



Lexicon Genetics Incorporated – Genentech Project Materials

Genentech ID:	UNQ3119	Date of Submission:	11-10-04
Lexicon Contract Name:	DNA220A	Mutation Type:	X Standard Knock out
LexVision Name:	SEC526N1		☐ Conditional
Reference accessions:	BC060239	Is this gene X-linked?	No

Required Materials:

☐ pKOS clone DNA(s) __pKOS59_____
☐ Target Vector DNA __pKOS59TV_____
☐ Targeted ES Cell DNA __1F11_____
☐ Genomic Map

Southern Blot Analysis: *External/Internal Probe Strategies*

	<u>5' External</u>	<u>3' External</u>
Name of Probe:	21+22	17+18
Restriction Enzyme for Genomic Digest:	NdeI	EcoRI
Predicted Wild-type Band (kb):	11.1 kb	9.7 kb
Predicted Mutant Band (kb):	10.1 kb	8.1 kb
Probe Size:	510 bps	471 bps

PCR Strategies:

For standard knockouts, give wildtype and mutant-specific strategies

For conditionals, give 5' loxP and cre-excision strategies

Wild type-specific (absent in targeted allele)		Mutation-specific product (absent in wt)	
5' Primer Name:	26	5' Primer Name:	Neo3A
3' Primer Name:	27	3' Primer Name:	31
Predicted Wild-type Band (bp):	180 bps	Predicted Wild-type Band (bp):	none
Predicted mutant band (bp)	none	Predicted mutant band (bp)	470 bps

5' loxP strategy		Distinguish Cre-excised and wt	
5' Primer Name:		5' Primer Name:	
3' Primer Name:		3' Primer Name:	
Predicted Wild-type Band (bp):		Predicted Wild-type Band (bp):	
Predicted mutant band (bp)		Predicted mutant band (bp)	

Primer sequences:**Southern probes**

21 5' – CAGAAGGCAGGACTTCAATGCA
 22 5' – CAGCATGAAGAGCTATCATCATG
 17 5' – CAGCAGACTCTACCTCTGGCA
 18 5' – CAAGGTTCTGGGAGCAGAGTC

PCR Genotyping

26 5' – GGCTTCCCAGATGACACTCGG
 27 5' –CTACCTCGGTGCAGTCGCAGAC
 31 5' – GCAGGGAAGCTGTGAGTAGGG
 Neo3A 5' – GCAGCGCATCGCCTTCTATC

Genomic Sequence Deleted:

GGCAGGGTGCCCCGTCCTCAGGGTCCCCACGCTGTTTCCTGATCCTCCTGCTGTTTCCAGAGCTCCACACGGCAGGCACC
CTTGCACTCTGGATCCTCTGCCCCGAACCTGCCGGAGACCCACTCCCACCTCCCCAGCTCTGCACTGTGGGTGTCCCAGG
CAAGCCATCATGGCCGTCGGGGCCTGGGGAAGAAAGACAGGGGGCCAGGAAGGCCTAGCCGGGGCCAGGAGGGGGCT
GTGGTCACTGCTACCAAGCAGGCTTCCCAGATGACACTCGGACAGCCCCCTGCTGGCCTTCTGCAGAATAAGGAGCTGC
TTCTGGGGCTGACTTTGCCCTACCCCGAGAAGGAGGGCCCGTCTCCCGCTTGGGAGAGGGTGAAGAAACGTGGCAGAG
AACACAAGAGACGCAGGGACCGTCTGCGACTGCACCGAGGTAGCTGGAGACCTGGGGGGAGGAGGG

Genomic Locus: *(The deleted sequence represents nt9797-10254-in the sequence below. KOS59 used to generate the TV
represents nt6773-16736 in the sequence below.)*

AGGGCTAGGGACCAGGAGAAGTAACTCTGCCCAGAGGGCCCATCTTGTCCTGCGTGGCTGTCAATTCTGAGGAGAGAAGTCA
GTTTTTGGTTCCAGGATCCACAAAGGAGAAGTTGCAAGATGGCCTGCCATGGACTATGGGCTAGAACCCCTGACCCAG
ATCCAGTAAGTAAGAAAAATTGTCTCGTGGATCCAAGGCTGCTCACCCCTGGTAGTCCCAGAGGAGACAGCGTCTAGGC
TGGGTTCTGATGGGTGCTTTCAGGACTGGGTATAGCTCAACTGGTGAATACTTGTCTATCATGATAAAGCAATGGGTT
TGATCCCCAGCACCACACAAACCAGTTAATTACACCTGTAATCCTAGCACTCAGGAGGTGGAGGCAGGAGGATCAAAA
GCTCAGAGCCATCCTTTGCTACATAAGGTTAGCCTTGTTTACATGAGACCCAGTCTCTAAAACAAAAACAGATGGTCAT
TTCCAGAGCTAGACTCTTCTTGGTCTCTGTGGGGTCTAAAGGGTCTTCCTAACAACCTTTAACAGTATACAATTGCTTCA
AATTTCTTCCAAGCCTAAAAAGGCTCGTGTTTTCTACTGGGGGAGGGGCATTTGAGCATCTGAGATATATCCCAAGGGAA
CTGCCAGCAGCAGGACTCTCCTTGTCCTGGTACTTTACTGTGATAACCTGAACCTGTTCTGAAGATCCCCGACATGGG
CAGCAGCCCTAACAAGGCCTGGTCTCCCAAGTGCCATCCCATAGCCAAGTCCGTAAATGTCTCACTTGTGCCAGAGATCA
TCAGCCACTGGGAACAGGAGCAGAGAGCAAAGTGGAACCGACTCCTTGAAGACCTGGAGAGAGGGAGCAACAGACATA
GGCTGTCAGAGTTGGAGTTCTGGGTCTCTCCTTGTAACCTTCACAAGTTATCCTTTGAGCCCATGCAAGGGTGTTCCTCC
CCCCAAGCTCCCAGGGGAGTGTATCTATTACCTCCCCCTCTAGGGAACTGGCAGTCAGGACAGACAGATGACGACAT
GCCTCACTTCAGATCGTGAATTCCCAAGCTCCCTTGACAGACAGGACTCTGGGTACCGTGACACCCATTCTCCCAAGCTC
TTTTTGTACTGATGTCATGAGGATGGAGGCCAGGACTCTTGGCACATGTTAAGCAAGCACTGAGCACAACCCCAGACC
CCGTAGGGATGGGGGCACACGCCGTGGTGTGCCTGTGTAGTTCAAAAAGAACTTTTTATGGAATTGGTTCTCTCCCCTCT
GTTTTTTGTTTGCTGTTTTGTTTTGTTTTGTTTTGTTTTGTTAAGGACAAAGTCTTACTCTGTATCTTAGAACTCTAGCTC
TGTCTAGGTCTACCTGGAACCTACTATGAAAACCAGGCTGCCCTCCAACCTCACTGAGAGATCCTTCTGCCTCCTAGGT
GCTCGCGTTATAAAAACACCACCATCCCTAGCTCCAAAAATCTTTGGAGCAATGCAAATCTTTGAAATCTAACCTGGGA
TCCCAATAATGTGCAGAAAACCAACAAAAGTGATATTTAATAAGCAGTAAGCACCTGCACTCACCAGTAACCTCATTGC
TGAAAAGATGATTACCCCTGACTTAGCTAAGCACACACAACCTGAAAACCCCTGCATTTCAGGCTTCAGCCTCACTGAGCA
GCATCCTGTGCAGCATCCTGTGCAGCATCCTGTGCAGCTATGGCTCTGCACAGCTTTAGAATGTCTACTTCAGGTGAATC
AGCAGGGCCAAACCCAGAGGCAGGGGCCAATGCGGAGGCCATAGAGGAGTGCTACTTACTGGCTTGCTCCAATGGTTT
CTTAGAGAACTCAGGAATACCAGCCTAGGGGTGAGCCCACTCACAATTGGCTGGGCCCTCCCACATCAATCAGTAATT
AAGAAAATGCCCCCACAGCCTTGCTACAGCATCTGATGGGAGCATTTTCTGAACTGAGGGTCCCTCCTTTTCAGATAAC
TCTAGCCTGTGTCAAGTTGACATAAATTGGCCAGCAGCAGGCATGAACTCAGCCTGGCTTCACATTGTCTCCTCGTGCCA
GAGTGGCCTGGAGCTAGTGCTAGAAATTCTCTGTGGGTACCCACAGCGTTCCTCGGAGAACCAGAAGAAAAAAACCCA
GGTCATGGTGAGTGTCCCTTGTGTTTAAACCGGATAAAGGGCCTGGACACATGGCTCAGTGGGTACAATGCTTGCAATA
CATGAAGCTCTGGTTCCATCCCCAGAACCACAGAAAACCAGGTGTGGGGGTATACCCAGGAACCCCAAGAACTCTCTG
TGGGGAGTGGAGACAATAGGATCAAGAGTTCAAGGTTATCCTTGGCTACCTGATGCCAACCTGGACTACGTTAAACATT
AAACTCTGTTTCAGCTGGGCGTGGTAGTGTACACCTTTAATCACAGCACTGGGGAGACAGGAGGCAGGTGGATCCCCA
AGTTCTAGGCCAGCCTGGTCTGCAGAGAGAGTTTCCAGGGCAGCTAGGACTACACAAAGAACTCTGTCTTGGGATCTC
TCTCTCTCTCTCTCTCACACACACACACTCACACACACACACACTTAGTAGATACCTCATTGAGAAC
ATTTATCATTTTTGTATTTGTTTTTTTTTAATAGATTAAATTTCTAAATTAATTCATACATTTTCTAGTGCTGGGGCATGAA
ACAGGGCCTCGTGAGAAGTGGGTAGGCCAGAAGTCTACCACCGAGCTCCATCCCCGGTACTATATTCTACAATCTTTA
AAACCCAATTGTTTGGGTGTGGTGCCACGCCCATTTAATTCCGGCACTTGTGAGGCCAAGGCAGGCAAACTCTCTGAGCT
AGAGGCCAACCTGGCCTAGGAGTTTCAGGGAAACCAGGCCTACATAATGAGACCCTATTTCAATTACCACCACCCCAT
CCCCATCCAATAAACAGACTAACCCAGCAAACAGAAAACCCACCTAATTAGACTCAGATGCTTCTGAGTTTTTAAAGTA
TTTGCATCAGGAGGAGTAGGAGGCTGGGGTTAGGGACCTGGTGTGTCATCAAGGTCTCTGAGTGAACCTGGATCAAGC
CACCCAGTCTTTAGACCCAGCAGAGCAGCCCTTCCCACAAGATGCTCCAGCCAGCATCTACCCAGCCACCCTGCAAC
CAGTGGGCAGAGCCAGTCAGCGAGGCAGGAATGCAGGCTCCGCAGCTGTTGTGGGAGGCCAGGTGGTCAGACTCCAC
AGTTGTCTGCCAGGCTTGTATTGCTGCGGGAGTCTCCCCCCCCCCCCCCCCACCAGTGCTGTGTGCCCTATCCCATGCAGG
GCTGTTGGTGGGAGAGGTTTCAGGAATTAAGCTTGCTTCAGCTGGTTGGATGCCTCATTTGCATATGACACTGCCTCCTG
CTGCCTCCTGGATGGAGACTGGCTACTAGACAACCTCTCTCCCACTGTGCCAGGCAAGACAGAGCCCGAATTCAAGCCC
CCCTTTCCCCTTCTCTCTCCCTCCCCTCCCACTTCTTCTCAGGTTTCATGTTTTTCTTGGCAATTTCTGGCTCTCACTTCTCAGC
AGGACCCCTGCGCTCACCAGTAGAGATACTGGTACAGCAAATACAGGGAAGAATGACATCAGACAGATAATCCTCAG
CACTGAACATAAGCACTATGATAAGCACTATGTCCCCTGTGCACAGGGAACCCAAGAGCCCAGGCCAGGAACCTGTGTT

