



# Fotosyntéza

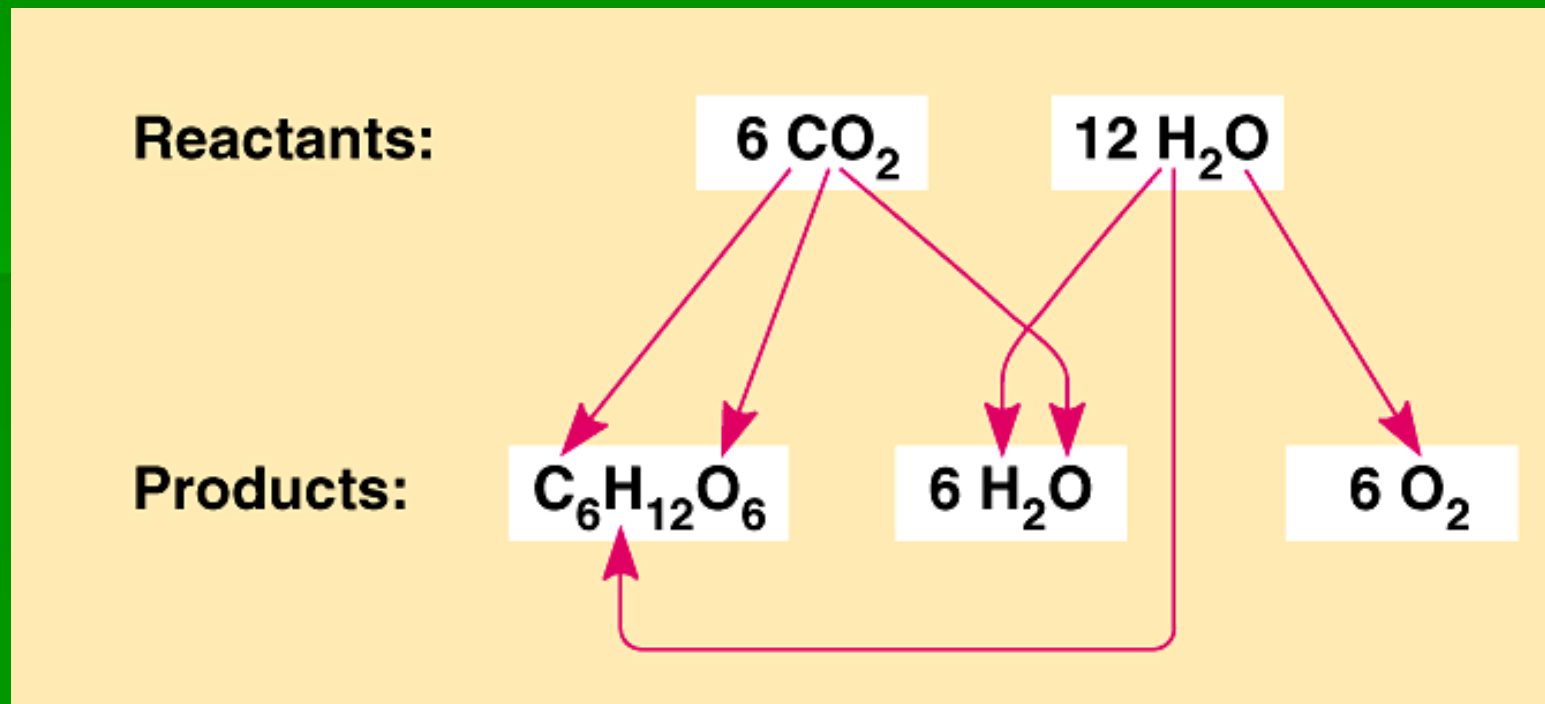
Július Cirák

Benjamin  
Cummings

Primárnym zdrojom energie pre živé organizmy na Zemi je slnečné žiarenie.

Priame využitie svetelnej energie je možné len u zelených rastlín a niektorých druhoch baktérií. Ide o zložitú postupnosť procesov, ktorá sa nazýva **fotosyntéza**.

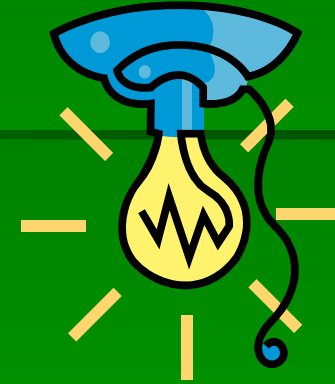
voda + oxid uhličitý - - - kyslík + cukor



# Fotosyntéza

- DVE ETAPY:

