



Lexicon Genetics Incorporated – Genentech Project Materials

Genentech ID:	UNQ6427	Date of Submission:	2/9/04
Lexicon Contract Name:	DNA485	Mutation Type:	X Standard Knock out
LexVision Name:	GPR027N1		☐ Conditional
Reference accessions:	BC026896	Is this gene X-linked?	No

Required Materials: X pKOS clone DNA(s) __pKOS/DNA485/37, pKOS/DNA485/44_____
X Target Vector DNA __pKOS/DNA485.TV/37_____
X Targeted ES Cell DNA __1A9_____
X Genomic Map

Southern Blot Analysis: *External/Internal Probe Strategies*

	<u>5' External</u>	<u>3' Internal</u>
Name of Probe:	29/30	33/34
Restriction Enzyme for Genomic Digest:	EcoRI	Bgl II
Predicted Wild-type Band (kb):	18	11.8
Predicted Mutant Band (kb):	15	17
Probe Size:	434 bp	485 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:	DNA485-3	5' Primer Name:	35
3' Primer Name:	DNA485-5	3' Primer Name:	36
Predicted Wild-type Band (bp):	279	Predicted Wild-type Band (bp):	none
Predicted mutant band (bp)	none	Predicted mutant band (bp)	353

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**

DNA485-29 5' – ATGCACTGTCCTAGGGACC
 DNA485-30 5' – TTCTGTGCCTCAGATGATGC
 DNA485-33 5' – ATGGGAATTCAATCTCAGAGG
 DNA485-34 5' – CATTTGGTGAATGCCCTTCC

PCR Genotyping

DNA485-3 5' – GCTTTGGGCTTACATCTATCT
 DNA485-5 5' – GAACTGACCATAGGTCAAGG
 DNA485-35 5' – AGGAGTTGTCTGATCATGGCTTTAC
 DNA485-36 5' – CCCTAGGAATGCTCGTCAAGA

Genomic Sequence Deleted:

CCCTGCGAGCACCTCTTTGAGAGCTGGGGCATCCGCCCTTGCTGTGTGGGCCATCGTGTTACTCTCCGTA CTCTGTAACGG
GCTGGTGCTGCTGACAGTCTTTGCCAGCGGACCCAGCCCGCTGTCCCCCGTCAAGCTTGTGGTGGGTGCGATGGCAGGC
GCCAACGCCCTGACGGGCATTTCTGTGGTCTCCTGGCCTCGGTGGACGCCTTGACCTATGGTCAGTTCGCTGAGTATG
GAGCCCGCTGGGAGAGCGGTCTGGGCTGCCAGGCTACGGGCTTCTGGCTGTCTGGGTTTCAGAGGCGTCGGTGCTGCT
GCTCACACTGGCGGCGGTGCAGTGCAGCATCTCTGTGACCTGCGTCCGAGCCTACGGGAAGGCGCCGCTCGCCTGGCAG
CGTCCGCGCAGGCGCACTGGGATGCCTGGCGCTGGCCGGGCTGGCCGCAGCACTGCCGCTGGCCTCGGTGGGAGAGTA
TGCGCGCTCCCCACTCTGCCTGCCCTACGCCCCACCCGAGGGGCCGGCCGGCCGCCCTGGGCTTCGCTGTAGCCCTGGTG
ATGATGAACTCGCTCTGCTTCCTGGTGGTGGCCGGCGCCTACATCAAGCTCTACTGTGACCTGCCACGGGGTGACTTTG
AGGCCGTGTGGGACTGCGCCATGGTGCGCCACGTGGCCTGGCTCATCTTTGCAGATGGCCTCCTCTACTGCCCCGTGGC
CTTCCTCAGCTTTGCCTCTATGCTGGGCCTCTTCCCTGTCACCCCCGAGGCTGTCAAGTCAGTCCTTCTGGTGGTGCTGC
CTCTGCCTGCCTGCCTCAACCCACTGCTCTACCTGCTCTTCAACCCCTCACTTCCGGGATGACCTTCGGCGGCTCTGGCCA
AGCCCTCGTCCCCAGGGCCCCTAGCCTACGCTCAGCCGGTGAGCTGGAGAAGAGCTCTCTGCGACTCCACCCAAGCG
CTGGTGCTTTCTCAGATGTGGATCTTATTCTGGAAGCTTCTGAGGCTGGGCGAGCCTCCTGGGCTAGAGACCTATGGCTT
CCCTTCAGTGACCCTCATCTCCCGACATCAGCCGGGGGCCACCAGGCTGGAGGGAAACCATTTTATAGAGTCTGATGGA
ACCAAGTTTGGGAACCCACAACCTCCCATGAAGGGAGAACTGCTGCTGAAGGCAGAGGGAGCCACTTTGGCAGGCTGT
GGCTCTTCCGTGGGTGGAGCCCTCTGGCCCTCTGGCTCTCTCTTTGCCTCTCACTTGTAATAATCCCTCT

Genomic Locus: *(the deleted sequence represents nt 10047-11301 in the sequence below)*

[illegible]

[illegible]