[illegible]

TGCTCTCTTGGCCTCCTCCTATCAGAAATCGTTCACATCACCCCGTTTTGACATGTTGAAATGACCGCAGCAGCACTTGG
TGATTCACACCTATCATCCCAGCATGCAGGATCCTGAAGCAGATGGAGCAGCATGAATTCAAGGCCGGCATGATCCTGT
CTCAAAATAATAATAATAATAATAATAATAATAATAATAATAATAATATGGTTTAAAGGAAGAAAGAAAGACAGACAG
ACAGACAGACAGACAGACAGACAGAAAGAAAGAAAGAAAGAAAGAAAGAAAGAAAGAAAGAAAGAAAGAAAGAAAG
GAGCCAGATGTGGTGCTGTATTTCCTTCAATCCCAGTACTCAGGAGGCAGAGGAAGGTGAATCTCTGTGAGTTTGAGACC
AGCCTTGCCTATATAACAAGTTCTAGGTCCACACAGAAAGACCTTGTCTCAAGGAGGGGAACAGAAGCTGGAGAGATG
GTTCTCTTAGGTAAAGAGTGCTTGTGTTTGACGCTCTTGTAAAAGACCTGAATTTGGTTCCCAGCACCCATCCATATCA
GGCTGCTCAGAACCCAGCTCCAGGGGATCCAGTGCCCTCTTCTGGCCTCCCCAGGTATTGCATTTACGTGACATCATT
ACAATTTAAAAAGAGAGAAAAAAATAGGTAAAGGAATTTGCTGTGAAGCTGGAGTGTGGTACTTGACCCACGGAGAG
AACTGACTTCTGCATGCACACACACCATAACATAACAATAAATGTATGTGAAGCGAATGAATTTTTTAATCTTCCCCAA
AAGGGAAGAAGCTGGGCACGGTGGTTCATGCGCTGCAATTTCTGATGCTTGAGGGATGGAGGCGGGAGGAACAGTTCTCC
TCCTGTATTCCGGGTACACGGGTACACGAGCTGTCTCAAAACCAACATAAAACCTCAATTAACAACAACAGTCC
AGGGGCTGGTGAGATGGCTCAGTGGGTAAAGAGCACTGACTGCTCTTCCAAAGGTCTCAGTTCAAATCCCAGCAACCA
CATGGTGGCTCACAACCATCCGTAATGAGATCTGACGCCCTCTTCTGGTGTGTCTGAAGACAGCTACAGTGTACTTATG
TATAATAATAAAATAAATCTTTGGGCCAGAGCGAGCAGAGTTCTTAAATTTCAATTTCCCAACAACCACGTAAAGGCTTAC
AATCATCTGTACAGCTACAGTGTGCTCATATCCATAAGATAAAATAAATATTAAAGAATATAATCCAAAAAACATTTTAA
AAGTTAAATCAGAAATGTGTACAGGGAGCCGAGTCTCCTCCACCCACGAGGGGAAAGCATTTTGGATGATGGGATGC
AGATATGGAACCTTGGGAGGGGATGTCGTGTATGTGTGTGTGTGGGGGGGAGCTGTGTACAGCACTCATGATGCTGGTT
TTCTTTTCAGGGAGAGCCAATGGCAGGGTGCCCCGTCCTCAGGGTCCCCACGCTGTTCTCTGATCCTCCTGCTGTTTCCAGA
GCTCCACACGGCAGGCACCCCTTGCATCTGGATCCTCTGCCCGGAACCTGCCGGAGACCCACTCCCACCTCCCAGCTCT
GCACTGTGGGTGTCCCAGGCAAGCCATCATGGCCGTCGGGGCCTGGGGAAGAAAGACAGGGGCCAGGAAGGCCTAG
CCGGGGCCAGGAGGGGGCTGTGGTCACTGCTACCAAGCAGGCTTCCCAGATGACACTCGGACAGCCCCCTGCTGGCCT
TCTGCAGAATAAGGAGCTGCTTCTGGGGCTGACTTTGCCCTACCCCGAGAAGGAGGCCCGGTCTCCCGCTTGGGAGAG
GGTGAAGAAACGTGGCAGAGAACACAAGAGACGCAGGGACCGTCTGCGACTGCACCGAGGTAGCTGGAGACCTGGGG
GGAGGAGGGAACACACGGGAGAAGGCTCTAATCCAGTGCCAAGAGCAGGAAGTGGTCGTAAAGTCTGCGTGTAAAG
CCCCCGCGCCCCGAAGAGACCATTACAGAGGTCTCCACCTAGGGCAGAAGGGGTACCCAGAAGAGGGGGAGGCATCTTCC
TGAAGTCAGAGTGGCCTGGCAGGCAGGGAAAGGCTAAGGGAGAGACCTGGGAGAGAGACAGGGGTGAAAGAGAGGA
AACTGACATAGAAGTTCTGCTCCCTTAGGCAATCAGTCACCTTGCATCTGACCTAAATCCACCCTACTCACAGCTTCCCT
GCGTACAGACAGAACGGCTGGAGTCTTCTCCTAGCACATCCTTTAGTGAGCTCTGGAGCAGAGTCTGGGTGGAGAGCT
TGCGCTCTAAAGCCAGATCTGCTGAGACCCGTGTCTGACTCCGCTACTAGCGAGTTTGTGCCTTGAGCGAGTCCCCTTC
CTAAGCCTCGCTTTGTCTGCTGCAAAGATGCCACCCAACCTTAGTGCAAGAGGGAGCTGATGCTCACAAGCCTAGG
GAAACTGCTACTAAACCTTGGCTCCCCAGTCGGCATCCTCCAACCCTGAACACCAGCGACACCGTGTGGCGATCACTG
GGAGATGCGGCACAAAGCAGGAGAGAGGTTGACTTGGGATGGGGAATGCAGGACGTCCAGCCTGCAGTTGCTTGGTTG
TGAGACAAAGCATCATAGAAGAAGCCTAGAAGTACACCTCATGGTGCCAGCGGCCAGAGAAGGAGGAGGAAGAG
AGAGAAAGACAGATAGACAGAGAGGAGGGATGAGAGAGGAGAAGGGGAGGAAGGAAGAGACCGCAGGAAC
ATCTGGGTCCCCATATCTCCTTCAAAGACACCCTGATGACTCAAGTTTCTCTGCTAGGCCTCATCTCCCAGAGGCCCT
ACTGTTTCCATGGAGAGCCAGTGGCTGGAGAGCCAAGTTTTCTTTGTTTTTGTTTTTTTTAAAGATTTATTTTTATT
ATTATGTGTATGTGTGTGTGGAGGTGGGGTGGTGTATGTGTATGTGAGTATGGGTGCCACCAGAGGCCACAGTCATCAG
ACCCCCAGGAGCTGGAGTTAAACAAAGTTGTGAGCCGCCTGACATGGGTGCTAGGAATTGAACTCAGGCCCTCTGCAA
GAGCAGGACGTCTCTTAACTGCTGCATCATCTCTCCAGCCCCAAGACCAAGCCCTGGGTCTCGGGCGCATCAAAGACA
TAAACTTCAGTGTCTTGAGAGAGAGAAGTCACCGTCCCATGTCTGCCTGTGTTCAACCTTCTTAAACACTCTCTGCCT
CCATTCCCTGTGCTCCTGCGGTACCCAGGCCCAAACGAACAGTCTCCAGCAAACCTGAGACTACCAGCCAGCGGGC
CTCTGCCAGCCTCACCTGGCCCTGAGCCTGCACAGGCCACCTGTGACTGCCTGTAGGGGCAGAACAAACACGCCACA
GATGGGTTGGTGGGGTTCACAGGGTATTATTTCTCTAAGAAGAAACTGGAGCAGCCTCAGCCTGCTTCTCTGTGGATA
GCAACAGGAGTGGAGTAGGGCAGGAAGTGCCTCCCTGCCAGGTGACTGAGACCCCTACGTGGCAACACATGCCCTCC
CATTCTCGAGATCCCCTCTGCCAGTTTAGAAGATGTTGATGCCTTGAGGACTCACATGGGGCCCATAGTTTCCACGAAG
TGATGGCTTCAGTGAACCGCAGGGATGTCTGAGGGAGGGTGACATGGTGGCAGAGGGCAGGTGAAGTCCACAGGC
CAGGCCAGGCCAGTTTATCAGCATTTGGGAAACCTCAGATTGACTGGGGTTCATTCTGCAACTCCTCCAGCCTCTGTCC
TGGTCCCATTGCTTGTGACCCTCTGCTGACCCTGTGTTGTTCCCTGCCACTGTGAGTATCCCACACCCAGGTGTCTTCA
AGATGGCCCCAGGAGTTAAAGCATCAGGTTTGCACTCAGGACTGAGGTTCAAATCCACGCTCTGCCAGGCACGAGCT
GTTTGTCTTGGCGAAACTGCCTAACCTCTCTGGCTCAGGCTCCTCCCCGTTCATGAGCAGAGCAGCAACTACTTCTCA
AGAGTCCCTGGGGAAGTTAGATGAAGTCATTATCATGGAGGGGTTCACTGGGGACCCAGCATGCCAGGTGCAATATCA
AGAAGCACATGCGTGTGCATGCATGTGTACATGAGTATGTGTGTACGTGTGCGTGTGTGTGTGTGTGAAGCAGTGGCTCT
CCTCCCAGCTACCTCAAAGGCTTCTCCCCAAGCAGTGTCTTCAACCTCCATAAACCTCACCTCCTCCAGGAAGTCTTCTA
TGATTTTATGTAACCTGGCCAACCTCAGGCATCCTGAATCCAGACTTACTAGAATGTAGCTTCTAGTGGAGAATCCTCTGT
TCACACACCGACCCCTCCCCAATGACAGGTCTCTAGCAGGGTAGACAGCAAGGATGATGGGTAGATCAAGGGCTCATG
ATGCCAGCAGCCCTTGGCTTACACAGTACACAGTGGGGTGGCACAGCAGAGAAGACAGGATGCCCTGTAGGTAGACA
CCGAACAGCAGGTGGGTACGCCTGTGCTTGCCTTGTCTCAGGCCGAGCTGCCATCCGTGGCCCCAGCTCCCTCATGAAG
AAGGTGGAACCCTCTGAAGACCGGATGCTGGAGGGTACCATGGAGGAGTCTTCCACTAGCCTGGCCCCCACCATGTTT

