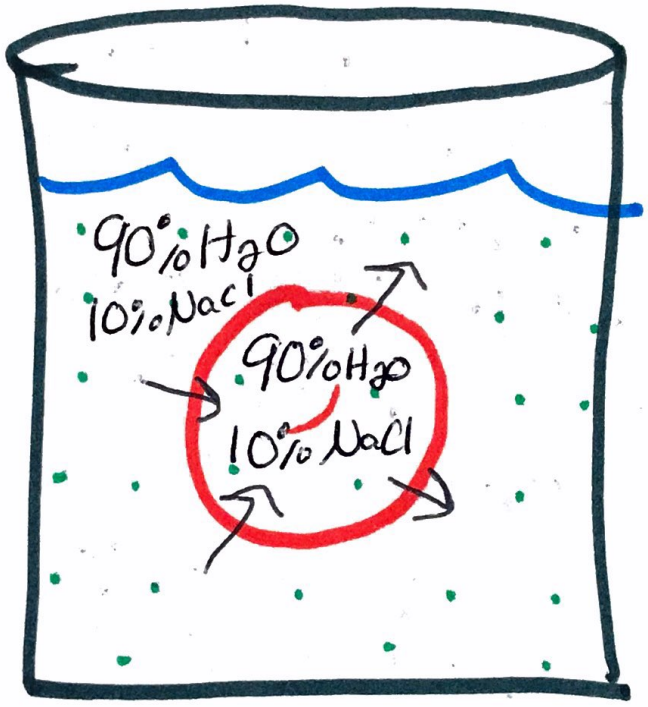
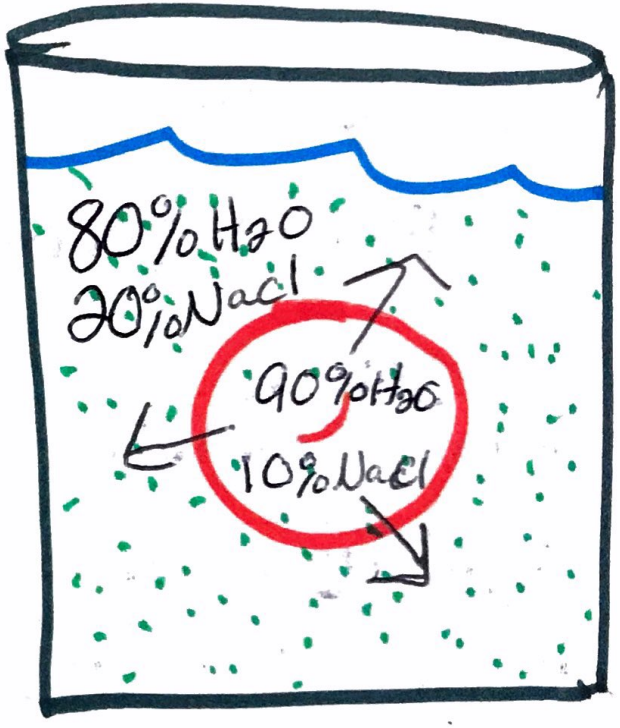
Hypotonic



Isotonic



Hypertonic



Hypo: "less" "lower"

Solution w/ a lower concentration of solute

: higher conc. of H_2O

- net movement of H_2O into cell

Animal Cells

- Cells swell & may lyse - pop

ex: IV of pure H_2O

Plant Cells

- normal for plants turgor pressure

Iso = "equal"

Solution w/ equal conc. of solute & equal conc. of H_2O

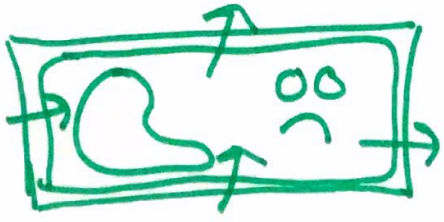
- compared to other solution
- no net mvmt of H_2O
- cell & environment in equillibrium

Animal Cells

- normal for animals (homeostasis)

ex: IV of Saline

Plant Cells



- plants wilt, no pressure on cell wall

Hyper: "more" "higher"

Solution w/ a higher conc. of solute

: lower conc. of H_2O

- Net mvmt out of cell

Animal Cells

- Cell shrinks

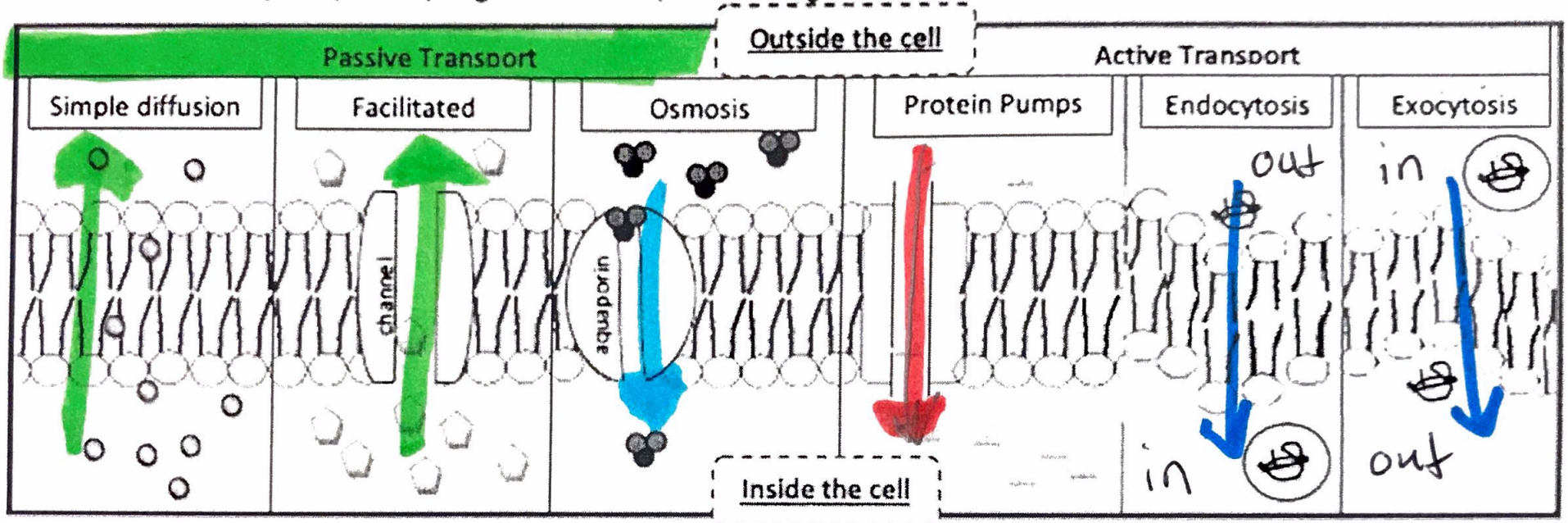
ex: IV of salt water

Plant Cell

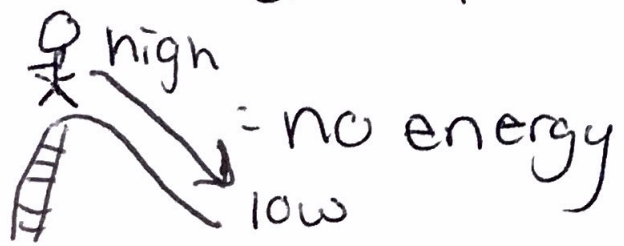
- membrane shrinks & detaches from cell wall
- plasmolysis

