

Supplementary Information

Separation of Bioproducts through the Integration of Cyanobacterial Metabolism and Membrane Filtration: Facilitating Cyanobacteria's Industrial Application

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Table S1. Oligonucleotides used in this study.

Name	Sequence (5'-3')
pcya-1-11	CACCGGAAGGAGCTGACTGGTATCAAGATTGCTGGGGAAGAAC
pcya-1-12	GATGCCCTTGAGAGCCTTCAACCTTCTGGAGCAGGAAGATGTC
pcya-1-13	CGGAAATGGCTTACGAACGGGAAGGCAGCGCTACCCAAATCG
pcya-1-14	CATCTTCCAGGAAATCTCCGCCGGGCATGGCAATGTCTCTCTG
pcya-1-15	GTTGAAGGCTCTCAAGGGCATCGGTCTG
pcya-1-16	CCCGTTCGTAAGCCATTTCCGCTCGCC
pcya-1-17	GCGGAGATTTCTGGAAGATGCCAGGAAG
pcya-1-18	CCAGTCAGCTCCTTCCGGTGGGC
pcya-2-21	CGCTCTCCCTTATGCGACTCCTGCATTAGGGGTGCCCATTGCTATCAGTTGTAAAGT
pcya-2-22	ATGTTCAAGAGCCATGGTGAAGGGCTCCTTCTGCAGGGTTCTCCTCGCTC
pcya-2-23	GCGAGGAGAACCCTGCAGAAGGAGCCCTTCACCATGGCTCTGAACAT
pcya-2-24	CTCAAATGCCTGAGGTTTCAGGCTCGGTACCCCTAGAGTC

pcya-2-25	CTGAAACCTCAGGCATTGAGAAGCACACGG
pcya-2-26	CCTAATGCAGGAGTCGCATAAGGG

Table S2. Strains and plasmids used in this study.

Strains	Genotype	References
<i>Syn7942</i>	<i>Synechococcus elongatus</i> PCC 7942	Ducat et al. ¹
<i>Syn6803</i>	<i>Synechocystis</i> sp. PCC 6803	Wei et al. ²
<i>Ana7120</i>	<i>Anabaena</i> sp. PCC 7120	Curatti et al. ³
<i>Lep0902</i>	<i>Leptolyngbya</i> sp. Strain BL0902	Park et al. ⁴
Tcya-1	<i>Syn7942</i> + <i>P_{psaAB}:: cscB</i> ; NSI targeting; cm ^R	This study
Plasmids		
pcya-1	NSI targeting vector; <i>P_{T7}</i> ; cm ^R	This study
pcya-2	<i>P_{psaAB}:: cscB</i> ; NSI targeting; cm ^R	This study

Table S3. Template sequences of genes and plasmids used in this study.

