Transcriptional and posttranscriptional regulation of cyanobacterial photosynthesis

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Proposal

Organization and dynamics of bioenergetic systems in bacteria

Transcriptional and posttranscriptional regulation of cyanobacterial photosynthesis

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Abstract

Cyanobacteria are well established model organisms for the study of oxygenic photosynthesis, nitrogen metabolism, toxin biosynthesis, and salt acclimation. However, in comparison to other model bacteria little is known about regulatory networks, which allow cyanobacteria to acclimate to changing environmental conditions. Current work has begun to illuminate how transcription factors modulate expression of different photosynthetic regulons. During the past few years, the research on other regulatory principles like RNA-based regulation showed the importance of non-protein regulators for bacterial lifestyle. Investigations on modulation of photosynthetic components should elucidate the contributions of all factors within the context of a larger regulatory network.

Here, we focus on regulation of photosynthetic processes including transcriptional and posttranscriptional mechanisms, citing examples from a limited number of cyanobacterial species. Though, the general idea holds true for most species, important differences exist between various organisms, illustrating diversity of acclimation strategies in the very heterogeneous cyanobacterial clade.

Keywords

Cyanobacteria, photosynthesis, two-component system, RNA regulation, high-light acclimation