



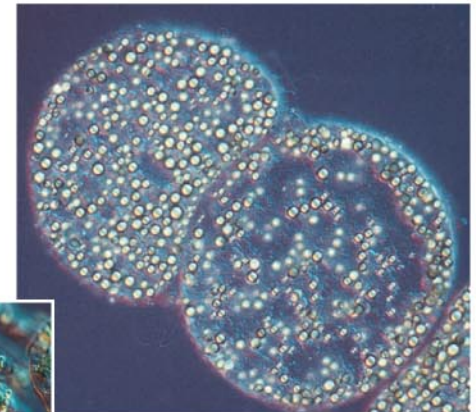
**(a) Plants**



**(b) Multicellular alga**



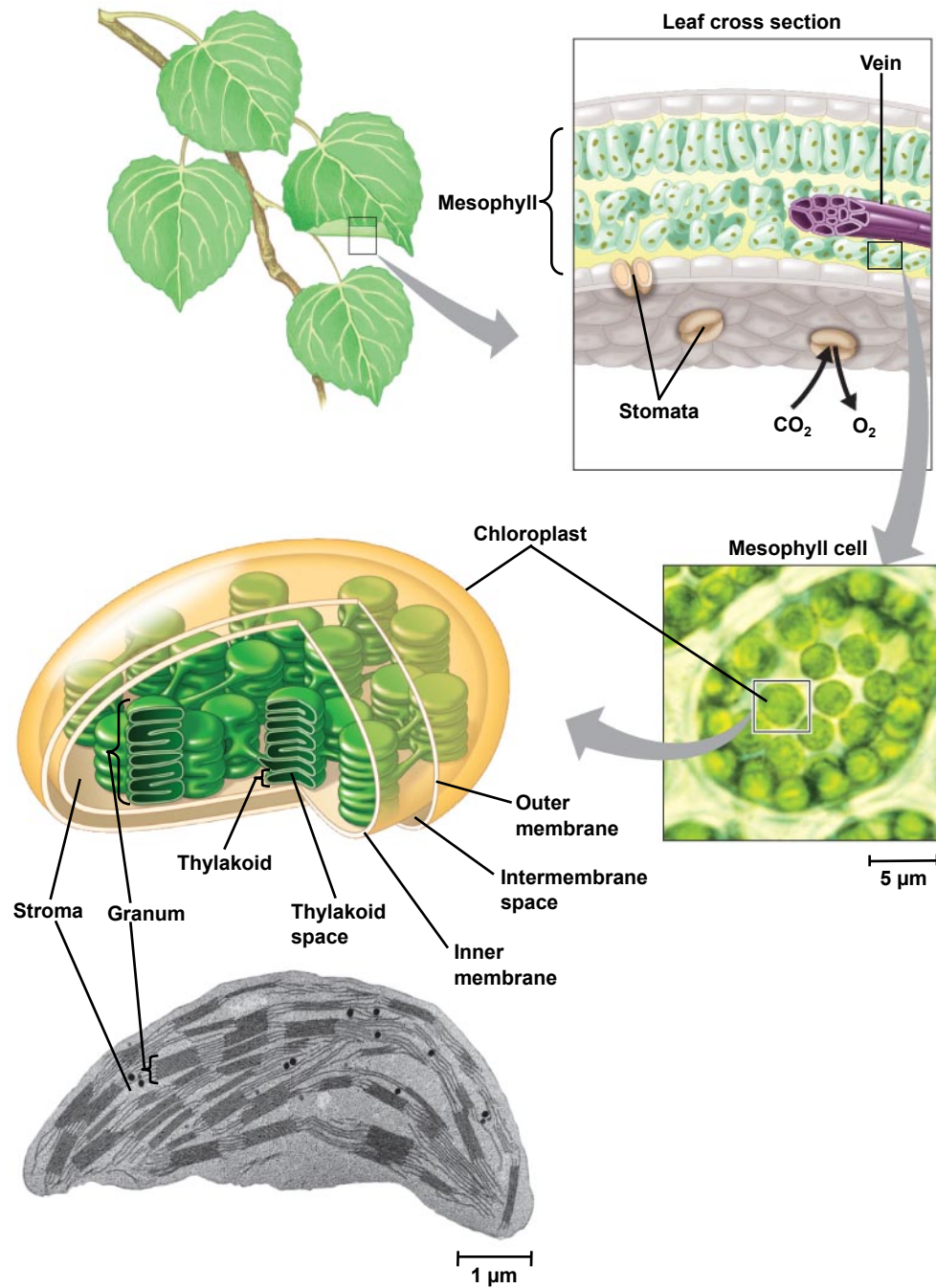
**(c) Unicellular protist**  $10\ \mu\text{m}$



