

Supplemental Figure 2a: Sequences and contexts of SDR2a elements (copy number ≥ 3)

Named SDR2a elements of *Nostoc punctiforme* (and instances in other cyanobacteria)

Replicon	Site	Ctx	SDR and flanking regions
SDR2a.1			
<i>Nostoc punctiforme</i> (20)			
Npun.chrom	219331B	PA	TTAGTTACTCCATAA ACTCCT GTACAGACGCGATTAAATCGCGTCT CTCCTAACTCTTAATATCCAA
Npun.chrom	541803F	C	GTAGGGGGAGAA TAATTCCT GTACAGACGCGATTAAATCGCGTCT CTTCTAACTCCCCTGATTTAG
Npun.chrom	573701B	C	GTAAGGGTAAAAATAATATT GTACAGACGCGATTAAATCGCGTCT CCCTCAGTTCCCGCTAAAT
Npun.chrom	2347677F	PA	GGGAAGATAG AACTCCTTCT GTACAGACGCGATTAAATCGCGTCT CTCCTAACTCCTAACTTTTAA
Npun.chrom	3582130F	PP	AATAAAA AACTTCTAACTCCT GTACAGACGCGATTAAATCGCGTCT CTCCTAACTCCTAACTTATTA
Npun.chrom	3693028B	I	GGTCTCTACTTCTAATTCTT GTACAGACGCGATTAA TCGCGTCTCTGGCTTCTGCCCTATTTGA
Npun.chrom	3926522B	PA	TTGACTTAGCACTCTTT CTT GTACAGACGCGATTAAATCGCGTCTTAGCAC TTTCACCCTTGCTG
Npun.chrom	4417701B	PA	TCGGATTTCCCT ACTTCCTA GTACAGACGCGATTAAATCGCGTCT CTCCT CACAGACTGCCGTCTA
Npun.chrom	4461835F	PP	TCTTGAT ACTCCTAACTCCT GTACAGACGCGATTAAATCGCGTCT CTCCTAACT GCCTACTTCCCC
Npun.chrom	4499112B	C	CCCTCGTACTTCC AACTCTT GTACAGACGCGATTAAATCGCGTCT TTCTTA AGTCGATATATAGAC
Npun.chrom	4951112F	I	TCCTCCTATACGACGCAAT TT GTACAGACGCGATTAA TCGCGTCTCTCCGATTCTCCACTCCCCG
Npun.chrom	5140402B	PP	CCTCAC ACTCCA TA ACTCTT GTACAGACGCGATTAAATCGCGTCT CTCT GCCGAT TTTGGA TTTG
Npun.chrom	5382161B	PA	ATTTCTATTCTCT ACTCCC GTACAGACGCGATTAAATCGCGTCT ACCTACTCCT CACTCACTGTT
Npun.chrom	5555486F	C	ATTCATAAA TCCTAACTCTT GTACAGACGCGATTAAATCGCGTCTGT ACTCTTA AACTTT GTACAG
Npun.chrom	5555525F	I	CGTCTGT ACTCTTA AACTTTT GTACAGACGCGATTAA TCGCGTCTCTTAATTCTCTCCAGCTGCGG
Npun.chrom	6123427F	I	TACTGTCGCCACTTT CCCTA GTACAGACGCGATTAAATCGCGTCT CTCCT CATTACGCCCTATACT
Npun.chrom	6487467B	PA	GTCTCTAA CTCCTAACTCTT GTACAGACGCGATTAAATCGCGTCT CTAACTTTA ACCCTCTTCTT
Npun.chrom	7162795F	PA	ACTCCTC ACTCCTA ATTCTT GTACAGACGCGATTAAATCGCGTCT CTGC TTTTA ACTTGCCAAATA
Npun.chrom	7477821B	PA	AACTTTATT CTTA AACTCTT GTACAGACGCGATTAAATCGCGTCTGT ACTCCT CACTTTTT ACA
Npun.chrom	7730125F	PP	TCAGAATAC CTG ACTTCT GTACAGACGCGATTAAATCGCGTCT CTCCC ACTCCTG ACTTCTGA
<i>Anabaena</i> PCC7120 (22)			
A7120.chrom	112982B	C	AAGATG AACA ACTGACTACT GTACAGACGCGATTAAATCGCGTCT CTGACA ACTACTGATATA AACT
A7120.chrom	1112320F	C	AGTAGGGGAAGAA GAA AACT GTACAGACGCGATTAAATCGCGTCT CTGACA ACTGACTAAAA AATCC
A7120.chrom	1572654B	D	CC ACTGA ACACTGACA ACT GTACAGACGCGATTAAATCGCGTCT CTGACA ACTGACAAGTA ACAA
A7120.chrom	1628033F	PP	TAAGGC AACA ACTAACA ACT GTACAGACGCGATTAAATCGCGTCT CTGAA AACTGACA ACTGACAA
A7120.chrom	2330558B	PP	AATCATATATCTA AACA ATT GTACAGACGCGATTAAATCGCGTCT CTGA ACCAATATGCTAAATAT
A7120.chrom	2465157F	D	GAAGCAGGGAAAA GACA ACT GTACAGACGCGATTAAATCGCGTCT CTGACA ACTGACTAATGATTA
A7120.chrom	2478163F	C	AGTAATGAGTA ATGACA ATT GTACAGACGCGATTAAATCGCGTCT CTAA ACTCCTAAAATCCCATC
A7120.chrom	2966052B	PA	ACT ATTGACA ACC GACA ACT GTACAGACGCGATTAAATCGCGTCT CTAA TTAGACCCAACCTCGTA