Name	Sequence (5'-3')
<i>cscB</i>	ATGGCTCTGAACATCCCCTCCGCAACGCTTACTACCGCTTCGCTAGCAGCTACAGCTTCCTGTTCTTCATCAGCTGGAGCCTGTGGTGGAGC CTGTACGCTATCTGGCTGAAAGGCCACCTGGGCCTGACCGGCACCGAACTGGGCACCTGTACAGCGTGAACCAATTCACCAGCATCTGTT CATGATGTTCTACGGCATCGTGCAAGACAAACTGGGCCTGAAAAACCCCTGATCTGGTGCATGAGCTTCATCTGGTGTGACCGGCCCT TCATGATCTACGTGTACGAACCCCTGCTGCAAGCAACTTCAGCGTGGGCCTGATCTGGGCGCTCTGTTCTTCGGCCTGGGTACCTGGCTG GCTGCGGCCTGCTGGACAGCTTCACCGAAAAATGGCTCGAACTTCCACTTCGAATACGGCACCGCTCGCGCTTGGGCGAGCTTCGGCTAT GCTATAGGCGGCTTCTTCGCTGGCATATTCTTCAGCATCAGCCCCACATCAACTTCTGGCTGGTGAGCCTGTTGCGCGCTGTGTTTCATGATGA TCAACATGCGCTTCAAGACAAAGACCACCAATGCATCGCTGCTGACGCTGGCGCGTGAAAAAGAAGACTTCATCGCTGTGTTCAAAGA CCGCAACTTCTGGGTGTTCTGATCTTCATCGTGGGCACCTGGAGCTTCTACAACATCTTCGACCAACAAGTGTCCCGGTGTTCTACGCTGG CCTGTTCGAAAGCCACGACGTGGGCACCCGCTGTACGGCTACCTGAACAGCTTCCAAGTGGTGTGGAAGCTCTGTGCATGGCTATCATCC CCTTCTTCGTGAACCGCGTGGGCCCAAAAAAGCTCTGCTGATCGCGGTGGTGTATCATGGCTCTGCGCATCCTGAGCTGCGCTCTGTTCTGTGA ACCCCTGGATCATCAGCTGGTGAAGTGTGCACGCTATCGAAGTGCCCTGTGCGTGTACAGCGTGTCAAATACAGCGTGGTCAACTTCG ACAAACGCTGAGCAGCACTTCTTCGTGATCGGCTTCAAATCGCTAGCAGCTGGGCATCGTGTCTGAGACCCCCACCGGCATCTG TTCGACCACGCTGGTACCAACCGTGTCTTCGTATCAGCGCATCGTGTGCTGTGCTGTGCTGCGCATCTTCTCTGAGCAAAAA CGCGAACAATCGTGTGGAACCCCGTGCCAGCGCTATCCACCACCACCACCACCTAA
<i>PpsaAB</i>	GTGTTACGGCATTCTACTACGGGTTAAGTAATCTTAAACAAGATTATGAGCCGTTACCGTAATTGCCCCACAGGGGAACGCGATGTCTGT GGACTCGCCAGGACGTAATCAATTTTCTGTACCGATATAGCGGTGAAAAAGTTTATTAACGTACTAAAATGCCCGCGGGAATTAAGT GGGTTCCGGGAAGTCGGGTGATTAGCCGTACTAGACTAACCAATAGTTACTTTGTTGATTCTTGATTTGGAGACCGCTGATTTTA
NSI site	TATCAAGATTGCTGGGGAAGAACCAGCATCCACAACGCGATCGAGCGGCTGCTTGGCAAAACCGTAAGGAATCGAGCAAATGCCAAG GAGACCCCTCGAAGGCAACTTGCCTGGTGTTTTAGCCAGCCTCACGCCGAGCAGATCAACGAGGACAAAATTGCCTTGCCAAAAGTCTGC TGGAAGAGGCGGAGGATGACCTTGAGCAGCTGGGTCTAGTCTCGATACGCTGCAAGTCCAGAACATTCCGATGAGGTCGGTATCTCTCG GCTAGTGGACGCAAGCAGCGGGCTGATGTGCAGCGAGATGCCGAATTGCTGAAGCCGATGCCAGGCTGCCTCTGCGATCCAAACGGCCG AAAATGACAAGATCACGGCCTGCGTCGGATCGATCGCATGTAGCGATCGCCAAAGCGAGGCCAGCGCCGGATTCAAGATGCGTTGAC GCGGCGCGAAGCGGTGGTGGCCGAAGCTGAAGCGGACATTGCTACCGAAGTCGCTCGTAGCCAAGCAGAACTCCCTGTGCAGCAGGAGCG GATCAAAACAGGTGCAGCAGCAACTTCAAGCCGATGTGATCGCCAGCTGAGGCAGCTTGTAACGGGCGATCGCGGAAGCGCGGGGGC CGCCGCCGTATGTCGAAGATGGAAGCTCAAGCGGAAGGGACCAACGGCTGGCGGAGGCTTGGCAGACCGCTGTGTCTAATGCCCGC GACATCTTCTGCTCCAGAAGCTCGAGTCCCTGCTGTCACGCTTTCAGGCACCGTGCCAGATATCGACGTGGAGTCGATCACTGTGATTGGC GAAGGGGAAGGCAGCGCTACCCAAATCGTAGCTTGCTGGAGAAGCTGAAACAAACCAGGGCAITGATCTGGCGAAATCCCTACCGGGTC AATCCGACTCGCCCGCTGCGAAGTCTAAGAGATAGCGATGTGACCGCATCGCTTGTCAGAATCCAGTGATCCCGAACCATAGGAAGGC AAGCTCAATGCTTGCTCGTCTTGAGGACTCTAGATGTCTGTGGAACGCACATTATTGCCATCAAGCCCGATGGCGTTACGCGGGGTTTG GTCGGTACGATATCGGCCGCTTTGAGCAAAAAGGCTTAAACTGGTGGGCCTAAAGCAGCTGAAGCCAGTCGCGAGCTGGCCGAACAGC ACTATGCTGTCCACCGCGAGCGCCCTTCTCAATGGCTCGTCGAGTTTCATACCTCTGGGCGATCGTGCGATCGTCTTGAAGGCGAAG GCGTTGTGGCGGTGCTCGCAAGTTGATCGGCGTACCAATCCGCTGACGGCAGAACGGGCACCATCCGTGGTGATTTTGGTGTCAATATTG GCCGCAACATCATCCATGGCTCGGATGCAATCGAAACAGCACAACAGGAAATGTCTCTGGTTTAGCCAGCAGAGCTAAGTGATTGGACC CCCACGATTCAACCCTGGCTGTACGAATAAGGTCTGCATTCCTTCAGAGAGACATTGCCATGCC
<i>pcya-1</i>	GGGGAATTGTGAGCGGATAACAATCCCCTGTAGAAATAATTTGTAACTTTAATAAGGAGATATACCATGGGCAGCAGCCATCACCATCAT CACCACAGCCAGGATCCGAATTCGAGCTCGGCGCGCTGCAGGTCGACAAGCTTCGGCGGCATAATGCTTAAGTCGAACAGAAAGTAATC GTATTGTACACGGCCGATAATCGAAATTAATACGACTCACTATAGGGGAATTGTGAGCGGATAACAATCCCCATCTTAGTATATAGTTAAGT ATAAGAAGGAGATATACATATGGCAGATCTAATTGGATATCGGCCGCGCCACGCGATCGTACGCTCGGTACCTCGAGTCTGGTAAAGAAAC CGCTGCTGCGAAATTTGAACGCCAGCAGTGGTCTGCTACTAGCGCAGCTTAATTAACCTAGGCTGCTGCCACCGCTGAGCAATAACTAGC ATAACCCCTTGGGGCTCTAAACGGGTCTGAGGGGTTTTTGTGTAACCTCAGGCATTTGAGAAGCACAGGTACACTGCTCCGGTAG TCAATAAACCGGTAAACCAGCAATAGACATAAGCGGCTATTTAACGACCCTGCCCTGAACCGACGACCGGGTCGAATTTGCTTTCGAATTTCT