1. Reakcie za svetla



2. Reakcie za tmy

Calvinov cyklus



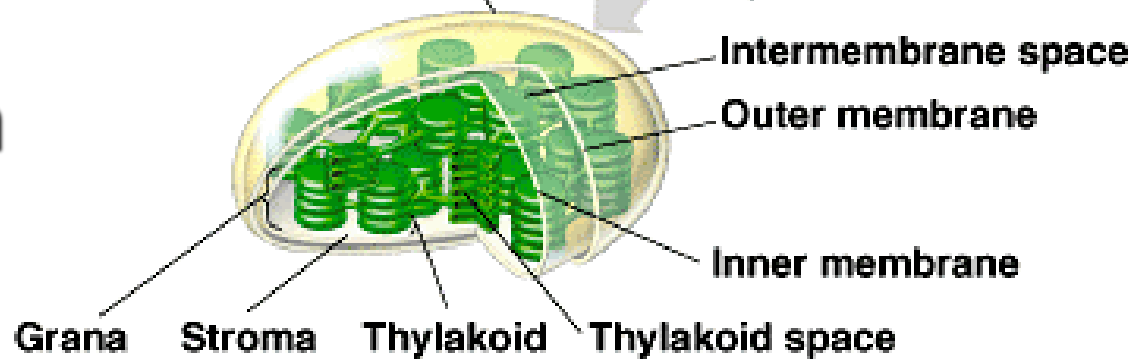
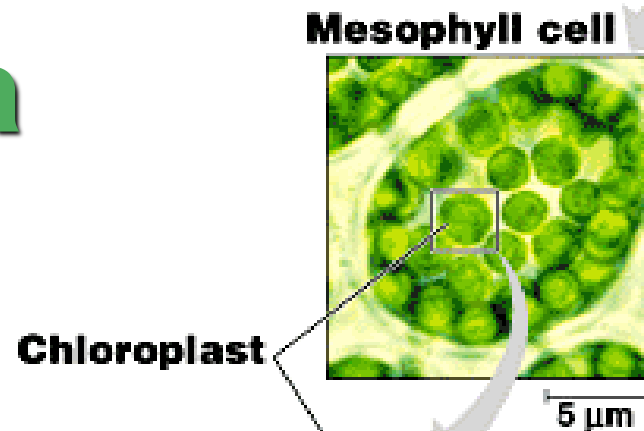
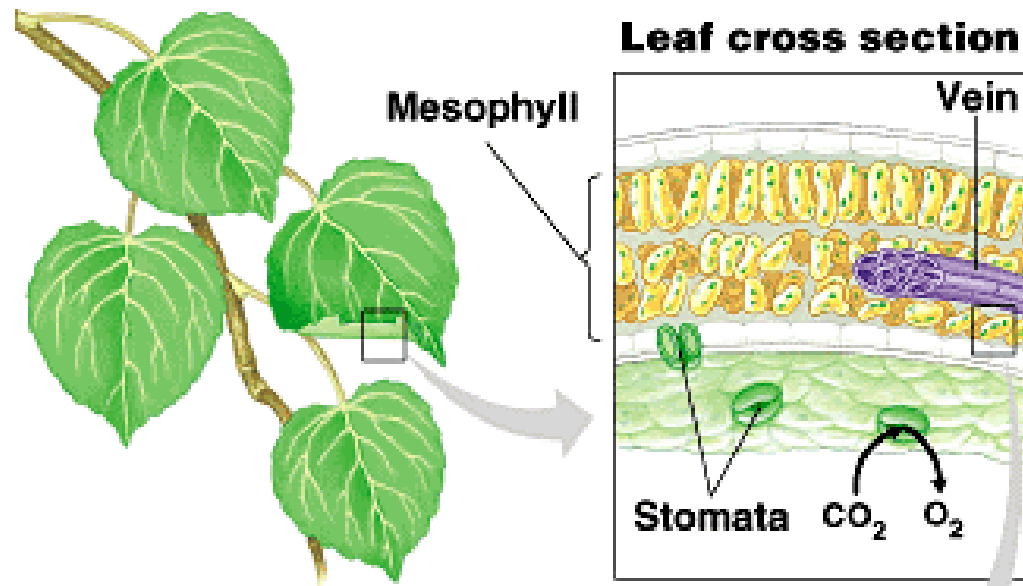


