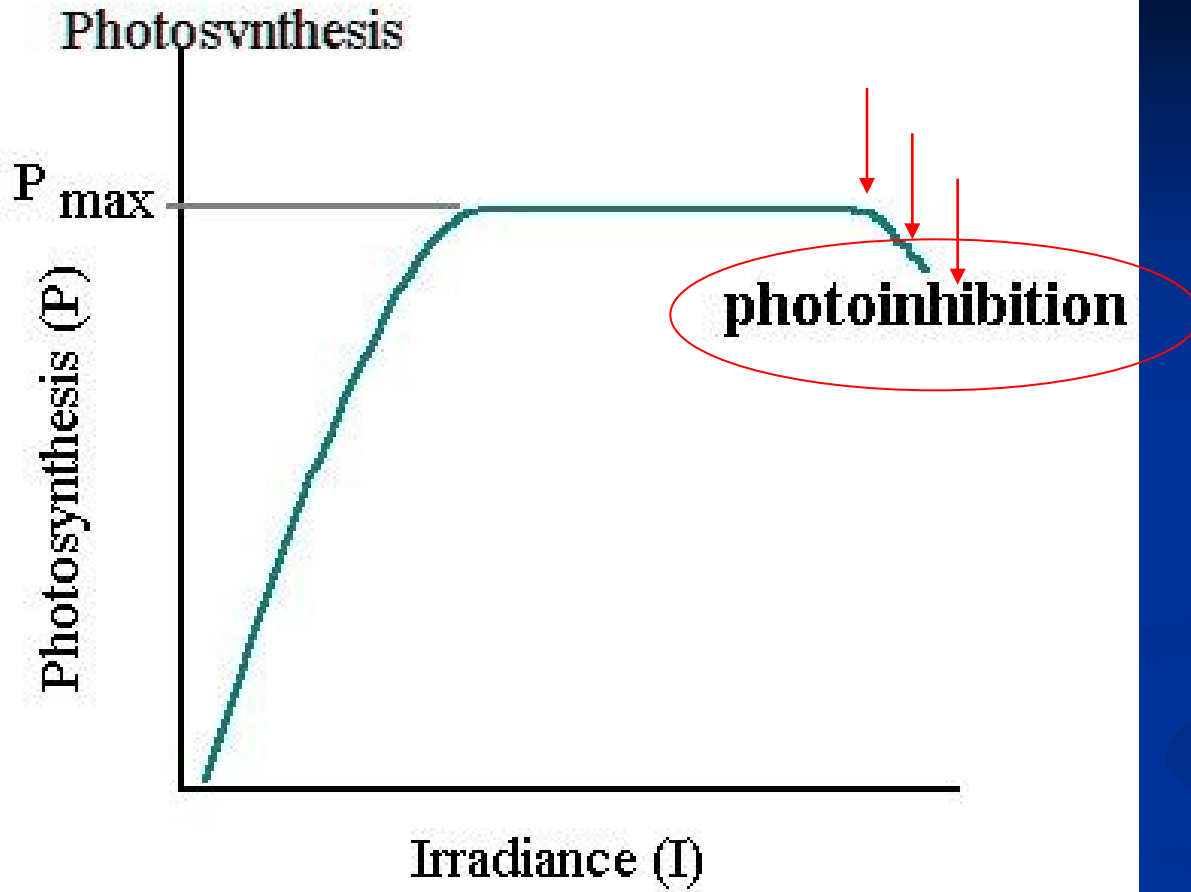
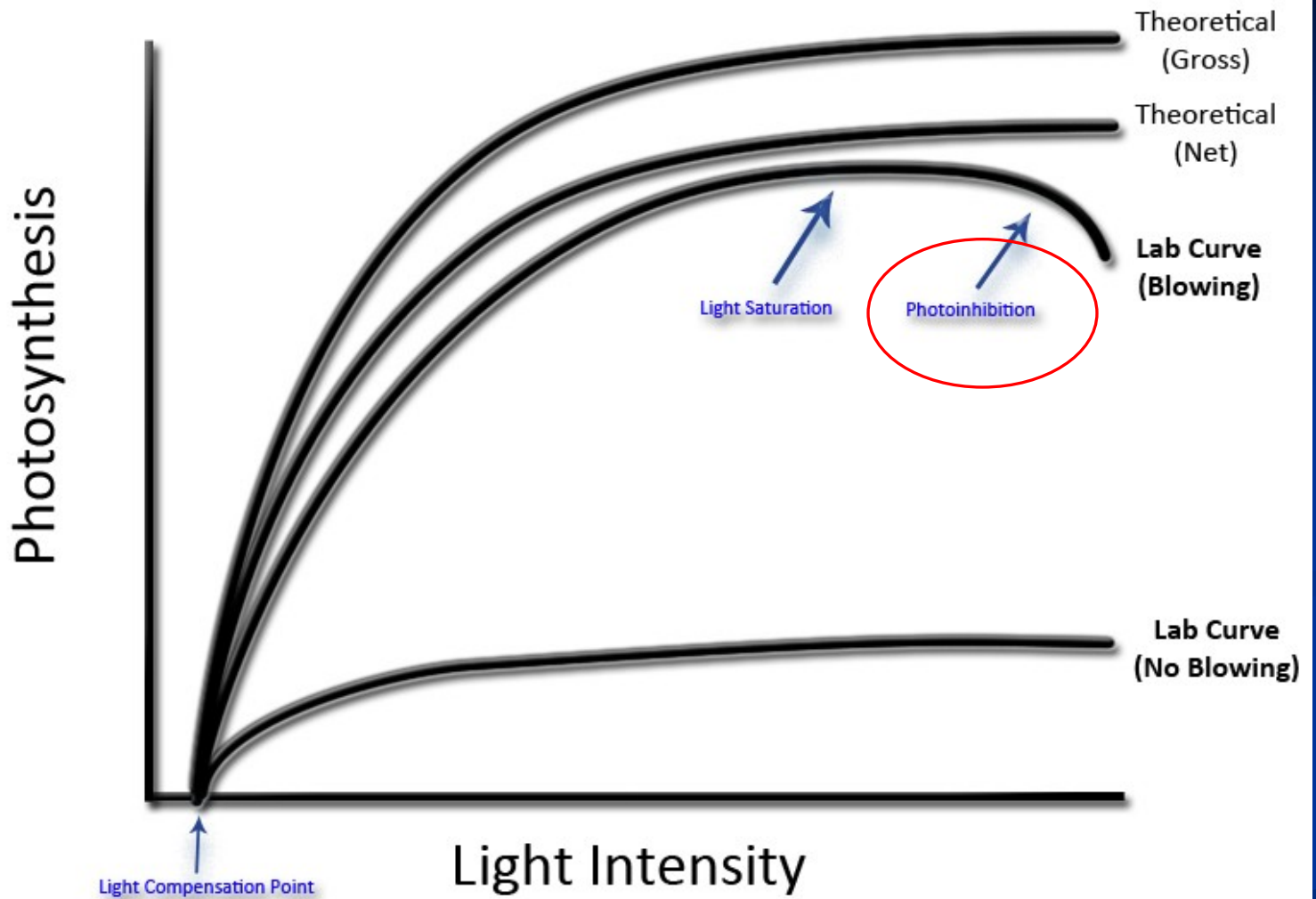