A7120.chrom	3074942F	C	GCTATTTTTCACAATTAA	TTGTACAGACGCGATTAA	TCGCGTCTCTCTAACAATTACCGAGCGAT
A7120.chrom	4025681F	PP	TAATCGCGTCTCTGACAATT	GTACAGACGCGATTAA	TCGCGTCTCCAACTAATGACTAATGCCTT
A7120.chrom	4063743F	PP	AGTAGGGGGGAGAA	GACAACGTACAGACGCGATTAA	TCGCGTCTCTGACTAATAATTAAACTCT
A7120.chrom	4514790B	PA	ACAACGTGACAACGTGACAAC	GTACAGACGCGATTAA	TCGCGTCTCTGACAACGTGACAATAACTA
A7120.chrom	4608420B	PA	ACATCTGACTACTGACCAAT	GTACAGACGCGATTAA	TCGCGTCTCTGACTAATTTGCCAAATACT
A7120.chrom	4870233B	D	ACTATTGGCAACGTGACAAC	GTACAGACGCGATTAA	TCGCGTCTCTAACAACATAATTAAATACT
A7120.chrom	4896683F	PP	GGTGATAATTTTCAGGTTA	GTACAGACGCGATTAA	TCGCGTCTCTGACAACGTGACTAATTAAAT
A7120.chrom	5418499F	I	ACCAATTACCACTAACAAT	GTACAGACGCGATTAA	TCGCGTCTCTAACAACATAACAATTATGGA
A7120.chrom	5572413F	D	AACAACGTGAATTAACAAC	GTACAGACGCGATTAA	TCGCGTCTCTAACAACGTGACCACTGACAC
A7120.chrom	5581576F	D	TTGACTGTTGACTGAAAC	GTACAGACGCGATTAA	TCGCGTCTCTGACTAATGACAAATCACGC
A7120.chrom	5827547F	PP	GAAATTGACTATGGACAATT	GTACAGACGCGATTAA	TCGCGTCTCTGACCAATAACTAAATTAGT
A7120.chrom	5930006B	PP	GGGAAAGAAATTTGACAAC	GTACAGACGCGATTAA	TCGCGTCTCTGAGCAATGACCAAAATACAT
A7120.chrom	5996616F	PA	AAAGATGACAACCGACAATT	GTACAGACGCGATTAA	TCGCGTCTCTGACTAATTTTATTGTCTC
A7120.chrom	6298900B	C	GGGAATTAACAACCAACGACT	GTACAGACGCGATTAA	TCGCGTCTCTAACAATAAGCTAATTCGTT

Anabaena variabilis ATCC29413 (22)

Avar.chrom	156460F	D	CAGGAGTTAGGACGCGAGTGGGGAAAAAGAAATCAT	TAGCAACTAATAACT	GTACAGACGCGATTAA	TCGCGTCTCTGACAACGTGACAACGTGACTATTACCAAATGACTAAAAATTTTCTTGCA	
Avar.chrom	675115F	C	ATGGATATCGGCATCCTCAAGAGGAAGAG	TAGGGAGGCTGGGAGAA	AATTTGTACAGACGCGATTAA	TCGCGTCTCTTATAACTCACTTTTACCAAAACCGTCTCATCATAGGCTCTCGTGATCT	
Avar.chrom	696499B	PA	CCCCAACCGTTGTGCAGGTTGGGGTATTAGACCAGATCCTTTC	AACAATTTGTACAGACGCGATTAA	TCGCGTCTCTCGTTTCGCGGAGCGTCCCACACTTAAGCGCAATAAAATTA	CACCTTACCT	
Avar.chrom	724340F	PA	AGAAGAATTACTATTGACTATTGACTATTGACCAAT	TGACAACGTGACAAC	GTACAGACGCGATTAA	TCGCGTCTCTGACTAATCTTTTGGTGGAACATAATCTAGTAACCCCTTCAGGGGTA	
Avar.chrom	1468416B	PP	ATATTAATTACTATCGTTGGGTTGGCA	TGAAAAATGATTGCA	GACAATTTGTACAGACGCGATTAA	TCGCGTCTCTAATTAATAATAATTTAAGCGGGTGATAAGAAAAAGTATGAAAAAG	
Avar.chrom	1866621B	C	CTTTAATTTAGTCAATAGTCAATAGCCATGAGTAATGACAT	CTGACAATTTGTACAGACGCGATTAA	TCGCGTCTCTAATTAATCTCTCCCACTCTTGCAATTTCCACTAACTCCATACACAACTA		
Avar.chrom	1966415B	PP	TAGCACCTCATGAATCAATTCAAAGTACCTACGGGAACTAA	AACAATTTGTACAGACGCGATTAA	TCGCGTCTCTAATAAAATGACATACGCGAGTGAATAAAGTCGAGCTTATAGTAATTTGT		
Avar.chrom	2066389B	PP	TAGCATCTTAACAATTGTACAGACGCGATTAA	TCCATCTCTGACAATTTGTACAGACGCGATTAA	TCGCGTCTCTGACCAATAACTCTTAACCCACACTTTATAATTATGGCTGCAAAATGAA		
Avar.chrom	2086638F	D	AACCTCGGGGAAGCAGGGGGGAAAGAGAAAACTATTGG	CAACTGACAAC	GTACAGACGCGATTAA	TCGCGTCTCTAACAACGTGACAAATAACTAATGAACACACAACGCTCATTCTTCTGGTT	
Avar.chrom	2368271B	PP	TTTGGGATTC	TAGTGTGAGAAGCAGGGGGAGCAGAGCAGCAGA	GACAAC	GTACAGACGCGATTAA	TCGCGTCTCTGACAACCGACAAC
Avar.chrom	2467606B	D	AATTCAATAAATATTTA	GTACAGACGCGATTAA	TCGCGTCTCTTGAAATTTGTACAGACGCGATTAA	TCGCGTCTCTAACAATAATGACAAATCACTCTCTATTCTGGGTTTGGTGACATTAGATT	
Avar.chrom	2542835F	PP	AGTACTAAGTCAAAAGTCCAGAGTCCAGAG	TTTTGTGACAACAGACAAAT	GTACAGACGCGATTAA	TCGCGTCTCTAACAACATAACAAC	
Avar.chrom	3871317F	C	GCAGGGGAGCAGAGGAGCAGGGGAGTAACGAGAAATGAGTAA	TGACAATTTGTACAGACGCGATTAA	TCGCGTCTCTCAAACTCTTAAATCCCATTGCCTTGCGTA	CATCTTTTAAATCTGCCTC	
Avar.chrom	3985033F	PP	TAGGGGGTGCA	GACAATTTGTACAGACGCGATTAA	TCGCGTCTCTCTAAATTTGTACAGACGCGATTAA	TCGCGTCTCTGACTAATAATTAAACTCTATTTAAGAATGCTGGATTGGCTGGATATA	
Avar.chrom	4009695B	PP	AGCCGCCACAGCGCTGTCTCCCAACGCACTGCTTC	ACAACGTGACAATTTGTACAGACGCGATTAA	TCGCGTCTCTGACAACGTGACAACGTGAC	CATTGACCAATCAGATAATCTAACTCAAGG	
Avar.chrom	4127199F	C	CGGTCAATCCTTTAAAAACAGACAAC	AGACGCGATTAA	TCGCGTCTCTTAACAAC	GTACAGACGCGATTAA	TCGCGTCTCTAACAATAACACATGATTGATTGCGCTCTGTTTATACTTTGAATTTT
Avar.chrom	4133577B	D	CAAAACAATGACAAATGTAAGGACGCGACTAATCAGTCTCTT	ACAATTTGTACAGACGCGATTAA	TCGCGTCTCTAATAAATTACCCCGCAACAAAAATAAAAATGTAATTATATAACAATT		
Avar.chrom	4531959B	PA	TCACTTGGGGTTGGGATATTAGACCAGATCCTCTCAAA	AACTGACAATTTGTACAGACGCGATTAA	TCGCGTCTCTAACAACGTGACAAC	CGCAAAAGCGCAATAAAATTTCCACATCTGGTTGGT	
Avar.chrom	4726162B	D	AGGGGAGCAGGGGAAACTAATGATTAATGAGTAA	TGACAACGTGACAATTTGTACAGACGCGATTAA	TCGCGTCTCTAACA	CAAAATGCAAAATTCGCGCTCTCCATCCAGATACGATTGATGAAGT	
Avar.chrom	4996648B	PP	ATGGTTGGGTGCAAGTCATCAAGAAATTTACGCCTTTCGCT	TAATATCAAGTACAGACGCGATTAA	TCGCGTCTCTGACAACGTGACAACGTGACAACGTGAC	TAAATTTGTTAGTGTAGGGTAAGT	
Avar.chrom	5472503F	PP	GGGTGGTGAATCAAGACAAC	AGACGCGATTAA	TATATTAACAATTTGTACAGACGCGATTAA	TCGCGTCTCTGAACCAATATGCTAAATATTTCTAACCTTAACGTTTACTATGGCGAAA	
Avar.chrom	6037471F	C	GGTTGCTGTGTGGGATAAG	TGAGGGATTGGGGATTGGGGATTGATGATT	GTACAGACGCGATTAA	TCGCGTCTCTGACCACGCTTAATTAACGTGGCGACGACTGTAGCCAATCTGTGGGTT	