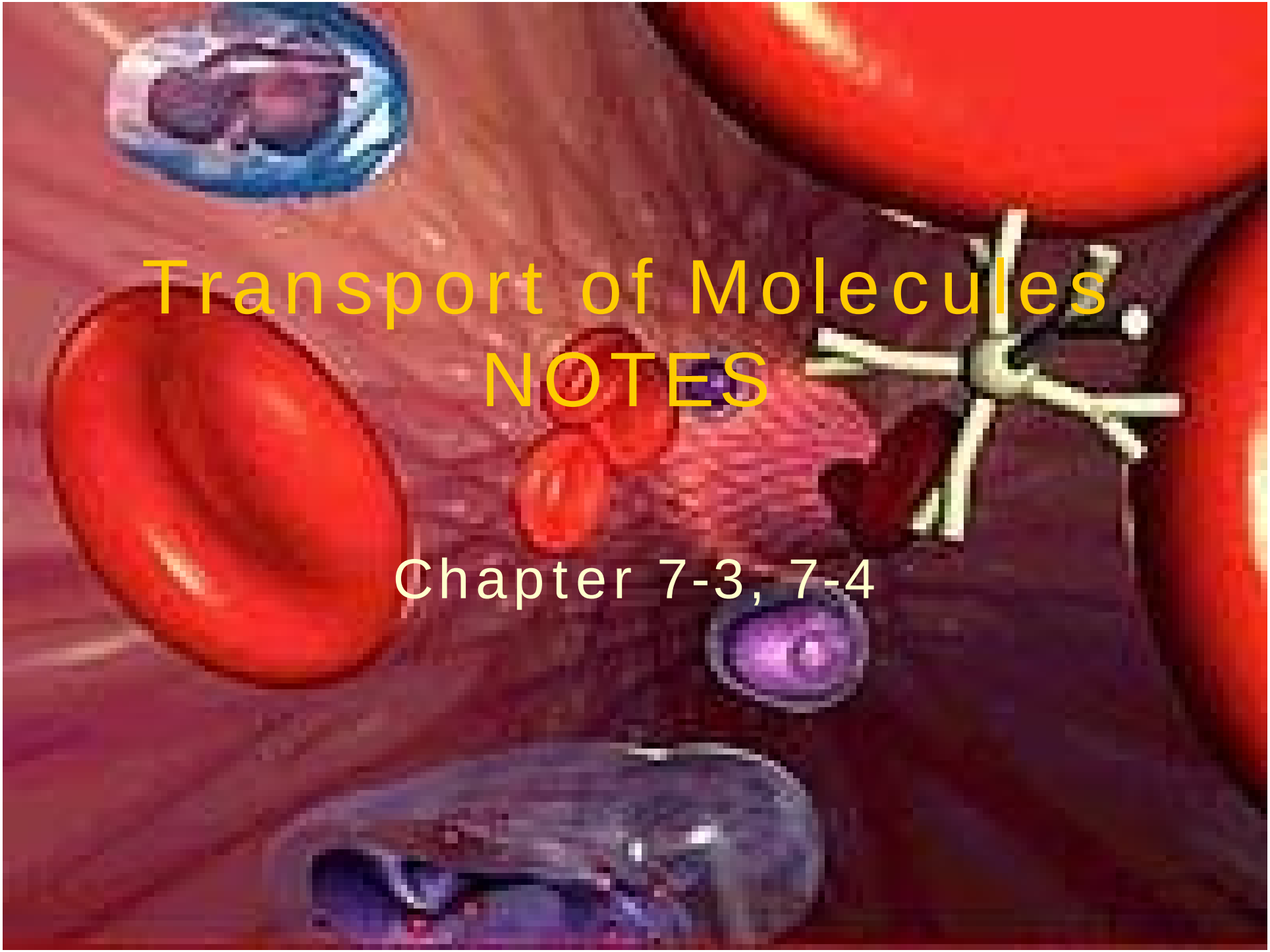
Cell Transport G.O.

- ✓ Circle one phospholipid and label – hydrophilic heads, hydrophobic tails.
- ✓ For each type of transport, use an arrow to show the direction the substances (small molecules, ions, water, larger molecules) are moving across the membrane.



Uses Energy?	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No
Summary:	small molecules move high → low	large molecules move high → low through channel	H_2O moves high → low	molecules move low → high using energy	cell surrounds particles w/ membrane	cell pushes out particles



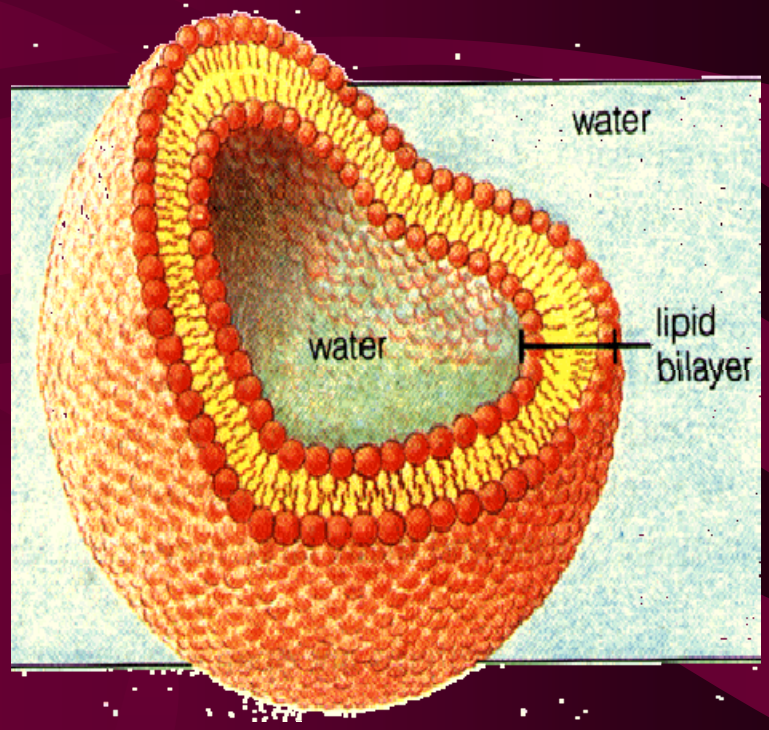


Transport of Molecules NOTES

Chapter 7-3, 7-4

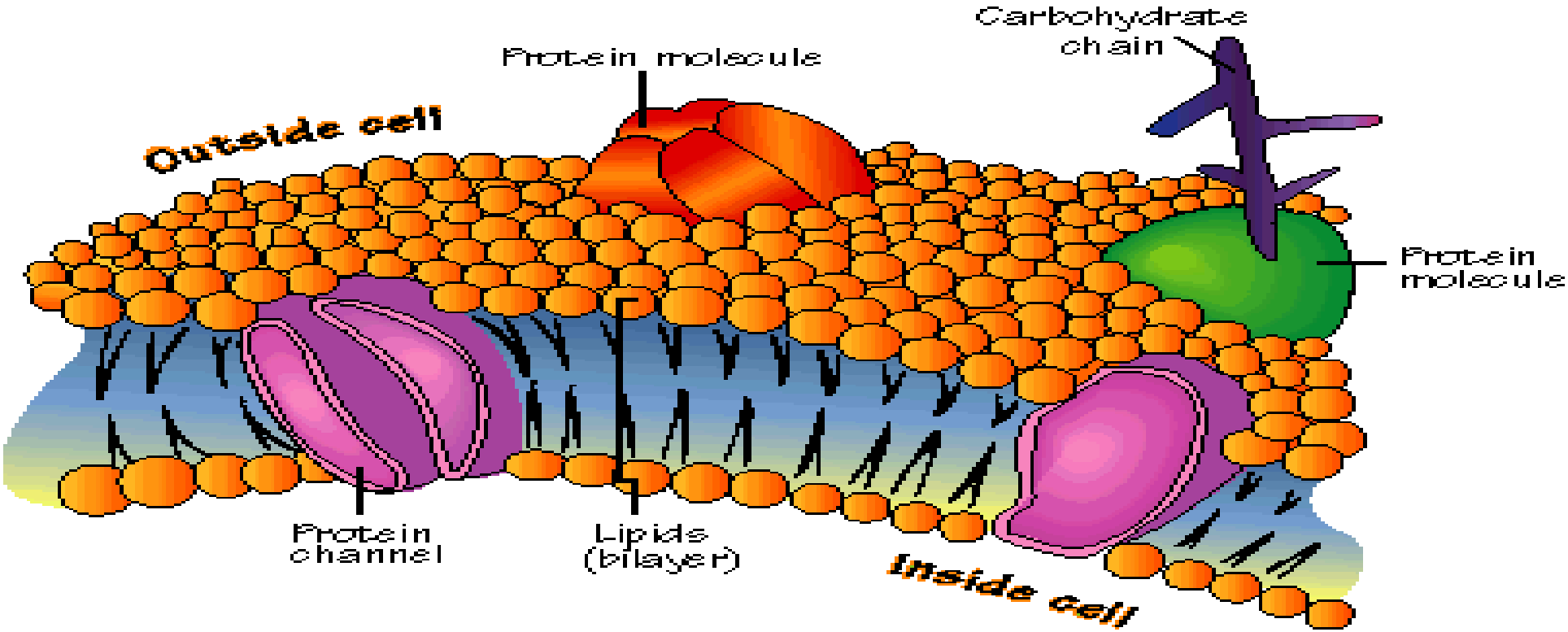
1.What does the Cell Membrane do for the cell?

