

Rubredoxin in PSII of *Synechocystis* sp. PCC 6803

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Rubredoxin A (RubA) is a small nonheme iron protein located on the stromal side of thylakoid membranes in cyanobacteria. In *Synechocystis* sp. PCC 6803 (*Syn* 6803), removal of RubA from PSII prevents supercomplex formation and leads to significantly inhibited growth. RubA has been proposed to be involved in the delivery and/or stabilization of the nonheme iron on the acceptor side of PSII. To test this hypothesis, we aim to alter the reduction potential of RubA by creating selected point mutations. Based on homology to bacterial rubredoxins, we have generated RubA variants predicted to have more positive (A58V) and more negative (V55L) reduction potentials compared to the native form. Truncated forms of these proteins have been expressed and purified from *E. coli* and are being studied *in vitro* using electrochemistry and NMR. We are also complementing a *Syn* 6803 $\Delta rubA$ mutant with RubA variants and will analyze growth, photosynthetic efficiency, and photosynthetic protein complex accumulation. Together, these studies will inform the mechanisms of PSII acceptor side assembly and regulation.