

Bacterial Photosynthesis

- **Photosynthesis by *Cyanobacteria***
- **Photosynthesis by Green Bacteria**
- **Photosynthesis by Purple Bacteria**

Photosynthetic pigments in cyanobacteria

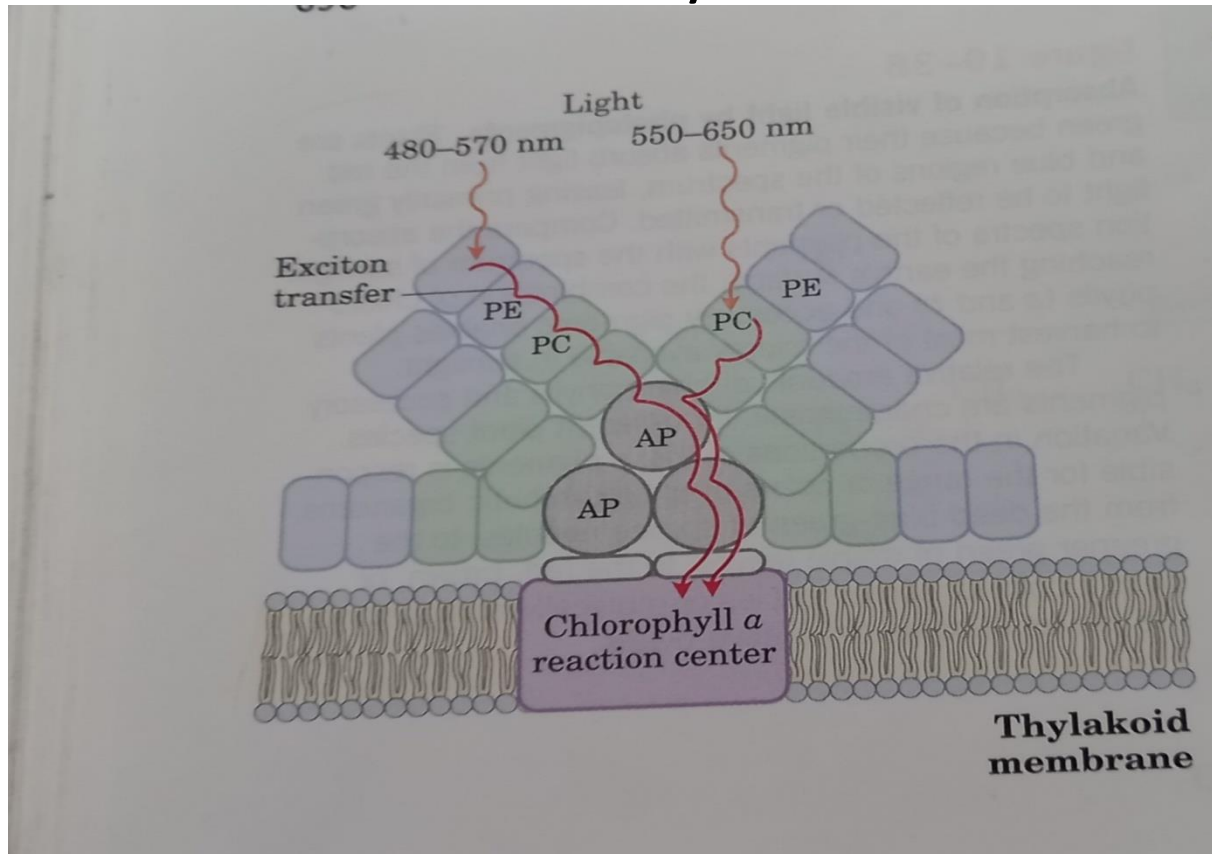
- Major Pigment: Chlorophyll
- Minor Pigments: phycoerythrin, Phycocyanin

