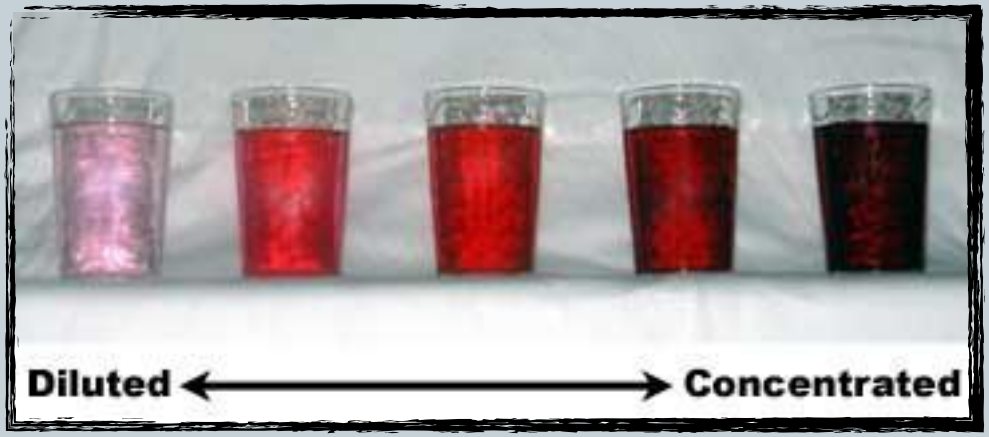
Concentration

- The amount of something in a solution compared to the whole solution.
- Given as a %

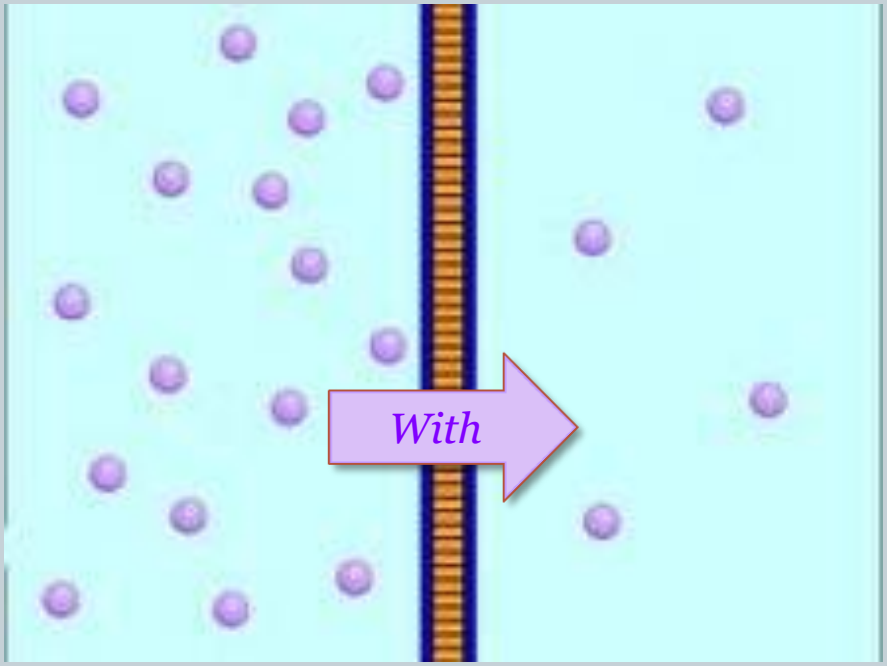


- The glass to the right has a higher concentration of red dye.

Review: Concentration

- Concentration Gradient is

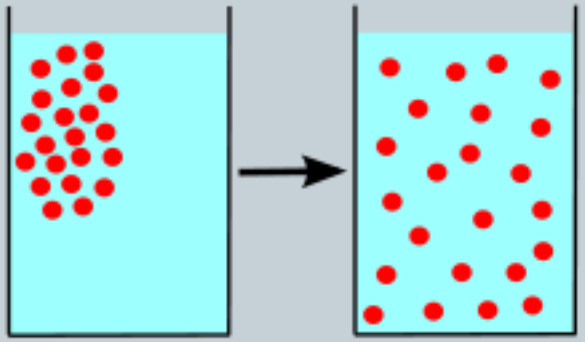
  when there is a difference between the concentrations in 2 locations.



