

# Chlorophyll Encyclopedia Article

## Chlorophyll

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# Chlorophyll

Chlorophyll is a green pigment contained in the foliage of plants, giving them their notable coloration. This pigment is responsible for absorbing sunlight required for the production of sugar molecules, and ultimately of all biochemicals, in the plant.

Chlorophyll is found in the thylakoid sacs of the **chloroplast**. The chloroplast is a specialized part of the cell that functions as an organelle. Once the appropriate wavelengths of light are absorbed by the chlorophyll into the thylakoid sacs, the important process of **photosynthesis** is able to begin. In photosynthesis, the chloroplast absorbs light energy, and converts it into the chemical energy of simple sugars.

Vascular plants, which can absorb and conduct moisture and nutrients through specialized systems, have two different types of chlorophyll. The two types of chlorophyll, designated as chlorophyll a and b, differ slightly in chemical makeup and in color. These chlorophyll molecules are associated with specialized proteins that are able to penetrate into or span the membrane of the thylakoid sac.

When a chlorophyll molecule absorbs light energy, it becomes an excited state, which allows the initial chain reaction of photosynthesis to occur. The pigment molecules cluster together in what is called a photosynthetic unit. Several hundred chlorophyll a and chlorophyll b molecules are found in one photosynthetic unit.

A photosynthetic unit absorbs light energy. Red and blue wavelengths of light are absorbed. Green light cannot be absorbed by the chlorophyll and the light is reflected, making the plant appear green. Once the light energy penetrates these pigment molecules, the energy is passed to one chlorophyll molecule, called the reaction center chlorophyll. When this molecule becomes excited, the light reactions of photosynthesis can proceed. With carbon dioxide, water, and the help of specialized **enzymes**, the light energy absorbed creates chemical energy in a form the cell can use to carry on its processes.

In addition to chlorophyll, there are other pigments known as accessory pigments that are able to absorb light where the chlorophyll is unable to. Carotenoids, like B-carotenoid, are also located in the thylakoid membrane. Carotenoids give carrots and some autumn leaves their color. Several different pigments are found in the chloroplasts of algae, **bacteria**, and **diatoms**, coloring them varying shades of red, orange, blue, and violet.