# Fotoinhibice fotosyntézy

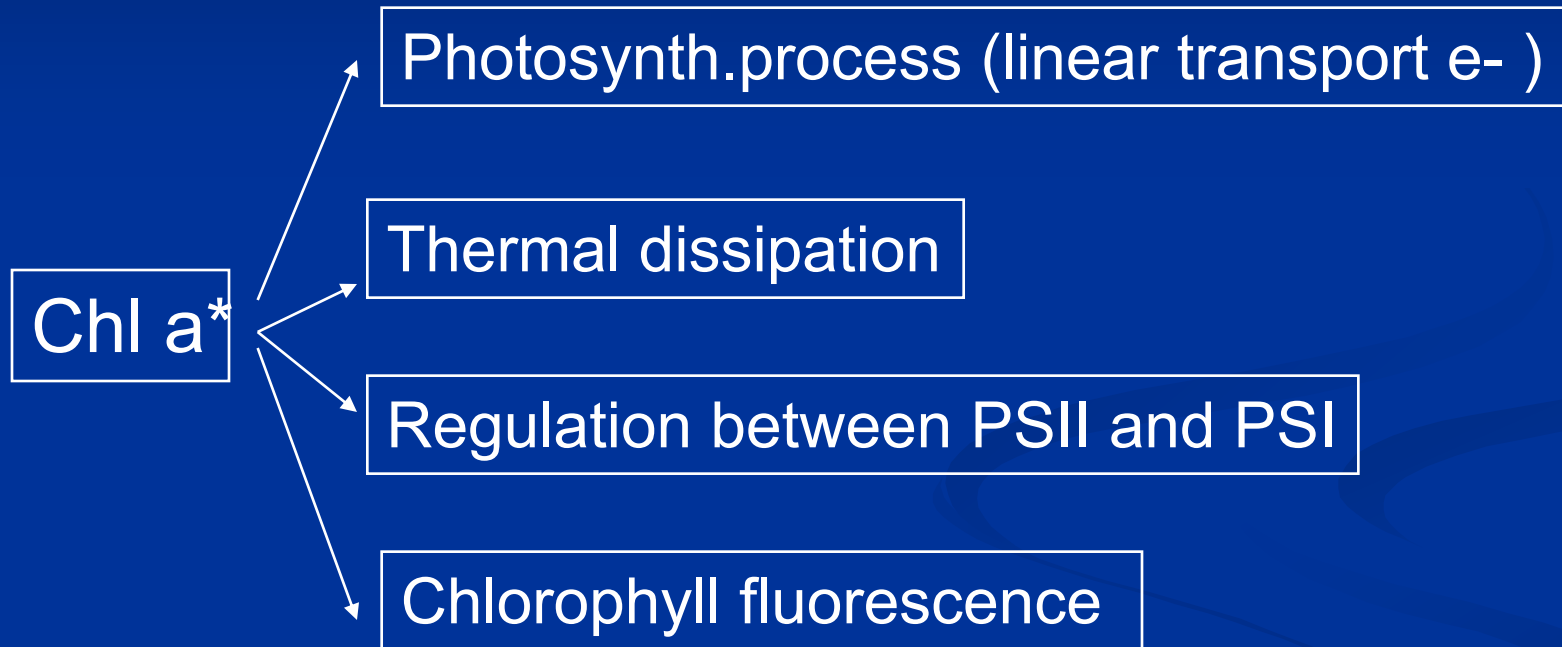
## fluorometrické metody stanovení

M. Barták

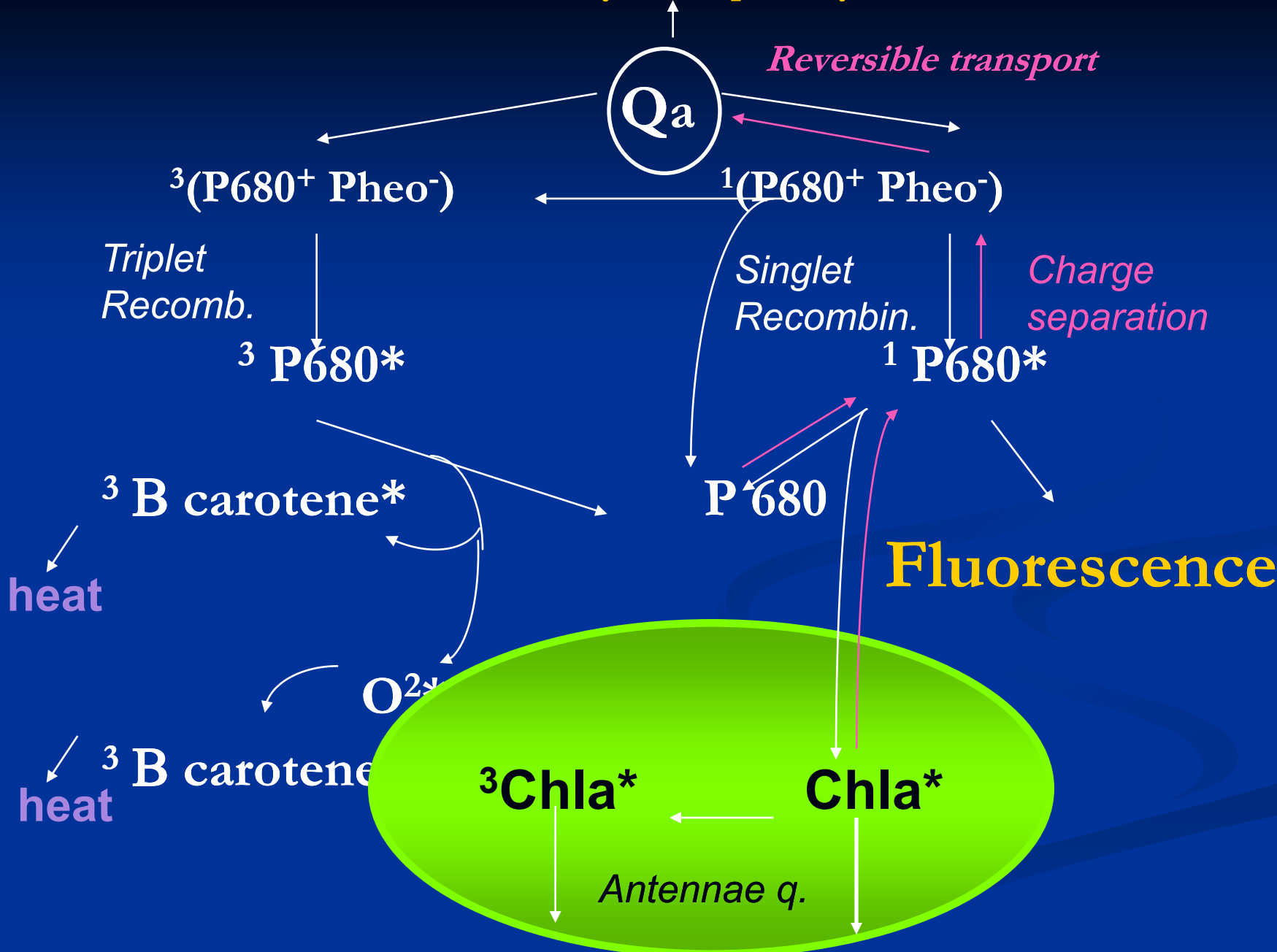




# Basic de-excitation mechanisms of Chl a



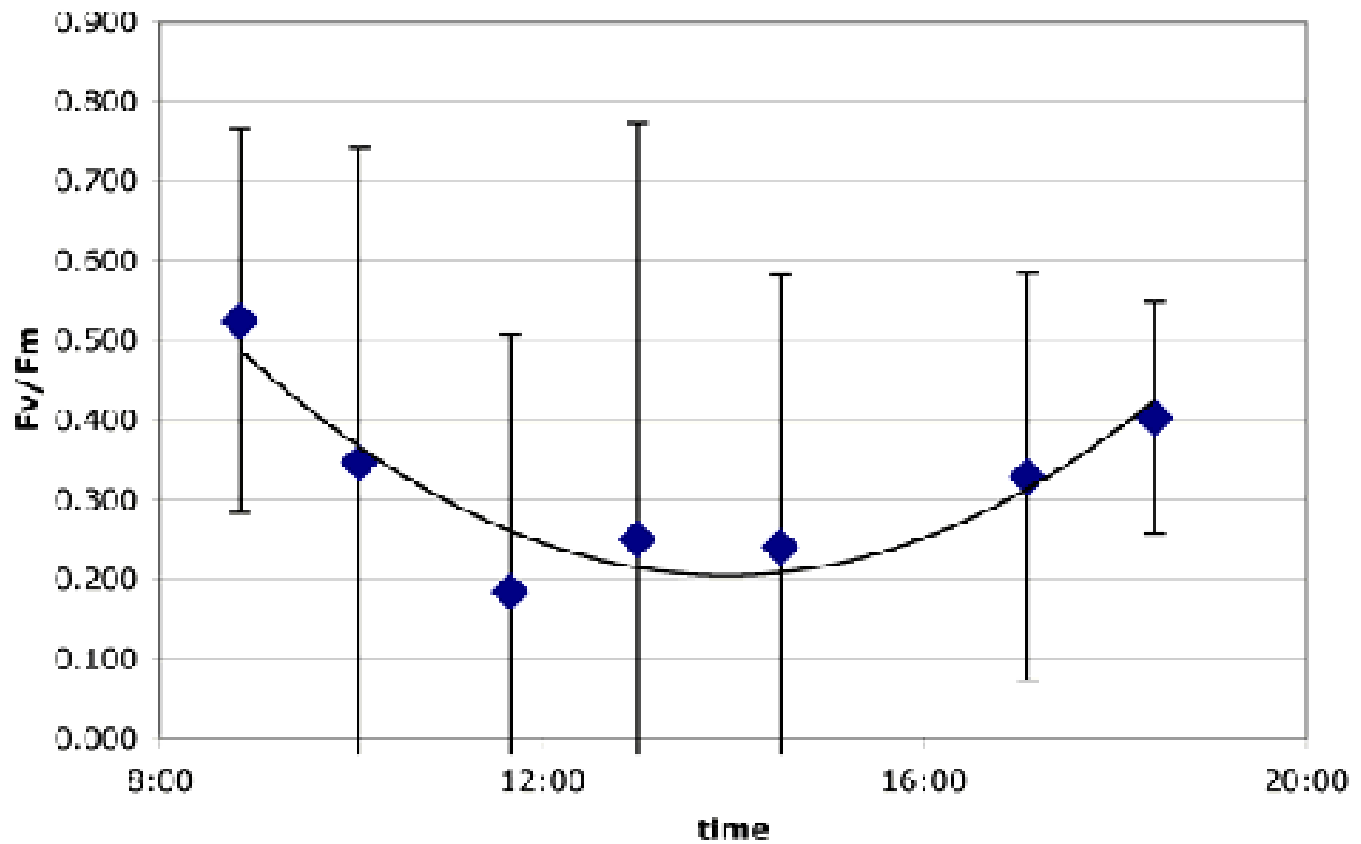
# Photosynthetic pathway



# Metody stanovení míry fotoinhibice

- Kautského křivka fluorescence chlorofylu doplněná o zhasací mechanismy
- Časové řady parametrů fluorescence chlorofylu