When molecules move from high to low, we say it moves "with" the concentration gradient.

Diffusion & Osmosis

- Diffusion is when any molecules moves from high to low concentration.



- Molecules naturally want to spread apart.

- Osmosis is when **water** flows across a **membrane** from high to low concentration.

- Water does this to reach equilibrium.

Osmosis & Diffusion Video

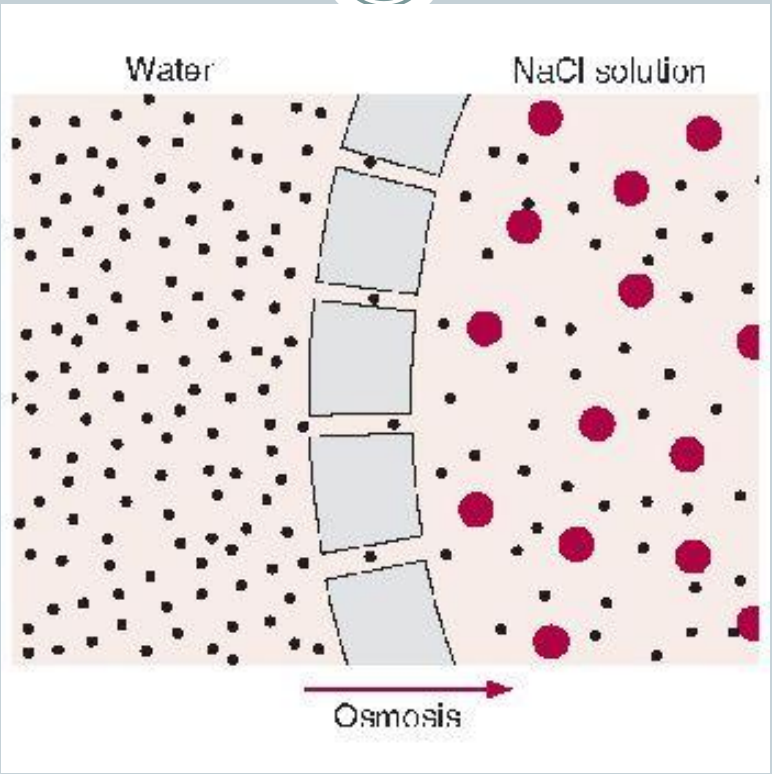
http://www.youtube.com/watch?v=9QCxTfoQfTo

- In the video, dye diffuses through a glass; moving from high to low concentration.
- A wilted leaf becomes plump again through osmosis

