

Meristematic Tissue Definition

“Meristematic tissue is the plant tissue that has the ability to divide actively throughout its life.”

What is Meristematic Tissue?

The term meristem was given by Carl Wilhelm von Nägeli. Meristematic tissue contains undifferentiated cells which are the building blocks of the specialized plant structures.

Meristematic tissues contain living cells with varied shapes. They possess a large nucleus devoid of the vacuole. The cells have no intercellular space. The zone where these cells exist is known as meristem.

The cells of the meristematic tissue divide actively to form specialized structures such as buds of leaves and flowers, tips of roots and shoots, etc. These [cells](#) help to increase the length and girth of the plant.

Let us have a detailed look at the characteristics and types of meristematic tissue.

Characteristics of Meristematic Tissue

The characteristics of meristematic tissue are as follows:

1. The cells of these tissues are commonly called meristems.
2. The meristematic tissue has the quality of self-renewal. Every time the cell divides, one cell remains identical to the parent cell and the others form specialized structures.
3. They have very small and few vacuoles.
4. The meristematic tissue are living and thin-walled.
5. The protoplasm of the cells is very dense.
6. The meristematic tissues heal the wounds of an injured plant.
7. The cells of the meristematic tissue are young and immature.
8. They do not store food.
9. They exhibit a very high metabolic activity.
10. They possess a single, large and prominent nucleus.

Types of Meristematic Tissue

The meristematic tissue is of the following types:

Meristematic Tissue On the basis of Origin

Promeristem

- The earliest and youngest meristematic tissue.

- It originates from the embryo.
- The primary meristem arises from the promeristem.
- It is found in the root and the shoot tips.

Primary Meristem

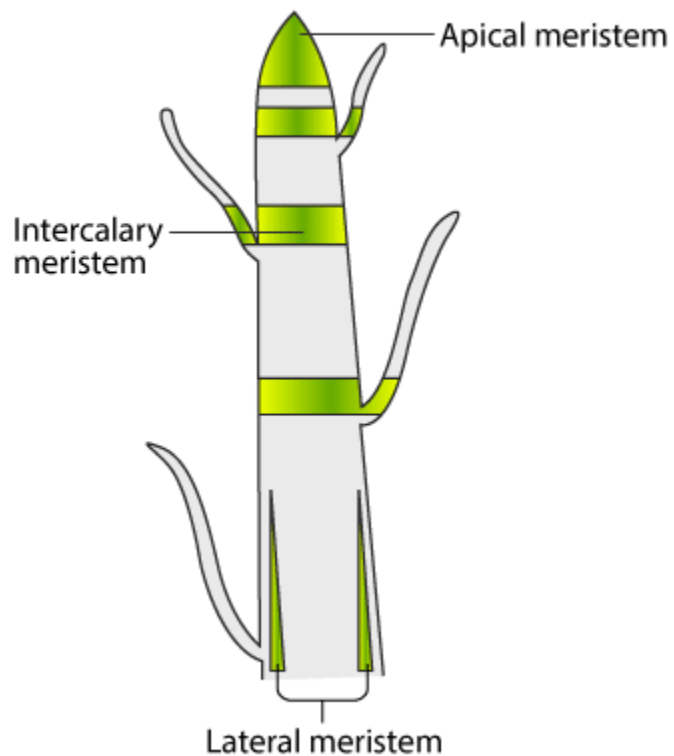
- It arises from the promeristem.
- Cells divide actively.
- It is present below the promeristem and forms the permanent tissue.

Secondary Meristem

- It originates from the primary meristem.
- The permanent tissue forms from the secondary meristem.

Meristematic Tissue On the Basis of Position

MERISTEMATIC TISSUE



Meristematic Tissue – Based on Occurrence

Apical Meristem

- These are present at the tips of the roots and shoots and help in the increase in height of the plants.
- Various cell divisions facilitate the growth of the cells in the roots and shoots. and help in cellular enlargement.
- Apical meristem is divided into-promeristem zone which contains actively dividing cells, and the meristematic zone which contains protoderm, procambium, and ground meristem.

Intercalary Meristem

- It is located in the leaves and internodes at the intercalary position.
- These help to increase the length of the internode.
- It is found in grass, monocots, and pines.
- It is a part of apical meristem and adds to the height of the plant.

Lateral Meristem

- It is located in the stems and roots on the lateral side.
- It increases the thickness of the plant.
- Vascular cambium and cork cambium are the two lateral meristems.
- These divide periclinally or radially and give rise to secondary permanent tissues.

Meristematic Tissue On the Basis of Function

Protoderm

- It is the outermost plant tissue and forms the epidermis.
- It protects the plants from any mechanical shocks.

Procambium

- It is the innermost tissue and gives rise to xylem and phloem.
- It helps in the transport of water and nutrients to different parts of the plant.

Ground Meristem

- The cells are large with thick walls.
- It forms the cortex, pericycle, and pith.

The meristematic tissue is usually found in the apices of the [root systems](#) and the shoots and is in a continuous state of division.