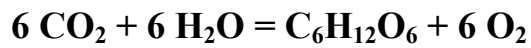
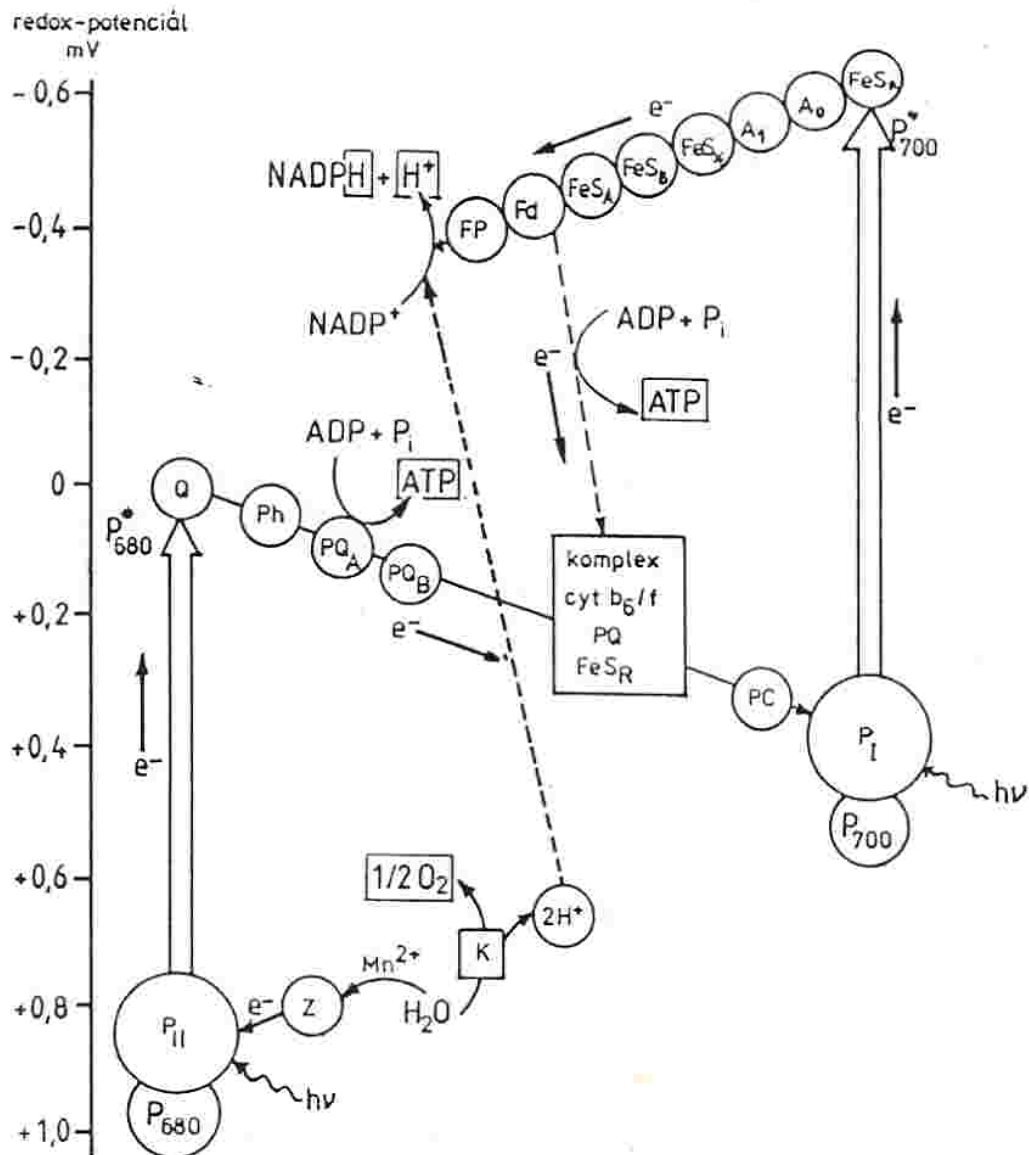


