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Precise transcript targeting by CRISPR-Csm complexes

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Supplementary Information

Precise transcript targeting by CRISPR-Csm complexes

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Supplementary Figures:

Supplementary Figure 1. Additional information regarding flow cytometry and FACS experiments.

Supplementary Figure 2. Additional information regarding RT-qPCR and RNA FISH experiments.

Supplementary Figure 3. Additional information regarding RNA-sequencing experiments.

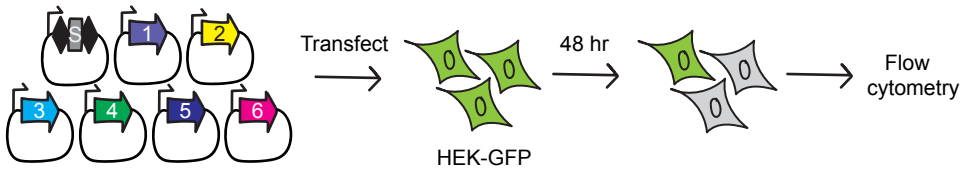
Supplementary Figure 4. Additional information regarding live-cell RNA imaging experiments.

Supplementary Tables:

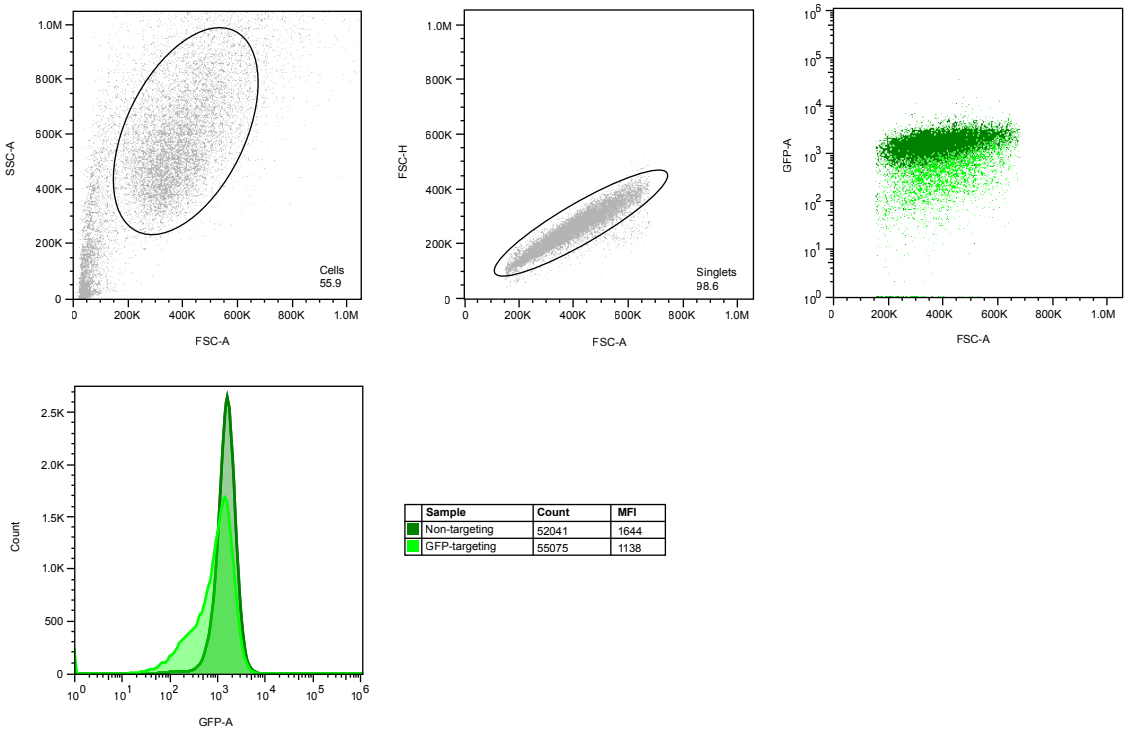
Supplementary Table 1. qPCR primer, crRNA, shRNA, and FISH probe sequences.

Supplementary Table 2. Plasmid sequences.

a

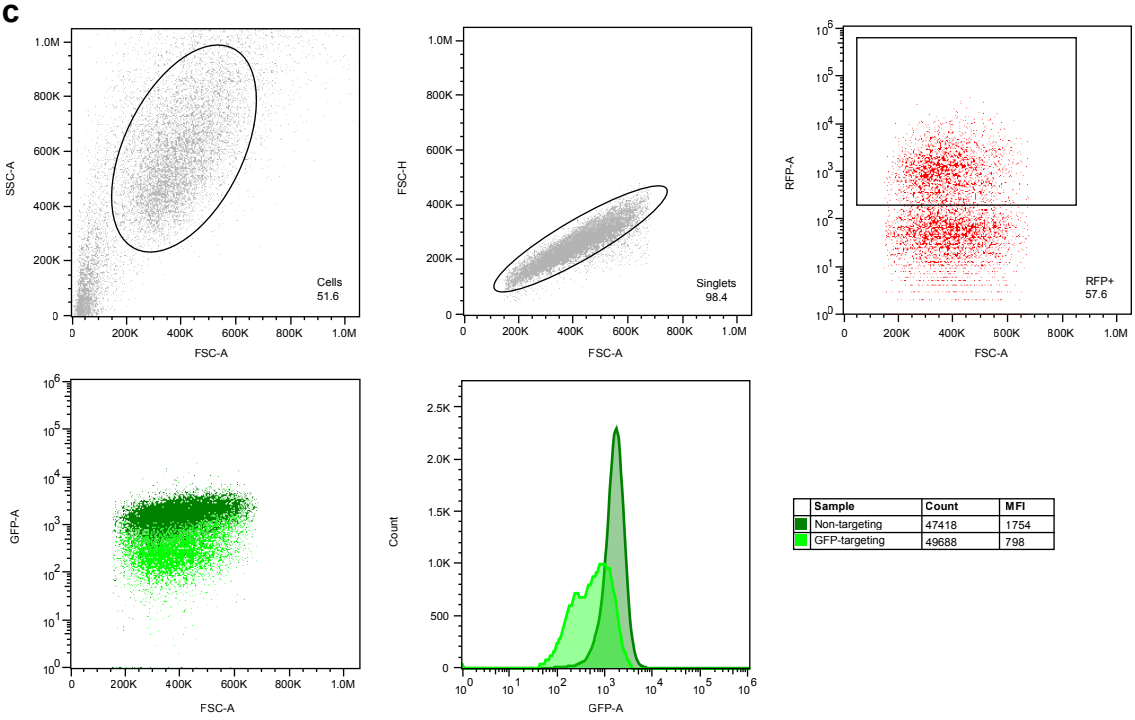


b



Sample	Count	MFI
Non-targeting	52041	1644
GFP-targeting	55075	1138

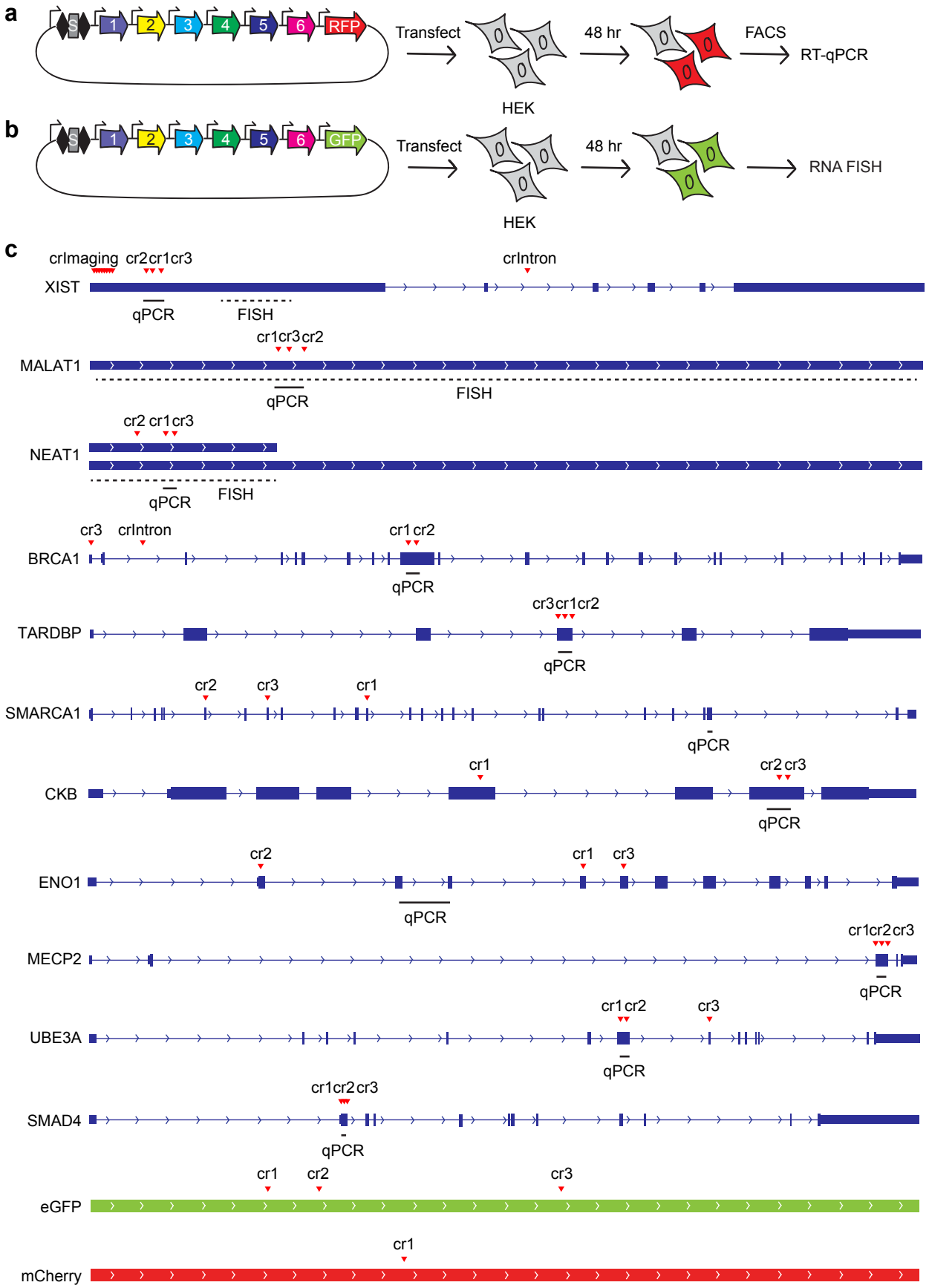
c



Sample	Count	MFI
Non-targeting	47418	1754
GFP-targeting	49688	798

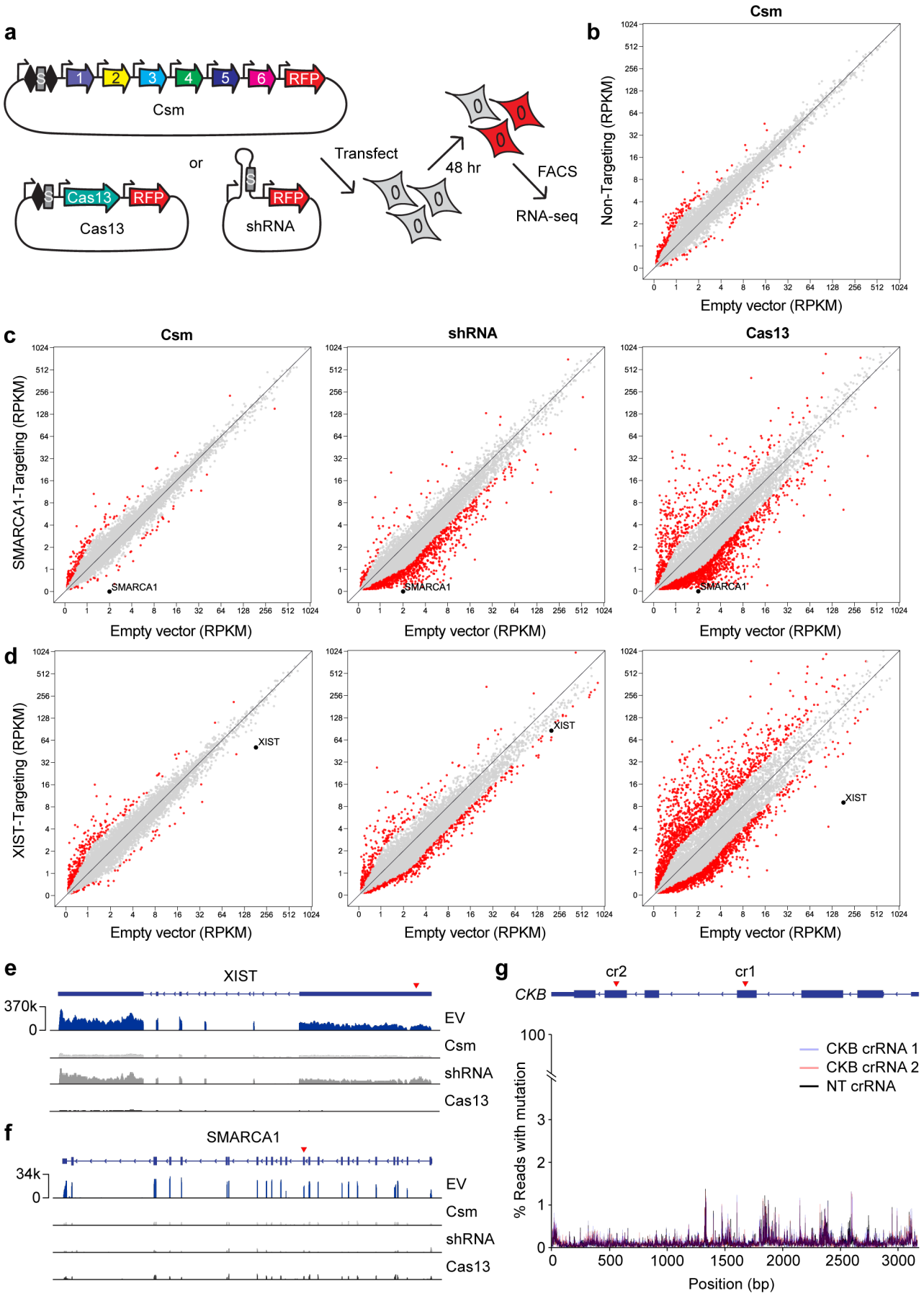
Supplementary Figure 1. Additional information regarding flow cytometry and FACS experiments.

a, Diagram showing workflow for flow cytometry experiments. Delivery plasmids and recipient cell lines are indicated in each experiment. **b**, Diagram showing gating strategy for flow cytometry experiments. **c**, Diagram showing gating strategy for flow cytometry and FACS experiments in which transfected (RFP-positive) cells were enriched.


a
S
1
2
3
4
5
6
RFP
Transfect
HEK
48 hr
FACS
RT-qPCR
b
GFP
RNA FISH
c
crImaging
cr2cr1cr3
crIntron
XIST
qPCR
FISH
cr1cr3cr2
MALAT1
NEAT1
cr3
BRCA1
TARDBP
SMARCA1
CKB
ENO1
MECP2
cr1cr2cr3
UBE3A
SMAD4
eGFP
mCherry

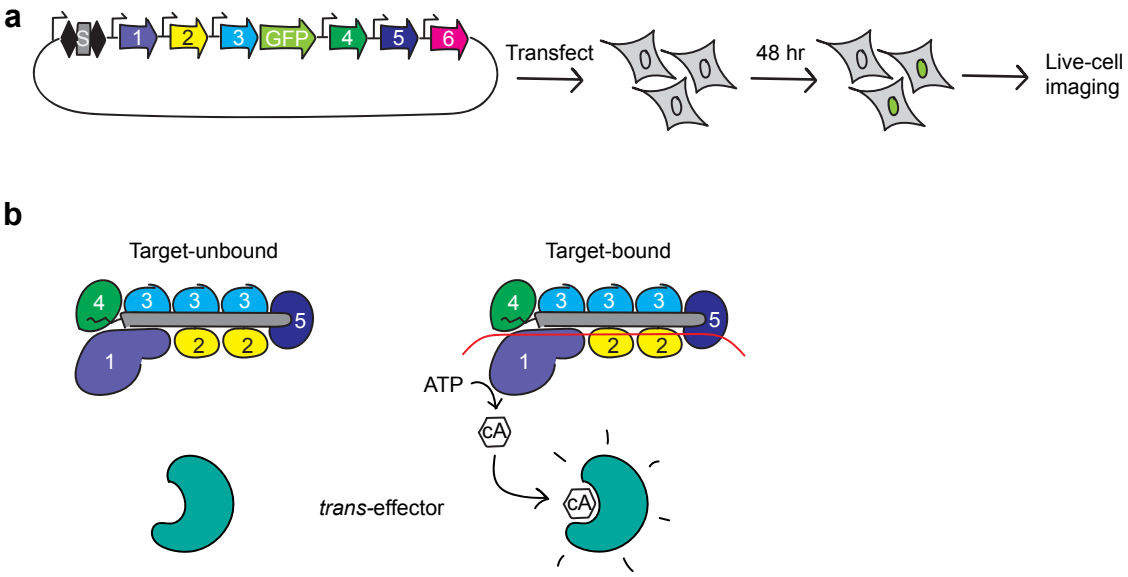
Supplementary Figure 2. Additional information regarding RT-qPCR and RNA FISH experiments.

a, Diagram showing workflow for RT-qPCR experiments. **b**, Diagram showing workflow for RNA FISH experiments. **c**, Diagram showing location of crRNA target site (red arrow), qPCR amplicon (solid black line), and FISH probe (dashed black line) for each transcript. Transcripts are shown 5' to 3', with thinner blocks representing UTR regions, thicker blocks representing coding regions, and lines representing intronic regions. Transcripts not to scale.


a
S
1
2
3
4
5
6
RFP
Csm
or
Cas13
RFP
Cas13
S
RFP
shRNA
Transfect
48 hr
FACS
RNA-seq
b
Csm
Non-Targeting (RPKM)
Empty vector (RPKM)
c
Csm
shRNA
Cas13
SMARCA1-Targeting (RPKM)
SMARCA1
Empty vector (RPKM)
d
XIST-Targeting (RPKM)
XIST
Empty vector (RPKM)
e
XIST
370k
0
EV
Csm
shRNA
Cas13
f
SMARCA1
34k
0
EV
Csm
shRNA
Cas13
g
cr2
cr1
CKB
100
3
2
1
0
% Reads with mutation
CKB crRNA 1
CKB crRNA 2
NT crRNA
0
500
1000
1500
2000
2500
3000
Position (bp)

Supplementary Figure 3. Additional information regarding RNA-sequencing experiments.

a, Diagram showing workflow for RNA-seq experiments. **b**, Scatterplot showing differential transcript levels between HEK293T cells transfected with plasmid expressing Csm with non-targeting crRNA versus empty vector control. Up- or down-regulated transcripts (≥2-fold change) indicated in red. **c**, **d**, Scatterplots showing differential transcript levels between HEK293T cells transfected with plasmid expressing Csm, Cas13, or shRNA targeting SMARCA1 (**b**) or XIST (**c**), versus empty vector control. Target transcript indicated in black; off-targets (≥2-fold change) indicated in red. **e**, **f**, RNA-seq read coverage across target transcripts SMARCA1 (**d**) or XIST (**e**). Red arrow indicates location of crRNA/shRNA target site; EV, empty vector. **g**, Plot showing % reads with mutation compared to reference genome across the *CKB* locus in HEK293T cells transfected with all-in-one plasmid expressing Cas/Csm proteins and the indicated crRNAs, assayed by genomic PCR followed by DNA-seq. Red arrow indicates location of crRNA target site; NT, non-targeting.


a
S
1
2
3
GFP
4
5
6
Transfect
48 hr
Live-cell
imaging
b
Target-unbound
Target-bound
4
3
3
3
5
1
2
2
ATP
cA
cA
trans-effector

Supplementary Figure 4. Additional information regarding live-cell RNA imaging experiments.

a, Diagram showing workflow for live-cell RNA imaging experiments. **b**, Diagram showing target-dependent activation of downstream effectors by the Csm complex.

