



Lexicon Genetics Incorporated – Genentech Project Materials

Genentech ID:	UNQ295	Date of Submission:	01/26/04
Lexicon Contract Name:	DNA475	Mutation Type:	X Standard Knock out
LexVision Name:	SEC250N1		☐ Conditional
Reference accessions:	NM_033525	Is this gene X-linked?	NO

Required Materials: X pKOS clone DNA(s) __pKOS37 & pKOS50____
 X Target Vector DNA __pKOS50-FTV____
 X Targeted ES Cell DNA __2C7 & 2D6____
 X Genomic Map

Southern Blot Analysis: *External/Internal Probe Strategies*

	<u>5' External</u>	<u>3' Internal</u>
Name of Probe:	30/31	Neo2/5
Restriction Enzyme for Genomic Digest:	XbaI	SpeI
Predicted Wild-type Band (kb):	10.3	N/A
Predicted Mutant Band (kb):	8.2	11
Probe Size:	191bp	617bp

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:	15	5' Primer Name:	Neo3A
3' Primer Name:	35	3' Primer Name:	35
Predicted Wild-type Band (bp):	694	Predicted Wild-type Band (bp):	none
Predicted mutant band (bp)	none	Predicted mutant band (bp)	669

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**

30 5' – CATGTATGCCATTGCACACG
 31 5' – GCACATATGAAGTACTCGGTT
 Neo2 5' – GGCAGCGCGGCTATCGTGG
 Neo5 5' – GCCGATCCCCTCAGAAGAAGTCTCG

PCR Genotyping

15 5' – CCTATGTCGCTATGGAGGC
 35 5' – CCACCTTACACAGCAGTTCC
 Neo3A 5' – GCAGCGCATCGCCTTCTATC

Genomic Sequence Deleted:

CCGCGTCCCGGTCTCCGGCATGGCTGTGCTCCTAGCGGCGGTGCTCGCGTCTCGCTCTACCTGCAGGTGGCTGCCGACTTCGACGGG
AGGTGAGGCGGGTCTCGGGTGCCCTCCCCTTTCCCTCAGGGACCTCGAGTGGAGCAGCCTGGCTCCGGGCTCAGGAGAAAGAGAGGCTC
GTGCCCCGTGTGCGGTGAGAGCGGGCAGGAGCAGGGACACAGGTGACGCGTGGAGCGTCCCTACAGCCAGTGATCAGGATGGACTGTGT
CCCGAGGGGAAACTTGCAGGTGACCCGGCGATTTCGACAAAGGGTGGCGGCGAGGACCGTACTTGGAAACAAATGGCACCCGAGGGCTCTC
GGTTTGTGGTTCCGAGGGGGGACGGTGTACACAAGCTTAACATGAGTACTGAGAGGAGGCGCTCGGGGTGCGTGTGTGTGTGTGTGT
GT
ACAACCTCCGGCAGGGTCTCTGCTGTCACTCAGCGTGTCCCCCAAGGCAGCGCACCCGCGCATCTCCCGGAGATCCCGGGCTCAGTC
CCCCTGAAGGCCTCAGCTGGACAGGTTTCCCGCTGGCTCACACCACCACTACCCCTGTCCCCATCCCTCAGAGCTTGTCCCAGGGCT
GCCTTGAAGATGCCGACCTGTTTTACCTGCAATCTTGAACGAATCAATTCAGGATTGATTGGCTTTCTGTCCCTGGAGGGGACCA
GAGGAAAAGCCTCGGAGCGCGGAAGAAAAGGCACCCGCTCCCGGTTCAACCACTGGTGGAGGAAATAGAAGTTGGGGTTGTTTTGTAC
TTTGAGCCTGAGGGTAAAGCGAAGATGAATTGAAGAGATAAAGAGTTTAAAGAAGAGTGGAAGCAGCCAGAGGCTAAGCCTTTTATTT
TCCAAAAGCAATTCTTTGCCACATTTGGATTTGTGGTGCATTACTTTGGGGCACACATATTTACAAAGAAACACACACACACACACAC
ACACACACACACACACACACACACAGCCTAGGTGTCCATTTACAAAGAAACACACACACACACACACACACACACACACACACACAC
ACACACACACACACACACAGCCTAGGTGTCCAGAAAGTCTGGTAGGTGTGAATCTAAACAGGCTAACAGTCACAGGTGTAAGTGTGATC
TGATGCATAAATCTGCATCCTAACTTGGAGTCTCTCTGGGTACACTTTACATCGGAGAGGGAAATAATGTGGATTGCTGATGCAGACA
GCTTGTAAAATACGAGGACACTTGAGACACTCTTCACGGCCTGGTTTTGGGCTTTTCTTACAGCAGTGGTGGGGAAGAGGAGGAGGAGG
AGGAGGCAGTTGTATAGAAAGAGCTTGGTTGGTTGCATTTGATTTTTGAATAAGCTCCTCTTCTTGCCATTTCTTATCTGCCCTTTA
TATGAAGCAAACATTCTTTCTGCTCTGACAGATCTGTTATTCAGCACATTTACAGCTCCCGGTGCATTAGTCAAAACTGCCCCCTCCTC
CCCGCCCCAACAGCTGTGAGTCTGGCTAATCTGTTTTATTTCAAGCTTTAGAAACCATCCCGTGAATAGTAGCCTGAGCTTTCTTGG
TTGCAGCCAACCTGGTTTTCTTCTCCCTACTCTGTGGGCTGGGTGTGTGTACATTTAATTTACAATTAGAAATTAGATCACTGTAGGA
CTACTACTGGGAAGGTGTCTTATTCTCCAATTCCTTGCAGGCAGTAAGGAGCTTGTAGAAAATTACTGGGTGTGGTTTAAGTATATATA
CATTTTCTAAATAAAACAAAGGGGAAATTATTTTAAATCTCAGGTGTCTTTATTTATTTTAAATATTTTGTGTTTGGTAGGTGGCCC
AGGCAAATAGTTTCTTCAATCGGCCTATGTCGCTATGGAGGCAGGATTGACTGCTGCTGGGGCTGGGCCCGCCAGTCTGGGGACAGTG
CCAACGTGAGTATCGGGGCTGGAGACTCCTGTTCTTGGT
TTCTAGACTTTACTCTGCACTTTGGAGG

Genomic Locus: (the deleted sequence represents nt 10,001 to 12,164 in the sequence below)