### Time series of Fv/Fm 2004.09.22



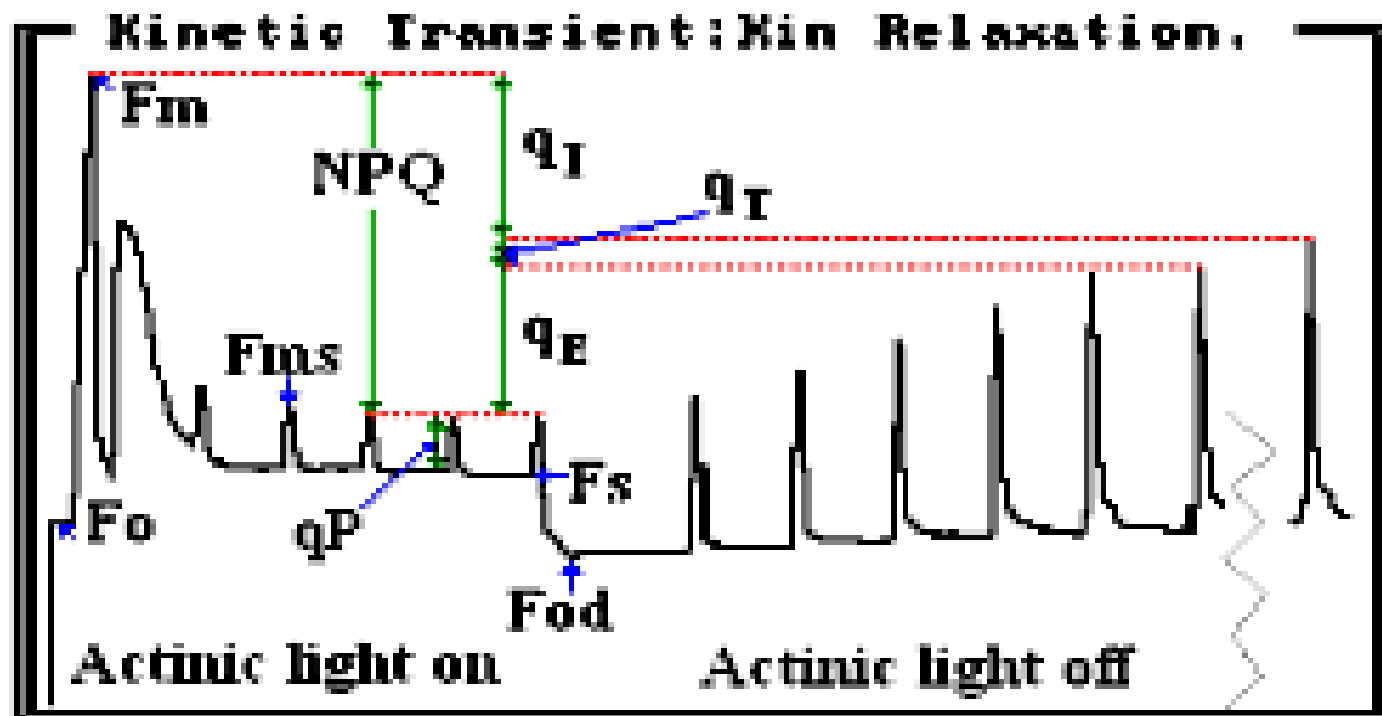
$$qP = (Fm' - F) / (Fm' - Fo')$$

$$NPQ = (Fm - Fm') / (Fm')$$

$$qN = qE + qT + qI$$

$$qE$$

## Puddle Model For PSII Antennae

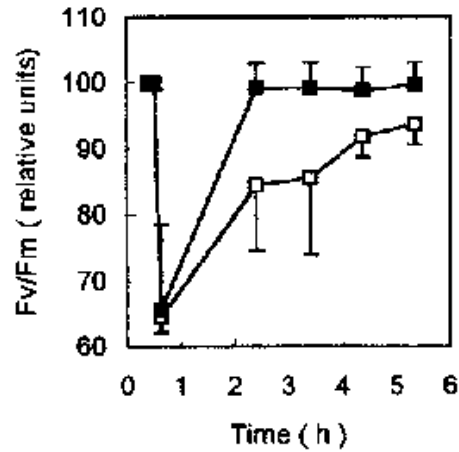
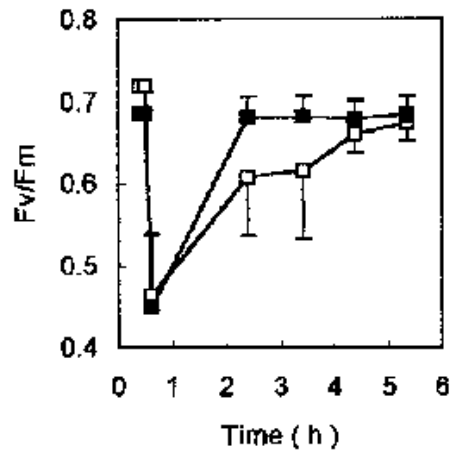


## Lake Model for PSII Antennae

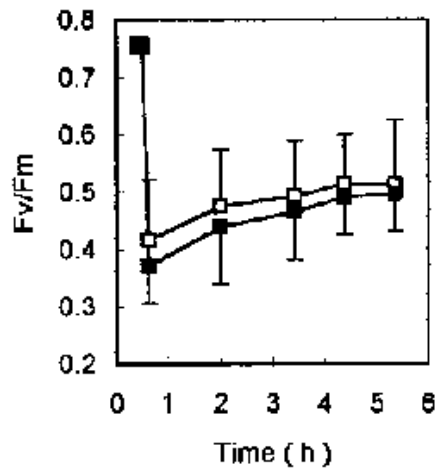


**HL** **HL - relative**

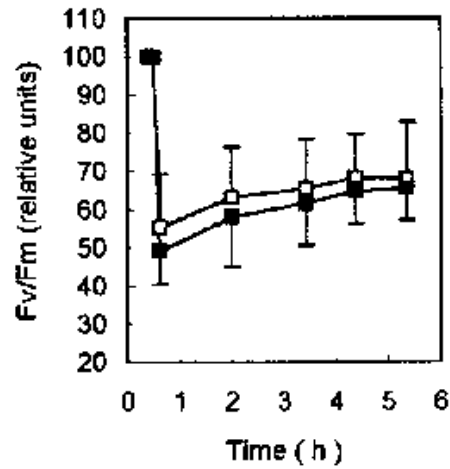
Vliv formy dusíkové výživy na rychlost zotavení se z fotoinhibice