SDR2a.2

Nostoc punctiforme (7)

Npun.chrom	3180964F	PP	CCTCAAT TCCTAACTCCT TTACAGACGCGATTAATCGCGTCTCT ACTCATAA ATTTTCGCTTGTTAC
Npun.chrom	3192733B	C	ACTTGATATAT TTTTGCCAAAA AGACGCGATTAATCGCGTCTCTAC AACT TGTTTA ATTCCCTTGC
Npun.chrom	5324654F	I	GTACCGGATCAATAT CTGTAG AGACGCGATTAATCGCGTCTCT ACT ATAAATGCGATTTCATCACG
Npun.chrom	5475431F	PA	TACTTGGTGCTTTAAATC CTT AGACGCGATTAATCGCGTCTCTAC CCACCC AAATTCAATTAG
Npun.chrom	6267017F	C	ATACAAAATATCATTT CTAAC AGACGCGATTAATCGCGTCTCT ACTGCTAACTTA AACTGTTGG
Npun.chrom	7077357B	C	TATGAGTTTAATTCCTGC ACAGACGCGATTAATCGCGTCTCT ACTCCTAACTCA TTTGCCGCCG
Npun.chrom	7710686F	PA	CG TAA TCCTAACTCCT GTAGAGACGCGATTAATCGCGTCTCT ACTCCTAACTACTTTTTGCTGG

Anabaena variabilis ATCC29413 (4)

Avar.chrom	584879F	PA	AATTGCAGCAGAGTATTAATTTAAGTG ATACCAATTTGAA TAAACCATT GTAG AGACGCGATTAATCGCGTCTCTCTTGACTAATTATTAGCCCTAACCTAGTATGTTGTGCCAACCTAGTTA
Avar.chrom	2386473B	PA	ATTTGGATGTAT ATACCAATTTGAAAAAGAATGCGACAAATA-ACCATCC GTAGAGACGCGATTAATCGCGTCTCTCT TCATCCAAAGATGTGTTGCAATCATTAGTTGAATTGGTAT AACCTGC
Avar.chrom	3874435F	PP	AGAAAAAGTC ATACCAATTTGAAAAAGAATGCGACAAATAAACCATCT GTAGAGACGCGATTAATCGCGTCTCTCT TCACCCAAATGATGTATTGCAATCATGAATTGAT CTAAAAAGTAAAA
Avar.chrom	5055207F	PP	GTATGTAAAAACCACACACTAAGGGTTGGGGTATTAGACCAGATCAT TTTTGTAG AGACGCGATTAATCGCGTCTCT TTTTCTT AAAAGTTCACCTAAAGATTCAAACAACAAATATTCTAGAA

SDR2a.3

Nostoc punctiforme (7)

