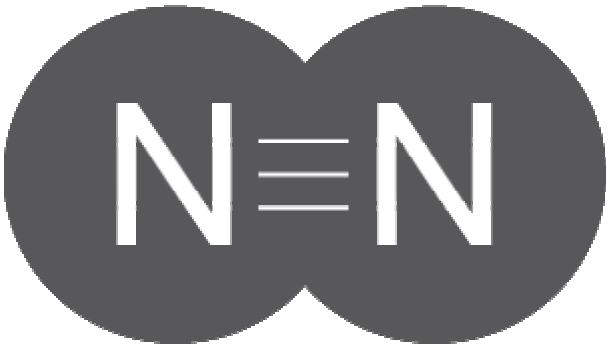

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PS2-3 Role of SipA, the NblS histidine kinase-binding factor, in acclimation to stress and photosynthesis regulation in *Synechococcus* sp. PCC7942

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In *Synechococcus* sp. PCC7942, different stress conditions result in photosynthesis down-regulation and phycobilisome degradation. The small protein NblA is a key effector of this process of chlorosis or bleaching. Transcription of the *nblA* gene is subjected to a complex control in response to a variety of signals and regulatory factors. Amongst them, the histidine kinase NblS and the response regulator NblR that belong to different signalling systems and have, respectively, negative and positive effects on *nblA* expression. Yeast two-hybrid approaches led to the identification of SipA (NblS interacting protein A), a protein that binds to the ATP-binding domain of NblS. Constitutive expression of the *sipA* gene from an ectopic promoter resulted in a strong *non-bleaching* phenotype, a result supporting SipA cooperation with NblS in down-regulation of *nblA*. The lethality of the NblR mutant under nitrogen deprivation and high light stress was significantly suppressed by inactivation of *sipA*, suggesting that SipA impairs recovery from chlorosis in the absence of a functional *nblR* gene. Inactivation of the *sipA* gene had a very small effect on pigment content, *nblA* expression, and phycobilisome degradation induced by nitrogen deprivation or high light stress. With the aim of discovering the "*sipA* phenotype", we have investigated photosynthesis performance and acclimation to a series of stress conditions. In particular, we have monitored chlorophyll fluorescence and oxygen evolution activities of photosystem II in different genetic backgrounds and environmental conditions, and tested the sensitivity to and recovery from additional types of stresses. As a result, a pleiotropic phenotype was unravelled for the SipA strain, which seems to be specifically impaired in acclimation to particular types of stress.