Electron donor in photosynthesis

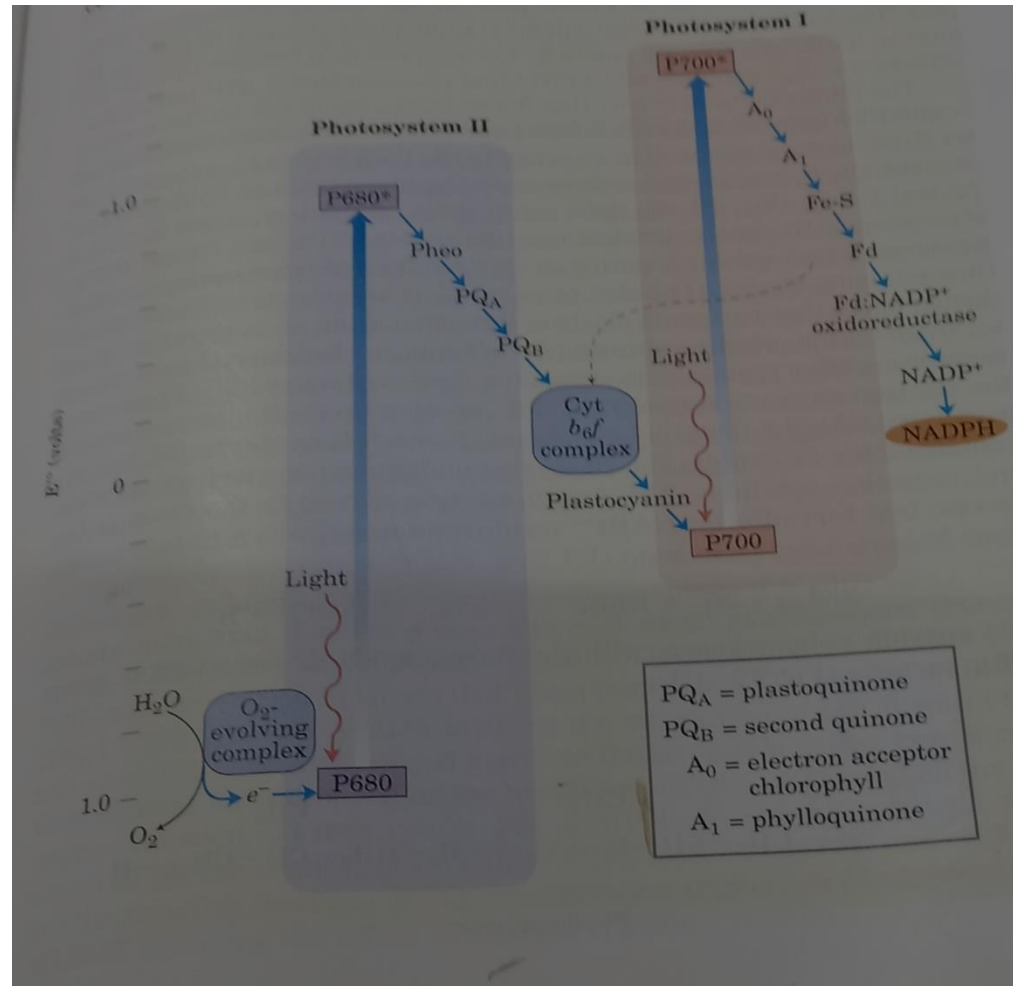
- Cyanobacteria: Water Molecule
- Green sulfur and non sulfur bacteria:
Hydrogen, Hydrogen Sulphide, Amino Acid,
Organic molecule.
- Purple sulfur and purple non sulphur bacteria:
- Hydrogen, Hydrogen Sulphide, Organic
Molecule.

