

1 **Additional files**

2 **Additional Table 1** List of strains, plasmids and oligonucleotides used in this study.

Strain, plasmid or oligonucleotide	Description or sequence	Source or reference *
<i>E. coli</i> strains		
BL21	Recombinant expression of CSE	[1, 2]
JM109	Gene cloning and plasmid construction	[3]
HB101	<i>Anabaena</i> conjugation	[4]
J53	<i>Anabaena</i> conjugation	[5]
<i>Anabaena</i> strains		
wild-type	<i>Anabaena</i> sp. PCC 7120	[6]
Δcse	<i>cse</i> knockout mutant with neomycin resistance	This study
$\Delta cse::pBG2089$	Complementation of the <i>cse</i> knockout mutant with neomycin and erythromycin resistance	This study
Plasmids		
pET-28a(+)	Histidin-tag and kanamycin resistance	Novagen
pET-28a(+): <i>cse</i>	Recombinant expression of CSE with kanamycin resistance	This study
<i>pRL448</i>	Neomycin/kanamycin resistance	[7]
<i>pRL271</i>	<i>sacB</i> gene from <i>Bacillus subtilis</i> , chloramphenicol resistance	[8]
Δcse plasmid	1.5 kbp upstream region of <i>cse</i> + Nm/Km resistance + 1.5 kbp downstream region of <i>cse</i> + <i>sacB</i> gene	This study
<i>pBG2089</i>	low-copy number <i>asr1131</i> overexpression vector with erythromycin resistance	[9]
<i>pRL528</i>	Helper plasmid for bacterial conjugal DNA transfer, chloramphenicol resistance	[10]
RP4	Conjugative plasmid containing an Origin of Transfer (OriT) and transfer genes, ampicillin + kanamycin + tetracyclin resistances	[11, 12]
Oligonucleotides		
<i>cse</i> -NdeI-S	5'-CCACTCCCATATGGCAACCGAGCAAGAGCTTCAA-3'	This study
<i>cse</i> -EcoRI-AS	5'-GCCGCTGCCAGCGCTGAATTCCTAGGTTAAATTACTTGCTTTCTT-3'	This study
<i>cse</i> _upst-PstI-S	5'-CTGCAGAAAATGGCGATGTCATCTTAGTT-3'	This study
<i>cse</i> _upst-XbaI-AS	5'-TCTAGAAAAATTAAGAATACTAAAGGTGA-3'	This study

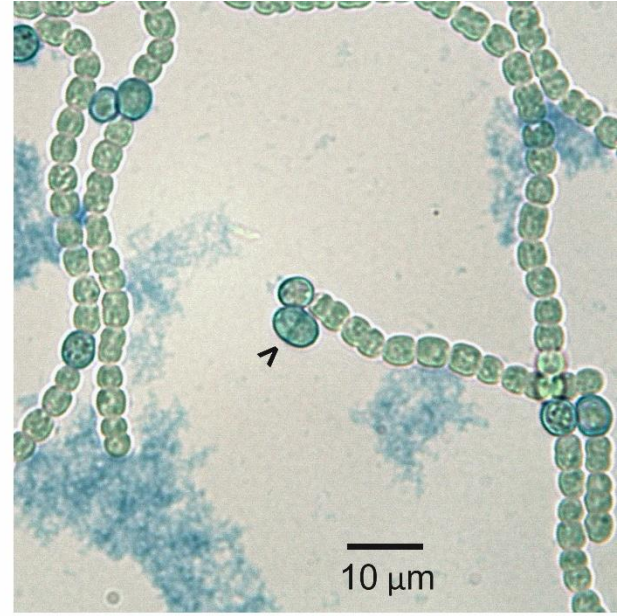
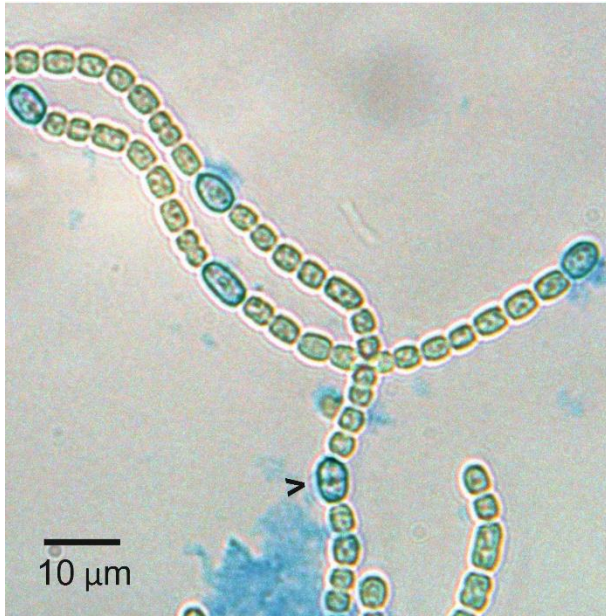
<i>cse_dwst-BamHI-S</i>	5'-GGATCCAAATGTTACCAGTTCTAATACT-3'	This study
<i>cse_dwst-Sall-AS</i>	5'-GTCGACAAAGCAAATTGGTAGAAGCGCAA-3'	This study
<i>rpoA_qPCR-S</i>	5'-CAACTCTCTGTACGGGCCTA-3'	This study
<i>rpoA_qPCR-AS</i>	5'-GCTTCTTTCTTGGGGTAAGG-3'	This study
<i>cse_qPCR-S</i>	5'-TCAAGACGGCAAATCTCCA-3'	This study
<i>cse_qPCR-AS</i>	5'-CTGTACTAGCAACTCTTGGGG-3'	This study
<i>ntcA_qPCR-S</i>	5'-GTCTTCGCGGATTCTACAAA-3'	This study
<i>ntcA_qPCR-AS</i>	5'-GCACAAGGAACACCAAAATC-3'	This study
<i>hetR_qPCR-S</i>	5'-CCCTGGCAGAGCATATCAAG-3'	This study
<i>hetR_qPCR-AS</i>	5'-CCAGTCTTTCATCATGCGGA-3'	This study

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Additional Fig. 1: Bright-field micrographs of Alcian Blue stained *Anabaena Δcse* filaments. Carets indicate dividing heterocysts.