

De novo biosynthesis of glycosylated carotenoids in *Escherichia coli*

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Supplementary Note:

crtX codon-optimized sequence in this study:

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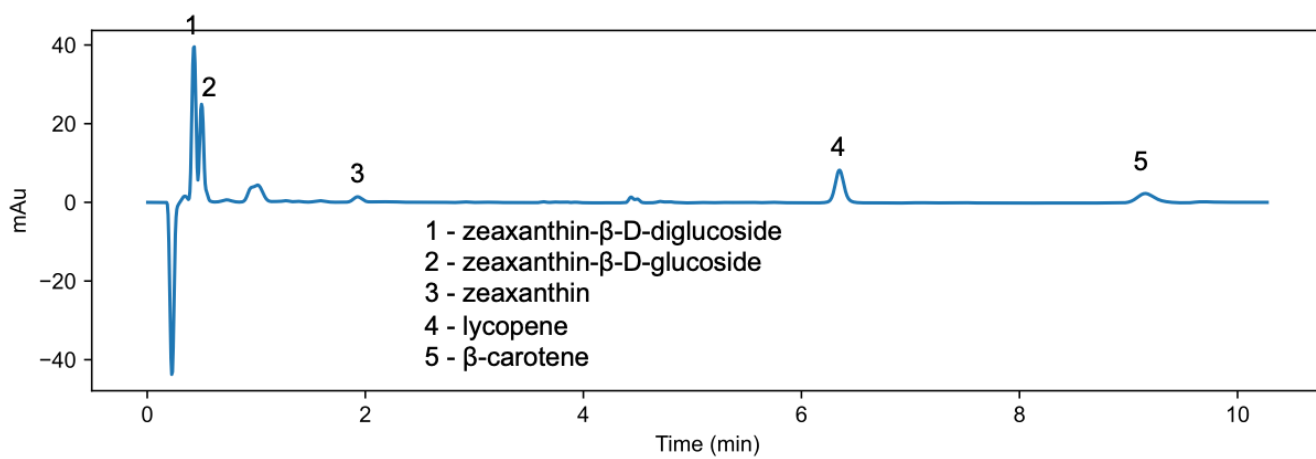
Tables

Supplementary Table S1. Strains and their RBSs.

