

GENOTYPING BY PCR PROTOCOL

MUTANT MOUSE RESOURCE & RESEARCH CENTER: UC DAVIS

mmrrc@ucdavis.edu

530-754-MMRRC

Protocol Name: B6;129S5-Tmprss3tm1Lex/Mmucd **MMRRC: 032680-UCD**

Protocol:

Reagent/Constituent	Volume (μL)
Water	5.15
GoTaq® G2 Colorless Master Mix,2X	7.5
Primer 1. (stock concentration is 20μM)	0.45
Primer 2. (stock concentration is 20μM)	0.45
Primer 3. (stock concentration is 20μM)	0.45
DNA (example) extracted w/ "Qiagen DNeasy columns or other similar silica based kits"	1.0
TOTAL VOLUME	
15	

Comments on protocol:

- Protocol may work with other DNA extraction methods.
- Use Touch-Down cycling protocol-first 10 cycles anneal at 65°C decreasing in temperature by 1.0°C; next 30 cycles anneal at 55°C.

Strategy:

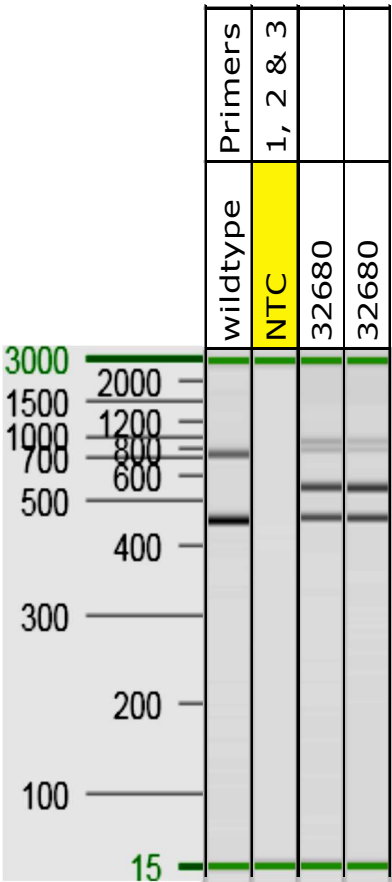
Steps	Temp (°C)	Time (m:ss)	# of Cycles
1. Initiation/Melting HOT START? ☐	94	2:00	1x
2. Denaturation	94	0:10	
3. Annealing steps 2-3-4 cycle in sequence	65 (↓1°C/cycle)	0:30	10x
4. Elongation	68	2:00	
5. Denaturation	94	0:15	
6. Annealing steps 5-6-7 cycle in sequence	55	0:30	25x
7. Elongation	68	2:00 (↑20sec/cycle)	

Primers:

Electrophoresis Protocol:

Name	Nucleotide Sequence (5' - 3')	Agarose: 1.5% V: 90		
1. DNA066-4	CACAGCCTTA ACTCTCCACG	Estimated Running Time: 90 min.		
2. neo3a	GCAGCGCATCGCCTTCTATC	Primer Combination	Band (bp)	Genotype
3. DNA066-3	TTCTAGGACTTTGCTATGACC	1 & 2	639	mutant
		1 & 3	522	wildtype

GENOTYPING BY PCR PROTOCOL
MUTANT MOUSE RESOURCE & RESEARCH CENTER: UC DAVIS
mmrrc@ucdavis.edu
530-754-MMRRC





Lexicon Genetics Incorporated – Genentech Project Materials

Genentech ID:	UNQ323	Date of Submission:	5/12/05
Lexicon Contract Name:	DNA066	Mutation Type:	☒ Standard Knock out
LexVision Name:	PRT329N1		☐ Conditional
Reference accessions:	NM_080727	Is this gene X-linked?	No

Required Materials: ☒ pKOS clone DNA(s) __pKOS/38_____
☒ Target Vector DNA __DNA066-FTV1_____
☒ Targeted ES Cell DNA __2B6_____
☒ Genomic Map

Southern Blot Analysis: *External/Internal Probe Strategies*

	<u>5' External</u>	<u>3' External</u>
Name of Probe:	DNA066 – 31/32	DNA066 – 25/26
Restriction Enzyme for Genomic Digest:	Spe I	Hind III
Predicted Wild-type Band (kb):	>27 kb	6.1 kb
Predicted Mutant Band (kb):	11.7 kb	9.4 kb
Probe Size:	511 bp	446 bp

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:	DNA066-3	5' Primer Name:	Neo3a
3' Primer Name:	DNA066-4	3' Primer Name:	DNA066-4
Predicted Wild-type Band (bp):	522 bp	Predicted Wild-type Band (bp):	none
Predicted mutant band (bp)	none	Predicted mutant band (bp)	639 bp

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**

DNA066-25 5' – CAGTGAGGATCCTTTTCAGC
 DNA066-26 5' – AGCAGCAAGTACAGACAAGG
 DNA066-31 5' – CCACAAGCTACTCTTTAGACC
 DNA066-32 5' – TCTAAGGCTAGGATCTCTCG

PCR Genotyping

DNA066-3 5' – TTCTAGGACTTTGCTATGACC
 DNA066-4 5' – CACAGCCTTAAGTCTCCACG
 Neo3a 5' – GCAGCGCATCGCCTTCTATC

Genomic Sequence Deleted:

ATGGGGGAGAATGACCTCCGGCAGCCGAAGCTCCCTTCTCCTTCCGGTCTCTCTTCGGCTTGGATGATTTGAAAATAAGTCCTGTGGCACCAGGTAAG
TGGGCCCTTTGGGATGCAGGCCCTTGTGTAGGAGGGATGAATGTGGTCAAGTGTCTGGGGCTGGGAGGCGGGGGATCCCCTCTTACAGTCTCTCATTCTCC
TACTCTGTCTCTTTTTCTCTCCACGTCCCTCTGTCTGTCTCTCTCCTCCCCTCTGCTCCTTCTCTACAGTACTGGGCCTTACCCACAGTAGATAGTTAT
TCTAGGACTTTGCTATGACCCCAACCCATCTGGGTATCTTTCCATC

Genomic Locus: (*The deleted sequence represents nt 11743 – 12089 in the sequence below. KOS38 used to generate the TV represents nt 3638 – 14155 in the sequence below.*)

[illegible]