**(e) Purple sulfur bacteria**  $1.5\ \mu\text{m}$



**(d) Cyanobacteria**  $40\ \mu\text{m}$



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**Reactants:**

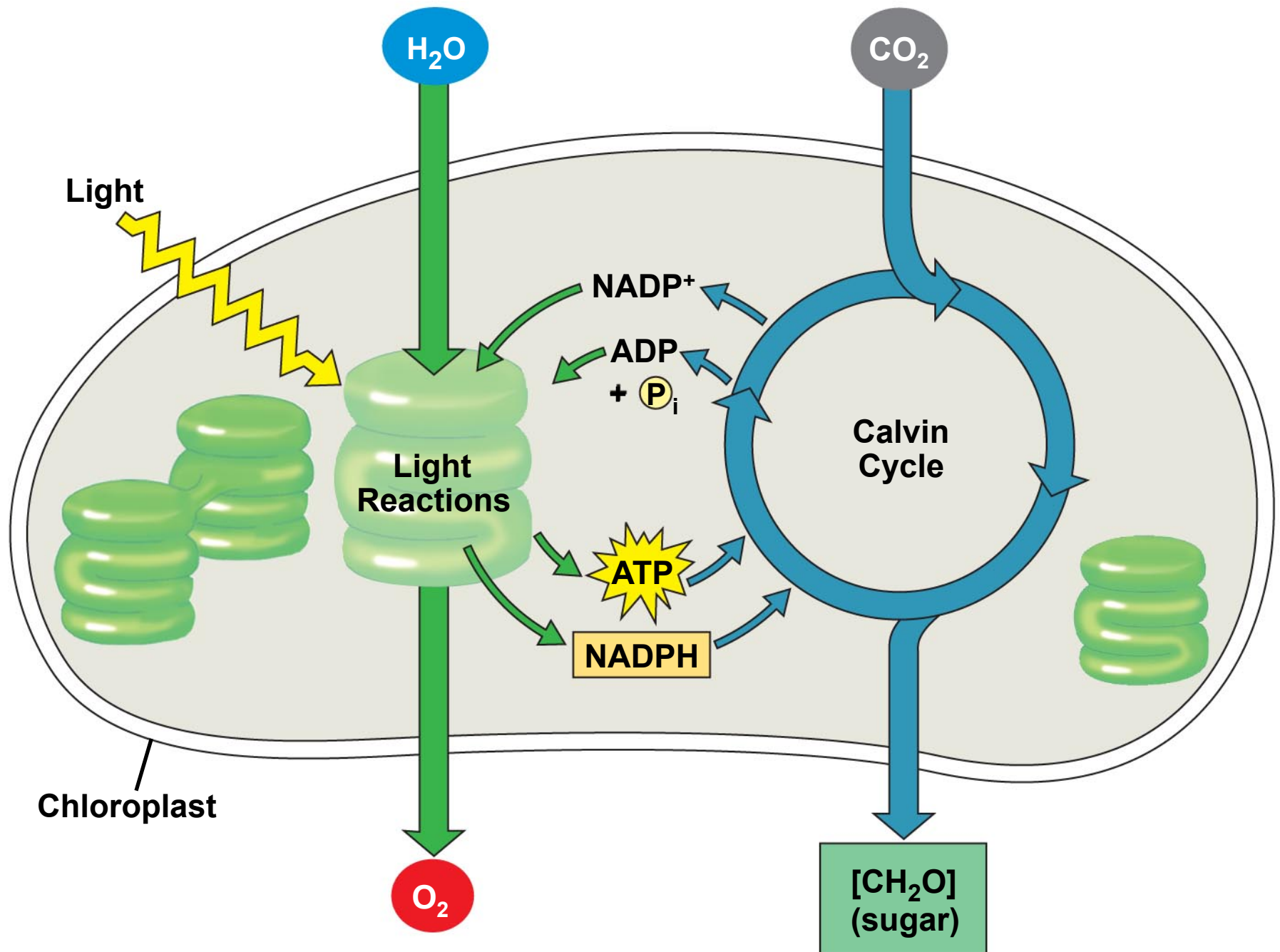