## 25. Fotosyntéza



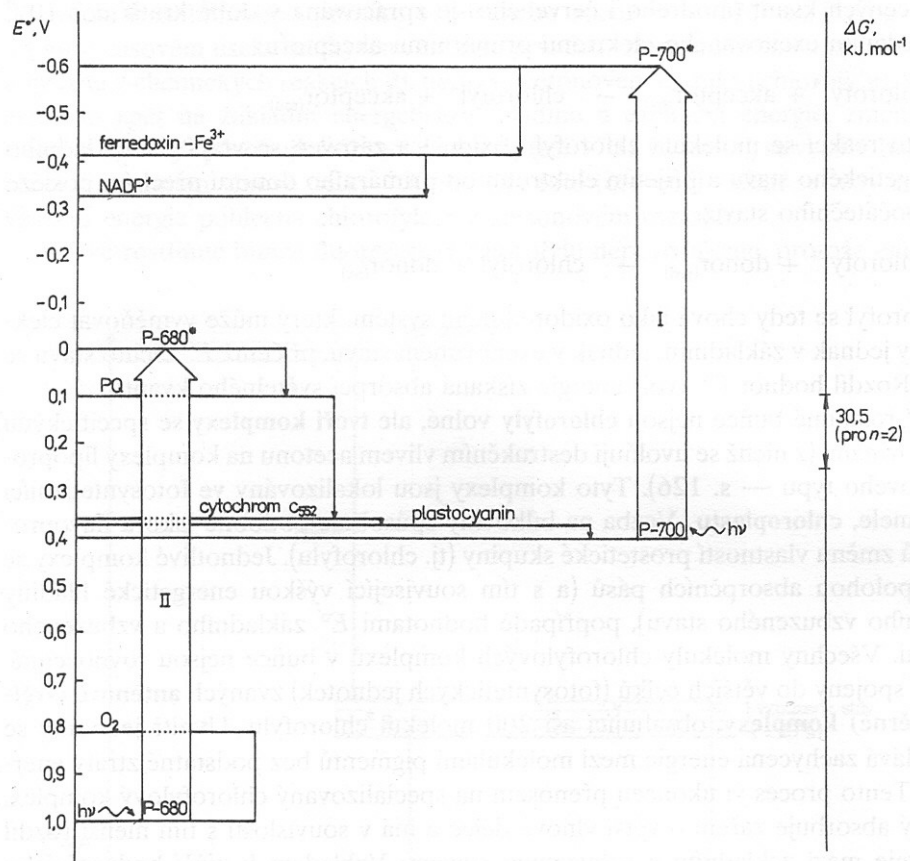
Světlá fáze – tvorba NADPH a ATP

Fotosyntetický elektronový transport



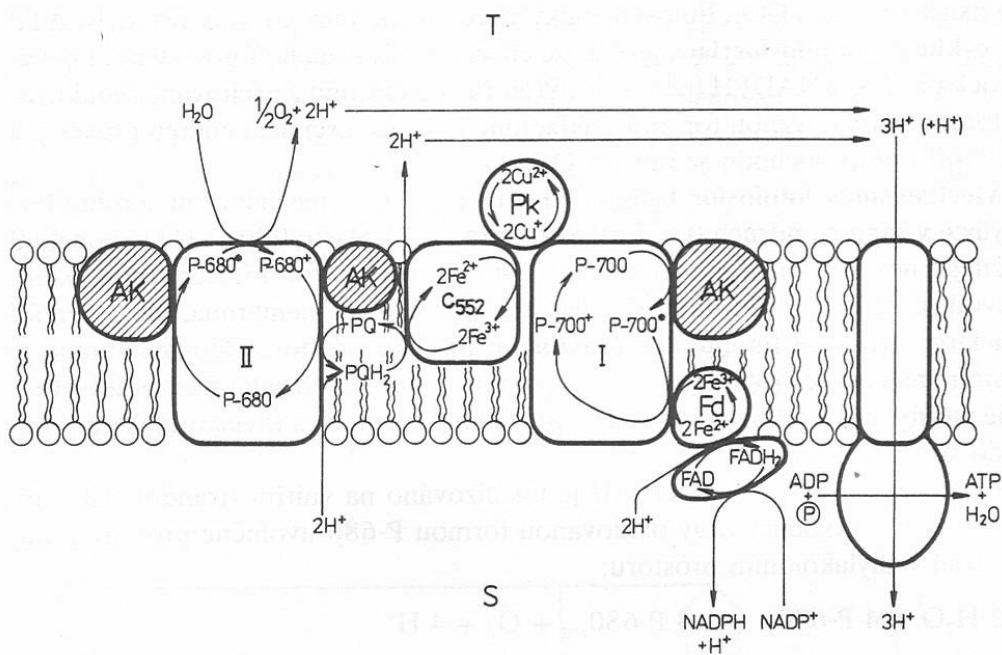
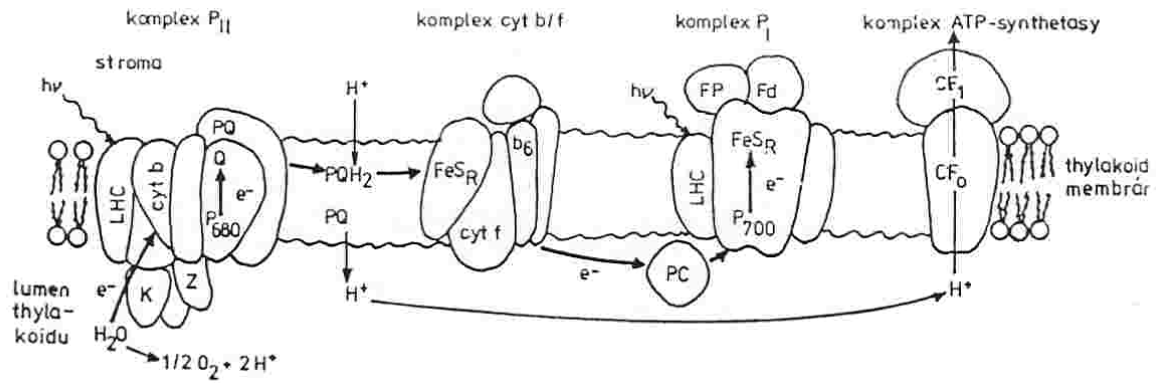
necyklický – PS II i PS I

cyklický – PS I – další ATP



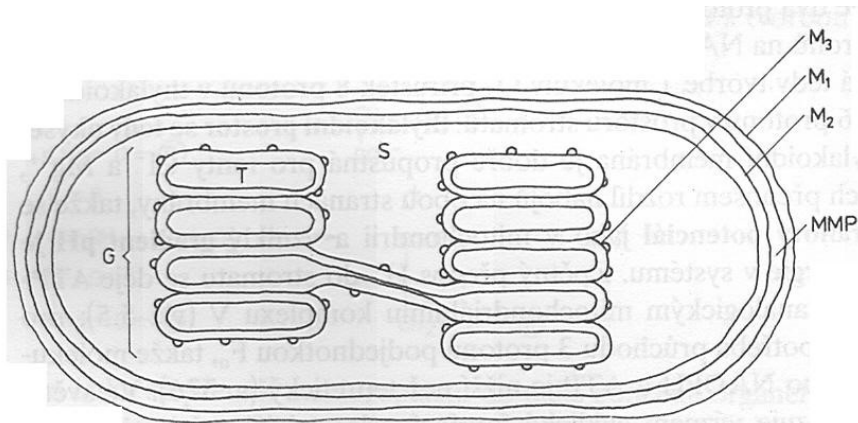
Obr. 139 Elektrochemické a energetické schéma redoxních pochodů, probíhajících při necyklické fotosyntetické fosforylaci

