

- Photosynthesis is a process that occurs in the chloroplast of photosynthetic organisms, primarily plants.
- The chloroplast is the main site of the photosynthetic process. Important features of the chloroplast includes the thylakoids where the light-dependent reactions occur and stroma where the Calvin cycle happens.
- The stack of thylakoid comprise a granum, and grana is interconnected by interganal membranes.
- Plants use a variety of pigments that capture radiant energy from the sun to drive photosynthetic reactions. The main pigment used is chlorophyll, usually in forms of chlorophyll a, b and bacteriochlorophyll a (for prokaryotes). Other pigments such as carotenoids, xanthophylls and anthocyanins

ability of chlorophyll to reflect green light, thus leaves of plants appear green most of the time. In contrast to chlorophyll, heme group of hemoglobin contains Iron, thus causing the blood to have a red color.

- Light-dependent reactions occur in the thylakoid membrane, as protein complexes and photosystems facilitate relay of electrons that is acquired from splitting of water towards formation of Oxygen gas.
- Photosystems I absorbs radiant energy at 700 nm while PI absorbs at 680 nm. Nomenclature is related to their date of discovery, while in actual photosynthetic process, PII is responsible for the first excitation event of electrons from water followed by PI.
- The light-independent reactions or Calvin cycle occurs in the stroma and its mechanisms depend on the type of plant wether

that wastes ATP and leads to decline in glucose production. This has been circumvented by C4 and CAM plants through development of mechanism to effectively fix carbon dioxide to sustain the Calvin cycle.

- C4 plants which evolved with two dedicated layers of cells to support capture of CO₂ and sustenance of the Calvin cycle. When CO₂ enters the stomata, it encounters the mesothelioma cells which combines it with Phosphoenolpyruvate (PEP) to form a four-carbon intermediate called oxaloacetate (OA).

- Succulent (water-storing) plants open their stomata at night and close them during daytime. As this may limit their CO₂ intake, such plants undergo fixation of CO₂ with crassulacean acid. CAM plants trap and fix CO₂ in their mesophyllic cells during the night and perform Calvin cycle and carbohydrate production during the day.