	<p> GCCATTCATCCGCTTATATCACTTATTCAGGCGTAGCACCAGGCGTTTAAAGGGACCAATAACTGCCTTAAAAAATACGCCCGCCCTGCC ACTCATCGCAGTACTGTTGTAATTCATTAAGCATTCTGCCGACATGGAAGCCATCAGACGCGCATGATGAACCTGAATCGCCAGCGGCATCA GCACCTTGTGCGCTTGCGTATAATATTGCCATAGTGAAAACGGGGGCGAAGAAGTTGTCCATATTGGCCACGTTAAATCAAACTGGTGA AACTCACCCAGGGATTGGCTGAGACGAAAAACATATTCTCAATAAACCTTTAGGGAAATAGGCCAGGTTTTCACCGTAACACGCCACATCTT GCGAATATATGTGTAGAAACTGCCGGAATCGTCGTGGTATTCCTCCAGAGCGATGAAAACGTTTCAGTTTGCTCATGGAACCGGTGAAC AAGGGTGAACTATCCCATATCACCAGCTCACCGTCTTTCATTGCCATACGGAACCTCCGATGAGCATTATCAGGCGGGCAAGAATGTAA TAAAGGCCGGATAAACTTGTGCTTATTTTTCTTACGGTCTTAAAAAGGCCGTAATATCCAGCTGAACGGTCTGGTTATAGGTACATTGAGC AACTGACTGAAATGCCTCAAATGTTCTTTACGATGCCATTGGGATATATCAACGGTGGTATATCCAGTGATTTTTTCTCCATTTAGCTTCCTT AGCTCCTGAAAATCTCGATAACTCAAAAAATACGCCCGGTAGTGATCTTATTTCAATTATGGTGAAAGTTGGAACCTCTTACGTGCCGATCAACG TCTCATTTTCGCCAAAAGTTGGCCAGGGCTTCCCGGTATCAACAGGGACACAGGATTATTTATTTCTGCGAAGTGATCTCCGTCACAGGT ATTTATTCGGCGCAAAGTGCCTCGGGTGATGCTGCCAACTTACTGATTTAGTGATGATGGTGTGTTTTGAGGTGCTCCAGTGCTGCTGTTCT ATCAGCTGTCCCTCTGTTCAGCTACTGACGGGTGGTGCCTAACGGCAAAAGCACCGCGGACATCAGCGCTAGCGGAGTGATATCTGGCT TACTATGTTGGCACTGATGAGGGTGTCAAGTGCTTATGTGGCAGGAGAAAAAGGCTGCACCGGTGCGTCAGCAGAATATGTGATAC AGGATATATTCCGCTTCTCGCTACTGACTCGCTACGCTCGGTCTGCTGACTGCGGCGAGCGGAAATGGCTTACGAACGGGAAGCGAGCGC TACCAAAATCGCTAGCTTGTGGAGAAGCTGAAACAAACACGGGCATTGATCTGGCGAAATCCTACCGGGTCAATCCGACTCGCCCGCTG CGAAGTCTTAAGAGATAGCGATGTGACCGGATCGCTTGTCAAGAATCCAGTGATCCCGAACCATAGGAAGGCAAGCTCAATGCTTGCCTC GTCTTGAGGACTATCTAGATGTCTGTGAACGCACATTTATGCCATCAAGCCGATGGCGTTACGCGGGTTTGGTCGGTACGATATCGGC CGCTTTGAGCAAAAAGGCTTCAAATGGCTCGTCGAGTTCATACCTCTGGGCGGATCGTGGCGATCGTCTTGAAGGCGAAGCGGTTGTGGCGGCTGCT CGCAAGTGTGATCGGCGCTACCAATCCGCTGACGGCAGAACCGGGACCATCCGTGGTGATTTGGTGTCATATTGGCCGCAACATCATCCAT GGCTCGGATGCAATCGAAACAGCACAAACAGGAAATTGCTCTCTGTTTAGCCAGCAGAGCTAAGTGATTGGACCCCCACGATTCACACCTG GCTGTACGAATAAGGTCTGCATTCCTTCAGAGAGACATTGCCATGCCCGGCGGAGATTTCTGGAAGATGCCAGGAAGATACTTAACAGGGA AGTGAGAGGGCGCGGCAAGCCGTTTTTCCATAGGCTCCGCCCCCTGACAAGCATCACGAAATCTGACGCTCAAATCAGTGGTGGCGAA ACCCGACAGGACTATAAAGATACCAGGCGTTCCCTGGCGGCTCCCTCGTGCGCTCTCCTGTTCTGCCTTTCGGTTTACCGGTGTCAITTC GCTGTTATGGCCGCTTTGTCTATTCCACGCGCTGACACTAGTTCCGGGTAGGCAGTTCGCTCCAAGCTGGACTGTATGCACGAACCCCCG TTCAGTCCGACCGCTGCGCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGAAAGACATGCAAAAGCACCTGGCAGCAGCCACTGGT AATTGATTAGAGGAGTTAGTCTTGAAGTCATGCGCCGGTTAAGGTAAACTGAAAGGACAAGTTTTGGTGACTGCGCTCCTCCAAGCCAGT TACCTCGGTTCAAAGAGTTGTAGCTCAGAGAACCTTGAAAAACCGCCTGCAAGGCGGTTTTTTCGTTTTCAGAGCAAGAGATTACGCGC AGACCAAAACGATCTCAAGAAGATCATCTTATTAATCAGATAAAATATTCTAGATTTCAGTGCAATTTATCTCTTCAAATGTAGCACCTGAAGT CAGCCCCATACGATATAAGTTGAATTCTCATGTATGTCATGCCCCGCGCCACCGGAAGGAGCTGACTGGTATCAAGATTGCTGGGAAGAA