AACTCATCCAATTACTTTGGGAAATTCCTTGACGCAATGTCTTTATAAAGGTCAACATACATTTACGACCCAACCAATTCTGATTTTTAGATTCTACCAGG
GAAAAGTGAAAATGTGTGCCTCCCCAAAAAAAAAAAAAAAAAAAAAAAAAAAAACCAACAAAAACAAAAACAAAAACAAAAACAAAAACAA
AAACAAAAACAAAAACAAACCATCTTTGAACGCCCATGGTGGCTTTACTCATTAGCATCCCAAACTGGAAACGCTCTGAATAGTCCAACTATTGTGAA
CAGACACACAGCAGTTGTGTGCTCCGGGTAGTTGTGCCACCCACAGGAAGCACTACAGCCCTGCTTCCTACAACACGAATGAACAGAAGCACTCCCT
GTGCTGAGCACCGGGGCCAGGCTCCATCACACTTCCATATGGATTACTTAGATGACATTTAGACATATAGCTTCAAAGAGCTGATCAGTGGTTGCCT
GAGGCAGGGTGGGAGGGAGTTGTGGGCGGAGGGACCTGACTGAGCGGTGTCTACACAGGTGTCTTTTTTTATTTTTATTTTTTTGTACAAACCGAGTAT
TTAGAAATGGACACATTAGACAGCCTGTCAATTAAGCCTCAATATAAACCTGATCTTAAGAAATAAAGCAATGTAAAGATAACAAAAAACCGAATATAC
TAATTAATTACTTTTGCCAGAAACAATCCATGAGGTGAGACGGAACCTGCAGATCACTTGGGAGATAATTGACATTTAAGGGTAGTATGTCTTTGATT
CCATGAATATGGTATATTTCTCTGCTTAATTTCTCCTGATACTGGGTGGTAGTTTTTCAGTTTCTTTTCTTAATTAGGAAAGGATTTTATTGTGTGTGTGT
GCGCGTGTGCATGTTCTGTGTGTACCTATGGGTCGTGCATGCAATGGCCTTATGTGGAGATCAGAGGGCACATAAGCAGAGTTGCTTCTCCCTGCCA
TCTTTGAGTAGGTTCTAGGAATCAAATTCAGGTTACCAGGCTTGTATAAACAGCACTTTATCCACTGGCCCCCTTCATTTGCGTTTTTGTATGCTATTATAA
ATTATATATGTATATGATAAATTTTATGCATATATAATTTAAATAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAA
AAGACAAACCATGCATGAATTAATTAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAAATAA
AGGCTTTTCATCATATAGCTAGGTTGGCTTTGAACCTATTAGGCAGTACAGTGTGACCTTAAACTCCTGATCCTTCTGCCCTGCCTTCCAAATCTGTGCA
TCTAGTAGGGTACCACCGTCAATTTTAAATAATATTTAATAGACATCTGTACTTAATATTTATGTGTGTGGGTATTTTACCTGCATTTGTGCTATGTG
TACCATGTGAATGTCTCTTGGCCACGAGGCGGGAAGAGGCCGATCAGATCCCCGGAAGCTTGAATTAAGAAATAGACAAAGTGTCTACCATCAAGGCAAACTGTCT
CTTGCTAGGTTTCTTATTATTCCTGGAGCTGCGGAGATTCTTTTACACGTTTACGGACTTAATGTGATCTGTTCTATATCCTTTGAGTCATATCCCCCT
ACTTCTCTCAGTCCACCTGAACCCACCACAACCATATGCTCTCTGTACAGTTTTTTTTTTTTTTGTTTGTGTTGCTGTTTGTGTTGGTTTTTTGTTTTGTT
TTTGTTTTTTTTTTGCATATCAACCTAAGGGTAGCGGCAGTCTATTTCTCCGCTGGCCTGTGGTGGAAACCCAGGTCCCACTCATTCTCCCTTCT
CTCTCAGGATCCAAGAGAATTTTCCCGTCAACTTATTTATCTTGAATTTGAACCTTAGAAATAGACAAAGTGTCTACCATCAAGGCAAACTGTCT
CTTGCTCCAAAGGGAATTAAGAGATGGTTTCATTGTGATTGCGCTGTGAGTCACATGGCTTCAAGTTACTCCCGATGACAAGGCTTCACTGTGGAAACG
TTACATGAACCTTTTGATAGTCGCAAGACAAAAGGCAGTCTAAATGAAGGCATTTTCAAATACATTTGCCAGGGACATCAGATAGATGGGTTACAGGAAA
GCGGGGCTATCTCTCTGTAAGTCTCGGGTGCCATCTGATGCCATGCTTAGCCTTAGACCTGGCGGAGCTACTGGTCTGTAATAAATCATGGTGTGTTTA
CTTGTTAGTTGAAGGAATGCAAGGTACAGATACAGAGGTGGCGGACAAATGACCTTAGAAGGGGATTAAGAGTAGCCCAAGATGCTACCTCTGGATCT
GCAACATTCCAACATGTGCAAGTGCACACATATACTTTCTCTCTCTTCA
CACACACACACACACACACACACACACACACCCCAAACCCCATAGTTGTAGTCAGTCTATAAAATCTTCAACACAGGTGAGGCTTTGTGAGGTATG
TGTGTACAGGGGCTTCACTCCACATTACTCTGAGAAAAACGTAATATGAGGCTGTGATAAATAGCTCTGTTCAAATATGGGTTTTCTTCCAAATAAT
AACTGTGAGCAGGTACACTTGTATTCATAATATATTTGAAATATGATATGTTTTGACTCACTTTTCTGTGCTCTTAAACTTGAAGCCAGGACGAGAA
GGGTGAGTTTGAGGCTAGCCTGGGCTACACAATGTGATGTTGACTCATAAAACAGAAGGAAGGACAAAAGGAAGGAAGGAAGGAAGGAAGGAAGGA
AGGA
GCTGATTTATTCCTTTCTCATACCTAAAAAAAAGTTGTCTTCCCGGTGTGTACAGGAAAAAACCCATCCTGGTGGTTCATCCACAAGGCTGGCAGG
AGAGAACAGACTTCTATGCAAAATTATGCTGAGCAGGACAGCCCTTGCACCTCATCTGTCATCTGTTGGCAGTCTGAGCGGTGTGTTTATTTCAATGC
CGTTTGAACACTTATGCTTCAACATCAGCCCTTCTGGTGGCGGCCACAGTGGCCCATGACAGAACATTTCTAGATGATCGTCTAAGAGGCTCCAATCC
ACAGAAAGAAAAGAGAGCTTCAGAGATAAGTCTCTGTTATTGTCTCCAGAAATGTTTCATCTTGGGACCAGGAGAGTTGTCTCAGAGATAAGAGAGGACC
TGCAAGCATGGGGGATTTCAGTGAATCCAGACATTAAGGGGTGGGGTAGGTGGAGACAGGCAGGAAAAATAGAGTCATTTGGTGGGNNNNNNNNNNNN
NN
NNNCAGCTGTTGTAATTCAGCAGAGTGTAGCCACTGAGGCTCACTCCTGCTGCTGAGTCTGCTCAAAACCCCGTGTGTCTAGCTCTCAACCCAGAAAC
GTGTCTGCTCTGCTGAGCTCATTCTGTCCCGGTCCGTATCAGACAGGAAGCAAACCTGGAATCCTTTCTGATATTGCAGATTCTCTGAGCTGCACCTCAG
AATCCCTGGCCGCCTCTGGCTCCAGGCACAGGGATTTCCTAGGGGCACCTCTCTCCTGGCTTGAAGTCATGGTGCCTATGACGAACTACCTAATCC
TTATTTACAGGACTAATGCTGTCTCTGAGGTTCTGTCTTCCAGAGGTCATACTCTACACCATCATCTTCTATCTCTCCAGCACTCTGTATGGCCC
AAGGCCACATAGCTGAACACAGATGCAGTACAGACATAGAGACTCTGCACCATAAACCTCCAAGTTTCTGTCTGACTGCTGCTACCTCTCTGTGTTCCA
ACTTTTGTCTTGGGGCAGCTGTAGGACTCAATCAAGGCTCAGTCACCTGTGCTGATGTGGCCTTTTGTGGGACTGTCTGCTTGGCACTGGGTATGGCCC
CGCTGTTACATTTGAACAAAACGTGTGTCTCGGGCCCTACATTTCTCCGTACGCTCCTATAATTCTGCTTTGCTCATTTACAAGCTGCTCTCTCCTA
TCTCTGCGCCCACTACTACCAGGGCTACCTGATAGCCACCTTCAGATTGAGTTACAGAGGCGCCACGGTGATGCCGCTGGCTTCAGTGACGGAGTCTGCA
AGGCTGAGTGGGCTTGGTGAATAAGTTCTTACTGGACTCCCCCTTGGCAGTCTGCTACCCCTCTGCTCTGCTTTTTTATAATTGAAACGGAATTTATCT
GCTTCCAAGTATGGCGCTTCAGAAATGGTAAGTAAGGAAGGACCGGGGGAGGGGCGCTTCCAGGATGCACCTCTGAGGAACCTTCCCGGCTTCCCAT
TGGGACCTGCCAACCATGGCCTGCTTTGAGGGGATACTCCCCCAAGGCATATTTCCAGAAGCTTAGACTTTACTAATATTGTAATAAATAAATAAACA
CAAAAACAAAAACAAAGGTAAGTTTTTAATGGTGAGTAGCTCCATTTGGAATGTAAATAACCTTAACAGGTAGCCAGGAAGGAGGCAGGCATAGACAG
CCTCTGCGGGGAGGGCTCCGTGGACCTCAACCTTGGCGGAGCAGATTCTCCAACACCTTGTGTGGACTGATCTGGGCTGAGGCTGAGGAGCACCCT
ACATCTGTGGCTGCCCCAGACCTGTCCAGAAGGTCTTATTGTGAGAAACAGCAACCTGTGTGGGTTTGGCCCCGAGGCGGAGGTTTGGCCGAGGTG
GAGGCTCCCAGCCACTCTTCACTTGGCTGGGTGGCTGGGTCCCCAGGGCTCGGATACTTTCTTTCTCAATTAGGTCTGCTTGCATGAGCCAGGAAAAG
GGCTGTATTGTGGGCCGCTACTAACATCGTGACAGTGCCCATTCGCGGGTGTGCTTCTTCTCGGGACACATAAATTGAGTATCAGAAGATCTTAGG
TCTATGACAGGTAATCTTATGGCTAGAAAGAAGAAATCAAATGTTGGCAAAAGGAGAACCGTCTCATCGTGATGATCAGAGTTTTTTCTAAGGAACA
ACACAACCGTGACTTCTGGGTGACAAATGGGCTTATCTTAAAGAGCCCATTTAGTTGGCTACACAGAAGACATGGCAGCTGTTAACTGTTAAAGGAA
TTAAATTTCTGAGTTTTGTGCTGCTCTAGAAGCCACTCTGCGATTTTCTGTGGTCTCGAGAAAGTTGTGTTCTCAGTAGACAGATATTGCGACAAACCCA
CAGGGGGTGTGGGCTTCTGTGGGACTGAAAGGATTTAAATGGGACAGAGGCACCCCTAGTGCCCACTTTCCACAGGGACCAACCCTGCTCACCC
CTGACTAAGCAGGTGGAGGTGGAGCCGGAACCCAAACATCAGAGGGCCCTGAGATAGTACCATGGGGGAGAATGACCCTCCGGCAGCCGAAGCTCCCT
TCTCTTCCGCTCTCTCTCGGCTTGGATGATTTGAAAATAAGTCTGTGGCACCAGGTAAGTGCGCCTTTGGGACCTGAGGCCTGTGTAGGAGGATG
AATGTGGTCAAGTGTCTGGGGCTGGGAGGCGGGGGATCCCCCTTACAGTCTCTCATTTCTCTCTACTCTGTCTCTTTTTCTCTCCACGCTCCCTCTGTCTGT
CTGTCTCTCTCTCCCTCTGTCTCTTCTCTACAGTACTGGGCCTTACCCACAGTAGATAGTTATTCTAGGACTTTGCTATGACCCCAACCCATCCTGGGTAT
CTTTCATCACTGGCTGGACACTTTTTCTGATCTTGTAGAACCACAAAGTTGAAGGGTGCTAAGAAGGAGCCCCCTTGATTACAGGTACTTGACGAGTCT
CTGCAGGCAGTGTGTACGTGTGTGATGTTTGTGTTTAACTCTCTTCTTGGGGTGGGGGTGTCTTTCAGAGACCCAACTCCACAGTGGCTGTCT
TCTCTCAAAAGAAGGTCAAAATGGCCACCACCTCTAGAAAATTTGGCAGGCTGTATGTACCAAGGGTCAATGTCAAGGTGACAGGTGAGGTTGGTCCA
GCCACCCAAAGAAGGAAAACCTGGTTTTATGAGTCACATACCTATGCAGGTAGCATTCCCCGCTGATGTCTGCCACTATGCAGTCTTTGTGCTGAAAGC
TATCTGTGGCTTGTAGTCTGAGAGCAGGGCTCAGGAGCAATGGGAAGAATGGGTGAGAATGGGAACGTGGAGAGTTAAGGCTGTGCTCTGAACG
ACGCGTATATGGGATCCCCGAACAATCTTTTTAAGCCATCTGGGCTGGGACAGAGTAAGAAGAACAAGGTAGAAGGCGTAGGTTTACGAATTGAAA
AGACCCCTGGGTCTATCCCGTGTATGCTGCCGCAATGCCAAGGCTTATGATGCCCTTTCATTGGCTTGTTCAGACTGTTTCAAGCTGTTGCCAGGTCATGA
GTGTCATCTCCACAGGGTGTGTGGGATACATTTCTGGAAGTGTGGCAAGAATTACTGTGGCAAGAATTGTATCTGCTTTTAAAGCTGTGTAGCTACATC
TCCGATCTCACACAAACGGGAAGCAACATGGCCCGTTCCCCACCCAGTGCTGTGTAAGAGACTGGCCATCCCTTCCACAGTAAGCACCAGTGGGTGT
GGCTCATAGAAAGTCATGGTGTAGTATGAATTTAAGTCCACTTTTTTCAATTTGTTTCAATTTCCGGGGAGGCTTTCTCTGTCGTCAGTCTTTGTGGA
GCCTCTAGAGAGATACCTTACACAAATCCCACTTGGTTGTTTATTTGCTTATGTTGCTTGGTGAACATGGCCAGGAACCTGGAAGCAAGGAAAGGAA
GGATTAGATCCGCCTCACAGTTTATAGTCTGCCATCCAGGGAAGTCAGGACAGGAACCTCAAACAGAGCAGGAAGCCAGAGGCAGGAGCAGAAGCAGA
GGCCATGGAGGAATGTGGCTTCTGGCTTTTTCAGGCCATGTTCTTATGTCAATTCAGGACCGACTGCCCTGGAGTGACACCACCCACAATGAGCTGGGC
TCTCCCATGTCCATCAAGGACAGGGATTGTGTTACTCCCTGAACAGCAGGTGACCTCATCACCTTTGTCACTGCCAGCCCCCTCCCCAGTGGGTATTGCA

