

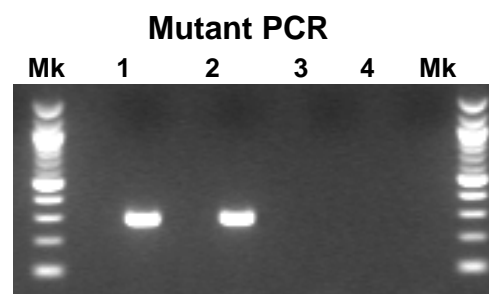
NIH-1105 Genotyping Strategies

Reaction Components	Vol (ul)
5X GoTaq Buffer	10
25mM MgCl ₂	3.5
10mM dNTPs	1
Primer 20 uM	1
Primer 20 uM	1
5 U/ul Taq polymerase	0.5
Water	28
Total mix volume	45
Tail lysate (1:20 dilution)	5
Total reaction volume	50

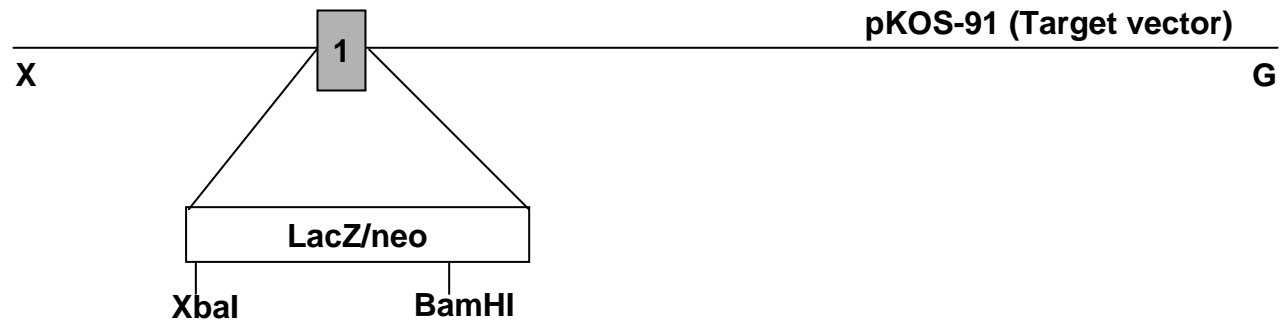
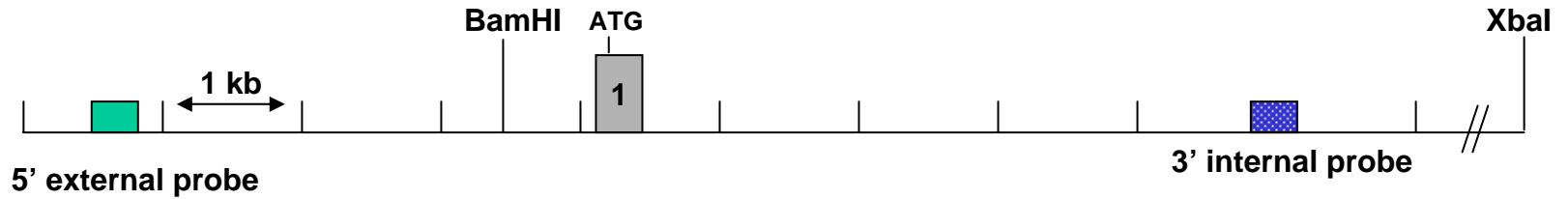
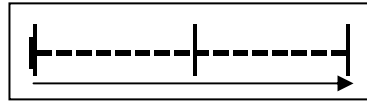
Step	Temp	Time	Note
1	94C	15"	
2	65C	30"	Decrease 1C/cycle
3	72C	40"	Go to 1, 10 cycles
4	94C	15"	
5	55C	30"	
6	72C	40"	Go to 4, 30 cycles

Primer Sequences (5' to 3')	
Mutant PCR: Primer Neo3A and Primer 1105-18, 286 bp	
Recommended Wt PCR: Primer 1105-3 and Primer 1105-5, 222 bp	
Primer Neo3a	GCAGCGCATCGCCTTCTATC
Primer 1105-18	ATGCGTGCATGCACCTCATG
Primer 1105-3	GCTCGGCTTGTTCCATC
Primer 1105-5	TCGGAGTTGTTACGTACAC



Well	Sample	Genotype
1	186	het
2	187	het
3	wt lysate	wt
4	water	no amp



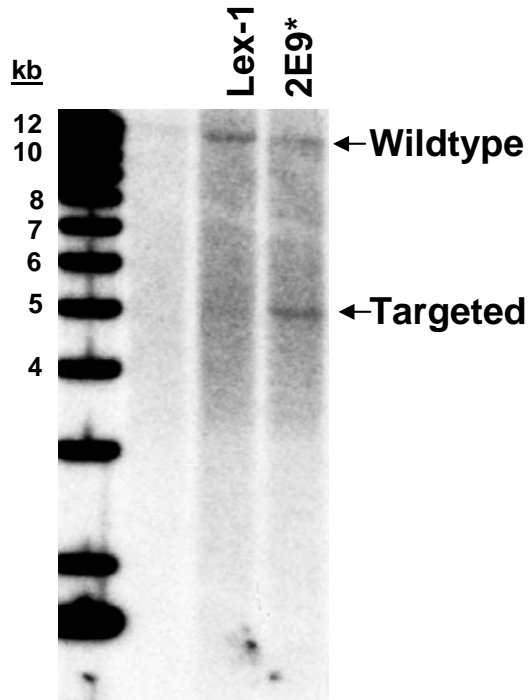
Targeting Strategy



Southern Strategies

Probe	5' external 	3' internal 
Enzyme	Xbal	BamHI
Wildtype	~12.0 kb	12.0 kb
Targeted	~5.1 kb	11.3 kb