TTCTGACCATGACAGACAGCGGCGCCACGCCTACTACAGAAAGAGTCCCGGATCCTGCTGTACAGTCTTTGCGGCCCCAGG
TAGGGGCCCCACGAGGCCTTGAATCTGAACACGCCTTTAAGCCTCATGCAAGCTGCCTGTCAGGGTTCCCTAGATGAAC
AGAGTGATAGTGTGAATGTAAATATCTAGGGATTTATTAGAGTGGCTTACAGGCTGTGGTCCGGCTAGTCCAAAAGCA
GCTGTCTCCCGATGGAAAGGCAAGACTCCAAGGCTGGCTAGCTCAGGGGATTTTGGGCTATGTTGGATTCTGAAGGAG
CAGGTTCTAAGACCAGCAAAGGAATGCCTCAGCAGCAGGATAGATGAACTTGCCAGCGAGAGTCAGGGCAAGCAGGC
AAAAAAAGCAAACGCTTCCTCCTTCCCTGTCCTTTCTTGGAGGCTACCTCAAGAAGGCGTGGCCCACACTTGAGGTGGG
GCTTCCTGCTTCAACCATCCAGTCAGGAGAAGTCCCTCACAGGTGTGCCAGCTGCTTGAATTGATTACCTCCTGTTCC
ACTTAGGTAAACTGAGGCACAGCGGGGTGGTAGTGAACACCGTTAATCTCTGACTCCACCAGGTAGTCTGTCTGTAGAG
GGGCTGCCAGCACCCAGACAACATGGTTGGGGCTCGGGCTGGGGACAACCAGGAAGCCAATTCCATCTCAGCATGCTG
TTCTCTGCACACACAGAGGTGGGACTGTTGTGGAGGACGTTTAAAGTCTGGAAGAGTACAGAAAGCAGCCACGGTGAT
TTAAAGCCCAGATCTAGGGACTAAAGAGATGGCTCAGATGTTAAGAGCACTGACTGCTCATCTAGGGGTCTCTGAGTTC
AATTCCCAGCAATGCTCACAACCATCTGTAATGAGATCTGATGCCCTCTTCTGGTGTGTCTGAAGACAGTGACAGTGTA
CTCATATAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATCATTTTAAAAAACAGATCTAGAAT
GGCATAGTCAGTTGGGGGGTTGACTTATCTACTCCCCAACTCTGAAAAAGAAAGTGGAAGAAAAACAGGGGGAGCAG
GGGGTTGGGAGGGGATGACAAATCTGGGGGTGGTGATTCTAGAAAGAAAGGACAGGCATTACCAGGTCATTCTT
GCCGATAGCTTAGAAAGTTTGTTTTTGTTTTCAAAATAAAATCTTTTCAAGTGCCAGATGTGGTGTCTTACATCTACAATCC
CAACCTTTGGGAGACAGAGGACAGGGGCAGTGGCATCACACAGAATTGAGGCCAGCCTGGGCTACAACAGCAACTC
TCGGCCAACCTGGGCTATGAAGTGGGACCCTGTCTCAAAACAAACTAAACACTGTTTTGCTTTCAAAATGAAGTAATAC
CATTGAAATGGATCATATATATATGTATATTGATGAGATAGAATACATATGTGTATATTGATGAGAATACAATATTACA
ATATGTAGCTCTGATGGTAAATGTTTCCTTAGCATGCCTGGAGCCCTAGGTTTGATTCTCAGCACTGTATAAAATAGG
CAAGCTGGTACGTGACAATTATCCCAGCATTTCGGGAGGTGGGGRCTGGAGGATCAGGAGTCTGAGATTGTCCTTGGCT
ACACAGTGACTTTGGGRCCAGTCAGGGCTCTGTGATATTCTWCTTCAGAAAGGAAGGAAGAAAGAAATGGAGGGRA
GGGAGAGAAAGAGAGAGGCAGTGCCACTGCTGTGCCGCTCTGTTTTGTGAGTTCTTGCTCATCTCTTGCTGTGCCTTGT
TAAACTGATTGTTTTTTATTTTAATCTATGTTATGTTCTGTGGGGAGGGTGATATACACACATGAGCRGAGGTRCCTTTG
GAGGCCWAGGYACCACATCTCCTGGAGCTGGAGTTACAGGCATTTGTGAACCACCTGACGTGGGCRCTGGGAAGTGA
ACAGCACTCGGGAGGCAGAGGCAGGCAGATTTCTGAGTTCAAGGCTAGACTGATCTACAAAGTGAGTTCCAGGACAGC
CAGGGCTACACAGAGAAACCCTGTCTCGAAAAAAGATGTGTGTGTATGCACGTGTGTGTGTAAATAGT
GCACATACAGGCTTTAGCTCTTCCAGGCATCGCTGTCAGGTTGGACCACATCTCCTGAGTATCAGGAGACGGCTGTAGA
TATTCTTTGTCTCTTTCTTTCATCTTGGCATCCTGAGAGTCAGGCCAACGCCGAGGCCATGAGCAGGTAGTTATGGTCCG
TGCCTCGCTGAACCCTAGTGATCATGGACATGAGCACTCAGCCATAGTATCTGGTCTCAGTAGTCTCCAGACTATTGG
TGGGGGCTGTGAGTGGAATTGAAGGCTGTGCATGGTCTCTACAGGACTCTTCAGAGGAAGGGACAGGGAAGTGAGCAG
TGGGCCACGTCTGGTTCCCTCCCTGACGTGTTAGAAATGCTGAGCAATCAGAACAGCCTCTCTAGCCACTATCTTGAC
ATCTTCAGCATGGATTCCAGGATCCAAGCAGAAAAACAAGGTGGCCTTGTCTCTGGCCTCTGGCCTTGAGATCCCAGGT
TCCCAGTCCCTTCACTTCGAAGGCTCCAGGTCCCCTCTCCTGCCTTGACTTCTGCAGACACAGCCCAGGTCTGACGGGG
AGGTGATGCCCACACTGGACATGGCCTTATTTGACTGGACGGATTATGAAGACTTAAAGCCAGAGGTCTGGCCTTCTGC
AAAGAAGAAAGGTATGTCCACTTTGCCACCCCAACCCACACTTAGACTCCTTTCCAGCATCTATTGGTGGAGGACGT
TTGCTGAGACCAGAATTGACCTACAGGTATCCCAAGGTGGGCTGGAGTCCATTGATCTAAAGTGGACCTGACACTCAGT
GGACAAGCCATAACCCTCACTCACTGACGCTACTCGGGCCCCCTTGTCTCTTTAGGGAAGAAAGTAAAAGCAGAGAGA
GAAAGAAAGGCAGAGGGTCTCGTCCAAGTCGCACCGTGGGAGTGGCCATCTGGCACCATGACACCCAAGTCTTGTGCT
TAATCTAATCACAAATTTTCTTGTCCCCAGAGAAACACTGGAGTCATTTTACCAGTGATGGTAACGAGACCTCGCCAGC
TGAGGGGGATCCGTGTGACCATCACCAGGATTGCTTGCCAGGTATTCTGCCCCCCCCCAACACCCACCCTTGAGGCA
CCAGGCTGGGAGGGAATACCAGTAAGGTAATTGAGACAGGGCTTGGGAGCAAGCCAGGGAGTAGTGGCCCTTTATTTCG
CAATACGGAGAAGCTACAGTGTCCACCAGTTTTTCTGAGGGTCTTATCAGCGGCCACCAATTTCTGAGAGTCACTA
CCATACACTGACTCACAGAATGACCTCAGAAAGAGGTGGTGGAGGGGGAGGGCAAGCGAGCCTGGGCCAACTTGGTTC
CTAAGCTTCTTACCCATATCCCACCCTGCCCTGAGTCAGATGGCCTGCTCCTAACCTTGTCTCTGAACACCCGCAGGGG
TTAATTGAGTCTCCTCATCATGGCACCAACTGGCATTCTGGGGACAGTGTAAGTGACACTGTTGCTTGTTCACAGCTCT
ACCTATCAGGTCAGGATAAATGGAAGGGGCCCTTCTGTTTGATTAGAGTCCGGRCTGATGGCCCTGTGGCATCCAGAGGA
CCTCTTACAGAGCAGACTGGGATAGACTTCGATGCTGTGGAGGGGAAATGCCTACCATCAGAGCACTTGGGAGGTGGAG
GCAGGAAGATCAAGAGTTCAAGGTCGTCTTGGGGGTACAGAGAGAGTTCCAGGCCAGACCCTGTCTTGGGTGCTTATC
TAGGACATTGGTGGTTATATTTATTAAGGCCAAGAGAGGAAACAAGATGACAGGAAAACCTCGGGTCTGATGTCATGC
TGGCTCTGCAGGAGCTGTGGAGAAAAATCCTGCCAGAAAAAGCCCTGTGCTGAGCAGAATGGTGGCCCCGGTGCTGGCTG
GCGGTTGCCTGAAGCTGCTGAGGAAGGGGTGGTTGGGACATGAGCCAAGGTGGCCCCCTGAAACTGCTCACAGCAGGAG
ACCAGTGACTCATGTCCCTTCTTGCCACTAAATAATGAGTGCTTTGGGAGACGAGAGGGAGCTGGAGAGACCCAAGGA
GCCATCTCCAAGGCACCAACCACATCAGTAGGAGAGTCTGCAAAGTAGAAGCCATTGGCATTGCAGAAGACACACAG
CACAGACAGGCTGTTGTCATCCTGAGTGTGAAGAAAAAGTGAAGTCAGGGCCAACAGGACAGAACTTGAAGCTAG
CTTTGTAATGGGCAAGAGATGCCTCGGCCCTGCCTAGATTTGCCCTGAACCTTACCTACCCACAGCCAGGGCTTCA
GTTTCCCCATCTGTCCAAGAGGATGTTGTTGGTCCATGATCCCCGAGGCCCCCTGCAGCTCTCAGCAGACTCTACCTCTG
GCACCCCTAGCTGTTACAACCCCATCCCTGGGAAGTAAACCCACACCACCTTTGATCCTCCCATGATCAATCAAGTGG
CCCATCTGGGGAGGCTCAAGTCTCTGCCACCCGCTCTCTGGGGACTTTATCCATGACATCCAGCAGCGGTCCCCGGCCCAG