CCTAGTAGGTGGTTCCCATAGAGCTGAAGAATCCATATTCTGGGAACCCAGTCCTTGAGAGTGGCATGCAGCCATGACAGCTCTGATCTGGAAGCA
GAAATGTACTAAGCTGAGCATTCTGCTACTGGGCAGCCCATACTGAGGAAAAACAAGCCACTTACATGGTGGCTTCTGCTCACATGTGGCAAATGGCC
TGGAACAAAGGCTGCCGGTGCTCTGTAGAGGAAGAGCCACCTTGGGGTGGTTTGAGAGAGCCAGTGCCTCTCTGCTTCAACCATGTTGATAAAAC
CCTCCATGACAGTTGAAGGAAGTCCCAGGTCCCAGGGCTGCTGGGCAGCATGCCACAGCTGGGTGGCTCAGTCAACGGTCTCCTTGTCTTCTCTTTTGG
GAGCCGGAGTCTGAGAGCCCTGATGTCAAGTTCATTGTCTGTGAATACACAGGGGACCCTGTGCAGATACAGGCCCTTGGTCGATAGCCTACGG
GGTTCCTTGAATTGTGGACATATCACTCTGCCCTCTGCCTTCATCTTCCCATGGATGTCTGTTCTCCTAGTCTCTTATCTTTCTTCTATGCTTGTGTCTGTG
TTAAACCTTGGCCCTCTCTGAGGACGCCAATCATACAAGATTAGCCACTGCCCTATGGGCCTCATCTTAACCTTCTCTTCTTGTGGCCTCCAAGTAAGAT
CCCATTCTTGGCTGTTGAGGATTCTGTGTCAAGGGCTCCCAGTGAGGATCCTTTTCAGCCCAACAACAATGTCGCTTAAGCTGGGGCAGAGAGCTGGGT
GAGCAAAGACTGACCCAGACAACGTGGTCATTTCATCTAACCAAGTCAGCTGTCTTTGGGCCAGTGCTTTTCTTTCACAGAGGGGACACGGCACACATG
ACTAAACTTTTAAAGTTTTCATGTCACTCAGAACTAATGTTCCCCGGCTCCCCCAAACCCCATCCCTTTGGTTCTCAGATGGAGACGCAGTGGCTGCGCA
GATCTGTGCCCTTCTGCCCTTGAAGTTTTTCCGATCATCGTCAATTGGGATCATCGCCTTGATACTGGCGCTGGCCATCGGCTGGGCAGTGAGTACCAT
CTATTATTTAGTAGGGCGCTCGATTACCTGTCTTGGCATTTAAACTTGCATGAGACCCCCCGCCCCACCCCTTGTCTGTACTTGTGCTGCTGCCTGGCCTT
AATTACTGGTGGCCGGTGTCTTTGGGTTTGATGGCTATGGGTTTGATCATCTGTCATGAATGTCAAACAGTGTGGGAATAGGCAGGGGCCACTGGCT
GTGCTCCAGGCTCTGCCACCAGGGTACCTGGCCGGTTAGAATTACTCAAAGGTAGCAGGTGAAACAGGACTCTGAGATGGGAAGGCAGAGGGCTGGGG
TGGGGCAAACAAAGCTTCCATTCAAGTCAACACCGGCATCAGCTATTTTATAGGGAGGTATGTAGGGCTTTTGAAGAAAGTGGGTGAGCAAGG
AAGGGGCTCTCTTAGAGTCTATAGTTTCTTATTTTCTTCTCAAGTAACTGCAGCACAGGGCAGCATATTTTGCCTCCTGCTCAGGGTTCATTGGCTTCA
GGCCAGAGTAAAAGGAGGCAGGGCTGTTGAGCAGTTGAATGGTCTTAGTTGGGGCTCTTGTGCTGGGCTAGCTTAGTGCCTTGGGCTAGCCATGCAGT
TTTGTCTGCTCTGAATCCCTGAGAGTCTGACTGCACCGTCTTGTGATTCTCTGGAGGTAGTGATACTGTGGTTGTGGCAGCCCTGTCCCTTGGAGTTCA
GGACAGACGATAGTACTGGAGGAAACAGGCTGCTTGGAGATGTAGTTTCAATGCAGGTTTCATTATGATAGGCAAGTTCAAGGCCACACGGCAGG
TACATAGCTGTAGGTGTGCGCAAGGGAACCACTTGGCTGGCATTTCCCTCCCTTCTCCTCAGTCCACTTCAGCTGTCTGGGAAGTACAGG
TGCCATTTCATCTTCAAGTGTATTGAACTAACAGCTCGATGCGACGGGGTCTCCGACTGCAAGAACGCAGAGGATGAGTACCGATGCGGTGAGTCGCA
ACCAATCACAGAGAGCGAACACAAGCCAGCAACGTGCCCTTCTGTCTGATGAACCCCAACCATAGCCAGCGTCATGCCCTGTCTCAGCTGGGATGT
GCCTAGCTGGGTTCTTGGAGAAGCTTTATACATGTTTACATCCAGTTGGGGGACCAGACAGGTTCTGAGTTGGGGGTGGGTGGGGAGCTGCAGCTAATG
TGGGGAGGGCTGTGGCTGCGCAAGGGAACAGGTAAGTGTAGAAAGAGGTAAGTGTAGGACAGCTCCGCTGCAAGCTGCGCTGTGCTGTGCTTCTGTAATC
ATTGCCCTCCCCCATGCTGGCCAGTGCGGGTGAGCGGCCAAAGAGCGGGCGACCAAGTGTTCACAGCTGCTGCGTGGAGGACCATGTGCTCCGATG
ACTGGAAGAGTCACTATGCCAAGATTGCCGTGTGCCAGCTGGGGTTTCCAGGTGAGTCAAGGCCAAACGGCAGAGCAAAAGCAGCTTGATACAGGA
CAGTCCAGAACTCTAGATGCTTCAACAGAGTCACACTCTGTTCTTATAGCACCTTCCCCAACCCACCCCACTCCCTGGCATGGGAGCTGGGCCCT
CACAGAGCAGGACAAGTCCCAACAGCTAGGTGACTTACGGCATGAAGAACATCTCATGAAGGGAGTTCTCAGGGCTAGTCCAAGACCTTAG
ACACAAAAGCCATTTAGACGTTTGGAGCTAGGGCTAGGACTGGGATTAGGACTGGGGCTCAGTTGGTAGAGCTCTAATCTGGCATGGCCAAAGCCATG
GGTTCGTGTTCCAGTGGAGTAACAAGCATGCAAGGTGACACATCTGTAATTCCTGTACTGGAGAGGCAGGAGCAAAAGGGAGTTCCAGATTGAGCTGAAA
AGTGAGTTCTGTCCAAAGACAGACAGACAGACAGACAGACAGAAAAAAGAAAGAAAGGAAACAGTAACAGAAAGCAAACCATTCACGTG
CCCAGAACTTTGAGTGGAAAAATAAATCTTGGTTGGGTGCGCTTGACGTTAAAAAGCAGATGTTTGGAGACAGGCATCGGCTGCTGTGCTGAC
TCCTGTACTCATCTCTCAAAGGATGCAATTATTCAAACACCACTTACGGCCAGGAGACCCCAAGACAGCATCTTTCCAATTTCAAGTTCTGGGAGC
CAGCTGCTGGCTTTCCACACTGTAGCAGCAGGCTTTTGCTGACCAAGGGCCCCCTCTCCTCATAGTCATCGATACTGACTCCTGACCCCTGCCTTGCT
TCCCTGGAGGCCACTGATACTGTAGGTCCAGTTACCAACAGGCAGGTTCCTAAAGTTCCTAAACTCATCTTAGGAAGTGAAGCTTGATGGTACAAA
ACTCTGAAGTATACCTTAGTTTGTGTTGTAACCCAGGAAGCAGGGCCCTTAAACGACATGGCTACACACGCTTCTGTCTGGGATCTAAACCAAGTAGG
ATCCTAGGCACCCGGCAGCTGAGGTCCCCAGGCCTCCTCTCTGTATGCCATGGCTGCTGGGTCTGAAACCAAGTTGCAACTGAATTGTCAGTGACA
GCTTCGAAGATTACTAAGAGACAATGTTGAGAATTACCTAGCTTTATTCTTAAAGAAAAGGTAGAGATTTCAAACAGCACAAAACCCACACACGTAC
ACATGTATGCATGCACATACGCACGCATATACGCACAAGCCAGTTAGCTCAAATCTCGGTGTAGATTACAGGCCAGTCTTGTGAGACCTGCTGCAGTTTC
TCCCTTAGAATGAATAAATAGCTCCACTTTAAAGAGCCGTGGGAGCTCTGTGGTCAATTAGGGTGTAGGCGTGACCATAGCTGTGGTGGCGGTTCCTG
AGCTGTAGGTGACCTGTAGGTTTGTGTTGTGACACTGAGACTGCCCTCTGTATGCCATGGCTGCTGGGTCTGAAACCAAGTTGCAACTGAAATTGTCAGTGACA
AAAGCAGGCTCCTTTATACCAAGGCAGCCAACTGCAGCCTCCCCACACCAAGGCAACAGATTGCAACCCCCCCCCCAAGGAAATGTCTGGCTAATA
TCTGATGCCTTTTCTTCATCCTTGTAGTCCCAGTGGCATTAATAGCATTGGGTGCTCATCTGGGTGACAAACTGCTGGGTAAATGAGAAGATGGCCAC
CTGCAGTACACTCTGCTCCTCACCTTCTTGGGAACCTTCAAACTCTGCACTCGCCCCACCTTGCACTTTTCTATGCTTGGGTTTGTGCTCAGCCGTTCC
ACCCCATCTTGTTTCTTCAATCTCTTCTGACCACTGAGCTGTGCATACCTGTCTCTTGGCATTTGAGCTCATTGTGTTGGTCCCAGGTCCTTAAGCCA
CTGCCCTTCTATGCAGCTGTAGGCAAGGTGAAACAGGCTCTCAAATGTCCCTACCTTACAGGCTAGACATCCAGTCTGCTCCCTCCCTGGGAGCCAA
ATCAAGAGCATCAGAGTGGGGTAGACGGAGACCTCTAACTGTGGCAGGAAGTGGTCTTTCTTGTGGCTGGAGCTGGGTGGGTGGGCAGGCCGGGCT
GTGGGCTGTGGGTGAGCAAGCGGGTCCCCAGGCCACAGCTAAGCTGGAACACCTGGCTAAGGTGTATGCAATTTATCAGGAAAATGATGCCTCTGGTG
ACTTGGGAAGGACCAAATGAGGTCCCCATAGCTTGTAACTGGTGTAGTAGGGGTGGCTGGTATCTCAGTCACCTGACTGTGGGTCTGGGTCTGCTTCAAT
GTGCGTCAGCTATGTGAGCTCAGACACCTAAGAGTGGATGCGCTGGAGGAGCACTTCAAGGGCGACTTCGTGTCCATCAATCACTCTTGTTCAGATG
ACAAGGTGACGGCGTTACACCCTCTGTGTACATGAGGTAAGCGGTTAGACAGGTGGTACTGCTGTCTACTCTGGGGCCAGGCCACAGGCTGGGTTTG
GGAAGCTGAGGTGTGAGGGGAAAGAACGTCACCTCTACAAGCAGAGGTGGAGCTCACTGCTATGGTTAGGGTGGTTCGTGCAATAATCTGGGGTGCAGG
GATGAATCCCAGCCCTGGAAGTCTGGTTTCAGTGTGAGGCGAGGGAAGGAAGCAGGTAAGGAGCAGCAGTGACAGGCAAGGTATGCTGTCTGTGTCA
GGCCATTTGTGTGCTGCTCCTCAGCAGGAGGAGT
TGCATGTGTGTAT
GTGTGTAT
TATATATATGTATATATGTAT

