

# PLANT TROPISMS

## WHAT ARE TROPISMS?

- Plants can respond to a stimulus such as light by growing towards it. These are called plant \_\_\_\_\_.
- **Tropisms** may be **positive** (e.g. roots growing towards earth) or **negative** (e.g. shoots growing away from earth).
- Plant coordination is by means of plant **hormones** that are produced in meristematic tissue such as cambium and travel either from cell to cell or in the \_\_\_\_\_ vessels.

<b>PLANT RESPONSE</b>	<b>DESCRIPTION</b>
<b>Phototropism</b>	Growth towards light
<b>Geotropism</b>	Growth of root towards earth's gravity, and growth of shoot away from earth's gravity
<b>Thigmotropism</b>	Response to touch (e.g. closing of leaves of <i>Mimosa pudica</i> , ivy vines that cling to walls, trapping of insect by Venus Flytrap)
<b>Elongation of shoots</b>	Elongation of cells in stems
<b>Abscission of leaves</b>	Falling of leaves particularly in autumn
<b>Photo-periodism</b>	Flowering of many plants stimulated by continuous periods of night

## SOME PLANT HORMONES

### Auxins

- Auxins are hormones produced in the shoot tip called the \_\_\_\_\_. They travel through layers of cells are very concentrated along the dark side of the shoot away from the \_\_\_\_\_. Those cell walls soften and the cells elongate, causing the stem to bend \_\_\_\_\_ the light.
- Auxins are also involved in regulating the growing of plant shoots upwards against the action of gravity. Auxins concentrate on the lower part, causing the plant shoot to grow \_\_\_\_\_.
- Auxins produced in the tips of a plant also affect the lateral or branching growth of a plant. The more auxin that is concentrated in the tip, the shorter are the side-branches. This is known as apical dominance. Gardeners encourage branching and bushiness of plants by snipping the tips of \_\_\_\_\_.

### Cytokinins

- In association with auxins, cytokinins stimulate cell division in plant cells.

### Gibberellins

- Gibberellins promote \_\_\_\_\_ of the entire plant by **elongating all cells** and promoting cell division. They are also responsible for flowering in some plants, enlargement of fruit and seed germination.

### **Abscisic Acid**

- Abscisic acid is responsible for the growth of roots \_\_\_\_\_ the earth.
- Abscisic acid is also responsible for **abscission** which is the dropping of leaves or fruit. Dicotyledons have leaves with both petiole (stalk) and blade. An area of weakness grows across the base of the stalk. Eventually only the veins remain holding the stalk. The \_\_\_\_\_ in the leaves breaks down, leaving the presence of other yellow pigments. The leaves and fruit then \_\_\_\_\_ easily from the tree.

### **Ethylene**

- Ethylene is a gas released by ripening fruits, and stimulates further fruit ripening.
- The production of ethylene is stimulated by auxins and \_\_\_\_\_ acid.

### **Hormones controlling Photoperiodism**

- The time at which a flower forms is controlled by various hormones.
- The **photoperiod** is the number of hours a plant is exposed to light. However, it is the increasing or decreasing number of hours of continuous darkness that stimulates the \_\_\_\_\_ in many plants.
- Examples of flowering plants that flower when continuous darkness is more than 14 hours are \_\_\_\_\_ (Mother's Day flowers), poinsettias and potatoes.
- Examples of flowering plants that flower when continuous darkness is less than 14 hours are clover, beets, corn and gladiolus.
- Carnations, cotton, dandelions, sunflowers and tomatoes are examples of plants that flower all year round.