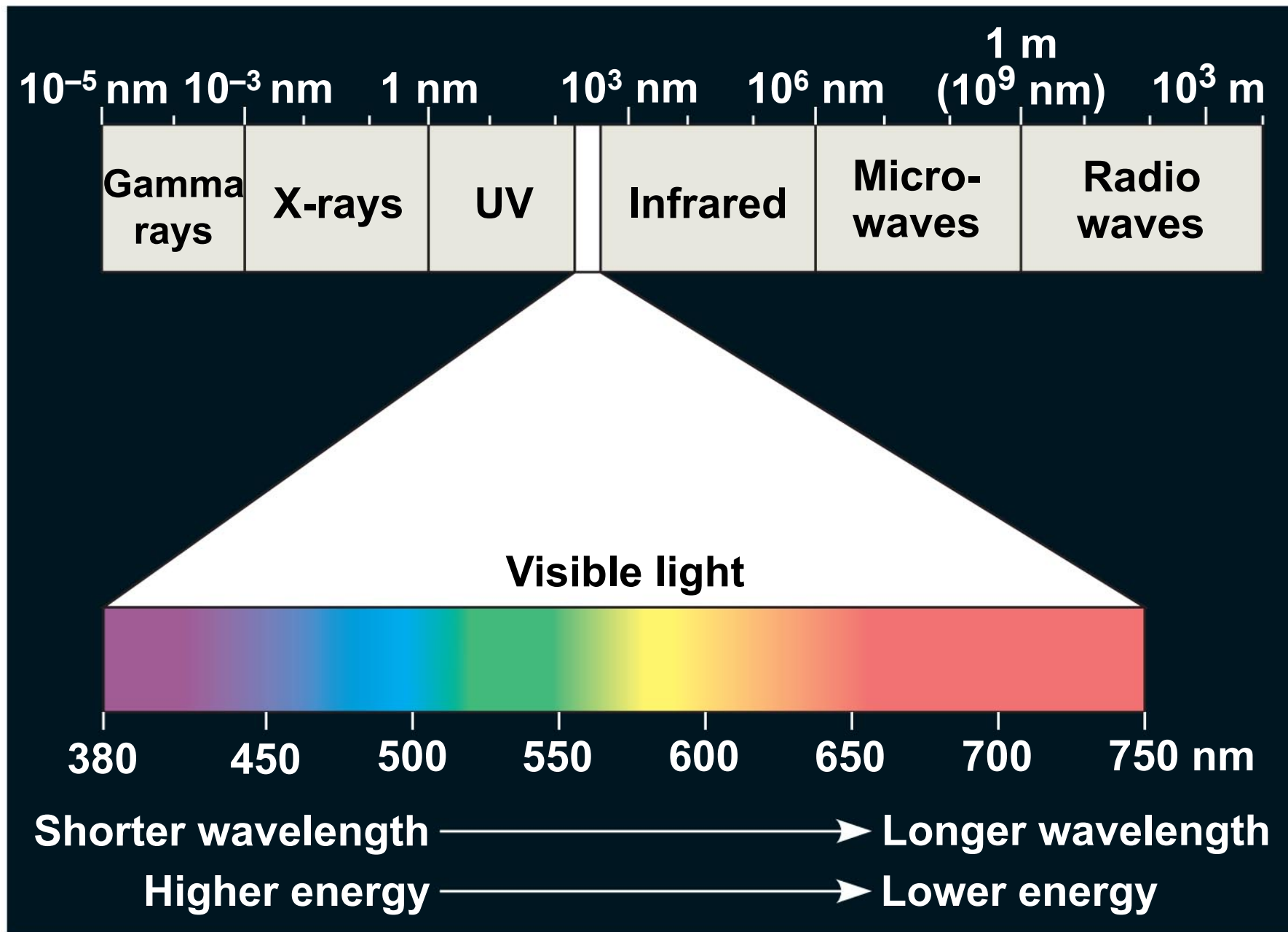
**Products:**



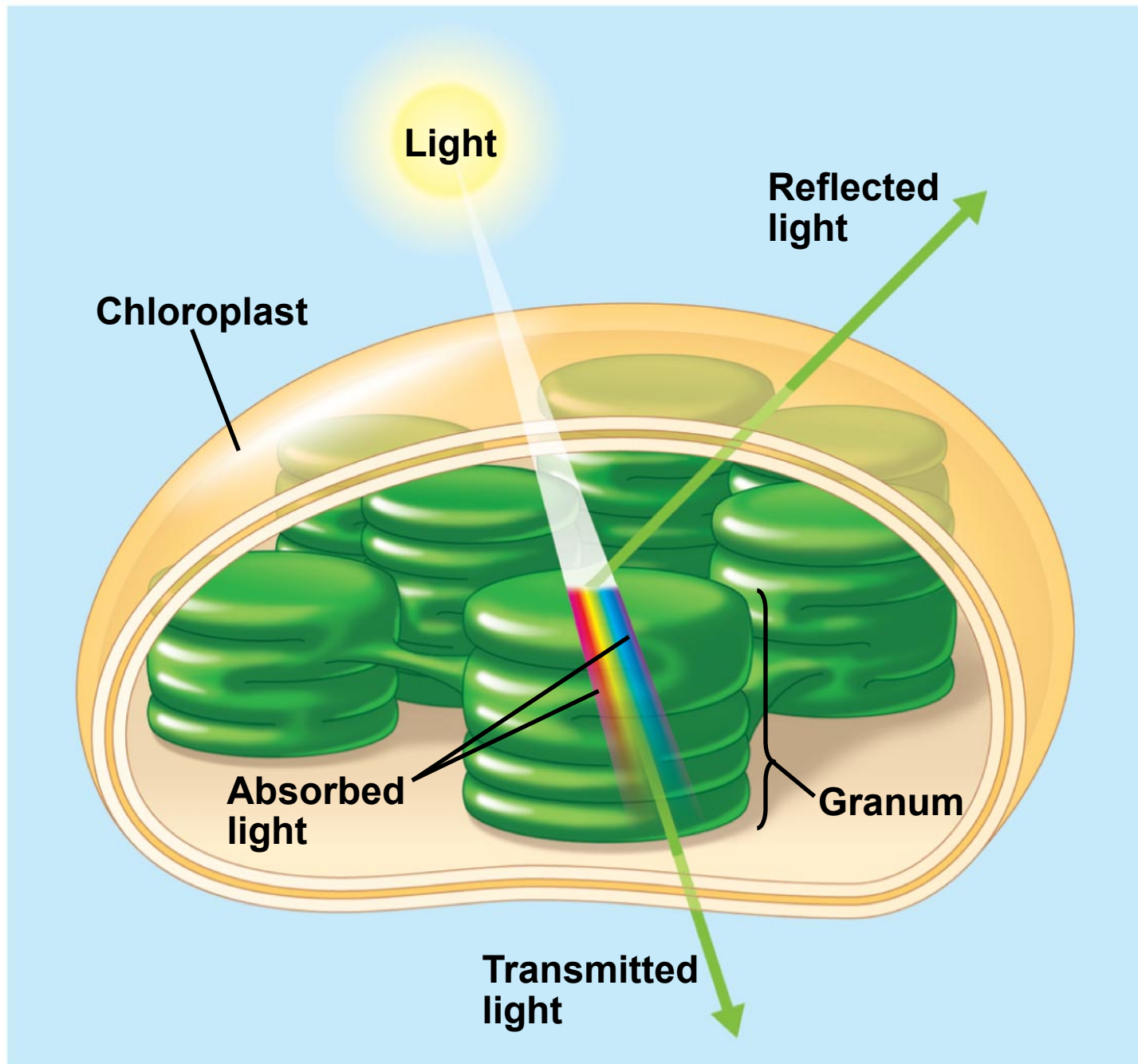
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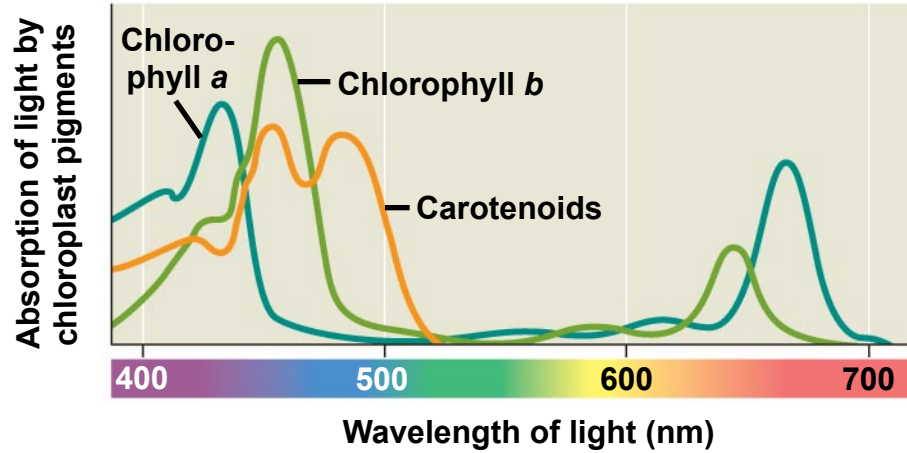