Selection Cassette:

GGCCGCTCTAGAGGCCATAGCGGCCATTTAAATGGCGCGCCGGATCCCGGGCCGCTCTAGCTAGACTAGTCTAGCTAGAGAATCCGCCCCCTCTCCCTC
CCCCCCCCCTAACGTTACTGGCCGAAGCCGCTTGGAATAAGGCCGGTGTGCGTTTGTCTATATGTTATTTCCACCATAITGCCGCTTTTGGCAATGTG
AGGGCCCGGAAACCTGGCCCTGTCTTCTTGACGAGCATTCTAGGGGTCTTCCCTCTCGCCAAAGGAATGCAAGGTCTGTTGAATGTCGTGAAGGAA
GCAGTTCTCTGGAAGCTTCTTGAAGACAAACAACGTCTGTAGCGACCTTTGACGGCAGCGGAACCCCCACCTGGCGACAGGTGCCCTCTGCGGCCA
AAAGCCACGTGTATAAGATACACCTGCAAAGCGCGCACAAACCCAGTGCCACGTTGTGAGTTGGATAGTTGTGGAAGAGTCAAATGGCTTCTCTCAA
CGGTATTCAAACAGGGGCTGAAGGATGCCAGAGGTACCCCATTTGATGGGATGTGATCTGGGGCTCGGTGCACATGTTTACATGTGTTTGTGCGA
GGTTAAAAAACGCTCTAGGCCCCCCGAACCCAGGGGACGTGGTTTTCTTTGAAAAACACGATGATAAGCTTGGCACAACCATGGAAGATCCCGTCTGT
TTTACAACGTCTGACTGGGAAAACCTGGCGTTACCCAACTTAATCGCTTGCAGCACATCCCCCTTTCGCCAGCTGGCGTAATAGCGAAGAGGCCCCG
CACCAGTCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGCTTTGCTGGTTTCCGGCACCGAAGCGGTGCCGGAAAAGCTGGCTGGAGT
GCGATCTTCTGAGGCGCATGCTGCTGCTCCCTCAAATGCGATGCAAGGTACGACGTTACGATGCGCCCATCTACACCAACGTAACCTATCCCATACGG
TCAATCCGCGTTTGTTCCTCCAGGAGAACCGACGGGTTGTTACTGCTGCTCACATTTAATGTTGATGAAAGCTGGCTACAGGAAGGCCAGACGCGAATTA
TTTTTGATGGCGTTAACTCGGCTTTCATCTGTGGTGAACGGGCGCTGGGTGCGTTACGGCCAGGACAGTCTGTTGCGCTCTGAATTTGACCTGAGCG
CATTTTACGCGCCGGAGAAAACCGCCTCGCGGTGATGGTGTGCTGCGCTGGAGTGACGGCAGTTATCTGGAAGTACAGGATATGTGGCGGATGAGCGCG