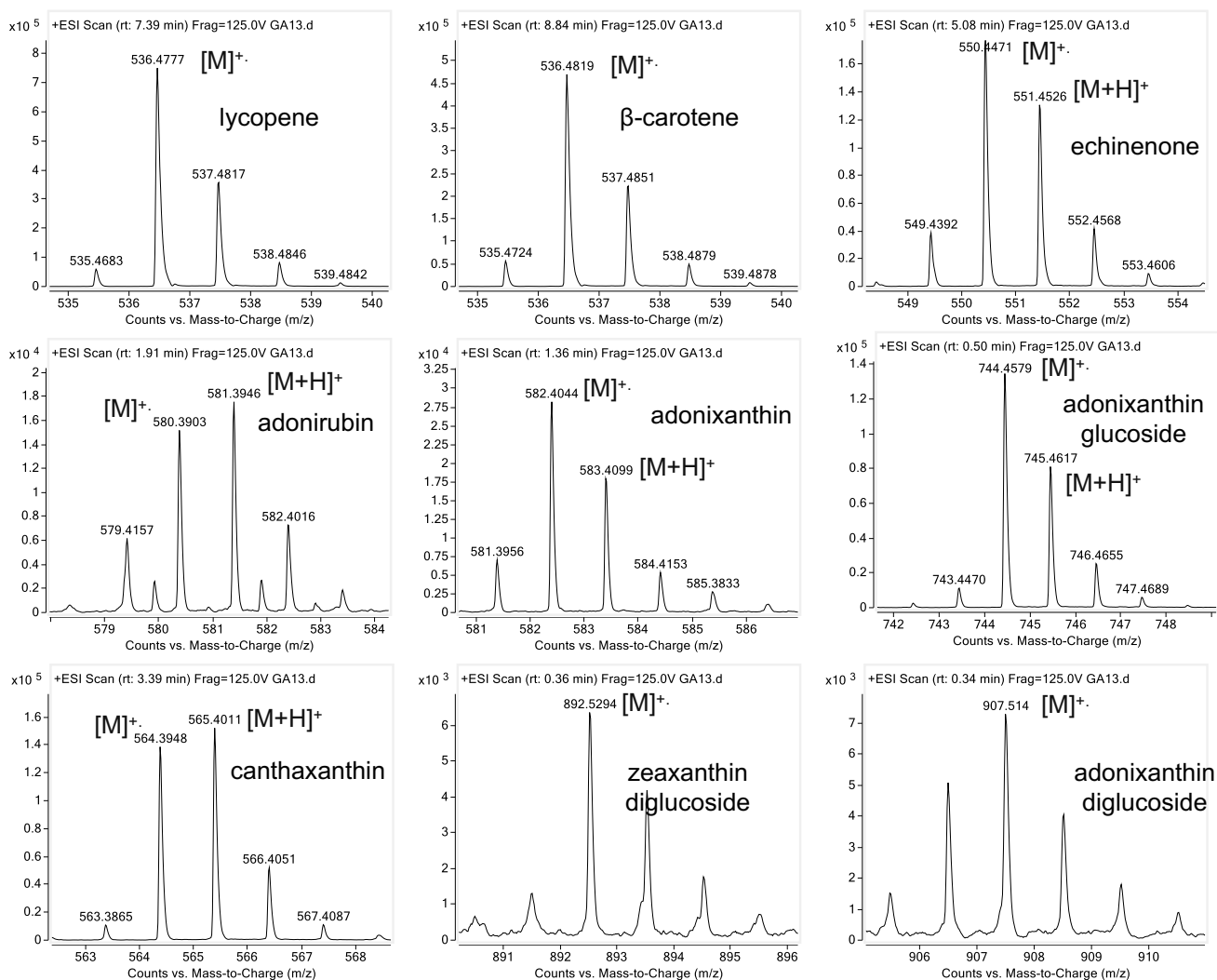
Strain names	crtZ RBS sequence	RBS strength	Relative strength
Consensus	 CA ACTTGACGCAATTATAATAAGGAGG TCAAAC	/	/
GA01	CAAACTTGACGCAATTATAATAAGGAGGTCAAAC	43498	1.00
GA02	CAAACCTTTACGCAATTATAATAAGGAGGTTCAAAC	29805	0.69
GA03	CAAACCTTGACGCAATTATAATAAGGAGGGTCAAAC	2085	0.05
GA04	CATACTTGACGCAATTATAATAAGGAGGATCAAAC	7473	0.17
GA05	CATACTTGACGCAATTATGATAAGGAGGTTCAAAC	4355	0.10
GA06	CAAACCTTTACGCAATTATAATAAGGAGGGTCAAAC	2858	0.07
GA07	CATACTTTACGCAATTATAATAAGGAGGATCAAAC	29538	0.68
GA08	CAGACTTGACGCAATTATGATAAGGAGGGTCAAAC	2973	0.07
GA09	CATACTTGACGCAATTATGATAAGGAGGGTCAAAC	585	0.01

Supplementary Table S2. Primers used in this study.