Semi-Permeable Membrane

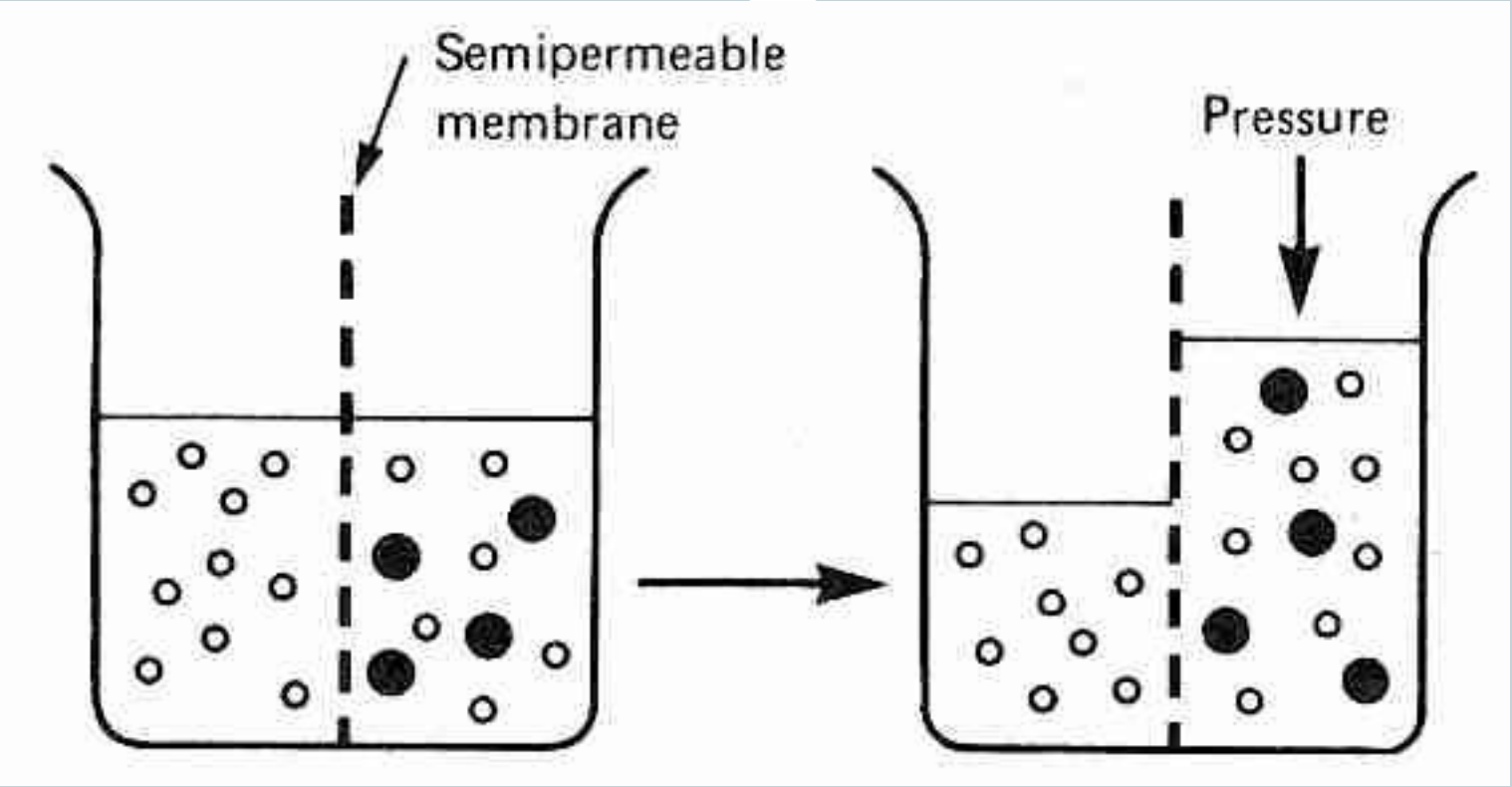
- A semi-permeable membrane is a membrane which allows only certain objects in or out.
- A cell's membrane is semi-permeable

Osmosis through semi-permeable membrane



In this picture, the left side has more H2O molecules than the right, so the H2O will permeate through the membrane until both sides have the same amount.

Osmosis through semi-permeable membrane



The salt molecules are too big to fit through the membrane, but the H2O goes through to make equal concentrations.

