ISSN: 2167-7662
Bioenergetics: Open Access

OPEN ACCESS Freely available online

Commentary

Mechanism and Enhancement in Photosynthesis

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DESCRIPTION

The process of producing organic molecules under the influence of light and serving as an energy source for cells is known as photosynthesis. Primary producers such as terrestrial plants, algae, and oxygenic/non oxygenic photosynthetic microorganisms are responsible for it. The two stages of oxygenic photosynthesis are light-dependent reactions that produce NADPH and ATP molecules as a byproduct and use oxygen as a co-product, and light-independent reactions that use NADPH and ATP as the energy source to transform carbon dioxide into organic molecules. Light-absorbing pigments such as carotenoids, bilins, and chlorophylls are needed for processes that depend on light.

Excited pigment molecules, oxygen, manganese, and electron donors with high oxidizing potential are the main causes of photosystem II light sensitivity. By combining the safe dissipation of absorbed light energy, nonradioactive charge recombination, and repair of damaged reaction center complexes, photosystem II can be effectively shielded fromUV rays damage. This enables the safe utilization of light, the extremely energetic substrate of photosynthesis.

Cyanobacteria, a type of prokaryotic cell, and eukaryotic plant cells both engage in oxygenic photosynthesis (*algae* and higher plants). The genetic material required for the reproduction of the photosynthetic machinery is split between the chloroplast and nucleus chromosomes in eukaryotic plant cells, which also contain chloroplasts. For instance, the big protein molecule ribulose 1,5-bisphosphate carboxylase, which is a compound of eight large polypeptide subunits and eight tiny polypeptide subunits, is a carboxylation enzyme. The nucleus contains the gene for the tiny subunits, whereas the chloroplast chromosome contains the gene for the big subunits. Messenger RNA (mRNA), which encodes the instructions for the synthesis of the tiny polypeptides, is produced by transcription of the nuclear gene's DNA. A few extra amino acid residues are added during this synthesis, which takes place on the cytosolic ribosomes, to create a recognition leader on the end of the polypeptide chain.

Mechanism of photosynthesis

In the process of photosynthesis, oxygen is produced from water and reduce carbon compounds, such as carbohydrates, are formed from carbon dioxide through an oxidation-reduction reaction that is sparked by light that is absorbed by chlorophyll or other substances such as phycocyanin. The poor photosynthetic activity of light absorbed by chlorophyll in some red alage may be an indication of a shift in this organisation. Utilization of NADP snd ATP as energy energy source to convert CO_2 into organic molecules.

Rhodopsin-based phototrophy involves in light activated photon pump in plasma memebrane. Significantly from chlorophyll-based photosynthesis in terms of mechanics, it transfer energised electron pigement to transfer proteins. It functions by directly coupling cis-trans isomerization to ion transport across a membrane. Depending on the class of the bacterial or *archaealrhodopsin*, the ions that are pumped as a result of the effect of light can either be H^+ or Cl^- ions. Halorhodopsins and bacteriorhodopsins are the names of the H^+ and Cl^- pumping complexes, respectively. There are currently no known light-driven electron transport processes in these systems.

CONCLUSION

The stability in the high-energy molecules and their use in various cellular activities constitute the last stage of photosynthetic energy storage. Carbon dioxide is reduced to glucose and water is oxidized by using the intermediate reduced chemical NADPH produced by Photosystem 1 and the phosphate bond energy of ATP. The phosphorylated sugars are then exported from the chloroplast in eukaryotic photosynthetic organisms. The chloroplast stroma is the site of the enzyme-catalyzed carbon absorption and reduction reactions.

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Received: 06-Jun-2022, Manuscript No. BEG-22-17504; **Editor assigned:** 09-Jun-2022, PreQC No. BEG-22-17504 (PQ); **Reviewed:** 30-Jun-2022, QC No BEG-22-17504; **Revised:** 08-Jul-2022, Manuscript No. BEG-22-17504 (R); **Published:** 18-Jul-2022, DOI: 10.35841/2167-7662.22.10.173

Citation: Ciofani S (2022) Mechanism and Enhancement in Photosynthesis. J Bio Energetics. 10:173.