AGCCTTGCACACCAGATGGCCTGCTAGGGCATGGCCTGCCACACATATGATGGATCTCCTGTCCGGTGGGACTCTGTAG
GGCAGGGCGCAGGCAGGGAGGAGCCGCTCAGCTTGGCTGACCACATGTGCTTGTATGTTGCCAGGAACCTTGCTGTGA
CCTCCGGGAACATCTCTGCACACCCCAACACCGCGGCCTCAACAACAAATGTTTCGACGACTGCATGTGCATGGAAGG
TCAGTCTGGAGCCTGGGAAGGGGAGAGCCCTCCCCACCGACTCTGCTCCCAGAACCTTGAAGCCTTTGTGTCCCAGCC
AGCTCCGCAATGAGTGGGGCACGGGGTTTCCCCGGCAGAGGGTGGATGTGGATGGAGGGGCTGCGGAAAAGGGAGTG
GGTAGGAGAACCCCTGGGAACCTGAARGCTCCAGTAGGAACAGCTTCGCTGGGGYCTTCCAATCTGTCAGCTCCGTGT
GCTTCCATCCCTGGCACYGGCTCCCAGATTTGTATTTCTCACCKCTTGAAATCCAAGCTGGCACGATCGCTCGGGATCA
GGACGGGGAGAAGGGAGGAGACAAAAACATAGTTCTTTAAATAAGATCCAACCTGAGAAGGCTGGCGCTTCTCAGTA
GAATTCTAGATAGGAGGCTTTCCAGGTGAGATAGTGGGGAGGCTGGAGCTGGGTGGGTTTCCAAGCAGTCACTGGGAG
AGGCTCGCTGGGTTATTCTTTAACTGCCCTGAGCACCAGCCTTGAGAGGAAGCGTGTGCCACCGCGCACATGTGCCT
GTTGGTCTGCTCTACGCTGAGTTCTTTCTTTCTGGAATAGTTCTAAGGCAGAGCTATGCTAAATTGCATAGACCGTT
CTCAAAGTCATGATCTCCTGCTTCAGCTCCTCAAGCAGCTAGATTACAGGCTATGCCACCATTTGCTGGCTCTCTCTTT
CTCCTTCCTTCTTCTCTTCTTCTTCTTGTACTATCACAGGTAGAAAGAAAGGATCAAGGAGGAGAGAGGGAAAGAGG
GAAAGGGAAAGAAATGAAAAGGAAGAGAAAAATTGGCTATGTCCGTATAAACACTTGCAACCGCCAGCACTTGAGAGT
CTGAAGGGCGACATCATAAGTTTGAGTCCAGCATAGGATGCACAGTGACACCTGGCTTGGAACAAAAACAACTAGGAC
TAGCAATTGGTTGGGCATGTAAAGGGCTTGCCCTGCCAGCCTGATGACCTGTATTCAATGCCTGGAATCTGTATAAAGG
TGGAAGGAGAGAGCCAAGCAAAGTTGTCTTTTGCCCTTCACCTGCACAGTGACACACAGACGCACATCAATAAACAA
AAATAAATGAAAATGAACCAAAAAAGGAAGAAAGGGGAGAGGGAAAGAGGGAGAGAGAGAGAGAGAGAGAGAGA
GAG
GCAGGAGGATAACGAGTTTGAAGCCTTCTCTGCAACTTAGCATAACTCTGCTTCAGGAAAAAAAAAAAAATTTGGAGAT
AAAATCTCTCAGGCGTCAGAGGCAGGTGGATCTCTGTGTTCAAGGCCAGCCTGGTATACATATTAAGATCCAGTTTCTA
AATGAATACATAAATTGCTGAAGGTGTAGTTCAGTGGTAGAGCTCTTTCTTGAAGGCCTCGAGTTCAATCCCCTACCC
ATATGAAAGGCAGAGCCAGGGATGGGGAGATGGCTCCGTGATTAAGAGCCCTTGCTGCTGTTGCAGAGGACCCAGGT
CAGTTCCTCACAGCAATATAGCAGCTCACTACCATCCAACACTCCAGTTCCAGGGGATCTAGTGTCTCTTCTGACCTTC
AGACACCAAACAATTATGTTGGTACGCATACATAACAAGCAGACAAAACAATCAAACCTCAAATAAATCTTTGTTGTTT
GTTTGTCTGAGACAGGGTTTTATGGTATAATAGCCCAGGCTGGTCTGGGTTTGCTTTGTAGACCAGGCTAGCCTTGAAC
AACAGAGATCCTTTTCCCTCTGCCTCCTGAGTGCTGGGATTAAAGGTATGTGCTGTGCTGGCTGACTTCAAATAAAT
CTTAAAGAAAAATTTTAAATAGAGAAGGATGAAGGAAATAAGTGGAATAAATTCTAATTGCATCTTCGGAGAATCT
TCAGACTGACACAAAAGTAGCCATAGTATCATTGAGTACCTGGTTCCCACCACTGAGATTCAATAAGACCAACGTGGC
CATCCTGAATGGGGCTGTCACTGCCACAGGCTTCCCTGTTTCAATCGGATCTTTATTTATTTATACAGTATTTATTTCCG
CACGCAGCTCTGAGAGATAAGCACCCTTTTAAATACAAGGTATCAGAATGGACAAGCCAACCAATTACAGCCTGCATT
CCAGGCTCTGAGAGCACAACCCTTCCCAGCTGGTCTGTGAACCTGAGCCCCGCTCCAAGTCTAGTTCACAGCCTCAGA
AGAGCCCCGTGCCATCTCCATTCTGAGGTCCATTCCAGTGAAGTGAGATAACAAGAAAAACAATCCATAGATAAGCT
GTCCCTGGAGCCAGGCACGGTGGCACAGGCCTGTGATCTCAGCATCCAGAGCTAGAGACAGGAGACTCATAGCTTCAA
GGTCATCTTCAACCAGCTATGGAATATCACCCAGGGCAGCCTAGGCTATAGAGGGCCCTGTGTCCATCCCACTACACT
ACACCCACCCCCAAAAAGAAAAAGAGAAAAAGAAAGTCTTGAATGTGATAAGGTCTGTAAAGGCTGCTTTTCTCTA
GAAGGTTAGTAGGTAGAGAAGAAGGATAAAGGAAGTTTCCAGAAGAGCCACACTGTGTTGCCCTTGTTTAGATTTTGT
TGATTAGTGATCGGAAGTAATGCCACACTTATACAGAGAAGTCACATGGTCTAGCCGCTGTGTTTAAAAGATAGCTCT
GGTAAGCTAGGTATAGTGACAAGGCTCACTATAGCTTACCTAGCATAACCCTAGGCCCTGAGTTCTGTTGCTGGTGAAAA
TTTGGTGTACGTACAATCTAAGCTTGGGAGGTAGAAGAACGGTTGGGAGTGGTTGGGATATCAAACCTCCATTCTCAGTC
GGCCAGCCTTGAGGCATGAGACCCTGTGTCCCCCCCCCCCCAAAAGCTATCTCTGATTGCAGAACTGGGGACAGTTGA
GGACAGGGAATAGGCTGGACGAGTGAAAAGATGTAAGATGCTGTTGCCTGTGTCCAGAGCACCGGCCACTTCGCAGAG
CGGCAGACAGGGGCACAGTATATAGGTGAGCCACTGAGGCCTTGGTGTGTCCTGGTAAGGGGGCTGTGGGAGGCTCT
CACGGGGAAAGCCTCCTCTGTGGGCCTCAGATGGCAAGCTGCTCACACTGCTTGTCTTCTAGGGATCCTCCAGGTGTC
TGCATCCAGAGCCTAATTGTGTCTTCTGTACTGATTAGTTTACCCAAATTCCTACTTCTTCTTGGAGACTCAGATTCC
AGGAACAAAGGGGAGAGTGGAAGCTATGATTTGGATAGCTCATTAAACATTAAACATGGCCAGAAAGTAAGGGGGTT
CACCCAAGATGCCACTCAGGAAGGACCTGAGAGGGACCAGAGCAGGCCAGGCCAGCAGAGTCTGGAAGCTCCTAATG
GCTTCTGTACCGCCTAACATTCCTGCTTCTACAACCTGGCCCTCTACTGTCACTTTGGCCAAGTGTGGGCTTGGGGCT
GGGGATCTGGCTTAGCTAGCAGAGCGCTTGTCTAGCTGCAGAAAGAATTGGGTCACTCACTCAGCACCACATAAAACT
AAGCTTGGTGGAGCACTCCTGTGATCTCAGTGCCTTAGAGATGGACATAAGAGGATCATGAGGGCCAAGGCTATCCTC
AGCTACAAAGCAAGTGGAAGGCCAGCCTGGGTACATGAGACCTTGTCTTCAAACCGTAACAAATTCTAGCCTTCCAAT
CACAAACTTCCCAGCAGCCCCCTTTGCCCTCCAGCTTGAAACAGAGGTATCCTCTCACTCTGAGGTCACTTCTGACCCTGA
AATGCAGGGGTTTCTTGGGCCACAGAGAACATCTCCTTTTCATGTTATCAGGGGGATGGGACCTACTATGATCTTAAATG
AAAAAAAAAAAAATATCTACTCACATCTCAGGTAGACTAAAGCCCCGATAAACAGAGCCACGGGCAAGATACCTACCCA
CTGGTGTGAGCAGGTTACACTTAATTAGGTGACATCATGTGTTTGTGTGTATGACGGATGAGCCTGTGTGGTGTGTGTT
TGAGGTATTTGTGTGTGATGTATGTGTGTGTTTGTATACGAGTGTAGAGGTGCATGTGCCAGGCTCATGTGTGGAGACA
GAGGACAATCCTACGTGTCAGCCCCTGCCTTCTACCTTGCTAGAGACAGGGTCACTCGTTTGTCTGTATGTATGCCTTTT
TTTGTGTTGTTTGTGTTGTTGTTGTTTAAAGATTTATTTATTATATGTAAGTACACTGTAGCTGTCTCAGATACTCC
AGAAGAGGGCATCAGATTTCAATTACGGATGGTTGTGAGCCACCATGTGGTTGCTGGGATTTGAACTCAGGACCTTCA

AGAGCAGTCGGCACTCTTAACCACTGAGCCATCTCACCAGCCCCCTGTTTGTGTTTGTGTTTGTGCTTGTTCTTCCCCGAA
GACAGGGTTTCTCTGTGTAGCCCTGGCTATCTTGAACTCACTCTGTACACCAGGCTGGCCTTGAACCTCAGAGATCTGC
CTGCCTTGGATTAAAGGTGTGCACCACCACCGCTGGCTGTGGGTGCTGTCTGGCCAAGCAATCCCATCTTGCCGTAGA
AGCTTTGTAGTCCCTTGCAGATGCACTACAGAGTCTGGCTTTTTACAGGAGTTCTTGGGATCTGAACATGGGTCCCTAAT
GTTGGCAGGGCAATCAGTTTACTGCCTAGGCCATCTCCCCATATGGTGAGAGATTTTATCTCTTGATTCTGGGCCTAGG
GCTTTCTAAGCAAGTACTCTATACCTGGCCTACAGCTTCAGTCTTTCATTTGTTTCGTTTAAATCTTTTGGATTTTTTTTTT
GAGACAGGGTTTCACTGTATAGTTGGCTAGCCTGGAACCTTACTCTGTACACCAGGCTGGCCTCAGAATCAGTGATCCAT
CTGCCTCTGCCTCCCAAATGCTGGGACTAAAGAATGGGCCACTATGCTCAACTTTTTCCACCTAAATTTATGAGGTTGTG
TGTAAGTTCAGCGATGAGTGTGCTCTTAATATCCACAAGCCCCACATTCAACATTTAAGTTTTGTTTTGTTTTGCTTTGAG
TCTGCTATGTAGTCTGGTCAGCCTCAGGCTAGATTCAAACCTGCTGCTTCAGCCTCCTTAGTGTTAGGATACTGTACAG
GCCTGTGTGACCAAGCCAGTTTCTTAAGTCTTTTCAGGCTCGTGTGTATGGGGGCTGTTGGATGAGAAGCCTGGGAAGG
CTGGAGGGGAAGAAAAAGAGGAGACTGTCACCCTCGGTTCTGACTTCCTTGCCTTCTTCCACTCAGGGCTGCGTTGCT
ATGCCAAATTCCACCGGAACCGCAGGGTCACTCGGAGGAAGGGGCGCTGCGTGGAACCGGAGACAGCCAACGGGGAC
CAGGGATCTTTCATCAACATCTAGTGCCCTAGTGGTGCCTCCCCACCGGCCCGGGTCTGAGCCAGGGAGGTTTAGGAC
AAACAGGACCGTGTTAGTAAGTCTAGCTCAGCTTGGGCTGAGTAGGGAACCAATGGCTGAGGCAGCAGGTGTACGCCAG
TACACTCAACCACAAGCTGGAGAGCGGTTTAGCAGAGAGCAGTGCGCCAGAGCCCGCCCGCCGAGTCCGGGGTGGG
ACCCCCACCTGCTCCCTGATTCTGCTCGACTCGGCGGTGGCTTTGTGTAGCGCACCCCTCTTCTGCTCGACACCAGCATTG
CAGCAGTTTCAATTGGCGAAAACAAGAGGCTTCCTTGACTGAAAAGGGTTGGAAAGAGAGGGGACAACCTGACAGTCCT
GGATCTGGAATGCTATGTGCGCAGGCAAACGCCAAGCGCCACATGTATTTTTACTGAATTTCCACAGAGACCGTGGAAG
AGACCACTGACCCGCACCTGAGGTGCGCGATCCACGTTTCAAGTCCCACGTCATCCATGATCCTCCAGTTTGGCCAC
AGAGACTAGACTTGACCTGTTCTCAGGCTTTTCCCAAGAGAGACTTATGTCTTTTTTGTATGGACTGAGTCTCACTCTTTG
GCCAAGCTGGCAACTCAGACAATCCTCCTGCCTCAGTCTTCCAAATGCTGGAATTATAGGCATGGGTGAGCATATTTGG
CAGGTGTATCTTCTTAAAAACAAGACATTAGGGCTGGGGATGTGGCTACGTTTGTAACATGCTTGCCTGGAATGCATG
AATCCTGCCCAGGCTGGACTTCTTCTGATTAGTGAGTGTGAGGCCAGACCACAGCAGACTGCATCTCAAGCAAAACAA
AGTAAGCTGTTTGCCTCACCTGCGCGAGGCCCTGGGCTTGCTCCCATTCGTTTCCCCCTCCTCCCACTTCTTTCCCTCAG
CTCTACACAGGGCACCTGTTTTCAAGTGAAGAATAATCCCCATGGCTGGGTGCTTGCATGTGACAGGTGCTAATCATC
ATCATGAATAGGAGAAACAGTAACGTTGCTCTGCTCCTATGCTTATCCATAGCCCAGATCATCCAGTCCCTGAGACGCCA
CGTCACTCCCTCCTCAGTGGTCTCAGTCTCTGCTCTGCTGCAAAGGCATGCACACACGTCCCCACATGCTCGCCAGAC
ATACTGTGTAATGACTCTCACCCCTCCATCCCTGACACTCCATCCTTACATCAGCAGCGATGCCCCCTTGGAAGTGGG
GCCACCTCTGAGTCTGGGGTACAGCGTGAAGCACCCCTACAGGCTAGAACCGTGACGACAAGCCCACGCTTACCGGCA
CTACTCAGGACATGTCTCAGCGGATCTGAGATCCCTGCGCCTGGCATCTCCGTCTGATCAACTTTTGCGAAGGACAAA
AGCCTTCCCAGGACAAGCCCTCCCCAGCCTGGACCTCACCCGTGGGATGCCAGGGCTGTTTACTGCTTTGGGATAACCA
GTCTGGTCCAGGGTCAGGCTCCAAGGAAAGCTGGCAGATCGAGAAGAAATCAAATATGCTTGTTCTTCTTTCCAAGCTG
GGTCTGATAGGCCCTGGGGAGTGGGCGGGGTGGGGGCGGGGCCAGGAGTCGGAAGGATCAAGGCCAAGGTGGGAAAGC
AAGTCCTAATACAGATTTCTTTTCTTTTTTGTAGTACCAGACGCTTGCACGGTCCAGGCAAGTGCTCGACTACTGAGTT
ACGTGCTAACTTGGTCTGGGCTTCAAAGTCTCCAAGCTCCCCAGGGAGCTGCCTTGGTCCCCTGTCTTCTCACCTGCT
GCAGTAAAGAGCCTGTTCTTCCAACCTCACTTTGCTGACCTTAGGGAAGTTACTTAAGGTCTCTGTCCCTTGACTTTTCAT
GTCTGGTTCTTACCAGGTGTTTAGTACAGTGTCTGGCCATAACACACACACACACACACACACACACACACACACACACA
CGCACGCACGCACACACGCACACACGCGCACATGCACACACACCTAGAGTGCCAGCTAACAACCGTCAACGGGCCTTT
TCTTCCACAGTGATCCATCATATAGCTAGTGATTTTTCTAAAAATTGATGTCTCACTACACAGTCTAGCTGATCTGAAA
TTCATAACGTAGACCAGCTTGGCTTGGCTGGGACTCACAGGGATCTGCCTGCCTCTGCCTTCTGCCTTTCTGTCTGGG
ATTAAGGTGTGCATCTCCAGGCACAGTTCAGGATGCTTTCTTCTCTGGTTTCTCCA