CCGACCATCCACAACGCGATCGAGCGGCTGCTGGCAAAAACGTAAGGAAATCGAGCAAAATGCCAAGGAGACCCTCGAAGGCAACTTGC GTGGTGTTTTAGCAGCCTCACCGCGGAGCAGATCAACGAGGACAAAATTGCCCTTGCCAAAAGTGTGCTGGAAGAGGCGGAGGATGACCT TGAGCAGCTGGGTCAAGTCTCGATACGCTGCAAGTCCAGAACATTCCGATGAGGTGGTTATCTCTCGGCTAGTGGACGCAAGCAGCGGG CTGATCTGCAGCGAGATGCCGAATTGCTGAAGCCGATGCCAGGCTGCCTCTGCGATCCAAACGGCCGAAATGACAAGATCACGGCCCTG CGTCGGATCGATCGCGATGTAGCGATCGCCAAAGCCGAGGCCGAGCGCGGATTAGGATGCGTTGACGCGGCGCAAGCGGTGGTGGCG AAGCTGAAGCGGACATTGCTACCGAAGTCGCTCGTAGCCAAGCAGAACTCCCTGTGACGAGGAGCGGATCAACAGGTGACGACGAAC TTCAAGCCGATGTGATCGCCCCAGCTGAGGCGACTTGTAACGGGCGATCGCGGAAGCGGGGGGCCCGCCGCTATCGTCGAAGATGG AAAAGCTCAAGCGGAAGGGACCAACGGCTGGCGGAGGCTTGGCAGACCGCTGGTGCTAATGCCCGGACATCTTCTGTCTCCAGAAGGTT GAAGGCTCTCAAGGGCATCGGTGAGATCCCGTGCTTAATGAGTGAGCTAATTACATTAATTGCGTTGCGCTACTGCCCGCTTCCAGTC GGGAAACCTGTCTGCCAGCTGCATTAATGAATCGGCCAACGCGGGGAGAGGCGGTTTGGCTATTGGGCGCCAGGGTGGTTTTTCTTTTC ACCAAGTGAGACGGGCAACAGCTGATTGCCCTTACCCTGCGCTGAGAGAGTTGACGAAGCGGTCCACGCTGGTTGCCCGACAGGCG GAAAATCCTGTTGATGGTGGTTAACGGCGGGATATAACATGAGCTGTCTTCGGTATCGTCGATATCCACTACCGAGATGTCGCAACCAACGC GCAGCCCGGACTCGGTAATGGCGCGATTGCGCCAGCGCATCTGATCGTTGGCAACAGCATCGCAGTGGGAACGATGCCCTATTACAGC ATTTGCATGGTTTGTGAAAACCGGACATGGCACTCCAGTCGCTTCCCGTTCGCTATCGGCTGAATTTGATTGCGAGTGAGATATTATGCC </p>
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	AGCCAGCCAGACGCAGACGCCGAGACAGAACTTAATGGGCCCGCTAACAGCGCGATTGCTGGTGACCCAATGCGACCAGATGCTCCAC GCCCCAGTCGCGTACCGTTCTCATGGGAGAAAATAACTGTTGATGGGTGCTGGTCAGAGACATCAAGAAAATACGCCGGAACATTAGTGC AGGCAGCTTCCACAGCAATGGCATCCTGGTCATCCAGCGGATAGTTAATGATCAGCCACTGACGCGTTGCGCGAGAAGATTGTGACCCGCC GCTTACAGGCTTCGACGCCGCTTCGTTCTACCATCGACACCACCAGCTGGCACCCAGTTGATCGGCGCGAGATTAAATCGCCGCGACAATT TGCGACGGCGCGTGCAGGGCCAGACTGGAGGTGGCAACGCCAATCAGCAACGACTGTTTGCCCGCCAGTTGTTGTGCCACGCGGTTGGGAA TGTAATTCAGTCCGCCATCGCCGCTTCCACTTTTCCCGCGTTTTCGAGAAACGTGGCTGGCTGGTTCACCACGCGGAAACGGTCTGAT AAGAGACACCGGCATACCTCTGCGACATCGTATAACGTACTGGTTTCACATTCACCACCCTGAATTGACTCTCTCCGGGCGCTATCATGCCAT ACCGCGAAAGGTTTTCGCCATTTCGATGGTGTCCGGGATCTCGACGCTCTCCCTTATGCGACTCTGCATTAGGAAATTAACGACTCACTAT A
pcya-2	CTTATGCGACTCCTGCATTAGGGTGTTACGGCATTTTACTGACGGGTAAAGTAATCTTTAAACAAAGATTATGAGCCGTACCGTAATTGCCCC ACAGGGGAACGCGATGTTCTGTGGACTCGCCAGGACGTAATCAATTTTCTGTACCGATATTAGCGGTGAAAAGTTTATTAACGTACTATAA ATGCCCGCGCGGAATTAACTTGGGTTCCGGGAAGTCGGGTGCATTAGCCGTACTAGACTAACCCAATAGTTACTTTGTTGATTCTTGATTTT GGAGACCGCTGATTTTAgaggagccctteaccATGGCTCTGAACATCCCCTCCGCAACGCTTACTACCGCTTCGCTAGCAGCTACAGCTTCCTGTTT TTCATCAGCTGGAGCCTGTGGTGGAGCCTGTACGCTATCTGGCTGAAAGGCCACCTGGGCCTGACCGGCACCGAACTGGGCACCCGTACAG CGTGAACCAATTACCGCATCTCTGTTATGATGTTCTACGGCATCGTGCAAGACAACTGGGCCTGAAAAAACCCCTGATCTGGTGCATGA