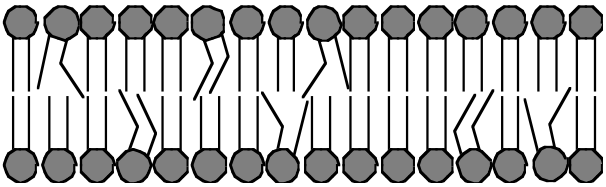
The Cellular Level of Organization

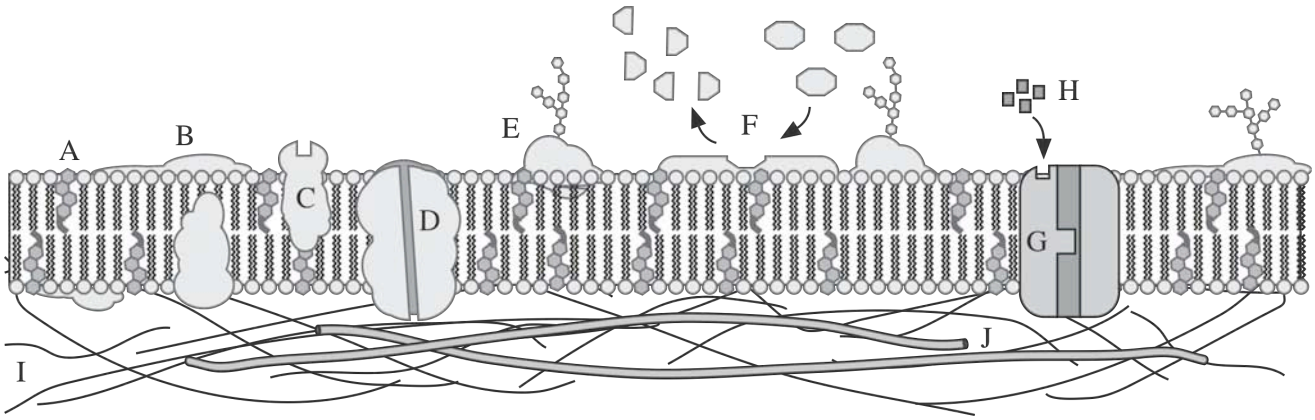
1. The Cell
   - A. Cell
   - B. Cell Types
     - i. Eukaryotic Cells
     - ii. Prokaryotic Cells
2. Plasma (cell) Membrane
   - Phospholipid Bilayer
     - * Hydrophilic
     - * Hydrophobic



- Cholesterol

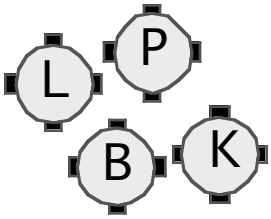
   - A. Proteins
     - i. Integral Proteins
       - a. Enzymes
       - b. Transporters
     - ii. Peripheral Proteins
       - a. Enzymes
       - b. Cytoskeleton

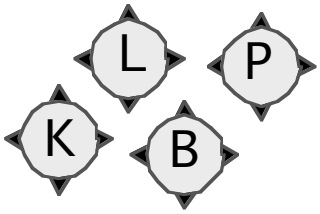
A.	Cholesterol
B.	Peripheral Protein
C.	Receptor
D.	Transporter (Carrier Molecule
E.	Glycoprotein (ie., Major Histocompatability Complex)
F.	Enzyme
G.	Transporter with "Gate"
H.	Hormone
I.	Peripheral proteins of Cytoskeleton
J.	Microtubules



