Cells

**Discovery of Cells**

Robert Hooke is the British scientist to credit for enabling insight to a world not yet known about till the mid 1660’s. Back then, microscopes were not that strong yet. Hooke looked at a thin slice of cork under his microscope. He was shocked to see what looked like a honeycomb. Hooke recorded his observation by drawing a picture; the cork was made up of many tiny units, which Hooke called cells. Not long after Hooke’s discovery of cells in the cork, originally a business man Anton Van Leeuwenhoek’s had made his own microscope lens. Leeuwenhoek’s microscope ended up being more powerful than any other microscopes of his day. His microscope was actually almost as strong as the modern light microscopes and because of this Leeuwenhoek was able to discover tiny animals, such as rotifers as well as human blood cells. He had even used the plaque from his own teeth to see what he could examine and, come to find out, he saw tiny living things with a single cell that he named animalcules (“tiny animals”). He later became known as father of microbiology.

**What is a Cell?**

A cell is the fundamental unit of life. The cell is the smallest unit of structure and function of all living organisms. Basically, a cell is necessary for life. Not all cells will carry the same characteristics. For example, some cells may have a nucleus with DNA as others do not. Some organisms will contain just one cell, and others will contain more such as hundreds, millions or even trillions.

**Cell Theory**

Two centuries after the discovery of the microscope by Robert Hooke and Anton Van Leeuwenhoek, they had found cells everywhere. Which came to realization, that the biologists in the early part of 19th century, which Hooke and Leeuwenhoek had suggested that all living things were made of cells, but the role of cells as the primary building block of life was not discovered until 1839 when two German scientists, Theodor Schwann and Matthias Jakob Schleiden had suggested that cells were the basic unit of structure and function of all life. Later, in 1858, Rudolf Virchow, who was a German doctor, examined that cells divide to produce more cells. He suggested that all cells emerge from only from other cells. From all of the three scientists had their observation to form the cell theory.

* All organisms are made up of one or more cells
* All the life functions of an organism occur within cells
* All cells come from preexisting cells

**Cell Diversity**

Not all cells have the same shape or have the same function. They actually come in various shapes but just because cells come in diverse shapes, all cells have certain parts in common from human beings to bacteria. These parts include plasma membrane, cytoplasm, ribosomes, and DNA. Certain shapes serve a purpose for where the cells are located. For example the nerve cell has many long extensions because its function is to allow the passing of messages to many other cells all at once. Another example is pollen grains have spikes that help them stick to insects such as bees. Last example is that algae live in water, and their tails help them swim.

**Four Common Parts of a Cell**

1. Plasma Membrane: Also referred to as Cell membrane, is the thin coat of lipid
2. Cytoplasm: Refers to all of the cellular material inside the plasma membrane, other than the nucleus. Yet, the cytoplasm is made up of a watery substance called cytosol.
3. Ribosomes: Are structures in the cytoplasm where proteins are made; sit of protein synthesis.
4. DNA: is a nucleic acid found in cells. It contains the genetic instructions that cells need to make proteins.

**Cell Functions**

As said earlier, cells are the fundamental unit of life which they all are but it’s quite more complex than that. All cells will serve different purposes. For example, there are blood cells, which serve a purpose that is for blood but there are different kinds of bloods cells, red blood cells and white blood cells. Red blood cells are what carry oxygen from the lungs to the tissues. White blood cells are what defend the body against infection and destroy infectious agents and cancer cells by producing antibodies.

**General Structure of Cells**

There are two basic types of cells, prokaryotic cells and eukaryotic cells. Any cell will fall into either category, depending if the characteristics match. When comparing prokaryotic and eukaryotic cells they are distinctly different based on their characteristics. Prokaryotic cells do not have a nucleus but eukaryotic cells do. All cells have a plasma membrane, ribosomes, cytoplasm and DNA.

**Prokaryotic Cells**

Organisms with prokaryotic cells are called prokaryotes. All prokaryotes are single-celled (unicelluar) organisms. Bacteria and Archaea are the only prokaryotes. Prokaryotic cells are usually smaller and simpler than eukaryotic cells. By simpler, meaning they do not have a nucleus or other membrane-bound structures which are called organelles. The DNA, or genetic material, forms a single large circle that coils upon itself. The DNA is located in the main part of the cell, which is just a single circular piece of DNA.

**Eukaryotic Cells**

Organisms with eukaryotic cells are called eukaryotes that include animals, plants, fungi, and protists. Eukaryotes may be single-celled but all multicellular organisms are eukaryotes. Multicellular eukaryotic cells can usually have multiple chromosomes, composed of DNA and proteins. This can also vary from just a few to 100 or more. These chromosomes are enclosed within the nucleus. Eukaryotic cells include other membrane- bound organelles. These organelles allow eukaryotic cells to be more specialized than prokaryotic cells.

**Cell Transport**

Cells are found in all various environments, and these environments are rapidly changing. For example, one-celled organisms, like bacteria can be found on animals, countertops, or in all different types of water. Therefore, cells will need to protect themselves. This is done by the plasma membrane. Also known as cell membrane, which is semipermeable, or selectively permeable, meaning that only some molecules can pass through the membrane. If the cell membrane were not semipermeable, then it would basically be the same as the outside of the cell. This would be a problem as then it would be hopeless for a cell to maintain homeostasis. Homeostasis means maintaining a stable internal environment. For example, consider the regulation of body temperature; normal body temperature is 98.6 degrees F and outside it is cold. Since human bodies maintain homeostasis, the temperature within the body will remain the same and does not drop with the outside temperature.

**Conclusion**

Cells come in all shapes, sizes and variation. Cells are located all throughout the body serving multiple purposes. Two basic cell types are prokaryotes and eukaryotes, will any cell will fall in either category. Prokaryotes are the single celled organisms that can be found in bacteria and archaea. Eukaryotes are multi-cellular that can be found in animals, fungi, plants and Protists. All the topics stated throughout this textbook chapter come together to make sense of cells and why they are shaped a certain way.

References

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