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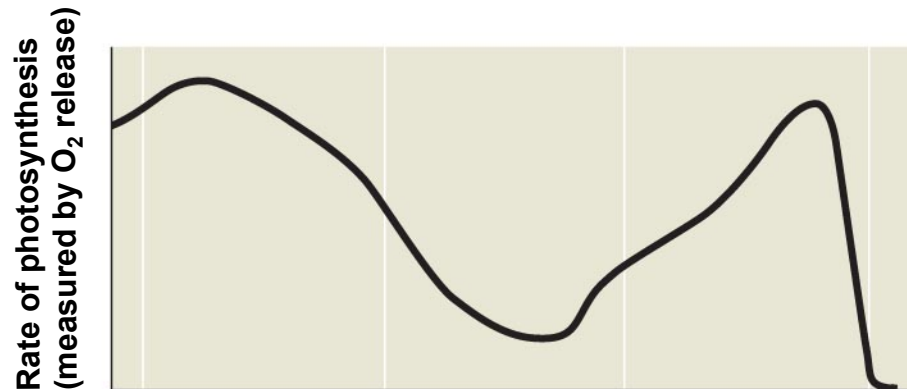


## RESULTS

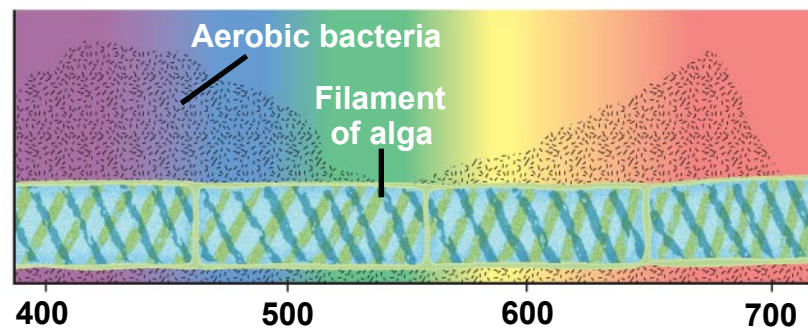
(a) Absorption spectra

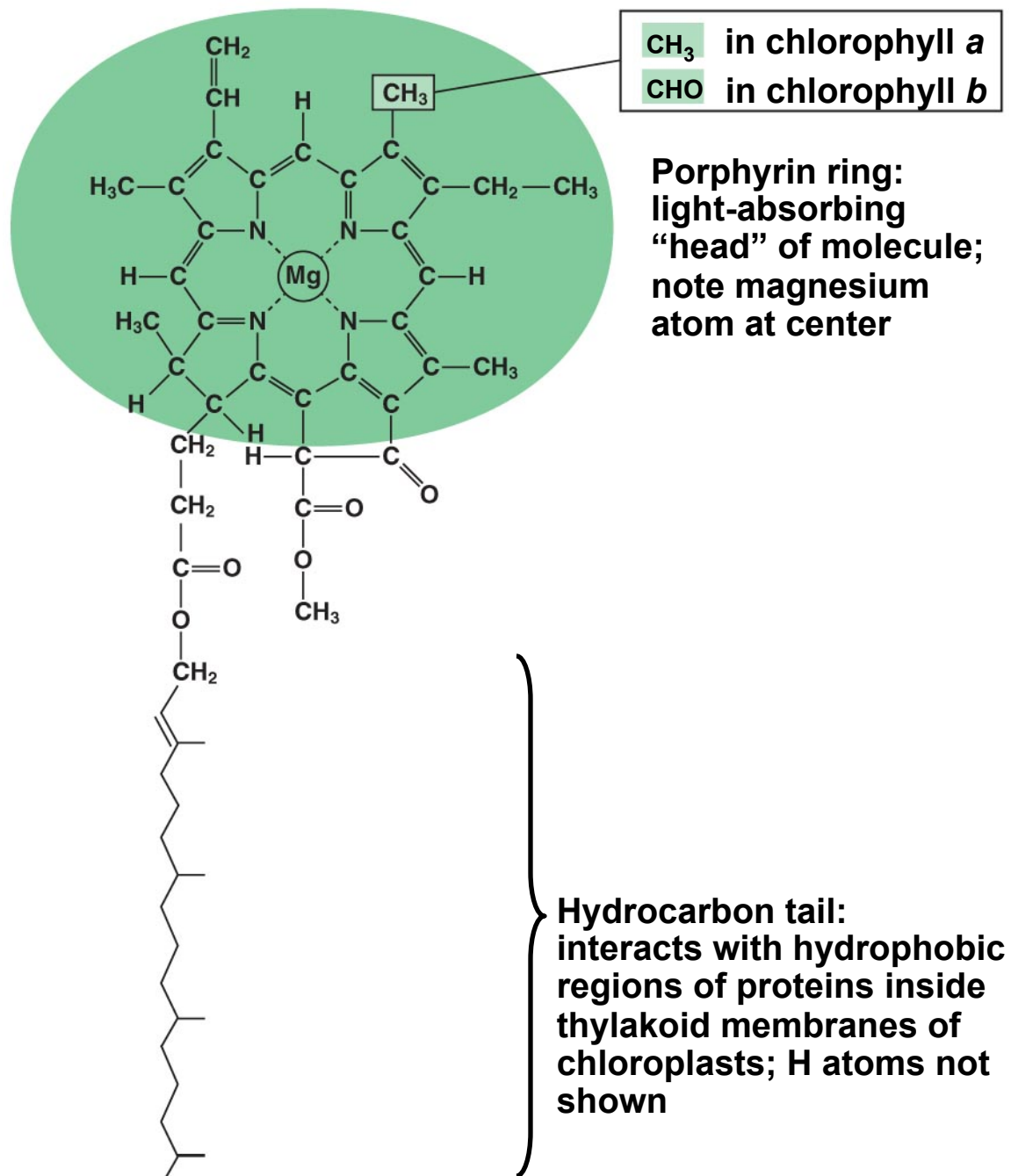