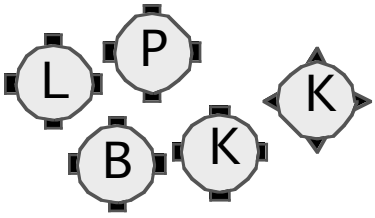
iii. Glycoproteins

a. Major Histocompatability Complex





b. Antigen



B. Cell Membrane Physiology

i. Facilitates Contact (see diagram in text)

a. Tight Junctions

- Interlocking Junctional Proteins

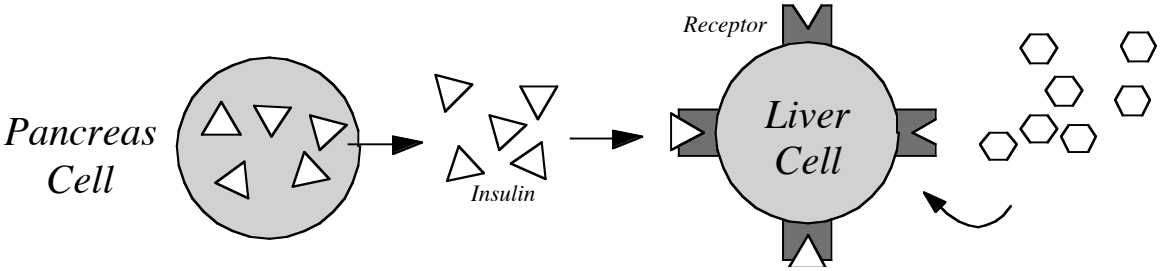
b. Desmosomes

- Interlocking Junctional Proteins
- Cytoskeleton

c. Gap Junctions

- Intercellular Communication

ii. Provides Receptors



- Enzymatic Functions

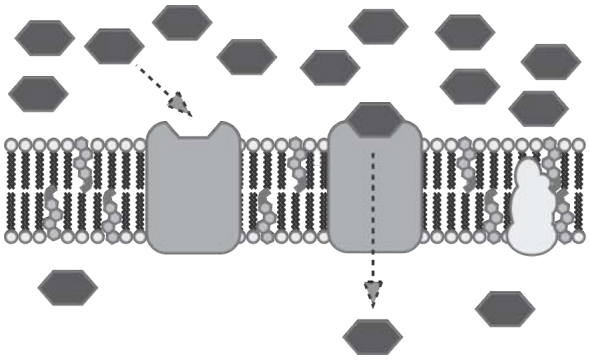
iii. Monitors

- Selective Permeability

Size

a. Solubility in Lipids