GCTGGGGGGCTGGGGAGCAGACACCCGATTGCCTGGGTGAGAAACCACTTTAGCGTGTCTACAGTCTATGTTGCAGAT
ATTTTCTTTGCCCAAAGCTCAACCTGCAGGGGTGAGGTGGGGTATAATCCCTGTCAGGAGGGGTGGAATTTTTTCTCT
TGGTGTCTATACAGGGGAAGCAGCAGGGTTGGGAAAGGTCAAACAGCCTTCCCAATTCAGCCAAATCAAAGGTTATGC
ATCTAGGAGTAAGTTGTTCTCATGGGAGAGAGAAGAGAAGAGAAGTGAGGGATGTCTTGATGTCATTGCTGGGGCTAC
TTTTTGAGCATGCCCTCAAACACACACACATACCACAGACTCATAGGGCCAGGAGAAGCTCTGAAAGATCACCTGCTCT
ATCCCGAGAAGAGTGAAATCTCTTTACTAACGTCTTCTAGAGTGGAACAATTTGGATAATTCCTAAAGTACTTCCTTA
GAGCCGGGAAAGCCTCCTCTGGAGTCTAACCT:GGGCCACGAGAGCCAGGTTGCTGGAAAGAAAGGGGAGGGGCTCTT
TTTTCTTGATGCCAAACAACCTAAGTTTTTCATTTGTTTCGATTTTAAGTGAGTAGAGTCCCTTCCCTGTGTATAAAATGT
GAACAGAGCCAGGAATGGTAGTGTGTGCCTTTAATCCAGTACTCAGGACACAGAGGCACACAGATCTCTAAGTTTGA
GGCCAGCCTGGTCTACGTCTCGAGTTCCAGGACAGCCAGAACTACATAGTGGGAACCTGTCTCAAAAAAGCCAAACCA
AAACAATAAAACGCCAGCAGGCCATGCCAGAACAGCACAGCATGTGTGTGGGCCAAGAGATGTTCAAAATAAACAC
AAATTTACAAACAGTTAGCTGTTTTTATTTACATCCACCTTCGTTTTCCAGATTTCCAGATTTCTTTGGCTTAAACCTTT
CTTTGCCCAGAAAGCTTTACGCCTTGACCTTGCTTCTGACAAGCTTTTAGCGCTTAGCGGCAAAGTGCACCCTCTAGTGG
TGGATGAGGGAAAGAAGCAGACGCGTATTTTGCTAGGAAACCGGTGCTTCAGTGCTCTGCCTCGGAGAATTTTCATGTC
TGAAAATCAGCAACAAACAAGGATGAGGTGAAAAGAGAAAGTCTTGAAAACAAGGTCCAACCTGAACTTGCTTTTTAAA
ATAGCTCACACAAATTGTCAGATAAATTGATGTGGAATAGTTATACAGCCATTAAAAATATGTGGGGTC:TTTTTGT
TGTTTTGT
TGTATGATTTGAGATTGTAAGGGAGCATGCAAAGCTTAATTTAAGGAGAATAAAAATCCCAACTTATTTTTAAA
TATACATATAAAACCTGAAAGGAAATATGCCAAATAAGGAGTTCTATTTGAGAGGTGAGGCCATACAGTTTAAATTTT
GCCATGCTATATTTTCAAATTTCCACCTATTATTTTATAATCAGAAAAATGTTTTCTAAAATAGCTCCACAGAAATCTG
TTAAATTTCCCAAGCCACCTAGCAATACATTGAAAAACAAGTCTAGAGCCAAAGGAAATGAAGAAATACTATGCCCAA
AGTTACAAGGTGACTTAAGAATAGCATTGGGGAAAGAGATGGAAGATGCCAGGATCTGACCAATCTACTCTGGGGTC
CAGTTGGAATAATTTGAGAAGTTCAAAGTATTTTTCTTTGTTTTTAGTTAGGGTCTCACTATCATCTCAGGCTAGCCTCA
CACACATCCCTCCTGCCTCAGCTCCCTAAGTGTTGAGATTATAGATGGGAACTGCTATACTTGCCAAAGTTTTCTATGT
TTCGATTATGCCCTTTGTCTTCCAAATACTGATTGCACGATAAACATGAAGTGTAAGCAAGGGAG:ACCAGCCTA
ATAAGTCTACTCAGGACTTCTCGACCAACCGTGGAATGTCAATGATGGCTTGGGCAGAGTCACCACCATAAAGTAGTT
GACTCTGGACAGCGCTCACTCTGCCTTTGCTCTCGCTGAACGTCTCTTCGCTTCTGTGCGACAGTTTGTTCCTTCTATC
TCTCCAAATCGTGTTCCCTTAGGAAGACTAAATTTCTTAGCATTTCTCGGGTCTGGGTTTGCAGTGCATCACGCATCTA
TTTCTGTGATTTTTCTTCCCAGCTTCTCTTAGTTCTCCCACCCCATTTTCGGGAGTTTTTTTTTTTTTTTTTCTTTTCG
GGAGGTTTTGT
TGAGTTAGGAGTTGTCTGATCATGGCTTTACCAAGTGAGCTGGGTTCTGGCAGCTCTGGCTCTGGGCTTACATCTATCTCT
GCTCCTCTCTCACACAGGCCCTTCAAGCCCTGCGAGCACCTCTTTGAGAGCTGGGGCATCCGCCTTGCTGTGTGGGCC
ATCGTGTTACTCTCCGTACTCTGTAACGGGCTGGTGCTGCTGACAGTCTTTGCCAGCGGACCCAGCCCGCTGTCCCCGT
CAAGCTTGTGGTGGGTGCGATGGCAGGCGCCAACGCCCTGACGGGCATTTCTGTGGTCTCCTGGCCTCGGTGGACGCC
TTGACCTATGGTCAGTTCGCTGAGTATGGAGCCCGCTGGGAGAGCGGTCTGGGCTGCCAGGCTACGGGCTTCTGGCTG
TCCTGGGTTCAGAGGCGTGGTGCTGCTGCTCACACTGGCGGCGGTGTCAGTGTCAGCATCTCTGTGACCTGCGTCCGAGC
CTACGGGAAGCGCGCTGCGCTGGCAGCGTCCGCGCAGCGCACTGGGATGCCTGGCGCTGGCCGGGTGCGCGAGC
ACTGCCGCTGGCCTCGGTGGGAGAGTATGGCGCTCCCACTCTGCCTGCCCTACGCCCAACCGAGGGCGCGCGCC
GCCCTGGGCTTCGCTGTAGCCCTGGTGATGATGAACCTCGCTCTGCTTCTGGTGGTGCGCGCCTACATCAAGCTCT
ACTGTGACCTGCCACGGGGTGACTTTGAGGCCGTGTGGGACTGCGCCATGGTGCGCCACGTGGCCTGGCTCATCTTTGC
AGATGGCCTCCTCTACTGCCCCGTGGCCTTCCCTCAGCTTTGCCTCTATGCTGGGCCTCTTCCCTGTACCCCCGAGGCTG
TCAAGTCAGTCTTCTGGTGGTGCTGCCTCTGCCTGCCTGCCTCAACCCACTGCTCTACCTGCTCTTCAACCCTCACTTCC
GGGATGACCTTCGGCGGCTCTGGCCAAGCCCTCGGTCCCCAGGGCCCCTAGCCTACGCTGCAGCCGGTGAGCTGGAGA
AGAGCTCCTGCGACTCCACCCAAGCGCTGGTGGCTTTCTCAGATGTGGATCTTATTCTGGAAGCTTCTGAGGCTGGGCA
GCCTCCTGGGCTAGAGACCTATGGCTTCCCTTCAGTGACCCTCATCTCCCGACATCAGCCGGGGGCCACCAGGCTGGAG
GGAAACCATTTTATAGAGTCTGATGGAACCAAGTTTGGGAACCCACAACCTCCCATGAAGGGAGAAGTGTGCTGAAG
GCAGAGGGAGCCACTTTGGCAGGCTGTGGCTCTTCCGTGGGTGGAGCCCTCTGGCCCTCTGGCTCTCTTTGCCTCTCA
CTTGTAATATCCCTCTCTGTTTGTCTCTCCCCATCCAATGATGGCTGCTTATAAAAGAAAGACAACCTCCAACCTCCATA
GCAAGATGGCCAACACCTCTGACTCCATTGTTCTCTCTCCACGACCCCTAACCAATGAGTGCTTCCAAGTCTTGCTTTGT
CTTGGCCTTCAGCTTCACTTTCACCTGGGCTTCTCTGTCCAATCCAATACTTCTGACAGAGGCTGGGAAATTTGCAT
AGGAGAAAGGAGAAAAGCAAAAGACAGTGAAGGTTATGGGGCCCTGACAGAGCCATGATCAGTAAGTGCAGAGTGAT
GGGGAGGTCTCACAGAGCATGACACTGGAAGACAACCTACCAAAGACATTGGAGAGTCTCCCCTGTGACATATAGAATA
TAAAATGTGTTCTGCGTTCCATTAATCTTGACCTATGCTGTGCCAAAGTGCTTCTGTTAAAATACACTTTGGAAGACAT
TGCATATTATGTCCCTTTCTTAGAGTCATGGGGTCATGTTAGTGTCTATAAGGTCTGAGAATTAGGACCTTTTGGCTTA
ATTACTACAGCAATTAACCTTAATTATTTGATGATACCTATATATTTGCTTTTCATGAAACACTTACAAATCTCTCATAG
AACTTAGCATGGTTTTTCTCCCGGGGAATCATCTTCATACCATGGAGTACTACCCTATGACATCATAAGATGCCACCCTC
TTTCAAAGCCCCTATGAAGCCAACCTGGGGTGAAGTGCCAGAGGTGACTGATGATCCGTCATCCAGGACAGATTTTGCA
TTCTGCTCCCCTCCCCACCTCACTTATCCTACTGGAACAGACACCTGGAGGAGCCTGCCCCATCTCCAAGGTGGGGCGG
GGRGAAAGAGACCCTTGATGTGTCCCACACCACACCGACCCCAAGCAGTAATGAAATTTCTGCCCTCAGCAAGACAG
GATTCTCAGGTCTGGYAAGATATACACTGAGAAGTCTGTGGTTCTCTGGGCTTCCCSGAACTCTATGCTAACTTTGTAT