Southern Data

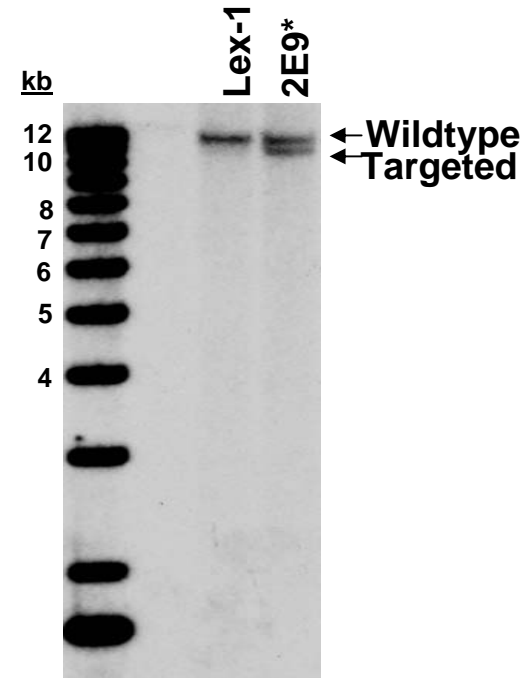


5' external probe

XbaI digests

Wildtype ~12.0 kb

Targeted ~5.1 kb



3' internal probe

BamHI digests

Wildtype 12.0 kb

Targeted 11.3 kb

* clone achieving germline transmission



**Lexicon Genetics Incorporated
Molecular Genetics Project Materials**

Catalog Number: NIH-1105 [REDACTED]

Reference accession(s): NM_021452

Standard KO or Conditional: Standard

Materials Submitted: Target Vector pKOS-91TVneo
 KOS clone(s) not available

Southern Blot Genotyping Strategies:

	<u>5' External</u>	<u>3' Internal</u>
Name of Probe:	15+19	24+25
Restriction Enzyme for Genomic Digest:	XbaI	BamHI
Predicted Wild-type Band (kb):	~12.0 kb	12.0 kb
Predicted Mutant Band (kb):	~5.1 kb	11.3 kb
Probe Size:	230 bp	245 bp

Primer sequences:

Southern probes

1105-15 5' – GAATCAGCACATCGTGGAGG
1105-19 5' – AAGTTAATTACGTGTGAGTTG
1105-24 5' – CATATCGGCTACGCTGAGC
1105-25 5' – AGTCAACGGCTCAACCAGC

Genomic Sequence Deleted (Floxed):

TGGCGAAGCTCAGGGTGTCTTACGAGTACACGGAAGCCGAAGACAAGAGCATCCGGCTCGGCTTGTTCCCTCATCGTCTC
CGGCATCCTGTCGCTCTTCATCTTCGGCTTCTGCTGGCTCAGTCCCGCTTGCAGGATCTGCAAGCCACGGCGGCCAACT
GCACCGTGTGTCGGTGCAGCAGATCGGCGAGGTGTTGAGTGCACCTTCACCTGTGGCACCGACTGCAGGGGCACCT
CGCAGTATCCCTGCGTCCAGGTGTACGTGAACAACCTCCGAGTCCAACCTCCAGGGCGCTGCTACACAGCGACCAGCACC
AGCTCCTGACCAACCCCAAGGTAAGCGCGCGG

KOS clone sequence: *(note: pKOS-91 was used to generate the TV and that is the sequence included here)*

