

WHAT IS LIGHT REACTION?

- In the intricate choreography of photosynthesis, the light reactions, often dubbed the 'photochemical' phase, stand as the initiators of a cascade of events leading to the creation of high-energy chemical intermediates—ATP and NADPH. This pivotal phase encompasses light absorption, water cleavage, and the liberation of oxygen, all orchestrated by an ensemble of intricate complexes.

Photosynthetic Units and Pigment Systems:

- At the heart of this spectacle are the photosynthetic units, distinguished as Photosystem I (PS-I) and Photosystem II (PS-II). Each unit boasts a reaction center housing a specific chlorophyll a molecule adept at absorbing light energy of extended wavelengths. These centers exhibit a fascinating dance, releasing electrons upon absorbing energy. PS-I's chlorophyll a revels in an absorption peak at 700 nm, earning the moniker P700, while its PS-II counterpart commands attention with an absorption maxima at 680 nm, earning the designation P680.

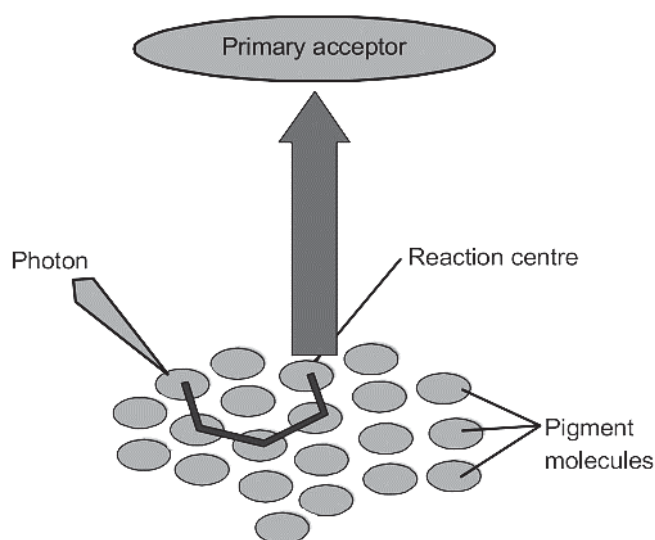
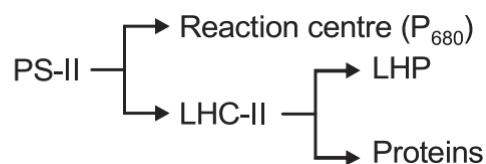
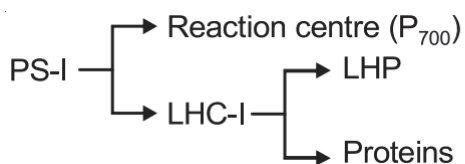


Fig. : The light harvesting complex

- The star-studded reaction centers find themselves encircled by an entourage of light-harvesting pigment (LHP) molecules, also aptly termed antenna molecules. Operating as conduits of luminescence, these antennas absorb photons across diverse wavelengths, channeling this vibrant energy towards the reaction center. These antennas coalesce in the form of specialized complexes known as light-harvesting complexes (LHC), showcasing their prowess as LHC-I and LHC-II. Tethered to proteins, these complexes optimize the efficiency of photosynthesis, transforming it into an artful interplay of light and pigments.



Energizing the Photosynthetic Symphony: Assimilatory Powers Unveiled

- Arnon, the architect of nomenclature, bestowed the term "assimilatory powers" upon ATP and NADPH. The reduction of NADP into the dynamic duo of NADPH + H⁺ finds its representation as the electron transport system (ETS) in photosynthesis. Simultaneously, the birth of ATP from the union of ADP and inorganic phosphate (iP) basks in the luminous embrace of light energy, earning the title of photophosphorylation.
- The intricate ballet of electron flow through ETS finds its counterpart in the rhythmic beats of photophosphorylation. Together, they harmonize in the light reaction, orchestrating a symphony of energy transformation that lays the foundation for the grand finale of photosynthesis.