MERISTEMATIC TISSUE

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PLANT ANATOMY(Bio 203)

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Outline

- Introduction
- Classification of meristematic tissue
- meristematic tissue based on origin
- meristematic tissue based on location
- meristematic tissue based on function
- Reference

Learning objectives

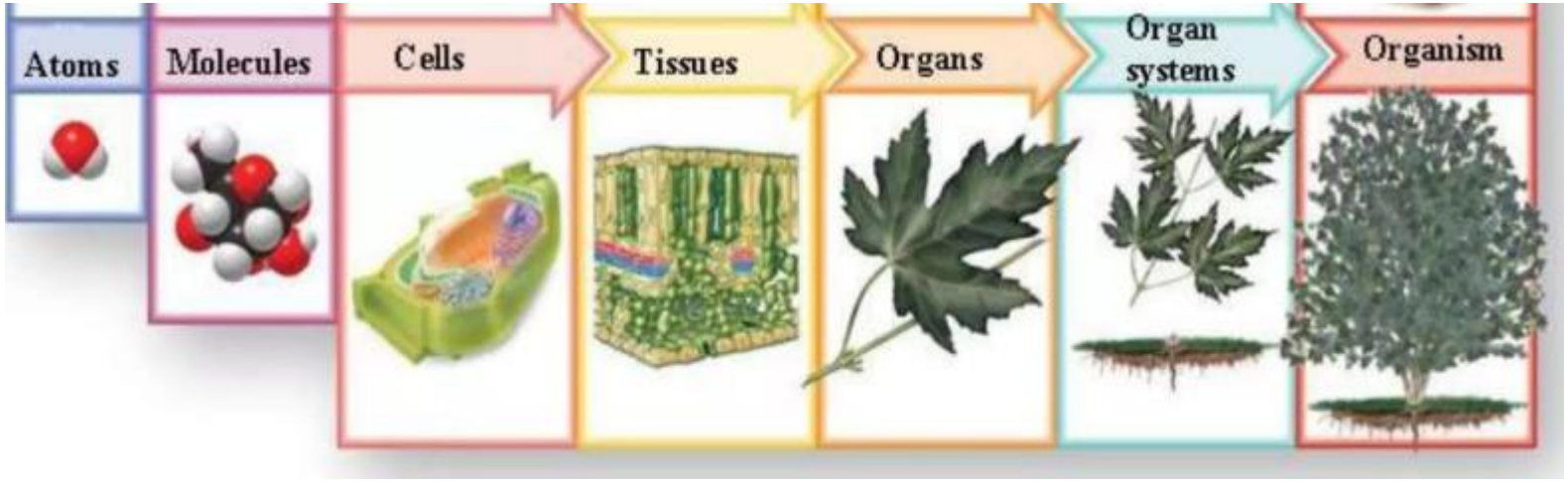
By the end of the class the students will be able to know:

1. Different types of plant tissue
2. Characteristics of Meristematic tissue
3. Classification of Meristematic tissue

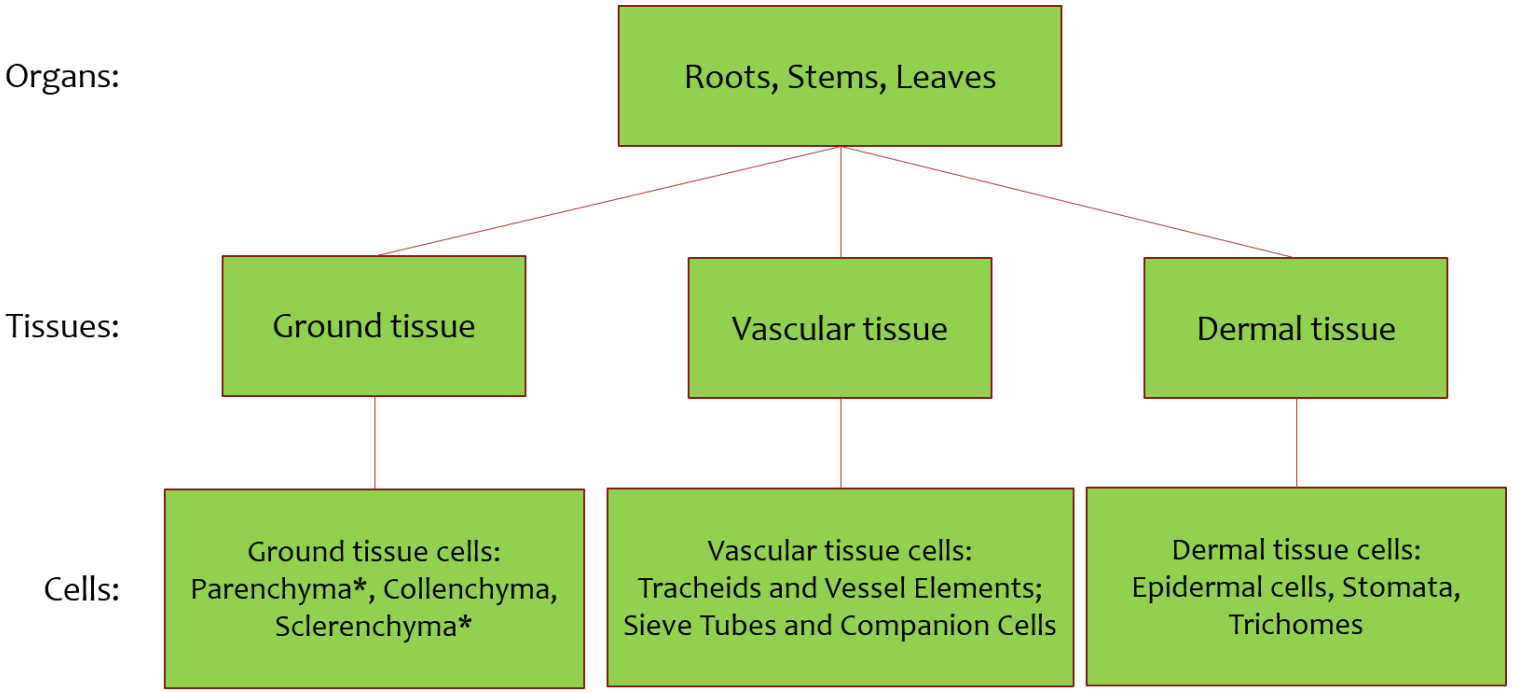
YESTERDAY IS NOT OURS TO RECOVER, BUT NOW IS OURS TO WIN OR TO LOSE

The plant body is made up of various kinds of tissues that can be broadly classified into two main types, i.e., meristematic tissues and permanent tissues.