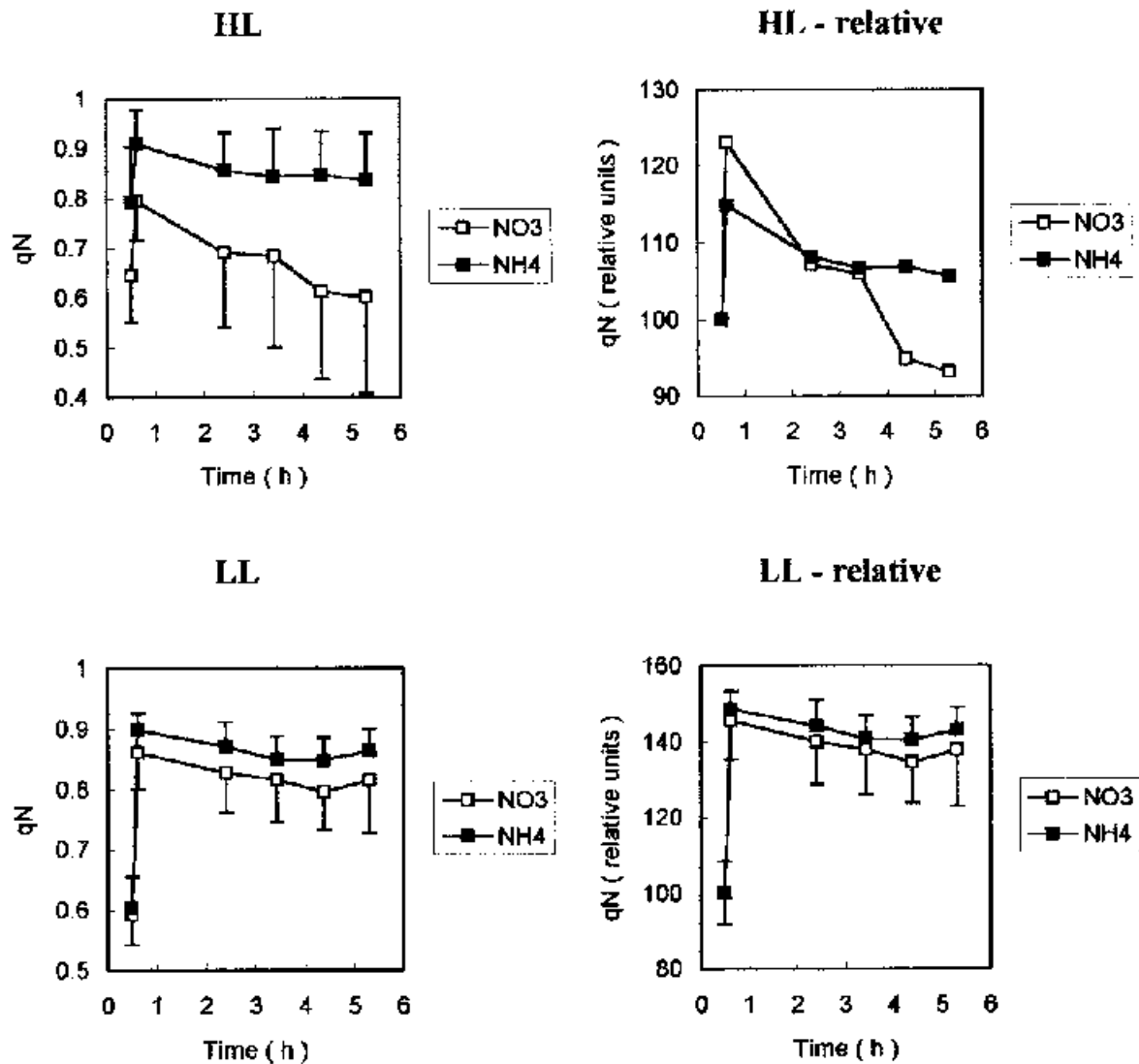
**LL**



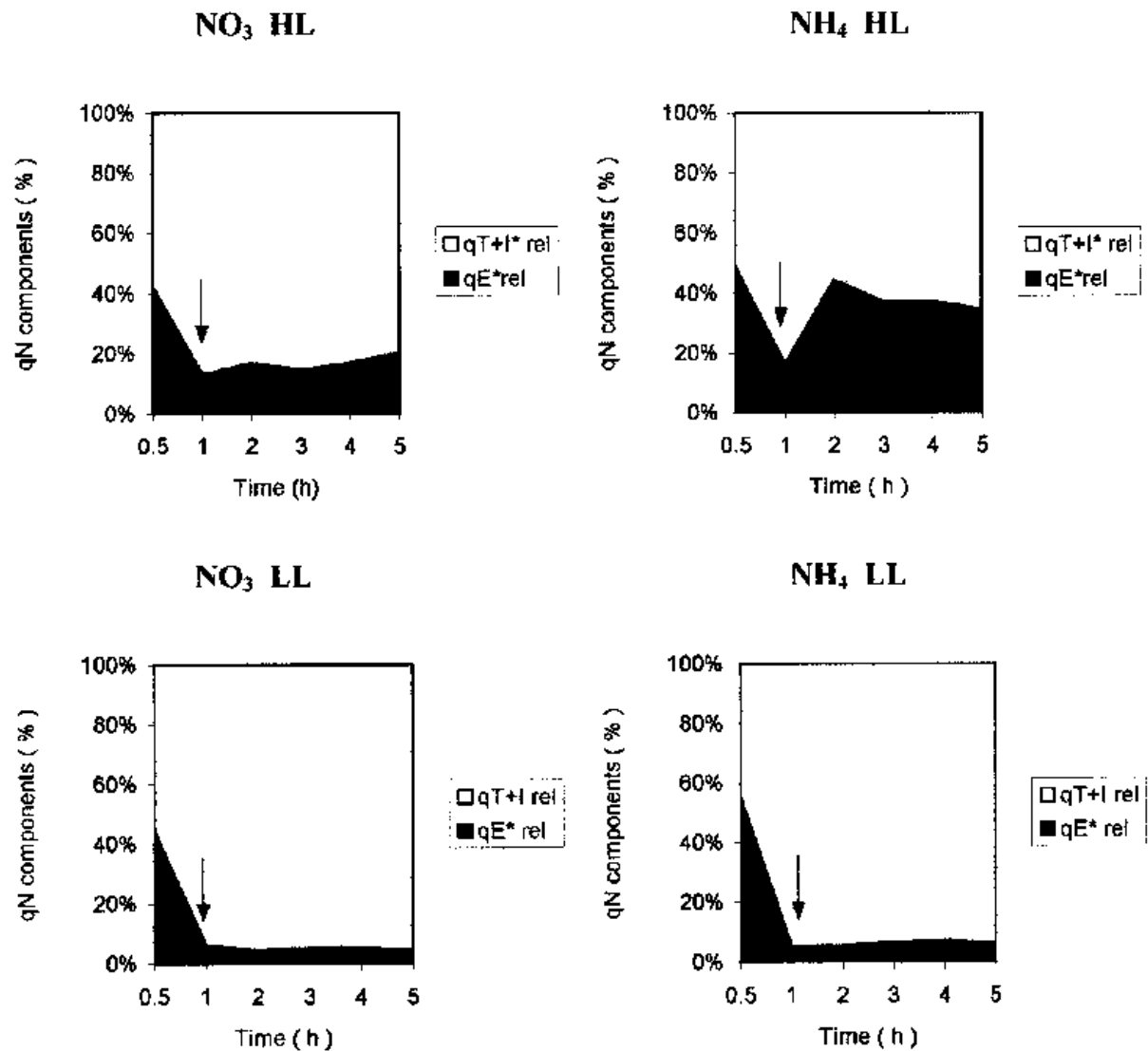
**LL - relative**



**Fig. 1.** Decrease and recovery of Fv/Fm after photoinhibitory treatment in plants of *A. pseudoplatanus* cultivated under  $400 \mu\text{mol m}^{-2} \text{s}^{-1}$  (HL, upper panels) or  $3.5$  (LL, lower panels). Open symbols: NO<sub>3</sub>-supplied plants, full symbols: NH<sub>4</sub>-supplied plants.



**Fig. 2.** Increase and recovery of non-photochemical quenching ( $qN$ ) after photoinhibitory treatment in *A. pseudoplatanus* plants cultivated under