

Table S1 primers used in this study.

oligo name	sequence (5'-3') †
For PCR & cloning	
PcuF	cgGAATTCTTCAACGGCATTTCATGGGGCTTCC
PcuR	ggGGTACCCATGAAGCCTCTTCACGAATGGATG
CreF2	ggGGTACCATGTCCAATTTACTGACCGTAC
CreBT1R	gcTCTAGAgcATAAAACGAAAGGCCAGTCTTTCGACTGAGCCTTTCGTT TTATaaCTAATCGCCATCTTCCAG
Cuo-Lox661-496F	gcTCTAGAgcATAACTTCGTATAGGGTAGGCTATACGAACggtactGTTCGG CGTGCTCATCGTGG
Cuo-Lox712-1578R	GCTGCAGCtaccgTTCGTATAGCCTACCCTATACGAAGTTATTCATTCTGG GCGGCGTTCC
CmR-LoxPFClaI	ccATCGATggatccATAACTTCGTATAGGGTAGGCTATACGAACggtactTCACG CTGCCGCAAGCACTC
CmR-LoxPREcoRV	cgGATATCgctgcagttaccgTTCGTATAGCCTACCCTATACGAAGTTATACTTA TTCAGGCGTAGCACCAGGC
CmR-Lox71F BamHI	cgggatcctaccgTTCGTATAGCATACTATATACGAAGTTAT TTCACGCTG CCGCAAGCACTC
CmR-Lox662R XbaI	gctctagataccgTTCGTATAGCATACATTATACGAAGTTAT ACTTATTCAGG CGTAGCACCAGGC
CmR-WloxPBamHI	cgggatccATAACTTCGTATAATGTATGCTATACGAAGTTAT TTCACGCTGCC GCAAGCACTC
CmR-WloxPXbaI	gctctagaATAACTTCGTATAGCATACATTATACGAAGTTAT ACTTATTCAGG CGTAGCACCAGGC
DDW5F2	ACATTATACGAACGGTAACTTATTCAGGCGTAGCACCAGGC
DDW5R	ATGCTATACGAACGGTATCTAGAGTCGACCTGCAGGC
DD41F	AGGCTATACGAACGGTATTCACGCTGCCGCAAGCACTC
DD41R	ACCCTATACGAACGGTAGGATCCTCTAGAGTCGACCTGC
DD35F2	ATGCTATACGAACGGTAACTTATTCAGGCGTAGCACCAGGC
DD35R	ACTATATACGAACGGTATCTAGAGTCGACCTGCAGGC
V41-3979F	CTGTGATGCGTGAGTCAGAAGAG
V41-4798R	AAGCGGCAGGGTCGGAACAGGA
TetR 1172F	cccccgggGAGTGGTGAATCCGTTAGCGAGGTG
Tet2644R	cccccgggGCAACTTTATCCGCTCCATCC
CmRF	CCCCCGGGTTCACGCTGCCGCAAGCACTC
CmRR	CCCCCGGGAATTATTCAGGCGTAGCACCAGGC
S12uu-130F	CGGAATTCGCGTTGATGTCGTCTTCTCCCA
S12uu-1638R2	GCTCTAGACCGCTCCAATTCTCGTTCCTTCG
S12uF2	GCTCTAGAtaccgTTCGTATAgggTAggCTATACGAAGTTATACCCGAGGAA GGAGTAGGCG
S12uR2	CCAAGCTTAGTCCAAGCGACAGCATCAGC
S12-1237F	TGGGTCATCCGGCTCTGGGACA

S12-2117R	CACGCTCGGCGGTTCATCTGCTT
S12-697LPF1	AACCGCAGTCCTTCGTATGTCAGCAC
S12-1263LPF2	GGCGCACAGGTTTCGAGTACCCCGTCC
S14-837F	GGGACGACGCAACTGCTGCTCTTC
S14-2188R	TTGCCTCGCACACCTGACCCACTC
For Red/ET Recombination	
S14E-451F	CGCCAGGGTTTTCCCAGTCACGACGTTGTAAAACGACGGCCAGTGAATT CGGCTTCAAACACCTCTTCAACCTGG
S14E-1457R	GCTCTAGAGGCTGGGTGCCATAGACATACGC
S14E-2057F	GCGTATGTCTATGGCACCAGCCTCTAGAGCATAACTTCGTATAGGGTAG GCTATACGAACgtaACCGACCTGCTGAAATCAAACCTG
S14E-3649R	GATAACAATTTACACAGGAAACAGCTATGACCATGATTACGCCAAGCT TGTAGGAGGGTAAGGTGGAACGGAACCT
CuMcrF	TCGTGAAGAGGCTTCATGGGTACCATGTCCAACCTGCTGACGG
McrCuR	TCAGCAGGTTGGACATGGTACCCATGAAGCCTCTTCACGAATGG
41McrR	ATTGTTGCGGTCGACTCTAGAGATATCATAAACGAAAGGCTCAGTCG
Mcr41F	TTTCGTTTTATGATATCTCTAGAGTCGACCGCAACAATCCACGGGGCGTGT CC