GGTTTTACATTGTATGCATCTCACTATGGCCCGGGCCTCTCTCCTCATCCCAATCCTGTTACTGGGAGGGATGGAAAACC
CAAGAGAAGGGATATTTGTATTGTGARTATTGCATTTTWGGGAGTGCTGTGGCTATCTGGGACTCCTGGATGCCCCCA
CAGGCCTTTGATTCTTCTGCCTCTCTCCTCTTGATCTTTCTTACCCTCTGCTTCCCCAAGTGCAGTTGAGGTACTATGCAG
TGCTCCGCCTCACTCCAAACATGGGAATTCAATCTC::A::GAGGAGGTAAGAAGTGGGGAGAAGCCAAGACTCAGCAA
TAGACGATAATTGCTCCTGGGATTGCCCTAACACCATTTACCTAGAAAAGGACCAAGTTTGGATCCTGAAGCCCAGTGG
AGCACCATTCTCTGCCTGAATCCTGTTGTGATCCCTAGCCAAGTCTCTTTCCAAAAACTCCACCTTTAAAAACAAGCTGA
GAAGGCCCTTCTCTAAGTTTAATAGTTAACTTTCCATAGCTTAGCTTCTCTGCGGTCTCCTGAGTGCCCAGTGAAAATTC
TGCCATAGGTCAACAAGTGAGGTGGAGAGATGAGTCAGAGGCCATGCATGGAGCTCAGAACATTTCCAAACCTCCTGT
GATTCACCTGAGTAGCCCTAGACTCTAGAAGGCTCAGAAGCAGAAAAAGGATGACTTTATTATTYCTTAGGGTCTTCTCA
TGGGGCCAGTTTCAGGAAGGCCATTACCAAATGATGGCAGATTTATTATCAATTGTTTCTGGGTGCCTGATTTCTTTA
TTTCCCCCGGGCTATGAGAGCCCTTGGTGGGAGTCCCCCACCTTGAGAAATTGGTGGGTTTGGGTTTTTGGKTWY
KWGCTCKYWTTWTTWWTYRTTTYMTAGGSYTRMRKRTTTTAGTTAGGTTTTACTGCTGTGAAGAGATACCATGACC
AAGGCAACTCTCATAAGGACAACATTTAATTGGGGCTGTTTGCAGGTTTAGAGGTTTCAGTCCATTATCATCAAGGTGA
GAACATGGCAGAATCCAGGCAAGCACAGTGCAGGAGGAGCTGAGAGTTCTACATCTTCATCTGAAGGTTGCTAGCAGA
ATACTCACTTCCAGGCAGCTAAGGACTAAGGTATTAAGGCCACACCCACAGTGACCCATCTACTCCAACAAGGCCAC
ACCTCCTAATAGTCCCCTGATCCAAGCATATACAACTATCACAATGGCAAAATTGGCATTCTTTTGGGGAGGC
TTGACTTACAGCAAGTTACCTAGATTTTTACCCTGCTCTCTCCACCTACATCACTATGAGATCATTCTCCCCTTTGGAGTC
AAGGAAGTACCTTGGAGTGAAGTGGCCATGTGTTGGTGGTCTAAGAATGTAGGCATTGTTCTTAAAGAGGTCTTCTA
TGAGAGTGAGCCAGCCCCTTTGGGCTGCAAGCTTTAGCATGGCACAGTTGTCACCTTACTGTCTGCTTCTAAATCTGGA
CATCAGCCAAAGTTCAACATTCTAATTAGAGAAGAGGCAAGGGAGGAGAGAGTTGAAGTTCATAAACTTTTATTTAA
ACGTCTAGCTAGGAGTGGTGGTGCCAGTGTGGAGGTGGCAAGATCGAGTGTAGGGTCATCCTCAGCTACATAATGAG
TTTGAGGCTATCCTAGGCTACATGAGACTCTGTCTCAAAAAACAAAAGCAAGCAAGCAAGCAAAACAAACCTCCA
ACTAGTTTCATATACATTTACCCCAATAAGATTGAGTAGTTAAGTTTCCTTGTGTTTTACTTTGGGCCAAATTTCTAGCA
AGCCAGAATGTTAGTACTTTGGTTATCTCCTTTGTGGTCAGTTGAAGACCATGGGTCTTCTTCTAAGCAAATTTCTGAGT
CTCTGTTCTACATATTTGGATCTGACAAGAAGGACCATGAGTCTTGTACTGGTCATAGGATGAAAAACTGAACGTGTTAG
GAGCACCTAAGTCTCTACTGTTATCATTAAACAAATCTTCCCAAAGCCATGGAAAAAGAAATCCACTCCAAGGCTGAGAT
GGTGGTGGTAGAAACGCAAGGGATTGGTATGTACTACCATGGGCTCTGTGTGCTGTGCCATTAGTTAGTGCCAACCACA
ATCTTCTCTTACACAGAGGAGAACTCATGGTAGGATCACAGCTTGTTAAGCATCTCATCAAAAGGAAAAAACCACAAA
ACAAATGTAGAGCTAAAGTCAATCAGAAGACTATGAGTGGGCGGGGCTTCTTACTGGGGCCTACCTTTTCTCTTACCT
CTTCTCCTGCTCCTTTGGGCTCATTTTTTCCAGGAAGAGTAAAGGCTTAAAGAGTAAGGGAGGAGAAGAAGGAAGAGCT
GGCAATAGGCAGTAGGCTCTTGGGACAAGGGTGGAAAGAGGTAGTAGGAACCGCCATCTTCTAGCTCCAGTCCCCTCTG
ACTACCTCTGCTCTGGGTTACCAAGTTCTCCACCTAAGACCTACCACCTCCACCTCCTTTCTGGGTTCCAGTCCCATGC
CTCATCACCAACCCAGCCATGTGAACATAACAATTGTCAAGATGTAAATATCCGGTTTTTCTGTATAGTAAAGCACC
TATGAAGTACCATGTGTGCTTTTCTGTTTCTTTAGCTGCCCCTGAGGGAACCATGAGTGTGATGAATGTGGGGTGGCTTT
GAGGGAGGGAGGTGTGGTCAGAGGACCAAGCTAATTACTCTCCCCTTCTGAATTCTGGGGCATTTCAGACCATAGCCAA
GGAGGCTCTGGGTTGATAACTTTGGAGCGATCAGAACCAAGTTTGGTCTCTGTGCTGAAGTGAGCGTCCCTTTGTGTACA
CTGGGTCAAATGGAACACACTAGAGAGAGCTGAGAACAGCTTAGGTTTTGTGTGTCTCAGACCTTGAAGCCTTGCCAG
ACCCAAGCCTCCTGCTGAGGTTTTCCCCAGAGAATCAGCTTGTTTTCTTTTCTTTTATTGACAGACTTGCCACCTACTTCTCT
CTTCTTCTTCCCCGAAGTGATGACATTCCCAAGGAAATGGGGAAGGCAAAGAGATAAAGATTTCACAAAATCCTGCAA
TCATGGGACATGACACACACCAAAAGTTATCCAGGAAGAGGAACCTCAATTGAGAAAAAGCCTCCATCAGATTGCTTAT
AGACGAGTCTGTGGGGCATTTTTTTCTTTTACTTATGATTGATGTGGGAGGCCCCCTCCTACTTGGGGGCGGTGCCACC
CCTGGGCAGGTGGTCTCTGAGTTTATCTTAAGAAAGTAGGCTGAGTCATTGGAAAGTAAGCTACTGAGCAGTGTCTCCCT
CATGGTCTCTGATTCACTTCTGCTCCAGGTTCTGCTCTGAATTTCTTTTATGATATGGATTGAAAGCTGTACACTGA
AATAAACCTTCCCTCCCAATGGTTTGGATCAGTGGTTTATCTCATCAATAGAAAGCAAATAAGACCTAGACCTAG
TGCCAGAAACCTTCTTCTTCTCCCATTTCCCTATTCCTCCATCTCTACATTGAAATATTTCCAAGGTACGTTTTTAAAGC
TGATACATAATCTTGATTCCCTTTTAAGAGACATATGATGTCTTCTTCCACAAACACCCAAGTTCTCCACCTAAGTTCT
TCCTCTTCTGTTCATTTTGAATTGAATATTCCAAACTCCTTATCCTTCTAGCTCAACTACAGGAGAGCCATTTCTCAGC
CTTGTTAGACTTGGTTAAGAGGAAAAACGTGTGGTTGACTCCAGTAAATGTGTTTCAAGATCTGAGCATCTAAGCAAACC
CAAGACCAGAGAGGCCTGGCATTGTGGGAGTTTTTATCTAAAACCAGAGGCTGTTCTGGTTGAGACAGCCCTGGGTTA
GCCAGCGAGATTCTGGTATTAGTCACTCGTGCCCACTGAGTGCATGCTCTGCTGTTTTCTGTAGGCCTGTTTTATGTCT
ATCTGCTCTGCAACCATAACCAACTGCTTCCTTCTGCTCTCTTTTGTTTAAAAGCTTTAATCTAATTTTTGAACAAGTAT
TACACTGACATGGCTCGCGCAGCAAAAGTCTGTCTCCCCTGTGTGCTCCCCTCTCTGTTCTCTTTGTTTCATTTAATACA
CACACACACACACACACACATGCTCATGAATGCTTCTTCTTCTTTGTTTTATTTTCTGAGAGTCTCATTACA
GCACACACTGACTTCGAACTTGCTGTATGGCAGAGGATAATTCTGTCTGTTACATCCCCGGTGTGAGGATTATATGCATG
TGTCTCCATATTCAATGTATGCAGTGTAGGGATCAATTTCTGGGCATTATGCCTGCTCAGCTAACATTCTGCCAACTGA
GCTCCATTCTAGTTGTTGGGTTGCCCTTCCCACCCCCACGCCCTACCTTTTTTGAATACTGGTAATTAACCATGAC
CTTCTGCATGCTAGACAAAAGTCTACTATTTGGTCAATTCCTAACTCAGAGTTTTTACACTCTATATTTAAAAAAAATAT
ATATGTACTTGTGTTTGTGGGGGGCAGTTTGCAGCACACCACAAGAAAGTTTCGCTTTTTAAAAAGCTGAATATAGTT
CAAATATCAATAAAGCCTTTTCATTTTTTTCCATAGCAGTTTATATCCTTTCTGTGCTGGTTAAGGTTTTTATTATTATTA