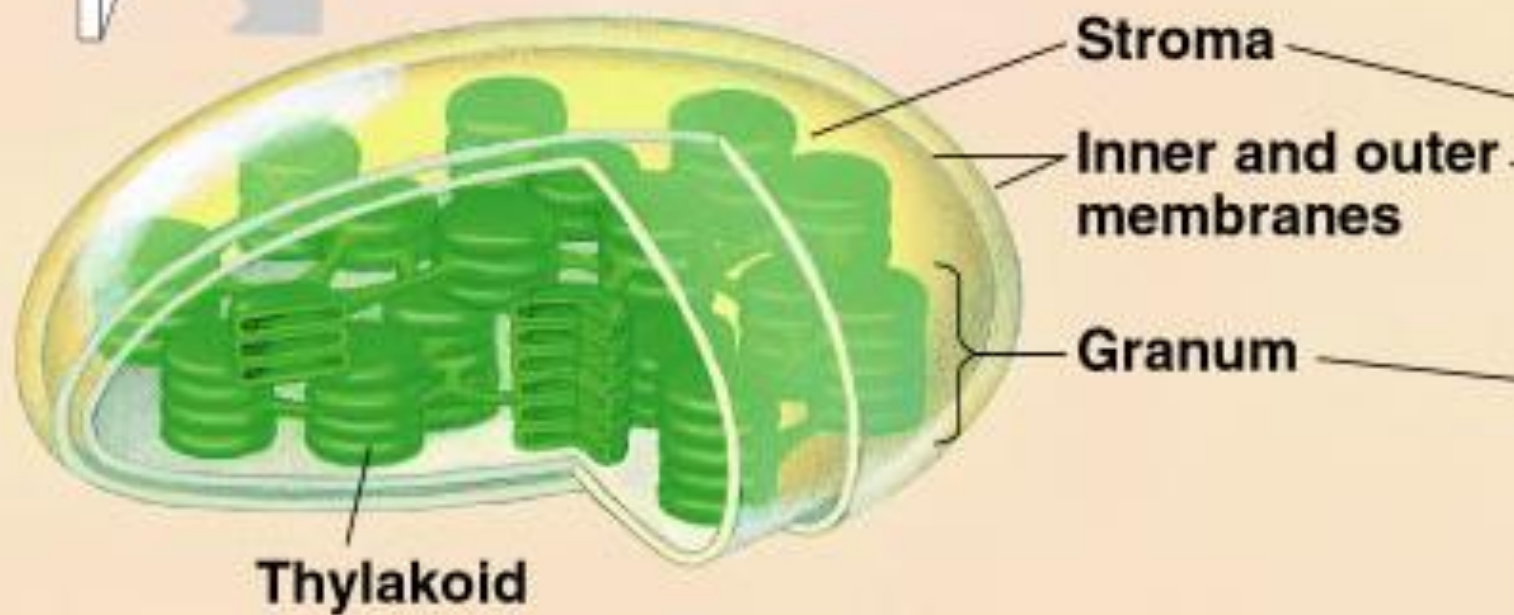
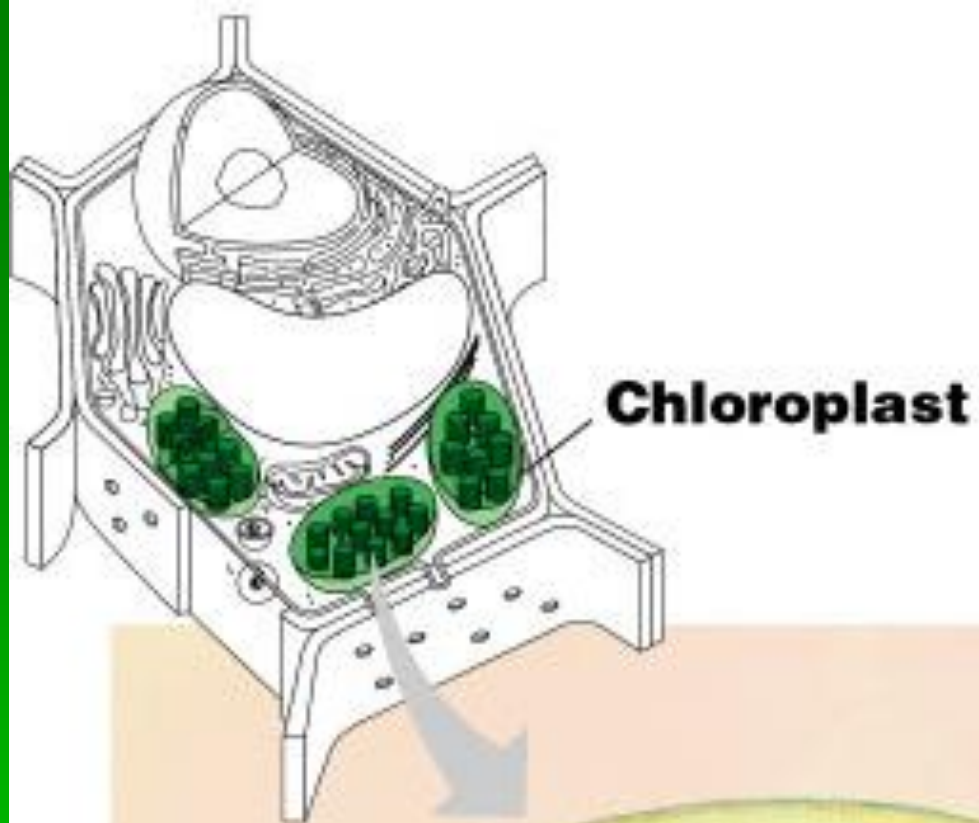
Watch Calvin Cycle animation

