



Transport

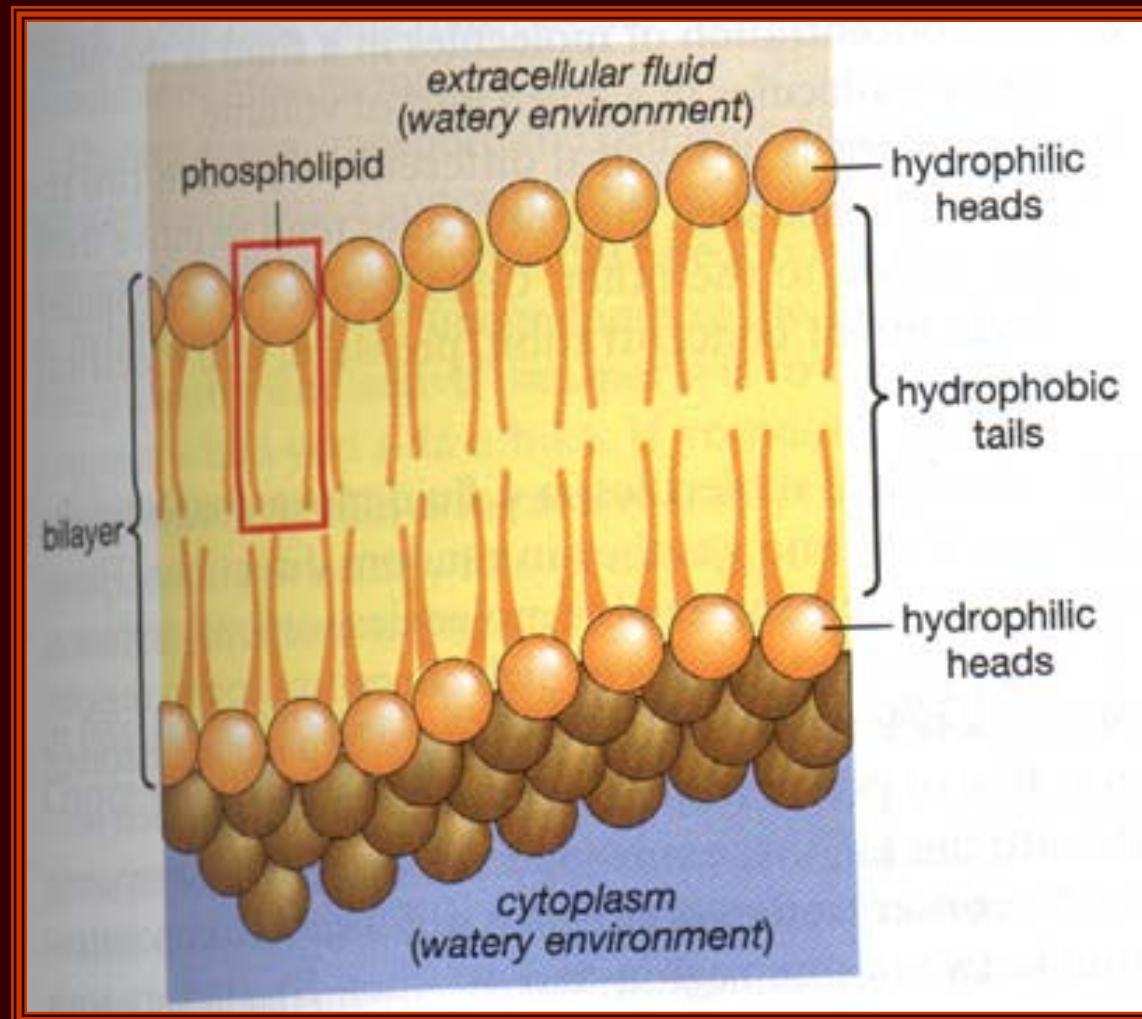
*absorption across the cell
membrane*

Life Function: Transport

- Involves the absorption and circulation of materials within a cell or throughout an organism.
- **Absorption:** the process by which the end products of digestion (amino acids, monosaccharides, and fatty acids and glycerol) as well as dissolved solids and gases enter the fluids and cells of an organism.