nitrate ( $NO_3$ ) or ammonium ( $NH_4$ ) nutrition and two levels of irradiance: high light (HL) =  $400 \mu mol m^{-2} s^{-1}$ , low light (LL) =  $35 \mu mol m^{-2} s^{-1}$ . Full symbols denote nitrate nutrition, open symbols denote ammonium nutrition.



**Fig. 3.** Relative proportion of energy quenching ( $qE^*$  - black area) and photoinhibitory quenching ( $qT+I^*$  - white area) forming together non-photochemical quenching ( $qN$ ) in *A. pseudoplatanus* plants during photoinhibitory treatment and recovery. Photoinhibition is indicated by an arrow. The plants were cultivated under nitrate ( $NO_3$ ) or ammonium ( $NH_4$ ) nutrition and two levels of irradiance: high light (HL) =  $400 \mu mol m^{-2} s^{-1}$ , low light (LL) =  $35 \mu mol m^{-2} s^{-1}$ .

**qT**  
= Fm' after rapid relaxation is complete usually with the actinic light turned off usually one hour - Fm' at qE / Fm' at steady state.

**qI** = Fm - Fm' at qT / Fm' at steady state.

**qN** = Fm - Fm' / Fm - Fo

**qL** = qP(Fo'/F')

**Y(NO)** = 1/NPQ + 1 + qL((Fm/Fo)-1)

**Y(NPQ)** = 1 - Y - Y(NO)

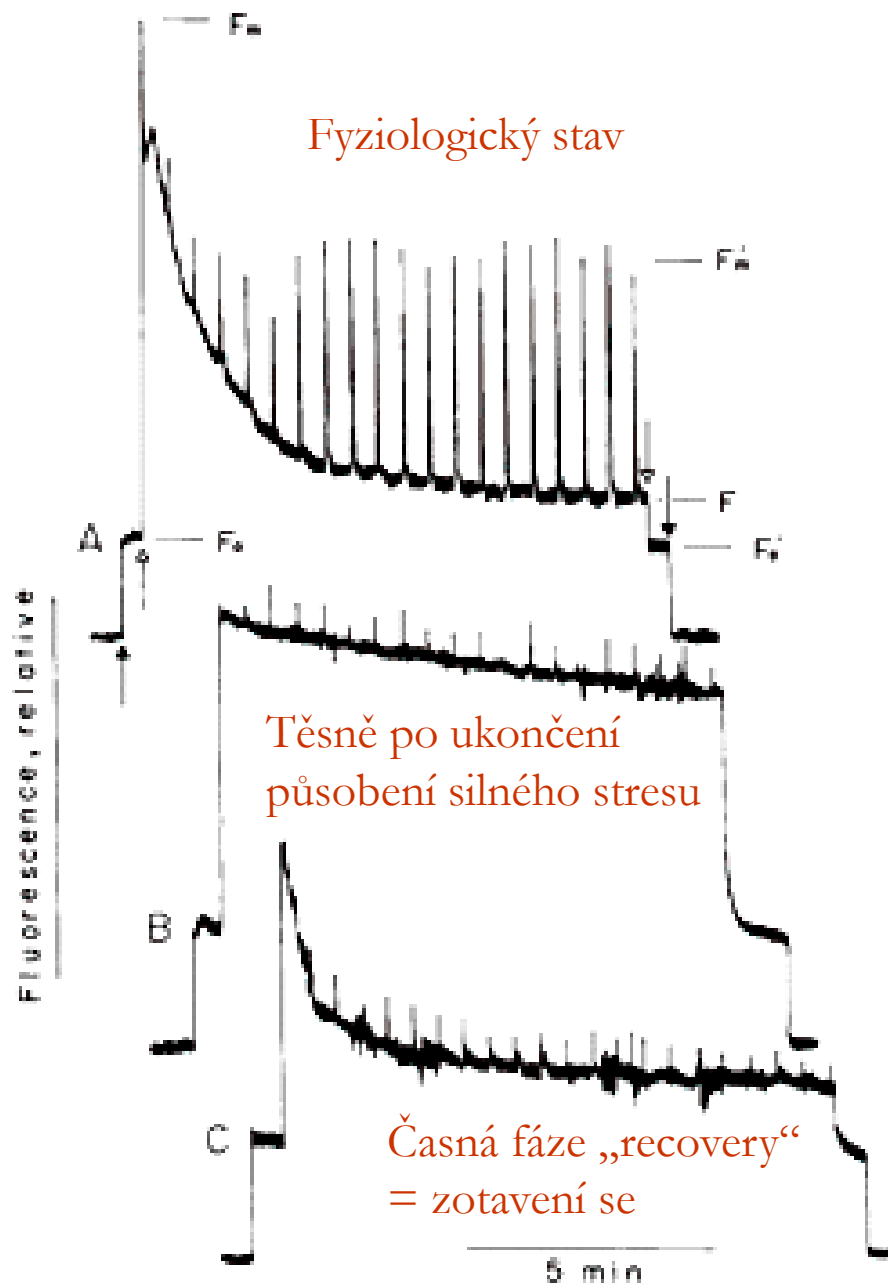
**1** = qL + Y(NPQ) + Y(NO)