Supplementary Table 1. qPCR primer, crRNA, shRNA, and FISH probe sequences.

Target	qPCR primer F	qPCR primer R
XIST	GTTGTATCGGGAGGCAGTAAGAATCATCTTT	GAAAAGCACACAGCAAAGACAAAGAGGC
MALAT1	ACTAGCATTAATTGACAGCTGACCCAGG	GCTACCTTCATCACCAAATTGCACTCG
NEAT1	GCTTAGGAGGAGGAAGTTCTCCAATGT	CTCCATCTGCAAGCTCCATCTACAAG
BRCA1	TACATCAGGCCTTCATCCTGAGGATTTTATC	ACAATTAGGTGGGCTTAGATTTCTACTGACTACTA
TARDBP	GTCAAGAAAGATCTTAAGACTGGTCATTCAAAGGG	CTTAGAATTAGGAAGTTTGCAGTCACACCATC
SMARCA1	GATAAACCAGTCAAATCTAAACTGGGGAGCA	GATACAAGGCTCCATTTCATCAGTTGCG
CKB	TTAAGCACCTCCGAGAACTTCTCATGC	TTGAAACTCTCTTCAAGTCTAAGGACTATGAGTTCA
ENO1	GGAACTCATTAATATACTTAATGGGTCTGGAGACG	CTTCAACTGGTATCTATGAGGCCCTAGAG
MECP2	GGAAGAAAAGTCAGAAGACCAGGACC	TTGATCAAATACACATCATACTTCCCAGCAGAG
UBE3A	ATATTGATGCCATTAGAAGGGTCTACACCAGAT	CTTTGCAAAATAATGGCAAAGCCATTTCCAG
SMAD4	ATGGACAATATGTCTATTACGAATACACCAACAAG TAATG	CTGAAGCCTCCCATCCAATGTTCTCT
GAPDH	CCAGAACATCATCCCTGCCTCTACTG	GGAAATGAGCTTGACAAAGTGGTCGTTG

Target	Genomic PCR primer F	Genomic PCR primer R
CKB	AATGGAATGAATGGGCTATAAATAGCCGCC	CTTGTCCCATCTCACAGAAGGCGAG

Target	Csm crRNA 1	Csm crRNA 2	Csm crRNA 3
XIST	GCCACTTGAACACTGCGACAGA ACTGGATCCG	TTGGACAACCTAACAAAGCACAGC CCGCCATG	CGCACATGTCCACCACCATGCTAA CCACTTAA
MALAT1	AGCTTCCTTCACCAAATCGCAC TGGCTCCTGG	GCCGCCTGCTACCTTCATCACCAA ATTGCACT	CCTAGCTTCACCACCAAATCGTTA GCGCTCCT
NEAT1	CCGGATGCATCTGCTGTGGACT TTTTAAGATT	CACCATTACCAACAATACCGACTC CAACAGCC	GAAGATGCAGCATCTGAAAACCTT TACCCCAG
BRCA1	GGTTAGGATTTTTCTCATTCTG AATAGAATCA	ATTGTGGATATTTAATTCGAGTTC CATATTGC	GAGCAGAGGGTGAAGGCCTCCTGA GCGCAGGG
TARDBP	CTTGTGTTTCATATTCCGTAAA ACGAACAAAG	GTCCATCTATCATATGTCGCTGTG ACATTACT	CTTTGAATGACCAGTCTTAAGATC TTTCTTGA
SMARCA1	GTCCATCCAGTCGACAATACTC ATAACCACGC	CCGACAAAACAAATGACACGGAGA GATGGGAC	AAAAGTTGAGTAAGGCCCACAGTT CATGCAGG
CKB	GCTTGTCGAAGAGGAAGTGGTC GTCGATGAGC	TTGATATGCACACCTGCCCGCAGC CCGGTGCC	CGAGAACTTCTCATGCTTGCCCAG GTTGGGCA
ENO1	CATCCATCTCGATCATCAGTTT GTCAATCTTC	TTCCCGCGAGAGTCAAAGATCTCC CTGGCATG	GACCCCCTTCTCAACGGCACCAGC TTTGCAGA
MECP2	CAGAGTGGTGGGCTGATGGCTG CACGGGCTCA	GGCAGAAGCTTCCGGCACAGCCGG GGCGGAGC	CAAATACACATCATACTTCCCAGC AGAGCGGC
UBE3A	CTCGAGAGTATACATTGTGATA CGTCAAGTCA	GAGATTTCTATTCTCCATTACGAT AATGAACA	AAATTCCACATACAACTGCTTCTT CAAGTCTG
SMAD4	TCCACCTTGTCTATGGCACATC AAACTATGCA	AGCTTCTTTACCAAACTTTCAATT GCTCTTTT	TCCAATGTTCTCTGTATGGTAACA CATTTACT
GFP	CAGCTTGCCGGTGGTGCAGATG AACTTCAGGG	TGAAGCACTGCACGCCGTAGGTCA GGGTGGTC	AGGATGTTGCCGTCCTCCTTGAAG TCGATGCC
RFP	CTTGAAGCCCTCGGGGAAGGAC AGCTTCAAGT		
NT	TCTCCGAACGTGTCACGTCTTT AGCGACTAAA		

Target	Csm crRNA intronic
XIST	GTCAGTAAATGAACCTTTCCTATCCCACGTGT
BRCA1	CCAGTCATGATCATTCCTGATCACATATTAAG

Target	Cas13 crRNA
XIST	GCCACTTGAACACTGCGACAGAACTGGATC
MALAT1	GCCGCCTGCTACCTTCATCACCAAATTGCA
CKB	GCTTGTCGAAGAGGAAGTGGTCGTCGATGA
SMAD4	TCCACCTTGTCTATGGCACATCAAACTATG
NT	TCTCCGAACGTGTCACGTCTTTAGCGACTA

Target	shRNA
XIST	GTTCTGTCGCAGTGTTCAAGTcctgacccaACTTGAACACTGCGACAGAAC
MALAT1	GTGATGAAGGTAGCAGGCGGCcctgacccaGCCGCCTGCTACCTTCATCAC
CKB	GACCACTTCCTCTTCGACAAGcctgacccaCTTGTCGAAGAGGAAGTGGTC
SMAD4	GATGTGCCATAGACAAGGTGGcctgacccaCCACCTTGTCTATGGCACATC
NT	GCTAAAGACGTGACACGTTCGcctgacccaCGAACGTGTCACGTCTTTAGC

Spacer length	Csm crRNA (GFP)
24 nt	CAGCTTGCCGGTGGTGCAGATGAA
28 nt	CAGCTTGCCGGTGGTGCAGATGAACTTC
32 nt	CAGCTTGCCGGTGGTGCAGATGAACTTCAGGG
36 nt	CAGCTTGCCGGTGGTGCAGATGAACTTCAGGGTCAG
40 nt	CAGCTTGCCGGTGGTGCAGATGAACTTCAGGGTCAGCTTG
44 nt	CAGCTTGCCGGTGGTGCAGATGAACTTCAGGGTCAGCTTGCCGT
48 nt	CAGCTTGCCGGTGGTGCAGATGAACTTCAGGGTCAGCTTGCCGTAGGT

Target	Live-cell imaging Csm crRNA
XIST	AAAAGCAGGTATCCGCGGCCCCGATGGGCAAA
MALAT1	AGCTTCCTTCACCAAATCGCACTGGCTCCTGG
NEAT1	CACCATTACCAACAATACCGACTCCAACAGCC

Target	RNA FISH probe
XIST	/5Cy3/GGGCACTCCCTGCTGGAAGGGAA; /5Cy3/AATTGTGCACCTTGACTGTCCAAA; /5Cy3/TCTGAGAGTAGGACCTTATTCA; /5Cy3/TCAGCACCCCTGCTGTACTGCAAA
MALAT1	SMF-2035-1 (LGC Biosearch Technologies)
NEAT1	SMF-2036-1 (LGC Biosearch Technologies)

Supplementary Table 2. Plasmid sequences.

Plasmid	**pDAC338**
Description	Expression of Csm1
Utility	
Features	Pcmv-FLAG-NLS-Csm1-pA
Sequence	ACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGG CTCCGCCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATA AAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGAT ACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCG GTGTAGGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTTATC CGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACA GGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACT AGAAGAACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTG ATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAA AAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACTCACGTTAA GGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTTAA ATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCT CAGCGATCTGTCTATTTCGTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAG GGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGC AATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCATCCAGTCTA TTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCT ACAGGCATCGTGGTGTCACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCG AGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTA AGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTA AGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTG CTCTTGCCCGGCGTCAATACGGGATAATACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATTGGAA AACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGT GCACCCAACTGATCTTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAA TGCCGCAAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTTTCAATATTATT GAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAATAAACAAATA GGGGTTCCGCGCACATTTCCCCGAAAAGTGCCACCTGACGTCGGATCCgacattgattattgactagttat taatagtaatcaattacggggtcattagttcatagcccatatatggagttccgCGTTACATAACTTACGGT AAATGGCCCGCCTGGCTGACCGCCCAACGACCCCCGCCCATTGACGTCAATAATGACGTATGTTCCCATAG TAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTA CATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTA TGCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCA TGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTC CACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAA CTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAG TGAACCGTCAGATCTCTAGAgccgccaccATGGATTACAAAGACGATGACGATAAGATGGCGCCTAAGAAG AAACGCAAAGTGCGGGGCATGAAGAAAGAAAAGATTGATCTGTTTTACGGAGCCCTGCTGCACGACATCGG AAAGGTCATCCAGCGAGCAACCGGAGAGCGGAAGAAACACGCACTTGTGGGCGCCGACTGGTTCGACGAGA TCGCCGACAACCAAGTCATCTCGGATCAGATCCGGTACCATATGGCCAACTACCAGTCTGATAAGCTCGGC AACGATCACCTGGCTTACATCACCTACATTGCCGACAACATCGCCTCCGGTGTCGACCGCCGGCAATCCAA CGAAGAGTCAGACGAAGATACCTCCGCAAAGATCTGGGACACCTACACGAACCAGGCCGACATCTTTAACG TGTTCGGAGCGCAGACCGATAAGCGGTACTTCAAGCCTACCGTGCTGAATCTCAAGTCGAAGCCCAACTTC GCGTCCGCCACTTACGAACCCTTTAGCAAGGGCGATTACGCTGCCATCGCCACCCGGATTAAGAACGAACT GGCCGAGTTCGAGTTCAACCAAGTCCAGATTGACTCCCTGCTCAACCTTTTCGAGGCTACTCTCTCCTTCG TGCCGTCAAGCACCAACACTAAGGAAATCGCCGACATCTCCCTGGCCGACCATTCCCGCTTGACTGCTGCC TTCGCTCTGGCGATCTACGACTACCTGGAGGACAAGGGTCGGCACAACTACAAAGAGGACCTGTTCACCAA AGTGTCAGCGTTCTATGAAGAAGAAGCCTTCCTGCTGGCCTCCTTCGACCTGTCGGGAATCCAGGACTTTA TCTACAACATTAACATCGCAACTAACGGCGCGGCGAAGCAGCTGAAGGCCCGGAGCCTCTACCTGGACTTT ATGTCCGAGTACATCGCCGATAGCCTGCTGGACAAGCTGGGACTGAACAGGGCTAACATGCTTTACGTCGG CGGCGGACACGCCTACTTCGTCCTGGCCAACACCGAAAAGACTGTGGAAACCCTGGTGCAGTTTGAGAAGG ATTTCAACCAGTTCCTGTTGGCAAACTTCCAGACCCGCCTCTATGTGGCCTTTGGCTGGGGTTCCTTCGCG GCCAAGGACATCATGTCCGAGCTGAATAGCCCCGAGTCCTACCGCCAAGTGTACCAAAAGGCTTCGCGCAT GATCTCCAAAAAGAAAATCTCCAGATACGACTACCAGACACTGATGCTCCTGAATCGCGGTGGAAAGTCCT CAGAGAGAGAGTGCGAGATTTGCCACTCCGTGGAGAACCTGGTGTCCTACCACGACCAGAAAGTCTGTGAC ATTTGCCGGGGACTGTACCAGTTCTCGAAAGAAATTGCCCATGACCACTTCATCATTACCGAAAATGAGGG GCTGCCGATTGGACCAAACGCGTGCTTAAAGGGCGTGGCATTCGAAAAGCTGTCCCAAGAAGCGTTCAGCC GGGTCTACGTGAAGAATGACTATAAGGCCGGTACCGTGAAGGCTACGCATGTGTTCGTGGGGGATTACCAG

	TGCGACGAGATCTACAACTACGCCGCCCTGAGCAAGAACGAGAACGGCCTAGGCATCAAGAGACTGGCCGT GGTCCGGCTCGACGTGGATGACTTGGGCGCCGCCTTCATGGCCGGTTTCAGCCAGCAGGGAAACGGACAAT ACTCCACTCTGTCAAGATCGGCCACATTCTCCCGGAGCATGTCGCTGTTCTTCAAAGTGTACATTAACCAG TTCGCCTCCGACAAGAAGCTGAGCATTATCTACGCGGGCGGCGATGACGTGTTCGCCATTGGATCGTGGCA GGATATCATCGCGTTCACTGTGGAACTTCGCGAAAACTTCATCAAGTGGACCAACGGGAAGCTCACCCTCT CCGCGGGGATAGGGTTGTTCGCCGACAAGACTCCTATTAGCCTGATGGCTCACCAGACCGGGGAACTGGAA GAGGCCGCCAAGGGCAACGAAAAGGACTCCATCTCGCTGTTCTCAAGCGACTACACTTTCAAGTTTGATAG GTTCATCACTAACGTGTACGACGACAAACTGGAACAGATTAGATACTTCTTCAACCATCAAGACGAGAGGG GAAAGAACTTCATCTATAAGCTTATTGAGCTTTTGAGGAACCACGACCGCATGAATATGGCACGCCTCGCC TATTACCTCACTCGCCTGGAAGAACTGACCCGGGAGACTGACAGGGACAAGTTCAAGACCTTCAAGAACCT GTTCTACTCCTGGTACACCAACAAGAACGATAAGGACCGGAAGGAAGCCGAGCTCGCGCTCCTGCTGTACA TCTACGAAATCAGAAAGGATTAAcggcaataaaaagacagaataaaacgcacggtgttgggtcgtttgttc AAGCTC

Plasmid	**pDAC803**
Description	Expression of Csm1(DNase mut)
Utility	
Features	Pcmv-FLAG-NLS-Csm1(DNase mut)-pA
Sequence	ACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGG CTCCGCCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATA AAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGAT ACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCG GTGTAGGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTTATC CGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACA GGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACT AGAAGAACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTG ATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAA AAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACTCACGTTAA GGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTTAA ATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCT CAGCGATCTGTCTATTTCGTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAG GGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGC AATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCATCCAGTCTA TTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCT ACAGGCATCGTGGTGTCACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCG AGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTA AGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTA AGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTG CTCTTGCCCGGCGTCAATACGGGATAATACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATTGGAA AACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGT GCACCCAACTGATCTTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAA TGCCGCAAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTTTCAATATTATT GAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAATAAACAAATA GGGGTTCCGCGCACATTTCCCCGAAAAGTGCCACCTGACGTCGGATCCgacattgattattgactagttat taatagtaatcaattacggggtcattagttcatagcccatatatggagttccgCGTTACATAACTTACGGT AAATGGCCCGCCTGGCTGACCGCCCAACGACCCCCGCCCATTGACGTCAATAATGACGTATGTTCCCATAG TAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTA CATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTA TGCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCA TGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTC CACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAA CTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAG TGAACCGTCAGATCTCTAGAgccgccaccATGGATTACAAAGACGATGACGATAAGATGGCGCCTAAGAAG AAACGCAAAGTGCGGGGCATGAAGAAAGAAAAGATTGATCTGTTTTACGGAGCCCTGCTGGCCGCCATCGG AAAGGTCATCCAGCGAGCAACCGGAGAGCGGAAGAAACACGCACTTGTGGGCGCCGACTGGTTCGACGAGA TCGCCGACAACCAAGTCATCTCGGATCAGATCCGGTACCATATGGCCAACTACCAGTCTGATAAGCTCGGC AACGATCACCTGGCTTACATCACCTACATTGCCGACAACATCGCCTCCGGTGTCGACCGCCGGCAATCCAA CGAAGAGTCAGACGAAGATACCTCCGCAAAGATCTGGGACACCTACACGAACCAGGCCGACATCTTTAACG TGTTCGGAGCGCAGACCGATAAGCGGTACTTCAAGCCTACCGTGCTGAATCTCAAGTCGAAGCCCAACTTC GCGTCCGCCACTTACGAACCCTTTAGCAAGGGCGATTACGCTGCCATCGCCACCCGGATTAAGAACGAACT GGCCGAGTTCGAGTTCAACCAAGTCCAGATTGACTCCCTGCTCAACCTTTTCGAGGCTACTCTCTCCTTCG TGCCGTCAAGCACCAACACTAAGGAAATCGCCGACATCTCCCTGGCCGACCATTCCCGCTTGACTGCTGCC TTCGCTCTGGCGATCTACGACTACCTGGAGGACAAGGGTCGGCACAACTACAAAGAGGACCTGTTCACCAA

	AGTGTCAGCGTTCTATGAAGAAGAAGCCTTCCTGCTGGCCTCCTTCGACCTGTCGGGAATCCAGGACTTTA TCTACAACATTAACATCGCAACTAACGGCGCGGCGAAGCAGCTGAAGGCCCGGAGCCTCTACCTGGACTTT ATGTCCGAGTACATCGCCGATAGCCTGCTGGACAAGCTGGGACTGAACAGGGCTAACATGCTTTACGTCGG CGGCGGACACGCCTACTTCGTCCTGGCCAACACCGAAAAGACTGTGGAAACCCTGGTGCAGTTTGAGAAGG ATTTCAACCAGTTCCTGTTGGCAAACTTCCAGACCCGCCTCTATGTGGCCTTTGGCTGGGGTTCCTTCGCG GCCAAGGACATCATGTCCGAGCTGAATAGCCCCGAGTCCTACCGCCAAGTGTACCAAAAGGCTTCGCGCAT GATCTCCAAAAAGAAAATCTCCAGATACGACTACCAGACACTGATGCTCCTGAATCGCGGTGGAAAGTCCT CAGAGAGAGAGTGCGAGATTTGCCACTCCGTGGAGAACCTGGTGTCCTACCACGACCAGAAAGTCTGTGAC ATTTGCCGGGGACTGTACCAGTTCTCGAAAGAAATTGCCCATGACCACTTCATCATTACCGAAAATGAGGG GCTGCCGATTGGACCAAACGCGTGCTTAAAGGGCGTGGCATTCGAAAAGCTGTCCCAAGAAGCGTTCAGCC GGGTCTACGTGAAGAATGACTATAAGGCCGGTACCGTGAAGGCTACGCATGTGTTCGTGGGGGATTACCAG TGCGACGAGATCTACAACTACGCCGCCCTGAGCAAGAACGAGAACGGCCTAGGCATCAAGAGACTGGCCGT GGTCCGGCTCGACGTGGATGACTTGGGCGCCGCCTTCATGGCCGGTTTCAGCCAGCAGGGAAACGGACAAT ACTCCACTCTGTCAAGATCGGCCACATTCTCCCGGAGCATGTCGCTGTTCTTCAAAGTGTACATTAACCAG TTCGCCTCCGACAAGAAGCTGAGCATTATCTACGCGGGCGGCGATGACGTGTTCGCCATTGGATCGTGGCA GGATATCATCGCGTTCACTGTGGAACTTCGCGAAAACTTCATCAAGTGGACCAACGGGAAGCTCACCCTCT CCGCGGGGATAGGGTTGTTCGCCGACAAGACTCCTATTAGCCTGATGGCTCACCAGACCGGGGAACTGGAA GAGGCCGCCAAGGGCAACGAAAAGGACTCCATCTCGCTGTTCTCAAGCGACTACACTTTCAAGTTTGATAG GTTCATCACTAACGTGTACGACGACAAACTGGAACAGATTAGATACTTCTTCAACCATCAAGACGAGAGGG GAAAGAACTTCATCTATAAGCTTATTGAGCTTTTGAGGAACCACGACCGCATGAATATGGCACGCCTCGCC TATTACCTCACTCGCCTGGAAGAACTGACCCGGGAGACTGACAGGGACAAGTTCAAGACCTTCAAGAACCT GTTCTACTCCTGGTACACCAACAAGAACGATAAGGACCGGAAGGAAGCCGAGCTCGCGCTCCTGCTGTACA TCTACGAAATCAGAAAGGATTAAcggcaataaaaagacagaataaaacgcacggtgttgggtcgtttgttc AAGCTC

