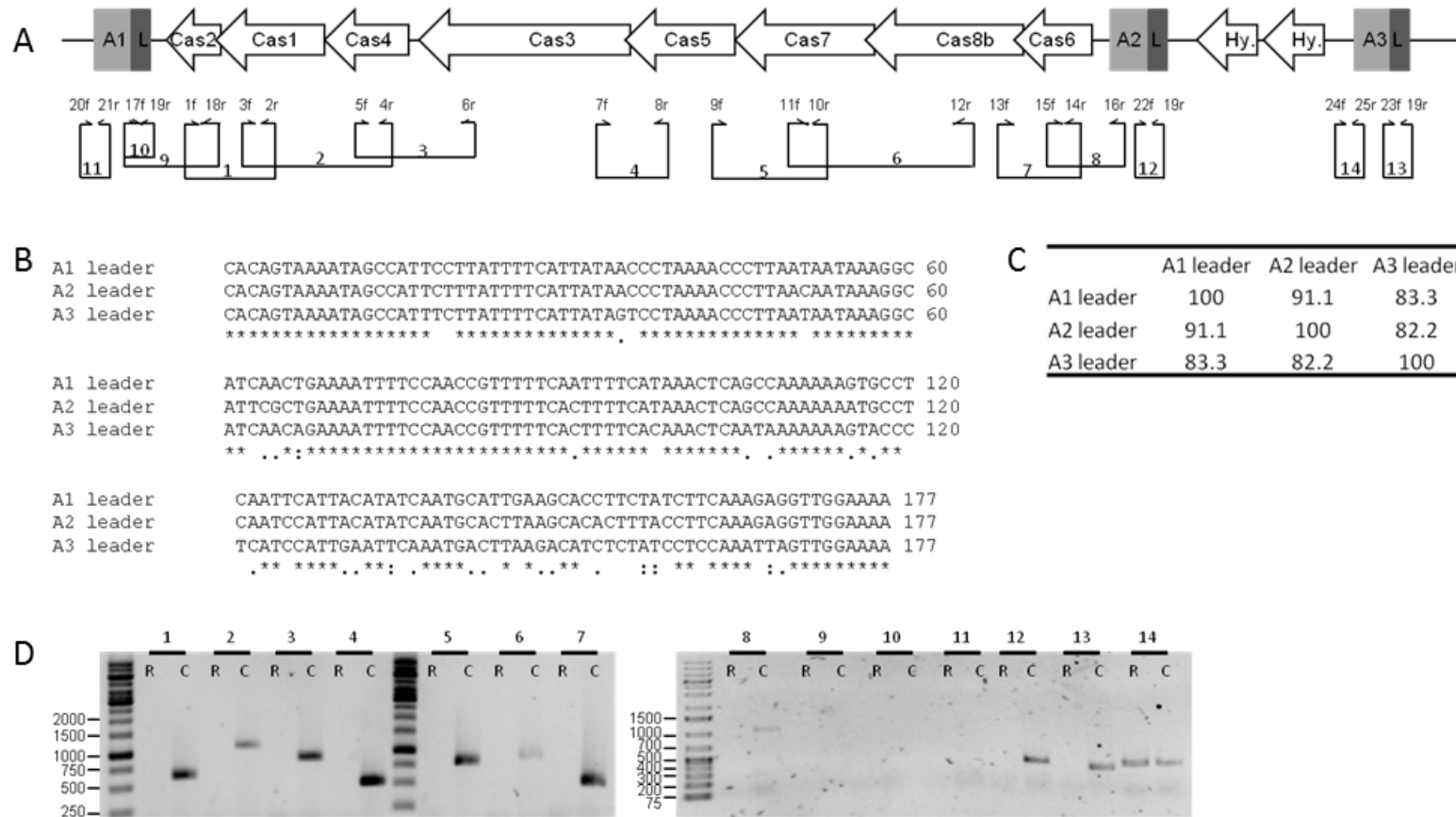


**Additional file 9. RT-PCR data for *C. autoethanogenum* CRISPR-cas system.**



Expression of CRISPR-*cas* loci in *C. autoethanogenum*. (A) The position of primers used in RT-PCR and (B) the agarose gel showing the expression of corresponding PCR products in control (R) and cDNA (C) samples. The numbers in (A) and (B) represent the same primer pairs. (C) Alignment of leader sequence of the three *C. autoethanogenum* CRISPR arrays and (D) table showing the per cent sequence identities between them.

List of primers used for RT-PCR in this study.

No.	Primer	Sequence	Amplicon (bp)
1	Cas2F	TTTATCCCTAAAGTATCCTCCTCAAAACAGC	661
2	Cas1R	TCTGCATGAACCATCTGAAGGAAGATT	
3	Cas1F	GCTTGTTTACTTGAATTTGCTTTGTGTTTACC	1250
4	Cas4R	TGAAAGCAGAAGGAAATAAAAATGCAGAA	
5	Cas4F	ACCTGCCATTTTACTGCTTCTACATCTGC	972
6	Cas3R	TGCAGAAGAACAATTTATGGGAAGGG	
7	Cas3F2	TCTCCTGCCGAATTATCCTTGTAGA	600
8	Cas5R2	ATACAGAATACCTTCCTGTGGCTCT	
9	Cas5F	TGCTTATTGATAGTAACTACAGCAACTTTGGC	900
10	Csh2R	GGCAGTGCAGATAGGTCAAGGATTTAATG	
11	Csh2F	GGTTTGCTTCTCCGCTTCTTTTCC	961
12	Csh1R2	GAGGAAAGAGTATGGATGCAGTTGT	
13	Csh1F2	TACCTTTGTTCGGATCTACTGGCTTA	550
14	Cas6R2	TATTGACAGGAGAGGCTGTGGATAA	
15	Cas6F	TTACATCTAAGGGGTACAAGCTGTTGAAGC	1121
16	CRISPR1 distal F	GCAAATACTGATAAAGTAAACAATA	
17	Cas2R	TTCTGTTTTTATAGAGGGGCTATAACGACTTCT	738
18	CRIPSR3 proximal R	GGTATAATTTGAAGCTTTTGAAAT	
19	leadR	TGAAAAACGGTTGGAAAATTTTC	475
20	CRIPSR3 proximal R	GGTATAATTTGAAGCTTTTGAAAT	
21	CRISPR3distal R2	CACCTCTTATATAAATAATTCTCTGG	211
22	CRISPR3 distal F2	GCTTGAAGAACAAATTCTTGATA	
19	leadR	TGAAAAACGGTTGGAAAATTTTC	418
23	A2F	TGCACAACCTTCGTTAAAACATAATTTAGCG	
19	leadR	TGAAAAACGGTTGGAAAATTTTC	351
24	CRISPR2 distal F	GCGGATCCACAAATATTAATCA	
25	CRISPR2 proximal F	TCATACAACATTTGTTACGG	392
26	CRISPR2 proximal R	GCAAATACTGATAAAGTAAACAATA	