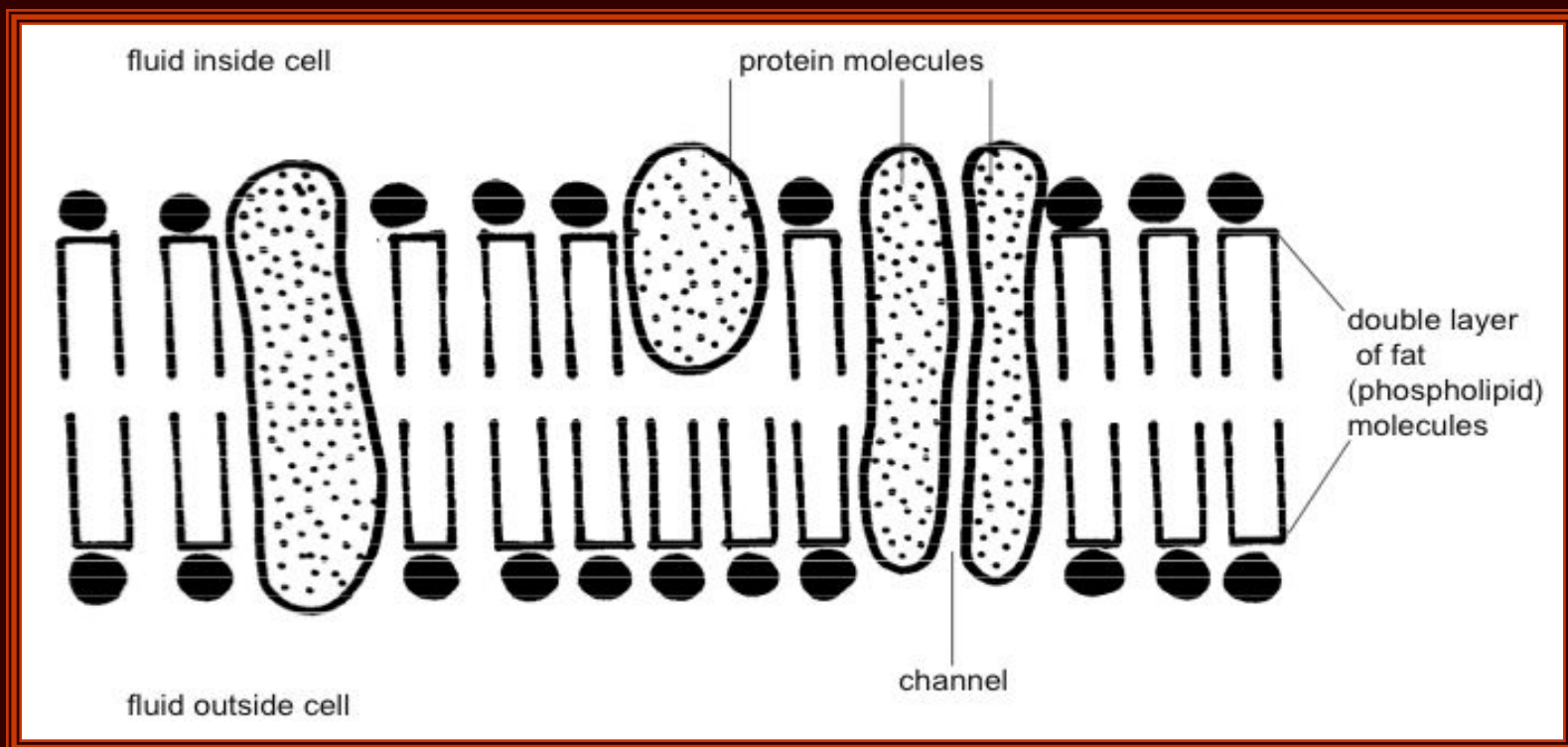
Structure of the Cell Membrane

Double Phospholipid layer

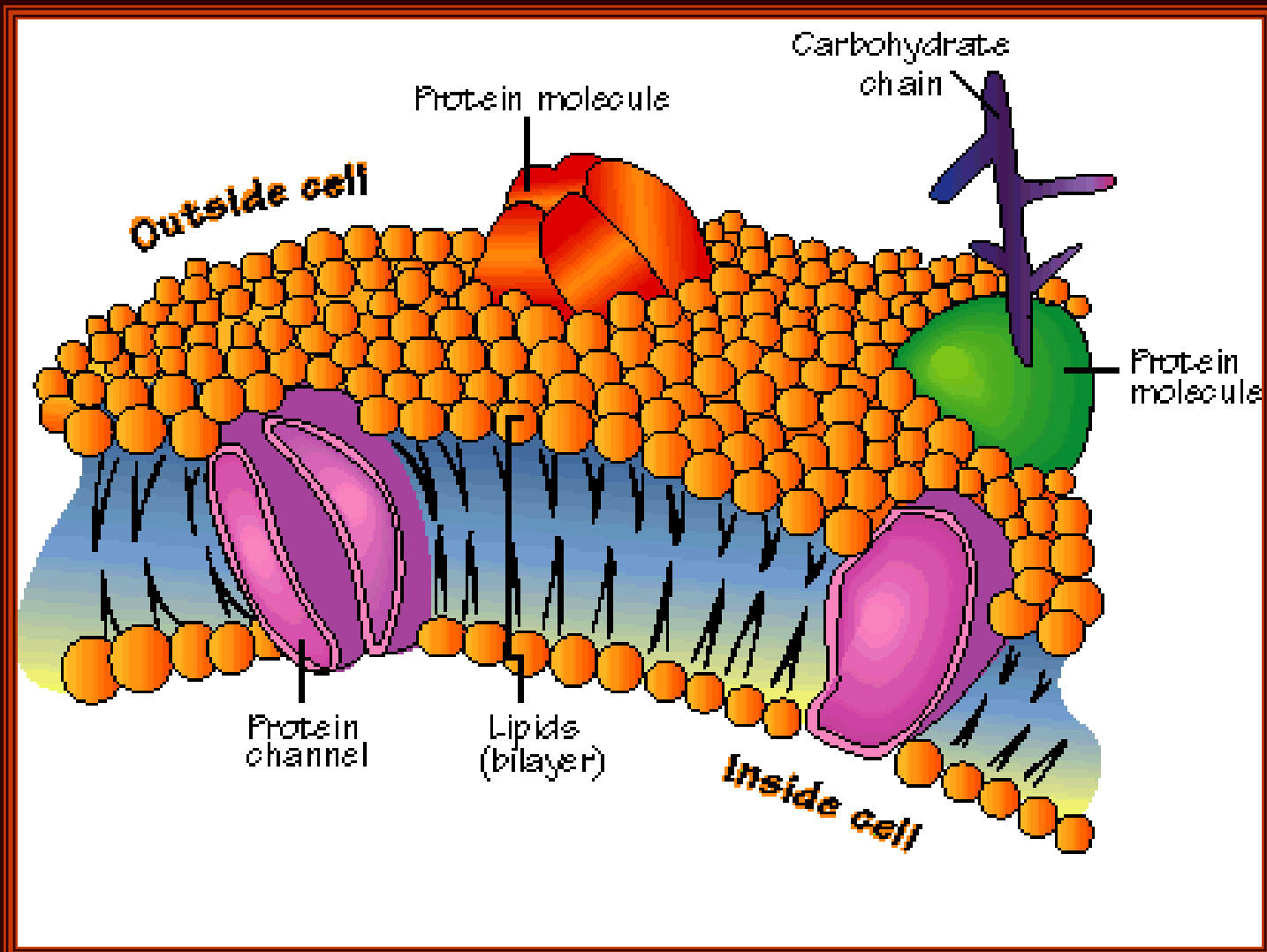


Two Dimensional View of Cell Membrane

- Some proteins are partially embedded in one layer of the cell membrane; other rest on the surface or poke completely through the double layers.