ATTTTCCGTGACGTCTCGTTGCTGCATAAACCCGACTACACAAATCAGCGATTTCCATGTTGCCACTCGCTTTAATGATGATTTACGCCGCGCTGTACTGG
AGGCTGAAGTTCAGATGTGCGGCGAGTTGCGTGACTACCTACGGGTAACAGTTTCTTTATGGCAGGGTGAAACGACAGGTGCGCAGCGGACCGCGCT
TTCGGCGGTGAAATTATCGATGAGCGTGTTGTTATGCCGATCGCGTCACACTACGTCTGAACGTCGAAAAACCCGAAACTGTGGAGCGCGCGAAATCCC
GAATCTCTATCGTGC GGTTGAACTGCACACCCGCCGACGGCACGCTGATTGAAGCAGAAGCCTGCGATGTCGGTTTCCGCGAGGTGCGGATTGAAA
ATGGTCTGCTGCTGCTGAACGGCAAGCCGTTGCTGATTTCGAGGCGTTAACCGTCACGAGCATCATCCTGTCATGGTCAGGTCATGGATGAGCAGACG
ATGGTGCAGGATATCTGCTGATGAAGCAGAACAACCTTTAACGCCGTGCGCTGTTTCGCATTATCCGAACCATCCGCTGTGGTACACGCTGTGCGACCGC
TACGGCCTGTATGTGGTGATGAAGCCAAATATTGAAACCCACGGCATGGATGGTGCCAAATGAATCGTCTGACCGATGATCCGCGTGGGTACCGGCGATGAG
CGAACCGGTAACGCGAATGGTGCAGCGCGATCGTAATCACCCGAGTGTGATCATCTGGTTCGCTGGGGAATGAATCAGGCCACGGCGCTAATCACGACG
CGCTGTATCGCTGGATCAAATCTGTCGATCCTTCCCGCCCCGGTGACGATGAAGGCCGCGGAGCCGACACCACGGCCACCGATATTATTTGCCCGATGT
ACGCGCGCGTGATGAAGACCAGCCCTTCCCGGCTGTGCCGAAATGGTCCATCAAAAAATGGCTTTTCGCTACCTGGAGAGACGCGCCCCGCTGATCCTT
TGCGAATACGCCCACGCGATGGGTAACAGTCTTGGCGGTTTCGCTAAATACTGGCAGGCGTTCGTCAGTATCCCCGTTTACAGGGCGGCTTCGTTCTGG
GACTGGGTGGATCAGTCGCTGATTAATATGATGAAAACGGCAACCCGTGGTTCGCTTACGGCGGTGATTTTGGCGATACGCCGAACGATCGCCAGTT
CTGTATGAACGGTCTGGTCTTTGCCGACCGCACGCCGCATCCAGCGCTGACGGAAGCAAAACACCAGCAGCAGTTTTCCAGTTCCGTTTATCCGGGCA
AACCATCGAAGTGACCAGCGAATACCTGTTCCTGCATAGCGATAACGAGCTCCTGCACCTGGATGGTGGCGCTGGATGGTAAGCCGCTGGCAAGCCGTG
AAGTGCTCTGGATTCGCTGCACAAAGGTAAACAGTTGATTGAATCCTGAACTACCGCAGCCGAGAGCGCGGCAACTCTGGCTCACAGTCAGTACG
GTAGTGCAACCGAACGCGACCGCATGGTACGAAGCTGGGCACATCAGCGCTGGCAGCAGTGGCGTCTGGCGGAAAAACCTCAGTGTGACGCTCCCCG
CCGCTCCCACGCCATCCCGCATCTGACCACCAGCGAAATGGATTTTGCATCGAGCTGGGTAATAAGCGTTGGCAATTTAACCGCCAGTCAGGCTTTC
TTTCACAGATGTGGATTGGCGATAAAAAACAACCTGCTGACGCCGCTGCGCGATCAGTTACCCCGTGACCCGCTGGATAACGACATTGGCGTAAGTGAA
CGGACCCGCTGATACCTAACCGCTGGGTGCAACGCTGGAAGCGCGCGGCCATTACCAGGCCGAGCAGCGTTGTTGCAGTGCACGGCAGATACACT
TGCTGTCGGTGTGCTATACGACCGCTCAGCGTGGCAGTACGGGGAACCACTTATTATCAGCCGAAAAACCTACCGGATTGATGGTAGTGTGCTC
AAATGGCGATTACCGTTGATGTTGAAGTGGCGAGCGATACACCGCATCCGGCGCGGATTGGCCTGAACTGCCAGCTGGCGCAGGTAGCAGAGCGGGTA
AACTGGCTCGGATTAGGGCCGCAAGAAAACTATCCCGACCGCCTTACTGCCGCTGTTTTGACCGCTGGGATCTGCCATTGTTCAGACATGTATACCCCG
TACGCTCTTCCCGAGCGAAAAACGGTCTGCGCTGCGGGACGCGCGAATTGAATTATGGCCACACCAAGTGGCGCGCGGACTTCCAGTTCAACATCAGCCG
CTACAGTCAACAGCAACTGATGGAAACAGCCATCGCCATCTGCTGCACGCGGAAGAAGGCACATGGCTGAATATCGACGTTTCCATATGGGGATTG
GTGGCGACGACTCCTGGAGCCCGTCAGTATCGGCGGAATTCCAGCTGAGCGCCGGTTCGCTACCATTACCAGTTGGTCTGGTGTCAAAAAATAATAATA
CCGGGACAGCCATGTCTGCCCGTATTTCCGCGTAAGGAAATCCATTATGTACTATTTAAAAAACACAAACTTTTGGATGTTTCGGTTTATTCTTTTCTTT
ACTTTTATCATGGGAGCCTACTTCCCGTTTTCCTCGATTGCTGCTACATAACCATACAGCAAAAGTGATACGGGTATTATTTTGGCGCTAT
TTCTCTCTGCTCGCTATTATTCAACCGCTGTTTGGTCTGCTTGTGCTACAAACTCGGAACCTTGTTTATTGTCAGTTATAATGTCACAAATAA
GCATCACAATTTACAAATTTAATTAAGGCCGCGGGATCGATCCCGTCGAGCAGTGTGGTTTTCAAGAGGAAGCAAAAAGCCTCTCCACCCAGGCCT
GGAATGTTTCCACCAATGTTCGAGCAGTGTGGTTTTGCAAGAGGAAGCAAAAAGCCTCTCCACCCAGGCCTGGAATGTTTCCACCAATGTTCGAGCAA
ACCCGCGCCAGCGTCTGTCAATTGGCGAATTCGAACACGCAGATGCAGTCGGGGCGCGCGGCTCCAGGTCCACTTCGCATATTAAAGGTGACGCGTGT
GGCCTCGAAGCAGCGACCCCTGCAGCAATATGGGATCGGCCATTGAACAAGATGGATTGCACGACAGTTTCCCGCGCTTGGGTGGAGAGGCTA
TTCCGCTATAGCTAGGACCAAGACAGACATCGGCTGCTGTGATCCGCGCTGTTCCGGCTGTACGCGCAGGGCGCCCGTTCTTTTGTCAAGACCGAC
CTGTCCGGTGCCCTGAATGAACTGCAGGACGAGGCAGCGCGCTATCGTGGCTGGCCACGACGGGCGTTCTTTCGCGAGCTGTGCTCGACGTTGTCAC
TGAAGCGGGAAGGGACTGGCTGCTATTGGGCGAAGTGCCGGGCGAGGATCTCCTGTCATCTCACCTTGCTCCTGCCGAGAAAGTATCCATCATGGCTG
ATGCAATGGCGCGCTGCATACGCTTGATCCGGCTACCTGCCCATTCGACCACCAAGCGAAACATCGCATCGAGCGAGCAGTACTCGGATGGAAGCC
GGTCTTGTTCGATACGGATGATCTGGACGAAGAGCATCAGGGGCTGCGGCCAGCCGAACTGTTTCGCCAGGCTCAAGGCGCGCATGCCCGACGGCAGG
ATCTCGTCTGACCCATGGCGATGCCTGCTTGCCGAATATCATGGTGGAAAATGGCCGCTTTTCTGGATTATCGACTGTGGCCGGCTGGGTGTGGCGG
ACCGCTATCAGGACATAGCGTTGGCTACCCGTGATATTGCTGAAGAGCTTGGCGGCGAATGGGCTGACCGCTTCTCTGCTGCTTACGGTATCGCCGCTC
CCGATTTCGACGCGATCGCCTTCTATCGCCTTCTTGACGAGTTCTTCTGAGGGGATCGGCAATAAAAAAGACAGAATAAAACGCACGGGTGTTGGGTCTG
TTGTTCCGATCCGAATTCTCTGAGGGCGCGCCATTAAATGGCCAGCGAGCCGGTACCCAATTTCGCCCTATAG

Targeted Locus:

AAAGAGATCTGTCTCAAGAAACAAATAAATGCTGTTTTTCATCAAAATAAATAAATACTTTTGTAGTCAAAAAACCCCACTAGTATTCACTTAAATGTT
GTCCAATCTTTTTTTTTTTTTTTTTTTGGTTTTTCAAGACAGGGTTTTCTCTATGTAGCTCTGGCTGTCTGGAACCTATTCTGTAGACCAGGCTGGCCTCGA
ACTCAGAAATCCACCTACCTCTGCTCCCAAGTGCTGGGATTAAGGCGTGACCAAAAGATTGGCTGTGTCCAATCTTTGTGATTTAAATTTTCCA
TTTAATGTGAAGTCAGTGGTGAAGTTAAAATGTGAAGATCATCACTCTTCTGAAGGTGAGGCTCTGGGTCCCTTTGTATCTGGACCTTTGGCTACAGA
GCCAGACTGTAATGAGTACATGATTAAGTATGTTGTCTAGCTAGAGCAACAGGCCACCACTGGGTGCCATCTGGAAGCTTTGGCGACAC
TGATGTTTTTGTGTGAGATCACTATAGCCCTAAGTGTGGGTGGTGTGGCGCTGTGTCATGCTTCAATGGGGACACATCCGATTGATATGACAGGGTT
TTCTGTTGCAGGCTGCATGGTCACTGCAATGACCCTTCTCTGGATGACCCTATCCCTCAGGAGTATGCTCTTCTCTGCCCCACGGGCCCTTGCTGG
AAAAACTCCAAGAGTTCTGGAGAGAGAGCAGACGGCAGTGTGCAAAGAACAGAGCACATGAGGTCTTCCCTCACGTGACACTCTGTGACTTTTTACAG
GTAAGTCTACTCTCAGAGGCCCTTAAATGCTCACCACCTCAGCTGATGGCGAGTGTCTCTGGTAACCTTGGCAACAATAGAACGCAACTGATTATTCTAAT
CAAGACATTAGCATAGGCTATCGTCTTGTGGGATCTTTTCTTCCCTCTTCAACTTCACTTCACTTCTCTTCAAGGACCCCAAACTTTTAGAGTCTTCAGC
TCTCCAGGCAGAAGAAGATAAAATCCAGGCTCTATGCATCTTATTGTCAATCTCTCTAGGAGCACATTGGGTGATATGAAGGTGATATGCCCTCTA
GGAAGGCAGATATTACCCCTGGTCTTGTCCACCCAGAGACTTGCAAAGTCTTAAACAGAGCAAGAACCCCTGTGTGATGAAGGACTAAAGGATGCT
GATTTGGCTGGACATAAACACAGGGTCTTCCCTAAGTTAGGGCCTAGCCCTCTGTGGAAAAAAAAAAAAAAAAATGGCCAGTTAGCAGCCTCCCTAGGGAG
CACTGTCAAAGAAAGAGGATGCACAGTTGTTGGACAAAGAGAAGAGGGCCTGAGGCCAAAGGGAAGGACCCACCGCCATTCTTCTACACCTTACTT
GATGAGCTAAAGAAGGACCTACCTACTGCTGGGACATCAGGGCAGNN
NN
GGTAGAAGCCAGGATGTTTGAGGATATGTGCAGAGTCTAAATCTGGTTTTCAAGTGAGAAAAAATCTCTAGATTCTCTGTAATGTCTTAAAGGTG
GGTTTCGTTATTCTCTGGGCTCAGAAGTGGTCAAAATGGATGTCATTTTGTGCTCACTTCCACAGGCACCCCACTGACAAAGACCCCTCTGGAT
AGAGAGTGCAGCGGTGAAGTACCCAAGCCCCCATAACCCTACAGCTCCCTTTTCGCTTACCAGTCTGCTGCCGCTCGGCTGTCTTCTCCCTGTG
GCCGCTAGTGCTTTGAGCCTGTGGAACGTGAACAAGGGACAGTCAAGGCCAGCGCTCTCTTCTTGGAAAGGTTGAGTACTGGCAGTGAAATGGCTG
CTCACTGACACTGTGCTCTATCAGGGCAAGACCCCTGGCCTTCCCATGAGTGGCTTTATGCCAAGATCTCCATCTTCTCATAAATAACTCATGCCACAC
CTAAATCCCATGGTGTCTAGAAGTCACTCTGCTTCTGCTCTCTGTCACCCGCTACCTGCGACAAAGTCAAGCAACCAATCATCTACTGTG
GATGCTCACCTGGCTGAGACAGGCTGCGTTCTGGCTCCAGCGTGTACTGCCCTGACAGGTGCTCAGCAGGAAGCATCCCTTACCCAACCACTGGGCA
GACATATCCACATCCCTCGCCTGTGTCCCCCACCCAGCTGCTCACTGGTGCTTTCCTCATGGCCCCGGTATGTCTTACTCACTCTGGGCGCTGGGATG
TAAATATGTTGACTTGAATTTGGCTGAGTTGGGTCAACAAGACCAGAAATGGGCCACAGACCCCAACCATATTGGCTGATACAGCTGGTCCCCATTGGA
ATCCAATCTGAATGCCACCCAGTAGTACTGCTATTTGTGCGAGGGACAATGGGATGTAGCCACCTGGAGAGGCTACAACAGAGAGGTCAAGAAACATG
AGCCCTCTGAGCCCTGACGAAGAGCTGAAGACACACAGGTGTTATCAGTTTAACTAACAGGAGGATTTTGAAGTTGAGGCCACCTACGGCTTAAGC
AGTAAACAGAGTGGGTCTCGGAGGCCTTGGGAACTGGCTCCTGTCTACCTAGGTTTGGCACAAGCTACTCTTACAGCTTGGTGTCTCATCTGCAG
CTGGATGGTGAACATGTGACCATCGGCTTCTGGTGGGTCTGTTCCTCATTTAGTGACCACGAAGCCCTGATGTCCGGAGGAGAAGAGACTAGCTTCA