>codon-optimized artificial cre gene (abbreviate cre(a) gene) cloned in pUC57

catATGTCCAACCTGCTGACGGTGCACCAGAACCTGCCGGCGCTGCCGGTCGACG
CGACGTCCGACGAGGTGCGCAAGAA
CCTGATGGACATGTTCCGGGACCGCCAGGCGTTCAGCGAGCACACGTGGAAGAT
GCTGCTGTCCGTGTGCCGCTCGTGGG
CGGCGTGGTGCAAGCTGAACAACCGCAAGTGGTTCCCCGCGGAGCCGGAGGAT
GTGCGCGACTACCTCCTCTACCTCCAG
GCGCGCGGGCTGGCCGTGAAGACGATCCAGCAGCACCTCGGCCAGCTCAACATG
CTCCACCGGCGGTCCGGGCTGCCCGG
CCCCTCCGATAGCAACGCGGTGTCGCTCGTGATGCGGCGGATCCGGAAGGAGAA
CGTGGACGCCGGTGAACGCGCGAAGC
AAGCCCTCGCGTTCGAGCGGACCGATTTCGACCAGGTGCGCTCGCTCATGGAGA
ACAGCGACCGCTGCCAGGACATCCGG
AACCTCGCCTTCCTGGGTATCGCGTACAACACCCTGCTGCGCATCGCCGAGATCG
CCCGGATTGCGGTGAAGGACATCTC
GCGCACGGACGGCGGCCGGATGCTGATCCACATCGGGCGGACCAAGACGCTGG
TGAGCACCGCCGGGGTGGAGAAGGCGC
TCAGCCTCGGGGTGACGAAGCTGGTCGAGCGCTGGATCTCCGTCAGCGGCGTCG
CGGATGACCCGAACAACCTACCTGTTC
TGTCGGGTCCGGAAGAACGGCGTGGCCGCGCCCAGCGCCACCAGCCAGCTCTC
GACGCGCGCCCTGGAAGGTATCTTCGA
GGCGACCCACCGCCTGATCTACGGCGCGAAGGACGACTCCGGCCAGCGGTATCT
GGCCTGGTCCGGCCATTCCGCCCCGCG

TCGGCGCCGCGCGGACATGGCCCGCGCCGGCGTGTCTGATTCCGGAAATTATGC
 AGGCGGGCGGCTGGACCAATGTCAAT
 ATCGTCATGAATTACATCCGCAACCTGGACTCGGAGACGGGCGCGATGGTGCGC
 CTGCTGGAGGACGGCGACTGAaaATA
 AAACGAAAGGCCCAGTCTTTCGACTGAGCCTTTCGTTTTATgatategaattc

1-6 **NdeI**

4-1035 codon-optimized cre

1036-1081 **rrnT1**

1082-1087 **EcoRV**

1088-1093 **EcoRI**

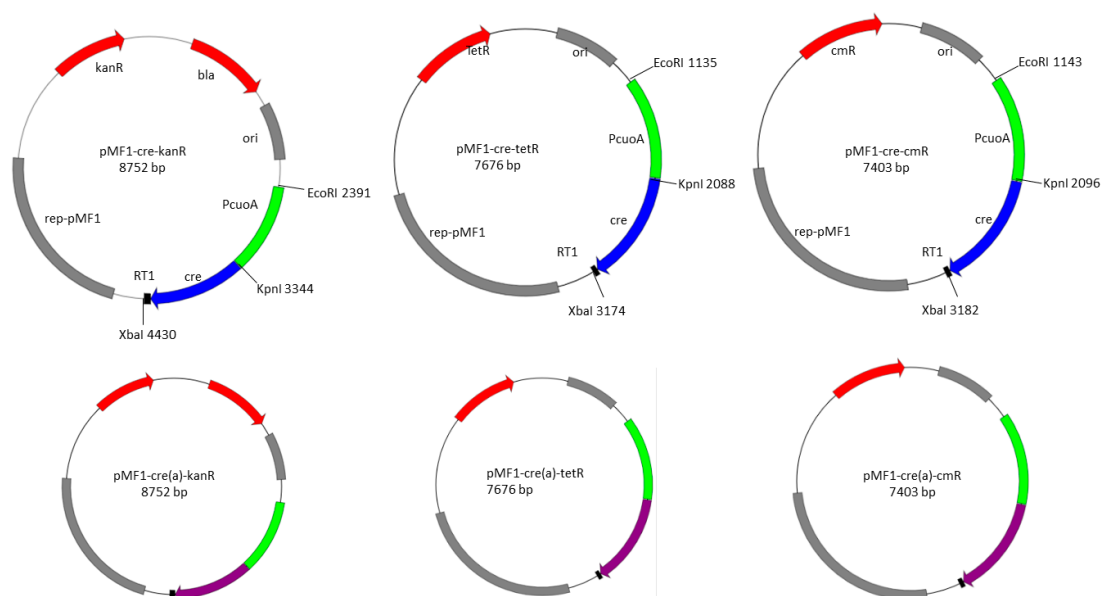


Figure S1. Construction of self-replicative plasmids for expression of native *cre* gene or artificial *cre* gene. Except the pMF1-cre-kanR, five other self-replicative plasmids were constructed. The kanamycin gene and ampicillin gene were replaced by tetR and cmR to obtain plasmid pMF1-cre-tetR and pMF1-cre-cmR, respectively. The native cre was replaced by the artificially synthetic cre gene to obtain the pMF1-cre(a)-kanR, pMF1-cre(a)-tetR and pMF1-cre(a)-cmR.