

# Types of plants and animal cells



Cells are the basic structure of all living things. All plants and animals have cells. All cells have three main parts, the nucleus, cytoplasm, and membrane. The nucleus is an organelle that is in the center of the cell and acts as the control center of the cell. It contains the DNA of an organism, which “ governs the construction and operation of the cell...” and also holds the “ blueprints” of the cell (Biology, 474). The cytoplasm is the jellylike substance that begins at the cell membrane and continues throughout the cell. It is in the cytoplasm that the organelles, or “ little organs” of the cell, are located. The cell membrane is the outer boundary of the cell that protects the cell from its environment. It also decides which materials can enter or leave the cell, transports certain materials in and out of the cell, and a few other purposes.

While all cells have these three basic components, plant and animal cells vary somewhat in several other ways. Both cells have vacuoles, which are organelles used as storage space for the cell. However, a difference between them is that the vacuoles of a plant cell are much larger, as they need more space to store the food they produce in photosynthesis. A vacuole in a plant cell usually occupies about 30% of the cell. Another difference is that plant cells have a cell wall on the outside of their cell membrane. This cell wall stiffen the plant itself and keeps it erect. One final difference is that plant cells contain chloroplasts, while animal cells do not. Chloroplasts are the organelles in which photosynthesis occurs. Photosynthesis is the process by which a plant makes its own food.

There are many different kinds of plant cells. One of these is the parenchyma cell. The parenchyma cell is a very important cell in a plant. Parenchyma

cells can be found all throughout the plant in different varieties. These varying types of parenchyma cells control factors such as making and storing food, buoyancy in aquatic plants, and even providing protection for certain plants.

To best understand a parenchyma cell, one can look at its basic structure. The cell structure begins with the cell wall. A parenchyma cell's cell wall is very thin and is made up of cellulose. Like other plant cells, parenchyma cells have organelles within their cytoplasm. These organelles include chloroplasts, vacuoles, Golgi complexes, ribosomes, mitochondria, nuclei, nucleoli, and peroxisomes. Chloroplasts, as already discussed, are the organelles in which the plant takes on the process of photosynthesis. Vacuoles, which are extremely large in a plant cell, serve to store reserve food made from photosynthesis. The Golgi complex is a "stack of flattened, membrane-enclosed compartments held together by [the] cell's cytoskeleton" (Biology, 479). The job of this organelle is to receive proteins that are manufactured in another part of the cell, "package" them into a special compartment called a vesicle, and "ship" them to various places in the cell where they are needed. A ribosome is a small "factory" in which proteins are manufactured. They are manufactured themselves inside the nucleolus, the organelle within the nucleus. Ribosomes create protein chains in a certain manner. A molecule containing the "blueprint" of a protein is sent through the center of the ribosome, which then assembles amino acids into a protein chain (Biology, 478). Ribosomes are the most minuscule but abundant organelles in the cell. Mitochondria (plural "mitochondrion") are the organelles that supply the cell with energy. They are known as the "

power plants” of the cell. The way a mitochondrion creates energy for the cell is by oxidizing, or “ burning,” carbohydrates and fats and using them to make ATP. ATP or adenosine triphosphate, in simplest terms, is the energy carrier for the cell. It temporarily stores chemical energy for use of the cell. The nucleus, as stated earlier, is the control center of the cell. It contains all the information of the cell and also holds the “ blueprints” used to create a new cell. The peroxisome is a smaller organelle that is involved in the metabolism of fatty acids and other metabolites (a substance formed in metabolism).

There are many different types of parenchyma cells, and each have different functions. Some of the types of this cell are chlorenchyma, prosenchyma, aerenchyma, vascular, medullary, conjunctive, and armed. All of these different parenchyma cells have specific functions that are essential to the plant.

Chlorenchyma is a type of parenchyma tissue found within the leaves and some other parts of the plant. It contains numerous chloroplasts for taking on the task of photosynthesis. Chlorenchyma is a very important type of cell because it feeds the plant.

A second type of parenchyma cell is prosenchyma. A prosenchyma has a long, tapering end and is found mainly in woody tissues. It is involved in the supporting and conducting of tissue.

A special type of parenchyma that is only found in aquatic plants is aerenchyma. Aerenchyma cells surround very large intercellular spaces that contain air. These air pockets help aquatic plants stay afloat in water. The

empty space also provides a medium through which cells can exchange gases easily.

Parenchyma cells also include the vascular tissue within plants. Vascular parenchyma is responsible for transporting different fluids, called sap collectively, throughout the plant. Vascular tissue composed of two types, xylem and phloem. The xylem has the job of transporting water and other soluble mineral nutrients from the roots to the rest of the plant. Phloem conducts the food made in the leaves of the plant through photosynthesis downward to the storage structures of the plant, such as its roots.

Another kind of parenchyma cell is medullary parenchyma. Medullary parenchyma is used for the storage of food produced by the plant. It is located between the vascular bundles of the stem.

A sixth variety of parenchyma cell is conjunctive. This type of parenchyma is reserved for the storage of water. It is found in the roots of the plant.

Armed parenchyma is involved in the protection of certain plants. Armed parenchyma can be seen in the leaves of some gymnosperms (plants that do not produce fruit), specifically in the epidermis of the leaves. Armed parenchyma cells possess numerous spike-like appendages for defense.