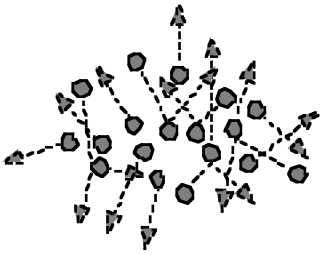
b. Carrier Molecules



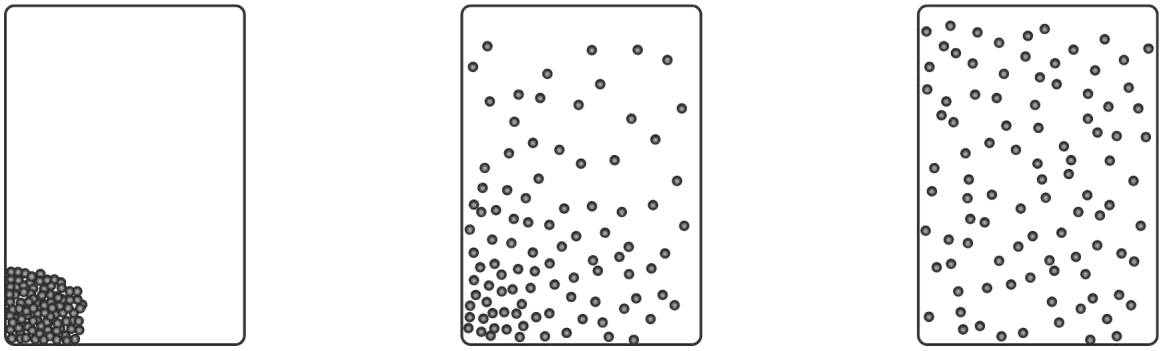
C. Transport Across the membrane

i. Passive Transport

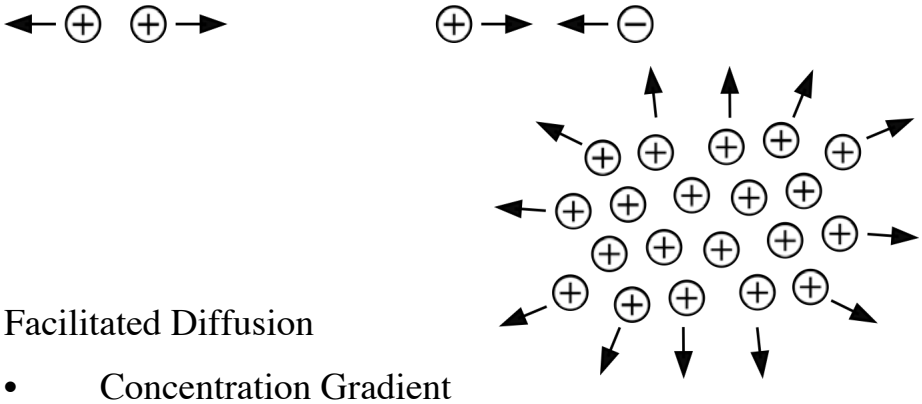
a. Simple Diffusion



- Diffusion Gradient



- Electro-Chemical Gradient



b. Facilitated Diffusion

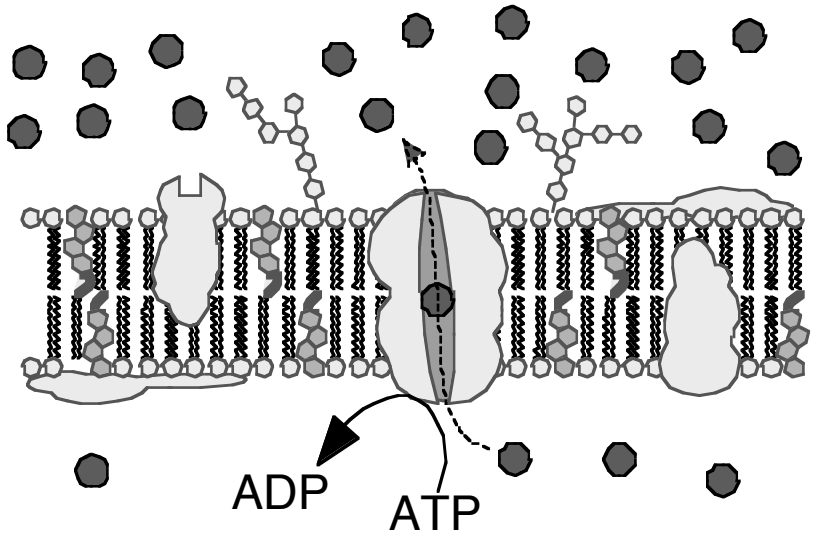
- Concentration Gradient
- Amount of Carrier (Transporters)

c. Osmosis **(See Handout on Osmosis)**

- Osmotic Pressure
- Isotonic Solution
- Hypotonic Solution
  - (Hemolysis)
- Hypertonic Solution
  - (Crenation)