Lokalisace fotosyntetických komplexů v membráně tylakoidů



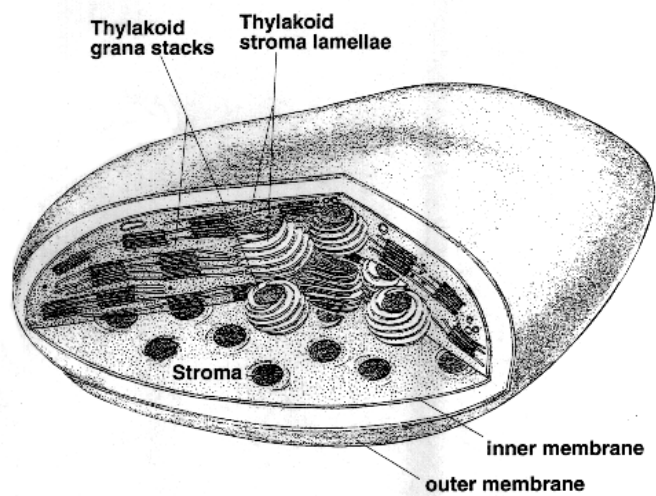
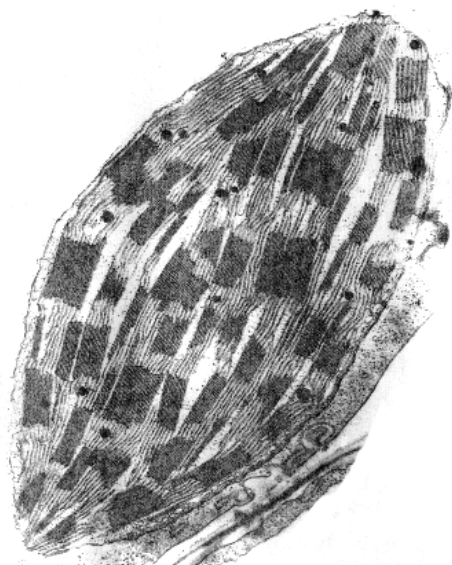
**Schéma chemiosmotického mechanismu fotofosforylace v thylakoidní membráně**

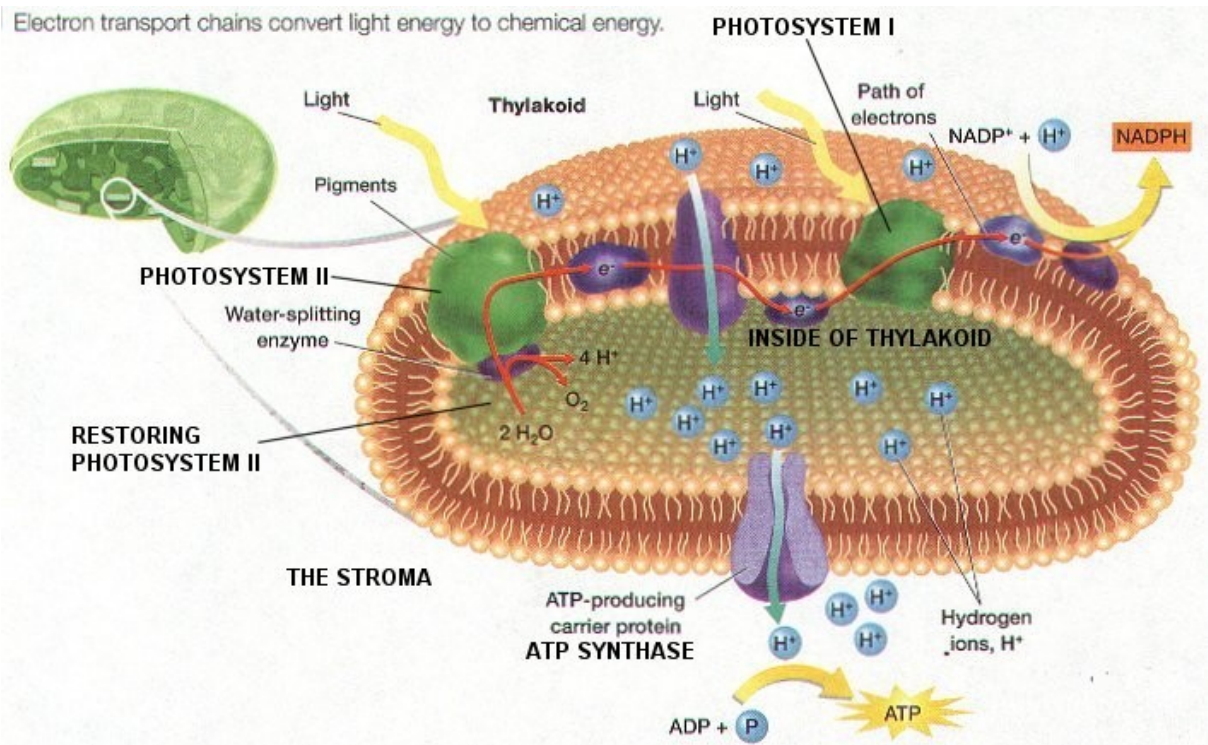
(T thylakoidní prostor, S stroma, AK anténové komplexy, I, II odpovídající fotosystémy, Fd ferredoxin, Pk plastocyanin, PQ plastochinon)