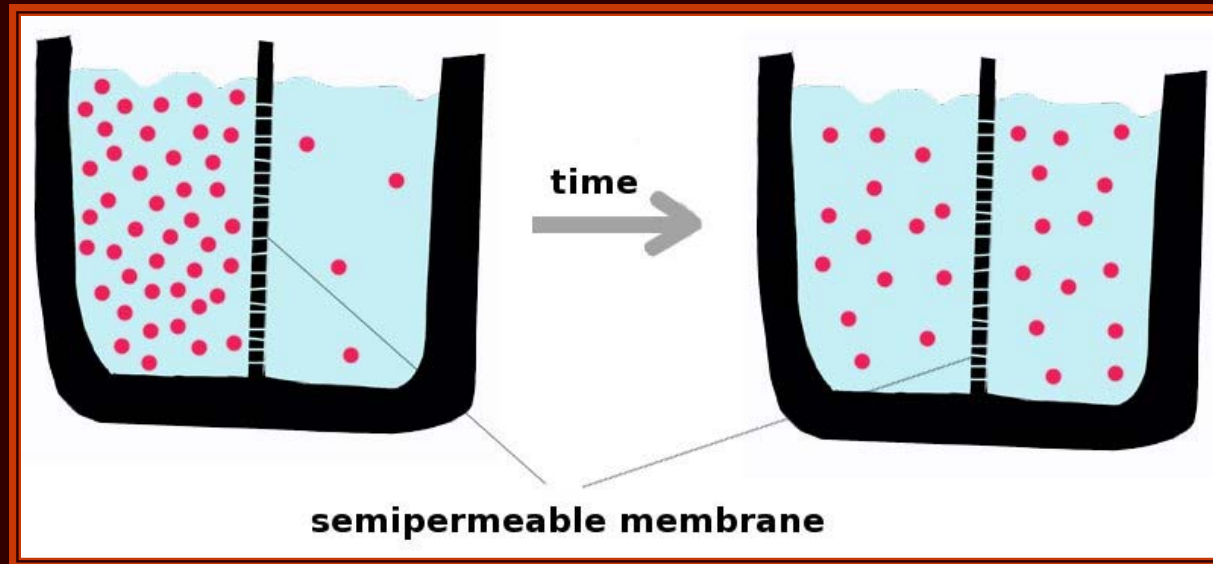


Fluid Mosaic Model of the Cell Membrane



Diffusion

- Passive Transport – does not require energy.
- The movement of materials from an area of high concentration to an area of low concentration.
- The difference between the two areas of concentration is called the Concentration Gradient.

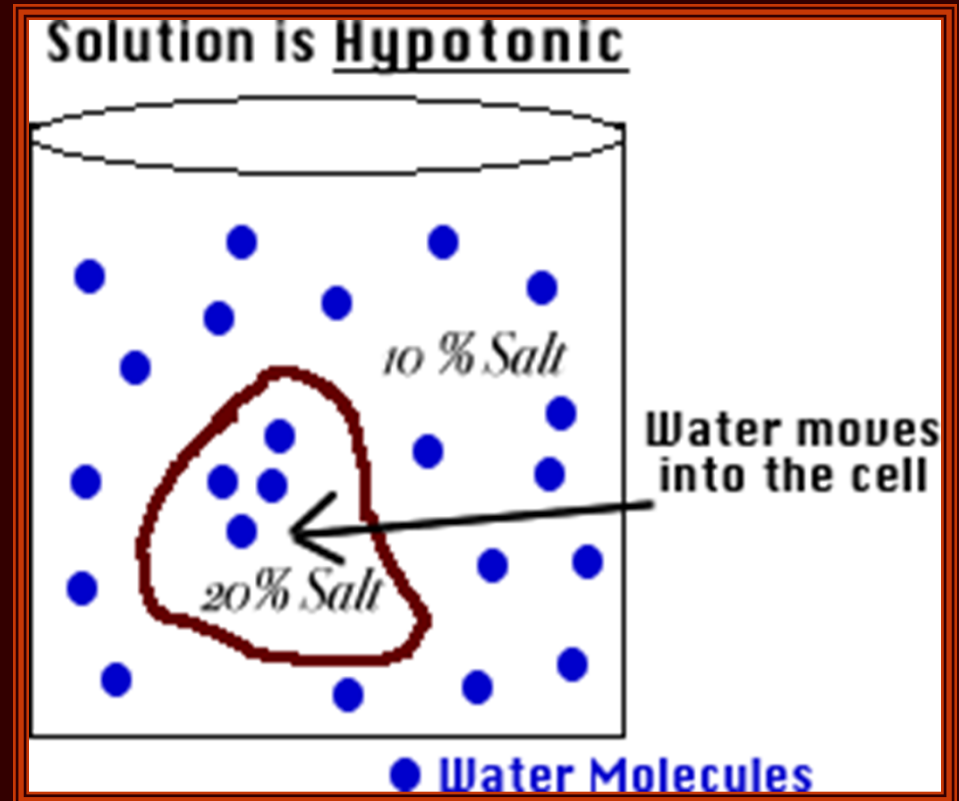
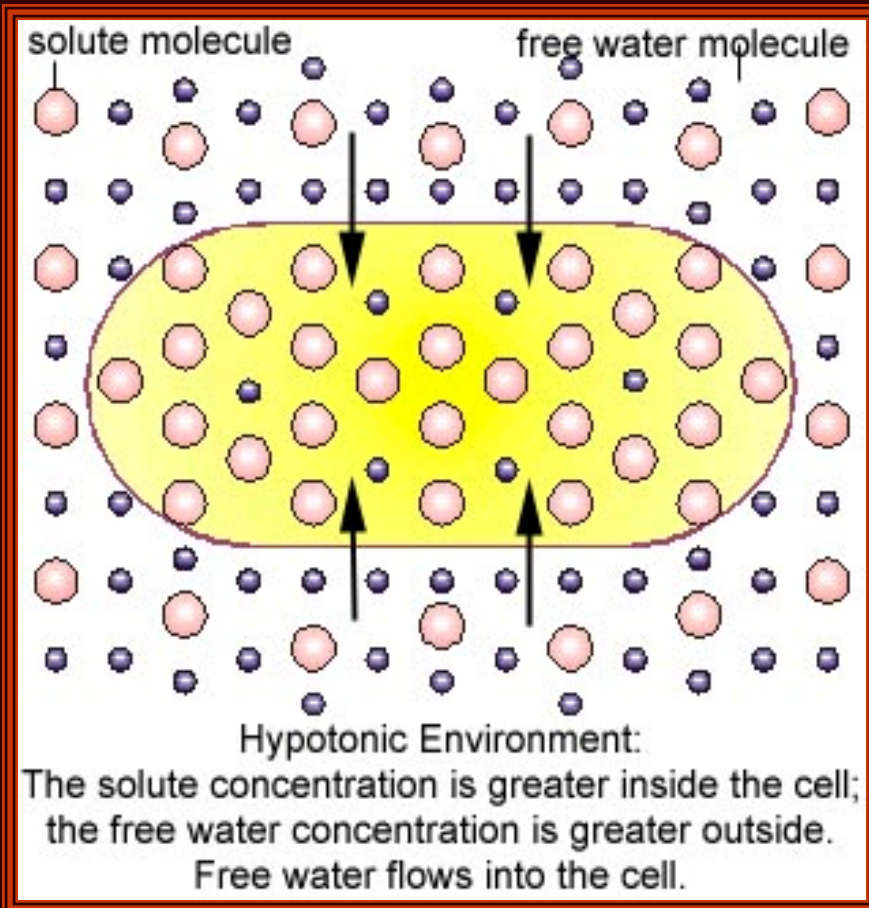


