

Osmosis Notes

Key Terms - Osmosis

OSMOSIS: Passive (not energy needed) diffusion of water through a semipermeable membrane.

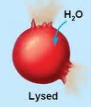
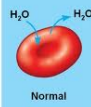

- **Semipermeable membrane:** Who has one of these? A cell!
- A simple rule to remember is: **SALT SUCKS!**
- Salt is a solute, when it is concentrated inside or outside the cell, it will draw the water in its direction.
 - This is also why you get thirsty after eating something salty.

Osmosis in plant cell

Key Terms - Transport

Transport

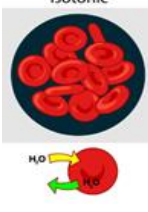
- Diffusion and Osmosis are both types of **PASSIVE TRANSPORT** - that is, no energy is required for the molecules to move into or out of the cell.
- Sometimes, large molecules cannot cross the plasma membrane, and are "helped" across by carrier proteins - this process is called facilitated diffusion.
- This process, if carried out against the concentration gradient, is called **ACTIVE TRANSPORT**, requires energy.

Key Terms - Solutions		Hypotonic solution	Isotonic solution	Hypertonic solution
Type of Solutions: Overview				
Solution		Lysed	Normal	Shriveled
ISOTONIC "ISO" means the same		If the concentration of solute (salt) is equal on both sides -No net movement of water		
HYPOTONIC "HYPO" means less		In this case there are less solute (salt) molecules outside the cell -The cell will gain water and grow larger		
HYPERTONIC "HYPER" means more		The word, in this case there are more solute (salt) molecules outside the cell -The cell will lose water and shrink		

ISOTONIC

"ISO" means the same Same solution on both sides
Equal movement in and out


- If the concentration of solute (salt) is equal on both sides, the water will move back in forth but it won't have any result on the overall amount of water on either side.



HYPOTONIC

"HYPO" means less "Hypo = Hippo (big fat guy)"


- Less solute (salt) molecules outside the cell, since salt sucks, water will move into the cell.
- The cell will gain water and grow larger.



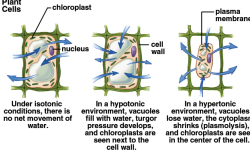
HYPOTONIC Strategies
How to deal with swelling up and not pop!

- **ANIMAL CELL:**
 - The cell may be in danger of bursting, organelles called **CONTRACTILE VACUOLES** will pump water out of the cell to prevent this
- **PLANT CELL:**
 - The central vacuoles will fill and the plant becomes stiff, the cell wall keeps the plant from bursting

Contractile Vacuole



Osmosis in plant cell



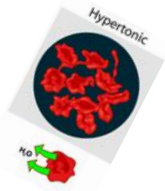
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HYPERTONIC

"HYPER" means more

- The word, in this case there are more solute (salt) molecules outside the cell, which causes the water to be sucked in that direction.
- **PLANT CELLS:** the central vacuole loses water and the cells shrink, causing wilting
- **ANIMAL CELLS:** the cells also shrink.
- In both cases, the cell may die.

"Hyper, hyper people burn lots of energy and are skinny!"





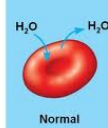

The Problem with HYPERTONICa

DANGER!

- This is why it is dangerous to drink sea water, people marooned at sea will speed up dehydration (and death) by drinking sea water.
- This is also why "salting fields" was a common tactic during war, it would kill the crops in the field, thus causing food shortages.

Its a myth that drinking sea water will cause you to go insane



	Hypotonic solution	Isotonic solution	Hypertonic solution
			
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Summary

(From your flexbook)

- All cells are very small because they need to pass substances across their surface. Their small size gives them a relatively large ratio of surface area to volume, facilitating the transfer of substances.
- The shapes of cells may vary, and a cell's shape generally suits its function.

Helpful Sites

Cell Membrane Structure:

- http://www.wisc-online.com/objects/index_tj.asp?objID=AP1101
- [http://www.youtube.com/watch?v=moP\]kCbKjBs](http://www.youtube.com/watch?v=moP]kCbKjBs)
- <http://www.youtube.com/watch?v=R15EmUQdkuI&feature=related>

Diffusion and Osmosis:

- <http://www.biologycorner.com/biol/diffusion.html>
- http://www.phschool.com/science/biology_place/labbench/lab1/intro.html
- <http://www.youtube.com/watch?v=VUnvvrX8Wg4>