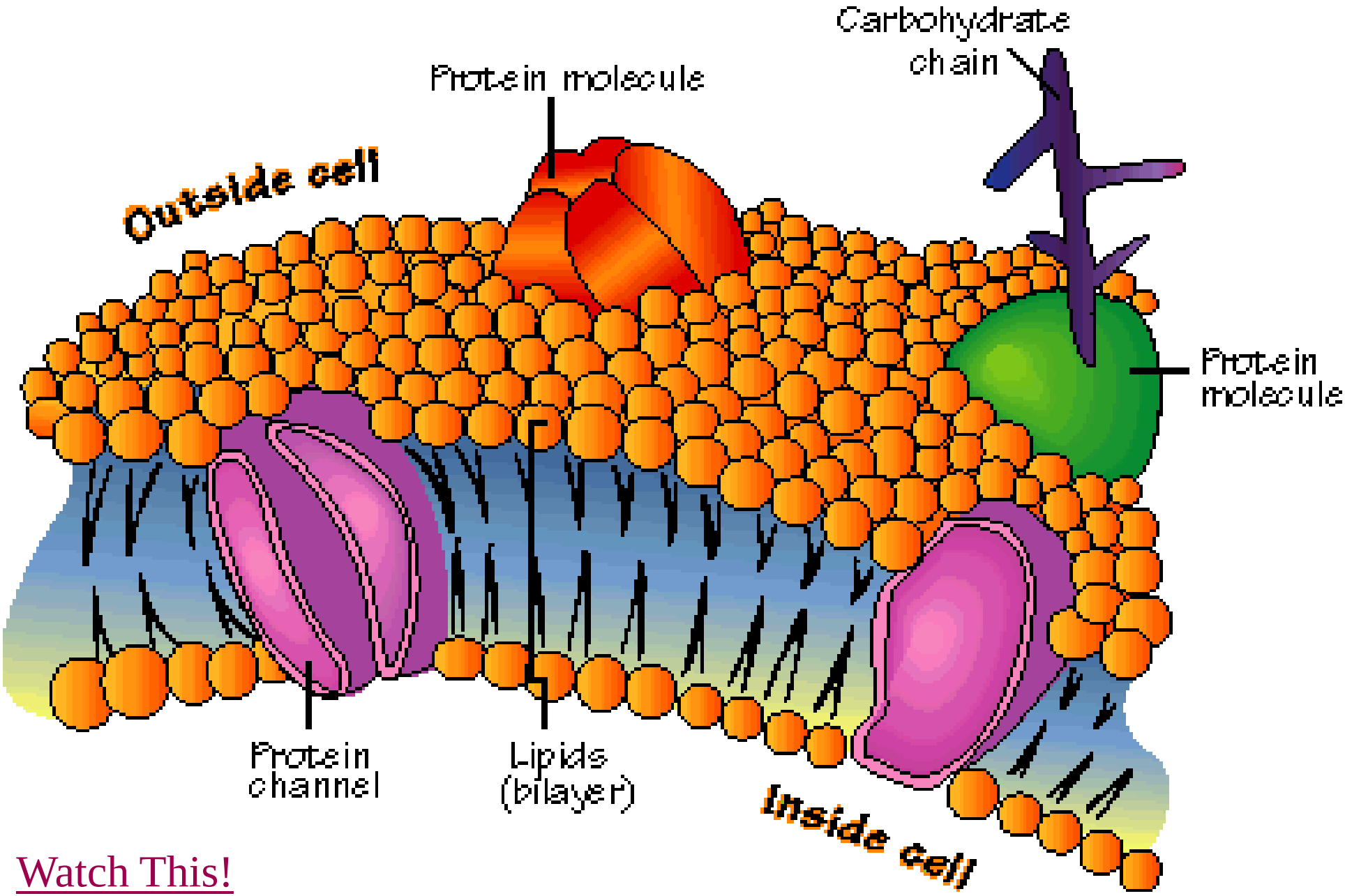
- Maintains homeostasis by regulating the movement of dissolved molecules from the liquid on one side of the membrane to the liquid on the other side.
- Provides structure and support



2. Cell Membrane Structure

- The Cell membrane is made out of a Lipid Bilayer that is semipermeable.
- Contains proteins imbedded to help regulation
- Only some things can go in and out.



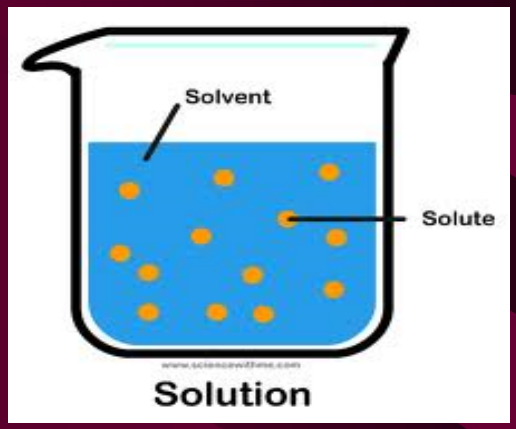

Carbohydrate chain
Protein molecule
Outside cell
Protein molecule
Protein channel
Lipids (bilayer)
Inside cell

Watch This!

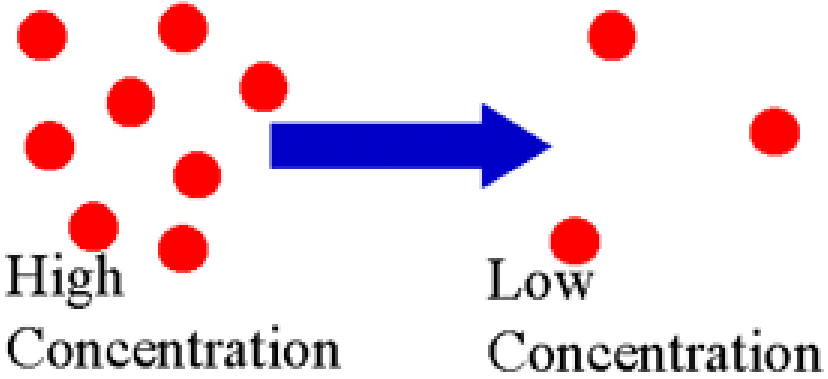
4. Remember these terms?

- **cytoplasm** of a cell contains a solution of many different substances in water.

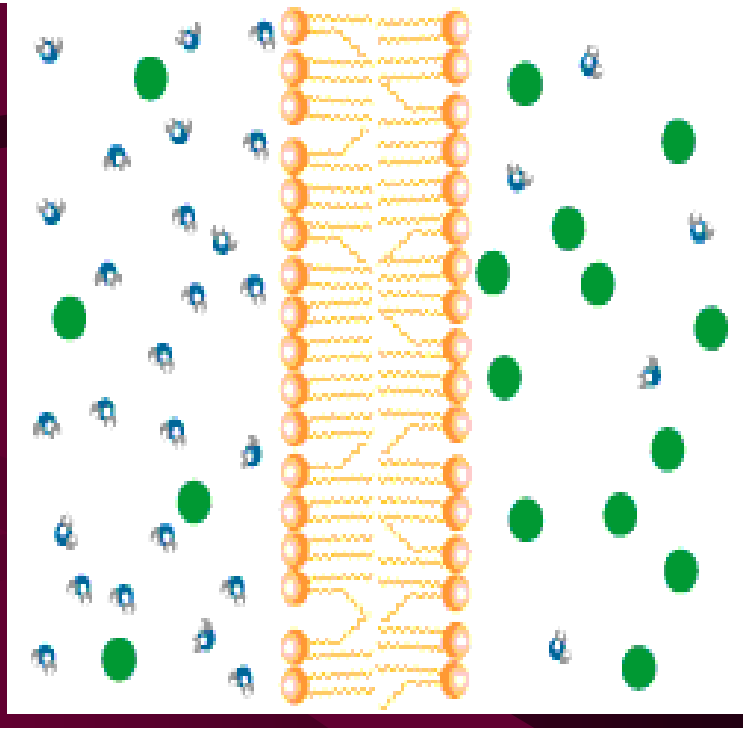
- **solution** is a mixture of two or more substances.



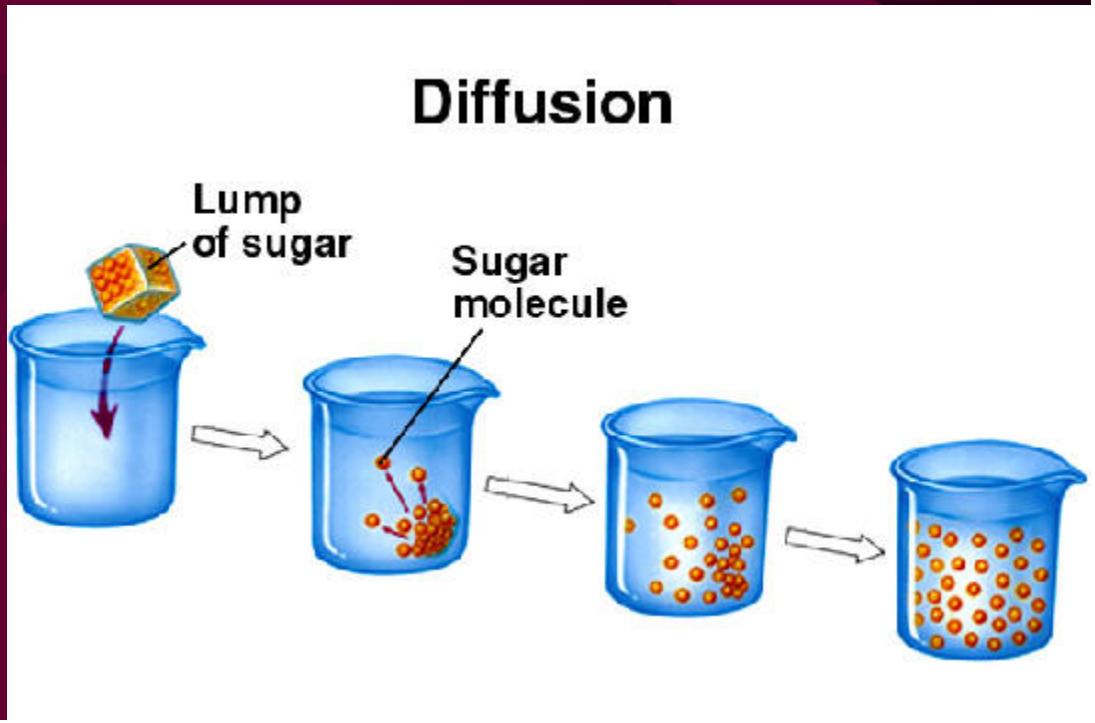
concentration is referring to the percentage of "stuff," or certain type of particles, in a solution.