TTTTCTTTTCGCTGAAGATGACAGCCACTAAGTAATCCATAGACACTAGATGTGAAGGATGCAAACATGAATCACTGCCAGGGTGATGCA
GGGGCATTGACTGGACTTCAGACAGATCAATCACGCATGCCTCAAACACAGACTACAAAGGCCAAAATAACGGATAGGATTAATTTCAA
ACCTTCTCTGAGATGCTTTCTTTAAACTCTAGTTTGAAAATTTTACAGAAAACATTTTCAACTGTATACTCACATAAATTATTTCTCCA
CTATAGTATGATAAGCAACTATTTATTTAAAAAATGGATGCAATCATTTTAATATTTAAAAGATCTCACATTATATGGTTTGTGGAAA
AGATAAAAGGATTCAACTTTTGCTTTTTTTTTTTTAAATCCAAGTTTTATTTATTCAAGTTAGAAAATGTTATTGCAGTTAAAGTCTTT
GTTCTGGAGATGCATTCTGATCCTGAAGAGGGGATCTTGGGATGTAAGGGTCAATCCAGCTGCCTGCATTCTTGACGCAACTCAGGCC
TCCAGAAAGGGCCAGGCCAGGCCTGAGCACTGAGCTCCTGCTCTGCTTCAGGACAATGGTGGCAGCAGGAGTTGCTTCTCTAGGAAGTT
TTTGTGCTTTTGGTTTTGATACAAAGCCCAGGTGGCCTTGAAGTGGCCCCAGCTCCCAAGCGCTAGAAGCACAGACTCACGCACGCG
CACCGTGCACCGACACACGCGGCTGGCCGGTTTCTCCTTCATTTGGTTGATTAGTTTGCTTTTGCTTTTGTGTTTAAACCACAGTGCCCA
GCGTGGTCTAGAATTTCTTTCTCAAGTCATCCTTCCACCTCAACCTTCCAAGAAATGAAACTGAACACCTATGCCACTGCCCCGCTT
CTAGAAATTTCTGAGCTAGGCCGTTTCTAGTTTACACCAAATGCAGAAGTAATGGTAGCATGGGAAACACGTAAAATGTCTCTCCACT
GAGTTCTGAGACTTTTTCGCGTTGCCCCATTAGAGTACATCACAGTAAAGAAGCATCAAGGCTTGACGGCTGACAACATGGCTAAGTGA
GCAAAGGTGCCTGCCCCAAAGCCTACTGGTGACAGGAGTTTGATCCTGGGACCTGAAAGGTAGAAAGAGAGACCAGACTCCTGCAAATT
GCCCTCTGACCTCCACAGACACAGGGCCCCCATCAGGAATGCCACTTAATTAATAAGTTAATTAATTAATAAGTAAACGAAATGAAACC
ATGGTTTGACAGTTGCTCCCAGCATAAATACTAACCTGACATTCTTACAAATTATGTCACGACCTGGGATTTTTAAATACAAAATTTA
TCAGCATTGACATGTAAACTTTTAACTTAAATGTACAGAAATTTATTTTCAAGTGTTCACATTTACATAATTAATGGAAAGAAAT
TTATGAATTTAAACTCAGTGGGGCTGGAAATGGATCAGCGGTTAAGAGCACTTGCTACTCTCACAGAGGACCCGTGTTTCAAGTCTCAG
GTTCCACACAGTAGCTCACAATGCCTGTAATCCAGGGGATTTTATGTCCCCTTCTTGCTCTTTGGGACCCAGCAACTCATGTGATG
CACAGACTTATAAACACTCAGGCATACATTTACACAAAATAAAGATGTATGACTTAATGGTGAGTTGTTTACAAAATACAGCAATAA
CCCTCTTAGTGTGTCCATTTTCCCATCAGTGCCTCAGTATAGGAATGTGCTGTTATACATTTGTTTTCTGATATTTCAAAACAGGTGTC
CAGCTCACAGCACTCTAGATACATGCTAGGTTTCCCTCCTTTCTGGACCTTCTCATCTAAAAATAGACTCAGGCTTGAGTTCTTTCC
ATGGCAATACCAAATAAACTCGCTCCTCTCTGATCAAGCAAAAGATAGGTACCTGCCCTTGAACCAAGCAAGGCTGAGTATTTTCTCT
TGAGAGCTGGAGCCTCCTTTTGATGGTAATGTGACTAGACATGTGTCCAAGGTCCAGAGAATGAGAGTGACTGGAGGCCGAGCCTA
GAAGGGCCATGAGGACAGCTAGTTTGAGGACTGGATAAAGTAGAGACAAAAGAAAAACACAAGCGAGAGAATGTGTAGCCCCAGAGAAA
GACATGCCAGTTCTGGAGACTCTTCAAGTTTCCAAGTGAATTCCTCATGATCCTAATGTCCTTCTCCTCTGGCAGGTGGCATGCCACA
GGGAGCAGCCGAATAAGTAAGTTTCTTTAAATAACCACCATGAGCTTGCTTCAATCAGATACACCTAAGAGAGAAGCCGTTGAGTGTT
AAAAACCTATATGTGTAGTGGCAGCCATAGCAAGGGAACATTTGGTGATGACATCCTCCTTGAAATACTTCATTCCAAGATTTGTGGT
CACGCCACTGAGTCTGCCGACATTTAAGCTTGATGTTAATTACACTATCAACTTAGATATATACTGCCTCGGAGGAAGTCAGGCCATCA
CAGTCTCCCATTCAGTCTTTCATAGAAAATGAGTTGCAAAATTTATGACTCACTTTACAGGTTCCCTATTCTCCAATGCTCCATTTTC
CTTGATAAAGAAGAGGGACGGGCGCCTCGCGGCTCTGCCTTCTTAGGCATCTCTGTTAGCATTTACTGTCTTTTTTAGGTTTTTTTT

TTTTTTCATGCCAACTCTGCTTGGCAAGGTCTGACAGCTTCAGCATCTCTGTCAAGTCTCAGCTAGTTTGGGGCCCAACATAAAATTA
TTTCTTTTACATCCCTGGTCCCTTTATCATTCCATCTACAAGGCAAGGTAAAATAAGATGAACTAAGTAGGGTGGCACACTTATTTCCC
TTTTGCTGTGATAAAACGCCGTGACAAGAGCGACACAGGAGAAAGGGTTTACTCTGGCTCAAAGTTCAAAAGTTCAGTCCATCAGGTCTG
GCGAAGCCAACTGGCAGGCGCTTGAAGCAACTCTTCATAGGACATCCACAATCAGGAAGCAAAGACCATGAATACGAGCCTCTGCTCA
GCTCCCTTGCTCCATTTATATAGTTTACACTCCCAGCCTGGAAATGGTACCGCCTACCCATGGGTGTGGTGTGTGGATCTTCCCACCCG
AATTAATGTAATCAAGGAAATCCCCAGTGGGCACGCCAGAAGTCCACCTGCCAGGCAGTTCTATATACTACGATGTTGACAATTTCTCA
CAACTGTAACGGGGTGCATAAAAGAGCTGTTTCAAAGGTAGGAGACTCCGGTTCCTGTTTAGTAGCTTGCAGGAGGTTGTTCCGGAGAC
CTGTCCAGCCTGCTCTGAGCTTTGTGTTAGTGAAAAGAATTTTTACTGTGGATCTAAGGATAGTGTGTACAGAAAGTAGGTATCATCA
CCATGCCTGGCTCTGCGATACAAAACACATCTTATAAACATGGAACGATCTTCTCTTTTATAAATAAACAAGAGAAGTCAATTTCTTT
TTTTTTAATTTGTGAGTAAACTTGTGACACAAAAAGAGGCTGAGGAGCAGGAAACGGAATAGAACGCTATCTTAGAGCTCTAATTTG
CTGTCCAGGGTCCCAGCCTCTTCGACGATTTAGCTAAATTCAAGTAGAATCCAAAGGATATCAAACAAAGCCTTCCATTGCCCTTCG
CAAAATTATTTGAAAGCAGATGAGAAACACTCAGAATTTAAATAACCATGCCTGAAGCATTTCCTTTCTCGTGTGTACATTAGCTAAG
AGAGAAATACTTTGTTTTATAAGGAGAAAACTAACATAAGAATTTGAATTATTAATGTTTTCATTGTATTTTAAATGCTTATA
TGTATATATTCATATTACAAATTTTTATACTAAATAGCTTATAGAATATTGTTATTTTCTCACAATTTTGTTTTTTCTTGAGACAAA
GTCTCATTACATTGCCCGAGTTCTATTGAATTCATCGACTCACAAAGTTCTCTTACCCAGCTTCTCAGTCATGAGAATTACATGTGT
