Supplementary Information

AraBAD Based Toolkit for Gene Expression and Metabolic Robustness Improvement in *Synechococcus elongatus*

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Figure legends

Figure S1. Fluorescence of eGFP and mtGFP led by P_{BAD} promoter in *S. elongatus* after inducing with 2 g/L *L*-arabinose for 2 days.

Figure S2. Standardized fluorescent intensity (RFU/OD_{600}) of *E. coli* BW25113, YQe1 (P_{BAD}) and YQe2 (P_{Trc}) under non-induced condition. An asterisk (*) represents a statistical difference ($p < 0.05$).

Figure S3. Fluorescence images of *S. elongatus* strains. (A) YQs1 and (B) YQs2 after inducing with 20 g/L *L*-arabinose and 5 mM IPTG for 2 days, respectively.

Figure S4. Growth curve of *S. elongatus* in continuous light condition with or without 2 g/L *L*-arabinose for 10 days.

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Table S1. Plasmids used in this study

Table S2. Primers used in this study

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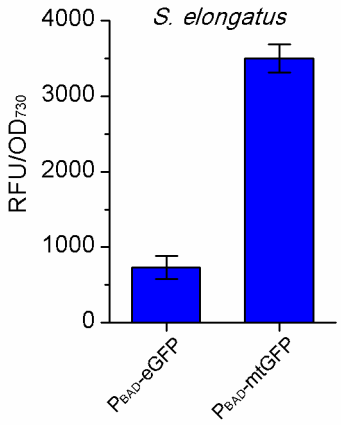

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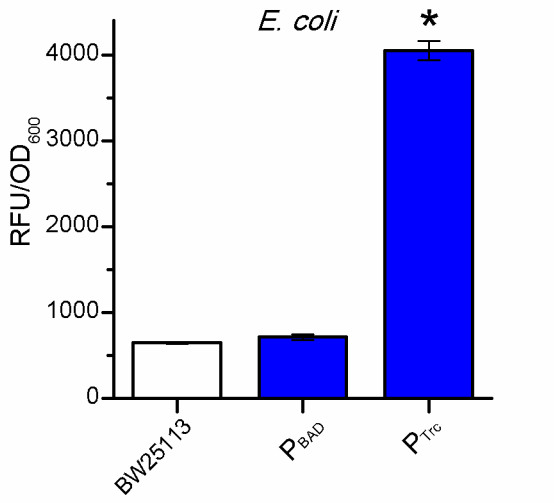

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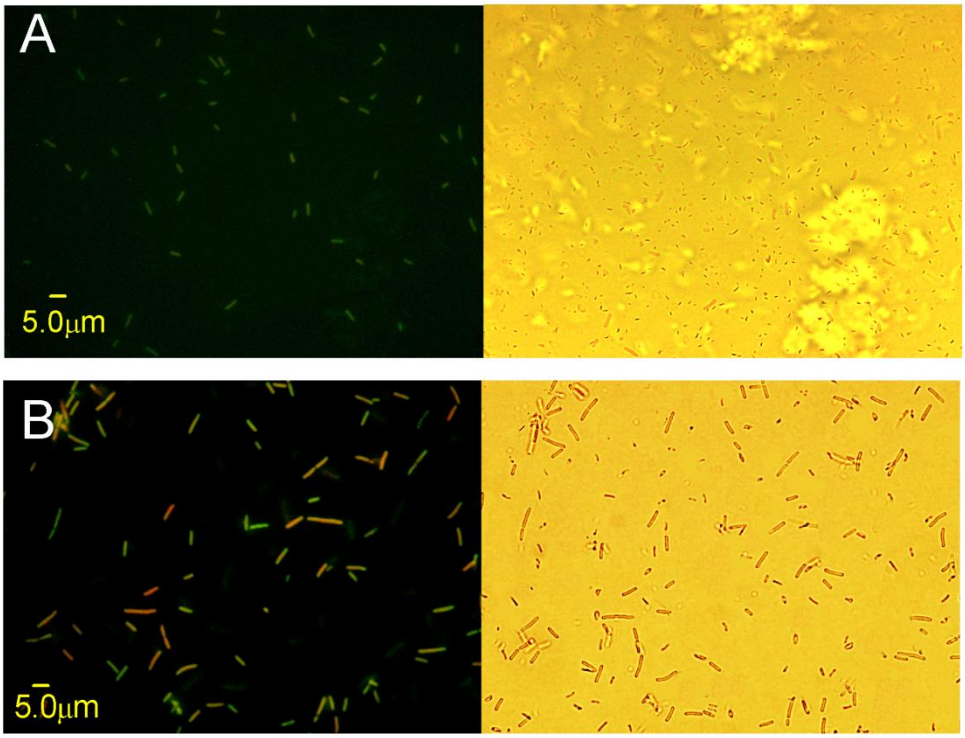

