Discovering Cells

Cells are the basic units of structure and function in living things. Most cells are too small to be seen with the naked eye. The invention of the microscope made it possible for people to discover and learn about cells. A microscope is an instrument that makes small objects look larger. Some microscopes do this by using lenses to focus light. A simple light microscope contains only one lens. A light microscope that has more than on lens is called a compound microscope.

One of the first people to observe cells was Robert Hooke. In 1663, Hooke observed the structure of a thin slices of cork using a compound microscope he had built himself. At about the same time, Anton van Leeuwenhoek began to construct microscopes and use them to observe tiny objects. Leeuwenhoek was the first person to see the single-celled organisms that are now called bacteria.

In 1838 Matthias Schleiden concluded that all plants are made up of cells. The next year, Theodor Schwann concluded that all animals are also made up of cells. In 1855 Rudolf Virchow proposed that new cells are formed only from existing cells. The observations and conclusions of Hooke, Leeuwenhoek, Schleiden, Schwann, Virchow, and others led to the development of the cell theory.

Life on planet Earth is incredibly varied. There are thousands of different types of creatures and thousands of different types of plants inhabiting the planet. For all of this variety, however, all living things share at least one common characteristic. All living things are made of cells, which Leeuwenhoek began observing back in 1663.

The cell is often considered to be the “building blocks of life”. In other words, most organisms, where large or small, are built of millions of individual cells. These cells all work together to allow one single animal or plant to survive. Most living things are multi-cellular. This means that they have a great many cells all working together. Some living things, though, are comprised of just one cell. In either case, without cells, nothing would be alive.

In humans and other animals, cells are specialized depending upon where they are located. Skin cells, for example, have special characteristics that allow them to perform the function of skin. Nerve cells, located in the brain and through the body, perform a different function, receiving, transporting and interpreting signals from stimuli. The cells that make up the internal organs of animals each have their own special features that allow them to perform their own special functions.

Like humans and animals, plants have cells too. Plant cells are very similar to animal cells in many ways but, because plants function differently than animals, their cells have many features that animal cells lack. Within plant and animal cells, there are small bodies called organelles. Organelles function in a way that is similar to the organs of an animal. Every single cell in every ingle living thing has its own organelles. Organelles allow cells to breathe, take in food and excrete waste, reproduce, and even think.

The complexity of cells allow animal and plant life to function and are the key to the survival of life on Earth. By understanding cells and how they work, humans can gain a deeper understanding of themselves and can work to ensure that they can live a rich and full life.

\*Adapted from Science Works Media 2012 & Prentice-Hall, Inc. Teaching Resources.

Review Questions

1. Who were the first scientists to discover cells and how was it done?

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1. What is the difference between multi-cellular and single-celled organisms?

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1. Describe some of the functions of organelles.

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1. Using evidence from the article, discuss how nerve cells function.

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1. When referring to cells, what does the term “specialized” mean?

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