

BIOL 101
Membrane Transport

- I. Movement through the plasma membrane
 - A. Selective permeability
 1. ICF vs. ECF
 2. bring in nutrients, expel wastes
 3. maintain normal levels of key substances
 - B. Passive transport processes
 1. solutions, solutes, and solvents
 2. diffusion : movement of solute molecules from high conc to low conc.
 - a. concentration gradient = measure of the difference in concentration of solute molecules between two points in a solution
 - b. may involve membrane channels
 3. osmosis
 - a. diffusion of water across selectively permeable membrane
 - b. water diffuses from low [solute] to high [solute]
 - c. osmotic pressure
 - created by movement of water into cell
 - d. hypotonic solutions
 - solution with lower [solutes] than cytoplasm
 - e. hypertonic solutions
 - solution has higher [solutes] than cytoplasm
 - f. isotonic solutions
 - [solutes] same inside and outside cell
- C. Selective transport mechanisms
 1. facilitated diffusion
 - a. moves molecules *with* gradient
 - b. requires transport protein (specific)
 2. active transport
 - a. moves substances *against* gradient

- b. increases [solute] on one side of cell membrane
- c. transport protein *and* energy (ATP) required

II. Bulk Transport

A. Endocytosis –

1. “engulfing” large molecules
 - pseudopodia
2. forms a membrane-bound vesicle

B. Subtypes

1. phagocytosis (cell eating)

2. pinocytosis (cell drinking)

C. Exocytosis –mechanism for secretion

1. products “packaged” for export
2. fuse with cell membrane
3. contents “spilled” into ECF

III. Cell “Sensors” – surface proteins for communication

A. Receptor proteins

1. recognize specific molecules (such as hormones)
2. receptor changes shape
3. change in cell activity (signal transduction)

B. Voltage-sensitive channels

1. “gated”
2. allow passage of ions (current)
3. how neurons and muscle cells work