GTACCATGACATCAACTGCAATAGATTCAATTTATGTTAAAGAGTCTTTTTAATTTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGT
TGTGTATGTGTGTGTCTTTGTACACTGGGTGTGCACAGGTGCTTTCAGAGATCGGAAGAGGGGCACTGGAGCCCTGCAGTGGAGTTGGAG
ACAGTGGTTGTGAGCCACCAGATGTGTGTACTGGGAAAGGACTCGGTCTCTGGAAGAGCATCAAGCCACCTTGCTTGTGAATCCTTT
CTCCACCTCTCCAGTCCCTACAGATTAGCTCAATTTCTCTTGTTACACAACCATGTCATTATCAAGGTTTAGGCTTTTCTATGTAAT
CCTAAGTACTTGGCCCTCAAGGCCTGGTTATTCCTGATTGGTGAATAAAGATGCCTGCAGCTTATAGCTGGACAGAGAGAGATCGGCAA
GGTTTGGGTTTCCAGACTTGAGCTTGTGGTCAGATCAGAGACCATGAAGAGGAGACAGAGAGAAGGTAGGGAGAGAAGATGCCATGGGT
TAGGCAAATCATGAAAACATGACCTTGAGGGCTGGCCAATTGGAGTTAAGAGCTACCCAGACGGAACACAGTAAGTAATACAGGGGTTA
TTGATGGGCAAGTAGATTCTAATAGCCCAGGGTAGATATCTGCTCGGCTCTAGTGCATTCAATTAAGGCTTATTATAAATATGAGTTGT
ATGCCTTTTATCTGGGAATTGAATGATAAAAAGTGAGGGGTAGAAACCTTGACTGAGATTAATAATTATTACAACATGTCATTTATG
TTTCAAATAAGAGAAAATGATTTTCATGCCTTCAAAACATATTTTTGCCTAATTTTAGCAAACCTTCCAGAATTAACAAAAAGCCTGTT
CCTTCATTTTTTTCTTAACATTATAAAAAATTTTTCCAGACTCTTCACTACTATATAGTATTTTTGTTTTAGTTTTGAGATATGATTCAAA
TATATATCTATTCTATAACTGATTAATATAACTATTTTTAATAAGGCCTCAATAGGTTGTATCATGTTCTCAGGAGTTCTTCTTAGGTG
TAAGTAGACAACCTGAGCCACAAGACTATCATGACCACATCTAGCACCTCCTTTCTCTGAAGGATAAAGGACGGGGACCACCCTGTGCC
TGCACAGGAGCGTCCAATGCCCTCTTCAGCAAACAGCTCACATAGCAGCAGATCTTGGGTGCAAAATATAAAGAAAAGCATCCTTACA
TAGGTGTAACCTGCCTGAACATAATTACCTTATTCTGTCTGGACCATCTCTGAGCCAACACTATAGGCATGGTGTCCAGGGGCCCTCCAA
GGACTCGGCACAGAAAAGTCATGTGAGCAGTGCCCAATGCGATGTTTTGCTAGTCATTGTATTTGTTTCCCTTCACTACACTTTATTT
GTGTGGAAGCCATTTTTACAGGCAATAATGGGTACATGCTACCTTTTTACGCTGAAAGAGGGAAGGAGCTAGAATGTGAACAGCAGTC
AAATTCTCATGCAGAAGGAGAAGATAGTTTGTAAAGTAGGACCCACATGGGACTCAGAAATTAACTTTCTTTAAATCCCTTCTTCAGGG
GCTAGAGAGATGACTCAGCAGTTAAGAGCCCTGACTTCTTCCAGAAGTCTGAGTTCAAGTCCCAGCAACCACATGGTGGCTTACAA
CCAACCACTATAATGGGATCTGATGTGTCTGAAGACAGCTACAGTGTACTCATATATATAATTTAAGTAATAATTTATAAAGATGGCT
CCTTCAGATATATTCTAGACCATATTTGCTAAGCACAGGTTAGGGCTTTAGCCTTGATGCTCATATCTGAGATTAGGTGTACATGGG
AGAACGTTTTTCTACCATGTCTGGATATCAATGTTTTTACACAATTCTCTTATTATTGTTTGCGGTCATGTATGCCATTGCACACGTAT
GGAGGCCAAATGACAGCTCTGCAGAGCTGATTCTCCCACCAGATCAAGAGACAGATGTATCAAATACAGACACAAAAATAATGAGGTTA
GTGTAATTTTTCTGTTTCTTATTGCTTTTTGGTAAGGCATCAGCAGAAAGGTGAGCTTAGAACCGAGTACTTCATATGTGCAAAAATAAAA
GGGAATGGGAGTGTTGAGAAGTCGGGGCCTGTGAGATTGAAGAGTTACTTTTATGCCTTGAAAGTTAGTAGATATAAAGGGATGGTGAG
AGTCAGGGTGCTGTCCCCCAAATGGCTTTCTGTGTCTGTGGCCTCAAGGTAGCCTTTGTAAGGACGAGAGAGGAAGGTATGGGTAG
AAGGAAGAAAGGGACTAAAGCTTAGAACTAGGCTTAGAATTTGGTGTAGCTGTGGTTATCAGCAAAAGAAACGGACTGGGAGCAACCA
GATCCCAAGCTTATGAGGTTTTAAGGAAGCCTAGTTGCCAAGAACTGTGAGTCTGGCCTGAAAACGTCTGTCTCTTTGAATTCCTTA
AAACAATGAAGGCTCAAGCCTTTAAAGAGTGCCAGTTGGAAGAGACTGCGAGTGAAGAGAGTTCCCAACCTCTTCGCATCCCTCAGT
CTTCACTGAACCCATGCTCTAACCTCTTCGCATCTGACTCTTCACTGGACGACACCTTGCTCCTTCAGGGGACTATAAACTCTCTTG
GGGCAGCCTTGATCTTGTCTCCAGCTGAAATCCTGGTACCTAGAGATGACCATTGTAGACTCTATGATGAATATTCGTTGGGATAAAA
GAACTAAATAATGAAGCACTTGTCAATTTCTGGAGGTTGAAAGTTAGACATTTGATTCTCATTTGTCAATTTCTACCACGGTGCCACCAAT
GGCAGATATTTTTTTTTGTATGTGTGAAACTTGGGATTACTCCTGGTAAGGTGTTATGTATCAGGAAACCTAACCAACCATTTGTCTTA
CAGGTTAAGTGCGGCTATTGCTAAAAGCAGGATATTTGATCTCGTTCCTGCTGATGTGTTTTAAGGCTGAAATGAAAGAGTGGGGCAGA
GGATGCAGCTCAATGGTTAGAGGGCTCGCTAGCATGCACGGAACCTTGGATTTAATCTCCAACACAGAACGAACAAGAGTGATCAAGT
TGGTGAAGCCGTCTGGGAATCCCATGGCTTTTTTCCCTTTTCAATTGAGAGACCAATCTTTTGGGTTCCAGACTCCATCTTAGAAAACCG
GACCTCAAGGTTGAACTCAAGTTAACTAACAGGCTGGTACCTAGCACAGTTCAGGCTACCCCCAACAAAGACCTGTGTCTAACACC
AGTTTCTAGGTTATTTCCCATCAAGTTGCACCTCCAGGTTACAGGCCTGCCCTGGCACTTCACTTCTTAACAACCACCAATCAGGAGG
AAAGCAGAAGTTAAGTTTATGGTTTGGCTCCTAGCACAGCCAATTACGTTAAAGGCCATAATGCCACCCAATCAGATGTGTACCAGGC
TAGATACCTGCTTCTTGCTCTATATGGGCTGGAGGCTCCCTCCTGTTCTCCTGCATCAGAGACAGTGGTGTGGCCCAAGCTCGAGCTT
GAGTAAAGAGATCCTAGTGAGATTGCATTGGAATCAGCTCCTTGGTGATCTTTTGGGGGTTTCATGATGTTTTCTGGCACAACACAATCA
CTAGTGTTTCATTAGTTATAACACAATGGCCTGATACACCATGGGAATCCTTTATCGTCTCCTCAAGCCATGATACAAGAGACTGATACA
GTATCCACTTCTCCAGGCAGGAGCGAGTGTGCAACAGACAGTGTGCCTGTCCATTCAACCTATTTAAGCCTTGTGCCAGCCAGTGGGC
CGAGCACCCAGGATGTACTGACACGAGAGGAATTACCTTTGGCTTCTTGTGGCTAGAAAGACCTAATGTGGCAGAGAGGCAATGACAA
CATAATTTGCCAAGAGCTGCTCTTGGAGACATATAATATTATAGAAGTCCATATAATAGAAGACAAGCCAAAAAATTATATAAGCATGG