CTTTAATGTTTCATCTTGGGGAAGGTTTTGCTTTTCTTCTAAATGAAAGCTCACTGGGGCTTGCTCTGGCTTTGAGAGAAC
CATTGGAGACAACAGTGTCTATGAGGGAGTCTGGTGCCGAATGGTGTGTCTTTCAGTTTCTGTGGATGGCTTACTATT
ATAGGGAGGTCTCGCTTCTCCTGTGCAGTCTCTGCCCTCCTGGGAACAGAAGGTGCCAAGTTGACCTGTGGTTCAA
CCTTTCGAGGCCCTGGGTTCTCCTGTCTTCTGACTTAAAGTCAAGGGTTGAGCGTTTTCTGATACAAGCAGCCT
AGGTGGGAATGTTACAAGGCAGCCCTACACTAGGAGAAGAACTAACACGGATTTCTAGTGAATCCTTCAAATAAA
AAAGTTGATTTCTGTCTGTGAAGCCTTACAGTCTGCTTCCCTTACCACAGAAGACAAGCCAACTTATATAGGAAAAACAA
GAATCAAAATGAAATGTTTGAATAACACAAAGCTGGAGAGAGAACAACAGCTTCTATCCCTGTGAGAATAAACAATGA
AGAAAGTAACTGAACTAACATTTGAGTTAAGACAGAACTCCCTGGCCCTGGTTTCTAGGTTGTAAGCAGTTTTTGTG
TTGTTGTTGCTGTTGTTTCATTCAACAACCTTAAAGGCGCCAGGAGACACTGAACTGTGAAGTGTGTAAGGTAATGGTG
TTACGTTACCCTTAGGGCTCTGCTCCTGGGCTTGTGCACGTTGCATGAATTACTTTATTTAGTCCCTTAGCCTTAGCGGC
CCTGTTCCGTGTTTATTCACCCACCCCTCGTCCCCATCTCCAATCCAGAAGAGGTTGCTTTTTTGAATGAGGATTGGC
ATCTGGAATCTGTGCAAGGAAAACACTCAGCGAAGATTTGCGATTTACAGGTTAAGACGCTTCAGCTTTGGAGCTCTCT
CTTTATAGCCAGCGTGTGCTAACAATGCCTTGACGCCAACAGGGGGGAAATCTCAGGCAGAAAACAAAACAAACAA
CAAACAAAAATACAGTGTCTGCTCTCAAACGGAGACGACTGAGACATCTTGTGATTTTAAAGTTTTTCCAAGTCC
TGCAGCCTTTTTTATTCATTAAGAAAAACAGACACTAAAGGTCTCCTTTACCATTGTTTGGAAATACCCATCAGCATAAC
ATGCCAGAACTCTGTCAAGTGCAGCCAAAGGGTTTGAAGTCTGGTAGAGTGGGCTTAAACATTTCCATGACTTGGCAACT
GTTATTCATCAGGAGCCTGAGTTCATTCATCTAGGACTTGAAGACAAGAAAAGGAGGGTTAAAACAACAACAACAAC
TTTATTTCTTCAAACGCAGCTCTAAACAGTTCTCAAGTTTGGTTTTATGATCTTTAAAAAAATGTAGGTA AAAAAGCAAAT
TTAAACTTACAAAGGAAAAGTCAAGGAGAATAGAGGCTGAATAAAGGTGTACATCGATAGGGTGGAGTTCCAAAGTGT
TGCAAGCCGCGGTGCGCTTGCACAGAGCTCCAGAAAAAGCTCACCTGCAAATCTCAGGGCCAGCTAAGGGTGGCAATA
TTCCTAAAGAGGCAACAGAGTCTGCTCACCCAGCCGAGCCAGGCTTTGCCACCTGTTTGCCTCCACCCCTAGGG
GTCGTTCCCGCTGTCTGGCAGCTATTTTTCCAGGAAAGTCCACCGCTCAAGGTTCCATCGTGTAGCCTGCACGG
TCCCGGTGGCGGCTGGGATCCGCGGGGACCTCCGGCTCCCGGCCGCTCGCCTGTGGGCATCCCCCGCGTCCGCGCCG
GTGCCCTCTGTCGCTCGCCGCCACCGGAGCTCCCTTTGCCGGTGGCCTGCTGCCCCGACGCTCCCCGGATCGGAGTTT
GAAGATTCCCGCTTCGACGCTCACGCCATCTCCCCACTTAAAAAAATTTTTTTTTTCTCTCTTTTAACTTTCTCCCCA
GCCACGCTCCCTCGGTGCTAAGCGTTTCGCTCGACCCTCCGCCATCTCTCCAGGTTGCATCTGGCGAGGATTCGAG
AGCAGCTCGCGGCGGCCCGGGTGTCTCGCCACGGGAGCTGCGGGGCGCGGCGCGGGGCGGGGCGGGGCGGGGCGGCGCC
CAGGGCGGGGAGGAGCAGCCTCGCTCAACGCGGAGCCAGGGCTCAGCAGCCCAGTCGCTCCAGCGTCGGGGCGCCG
GGCGCTCGGCCGCGGCGATGGCAGGCGGGCGGCGCGCGGGGAGGCGGGCGCGGGGCGCGGAGCGCGCGGGGGCG
GGGGCGGGTCTCGGGAGCCCCGGGGTGCCTGACGCTGTGAGGCGGGCGGTGGCACCCGGGAGCCCCGGCCTCGGGCAGC
GCCGTCGCCCGCCGCGGGGGCGTCCCGGCCCTCGGCCCTTTGTTCTCGCGCGCGCCCCCTCGCCGCCACTCCCCTGC
TGTGCGCGGGCGGCGGGCGGCTCCTCCCGCCGAGGCGGTTGAGCTCGGCGCCGGGGGCGGGAGGGGGCGGGGAG
CGCGCCAGCCGTGGAGAGTGGGGGGCGATGGCGAAGCTCAGGGTGTCTTACGAGTACACGGAAGCCGAAGACAAGAG
CATCCGGCTCGGCTTGTTCCTCATCGTCTCCGGCATCCTGTGCTCTTTCATCTTCGGCTTCTGCTGGCTCAGTCCCGCCT
GCAGGATCTGCAAGCCACGGCGGCCAACTGCACCGTGTGTCGGTGCAGCAGATCGGCGAGGTGTTGAGTGCACCTT
CACCTGTGGCACCGACTGCAGGGGCACCTCGCAGTATCCCTGCGTCCAGGTGTACGTGAACAACCTCCGAGTCCAACCTC
AGGGCGCTGCTACACAGCGACCAGCACCAGCTCCTGACCAACCCCAAGGTAAGCGCGCGGGGAGCTCCCCGCTAACAGT
GCAGGTTCCGGGCAACGTCCCGGTTAGACCCAGGGGAAGAATCGAGTGCACCTGTCTCGCTCGGAGTTGATGCGAG
GGAGGCATGAGGTGCATGCACGCATCCCTGGAGCCAGGGCTCCAGACCTCGGGGTGTGTTGCTACTGGGCGGTGG
TACGCGAGCCTCTCTGCAACAGATCTTTTCTGTTCTTAGATTTTTTTGAGCTCCGGACCACCCAGGTCCAGCGCCTGC
GGAAAGGGGTTGCTAAACTCAAGGAGCAAAGAAAGTTAACTTTTCTTCCAATGTAGCCATGGGATAGCCCAGGACC
CAGGTA CTCCAGTATATGGCCTGAGCTTCTATGGGGCTCAAGAACTCCCTTCTTTGAGAGGTTAAAGGGGTCTCTTCG
TTCTGGAAAGTATCTTAAAGTACTTTTGAATTTTAGTTCTAAACTGAAGTTTTTAACTTGAGGTCTACAGATAGACTTGG
GATGGTGAAGGTGGGGTCAACAGCCATCAGGAGGAATCCAAGAAGAGATTCTGATGAGGTGCGGGTTGGTTTGGTGGT
GCTGGTGGTGGAGGCTGAAAGGTTCTAACCACTGAGTGTGTTGGGCACAATGAGAAGCTGTAACCTAAGGAGTAAGTA
GGAGAACAACCTACCGAAAATAGAAAGCCCTTGATGACATATACCAAGCAGCGGTTTCTGACAACCTTCTTTTGTGTT
ACAGGGGAGGAAAAAAGAGGGGAAAAAATAGATAAAACCTGGTTAGACTTCTAGCCTCTGGAGAGC
AGAGAGGGAGACTCAGAAAACCTCCCCGGGGTAGGAAAGCACTTATAAAAAGCTGTGTCCCCAGTCCGTGAACTAAT

