Cell Membrane Notes

In 1665, Robert Hooke, an English scientist observed cork under a microscope and noted that it was composed of small units. He called these units cells. Later it was observed that most living things are composed of cells. This led to cell theory. Cell theory is that living things are composed of cells.A theory is a hypothesis that scientific investigations have shown to be true most of the time. A law is a hypothesis that scientific investigations have shown to be true all of the time. All life is composed of cells. The cell is the basic unit of life. Many organisms such as bacteria, amoeba, some algae, and yeast are composed of only a single cell. The single celled organisms are described as being "unicellular." However, most organisms are composed of many cells and are described as being "multicellular." All cells live in a fluid environment. The human body, for example, is about 70% water. To live, cells must be able to obtain material from and release substances into a liquid environment. It is the cell membrane which allows materials to come into a cell, as well as allowing substances to be released from a cell. An important property of the cell membrane is that it is semipermeable. Semipermeable means that the membrane only allows certain things to pass into or out of the cell. Generally, only those materials that need to enter the cell are allowed to enter. Generally, only those materials which need to be released from the cell are allowed to leave the cell.

Cell membranes are composed of two layers of molecules called phospholipid. This phospholipid membrane is composed of combinations of atoms called a phosphate group, and lipids (fats) such as cholesterol. This phospholipid bilayer functions to keep water outside and inside of the cell. However, in the space between the layers, there is no water. The outside parts of the bilayer are described as being hydrophilic (water loving) and the inside parts are described as being hydrophobic (water fearing). Since water is the universal solvent, things can dissolve in water outside and inside the membrane and join with the membrane to enter or leave the cell.

Embedded into the membrane are proteins. Some of these proteins are bonded together to form pores through which certain things can pass into and out of the cell. A mosaic is a work of art composed of bits and pieces of things inlaid into some uniform surface. Since the outside and inside of the cell membrane attract water, and because this surface is inlaid with protein, the model of the cell membrane is often described as being "fluid Mosaic Model."Some substances enter the cell by diffusion. Diffusion is the random movement of particles resulting in their movement from a region of greater concentration to one of lesser concentration. If you have a balloon filled with oxygen and you allow this oxygen to be released in a closed room, the random movements of the oxygen atoms will cause the oxygen to diffuse or spread out and become evenly distributed in the room. Most cell membranes are permeable to oxygen. As blood brings oxygen to cells, through diffusion, oxygen enters the cells. It is also through diffusion that carbon dioxide leaves a cell as a waste product of the sugar which was burned to produce energy. So diffusion is one way that things can enter or leave cells.