(b) Action spectrum

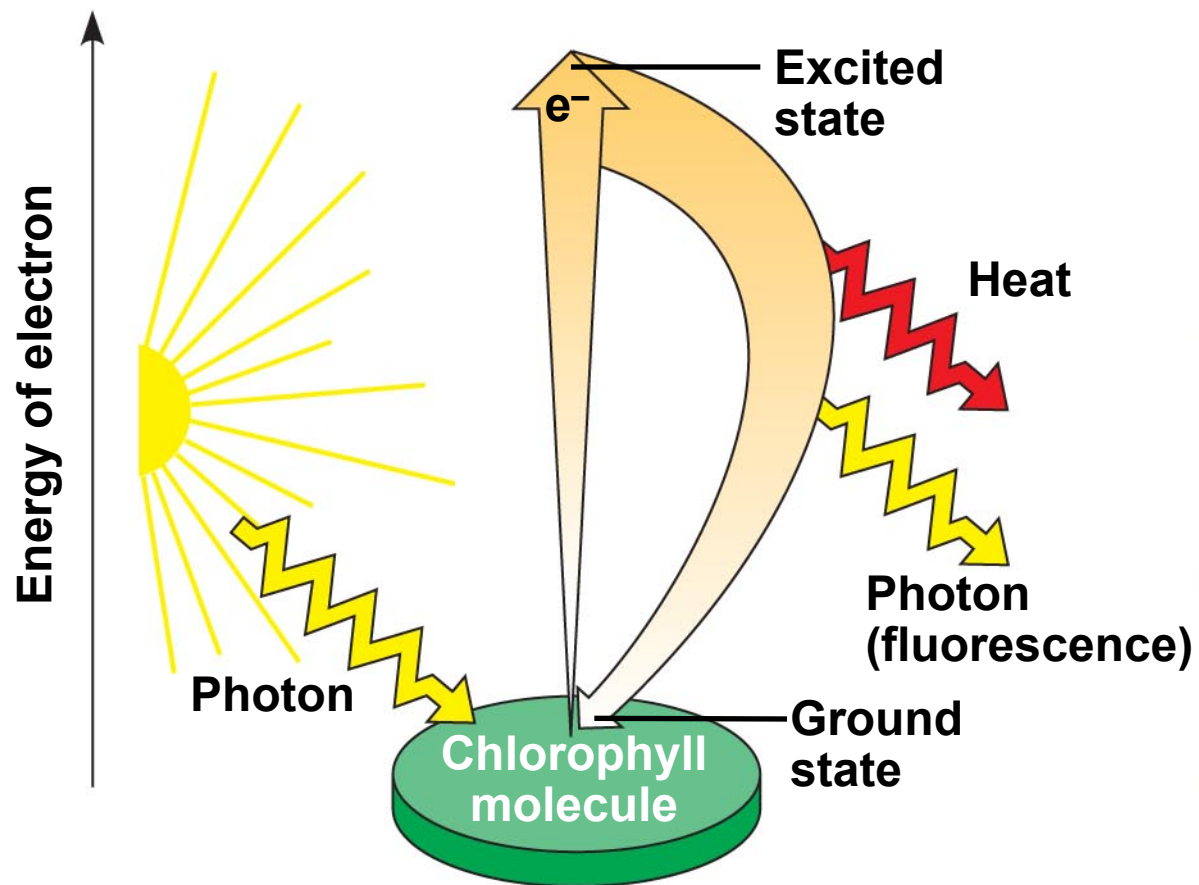


(c) Engelmann's experiment



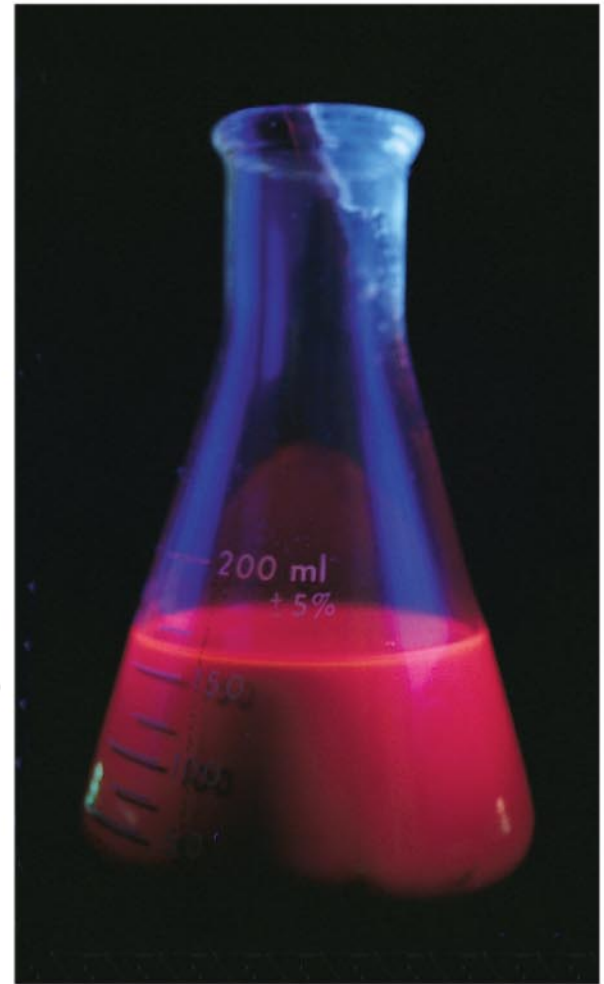




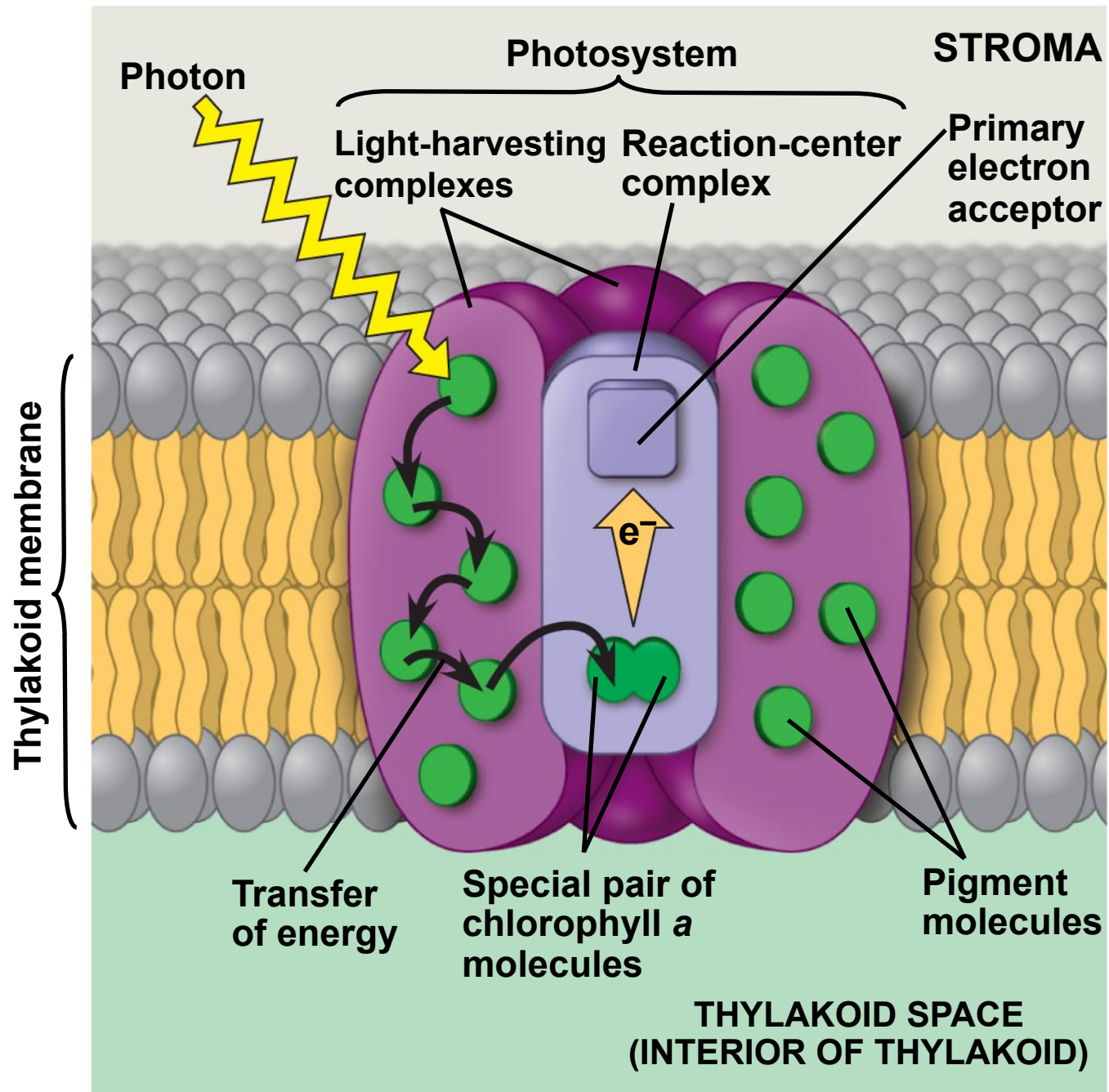