[illegible]

ACTTTTGTCTTGGGGGACGTGTAGGACTCAATCAAGGCTCAGTCACCTGTGCTGATGTGGCCCTTTTGTGGGACTGTCTGCTTGGCACTGGGTATGGCCC
CGCTGTTACATTTGAACAAAAACGTGTGCTCGGGCCCTACATTTCTCCGTGACGCTCCTATAATTTGCTCCTTTGCTCATTTACAAGCTGCTCTCTCCTA
TCTCTGCGCCATACTACCAGGGCTACCTGATAGCCACCTTCAGATTGAGTTACAGAGGCGCCACCGGTGATGCCGCTGGCTTCAGTGACGGAGTCTGCA
AGGCTGAGTGGCTTGGTAGAAAATAGTTCTCTACTGGACTCCCCTTTGCCAGCTGCTCACCCCTCTGCTCGTTTTTTATAATGAAAACGGAAATTATTCCT
GCTTCCAAGGATGGCCGCTTCAGAAATGGTAAGTAAGGGACCCGGGGGGAGGGGGCGCTTCCAGGATGCACTCTGAGGAACCTCCCGGCTTCCCATA
TGGGACCTGCCAACCTGGCCTGCTTTGAGGGGATACTCCCCCAAGGCATATTTTCCAGAAGCTTAGACTTTACTAATATTGTAATAAATTAAAAACAA
CAAAAAACAAAAACAGGTAAGTTTTTAATGGTGAGTGCAGTGCCTCATTTGGAAATGTAAATAAACCTTAACAGGTAGCCAGGAAGGACGGCAGGATAGACAG
CCTCTGCGGGGAGGGCTCCGTGGACCTCAACCTTGGCGGAAGCAGATTCTCCAACACCTTGTGTGGACTGATCTGGGGCTCACCCGGGAGCACCCCT
ACATCTCTGGCTCGCCAGACCTGTCCAGAAGGTCTCTATTGTAGGAAACAGAACCCCTGTGTGGGTTTGGCCCCGAGGCGGAGGTTTGGCCCCAGGTG
GAGGCTCCCAGCCACTTTCATTGGCTGGGTGGCTGGGTCCCCAGGGCTCGGATACCTTTCTTCTCAATTAGGTCATGCTTGCATGAGCCAGGAAAG
GGCTGATTTTGTGGGCGCTACTAACATCGTGACAGTGCCTTCCCGGGTCTGCCCTTCTTCGGGACACATAAATTGAGTATCAGAAGATCTTAGG
TCTATGACAGGTAAATCCTATGGCTAGAAAAGAAGATCAAAATGTTGGACAAAGGAGAACCGTCTCATCGTGATGATCAGAGTTTTTTCTAAGGAACA
ACACAACCGTGACTTCTGGGTGACAAATGGGGCTTATCTCTAAAAGCGCCACTTGATTGGCTACACAGAAGACACTGGCACTGTTAACTTGAAAGGAA
TTAAATTTCTGAGTTTTGTGACGCTCTAGAAGCCACTTTCGATTTTTCTGTGGTCTCGAGAAAGTTGTGTTCTCAGTAGACAGATATTTGCGACAAACCCA
CAGGGGTTGTGGCTTCGTGTGGGACTGAAAGGATTTAAATGGGACAGAGGCCACTAGTGCCACACTTTCCACAGGACCAACCTGCTCACCC
CTGACTAAGCAGGTGGAGGTGGAGCGGAAACCAACATCAGAGGCCCTGAGATAGTCACCGGCCGCTCTAGAGGCCATAGCGGCCATTTAAATGGCG
CGCCGGATCCCCGGGCGCTCTAGCTAGACTAGTCTAGCTAGAGAATTCCGCCCTCTCCCTCCCCCCCCCTAACGTTACTGGCCGAAGCGCTTGAA
TAAGGCCGTTGTGCGTTTGTCTATATGTTATTTCCACCATATTGCCGCTCTTTTGGAATGTGAGGGCCCGGAAACCTGGCCCTGTCTTCTTGACGAGCA
TTCCTAAGGGTCTTTCCCTCTCGCCAAAGGAATGCAAGGTCTGTTGAATGTCGTGAAGGAAGCAGTTCTCTGGAAGCTTCTTGGAAGACAAACACGCT
CTGTAGCGACCTTTGACAGGACCGGAACCCCCACCTGGCGCAGTAGGATGCCCTCTCGGCCCAAAGCCACAGCTGTATAAGATACACCTGCAAGGCGGCA
CAACCCAGTGCCACGTTGTGAGTTGGATAGTTGTGGAAGAGTCAAATGGCTCTCTCAAGCGTATTCAACAAGGGGCTGAAGGATGCCAGAAGGT
ACCCATTGTATGGGATCTGATCTGGGGCCTCGGTGCACATGCTTTACATGTGTTAGTCGAGGTTAAAAAACGCTTAGGCCCCCCGAACACAGGGGA
CGTGGTTTTCTTTGAAAAACAGCATGATAAGCTTGGCACAACCATGGAAGATCCCGTCTTTTACAACGTCGTGACTGGGAAAAACCTGGCGTTACCC
AACTAATTCGCTTTGCAGCACATCCCCCTTTCCGACAGTGGCTTAATGAGCAAGAGGCCGACCCAGCATCGCCCTTCCCAAGCTTCCGACAGCTGAATG
GCGAATGGCGCTTTGCTGTTTCCGGCACCAGAAGCGGTGCGGAAAGCTGGCTGGAGTGCGATCTTCTGAGGCGGATACTGTCGTCGTCCTTCAA
ACTGGCAGATGCACGGTTACGATGCGCCATCTACACCAACGTAACCTATCCCATACCGTCAATCCGCGCTTTGTTCCACGGAGAATCCGACGGGTT
GTTACTCGCTCAGATTTAATGTTGATGAAAGCTGGCTACAGGAAGGCCAGCGCAATTTATTTGATGGCGTTAACTCGGCGTTTTCATCTGTGGTGCA
ACGGGCGTGGGTGGTTACGGCCAGGACAGTGGTTTGGCTGTAATTTGACGATGAGGCGATTTTACGCGCGGAGAAAACCTGCGGTGATG
GTGCTGCGCTGGAGTGACGGCAGTTATCTGGAAGATCAGGATATGTGGCGGATGAGCGGCATTTTCCGTGACGCTCTGTTGCTGCATAAACCGACTAC
ACAAATCAGCGATTTCCATGTTGCCACTCGCTTTAATGATGATTTAGCGCGCTGTACTGGAGGCTGAAGTTCAGATGTGCGGCGAGTTGCGTGACTA
CCTACGGGTAACAGTTTCTTTATGGCAGGGTGAACGCGAGGTGCGCAGCGGACCGCGCTTTTCCGCGGTGAAATTATCGATGAGCGTGGTGGTTATG
CCGATCGCGTCACTACGTCAGCTGAAACGTCGAAACCCGAACTGTGGAGCGCGGAAATCCCGAATCTCTATCGTGGCGTGGTTGAAGTGCACACCGCC
GACGGCAGCTGATTGAGCAGGAAGCCTGCGATGTGCGTTTCCGCGAGGTGCGGATGAAATGGTCTGCTGCTGCTGACAGCGAAGCGCTGTGCTGAT
TCGAGGCGTTAACCGTCACGAGCATCATCTCTGCTGATGGTCAGGTCTATGGATGAGCAGACGATGGTGCAGGATATCTGCTGATGAAGCAGAACA
TTAACCGCGTGCGCTGTTCGCATTATCCGAACCATCCGCTGTGGTACACGCTGTGCGACCGCTACGGCTGTATGTGGTGGATGAAGCCAATATTGAAA
CCCACGGCATGTGGCCAATGAATCGTCTGACCGATGATCCGCGCTGGCTACCGGCGATGAGCGAACCGGTAACGCGAATGGTGCAGCGCATCGTAAT
CACCGAGCTGTGATCATCTGTGTCGTGGGGAATGATCAGGCCAGCCGCTGATACGACCGCGCTGTATCGCTGGATCAAAATGCTGTCATCTTCCCG