[illegible]

CCTATTTTCCCTCCAAAAAGAGATACCTCCTACCCCAAATGATCAAGGAGCTTTCTGAGGCATCCGTTGAGATGATGGGGGACTGAGGA
GGGCTCTACGGTGGGACTTCCACCTTGTCTAGTCATGATGTGTTACAGAGAAGGAGGATCGTAAAGGCCAGAGGGCAATGGAGGAGACTG
GCTTACAGATGGACTGGCTAACTGAGGAATCAAAAAGATGAAGAGTCCCCTCAGCTGTTACCAATAATCTGCTACTGTTTAACTTGGTT
GAGGAAGGAGAGTGATTGCCACAGGTTGGCTAGTGGACATTACAGGCTATCGTCTTTGGTTGAGGACGGGCAGTGAGTAGTAAAATGGCT
TCTTATTACTTGTGCACACTGGCCCCCTTGTCTATTCCAACCTTTGCCTCCTCCTTAAGGGAGGTGGAGTTTCTAGTTTCTAGTACACGG
AAGGACCAGGCAGTGTTGGCTTTCACTGGTTGGTCAGTTTCACTTGTCTGCAGGAAGATGGTCCAAAATAGGGTTGGCACCTGGTG
GAGAGTCGCCTTCTGCCAAACACATGGCACTGTTAGAAATACTGGCAGTCAGGTTGGTGAGCCACCAGGTAAAATAGAGTATAGACTCT
CTCTCTTGGCCCGATGGGGAACAGTCCATCCAGATAAAAAATATGGTGAGCCTCTTTGCAGGAAGGAGTTTCATTTTTCTTCTTGCCTG
CAGTAACTTTCAAGAAATGGGGGAATTAAGCTCTGAAGGGCCTCGAGGTCCACACAGTCTCCAGCTCTACCCAGGTCAAGGAGGCATG
CCCTGGCAGAATGCCCCGGCGCAGCAGTGGGCCACACCTTACACCTGCCCCGAGACAGAGATTAGGAGAATGTAGGTTCAATGCCAG
GTGTGTGCGAAATAATTCTAGGGTAAAAACCCCTGGGCTCCTGAGAGGAATCCCCAAGCAACACTCGGAAGTGTCTATTTTTCTGTAC
CGAGTAATTAATGGCTCAAGTATGCACCAGCTTGGCAAATCTGCATCTGGATAAGTACGGGGGCTCTTTAAGGTTACAGTATATGAT
AAAATGTAATCAACCAAAGATTTCCAGGCTTTTCTGTCTCCCACGCCTTTCTAACAGACTGGGGACACTGTCAGCTTCAAACCTTC
ATGTCTTTTTTTACAAGCATGCAACGTAGCGACATTACGATTTCCCTTCCCCTCTTTGTTGCCTCCCGAGTAAGGAAAGTGTAAACACA
GAACTGAAGACGGGAATGGTCACATTAAGGATGTATGTTATACAGTCTGCACGTGTACAGGTATCTGGGGTGTGGTAAAGTTGGG
GAGCCAGAGTATCTCAGAGGGGGCAGGGGGGCATAGACTCTGGTTCTAGACAGCCTGGTTTTAAATTCCAGTTTGACCTTCTTGACCTT
CTGTGTGACCTTGGCTGAGCAATTCACCGAGTTCTGTGCTTCATGTCTCCGTCTCTAAAATCGTTCTGAAATCTCACGCACCTTCAC
GACACAGAGCGCTCACACGAGTTATCATTTATAAAGCACAGAGACTTGTCTTGGCCTAAGCAACGGCTATACAGTTGTACTTGGTCAA
GTTCAATTACAATTACAGTTCTGGAGGGCATATATATGCTGTCTAGATTCTGAGTTCTTCAATCACGAAAAATCCACACTTGGATCACTA
CTGGCCAGATTAAAAATGTTCCCAAGCTCCCCTGGTGCAGTGTCTGAAGGCCCTTTAAGTTGAAAGAGCCTCAGCCATTACCACTAAA
GATGGGGAGACTGTGGAGATGAATCCAGGGGTAGAAGTATTCTTCTGTTTGTCTTCTTCTGCCAAGTCTTAGATGGTCCAAATGTCTC
CTGTCTAGTTGCTGAGTCTGCCTTCTTTGTTTTGATCTAAGGTAGAGGAATGTGAGGGCAAGAGGTGAGTGGAAAGGGGCAGAACAGTA
CCAAGAAGTGGCTTGTGGAATGAATGAAGTATCTCTGAACAGCCCCGGCTGTCTCACATGCCTTTACAAATGGGGGGCTTTACAGTCAA
AATTCAGTTGAAACAAGTCTGGTAGTCAGTTACCGCTGCAATTTCTGACCTTGTTCACAAAAGCATAGTGTGAAAAATATTTTTGGGCT
CTCTGACCTTAATACTATCTGAGTGTCTCTTTTTTTTTCCCCCATGTGCTTGTCTAGCAAAGGTGCCGTGGCTCTCTTCTGATTAAT
CACTTTGGAATTTTCTACAAATGGCTAACACTAACCGGAACACCTGTGCAGTCAAGTTCTCTCTAGGTAGACGCCTTAGTGGGGGAA
GGTGGTACCCACATTATGTTGTCTACTGGATTTTATGGCCTCTGAGCAGAGGGCCTTAGGGAGTGTCTACTCTCCTGGGTTGAATATTT
GTGACATGTTTTGACCCTACTGTACCTGAGTCTATGTTCTATGCAAGACACTCTGCATCTCGCTCCTGTTTGTCTCTCTTTTCTGA
ACTTGTGTGGAGAGACTCACATTGCAGGGTCACAGAATCGTCTGACCTCCTGTCTGGCTTACTACCATTAGCTACAAAACCACATTTAA
CTCAGGGACTTGTATCTTTCTCTCCAGGGCTATTGAGGGACAGAGTAGAGGAACCGCCAGTGGGCATGGGGTCTGTCTCATATTCC
CTGCCCCGTGCCACCCGGAGTCCACTCTTAGCATTCTGCCCTGCTGAAAAGGTCTGACAGTTTCCAGAAATAGGCAGGTTGTGTTTTCA
TAGTTTCATTTTTGGGTTAGATCTTTGGCGTCTTTCTATTTCTTTGACTCGTTGTTTTGTGTTCTCGGCTCATAAATAGCTCTCTTCCGC
ATTGAAAATTCACACTTGATTTTTCTAATTGTCTTGGGCCTTTAATGCATTGAATATTTATGGGGCTCATCATTATCCAATGCAGTT
CTCTTGCACTCACCTATGTATTGGTGGCTACATGTTTACGGCTCACAGGCCTCGGTCTCTCAACTATCATCACAACGGGTTTGTCTT
GCTTGTAAATTTCTGTACTTTAGCTTCCCTGTCAATGGCACATTTCAATTTAATTATGTTAACGTTTTCTCTCTTCTGCCAAGTAGAG
ACTTCTGTTGTTGAGGGTTCTTGGGTTTTATGTCACTTTAAGGCTCACCATGCAGCTGAAGGGGTGGGCAGCCCTATAGGTGGAACAG
CAGTATGAACTAACCAGTACCCCAAGAGCTCGTGTCTCTAGCTGCATATGTAGCAGAAGATGGCCTAGTTGGCCATCATTGGGAAGAGA
GGCCCCCTTGTCTTGCAAACCTTTATGTGCCCCAGTACAGGGGAACGCCAGGGCCAAGAAGTGGGAGTGGGTGGGTAGAGGAGCAGGGCCG
GGGGAGGGTATAGGGGACTTTCCGGATAGCATTGAAATGTAAATAAAGAAAATATCTAATAATAAAGGATAAAGGCTCACCATGCAAT
ACACACAAGTAAAGCACTAGATAAGTGGGGCCTTGAGCTCAGGCCCCCCCCACTTTGTACCTGCTTAGCCACTAGCAATTCTCCAAGG
AAGGCTGCCTGTAAACGCCACTGGAGAACTTCCCATGGTGAGAAAGAGCACAGTGTCTGGTACTAAGCACTAC

Selection Cassette:

GGCCGCTCTAGAGGCCATAGCGGCCGGATCCTCGAGGCGCGCCGGATCCCGGGCCGCTCTAGCTAGACTAGTCTAGCTAGAGAATTCGG
CCCCCTCTCCCTCCCCCCCCCTAACGTTACTGGCCGAAGCCGCTTGAATAAAGGCCGGTGTGCGTTTGTCTATATGTTATTTTCCACCA
TATTGCCGTCTTTTGGCAATGTGAGGGCCCGGAAACCTGGCCCTGTCTTCTTGACGAGCATTCTAGGGGTCTTTCCCTCTCGCCAAA
GGAATGCAAGGTCTGTTGAATGTGCTGAAGGAAGCAGTTCCTCTGGAAGCTTCTTGAAGACAAACAACGTCTGTAGCGACCTTTGCGAG
GCAGCGGAACCCCACTGGCGACAGGTGCCTCTGCGGCCAAAAGCCACGTGTATAAGATACACCTGCAAAGGCGGCACAACCCCACT
GCCACGTTGTGAGTTGGATAGTTGTGGAAGAGTCAAATGGCTCTCCTCAAGCGTATTCAACAAGGGGCTGAAGGATGCCAGAAGGTA
CCCCATTGTATGGGATCTGATCTGGGGCCTCGGTGCACATGCTTTACATGTGTTTAGTCGAGGTTAAAAAACGTCTAGGCCCCCCGAA
CCACGGGGACGTGGTTTTCTTTGAAAAACACGATGATAAGCTTGCCACAACCATGGAAGATCCCGTCTGTTTTACAACGTCTGTACTGG
GAAAACCTGGCGTTACCCAACCTTAATCGCCTTGACGACATCCCCCTTTGCCAGCTGGCGTAATAGCGAAGAGGCCCGCACCGATCG
CCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGCTTTGCCTGGTTTTCCGGCACCAGAAGCGGTGCCGGAAGCTGGCTGGAGT
GCGATCTTCTGAGGCCGATACTGTGCTGCTCCCTCAAACCTGGCAGATGCACGGTTACGATGCGCCCATCTACACCAACGTAACCTAT
CCCATTACGGTCAATCCGCCGTTTTGTTCCACGGAGAATCCGACGGGTTGTTACTCGCTCACATTTAATGTTGATGAAAGCTGGCTACA
GGAAGGCCAGACGCGAATTTATTTTGTGTCGTTAACTCGGCCTTTCATCTGTGGTGCAACGGGCGCTGGGTGCGTTACGGCCAGGACA
GTCGTTTGGCGTCTGAATTTGACCTGAGCGCATTTTACGCGCCGGAGAAAACCGCCTCGCGGTGATGGTGCTGCGCTGGAGTGACGGC
AGTTATCTGGAAGATCAGGATATGTGGCGGATGAGCGGCATTTTCCGTGACGTCTCGTTGCTGCATAAACCGACTACACAAATCAGCGA
TTTCCATGTTGCCACTCGCTTTAATGATGATTTACGCCGCGCTGTACTGGAGGCTGAAGTTTCAAGTGTGCGGGCAGTTGCGTGACTACC
TACGGGTAAACAGTTTCTTTATGGCAGGGTGAACGCAGGTGCCAGCGGCACCGCGCCTTTGGCGGTGAAATTATCGATGAGCGTGGT