GCTTCATCTGGTGTGACCGGCCCTTCATGATCTACGTGTACGAACCCCTGCTGCAAGCAACTTCAGCGTGGGCCTGATCTGGGCGCTC TGTTCTTCGGCCTGGGCTACCTGGCTGGCTGCGGCTGTGGACAGCTTACCGAAAAAATGGCTCGCAACTTCCACTTCGAATACGGCACC GCTCGCGCTTGGGCGAGCTTCGGCTATGCTATAGGCGCGTTCTTCGCTGGCATATTCTTCAGCATCAGCCCCACATCAACTTCTGGCTGGTGA GCCTGTTTCGGCGCTGTGTTTCATGATCAACATGCGCTTCAAAGACAAGACCACCAATGCATCGTGTGACGCTGGCGCGTGAAAAAA GAAGACTTCATCGCTGTGTTCAAAGACCGCAACTTCTGGGTGTTCTGATCTTCATCGTGGGCACCTGGAGCTTCTACAACATCTTCGACCAA CAACTGTTCGCCGTGTCTACGCTGGCCTGTTGAAAGCCACGACGTGGGCACCCGCTGTACGGCTACCTGAACAGCTTCAAAGTGGTGT GGAAGCTCTGTGCATGGCTATCATCCCTTCTTCGTGAACCGCTGGGCCCCAAAAACGCTCTGTGTATCGGCGTGGTGATCATGGCTCTGCG CATCTGAGCTGCGCTCTGTTCTGTAACCCCTGGATCATCAGCCTGGTGAAACTGTCTGACGCTATCGAAGTGCCTGTGCGTGATCAGCGT GTTCAAATACAGCGTGGCTAACTTCGACAAACGCTGAGCAGCACCATCTTCCTGATCGGCTTCCAAATCGCTAGCAGCTGGGCATCGTGCT GCTGAGCACCCCCACCGCATCTGTTCGACACGCTGGCTACCAAACCGTGTCTTCGCTATCAGCGGCATCGTGTGCCTGATGCTGCTGTT CGGCATCTTCTCTGAGCAAAAAACGGAACAAATCGTGATGGAACCCCGTGCCAGCGCTATCCACCACCACCACCACCTAAccagett tcctgtacaagtgctcctgcaggagaagccatcctgacggatggcctttttaagctgaactaggggtaccgagcCTGAAACCTCAGGCATTGAGAAGCACCGGTACACATGCTTC CGGTAGTCAATAAACCCGTAAACAGCAATAGACATAAGCGGCTATTAAACGACCTGCCCTGAACCGACGACCGGGTCAATTTGCTTTTCG AATTCTGCCATTATCCGCTTATTATCACTTATCAGGCGTAGCACAGGCGTTAAAGGGCACCATAACTGCCTTAAAAAATTACGCCCCG CCCTGCCACTCATCGAGTACTGTTGTAATTCATTAAGCAATTCTGCCGACATGGAAGCCATCACAGCGGCATGATGAACCTGAATCGGCAGC GGCATCAGCACCTTGTCGCTTGCGTATAATATTGCCATAGTGAAAACGGGGGCGAAGAAGTTGTCCATATTGGCCACGTTTAAATCAAAA CTGGTGAAACTACCCAGGGATTGGCTGAGACGAAAAACATATTCTCAATAAACCTTTAGGGAAATAGGCCAGGTTTACACGTAACACGC CACATCTTGCGAATATATGTGTAGAAATGCCGGAATCGTCGTGGTATTCTACTCCAGAGCGATGAAAACGTTTCAGTTTGCTCATGAAAAAC GGTGTAACAAGGGTGAACACTATCCATATCACAGCTACCGTCTTTCATTGCCATACGGAACCTCCGGATGAGCATTATCAGGCGGGCAAG AATGTGAATAAAGCCGGATAAAACTTGTGCTTATTTTCTTTACGGTCTTTAAAAAGGCCGTAATATCCAGCTGAACGGTCTGGTTATAGGTA CATTGAGCAACTGACTGAAATGCCTCAAAATGTTCTTTACGATGCCATTGGGATATATCAACGTTGGTATATCCAGTGATTTTTTCTCCATTTT AGCTTCCTTAGCTCCTGAAAATCTCGATAACTCAAAAAATACGCCCGGTAGTGATCTTATTTCAATTATGGTGAAAGTTGGAACCTCTTACGTGC CGATCAACGTCTCATTTTCGCCAAAAGTTGGCCAGGCTTCCGGTATCAACAGGGACACCAGGATTATTTATCTCGCAAGTGATCTTCC GTCACAGGTATTTATTCGGCGCAAAAGTGCCTGGGTGATGCTGCCAACTIAGTGATTAGTGATGATGGTGTTTTGAGGTGCTCCAGTGGCT TCTGTTTCTATCAGCTGTCCCTCCTGTTACGTACTGACGGGGTGGTGCGTAAACGGCAAAAGCACCGCGGACATCAGCGTAGCGGAGTGT ATACTGGCTIAGTATGTTGGCACTGATGAGGGTGTCAAGTGAAGTCTTCATGTGGCAGGAGAAAAAGGCTGCACCGGTGCGTCAGCAGAAT ATGTGATACAGGATATATCCGCTTCTCGCTACTGACTCGCTACGCTCGGTCTTCGACTGCGGCGAGCGGAAATGGCTTACGAACGGGAA GGCAGCGCTACCCAAATCGCTAGCTTGTGGAGAAGCTGAAACAAACACGGGCATTGATCTGGCGAAATCCCTACCGGGTCAATCCGACTC GCCCCGTGCGAAGTCCTAAGAGATAGCATGTGACCGCGATCGCTTGTCAGAATCCAGTGATCCCGAACCATAGGAAGGCAAGCTCAATG