Benjamin  
Cummings

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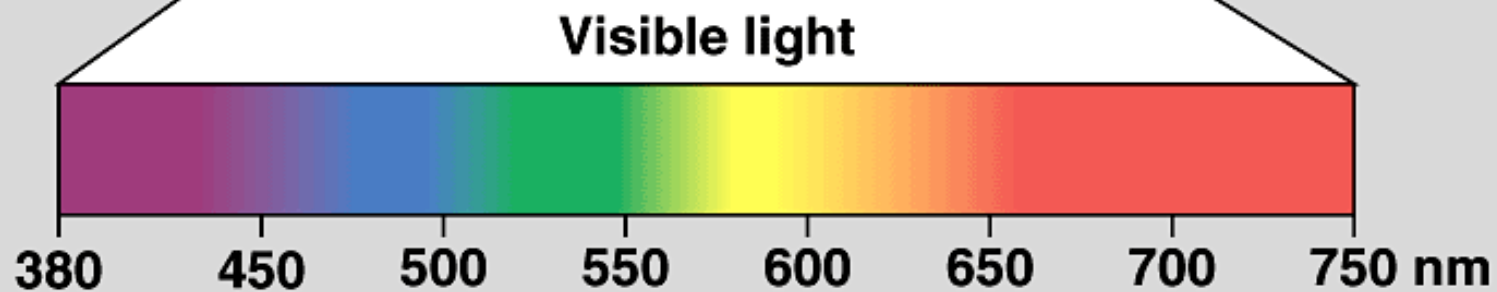
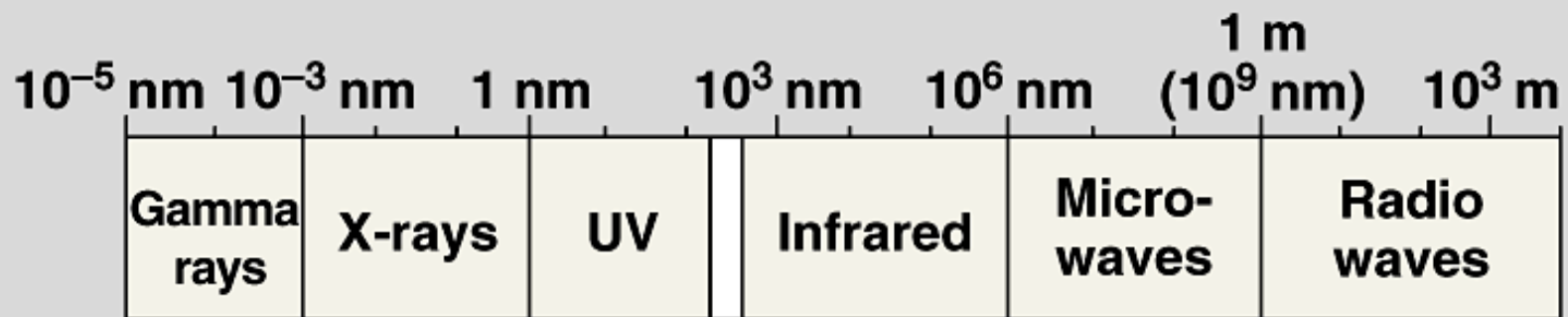
Uskutočňuje  
sa  
v chloroplastoch





# Fotosyntéza

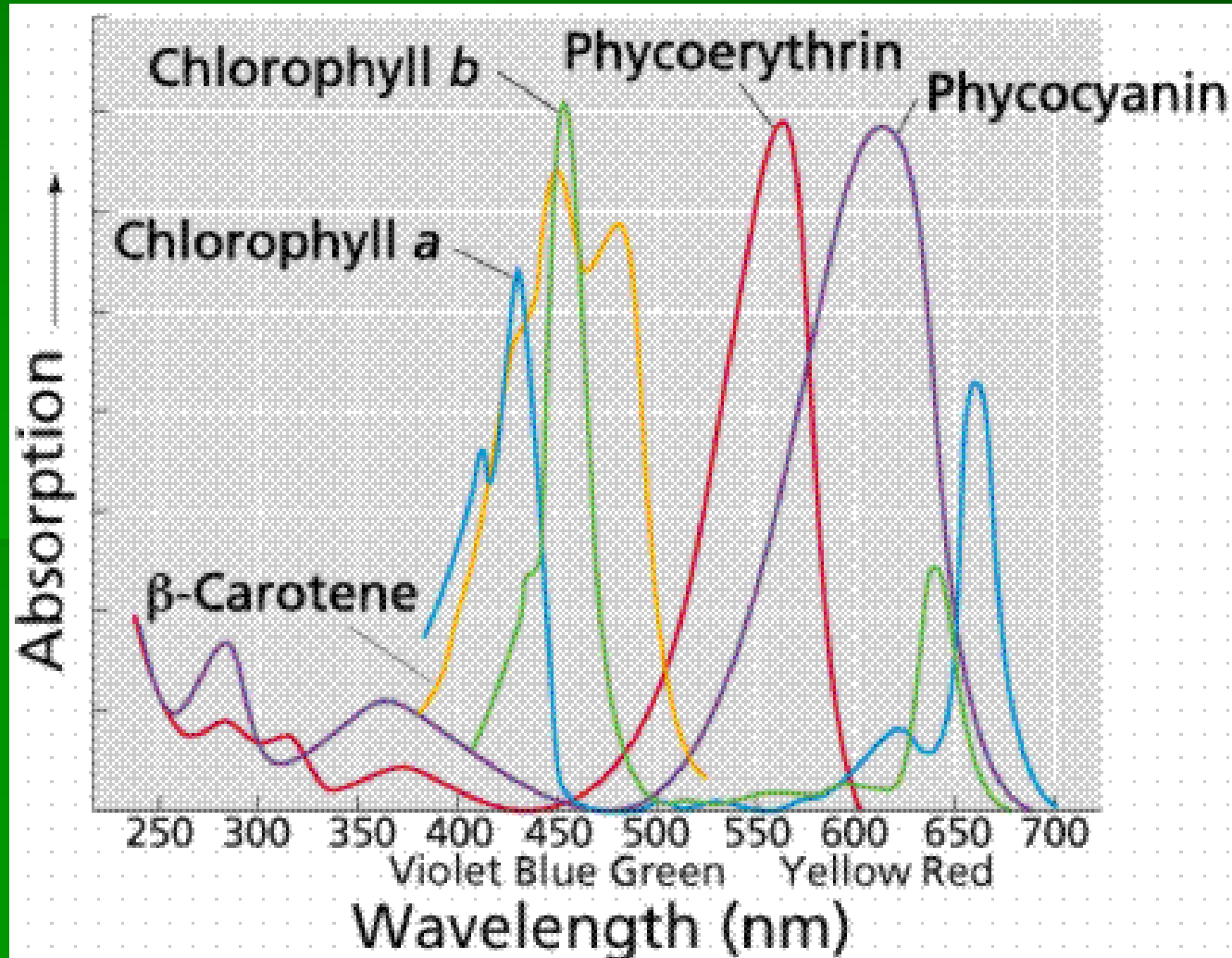
- Migrácia energie po pigmentových molekulách na úrovni molekulových excitácií
- Fotochemická reakcia – excitovaný stav vedie k nábojovej separácii
- Elektrónový transfer vedúci k redox reakciám
- Generovanie rozdielu el.-chemického potenciálu účinkom prenosu  $H^+$  iónov
- fotofosforylácia