Selection Cassette: (IRES Bgeo PGK Puro)

GCCATAGCGGCCATTTAAATGGCGCGCCGGATCCGAATTCTCGAGGCTAGAACTAGCGATAAGCTTCGAGGATCAAT
TCCGCCCTCTCCCTCCCCCCCCCTAACGTTACTGGCCGAAGCCGCTTGAATAAGGCCGGTGTGCGTTTGTCTATATG
TTATTTTCCACCATAATTGCCGCTTTTTGGCAATGTGAGGGCCCCGAAACCTGGCCCTGTCTTCTTGACGAGCATTCTAG
GGGTCTTTCCCTCTCGCCAAAGGAATGCAAGGTCTGTTGAATGTCGTGAAGGAAGCAGTTCCTCTGGAAGCTTCTTGA
AGACAAACAACGTCTGTAGCGACCTTTGCAGGCAGCGGAACCCCCACCTGGCGACAGGTGCCTCTGCGGCCAAAAG
CCACGTGTATAAGATACACTGCAAAGGCGGCACAACCCCAAGTGCCACGTTGTGAGTTGGATAGTTGTGGAAAGAGTC
AAATGGCTCTCCTCAAGCGTATTCAACAAGGGGCTGAAGGATGCCAGAAGGTACCCCAATTGTATGGGATCTGATCTG
GGGCTCGGTGCACATGCTTTACGTGTGTTAGTCGAGGTTAAAAAACGTCTAGGCCCCCGAACCACGGGGACGTGGT
TTTCCTTTGAAAAACACGATAATACCATGGCGGATCCCGTCGTTTTACAACGTCGTGACTGGGAAAACCTGGCGTTAC
CCAACTTAATCGCCTTGCAGCACATCCCCCTTTCGCCAGCTGGCGTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCC
CAACAGTTGCGCAGCCTGAATGGCGAATGGCGCTTTGCCTGGTTTCCGGCACCAAGAAGCGGTGCCGGAAAGCTGGCTG
GAGTGCAGATCTTCTGAGGCCGATACTGTGTCGTCGTCCTTCAAACCTGGCAGATGCACGGTTACGATGCGCCCATCTACA
CAACAGTAACCTATCCCATACGTTCAATCCGCCGTTTGTTCACGAGAGAATCCGACGGGTTGTTACTCGCTCACATTT
AATGTTGATGAAAGCTGGCTACAGGAAGGCCAGACCGCAATTATTTTGATGGCGTTAACTCGCGGTTTCATCTGTGGT
GCAACGGGGCGCTGGGTTCGTTACGGCCAGGACAGTCGTTTGGCGTCTGAATTTGACCTGAGCGCATTTTTACGCGCCGG