	<p>CTTGCCCTGCTTTGAGGACTATCTAGATGCTGTGGAACGCACATTIATTGCCATCAAGCCCGATGGCGTTCAGCGGGGTTTGGTCGGTACGAT</p> <p>CATCGGCCGCTTTGAGCAAAAAGGCTTCAAACCTGGTGGGCTAAAGCAGCTGAAGCCAGTCGCGAGCTGGCCGAACAGCACTATGCTGTC</p> <p>CACCGCGAGCGCCCTTCTTAATGGCCTCGTCGAGTTTATCACCCTGGGCGGATCGTGCGATCGTCTTGAAGGCGAAGGCGTTGTGGC</p> <p>GGCTGCTCGCAAGTTGATCGGCGTACCAATCCGCTGACGGCAGAACCGGGCACCATCCGTGGTGATTTTGGTGTCAATATTGGCCGCAACAT</p> <p>CATCCATGGCTCGGATGCAATCGAAACAGCACAACAGGAAATTGCTCTCTGGTTTACGCCAGCAGAGCTAAGTGATTGGACCCCAACGATTC</p> <p>AACCTGGCTGTACGAATAAGGTCTGCATTCTTCAGAGAGACATTGCCATGCCCGGCGGAGATTTCCTGGAAGATGCCAGGAAGATACTTA</p> <p>ACAGGGAAGTGAGAGGGCCGCGCAAGCCGTTTTTCATAGGCTCCGCCCCCTGACAAGCATCAGAAATCTGACGCTCAAAATCAGTGG</p> <p>TGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCTGGCGGCTCCCTCGTGCGCTCTCTGTTCTGCCTTTCGGTTTACCGGTG</p> <p>TCATTCCGCTGTTATGGCCGCTTTGTCTCATTCCACGCTGACACTCAGTTCCGGGTAGGCAGTTTCGCTCCAAGCTGGAGCTGTATGACAGAA</p> <p>CCCCCGTTTTCAGTCCGACCGCTGCGCCTTATCCGGTAACATATGCTTGTAGTCCAAACCGGAAAGACATGCAAAAGCACCCTGGCAGCAGC</p> <p>CAGTGGTAATTGATTAGAGGAGTTAGTCTTGAAGTCATGCGCCGGTTAAGGCTAAACTGAAAGGACAAGTTTGGTGACTGCGCTCTCTCA</p> <p>AGCCAGTTACCTCGGTTCAAAGAGTTGGTAGCTCAGAGAACCTTCGAAAACCGCCCTGCAAGGCGGTTTTTCGTTTTTCAGAGCAAGAGAT</p> <p>TACGCGCAGACCAAAACGATCTCAAGAAGATCATCTTATTAATCAGATAAAATTTCTAGATTCAGTGCAATTTATCTCTCAAATGTAGCAC</p> <p>CTGAAGTCAGCCCCATACGATATAAGTTGTAATTCATGTTAGTCATGCCCCGCGCCACCGGAAGGAGCTGACTGGTATCAAGATTGCTGG</p> <p>GGAAGAACCGACCATCCACAACGCGATCGAGCGGTGCTTGGCAAAACCGTAAGGAAATCGAGCAAATTGCCAAGGAGACCTCGAAGG</p> <p>CAACTGCGTGGTGTTTAGCCAGCTCACGCGGAGCAGATCAACGAGGACAAAATTGCCTTTGCCAAAAGTCTGCTGGAAGAGGCGGAG</p> <p>GATGACCTTGAGCAGCTGGGTCAAGTCTCGATACGCTGCAAGTCCAGAATTTCCGATGAGGTCGGTTATCTCTCGGCTAGTGGACGCAA</p> <p>GCAGCGGCTGATCTGACGCGAGATGCCGAATTGCTGAAGCCGATGCCAGGCTGCCTCTGCGATCCAACGCGCGGAAATGACAAGATC</p> <p>ACGGCCCTGCGTCGGATCGATCGCGATGAGCGATCGCCAAGCCGAGGCGGAGCGCGGATTACAGATGCGTTGACGCGCGCGAAGCGG</p> <p>TGGTGGCCGAAGCTGAAGCGGACATTGCTACCGAAGTCTGCTAGCCAAGCAGAACTCCCTGTGACGAGGAGCGGATCAAAACAGGTGCA</p> <p>GCAGCAACTCAAGCCGATGTGATCGCCCCAGCTGAGGAGCTTGTAAACGGGCGATCGCGGAAGCGCGGGGGCCGCCGCCGCTATCGTC</p> <p>GAAGATGGAAGGCTCAAGCGGAAGGACCAACGGCTGGCGGAGGCTTGGCAGACCGCTGGTGCTAATGCCCGGACATCTCTGCTCC</p> <p>AGAAGGTTGAAGGCTCTCAAGGCGATCGGTGAGATCCCGTGCCTAATGAGTGAGCTAACTTACATTAATTGCGTTGCGCTACTGCCCGCT</p> <p>TTCCAGTCGGGAAACCTGTCTGCCAGCTGCATTAATGAATCGGCCAACGCGCGGGAGAGGCGGTTTTCGCTATTGGGCGCAGGTTGGTTT</p> <p>TTCTTTTACCAGTGAGACGGGCAACAGCTGATTGCCCTTACCAGCTGGCCCTGAGAGAGTTGAGCAAGCGGTTCCACGCTGGTTTGGCCC</p> <p>AGCAGGCGAAAATCCTGTTTGTGTTGTTAACGGCGGATATAACATGAGCTGTCTTCGGTATCGTCGTATCCACTACCGAGATGTCCGA</p> <p>CCAAACGCGCAGCCCGACTCGGTAATGGCGCGCATTTGGCCCCAGCGCCATCTGATCGTTGGCAACAGCATCGCAGTGGGAACGATGCCCTC</p> <p>ATTACGATTTGCATGGTTTGTGAAACCGGACATGGCACTCCAGTCGCTTCCCGTTCCGCTATCGGCTGAATTTGATTGCGAGTGAGATAT</p> <p>TTATGCCAGCCAGCCAGACGCAGACGCGCGAGAGAGAACTTAATGGGCGCGTAACAGCGGATTTGTTGGTGACCAATGCGACCATGAT</p> <p>GCTCCAGCCCAGTCGCTACCGTCTTATGGGAGAAAATAATACTGTTGATGGGTGTCTGGTCAGAGACATCAAGAAATAACCGCGGAACA</p> <p>TTAGTGACGGCAGCTTCCACAGCAATGGCATCTGGTATCCAGCGGATAGTTAATGATCAGCCACTGACGCGTTGCGCGAGAGATTGTG</p> <p>CACCGCCGCTTACAGGCTTCGACGCGCTTCGTTCTACCATCGACACCAACGCTGGCACCCAGTTGATCGGCGCGAGATTAAATCGCCGC</p> <p>GACAATTTGCGACGGCGCTGACGGCCAGACTGGAGGTGGCAACGCCAATCAGCAACGACTGTTTGCCCGCAGTTGTTGTGCCACGCGG</p> <p>TTGGGAATGTAATTCAGTCCGCCATCGCCGCTTCCACTTTTCCCGCGTTTTTCGAGAAACGTGGCTGGCTGGTTTACCACCGCGGAAAC</p> <p>GGTCTGATAAGAGACACCGGCATACTGCGACATCGTATAACGTTACTGGTTTCACATTCAACACCTGAATTGACTCTCTCCGGGCGCTAT</p> <p>CATGCCATACCGGAAAGGTTTTGCGCCATTCGATGGTGTCCGGGATCTCGACGCTCTCC</p>
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Table S4. The characterization of MF and UF membranes.