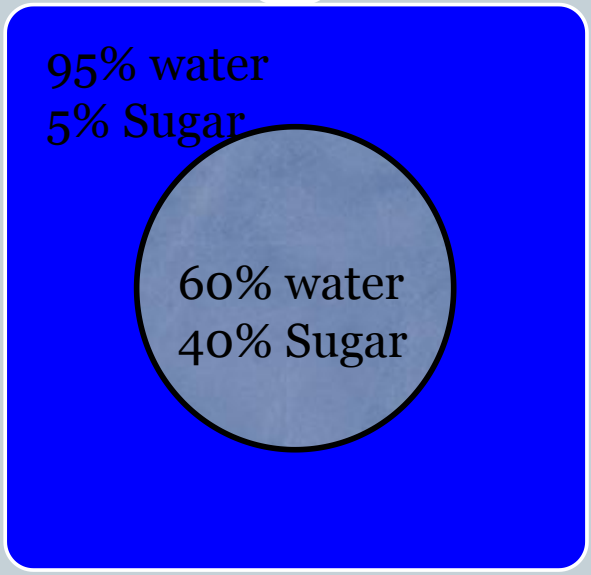
Isotonic, Hypotonic, Hypertonic

- Isotonic – A solution with equal concentration of solutes
- Hypotonic – A solution with less solute and higher % of H_2O
- Hypertonic – A solution with more solute and lower % of H_2O

Hyper/Hypotonic Example

In this picture we have a sugar solution in and outisde of the cell.

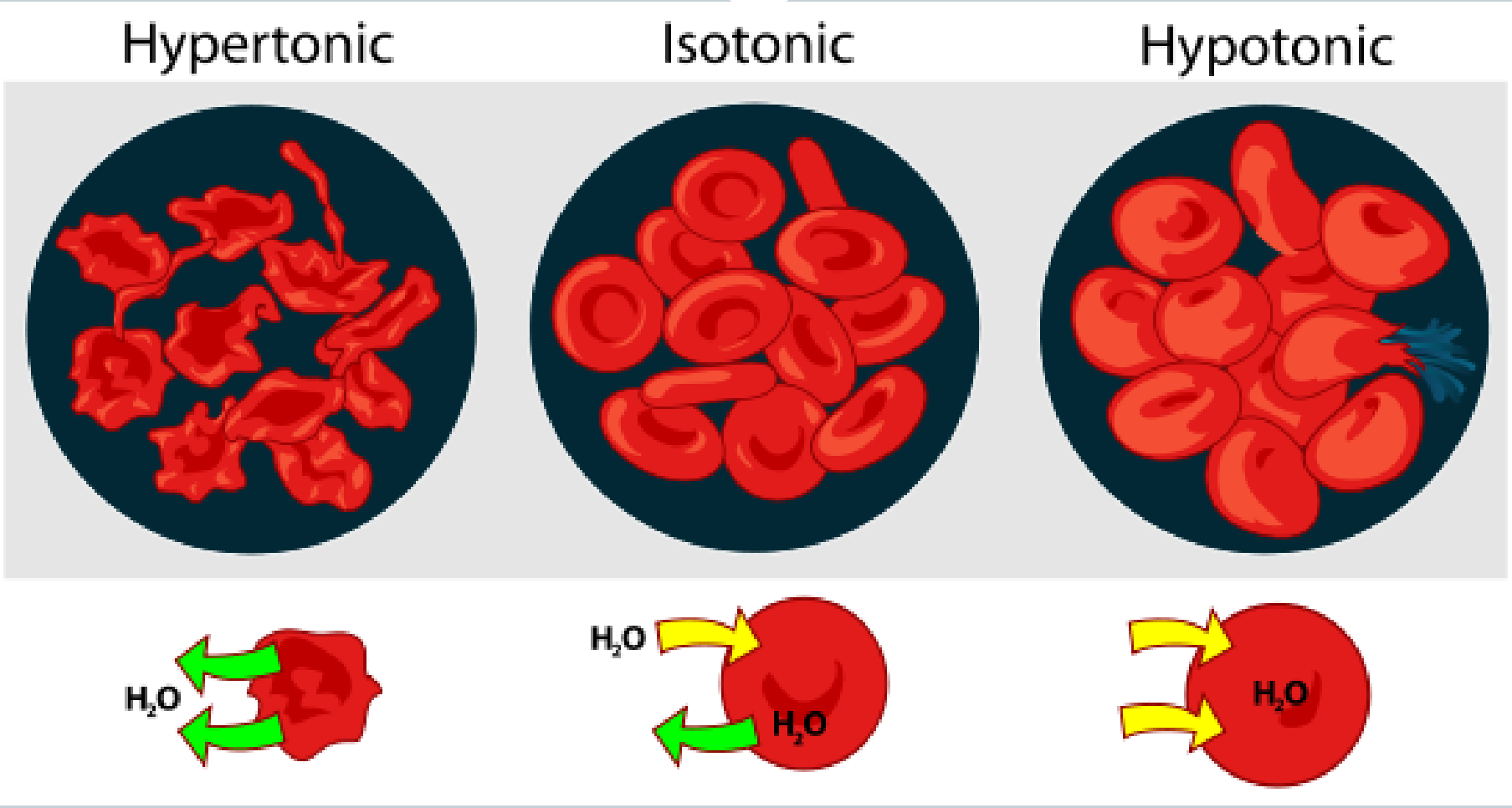
The cell wall is semi-permeable, keeping more sugar in than out.