Photosynthesis by Cyanobacteria

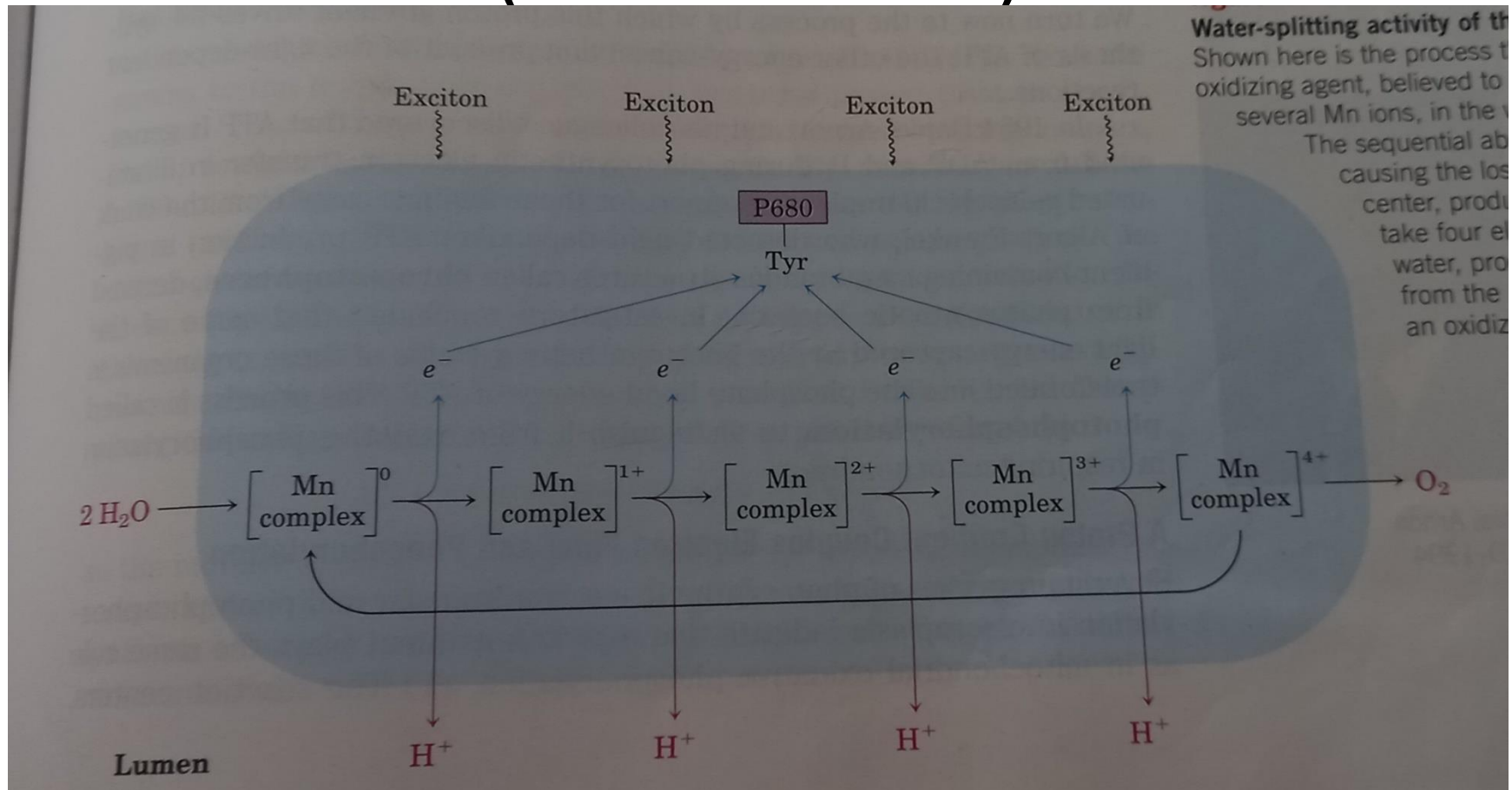
Location of light phase reaction in cyanobacteria is Phycobilisome



Light Reaction of photosynthesis (Z-scheme reaction)

