Phototropism Encyclopedia Article

Phototropism

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Phototropism

The tendency of plants to alter their growth in response to the direction of light shining on them is called phototropism. Generally the above ground shoot portion of plants tends to grow toward the light, exhibiting positive phototropism. This response increases the likelihood that the shoot will reach areas where it can maximize its ability to absorb light and carry out photosynthesis. As a result, the plant can grow more rapidly, and compete more successfully with its neighbors. Under some conditions a plant or a part of the plant such as a root may exhibit negative phototropism by growing away from the light. Phototropism is mediated by a yellow flavin pigment and responds to blue light.

A plant hormone called auxin stimulates the differential growth pattern that results in phototropism. Auxins are produced by cells in the growing tip or apical meristem of the plant and diffuse down through the lower tissues. When light strikes the stem from one side it causes the auxin to concentrate on the opposite side, away from the light. Auxin stimulates these cells to elongate. As a result, the tip bends toward the light. The bending reaction occurs in the zone of elongation, just below the rapidly dividing cells of the apical meristem

Some mobile lower forms of life in algae, protozoa and bacteria may respond to light by actually moving toward or away from it. This phenomenon is called phototaxis.