GAGCCTTGCAGTGTGCCTGCTTCTGCAGGAGGGTCTTTGATGCCTGTGTTCTTTCTGCTGCCAGCTGAAGGTGTGTAT
ATATATCAAGTACTGAGTCCCTGTACTTCTGGGGGCTGTGCTGGAAGACAAGCAGAAATCATTCCAAAGAAAATGA
GTCCTGTGCGTGCAGGAACATGTTCTCTTAAATGTGACCAGATAGATTAATCGGAATTCATTATTTTAAACAAGATCAC
TACCGCTGTGCAGAGAACTCGGGCGTAACTCACTTATTTGGAAAGTTAGAAGAACTAGTCTTTGAACATATGATGGA
CTCCTCAATGGAAAAGTCTCCCGCTAGTGCACGGAGGCTCGTTTGCTTTTAAAAATGGAGCTAATCCAAGAACAGTAAG
TGTAGACGTGAACATTTGGAATCCAGTCTCTAAGGACCAAGGTCTTGCCGAAGTGATCGGTCTCAAAAACAGATGTGG
GTTAATCTGCATAGTGTCTGAGAATTTAATAAGAGGTCTGGTGGCTTTGAGAAAAGCATTGTA AAAAATCAGAATTAAGTG
AAAAATATCTAAGAAAGGTGTCAAGTAGTAACTTAGTGATTTGGAAGGTGCTCTGTAGTTTGCCATACAGGTGTAGTCA
TAGTTGGTGAAACACTGCTAATTATTTTTGAGATAGTCGTTTAAATCAATTATATATGTGTGTGTGTGTATACATATGTAT
ATGTGTATACATACATACATATATGTGCATATACATTTCTACAAGGTA AATCTA AACTTGATGGTTAATATCTAATTTT
GGTGTAGACAAGTTAGGATTTACCACAGAAGTCAACCA AAGTTTCCAGGCAGTTTTG CAGGATTCTGGCAACAGGGAT
AAGTTGGAATCATTAGGACATCGATTCTTAAATAACTTGAAGCAATCACAATGTTTTATGTAATATTA A AATCTCTCT
CTCTCTCCACTTGCAAATAATCTTAT:CCCCCCCCCATGCCAGTTAAGA AACTTATCAATAGTTGAAGAAGTATCAAAC
AAAAATCGAAGTGGTCAGA AACTGGGAAAAAATGACATCTTTAATGGTCCGGAAGGGTGATAAATGACCTTTCCATCAA
TTTATGCAAGATTTCCCTCTGCCAAATACGCATCTCTTTGTCCAAATTGTGATGTATTGTAGTATTTATAGAACA AATC
ACTTTTTTTTTCCCCCAATTAGATGTTCAATTTGGAAATTTTTGTAAGCACTTTAGTAATGGAAAAATCTCAGTGCACCGA
AACACCATGTTAGGGTCAGACTCGTAAGAAGATTGAGTTTCTGTGGCGTCTTGCGCCTAGACAATCCCACTGCCCAGT
CCTGTTGCATATCGGCTACGCTGAGCTATGCCCTCCCTACTTACTTTTAAATTTCCAGTCTGTTCCTTTTCGTCTTCCATCT
GCTTCTCACATTCTCTCAAACCCAGGCATCCCAAGAACTGTTAGGGAACCACTCTCATCTACATAGAGCAAGCATC
TTCTCTGGGCTGTGCTCAAAGTATTACATACAGCCCAAGGCAGGGAGGGGACAGATGGTCCAAATGTACAGCTGGT
TGAGCCGTTGACTGTGAGGCAAGTGCTGGCCTTTAGAGTATCGTTATGCTCTGCTCAGTTTCTTTACGTTTTTTCATCAA
TCCTTGTATCTCAGGGGATCACTGTGTTTATGGCACAGTATTCGGATCAGGCAGGGACTTGATAAAGGAGCTGATGG
ATCACCCATAGCCAGTCTACGTTCCGGTGTAGCGTCTCTTGTGCTGCCCCAGCATTGCATCACCTCTGTGACTCAG
AATGGTGGGTGCCGAGTGCTCTGGTCTCAGCTACGCTGTGGGATTACTCAAGGACCTTGAGGATCACCTTTTTGGGCT
TAGGTTCAGTTTTCAGGCACATTGATGTGGT CAGGGATGGGGCCTGAGTGTTGTAGTTTTCAAAGCCGTGCAGGTGGTT
CTAATGCGTATCCAAGAGATGAAGATTAGTGCCTTGGAAAATGTGCTCATCTGTTGTGCAAGAACAACCACCGGGCTC
AAAATGAATTCACCATGATTAATGCTCATGTTTTCAACATAAAAAGATGTAGGCGCCACTGGGTAGAGAAGGTGCAGTA
GGGACTCAGCGGAACTCTGAAGAGAAGGGAGAGAGTCA TTTAAAATTAGTGCGGGAAGCTCATTTAGAGTTGATCAGT
TTAAATGAAACGAAGGTGCACCATTGCAAACACTCGCTTTTGCTGTTACCTACTTTGGAGGGCAAAGAAGAGATGAATT