	MF010	UF050
Contact angle (°)	69.2±1.7	82.5±1.3
Mean pore size (nm)	95.4	16.6

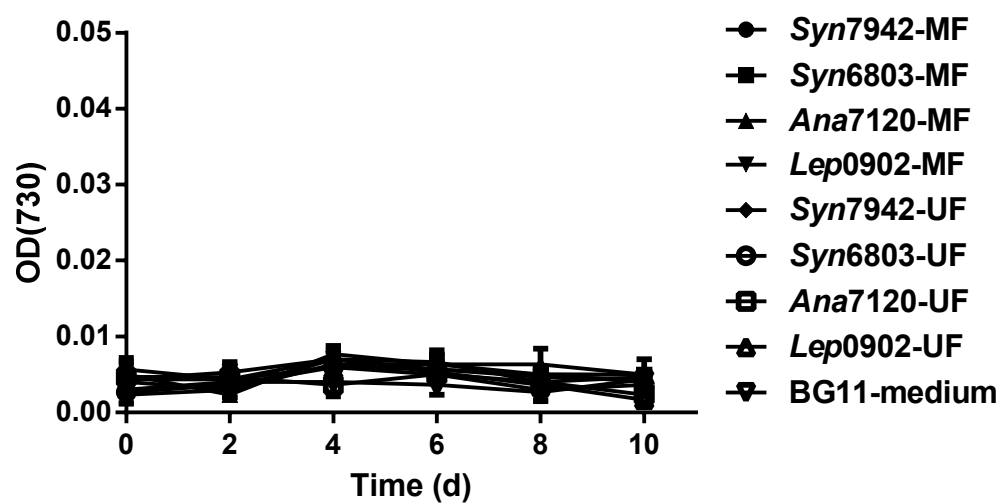


Figure S1. The detection of cyanobacteria existing in permeate solution after MF or UF filtration.

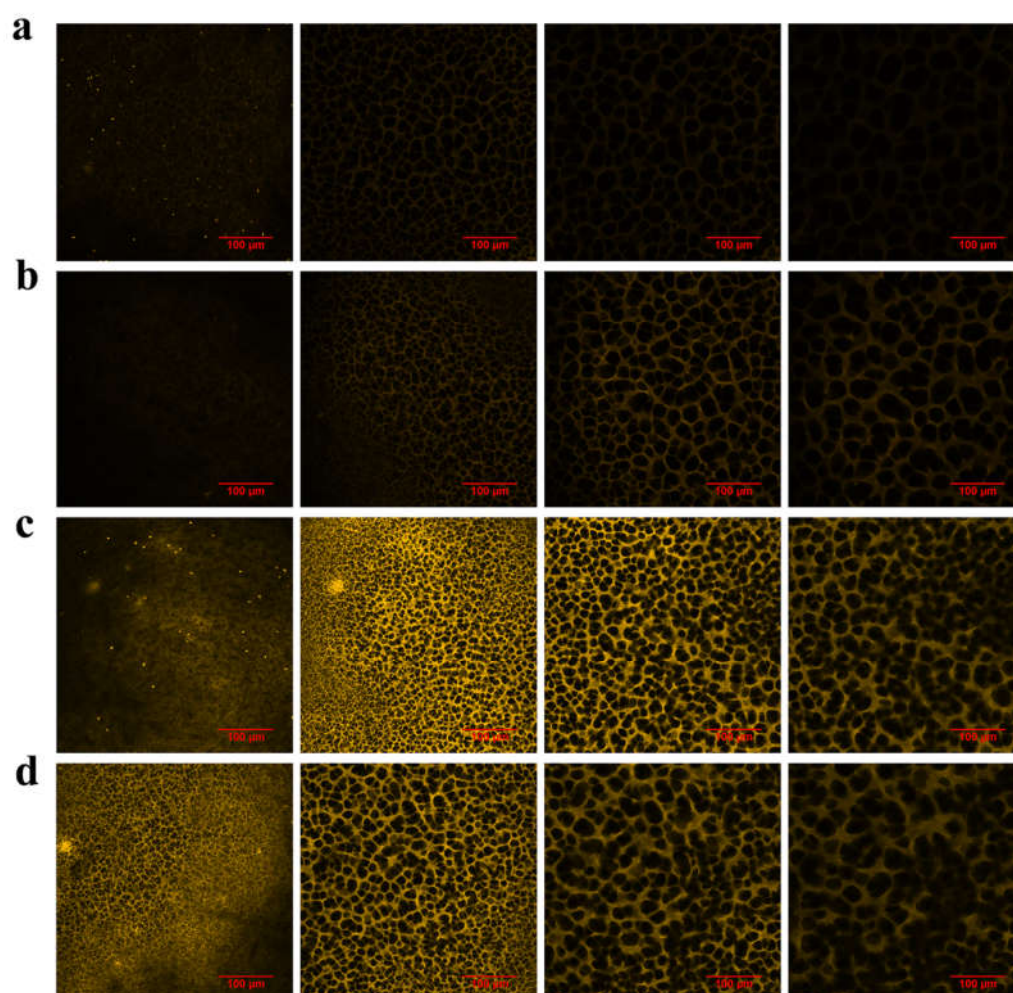


Figure S2. CLSM images of membranes after filtration of cyanobacteria. (a-b) Images (from left to right) of the surface of MF membranes after they were used to filter Syn7942 cells under a feed pressure of 0.34 bar (**a**) or 1.00 bar (**b**), (**c-d**) Images (from left to right) of the surface of UF membranes after they were used to filter Syn7942 cells under a feed pressure of 0.34 bar (**c**) or 1.00 bar (**d**). The imaging layers (from left to right) are 5-35 μm depth from the surface of the MF or UF membrane.