This cell is hypertonic compared to it's environment

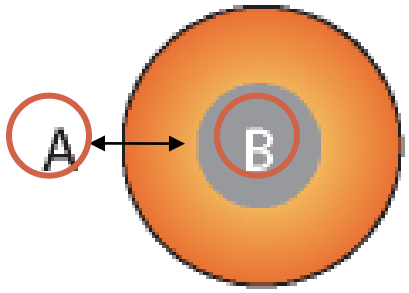
The environment is hypotonic compared to the cell

Cells in Hyper/Iso/Hypo Solutions

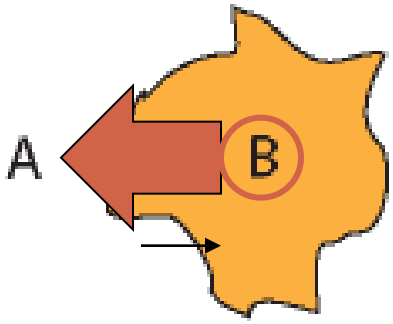


Osmosis is the **diffusion of WATER**

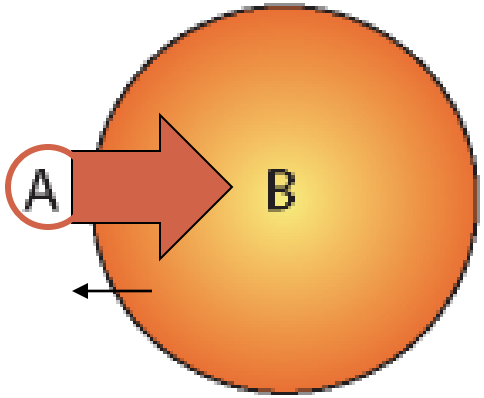
across a semi-permeable (selectively permeable) membrane



