



Plant Hormones and Tropisms

Although plants lack nervous systems, God has designed them to be able to respond to their environment in many ways. The simplest response to a stimulus occurs when an organism moves either toward or away from a stimulus. This type of response is called a **tropism** [trō'pīz'm]. Movements toward a stimulus are called **positive tropisms** and movements away from a stimulus are called **negative tropisms**.

You may have noticed that a plant left near a window for several days without being turned will often "bend" toward the window. This occurs because the plant senses the window as a source of light and grows toward the light (a process known as **phototropism**). Phototropism is considered a positive tropism.

Plants can also respond to gravity (a process called **geotropism**). Both positive and

negative geotropism often occur in the same plant; the roots grow downward in the direction of the earth's gravitation (positive geotropism) while the stems grow upward, in the opposite direction of the earth's gravitation (negative geotropism). Scientists have discovered that plants sense the direction of gravitational pull by means of special cells in their root caps and stem tips. Other tropisms are usually considered positive, such as **chemotropism**, growing toward chemicals; **hydrotropism**, growing toward water; and **thigmotropism**, growing toward touch.

Many aspects of plant growth and development, including most tropisms, are regulated by internally produced chemical "messengers" called *hormones*. Five basic types of plant hormones are presently known: *auxins*, *cytokinins*, *gibberellins*, *abscisic acid*, and *ethylene*. Very minute amounts of these chemicals can have drastic effects on plant growth.