How diffusion works

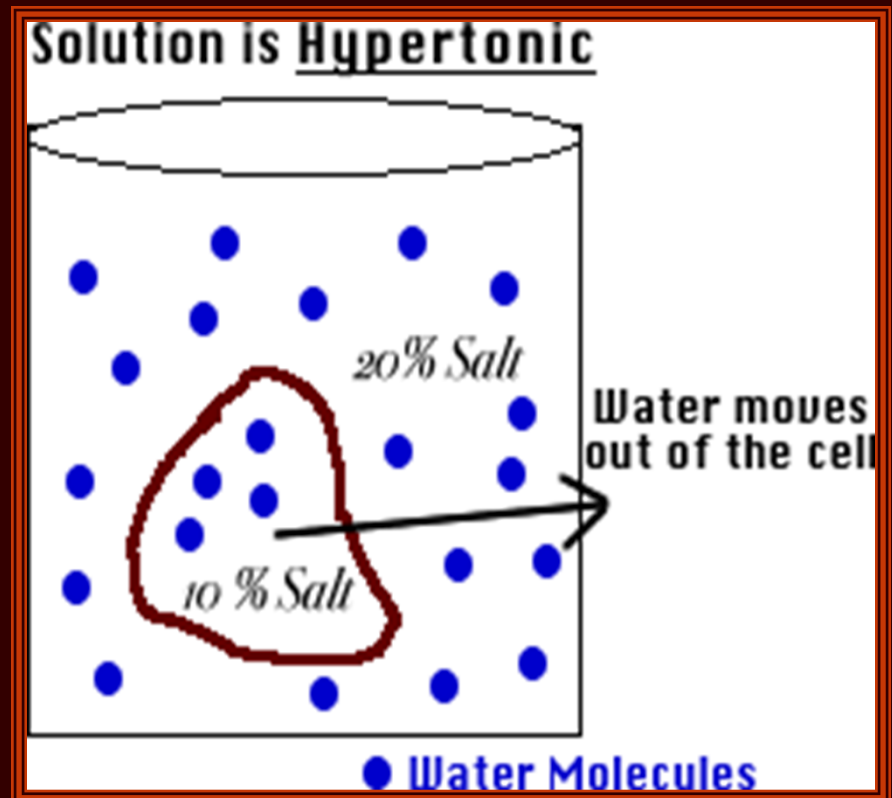
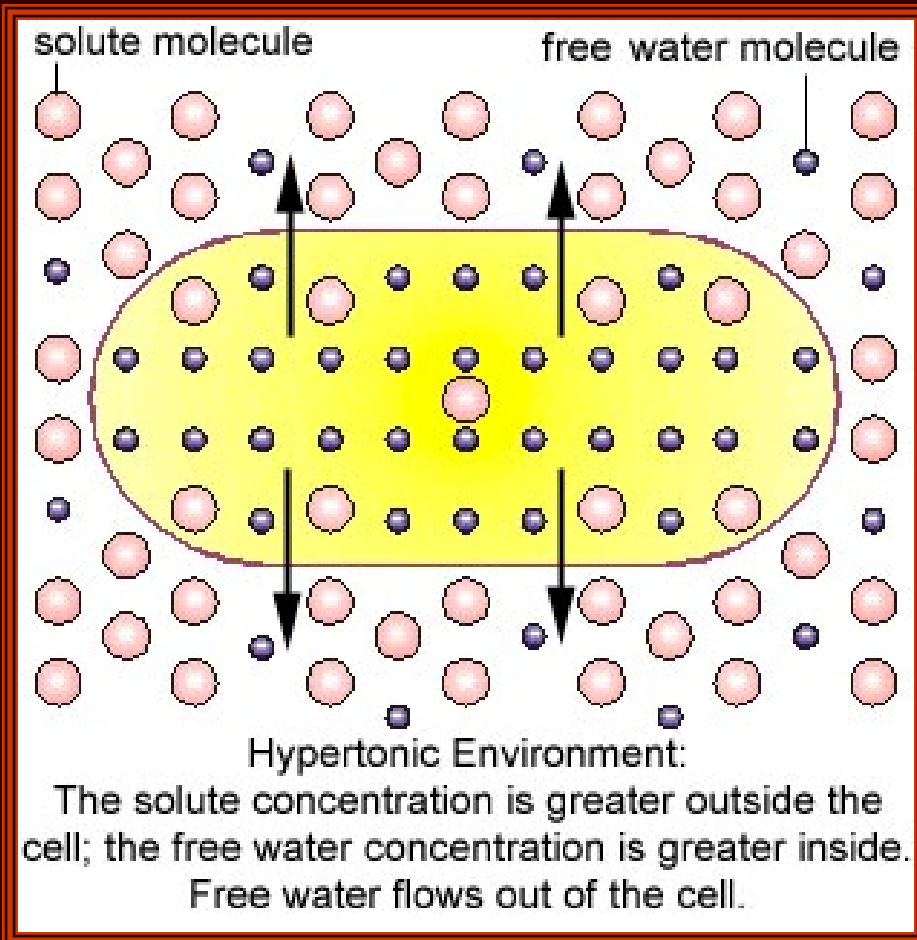
Osmosis

- The diffusion of water molecules with the concentration gradient.
- If the concentration of water OUTSIDE the cell is high, *water will move INTO the cell.*
- If the concentration of water is high INSIDE the cell, *water will move OUT of the cell.*
- If there are salt molecules in a beaker of water, these salt molecules take up space. So, there is less water in the beaker (concentration of water is low)
- If there was only water in a beaker, there are very few particles in the water, so the concentration of water is high.

