

I. LEVELS OF ORGANIZATION

- A. Atoms
- B. Molecules
- C. Organelles
- D. Cells - the cell is the smallest functional unit of life and all living things are composed of cells
- E. Tissues - cells of similar structure and function grouped together
 - 1. Epithelial
 - 2. Connective
 - 3. Muscle
 - 4. Nervous
- F. Organs - two or more tissues making up an anatomically distinct structure
- G. Organ Systems - group of organs that work together in a related function
 - 1. Integumentary System
 - 2. Skeletal System
 - 3. Muscular System
 - 4. Nervous System
 - 5. Endocrine System
 - 6. Digestive System
 - 7. Cardiovascular System (includes lymphatic system)
 - 8. Respiratory System
 - 9. Urinary System
 - 10. Reproductive System
- H. Organism

II. THE CELL – “the smallest functional unit of living things”

- A. Cell - Three divisions visible with the light microscope (structure of the 3 divisions determined with electron microscope):
 - 1. Plasma Membrane - bilipid layer (phospholipids) with embedded proteins...
 - a. Basic Structure
 - i. Bilipid Layer (phospholipids)
 - ii. Proteins
 - transport passageways (doorways)
 - receptors
 - enzymes
 - attachment / adhesion
 - recognition
 - iii. Cholesterol
 - iv. Carbohydrates
 - b. Membrane Folds
 - i. microvilli
 - ii. cilia
 - iii. flagella (flagellum)

2. Cytoplasm - fluid contents of the cell that contains the organelles (cellular machinery)

a. Cytosol

b. Organelles (“little organs”)

i. Membrane Bound

- Mitochondria
 - cristae
 - matrix
- Endoplasmic Reticulum
 - smooth endoplasmic reticulum (SER)
 - rough endoplasmic reticulum (RER)
- Golgi Apparatus (aka Golgi body)
- Vesicles
 - transport vesicle
 - lysosome
 - peroxisome

ii. Free (not enclosed by a membrane)

- Ribosomes
- Centrioles
- Cytoskeleton
 - microtubules
 - intermediate filaments
 - microfilaments

3. Nucleus

a. nuclear envelope / nuclear pores

b. nucleoplasm

c. nucleolus

d. chromosomes

- chromatin
- DNA double helix

4. Cell Junctions

a. Desmosomes

b. Gap Junctions

c. Tight Junctions

III. Additional Key Terms

amphipathic
hydrophobic

catalyst
interstitial

cytology
intracellular

enzyme
soluble

extracellular
somatic

hydrophilic