Name: Key

AP Bio: Active and Passive Transport Summary

Passive Transport

Description including Molecules & moved example | **Sketch**

Simple Diffusion:

Osmosis -
diffusion of water across a cell membrane through the phospholipids.

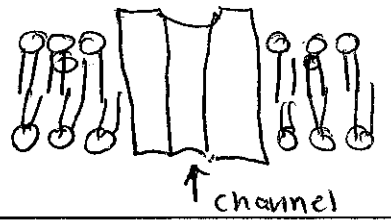
Facilitated diffusion: integral proteins allowing diffusion of specific molecules

★ Channel proteins-
narrow water filled tunnels that allow diffusion of solutes like ions. Faster movement than carrier proteins. Always passive

-ion channels and gated channels

ion- allow ions of certain size and/or charge through.
ex. voltage gated Na^+, K^+ or Ca^{2+} channels.

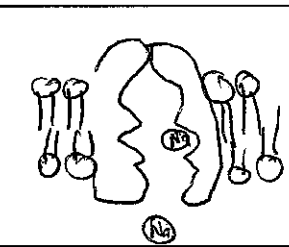
gated - have section that can open or close in response to a chemical (ligand) or electrical signal. When open, material diffuses.



Aquaporins
specific carrier protein used for water.
aka "water channel" allows for more rapid H_2O movement
found in animals, bacteria & plants.

Passive or Active Transport | **Description, example** | **Sketch**

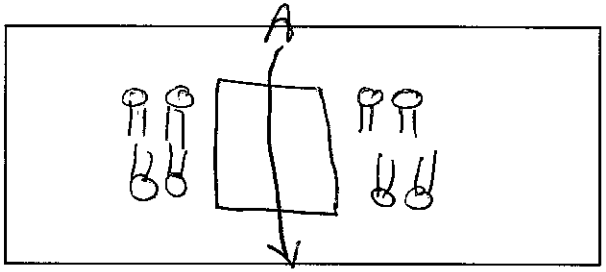
★ Carrier proteins - bind to specific molecules and then the protein goes through a series of conformational (shape) changes to move that bound particle across the membrane. Slower than channel protein.
ex. Na^+/K^+ pump, glucose transport protein.



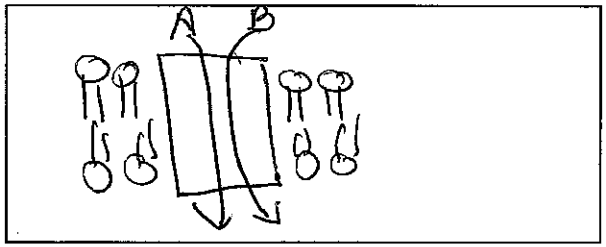
★ = good narrated animation on textbook site.

Passive or Active Transport continued **Description, example** **Sketch**

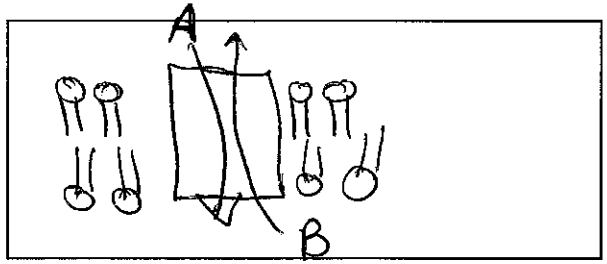
Uniporter - 1 material, 1 direction
ex. Na^+, K^+, Ca^{2+} channels
ion pumps



Symporter - 2 particles, same direction. Aka cotransport
ex- H^+/K^+ symporter in plant roots, Na^+/amino acids in small intestines
often secondary active transport.



Antiporter - 2 particles moved in opposite directions - active transport.
ex. Na^+/K^+ pump



Active Transport

Protein pumps: require ATP to move molecules often against the concentration gradient.
ex. Na^+/K^+ pump, H^+ pump.

★ Exocytosis:
active transport of particles/materials out of cell membrane by fusing vesicles/vacuoles containing materials ~~with~~ the cell membrane.

Active Transport continued

	Description, example	Sketch
★ Endocytosis: pinocytosis → liquids	active transport of particles) materials into cell by infolding of cell membrane to form vesicles (vacuoles to contain the new material	
phagocytosis - larger / solid materials.		

Define and give an example of the following terms:

Concentration gradient - difference in concentration in 2 places.
ex. hypertonic solution around plant roots = higher gradient of solute outside of roots.