5. What is diffusion?

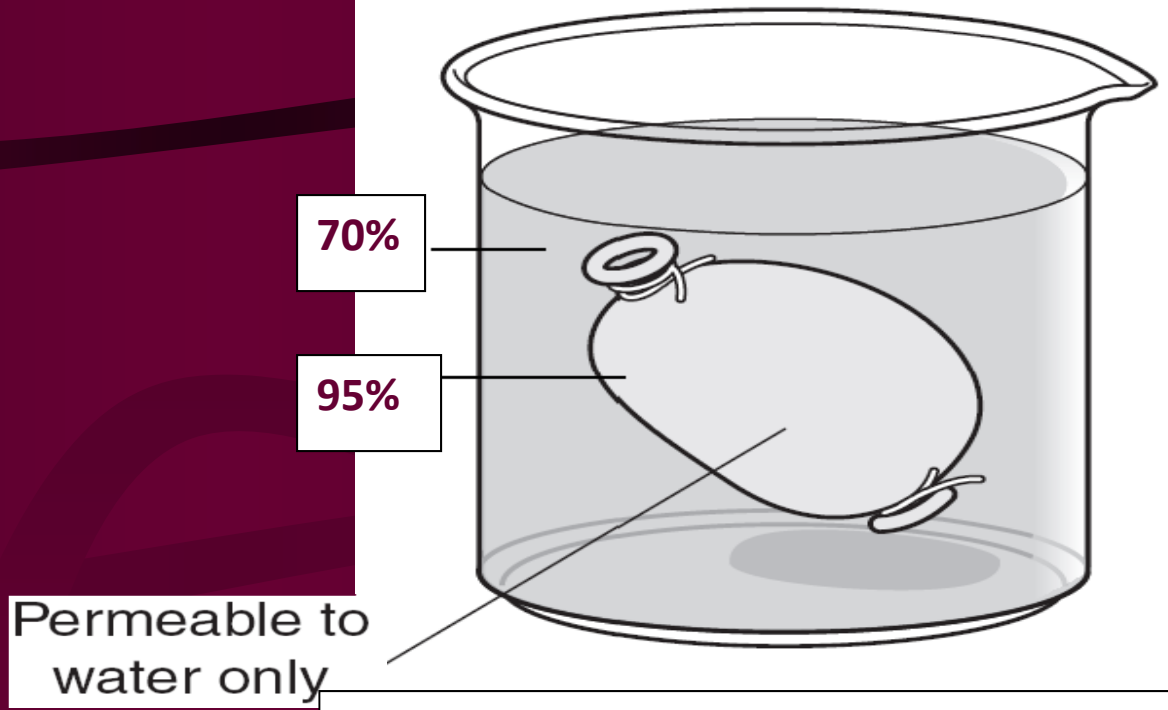


- As a result of this random motion, particles tend to move from an area of **high concentration to an area of low concentration**,



What is osmosis?

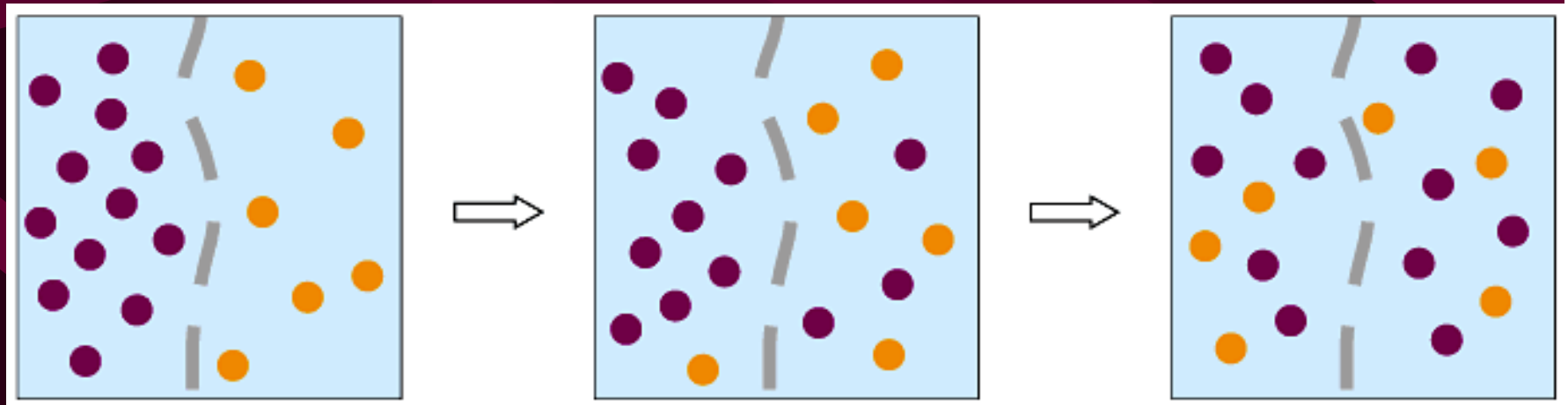
- Osmosis is specifically the diffusion of **water** through a selectively permeable membrane.



If the concentration of water inside was 95% and the concentration of water outside was 70% the “cell” would SHRINK because the water would diffuse out (from a high to low concentration 95% → 70%).

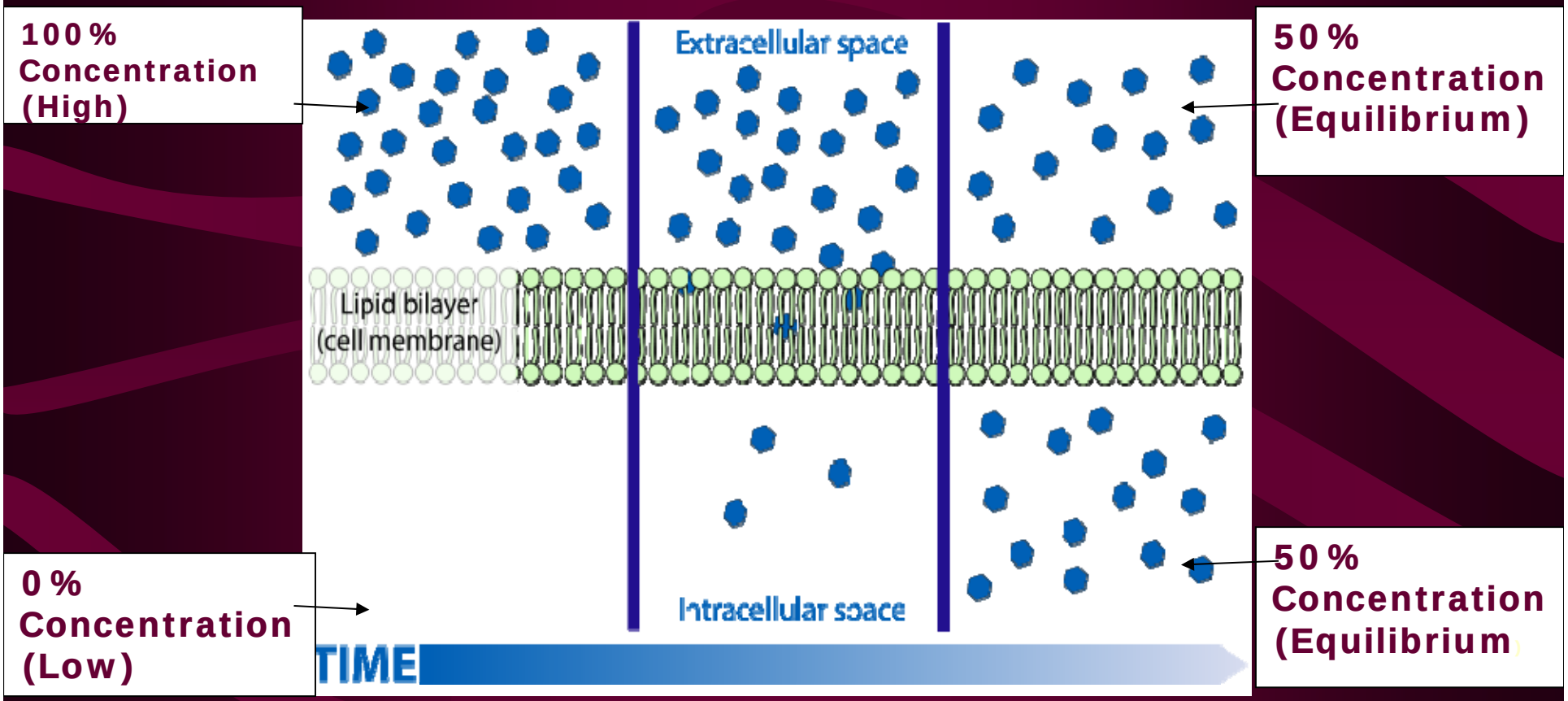
6. How do molecules reach Equilibrium?

- In a solution, **particles move constantly**, **collide with one another**, and tend to **spread out randomly and evenly** until they reach **equilibrium**.