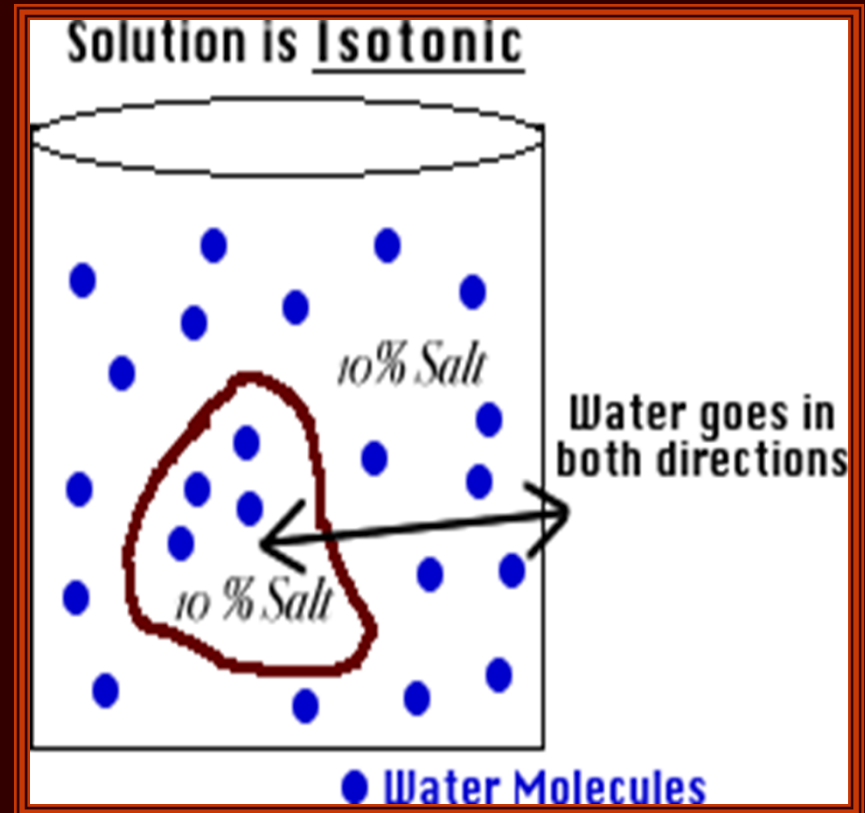
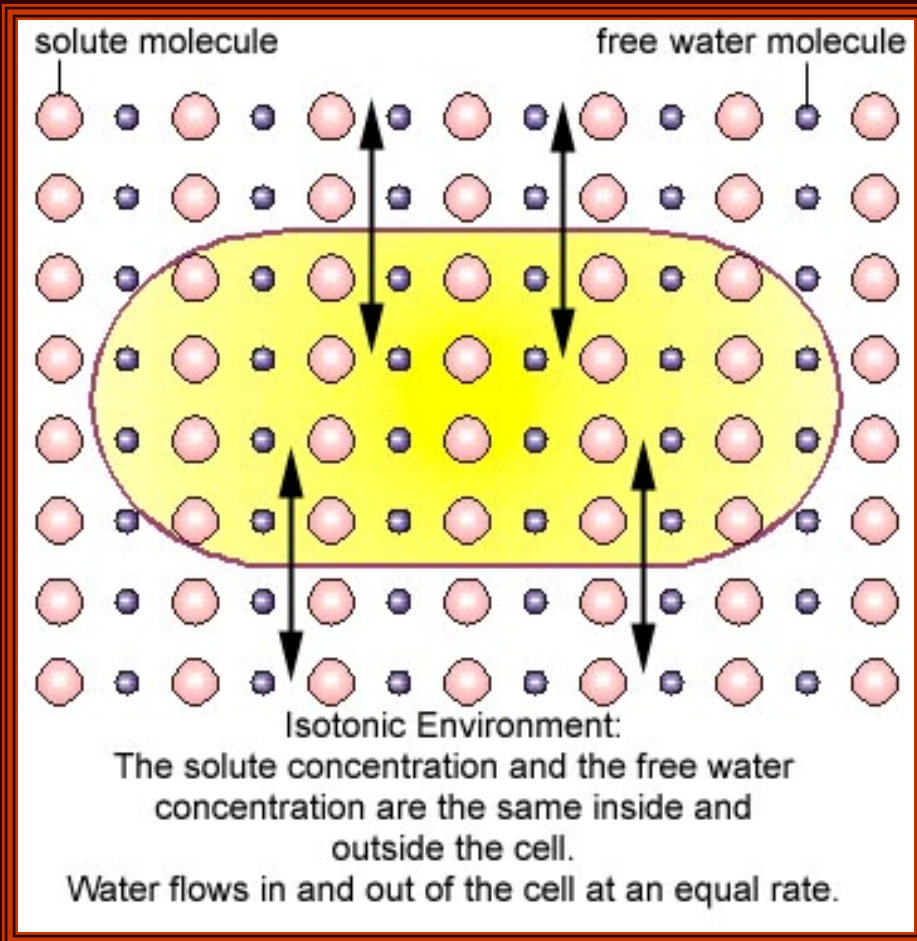
Hypotonic Solution