Selection Cassette:

CGCTCTAGAGGCCATAGCGGCCATTTAAATGGCGCGCCGGATCCCGGGCCGCTCTAGCTAGACTAGTCTAGCTAGAGA
ATTCCGCCCCCCCCCCCCCCCCCTCTCCCTCCCCCCCCCTAACGTTACTGGCCGAAGCCGCTTGGAATAAGGCCGGT
GTGCGTTTGTCTATATGTTATTTTCCACCATATTGCCGTCTTTTGGCAATGTGAGGGCCCCGAAACCTGGCCCTGTCTTC
TTGACGAGCATTCCTAGGGGTCTTTCCCTCTCGCCAAAGGAATGCAAGGTCTGTTGAATGTCGTGAAGGAAGCAGTTC
CTCTGGAAGCTTCTTGAAGACAAACAACGTCTGTAGCGACCCTTTCAGGCAGCGGAACCCCCACCTGGCGACAGGT
GCCTCTGCGGCCAAAAGCCACGTGTATAAGATACACCTGCAAAGGCGGCACAACCCCACTGCCACGTTGTGAGTTGGA
TAGTTGTGGAAGAGTCAAATGGCTCTCCTCAAGCGTATTCAACAAGGGGCTGAAGGATGCCAGAAGGTACCCCAT
GTATGGGATCTGATCTGGGGCCTCGGTGCACATGCTTTACATGTGTTTAGTCGAGGTTAAAAAACGTCTAGGCCCCCC
GAACCACGGGGACGTGGTTTTCTTTGAAAAACACGATGATAAGCTTGCCACAACCATGGAAGATCCCGTCGTTTTACA
ACGTCGTGACTGGGAAAACCTGGCGTTACCCAACTTAATCGCCTTGCAGCACATCCCCCTTTCCGACGCTGGCGTAAT
AGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGCTTTGCCTGGTTCCGG
CACCAGAAGCGGTGCCGAAAGCTGGCTGGAGTGCGATCTTCTGAGGCCGATACTGTCGTCTGCTCCCTCAAACCTGGC
AGATGCACGGTTACGATGCGCCCATCTACACCAACGTGACCTATCCATTACGGTCAATCCGCCGTTTGTTCACCGGA
GAATCCGACGGGTGTTACTCGCTCACATTTAATGTTGATGAAAGCTGGCTACAGGAAGGCCAGACGCGAATTATTTTT

GATGGCGTTAACTCGGCGTTTCATCTGTGGTGCAACGGGCGCTGGGTTCGGTTACGGCCAGGACAGTCGTTTGCCGCTCTG
AATTTGACCTGAGCGCATTTTACGCGCCGGAGAAAACCGCCTCGCGGTGATGGTGCTGCGCTGGAGTGACGGCAGTTA
TCTGGAAGATCAGGATATGTGGCGGATGAGCGGCATTTTCCGTGACGTCTCGTTGCTGCATAAACCGACTACACAAATC
AGCGATTTCCATGTTGCCACTCGCTTTAATGATGATTTACGCCGCGCTGTACTGGAGGCTGAAGTTCAGATGTGCGGCG
AGTTGCGTGACTACCTACGGGTAACAGTTTCTTTATGGCAGGGTGAAACGCAGGTCGCCAGCGGCACCGCGCCTTTTCGG
CGGTGAAATTATCGATGAGCGTGGTGGTTATGCCGATCGCGTCACACTACGTCTGAACGTCGAAAACCCGAAACTGTG
GAGCGCCGAAATCCCGAATCTCTATCGTGCGGTGGTTGAACTGCACACCGCCGACGGCACGCTGATTGAAGCAGAAGC
CTGCGATGTGCGTTTCCGCGAGGTGCGGATTGAAAATGGTCTGCTGCTGCTGAACGGCAAGCCGTTGCTGATTTCGAGGC
GTTAACCGTCACGAGCATCATCTCTGCATGGTCAGGTCATGGATGAGCAGACGATGGTGCAGGATATCCTGCTGATGA
AGCAGAACAACTTTAAACGCGCTGCGCTGTTTCGCATTATCCGAACCATCCGCTGTGGTACACGCTGTGCGACCGCTACGG
CCTGTATGTGGTGATGAAGCCAATATTGAAACCCACGGCATGGTGCCAATGAATCGTCTGACCGATGATCCGCGCTGG
CTACCGGCGATGAGCGAACGCGTAACGCGAATGGTGCAGCGCATCGTAATCACCCGAGTGTGATCATCTGCTCGCTG
GGGAATGAATCAGGCCACGGCGCTAATCACGACGCGCTGTATCGCTGGATCAAATCTGTGATCCTTCCCGCCCGGTGC
AGTATGAAGGCGGCGAGCCGACACCACGGCCACCGATATTATTGCCCAGATGTACGCGCGCTGGATGAAGACCAGC
CCTTCCCGGCTGTGCCGAAATGGTCCATCAAAAAATGGCTTTCGCTACCTGGAGAGACGCGCCCGCTGATCCTTTGCGA
ATACGCCCACGCGATGGGTAACAGTCTTGCGGTTTCGCTAAATACTGGCAGGCGTTTCGTCAGTATCCCCGTTTACAG
GGCGGCTTCGTCTGGGACTGGGTGGATCAGTCGCTGATTAAATATGATGAAAACGGCAACCCGTGGTCGGCTTACGGC
GGTGATTTTGCGGATACGCCGAACGATCGCCAGTTCTGTATGAACGGTCTGGTCTTTGCCGACCGCACGCGCATCCAG
CGCTGACGGAAGCAAAACACCAGCAGCAGTTTTTCCAGTTCGCTTTATCCGGGCAAACCATCGAAGTGACCAGCGAAT
ACCTGTTCCGTCATAGCGATAACGAGCTCCTGCACTGGATGGTGGCGCTGGATGGTAAGCCGCTGGCAAGCGGTGAAG
TGCCTCTGGATGTCGCTCCACAAGGTAAACAGTTGATTGAACTGCCTGAACTACCGCAGCCGGAGAGCGCCGGGCAAC
TCTGGCTCACAGTACGCGTAGTGCAACCGAACGCGACCGCATGGTCAGAAGCCGGGCACATCAGCGCCTGGCAGCAGT
GGCGTCTGGCGGAAAACCTCAGTGTGACGCTCCCCGCCGCTCCACGCCATCCCGCATCTGACCACCAGCGAAATGG
ATTTTTCATCGAGCTGGGTAATAAGCGTTGGCAATTTAACCGCCAGTCAGGCTTTCTTTCACAGATGTGGATTGGCGA
TAAAAACAACCTGCTGACGCCGCTGCGCGATCAGTTCACCCGTGCACCGCTGGATAACGACATTGGCGTAAGTGAAGC
GACCCGCATTGACCCTAACGCCTGGGTGCAACGCTGGAAGGCGGCGGGCCATTACCAGGCCGAAGCAGCGTTGTTGCA
GTGCACGGCAGATACACTTGCTGATGCGGTGCTGATTACGACCGCTCACGCGTGGCAGCATCAGGGGAAAACCTTATTT
ATCAGCCGGAAAACCTACCGGATTGATGGTAGTGGTCAAATGGCGATTACCGTTGATGTTGAAGTGGCGAGCGATACA
CCGCATCCGGCGCGGATTGGCCTGAACTGCCAGCTGGCGCAGGTAGCAGAGCGGGTAAACTGGCTCGGATTAGGGCCG
CAAGAAAACCTATCCCGACCGCCTTACTGCCGCCTGTTTTGACCGCTGGGATCTGCCATTGTCAGACATGTATACCCCGT
ACGTCTTCCCGAGCGAAAACGGTCTGCGCTGCGGGACGCGCGAATTGAATTATGGCCCACACCAGTGGCGCGGCGACT
TCCAGTTCAACATCAGCCGCTACAGTCAACAGCAACTGATGGAACACAGCCATCGCCATCTGCTGCACGCGGAAGAAG
GCACATGGCTGAATATCGACGGTTTCCATATGGGGATTGGTGGCGACGACTCCTGGAGCCCGTCAGTATCGGCGGAATT
CCAGCTGAGCGCCGGTCGCTACCATTACCAGTTGGTCTGGTGTCAAAAATAATAATAACCGGGCAGGCCATGTCTGCC
GTATTTCGCGTAAGGAAATCCATTATGTACTATTTAAAAAACACAAACTTTTGATGTTTCGGTTTATTCTTTTCTTTTAC
TTTTTTATCATGGGAGCCTACTTCCCGTTTTTCCCGATTGGCTACATGACATACCATATCAGCAAAAGTGATACGGG
TATTATTTTCCGCTATTTCTCTGTTCTCGCTATTATTCCAACCGCTGTTTGGTCTGCTTTCTGACAAAACCTCGGAACCTG
TTTATTGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTACAAATTTAATTAAGGCCGCGGGATCGA
TCCCGTCGAGCAGTGTGGTTTTCAAGAGGAAGCAAAAAGCCTCTCCACCCAGGCCTGGAATGTTTCCACCCAATGTCGA
GCAGTGTGGTTTTGCAAGAGGAAGCAAAAAGCCTCTCCACCCAGGCCTGGAATGTTTCCACCCAATGTCGAGCAAACC
CCGCCCAGCGTCTTGTCAATTGGCGAATTCGAACACGCAGATGCAGTCGGGGCGGCGCGGTCCCAGGTCCACTTCGCATA
TTAAGGTGACGCGTGTGGCCTCGAACACCGAGCGACCCTGCAGCCAATATGGGATCGGCCATTGAACAAGATGGATTG
CACGCAGGTTCTCCGGCCGCTTGGGTGGAGAGGCTATTCCGGCTATGACTGGGCACAACAGACAATCGGCTGCTCTGATG
CCGCCGTGTTCCGGCTGTACGCGCAGGGGCGCCCGGTTCTTTTTGTCAAGACCGACCTGTCCGGTGCCCTGAATGAACT
GCAGGACGAGGCAGCGCGGCTATCGTGGCTGGCCACGACGGGCGTTTCTTGGCAGCTGTGCTCGACGTTGTCACTGA
AGCGGGAAGGGACTGGCTGCTATTGGGCGAAGTGCCGGGGCAGGATCTCCTGTATCTCACCTTGCTCCTGCCGAGAA
AGTATCCATCATGGCTGATGCAATGCGGCGGCTGCATACGCTTGATCCGGCTACCTGCCCATTCGACCACCAAGCGAAA
CATCGCATCGAGCGAGCACGTACTCGGATGGAAGCCGGTCTTGTGATCAGGATGATCTGGACGAAGAGCATCAGGGG
CTCGCGCCAGCCGAACCTGTTCCGACAGGCTCAAGGCGCGCATGCCCGACGGCGAGGATCTCGTCTGACCCATGGCGAT
GCCTGCTTGCCGAATATCATGGTGGAATAATGGCCGTTTTCTGGATTATCGACTGTGGCCGGCTGGGTGTGGCGGACC
GCTATCAGGACATAGCGTTGGCTACCCGTGATATTGCTGAAGAGCTTGGCGGCGAATGGGCTGACCGCTTCTCTGCTGCT
TTACGGTATCGCCGCTCCCGATTTCGACGCGCATCGCCTTCTATCGCCTTCTTGACGAGTTCTTCTGAGGGGATCGGCAAT
AAAAAGACAGAATAAAACGCACGGGTGTTGGGTGCTTTGTTTCGGATCCGAATTCCTCGAGGGCGCGCCATTTAAATGG
CCAGCGAGGCCGGTACCCAATTGCCCCTATAG