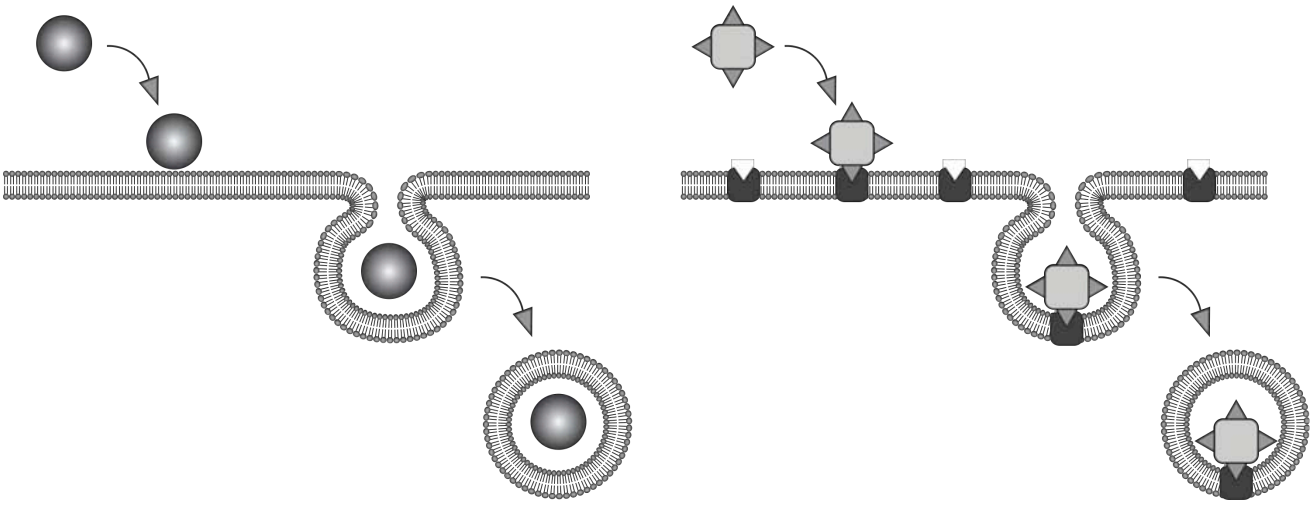
ii. Active Transport

a. Active Transport Transporters (Carrier Molecules)



