

Metabolic phenotyping of cyanobacteria with increased biofuel productivity

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Project Goals: This project aims to identify and remove bottleneck reactions that limit carbon flux towards synthetic pathways in engineered autotrophic systems. The long-term goal is to develop an integrated experimental and computational workflow that can be progressively used to enhance the performance of industrially pertinent autotrophs.

To quantitatively assess *in vivo* autotrophic metabolism, our lab has previously developed isotopically nonstationary ¹³C-MFA (INST-MFA) (1-4) and applied it to assess the photoautotrophic metabolism of cyanobacteria (4) and plant leaves (5). More recently, we combined INST-MFA with rational metabolic engineering to improve the productivity of an isobutyraldehyde producing mutant of the cyanobacterium *Synechococcus elongatus* PCC7942 (6).

This presentation describes our further efforts to examine the metabolic phenotypes of strains with improved isobutyraldehyde productivity. Our work demonstrates the promising utility of INST-MFA at guiding the metabolic engineering of autotrophs intended for industrial applications.

References

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