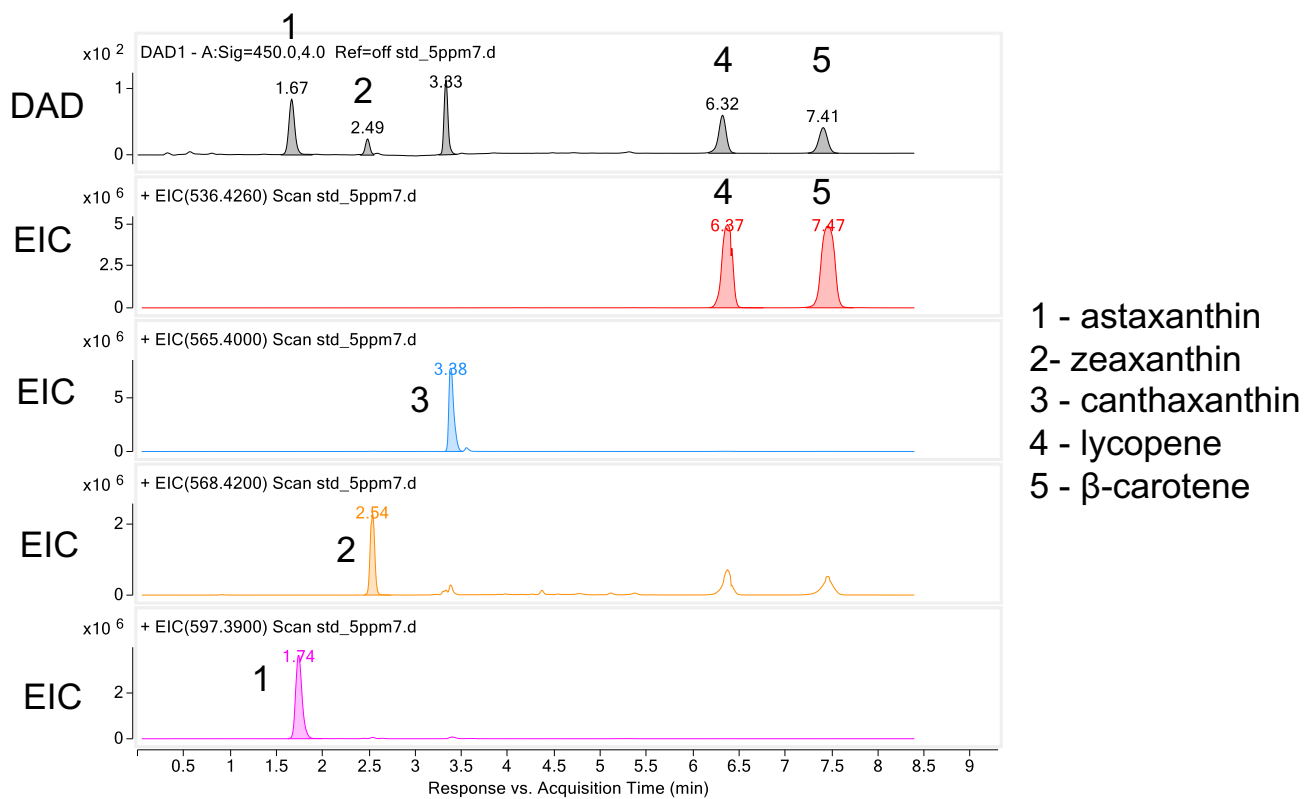
Primers	Sequence
I-p15A-crtYZ(-)-F	AAGGA*AGCTG*AGTTGGCTG
I-p15A-crtYZ(-)-R	TTACT*TACCA*GATGCCGGTT
I-crtX(YZ-R)-F	TGGTA*AGTAA*TATCCGCACCCAATTCACT
I-crtX(YZ-F)-R	CAGCT*TCCTT*TCACAGGGCGGTAGCATA



Supplementary Figure S1. The UPLC chromatograms of UV (DAD). Five carotenoids were detected: 1 - zeaxanthin- β -D-diglucoside, 2 - zeaxanthin- β -D-glucoside, 3 - zeaxanthin, 4 - lycopene, 5 - β -carotene.