1. Isotonic Solution



2. Hypertonic solution



3. Hypotonic solution

Review: Concentration

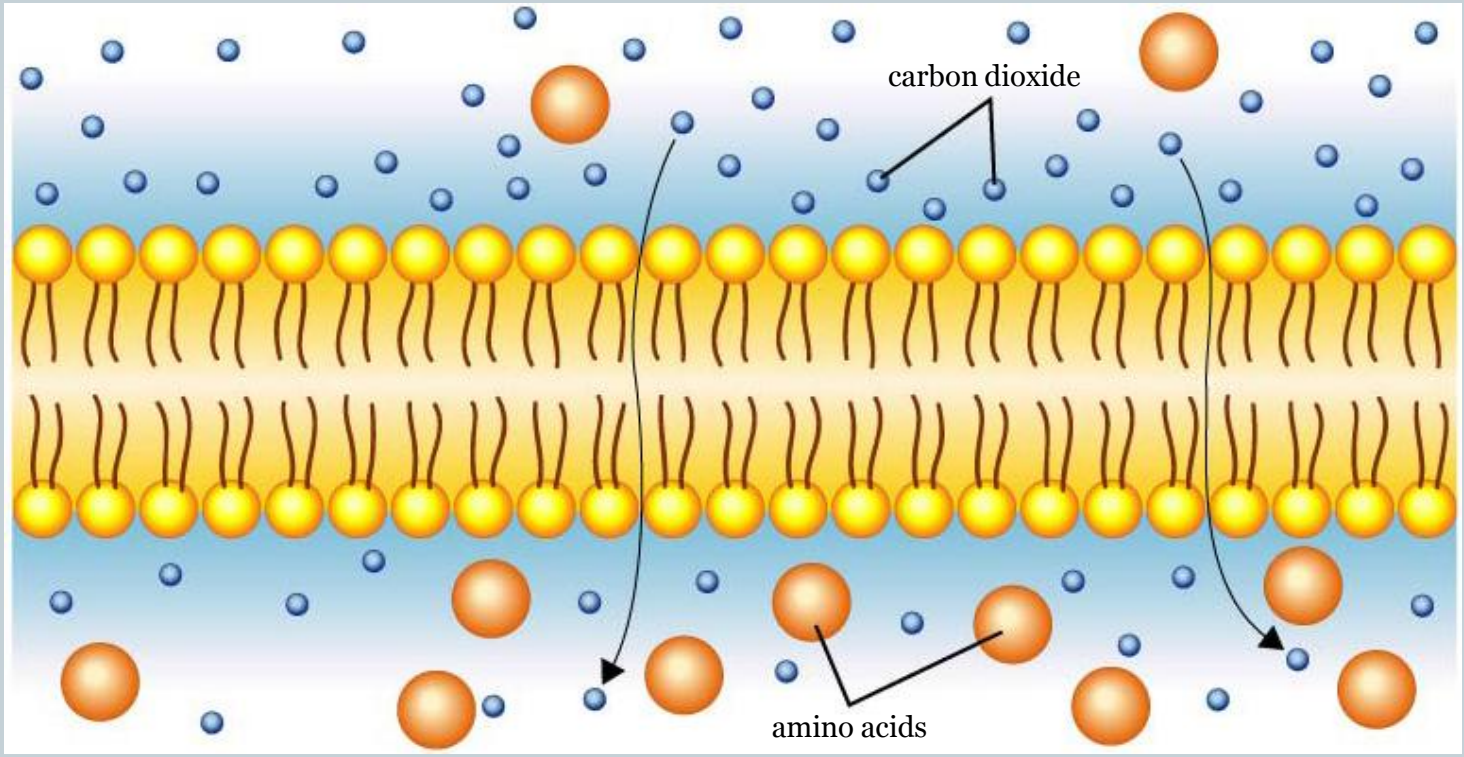
(Back of P.51)