AGAAAACCGCCTCGCGGTGATGGTGCTGCGTTGGAGTGACGGCAGTTATCTGGAAGATCAGGATATGTGGCGGATGAG
CGGCATTTTCCGTGACGTCTCGTTGCTGCATAAACCGACTACACAAATCAGCGATTTCCATGTTGCCACTCGCTTTAATG
ATGATTTTCAGCCGCGCTGTACTGGAGGCTGAAGTTCAGATGTGCGGCGAGTTGCGTGACTACCTACGGGTAAACAGTTTC
TTTATGGCAGGGTGAAACGCAGGTCGCCAGCGGCACCGCGCCTTTTCGGCGGTGAAATTATCGATGAGCGTGGTGTTAT
GCCGATCGCGTCACACTACGTCTGAACGTCGAAAACCCGAAACTGTGGAGCGCCGAAATCCCGAATCTCTATCGTGCG
GTGGTTGAACTGCACACCGCCGACGGCACGCTGATTGAAGCAGAAGCCTGCGATGTCGGTTTCCGCGAGGTGCGGATT
GAAAATGGTCTGCTGCTGCTGAACGGCAAGCCGTTGCTGATTTCGAGGCGTTAACCGTCACGAGCATCATCCTCTGCATG
GTCAGGTCATGGATGAGCAGACGATGGTGCAGGATATCCTGCTGATGAAGCAGAACAACTTTAACGCCGTGCGCTGTT
CGCATTATCCGAACCATCCGCTGTGGTACACGCTGTGCGACCGCTACGGCCTGTATGTGGTGGATGAAGCCAATATTGA
AACCCACGGCATGGTGCCAAATGAATCGTCTGACCGATGATCCGCGCTGGCTACCGGCGATGAGCGAACGCGTAACCGC
AATGGTTCGAGCGCGATCGTAATCACCCGAGTGTGATCATCTGGTTCGCTGGGGAATGAATCAGGCCACGGCGCTAATCA
CGACGCGCTGTATCGCTGGATCAAAATCTGTCGATCCTTCCCGCCCGGTGCAGTATGAAGGCGGCGGAGCCGACACCAC
GGCCACCGATATTATTTGCCGATGTACGCGCGCGTGGATGAAGACCAGCCCTTCCCGGCTGTGCCGAAATGGTCCATC
AAAAAATGGCTTTTCGCTACCTGGAGAGACGCGCCCGCTGATCCTTTGCGAATACGCCACGCGATGGGTAACAGTCTTG
GCGGTTTCGCTAAATACTGGCAGGCGTTTCGTCAGTATCCCCGTTTACAGGGCGGCTTCGTCGTTGGGACTGGGTGGATCA
GTCGCTGATTAAATATGATGAAAACGGCAACCCGTGGTCGGCTTACGGCGGTGATTTTGGCGATACGCCGAACGATCG
CCAGTTCTGTATGAACGGTCTGGTCTTTGCCGACCGCACGCCGCATCCAGCGCTGACGGAAGCAAAACACCAGCAGCA
GTTTTTCCAGTTCCGTTTATCCGGGCAAACCATCGAAGTGACCAGCGAATACCTGTTCCGTCATAGCGATAACGAGCTC
CTGCACTGGATGGTGGCGCTGGATGGTAAGCCGCTGGCAAGCGGTGAAGTGCCTCTGGATGTCGCTCCACAAGGTAAA
CAGTTGATTGAACTGCCTGAACTACCGCAGCCGGAGAGCGCCGGGCAACTCTGGCTCACAGTACGCGTAGTGCAACCG
AACGCGACCGCATGGTCAGAAGCCGGGCACATCAGCGCCTGGCAGCAGTGGCGTCTGGCGGAAAACCTCAGTGTGACG
CTCCCCGCGCGTCCCACGCCATCCCGCATCTGACCACCAGCGAAATGGATTTTGCATCGAGCTGGGTAATAAGCGTT
GGCAATTTAACCGCCAGTCAGGCTTTCTTTACAGATGTGGATTGGCGATAAAAAACAAGTCTGACGCCGCTGCGCGA
TCAGTTCACCCGTGCACCGCTGGATAACGACATTGGCGTAAGTGAAGCGACCCGATTGACCCTAACGCCTGGGTGCA
ACGCTGGAAGGCGGCGGGCCATTACCAGGCCGAAGCAGCGTTGTTGCAGTGCACGGCAGATACACTTGCTGATGCGGT
GCTGATTACGACCGCTCACGCGTGGCAGCATCAGGGGAAAACCTTATTTATCAGCCGGAAAACCTACCGGATTGATGG
TAGTGGTCAAAATGGCGATTACCGTTGATGTTGAAGTGGCGAGCGATACACCGCATCCGGCGCGGATTGGCCTGAACTG
CCAGCTGGCGCAGGTAGCAGAGCGGGTAAACTGGCTCGGATTAGGGCCGCAAGAAAACCTATCCCGACCGCCTTACTGC
CGCTGTTTTGACCGCTGGGATCTGCCATTGTCAGACATGTATACCCCGTACGTCTTCCCGAGCGAAAACGGTCTGCGC