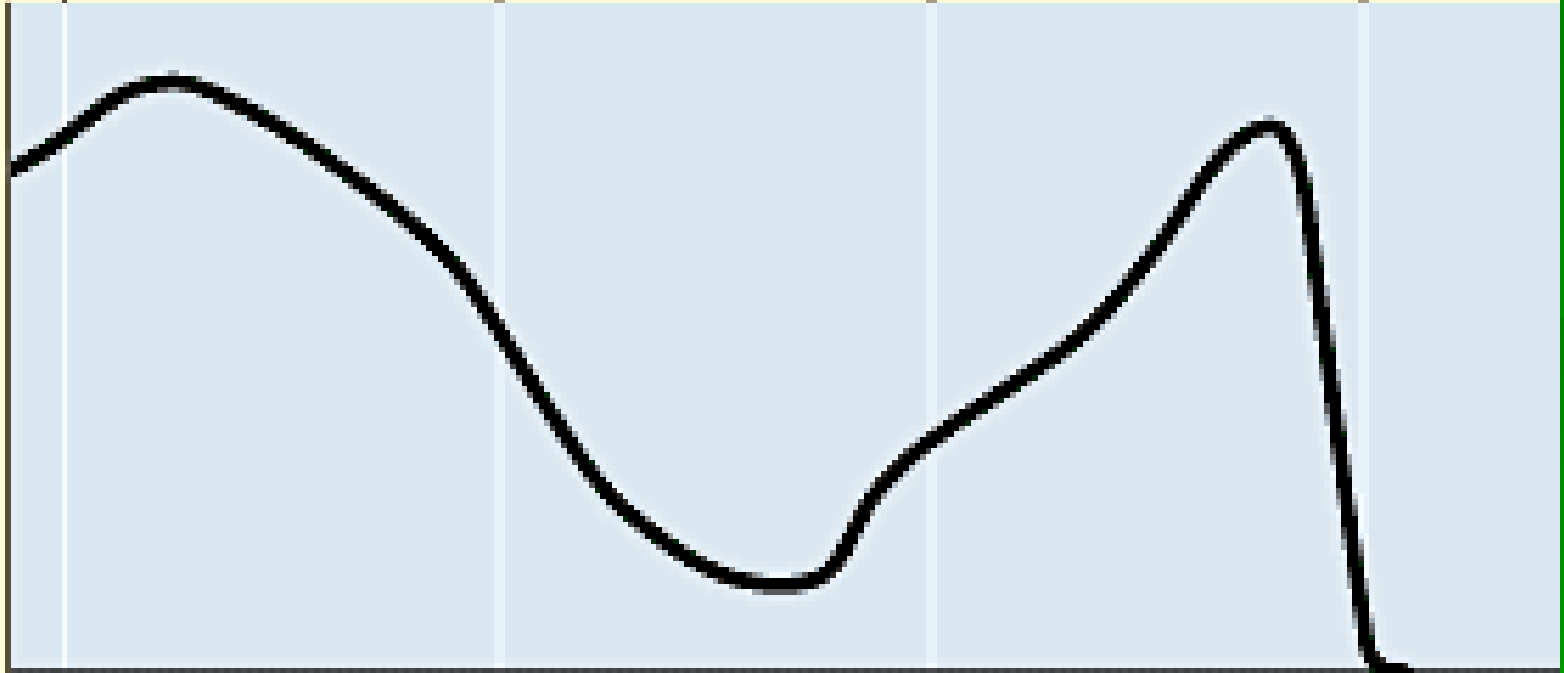
Shorter wavelength  $\longrightarrow$  Longer wavelength  
 Higher energy  $\longrightarrow$  Lower energy



# Absorpčné spektrá rastlinných pigmentov



Rate of photosynthesis  
(measured by  $O_2$  release)