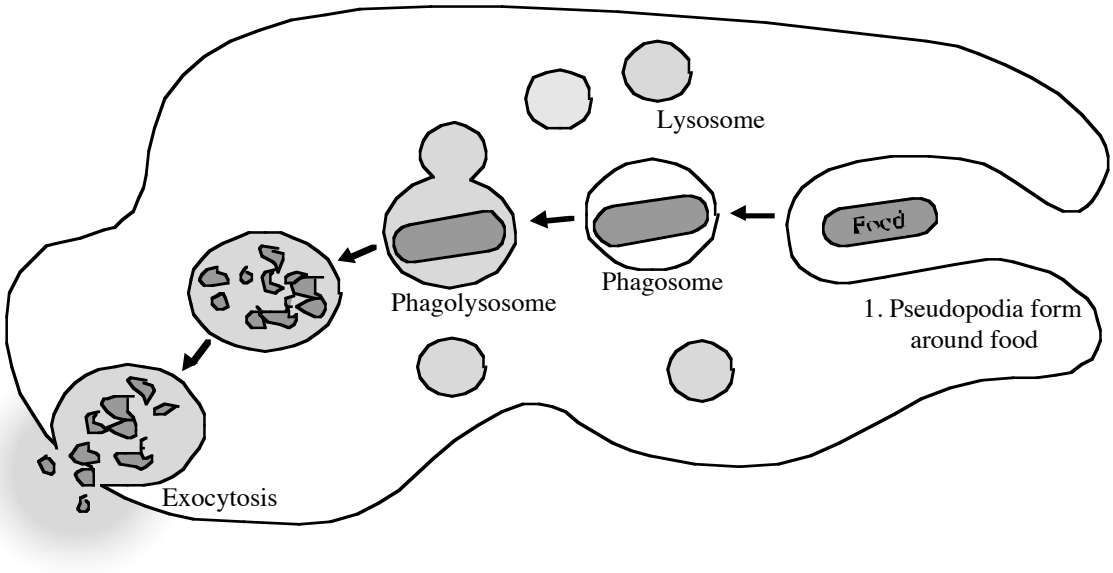
b. Endocytosis

c. Receptor-Mediated Endocytosis



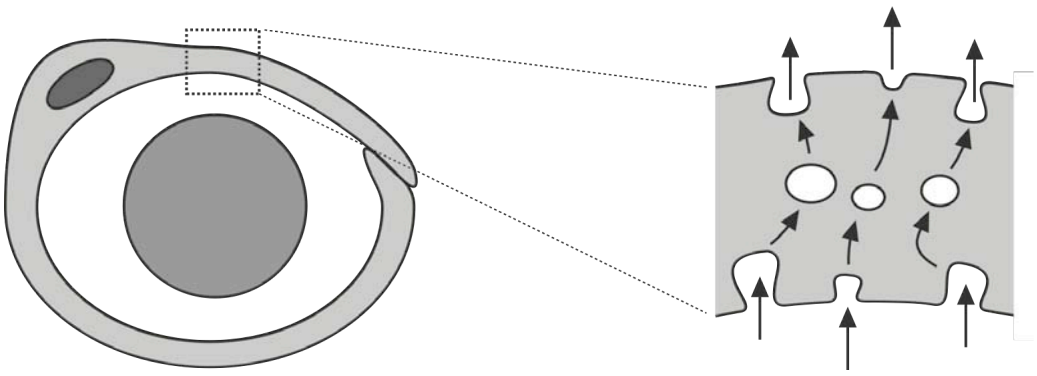
d. Phagocytosis

- Chemoattractants
- Negative Chemotaxis
- Positive Chemotaxis
- Pseudopodia
- Phagosome
- Exocytosis



f. Pinocytosis

- Pinocytic Vesicle



3. Cytoplasm
4. Organelles
   - A. Nucleus
     - i. Nuclear Membrane
       - a. Pores

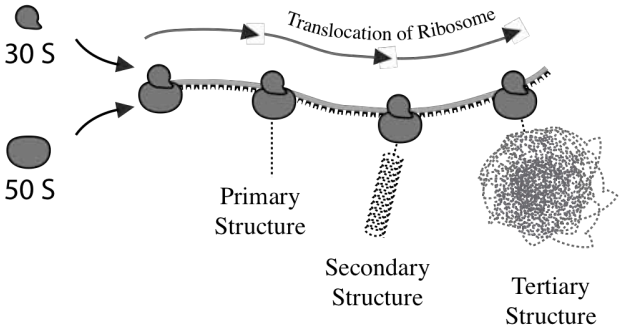
         Nucleoplasm
       - b. Genetic Material
         - Chromatin
         - Chromosomes
     - ii. Gene Action (PULL OUT HANDOUT ON PROTEIN SYNTHESIS)
       - a. Protein Syntheses
         - Structural
         - Metabolic

           Others
       - b. Enzymatic
       - c. Transcription and Translation

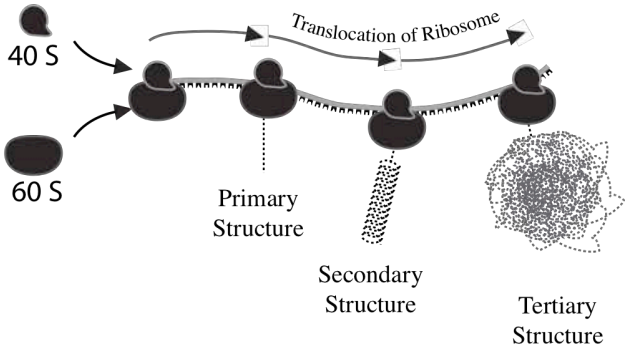
   - B. Ribosomes

     Ribosomal RNA (rRNS)
     - i Free Ribosomes
       - a. Small and Large Ribosomal Subunits