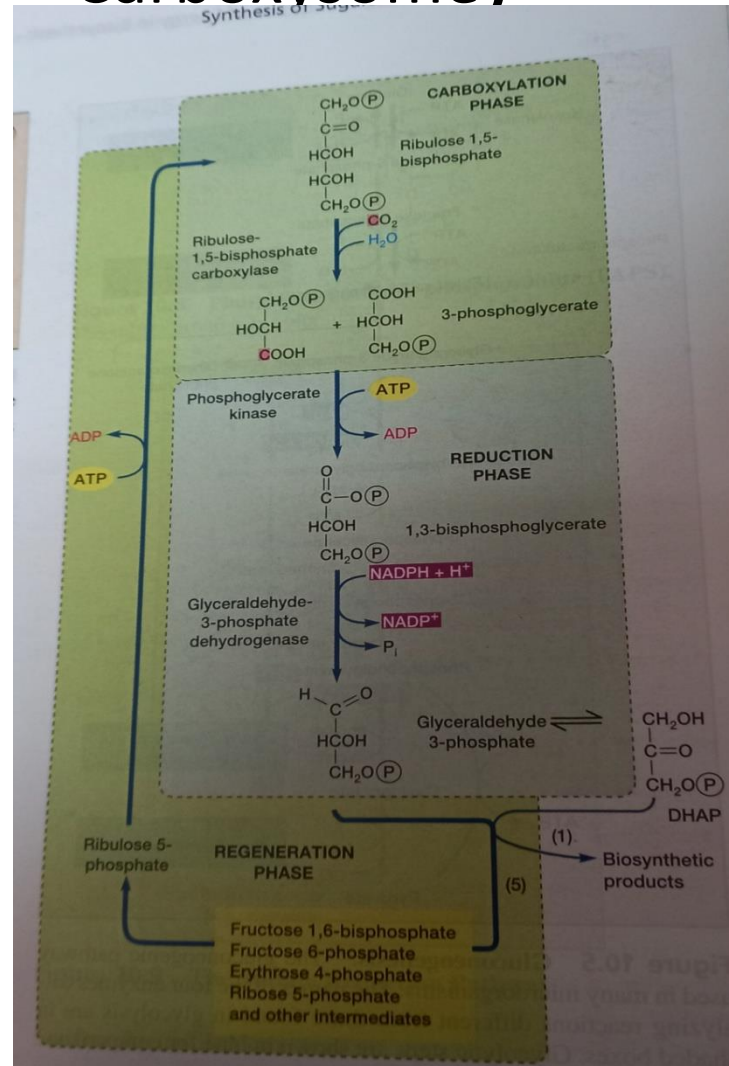


Role of Oxygen evolving complex (OEC) in light reaction of Cyanobacteria (Detailed Reaction)



Dark reaction of cyanobacteria

(Calvin cycle or Calvin-Benson Cycle, Location is Carboxysome)



Photosynthetic Pigments

(in Green bacteria and purple bacteria)