Plasmid	**pDAC804**
Description	Expression of Csm1(cA mut)
Utility	
Features	Pcmv-FLAG-NLS-Csm1(cA mut)-pA
Sequence	ACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGG CTCCGCCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATA AAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGAT ACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCG GTGTAGGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTTATC CGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACA GGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACT AGAAGAACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTG ATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAA AAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACTCACGTTAA GGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTTAA ATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCT CAGCGATCTGTCTATTTCGTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAG GGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGC AATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCATCCAGTCTA TTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCT ACAGGCATCGTGGTGTCACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCG AGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTA AGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTA AGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTG CTCTTGCCCGGCGTCAATACGGGATAATACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATTGGAA AACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGT GCACCCAACTGATCTTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAA TGCCGCAAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTTTCAATATTATT GAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAATAAACAAATA GGGGTTCCGCGCACATTTCCCCGAAAAGTGCCACCTGACGTCGGATCCgacattgattattgactagttat taatagtaatcaattacggggtcattagttcatagcccatatatggagttccgCGTTACATAACTTACGGT AAATGGCCCGCCTGGCTGACCGCCCAACGACCCCCGCCCATTGACGTCAATAATGACGTATGTTCCCATAG TAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTA CATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTA TGCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCA TGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTC CACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAA CTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAG

	TGAACCGTCAGATCTCTAGAgccgccaccATGGATTACAAAGACGATGACGATAAGATGGCGCCTAAGAAG AAACGCAAAGTGCGGGGCATGAAGAAAGAAAAGATTGATCTGTTTTACGGAGCCCTGCTGCACGACATCGG AAAGGTCATCCAGCGAGCAACCGGAGAGCGGAAGAAACACGCACTTGTGGGCGCCGACTGGTTCGACGAGA TCGCCGACAACCAAGTCATCTCGGATCAGATCCGGTACCATATGGCCAACTACCAGTCTGATAAGCTCGGC AACGATCACCTGGCTTACATCACCTACATTGCCGACAACATCGCCTCCGGTGTCGACCGCCGGCAATCCAA CGAAGAGTCAGACGAAGATACCTCCGCAAAGATCTGGGACACCTACACGAACCAGGCCGACATCTTTAACG TGTTCGGAGCGCAGACCGATAAGCGGTACTTCAAGCCTACCGTGCTGAATCTCAAGTCGAAGCCCAACTTC GCGTCCGCCACTTACGAACCCTTTAGCAAGGGCGATTACGCTGCCATCGCCACCCGGATTAAGAACGAACT GGCCGAGTTCGAGTTCAACCAAGTCCAGATTGACTCCCTGCTCAACCTTTTCGAGGCTACTCTCTCCTTCG TGCCGTCAAGCACCAACACTAAGGAAATCGCCGACATCTCCCTGGCCGACCATTCCCGCTTGACTGCTGCC TTCGCTCTGGCGATCTACGACTACCTGGAGGACAAGGGTCGGCACAACTACAAAGAGGACCTGTTCACCAA AGTGTCAGCGTTCTATGAAGAAGAAGCCTTCCTGCTGGCCTCCTTCGACCTGTCGGGAATCCAGGACTTTA TCTACAACATTAACATCGCAACTAACGGCGCGGCGAAGCAGCTGAAGGCCCGGAGCCTCTACCTGGACTTT ATGTCCGAGTACATCGCCGATAGCCTGCTGGACAAGCTGGGACTGAACAGGGCTAACATGCTTTACGTCGG CGGCGGACACGCCTACTTCGTCCTGGCCAACACCGAAAAGACTGTGGAAACCCTGGTGCAGTTTGAGAAGG ATTTCAACCAGTTCCTGTTGGCAAACTTCCAGACCCGCCTCTATGTGGCCTTTGGCTGGGGTTCCTTCGCG GCCAAGGACATCATGTCCGAGCTGAATAGCCCCGAGTCCTACCGCCAAGTGTACCAAAAGGCTTCGCGCAT GATCTCCAAAAAGAAAATCTCCAGATACGACTACCAGACACTGATGCTCCTGAATCGCGGTGGAAAGTCCT CAGAGAGAGAGTGCGAGATTTGCCACTCCGTGGAGAACCTGGTGTCCTACCACGACCAGAAAGTCTGTGAC ATTTGCCGGGGACTGTACCAGTTCTCGAAAGAAATTGCCCATGACCACTTCATCATTACCGAAAATGAGGG GCTGCCGATTGGACCAAACGCGTGCTTAAAGGGCGTGGCATTCGAAAAGCTGTCCCAAGAAGCGTTCAGCC GGGTCTACGTGAAGAATGACTATAAGGCCGGTACCGTGAAGGCTACGCATGTGTTCGTGGGGGATTACCAG TGCGACGAGATCTACAACTACGCCGCCCTGAGCAAGAACGAGAACGGCCTAGGCATCAAGAGACTGGCCGT GGTCCGGCTCGACGTGGATGACTTGGGCGCCGCCTTCATGGCCGGTTTCAGCCAGCAGGGAAACGGACAAT ACTCCACTCTGTCAAGATCGGCCACATTCTCCCGGAGCATGTCGCTGTTCTTCAAAGTGTACATTAACCAG TTCGCCTCCGACAAGAAGCTGAGCATTATCTACGCGGGCGGCGCCGCCGTGTTCGCCATTGGATCGTGGCA GGATATCATCGCGTTCACTGTGGAACTTCGCGAAAACTTCATCAAGTGGACCAACGGGAAGCTCACCCTCT CCGCGGGGATAGGGTTGTTCGCCGACAAGACTCCTATTAGCCTGATGGCTCACCAGACCGGGGAACTGGAA GAGGCCGCCAAGGGCAACGAAAAGGACTCCATCTCGCTGTTCTCAAGCGACTACACTTTCAAGTTTGATAG GTTCATCACTAACGTGTACGACGACAAACTGGAACAGATTAGATACTTCTTCAACCATCAAGACGAGAGGG GAAAGAACTTCATCTATAAGCTTATTGAGCTTTTGAGGAACCACGACCGCATGAATATGGCACGCCTCGCC TATTACCTCACTCGCCTGGAAGAACTGACCCGGGAGACTGACAGGGACAAGTTCAAGACCTTCAAGAACCT GTTCTACTCCTGGTACACCAACAAGAACGATAAGGACCGGAAGGAAGCCGAGCTCGCGCTCCTGCTGTACA TCTACGAAATCAGAAAGGATTAAcggcaataaaaagacagaataaaacgcacggtgttgggtcgtttgttc AAGCTC

Plasmid	**pDAC309**
Description	Expression of Csm2
Utility	
Features	Pcmv-FLAG-NLS-Csm2-pA
Sequence	ACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGG CTCCGCCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATA AAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGAT ACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCG GTGTAGGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTTATC CGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACA GGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACT AGAAGAACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTG ATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAA AAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACTCACGTTAA GGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTTAA ATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCT CAGCGATCTGTCTATTTCGTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAG GGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGC AATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCATCCAGTCTA TTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCT ACAGGCATCGTGGTGTCACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCG AGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTA AGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTA AGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTG CTCTTGCCCGGCGTCAATACGGGATAATACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATTGGAA AACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGT GCACCCAACTGATCTTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAA

	TGCCGCAAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTTTCAATATTATT GAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAATAAACAAATA GGGGTTCCGCGCACATTTCCCCGAAAAGTGCCACCTGACGTCGGATCCgacattgattattgactagttat taatagtaatcaattacggggtcattagttcatagcccatatatggagttccgCGTTACATAACTTACGGT AAATGGCCCGCCTGGCTGACCGCCCAACGACCCCCGCCCATTGACGTCAATAATGACGTATGTTCCCATAG TAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTA CATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTA TGCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCA TGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTC CACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAA CTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAG TGAACCGTCAGATCTCTAGAgccgccaccATGGATTACAAAGACGATGACGATAAGATGGCGCCTAAGAAG AAACGCAAAGTGCGGGGCATGACCATCCTGACCGACGAGAACTACGTGGACATCGCCGAGAAAGCCATCCT GAAGCTGGAAAGAAACACCAGAAATAGAAAGAACCCTGATGCCTTCTTCCTGACCACATCTAAGCTGCGGA ACCTGCTGAGCCTGACAAGCACCCTGTTCGACGAGAGCAAGGTGAAGGAATACGACGCCCTGCTGGACAGA ATCGCTTATCTGAGAGTGCAGTTCGTGTACCAGGCCGGCAGAGAGATCGCCGTGAAAGATCTGATCGAGAA GGCCCAGATCCTGGAAGCTCTGAAAGAGATCAAGGACCGGGAAACCCTGCAGAGATTCTGCAGATACATGG AAGCCCTGGTGGCCTACTTCAAGTTCTACGGCGGCAAGGACTGAcggcaataaaaagacagaataaaacgc acggtgttgggtcgtttgttcAAGCTC

Plasmid	**pDAC310**
Description	Expression of Csm3
Utility	
Features	Pcmv-FLAG-NLS-Csm3-pA
Sequence	ACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGG CTCCGCCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATA AAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGAT ACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCG GTGTAGGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTTATC CGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACA GGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACT AGAAGAACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTG ATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAA AAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACTCACGTTAA GGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTTAA ATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCT CAGCGATCTGTCTATTTCGTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAG GGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGC AATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCATCCAGTCTA TTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCT ACAGGCATCGTGGTGTCACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCG AGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTA AGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTA AGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTG CTCTTGCCCGGCGTCAATACGGGATAATACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATTGGAA AACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGT GCACCCAACTGATCTTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAA TGCCGCAAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTTTCAATATTATT GAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAATAAACAAATA GGGGTTCCGCGCACATTTCCCCGAAAAGTGCCACCTGACGTCGGATCCgacattgattattgactagttat taatagtaatcaattacggggtcattagttcatagcccatatatggagttccgCGTTACATAACTTACGGT AAATGGCCCGCCTGGCTGACCGCCCAACGACCCCCGCCCATTGACGTCAATAATGACGTATGTTCCCATAG TAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTA CATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTA TGCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCA TGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTC CACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAA CTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAG TGAACCGTCAGATCTCTAGAgccgccaccATGGATTACAAAGACGATGACGATAAGATGGCGCCTAAGAAG AAACGCAAAGTGCGGGGCATGACCTTCGCCAAGATCAAATTCAGCGCCCAGATCCGGCTGGAAACCGGCCT GCACATCGGAGGATCTGATGCCTTTGCCGCTATCGGCGCCATCGACAGCCCTGTGATCAAGGACCCCATCA CCAACCTGCCTATCATCCCCGGCTCTAGCCTGAAGGGCAAGATGAGAACACTGCTGGCCAAGGTGTACAAC GAAAAGGTGGCCGAGAAGCCTAGCGACGACAGCGACATCCTGAGCAGACTGTTCGGAAATAGCAAGGATAA

	GCGGTTCAAGATGGGCAGACTGATCTTCCGGGACGCCTTCCTGAGCAACGCCGACGAGCTGGATTCTCTGG GCGTGCGGAGCTACACCGAGGTGAAGTTCGAGAACACCATCGATAGAATCACCGCCGAGGCCAATCCTAGA CAGATCGAGAGAGCCATTCGGAACTCAACATTCGACTTCGAGCTGATCTACGAGATCACTGATGAGAATGA GAACCAGGTCGAGGAAGATTTCAAGGTGATCAGAGACGGCCTGAAGCTGCTGGAACTGGACTACCTGGGCG GAAGCGGCTCCAGAGGCTACGGCAAAGTGGCTTTTGAGAACCTGAAAGCCACCACAGTGTTCGGCAACTAC GACGTGAAAACCCTGAACGAGCTGCTGACCGCCGAAGTGTGAcggcaataaaaagacagaataaaacgcac ggtgttgggtcgtttgttcAAGCTC

Plasmid	**pDAC327**
Description	Expression of Csm3(RNase mut)
Utility	
Features	Pcmv-FLAG-NLS-Csm3(RNase mut)-pA
Sequence	ACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGG CTCCGCCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATA AAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGAT ACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCG GTGTAGGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTTATC CGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACA GGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACT AGAAGAACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTG ATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAA AAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACTCACGTTAA GGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTTAA ATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCT CAGCGATCTGTCTATTTCGTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAG GGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGC AATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCATCCAGTCTA TTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCT ACAGGCATCGTGGTGTCACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCG AGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTA AGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTA AGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTG CTCTTGCCCGGCGTCAATACGGGATAATACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATTGGAA AACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGT GCACCCAACTGATCTTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAA TGCCGCAAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTTTCAATATTATT GAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAATAAACAAATA GGGGTTCCGCGCACATTTCCCCGAAAAGTGCCACCTGACGTCGGATCCgacattgattattgactagttat taatagtaatcaattacggggtcattagttcatagcccatatatggagttccgCGTTACATAACTTACGGT AAATGGCCCGCCTGGCTGACCGCCCAACGACCCCCGCCCATTGACGTCAATAATGACGTATGTTCCCATAG TAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTA CATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTA TGCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCA TGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTC CACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAA CTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAG TGAACCGTCAGATCTCTAGAgccgccaccATGGATTACAAAGACGATGACGATAAGATGGCGCCTAAGAAG AAACGCAAAGTGCGGGGCATGACCTTCGCCAAGATCAAATTCAGCGCCCAGATCCGGCTGGAAACCGGCCT GCACATCGGAGGATCTGATGCCTTTGCCGCTATCGGCGCCATCGCCAGCCCTGTGATCAAGGACCCCATCA CCAACCTGCCTATCATCCCCGGCTCTAGCCTGAAGGGCAAGATGAGAACACTGCTGGCCAAGGTGTACAAC GAAAAGGTGGCCGAGAAGCCTAGCGACGACAGCGACATCCTGAGCAGACTGTTCGGAAATAGCAAGGATAA GCGGTTCAAGATGGGCAGACTGATCTTCCGGGACGCCTTCCTGAGCAACGCCGACGAGCTGGATTCTCTGG GCGTGCGGAGCTACACCGAGGTGAAGTTCGAGAACACCATCGATAGAATCACCGCCGAGGCCAATCCTAGA CAGATCGAGAGAGCCATTCGGAACTCAACATTCGACTTCGAGCTGATCTACGAGATCACTGATGAGAATGA GAACCAGGTCGAGGAAGATTTCAAGGTGATCAGAGACGGCCTGAAGCTGCTGGAACTGGACTACCTGGGCG GAAGCGGCTCCAGAGGCTACGGCAAAGTGGCTTTTGAGAACCTGAAAGCCACCACAGTGTTCGGCAACTAC GACGTGAAAACCCTGAACGAGCTGCTGACCGCCGAAGTGTGAcggcaataaaaagacagaataaaacgcac ggtgttgggtcgtttgttcAAGCTC

Plasmid	**pDAC339**
Description	Expression of Csm4
Utility	

Features	Pcmv-FLAG-NLS-Csm4-pA
Sequence	ACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGG CTCCGCCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATA AAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGAT ACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCG GTGTAGGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTTATC CGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACA GGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACT AGAAGAACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTG ATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAA AAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACTCACGTTAA GGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTTAA ATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCT CAGCGATCTGTCTATTTCGTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAG GGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGC AATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCATCCAGTCTA TTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCT ACAGGCATCGTGGTGTCACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCG AGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTA AGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTA AGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTG CTCTTGCCCGGCGTCAATACGGGATAATACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATTGGAA AACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGT GCACCCAACTGATCTTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAA TGCCGCAAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTTTCAATATTATT GAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAATAAACAAATA GGGGTTCCGCGCACATTTCCCCGAAAAGTGCCACCTGACGTCGGATCCgacattgattattgactagttat taatagtaatcaattacggggtcattagttcatagcccatatatggagttccgCGTTACATAACTTACGGT AAATGGCCCGCCTGGCTGACCGCCCAACGACCCCCGCCCATTGACGTCAATAATGACGTATGTTCCCATAG TAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTA CATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTA TGCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCA TGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTC CACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAA CTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAG TGAACCGTCAGATCTCTAGAgccgccaccATGGATTACAAAGACGATGACGATAAGATGGCGCCTAAGAAG AAACGCAAAGTGCGGGGCATGACTTACAAGCTCTACATTATGACCTTTCAAAACGCCCACTTCGGTTCCGG CACTCTGGACTCATCGAAGCTGACCTTCTCCGCGGATAGAATCTTCTCGGCACTCGTGCTCGAGGCTCTGA AGATGGGAAAGCTCGACGCCTTCTTGGCCGAGGCCAACCAGGATAAGTTCACTCTGACCGACGCGTTCCCA TTCCAATTCGGTCCTTTCCTGCCGAAACCGATTGGTTACCCCAAGCACGACCAGATCGACCAGTCTGTGGA CGTGAAGGAAGTCCGCCGCCAAGCGAAGCTGTCCAAAAAGCTCCAGTTCCTGGCTCTGGAAAACGTCGACG ACTACCTGAACGGAGAGCTGTTTGAGAATGAGGAACACGCCGTGATCGACACAGTGACCAAGAACCAGCCC CATAAAGATGATAATCTGTACCAAGTGGCCACCACTCGGTTCTCGAACGACACCTCCCTTTACGTGATCGC CAACGAATCCGATCTGCTGAACGAACTGATGAGCAGCCTTCAGTACTCCGGGCTGGGCGGCAAAAGGTCCT CAGGATTCGGCAGATTTGAGCTGGACATCCAGAACATTCCCTTGGAACTGTCCGACCGGCTGACGAAGAAC CACAGCGACAAGGTCATGTCACTTACCACCGCCCTCCCGGTGGACGCTGATCTCGAGGAAGCGATGGAAGA TGGCCATTACCTGTTGACCAAGTCGTCCGGATTCGCATTCTCCCACGCCACCAACGAAAACTATCGGAAGC AGGACCTGTACAAGTTCGCCTCCGGGAGCACCTTCAGCAAGACTTTCGAGGGACAGATCGTGGACGTGCGC CCTCTCGATTTCCCTCACGCCGTGCTGAACTACGCCAAGCCGCTGTTCTTTAAGCTCGAAGTCTAAcggca ataaaaagacagaataaaacgcacggtgttgggtcgtttgttcAAGCTC

Plasmid	**pDAC312**
Description	Expression of Csm5
Utility	
Features	Pcmv-FLAG-NLS-Csm5-pA
Sequence	ACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGG CTCCGCCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATA AAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGAT ACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCG GTGTAGGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTTATC CGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACA GGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACT AGAAGAACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTG

	ATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAA AAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACTCACGTTAA GGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTTAA ATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCT CAGCGATCTGTCTATTTCGTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAG GGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGC AATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCATCCAGTCTA TTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCT ACAGGCATCGTGGTGTCACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCG AGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTA AGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTA AGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTG CTCTTGCCCGGCGTCAATACGGGATAATACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATTGGAA AACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGT GCACCCAACTGATCTTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAA TGCCGCAAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTTTCAATATTATT GAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAATAAACAAATA GGGGTTCCGCGCACATTTCCCCGAAAAGTGCCACCTGACGTCGGATCCgacattgattattgactagttat taatagtaatcaattacggggtcattagttcatagcccatatatggagttccgCGTTACATAACTTACGGT AAATGGCCCGCCTGGCTGACCGCCCAACGACCCCCGCCCATTGACGTCAATAATGACGTATGTTCCCATAG TAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTA CATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTA TGCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCA TGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTC CACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAA CTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAG TGAACCGTCAGATCTCTAGAgccgccaccATGGATTACAAAGACGATGACGATAAGATGGCGCCTAAGAAG AAACGCAAAGTGCGGGGCATGAAAAATGACTACCGGACCTTCAAGCTGAGCCTGCTGACCCTGGCTCCTAT CCACATCGGCAACGGCGAGAAGTACACCAGCAGAGAATTCATCTACGAGAACAAGAAGTTCTACTTCCCCG ACATGGGCAAGTTCTACAACAAGATGGTGGAAAAGAGACTGGCCGAGAAGTTCGAGGCCTTCCTGATCCAG ACCAGACCCAACGCCAGAAACAACCGGCTGATTTCTTTTCTGAACGACAACAGAATCGCCGAAAGATCTTT TGGCGGCTACAGCATCAGTGAAACCGGCCTGGAATCTGATAAGAACCCTAACAGCGCCGGAGCTATCAACG AGGTGAACAAATTCATCCGGGACGCCTTCGGAAATCCTTACATCCCAGGCAGCAGCCTGAAGGGCGCCATC CGCACCATCCTGATGAACACCACACCTAAGTGGAACAACGAGAACGCCGTGAACGACTTCGGCAGATTCCC AAAGGAAAACAAGAACCTGATCCCTTGGGGACCTAAGAAAGGCAAGGAATACGACGACCTGTTCAACGCCA TCAGAGTGTCCGACAGCAAGCCCTTCGACAACAAAAGCCTGATCCTCGTGCAGAAGTGGGACTACAGCGCC AAAACCAACAAGGCCAAGCCTCTGCCTCTGTACAGAGAGTCTATCAGCCCTCTGACCAAGATCGAGTTCGA GATAACAACAACCACTGATGAGGCCGGCAGACTGATCGAGGAACTGGGAAAGCGGGCCCAGGCCTTTTATA AGGACTACAAGGCCTTTTTCCTGTCTGAATTCCCTGATGATAAGATCCAGGCTAATCTGCAATACCCCATC TACCTGGGCGCCGGCAGCGGCGCTTGGACAAAGACCCTGTTTAAGCAGGCCGACGGCATCCTGCAGCGGAG ATACTCCAGAATGAAAACCAAGATGGTCAAGAAGGGCGTGCTGAAGCTGACAAAGGCCCCTCTGAAAACAG TGAAGATCCCCAGCGGCAACCACAGCCTGGTGAAGAATCACGAGAGCTTCTACGAGATGGGCAAAGCCAAC TTCATGATCAAGGAAATCGACAAGTGAcggcaataaaaagacagaataaaacgcacggtgttgggtcgttt gttcAAGCTC

Plasmid	**pDAC307**
Description	Expression of Cas6
Utility	
Features	Pcmv-FLAG-NLS-Cas6-pA
Sequence	ACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGG CTCCGCCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATA AAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGAT ACCTGTCCGCCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCG GTGTAGGTCGTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTTATC CGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACA GGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACT AGAAGAACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTG ATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAA AAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACTCACGTTAA GGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTTAA ATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCT CAGCGATCTGTCTATTTCGTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAG GGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGC

	AATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCATCCAGTCTA TTAATTGTTGCCGGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCT ACAGGCATCGTGGTGTCACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCG AGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTA AGTTGGCCGCAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTA AGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTG CTCTTGCCCGGCGTCAATACGGGATAATACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATTGGAA AACGTTCTTCGGGGCGAAAACTCTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGT GCACCCAACTGATCTTCAGCATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAA TGCCGCAAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTTTCAATATTATT GAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAATAAACAAATA GGGGTTCCGCGCACATTTCCCCGAAAAGTGCCACCTGACGTCGGATCCgacattgattattgactagttat taatagtaatcaattacggggtcattagttcatagcccatatatggagttccgCGTTACATAACTTACGGT AAATGGCCCGCCTGGCTGACCGCCCAACGACCCCCGCCCATTGACGTCAATAATGACGTATGTTCCCATAG TAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTA CATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTA TGCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCA TGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTC CACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAA CTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAG TGAACCGTCAGATCTCTAGAgccgccaccATGGATTACAAAGACGATGACGATAAGATGGCGCCTAAGAAG AAACGCAAAGTGCGGGGCATGAAAAAGCTCGTGTTCACCTTTAAGCGGATCGACCACCCTGCTCAGGACCT GGCCGTGAAATTCCACGGCTTCCTGATGGAACAGCTGGATAGCGACTACGTGGACTACCTGCACCAGCAGC AGACCAACCCCTACGCCACAAAGGTGATCCAGGGCAAAGAGAACACCCAGTGGGTCGTGCATCTGCTGACA GACGACATCGAGGACAAGGTGTTCATGACCCTGCTGCAGATCAAGGAAGTGTCCCTGAACGACCTGCCTAA GTTGTCTGTGGAAAAGGTGGAAATCCAGGAGCTGGGCGCTGATAAGCTGCTCGAGATCTTCAACAGCGAGG AAAACCAGACCTACTTCAGCATCATCTTCGAGACACCTACAGGCTTTAAAAGCCAGGGCAGCTACGTGATC TTCCCCAGCATGCGGCTGATCTTTCAGAGCCTGATGCAGAAGTACGGCAGACTGGTGGAAAACCAGCCTGA GATCGAGGAAGATACCCTGGACTACCTGAGCGAGCACAGCACCATCACCAATTACAGACTGGAAACAAGCT ACTTCAGAGTGCATAGACAGAGAATCCCCGCCTTCCGGGGCAAGCTGACCTTCAAGGTGCAGGGAGCCCAG ACACTGAAGGCCTACGTGAAGATGCTGCTGACCTTCGGCGAGTACAGCGGCCTGGGCATGAAAACCAGCCT GGGAATGGGCGGCATCAAGCTGGAAGAAAGAAAGGACTGAcggcaataaaaagacagaataaaacgcacgg tgttgggtcgtttgttcAAGCTC

Plasmid	**pDAC324**
Description	Expression of crRNA
Utility	
Features	Pu6-crRNA-pT
Sequence	TCGCGCGTTTCGGTGATGACGGTGAAAACCTCTGACACATGCAGCTCCCGGAGACGGTCACAGCTTGTCTG TAAGCGGATGCCGGGAGCAGACAAGCCCGTCAGGGCGCGTCAGCGGGTGTTGGCGGGTGTCGGGGCTGGCT TAACTATGCGGCATCAGAGCAGATTGTACTGAGAGTGCACCATATGGAGGGCCTATTTCCCATGATTCCTT CATATTTGCATATACGATACAAGGCTGTTAGAGAGATAATTAGAATTAATTTGACTGTAAACACAAAGATA TTAGTACAAAATACGTGACGTAGAAAGTAATAATTTCTTGGGTAGTTTGCAGTTTTAAAATTATGTTTTAA AATGGACTATCATATGCTTACCGTAACTTGAAAGTATTTCGATTTCTTGGCTTTATATATCTTGTGGAAAG GACGAAACACCGATATAAACCTAATTACCTCGAGAGGGGACGGAAACCCGTCTTCGATGAAGCGATTCAGA AGACTTGATATAAACCTAATTACCTCGAGAGGGGACTTTTTTACATGTGAGCAAAAGGCCAGCAAAAGGCC AGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCCTGACGAGCATCACAAAAA TCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCT CCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGGAAGC GTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTCGCTCCAAGCTGGGCTG TGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGG TAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGT GCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGAACAGTATTTGGTATCTGCGCTCT GCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCG GTGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAAAAGGATCTCAAGAAGATCCTTTGATCTTT TCTACGGGGTCTGACGCTCAGTGGAACGAAAACTCACGTTAAGGGATTTTGGTCATGAGATTATCAAAAAG GATCTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTTAAATCAATCTAAAGTATATATGAGTAAACTT GGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCTCAGCGATCTGTCTATTTCGTTCATCCATA GTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAGGGCTTACCATCTGGCCCCAGTGCTGCAAT GATACCGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGCAATAAACCAGCCAGCCGGAAGGGCCGAGC GCAGAAGTGGTCCTGCAACTTTATCCGCCTCCATCCAGTCTATTAATTGTTGCCGGGAAGCTAGAGTAAGT AGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTCACGCTCGTCGTT TGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAAA

	AAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTAAGTTGGCCGCAGTGTTATCACTCATGGTT ATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGAGTACTC AACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAATACGGGATAATA CCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATTGGAAAACGTTCTTCGGGGCGAAAACTCTCAAGG ATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGTGCACCCAACTGATCTTCAGCATCTTTTAC TTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAAGGGAATAAGGGCGACAC GGAAATGTTGAATACTCATACTCTTCCTTTTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATG AGCGGATACATATTTGAATGTATTTAGAAAAATAAACAAATAGGGGTTCCGCGCACATTTCCCCGAAAAGT GCCACCTGACGTCTAAGAAACCATTATTATCATGACATTAACCTATAAAAATAGGCGTATCACGAGGCCCT TTCGTC

Plasmid	**pDAC439**
Description	Expression of Csm complex from single promoter; RFP backbone
Utility	RNA KD
Features	Pcmv-FLAG-NLS-Csm5-2A-FLAG-NLS-Csm4-2A-FLAG-NLS-Csm3-2A-FLAG-NLS-Csm2-pA; Pcmv-RFP-2A-FLAG-NLS-Cas6-2A-FLAG-NLS-Csm1-pA; Pu6-crRNA-pT
Sequence	CTCGAGTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCCGCGTTA CATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCCCCGCCCATTGACGTCAATAATGACG TATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGC CCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGC CCGCCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTC ATCGCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGG ATTTCCAAGTCTCCACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAA AATGTCGTAACAACTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGC AGAGCTGGTTTAGTGAACCGTCAGATCCGCTAGGGATCCgccgccaccATGGATTACAAAGACGATGACGA TAAGATGGCGCCTAAGAAGAAACGCAAAGTGCGGGGCATGAAAAATGACTACCGGACCTTCAAGCTGAGCC TGCTGACCCTGGCTCCTATCCACATCGGCAACGGCGAGAAGTACACCAGCAGAGAATTCATCTACGAGAAC AAGAAGTTCTACTTCCCCGACATGGGCAAGTTCTACAACAAGATGGTGGAAAAGAGACTGGCCGAGAAGTT CGAGGCCTTCCTGATCCAGACCAGACCCAACGCCAGAAACAACCGGCTGATTTCTTTTCTGAACGACAACA GAATCGCCGAAAGATCTTTTGGCGGCTACAGCATCAGTGAAACCGGCCTGGAATCTGATAAGAACCCTAAC AGCGCCGGAGCTATCAACGAGGTGAACAAATTCATCCGGGACGCCTTCGGAAATCCTTACATCCCAGGCAG CAGCCTGAAGGGCGCCATCCGCACCATCCTGATGAACACCACACCTAAGTGGAACAACGAGAACGCCGTGA ACGACTTCGGCAGATTCCCAAAGGAAAACAAGAACCTGATCCCTTGGGGACCTAAGAAAGGCAAGGAATAC GACGACCTGTTCAACGCCATCAGAGTGTCCGACAGCAAGCCCTTCGACAACAAAAGCCTGATCCTCGTGCA GAAGTGGGACTACAGCGCCAAAACCAACAAGGCCAAGCCTCTGCCTCTGTACAGAGAGTCTATCAGCCCTC TGACCAAGATCGAGTTCGAGATAACAACAACCACTGATGAGGCCGGCAGACTGATCGAGGAACTGGGAAAG CGGGCCCAGGCCTTTTATAAGGACTACAAGGCCTTTTTCCTGTCTGAATTCCCTGATGATAAGATCCAGGC TAATCTGCAATACCCCATCTACCTGGGCGCCGGCAGCGGCGCTTGGACAAAGACCCTGTTTAAGCAGGCCG ACGGCATCCTGCAGCGGAGATACTCCAGAATGAAAACCAAGATGGTCAAGAAGGGCGTGCTGAAGCTGACA AAGGCCCCTCTGAAAACAGTGAAGATCCCCAGCGGCAACCACAGCCTGGTGAAGAATCACGAGAGCTTCTA CGAGATGGGCAAAGCCAACTTCATGATCAAGGAAATCGACAAGgaaggaaggggctccctcctcacttgtg gagatgtcgaagaaaatcctggacctGATTACAAAGACGATGACGATAAGATGGCGCCTAAGAAGAAACGC AAAGTGCGGGGCATGACTTACAAGCTCTACATTATGACCTTTCAAAACGCCCACTTCGGTTCCGGCACTCT GGACTCATCGAAGCTGACCTTCTCCGCGGATAGAATCTTCTCGGCACTCGTGCTCGAGGCTCTGAAGATGG GAAAGCTCGACGCCTTCTTGGCCGAGGCCAACCAGGATAAGTTCACTCTGACCGACGCGTTCCCATTCCAA TTCGGTCCTTTCCTGCCGAAACCGATTGGTTACCCCAAGCACGACCAGATCGACCAGTCTGTGGACGTGAA GGAAGTCCGCCGCCAAGCGAAGCTGTCCAAAAAGCTCCAGTTCCTGGCTCTGGAAAACGTCGACGACTACC TGAACGGAGAGCTGTTTGAGAATGAGGAACACGCCGTGATCGACACAGTGACCAAGAACCAGCCCCATAAA GATGATAATCTGTACCAAGTGGCCACCACTCGGTTCTCGAACGACACCTCCCTTTACGTGATCGCCAACGA ATCCGATCTGCTGAACGAACTGATGAGCAGCCTTCAGTACTCCGGGCTGGGCGGCAAAAGGTCCTCAGGAT TCGGCAGATTTGAGCTGGACATCCAGAACATTCCCTTGGAACTGTCCGACCGGCTGACGAAGAACCACAGC GACAAGGTCATGTCACTTACCACCGCCCTCCCGGTGGACGCTGATCTCGAGGAAGCGATGGAAGATGGCCA TTACCTGTTGACCAAGTCGTCCGGATTCGCATTCTCCCACGCCACCAACGAAAACTATCGGAAGCAGGACC TGTACAAGTTCGCCTCCGGGAGCACCTTCAGCAAGACTTTCGAGGGACAGATCGTGGACGTGCGCCCTCTC GATTTCCCTCACGCCGTGCTGAACTACGCCAAGCCGCTGTTCTTTAAGCTCGAAGTCgagggcagaggaag tctgctaacatgcggtgacgtcgaggagaatcctggacctGATTACAAAGACGATGACGATAAGATGGCGC CTAAGAAGAAACGCAAAGTGCGGGGCATGACCTTCGCCAAGATCAAATTCAGCGCCCAGATCCGGCTGGAA ACCGGCCTGCACATCGGAGGATCTGATGCCTTTGCCGCTATCGGCGCCATCGACAGCCCTGTGATCAAGGA CCCCATCACCAACCTGCCTATCATCCCCGGCTCTAGCCTGAAGGGCAAGATGAGAACACTGCTGGCCAAGG TGTACAACGAAAAGGTGGCCGAGAAGCCTAGCGACGACAGCGACATCCTGAGCAGACTGTTCGGAAATAGC AAGGATAAGCGGTTCAAGATGGGCAGACTGATCTTCCGGGACGCCTTCCTGAGCAACGCCGACGAGCTGGA TTCTCTGGGCGTGCGGAGCTACACCGAGGTGAAGTTCGAGAACACCATCGATAGAATCACCGCCGAGGCCA ATCCTAGACAGATCGAGAGAGCCATTCGGAACTCAACATTCGACTTCGAGCTGATCTACGAGATCACTGAT

	GAGAATGAGAACCAGGTCGAGGAAGATTTCAAGGTGATCAGAGACGGCCTGAAGCTGCTGGAACTGGACTA CCTGGGCGGAAGCGGCTCCAGAGGCTACGGCAAAGTGGCTTTTGAGAACCTGAAAGCCACCACAGTGTTCG GCAACTACGACGTGAAAACCCTGAACGAGCTGCTGACCGCCGAAGTGgaggggcgggggtctttgttgact tgcggggatgttgaggagaacccagggccaGATTACAAAGACGATGACGATAAGATGGCGCCTAAGAAGAA ACGCAAAGTGCGGGGCATGACCATCCTGACCGACGAGAACTACGTGGACATCGCCGAGAAAGCCATCCTGA AGCTGGAAAGAAACACCAGAAATAGAAAGAACCCTGATGCCTTCTTCCTGACCACATCTAAGCTGCGGAAC CTGCTGAGCCTGACAAGCACCCTGTTCGACGAGAGCAAGGTGAAGGAATACGACGCCCTGCTGGACAGAAT CGCTTATCTGAGAGTGCAGTTCGTGTACCAGGCCGGCAGAGAGATCGCCGTGAAAGATCTGATCGAGAAGG CCCAGATCCTGGAAGCTCTGAAAGAGATCAAGGACCGGGAAACCCTGCAGAGATTCTGCAGATACATGGAA GCCCTGGTGGCCTACTTCAAGTTCTACGGCGGCAAGGACTGAGCTAGCGCGGCCGCATCGATAAGCTTGTC GACGATATCTCCAGAGGATCATAATCAGCCATACCACATTTGTAGAGGTTTTACTTGCTTTAAAAAACCTC CCACACCTCCCCCTGAACCTGAAACATAAAATGAATGCAATTGTTGTTGTTAACTTGTTTATTGCAGCTTA TAATGGTTACAAATAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGCCCCGAGCTT CCTCGCTCACTGACTCGCTGCGCTCGGTCGTTCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGCGGTA ATACGGTTATCCACAGAATCAGGGGATAACGCAGGAAAGAAACTAGTGAGGGCCTATTTCCCATGATTCCT TCATATTTGCATATACGATACAAGGCTGTTAGAGAGATAATTAGAATTAATTTGACTGTAAACACAAAGAT ATTAGTACAAAATACGTGACGTAGAAAGTAATAATTTCTTGGGTAGTTTGCAGTTTTAAAATTATGTTTTA AAATGGACTATCATATGCTTACCGTAACTTGAAAGTATTTCGATTTCTTGGCTTTATATATCTTGTGGAAA GGACGAAACACCGATATAAACCTAATTACCTCGAGAGGGGACGGAAACCCGTCTTCGATGAAGCGATTCAG AAGACTTGATATAAACCTAATTACCTCGAGAGGGGACTTTTTTACATGTGAGCAAAAGGCCAGCAAAAGGC CAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCCTGACGAGCATCACAAAA ATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAGC TCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCGGGAAG CGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTCGCTCCAAGCTGGGCT GTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAACCCG GTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGG TGCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGAACAGTATTTGGTATCTGCGCTC TGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGC GGTGGTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAAAAGGATCTCAAGAAGATCCTTTGATCTT TTCTACGGGGTCTGACGCTCAGTGGAACGAAAACTCACGTTAAGGGATTTTGGTCATGAGATTATCAAAAA GGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTTAAATCAATCTAAAGTATATATGAGTAAACT TGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCTCAGCGATCTGTCTATTTCGTTCATCCAT AGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAGGGCTTACCATCTGGCCCCAGTGCTGCAA TGATACCGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGCAATAAACCAGCCAGCCGGAAGGGCCGAG CGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCATCCAGTCTATTAATTGTTGCCGGGAAGCTAGAGTAAG TAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTCACGCTCGTCGT TTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAA AAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTAAGTTGGCCGCAGTGTTATCACTCATGGT TATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGAGTACT CAACCAAGTCATTCTGAGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAACACGGGATAAT ACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATTGGAAAACGTTCTTCGGGGCGAAAACTCTCAAG GATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGTGCACCCAACTGATCTTCAGCATCTTTTA CTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAAGGGAATAAGGGCGACA CGGAAATGTTGAATACTCATACTCTTCCTTTTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCAT GAGCGGATACATATTTGAATGTATTTAGAAAAATAAACAAATAGGGGTTCCGCGCACATTTCCCCGAAAAG TGCCACCTGACGTCGGCAGTGAAAAAAATGCTTTATTTGTGAAATTTGTGATGCTATTGCTTTATTTGTAA CCATTATAAGCTGCAATAAACAAGTTAACAACAACAATTGCATTCATTTTATGTTTCAGGTTCAGGGGGAG GTGTGGGAGGTTTTTTAAAGCAAGTAAAACCTCTACAAATGTGGTATGGCTGATTATGATCCTCTAGATTA ATCCTTTCTGATTTCGTAGATGTACAGCAGGAGCGCGAGCTCGGCTTCCTTCCGGTCCTTATCGTTCTTGT TGGTGTACCAGGAGTAGAACAGGTTCTTGAAGGTCTTGAACTTGTCCCTGTCAGTCTCCCGGGTCAGTTCT TCCAGGCGAGTGAGGTAATAGGCGAGGCGTGCCATATTCATGCGGTCGTGGTTCCTCAAAAGCTCAATAAG CTTATAGATGAAGTTCTTTCCCCTCTCGTCTTGATGGTTGAAGAAGTATCTAATCTGTTCCAGTTTGTCGT CGTACACGTTAGTGATGAACCTATCAAACTTGAAAGTGTAGTCGCTTGAGAACAGCGAGATGGAGTCCTTT TCGTTGCCCTTGGCGGCCTCTTCCAGTTCCCCGGTCTGGTGAGCCATCAGGCTAATAGGAGTCTTGTCGGC GAACAACCCTATCCCCGCGGAGAGGGTGAGCTTCCCGTTGGTCCACTTGATGAAGTTTTCGCGAAGTTCCA CAGTGAACGCGATGATATCCTGCCACGATCCAATGGCGAACACGTCATCGCCGCCCGCGTAGATAATGCTC AGCTTCTTGTCGGAGGCGAACTGGTTAATGTACACTTTGAAGAACAGCGACATGCTCCGGGAGAATGTGGC CGATCTTGACAGAGTGGAGTATTGTCCGTTTCCCTGCTGGCTGAAACCGGCCATGAAGGCGGCGCCCAAGT CATCCACGTCGAGCCGGACCACGGCCAGTCTCTTGATGCCTAGGCCGTTCTCGTTCTTGCTCAGGGCGGCG TAGTTGTAGATCTCGTCGCACTGGTAATCCCCCACGAACACATGCGTAGCCTTCACGGTACCGGCCTTATA GTCATTCTTCACGTAGACCCGGCTGAACGCTTCTTGGGACAGCTTTTCGAATGCCACGCCCTTTAAGCACG CGTTTGGTCCAATCGGCAGCCCCTCATTTTCGGTAATGATGAAGTGGTCATGGGCAATTTCTTTCGAGAAC TGGTACAGTCCCCGGCAAATGTCACAGACTTTCTGGTCGTGGTAGGACACCAGGTTCTCCACGGAGTGGCA