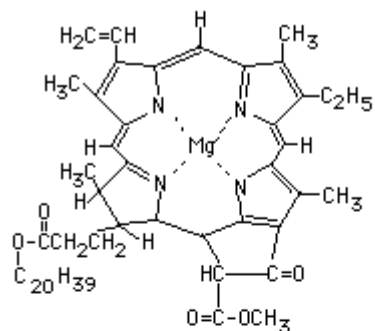
**Schematický řez chloroplastem**

(M<sub>1</sub> vnější membrána, M<sub>2</sub> vnitřní membrána, M<sub>3</sub> thylakoidní membrána, G grana, S stroma, T thylakoidní prostor, MMP mezimembránový prostor)

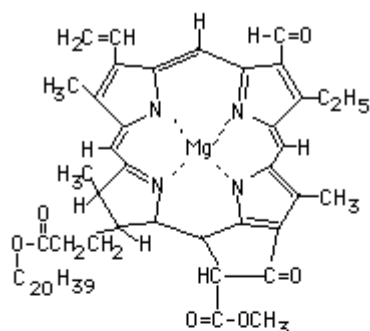




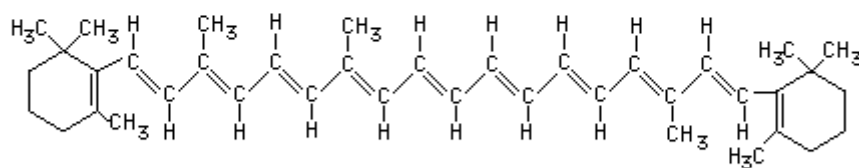
Záchyt světelné energie  
 - pigmenty



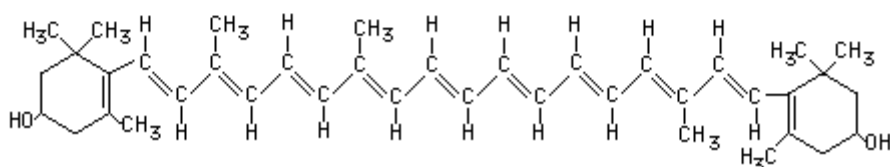
**Chlorophyll a**



**Chlorophyll b**

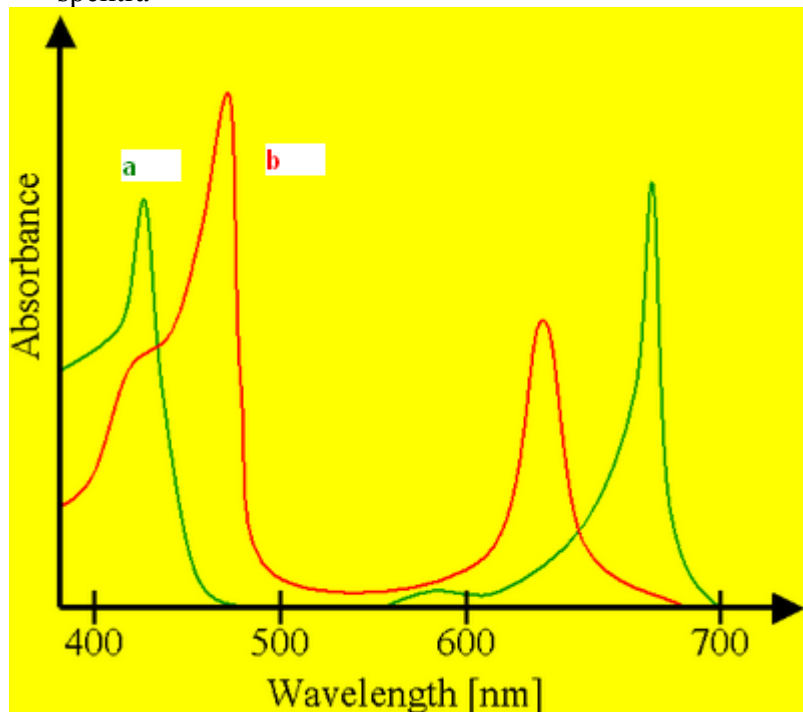


**β-Carotene**

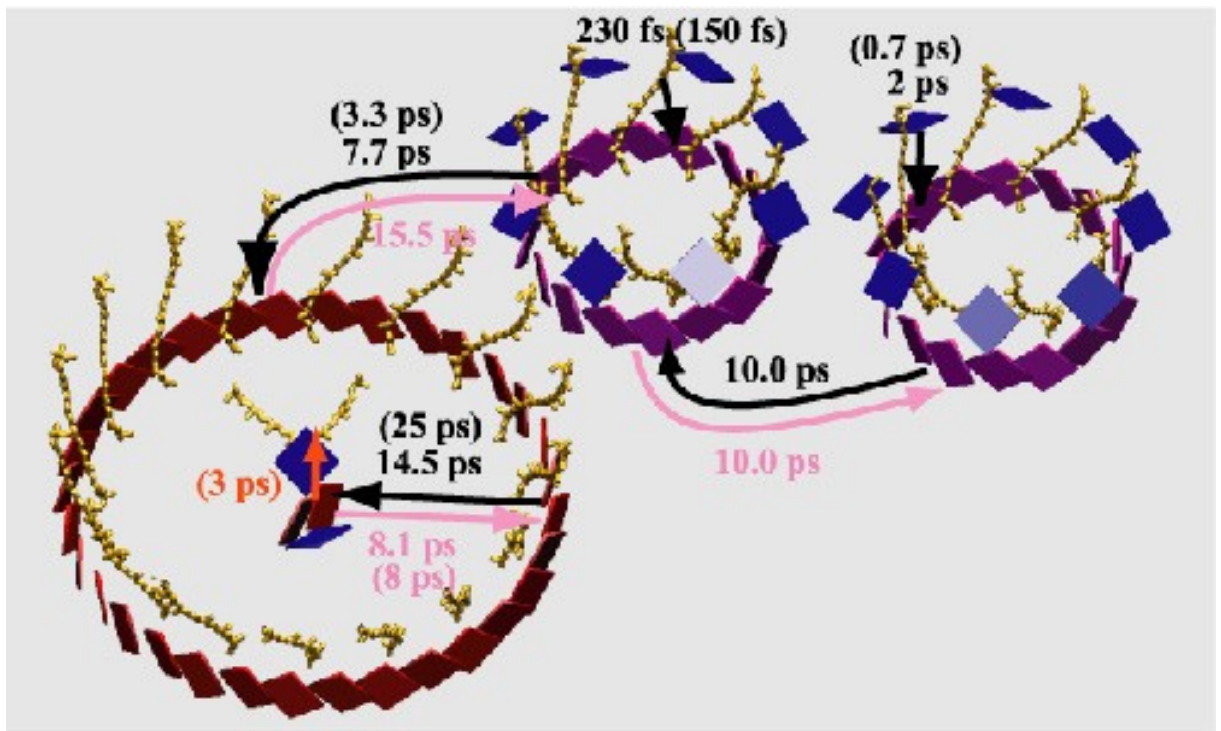
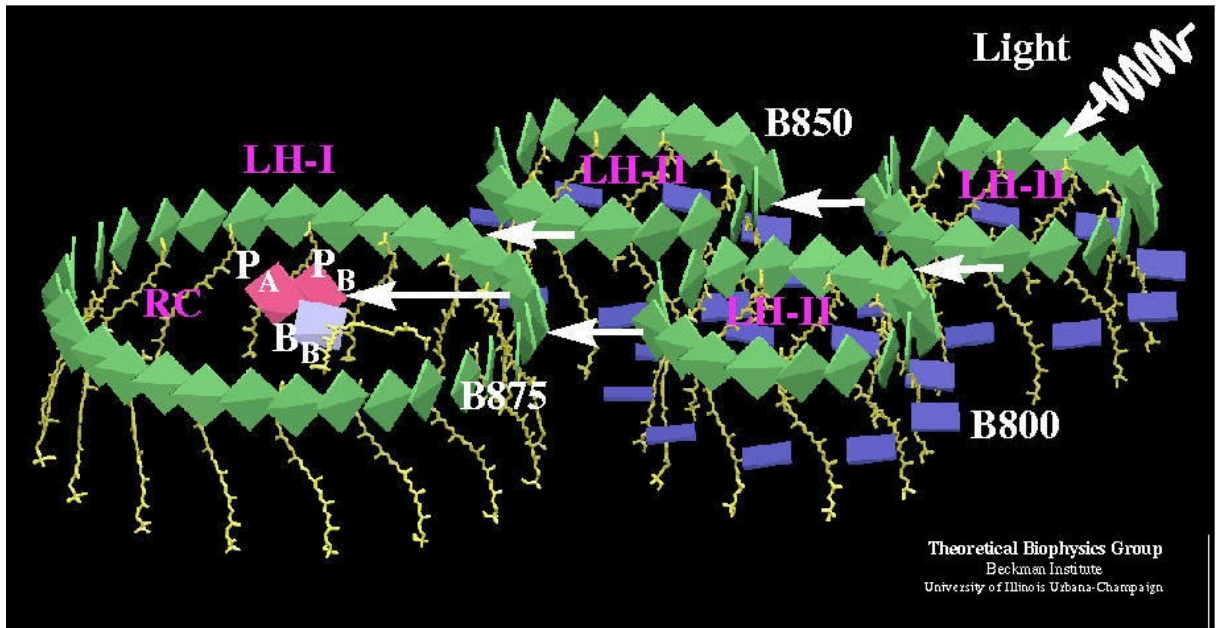