Hypertonic Solution



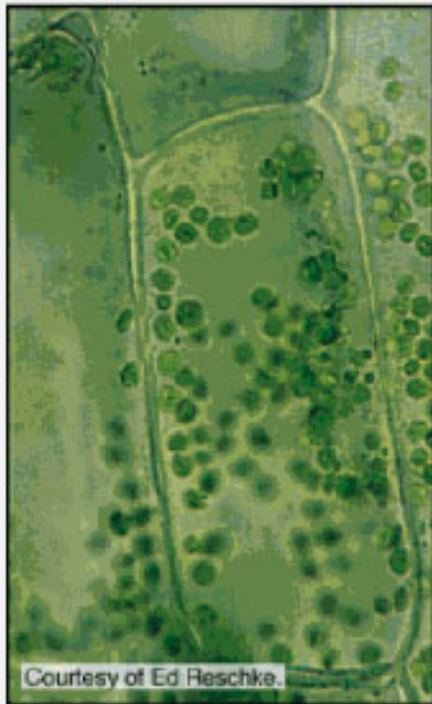
Isotonic Solution



how osmosis works

Osmosis in Plant Cells

Hypotonic

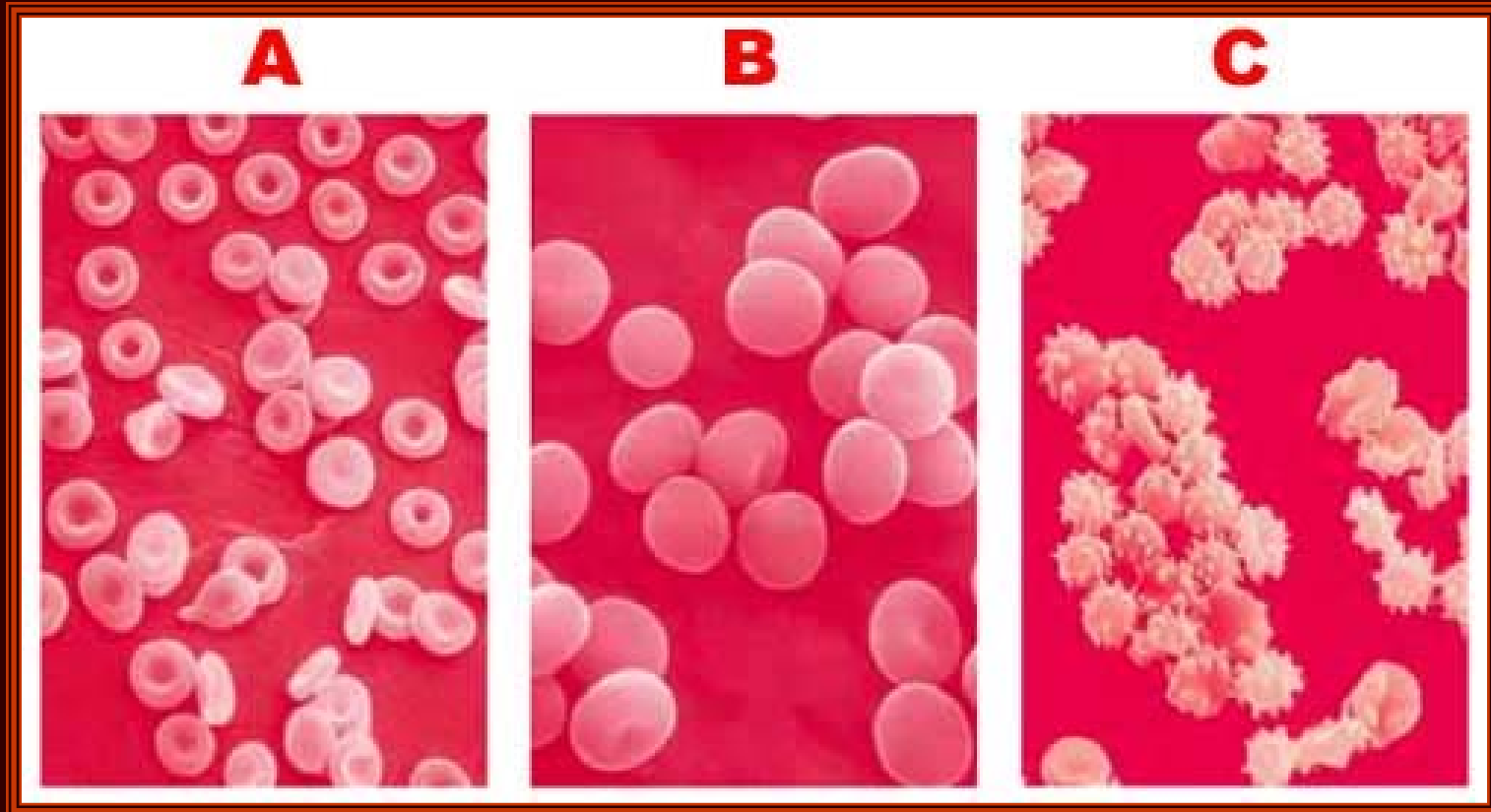


Hypertonic



Copyright 1999 John Wiley and Sons, Inc. All rights reserved.