GGTTATGCCGATCGCGTCACACTACGTCTGAACGTCGAAAACCCGAAACTGTGGAGCGCCGAAATCCCGAATCTCTATCGTGCGGTGGT
TGAAGTGCACACCGCCGACGGCAGCGTGAATTGAAGCAGAAGCCTGCGATGTCGGTTTCCGCGAGGTGCGGATTGAAAATGGTCTGCTGC
TGCTGAACGGCAAGCCGTTGCTGATTCGAGGCGTTAACCGTCACGAGCATCATCCTCTGCATGGTCAGGTCATGGATGAGCAGACGATG
GTGCAGGATATCCTGCTGATGAAGCAGAACAACTTTAACGCCGTGCGCTGTTTCGCATTATCCGAACCATCCGCTGTGGTACACGCTGTG
CGACCGCTACGGCCTGTATGTGGTGGATGAAGCCAATATTGAAACCCACGGCATGGTGCCAATGAATCGTCTGACCGATGATCCGCGCT
GGCTACCGGCGATGAGCGAACGCGTAACGCGAATGGTGCAGCGCGATCGTAATCACCCGAGTGTGATCATCTGGTCGCTGGGGAATGAA
TCAGGCCACGGCGCTAATCACGACGCGCTGTATCGCTGGATCAAATCTGTGATCCTTCCCGCCCGGTGCAGTATGAAGGCGGCGGAGC
CGACACCACGGCCACCGATATTATTTGCCGATGTACGCGCGCGTGGATGAAGACCAGCCCTTCCCGGCTGTGCCGAAATGGTCCATCA
AAAAATGGCTTTTCGCTACCTGGAGAGACGCGCCCGCTGATCCTTTGCGAATACGCCACGCGATGGGTAACAGTCTTGGCGGTTTCGCT
AAATACTGGCAGGCGTTTCGTCAGTATCCCCGTTTACAGGGCGGCTTCGTCTGGGACTGGGTGGATCAGTCGCTGATTAATATGATGA
AAACGGCAACCCGTGGTGGCTTACGGCGGTGATTTTGGCGATACGCCGAACGATCGCCAGTTCTGTATGAACGGTCTGGTCTTTGCCG
ACCGCACGCCGCATCCAGCGCTGACGGAAGCAAAACACCAGCAGCAGTTTTTCCAGTTCCGTTTATCCGGGCAAACCATCGAAGTGACC
AGCGAATACCTGTTCCGTCATAGCGATAACGAGCTCCTGCACTGGATGGTGGCGCTGGATGGTAAGCCGCTGGCAAGCGGTGAAGTGCC
TCTGGATGTGCTCCACAAGGTAACAGTTGATTGAACTGCCTGAACTACCGCAGCCGGAGAGCGCCGGGCAACTCTGGCTCACAGTAC
GCGTAGTGCAACCGAACGCGACCGCATGGTCAGAAGCCGGGCACATCAGCGCCTGGCAGCAGTGGCGTCTGGCGGAAAACCTCAGTGTG
ACGCTCCCCGCCGCGTCCACGCCATCCCGCATCTGACCACCAGCGAAATGGATTTTTGCATCGAGCTGGGTAATAAGCGTTGGCAATT
TAACCGCCAGTCAGGCTTTCTTTACAGATGTGGATTGGCGATAAAAAACAACCTGCTGACGCCGCTGCGCGATCAGTTCACCCGTGCAC
CGCTGGATAACGACATTGGCGTAAGTGAAGCGACCCGCATTGACCCTAACGCCTGGGTGCAACGCTGGAAGGCGGCGGGCCATTACCAG
GCCGAAGCAGCGTTGTTGCAGTGCACGGCAGATACACTTGCTGATGCGGTGCTGATTACGACCGCTCACGCGTGGCAGCATCAGGGGAA
AACCTTATTTATCAGCCGGAAAACCTACCGGATTGATGGTAGTGGTCAAATGGCGATTACCGTTGATGTTGAAGTGGCGAGCGATACAC
CGCATCCGGCGCGGATTGGCCTGAACTGCCAGCTGGCGCAGGTAGCAGAGCGGGTAAACTGGCTCGGATTAGGGCCGCAAGAAAACCTAT
CCCGACCGCCTTACTGCCGCCTGTTTTGACCGCTGGGATCTGCCATTGTGAGACATGTATACCCCGTACGTCTTCCCGAGCGAAAACGG
TCTGCGCTGCGGGACGCGCGAATTGAATTATGGCCCACACCAGTGGCGCGGCGACTTCCAGTTCAACATCAGCCGCTACAGTCAACAGC
AACTGATGGAAACCAGCCATCGCCATCTGCTGCACGCGGAAGAAGGCACATGGCTGAATATCGACGGTTTCCATATGGGGATTGGTGGC
GACGACTCCTGGAGCCCGTCAGTATCGGCGGAATTCAGCTGAGCGCCGGTCTGCTACCATTTACCAGTTGGTCTGGTGTCAAAAATAATA
ATAACCGGGCAGGCCATGTCTGCCGTATTTGCGCTAAGGAAATCCATTATGTACTATTTAAAAAACACAAACTTTTGGATGTTTCGGTT
TATCTTTTTCTTTTACTTTTTTATCATGGGAGCCTACTTCCCGTTTTTCCCGATTTGGCTACATGACATCAACCATATCAGCAAAAAGT
GATACGGGTATTATTTTTGCCGCTATTTCTCTGTTCTCGCTATTATTCCAACCGCTGTTTGGTCTGCTTTCTGACAAACTCGGAACTTG
TTTATTGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTACAAATTTAATTAAGGCCGCGGGATCGATCCCGTCGAG
CAGTGTGGTTTTCAAGAGGAAGCAAAAAGCCTCTCCACCCAGGCCTGGAATGTTTCCACCCAATGTCGAGCAGTGTGGTTTTGCAAGAG
GAAGCAAAAAGCCTCTCCACCCAGGCCTGGAATGTTTCCACCCAATGTCGAGCAAAACCCCGCCAGCGTCTTGTATTGGCGAATTCGA
ACACGCAGATGCAGTCGGGGCGGCGCGGTCCCAGGTCCACTTCGCATATTAAGGTGACGCGTGTGGCCTCGAACACCGAGCGACCCTGC
AGCCAATATGGGATCGGCCATTGAACAAGATGGATTGCACGCAGGTTCTCCGGCCGCTTGGGTGGAGAGGCTATTGGCTATGACTGGG
CACAACAGACAATCGGCTGCTCTGATGCCGCCGTGTTCCGGCTGTGAGCGCAGGGGCGCCCGTTCTTTTTGTCAAGACCGACCTGTCC
GGTGCCCTGAATGAACTGCAGGACGAGGCAGCGCGGCTATCGTGGCTGGCCACGACGGGCGTTCTTGCAGCTGTGCTCGACGTTGT
CACTGAAGCGGGAAGGGACTGGCTGCTATTGGGCGAAGTGCCGGGGCAGGATCTCCTGTCATCTCACCTTGCTCCTGCCGAGAAAGTAT
CCATCATGGCTGATGCAATGCGGCGGCTGCATACGCTTGATCCGGCTACCTGCCCATTCGACCACCAAGCGAAACATCGCATCGAGCGA
GCACGTAATCGGATGGAAGCCGGTCTTGTGATCAGGATGATCTGGACGAAGAGCATCAGGGGCTCGCGCCAGCCGAACCTGTTGCCAG
GCTCAAGGCGCGCATGCCCGACGGCGAGGATCTCGTCTGACCCATGGCGATGCCTGCTTGCCGAATATCATGGTGGAAAATGGCCGCT
TTTCTGGATTATCGACTGTGGCCGGCTGGGTGTGGCGGACCGCTATCAGGACATAGCGTTGGCTACCCGTGATATTGCTGAAGAGCTT
GGCGGCGAATGGGCTGACCGCTTCTCTGCTTTACGGTATCGCCGCTCCCGATTGCGAGCGCATCGCCTTCTATCGCCTTCTTGACGA
GTTCTTCTGAGGGGATCGGCAATAAAAAGACAGAATAAAACGCACGGGTGTTGGGTGCTTTGTTGCGATCCGAATTCCTCGAGGGCGCG
CCGGCCAGCGAGGCGGTACCCAATTGCCCCATAG

Targeted Locus:

TGAAGAGAGAGTTCCCAACCTCTTCGCATCCCTCAGTCTTCACTGAACCCATGCTCTAACCTCTTCGCATCTGACTCTCTTCACTGGAC
GACACCTTGCTCCTTCAGGGGACTATAAACTCTCTTGGGGCAGCCTTGATCTTGTCTCCAGCTGAAATCCTGGTACCTAGAGATGACCA
TTTGTAGACTCTATGATGAATATTCGTTGGGATAAAAAGAACTAAATAATGAAGCACTTGTCAATTTCTGGAGGTTGAAAGTTAGACATTT
GATTCTCATTTGTCAATTTCTACCACGGTGCCACCAATGGCAGATATTTTTTTTTGTATGTGTGAAACTTGGGATTACTCCTGGTAAGGT
GTTATGTATCAGGAAACCTAACCAACCATTTGTCTACAGGTTAAGTGCGGCTATTGCTAAAAGCAGGATATTTGATCTCGTTTCTGCT
GATGTGTTTTAAGGCTGAAATGAAAGAGTGGGGCAGAGGATGCAGCTCAATGGTTAGAGGGCTCGCCTAGCATGCACGGAACCTTGGAT
TTAATCTCCAACACAGAACGAACAAGAGTGATCAAGTTGGTGAAGCCGTCTGGGAATCCCATGGCTTTTTTTCCCTTTTCATTGAGAGAC
CAAATCTTTTTGGGTTTCAGACTCCATCTTAGAAAACCGGACCTCAAGGTTGAACTCAAGTTAACTAACAGGCTGGTACCTAGCACCAGTT
TCCAGGCTACCCCCAACAAAGACCTGTGTCTAACACCAAGTTTCTAGGTTATTCCCATCAAGTTGCACCTCCAGGTTACAGGCCTGCCC
CTGGCACTTCACTTCTAACAAACCAATCAGGAGGAAAGCAGAAGTTAAGTTTATGGTTTGGCTCCTAGCACCAGCCAATTACGTTA
AAGGCCATAATGCCACCAATCAGATGTGTACCAGGCTAGATACCTGCTTCTTGCTCTATATGGGCTGGAGGCTCCCTCCTGTTCTCC
TGCATCAGAGACAGTGGTGTGGCCCAAGCTCGAGCTTGAGTAAAGAGATCCTAGTGAGATTGCATTGGAATCAGCTCCTTGGTGATCTT
TTGGGGGTTTCATGATGTTTTCTGGCACAACACAATCACTAGTGTTTCATTAGTTATAACACAATGGCCTGATACACCATGGGAATCCTTT
ATCGTCTCCTCAAGCCATGATACAAGAGACTGATACAGTATCCACTTCTCCAGGCAGGAGCGAGTGTGCAACAGACAGTGTGCCTGTC
CATTCAACCTATTTAAGCCTTGTGCCAGCCAGTGGGCCGAGCACCCAGGATGTAAGTACGACGAGAGGAATTACCTTTGGCTTCTTGTG