	AATCTCGCACTCTCTCTCTGAGGACTTTCCACCGCGATTCAGGAGCATCAGTGTCTGGTAGTCGTATCTGG AGATTTTCTTTTTGGAGATCATGCGCGAAGCCTTTTGGTACACTTGGCGGTAGGACTCGGGGCTATTCAGC TCGGACATGATGTCCTTGGCCGCGAAGGAACCCCAGCCAAAGGCCACATAGAGGCGGGTCTGGAAGTTTGC CAACAGGAACTGGTTGAAATCCTTCTCAAACTGCACCAGGGTTTCCACAGTCTTTTCGGTGTTGGCCAGGA CGAAGTAGGCGTGTCCGCCGCCGACGTAAAGCATGTTAGCCCTGTTCAGTCCCAGCTTGTCCAGCAGGCTA TCGGCGATGTACTCGGACATAAAGTCCAGGTAGAGGCTCCGGGCCTTCAGCTGCTTCGCCGCGCCGTTAGT TGCGATGTTAATGTTGTAGATAAAGTCCTGGATTCCCGACAGGTCGAAGGAGGCCAGCAGGAAGGCTTCTT CTTCATAGAACGCTGACACTTTGGTGAACAGGTCCTCTTTGTAGTTGTGCCGACCCTTGTCCTCCAGGTAG TCGTAGATCGCCAGAGCGAAGGCAGCAGTCAAGCGGGAATGGTCGGCCAGGGAGATGTCGGCGATTTCCTT AGTGTTGGTGCTTGACGGCACGAAGGAGAGAGTAGCCTCGAAAAGGTTGAGCAGGGAGTCAATCTGGACTT GGTTGAACTCGAACTCGGCCAGTTCGTTCTTAATCCGGGTGGCGATGGCAGCGTAATCGCCCTTGCTAAAG GGTTCGTAAGTGGCGGACGCGAAGTTGGGCTTCGACTTGAGATTCAGCACGGTAGGCTTGAAGTACCGCTT ATCGGTCTGCGCTCCGAACACGTTAAAGATGTCGGCCTGGTTCGTGTAGGTGTCCCAGATCTTTGCGGAGG TATCTTCGTCTGACTCTTCGTTGGATTGCCGGCGGTCGACACCGGAGGCGATGTTGTCGGCAATGTAGGTG ATGTAAGCCAGGTGATCGTTGCCGAGCTTATCAGACTGGTAGTTGGCCATATGGTACCGGATCTGATCCGA GATGACTTGGTTGTCGGCGATCTCGTCGAACCAGTCGGCGCCCACAAGTGCGTGTTTCTTCCGCTCTCCGG TTGCTCGCTGGATGACCTTTCCGATGTCGTGCAGCAGGGCTCCGTAAAACAGATCAATCTTTTCTTTCTTC ATGCCCCGCACTTTGCGTTTCTTCTTAGGCGCCATCTTATCGTCATCGTCTTTGTAATCGCCGGAATGGTG ATGGTGATGGTGtggtcctggattttcttcaacatctccacaagttagcaaacttcctcttccttcGTCCT TTCTTTCTTCCAGCTTGATGCCGCCCATTCCCAGGCTGGTTTTCATGCCCAGGCCGCTGTACTCGCCGAAG GTCAGCAGCATCTTCACGTAGGCCTTCAGTGTCTGGGCTCCCTGCACCTTGAAGGTCAGCTTGCCCCGGAA GGCGGGGATTCTCTGTCTATGCACTCTGAAGTAGCTTGTTTCCAGTCTGTAATTGGTGATGGTGCTGTGCT CGCTCAGGTAGTCCAGGGTATCTTCCTCGATCTCAGGCTGGTTTTCCACCAGTCTGCCGTACTTCTGCATC AGGCTCTGAAAGATCAGCCGCATGCTGGGGAAGATCACGTAGCTGCCCTGGCTTTTAAAGCCTGTAGGTGT CTCGAAGATGATGCTGAAGTAGGTCTGGTTTTCCTCGCTGTTGAAGATCTCGAGCAGCTTATCAGCGCCCA GCTCCTGGATTTCCACCTTTTCCACAGACAACTTAGGCAGGTCGTTCAGGGACACTTCCTTGATCTGCAGC AGGGTCATGAACACCTTGTCCTCGATGTCGTCTGTCAGCAGATGCACGACCCACTGGGTGTTCTCTTTGCC CTGGATCACCTTTGTGGCGTAGGGGTTGGTCTGCTGCTGGTGCAGGTAGTCCACGTAGTCGCTATCCAGCT GTTCCATCAGGAAGCCGTGGAATTTCACGGCCAGGTCCTGAGCAGGGTGGTCGATCCGCTTAAAGGTGAAC ACGAGCTTTTTCATGCCCCGCACTTTGCGTTTCTTCTTAGGCGCCATCTTATCGTCATCGTCTTTGTAATC ggggccggggttctcctccacgtcgccgcaggtcagcaggctgcctctgccctcCTTGTACAGCTCGTCCA TGCCGCCGGTGGAGTGGCGGCCCTCGGCGCGTTCGTACTGTTCCACGATGGTGTAGTCCTCGTTGTGGGAG GTGATGTCCAACTTGATGTTGACGTTGTAGGCGCCGGGCAGCTGCACGGGCTTCTTGGCCTTGTAGGTGGT CTTGACCTCAGCGTCGTAGTGGCCGCCGTCCTTCAGCTTCAGCCTCTGCTTGATCTCGCCCTTCAGGGCGC CGTCCTCGGGGTACATCCGCTCGGAGGAGGCCTCCCAGCCCATGGTTTTCTTCTGCATTACGGGGCCGTCG GAGGGGAAGTTGGTGCCGCGCAGCTTCACCTTGTAGATGAACTCGCCGTCCTGCAGGGAGGAGTCCTGGGT CACGGTCACCACGCCGCCGTCCTCGAAGTTCATCACGCGCTCCCACTTGAAGCCCTCGGGGAAGGACAGCT TCAAGTAGTCGGGGATGTCGGCGGGGTGCTTCACGTAGGCCTTGGAGCCGTACATGAACTGAGGGGACAGG ATGTCCCAGGCGAAGGGCAGGGGGCCACCCTTGGTCACCTTCAGCTTGGCGGTCTGGGTGCCCTCGTAGGG GCGGCCCTCGCCCTCGCCCTCGATCTCGAACTCGTGGCCGTTCACGGAGCCCTCCATGTGCACCTTGAAGC GCATGAACTCCTTGATGATGGCCATGTTATCCTCCTCGCCCTTGCTCACCATggtggcggcACCGGTGAAT TCTCCAGGCGATCTGACGGTTCACTAAACGAGCTCTGCTTATATAGGCCTCCCACCGTACACGCCACCTCG ACATA

Plasmid	**pDAC435**
Description	Expression of Csm complex from separate promoters; RFP backbone
Utility	RNA KD
Features	Pcmv-FLAG-NLS-Csm1-pA; Pcmv-FLAG-NLS-Csm2-pA; Pcmv-FLAG-NLS-Csm3-pA; Pcmv-FLAG-NLS-Csm4-pA; Pcmv-FLAG-NLS-Csm5-pA; Pcmv-FLAG-NLS-Cas6-pA; Pu6-crRNA-pT; Pcmv-RFP-pA
Sequence	GTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTCCA CCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAACT CCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAGTG AACCGTCAGATCTCTAGAgccgccaccATGCACCATCACCATCACCATTCCGGCGATTACAAAGACGATGA CGATAAGATGGCGCCTAAGAAGAAACGCAAAGTGCGGGGCATGAAGAAAGAAAAGATTGATCTGTTTTACG GAGCCCTGCTGCACGACATCGGAAAGGTCATCCAGCGAGCAACCGGAGAGCGGAAGAAACACGCACTTGTG GGCGCCGACTGGTTCGACGAGATCGCCGACAACCAAGTCATCTCGGATCAGATCCGGTACCATATGGCCAA CTACCAGTCTGATAAGCTCGGCAACGATCACCTGGCTTACATCACCTACATTGCCGACAACATCGCCTCCG GTGTCGACCGCCGGCAATCCAACGAAGAGTCAGACGAAGATACCTCCGCAAAGATCTGGGACACCTACACG AACCAGGCCGACATCTTTAACGTGTTCGGAGCGCAGACCGATAAGCGGTACTTCAAGCCTACCGTGCTGAA TCTCAAGTCGAAGCCCAACTTCGCGTCCGCCACTTACGAACCCTTTAGCAAGGGCGATTACGCTGCCATCG CCACCCGGATTAAGAACGAACTGGCCGAGTTCGAGTTCAACCAAGTCCAGATTGACTCCCTGCTCAACCTT TTCGAGGCTACTCTCTCCTTCGTGCCGTCAAGCACCAACACTAAGGAAATCGCCGACATCTCCCTGGCCGA

	CCATTCCCGCTTGACTGCTGCCTTCGCTCTGGCGATCTACGACTACCTGGAGGACAAGGGTCGGCACAACT ACAAAGAGGACCTGTTCACCAAAGTGTCAGCGTTCTATGAAGAAGAAGCCTTCCTGCTGGCCTCCTTCGAC CTGTCGGGAATCCAGGACTTTATCTACAACATTAACATCGCAACTAACGGCGCGGCGAAGCAGCTGAAGGC CCGGAGCCTCTACCTGGACTTTATGTCCGAGTACATCGCCGATAGCCTGCTGGACAAGCTGGGACTGAACA GGGCTAACATGCTTTACGTCGGCGGCGGACACGCCTACTTCGTCCTGGCCAACACCGAAAAGACTGTGGAA ACCCTGGTGCAGTTTGAGAAGGATTTCAACCAGTTCCTGTTGGCAAACTTCCAGACCCGCCTCTATGTGGC CTTTGGCTGGGGTTCCTTCGCGGCCAAGGACATCATGTCCGAGCTGAATAGCCCCGAGTCCTACCGCCAAG TGTACCAAAAGGCTTCGCGCATGATCTCCAAAAAGAAAATCTCCAGATACGACTACCAGACACTGATGCTC CTGAATCGCGGTGGAAAGTCCTCAGAGAGAGAGTGCGAGATTTGCCACTCCGTGGAGAACCTGGTGTCCTA CCACGACCAGAAAGTCTGTGACATTTGCCGGGGACTGTACCAGTTCTCGAAAGAAATTGCCCATGACCACT TCATCATTACCGAAAATGAGGGGCTGCCGATTGGACCAAACGCGTGCTTAAAGGGCGTGGCATTCGAAAAG CTGTCCCAAGAAGCGTTCAGCCGGGTCTACGTGAAGAATGACTATAAGGCCGGTACCGTGAAGGCTACGCA TGTGTTCGTGGGGGATTACCAGTGCGACGAGATCTACAACTACGCCGCCCTGAGCAAGAACGAGAACGGCC TAGGCATCAAGAGACTGGCCGTGGTCCGGCTCGACGTGGATGACTTGGGCGCCGCCTTCATGGCCGGTTTC AGCCAGCAGGGAAACGGACAATACTCCACTCTGTCAAGATCGGCCACATTCTCCCGGAGCATGTCGCTGTT CTTCAAAGTGTACATTAACCAGTTCGCCTCCGACAAGAAGCTGAGCATTATCTACGCGGGCGGCGATGACG TGTTCGCCATTGGATCGTGGCAGGATATCATCGCGTTCACTGTGGAACTTCGCGAAAACTTCATCAAGTGG ACCAACGGGAAGCTCACCCTCTCCGCGGGGATAGGGTTGTTCGCCGACAAGACTCCTATTAGCCTGATGGC TCACCAGACCGGGGAACTGGAAGAGGCCGCCAAGGGCAACGAAAAGGACTCCATCTCGCTGTTCTCAAGCG ACTACACTTTCAAGTTTGATAGGTTCATCACTAACGTGTACGACGACAAACTGGAACAGATTAGATACTTC TTCAACCATCAAGACGAGAGGGGAAAGAACTTCATCTATAAGCTTATTGAGCTTTTGAGGAACCACGACCG CATGAATATGGCACGCCTCGCCTATTACCTCACTCGCCTGGAAGAACTGACCCGGGAGACTGACAGGGACA AGTTCAAGACCTTCAAGAACCTGTTCTACTCCTGGTACACCAACAAGAACGATAAGGACCGGAAGGAAGCC GAGCTCGCGCTCCTGCTGTACATCTACGAAATCAGAAAGGATTAAcggcaataaaaagacagaataaaacg cacggtgttgggtcgtttgttcGCACACATTAGCTAGCCGTCAGCACACATTGTGATGCGGTTTTGGCAGT ACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTCCACCCCATTGACGTCAATGGG AGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAACTCCGCCCCATTGACGCAAAT GGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAGTGAACCGTCAGATCTCTAGAg ccgccaccATGGATTACAAAGACGATGACGATAAGATGGCGCCTAAGAAGAAACGCAAAGTGCGGGGCATG ACCATCCTGACCGACGAGAACTACGTGGACATCGCCGAGAAAGCCATCCTGAAGCTGGAAAGAAACACCAG AAATAGAAAGAACCCTGATGCCTTCTTCCTGACCACATCTAAGCTGCGGAACCTGCTGAGCCTGACAAGCA CCCTGTTCGACGAGAGCAAGGTGAAGGAATACGACGCCCTGCTGGACAGAATCGCTTATCTGAGAGTGCAG TTCGTGTACCAGGCCGGCAGAGAGATCGCCGTGAAAGATCTGATCGAGAAGGCCCAGATCCTGGAAGCTCT GAAAGAGATCAAGGACCGGGAAACCCTGCAGAGATTCTGCAGATACATGGAAGCCCTGGTGGCCTACTTCA AGTTCTACGGCGGCAAGGACTGAcggcaataaaaagacagaataaaacgcacggtgttgggtcgtttgttc AGTTCTTTTGCCTTACTTTCAATGCATGCGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCG GTTTGACTCACGGGGATTTCCAAGTCTCCACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATC AACGGGACTTTCCAAAATGTCGTAACAACTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGG GAGGTCTATATAAGCAGAGCTCGTTTAGTGAACCGTCAGATCTCTAGAgccgccaccATGGATTACAAAGA CGATGACGATAAGATGGCGCCTAAGAAGAAACGCAAAGTGCGGGGCATGACCTTCGCCAAGATCAAATTCA GCGCCCAGATCCGGCTGGAAACCGGCCTGCACATCGGAGGATCTGATGCCTTTGCCGCTATCGGCGCCATC GACAGCCCTGTGATCAAGGACCCCATCACCAACCTGCCTATCATCCCCGGCTCTAGCCTGAAGGGCAAGAT GAGAACACTGCTGGCCAAGGTGTACAACGAAAAGGTGGCCGAGAAGCCTAGCGACGACAGCGACATCCTGA GCAGACTGTTCGGAAATAGCAAGGATAAGCGGTTCAAGATGGGCAGACTGATCTTCCGGGACGCCTTCCTG AGCAACGCCGACGAGCTGGATTCTCTGGGCGTGCGGAGCTACACCGAGGTGAAGTTCGAGAACACCATCGA TAGAATCACCGCCGAGGCCAATCCTAGACAGATCGAGAGAGCCATTCGGAACTCAACATTCGACTTCGAGC TGATCTACGAGATCACTGATGAGAATGAGAACCAGGTCGAGGAAGATTTCAAGGTGATCAGAGACGGCCTG AAGCTGCTGGAACTGGACTACCTGGGCGGAAGCGGCTCCAGAGGCTACGGCAAAGTGGCTTTTGAGAACCT GAAAGCCACCACAGTGTTCGGCAACTACGACGTGAAAACCCTGAACGAGCTGCTGACCGCCGAAGTGTGAc ggcaataaaaagacagaataaaacgcacggtgttgggtcgtttgttcTGGATTGCGAGAATGGACTAGTAG CAAACTGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAG TCTCCACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTA ACAACTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGT TTAGTGAACCGTCAGATCTCTAGAgccgccaccATGGATTACAAAGACGATGACGATAAGATGGCGCCTAA GAAGAAACGCAAAGTGCGGGGCATGACTTACAAGCTCTACATTATGACCTTTCAAAACGCCCACTTCGGTT CCGGCACTCTGGACTCATCGAAGCTGACCTTCTCCGCGGATAGAATCTTCTCGGCACTCGTGCTCGAGGCT CTGAAGATGGGAAAGCTCGACGCCTTCTTGGCCGAGGCCAACCAGGATAAGTTCACTCTGACCGACGCGTT CCCATTCCAATTCGGTCCTTTCCTGCCGAAACCGATTGGTTACCCCAAGCACGACCAGATCGACCAGTCTG TGGACGTGAAGGAAGTCCGCCGCCAAGCGAAGCTGTCCAAAAAGCTCCAGTTCCTGGCTCTGGAAAACGTC GACGACTACCTGAACGGAGAGCTGTTTGAGAATGAGGAACACGCCGTGATCGACACAGTGACCAAGAACCA GCCCCATAAAGATGATAATCTGTACCAAGTGGCCACCACTCGGTTCTCGAACGACACCTCCCTTTACGTGA TCGCCAACGAATCCGATCTGCTGAACGAACTGATGAGCAGCCTTCAGTACTCCGGGCTGGGCGGCAAAAGG TCCTCAGGATTCGGCAGATTTGAGCTGGACATCCAGAACATTCCCTTGGAACTGTCCGACCGGCTGACGAA