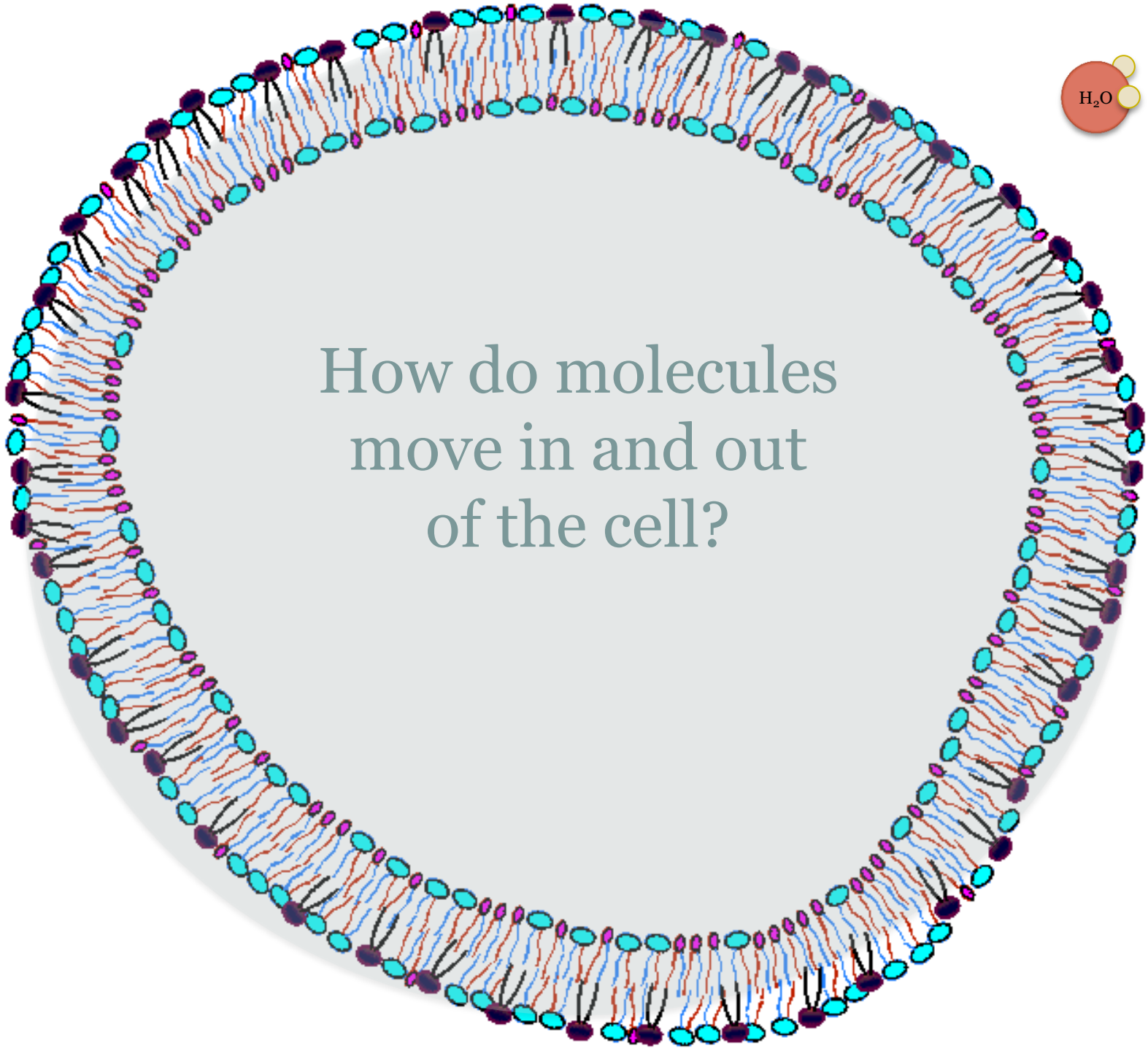
Based on your knowledge (from diffusion), which way will the sugar molecules go?

Why does this happen??

Cell Transport: How do Molecules Move In & Out?