GCTAGAAAGACCTAATGTGGCAGAGAGGCAATGACAACATAATTTGCCAAGAGCTGCTCTTGGAGACATATAATATTATAGAAGTCCAT
ATAATAGAAGACAAGCCAAAAAATTATATAAGCATGGATCCAAAAAGTATAAGTGGAGATTGTTCAAGTGAAGGAATGTGGAAGTTTTCT
TGGGCCAAAAAACAAAAACAAAAACAAAAACAAAAACAAAAACCTACCTATGTCAGAGAAGTGTGCAGTCACTGTCTTATTTCCACC
TATCACTCTTCTCCCCTCTTCTGAAGTTATTCTCTAGCCTGCAGGTTAACCAACCATCCACTGTGCCAATGGAGCTCTTTCAGGAACC
GAACAGGAGCCAATAAGCAATGCATGCCACCAAGGAGTGGGGTCGGGAAGCAAGCCTACATTACACTGACAAACATTTGACTTTTCTGC
AGAAAAAATATTATGCCTCTTAGACTATTTTGGACTTTGTTAGAAGCATCTGAAATGGATGACACCAAGCTGTTTGCCTCAAACAGTG
TCCCAAGCCTGAACCGCAAGGATAATTTTCTGAGATTAATAAGAACTTCTTTTGCTAACAGAAGCAACTTGGAAATCAAAGAACTA
TTATTTTCTTTTCTTGCAGAAAAGTCTGTTTTTACACATACTGATAAATCAGGATAGTGAACCAAACTGGCACAGAACTTTTCGT
TAACAATTTGAAGTAGCAGAAAACCTTAAATGATGCGAACGGAGTGACAGTTGAATGTACGGTAGCAAATACTTTTCGATTAACATTTAT
GAGCACCTACTATGTGCCAGGCAATGTTGTAGGCACTAAACAAAGATAGCTCTTCTTGGAGAGTTTACATTACAACAGAAAGAAGACAT
AGATAAACAAATTATGCTGTAAGAGAAAAGATCAGTACAATGGGGGGGAAGGCAAAGTATGGCTGGACGTGACACCAGAGGGGAAGATA
AGAATTTTAAACAGCATTTCATATTTGGCTTTTAGGGTGACTTTTAGGCAAGGAAGTGAGATTAGCTATACACACAACCTCTTCAATGC
ATGCCTAGAGGGTGCCAGGCCAGGAGATCATGGACTGAAGAGAGAGAGGACAGGACAGCCAGCCATTGGGGGTATGGCCTAAGGACGGG
AATGATTTAAGTTTGAACGTATATTTATGAAAATCATTTCTTTTCAGTCCTTTGGTGCAATGCTTTTTACGATAGCTCAGTAACTACTT
CAAATGTTTCTAAAGAGGTCCCCTCAAGACCAGCTACACCACAAGCTAAGTGTAATACTCCCTTCTCTGGGGTGGAGCACTTGC
CCTACCCACGGGGGTGCACCAAGTGGAGCTTCAGGACACAGACAGTTTTCCAAGTTCTTCTCTTCTCTCTGAGCCAGAGTTCTTCTT
CAAAATTCGACCTGAGAGCCGAACCCCCCACCCTACTCCCACCCCGTTAAAAGGTGCAGGGATATTCCAGCTCTGTAGGAGAAGCA
ATCTGGGTCTGCCTGCCTTCATCAGTCCAGGAACCCCTCCGGTAGGTGCAGAAAAGTTGGGTTCTCCCCTATAGACCGCTGTGTGTGT
ATGTGGGGGGGCATCTGTCTACCCCCACAGAACGCGTACTTCCACTTCCAACCCCACTGTCGCCCCAGCCTCTGGCGGCTGGGCTCACT
TTTTCAGGCAGGTACCCGACAAGCCCTCTCCCTAGCTCTGCTCCCAACTTTTCTCGCAGCCCGGGGGCAAGCGCCACCCGTGGCCGAG
GCTGCCTGCGCGCCGCATCCCCGCCCTGAGCCGCCCTGCCCCTGGGGCCCGGGGAGGGGCGAGCCCCGGCGCGCGCCAGGGCACCA
GGGCGGCGGGGCAAGGAGGGCGGCGGGCTGCGCGGCGCGTCCCTCCCGCTCGCCCCCTCCCGCGGGGCGGCGCGGCTCCCGCCGAGCG
CCTCCCCTCGCCAGGAGGGAGCCGGAGGGGCTCTGCCAGCCCGCCGACAGCTGCCCGGCTGCGCGCTGCGCTCTGTGCGTCCCAGCAG
CCGCGGGTGCCGCGCCGAAGGCGGCGGGAGATCCCGGGACGCGCAGCTCCCCGAACCTTCAGCGTCCGGCCGCTCTAGAGGCCATAG
CGGCCGGATCCTCGAGGCGCGCGGATCCCGGGCGCTCTAGCTAGACTAGCTAGCTAGAGAATTCGCCCTCTCCCTCCCCCCCC
CTAACGTTACTGGCCGAAGCCGCTTGAATAAGGCCGCTGTCGTTTTGTCTATATGTTATTTTCCACCATATTGCCGTCTTTTGGCAAT
GTGAGGGCCCGAAACCTGGCCCTGTCTTCTGACGAGCATTCCTAGGGGTCTTTCCCCTCTCGCCAAAGGAATGCAAGGTCTGTTGAA
TGTCGTGAAGGAAGCAGTTCTCTGGAAGCTTCTTGAAGACAAACAACGTCTGTAGCGACCTTTGCAGGCAGCGGAACCCCCACCTG
GCGACAGGTGCCTCTGCGGCCAAAAGCCACGTGTATAAGATACACCTGCAAAGGCGGCACAACCCCACTGCCACGTTGTGAGTTGGATA
GTTGTGGAAGAGTCAAATGGCTCTCCTCAAGCGTATTCAACAAGGGGCTGAAGGATGCCAGAAGGTACCCATTGTATGGGATCTGA
TCTGGGGCCTCGGTGCACATGCTTTACATGTGTTTAGTCGAGGTTAAAAAACGTCTAGGCCCCCGAACCACGGGGACGTGTTTTCC
TTTGA AAAACACGATGATAAGCTTGCCACAACCATGGAAGATCCCGTCTTTTTACAACGTCGTGACTGGGAAAACCTGGCGTTACCCA
ACTTAATCGCCTTGACGACATCCCCCTTTGCCAGCTGGCGTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCA
GCCTGAATGGCGAATGGCGCTTTGCTGTTTTCCGGCACCAGAAGCGGTGCCGGAAGCTGGCTGGAGTGCATCTTCTGAGGCCGAT
ACTGTCGTCTGCTCCCTCAAACCTGGCAGATGCACGTTACGATGCGCCCATCTACACCAACGTAACCTATCCCATTACGGTCAATCCGCC
GTTTGTTCCACGGAGAATCCGACGGGTGTTACTCGCTCACATTTAATGTTGATGAAAGCTGGCTACAGGAAGGCCAGACGCGAATTA
TTTTTGATGGCGTTAACTCGGCGTTTTCATCTGTGGTGCAACGGGCGCTGGGTGCGTTACGGCCAGGACAGTCGTTTGCCGTCTGAATTT
GACCTGAGCGCATTTTTACGCGCCGGAGAAAACCGCCTCGCGGTGATGGTGCTGCGCTGGAGTGACGGCAGTTATCTGGAAGATCAGGA
TATGTGGCGGATGAGCGGCATTTTCCGTGACGTCTCGTTGCTGCATAAACCGACTACACAAATCAGCGATTTCCATGTTGCCACTCGCT
TTAATGATGATTTAGCCGCGCTGTACTGGAGGCTGAAGTTTCAAGTGTGCGGCGAGTTGCGTGACTACCTACGGGTAACAGTTTCTTTA
TGGCAGGGTGAAACGCAGGTGCGCAGCGGCACCGCGCTTTCCGGCGTGAAATTATCGATGAGCGTGGTGGTTATGCCGATCGCGTCAC
ACTACGTCTGAACGTCGAAAACCCGAAACTGTGGAGCGCCGAAATCCCGAATCTCTATCGTGCGGTGGTTGAACGTGCACACCGCCGACG
GCAGCTGATTGAAGCAGAAGCCTGCGATGTCGGTTTTCCGCGAGGTGCGGATGAAAATGGTCTGCTGCTGCTGAACGGCAAGCCGTTG
CTGATTCGAGCGTTAACCGTCACGAGCATCTCCTGATGAGTGCAGTATGAGTACGAGCAGCATGGTGAGGATATCTGCTGATG
GAAGCAGAACAACCTTTAACGCCGTGCGCTGTTGCGATTATCCGAACCATCCGCTGTGGTACACGCTGTGCGACCGCTACGGCCTGTATG
TGGTGGATGAAGCCAATATTGAAACCCACGGCATGGTGCCAATGAATCGTCTGACCGATGATCCGCGCTGGCTACGGCGATGAGCGAA
CGCGTAACGCGAATGGTGACGCGCATGTAATACCCGAGTGTGATCATCTGGTGCCTGGGGAATGAATCAGGCCACGGCGCTAATCA
CGACGCGCTGTATCGCTGGATCAAATCTGTCGATCCTTCCCGCCCGGTGCAGTATGAAGGCGGCGGAGCCGACACCACGGCCACCGATA
TTATTTGCCCGATGTACGCGCGCTGGATGAAGACCAGCCCTTCCGGCTGTGCCGAAATGGTCCATCAAAAAATGGCTTTGCTACCT
GGAGAGACGCGCCCGCTGATCCTTTGCGAATACGCCCACGCGATGGGTAACAGTCTTGGCGGTTTTCGCTAAATACTGGCAGGCGTTTCG
TCAGTATCCCCGTTTACAGGGCGGCTTCGTCTGGGACTGGGTGGATCAGTCGCTGATTAATATGATGAAAACGGCAACCCGTGGTCCG
CTTACGGCGGTGATTTTGGCGATACGCCGAACGATCGCCAGTTCTGTATGAACGGTCTGGTCTTTGCCGACCGCACGCCGATCCAGCG
CTGACGGAAGCAAAACACCAGCAGCAGTTTTTCCAGTTCCGTTTATCCGGGCAACCATCGAAGTGACCAGCGAATACCTGTTCCGTCA
TAGCGATAACGAGCTCCTGCACTGGATGGTGGCGCTGGATGGTAAGCCGCTGGCAAGCGGTGAAGTGCCTCTGGATGTCGCTCCACAAG
GTAAACAGTTGATTGAAGTGCCTGAAGTACCGCAGCCGGAGAGCGCCGGGCAACTCTGGCTCACAGTACGCGTAGTGCAACCGAACGCG
ACCGCATGGTCAGAAGCCGGGCACATCAGCGCCTGGCAGCAGTGGCGTCTGGCGGAAAACCTCAGTGTGACGCTCCCCGCCGCGTCCCA
CGCCATCCCGCATCTGACCACAGCGAAATGGATTTTGCATCGAGCTGGGTAATAAGCGTTGGCAATTTAACCGCCAGTCAGGCTTTC
TTTACAGATGTGGATTGGCGATAAAAAACAACCTGCTGACGCCGCTGCGCGATCAGTTACCCGTGCACCGCTGGATAACGACATTGGC
GTAAGTGAAGCGACCCGCAATTGACCCTAACGCCTGGGTGCAACGCTGGAAGGCGGCGGGCCATTACCAGGCCGAAGCAGCGTTGTTGCA
GTGCACGGCAGATACACTTGCTGATGCGGTGCTGATTACGACCGCTCACGCGTGGCAGCATCAGGGGAAAACCTTATTTATCAGCCGGA