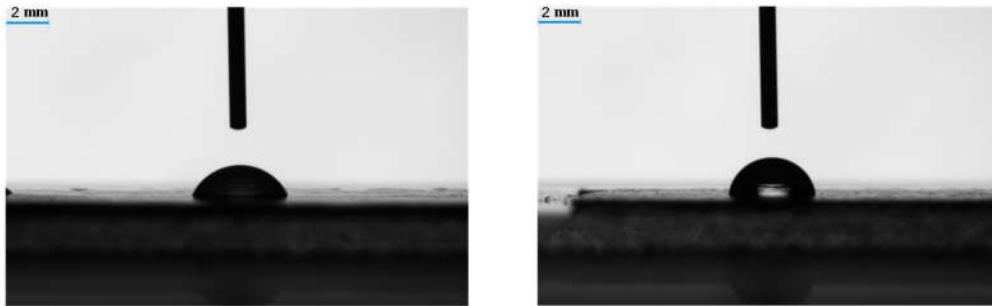


Figure S3. The contact angle of MF and UF membranes.

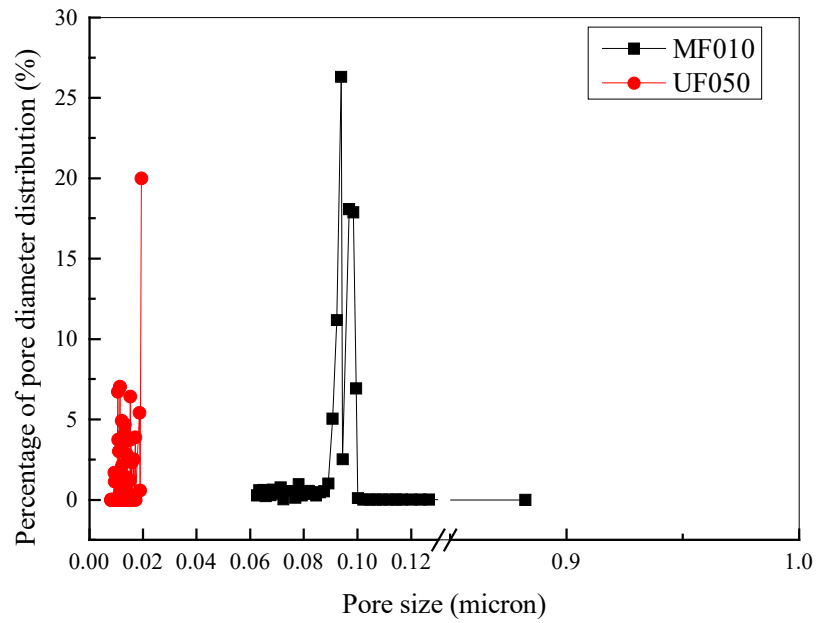


Figure S4. The pore size of MF and UF membranes.

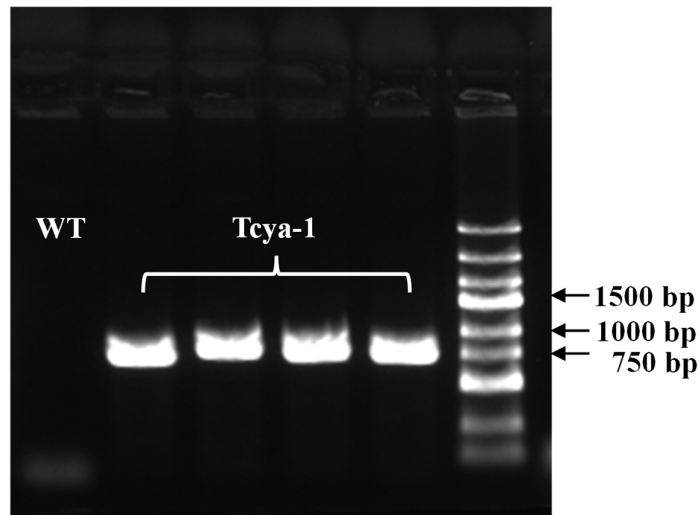


Figure S5. Colony PCR with gene- specific primers. The target size of PCR product is 904 bp (including *PpsaAB* sequences and part of *cscB* sequences). WT present wild type of *Syn7942*, and Tcya-1 present *cscB*⁺ *Syn7942*.

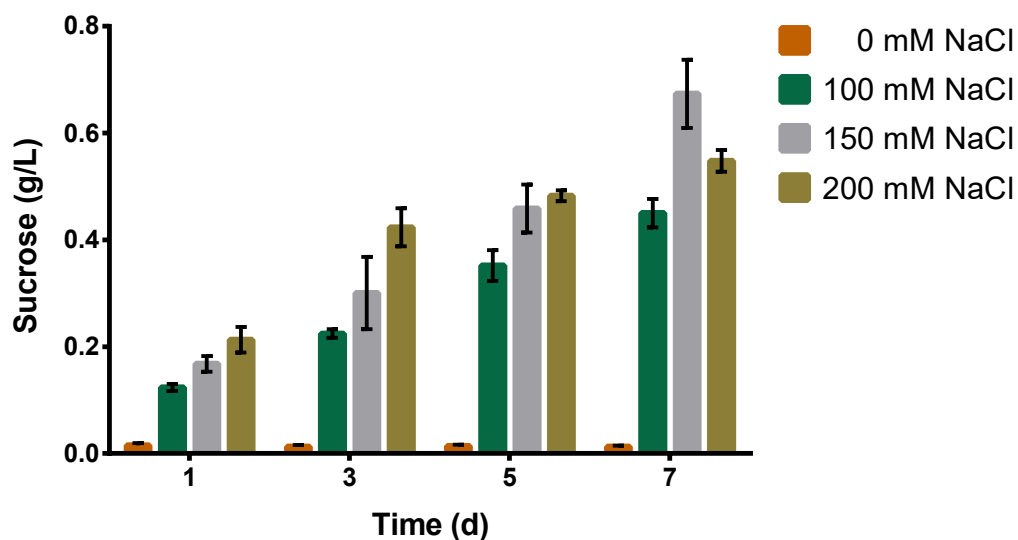


Figure S6. The secreted sucrose yield of Tcya-1 under different concentrations of NaCl shock. Error bars represent standard deviations (in triplicate).

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4. Park, S. *et al.* Gene Transfer in *Leptolyngbya* sp. Strain BL0902, a Cyanobacterium Suitable for Production of Biomass and Bioproducts. *PLoS ONE* **7**, e30901 (2012).