TGCGGGACGCGCGAATTGAATTATGGCCACACCAAGTGGCGCGGCGACTTCCAGTTCAACATCAGCCGCTACAGTCAA
CAGCAACTGATGAAACCAGCCATCGCCATCTGCTGCACGCGGAAGAAGGCACATGGCTGAATATCGACGGTTTCCAT
ATGGGGATTGGTGGCGACGACTCCTGGAGCCCGTCAGTATCGGCGGAATTCCAGCTGAGCGCCGGTCGCTACCATTAC
CAGTTGGTCTGGTGTACAGGGGATCCCCCGGGCTGCAGCCAATATGGGATCGGCCATTGAACAAGATGGATTGCACGCA
GGTCTCCGGCCGCTTGGGTGGAGAGGCTATTCGGCTATGACTGGGCACAACAGACAATCGGCTGCTCTGATGCCGCCG
TGTTCCGGCTGTACGCGCAGGGGCGCCCGTTCTTTTGTCAAGACCGACCTGTCCGGTGCCTGAATGAACTGCAGGA
CGAGGCAGCGCGGCTATCGTGGCTGGCCACGACGGGCGTTCTTGGCGCAGCTGTGCTCGACGTTGCTCACTGAAGCGGG
AAGGGACTGGCTGCTATTGGGCGAAGTGCCGGGCGAGGATCTCCTGTATCTCACCTTGTCTCTGCCGAGAAAGTATCC
ATCATGGCTGATGCAATCGGCGGGCTGCATACGCTTGATCCGGCTACCTGCCCATTCGACCACCAAGCGAAACATCGCA
TCGAGCGAGCACGTACTCGGATGGAAGCCGGTCTTGTGATCAGGATGATCTGGACGAAGAGCATCAGGGGCTCGCGC
CAGCCGAACGTTCGCCAGGCTCAAGGCGCGCATGCCGACGGCGAGGATCTCGTCGTGACCCATGGCGATGCCTGCT
TGCCGAATATCATGGTGGAAAATGGCCGCTTTTCTGGATTATCGACTGTGGCCGGCTGGGTGTGGCGGACCGCTATCA
GGACATAGCGTTGGCTACCCGTGATATTGCTGAAGAGCTTGGCGGCGAATGGGCTGACCGCTTCTCTGCTGCTTTACGGT
ATCGCCGCTCCCGATTTCGACGCGCATCGCCTTCTATCGCCTTCTTGACGAGTTCTTCTGAGGGGATCAATTCTCTAGAGC
TCGCTGATCAGCCTCGACTGTGCCTTCTAGTTGCCAGCCATCTGTTGTTTGCCCTCCCCCGTGCCTTCTTGACCCTGG
AAGGTGCCACTCCCCTGTCTTTTCTAATAAAATGAGGAAATTGCATCGCATTGTCTGAGTAGGTGTCATTCTATTCTG
GGGGTGGGGTGGGGCAGGACAGCAAGGGGGAGGATTGGGAAGACAATAGCAGGCATGCTGGGGATGCGGTGGGGCTC
TATGGCTTCTGAGACGGAAAGAACCAGCTGGGGCTCGATCCTCTAGAGTCGAGTACCGGGTAGGGGAGGCGTTTTCC
CAAGGCAGTCTGGAGCATGCGCTTAGCAGCCCCGCTGGGCACTTGGCGCTACACAAGTGGCCTCTGGCCTCGCACAC
ATTCCACATCCACCGGTAGGCGCCAACCGGCTCCGTTCTTTGGTGGCCCTTCGCGCCACCTTCTACTCCTCCCCTAGTC
AGGAAGTTCCCCCCCCGCCCCGAGCTCGCGTCGTGCAGGACGTGACAAATGGAAGTAGCACGTCTCACTAGTCTCGTG
CAGATGGACAGCACCGCTGAGCAATGGAAGCGGGTAGGCCTTTGGGGCAGCGGCCAATAGCAGCTTTGGCTCCTTCGC
TTTCTGGGCTCAGAGGCTGGGAAGGGGTGGGTCCGGGGGCGGGCTCAGGGGCGGGGCTCAGGGGCGGGGCGGGCGCC
GAAGGTCTCCGAAGCCCGGCATTCTGCACGCTTCAAAAGCGCACGTCTGCCGCGCTGTTCTCCTCTTCTCATCTCCG
GGCCTTTCGACCTGCACTGCGCGCCAGCTTACCATGACCGAGTACAAGCCCACGGTGCGCCTCGCCACCCGCGACGAC
GTCCCCAGGGCCGTACGCACCCTCGCCGCGCGTTTCGCCGACTACCCCGCCACGCGCCACACCGTCGATCCAGACCGCC
ACATCGAGCGGGTCACCGAGCTGCAAGAACTCTTCTCAGCGCGCTCGGGCTCGACATCGGCAAGGTGTGGGTGCGCG
ACGACGGCGCAGCAGTGGCGGTCTGGACCACGCCGGAGAGCGTCGAAGCGGGGGCGGTGTTCCCGGAGATCGGCCCG
CGCATGGCCGAGTTGAGCGGTTCCCGGCTGGCCGCGCAGCAACAGATGGAAGGCCTCTGGCGCCGACCGGCCCAAG
GAGCCCGCGTGGTTCTGGCCACCGTCGGCGTCTCGCCCGACCACCAGGGCAAGGGTCTGGGCAGCGCCGTCGTGCTC