Prokaryotic
Ribsomal Subunits



Eukaryotic
Ribsomal Subunits



C. Endoplasmic Reticulum (ER) (Pull out handout)

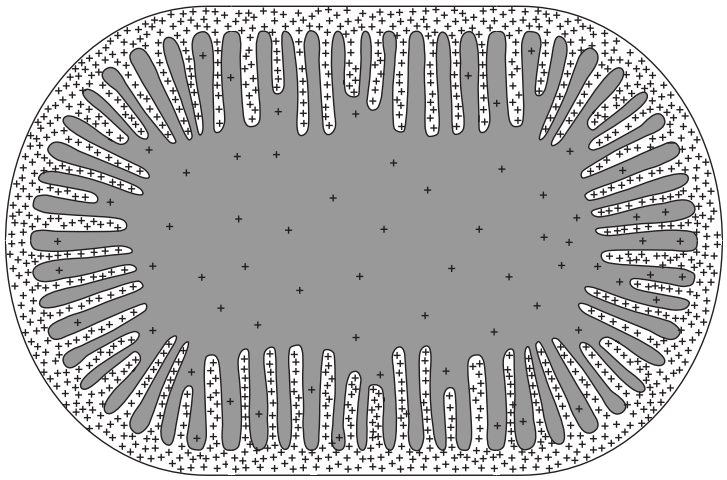
i. Agranular (Smooth) ER

ii. Granular (Rough) ER

D. Golgi Complex

i. Cisternae

- Secretory Vesicles
- Transitional Vesicles
- Secretory Granules
- Exocytosis



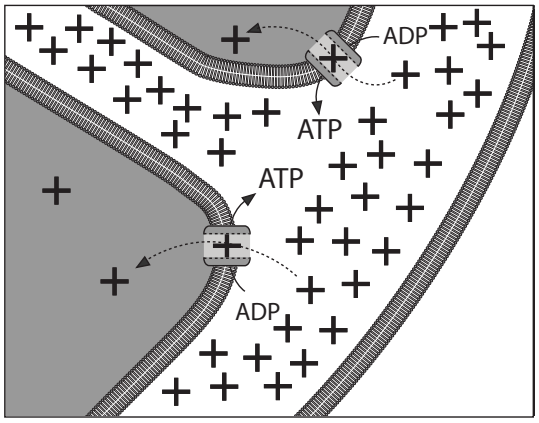
E. Mitochondria

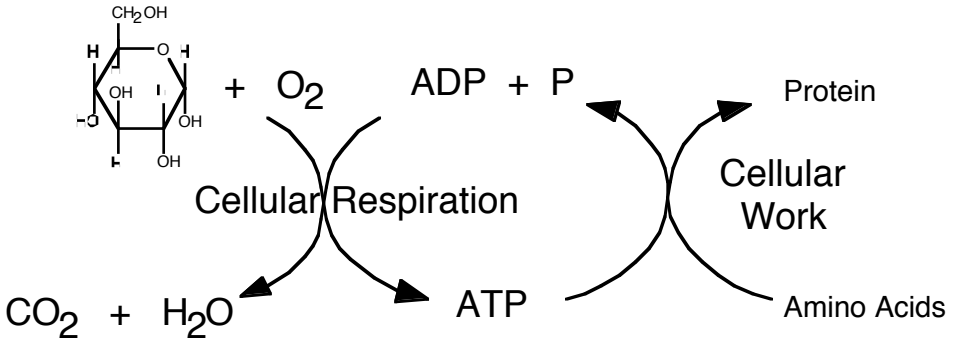
i. Membranes

ii. Intermembrane Space

iii. Electrochemical Gradient

iv. Cellular Respiration





F. Lysosomes

i. Phagocytosis

ii. Apoptosis