TAGGAACTGCCTTCTGCTGTGTGCTGCGAGAGGGGGTGATTAGAGGCAGGAGCCATGTTTAAAGTTTTTGTTTGGAAGGG
TTTCTCTCCCTTCTTCGATTA AAAAAACAAAAAACA AAAAAACA AAAAAACA AAAAAACA AAAAAACA AAAAAACA
CAGCCACAAAAGCAAATAAAGAATAAAGAATAAGTTTTGTTTCTAAGAACTAGTTC TTTGACTGAAGACTGAGG
AAAAACTTCAGCGGGGACAGAGGAAGGCTTTTGGCTTGAAGAGCATCCAGGAAGGGCAGCAGAGCACAGATGAAGGC
TTCGTGTTGCCAGCCACTTAGCGAAGGGCCTTCAGACCCACTCACCGCCCTGTCCTCTACATGTAAGGGCAGC
ATGGCTTTGACCTGTGGGTTGACCTTGATGCGCTTGGTCTCTAGGGAGAAAGCCATCAGACCCAGGGCCGCATCATGA
AAAGATATTGAGCTGTGCCAACATCTTAGCCTTATCTGTCCGCAAGAAGTGGCTTCCTTTGGATTTTTCTTTCTTT
GGTAATGTTATTAATAATATATATGTAATATTATATGTAATTATATAGAGATGTTAGATGGACAGATAGAAGATAGAC
AGACAGACAGGTAGGTAGGTGATAGATAGATGATAGGTAGATGATAGATAAATAGATGATAGTTAGGTAGGTAGATA
GATGATAGGTAGATGATTGATAGATAAATGATAGGTAGATGATAGATAGATAGATAGATAGATAGATAGATAGATA
TAGATAGATGATAGGTAGGTAGATAGATTCATTTGAGCTTCTGGTTTTCTCAGAACTTATTGTGGCCAAAGAACAGGGCA
AAACCCCTACGAGACATATAAAGCTAAGCTTGTGTTTATCAGTCCATCTGTGCCTTTGTTACTGCCGGTTCCAGACC
AGAACAGAGATCAAAGTTCCTGCCCTCACAGAGCTGGCATCTTGGTGCAGGAAACAGACGTGAGTCAATTTATAATAG
AATTCCATGTAGTGATAGATATTTAAAAGTTCTAGTGTGGGCAAGAGAGAGTGGCAGCCCGGGTTCGGTGGGTGCCCGC
GACTGGTGGCCTGGATCGGGGTGGCGTGACTAGATTTATCGTTGAACTGGATATGAAGAATGAAGGCAAGAAGAATTG
AAGATGGCGTCAGAGTGTGTTGGCCAGCACATCACGGCAAGGGAGGGGGTGCCTTTACAGGAGATGGGGGATGTGGAA
AGGTTGATGTCGATGAAAACCAAGGGTGTTCGTTTTATGATTATCTATGTTCTACGTGTCTCTGCTGGGCCATAATC
TTTGGGGCAGAACTCATAATAGATTATCTTCAATTTGTGTACCTGTTGGGCCATTTGAAACATAGAAAGGGAAATG
GGGAGGGAACGGATTCTTGCTAACTCCAGAAAGGCCTGAAGCTTGGCTGGAGTGCAGATGTTTTACCCCGCTAGACTT
TCTGACGTCCAAGACCTTCTGACGTCCAGACTCTTCTCAA AAGTTACTTATTAGTATTTTATGTGTCTAGGTGTTTTT
TTTTTTTTCTGTATGTGTGCTCTGTACCACGGAGGCCAGAGGAGGGTATCAGATCTACCCCCCCCCCAGCCCCCTGG
AACTGGAGTTACAATTGTGAGGCACAATGTGTGTTCTGGAACTGAACCCAGAGCCCCTGGAACAGCAGCCAGTGCTC
TCAACTGATAAACCATCTCTCTCCACCCTGTTAATGATAGTAAAATGTGTGCCTTTTGCTGTTGTTGCTTGGTTGGTTGG
TTTGGTTTGGTTTGGTTTGTACTAAGTTTGTGTCTCAGCAACAGAACGCATCCAGAAGCCAAGGAATGCTTTTTGAGC
AGGTAGCTCGTTTGGTCAGGCATTCCAGAGTGCACCAGAAATGATGGCAAGCACTTGGGATTATTCTAGCACTAGGGTT
ATTGCGGCTGAGGCAGGAGAATAACAGGTTTGAAGCCAGCCTGAGCAACGTAGTAAGATACTGTCTCAAACA AAGTAA
TACGTTGATTGTTCTTTTTATATGGAGACGTGGTTTCACCACGTA AACTCTGGCTGGCCTAGAACCATTGCTGTATAG
TCCAAGCTGGTTTCAAATCAGAGGTCTTCAGCATCCACCTTTCAATTGCGGGAATTAATAGTGTGCACGACCACACAC
TTTGAAGCCATCTAATTTGTGTACCCAAGGGTGTTTTTTTTATGTTATCTCTCTAATCTCCACTTGTGGATACCATTTAT
GGAAATCTCAATTACAAAGATCCCCCCAAGGTCATATATTGAAAATAAACCAGGAACTAAAATTCAGGAGATTTGTG