CCGGTGCAGTATGAAGGCGCGGAGCCGACACCACGGCCACCGATATTATTTGCCGATGTACGCGCGCTGGATGAAGACCAGCCCTTCCCGGCTGT
GCCGAAATGGTCCATCAAAAAATGGCTTTTCGCTACCTGGAGAGACGCGCCGCTGATCCTTTGCGAATACGCCACCGCATGGGTAAACAGTCTTGGCG
GTTTCGCTAAATACTGCGAGGCGTTTCGTCAGTATCCCCGTTTACAGGGGCGCTTCGCTTGGGACTGGGTGGATCAGTCTGCTGATTAAATATGATGAAA
ACGGCAACCGTGGTGGCTTACGGCGGTGATTTTGGGATACGCGGAACGATGCGCGAGTTCTGTATGAACGGTCTGGTCTTTTGGCCACCGCAGCGCGC
ATCCAGCGCTGACGGAAGCAAAACACCAGCAGCAGTTTTCAGTTCCGTTTATCCGGGCAAAACCATCGAAGTGACCAGCGAATACCTGTTCCGTCAT
AGCGATAACGAGCTCCTGCACTGGATGGTGGCGCTGGATGGTAAGCCGCTGGCAAGCGGTGAAGTGCCCTGATGTCGCTCCACAAGGTAAACAGTT
GATTGAAGTGCCTGAACTACCGCAGCCGAGAGCGCGGGCAACTCTGGCTCAGAGTACCGCTAGTGCAACCGGAACGCGACCGCATGGTCAGAAGCC
GGGCATCAGCGCTGGCAGCAGTCTGGCGTAATGAGCCCTCAGTGTAGCTCCCCGCGCTGCCACGCCATCCGCACTGACCAACACAGCGA
AATGGATTTTTGTCATCGAGTGGGTAATAAGCGTTGGCAAAATTTAACGCCAGTACAGGCTTTCTTTACAGATGTGGAATGGCGATAAAAAACAACTGCT
GACGCGCTGCGCGATCAGTTACCCGTCGACCGCTGGATAACGACATTGGCGTAAGTGAAGCGACCCGATTGACCCTAACGCCTGGGTGGAACGCT
GGAAGGCGCGGGCCATTACAGGCGGAAGCAGCGTTGTTGCAGTGCACGGCAGATACACTTGTGATGCGGTGCTGATTACGACCGCTCAGCGCTGG
CAGCATCAGGGGAAAAACCTTATTATCAGCCGGAACACCTACCGGATTGATGGTAGTGGTCAAATGGCGATTACCGTTGATGTTGAAGTGAAGCGCGA
TACACCGCATCCGCGCGGATTTGGCTGAACCTGCCAGTGGCGAGGTAGCAGCGGGTAAACTGGCTCGGATTAGGCGCGCAAGAAAACTATCCC
GACCGCTTACTGCGCGCTGTTTTGACCGCTGGGATCTGCCATTGTGACACATGTATACCCCGTACGTTCTTCCGAGCGAAAAACGGTCTGCGCTGCGGG
ACGCGCGAATTGAATTATGGCCACACCAAGTGGCGCGCGCACTTCCAGTTCAACATCAGCCGCTACAGTCAACAGCAACTGATGGAACACAGCCATCG
CCATCTGCTGCACCGGAAGAAGGCACATGGCTGAATATCGACGGTTTCCATATGGGGATTGGTGGCGACGACTCTGAGCCCGCTCAGTATCGGCGG
AATTCAGCTGAGCGCGGTGCTGCTACCATACCAATTAGGTTGGTCTGGTGTCAAAATAATAAACGGGCGAGGCAATGCTGCGCGTATTTGCGGTAAAGGA
AATCCATTATGTACTATTTAAAAAACACAACTTTTGGATGTTGCGTTTATCTTTTTCTTTTACTTTTTATCATGGGAGCCTACTTCCCGTTTTTCCCGA
TTTGGCTACATGACATCAACCATATCAGCAAAAGTGATACGGGTATTATTTTGGCGCTATTTCTCTGTTCTCGCTATTATTCCAACCGCTGTTTGGTCTG
CTTTCTGACAAACTCGGAACCTGTTTATTGACGTTATAATGGTTACAAATAAAGCAATAGCATCACAATTTACAAATTTAATTAAGGCGCGGGAT
CGATCCGCTCGAGCAGTGTGTTTTCAAGAGGAAGCAAAAAGCCCTGCCACCCAGGCTGGAATGTTTCCACCAATGTCAGTGTGGTTTTGCGAA
GAGGAAGCAAAAAGCCTCTCCACCCAGGCCTGGAATGTTTCCACCCAATGTCGAGCAAAACCCCGCCAGCGTCTTGTCAATTGGCGAATTGCAACACGC
AGATGACAGTGGGGGCGGCGGTCCCAGGTCCACTTCGCATATTAAGGTGACGCGTGTGGCCTCGAACACCGAGCGACCTGCAGCCAATATGGGATC
GGCCATTGAACAAGATGGATTGCACGCGAGTTCTCCGGCGCTTGGGTGGAGAGGCTATTCCGCTATGACTGGGCAACAGACAATCGGCTGCTCTG
ATGCCGCGTGTTCGGCTGTGACGCGAGGGGCGCCGTTCTTTTGTCAAGACCGACCTGTCCGGTGCCTGAATGAAGTGCAGGACGAGGACGCG
CGGCTATCGGTTGGCCACGACGGCGGTTCTTGGCAGCTGTGCTGACAGTTGTCAAGCGGGAAGGGAAGGACTGCTGCTGCTATTGGCGGAAGTCC
GGGCGAGGATCTCTGTCATCTCACCTTGCTCTGCGGAGAAAGTATCCATCATGGCTGATGCAATGCGGCGGCTGCATACGCTTGTATCCGGCTACCTG
CCCATTGCAACCAAGCGAAACATCGCATCGAGCGAGCAGTACTCGGATGGAAGCGGCTTGTGCGATCAGGATGATCTGGACGAAGAGCATCAG
GGGCTCGCGCCAGCCGAAGTGTTCGCGAGGCTCAAGGCGCGCATGCCGACGGGAGGATCTCGTCTGACCCATGGCGATGCCTGCTTGGCAATAT
CATGGTGGAAAAATGGCGCTTTTCTGATTATCATGACTGTGGCGGCTGGGTGTGGCGGACCGCTATCAGGACATAGCGATGCGTTGCTGATTGCT
TGAAGAGCTTGGCGGCGAATGGGCTGACCGCTTCTCTGCTTTACGGTATCGCGCTCCCGATTGCGAGCGCATCGCCTTCTATCGCCTTCTTGACGA
GTTCTTCTGAGGGGATCGGCAATAAAAAAGACAGAATAAAACGCACGGGTGTTGGGTGCTTTGTTGCGGATCCGAATTCCTCGAGGGCGCGCCATTTAAT
GGCCAGCGAGGCGGCTACCCAATTCGCCCTATAGACTGGCTGGACACTGTTTTCTGATCTTGTAGAACCACAAAGGTTGCTAAGAAGGAGGCC
CTTTGATTAGGTACTTGACAGTCTCGAGGCACTGTGAGCTGTGTGCTGTTGTTGTTTAAACCTCTCTTTGGGGTGGGGGTGCTTCTCAGA
GACCCAAACTCCACAGTGGCTCTGCTTCTCTCAAAAGAAGGTCAAATGGCCACCACCTTCTAGAAAAATCTGGCAGGCTGTATGTCACCAAGGGTCA
AATGTCAGGTTAGAACGGGTGGTCCAGCCACCAAGAAGGAAAACGTGTTTTATGAGTCACATACCTATGCAGGTAGCATTCCCCGCTGATGTCTG
CCACTATGCAGTCTTTGTGCTGAAAGCTATCTGTGGCTTGCTAGTCTGGAGAGCAGGGCTCAGGAGCAATGGGAAGAATGGGTGAGAAATGGGAACGTG