**(a) Excitation of isolated chlorophyll molecule**

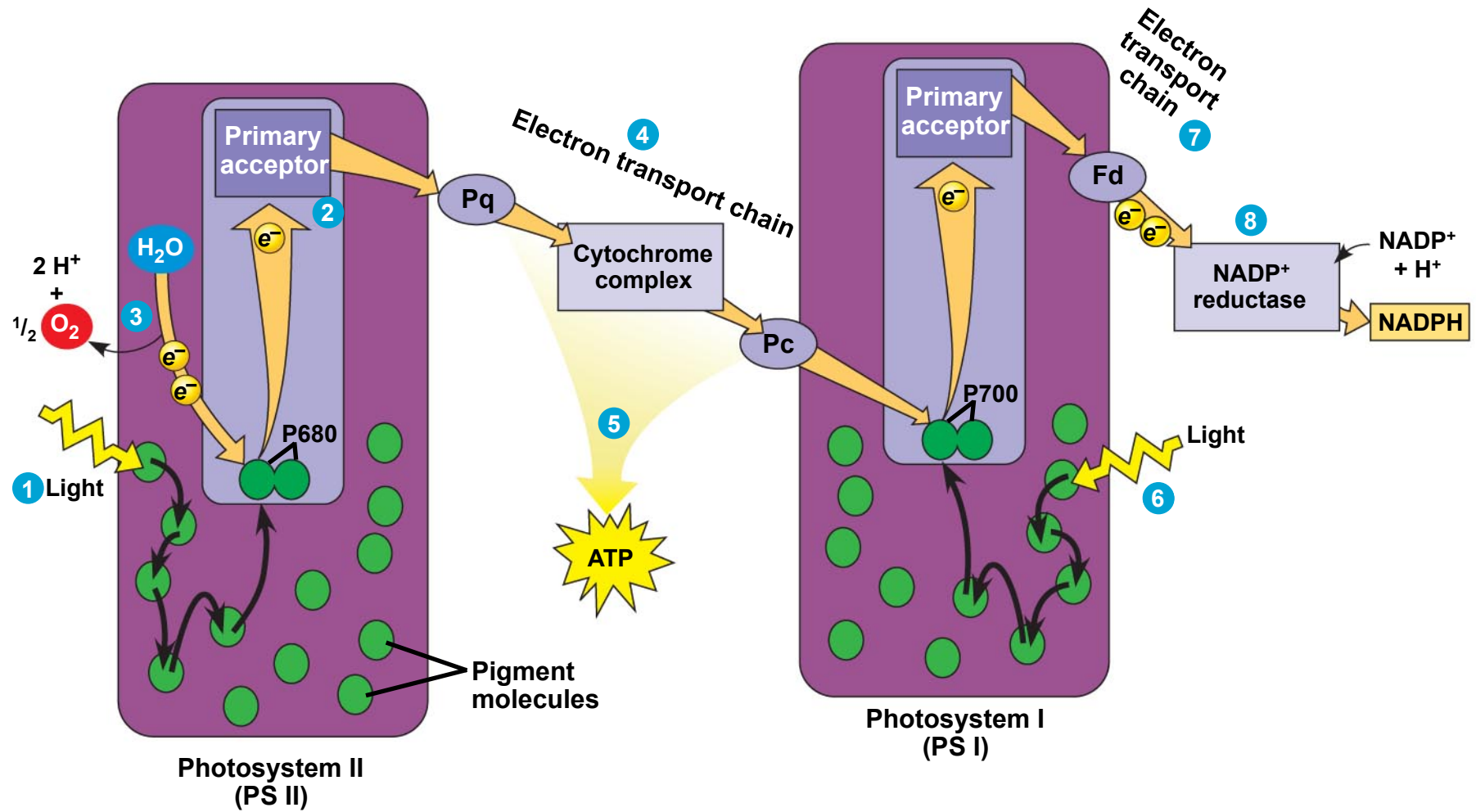
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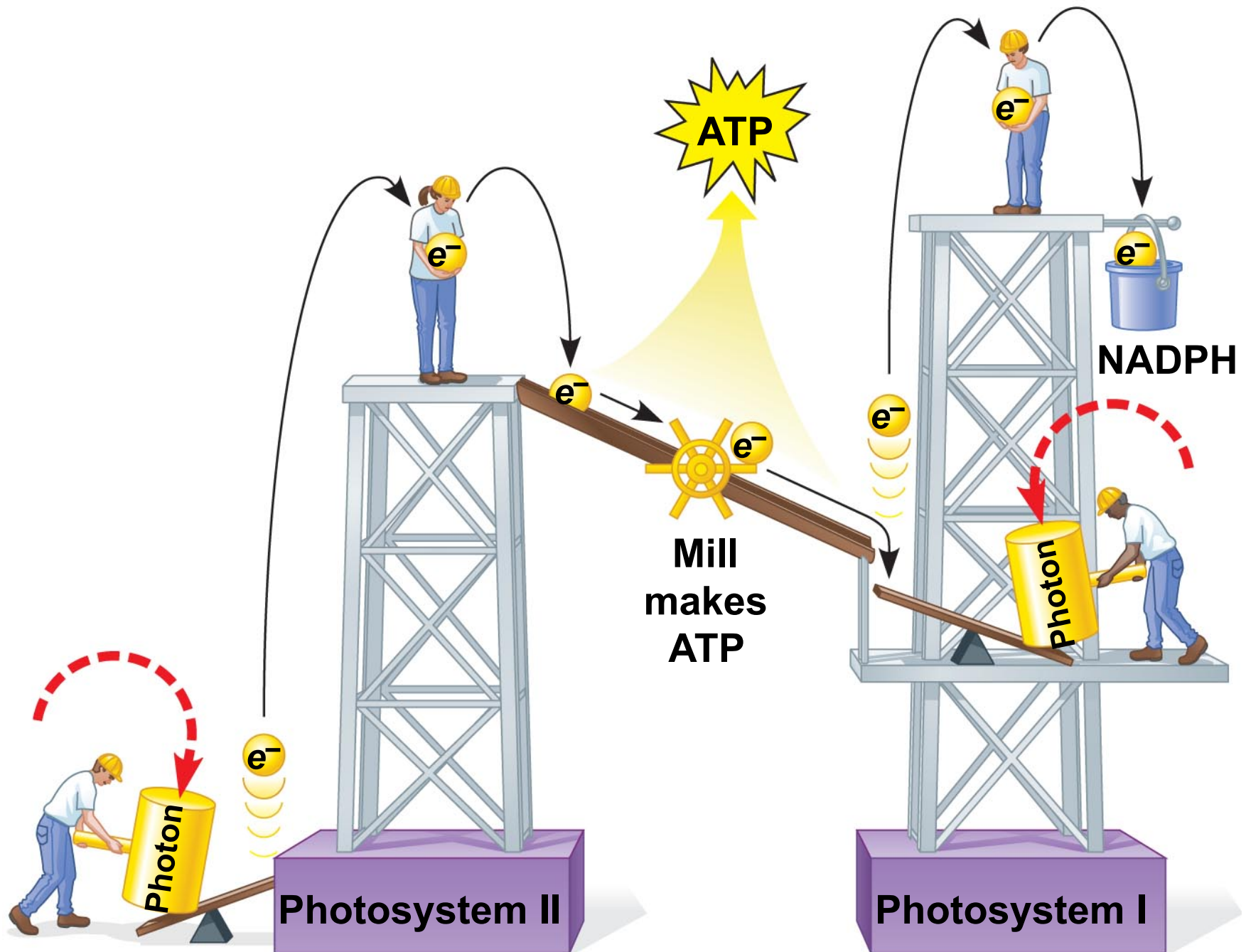
**(b) Fluorescence**



