

> Some accessory pigments present in the thylakoids assist in photosynthetic light-harvest.

> The accessory pigments includes various carotenoids which may be yellow, red or purple.

> The most important pigment ones are red coloured  $\beta$  carotene which is precursor of vitamin A in animals.

> The carotenoid pigments absorb light at wavelengths other than those absorbed by the chlorophylls. Thus these are supplementary light harvesters.

## Light Reactions of Photosynthesis =

### Absorption of Light =

> Light absorption and utilization is the primary requirement of photosynthesis.

> The physical aspects light stated by Planck that the size of quantum of energy is directly proportional to the frequency of

radiation.

> The energy of light quanta or photons will depend upon the frequency or wavelength of radiation.

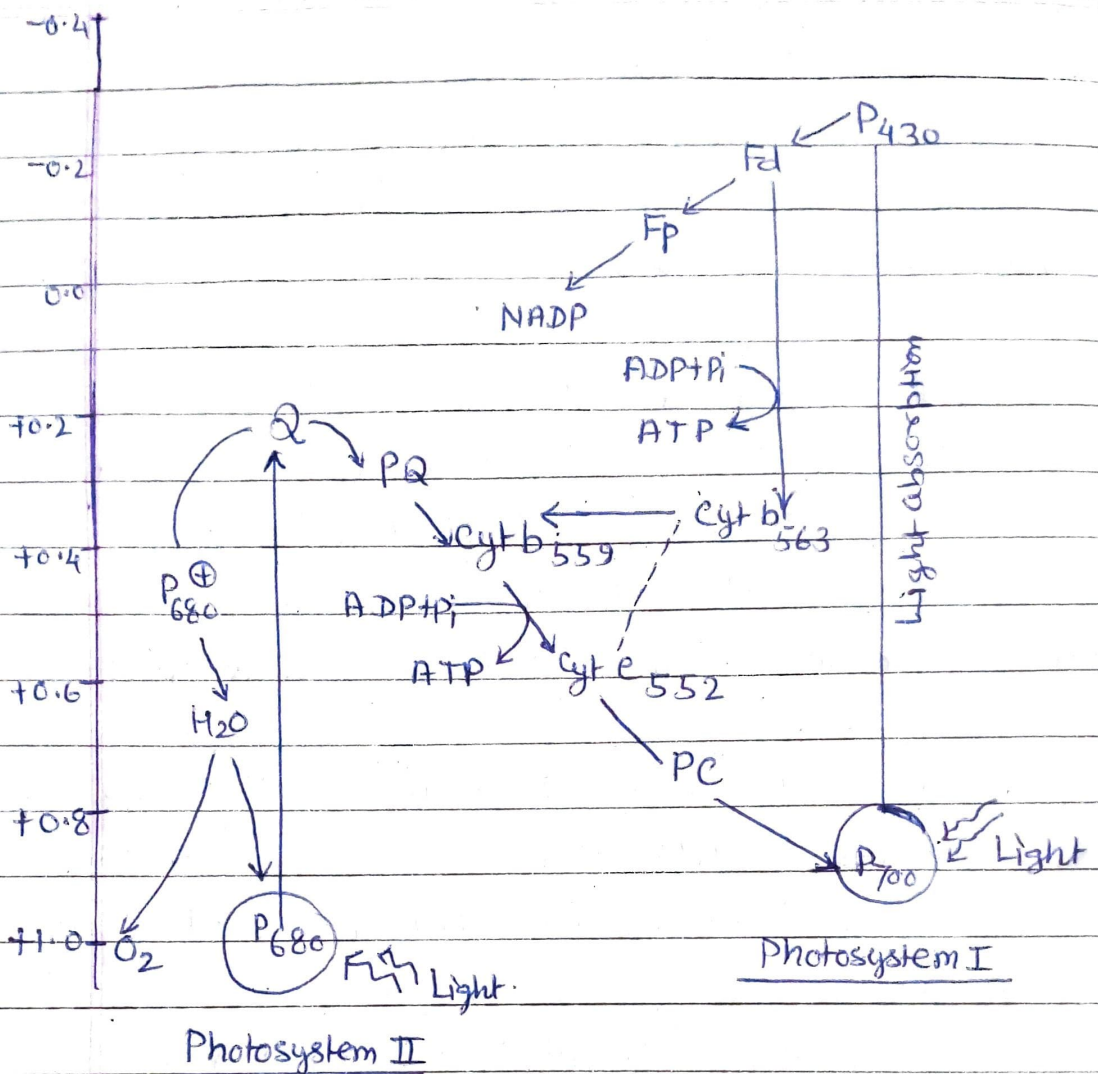
> Blue light which has higher frequency than the red light will have more energy in photon than the red light but blue light is no more effective than the less energetic red light in promoting the light reaction of photosynthesis.

This is because the chlorophyll molecules undergo differential changes in ~~their~~ their energy states in blue and red light.

When visible light photon strikes a chlorophyll molecule, it releases an electron of chlorophyll in an outer molecular orbital. This stage is called excited state of chlorophyll molecule.

There are at least four states of excited chlorophyll molecule: first singlet state, first triplet state, second singlet state and second triplet state.

The conversion of light energy into chemical energy takes place in specialized photosystems which consist of 200-300 chlorophyll molecules and about 50 carotenoid molecules.



### Electron transport in Light reaction of Photosynthesis.

Each photosystem have a reaction center who get excited to receive radiant energy from other neighbour chlorophyll ~~etc~~ molecules.

There are two group of pigments - Photosystem I (P<sub>700</sub>) and photosystem II (P<sub>680</sub>) which absorb longer and shorter wavelengths respectively.