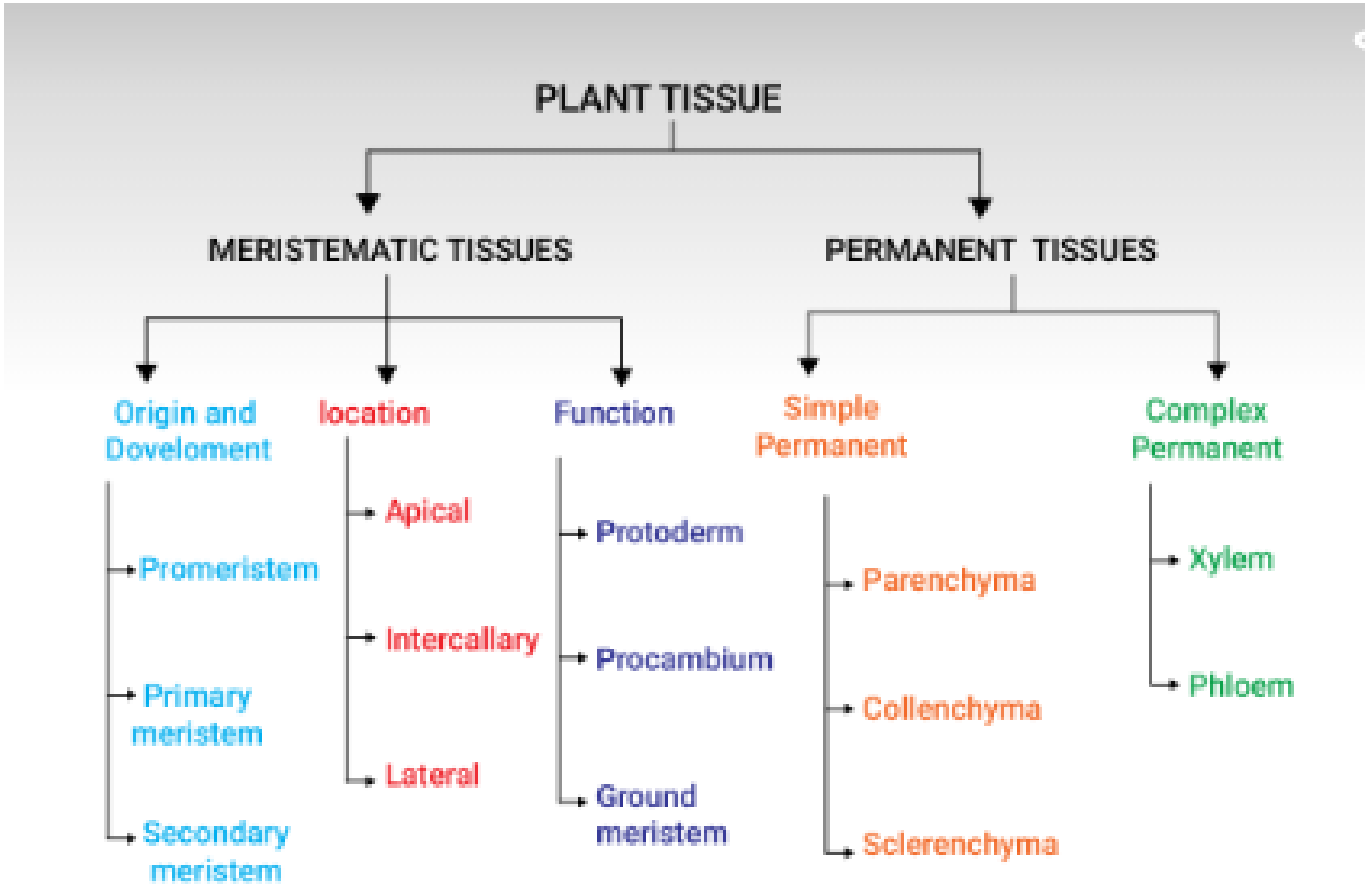
Plants Level of Organization



LEVEL OF ORGANISATION



*Parenchyma and sclerenchyma are also associated with xylem and phloem (vascular tissue)


PLANT TISSUE
MERISTEMATIC TISSUES
PERMANENT TISSUES
Origin and Dovelopment
location
Function
Simple Permanent
Complex Permanent
Promeristem
Primary meristem
Secondary meristem
Apical
Intercallary
Lateral
Protoderm
Procambium
Ground meristem
Parenchyma
Collenchyma
Sclerenchyma
Xylem
Phloem

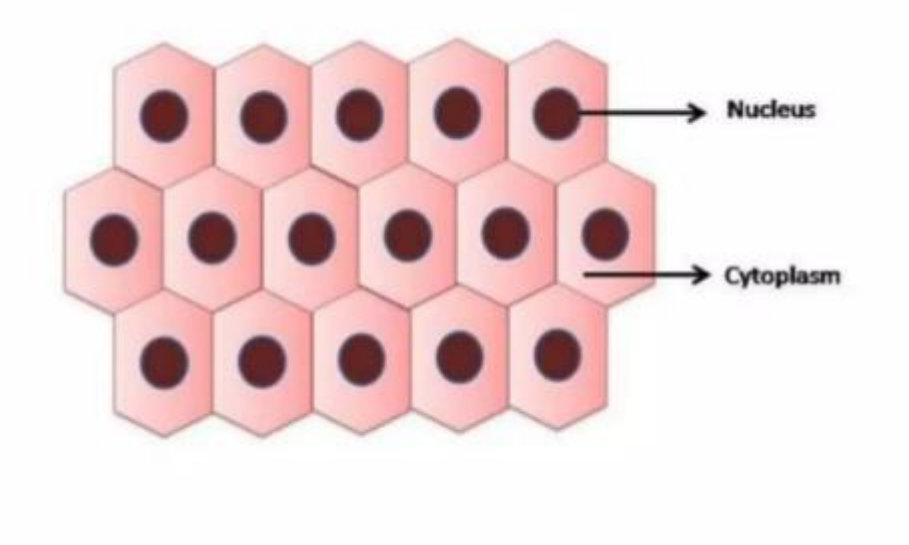
Plants show indefinite growth.

But why does a plant show
indefinite growth?

The word ‘Meristems’ was derived from the Greek word called ‘Meristos’, which means ‘divisible’.

MERISTEMATIC TISSUE

Meristematic tissue contains **undifferentiated cells**, which are the building blocks of the specialized plant structures and give rise to permanent tissues.



Characteristics of Meristematic Tissue

1. Small cells
2. Dense cytoplasm
3. Large nucleus
4. No vacuoles
5. No intracellular space

6. The meristematic tissues heal the wounds of an injured plant.

7. The cells of the meristematic tissue are young and immature.

8. 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 are living and contain an undifferentiated mass of rapidly dividing cells.