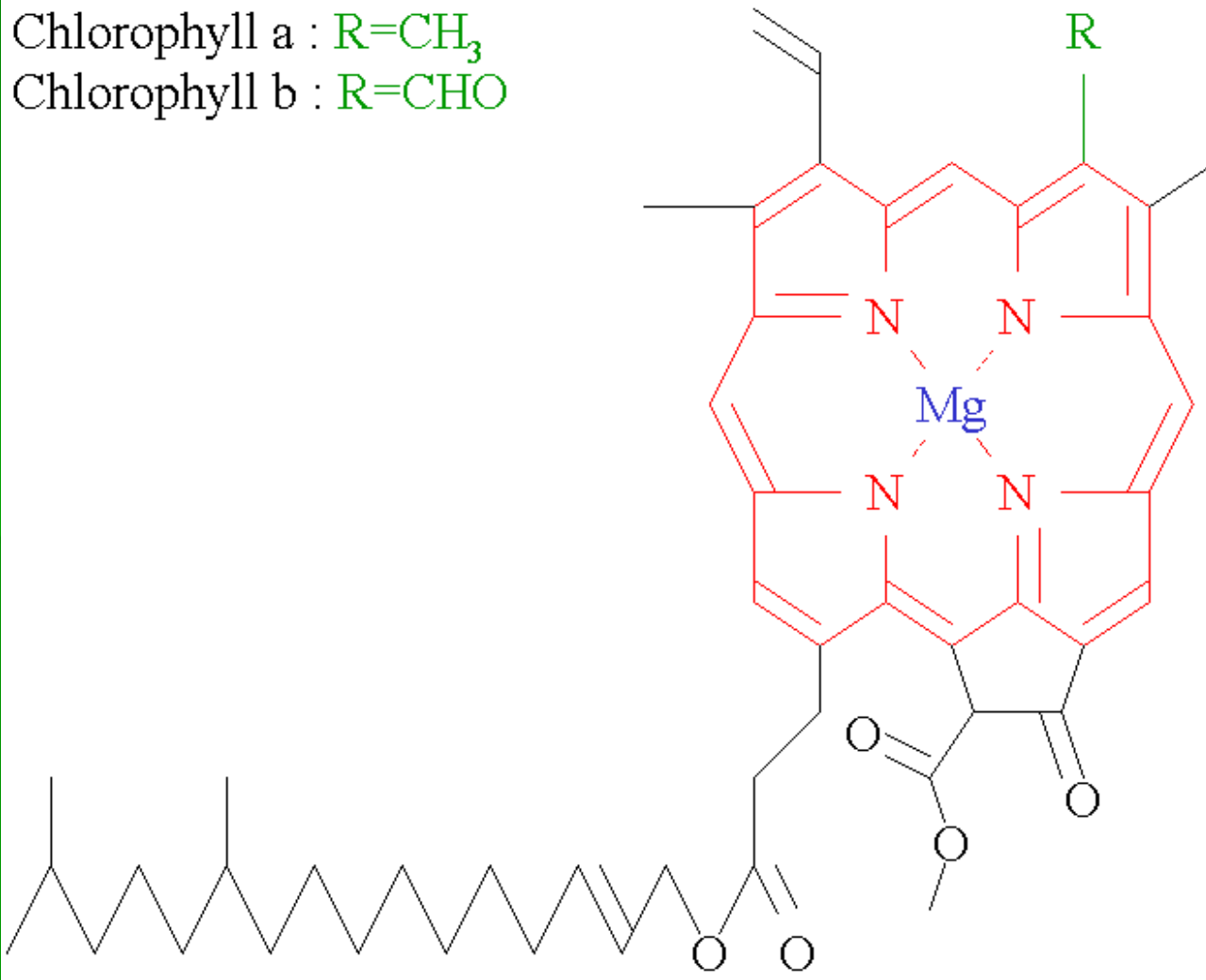


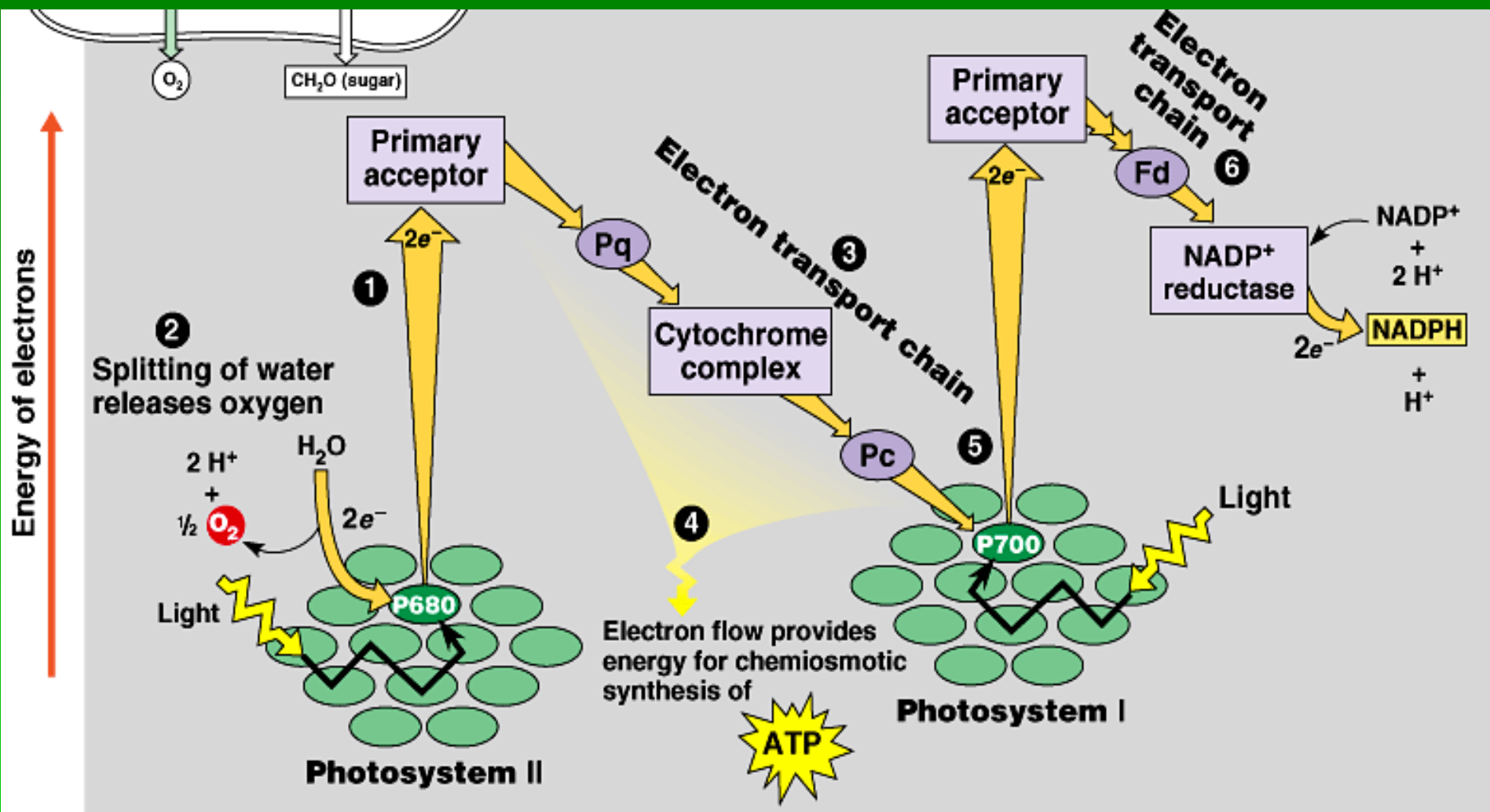
**(b) Action spectrum**

Action Spectrum =  
the rate of photosynthesis  
vs. wavelength

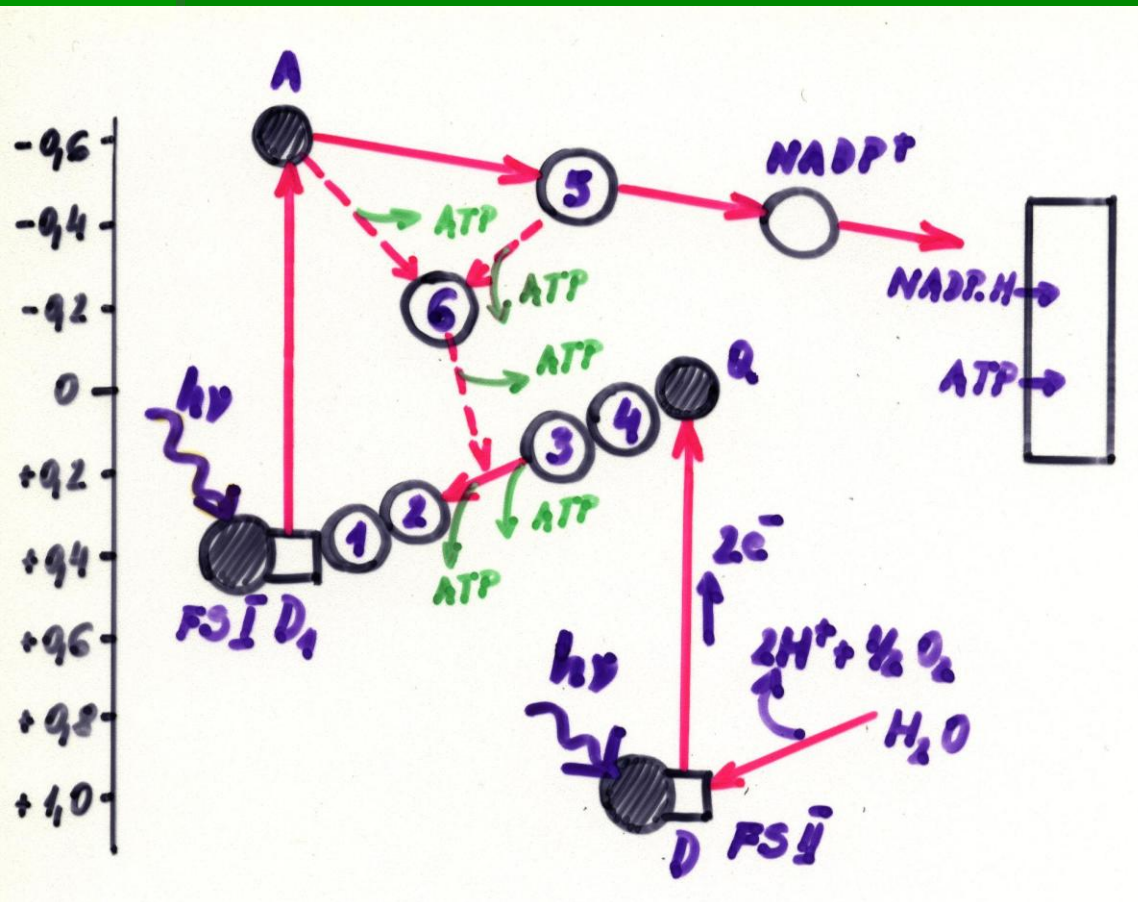
# Chlorofyl

Chlorophyll a :  $R=CH_3$   
Chlorophyll b :  $R=CHO$