	GAACCACAGCGACAAGGTCATGTCACTTACCACCGCCCTCCCGGTGGACGCTGATCTCGAGGAAGCGATGG AAGATGGCCATTACCTGTTGACCAAGTCGTCCGGATTCGCATTCTCCCACGCCACCAACGAAAACTATCGG AAGCAGGACCTGTACAAGTTCGCCTCCGGGAGCACCTTCAGCAAGACTTTCGAGGGACAGATCGTGGACGT GCGCCCTCTCGATTTCCCTCACGCCGTGCTGAACTACGCCAAGCCGCTGTTCTTTAAGCTCGAAGTCTAAc ggcaataaaaagacagaataaaacgcacggtgttgggtcgtttgttcGCACATTCAAAAACAGGCAATTGG ACAAGCGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAG TCTCCACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTA ACAACTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGT TTAGTGAACCGTCAGATCTCTAGAgccgccaccATGGATTACAAAGACGATGACGATAAGATGGCGCCTAA GAAGAAACGCAAAGTGCGGGGCATGAAAAATGACTACCGGACCTTCAAGCTGAGCCTGCTGACCCTGGCTC CTATCCACATCGGCAACGGCGAGAAGTACACCAGCAGAGAATTCATCTACGAGAACAAGAAGTTCTACTTC CCCGACATGGGCAAGTTCTACAACAAGATGGTGGAAAAGAGACTGGCCGAGAAGTTCGAGGCCTTCCTGAT CCAGACCAGACCCAACGCCAGAAACAACCGGCTGATTTCTTTTCTGAACGACAACAGAATCGCCGAAAGAT CTTTTGGCGGCTACAGCATCAGTGAAACCGGCCTGGAATCTGATAAGAACCCTAACAGCGCCGGAGCTATC AACGAGGTGAACAAATTCATCCGGGACGCCTTCGGAAATCCTTACATCCCAGGCAGCAGCCTGAAGGGCGC CATCCGCACCATCCTGATGAACACCACACCTAAGTGGAACAACGAGAACGCCGTGAACGACTTCGGCAGAT TCCCAAAGGAAAACAAGAACCTGATCCCTTGGGGACCTAAGAAAGGCAAGGAATACGACGACCTGTTCAAC GCCATCAGAGTGTCCGACAGCAAGCCCTTCGACAACAAAAGCCTGATCCTCGTGCAGAAGTGGGACTACAG CGCCAAAACCAACAAGGCCAAGCCTCTGCCTCTGTACAGAGAGTCTATCAGCCCTCTGACCAAGATCGAGT TCGAGATAACAACAACCACTGATGAGGCCGGCAGACTGATCGAGGAACTGGGAAAGCGGGCCCAGGCCTTT TATAAGGACTACAAGGCCTTTTTCCTGTCTGAATTCCCTGATGATAAGATCCAGGCTAATCTGCAATACCC CATCTACCTGGGCGCCGGCAGCGGCGCTTGGACAAAGACCCTGTTTAAGCAGGCCGACGGCATCCTGCAGC GGAGATACTCCAGAATGAAAACCAAGATGGTCAAGAAGGGCGTGCTGAAGCTGACAAAGGCCCCTCTGAAA ACAGTGAAGATCCCCAGCGGCAACCACAGCCTGGTGAAGAATCACGAGAGCTTCTACGAGATGGGCAAAGC CAACTTCATGATCAAGGAAATCGACAAGTGAcggcaataaaaagacagaataaaacgcacggtgttgggtc gtttgttcATGTGTGCCGGCCGGAGAATAAAAGTCTAAGTGATGCGGTTTTGGCAGTACATCAATGGGCGT GGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTCCACCCCATTGACGTCAATGGGAGTTTGTTTTGGCA CCAAAATCAACGGGACTTTCCAAAATGTCGTAACAACTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTG TACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAGTGAACCGTCAGATCTCTAGAgccgccaccATGGAT TACAAAGACGATGACGATAAGATGGCGCCTAAGAAGAAACGCAAAGTGCGGGGCATGAAAAAGCTCGTGTT CACCTTTAAGCGGATCGACCACCCTGCTCAGGACCTGGCCGTGAAATTCCACGGCTTCCTGATGGAACAGC TGGATAGCGACTACGTGGACTACCTGCACCAGCAGCAGACCAACCCCTACGCCACAAAGGTGATCCAGGGC AAAGAGAACACCCAGTGGGTCGTGCATCTGCTGACAGACGACATCGAGGACAAGGTGTTCATGACCCTGCT GCAGATCAAGGAAGTGTCCCTGAACGACCTGCCTAAGTTGTCTGTGGAAAAGGTGGAAATCCAGGAGCTGG GCGCTGATAAGCTGCTCGAGATCTTCAACAGCGAGGAAAACCAGACCTACTTCAGCATCATCTTCGAGACA CCTACAGGCTTTAAAAGCCAGGGCAGCTACGTGATCTTCCCCAGCATGCGGCTGATCTTTCAGAGCCTGAT GCAGAAGTACGGCAGACTGGTGGAAAACCAGCCTGAGATCGAGGAAGATACCCTGGACTACCTGAGCGAGC ACAGCACCATCACCAATTACAGACTGGAAACAAGCTACTTCAGAGTGCATAGACAGAGAATCCCCGCCTTC CGGGGCAAGCTGACCTTCAAGGTGCAGGGAGCCCAGACACTGAAGGCCTACGTGAAGATGCTGCTGACCTT CGGCGAGTACAGCGGCCTGGGCATGAAAACCAGCCTGGGAATGGGCGGCATCAAGCTGGAAGAAAGAAAGG ACTGAcggcaataaaaagacagaataaaacgcacggtgttgggtcgtttgttcGTGCGATAGAGGGATCCC GCATTGAATTATGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATT TCCAAGTCTCCACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAAT GTCGTAACAACTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGA GCTCGTTTAGTGAACCGTCAGATCTCTAGAgccgccaccATGGTGAGCAAGGGCGAGGAGGATAACATGGC CATCATCAAGGAGTTCATGCGCTTCAAGGTGCACATGGAGGGCTCCGTGAACGGCCACGAGTTCGAGATCG AGGGCGAGGGCGAGGGCCGCCCCTACGAGGGCACCCAGACCGCCAAGCTGAAGGTGACCAAGGGTGGCCCC CTGCCCTTCGCCTGGGACATCCTGTCCCCTCAGTTCATGTACGGCTCCAAGGCCTACGTGAAGCACCCCGC CGACATCCCCGACTACTTGAAGCTGTCCTTCCCCGAGGGCTTCAAGTGGGAGCGCGTGATGAACTTCGAGG ACGGCGGCGTGGTGACCGTGACCCAGGACTCCTCCCTGCAGGACGGCGAGTTCATCTACAAGGTGAAGCTG CGCGGCACCAACTTCCCCTCCGACGGCCCCGTAATGCAGAAGAAAACCATGGGCTGGGAGGCCTCCTCCGA GCGGATGTACCCCGAGGACGGCGCCCTGAAGGGCGAGATCAAGCAGAGGCTGAAGCTGAAGGACGGCGGCC ACTACGACGCTGAGGTCAAGACCACCTACAAGGCCAAGAAGCCCGTGCAGCTGCCCGGCGCCTACAACGTC AACATCAAGTTGGACATCACCTCCCACAACGAGGACTACACCATCGTGGAACAGTACGAACGCGCCGAGGG CCGCCACTCCACCGGCGGCATGGACGAGCTGTACAAGTAAcggcaataaaaagacagaataaaacgcacgg tgttgggtcgtttgttcGAGCAGATTGTACTGAGAGTGCACCGGTTGGAGGGCCTATTTCCCATGATTCCT TCATATTTGCATATACGATACAAGGCTGTTAGAGAGATAATTAGAATTAATTTGACTGTAAACACAAAGAT ATTAGTACAAAATACGTGACGTAGAAAGTAATAATTTCTTGGGTAGTTTGCAGTTTTAAAATTATGTTTTA AAATGGACTATCATATGCTTACCGTAACTTGAAAGTATTTCGATTTCTTGGCTTTATATATCTTGTGGAAA GGACGAAACACCGATATAAACCTAATTACCTCGAGAGGGGACGGAAACCCGTCTTCGATGAAGCGATTCAG AAGACTTGATATAAACCTAATTACCTCGAGAGGGGACTTTTTTACATGTGTCAGAGGTTTTCACCGTCATC ACCGAAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCATGATAATAATGG TTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTTCTAAATA

	CATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAG TATGAGTATTCAACATTTCCGTGTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTC ACCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACATCGAACTG GATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAA AGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTCGCCGCATACACT ATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACAGAAAAGCATCTTACGGATGGCATGACAGTAAGA GAATTATGCAGTGCTGCCATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGG ACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTAACTCGCCTTGATCGTTGGGAACCGG AGCTGAATGAAGCCATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGC AAACTATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGCGGATAA AGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGGTG AGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTAC ACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAA GCATTGGTAACTGTCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTTA AAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTCGTTCCAC TGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTG CTTGCAAACAAAAAAACCACCGCTACCAGCGGTGGTTTGTTTGCCGGATCAAGAGCTACCAACTCTTTTTC CGAAGGTAACTGGCTTCAGCAGAGCGCAGATACCAAATACTGTTCTTCTAGTGTAGCCGTAGTTAGGCCAC CACTTCAAGAACTCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAG TGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTCGGGCT GAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGT GAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGG AACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAAACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCC ACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAAACGCCAGCAAC GCGGCCTTTTTCTTAAGC

Plasmid	**pDAC446**
Description	Expression of Csm complex from separate promoters; GFP backbone
Utility	RNA KD
Features	Pcmv-FLAG-NLS-Csm1-pA; Pcmv-FLAG-NLS-Csm2-pA; Pcmv-FLAG-NLS-Csm3-pA; Pcmv-FLAG-NLS-Csm4-pA; Pcmv-FLAG-NLS-Csm5-pA; Pcmv-FLAG-NLS-Cas6-pA; Pu6-crRNA-pT; Pcmv-GFP-pA
Sequence	GTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTCCA CCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAACT CCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAGTG AACCGTCAGATCTCTAGAgccgccaccATGCACCATCACCATCACCATTCCGGCGATTACAAAGACGATGA CGATAAGATGGCGCCTAAGAAGAAACGCAAAGTGCGGGGCATGAAGAAAGAAAAGATTGATCTGTTTTACG GAGCCCTGCTGCACGACATCGGAAAGGTCATCCAGCGAGCAACCGGAGAGCGGAAGAAACACGCACTTGTG GGCGCCGACTGGTTCGACGAGATCGCCGACAACCAAGTCATCTCGGATCAGATCCGGTACCATATGGCCAA CTACCAGTCTGATAAGCTCGGCAACGATCACCTGGCTTACATCACCTACATTGCCGACAACATCGCCTCCG GTGTCGACCGCCGGCAATCCAACGAAGAGTCAGACGAAGATACCTCCGCAAAGATCTGGGACACCTACACG AACCAGGCCGACATCTTTAACGTGTTCGGAGCGCAGACCGATAAGCGGTACTTCAAGCCTACCGTGCTGAA TCTCAAGTCGAAGCCCAACTTCGCGTCCGCCACTTACGAACCCTTTAGCAAGGGCGATTACGCTGCCATCG CCACCCGGATTAAGAACGAACTGGCCGAGTTCGAGTTCAACCAAGTCCAGATTGACTCCCTGCTCAACCTT TTCGAGGCTACTCTCTCCTTCGTGCCGTCAAGCACCAACACTAAGGAAATCGCCGACATCTCCCTGGCCGA CCATTCCCGCTTGACTGCTGCCTTCGCTCTGGCGATCTACGACTACCTGGAGGACAAGGGTCGGCACAACT ACAAAGAGGACCTGTTCACCAAAGTGTCAGCGTTCTATGAAGAAGAAGCCTTCCTGCTGGCCTCCTTCGAC CTGTCGGGAATCCAGGACTTTATCTACAACATTAACATCGCAACTAACGGCGCGGCGAAGCAGCTGAAGGC CCGGAGCCTCTACCTGGACTTTATGTCCGAGTACATCGCCGATAGCCTGCTGGACAAGCTGGGACTGAACA GGGCTAACATGCTTTACGTCGGCGGCGGACACGCCTACTTCGTCCTGGCCAACACCGAAAAGACTGTGGAA ACCCTGGTGCAGTTTGAGAAGGATTTCAACCAGTTCCTGTTGGCAAACTTCCAGACCCGCCTCTATGTGGC CTTTGGCTGGGGTTCCTTCGCGGCCAAGGACATCATGTCCGAGCTGAATAGCCCCGAGTCCTACCGCCAAG TGTACCAAAAGGCTTCGCGCATGATCTCCAAAAAGAAAATCTCCAGATACGACTACCAGACACTGATGCTC CTGAATCGCGGTGGAAAGTCCTCAGAGAGAGAGTGCGAGATTTGCCACTCCGTGGAGAACCTGGTGTCCTA CCACGACCAGAAAGTCTGTGACATTTGCCGGGGACTGTACCAGTTCTCGAAAGAAATTGCCCATGACCACT TCATCATTACCGAAAATGAGGGGCTGCCGATTGGACCAAACGCGTGCTTAAAGGGCGTGGCATTCGAAAAG CTGTCCCAAGAAGCGTTCAGCCGGGTCTACGTGAAGAATGACTATAAGGCCGGTACCGTGAAGGCTACGCA TGTGTTCGTGGGGGATTACCAGTGCGACGAGATCTACAACTACGCCGCCCTGAGCAAGAACGAGAACGGCC TAGGCATCAAGAGACTGGCCGTGGTCCGGCTCGACGTGGATGACTTGGGCGCCGCCTTCATGGCCGGTTTC AGCCAGCAGGGAAACGGACAATACTCCACTCTGTCAAGATCGGCCACATTCTCCCGGAGCATGTCGCTGTT CTTCAAAGTGTACATTAACCAGTTCGCCTCCGACAAGAAGCTGAGCATTATCTACGCGGGCGGCGATGACG TGTTCGCCATTGGATCGTGGCAGGATATCATCGCGTTCACTGTGGAACTTCGCGAAAACTTCATCAAGTGG ACCAACGGGAAGCTCACCCTCTCCGCGGGGATAGGGTTGTTCGCCGACAAGACTCCTATTAGCCTGATGGC

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Plasmid	**pDAC627**
Description	Expression of Csm complex from separate promoters; Puro backbone
Utility	RNA KD
Features	Pcmv-FLAG-NLS-Csm1-pA; Pcmv-FLAG-NLS-Csm2-pA; Pcmv-FLAG-NLS-Csm3-pA; Pcmv-FLAG-NLS-Csm4-pA; Pcmv-FLAG-NLS-Csm5-pA; Pcmv-FLAG-NLS-Cas6-pA; Pu6-crRNA-pT; Pcmv-Puro-pA
Sequence	GTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTCCA CCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAACT CCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAGTG AACCGTCAGATCTCTAGAgccgccaccATGCACCATCACCATCACCATTCCGGCGATTACAAAGACGATGA CGATAAGATGGCGCCTAAGAAGAAACGCAAAGTGCGGGGCATGAAGAAAGAAAAGATTGATCTGTTTTACG GAGCCCTGCTGCACGACATCGGAAAGGTCATCCAGCGAGCAACCGGAGAGCGGAAGAAACACGCACTTGTG GGCGCCGACTGGTTCGACGAGATCGCCGACAACCAAGTCATCTCGGATCAGATCCGGTACCATATGGCCAA CTACCAGTCTGATAAGCTCGGCAACGATCACCTGGCTTACATCACCTACATTGCCGACAACATCGCCTCCG GTGTCGACCGCCGGCAATCCAACGAAGAGTCAGACGAAGATACCTCCGCAAAGATCTGGGACACCTACACG AACCAGGCCGACATCTTTAACGTGTTCGGAGCGCAGACCGATAAGCGGTACTTCAAGCCTACCGTGCTGAA TCTCAAGTCGAAGCCCAACTTCGCGTCCGCCACTTACGAACCCTTTAGCAAGGGCGATTACGCTGCCATCG CCACCCGGATTAAGAACGAACTGGCCGAGTTCGAGTTCAACCAAGTCCAGATTGACTCCCTGCTCAACCTT TTCGAGGCTACTCTCTCCTTCGTGCCGTCAAGCACCAACACTAAGGAAATCGCCGACATCTCCCTGGCCGA CCATTCCCGCTTGACTGCTGCCTTCGCTCTGGCGATCTACGACTACCTGGAGGACAAGGGTCGGCACAACT ACAAAGAGGACCTGTTCACCAAAGTGTCAGCGTTCTATGAAGAAGAAGCCTTCCTGCTGGCCTCCTTCGAC CTGTCGGGAATCCAGGACTTTATCTACAACATTAACATCGCAACTAACGGCGCGGCGAAGCAGCTGAAGGC CCGGAGCCTCTACCTGGACTTTATGTCCGAGTACATCGCCGATAGCCTGCTGGACAAGCTGGGACTGAACA GGGCTAACATGCTTTACGTCGGCGGCGGACACGCCTACTTCGTCCTGGCCAACACCGAAAAGACTGTGGAA ACCCTGGTGCAGTTTGAGAAGGATTTCAACCAGTTCCTGTTGGCAAACTTCCAGACCCGCCTCTATGTGGC CTTTGGCTGGGGTTCCTTCGCGGCCAAGGACATCATGTCCGAGCTGAATAGCCCCGAGTCCTACCGCCAAG TGTACCAAAAGGCTTCGCGCATGATCTCCAAAAAGAAAATCTCCAGATACGACTACCAGACACTGATGCTC CTGAATCGCGGTGGAAAGTCCTCAGAGAGAGAGTGCGAGATTTGCCACTCCGTGGAGAACCTGGTGTCCTA CCACGACCAGAAAGTCTGTGACATTTGCCGGGGACTGTACCAGTTCTCGAAAGAAATTGCCCATGACCACT TCATCATTACCGAAAATGAGGGGCTGCCGATTGGACCAAACGCGTGCTTAAAGGGCGTGGCATTCGAAAAG CTGTCCCAAGAAGCGTTCAGCCGGGTCTACGTGAAGAATGACTATAAGGCCGGTACCGTGAAGGCTACGCA TGTGTTCGTGGGGGATTACCAGTGCGACGAGATCTACAACTACGCCGCCCTGAGCAAGAACGAGAACGGCC TAGGCATCAAGAGACTGGCCGTGGTCCGGCTCGACGTGGATGACTTGGGCGCCGCCTTCATGGCCGGTTTC AGCCAGCAGGGAAACGGACAATACTCCACTCTGTCAAGATCGGCCACATTCTCCCGGAGCATGTCGCTGTT CTTCAAAGTGTACATTAACCAGTTCGCCTCCGACAAGAAGCTGAGCATTATCTACGCGGGCGGCGATGACG TGTTCGCCATTGGATCGTGGCAGGATATCATCGCGTTCACTGTGGAACTTCGCGAAAACTTCATCAAGTGG ACCAACGGGAAGCTCACCCTCTCCGCGGGGATAGGGTTGTTCGCCGACAAGACTCCTATTAGCCTGATGGC TCACCAGACCGGGGAACTGGAAGAGGCCGCCAAGGGCAACGAAAAGGACTCCATCTCGCTGTTCTCAAGCG ACTACACTTTCAAGTTTGATAGGTTCATCACTAACGTGTACGACGACAAACTGGAACAGATTAGATACTTC TTCAACCATCAAGACGAGAGGGGAAAGAACTTCATCTATAAGCTTATTGAGCTTTTGAGGAACCACGACCG CATGAATATGGCACGCCTCGCCTATTACCTCACTCGCCTGGAAGAACTGACCCGGGAGACTGACAGGGACA AGTTCAAGACCTTCAAGAACCTGTTCTACTCCTGGTACACCAACAAGAACGATAAGGACCGGAAGGAAGCC GAGCTCGCGCTCCTGCTGTACATCTACGAAATCAGAAAGGATTAAcggcaataaaaagacagaataaaacg cacggtgttgggtcgtttgttcGCACACATTAGCTAGCCGTCAGCACACATTGTGATGCGGTTTTGGCAGT ACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTCCACCCCATTGACGTCAATGGG AGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAACTCCGCCCCATTGACGCAAAT GGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAGTGAACCGTCAGATCTCTAGAg ccgccaccATGGATTACAAAGACGATGACGATAAGATGGCGCCTAAGAAGAAACGCAAAGTGCGGGGCATG ACCATCCTGACCGACGAGAACTACGTGGACATCGCCGAGAAAGCCATCCTGAAGCTGGAAAGAAACACCAG AAATAGAAAGAACCCTGATGCCTTCTTCCTGACCACATCTAAGCTGCGGAACCTGCTGAGCCTGACAAGCA CCCTGTTCGACGAGAGCAAGGTGAAGGAATACGACGCCCTGCTGGACAGAATCGCTTATCTGAGAGTGCAG TTCGTGTACCAGGCCGGCAGAGAGATCGCCGTGAAAGATCTGATCGAGAAGGCCCAGATCCTGGAAGCTCT GAAAGAGATCAAGGACCGGGAAACCCTGCAGAGATTCTGCAGATACATGGAAGCCCTGGTGGCCTACTTCA AGTTCTACGGCGGCAAGGACTGAcggcaataaaaagacagaataaaacgcacggtgttgggtcgtttgttc AGTTCTTTTGCCTTACTTTCAATGCATGCGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCG