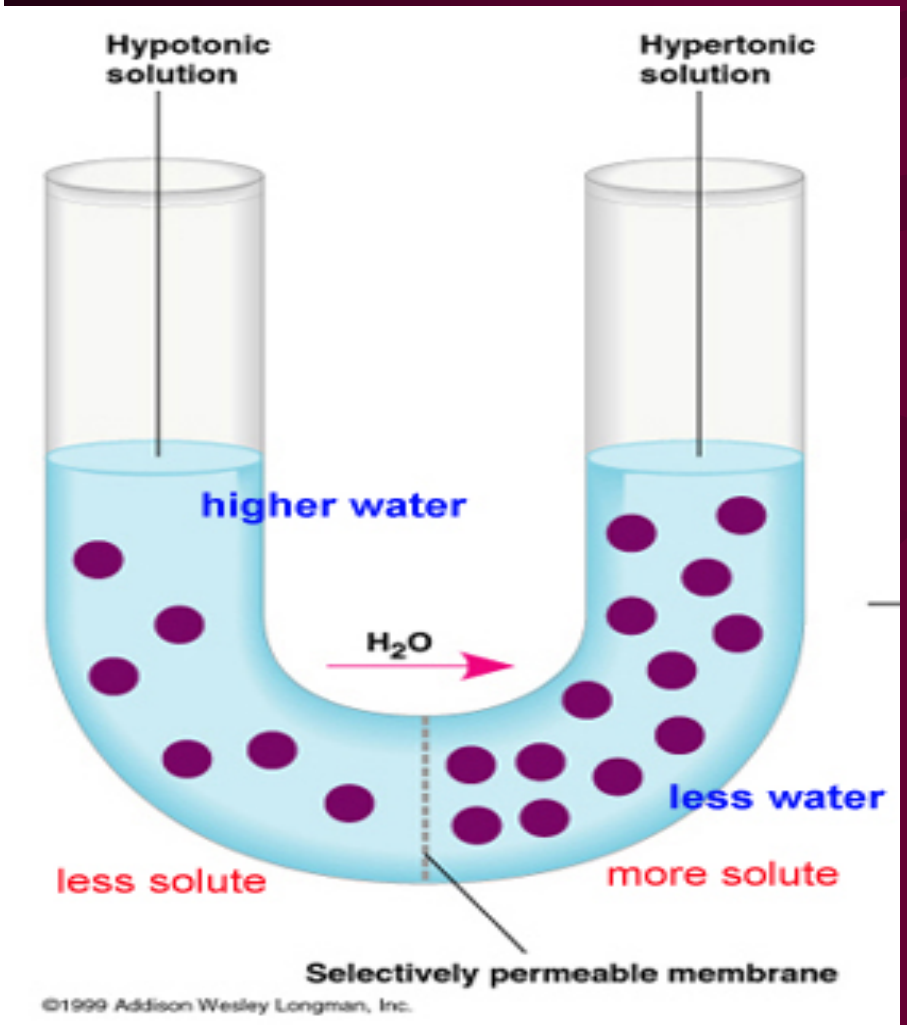


Diffusion of two solutes

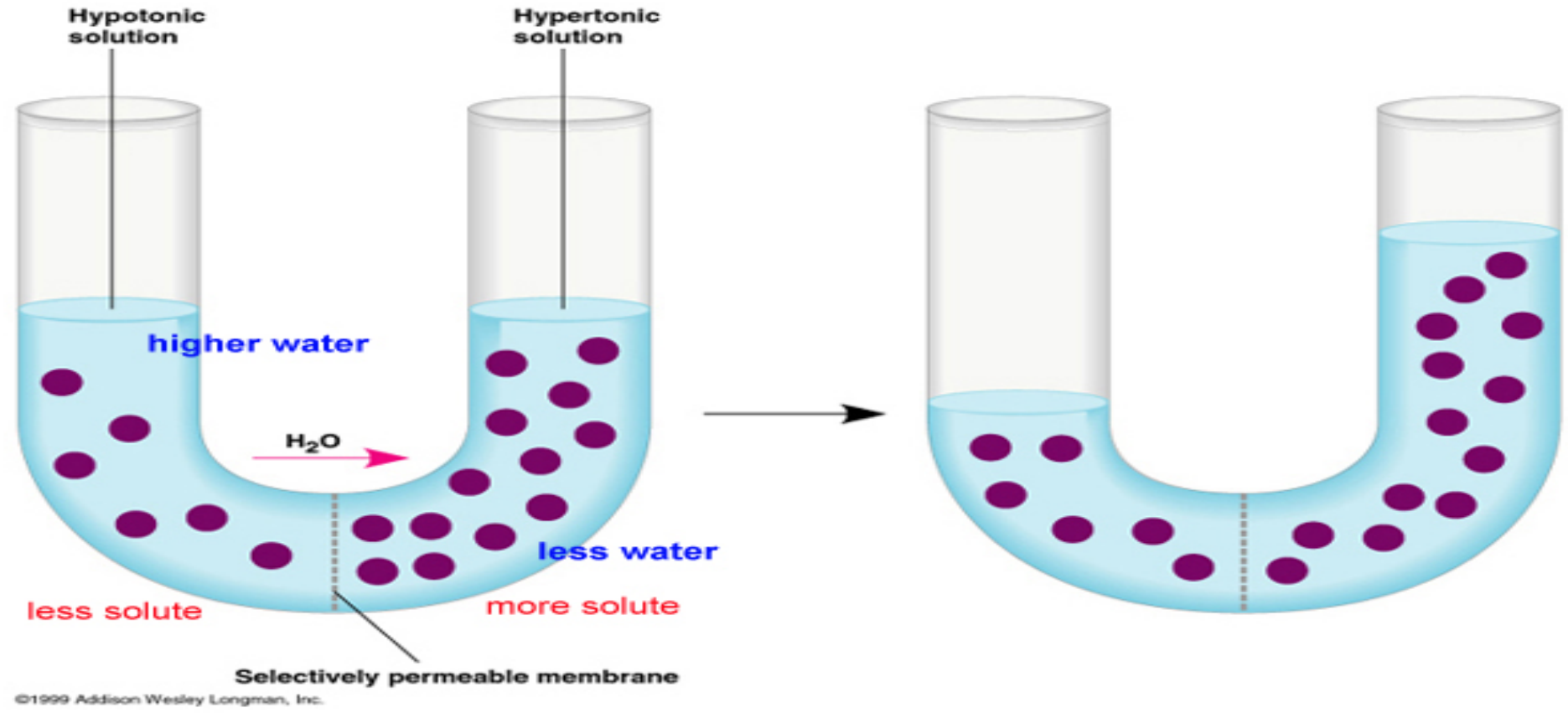
Osmosis Further Explained



BioBuck Stumper



- What will happen to the water level in this "U-tube" when left to sit overnight? Why?

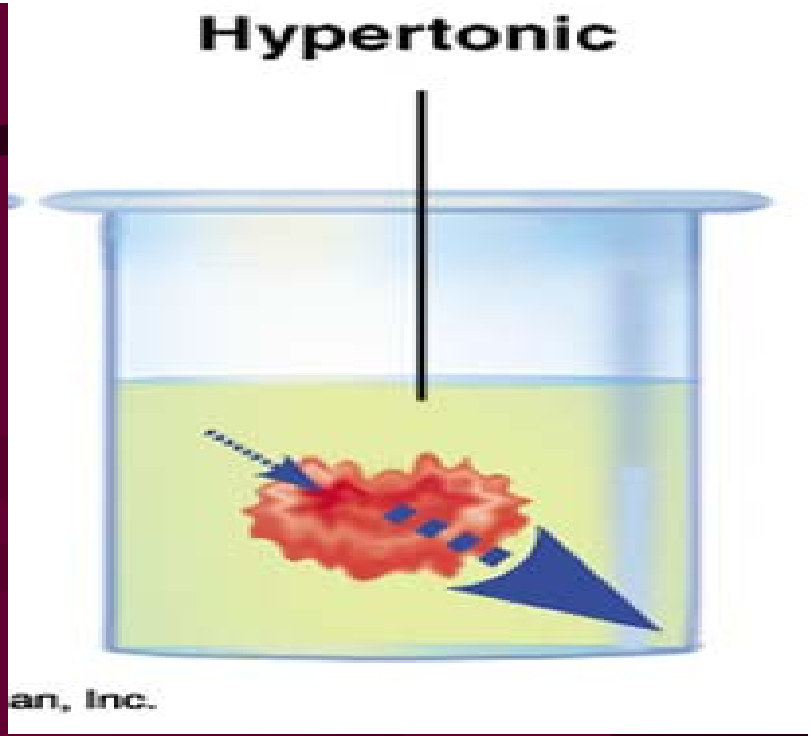

Hypotonic solution
Hypertonic solution
higher water
H_2O
less water
less solute
more solute
Selectively permeable membrane
©1999 Addison Wesley Longman, Inc.

