



# Plant Physiology: Mechanism and Functions

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### Editorial

Plant physiology may be a sub discipline of botany concerned with the functioning, or physiology, of plants. Closely related fields include plant morphology (structure of plants), plant ecology (interactions with the environment), phyto-chemistry (biochemistry of plants), cell biology, genetics, biophysics and biology. Fundamental processes like photosynthesis, respiration, plant nutrition, phyto-hormone functions, tropisms, nastic movements, photo periodism, photo morphogenesis, circadian rhythms, environmental stress physiology, seed germination, dormancy and stomata function and transpiration, both parts of plant water relations, are studied by plant physiologists.

### Aims

The field of plant physiology includes the study of all the interior activities of plants those chemical and physical processes related to life as they occur in plants. This includes study at many levels of scale of size and time. At the littlest scale are molecular interactions of photosynthesis and internal diffusion of water, minerals, and nutrients. At the most important scale are the processes of plant development, seasonality, dormancy, and reproductive control. Major subdisciplines of plant physiology include phytochemistry (the study of the biochemistry of plants) and phytopathology (the study of disease in plants). The scope of plant physiology as a discipline could also be divided into several major areas of research.

First, the study of phytochemistry (plant chemistry) is included within the domain of plant physiology. To function and survive, plants produce a good array of chemical compounds not found in other organisms. Photosynthesis requires an outsized array of pigments, enzymes, and other compounds to function. Because they can't move, plants must also defend themselves chemically from herbivores, pathogens and competition from other plants. They are doing this by producing toxins and foul-tasting or smelling chemicals. Other

compounds defend plants against disease, permit survival during drought, and prepare plants for dormancy, while other compounds are wont to attract pollinators or herbivores to spread ripe seeds.

Secondly, plant physiology includes the study of biological and chemical processes of individual plant cells. Plant cells have variety of features that distinguish them from cells of animals, and which cause major differences within the way that flowers behaves and responds differently from animal life. For instance, plant cells have a cell membrane which restricts the form of plant cells and thereby limits the pliability and mobility of plants. Plant cells also contain chlorophyll, a compound that interacts with light during a way that permits plants to manufacture their own nutrients instead of consuming other living things as animals do.

Thirdly, plant physiology deals with interactions between cells, tissues, and organs within a plant. Different cells and tissues are physically and chemically specialized to perform different functions. Roots and rhizoids function to anchor the plant and acquire minerals within the soil. Leaves catch light so as to manufacture nutrients. For both of those organs to stay living, minerals that the roots acquire must be transported to the leaves, and therefore the nutrients manufactured within the leaves must be transported to the roots. Plants have developed variety of the way to realize this transport, like plant tissue, and therefore the functioning of the varied modes of transport is studied by plant physiologists.

Fourthly, plant physiologists study the ways in which plants control or regulate internal functions. Like animals, plants produce chemicals called hormones which are produced in one a part of the plant to signal cells in another part of the plant to reply. Many flowering plants bloom at the acceptable time due to light-sensitive compounds that answer the length of the night, a phenomenon referred to as photoperiodism. The ripening of fruit and loss of leaves within the winter are controlled partially by the assembly of the gas ethylene by the plant.

Finally, plant physiology includes the study of plant response to environmental conditions and their variation, a field referred to as environmental physiology. Stress from water loss, changes in air chemistry, or crowding by other plants can cause changes within the way a plant functions. These changes could also be suffering from genetic, chemical, and physical factors.

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