AACTTACCGGATTGATGGTAGTGGTCAAAATGGCGATTACCGTTGATGTTGAAGTGGCGAGCGATACACCGCATCCGGCGCGGATTGGC
CTGAACTGCCAGCTGGCGCAGGTAGCAGAGCGGGTAAACTGGCTCGGATTAGGGCCGCAAGAAAACATATCCCGACCGCCTTACTGCCGC
CTGTTTTGACCGCTGGGATCTGCCATTGTAGACATGTATACCCCGTACGTCTTCCCGAGCGAAAACGGTCTGCGCTGCGGGACGCGCG
AATTGAATTATGGCCACACCAAGTGGCGCGGGGACTTCCAGTTCACATCAGCCGCTACAGTCAACAGCAACTGATGGAACACAGCCAT
CGCCATCTGCTGCACGCGGAAGAAGGCACATGGCTGAATATCGACGGTTTCCATATGGGGATTGGTGGCGACGACTCCTGGAGCCCCGTC
AGTATCGGCGGAATTCAGCTGAGCGCCGGTCGCTACCATTACCAAGTTGGTCTGGTGTCAAAAAATAATAAACCAGGGCAGGCCATGTC
TGCCCGTATTTTCGCGTAAGGAAATCCATTATGTAATATTTAAAAAACACAACTTTTGGATGTTTCGGTTTATTTCTTTTTCTTTACTTT
TTTATCATGGGAGCCTACTTCCCCTTTTTCCCGATTTGGCTACATGACATCAACCATATCAGCAAAAGTGATACGGGTATTATTTTTGC
CGCTATTTCTCTGTTCTCGCTATTATTTCAACCGCTGTTTGGTCTGCTTTCTGACAACTCGGAACTTGTTTTATTGCAGCTTATAATGG
TTACAAATAAAGCAATAGCATCACAAATTTACAAATTTAATTAAGGCCGCGGGGATCGATCCCGTCGAGCAGTGTGGTTTTCAAGAGGA
AGCAAAAAGCCTCTCCACCCAGGCTGGAATGTTTCCACCCAATGTCGAGCAGTGTGGTTTTGCAAGAGGAAGCAAAAAGCCTCTCCAC
CCAGGCTGGAATGTTTCCACCAATGTCGAGCAAAACCCGCCAGCGCTCTGTTCATTGGCGAATTCGAACAGCATGCGAGTCGGGG
CGGCGCGGTCCCAGGTCACCTTCGCATATTAAGGTGACGCGTGTGGCTCGAACACCGAGCGACCTCGACCCAATATGGGATCGGGCA
TTGAACAAGATGGATTGCACGCAGGTTCTCCGGCCGCTTGGGTGGAGAGGCTATTCGGCTATGACTGGGCACAACAGACAATCGGCTGC
CTGATGCCGCCGTGTTCCGGCTGTGACGCGAGGGGCGCCCGTCTTTTTGTCAAGACCGACCTGTCCGGTGCCCTGAATGAACTGCA
GGACGAGGCAGCGCGGCTATCGTGGCTGGCCACGACGGGCGTTCCTTGCGCAGCTGTGCTCGACGTTGTCACTGAAGCGGGAAGGGACT
GGCTGCTATTGGGCGAAGTGCCGGGGCAGGATCTCCTGTATCTCACCTTGCTCCTGCCGAGAAAGTATCCATCATGGCTGATGCAATG
CGGCGGCTGCATACGCTTGATCCGGCTACCTGCCATTTCGACCACCAAGCGAAACATCGCATCGAGCGAGCACGTACTCGGATGGAAGC
CGGTCTTGTCGATCAGGATGATCTGGACGAAGAGCATCAGGGGCTCGCGCCAGCCGAACGTTCGCCAGGCTCAAGGCGCGCATGCCCG
ACGGCGAGGATCTCGTCTGACCCATGGCGATGCCTGCTTGCCGAATATCATGGTGGAAAATGGCCGCTTTTCTGGATTTCATCGACTGT
GGCCGGCTGGGTGTGGCGGACCGCTATCAGGACATAGCGTTGGCTACCCGTGATATTGCTGAAGAGCTTGGCGGCGAATGGGCTGACCG
CTTCTCTGCTGCTTACGGTATCGCCGCTCCCATTTCGAGCGCATCGCCTTCTATCGCCTTCTTGACGAGTTCTTCTGAGGGGATCGGC
AATAAAAAGACAGAATAAAACGCACGGGTGTTGGGTGCTTTGTTTCGGATCCGAATTCCTCGAGGGCGCGCCGGCCAGCGAGGCCGGTAC
CCAATTCGCCCTATAGGCTTACCATTACTGAATAAGTCTTAACTGTGCAGATCTGACCCAAATCTTTATTCTGCCCTTTCTAATCAGA
GGTACCTGTGTCACAGTGCCAGCGTTGCCATTTACAGAGAGCCACTTACTGTGTTGTCCAACAACACAATGTATTTTATTCTTTTATGT
GTAAGGGTGTTTTATCGCATGTATGTGCACCACCTGGTCTGGAGGATAGCCTGGAAGTGGAGTTACAGGTGGTTGTGAGCCAAACAG
ATGTTTCTAGGAATTGAACGCGGGGCTCTGGCAGCAACATCAGTCTTTAAACCATGAGTCATCGCTCCAGCTCGGCTGCACACTTA
ACTTTTGTTTTTCAGTTCCTTCCGCTCTAGGCTTCTCATCAGGCTTCTCCCTCCTTTGCTCCAAGCTCTGAGATGACGGTGAGATAGTG
AGTCTAGACACTATTTACACTAAATAAACTGAGAACTTAAGAGTCCCTGTAAAACCACCACTGGAAGTGTGTGTAAGGTGGCCGCTTG
CCCTTTCCAAGTCTCTTTCTCCTCCTCTTCTCCTCCTCCTCCTCCTCCTCCTCCTCCTCCTCCTCCTCCTCCTCCTCCTCCTCCTCCT
YCTYKCTCTYCTYCTYCTYCTCCTTCTCCTTCTCCTTCTCCTTCTCCTTCTCCTTCTCCTTCTCCTTCTCCTTCTCCTTCTCCTTCTCCT
CTCCTCCTCCTCCTCCTCCTCCTTCTTCTTTCTTTTCTTTGGGAATTATTTATTTTATGTATATGAGTACACAGTAGCTGTCTTCAGAC
ACCCAGAAAGAGGGCATCAGATCCTACTACAGATGGTTGTGAGCCACCATGTGGTTGCTGGGAATTTGAACTCAGGACCTCTGGAAGAG
CATCCCATGCTCTTAACCGCTGAGCCATCTCTCCATCCCCTTCATGTTCTTTTTGATGAAGGGAAGTTATACTGACATCCATATGAGCC
AACTGATAGTGTATAGGAAACTTCTGGAAAACGTCGTTTATAGACTCCATAAATTGATCAAAGTCTTATATAGTAGGTGACAAATCAGA
ACACTAATTTCTGTTTTATTTCATGATTGAATTAGATACTTTAATGATACAATTGCTAGTCTTAAACGAAACTTTGATTTGGCAGATTGC
TCAGATTTTACTTCGATCTGGACCTACAACTTCACCCCACTTCCCTATTTTTCCCTCCAAAAAGAGATACCTCCTACCCCAAATGATC
AAGGAGCTTTCTGAGGCATCCGTTGAGATGATGGGGGACTGAGGAGGGCTCTACGGTGGGACTTCCACCTTGTCAGTCATGATGTGTTA
CAGAGAAGGAGGATCGTAAAGGCCAGAGGGCAATGGAGGAGACTGGCTTACAGATGGACTGGCTAACTGAGGAATCAAAAAGATGAAGA
GTCCCCCTCAGCTGTTACCAATAATCTGCTACTGTTTAACTTGGTTGAGGAAGGAGAGTGATTGCCACAGGTTGGCTAGTGGACATTGAG
GCTATCGTCTTTGGTTGAGGACGGGAGTAGGTAGTAAAAATGGCTTCTTATTACTGTGCACATGGCCCCCTTGCTCATTTCCAACCTTT
GCCCTCCTCTTAAGGGAGGTGGAGTTTCTAGTTTCTAGTACACGGAAGGACGAGGAGTGTGGCTTTCAGTGGTTGGTGCAGTTTCAGCA
TGTGTTCTGCAGGAAGATGGTCCAAAATAGGGTTGGCACCTGGTGAGAGTGCCTTCTGCCAAACACATGGCAGTGTAGAAATACTG
GCAGTCAGGTTGGTGAGCCACCAGGTAAAATAGAGTATAGACTCTCTCTCTTGGCCCCGATGGGGAAACAGTCCATCCCAGATAAAAAATA
TGGTGAGCCTCTTTGAGGAAGGAGTTCATTTTTCTTCTTGCTGCAGTAACCTTTCAAGAAATGGGGGAATTAAACTCTGAAGGGCCTC
GAGGTCCACACAGTCTCCCAGCTCTACCCAGGTCAAGGAGGCATGCCCTGGCAGAATGCCCCGGCGCAGCAGTGGGCCACACCTTCACA
CCTGCCCCCGAGACAGAGATTAGGAGAATGTAGGTTCAATGCCAGGTGTGTGAAATAAATTCTAGGGTAAAAACCCCTGGGCTCCTGAG
AGGAATTTCCCAAGCAACACTCGGAAGTGTCTATTTTTCTGTACCGAGTAATTAATAAGGCTCAAGTATGCACCAGCTTGGCAATCT
GCATCTGGATAAGTACGGGGGCTCTTTAAGGTTACAGTATATGATAAAATGTAATCAACCAAAAGATTTCCAGGCTTTTCTGTCTCCC
ACGCCTTTCTTAACAGACTGGGGACACTGTGAGCTTCAAACCTTCATGTCCTTTTTTACAAGCATGCAACGTAGCGACATTGAGCATTT
CCCTTCCCCTCTTTGTTGCCTCCCGAGTAAGGAAAGTGTAAACAGAAACTGAAGACGGGAATGGTCACATTAAGGATGTATGTTATAC
AGTCTGACGCTGTACAGGTCATCTGGGGTGTGGTAAAGTTGGGGAGCCAGAGTATCTCAGAGGGGGCAGGGGGGCATAGACTCTGGT
TCTAGACAGCCTGGTTTTAAATTCAGTTTGACCTTCTTGACCTTCTGTGTGACCTTGGCTGAGCAATTCACCGAGTTCTGTGCTTCA
TGTCTCCGCTCTCTAAAAATCGTTCTGAAATCTCACGCACCTTCACGACACAGAGCGCTCACACGAGTTATCATTTATAAAGCACAGAGA
CTGTTCTTGGCCTAAGCAACGGCTATACAGTTGTACTTGGTCAAGTTCAATTACAATTACAGTTCTGGAGGGCATATATATGCTGTCA
GATTCTGAGTTCTTCAATACGAAAAATCCACACTTGGATCACTACTGGCCAGATTAAAAATGTTCCCAAGCTCCCCTGGTGCAGTGTCT
CTGAAGGCCCTTTAAGTTGAAAGAGCCTCAGCCATTACCATAAAGATGGGAGACTGTGGAGATGAATCCAGGGGTAGAAGTATTTCTT
CTGTTTTGTTTTCTTCTGCCAGTCTTAGATGGTCCAAATGTCTCCTGTGAGTGTGCTGAGTCTGCCCTTCTTGTGTTTTGATCTAAGGTA
GAGGAATGTGAGGGCAAGAGGTGAGTGGAAAGGGGCAGAACAGTACCAAGAAGTGGCTTGTGGAATGAATGAAGTATCTCTGAACAGCC
CCGGCTGTCTCACATGCCCTTACAAATGGGGGGCTTTACAGTCAAAATTCAGTTGAAACAAGTCTGGTAGTCAGTTACCGCTGCAATTT