Npun.chrom	703601F	PA	ATTGGGCATGACAGAAGATTT AGACGCGATGAATCGCGTCTCTAC CT ACTCC CGTTTCGACTACGC
Npun.chrom	704222B	PP	CCCCTGCCCCCTACCCACAC AGACGCGATGAATCGCGTCTCTAC AACTCC AAAAAATTA TGTA
Npun.chrom	1183296F	I	GGCGATCGCGTATCCAG GTAG AGACGCGATGAATCGCGTCTCTAC AAGATTCTGAATTCTGAAT
Npun.chrom	2948201B	D	TCTCTCCTGTCT CTCTGC ACAGACGCGATGAATCGCGTCTCTAC AACTCCTAACT TTCTCTC A
Npun.chrom	3319503B	I	TACCGATAATCGG TTTTGTAG AGACGCGATGAATCGCGTCTCTAC AATGGGTTTTATACCATTCC
Npun.chrom	3693064B	PA	TAA AACTCCTCACTCTTATAC AGACGCGATGAATCGCGTCTCT ACTTCTAATTCTTGTACAGACG
Npun.chrom	7099046F	I	TTCAT TCCT TTGGTGTGGGA AGACGCGATGAATCGCGTCTCTAC AATTTGGGTTTCGTCAATTT

SDR2a.4

Nostoc punctiforme (6)

Npun.chrom	2545124B	I	CGTCTCTACTCTAACTCTT GTACAGACGCGATT CATCGCGTCTCTATT CAAAATTGGCTAGAAA
Npun.chrom	2948242B	D	ATTAT TTTTAACTCTTTCTT GTACAGACGCGATT CATCGCGTCTCTCCT GTCT CTCCT GCACAGA
Npun.chrom	3399341F	D	AGAGAATAATAAA AACTCTT GTACAGACGCGATT CATCGCGTCTCTATTCTCTAACTCAGCACTCC
Npun.chrom	3919412F	I	TTACTGTACAGATGCAT CTTGTAC AGACGCGATT CATCGCGTCTCTAAAGTCTCCA ACTTACAGA
Npun.chrom	6850172F	C	CCGAAACTCAGCACTATAT TTGTAC AGACGCGATT CATCGCGTCTCTATT CAGCGCTATCTA ATAA
Npun.chrom	7278933F	PP	CCTTAGC ACTCCTAACTCTT GTACAGACGCGATT CATCGCGTCTCTCAACACTCCCA ATGCCCA

Avar.Chrom	3641097F	PP	CAC TGAAGC GATAACT GTACAGACGCGATT CATCGCATTTCTAACAATT GTACAGACGCGATT CATCGCGTCTCTCAACA ACTGACA ACTAA ACCAAACT ATGTCAATCCCATTACTTGAATAC
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SDR2a.5

Nostoc punctiforme (6)

Npun.Chrom 209766B PP TAGTGGGACTT **ATACCAATT**GGAAAAAGAATGCGACAAATAGACCATTGTAGAGACGCGATGAATCGCGTCTTGACCCAAGGATGTGTTGCAATCATTAATTGAATTGGTATTCGACAAAGA
 Npun.Chrom 1504360F C AATGTGTAGGCGTAGTCCGCCGACGGCATCGTTTTCGATCGCACCTTGTAGAGACGCGATGAATCGCGTCTTCTTGATTGATTTCATCTATTGACGCGATAACGATGTTTCA**CCCCAAT**
 Npun.Chrom 4440804F C **TATTTAGTC**T**ATACCAATT**GC**AAAAAGAATGCGAGAAATAGACCATT**GTAGAGACGCGATGAATCGCGTCT**TTACCCAAGGATGTGTTGCAATCATTAATTGAATTG**AATGAACAGAGGGA
 Npun.Chrom 4846870B C **AAAA**CCTT**ATACCAATT**GA**AAAAAGAATGCGACAAATAGACCATT**GTAGAGACGCGATGAATCGCGTCT**TTACCCAAGGATGTGTTGCT**TCGAGGAGTATTGAATTCTGTATGAAGATG
 Npun.Chrom 7174913B PP **TTTT**GTATCTA**ATACCAATT**AAAAAGAATGCAACAAATAGACCATTGTAGAGACGCGATGAATCGCGTCT**TTACCCAAGGATGTGTTGCAATCATCAATCAAAATGGTAT**AAAA**TTTT**

Anabaena PCC7120 (3)

A7120.Chrom 410814B C **GCATCAAGG**T**ATACCAAT**-AAAAAGAATGCGACAAATAAACCATCTGTAGAGACGCGATGAATCGCGTCT**TCACCCAAGGATGT**ATAGCAATCATTTATAAAGAGTAAAGCAGAGGAA
 A7120.Chrom 1258171F C TTAATAACATA**ATACCAATTT**AAAA**CAATACGACAAATAAGCATTT**GTAGAGACGCGATGAATCGCGTCTAT**TCACCCAATGATGTGCTGCT**TAAAGTCGGTAATAGATAA**TTTT**TACCA
 A7120.Chrom 5761646B PA TCCCCATCTA**ATACCAAT**CGG**AAAAAGAATGCGACAAATAAACCATCT**GTAGAGACGCGATGAATCGCGTCTCT**TCAC**TGTTGGCGTTAACCGTTAGCAATCAAATCATGGTTA**TGTAAT**

Anabaena variabilis ATCC29413 (14)