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	GCAGAAGTACGGCAGACTGGTGGAAAACCAGCCTGAGATCGAGGAAGATACCCTGGACTACCTGAGCGAGC ACAGCACCATCACCAATTACAGACTGGAAACAAGCTACTTCAGAGTGCATAGACAGAGAATCCCCGCCTTC CGGGGCAAGCTGACCTTCAAGGTGCAGGGAGCCCAGACACTGAAGGCCTACGTGAAGATGCTGCTGACCTT CGGCGAGTACAGCGGCCTGGGCATGAAAACCAGCCTGGGAATGGGCGGCATCAAGCTGGAAGAAAGAAAGG ACTGAcggcaataaaaagacagaataaaacgcacggtgttgggtcgtttgttcGTGCGATAGAGGGATCCC GCATTGAATTATGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATT TCCAAGTCTCCACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAAT GTCGTAACAACTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGA GCTCGTTTAGTGAACCGTCAGATCTCTAGAgccgccaccATGACCGAGTACAAGCCCACGGTGCGCCTCGC CACCCGCGACGACGTCCCCAGGGCCGTACGCACCCTCGCCGCCGCGTTCGCCGACTACCCCGCCACGCGCC ACACCGTCGATCCGGACCGCCACATCGAGCGGGTCACCGAGCTGCAAGAACTCTTCCTCACGCGCGTCGGG CTCGACATCGGCAAGGTGTGGGTCGCGGACGACGGCGCCGCGGTGGCGGTCTGGACCACGCCGGAGAGCGT CGAAGCGGGGGCGGTGTTCGCCGAGATCGGCCCGCGCATGGCCGAGTTGAGCGGTTCCCGGCTGGCCGCGC AGCAACAGATGGAAGGCCTCCTGGCGCCGCACCGGCCCAAGGAGCCCGCGTGGTTCCTGGCCACCGTCGGA GTCTCGCCCGACCACCAGGGCAAGGGTCTGGGCAGCGCCGTCGTGCTCCCCGGAGTGGAGGCGGCGGAGCG CGCCGGGGTGCCCGCCTTCCTGGAAACCTCCGCGCCCCGCAACCTCCCCTTCTACGAGCGGCTCGGCTTCA CCGTCACCGCCGACGTCGAGGTGCCCGAAGGACCGCGCACCTGGTGCATGACCCGCAAGCCCGGTGCCTGA cggcaataaaaagacagaataaaacgcacggtgttgggtcgtttgttcGAGCAGATTGTACTGAGAGTGCA CCGGTTGGAGGGCCTATTTCCCATGATTCCTTCATATTTGCATATACGATACAAGGCTGTTAGAGAGATAA TTAGAATTAATTTGACTGTAAACACAAAGATATTAGTACAAAATACGTGACGTAGAAAGTAATAATTTCTT GGGTAGTTTGCAGTTTTAAAATTATGTTTTAAAATGGACTATCATATGCTTACCGTAACTTGAAAGTATTT CGATTTCTTGGCTTTATATATCTTGTGGAAAGGACGAAACACCGATATAAACCTAATTACCTCGAGAGGGG ACGGAAACCCGTCTTCGATGAAGCGATTCAGAAGACTTGATATAAACCTAATTACCTCGAGAGGGGACTTT TTTACATGTGTCAGAGGTTTTCACCGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTA TTTTTATAGGTTAATGTCATGATAATAATGGTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTGCG CGGAACCCCTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGAT AAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTCGCCCTTATTCCCTTT TTTGCGGCATTTTGCCTTCCTGTTTTTGCTCACCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGATCA GTTGGGTGCACGAGTGGGTTACATCGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCG AAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCC GGGCAAGAGCAACTCGGTCGCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACAGA AAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTGATAACACTG CGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGAT CATGTAACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGACGAGCGTGACACCAC GATGCCTGTAGCAATGGCAACAACGTTGCGCAAACTATTAACTGGCGAACTACTTACTCTAGCTTCCCGGC AACAATTAATAGACTGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGC TGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGA TGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGAC AGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACCAAGTTTACTCATATATACTT TAGATTGATTTAAAACTTCATTTTTAATTTAAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGAC CAAAATCCCTTAACGTGAGTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTT GAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCTACCAGCGGTGGTTTGT TTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGATACCAAATAC TGTTCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCACCGCCTACATACCTCGCTC TGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGA TAGTTACCGGATAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGCGAAC GACCTACACCGAACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGG CGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAAACGCC TGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGG GGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTCTTAAGC

Plasmid	**pDAC569**
Description	Expression of Csm complex (RNase mut) from separate promoters; GFP backbone
Utility	RNA binding/tethering/pulldown
Features	Pcmv-FLAG-NLS-Csm1-pA; Pcmv-FLAG-NLS-Csm2-pA; Pcmv-FLAG-NLS-Csm3(RNase mut)-pA; Pcmv-FLAG-NLS-Csm4-pA; Pcmv-FLAG-NLS-Csm5-pA; Pcmv-FLAG-NLS-Cas6-pA; Pu6-crRNA-pT; Pcmv-GFP-pA
Sequence	GTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTCCA CCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAACT CCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAGTG AACCGTCAGATCTCTAGAgccgccaccATGCACCATCACCATCACCATTCCGGCGATTACAAAGACGATGA CGATAAGATGGCGCCTAAGAAGAAACGCAAAGTGCGGGGCATGAAGAAAGAAAAGATTGATCTGTTTTACG

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Plasmid	**pDAC565**
Description	Expression of Csm-GFP complex (RNase mut) from separate promoters
Utility	RNA imaging
Features	Pcmv-FLAG-NLS-Csm1-pA; Pcmv-FLAG-NLS-Csm2-pA; Pcmv-FLAG-NLS-Csm3(RNase mut)-GFP-pA; Pcmv-FLAG-NLS-Csm4-pA; Pcmv-FLAG-NLS-Csm5-pA; Pcmv-FLAG-NLS-Cas6-pA; Pu6-crRNA-pT
Sequence	GTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTCCA CCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAACT CCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAGTG AACCGTCAGATCTCTAGAgccgccaccATGCACCATCACCATCACCATTCCGGCGATTACAAAGACGATGA CGATAAGATGGCGCCTAAGAAGAAACGCAAAGTGCGGGGCATGAAGAAAGAAAAGATTGATCTGTTTTACG GAGCCCTGCTGCACGACATCGGAAAGGTCATCCAGCGAGCAACCGGAGAGCGGAAGAAACACGCACTTGTG GGCGCCGACTGGTTCGACGAGATCGCCGACAACCAAGTCATCTCGGATCAGATCCGGTACCATATGGCCAA CTACCAGTCTGATAAGCTCGGCAACGATCACCTGGCTTACATCACCTACATTGCCGACAACATCGCCTCCG GTGTCGACCGCCGGCAATCCAACGAAGAGTCAGACGAAGATACCTCCGCAAAGATCTGGGACACCTACACG AACCAGGCCGACATCTTTAACGTGTTCGGAGCGCAGACCGATAAGCGGTACTTCAAGCCTACCGTGCTGAA TCTCAAGTCGAAGCCCAACTTCGCGTCCGCCACTTACGAACCCTTTAGCAAGGGCGATTACGCTGCCATCG CCACCCGGATTAAGAACGAACTGGCCGAGTTCGAGTTCAACCAAGTCCAGATTGACTCCCTGCTCAACCTT TTCGAGGCTACTCTCTCCTTCGTGCCGTCAAGCACCAACACTAAGGAAATCGCCGACATCTCCCTGGCCGA CCATTCCCGCTTGACTGCTGCCTTCGCTCTGGCGATCTACGACTACCTGGAGGACAAGGGTCGGCACAACT ACAAAGAGGACCTGTTCACCAAAGTGTCAGCGTTCTATGAAGAAGAAGCCTTCCTGCTGGCCTCCTTCGAC CTGTCGGGAATCCAGGACTTTATCTACAACATTAACATCGCAACTAACGGCGCGGCGAAGCAGCTGAAGGC CCGGAGCCTCTACCTGGACTTTATGTCCGAGTACATCGCCGATAGCCTGCTGGACAAGCTGGGACTGAACA GGGCTAACATGCTTTACGTCGGCGGCGGACACGCCTACTTCGTCCTGGCCAACACCGAAAAGACTGTGGAA ACCCTGGTGCAGTTTGAGAAGGATTTCAACCAGTTCCTGTTGGCAAACTTCCAGACCCGCCTCTATGTGGC CTTTGGCTGGGGTTCCTTCGCGGCCAAGGACATCATGTCCGAGCTGAATAGCCCCGAGTCCTACCGCCAAG TGTACCAAAAGGCTTCGCGCATGATCTCCAAAAAGAAAATCTCCAGATACGACTACCAGACACTGATGCTC CTGAATCGCGGTGGAAAGTCCTCAGAGAGAGAGTGCGAGATTTGCCACTCCGTGGAGAACCTGGTGTCCTA CCACGACCAGAAAGTCTGTGACATTTGCCGGGGACTGTACCAGTTCTCGAAAGAAATTGCCCATGACCACT

	TCATCATTACCGAAAATGAGGGGCTGCCGATTGGACCAAACGCGTGCTTAAAGGGCGTGGCATTCGAAAAG CTGTCCCAAGAAGCGTTCAGCCGGGTCTACGTGAAGAATGACTATAAGGCCGGTACCGTGAAGGCTACGCA TGTGTTCGTGGGGGATTACCAGTGCGACGAGATCTACAACTACGCCGCCCTGAGCAAGAACGAGAACGGCC TAGGCATCAAGAGACTGGCCGTGGTCCGGCTCGACGTGGATGACTTGGGCGCCGCCTTCATGGCCGGTTTC AGCCAGCAGGGAAACGGACAATACTCCACTCTGTCAAGATCGGCCACATTCTCCCGGAGCATGTCGCTGTT CTTCAAAGTGTACATTAACCAGTTCGCCTCCGACAAGAAGCTGAGCATTATCTACGCGGGCGGCGATGACG TGTTCGCCATTGGATCGTGGCAGGATATCATCGCGTTCACTGTGGAACTTCGCGAAAACTTCATCAAGTGG ACCAACGGGAAGCTCACCCTCTCCGCGGGGATAGGGTTGTTCGCCGACAAGACTCCTATTAGCCTGATGGC TCACCAGACCGGGGAACTGGAAGAGGCCGCCAAGGGCAACGAAAAGGACTCCATCTCGCTGTTCTCAAGCG ACTACACTTTCAAGTTTGATAGGTTCATCACTAACGTGTACGACGACAAACTGGAACAGATTAGATACTTC TTCAACCATCAAGACGAGAGGGGAAAGAACTTCATCTATAAGCTTATTGAGCTTTTGAGGAACCACGACCG CATGAATATGGCACGCCTCGCCTATTACCTCACTCGCCTGGAAGAACTGACCCGGGAGACTGACAGGGACA AGTTCAAGACCTTCAAGAACCTGTTCTACTCCTGGTACACCAACAAGAACGATAAGGACCGGAAGGAAGCC GAGCTCGCGCTCCTGCTGTACATCTACGAAATCAGAAAGGATTAAcggcaataaaaagacagaataaaacg cacggtgttgggtcgtttgttcGCACACATTAGCTAGCCGTCAGCACACATTGTGATGCGGTTTTGGCAGT ACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTCCACCCCATTGACGTCAATGGG AGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAACTCCGCCCCATTGACGCAAAT GGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAGTGAACCGTCAGATCTCTAGAg ccgccaccATGGATTACAAAGACGATGACGATAAGATGGCGCCTAAGAAGAAACGCAAAGTGCGGGGCATG ACCATCCTGACCGACGAGAACTACGTGGACATCGCCGAGAAAGCCATCCTGAAGCTGGAAAGAAACACCAG AAATAGAAAGAACCCTGATGCCTTCTTCCTGACCACATCTAAGCTGCGGAACCTGCTGAGCCTGACAAGCA CCCTGTTCGACGAGAGCAAGGTGAAGGAATACGACGCCCTGCTGGACAGAATCGCTTATCTGAGAGTGCAG TTCGTGTACCAGGCCGGCAGAGAGATCGCCGTGAAAGATCTGATCGAGAAGGCCCAGATCCTGGAAGCTCT GAAAGAGATCAAGGACCGGGAAACCCTGCAGAGATTCTGCAGATACATGGAAGCCCTGGTGGCCTACTTCA AGTTCTACGGCGGCAAGGACTGAcggcaataaaaagacagaataaaacgcacggtgttgggtcgtttgttc AGTTCTTTTGCCTTACTTTCAATGCATGCGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCG GTTTGACTCACGGGGATTTCCAAGTCTCCACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATC AACGGGACTTTCCAAAATGTCGTAACAACTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGG GAGGTCTATATAAGCAGAGCTCGTTTAGTGAACCGTCAGATCTCTAGAgccgccaccATGGATTACAAAGA CGATGACGATAAGATGGCGCCTAAGAAGAAACGCAAAGTGCGGGGCATGACCTTCGCCAAGATCAAATTCA GCGCCCAGATCCGGCTGGAAACCGGCCTGCACATCGGAGGATCTGATGCCTTTGCCGCTATCGGCGCCATC GCCAGCCCTGTGATCAAGGACCCCATCACCAACCTGCCTATCATCCCCGGCTCTAGCCTGAAGGGCAAGAT GAGAACACTGCTGGCCAAGGTGTACAACGAAAAGGTGGCCGAGAAGCCTAGCGACGACAGCGACATCCTGA GCAGACTGTTCGGAAATAGCAAGGATAAGCGGTTCAAGATGGGCAGACTGATCTTCCGGGACGCCTTCCTG AGCAACGCCGACGAGCTGGATTCTCTGGGCGTGCGGAGCTACACCGAGGTGAAGTTCGAGAACACCATCGA TAGAATCACCGCCGAGGCCAATCCTAGACAGATCGAGAGAGCCATTCGGAACTCAACATTCGACTTCGAGC TGATCTACGAGATCACTGATGAGAATGAGAACCAGGTCGAGGAAGATTTCAAGGTGATCAGAGACGGCCTG AAGCTGCTGGAACTGGACTACCTGGGCGGAAGCGGCTCCAGAGGCTACGGCAAAGTGGCTTTTGAGAACCT GAAAGCCACCACAGTGTTCGGCAACTACGACGTGAAAACCCTGAACGAGCTGCTGACCGCCGAAGTGGGCG GAGGTGCTGCCGCAAtggtgagcaagggcgaggagctgttcaccggggtggtgcccatcctggtcgagctg gacggcgacgtaaacggccacaagttcagcgtgtccggcgagggcgagggcgatgccacctacggcaagct gaccctgaagttcatctgcaccaccggcaagctgcccgtgccctggcccaccctcgtgaccaccctgacct acggcgtgcagtgcttcagccgctaccccgaccacatgaagcagcacgacttcttcaagtccgccatgccc gaaggctacgtccaggagcgcaccatcttcttcaaggacgacggcaactacaagacccgcgccgaggtgaa gttcgagggcgacaccctggtgaaccgcatcgagctgaagggcatcgacttcaaggaggacggcaacatcc tggggcacaagctggagtacaactacaacagccacaacgtctatatcatggccgacaagcagaagaacggc atcaaggtgaacttcaagatccgccacaacatcgaggacggcagcgtgcagctcgccgaccactaccagca gaacaccccatcggcgacggccccgtgctgctgcccgacaaccactacctgagcacccagtccgccctga gcaaagaccccaacgagaagcgcgatcacatggtcctgctggagttcgtgaccgccgccgggatcactctc ggcatggacgagctgtacaagtgacggcaataaaaagacagaataaaacgcacggtgttgggtcgtttgtt cTGGATTGCGAGAATGGACTAGTAGCAAACTGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGC GGTTTGACTCACGGGGATTTCCAAGTCTCCACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAAT CAACGGGACTTTCCAAAATGTCGTAACAACTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTG GGAGGTCTATATAAGCAGAGCTCGTTTAGTGAACCGTCAGATCTCTAGAgccgccaccATGGATTACAAAG ACGATGACGATAAGATGGCGCCTAAGAAGAAACGCAAAGTGCGGGGCATGACTTACAAGCTCTACATTATG ACCTTTCAAAACGCCCACTTCGGTTCCGGCACTCTGGACTCATCGAAGCTGACCTTCTCCGCGGATAGAAT CTTCTCGGCACTCGTGCTCGAGGCTCTGAAGATGGGAAAGCTCGACGCCTTCTTGGCCGAGGCCAACCAGG ATAAGTTCACTCTGACCGACGCGTTCCCATTCCAATTCGGTCCTTTCCTGCCGAAACCGATTGGTTACCCC AAGCACGACCAGATCGACCAGTCTGTGGACGTGAAGGAAGTCCGCCGCCAAGCGAAGCTGTCCAAAAAGCT CCAGTTCCTGGCTCTGGAAAACGTCGACGACTACCTGAACGGAGAGCTGTTTGAGAATGAGGAACACGCCG TGATCGACACAGTGACCAAGAACCAGCCCCATAAAGATGATAATCTGTACCAAGTGGCCACCACTCGGTTC TCGAACGACACCTCCCTTTACGTGATCGCCAACGAATCCGATCTGCTGAACGAACTGATGAGCAGCCTTCA GTACTCCGGGCTGGGCGGCAAAAGGTCCTCAGGATTCGGCAGATTTGAGCTGGACATCCAGAACATTCCCT