iii. Bone Reabsorption

H. The Cytoskeleton

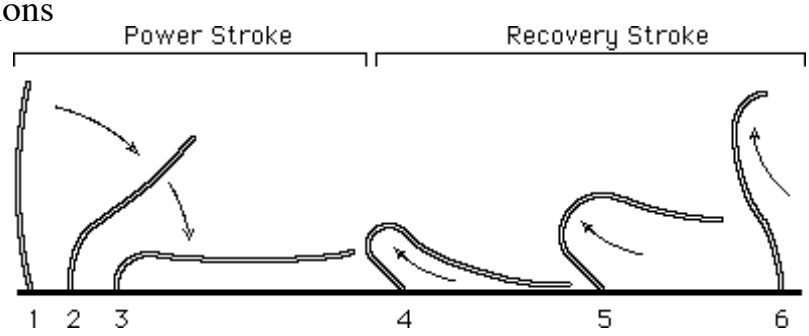
i. Microtubules

a. Functions

I. Flagella and Cilia

i. Flagella

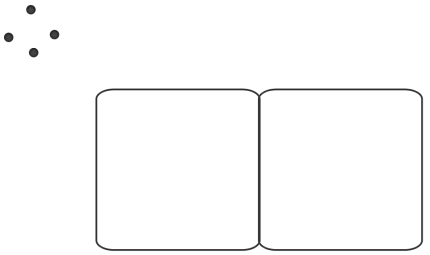
ii. Cilia

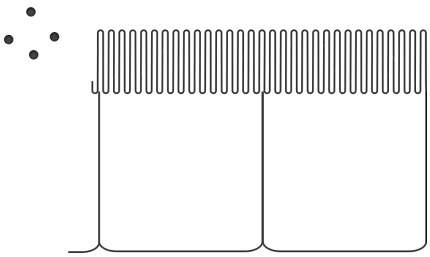


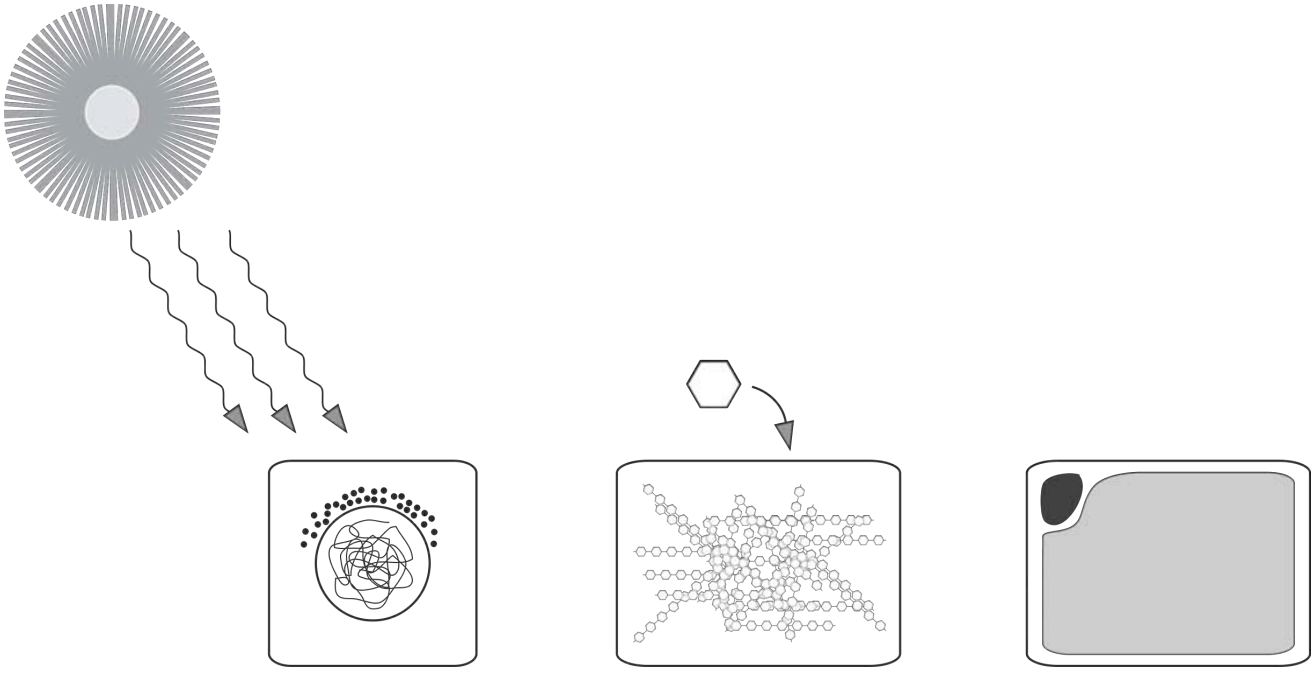
from Marieb

J. Microvilli

a. Function







5. Cell Inclusions
   - A. Melanin
   - B. Glycogen
   - C. Lipids

6. Growth and Developmental Processes
   - A. Cell Division
     - i. Mitosis (see handout on mitosis for details)
     - ii. Cytokinesis
   - B. Apoptosis
     - Necrosis