Avar.chrom 252359F C AATTCTTAATC**ATACCAATT**GAAAAAGAATGCGACAAATAAACCCCGGTAGAGACGCGATGAATCGCGTCT**TCACCCAAGGATGTGTTGCAATCATTAATTGAATTGGTAT**CATTTT**GAG**
 Avar.chrom 267305B D ATAGGGGCGTA**ATACCAATTT**GAAAAAGAATGCGACAAATAAACCATCTGTAGAGACGCGATGAATCGCGTCT**TCACCCAATGATGTGTTGCCATCATTAATTGAATTGGT**TAAGGGTGTA
 Avar.chrom 779739F PP ACAGTTAGGT**ATACCAATTT**GAAAAAGAATGCGACAAATAAACCATTTGTAGAGACGCGATGAATCGCGTCT**TCACCCAAGGATGTGTTGCAATCATTAATTAATTGGTAT**AGTTAATAGC
 Avar.chrom 1621903B C TTTGGTA**ATGCCAATTT**GAAAAAGAATG**GCACAAATAAACCA**TTT**GTTT**GTAGAGACGCGATGAATCGCGTCTCT**TCACCCAACGATGTGTTGCC**CATTTCAGGCGTAGGGCGCGTCAGATA
 Avar.chrom 1910803B PP **AAAAAGAATGGAC**AAATGAATCAATTCAAATTC**AAATAAACCATCT**GTAGAGACGCGATGAATCGCGTCT**TCAGCCAAGGATGTATTGCAATCATTAATTGAATTGGTAT**AAGTAGTGGG
 Avar.chrom 2504401B C AAATTGGTAATAGGAAAAACAATT**ATACCAATTT**AAAA**AGAAC**CCCTTGTAGAGACGCGATGAATCGCGTCTCT**TCACCCAATGATGTGTTGCCATCATTAATTGAATCGGTAT**TAATATT
 Avar.chrom 3217801B PA AAACCCAG**TTTT**CTGAGAACTGGGTTACACGCATG**AAATAAACCATCT**GTAGAGACGCGATGAATCGCGTCT**TCACCC**GATTCATGAGCCAGCGCTTGCAGGAGACAGTTGCGTGGGCGGG
 Avar.chrom 4230019B PA GTAACGTAGTT**ATACCAATTT**AAAAAGAATGCGACAAATAAACCATCTGTAGAGACGCGATGAATCGCGTCT**TCACCC**TC**CGACAAATAAACCATCT**GTAGATT**ATCGCGTCTTCACCCA**
 Avar.chrom 4243245F PA TGAGAATTGT**ATACCAATT**-AAAA**ATATCCAACAAATAAACCATTT**GTAGAGACGCGATGAATCGCGTCTCTTCT**TCACCCAAGGATGCGTTGCAATTATTAATTGAATTGGTAT**AAAT
 Avar.chrom 4413533F C **TAACAATTCAA**AAATTCAAAAACAGGAATAAATA**ATACCAATTAACCATTT**GTAGAGACGCGATGAATCGCGTCTCTTCACTA**AACCACCGCTTGTTTGAAGATTTAGTTAAATCACAAGGAG**
 Avar.chrom 4752232B C **AATTCAAAGTAATACCAATTT**GAAAAAG**CATCCGACAAATAAACCATCT**GTAGAGACGCGATGAATCGCGTCT**TCACCCAAGGATGTGTTGCAATCATTAATTGAATTGGTAT**TATTGTAAT
 Avar.chrom 5401617B PA TGAAGGGATTA**ATACCAATTT**GAAAAAGAATGCGACAAATAAACCATCTGTAGAGACGCGATGAATCGCGTCT**TCATCCAAGGATGTGTTGCAATCATTAATTGAATTGGTAT**AAGGCTAAGG
 Avar.chrom 5850572B C TATTAATTTATTGGTGATTTCACAAGACCAAAATAACGCCAAATAAACCATGTAGAGACGCGATGAATCGCGTCTCTTCTGTATTGG**TTTT**ATATGGGAATGTATAGCCGTCGCCAGTAGTGTTA
 Avar.chrom 6237410B PA TACCCTTGAGGGTGATATTGATGAGATGAGGACTTACGT**ATAAACCATTT**GTAGAGACGCGATGAATCGCGTCTCTAGTAGA**TTTT**GACATAAAAAAGTGGCTCTGTGTAAACAGAACCA

Nodularia CCY9414 (2)

nod-044 27887F C **TTCAATTCGGGGCGTGAAATTGGATAAA**TAATCAACGCAATACCCATATTGTAGAGACGCGATGAATCGCGTCTCATTCATCTTTAATAGGTATACTTGAAACCCACCCCCAACCCCTCCCC
 nod-060 5239B PP **CATTACCTTGATTGTGATGCCAGATTATCTATTGCGT**TGAGTGCGCGCTGTAGAGACGCGATGAATCGCGTCTGGGAAGAGGAACGAACCACGTTGGCGCTAGCCTCTCCCTTTGGGAGAAGG

SDR2a.6

Nostoc punctiforme (5)

Npun.chrom	525806B	PA	GATAACCAGAAAGCCCTCAT	GTAGAGACGCGATTATCGCGTCT	-GAAAACTGGCACGTTAGATG
Npun.chrom	1235040B	PP	ATAAGCCAGAAAGCCCTCAT	GTAGAGACGCGATTATCGCGTCT	-AAAAGACTGACACGATAAATC
Npun.chrom	5528860F	PA	AAGATCCAGAAAGCCCTCAT	GTAGAGACGCGATTATCGCGTCT	-GAAAGACTGACATGTTAGAAA
Npun.chrom	6845986B	I	GTCTGCGGAGCTTTATCTCAT	GTAGAGACGCGATTATCGCGTCT	-AAAAAATTGACACGTTAGAGA
Npun.chrom	7901034F	C	GATAAGCCCAAAATCCTCAT	GTAGAGACGCGATTATCGCGTCT	TGAAAGACCAATCATCTACAC

Anabaena PCC7120 (2)

A7120.pAlpha	341940F	C	TTGTTCTGGAGAAACCAATACACTTCAAATGAGCAACAAACCCTGAT	GTAGAGACGCGATTATCGCGTCT	TGAAAGACCAATCATCTACACCAATAACCCTTAACCAAGCATATTGTTT
A7120.chrom	1317577B	I	ATGGATTGGTAATTGTGGTGCGATCGTCAAAACAATTGAGTCGTACCCT	GTAGAGACGCGATTATCGCGTCT	ATTTGGGTCAACGTAGATTACGACCAAAACCGATTATCGCGTCTGCATG

