

# Cell & Developmental Biology

## The Plant Cell Functions and its Types

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### DESCRIPTION

Plant cells do include certain organelles, though they differ from those seen in other eukaryotic cells in some ways. The multicellular eukaryotic cells that make up a plant are called plant cells (a group of eukaryotes belonging to the Plantae kingdom, with the ability to synthesis their own food using water, Sunlight, and  $CO_2$ ). They have a distinct nucleus and specific structural organelles since they are known as eukaryotic cells, which allow them to work in an organized way.

The plant cell has a distinct cell wall formed of cellulose elements, plastids that perform out photosynthesis and store carbohydrates in the form of starch, central vacuoles for controlling the cell's turgor pressure, and a nucleus that plays a crucial role in cell division. Plant cells are eukaryotic cells that are found in different plant organisms. Plant cells are available in a variety of forms, but the most notable cells are; Xylem cells, Phloem cells, Meristematic cells, Parenchyma cells, Collenchyma cells, Sclerenchyma Cells, and Epidermal Cells.

#### Parenchyma cells

A basic permanent tissue is known as parenchyma. It makes up a large portion of the ground tissues of plants, where vascular tissues and other tissues are attached. They are made up of undifferentiated, simple living cells that are changed to carry out varied functions, and they are non-vascular.

#### Collenchyma cells

In plants, collenchyma is a living tissue made up of elongated cells with irregular cell walls. Cell walls of collenchyma cells contain significant amounts of cellulose and are polygonal in appearance. These thicker cell walls and the longitudinal interconnecting of the cells give the tissue and its strength.

#### Sclerenchyma cells

Sclerenchyma cells that have reached maturity are often dead cells with significantly enlarged secondary walls that contain lignin. The cells, which are inflexible and non-stretchable, are

generally located in regions of plant bodies that are not actively growing, such as the bark or mature stems. When mature, sclerenchyma tissue, supports the structure of plants, is made up of dead cells with heavily thickened walls that contain lignin and a high concentration of cellulose (60%-80%). Primary and secondary cell walls are present in sclerenchyma cells. Sclerenchyma cells that have reached maturity are often dead cells with significantly enlarged secondary walls that contain lignin. The cells, which are hard and non-stretchable, are typically found in parts of plant bodies that are not actively growing, such as the bark or mature stems.

#### Xylem cells

A plant tissue produces the wood of trees and shrubs and they provide mechanical support by transporting water and mineral salts from the roots to all other parts of the plant. Protoxylem and metaxylem are two types, and both are mainly made up of vessels and tracheid.

#### Phloem cells

The vascular tissue is known as phloem in charge of moving and distributing organic nutrients. The phloem serves as a structural component of the plant body as well as a channel for signalling molecules. Typically, sieve elements, parenchyma, and sclerenchyma make up this tissue.

#### Meristematic cells

Meristematic cells lack or exhibit partial differentiation. They can continue to divide their cells because they are totipotent. Meristematic cell division produces new cells for tissue expansion and differentiation as well as the initiation of new organs, supplying the fundamental framework of the plant body.

#### **Epidermal cells**

Cells that are found in an organism's epidermis are known as epidermal cells. Human skin cells are an example of epidermal cells. Plant leaves contain epidermal layers on both top and bottom of the leaf.

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