TTCATTTTAATTTGCAATTTGAGGAAAATGCATTTTTTTTTCTCAATAGGATTTTTTTTTCTTAATGTTTTTATTATTTAAATG
CATTTTATAACATCAAGCATATTAATAATATTGAGAATTTTGAGAAGCAAATGATACATAAAAATTTGTTCAACTTTTATAT
TCATATCCTTTTCATACCCTAAAAATAAAAATTAATGAATATTTAATACTATCCATAACTGATGATCCTATATCTAATGTTG
AATACTAAATTTGTTTCAAAACATGCAAAAATATTCTTTGGGAATTAAGCATAGTAAAAGAGCATAAAAATATTA AAAATG
AATTATTAAGAATATGTTTCAAGCCCTTATATGATAACACCTGACATAGTAAAGAGATTTTAAAGTGTATTATATAT
ATGTGTACATTGTCTAACTGTAAGTTTACTTAAGGAAAATTATCAGTGTCTTAGGAGAGAATTATTTTTAAGATTTATT
TATTTATTATAAGTAAGTACTGTAGCTGTCTTCAGACACACCAGAAGAGGGGCATCA

Selection cassette sequence: (note: linker sequences may vary and are not provided)

GGCGCGCCGGATCCCGGGCCGCTCTAGCTAGACTAGTCTAGCTAGAGAATTCCGCCCCCCCCCCCCCCCCCTCTCCC
TCCCCCCCCCTAACGTTACTGGCCGAAGCCGCTTGGAAATAAGGCCGGTGTGCGTTTTGTCTATATGTTATTTTCCACCAT
ATTGCCGTCTTTTGGCAATGTGAGGGCCCCGAAACCTGGCCCTGTCTTCTTGACGAGCATTCTAGGGGTCTTTCCCCTC
TCGCCAAAGGAATGCAAGGTCTGTTGAATGTCGTGAAGGAAGCAGTTCCTCTGGAAGCTTCTTGAAGACAAACAACGT
CTGTAGCGACCCTTGCAGGCAGCGGAACCCCCACCTGGCGACAGGTGCCTCTGCGGCCAAAAGCCACGTGTATAAG
ATACACCTGCAAAGGCGGCACAACCCAGTGCCACGTTGTGAGTTGGATAGTTGTGGAAAGAGTCAAATGGCTCTCCT
CAAGCGTATTCAACAAGGGGCTGAAGGATGCCAGAAGGTACCCATTGTATGGGATCTGATCTGGGGCCTCGGTGCA
CATGCTTTACATGTGTTTAGTCGAGGTTAAAAAACGTCTAGGCCCCCCGAACCACGGGGACGTGGTTTTCTTTGAAA
AACACGATGATAAGCTTGCCACAACCATGGAAGATCCCGTCGTTTTACAACGTCGTGACTGGGAAAACCTGGCGTTAC
CCAACCTTAATCGCCTTGCAGCACATCCCCCTTTCGCCAGCTGGCGTAATAGCGAAGAGGGCCCGCACCCGATCGCCCTTC
CAACAGTTGCGCAGCCTGAATGGCGAATGGCGCTTTGCTGGTTTTCCGGCACCAGAAGCGGTGCCGAAAGCTGGCTG
GAGTGCATCTTCTGAGGCCGATACTGTCTGTCGCTCCCTCAAACCTGGCAGATGCACGGTTACGATGCGCCATCTACA
CCAACGTGACCTATCCATTACGGTCAATCCGCCGTTTGTTCACGGAGAATCCGACGGGTTGTTACTCGCTCACATTT
AATGTTGATGAAAGCTGGCTACAGGAAGGCCAGACGCGAATTATTTTTGATGGCGTTAACTCGGCGTTTCATCTGTGGT
GCAACGGGCGCTGGGTGCGTTACGGCCAGGACAGTCTGTTTGGCGTCTGAATTTGACCTGAGCGCATTTTTACGCGCCGG
AGAAAACCGCCTCGCGGTGATGGTGCTGCGCTGGAGTGACGGCAGTTATCTGGAAGATCAGGATATGTGGCGGATGAG
CGGCATTTTCCGTGACGTCTCGTTGCTGCATAAACCGACTACACAAATCAGCGATTTCCATGTTGCCACTCGCTTTAATG
ATGATTTACGCCGCGCTGACTGGAGGCTGAAGTTCAGATGTGCGGCGAGTTGCGTGACTACCTACGGGTAACAGTTTC
TTTATGGCAGGGTGAACGCAGGTCGCCAGCGGCACCGCGCCTTTCGGCGGTGAAATTATCGATGAGCGTGGTGGTTAT
GCCGATCGCGTCACACTACGTCTGAACGTCGAAAACCCGAAACTGTGGAGCGCCGAAATCCCGAATCTCTATCGTGCG