GAGAGTTAAGGCTGTGCCTCTGAACACGCGGTATATGGGATCCCCGAACAATTCTTTTAAAGCCATCTGGGCTGCGGACAGAGTAAGAAGAACAAGGT
AGAAGGGCTAGGTTTACGAATTGAAAAGACCCCTGGGTCTATCCCGTGATGCTGCCGCAAGTATGCCAAGGGCTTTATGATGCCCTTTTACATTGGCTGTTCAG
ACTGCTTCATGCTTTGCCACGGTGTCATAGTGCATCTCTCCACAGGGGTGTGGGATACATTTCTGGAAGTGTGGCAAGAAGTACTGTGGCAAGAATTGTA
TCTGCTTTTAAAGCTGTGTAGCTACATCTCCGATCTCACACAAACGGGAAGCAACAATGCCCCGTTCCCCACCCAGTGTGTGTGAAGAGACTGGCCATCC
CTTCCACAGTAAGCACCAAGTGGGTGTGGTCATAGCAAAGTCATGGTGATGTTAGGATGAATTTAAGTCCACTTTTTTCATTTGTTTCATTTCCGGGGAGG
CTTTCCTGTTTCGTACAGTCTTTGTGGAGCCTCTCTAGAGAGATACATCTTACACAACATCCCACGTTGCCAACCTTGGTTTCTATTGCTGTGGTAAACAT
GGCCAGAAGCAACCTGGAAGCAAGGATTAGATCCGCTACAGTTTTATAGTCTGCCATCCAGGAAGTCAGGACAGGAACCTCAAACAGAGCAGGA
ATGCCAGAGGCAGGAGCAGAAGCAGAGGCCATGGAGGAATGTGGCTTCTGGCTTTTTCAGGCCATGTTCTTATGTCATTAGGACCGACTGCCCTGGA
GTGACACCAACCCACAATGAGCTGGGCTCTCCCATGTCCATCAAGGACAGGGATTTGTTACTCCCTGAACAGCAGGTGACCTCATCACCTTTGTCACTGC
CAGCCCCCTCCCCAGTGGGTATTGCACCTAGTAGGTGGTTCCCCTAGAGCTGAAGAATCCATATTCTGGGAACCCAGTCTTTGAGAGTGGCATGCAG
CCATGACAGCTCTGATCTGGAAGCAGAAAGTACTAAGCTGAGCATCTTGCTACTGTTGGGACGCCCATCTAGGAGAAAACAAGGCCATTTACATGGTGGC
TTCTGCTACATGTGGCAAATGGCTTGAAGCAAGGCTGCCGTGGCTCTGTAGAGGAAGGCCACCTTGGGTGGTTTGTAGAGAGCCGACTGCCCT
CTTGCTTCAACACATGGTATAAACCTCCATGACAGTTGAAGGAAGTCCAGGTTCCAGGGCTGCTGGGCAGCATGCCACAGCTGGGTGGCTCAGTC
AACGGTCTCCTTGTCTTCTTTTTGGGAGCCGGAGTCTGAGAGCCCTGATGTCAGTAAGGTTCCATTGCTGTGAATACACAGGGGACCCTGTGCAGATA
CAGGGCTTTGGTTCGATAGCCTACGGGGTTCCTTGAATTGTGGACATATCACTCTGCCCTCTGCCTTCATCTTCCCATTGGATGTCTGTCTCTAGTCTCTT
ATCTTTTCTTGTCTGTCTGTGTTAAACCTTGCCCTCTCTGAGGACGCCAATCATACAAGATTAGCCATGCCCTTATGCCCTGATATGGGCTCATCTTAACCTCT
CTCTTTGTGGCTCCAGTAAGATACCATCTTCTTGGCTGTTGAGGATTTCTGTGTCAAGGGCTCCCAGTGAGGATCCTTTTACGCCCAACAACATGTCGC
TTAAGCTGGGGCAGAGAGCTGGGTGAGCAAAGACTGACCCAGACAACGTGGTCAATTCATCTAACCAAGTCAGCTGTCTTTGGGCCAGTGCTTTCTTTG
ACAGAGGGGACAGCGGCACATGACTAAACTTTTAAAGTTTTCATGTCTACTCAGAACAATGTTCCCGGGTCCCCAAACCCCCCATCCCTTTGGTTCTCA
GATGGAGACGCAGTGGCTGCGCAGATCTTGTCCCTTGTCCCTTGAAGTTTTCGATCATCGCTCATTGGGATCGCATCGCCCTTGATATGGCGCTGGCCA
TCGGTCTGGGCAGTGAGTACCATTCTATTATTAGTAGGCGCTCGATTACCTGTTCTGGCATTTAAACTTGCATGAGACCCCCGCCCCACCCCTTGTCT
TGTACTTGTGCTGCTGCCTGGCCTTAATTACTGGTGGCCGGTGTCTTTGGGTTTGATGGCTATGGGTTTGATCATCTCGATGAATGTCAAACCAAGTGTGG
GAATAGGACAGGGGCCACTGGGTGTGCTCCAGGCTCTGCCACCAAGGTACCTGGCCGGTTAGAATTACTCAAAGGTAGCAGGTGAAACAGGACTCTGAG
ATAGGAAGGCAGAGGCTGGGCTGGGGCAAACAAGCCTTCCATTCAAGTCTATACCACCGCATCAGCTATTTTTATAGGAGGATGTAGGGCTTTTG
AGAAAGTGGGTATGGCAAGGAAGGGGCTCTCTAGAGTCTATAGTTTCTTATTCTTCTCAAGTAAGTCAGACAGGGCAGCATATTTTGCCTCC
TGCTCAGGGTTTATTGGCTTCAGGCCCAGAGTAAAAGGAGGCAGGGCTGTGAGCAGTTGAATGGTCTTAGTTGGGGCTCTTGCTGGGCTAGCTTAGTG
CGTTGGGCTAGCCATGACGTTTGTCTCGCTCTGAATCCCTGAGAGTGTGACTGCACCGCTTGTGATTCTGGAGGTAGTGATAGTGTGTTGTGGC
AGCCCTGTCCCTTGGAGTTCAGGACAGACGATGACTGCTGGAGGAACAGGCTGCTGTGGAGATGTAGTTTCAATGCAAGTTTCAATTATGATAGGCA
AGTTCAAGGCCACACGGCAGGTACATAGTGTAGGTGCTGTGCACTGAAGGACCACTTGTGTCATTCTCCATCCCTCCCTTTCTCAGTCCACTT
CGACTGCTCTGGGAAGTACAGGTGCCATTTCATCTTTCAAGTGTATTGAACTAACAGCTCGATGCGACGGGGTCTCCGACTGCAAGAACGCAGAGGATG
AGTACCGATGCGGTGAGTCGCAACCAATCACAGAGAGCGAACACAAGCCAGCAACGTGCCCTTCTGTCTGATGAACCCAACCATAGCCAGCGTCAT
GCCCTGTCTCAGCTGGGATGTGCCTAGCTGGGTCTTCTGGAGAACTGTTATACATGTTTACATCCAGTTGGGGGACCCAGACAGGTTCTGAGTTGGGGT
GGTGGGGACTGCAGACTCTTGTGGGGAGGGGCTGTGGGCAGGAACAGGCAAGGTCAGTTAGAAGAGAGGGTACTTGGAGCAAGCTCCGCTGC
AGCCTCTGCCTGTTCTTGTAATCATTGCCCTCCCCCATGCTGTGGCAGTGCGGGTGAGCGGCCAAAGAGCGGGCGACCAAGTGTTCACAGCTGCTGCG
TGGAGGACCATGTGCTCCGATGACTGGAAAAGTCACTATGCCAAGATTGCTGTGCCAGCTGGGGTTTCCAGGTGAGTCAAGGCCAAACGGCAGAG
CAAAAGCAGCTTGATACAGGACAGTCCAGAACCTCTAGATGCTTCAACGAGTCAACATCTGTTTCTTATAGCACCCCTCCCCAACCCCAACCCAACTCC
CTGGCATGGGGAGCTGGGCTCAGAGAGCAGGACAAGTCCCAAGTCAAGTCAAGTCAAGTCAAGTCAAGTCAAGTCAAGTCAAGTCAAGTCAAGTCAAGT
AGGGCTAGTCCAAAGCACTTAGACACAAAAGCCATTTAGACGTTTGGAGCTAGGGCTAGGACTGGGATTAGGACTGGGGCTCAGTTGGTAGAGCTCTAA
TCTGGCATGGCCAAAGCCATGGGTCTGTGTTCCAGTGGAGTAACAAGCATGCAAGGTGACACATCTGTAATTCCTGTACTGGAGAGGCAGGAGCAAAGG
GAGTTCAGATTGAGCTGAAAAGTAGTTCCTGTGCCAAGACAGACAGACAGACAGACAGACAGACAGACAGACAGACAGACAGACAGACAGACAGACAG
AGAAAGCAAAACATTACGTCGCCAGAACTTTGAGTGGAAAAATAAATACTTGGTTGGGTGCTTACGAGTTTAAAGACAGATGTTTGGAGACAGG
CATCGGGTCTGCTGGTCACATCTGTACTACATCTCAAAAGGATGCAATTATTCAAAACACCAATTAGCCCCAGGAGCACCAACCAAGACAGCATCTT
TCCAATTTCAAGGTCTGGGAGCCAGCTGCTGGCTTTCCACACTGTAGCAGCAGGCTTTTGCCTGACCAAGGGCCCCCTCTCCTCATAGTCATCGATACT
GACTCCTGACCCCTGCCTTGTCTTCCCTGGAGGCCACTGATACCTGTAGGTCAGGTTACACACAGCAGGTTCCCAAGTTTCTTAACTCATCTTAGGAAC
TGAGAGAGCTTGATGGTCACAACTCTGAAGTATAACCTAGTTTGTGTTTGAACCCAGGAAGCAGGGCCCTTAAACACGATGGGTACACAGCCCTTCT
GTCTGGGATCTAAACCAAGTAGGATCTTAGCACCCGCGAGCTGAGGTCGCCAGGCCTCCTCCTGTGATGCCATGCTGCTGGGTCTGAAACCAAG
TTGCAACTGAATTCAGTGACAGCTTGAAGATTACTAAGAGACAATGTTGAGAATTACCTAGCTTTATTCCTTAAAGAAAAGGTAGAGATTTCAAAC
AGCAAAAACCCACACAGTCACATGTATGCATGCACATACGCACGCATATACGCAACAGCCAGTTAGCTCAAACTCTCGGTGTAGATTTCAGGCCAGT
CTTGTGAGACCTGTCTGAGTTTCTCCCTTGAAGTGAATAAAGCTCCCACTTTAAAGGCCGCTGGGAGCTCTGTGGTCAATTAGGTTGATAGGCGTGACC
ATAGCTGTGGTGGCGGTGTGCTGACGCTGTAGGTGACCTGTGTAGTTTGTGTTGTGACACTGAGACTCCCTGCTGCTCAGCTATTGCTCTGTCATCT
CCCTATGACCCAGGATCCCAGCAAAGCAGGCTCCTTTATACCAAGGCAGCCAACTGCAGCCTCCCCACACCAAGGCAACAGATTGCAACCCCCCCC
CCCAAGGAAATGCTGGCTAATATCTGGATGCCTTTTCTTCATCCTTGAGTCCCAGTGGCATTAAATAGCATTGGGTGCTCATCTGGGTGACAAACTGC
TGGGTTAATGAGCAAGATGGCCACCTGCAGTACACTGTCTCTCCTACCTTCTTGGGAACCTTCAAACTCTGCTGCCCCCACTTGACCTTTTCTATG
CTTGGGTTTGTGCTACGCCGTTCACCCCATCTTGTGTTCTTCAATCTCTCTTGTGACCATGGCTGTGCATACCTGCTCTTGGCATGTAGCTCATTG
TTGGTCCCAGGCTCCTTAAGCCACTGCCTT