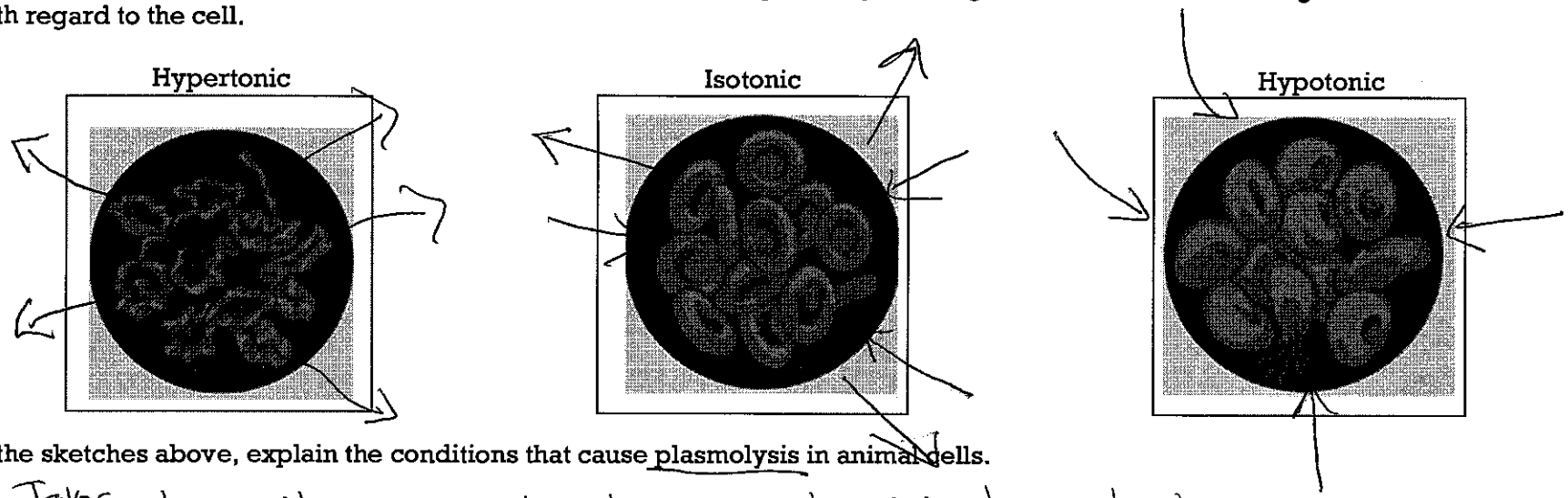
Ligand - chemical made of ions or molecules that can be released by a cell to signal or communicate with another cell by binding to a specific receptor along the cell membrane.

Membrane potential - resting state of nerve or muscle cells where they have a greater negative charge inside the cell (about −70mV) as compared to the fluid around the cell. The change in potential is part of the transmission of a nerve signal. It's the difference in charge across the cell membrane.

Go back and give at least one example based on your research for this packet of a uniporter, symporter and anitiporter.

Effects of Osmosis on Cells:

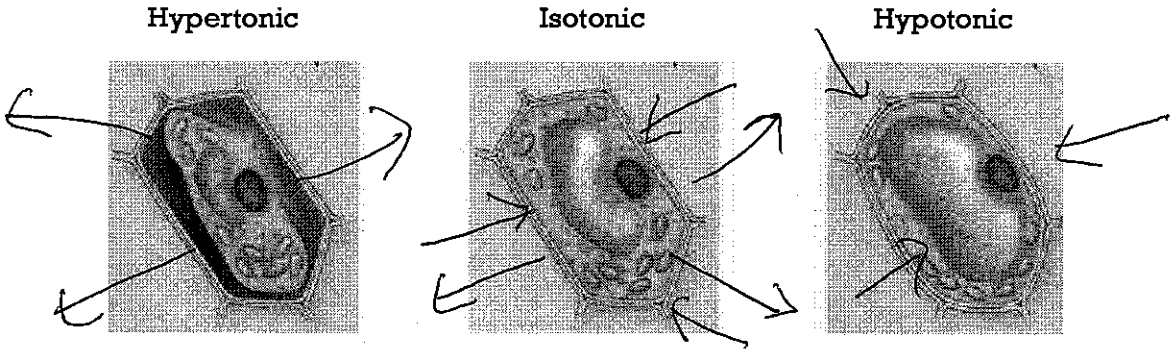
1. The center picture shows a normal red blood cell. Complete the diagrams by labeling them with arrows showing the overall movement of water with regard to the cell.



2. Using the sketches above, explain the conditions that cause plasmolysis in animal cells.

Takes place when animal cells are placed in hypotonic solutions and the cells take in enough water for the membrane to burst.

3. The center picture shows a normal plant cell. Complete the diagrams by labeling them with arrows showing the overall movement of water with regard to the cell.



4. Using the sketches above, explain the conditions that cause high Turgor pressure in plant cells. Why is this beneficial for plants?

High Turgor pressure takes place when plant roots are in hypotonic environments. This helps plant stems & leaves to have support and have a more rigid structure.