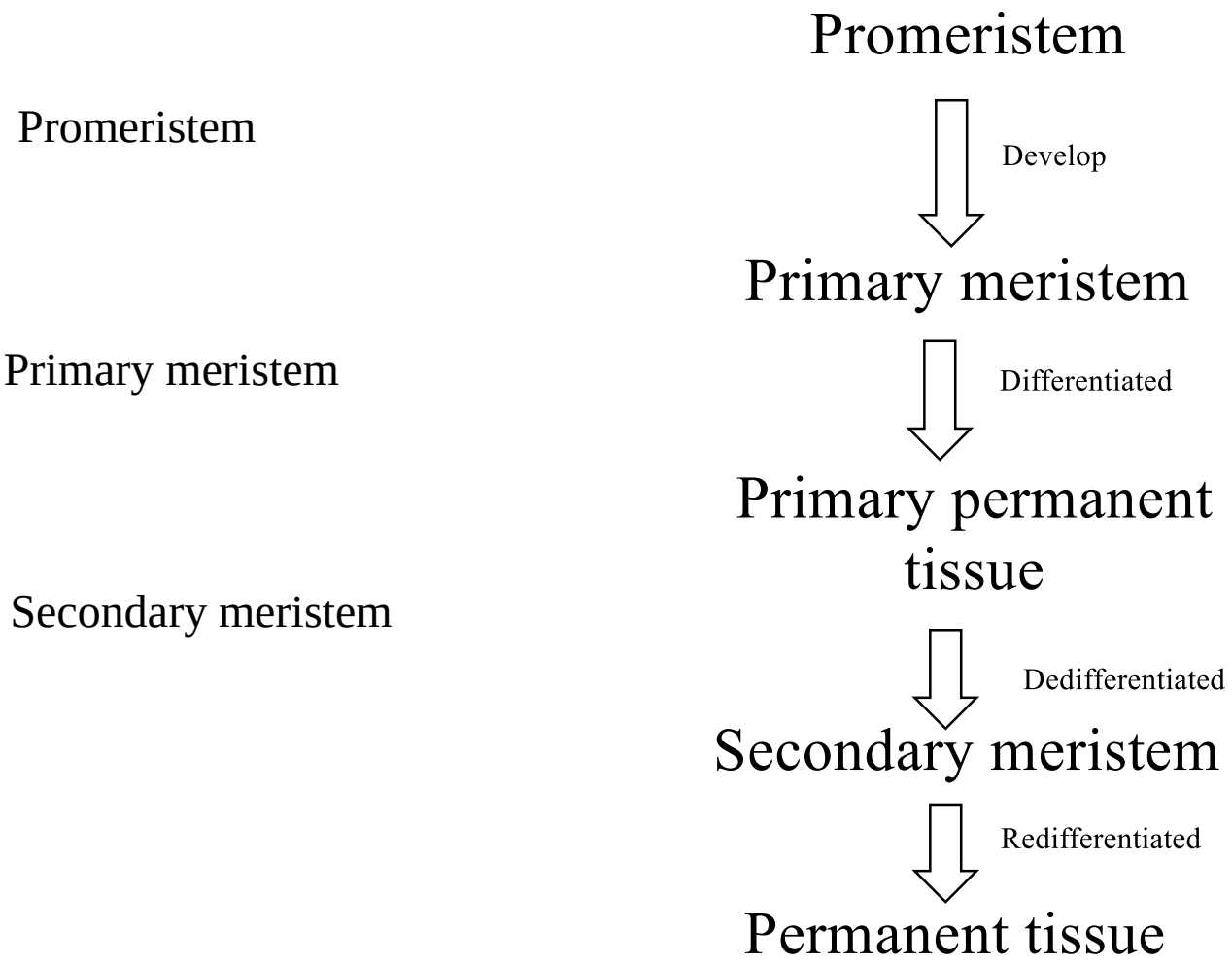
CLASSIFICATION OF MERISTEMATIC TISSUE

Classification Based on Origin

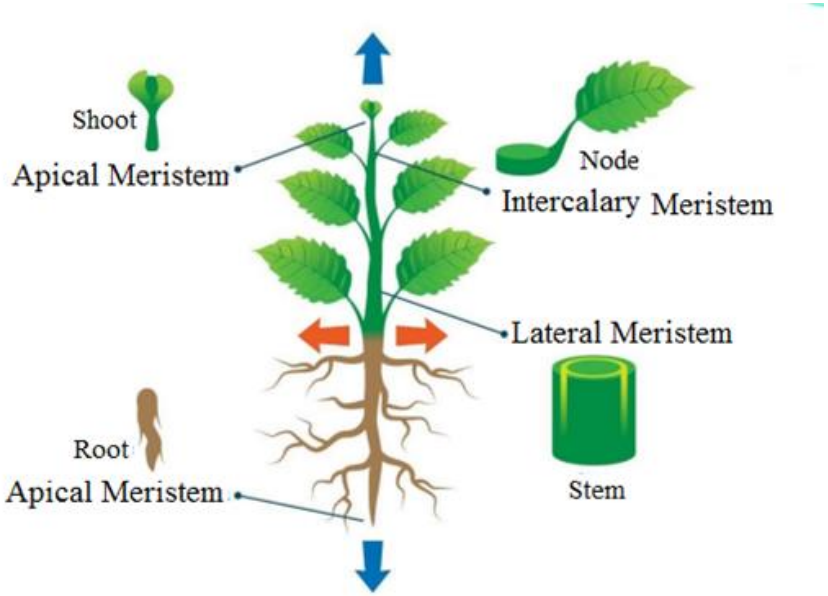
Classification Based on Position

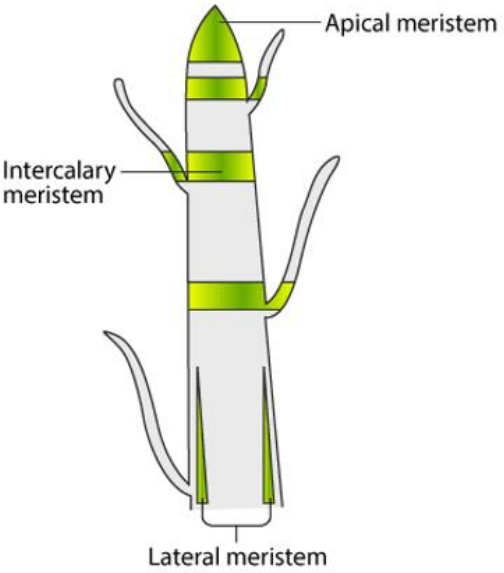
Classification Based on Functions

Classification Based on Origin and Development



Classification Based on Position





APICAL MERISTEM

- ✓ These are present at the tips of the roots and shoots and helps in the increase of the 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

- ✓ At internodes, or stem regions between the places at which leaves attach, and leaf bases.
- ✓ These help to increase the length of the internode.
- ✓ It is a part of apical meristem and adds to the height of the plant

LATERAL MERISTEM

- ✓ Lateral meristems are known as secondary meristems because they are responsible for secondary growth, or increase in stem girth and thickness.
- ✓ It is located in the stems and roots on the lateral side.