	TGGAACTGTCCGACCGGCTGACGAAGAACCACAGCGACAAGGTCATGTCACTTACCACCGCCCTCCCGGTG GACGCTGATCTCGAGGAAGCGATGGAAGATGGCCATTACCTGTTGACCAAGTCGTCCGGATTCGCATTCTC CCACGCCACCAACGAAAACTATCGGAAGCAGGACCTGTACAAGTTCGCCTCCGGGAGCACCTTCAGCAAGA CTTTCGAGGGACAGATCGTGGACGTGCGCCCTCTCGATTTCCCTCACGCCGTGCTGAACTACGCCAAGCCG CTGTTCTTTAAGCTCGAAGTCTAAcggcaataaaaagacagaataaaacgcacggtgttgggtcgtttgtt cGCACATTCAAAAACAGGCAATTGGACAAGCGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGC GGTTTGACTCACGGGGATTTCCAAGTCTCCACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAAT CAACGGGACTTTCCAAAATGTCGTAACAACTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTG GGAGGTCTATATAAGCAGAGCTCGTTTAGTGAACCGTCAGATCTCTAGAgccgccaccATGGATTACAAAG ACGATGACGATAAGATGGCGCCTAAGAAGAAACGCAAAGTGCGGGGCATGAAAAATGACTACCGGACCTTC AAGCTGAGCCTGCTGACCCTGGCTCCTATCCACATCGGCAACGGCGAGAAGTACACCAGCAGAGAATTCAT CTACGAGAACAAGAAGTTCTACTTCCCCGACATGGGCAAGTTCTACAACAAGATGGTGGAAAAGAGACTGG CCGAGAAGTTCGAGGCCTTCCTGATCCAGACCAGACCCAACGCCAGAAACAACCGGCTGATTTCTTTTCTG AACGACAACAGAATCGCCGAAAGATCTTTTGGCGGCTACAGCATCAGTGAAACCGGCCTGGAATCTGATAA GAACCCTAACAGCGCCGGAGCTATCAACGAGGTGAACAAATTCATCCGGGACGCCTTCGGAAATCCTTACA TCCCAGGCAGCAGCCTGAAGGGCGCCATCCGCACCATCCTGATGAACACCACACCTAAGTGGAACAACGAG AACGCCGTGAACGACTTCGGCAGATTCCCAAAGGAAAACAAGAACCTGATCCCTTGGGGACCTAAGAAAGG CAAGGAATACGACGACCTGTTCAACGCCATCAGAGTGTCCGACAGCAAGCCCTTCGACAACAAAAGCCTGA TCCTCGTGCAGAAGTGGGACTACAGCGCCAAAACCAACAAGGCCAAGCCTCTGCCTCTGTACAGAGAGTCT ATCAGCCCTCTGACCAAGATCGAGTTCGAGATAACAACAACCACTGATGAGGCCGGCAGACTGATCGAGGA ACTGGGAAAGCGGGCCCAGGCCTTTTATAAGGACTACAAGGCCTTTTTCCTGTCTGAATTCCCTGATGATA AGATCCAGGCTAATCTGCAATACCCCATCTACCTGGGCGCCGGCAGCGGCGCTTGGACAAAGACCCTGTTT AAGCAGGCCGACGGCATCCTGCAGCGGAGATACTCCAGAATGAAAACCAAGATGGTCAAGAAGGGCGTGCT GAAGCTGACAAAGGCCCCTCTGAAAACAGTGAAGATCCCCAGCGGCAACCACAGCCTGGTGAAGAATCACG AGAGCTTCTACGAGATGGGCAAAGCCAACTTCATGATCAAGGAAATCGACAAGTGAcggcaataaaaagac agaataaaacgcacggtgttgggtcgtttgttcATGTGTGCCGGCCGGAGAATAAAAGTCTAAGTGATGCG GTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTCCACCCCATTG ACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAACTCCGCCCCA TTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAGTGAACCGTCA GATCTCTAGAgccgccaccATGGATTACAAAGACGATGACGATAAGATGGCGCCTAAGAAGAAACGCAAAG TGCGGGGCATGAAAAAGCTCGTGTTCACCTTTAAGCGGATCGACCACCCTGCTCAGGACCTGGCCGTGAAA TTCCACGGCTTCCTGATGGAACAGCTGGATAGCGACTACGTGGACTACCTGCACCAGCAGCAGACCAACCC CTACGCCACAAAGGTGATCCAGGGCAAAGAGAACACCCAGTGGGTCGTGCATCTGCTGACAGACGACATCG AGGACAAGGTGTTCATGACCCTGCTGCAGATCAAGGAAGTGTCCCTGAACGACCTGCCTAAGTTGTCTGTG GAAAAGGTGGAAATCCAGGAGCTGGGCGCTGATAAGCTGCTCGAGATCTTCAACAGCGAGGAAAACCAGAC CTACTTCAGCATCATCTTCGAGACACCTACAGGCTTTAAAAGCCAGGGCAGCTACGTGATCTTCCCCAGCA TGCGGCTGATCTTTCAGAGCCTGATGCAGAAGTACGGCAGACTGGTGGAAAACCAGCCTGAGATCGAGGAA GATACCCTGGACTACCTGAGCGAGCACAGCACCATCACCAATTACAGACTGGAAACAAGCTACTTCAGAGT GCATAGACAGAGAATCCCCGCCTTCCGGGGCAAGCTGACCTTCAAGGTGCAGGGAGCCCAGACACTGAAGG CCTACGTGAAGATGCTGCTGACCTTCGGCGAGTACAGCGGCCTGGGCATGAAAACCAGCCTGGGAATGGGC GGCATCAAGCTGGAAGAAAGAAAGGACTGAcggcaataaaaagacagaataaaacgcacggtgttgggtcg tttgttcGTGCGATAGAGGGATCCAGTGCACCGGTTGGAGGGCCTATTTCCCATGATTCCTTCATATTTGC ATATACGATACAAGGCTGTTAGAGAGATAATTAGAATTAATTTGACTGTAAACACAAAGATATTAGTACAA AATACGTGACGTAGAAAGTAATAATTTCTTGGGTAGTTTGCAGTTTTAAAATTATGTTTTAAAATGGACTA TCATATGCTTACCGTAACTTGAAAGTATTTCGATTTCTTGGCTTTATATATCTTGTGGAAAGGACGAAACA CCGATATAAACCTAATTACCTCGAGAGGGGACGGAAACCCGTCTTCGATGAAGCGATTCAGAAGACTTGAT ATAAACCTAATTACCTCGAGAGGGGACTTTTTTACATGTGTCAGAGGTTTTCACCGTCATCACCGAAACGC GCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTTCTTAGAC GTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTTCTAAATACATTCAAATA TGTATCCGCTCATGAGACAATAACCCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATT CAACATTTCCGTGTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCACCCAGAAAC GCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACATCGAACTGGATCTCAACA GCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCTA TGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTCGCCGCATACACTATTCTCAGAA TGACTTGGTTGAGTACTCACCAGTCACAGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCA GTGCTGCCATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAG CTAACCGCTTTTTTGCACAACATGGGGGATCATGTAACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGA AGCCATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAACTATTAA CTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGCAGGA CCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTC TCGCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGA GTCAGGCAACTATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAA CTGTCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTTAAAAGGATCTA

	GGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTCGTTCCACTGAGCGTCAG ACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACA AAAAAACCACCGCTACCAGCGGTGGTTTGTTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAAC TGGCTTCAGCAGAGCGCAGATACCAAATACTGTTCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGA ACTCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAG TCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTCGGGCTGAACGGGGGG TTCGTGCACACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGAGCTATGAG AAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAG CGCACGAGGGAGCTTCCAGGGGGAAACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACT TGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTT TCTTAAGC

Plasmid	**pDAC689**
Description	Expression of Cas13; RFP backbone
Utility	RNA KD
Features	Pcmv-NLS-Cas13-NLS-pA; Pu6-crRNA-pT; Pcmv-RFP-pA
Sequence	GTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTCCA CCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAACT CCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAGTG AACCGTCAGATCTCTAGAgccgccaccATGcccaagaagaagagaaaggtggaggccagcatcgagaagaa gaagagcttcgccaagggcatgggagtgaagagcaccctggtgtccggctctaaggtgtacatgaccacat ttgctgagggaagcgacgccaggctggagaagatcgtggagggcgatagcatcagatccgtgaacgaggga gaggctttcagcgccgagatggctgacaagaacgctggctacaagatcggaaacgccaagttttcccaccc aaagggctacgccgtggtggctaacaacccactgtacaccggaccagtgcagcaggacatgctgggactga aggagacactggagaagaggtacttcggcgagtccgccgacggaaacgataacatctgcatccaggtcatc cacaacatcctggatatcgagaagatcctggctgagtacatcacaaacgccgcttacgccgtgaacaacat ctccggcctggacaaggatatcatcggcttcggaaagttttctaccgtgtacacatacgacgagttcaagg atccagagcaccaccgggccgcttttaacaacaacgacaagctgatcaacgccatcaaggctcagtacgac gagttcgataactttctggataaccccaggctgggctacttcggacaggctttcttttctaaggagggcag aaactacatcatcaactacggaaacgagtgttacgatatcctggcgctgctgagcggactgaggcactggg tggtgcacaacaacgaggaggagtctcggatctctcgcacctggctgtacaacctggacaagaacctggat aacgagtacatctccacactgaactacctgtacgacaggatcaccaacgagctgacaaacagcttctccaa gaactctgccgctaacgtgaactacatcgctgagaccctgggcatcaacccagctgagttcgctgagcagt acttcagattttccatcatgaaggagcagaagaacctgggcttcaacatcacaaagctgagagaagtgatg ctggacagaaaggatatgtccgagatcaggaagaaccacaaggtgttcgattctatcagaaccaaggtgta cacaatgatggactttgtgatctacaggtactacatcgaggaggatgccaaggtggccgctgccaacaaga gcctgcccgacaacgagaagtctctgagcgagaaggatatcttcgtgatcaacctgagaggctcctttaac gacgatcagaaggacgctctgtactacgatgaggccaacaggatctggagaaagctggagaacatcatgca caacatcaaggagttccggggaaacaagacccgcgagtacaagaagaaggacgctccaaggctgcctagga tcctgcctgctggaagggacgtgagcgccttcagcaagctgatgtacgccctgacaatgtttctggacgga aaggagatcaacgatctgctgaccacactgatcaacaagttcgacaacatccagtcttttctgaaagtgat gcctctgatcggcgtgaacgctaagttcgtggaggagtacgccttctttaaggacagcgccaagatcgctg atgagctgcggctgatcaagtcctttgccaggatgggagagccaatcgctgacgctaggagagctatgtac atcgatgccatccggatcctgggaaccaacctgtcttacgacgagctgaaggctctggccgacaccttcag cctggatgagaacggcaacaagctgaagaagggcaagcacggaatgcgcaacttcatcatcaacaacgtga tcagcaacaagcggtttcactacctgatcagatacggcgacccagctcacctgcacgagatcgctaagaac gaggccgtggtgaagttcgtgctgggacggatcgccgatatccagaagaagcagggccagaacggaaagaa ccagatcgaccgctactacgagacctgcatcggcaaggataagggaaagtccgtgtctgagaaggtggacg ctctgaccaagatcatcacaggcatgaactacgaccagttcgataagaagagatctgtgatcgaggacacc ggaagggagaacgccgagagagagaagtttaagaagatcatcagcctgtacctgacagtgatctaccacat cctgaagaacatcgtgaacatcaacgctagatacgtgatcggcttccactgcgtggagcgcgatgcccagc tgtacaaggagaagggatacgacatcaacctgaagaagctggaggagaagggctttagctccgtgaccaag ctgtgcgctggaatcgacgagacagcccccgacaagaggaaggatgtggagaaggagatggccgagagagc taaggagagcatcgactcccctggagtctgctaaccctaagctgtacgccaactacatcaagtactccgatg agaagaaggccgaggagtttaccaggcagatcaacagagagaaggccaagaccgctctgaacgcctacctg aggaacacaaagtggaacgtgatcatccgggaggacctgctgcgcatcgataacaagacctgtacactgtt ccggaacaaggctgtgcacctggaggtggctcgctacgtgcacgcctacatcaacgacatcgccgaggtga actcctactttcagctgtaccactacatcatgcagaggatcatcatgaacgagagatacgagaagtctagc ggcaaggtgtctgagtacttcgacgccgtgaacgatgagaagaagtacaacgatagactgctgaagctgct gtgcgtgcctttcggatactgtatcccacggtttaagaacctgagcatcgaggccctgttcgaccgcaacg aggctgccaagtttgataaggagaagaagaaggtgagcggcaactccggatccggacctaagaaaaagagg aaggtgtgacggcaataaaaagacagaataaaacgcacggtgttgggtcgtttgttcGTGCGATAGAGGGA TCCCGCATTGAATTATGTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGG

	GATTTCCAAGTCTCCACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCA AAATGTCGTAACAACTCCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAG CAGAGCTCGTTTAGTGAACCGTCAGATCTCTAGAgccgccaccATGGTGAGCAAGGGCGAGGAGGATAACA TGGCCATCATCAAGGAGTTCATGCGCTTCAAGGTGCACATGGAGGGCTCCGTGAACGGCCACGAGTTCGAG ATCGAGGGCGAGGGCGAGGGCCGCCCCTACGAGGGCACCCAGACCGCCAAGCTGAAGGTGACCAAGGGTGG CCCCCTGCCCTTCGCCTGGGACATCCTGTCCCCTCAGTTCATGTACGGCTCCAAGGCCTACGTGAAGCACC CCGCCGACATCCCCGACTACTTGAAGCTGTCCTTCCCCGAGGGCTTCAAGTGGGAGCGCGTGATGAACTTC GAGGACGGCGGCGTGGTGACCGTGACCCAGGACTCCTCCCTGCAGGACGGCGAGTTCATCTACAAGGTGAA GCTGCGCGGCACCAACTTCCCCTCCGACGGCCCCGTAATGCAGAAGAAAACCATGGGCTGGGAGGCCTCCT CCGAGCGGATGTACCCCGAGGACGGCGCCCTGAAGGGCGAGATCAAGCAGAGGCTGAAGCTGAAGGACGGC GGCCACTACGACGCTGAGGTCAAGACCACCTACAAGGCCAAGAAGCCCGTGCAGCTGCCCGGCGCCTACAA CGTCAACATCAAGTTGGACATCACCTCCCACAACGAGGACTACACCATCGTGGAACAGTACGAACGCGCCG AGGGCCGCCACTCCACCGGCGGCATGGACGAGCTGTACAAGTAAcggcaataaaaagacagaataaaacgc acggtgttgggtcgtttgttcGAGCAGATTGTACTGAGAGTGCACCGGTTGGAGGGCCTATTTCCCATGAT TCCTTCATATTTGCATATACGATACAAGGCTGTTAGAGAGATAATTAGAATTAATTTGACTGTAAACACAA AGATATTAGTACAAAATACGTGACGTAGAAAGTAATAATTTCTTGGGTAGTTTGCAGTTTTAAAATTATGT TTTAAAATGGACTATCATATGCTTACCGTAACTTGAAAGTATTTCGATTTCTTGGCTTTATATATCTTGTG GAAAGGACGAAACACCGcaagtaaaccctaccaactggtcggggtttgaaacgggtcttcgagaagaccc TTTTTTACATGTGTCAGAGGTTTTCACCGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATACGC CTATTTTTATAGGTTAATGTCATGATAATAATGGTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGT GCGCGGAACCCCTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCT GATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTCGCCCTTATTCCC TTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCACCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGA TCAGTTGGGTGCACGAGTGGGTTACATCGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCC CCGAAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGAC GCCGGGCAAGAGCAACTCGGTCGCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCAC AGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTGATAACA CTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGG GATCATGTAACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGACGAGCGTGACAC CACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAACTATTAACTGGCGAACTACTTACTCTAGCTTCCC GGCAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCT GGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCC AGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATA GACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACCAAGTTTACTCATATATA CTTTAGATTGATTTAAAACTTCATTTTTAATTTAAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCAT GACCAAAATCCCTTAACGTGAGTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTT CTTGAGATCCTTTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCTACCAGCGGTGGTT TGTTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGATACCAAA TACTGTTCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCACCGCCTACATACCTCG CTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGA CGATAGTTACCGGATAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGCG AACGACCTACACCGAACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAA AGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAAAC GCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTC AGGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTCTTAAGC

Plasmid	**pDAC690**
Description	Expression of shRNA; RFP backbone
Utility	RNA KD
Features	Pu6-shRNA-pT; Pcmv-RFP-pA
Sequence	GTGATGCGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCCAAGTCTCCA CCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTAACAACT CCGCCCCATTGACGCAAATGGGCGGTAGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAGTG AACCGTCAGATCTCTAGAgccgccaccATGGTGAGCAAGGGCGAGGAGGATAACATGGCCATCATCAAGGA GTTCATGCGCTTCAAGGTGCACATGGAGGGCTCCGTGAACGGCCACGAGTTCGAGATCGAGGGCGAGGGCG AGGGCCGCCCCTACGAGGGCACCCAGACCGCCAAGCTGAAGGTGACCAAGGGTGGCCCCCTGCCCTTCGCC TGGGACATCCTGTCCCCTCAGTTCATGTACGGCTCCAAGGCCTACGTGAAGCACCCCGCCGACATCCCCGA CTACTTGAAGCTGTCCTTCCCCGAGGGCTTCAAGTGGGAGCGCGTGATGAACTTCGAGGACGGCGGCGTGG TGACCGTGACCCAGGACTCCTCCCTGCAGGACGGCGAGTTCATCTACAAGGTGAAGCTGCGCGGCACCAAC TTCCCCTCCGACGGCCCCGTAATGCAGAAGAAAACCATGGGCTGGGAGGCCTCCTCCGAGCGGATGTACCC CGAGGACGGCGCCCTGAAGGGCGAGATCAAGCAGAGGCTGAAGCTGAAGGACGGCGGCCACTACGACGCTG AGGTCAAGACCACCTACAAGGCCAAGAAGCCCGTGCAGCTGCCCGGCGCCTACAACGTCAACATCAAGTTG GACATCACCTCCCACAACGAGGACTACACCATCGTGGAACAGTACGAACGCGCCGAGGGCCGCCACTCCAC

	CGGCGGCATGGACGAGCTGTACAAGTAAcggcaataaaaagacagaataaaacgcacggtgttgggtcgtt tgttcGAGCAGATTGTACTGAGAGTGCACCGGTTGGAGGGCCTATTTCCCATGATTCCTTCATATTTGCAT ATACGATACAAGGCTGTTAGAGAGATAATTAGAATTAATTTGACTGTAAACACAAAGATATTAGTACAAAA TACGTGACGTAGAAAGTAATAATTTCTTGGGTAGTTTGCAGTTTTAAAATTATGTTTTAAAATGGACTATC ATATGCTTACCGTAACTTGAAAGTATTTCGATTTCTTGGCTTTATATATCTTGTGGAAAGGACGAAACACC GcgtcttcCCTGACCCAgaagacgCTTTTTTACATGTGTCAGAGGTTTTCACCGTCATCACCGAAACGCGC GAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTTCTTAGACGT CAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTTCTAAATACATTCAAATATG TATCCGCTCATGAGACAATAACCCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCA ACATTTCCGTGTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCACCCAGAAACGC TGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACATCGAACTGGATCTCAACAGC GGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCTATG TGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTCGCCGCATACACTATTCTCAGAATG ACTTGGTTGAGTACTCACCAGTCACAGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGT GCTGCCATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCT AACCGCTTTTTTGCACAACATGGGGGATCATGTAACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAG CCATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAACTATTAACT GGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGCAGGACC ACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTC GCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGT CAGGCAACTATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACT GTCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTTAAAAGGATCTAGG TGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTCGTTCCACTGAGCGTCAGAC CCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAA AAAACCACCGCTACCAGCGGTGGTTTGTTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACTG GCTTCAGCAGAGCGCAGATACCAAATACTGTTCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAAC TCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTC GTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTCGGGCTGAACGGGGGGTT CGTGCACACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGAGCTATGAGAA AGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCG CACGAGGGAGCTTCCAGGGGGAAACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACTTG AGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTC TTAAGC