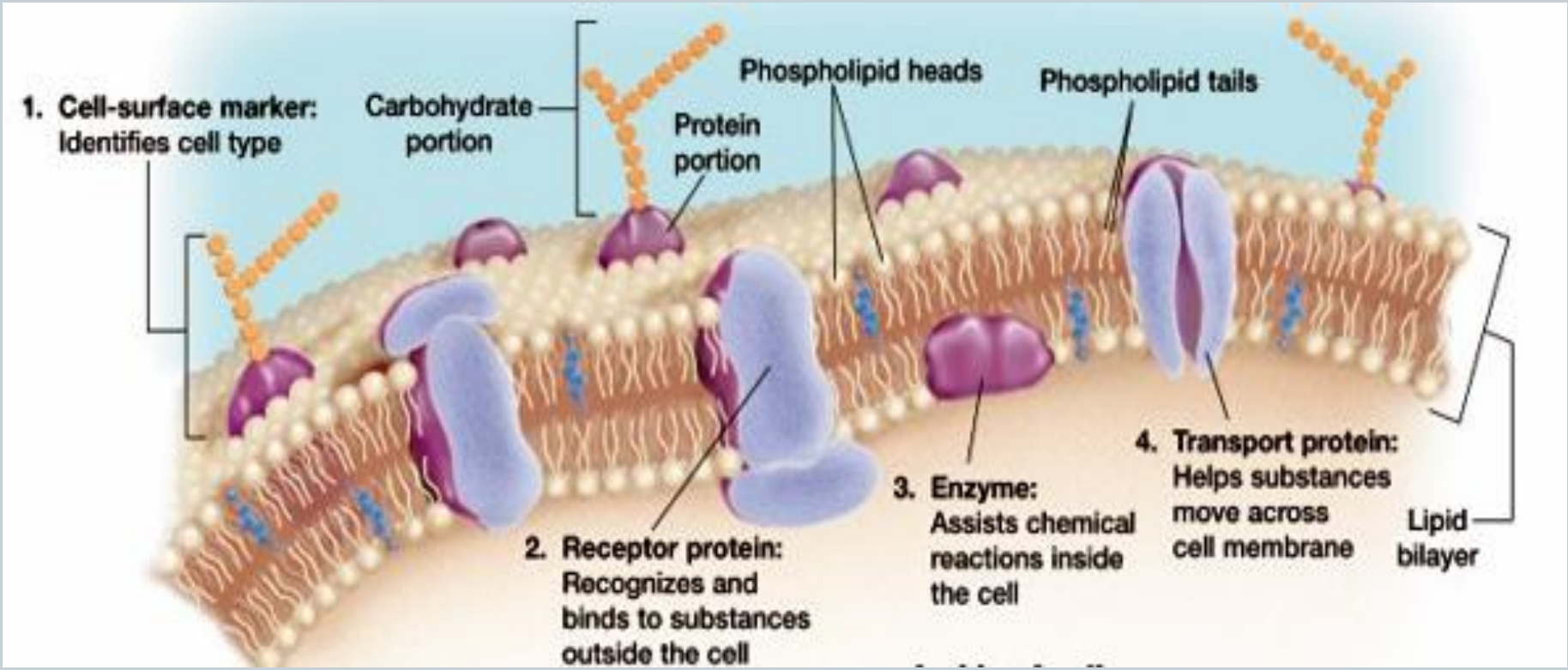
Phospholipid Bilayer




How do molecules
move in and out
of the cell?
H_2O

Fluid Mosaic Model

(flexible & made of many pieces)



Passive/Active Transport Videos

http://www.youtube.com/watch?v=kfy92hdaAH0

2 Short clips on Active Transport

http://www.youtube.com/watch?v=owEgqrq51zY

http://www.youtube.com/watch?v=STzOiRqzzL4&feature=related

There are 2 Types of Cell Transport

(How things move in & out of cells)

Passive Transport:

- Molecules move from High to Low Conc.

  ("with" conc. gradient)

- Requires No Energy

Active Transport:

- Molecules move from Low to High Conc.

  ("against" conc. gradient)

- Requires ENERGY!! (it's active!)

Passive Transport:

- Particles move from High Conc. to Low Conc.
- Requires No Energy

Simple Diffusion:

- Does not need a carrier/membrane protein
- *Do particles move from high to low?*
- *Do particles need energy to pass through?*

Facilitated Diffusion:

- Needs a Carrier Protein
- Ex: Osmosis *(Water diffusion)*
- *Do particles move from high to low?*
- *Do particles need energy to pass through?*

Active Transport:

•Particles move from Low Conc. to High Conc.

•Requires Energy

Protein Pump:

- Needs a carrier/membrane protein
- Energy molecule is required to open the protein
- *Do particles move from high to low?*
- *Do particles need energy to pass through?*

Coupled Transport:

- Needs a Carrier Protein
- Needs 2 or more molecules to go together
- Energy molecule is required to open the protein
- *Do particles move from high to low?*
- *Do particles need energy to pass through?*