Anabaena variabilis ATCC29413 (7)

Avar.chrom	682525F	PA	AGTCGTTTGTATATCAATTCCTATAAAATTGCGTCAAAATAAACCATCC	GTAGAGACGCGATTATCGCGTCT	TCTTCACCCAAATTTTACCTCTCCCCAACCCCTCTCCGACGCGGAGAG
Avar.chrom	1485696F	PP	CGCCGGAATTTATACCAATTC-AATTAATAATG---GCAACACATCATCT	GTAGAGACGCGATTATCGCGTCT	CTACAGATAGTTTATTTGTCGCCTTCATTTTCAAATTGGTATTATACTG
Avar.chrom	1975114F	PA	AGTCAGTTGTTATACCAATTT-----AAATAAACCGTCT	GTAGAGACGCGATTATCGCGTCT	TCTTCACCCAAATGATGTGTTGCCATCATTAAATTGAGTTGGTATTAGTTGT
Avar.chrom	2959201B	PP	GTCTTCAGATAGCGTAATTAATTCAAATTCAAATTAATGAACCATTT	GTAGAGACGCGATTATCGCGTCT	---TCACCCCATGATATGTTGCAATCATTAAATTGAATTGGTATAAGTTAA
Avar.chrom	3419258B	C	AGACGCGATTGATGTTTGTGGGATTCTAGTACAGACACGATTGATGTTT	GTAGAGACGCGATTATCGCGTCT	CTACAAAGATTTTTCACCCAGATGCTGAATTAATTTAGCGACTAAACCTG
Avar.chrom	5863381F	I	ATGAATTAAGTGATGTTGGTGCGATCGTCAACAAGGATTGAGTCGTACTTT	GTAGAGACGCGATTATCGCGTCT	GCCTGGGTCAACGTAGATTACGCACTAAATTGCGGTAAATAGAAGGTAAA
Avar.chrom	6179710F	PA	TGGGACAAATTTATACCAATTTGAAAAAGAATGCGACAAATCAACCATCT	GTAGAGACGCGATTATCGCGTCT	TCACCCAAGGATGTGTTGCAGTCATTAAATTGAATTGGTATTAGCTAGTAT

Nodularia CCY9414 (1)

nod-058	26413F	PP	GCAATTAAGTGAAGCTCTGTTGTTGGAGATGTTGTCAAATTAACACCCTT	GTAGAGACGCGATTATCGCGTCT	GGTTTATCTTGTTTATATATAAGGGAAGATTTAACGAACACAGATGAACA
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SDR2a.7

Nostoc punctiforme (3)

Npun.chrom	3929680B	I	CAATAATGGCAATATCTTCA	GTAGAGATGCGATTAATCGCGTCT	TTACAAGATTGGGGGAGATTT
Npun.chrom	6212605B	I	TCCTCACTCTCACTCCCTA	GTAGAGATGCGATTAATCGCGTCT	CTCCCAACTCTCCACTCCCTT
Npun.chrom	7045394F	PP	ATTCGCCAAAATTTAGAATC	GTAGAGATGCGATTAATCGCGTCT	GTTGTTACGGAATTGGGGGTG

SDR2a elements in cyanobacteria other than *N. punctiforme* and not sharing its sequence with a multicopy SDR2a from *N. punctiforme*

SDR2.x

Anabaena PCC7120 (6)

A7120.chrom 452007B C ATACCCTGCGGGAAGGCTGCGCCAACAAATTCAAAATAAACCACCTGCTGTAGAGACGCGATTATCGCGTCTTCTTCTTCACCCAAATCCCAGTCCCTAATCAATCAAATTTTCTAAAGCCA
A7120.chrom 798657F PP CAGCAGAAATTAGGATAAGCATGAGTAATGGCGACAAATAAACCATT--TGAGAGACGCGATTATCGCGTCTTCT--TCACCCAAAGATATGTTGCTAACAAATGACAAATTTAGAAAGATT
A7120.chrom1189071B C AACTGATCGCACCAGTTTAAAAAGAATAGGACACACAAACCATT--TGAGAGACGCGATTATCGCGTCTTCC--TCAGCCAATGATTAATTTGTCAATAGTCCATAGTCCATAGTCAA
A7120.chrom3440659F PP ATTCGAGTTATACCAATTGGAAAAAGAATGGGACAAATGAACCATC--TGAGAGACGCGATTATCGCGTCTTCT--TCACCCAAAGGATGTTGCAATCATTAAATTGAATTGGTATTAAT
A7120.chrom3867147B PA TTATAAGTTATACCAATTTGAAAAAGAATGCGACAAATCAAACATC--TGAGAGACGCGATTATCGCGTCTTCT--TCACCCCGCAATTCATCGCGTCTTACCCAATGATGTGTTGCAA
A7120.chrom6401631B PA AAACCCAGTTTCTCAGCGAACTGGGTTACACGCATGAAATAAACCATCTGTAGAGACGCGATTATCGCGTCTTCTCTCACGCCAAGGTTAAGAACCCTGGTTGAATCAAGTAAGCTGTGTA

Anabaena variabilis ATCC29413 (13)