Targeted Locus:

TCAAGCATCCTGAGACAGGGGATGGGCTTTCTCACTTGATTCTGCAAGGGAAGAGCTGTTCTCCAAGACCACACCCAGG
CTGATAGGGAAGCTCTGAGGGTCACTGACTTTGTGACTCCATGGGGACAGCAAGCTGGCTTCAAAGCACCTCAGATCTT

GATCTCAAGATAGCAGAGGAAACAGGAAGCCAGGAGATCTGGTGACATTTCATCTAGTCAGTGGCTCTGAGAGGAGCCC
AGGGCCCCAGGTGAAGAGGAGCGTGGAGAGAAATGTGGTTCTTTCTTAGCCTTGTGGGTCAGCGAGGTGGTGACTCCA
AGGCTGGGCATGGCAGCCCCTGCTTCCAGTTGTTAAAGACCAGCCTGACTGAGGTGGTCTGAGGGCTTCAGAAGCTG
GGCCAGCTAGAGTGAGGGATGCTGGGAACCAGGGAATCTTCCAGACCTAATTATAAAGCCACAAATCACAAAGAAATG
GTGGTATCAGCACCTTGGGGACCCTAATGGAATCCTGTGCCATAAAAAATTCAATCAGCCAGCTGACCTGGTATGAGCCT
GGCCAGGGCAGTGAAGCTGGGGTGGATACGATTGCTACAGGCAGGAGGGTCTCAGGGACTGGCAGACATGTCCCATC
CACCCGCTACATCCAGGCCCTCTGAAACAGTCCTCTGGACCCACTGGGCTCAGCCTCATGCTTGGGCACTGAATCTCCA
AGAGGCTCTGCTTTGCCTAAGATGGGTACGAGAACAGGTTGGCTTGTCTACTCTGTGTGTATGTGGCAGAGGGGGGAT
GGTCAGAGTCATTTCTGCACAGCCATTCCCAAAGCCCTCAGCTCCATGGGACAATGCCGGAACCTCTGGAGACTCTCAA
AGCTCATGGGAACATGACAAACAGATGCATGCTTGTATCCTAGCACTATAGAGGCAGAGGCAGGCAGGCAAGAGAAG
CAGAGATTCCAAGTCTCCTTTCATTATATAATGGGTTCCAACCTGGGCACCATGAGATTCTATCAAAGGTGGGGAGAGT
GGATAATAGGGACAATGACAGAGCTAAGCCACTCTGGACAGCCACATGAGGCCAGAGGGCAGAGCACTTGTCTCATAA
GGTGTAACCTACCATCCTGCAACTGTCTCTACATCAGGAATATGGGGGAAATGACAGGAGTCACCATAGAGAGGTGC
TAAGGAAATAGAGCACTCCAGTTTCTGGATGTGAGATACAGGTCAAATCTCAGCAGCAAGGGGTATGTTCTGGGCTCT
AAGAAGCTCAGCTGTGTCTCAGAGGGCTTGGCTAAGGGCAAAGGCAGAGAAAGGACATCTAGACTAGTCTGGAAGCC
AAAGATCCTCAGCCTCAGGTGATTTAAAAATTTTTATTTTATTTTATGTGTATGGCTGTTTTGCCTGCATGTGTGTCTGGGC
ACTGTGTGCATGCAGTACCCAAGGAGACCAGAAGAGGGCGATAGCTCTTCAGAACTGGAATTATAGATGGTTGTGAAT
GGCCATGTGGGTGCTGAGAACAAAGCAGCAAGTGTCTTAACCACTGAGCCATCTTCCAGCCCTGTAAGGACTATCCT
TTGTGGAGGAACCGAACTCTGAATCGTGGTGTGGGTGTGCCACCTGCTCTCTTGGCCTCCTCCTATCAGAAATCGTTCA
CATCACCCCGTTTTGACATGTTGAAATGACCGCAGCAGCACTTGGTGATTCACACCTATCATCCAGCATGCAGGATCC
TGAAGCAGATGGAGCAGCATGAATTCAAGGCCGGCATGATCCTGTCTCAAATAATAATAATAATAATAATAATAATA
ATAATAATAATAATATGGTTTAAAGGAAGAAAGAAAGACAGACAGACAGACAGACAGACAGACAGACAGAAAGAAA
GAAAGAAAGAAAGAAAGAAAGAAAGAAAGAAAGAAAGAAAGAGCCAGATGTGGTGCTGTATTCTTCAATCCC
AGTACTCAGGAGGCAGAGGAAGGTGAATCTCTGTGAGTTTGAGACCAGCCTTGCCTATATAACAAGTTCTAGGTCCAC
ACAGAAAGACCTTGTCTCAAGGAGGGGAACAGAAGCTGGAGAGATGGTTCTCTTAGGTAAAGAGTGCTTGTGTTTGA
CGCTCTTGTAAGAACCTGAATTTGGTTCCCAGCACCCATCCATATCAGGCTGCTCAGAACCCAGCTCCAGGGGATCCA
GTGCCCTCTTCTGGCCTCCCCAGGTATTGCATTTACGTGACATCATTAAACAATTTAAAAAGAGAGAAAAAATAGGTAA
AGGAATTTGCTGTGAAGCTGGAGTGTGGTACTTGACCCACGGAGAGAACTGACTTCTGCATGCACACACACCATACAT
AACAAATAAATGTATGTAAGCGAATGAATTTTTTAATCTTCCCCCAAAGGGAAGAAGCTGGGCACGGTGGTTCATGC
CTGCAATTCTGATGCTTGAGGGATGGAGGCGGGAGGAACAGTTCTCCTCCTGCTATTCCGGGCTACACGGGCTACACGA
GACTGTCTCAAAACCAACATAAAACCTCAATTAACAACAACAGTCCAGGGGCTGGTGAGATGGCTCAGTGGGTAAAGAG
CACTGACTGCTCTTCCAAAGGTCCTCAGTTCAAATCCCAGCAACCACATGGTGGCTCACAACCATCCGTAATGAGATCT
GACGCCCTCTTCTGGTGTGTCTGAAGACAGCTACAGTGTACTTATGTATAATAATAATAATAATCTTTGGGCCAGAGCGA
GCAGAGTTCCTAAATTCATTTCCCAACAACCACGTAAAGGCTTACAATCATCTGTACAGCTACAGTGTGCTCATATCC
ATAAGATAAAATAATATTAAGAATATAATCCAAAAAACATTTTAAAGTTAAATCAGAAATGTGTACAGGGAGCCG
AGTCTCCTCCACCCACGAGGGGAAAGCATTTTGGATGATGGGATGCAGATATGGAACCTTGGGAGGGGATGTCGTGTA
TGTGTGTGTGTGGGGGGAGCTGTGTACAGCACTCATGATGCTGGTTTTCGGAGAGCCAATCGCTCTAGAGGCCATAGC
GGCCATTTAAATGGCGCGCCGGATCCCGGGCCGCTCTAGCTAGACTAGTCTAGCTAGAGAATTCCGCCCCCCCCCCCC
CCCCCTCTCCCTCCCCCCCCCCTAACGTTACTGGCCGAAGCCGCTTGAATAAGGCCGGTGTGCGTTTTGTCTATATGTT
ATTTTCCACCATATTGCCGTCTTTTGGCAATGTGAGGGCCCGGAAACCTGGCCCTGTCTTCTTGACGAGCATTCCTAGGG
GTCTTTCCCTCTCGCCAAAGGAATGCAAGGTCTGTTGAATGTCTGTGAAGGAAGCAGTTCTCTGGAAGCTTCTTGAAG
ACAAACAACGTCTGTAGCGACCTTTGCAGGCAGCGGAACCCCCACCTGGCGACAGGTGCCTCTGCGGCCAAAAGCC
ACGTGTATAAGATACACCTGCAAAGGCGGCACAACCCCACTGCCACGTTGTGAGTTGGATAGTTGTGGAAGAGTCAA
ATGGCTCTCCTCAAGCGTATTCAACAAGGGGCTGAAGGATGCCAGAAGGTACCCCATTTGATGGGATCTGATCTGGG
GCCTCGGTGCACATGCTTTACATGTGTTTAGTCGAGGTAAAAAAACGTCTAGGCCCCCGAACCACGGGGACGTGGTT
TTCTTTGAAAAACACGATGATAAGCTTGCCACAACCATGGAAGATCCCGTCGTTTTACAACGTCGTGACTGGGAAAAC
CCTGGCGTTACCCAACCTTAATCGCCTTGACGACATCCCCCTTTCCGACAGCTGGCGTAATAGCGAAGAGGCCCGCACCG
ATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGCTTTGCCTGGTTTCCGGCACAGAAAGCGGTGCCGGA
AAGCTGGCTGGAGTGCGATCTTCTGAGGCCGATACTGTCTGCTCGTCCCTCAAACCTGGCAGATGCACGGTTACGATGCG
CCCATCTACACCAACGTGACCTATCCCATACGGTCAATCCGCCGTTTGTTCACCGGAGAATCCGACGGGTGTTACT
CGCTCACATTTAATGTTGATGAAAGCTGGCTACAGGAAGGCCAGACGCGAATTATTTTTGATGGCGTTAACTCGGCGTT
TCATCTGTGGTGCAACGGGCGCTGGGTGCGTTACGGCCAGGACAGTCGTTTGCCGCTGAATTTGACCTGAGCGCATTT
TTACGCGCCGGAGAAAACCGCCTCGCGGTGATGGTGTGCGCTGGAGTGACGGCAGTTATCTGGAAGATCAGGATATG
TGGCGGATGAGCGGCATTTTCCGTGACGTCTCGTTGCTGCATAAACCGACTACACAAATCAGCGATTTCCATGTTGCCA
CTCGCTTTAATGATGATTTACGCCGCGCTGTACTGGAGGCTGAAGTTTCAAGATGTGCGGCGAGTTGCGTGACTACCTACG
GGTAACAGTTTCTTTATGGCAGGGTGAAACGCAGGTGCGCAGCGGCACCGCGCCTTTCCGGCGGTGAAATTATCGATGA
GCGTGGTGGTTATGCCGATCGCGTCACACTACGTCTGAACGTCGAAAACCCGAAACTGTGGAGCGCCGAAATCCCGAA
TCTCTATCGTGGGTGGTTGAACTGCACACCGCCGACGGCACGCTGATTGAAGCAGAAGCCTGCGATGTCGGTTTTCCG
GAGGTGCGGATTGAAAATGGTCTGCTGCTGCTGAACGGCAAAGCCGTTGCTGATTTCGAGGCGTTAACCGTCACGAGCAT