# Schéma reakcií za svetla



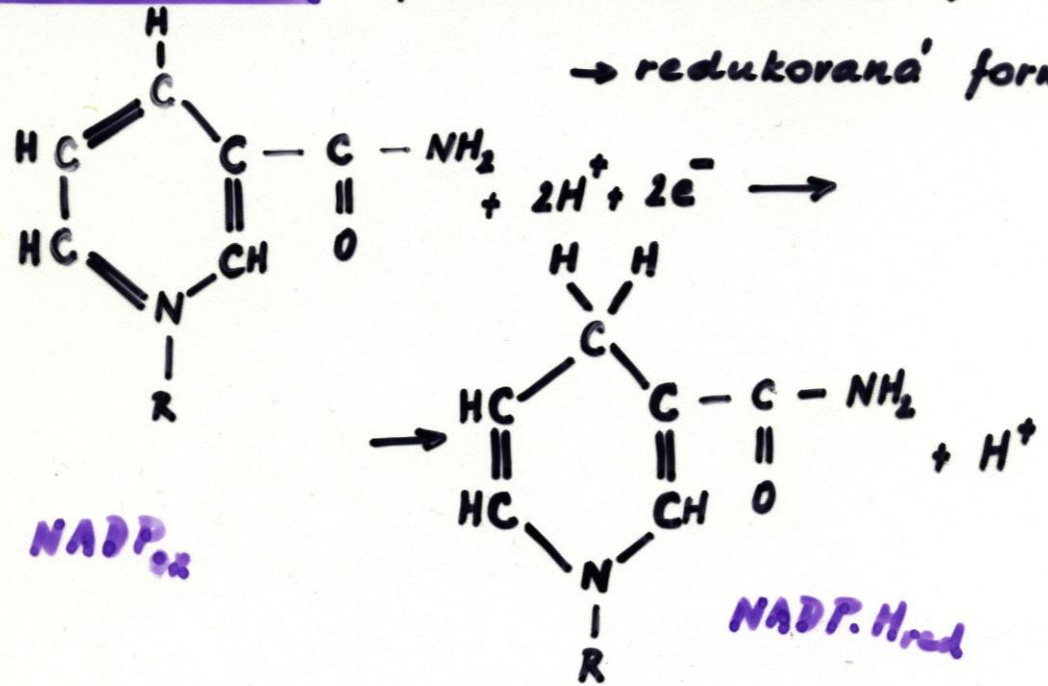
- 1 plastocyanín
- 2 cytochrom f
- 3 cytochrom b
- 4 plastochinon
- 5 feredoxín
- 6 cytochrom b6

NADP  
nikotinamid adenín  
dinukleotid fosfát

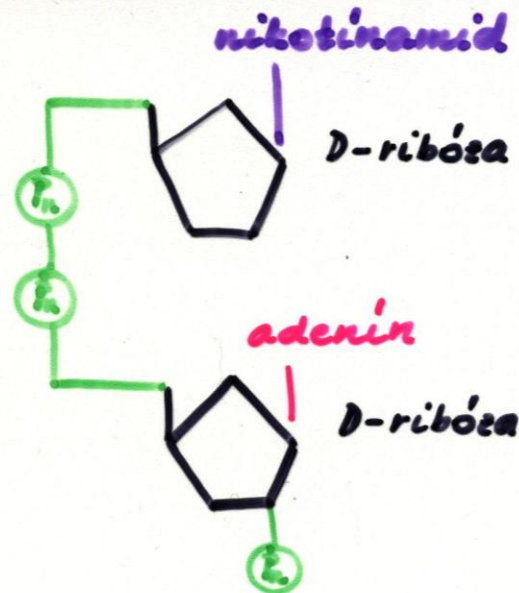
# NADP

Nikotinamid : prechod oxidovaná →

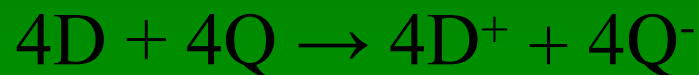
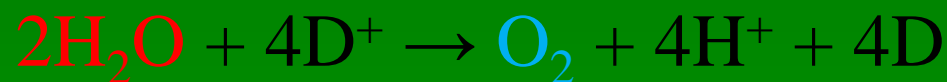
→ redukovaná forma



Nikotinamid adenin dinukleotid fosfat



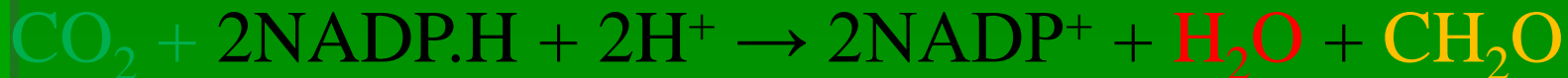
# Fotochemické reakcie za svetla



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# Mitchellova hypotéza