GGGGCTACTTTTTGAGCATGCCCTCAAACACACACACATACCACAGACTCATAGGGCCAGGAGAAGCTCTGAAAGATC
ACCTGCTCTATCCCGAGAAGAGTGAAATCTCTTTACTAACGTCTTCTAGAGTGGAACAATTTTGGATAATTCCTAAAGT
ACTTCCTTAGAGCCGGGAAAGCCTCCTCTGGAGTCTAACCTGGGCCACGAGAGCCAGGTTGCTGGAAAGAAAGGGGAG
GGGCTCTTTTTTCTTGATGCCAAACAACCTAAGTTTTTCATTTGTTTCGATTTTAAAGTGAGTAGAGTCCCTTCCCTGTGTAT
AAAATGTGAACAGAGCCAGGAATGGTAGTGTGTGCCTTTAATCCAGTACTCAGGACACAGAGGCACACAGATCTCTA
AGTTTGAGGCCAGCCTGGTCTACGTCTCGAGTTCCAGGACAGCCAGAATACTACATAGTGGGAACCTGTCTCAAAAAAGC
CAAACCAAAACAATAAAACGCCAGCAGGCCATGCCAGAAGACAGCACAGTGCTGTGTGGGCCAAGAGATGTTCAAAA
TAAACACAAATTTACAAACAGTTAGCTGTTTTTATTTTCATCCCACCTTCGTTTTCCAGATTTCCAGATTTCTTTGGCTTAA
AACCTTTCTTTGCCCAGAAAGCTTTCAGCCTTGACCTTGCTTCTGACAAGCTTTTAGCGCTTAGCGGCAAAGTGCACCCT
CTAGTGGTGGATGAGGGAAAGACAGCAGCGTATTTTGCTAGGAAACCGGTGCTTCAGTGGCTCTGCCTCGGAGAAT
TTCATGTCTGAAAATCAGCAACAACAGGATGAGGTGAAAGAGAAGTCTGGAAAACAAGTCCAACTTGAACCTTG
CTTTTAAAATAGCTCACACAAATGTCAGATAAATTGATGTGGAATAAGTTATACAGCCATTAATAAATATGTGGGTCTT
TTTTGTTTTGTTTTGTTTTGTTTTTGGAGATTGTAAGGGAGCATGCAAAGCTTAATTTAAGGAGAATAAAATCCCAACTT
ATTTTAAATATACATATAAAACCTGAAAGGAAATATGCCAAAATAAGGAGTTCTATTTGAGAGGTGAGGCCATACAGT
TTAAATTTTGCCATGCTATATTTTCAAATTTCCACCTATTATTTTCATAATCAGAAAAATGTTTTCTAAAAATAGCTCCCAC
AGAAATCTGTTAAATTCCCAAGCCACCTAGCAATACATTGAAAAACAAGTCTAGAGCCAAAGGAAATGAAGAAATACT
ATGCCCAAAAGTTACAAGGTGACTTAAGAATAGCATTGGGGAAAGAGATGGAAAGATGCCAGGATCTGACCAATCTAC
TCTGGGGTCCAGTTGGAAAATTTGAGAAGTTCAAAGTATTTTTCTTTGTTTTTAGTTAGGGTCTCACTATCATCTCAGG
CTAGCCTCACACACATCCCTCCTGCCTCAGCTCCCTAAGTGTTGAGATTATAGATGGGAACTGCTATACTTGCCAAAG
TTTTCTATGTTTCGATTATGCCCTTTGTCTTCCAAATACTGATTGCACGATAAACATGAAGTGTACTCAAAGCAAGGGAG
ACCAGCCTAATAAGTCTACTCAGGACTTCTCGACCAACCGTGGAATGTCAATGATGGCTTGGGCAGAGTCACCACCAT
AAAGTAGTTGACTCTGGACAGCGCCTCACTCTGCCTTTGCTCTCGCCTGAACGTCTCTTCGCTTCTGTGCGACAGTTTGT
TCCTTCTATCTCTCAAATCGTGTTCCCTTAGGAAGACTAAATTTCTTAGCATTTCCTCGGGTCTGGGTTTGCCTGCATC
ACGCATCTATTTCTGTGTATTTTTCTTCCCAGCTTCTCTTAGTTCTCCCACCCCATTTTCGGGAGTTTTTTTTTTTTTTTT
TTCTTTTCGGGAGGTTTTTGTGTTTTGTTTTTTCGAGTTTCAAGTCTCTATTTCTGAGACAGAAATCTCTCCTGTT
GGTCTCCTTTGAGTTAGGAGTTGTCTGATCATGGCTTTACCAGTGAGCTGGGTTCTGGCAGCTCTGGCTCTGGGCTTACA
TCTATCTCTGCTCCTCTCTCACACAGGCCCTTCAAGGCCGCTCTAGAGGCCATAGCGGCCATTTAAATGGCGCGCCGG
ATCCGAATTCCTCGAGGCTAGAACTAGCGATAAGCTTCGAGGATCAATTCGCCCCCTCTCCCTCCCCCCCCCTAACGT
TACTGGCCGAAGCCGCTTGAATAAAGGCCGGTGTGCGTTTGTCTATATGTTATTTTCCACCATATTGCCGTCTTTTGGA
ATGTGAGGGCCCGAAACCTGGCCCTGTCTTCTTGACGAGCATTCTAGGGGTCTTTCCCTCTCGCCAAAGGAATGCA
AGGTCTGTTGAATGTCGTGAAGGAAGCAGTTCTCTGGAAGCTTCTTGAAGACAAACAACGTCTGTAGCGACCCTTTGC
AGGCAGCGGAACCCCCACCTGGCGACAGGTGCCTCTGCGGCCAAAAGCCACGTGTATAAGATACACCTGCAAAGGCG
GCACAACCCAGTGCCACGTTGTGAGTTGGATAGTTGTGGAAGAGTCAAATGGCTCTCCTCAAGCGTATTCAACAAG
GGGCTGAAGGATGCCAGAAGGTACCCCATTTGATGGGATCTGATCTGGGGCCTCGGTGCACATGCTTTACGTGTGTTT
AGTCGAGGTTAAAAAACGCTCTAGGCCCCCGAACCACGGGGACGTGGTTTTCTTTGAAAAACACGATAATACCATGG
CGGATCCCGTCGTTTTACAACGTCGTGACTGGGAAACCCCTGGCGTTACCCAACTTAATCGCCTTGACGCACATCCCCC
TTTCGCCAGCTGGCGTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATG
GCGCTTTGCCTGGTTTCCGGCACCAAGAAGCGGTGCCGGAAGCTGGCTGGAGTGCGATCTTCTGAGGCCGATACTGTCT
GTCGTCCCTCAAACCTGGCAGATGCACGGTTACGATGCGCCCATCTACACCAACGTAACCTATCCCATACGGTCAATC
CGCCGTTTGTTCACGAGAAATCCGACGGGTTGTTACTCGCTCACATTTAATGTTGATGAAAGCTGGCTACAGGAAGG
CCAGACGCGAATTATTTTTGATGGCGTTAACTCGGCGTTTCATCTGTGGTGCAACGGGCGTGGGTGCGTTACGGCCAG
GACAGTCGTTTGGCGTCTGAATTTGACCTGAGCGCATTTTTACGCGCCGAGAAAACCGCCTCGCGGTGATGGTGCTGC
GTTGGAGTGACGGCAGTTATCTGGAAGATCAGGATATGTGGCGGATGAGCGGCATTTTCCGTGACGTCTCGTTGCTGCA
TAAACCGACTACACAAATCAGCGATTTCCATGTTGCCACTCGCTTTAATGATGATTTACGCCGCGCTGTACTGGAGGCT
GAAGTTCAGATGTGCGGCGAGTTGCGTGACTACCTACGGGTAACAGTTTCTTTATGGCAGGGTGAAACGCAGGTGCGC
AGCGGCACCGCGCCTTTTCGGCGGTGAAATTATCGATGAGCGTGGTGTTATGCCGATCGCGTCACACTACGTCTGAACG
TCGAAAACCCGAAACTGTGGAGCGCCGAAATCCCGAATCTCTATCGTGCGGTGGTTGAACTGCACACCGCCGACGGCA
CGCTGATTGAAGCAGAAGCCTGCGATGTGCGTTTCCGCGAGGTGCGGATTGAAAATGGTCTGCTGCTGCTGAACGGCA
AGCCGTTGCTGATTGAGGCGTTAACCGTCACGAGCATCATCCTCTGCATGGTCAGGTCATGGATGAGCAGACGATGGT
GCAGGATATCCTGCTGATGAAGCAGAACAACTTTAACGCCGTGCGCTGTTTCGCATTATCCGAACCATCCGCTGTGGTAC
ACGCTGTGCGACCGCTACGGCCTGTATGTGGTGGATGAAGCCAATATTGAAACCCACGGCATGGTGCCAATGAATCGT
CTGACCGATGATCCGCGCTGGCTACCGGCGATGAGCGAACGCGTAACGCGAATGGTGACGCGCATCGTAATCACCCG
AGTGTGATCATCTGGTCGCTGGGGAATGAATCAGGCCACGGCGCTAATCACGACGCGCTGTATCGCTGGATCAAATCTG
TCGATCCTTCCCGCCCGGTGCAGTATGAAGGCGGCGGAGCCGACACCACGGCCACCGATATTATTTGCCCGATGTACGC
GCGCGTGGATGAAGACCAGCCCTTCCCGGTGTGCCGAAATGGTCCATCAAAAAATGGCTTTTCGCTACCTGGAGAGAC
GCGCCCGCTGATCCTTTGCGAATACGCCCACGCGATGGGTAAACAGTCTTGCGGTTTCGCTAAATACTGGCAGGCGTTT
CGTCAGTATCCCCGTTTACAGGGCGGCTTCGTCTGGGACTGGGTGGATCAGTCGCTGATTAAATATGATGAAAACGGCA
ACCCGTGGTTCGGCTTACGGCGGTGATTTTGGCGATACGCCGAACGATCGCCAGTTCTGTATGAACGGTCTGGTCTTTGC
CGACCGCACGCGCATCCAGCGCTGACGGAAGCAAAACACCAGCAGCAGTTTTTCCAGTTCCGTTTATCCGGGCAAAC