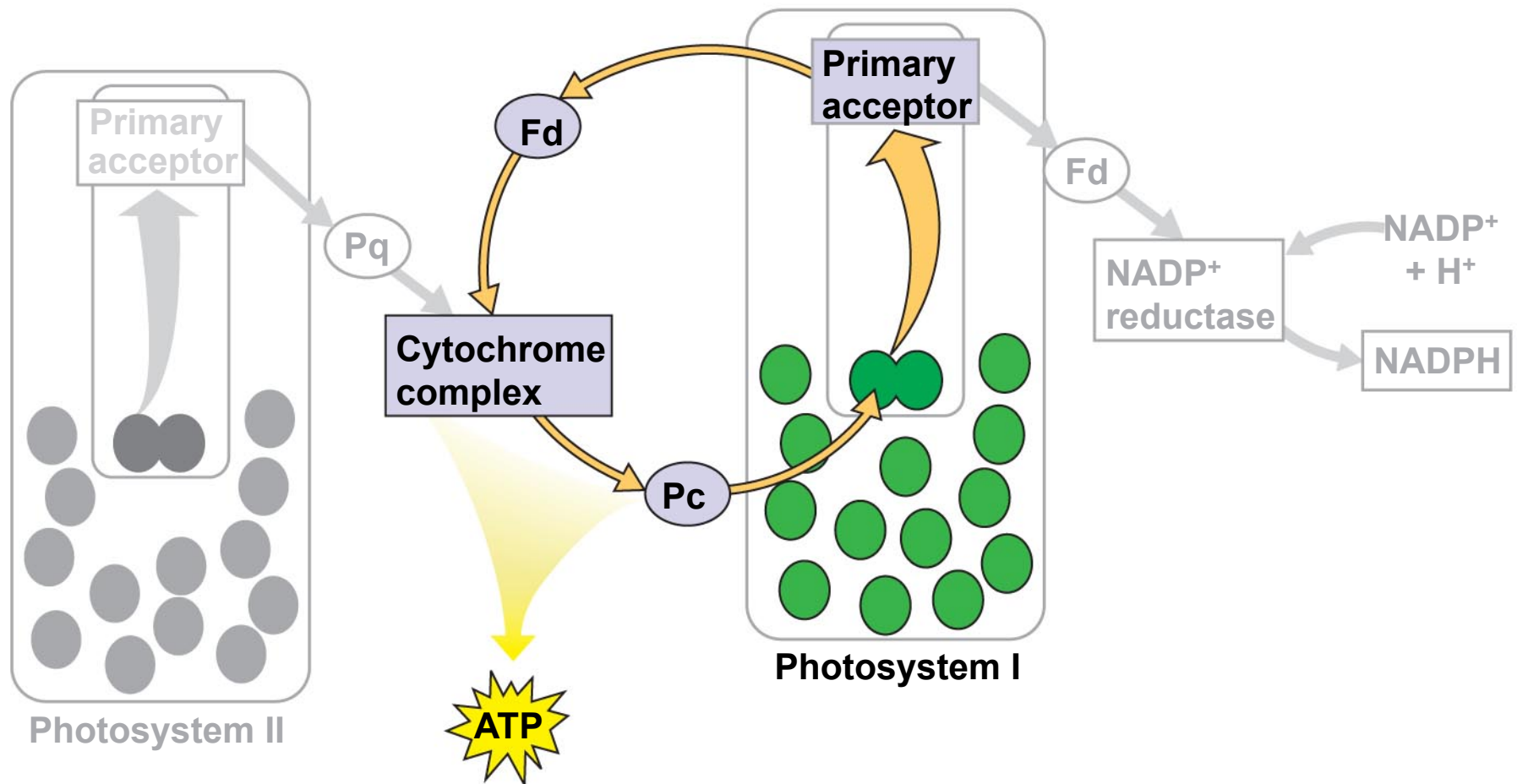
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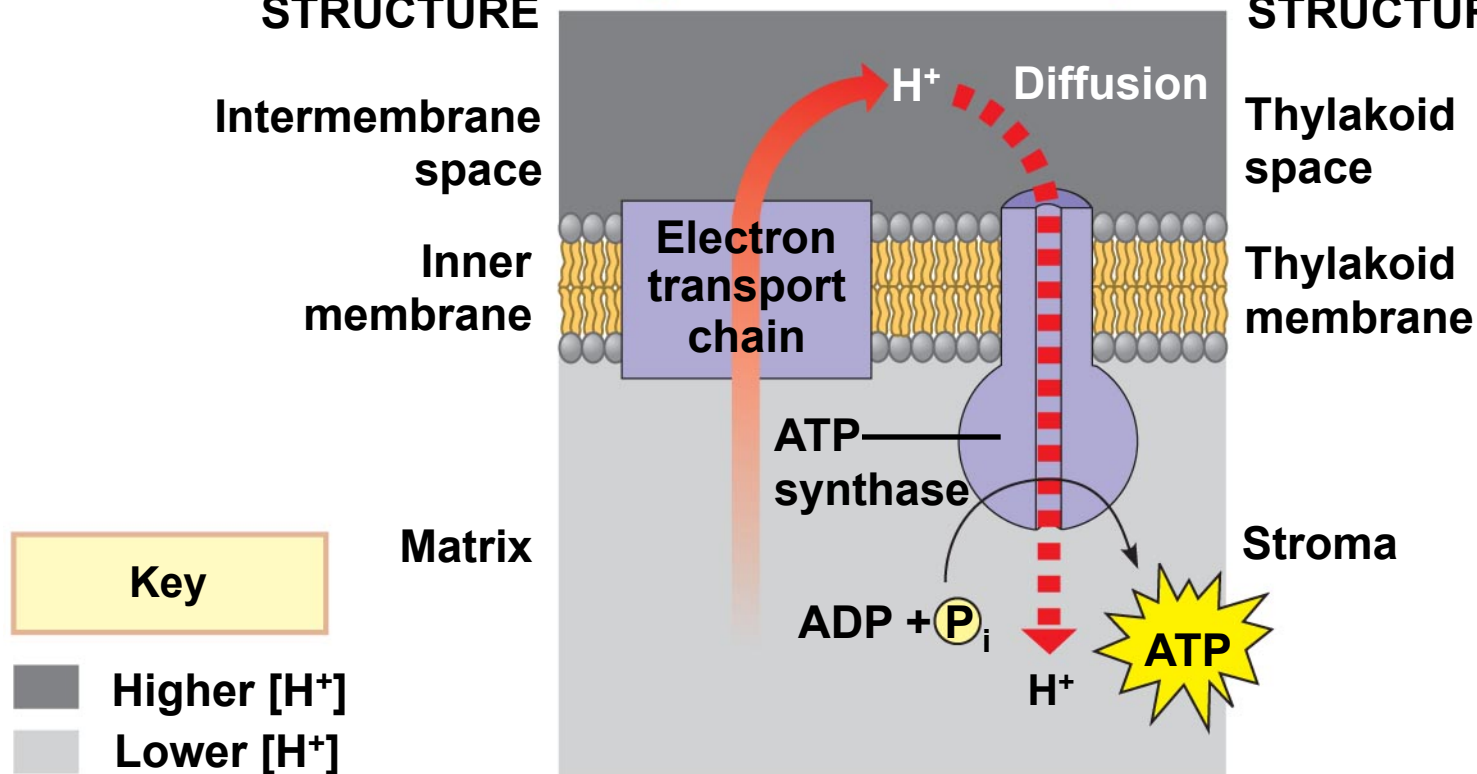
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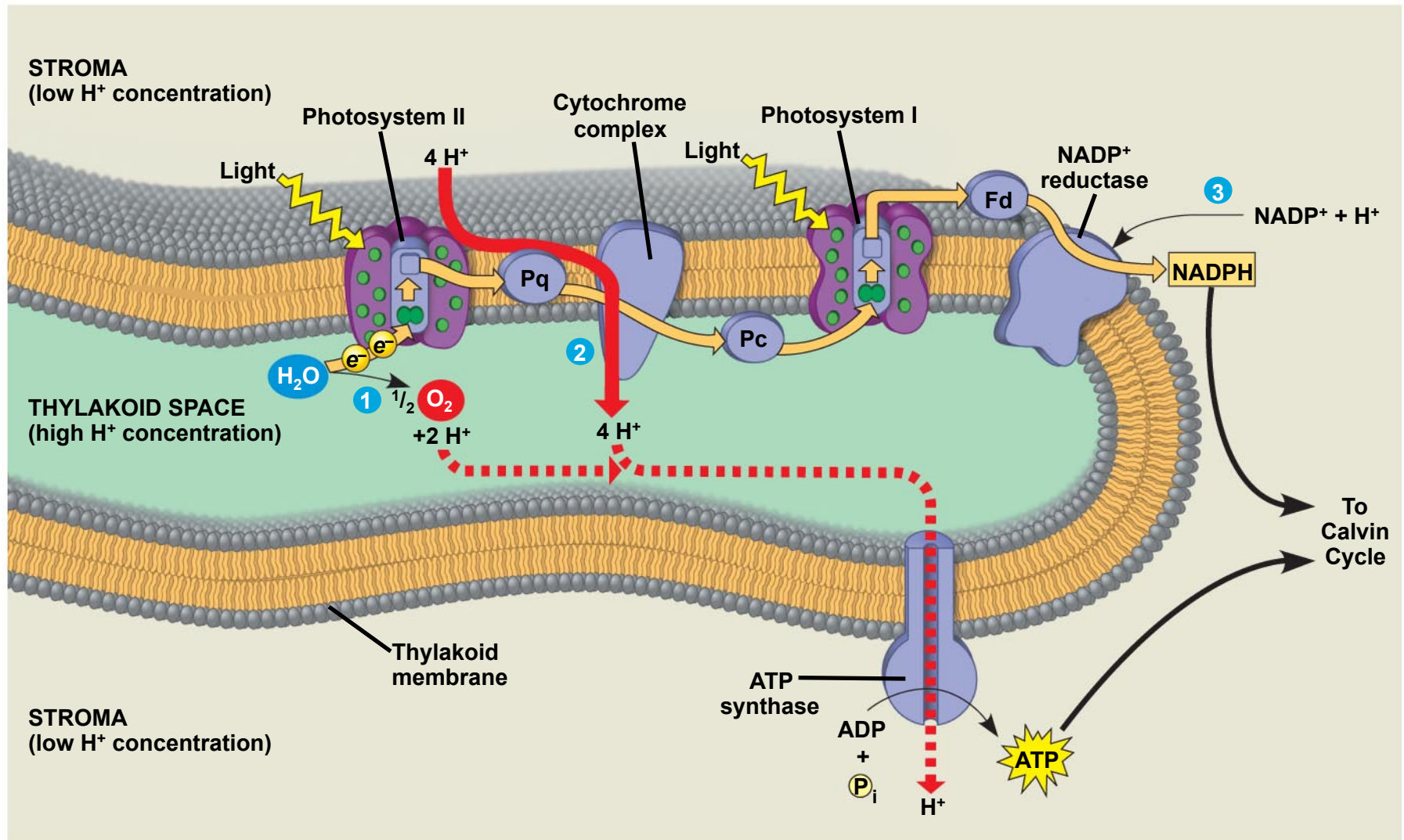
## Mitochondrion