CATCCTCTGCATGGTCAGGTCATGGATGAGCAGACGATGGTGCAGGATATCCTGCTGATGAAGCAGAACAACCTTTAAC
GCCGTGCGCTGTTTCGCATTATCCGAACCATCCGCTGTGGTACACGCTGTGCGACCGCTACGGCCTGTATGTGGTGGATG
AAGCCAATATTGAAACCCACGGCATGGTGCCAATGAATCGTCTGACCGATGATCCGCGCTGGCTACCGGCGATGAGCG
AACGCGTAACGCGAATGGTGCAGCGCGATCGTAATCACCCGAGTGTGATCATCTGGTTCGCTGGGGAATGAATCAGGCC
ACGGCGCTAATCACGACGCGCTGTATCGCTGGATCAAATCTGTGATCCTTCCCGCCCGGTGCAGTATGAAGCGCGCGG
AGCCGACACCACGGCCACCGATATTATTTGCCCGATGTACGCGCGCGTGGATGAAGACCAGCCCTTCCCGGCTGTGCCG
AAATGGTCCATCAAAAAATGGCTTTCGCTACCTGGAGAGACGCGCCCGCTGATCCTTTGCGAATACGCCCACGCGATG
GGTAACAGTCTTGGCGGTTTCGCTAAATACTGGCAGGCGTTTCGTACGTATCCCCGTTTACAGGGCGGCTTCGTCTGGG
ACTGGGTGGATCAGTCGCTGATTAAATATGATGAAAACGGCAACCCGTGGTCGGCTTACGGCGGTGATTTTGGCGATAC
GCCGAACGATCGCCAGTTCTGTATGAACGGTCTGGTCTTTGCCGACCGCACGCCGCATCCAGCGCTGACGGAAGCAAA
ACACCAGCAGCATTTTTTCCAGTTCCGTTTATCCGGGCAAACCATCGAAGTGACCAGCGAATACCTGTTCCGTCATAGC
GATAACGAGCTCCTGCACCTGGATGGTGGCGCTGGATGGTAAGCCGCTGGCAAGCGGTGAAGTGCCCTCTGGATGTGCT
CCACAAGGTAAACAGTTGATTGAACCTGCCTGAACCTACCGACGCCGAGAGCGCGCGGCAACTCTGGCTCACAGTACGC
GTAGTGCAACCGAACGCGACCGCATGGTCAGAAGCCGGGCACATCAGCGCCTGGCAGCAGTGGCGTCTGGCGGAAAA
CCTCAGTGTGACGCTCCCCGCCGCTCCACGCCATCCCGCATCTGACCACCAGCGAAATGGATTTTTTGCATCGAGCTG
GGTAATAAGCGTTGGCAATTTAACGCCAGTCAGGCTTTCTTTTACAGATGTGGATTGGCGATAAAAAACAACCTGCTGA
CGCCGCTGCGCGATCAGTTCACCCGTGCACCGCTGGATAACGACATTGGCGTAAGTGAAGCGACCCGCATTGACCCTA
ACGCCTGGGTGCAACGCTGGAAGGCGGCGGGCCATTACCAGGCCGAAGCAGCGTTGTTGCAGTGCACGGCAGATACAC
TTGCTGATGCGGTGCTGATTACGACCGCTCACGCGTGGCAGCATCAGGGGAAAACCTTATTTATCAGCCGAAAAACCTA
CCGATTGATGGTAGTGGTCAAATGGCGATTACCGTTGATGTTGAAGTGGCGAGCGATACACCGCATCCGGCGCGGAT
TGGCCTGAACTGCCAGCTGGCGCAGGTAGCAGAGCGGGTAAACTGGCTCGGATTAGGGCCGCAAGAAAACTATCCCGA
CCGCTTACTGCCGCTGTTTTGACCGCTGGGATCTGCCATTGTCAGACATGTATACCCCGTACGTCTTCCCGAGCGAAA
ACGGTCTGCGCTGCGGGACGCGCGAATTGAATTATGGCCCACACCAGTGGCGCGGCGACTTCCAGTTCAACATCAGCC
GCTACAGTCAACAGCAACTGATGGAACACGACCATCGCCATCTGCTGCACGCGGAAGAAGGCACATGGCTGAATATCG
ACGGTTTCCATATGGGGATTGGTGGCGACGACTCCTGGAGCCCGTCAGTATCGGCGGAATTCCAGCTGAGCGCCGTCG
CTACCATTACCAGTTGGTCTGGTGTCAAAAATAATAATAACCGGGCAGGCCATGTCTGCCCGTATTTTCGCGTAAGGAAA
TCCATTATGTACTATTTAAAAAACACAACTTTTTGGATGTTTCGGTTTATTCTTTTTCTTTTACTTTTTATCATGGGAGCC
TACTTCCCGTTTTTTCCCGATTGGCTACATGACATCAACCATATCAGCAAAAGTGATACGGGTATTATTTTTGCCGCTAT
TTCTCTGTTCTCGCTATTATTCCAACCGCTGTTTGGTCTGCTTTCTGACAAACTCGGAACCTTGTTTATTGCAGCTTATAAT
GGTTACAAATAAAGCAATAGCATCACAAATTTACAAATTTAATTAAGGCCGCGGGATCGATCCCGTCGAGCAGTGTG
GTTTTCAAGAGGAAGCAAAAAGCCTCTCCACCCAGGCCTGGAATGTTTCCACCCAATGTGAGCAAAACCCCGCCAGCGTCTGTG
GAGGAAGCAAAAAGCCTCTCCACCCAGGCCTGGAATGTTTCCACCCAATGTGAGCAAAACCCCGCCAGCGTCTGTG
ATTGGCGAATTCGAACACGCAGATGCAGTCGGGGCGGCGCGGTCCCAGGTCCACTTCGCATATTAAGGTGACGCGTGT
GGCCTCGAACACCGAGCGACCCCTGCAGCCAATATGGGATCGGCCATTGAACAAGATGGATTGCACGCAGGTTCTCCGG
CCGCTTGGTGGAGAGGCTATTCCGCTATGACTGGGCACAACAGACAATCGGCTGCTCTGATGCCGCCGTGTTCCGGCT
GTCAGCGCAGGGGCGCCGGTTCTTTTGTCAAGACCGACCTGTCCGGTGCCCTGAATGAAGTGCAGGACGAGGCGAGC
GCGGCTATCGTGGCTGGCCACGACGGGCGTTCCCTTGCGCAGCTGTGCTCGACGTTGTCTACTGAAGCGGGAAGGGACTG
GCTGCTATTGGGCGAAGTGCCGGGGCAGGATCTCCTGTCTCTCACCTTGCTCCTGCCGAGAAAGTATCCATCATGGCT
GATGCAATGCGGCGGCTGCATACGCTTGATCCGGCTACCTGCCCATTCGACCACCAAGCGAAACATCGCATCGAGCGA
GCACGTACTCGGATGGAAGCCGGTCTTGTGATCAGGATGATCTGGACGAAGAGCATCAGGGGCTCGCGCCAGCCGAA
CTGTTTCGCCAGGCTCAAGGCGCGCATGCCGACGGCGAGGATCTCGTCGTGACCCATGGCGATGCCTGCTTGCCGAATA
TCATGGTGGAAAATGGCCGCTTTTCTGGATTTCATCGACTGTGGCCGGCTGGGTGTGGCGGACCGCTATCAGGACATAGC
GTTGGCTACCCGTGATATTGCTGAAGAGCTTGGCGGCGAATGGGCTGACCGCTTCTCTGCTGCTTTACGGTATCGCCGCT
CCCGATTTCGACGCGCATCGCCTTCTATCGCCTTCTTGACGAGTTCTTCTGAGGGGATCGGCAATAAAAAAGACAGAATAA
AACGCACGGGTGTTGGGTGCTTTGTTTCGGATCCGAATTCCTCGAGGGCGCGCCATTTAAATGGCCAGCGAGGCCGGTAC
CCAATTTCGCCCTATAGAACTACACGGGAGAAGGCTCTAATCCAGTGCCAAGAGCAGGAAGTGGTCGTAAAGTCTGCGT
GTTAAGCCCCCGCACCCCGAAGAGACCATTAGAGGTCTCCACCTAGGGCAGAAGGGGTACCCAGAAGAGGGGAGGC
ATCTTCTGAAGTCAGAGTGGCCTGGCAGGCAGGGAAAGGCTAAGGGAGAGACCTGGGAGAGAGACAGGGGTGAAAG
AGAGGAAACTGACATAGAAGTTCTGCTCCCTTAGGCAATCAGTCACCTTGATCTGACCTAAATCCACCTACTCACAG
CTTCCCTGCGTACAGACAGAACGGCTGGAGTCTTCTCTAGCACATCCTTTAGTGAGCTCTGGAGCAGAGTCTGGGTG
GAGAGCTTTCGCTCTAAAGCCAGATCTGCTGAGACCCGTGTCTGACTCCGCTACTAGCGAGTTTGTGCCTTGAGCGAGT
CCCCTTCTAAGCCTCGCTTTGTCTGCTGCAAAGATGCCACCCAACCTTAGTGCAAGAGGGAGCTGATGCTCACAAAG
CCTAGGGAACCTGCTACTAAACCTTGGCTCCCCAGTCGGCATCCTCCAACCTGAACACCAGCGACACCGTGTGGCGA
TCACTGGGAGATGCGGCACAAAGCAGGAGAGAGGTTGACTTGGGATGGGGAATGCAGGACGTCCAGCCTGCAGTTGCT
TGGTTGTGAGACAAAGCATCATAGAAGAAGCCTAGAAGTACACCTCATGGTGCCAGCGGCCAGAGAAGGAGGAG
GAAGAGAGAGAAAAGACAGATAGACACAGAGAGGAGGGATGAGAGAGGAGAAGGGGGAGGAAGGAAGAGACAGCGC
AGGAACATCTGGGTCCCCATATCTCCTTCAAAGACACCCTGATGACTCAAGTTTCTCTGCTAGGCCTCATCTCCAGA
GGGCCCTACTGTTTCCATGGAGAGCCACTGGCTGGAGAGCCAAGTTTTCTTTGTTTTTTTAAAGATTTATTTT
TATTTTTAATTATGTGTATGTGTGTGGAGGTGGGGTGGTGTATGTGTATGTGAGTATGGGTGCCACCAGAGGCCACA