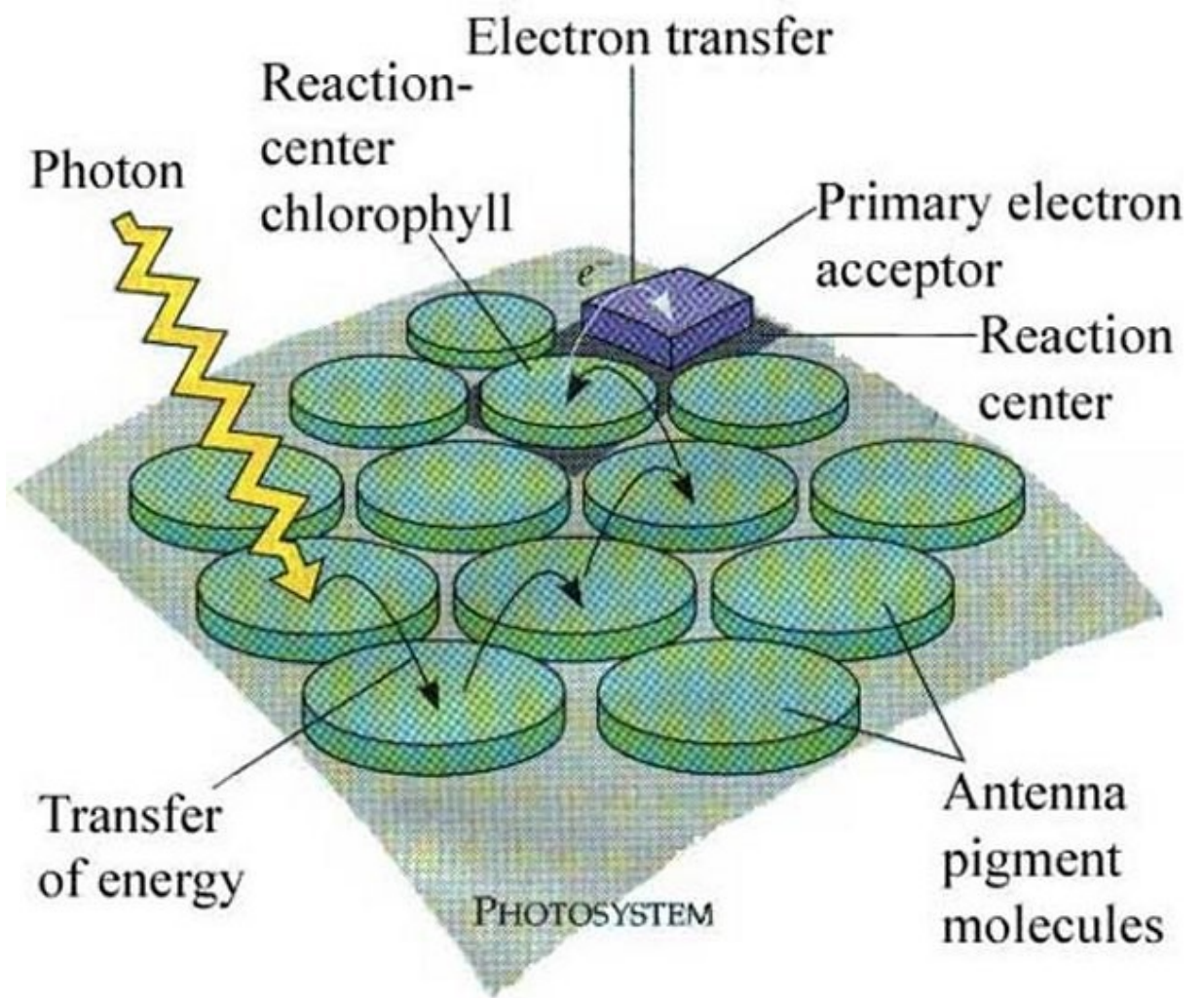
**Lutein**

- spektra



- organisace – anténní systém

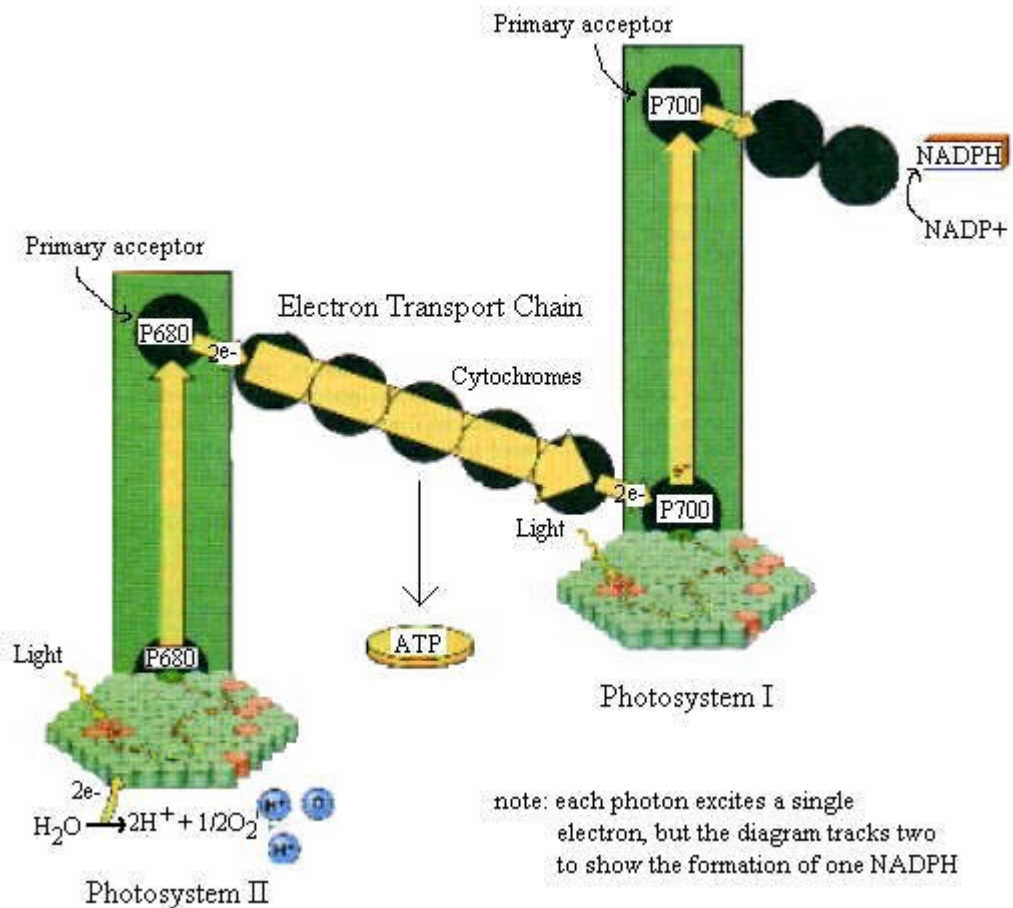




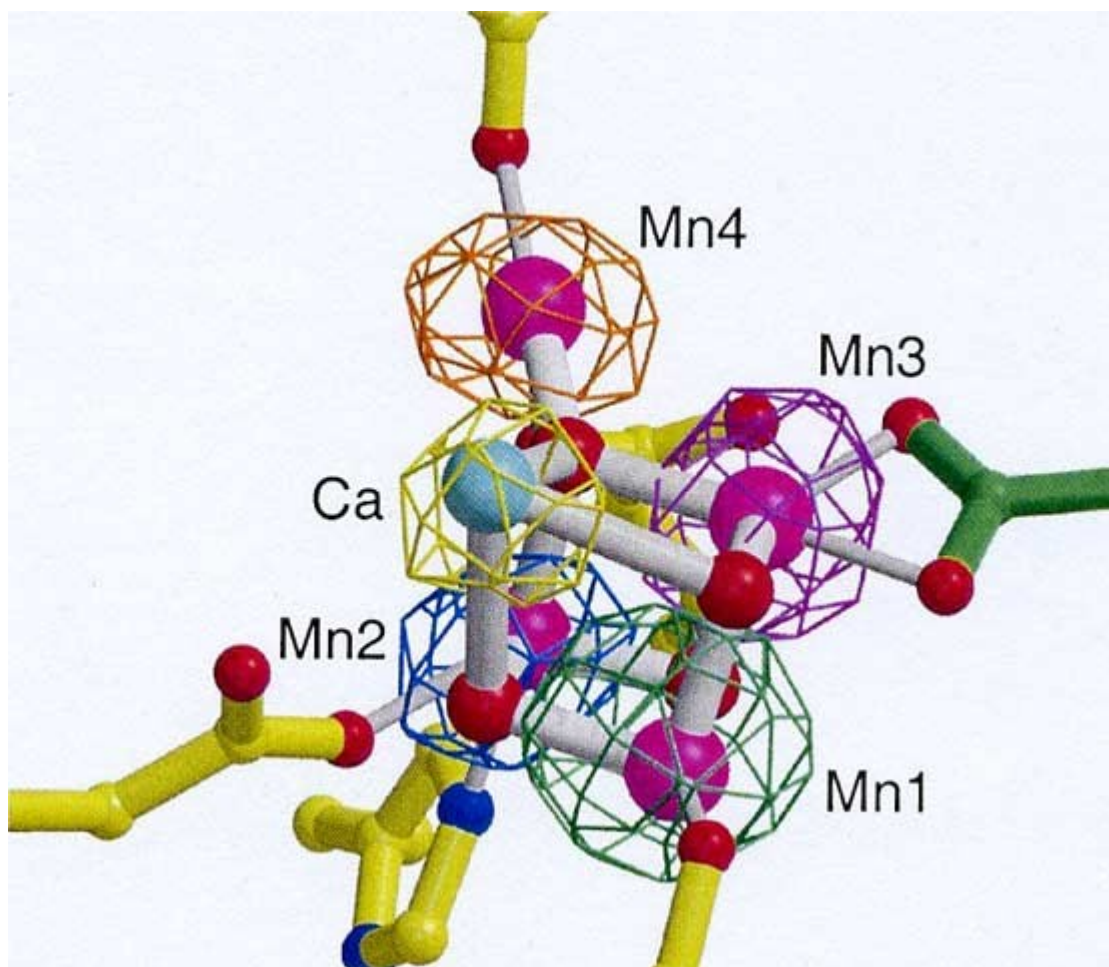


### Složení fotosystémů I a II

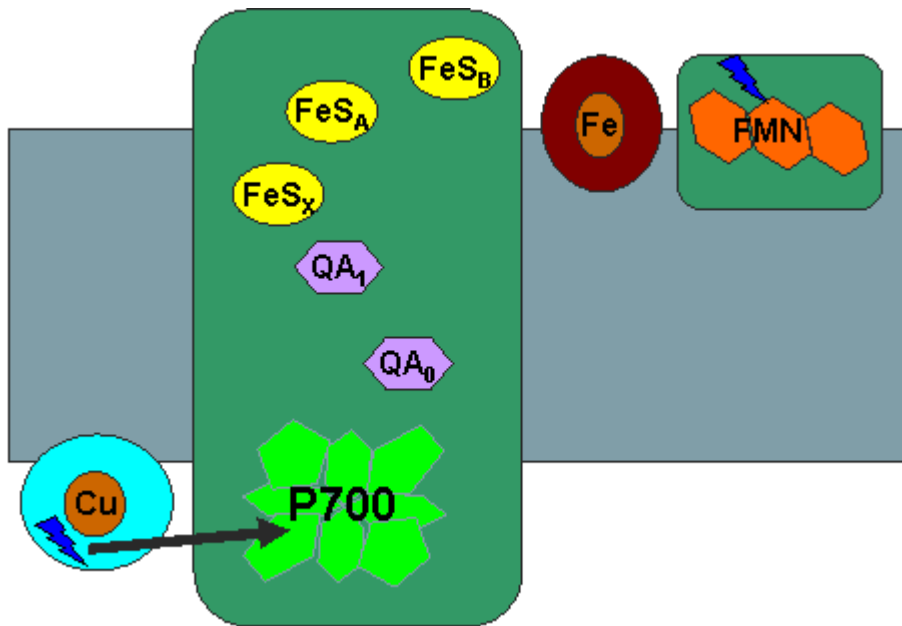
Látka	Přibližný počet molekul
<b>Fotosystém I</b>	
anténové chlorofyly	200
karotenoidy	50
reakční centrum P-700	1
cytochrom $c_{552}$	1
plastocyanin	1
cytochrom $b_{563}$	2
ferredoxin	2
ferredoxin-NAD <sup>+</sup> -reduktasa	1
<b>Fotosystém II</b>	
anténové chlorofyly	200
karotenoidy	50
reakční centrum P-680	1
plastočinon	4
manganaté ionty	6
cytochrom $b_{559}$	2