Avar.chrom 1349076F PP CATTGATTTATACCAATT-GGC-AAAAGAATGGGACAAATGAACCATCTGTAGAGACGCGATTATCGCGTCTTCT--TCACCCAAAGGATGTTGCAATCATTAAATTGAATTGGTATTAAT
Avar.chrom 2391340F D GAGGTGTGGAAGTTACTAAATTGGGGATTGGGGACTGGGGATTGGGTATTGTAGAGACGCGATTATCGCGTCTATGAAAAAATTCATCGCGTCACTAATGACCAATCTCCTAATTGCAATCA
Avar.chrom 2606784B PA CGCCCATCTAATACCAATC-GGAAAAAGAATGAGACAAATAAACCATCTGTAGAGACGCGATTATCGCGTCTTCTTCACTGTTGGTAGTTAACCGTTAGCAATCAAATCATGGTTATGTAAT
Avar.chrom 2929119B C CCAAATGTAATACCAATTTGAC-AAAAGAATGCGACAAATAAACCATTTGTAGAGACGCGATTATCGCGTCT-----TCACCCAAAGATATGTTGCAATCATTAAATTGAATTGGTATGGGA
Avar.chrom 3199749F PP AAAAGCATTAATACCAATTTGAAAAAGAATGTGATAATAAACCATCTGTAGAGACGCGATTATCGCGTCT-----TCACCCAAAGGATGTCGCAATCATTAAATTGAATTGGTATAAGT
Avar.chrom 3247837B PP AAGTCAAGTAAGACCAATT-GGAAAAAGAATGCGACAAATAAACCATCTGTAGAGACGCGATTATCGCGTCT-----TCACCCAAAGGATGTCGCAATCATTAAATAAAATTCAGCATAT
Avar.chrom 3399656F C GTACCTGCGTTTTTTTTCAACACAGGGAAAAACCAAAATAAACCATTTGTAGAGACGCGATTATCGCGTCTTCACATTCACCCCAATGATGTTTGCCATCATTAAATTGAACGTATATT
Avar.chrom 3500067B C CCCGCTACAGAATTTCCGCAAAATTCAAAATTCAAATAAACCACTGTAGAGACGCGATTATCGCGTCTTCTTCTTCACCCAAATCCCAATCCCAATCCCTAATCAATCAAATTTTCC
Avar.chrom 3685989B I AGCCATTTTTAACCCAAAAAGTTTGTATTTATTAATCGGAGATTACCTTGTAGAGACGCGATTATCGCGTCTGGTGAAAAACAAAGAGAAATCATCAATTGAAAATTTAGTTGCAACGGTAGT
Avar.chrom 4696870B C TAATAATATAATACCAACTTTAA-AAAAAATACAACAAATAAAGCATTTGTAGAGACGCGATTATCGCGTCTTCTTCTTCACCCCAATGATGTTGTTGCTGCCGATATGGTTGCTAGAGTCGGT
Avar.chrom 5637651B C CGAACCCGTAGGGTATTTGAATTTGAATTCATCGATAAATAAACCATCTGTAGAGACGCGATTATCGCGTCTCTAATCATCCCGCCGCTGAACCTTGTGGGGTGGGCTAGTTGCTTCCACG
Avar.chrom 5754984F I GTAGCCAGGCATTGATGATGAGGTAGGGGACAGAAATCCGGATAAGCCACTTGTAGAGACGCGATTATCGCGTCTTCTTCACGCAATGATATGTTGATATGTTGCTAACAAATGACAAATTTAGA
Avar.chrom 5857478B PA CTATAAAAGTTATACCAATTTGAAAAAGAATGCGACAAATAAACCATTTGTAGAGACGCGATTATCGCGTCTTCTTCATCCAAAGGATTCATCGCATCTTACCTAAGGATGTTGCAATC

Other multicopy SDR2a

Avar.Chrom 1958868F PA ATCTACTTAACAGGTTACGCCAAGTAGTCACTCTTTGCCAGAGACAACGTACAGACGCGATGAATCGCGTCTTAACAACCTAAATATAAGGCGAAACGTCTCTTTACATTTCATCTGCCAA
Avar.Chrom 2059885B PP TTACGTCTTAACAACGTACAGACGATTGATTAATGCGTCTTAACAACGTACAGACGCGATGAATCGCGTCTTAACAACCTGACTAATCAAATTTGGTAGCCAAGAACTCTCGCTTTTT
Avar.Chrom 2061377B PP TGCGAAGAGACAACAGACGCAACGAATCTCTATAGTAATGGATCTATATTGTACAGACGCGATGAATCGCGTCTTGATATCGACGAACTTTAACTTTAACGTAGCGTCAAGATTTCAAGCT
Avar.Chrom 4565593B PP GGATTGGAGACAACAGACGCGATGAATCGCGTCTTAACAACCTAAACAATGTACAGACGCGATGAATCGCGTCTCCAAATAATGACTAACGCTTCAACAGACTTGACCTTTTATTCAAGAAT

Avar.Chrom 1485697B PA TATTCAGTATAATACCAATTTGAAAAAGAAGGCGACAAATAAACATATCTGTAGAGACGCGATGAATCGCGTCTTAACAG-ATGATGTTGTCATTATTAATTGAATTGGTATAAGTCCGGC
Avar.Chrom 1790136F PP TGTATGCGTAAATACCAATTTGAAAAAGAATGCGATAGATAAACCATCTGTAGAGACGCGATGAATCGCGTCTTCACCCCATGATGTTGCAATCATTATTTGAATTGGTATAAGTCCTAAG
Avar.Chrom 2106278B PA ATTGACAGTTAATATCAATGTAAAAAGAATGCGACAAATAAACCATCTGTAGAGACGCGATGAATCGCGTCTTCACCCCAATGATGTTGCAATCATTAAATTGAATTGGTATAACCGTCAA