**qP**  
= (Fm' - F) / (Fm' - Fo')

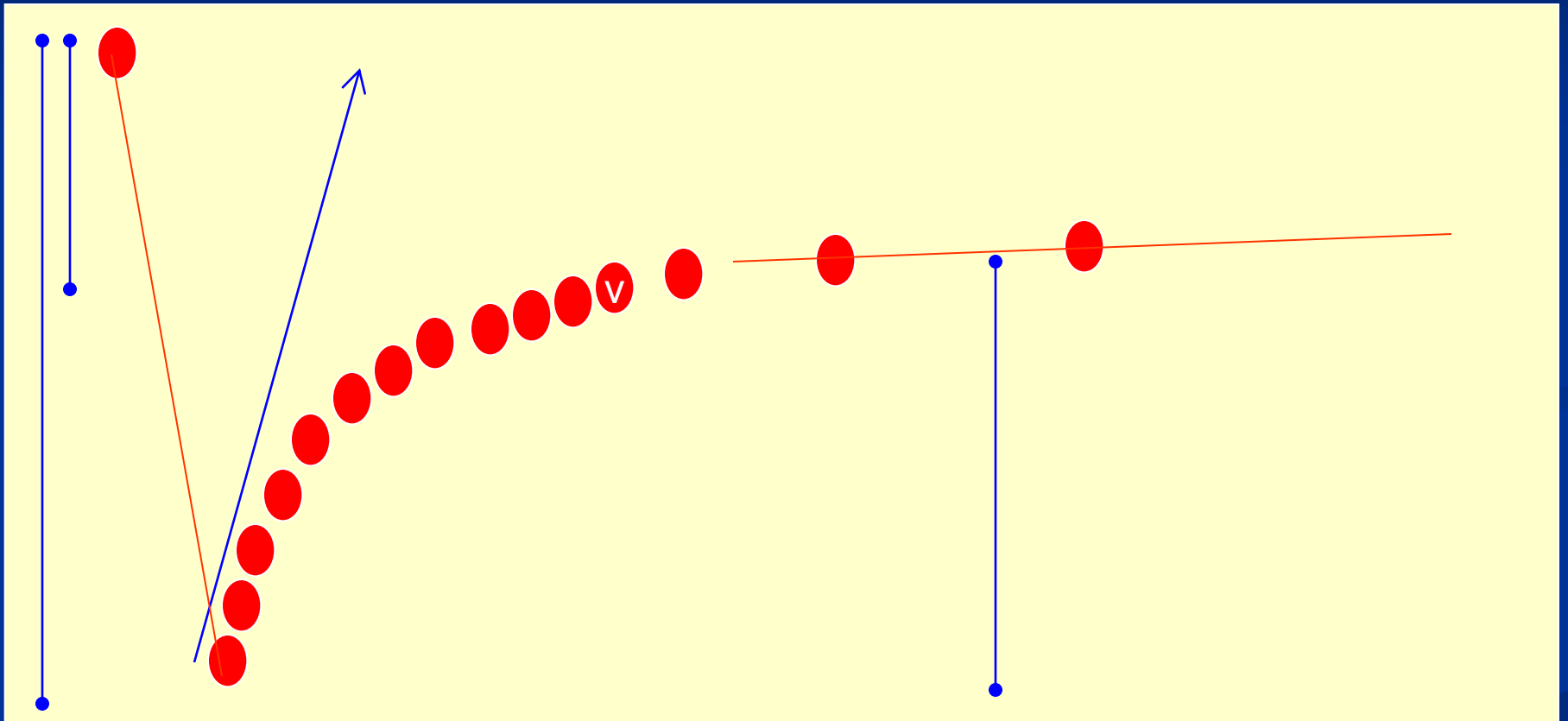
**NPQ**  
= (Fm - Fm') / (Fm')

**qN**  
= qE + qT + qI

**qE**



# Brno, Laboratoř fotosyntetických procesů



Senzitivita vůči dlouhotrvající fotoinhibici  
a zotavení se

Dámy a pánové,  
děkuji Vám za pozornost