- ✓ It increases the thickness of the plant

LATERAL MERISTEM

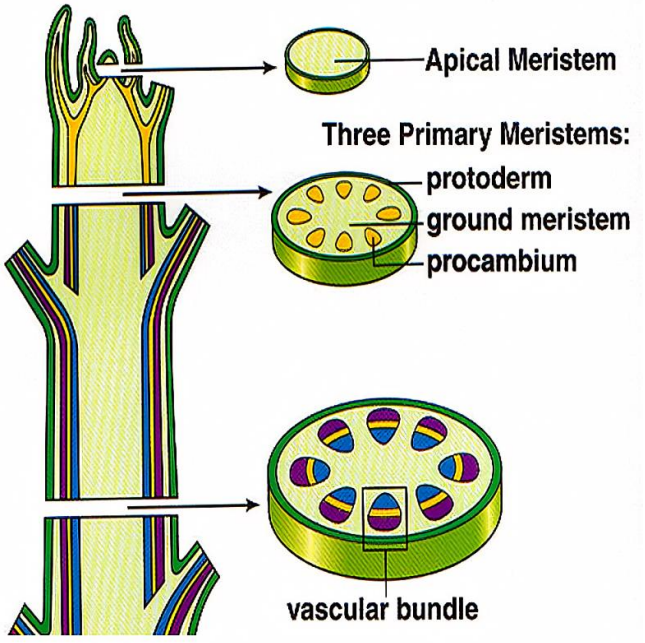
CLASSIFICATION OF MERISTEM BASED ON FUNCTIONS

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 wall. It forms the cortex, pericycle and pith

CLASSIFICATION OF MERISTEM BASED ON FUNCTIONS



Difference BETWEENT Meristematic and Permanent Tissue

S/N	MERISTEMATIC TISSUE	PERMANENT TISSUE
1	Can divide	Loose the power to divide
2	Immature cells	Mature cells
3	Un differentiated	Differentiated
4	Do not store food	Store food
5	Cell wall absent	Cell wall present

Overview

What is meristematic tissue?

List five characteristics of meristematic tissue

Meristematic tissue was introduced by?

Mentioned the three classification of Meristematic tissue

What tissue is responsible for the formation of permanent tissue in plants?

Apical meristem are responsible for what type of growth in plant?

Reference

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