nod-019 40919F C CAAAAGTCAAAAAGATTATTGTATCGGC**TTTT**ATTGATTATAAAAAATGTAGAGACG**TTCCATGGAAC**CGTCTCTACAAACGGTTTAGGAACTAACAC**TTTTATTCTGCGCTTGATAGCTGG**
 nod-078 18549B D TGTGCCAAATCTTTGGCGTTGCTCAAAACAAGTATGAATTTCAATGTAGAGACG**TTCCATGGAAC**CGTCTCTACAAAGG**TTTT**GA-CTCATAGATATGTGCAGAACTCTGAAGATTCCAC
 nod-003 100933F PP GCGTTCCGCCCTTAGCGGTATGCGTGAAACCAAATATGAATTTAAATGTAGAGACG**TTCCATGGAAC**CGTCTCTACAGGGG**TTTT**GAGATCATCACAAATCGTGTTCATACTTCAAATCAGC
 nod-045 11048B C TATATTCAGTAT**TTTT**CATAAT**TTTT**GTTAAAGTTGTGGTTAAT-AAATGTAGAGACG**TTCCATGGAAC**CGTCTCTACACGGG**TTTT**GACATCATCACAAATCGTGTTGATACTTCAAGTCAAA
 nod-063 10854F C AAGTTACGATGGAAAAGTATCAGTCAATACCTTTTCGGTTAGGGGATGTAGAGACG**TTCCATGGAAC**CGTCTCTACAGGGG**TTTT**CGGATCACGAATTTGCTTAACCGAACAGTATTGAAGT
 nod-019 15586B PP ACAAATTTGGGGGGTCTAGGGGTGCAATACCTTTTCGGTTAAGGGATGTAGAGACG**TTCCATGGAAC**CGTCTCTACAATGG**TTTT**CGGCTCAGGAATTTGCTTAACCGAACAGTATTGTCTA
 nod-067 15472F PP TTATACGCGCTGCTCAACCCAATCAATAC**TTTT**CGGTTAAGGAATGTAGAGACG**TTCCATGGAAC**CGTCTCTACAAAGG**TTTT**CGGCTCACGAATTTGCTTAACCGAGT**AGTATTG**CAAC
 nod-019 46579B C **GATTGAAACCAACCCTCAATCATTAACCATG**TAGAGACGTTGCAAAAAATGTAGAGACG**TTCCATGGAAC**CGTCTCTACAAAGTTATGTATTTCTCCGCTACCTTTGCGCTAACCTCCGCGCA

 nod-014 59148B C **CTGGTGTA**TGAT**TTTT**AGATGACGATA**TTTT**CGGTTAATTAGATCATAATGTAGAGACG**TTGCATGCAAC**CGTCTCTACT-**TTTT**AATTTCCGCTTTGCGTAGCACTTAAGGAA**TTATTTCAC**
 nod-020 42040F PA GTGCTGGATGCTGTTAGCGTTGAGGGGCAGAGACATCTCCAATAAAAAATGTAGAGACG**TTGCATGCAAC**CGTCTCTACAGGGG**TTTT**AGAAAAAGCATATTTAAATTCAGTCGATGCTCATGT
 nod-137 6769B PP CGGCACGGTTCCTCACAAGAAATGATGGAAGTCTATATATTCTGAATGTAGAGACG**TTGCATGCAAC**CGTCTCTACAAAGGTTTGGTCAGACGTTTATTTGACTGTTAATTCAGTTCCGTTGA

 nod-082 12929B C **ACCCTTCAAAGGTAGTCTCTGGCAGCTTGGGGATGG**TAAATTAATACAGTAGAGACG**TTCCATGCAAC**CGTCTCTAACCGGTTATGTCAGACGCATAT**TTTT**ATTTTCGGTCAATATCTAGTAC
 nod-111 11917F C AGACGGTAACTTCCAATGACCAATAGACATCTGATTACAAATAATGTAGAGACG**TTCCATGCAAC**CGTCTCTACAAGGGTGATGAAAGACGCATATTTAAATTCGTTTCGATGACTAATGA
 nod-008 56956F C TAAT**TTTT**TGCAGCACACTTTGCACCTTAGGCATCTGCTGATAAAAAAGTAGAGACG**TTCCATGCAAC**CGTCTCTACAAGAGTTTACCGAAGAGGCATATTA**ACGCCCTTCTGCCGCTGAGCG**

 nod-047 5700F C AAGTACACACATTAATACAGCAGTTCTCGGTTAATTAGACCACAGTGTAGAGACG**TTGTATGCAAC**CGTCTCTACAGGG**TTTTTTTT**ACCTGAAAATTGCTGTAAATTCAGTCGATATCA**AA**
 nod-059 31226B PA TTTATGCTATTTGTGAAAATGCCATAGACATCTGGTGATCAAGAATGTAGAGACG**TTGTATGCAAC**CGTCTCTACAAAGGTTACCCAAGACAGATATTTGA**TTTTTAGATTATATTGTCT**
 nod-018 31242B PP **TCATCATCAT**TAGACATCGAGCAAATCTAAATCTGATCTAACCGTTGTAGAGACG**TTGTATGCAAC**CGTCTCTACAT**TTTTTT**GTCACCTGAGAGAATATCATCCCCATAGCTCAAGTTTC

 nod-073 2181F PP TGGCTTAAAGTTATAGGAAGTGCTGAGTCAATACCTTTTCGGTTAAGGGATGTAGAGAC**TTCCATGGAAC**CGTCTCTACAAGGG**TTTT**CGGCTCAGGAATTTGCTTAACCGAACAGTATTG
 nod-072 13491B D GTTCGCGTAGCGCATACTACACCAGGCACAGAGGACAGAGGAAGAAATGTAGAGAC**TTCCATGGAAC**CGTCTCTACAACGGTTCTGTGATAAGGCATAT**TTTTATTTT**CACCAGATGCTATT
 nod-082 1788B PA AAAAATTATCAAAACACCCACCCCTTAGCAAAGAAGTGAAAAACCTTGTAGAGAC**TTCCATGGAAC**CGTCTCTACATTAATTTACTACATGGTTGAGGTGAAATGGTGCATTGATTTA**AGCT**

Supplemental Figure 2a: Sequences and contexts of SDR2a elements. All instances of SDR2a with copy number of at least 3 in any genome of a cyanobacterium listed in Figure 5 of the main text are indicated. Conventions are as described in Supplemental Figure 1, except that the coordinate listed under **site** is the low order coordinate of the sequence shown (including the sequence flanking the SDR element). In addition, runs of at least four thymidines or four adenosines are rendered in blue or green letters, respectively.