

CELL AND TISSUE -anatomy and physiology-

Simplified Reviewer and Notes

- Peroxisomes convert free radicals to hydrogen peroxide and enzyme catalase convert hydrogen peroxide (H_2O_2) to water (H_2O).
- Peroxisomes are **numerous in liver and kidney cells**, which are very active in detoxification.
- vii. Cytoskeleton: cell's bones and muscles; furnishes internal framework that determines cell shape.
- viii. Centrioles: paired; during cell division, centrioles direct the formation of the mitotic spindle.
 - Some cells have projections called cilia:
 - The ciliated cells of the respiratory system lining move mucus up and away from the lungs.
 - If the projections formed by the centrioles are substantially longer, they are called **flagella**. The **only example** of flagellated cell in the human body is the **sperm**.
 - Notice that cilia propel other substances across a cell's surface, whereas a flagellum propels the cell itself.
- Plasma Membrane/ Cell Membrane: transparent barrier that contains the cell contents and separates them from the surrounding environment.
- It acts as a selective barrier to the movement of substances into and out of the cell.
- The structure of the plasma membrane consists of 2 lipids (fat) layers arranged "tail to tail" in which protein molecules float.
 - "heads" are hydrophilic: water loving
 - "tails" are hydrophobic: water hating
- Plasma membrane is composed of a lipid bilayer containing CHONs, many of w/c are glycoproteins (sugar-proteins).
 - **Glycoproteins determine your blood type!**

- Specialization of plasma membrane:

1. Microvilli: fingerlike projections that increase cell's surface area for absorption so that the process occurs more quickly.
2. Membrane junctions
 - i. Tight junctions: impermeable junctions. E.g. in the small intestine, these junctions prevent digestive enzymes from seeping into the bloodstream.
 - ii. Desmosomes: prevent cells subjected to mechanical stress (such as skin cells) from being pulled apart.
 - iii. Gap junctions: seen in heart and b/n embryonic cells; function mainly to allow communication.

Cell Physiology

- Most cells have the ability to:
 1. Metabolize (use nutrients to build new cell material, break down substances and make ATP)
 2. Digest foods
 3. Dispose of wastes
 4. Reproduce
 5. Grow
 6. Move
 7. Respond to a stimulus (irritability)

Membrane Transport/ Fluid Movement

Solution: is a homogenous mixture of 2 or more components. E.g. air we breathe (a mixture of gases); seawater (a mixture of water and salts); rubbing alcohol (water and alcohol).