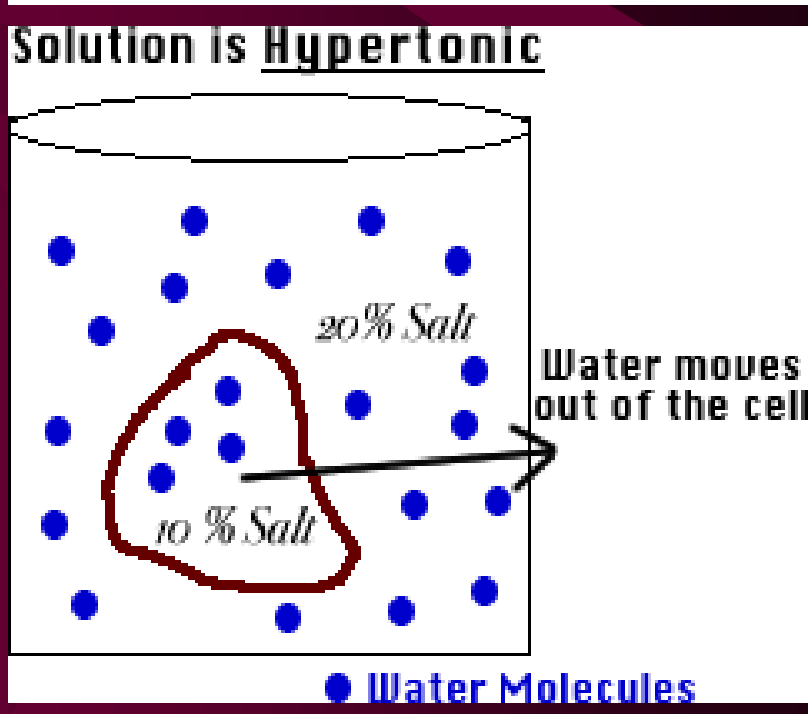
Is this really Osmosis???

7. Hypertonic

"Hyper" = more

- **Concentration of solutes is more outside the cell than in**
- **Water flows out of cell**
- **The cell shrivels and may die.**

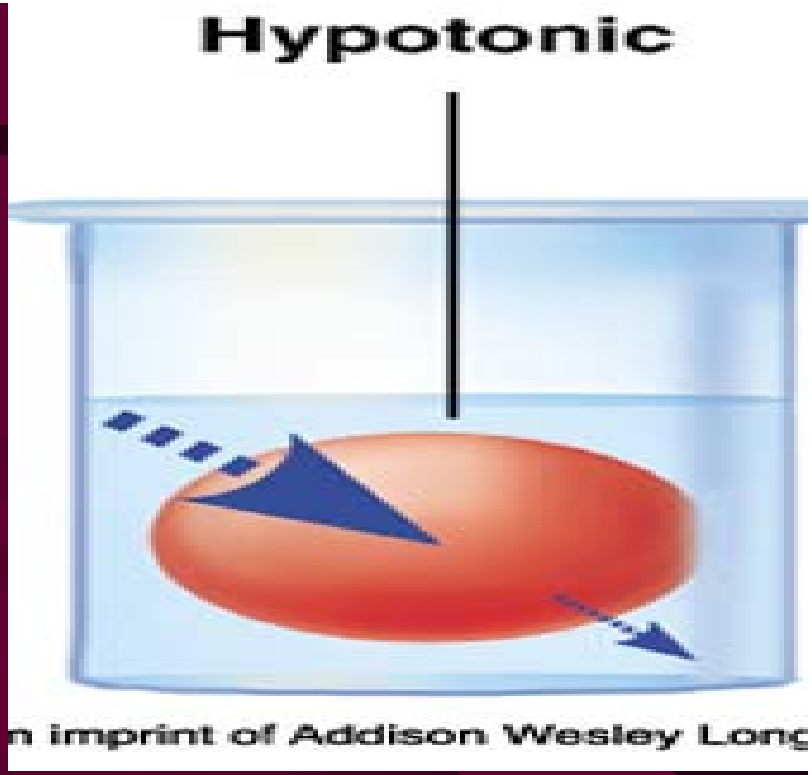


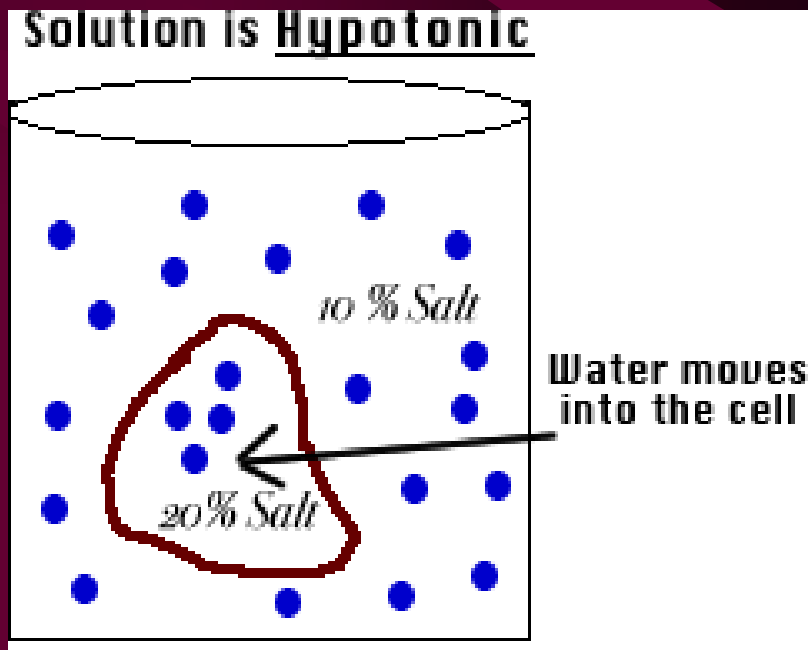


3. Hypotonic

"**HYPO**" means less

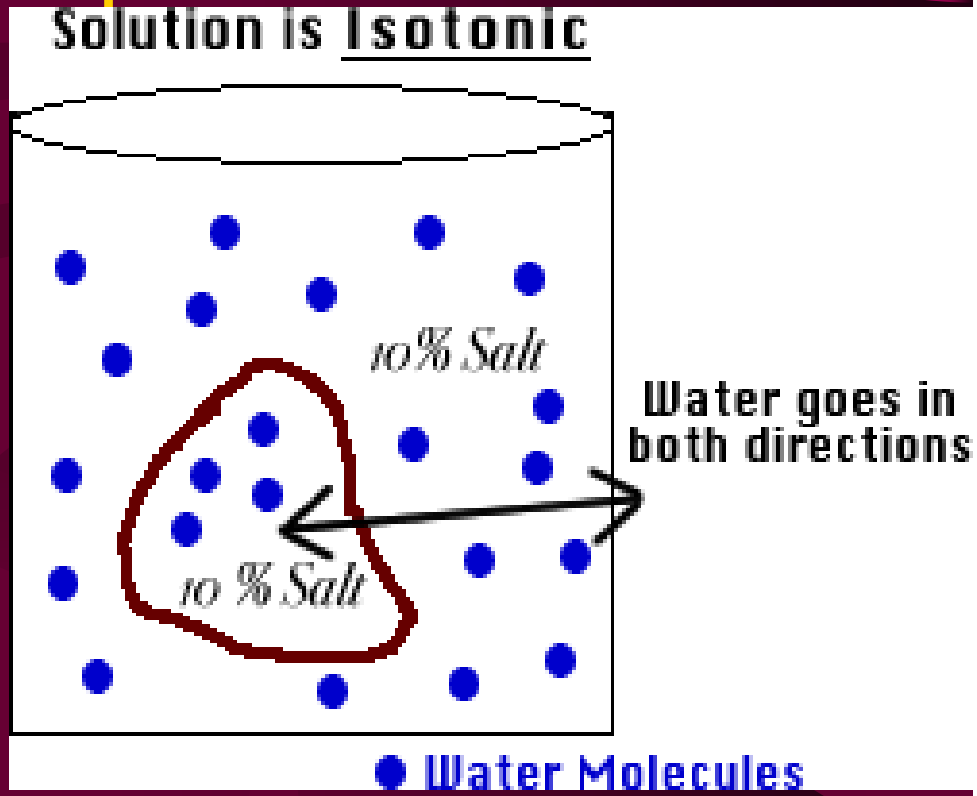
- **Concentration of solutes is <u>less</u> outside the cell than in.**
- **Water flows in**
- **The cell swells with water, becomes "turgid", and dies.**