## Chloroplast

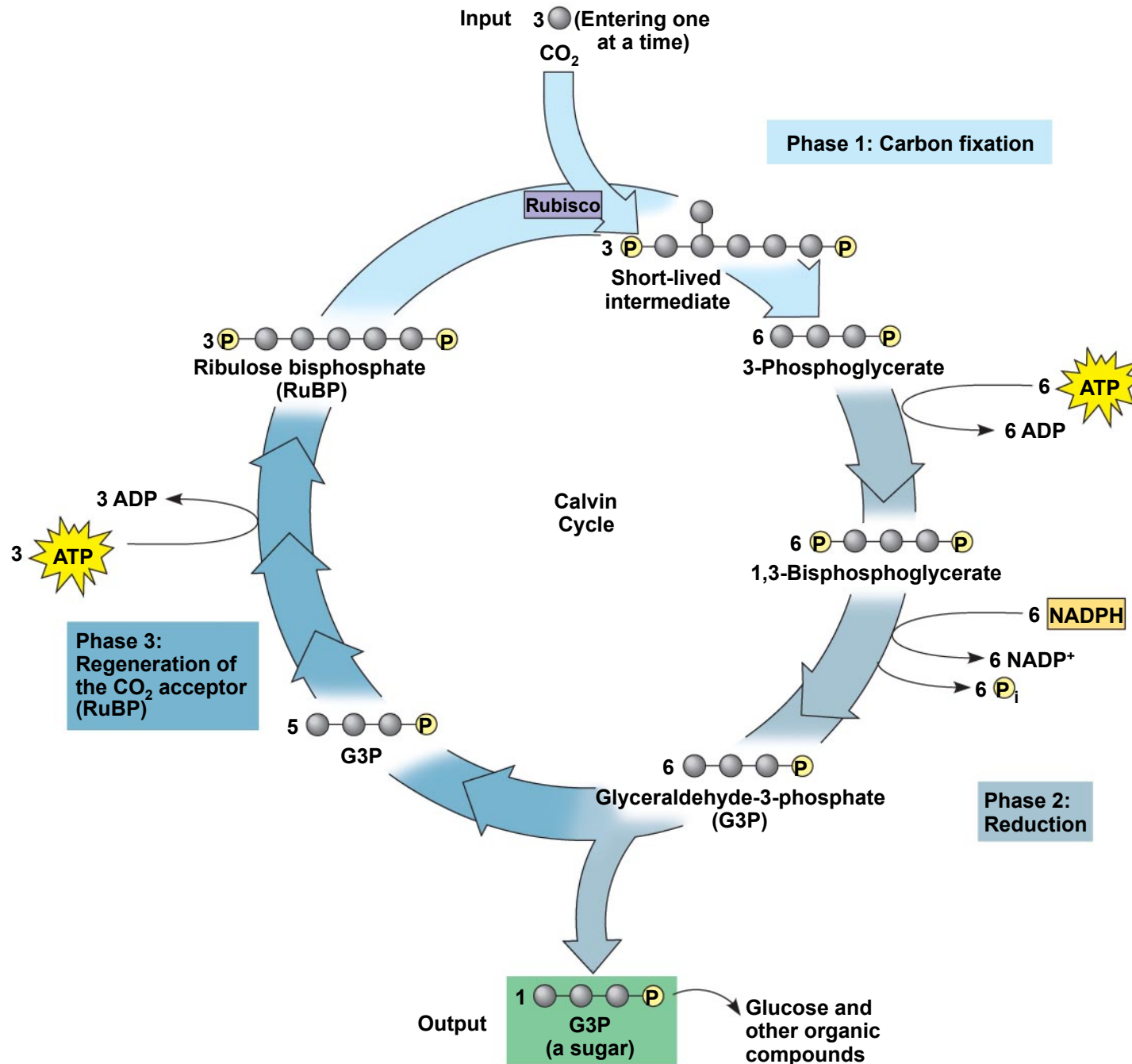
### MITOCHONDRION STRUCTURE

### CHLOROPLAST STRUCTURE



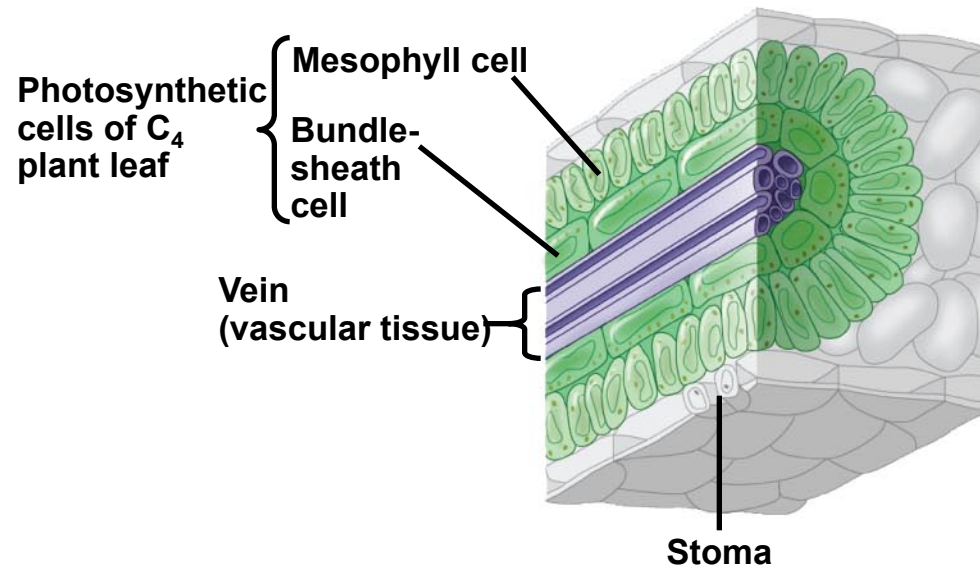


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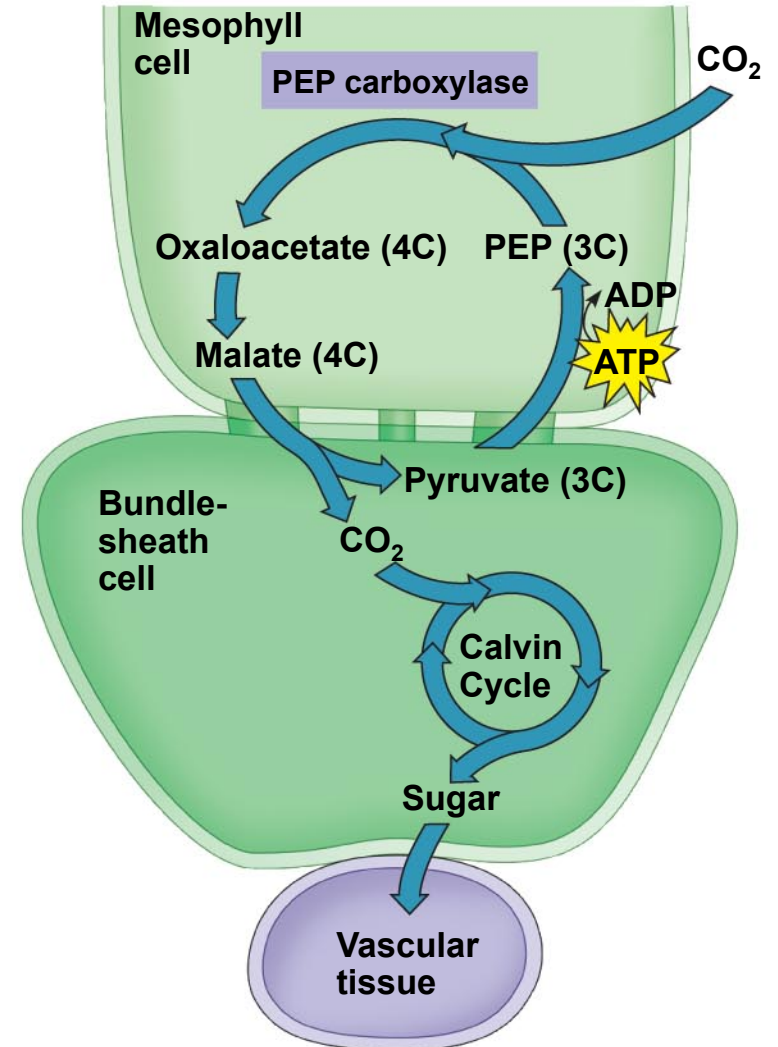




## C<sub>4</sub> leaf anatomy

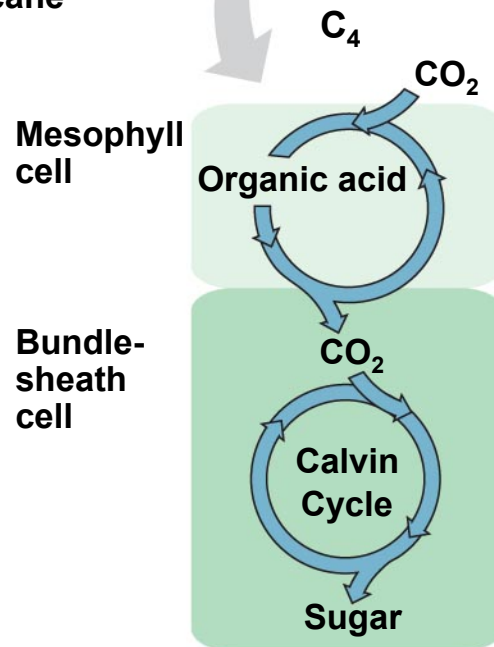


## The C<sub>4</sub> pathway





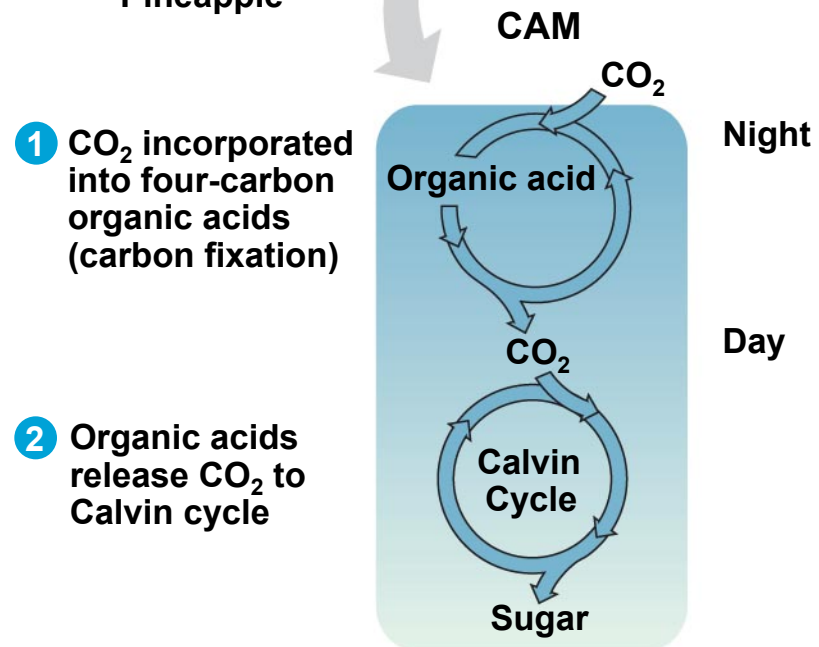
**Sugarcane**



**(a) Spatial separation of steps**



**Pineapple**



**(b) Temporal separation of steps**