GTCATCAGACCCCCAGGAGCTGGAGTTAAACAAAGTTGTGAGCCGCCTGACATGGGTGCTAGGAATTGAACTCAGGCC
CTCTGCAAGAGCAGGACGTCTCTTAACCTGCTGCATCATCTCTCCAGCCCCAAGACCAAGCCCTGGGTCTCGGGCGCAT
CAAAGACATAAACTTCAGTGTCTTGAGAGAGAGAAGTCACCGTCCCATGTCTGCCTGTGTTCAACCTTCCTTAACACAC
TCTCTGCCTCCATTCCCTGTGCTCCTGCGGTACCCAGGCCCAAACGAACAGTCTCCAGCAAACCTGAGACTCACCAGC
CAGCGGGCCTCTGCCCAGCCTCACCTGGCCCTGAGCCTGCACAGGCCACCTGTGACTGCCTGTAGGGGCAGAACACA
ACGCCACAGATGGGTGGTGGGGTTCACAGGGTATTATTTCTCTAAGAAGAACTGGAGCAGCCTCAGCCTGCTTCTCC
TGTGGATAGCAACAGGAGTGGAGTAGGGCAGGAAGTGCCTCCCTGCCAGGTGACTGAGACCCCTACGTGGCAACACA
TGCCCTCCCATTCTCGAGATCCCCCTCTGCCAGTTTAGAAGATGTTGATGCCTTGAGGACTCACATGGGGCCCATAGTTTC
CACGAAGTGATGGCTTCAGTGAAACGGCAGGGATGTCCTGAGGGAGGGTGACATGGTGGCAGAGGGCAGGTGAAGTC
CACAGGCCAGGCCAGGCCAGTTTATCAGCATTTGGGAAACCTCAGATTGACTGGGGTTCATTTCTGCAACTCCTCCAGC
CTCTGTCTGGTCCCATTGTGTTGTGACCCTCTGCTGACCCTGTGTTGTTCCCTGCCACTGTCAATCCACCTCTGCCAGG
GTCTTTCAAGATGGCCCCAGGAGTTAAAGCATCAGGTTTGCACTCAGGACTGAGGTTCAAATCCACGCTCTGCCAGGC
ACGAGCTGTTTGTCTTGCGAAACTGCCTAACCTCTCTGGCTCAGGCTCCTCCCTGTTTCATGAGCAGAGCAGCAACT
ACTTCTCAAGAGTCCCTGGGGAAGTTAGATGAAGTCATTATCATGGAGGGGTTCACTGGGGACCCAGCATGCCAGGTG
CAATATCAAGAAGCACATGCGTGTGCATGCATGTGTACATGAGTATGTGTGTACGTGTGCGTGTGTGTGTGTGAAGCA
GTGGCTCTCCTCCCAGCTACCTCAAAGGCTTCTCCCCAAGCAGTGTCTTCAACCTCCATAAACCTCACCTCCTCCAGGAA
GTCTTCTATGATTTTATGTAACCTGGCCAACCTCAGGCATCCTGAATCCAGACTTACTAGAATGTAGCTTCTAGTGAGGA
ATCCTCTGTTCACACACCGACCCCTCCCCAATGACAGGTCTCTAGCAGGGTAGACAGCAAGGATGATGGGTAGATCAA
GGGCTCATGATGCCCAGCAGCCCTTGGCTTACACAGTACACAGTGGGGTGGCACAGCAGAGAAGACAGGATGCCCTGT
AGGTAGACACCGAACAGCAGGTGGGTGAGCCTGTGCTTGCCTTGTCTCAGGCCGAGCTGCCATCCGTGGCCCCAGCTCC
CTCATGAAGAAGGTGGAACCCCTCTGAAGACCGGATGCTGGAGGGTACCATGGAGGAGTCTTCCACTAGCCTGGCCCC
ACCATGTTCTTCTGACCATGACAGACGGTGCCACGCCTACTACAGAAGAGTCCCGGATCCTGCCTGTCACGTCCTTGC
GGCCCCAGGTAGGGGCCCCACGAGGCCTTGAATCTGAACACGCCTTTAAGCCTCATGCAAGCTGCCTGTCAGGGTTCCC
TAGATGAACAGAGTGATAGTGTGAATGTAAATATCTAGGGATTTATTAGAGTGGCTTACAGGCTGTGGTCCGGCTAGTC
CAAAAGCAGCTGTCTCCCGATGGAAAGGCAAGACTCCAAGGCTGGCTAGCTCAGGGGATTTTGGGCTATGTTGATTCT
GAAGGAGCAGGTTCTAAGACCAGCAAAGGAATGCCTCAGCAGCAGGATAGATGAACTTGCCAGCGAGAGTCAGGGCA
AGCAGGCCAAAAAAGCAAACGCTTCTCCTTCCCTGTCTTTCTTGGAGGCTACCTCAAGAAGGCGTGGCCCCACACTTG
AGGTGGGGCTTCCCTGCTTCAACCATCCAGTCAGGAGAAGTCCCTCACAGGTGTGCCCAGCTGCTTGAATTGATTCACCT
CCTGTTCCACTTAGGTAAACTGAGGCACAGCGGGGTGGTAGTGAACACCGTTAATCTCTGACTCCACCAGGTAGTCTGT
CTGTAGAGGGGCTGCCAGCACCCAGACAACATGGTTGGGGCTCGGGCTGGGGACAACCAGGAAGCCAATTCCATCTCA
GCATGCTGTTCTCTGCACACACAGAGGTGGGACTGTTGTGGAGGACGTTTAAAGTCTGGAAGAGTACAGAAAGCAGCC
ACGGTGATTTAAAGCCCAGATCTAGGGACTAAAGAGATGGCTCAGATGTTAAGAGCACTGACTGCTCATCTAGGGGTC
CTGAGTTCAATTCCCAGCAATGCTCACAACCATCTGTAATGAGATCTGATGCCCTCTTCTGGTGTGTCTGAAGACAGTG
ACAGTGTACTCATATAATAAATAAATAAATAAATAAATAAATAAATAAATAAATCATTTTAAAAAACAGA
TCTAGAATGGCATAGTCAGTTGGGGGGTTGACTTATCTACTCCCAACTCTGAAAAAGAAAGTGGAAGAAAAACAGGG
GGAGCAGGGGTTGGGAGGGGATTGCACAAATCTGGGGGTGGTGATTCTAGAAGAAAGGACAGGCATTACCAGG
TCATTCTTGCCGATAGCTTAGAAAGTTTTGTTTTTCAAAATAAAATCTTTCAGTGCCAGATGTGGTGTCTTACATCT
ACAATCCCAACCCTTGGGAGACAGAGGACAGGGGCAGTGCCATCACCACAGAATTGAGGCCAGCCTGGGCTACAACA
GGAActCTCGGCCAACTGGGCTATGAAGTGGGACCCTGTCTCAAAACAACTAAAACACTGTTTTGCTTTCAAAATGAA
GTAATACCATGAAATGGATCATATATATATGTATATTGATGAGATAGAATACATATGTGTATATTGATGAGAATACAA
TATTACAATATGTAGCTCTGATGGTAAATGTTTTCTTAGCATGCCTGGAGCCCTAGGTTTGAATTCTCAGCACTGTATAA
AATAGGCAAGCTGGTACGTGACAATTATCCCAGCATTCGGGAGGTGGGGACTGGAGGATCAGGAGTCTGAGATTGTCC
TTGGCTACACAGTGACTTTGGGGCCAGTCAGGGCTCTGTGATATTCTTCTTTCAGAAAGGAAGGAAGAAAGAAATGGAG
GGAGAGGGAGAGAAAGAGAGAGGACAGTGCCTGCTGTGCCGCTCTGTTTTGTGAGTTCTTGCTCATCTCTTGCTGTGC
CTTGTTTAAACTGATTGTTTTTATTTAATTATGTATGTCTGTGGGGAGGGTGATATACACACATGAGCAGAGGTGCCTTT
GGAGGCCTGAGGTACCACATCTCCTGGAGCTGGAGTTACAGGCATTTGTGAACCACCTGACGTGGGCGCTGGGAAGTG
AACAGCACTCGGGAGGCAGAGGCAGGCAGATTTCTGAGTTCAAGGCTAGACTGATCTACAAAGTGAGTTCCAGGACAG
CCAGGGCTACACGGAGAAACCCTGTCTCGAAAAACCAATGTGTGTATGCACGTGTGTGTGTAAATAGTGCACAGACAG
GCTTTAGCTCTTCCAGGCATCGCTGTCAGGTTGGACCACATCTCCTGAGTATCAGGAGACGGCTGTAGATATTCTTTGTCT
CTCTTTCTTCATCTTGCCATCCTGAGAGTCAGGCCAACGCCGAGGCCATGAGCAGGTAGTTATGGTCCGTGCCTCGCTG
AACCCTAGTGATCATGGACATGAGCACTCAGCCATAGTATCTGGTCCTCAGTAGTCTCCAGACTATTGGTGGGGGCTGT
GAGTGGAAATTGAAGGCTGTGCATGGTCTCTACAGGACTCTTCAGAGGAAGGGACAGGGAAGTGAGCAGTGGGCCACGT
CTGGTTCCCTCCCTGACGTGTTTGAATGCTGAGCAATCAGAACAGCCTCTCTAGCCACTATCTTGACATCTTCAGCAT
GGATTCCAGGATCCAAGCAGAAAACAAGGTGGCCTTGTCTCTGGCCTCTGGCCTTGAGATCCCAGGTTCCAGTCCCT
TCACTTCGAAGGCTCCAGGTCCCCTCTCCTGCCTTGACTTCTGCAGACACAGCCAGGTCTGACGGGGAGGTGATGCCC
ACACTGGACATGGCCTTATTTGACTGGACGGATTATGAAGACTTAAAGCCAGAGGTCTGGCCTTCTGCAAGAAGAAA
GGTATGTCCACTTTGCCACCCACCCACACTTAGACTCCTTTCTCCAGCATCTATTGGTGGAGGACGTTTGCTGAGACC
AGAATGACCTACAGGTATCCAAAGGTGGGCTGGAGTCCATTGATCTAAGCTGGACCTGACACTCACTGGGACAAGCCA
TAACCCTCACTCACTGCACGCTACTCGGGCCCCTGTCTCTTTAGGGAAGAAAGTAAAGCAGAGAGAGAAAGAAAGG

CAGAGGGTCTCGTCCAAGTCGCACCGTGGGAGTGGCCATCTGGCACCATGACACCCAAGTCTTGTGCTTAATCTAATCA
CAAATTTTCTTGTCCCCAGAGAAACACTGGAGTCATTTTACCAGTGATGGTAACGAGACCTCGCCAGCTGAGGGGGATC
CGTGTGACCATCACCAGGATTGCTTGCCAGGTATTCTGCCCCCCCCCCCCAACACCCACCCCTTGAGGCACCAGGCTGGGA
GGGAATACCAGTAAGGTAATTGAGACAGGGCTTGGGAGCAAGCCAGGGAGTAGTGGCCCTTTATTTCGCAATACGGAGA
AGCTACAGTGTCCACCAGTTTTTCCTGAGGGTCCTTATCAGCGGCCACCAATTTCTGAGAGTCACTACCATACACTGA
CTCACAGAATGACCTCAGAAAGAGGTGGTGGAGGGGGAGGGCAAGCGAGCCTGGGCCAACTTGGTTCCTAAGCTTCTT
ACCCATATCCCACCCTGCCCTGAGTCAGATGGCCTGCTCCTAACCTTGTCTCTGAACACCCGCAGGGGTAAATTCAGT
CTCCTCATCATGGCACCAACTGGCATTCTGGGGACAGTGTAAGTGACACTGTTGCTTGTTC AACAGCTCTACCTATCAG
GTCAGGAT:AAATGGAAGGGGCCTTCTGTTTGATTAGAGTCCGGACTGATGGCCCTGTGGCATCCAGAGGACCTCTTCA
GAGCAGACTGGGATAGACTTCGATGCTGTGGAGGGG