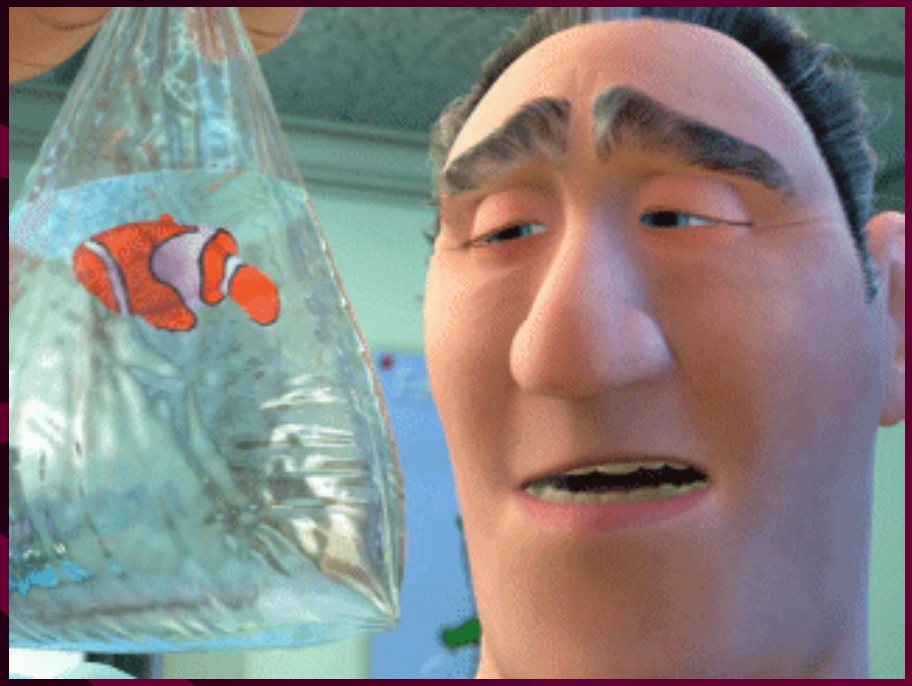




3. Isotonic
Iso = equal

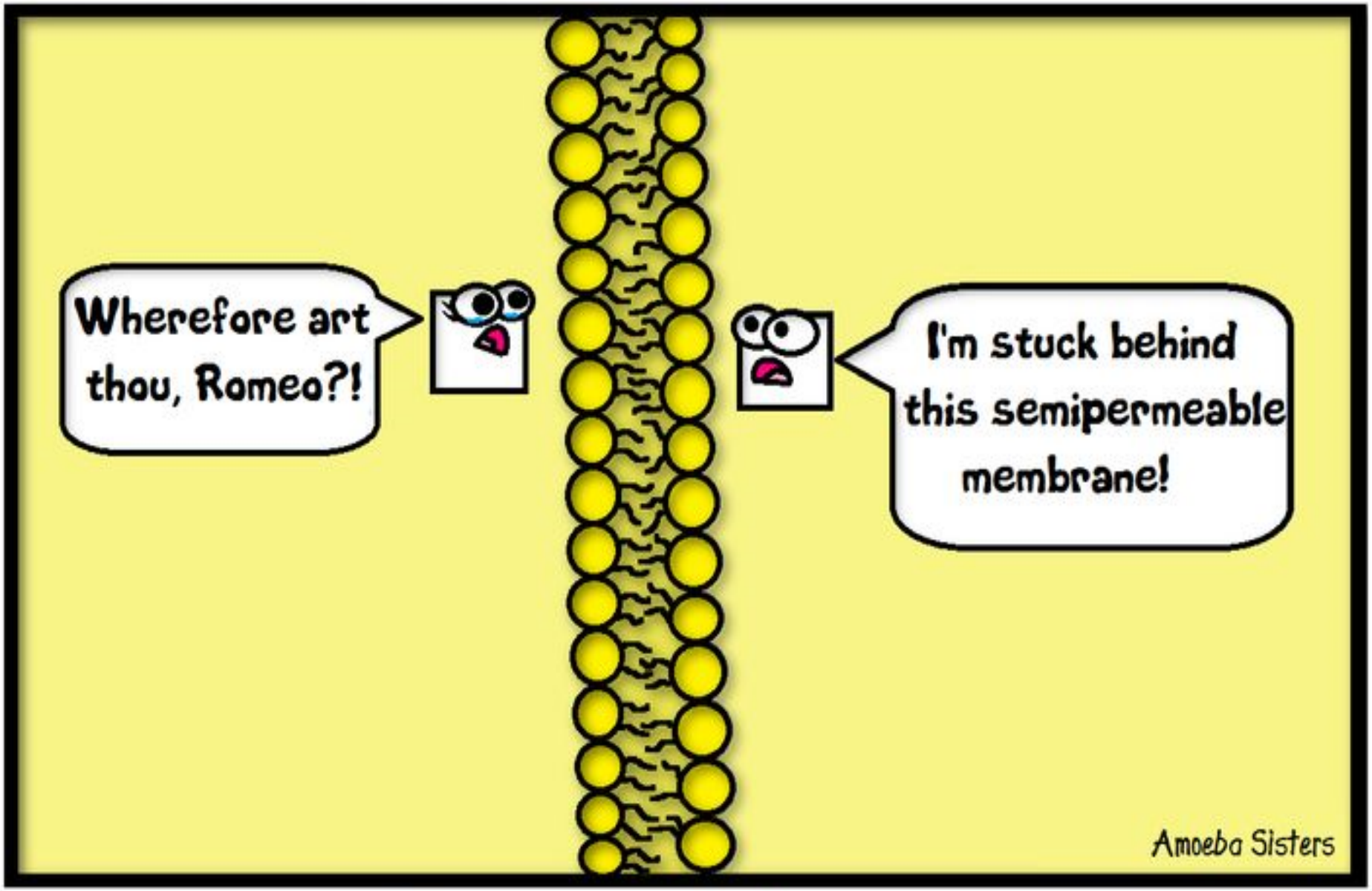
- Concentration is the same inside and out
- No net movement
- The cell stays the same





- What would have happened to Nemo (a saltwater fish with 40% solute) if he was caputured by someone who didn’t know about osmosis and put him in a freshwater tank with 0% solute?

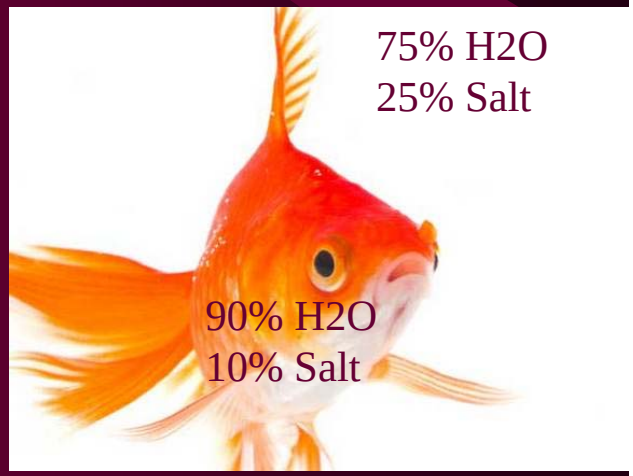
The Paramecium Parlor



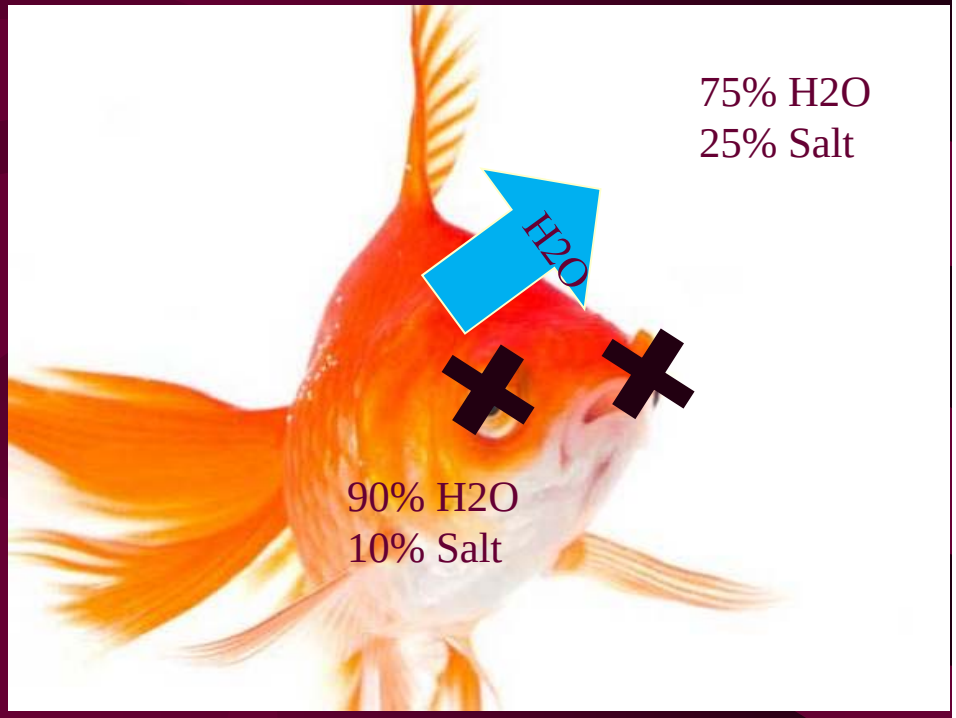
Star-crossed solutes

Sept 26/27th

- On your new warm-up page: Imagine that I take a freshwater fish (Goldfish) who has an internal concentration of 90% water and 10% Salt and place them inside an aquarium that is 75% water and 25% salt. What do you think would happen to the goldfish? What type of solution is the fish in?
  Draw a "Dam" problem to show where the water is going to move.