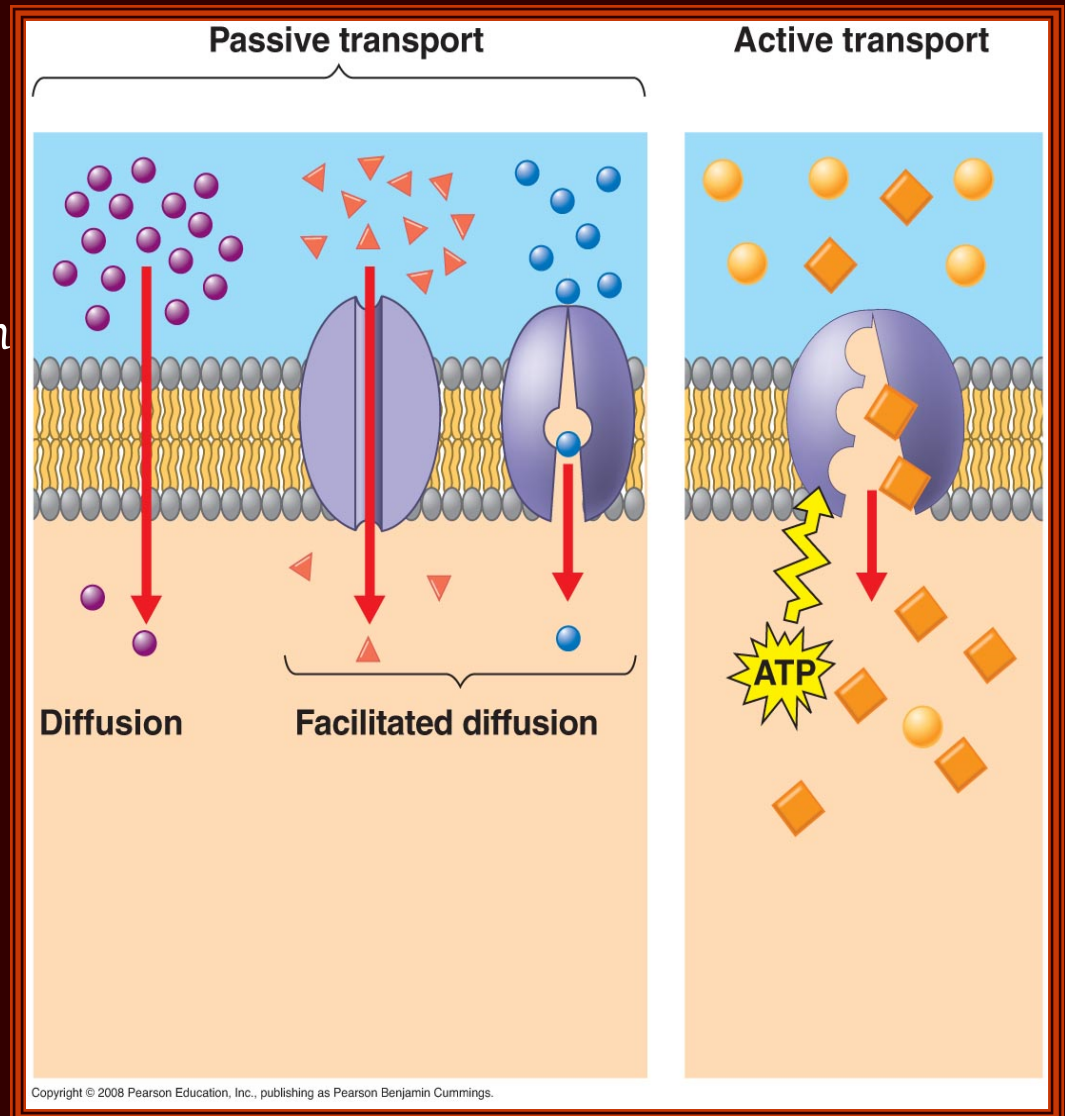
Red Blood Cells & Osmosis



Identify which group of RBCs (A,B, or C) were placed in a hypertonic, isotonic, or hypotonic solution.

Facilitated Diffusion

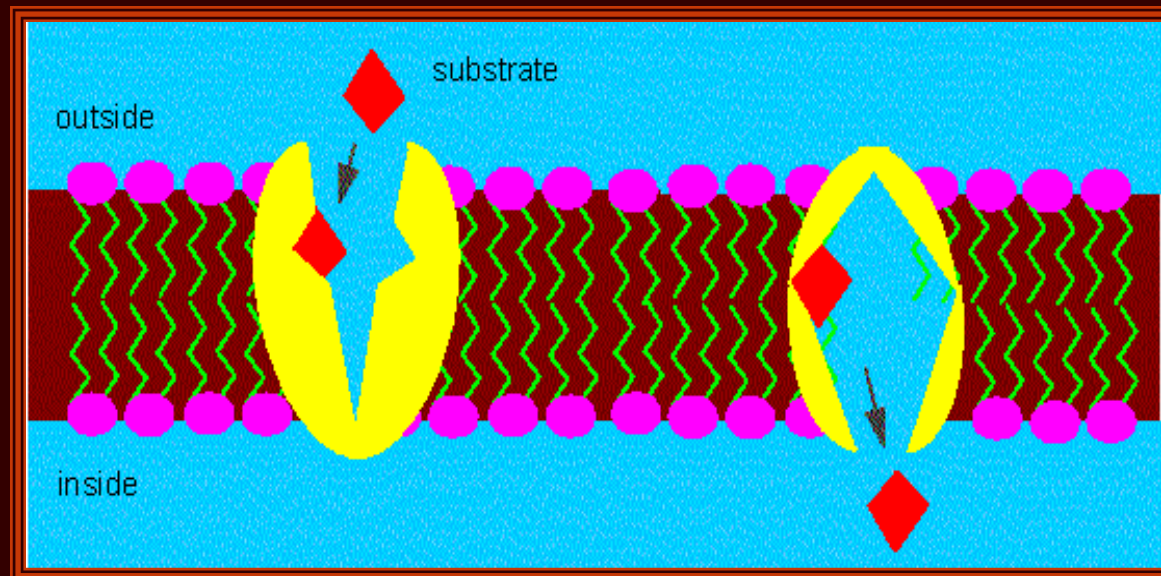
- Form of passive transport., NO energy needed!
- Some larger molecules such as glucose are too big to fit between the spaces between phospholipids molecules.
- Since lipids repel ions, protein channels enable certain ions to get across the cell membrane and into the cell.