GTGGTTGAACTGCACACCGCCGACGGCACGCTGATTGAAGCAGAAGCCTGCGATGTGCGTTTTCCGCGAGGTGCGGATT
GAAAATGGTCTGCTGCTGCTGAACGGCAAGCCGTTGCTGATTTCGAGGCGTTAACCGTCACGAGCATCATCCTCTGCATG
GTCAGGTCATGGATGAGCAGACGATGGTGCAGGATATCCTGCTGATGAAGCAGAACAACCTTTAACGCCGTGCGCTGTT
CGCATTATCCGAACCATCCGCTGTGGTACACGCTGTGCGACCGCTACGGCCTGTATGTGGTGGATGAAGCCAATATTGA
AACCCACGGCATGGTGCCAATGAATCGTCTGACCGATGATCCGCGCTGGCTACCGGCGATGAGCGAACGCGTAACGCG
AATGGTGCAGCGCGATCGTAATCACCCGAGTGTGATCATCTGGTCTGCTGGGGAATGAATCAGGCCACGGCGCTAATCA
CGACGCGCTGTATCGCTGGATCAAATCTGTCGATCCTTCCC GCCCGGTGCAGTATGAAGGCGGCGGAGCCGACACCAC
GGCCACCGATATTATTTGCCCGATGTACGCGCGCTGGATGAAGACCAGCCCTTCCC GGCTGTGCCGAAATGGTCCATC
AAAAAATGGCTTTTCCTACTGAGAGACGCGCCGCTGATCCTTTTGCAGAAATCGCCACCGCATGGGTAACAGTCTTG
GCGTTTTGCTAAATACTGGCAGGCGTTTCGTCAGTATCCCCGTTTACAGGGCGGCTTCGTTGGGATCGGATGATCA
GTCGCTGATTAAATATGATGAAAACGGCAACCCGTGGTTCGGCTTACGGCGGTGATTTTGGCGATACGCCGAACGATCG
CCAGTTCTGTATGAACGGTCTGGTCTTTGCCGACCGCACGCCGATCCAGCGCTGACGGAAGCAAAAACACCAGCAGCA
GTTTTTCCAGTTCCGTTTATCCGGGCAAACCATCGAAGTGACCAGCGAATACCTGTTCCGTCATAGCGATAACGAGCTC
CTGCACTGGATGGTGGCGCTGGATGGTAAGCCGCTGGCAAGCGGTGAAGTGCCTCTGGATGTGCTCCACAAGGTAAA
CAGTTGATTGAACTGCCTGAACTACCGCAGCCGGAGAGCGCCGGGCAACTCTGGCTCACAGTACGCGTAGTGCAACCG
AACGCGACCGCATGGTCAGAAGCCGGGCACATCAGCGCCTGGCAGCAGTGGCGTCTGGCGGAAAACCTCAGTGTGACG
CTCCCCGCCGCTCCCACGCCATCCCGCATCTGACCACAGCGAAATGGATTTTTGCATCGAGCTGGGTAATAAGCGTT
GGCAATTTAACCGCCAGTCAGGCTTTCTTTTACAGATGTGGATTGGCGATAAAAAACAACCTGCTGACGCCGCTGCGCGA
TCAGTTCACCCGTGCACCGCTGGATAACGACATTGGCGTAAGTGAAGCGACCCGATTGACCCTAACGCCTGGGTGCA
ACGCTGGAAGGCGGCGGGCCATTACCAGGCCGAAGCAGCGTTGTTGACGTGCACGGCAGATACACTTGTGATGCGGT
GCTGATTACGACCGCTCACGCGTGGCAGCATCAGGGGAAAACCTTATTTATCAGCCGAAAACCTACCGGATTGATGG
TAGTGGTCAAATGGCGATTACCGTTGATGTTGAAGTGGCGAGCGATACCCGCATCCGGCGCGGATTGGCCTGAACTG
CCAGCTGGCGCAGGTAGCAGAGCGGGTAAACTGGCTCGGATTAGGGCCGCAAGAAAACCTATCCCGACCGCCTTACTGC
CGCTGTTTTGACCGCTGGGATCTGCCATTGTCAGACATGTATACCCCGTACGTCTTCCCAGCGGAAAACGGTCTGCGC
TGCGGGACGCGCGAATTGAATTATGGCCACACCAGTGGCGCGGCGACTTCCAGTTCAACATCAGCCGCTACAGTCAA
CAGCAACTGATGGAAACCAGCCATCGCCATCTGCTGCACGCGGAAGAAGGCACATGGCTGAATATCGACGGTTTTCCAT
ATGGGGATTGGTGGCGACTCCTGGAGCCCGTCAGTATCGGCGGAATTCCAGCTGAGCGCCGGTGCCTACCATAC
CAGTTGGTCTGGTGTCAAAAATAATAAACCGGGCAGGCCATGTCTGCCCGTATTTCCGCTAAGGAAAATCCATTATGT
ACTATTTAAAAAACACAACTTTTGGATGTTCCGGTTTATTCTTTTTTACTTTTTTATCATGGGAGCCTACTTCCCCT