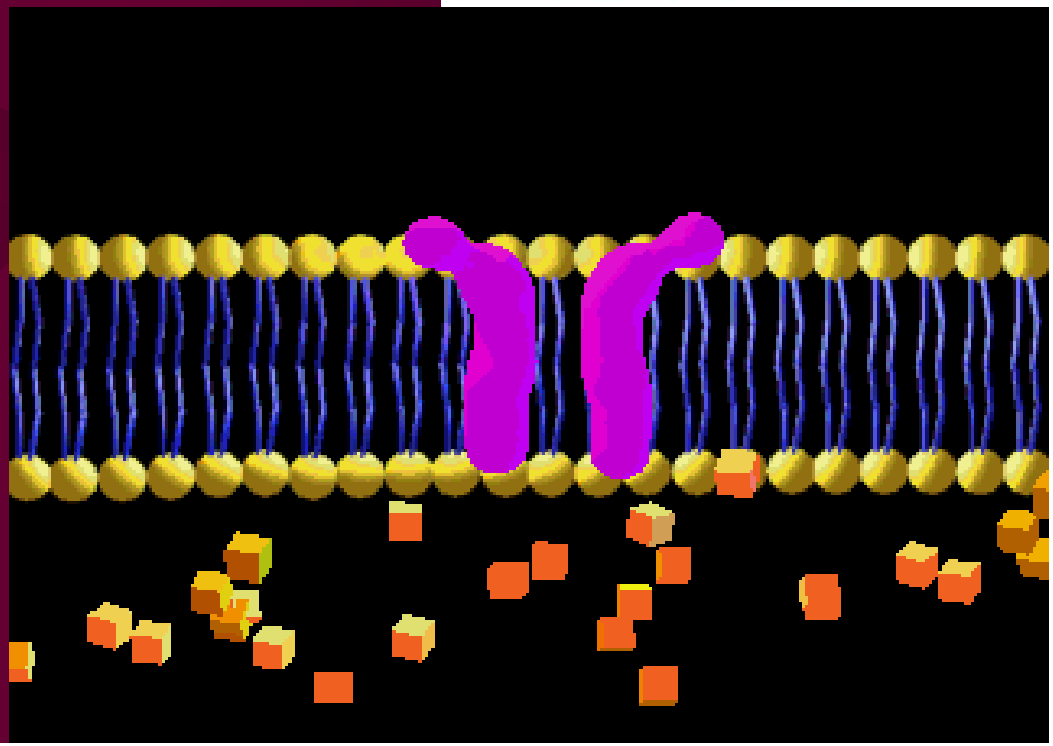
- Water would leave the cell (move from high conc. to low conc) to even out the difference
- The solution is Hypertonic
- The fish would shrivel and die



Hypertonic Solution

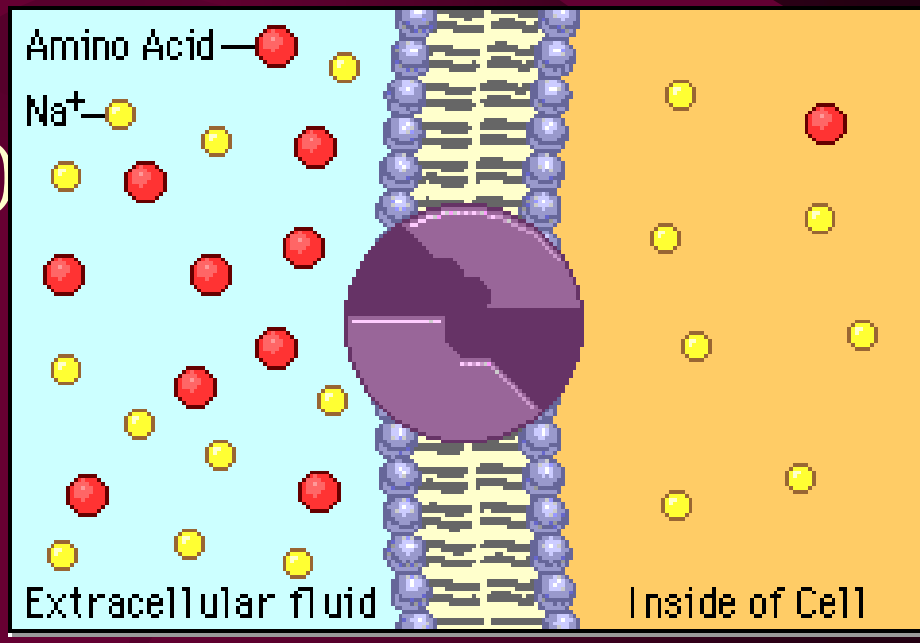
Facilitated Diffusion

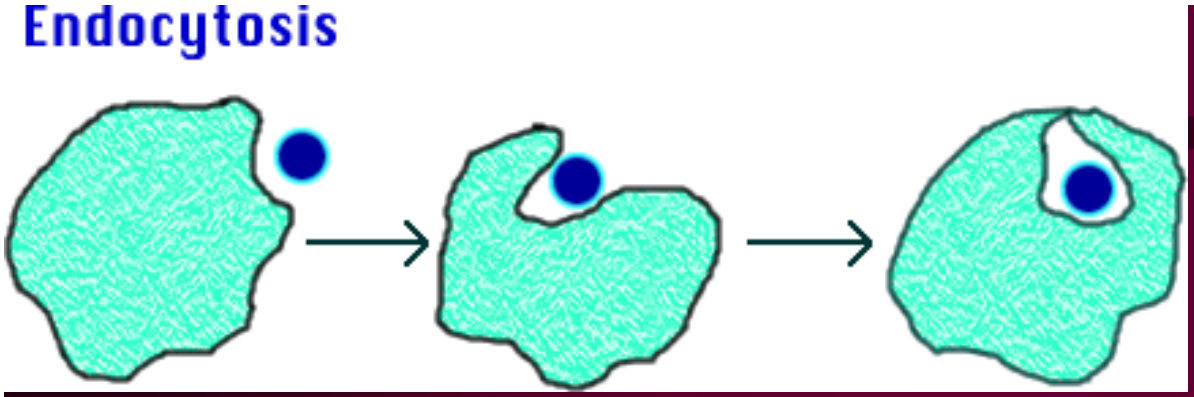
- Helps large molecules move through protein channels found in the membrane
- Depends on random particle movements
- High -> Low conc
- No energy required



Active Transport

- Forces large molecules to move in and out of the cell through protein pumps (Carrier proteins) found in the membrane
- Low -> High Conc. (backwards from passive)
- Energy is required

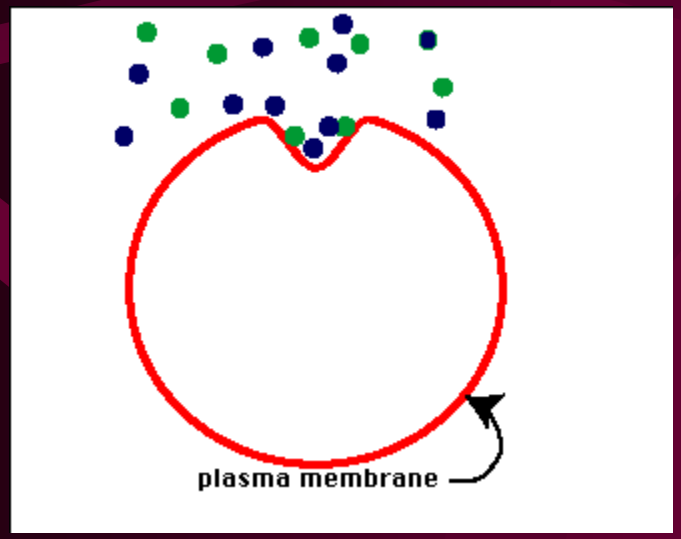


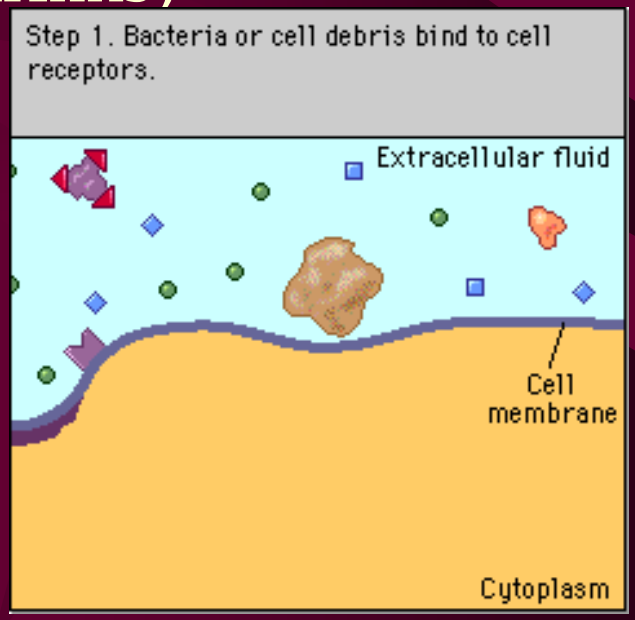


Endocytosis

"endo"="into"

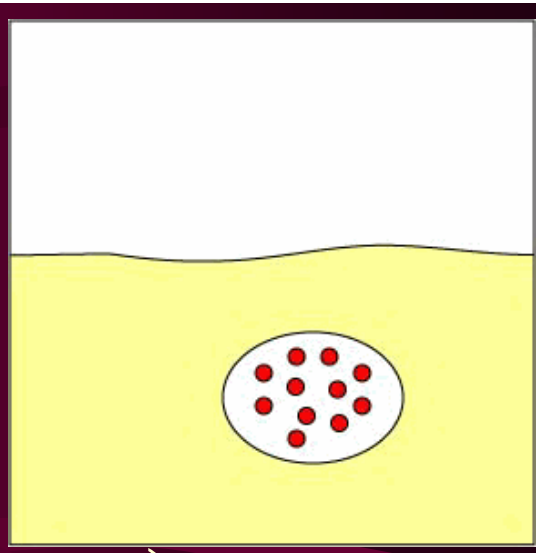
- Cell takes material into cell by surrounding the material with cell membrane and creating vesicles
- Phagocytosis - cell engulfs large particles (eats)
- Pinocytosis - cell takes in liquid (drinks)





Exocytosis

"exo"="exit"



- The cell pushes material out of the cell when vesicles merge with the membrane and release their contents
- Cell releases large amounts of material (waste)