CTGACCTTGTTCCACAAAAGCATAGTGTGAAAAATATTTTGGGCTCTCTGACCCTTAACCTAATCTGAGTGTTCTCTTTTTTTTCCCCCA
TGTCGCTTGCTTAGCAAAGGTGCCGTGGCTCTCTTCTGATTAACCTCACTTTGGAATTTTCTACAAATGGCTAACCTAACCGGAACCA
CCTGTGCAGCTCAGTTCTCTCTAGGTAGACGCTTAGTGGGGGAAGGTGGTACCCACATTATGTTGTCTACTGGATTTTATGGCCTCTG
AGCAGAGGCCCTTAGGGAGTGTCTACTCTCCTGGGTTGAATATTTGTGACATGTTTTGACCCTACTGTCACCTGAGTCCTATGTTCTAT
GCAAGACACTCTGCATCTCGCTCCTGTTTGCTCTCCTTTTCTGAACCTGTTTGGAGAGACTCACATTGCAGGGTCACAGAATCGTCTG
ACCTCCTGTCTGGCTTACTACCATTAGCTACAAAACCACATTTAACTCAGGGACTTGCTATCTTTCTCTCCAGGGCTATTGAGGGACAG
AGTAGAGGAACCGCCAGTGGGCATGGGGTCTGTCTCATATTCCTGCCGTGCCACCCGGAGTCCACTCTTAGCATTCCCTGCCCTGC
TGAAAAGGTCTGACAGTTTCCAGAAATAGGCAGGTTGTGTTTTCATAGTTTCATTTTTGGGTTAGATCTTTGGCGTCTTTCTATTTCTTT
GACTCGTTGTTTTGTGTTCTCGGCTCATAAATAGCTCTCTTCCGCATTGAAAATTCCACACTTGATTTTTCTAATTGTCTTGGGCCTTT
AAATGCATTGAATATTTATGGGGCTCATCATTATCCAATGCAGTTCTCTTGACGTCACCTATGTATTGGTGGCTACATGTTTACGGCTC
ACAGGCCTCGGTCTCTCAACTATCATCACAACGGGTTTGTCTTCTGCTTGTAATTTCTGTACTTTAGCTTCCCTGTCAATGGCACATT
TCATTTTAATTATGTAAACGTTTTCTCTCCTTCTGCCAAGTAGAGACTTCTGTTGTTGAGGGTTCTTGGGTTTTATGTCACTTTAAAGG
CTCACCATGCAGCTGAAGGGGTGGGCAGCCCTATAGGTGGAACAGCAGTATGAACTAACAGTACCCCCAGAGCTCGTGTCTCTAGCTG
CATATGTAGCAGAAGATGGCCTAGTTGGCCATCATTGGGAAGAGAGGCCCTTGTCTTGCAAACCTTTATGTGCCCCAGTACAGGGGAAC
GCCAGGGCCAAGAAGTGGGAGTGGGTGGGTAGAGGAGCAGGGCCGGGGGAGGGTATAGGGGACTTTCCGGATAGCATTTGAAATGTAAA
TAAAGAAAATATCTAATAATAAAGGATAAAGGCTCACCATGCAATACACACAAGTAAAAGCACTAGATAAGTGGGGCCTTGAGCTCAGG
CCCCCCCACCTTTTGACCTGCTTAGCCACTA