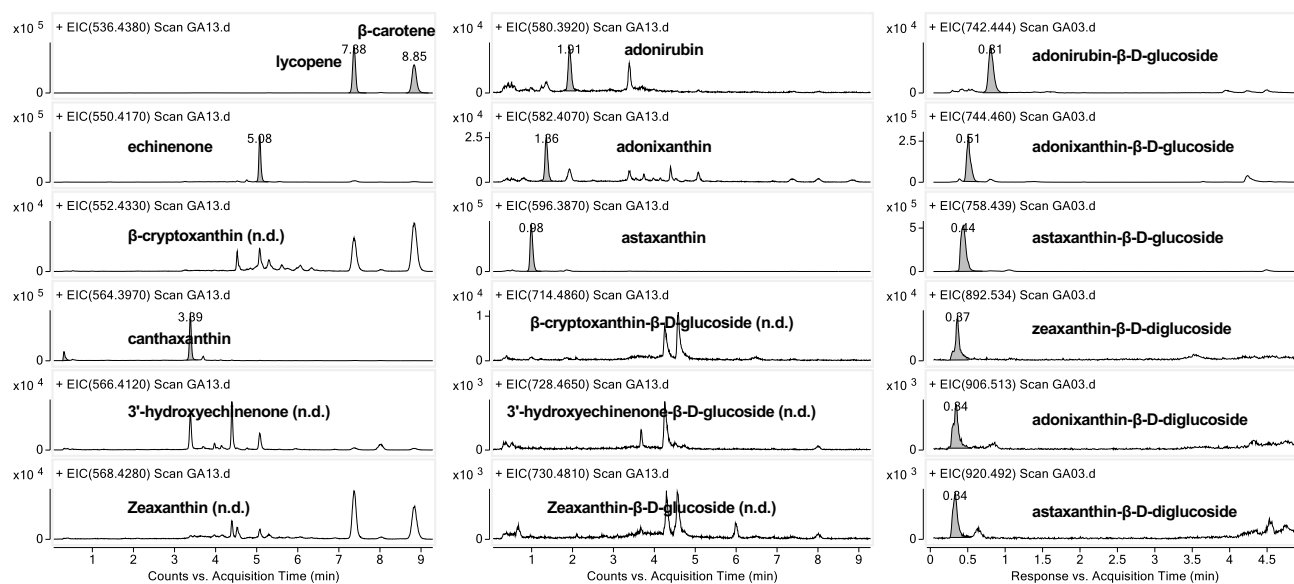


Supplementary Figure S2. The mass spectra of various carotenoids detected.



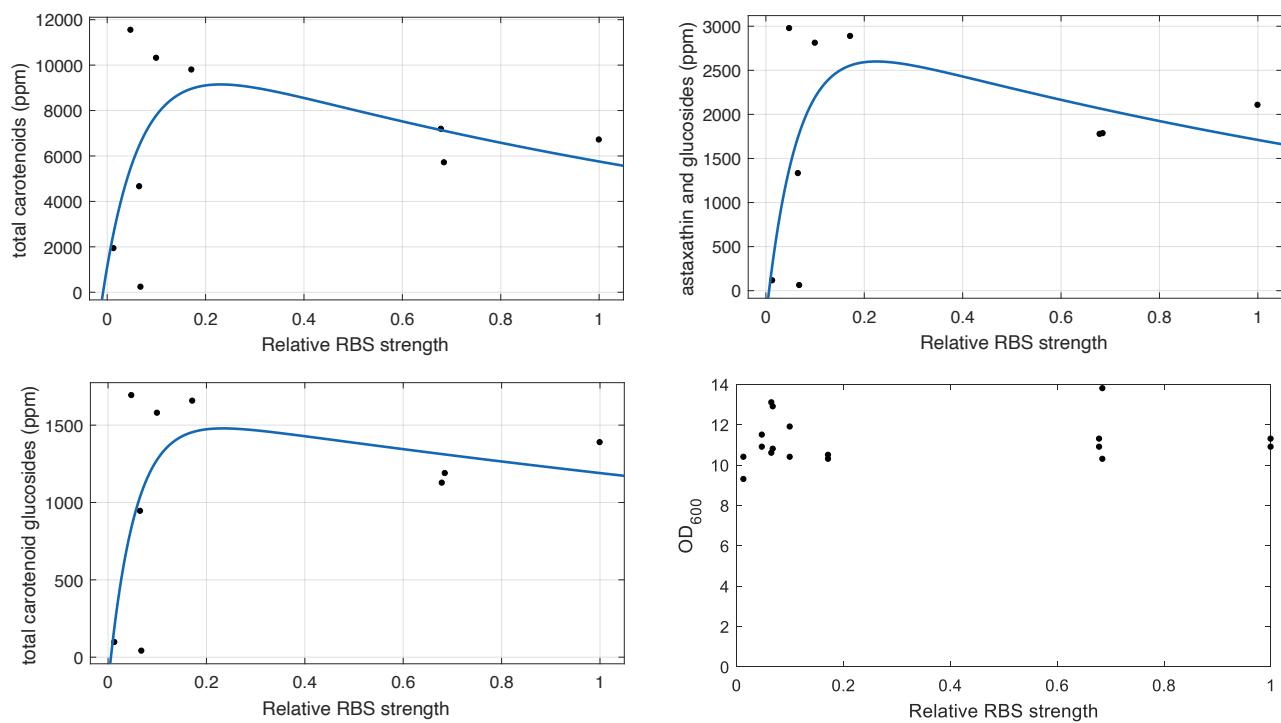
Supplementary Figure S3. UPLC chromatograms of UV (DAD) and extracted-ion monitoring (EIC) of five standards.

1 - astaxanthin; 2 - zeaxanthin; 3 - canthaxanthin; 4 - lycopene; and 5 - β -carotene



Supplementary Figure S4. LC/MS chromatograms of various carotenoids.

3'-hydroxyechinenone, β -cryptoxanthin- β -D-glucoside and 3'-hydroxyechinenone- β -D-glucoside were not detected (n.d.) in none of the nine strains GA01-09.



Supplementary Figure S5. Correction of RBS strength with the yields of different carotenoids and OD₆₀₀.