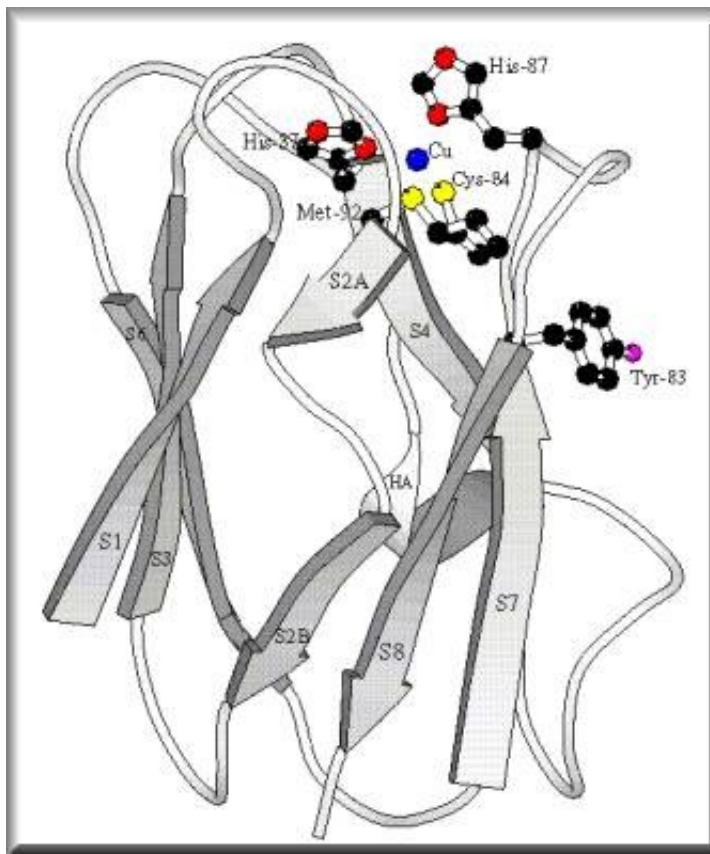
Štěpení vody – „fotolýza?“



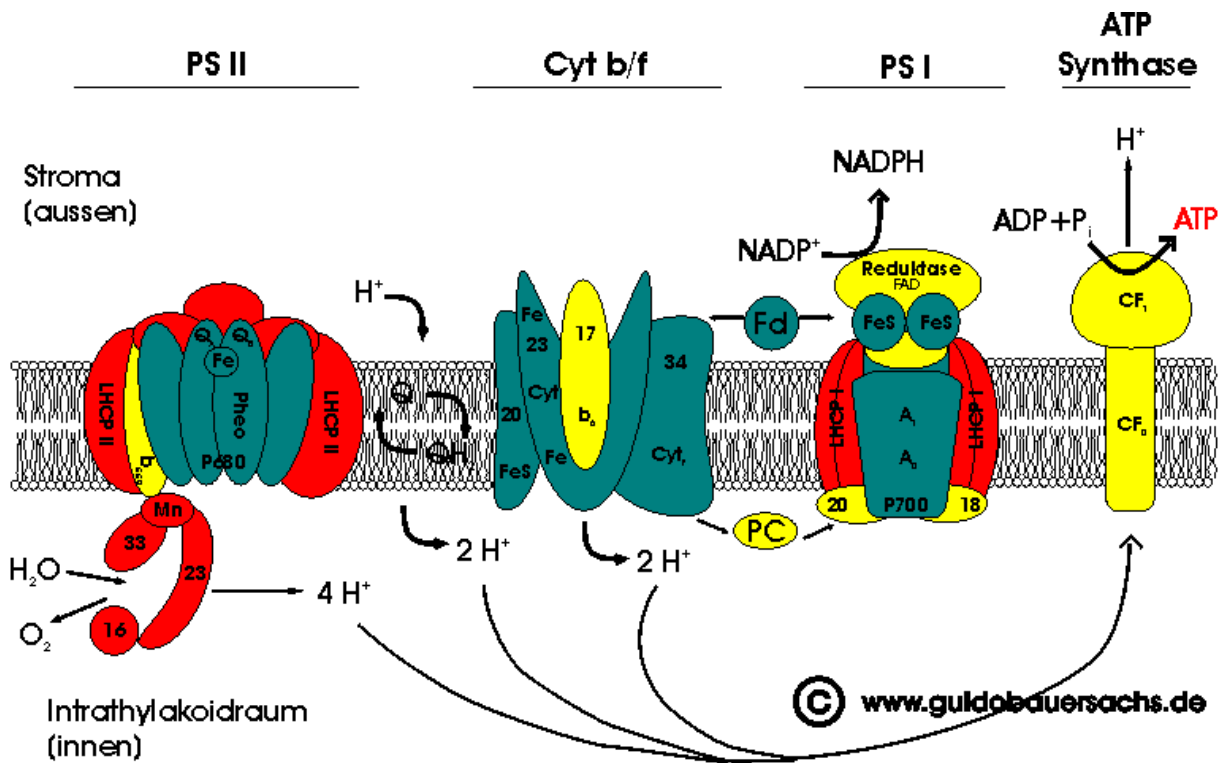
## Redukce NADP



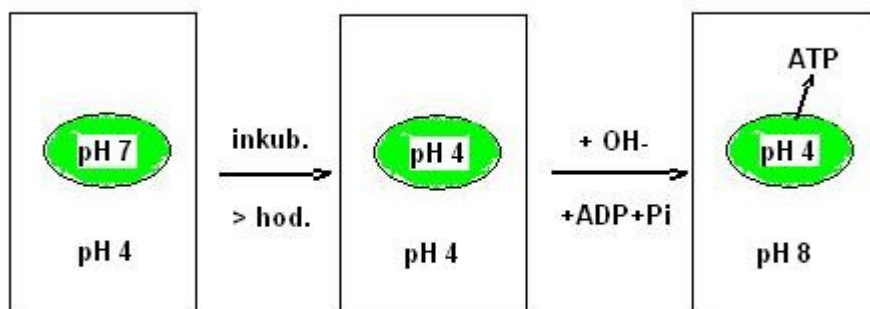
## PLASTOCYANIN

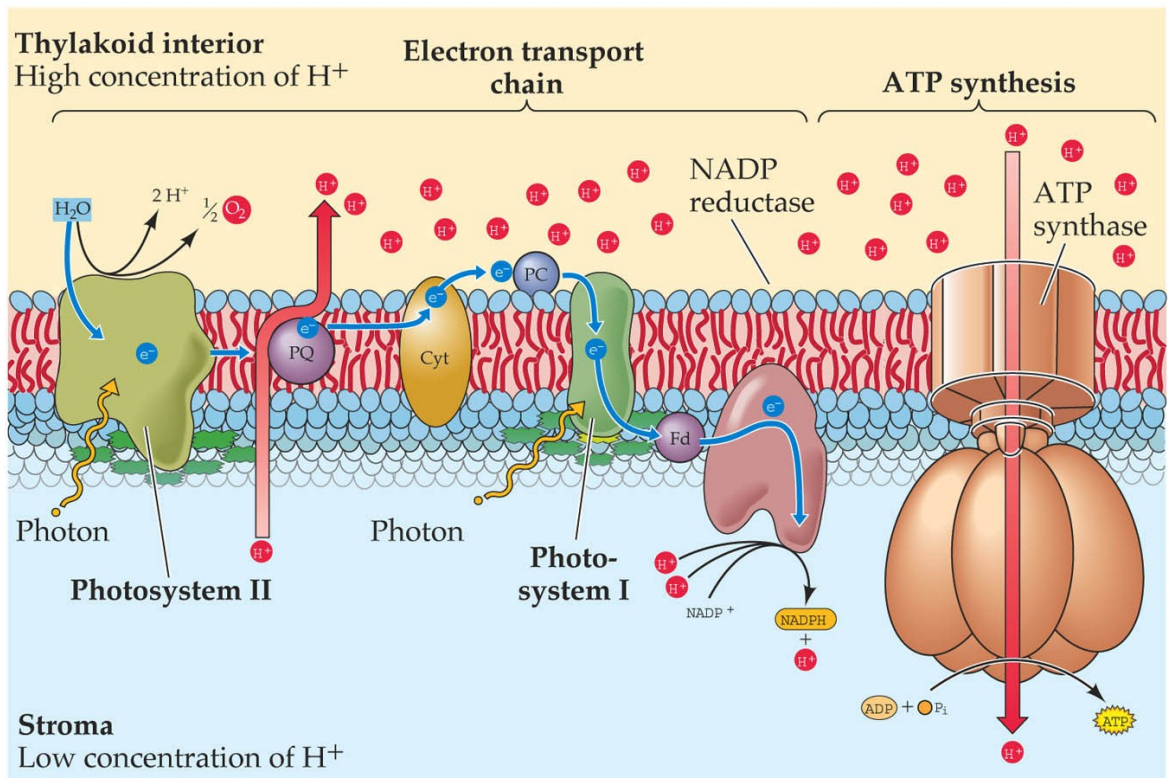


Tvorba ATP



Experimentální průkaz tvorby ATP na konto  $\Delta H^+$

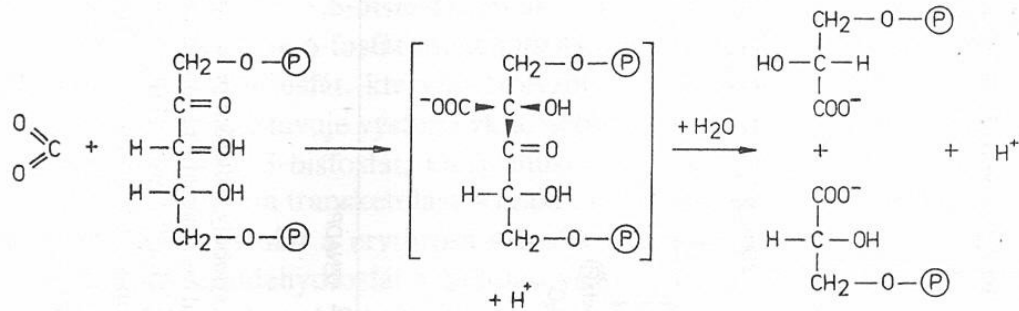




LIFE: THE SCIENCE OF BIOLOGY, Seventh Edition, Figure 8.11 Chloroplasts Form ATP Chemiosmotically  
 © 2004 Sinauer Associates, Inc. and W. H. Freeman & Co.