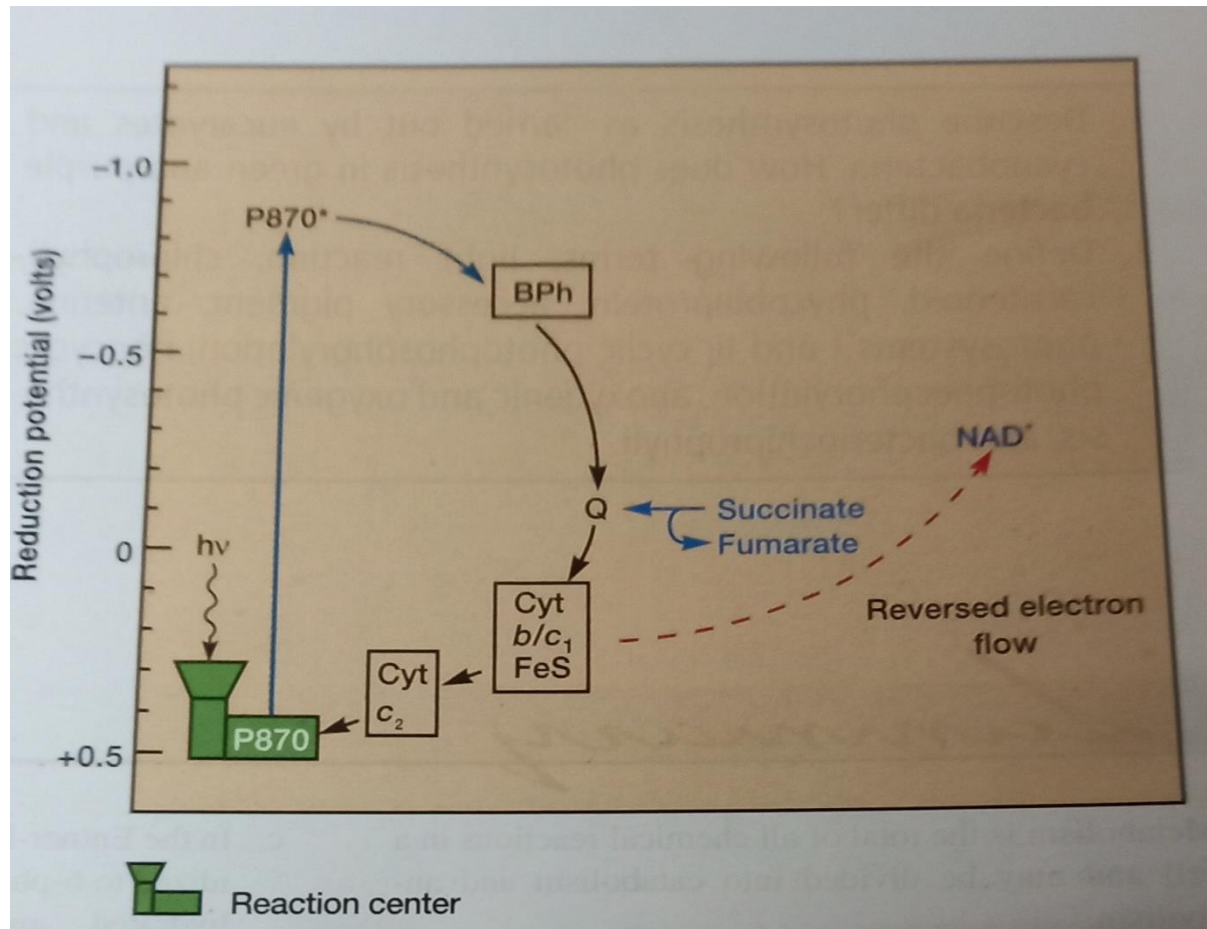
Table 21.2

Procaryotic Bacteriochlorophyll and Chlorophyll Absorption Maxima

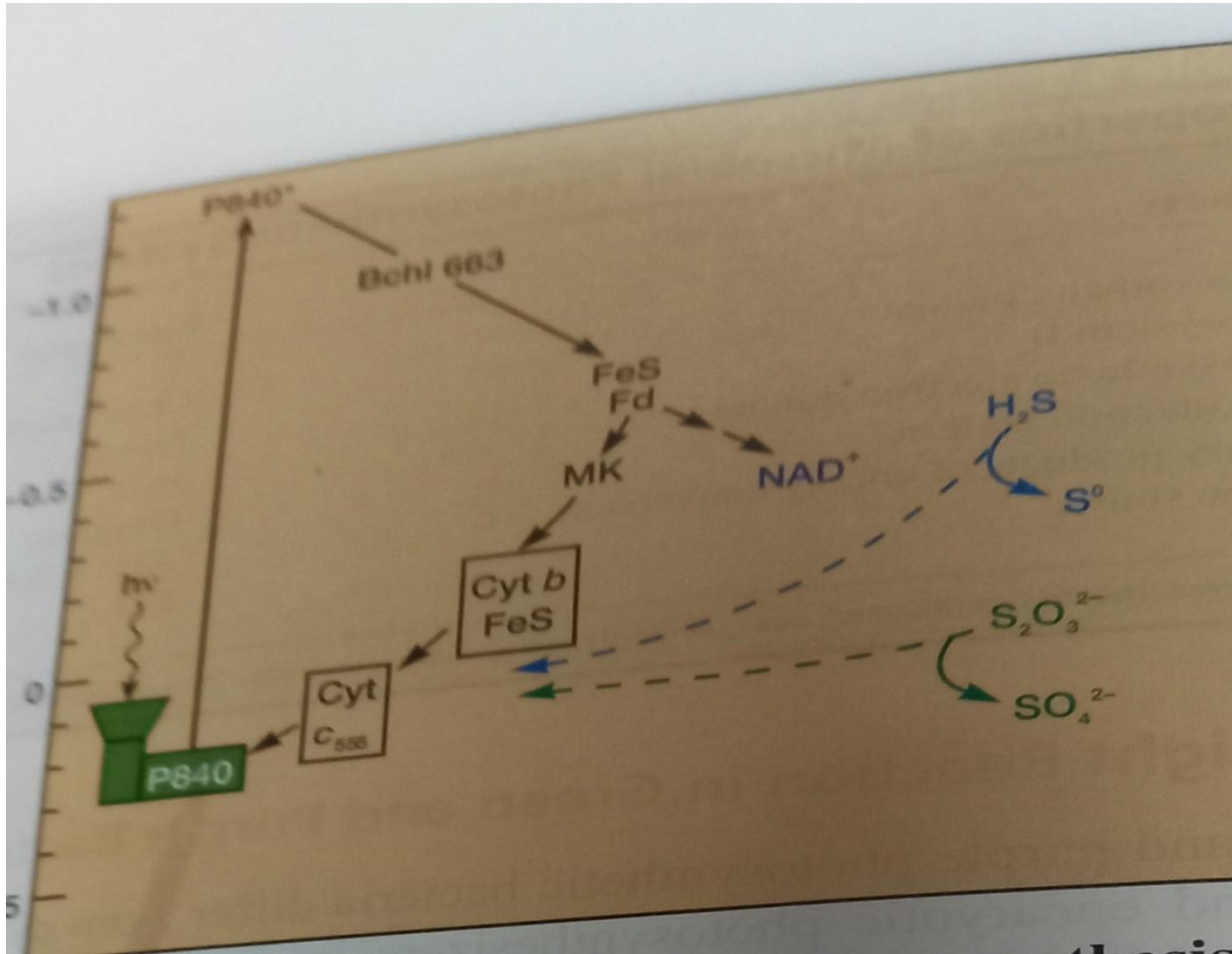
Pigment	Long Wavelength Maxima (nm)	
	In Ether or Acetone	Approximate Range of Values in Cells
Chlorophyll <i>a</i>	665	680–685
Bacteriochlorophyll <i>a</i>	775	850–910 (purple bacteria) ^a
Bacteriochlorophyll <i>b</i>	790	1,020–1,035
Bacteriochlorophyll <i>c</i>	660	745–760
Bacteriochlorophyll <i>d</i>	650	725–745
Bacteriochlorophyll <i>e</i>	647	715–725

^aThe spectrum of bacteriochlorophyll *a* in green bacteria has a different maximum, 805–810 nm.

Light reaction in Purple sulfur bacteria



Light reaction in Green sulphur bacteria



Few questions

- Compare photosynthesis between cyanobacteria and green bacteria and purple bacteria.
- Compare oxidative phosphorylation and photophosphorylation.
- Define photosystem.
- Mention the composition of oxygen evolving complex.
- Define antenna molecule.
- Explain Z scheme reaction in light reaction of photosynthesis of cyanobacteria.