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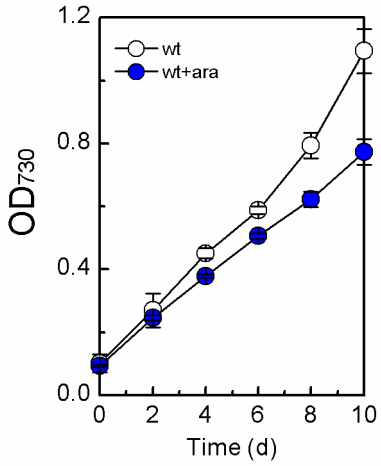

Figure S4. Growth curve of *S. elongatus* in continuous light condition with or without 2 g/L *L*-arabinose for 10 days.

Tables

Table S1. Plasmids used in this study.

Plasmids	Genotypes	Sources
pAM2991	NSI targeting vector; P_{Trc}; Sp^R	Addgene #40248
pAM1573	NSII targeting vector; Cm^R	Addgene #40239
pcrRNA.ind	*araC*-P_{BAD}; Amp^R	Addgene #61284
pcrRNA.con	P_{J23119}; Amp^R	Addgene #61285
pYQ1	pAM2991, but P_{Trc}: *araE*	This study
pYQ2	pAM2991, but P_{Trc}: *mtgfp*	This study
pYQ3	pAM2991, but P_{Trc}: *araE-mtgfp*	This study
pYQ4	pcrRNA.ind, but P_{BAD}: *mtgfp*	This study
pYQ5	pAM2991, but P_{BAD}: *mtgfp*	This study
pYQ6	pYQ1 containing P_{BAD}-*mtgfp*	This study
pYQ7	pcrRNA.con, but P_{J23119}: *araA-araB-araD*	This study
pYQ8	pAM1573, but P_{J23119}: *araA-araB-araD*	This study

52 **Table S2.** Primers used in this study**.**

Primers	Sequences (5'-3')
Q1	ccggaattcatggttactatcaatacggaatctg
Q2	ccggaattctcagacgccgatatttctcaa
Q3	ccggaattcatggttactatcaatacggaatctgct
Q4	gtgaatagttcctcgccttttgacatgacgccgatatttctcaacttt
Q5	aagttgagaaatatcggcgtcatgtcaaaaggcgaggaactatt
Q6	ccggaattcttacttgtataattcatccatgccca
Q7	ccggaattcatgtcaaaaggcgaggaactatt
Q8	cccaagcttttacttgtataattcatccatgccca
Q9	aaggaaaaaagcggccgcttatgacaacttgacggctacatca
Q10	aaggaaaaaagcggccgcaaaaggccatccgtcaggat
Q14	catggcgcgaaggcatattacgggcagtaaaacgcagaagcggtctgataaaacagaatt
Q15	ccacacttcataattatcaaaaatcgtcat gtaccgagctcgaattcgctagcgctagca
Q16	tgctagcgctagcgaattcgagctcggtacatgacgatttttgataattatgaagtgtggtttgtcattggcagc
Q17	gccaaaatcgaggccaattgcaatcgccatttagcgacgaaacccgtaatacacttcgttccagcgcag
Q40	ccgctcgagtgctcatgtttgacagcttatcatcgat
Q41	tgctctagaaaaaggccatccgtcaggat
Q50	ccggaattcatgtcaaaaggcgaggaactatt
Q51	cgcggatccttacttgtataattcatccatgccca

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