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# Functional interaction of STN7/8 and pCK2 in photosynthetic acclimation

In plant chloroplasts, protein kinases regulate photosynthetic acclimation by phosphorylation of thylakoid membrane proteins allowing rapid short-term acclimation to changing light conditions. This type of phosphorylation control is mediated by the light-regulated kinases STN7/STN8 at the thylakoid membrane system. Recent data suggested furthermore that STN7 may be involved in long-term acclimation affecting chloroplast and nuclear gene expression (Schönberg et al., 2017, Longoni and Goldschmidt-Clermont, 2021). The plastid kinase originally identified as a regulator of plastid gene expression is plastid casein kinase 2 (pCK2) that phosphorylates RNA binding proteins and components of the transcription apparatus (Rödiger et al., 2021). We have generated the triple mutant stn7/stn8/pck2 and characterized it phenotypically and biochemically. Our goal is to unravel functional crosstalk between these three protein kinases in photosynthetic acclimation. Since the stn7/stn8/pck2 phenotype is severe we hypothesized cooperativity between the different chloroplast kinases in the regulation of chloroplast functions. Phosphoproteome analyses revealed cooperation in the phosphorylation of at least two proteins of the thylakoid membrane system, i.e. PsbH and PSI-P.

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