## Temná fáze

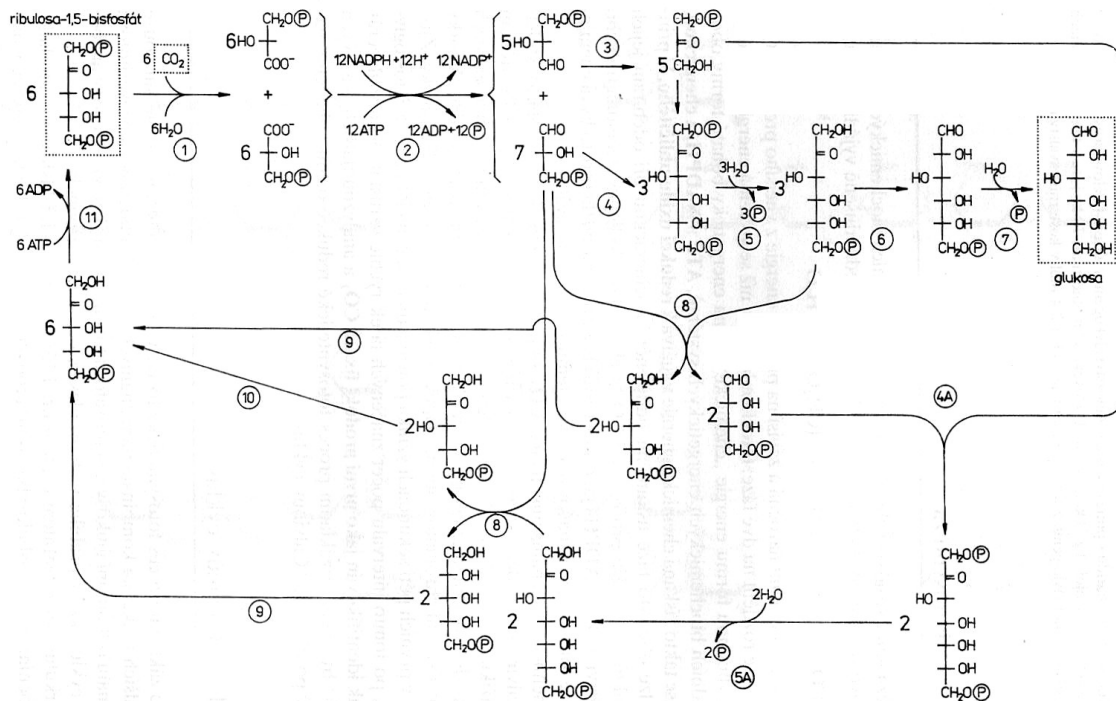
- fixace CO<sub>2</sub>

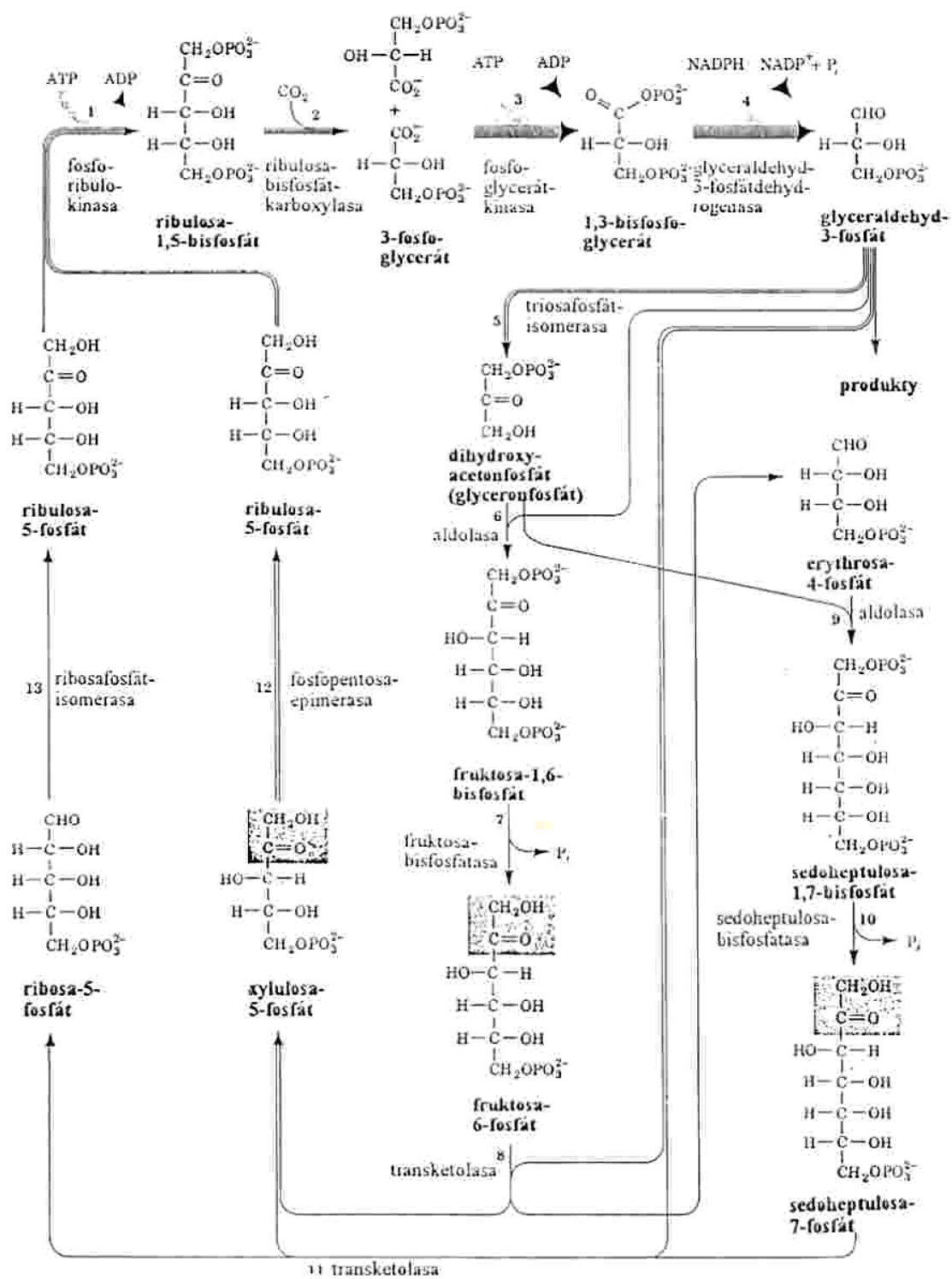


RUBISCO

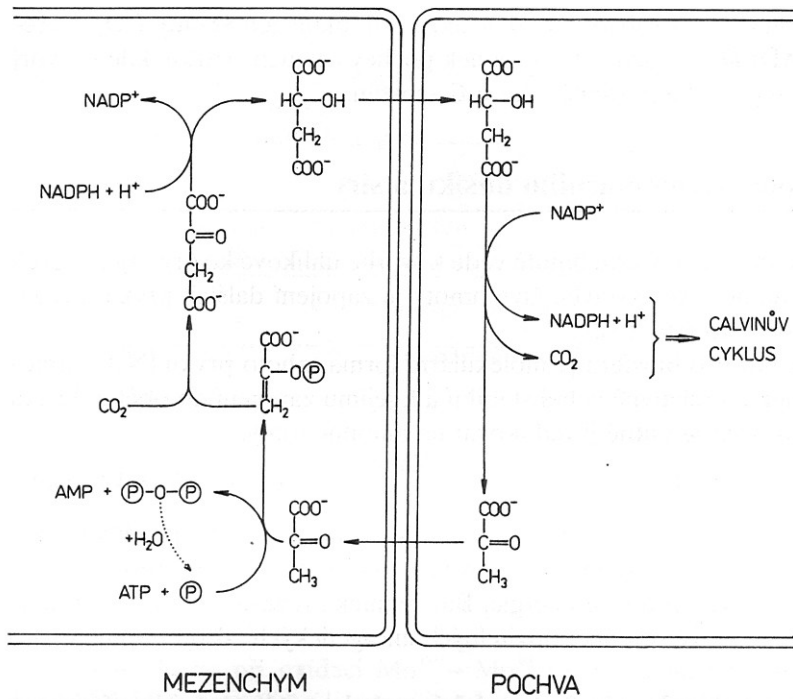
Redukce 3-PG – analogie s glykolýzou, spotřeba NADPH a ATP – tvorba GA3P  
 Tvorba hexos (fruktosa, glukosa – P) – atd.

## Regenerace Rul-1,5-bisP – Calvinův cyklus



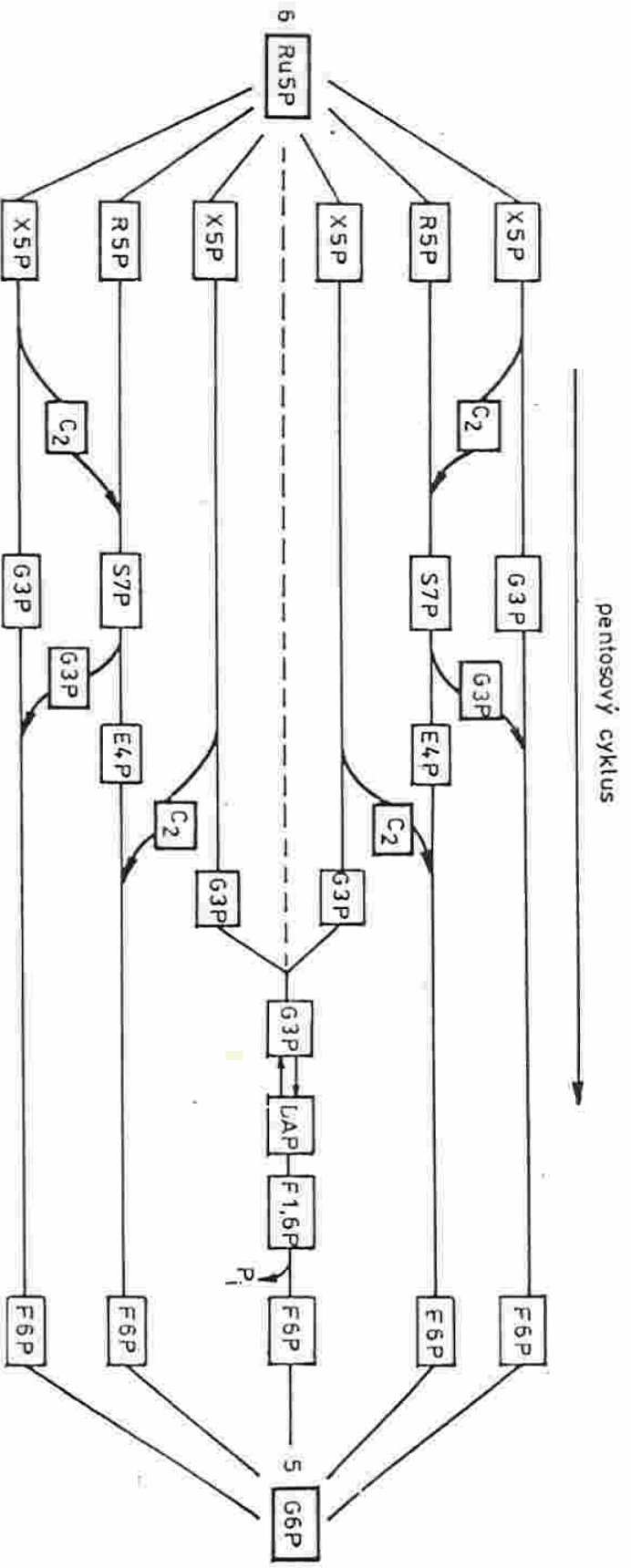


## Záchyt nízkých koncentrací CO<sub>2</sub> – tvorba C<sub>4</sub> sloučenin (OA, malát)



Obr. 145 Schéma fixace CO<sub>2</sub> u (malátových) C<sub>4</sub>-rostlin





4.19 Zjednodušené schéma regenerační fáze pentosového cyklu a Calvinova cyklu (kap. 6.2.3)

Seznam zkratk:

aktivovaný glykolaldehyd

Aldosy

- glyceraldehyd-3-fosfát
- erythrosa-4-fosfát
- ribosa-5-fosfát
- glukosa-6-fosfát

$C_2$

- G3P
- E4P
- R5P
- G6P

Ketosy

- dihydroxyacetonfosfát
- ribulosa-5-fosfát
- xyľulosa-5-fosfát
- fruktosa-6-fosfát
- fruktosa-1,6-bisfosfát
- sedoheptulosa-7-fosfát

- DAP
- Ru5P
- X5P
- F6P
- F1,6P
- S7P

