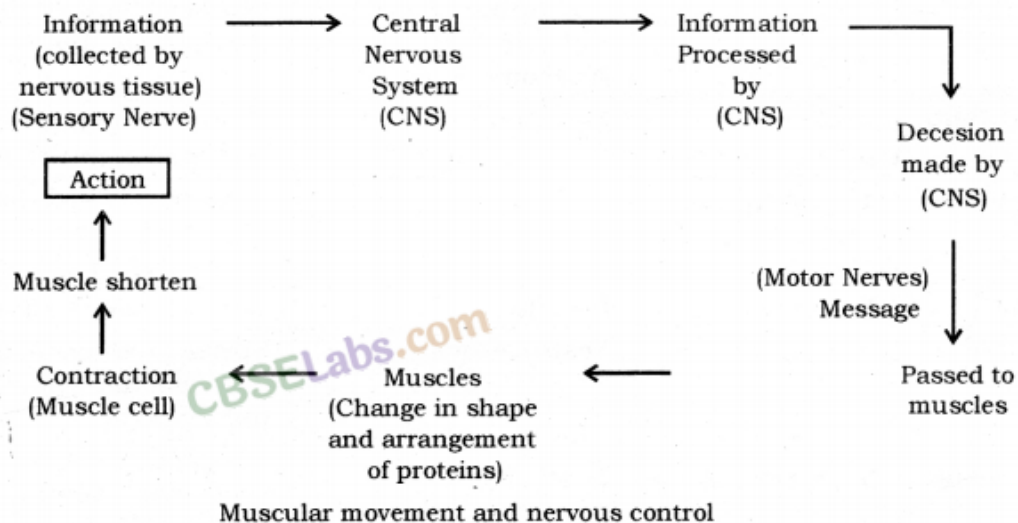


Muscular Movements and Nervous Control:

Muscle tissues have special filaments, called actin and myosin. When a muscle receives a nerve signal, a series of events is triggered in the muscle.

- Calcium ions enter the muscle cells.
- It results in actin and myosin filaments sliding towards each other and that is how a muscle contracts.
- Contraction in a muscle brings movement in the related organ.



Control and Co-ordination in Plants:

Movements in plants and plant hormones.

Co-ordination in Plants: Unlike animals, plants do not have a nervous system. Plants use chemical means for control and co-ordination. Many plant hormones are responsible for various kinds of movements in plants. Movements in plants can be divided into two main types :

- Tropic movement
- Nastic movement

1. Tropic Movement: The movements which are in a particular direction in relation to the stimulus are called tropic movements. Tropic movements happen as a result of growth of a plant part in a particular direction. There are four types of tropic movements.

(i) Geotropic movement: The growth in a plant part in response to the gravity is called geotropic movement. Roots usually show positive geotropic movement, i.e. they grow in the direction of the gravity. Stems usually show negative geotropic movement.

(ii) Phototropic Movement: The growth in a plant part in response to light is called phototropic movement. Stems usually show positive phototropic movement, while roots usually show negative phototropic movement. If a plant is kept in a container in which no sunlight reaches and a hole in the container allows some sunlight; the stem finally grows in the direction of the sunlight. This happens because of a higher rate of cell division in the part of stem which is away from the sunlight. As a result, the stem bends towards the light. The heightened rate of cell division is attained by increased secretion of the plant hormone auxin in the part which is away from sunlight.

(iii) Hydrotropic Movement: When roots grow in the soil, they usually grow towards the nearest source of water. This shows a positive hydrotropic movement.

(iv) Thigmotropism Movement: The growth in a plant part in response to touch is called thigmotropism movement. Such movements are seen in tendrils of climbers. The tendril grows in a way so as it can coil around a support. The differential rate of cell division in different parts of the tendril happens due to action of auxin.

2. Nastic Movement: The movement which does not depend on the direction from the stimulus acts are called nastic movement. For example, when someone touches the leaves of mimosa, the leaves droop. The drooping is independent of the direction from which the leaves are touched. Such movements usually happen because of changing water balance in the cells. When leaves of mimosa are touched, the cells in the leaves lose water and become flaccid, resulting in drooping of leaves.