TTTTCCCGATTTGGCTACATGACATCAACCATATCAGCAAAAGTGATACGGGTATTATTTTTGCCGCTATTTCTCTGTTCTCGCTATTATTCCAACCGCTGTTTGGTCTGCTTTCTGACAAACTCGGAACTTGTTTTATTGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTACAAATTTAATTAAGGCCGCGGGATCGATCCCGTCGAGCAGTGTGGTTTTCAAGAGGAAGCAAAAAGCCTCTCCACCCAGGCCTGGAATGTTTCCACCCAATGTCGAGCAGTGTGGTTTTGCAAGAGGAAGCAAAAAGCCTCTCCACCCAGGCCTGGAATGTTTCCACCCAATGTCGAGCAAACCCCGCCAGCGTCTTGTCATTGGCGAATTCGAACACGCAGATGCAGTCGGGGCGGGCGGGTCCCAGGTCCACTTCGCATATTAAGGTGACGCGTGTGGCCTCGAACACCGAGCGACCCTGCAGCCAATATGGGATCGGCCATTGAACAAGATGGATTGCACGCAGGTTCTCCGGCCGCTTGGGTGGAGAGGCTATTCGGCTATGACTGGGCACAACAGACAATCGGCTGCTCTGATGCCGCCGTGTTCCGGCTGTCAGCGCAGGGCGCCCGGTTCTTTTTGTCAAGACCGACCTGTCCGGTGCCCTGAATGAACTGCAGGACGAGGCAGCGCGGCTATGTGGCTGGCCACGACGGGCGTTCTTGGCGAGCTGTGCTCGACGTTGTACTGAAGCGGGAAGGGACTGGCTGCTATTGGCGAAGTGCCGGGCGAGGATCTCCTGTCATCTCACCTTGCTCCTGCCGAGAAAGTATCCATCATGGCTGATGCAATCGCGGCTGCATACGCTTGATCCGGCTACCTGCCATTGACCACCAAGCGAAACATCGCATCGAGCGAGCACGTACTGGATGGAAGCCGGTCTTGTCGATCAGGATGATCTGGACGAAGAGCATCAGGGGCTCGCGCCAGCCGAAGTTCGCCAGGCTCAAGGCGCGCATGCCCGACGGCGAGGATCTCGTCGTGACCCATGGCGATGCCTGCTTGCCGAATATCATGGTGGAAAATGGCCGCTTTTCTGGATTTCGACTGTGGCCGGCTGGGTGTGGCGGACCGCTATCAGGACATAGCGTTGGCTACCCGTGATATTGCTGAAGAGCTTGGCGGCGAATGGGCTGACCGCTTCTCGTGCTTTACGGTATCGCCGCTCCCGATTCCAGCGCATCGCCTTCTATCGCCTTCTTGACGAGTTCTTCTGAGGGGATCGGCAATAAAAAGACAGAATAAAACGCACGGGTGTTGGGTCGTTTGTTCGGATCCGAATTCCTCGAGGGCGCGCC