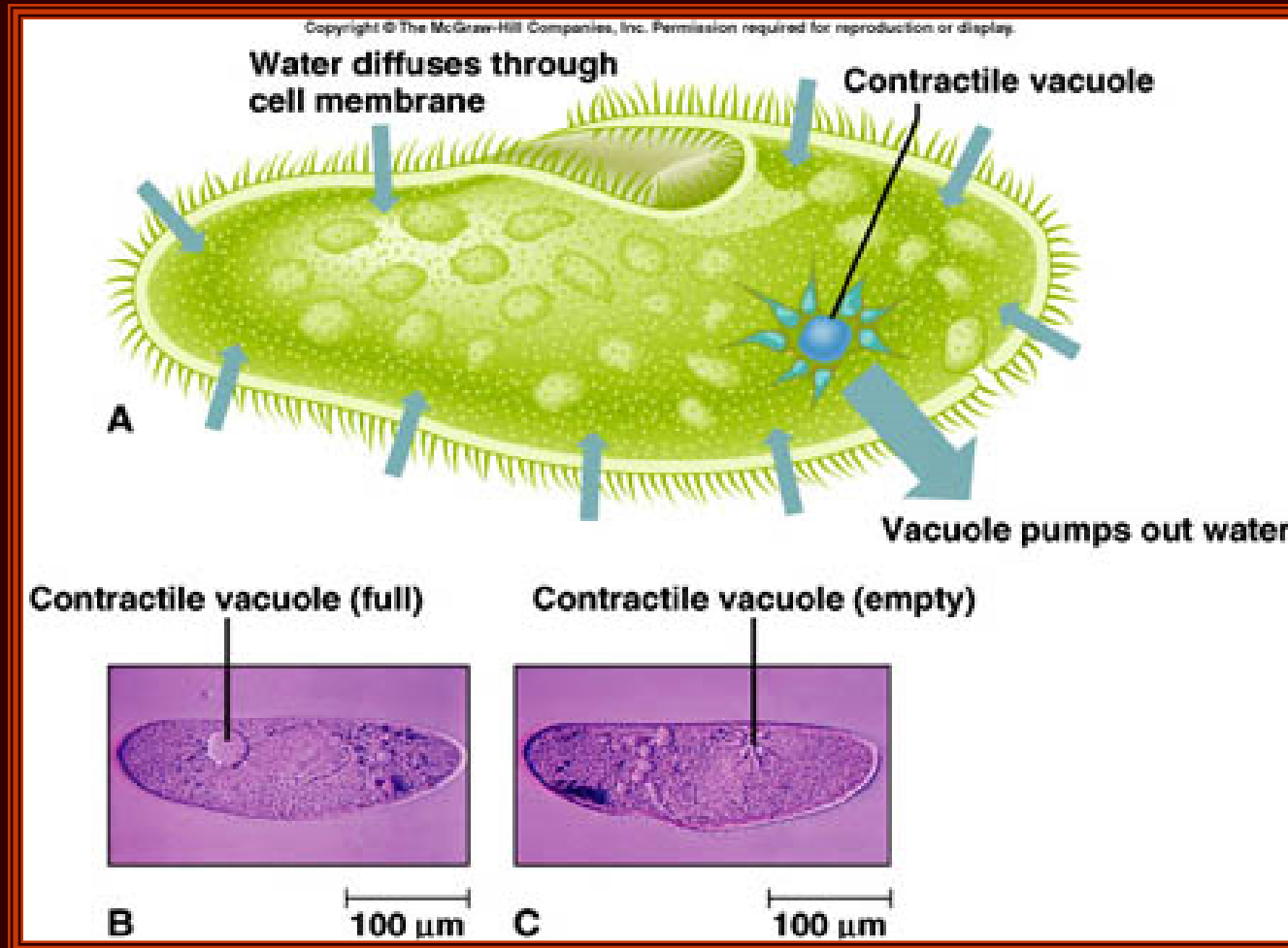
How Facilitated Diffusion Works

Active Transport

- Certain substances need a bit of help in order to move across the cell membrane.
- This help comes in the form of some **ENERGY INPUT (ATP)**
- When substances are moved **AGAINST** the concentration gradient, from low concentration to high concentration, energy is required.



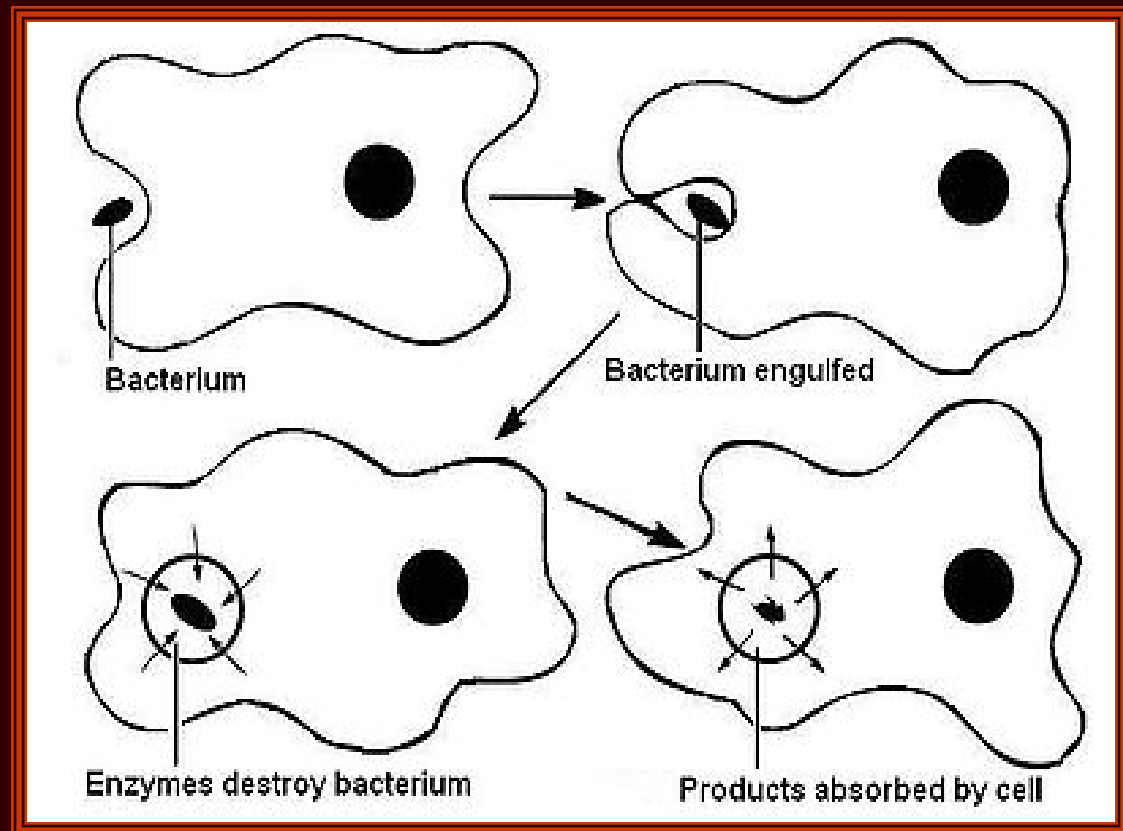
Paramecium: Contractile Vacuole



contractile vacuole

Phagocytosis

- “cell eating”
- requires an input of energy
- --process by which large, undissolved particles are engulfed and taken into the cell



phagocytosis

Pinocytosis

- *requires energy*
- *“cell drinking”*
- *process by which large, dissolved molecules become enclosed in a vacuole.*
- *--to accomplish this, the cell membrane pockets inward and after the dissolved material is in the pocket, it pinches off from the main membrane to form a vacuole.*

