

Introduction to the Cell All living organisms are composed of cells. A cell is a small, membrane-bound compartment that contains all the chemicals and molecules that help support an organism's life. An understanding of the structure of cells is one complex life.

of the first steps in comprehending the cellular interactions that direct and produce Cells can be thought of as building blocks of organisms.

Some organisms are composed of a single cell.

Others, like ourselves, are composed of millions of cells that work together to perform the more complex functions that make us different from bacteria. It is difficult to imagine that humans are descendants of a single cell, but this is a common belief in the scientific world. Before we can understand how

Cell Membranes

Cell membranes are very important structures to cells because they function as a barrier between the components of the cell and the outside environment.

The cell membrane is not only responsible for creating a wall between inside and outside the cell, it must also act as a threshold through which select molecules can enter and exit the cell when necessary. The cell membrane is what defines the cell and keeps its components separate from outside cells or organisms.

The cell membrane is composed of a double layer of fat cells called a lipid bilayer in which membrane proteins are embedded. The structure of the lipid bilayer prevents the free passage of most molecules into and out of the cell. We will begin our discussion of the structure of the cell membrane by discussing the structure and properties of the lipid bilayer. We will then go on to discuss the role of membrane bound proteins, and finally, will discuss membrane transport structures.

multiple cells can work together to create complex biological functions, it is necessary to understand what biological functions single cells perform on their own to sustain life.

There are different types of cells with individualized structures. Single-celled organisms have different cell structure from multi-celled organisms and plant cells have different structures from animal cells. These differences reflect differences in the functions that each of these classes of cells is required to perform.

While the focus of this guide will be on the structures that compose complex multi-cellular organisms, we will begin our discussion of cell structure with a structure that is universal to all cells, membranes.

Cell Differences

Thus far we have been describing the structure and function of eukaryotic animal cells. As we have mentioned earlier, there are different classes of cells. In this short section, we will discuss the major cellular differences between prokaryotic and eukaryotic cells, and between animal and plant cells. The diversity among various cells is a result of the varying functions and complexity of those cells.

Because plants convert sunlight into energy rather than obtaining energy by eating food the way we humans do, plant cells require additional structures that can perform this function. While most structures between animal and plant cells are the same, there are a couple of additional structures that perform specific functions in plant cells that are unnecessary in animal cells.

In contrast to eukaryotic cells, prokaryotic cells lack membrane-bound organelles. Such organization is necessary in eukaryotic cells because eukaryotes are often multi-cellular organisms whose cells communicate with the help of specific membrane bound structures.

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Page 1 of 1