CATCGAAGTGACCAGCGAATACCTGTTCCGTCATAGCGATAACGAGCTCCTGCACTGGATGGTGGCGCTGGATGGTAA
GCCGCTGGCAAGCGGTGAAGTGCCTCTGGATGTCGCTCCACAAGGTAAACAGTTGATTGAACTGCCTGAACTACCGCA
GCCGGAGAGCGCCGGGCAACTCTGGCTCACAGTACGCGTAGTGCAACCGAACGCGACCGCATGGTCAGAAGCCGGGC
ACATCAGCGCCTGGCAGCAGTGGCGTCTGGCGGAAAACCTCAGTGTGACGCTCCCCGCCGCGTCCACGCCATCCCCG
ATCTGACCACCAGCGAAATGGATTTTTGCATCGAGCTGGGTAATAAGCGTTGGCAATTTAACCGCCAGTCAGGCTTTCT
TTCACAGATGTGGATTGGCGATAAAAAACAACCTGCTGACGCCGCTGCGCGATCAGTTCACCCGTGCACCGCTGGATAA
CGACATTGGCGTAAGTGAAGCGACCCGCATTGACCCTAACGCCTGGGTGCAACGCTGGAAGGCGGCGGGCCATTACCA
GGCCGAAGCAGCGTTGTTGCAGTGCACGGCAGATACACTTGCTGATGCGGTGCTGATTACGACCGCTCACGCGTGGCA
GCATCAGGGGAAAACCTTATTTATCAGCCGGA AAAACCTACCGGATTGATGGTAGTGGTCAAATGGCGATTACCGTTGAT
GTTGAAGTGGCGAGCGATAACCCGCATCCGCGCGGATTGGCCTGAACTGCCAGCTGGCGCAGGTAGCAGAGCGGGTA
AACTGGCTCGGATTAGGGCCGCAAGAAAACCTACCCGACCGCTTACTGCCGCTGTTTTGACCGCTGGGATCTGCCAT
TGTCAGACATGTATACCCCGTACGTCTTCCCGAGCGAAAACGGTCTGCGCTGCGGGACGCGCGGAATTGAATTATGGCCC
ACACCAGTGGCGCGCGACTTCCAGTTCAACATCAGCCGCTACAGTCAACAGCAACTGTAGGAAACCAGCCATCGCCA
TCTGCTGCACGCGGAAGAAGGCACATGGCTGAATATCGACGGTTTCCATATGGGGATTGGTGGCGACGACTCCTGGAG
CCCGTCAGTATCGGCGGAATTCCAGCTGAGCGCCGGTCGCTACCATTACCAGTTGGTCTGGTGTACGGGGATCCCCCG
GCTGCAGCCAATATGGGATCGGCCATTGAACAAGATGGATTGCACGCAGGTTCTCCGGCCGCTTGGGTGGAGAGGCTA
TTCGGCTATGACTGGGCACAACAGACAATCGGCTGCTCTGATGCCGCCGTGTTCCGGCTGTCAGCGCAGGGGCGCCCC
GTTCTTTTTGTCAAGACCGACCTGTCCGGTGCCCTGAATGAACTGCAGGACGAGGCAGCGCGGCTATCGTGGCTGGCCA
CGACGGGCGTTCTTGGCGAGCTGTGCTCGACGTTGTCACTGAAGCGGGAAGGGACTGGCTGCTATTGGGCGAAGTGC
CGGGGCAGGATCTCCTGTCATCTCACCTTGCTCCTGCCGAGAAAGTATCCATCATGGCTGATGCAATGCGGCGGCTGCA
TACGCTTGATCCGGCTACCTGCCCATTGACACCAAGCGAAACATCGCATCGAGCGAGCACGTACTCGGATGGAAGC
CGGTCTTGTCGATCAGGATGATCTGGACGAAGAGCATCAGGGGCTCGCGCCAGCCGAAGTGTTCGCCAGGCTCAAGGC
GCGCATGCCCCGACGGCGAGGATCTCGTCGTGACCCATGGCGATGCCTGCTTGCCGAATATCATGGTGGAAAATGGCCG
CTTTTCTGGATTATCGACTGTGGCCGGCTGGGTGTGGCGGACCGCTATCAGGACATAGCGTTGGCTACCCGTGATATT
GCTGAAGAGCTTGGCGGCGAATGGGCTGACCGCTTCTCGTGCTTTACGGTATCGCCGCTCCCGATTTCGCAGCGCATCG
CCTTCTATCGCCTTCTTGACGAGTTCTTCTGAGGGGATCAATTCTCTAGAGCTCGCTGATCAGCCTCGACTGTGCCTTCT
AGTTGCCAGCCATCTGTTGTTTGGCCCTCCCCCGTGCTTCTTGACCCTGGAAGGTGCCACTCCCCTGTCTTTCTTA
ATAAAATGAGGAAATTGCATCGCATTGTCTGAGTAGGTGTCAATTCTATTCTGGGGGTGGGGTGGGGCAGGACAGCAA
GGGGGAGGATTGGGAAGACAATAGCAGGCATGCTGGGGATGCGGTGGGCTCTATGGCTTCTGAGACGGAAAGAACCA
GCTGGGGCTCGATCCTCTAGAGTCGAGTACCGGGTAGGGGAGGCGTTTTCCCAAGGCAGTCTGGAGCATGCGCTTTAG
CAGCCCCGCTGGGCACTTGGCGCTACACAAGTGGCCTCTGGCCTCGCACACATTCCACATCCACCGGTAGGCGCCAACC
GGCTCCGTTCTTTGGTGGCCCCCTTCGCGCCACCTTCTACTCCTCCCCTAGTCAGGAAGTTCCCCCCCCCGCCCGCAGCTCG
CGTCGTGCAGGACGTGACAAATGGAAGTAGCACGTCTCACTAGTCTCGTGCAGATGGACAGCACCGCTGAGCAATGGA
AGCGGGTAGGCCTTTGGGGCAGCGGCCAATAGCAGCTTTGGCTCCTTCGCTTTCTGGGCTCAGAGGCTGGGAAGGGGT
GGTCCGGGGGCGGGCTCAGGGGCGGGCTCAGGGGCGGGGCGCCGAAGGTCTCCGGAAGCCCGGCATTCTG
CACGCTTCAAAAGCGCACGTCTGCCGCGCTGTTCTCCTTCTCATCTCCGGGCTTTCGACCTGCACTGCGCGCCAGC
TTACCATGACCGAGTACAAGCCACGGTGCGCTCGCCACCCGCGACGACGTCCCCAGGGCCGTACGCACCCCTCGCCG
CCGCGTTCCGCCACTACCCCGCCACGCGCCACACCGTCGATCCAGACCGCCACATCGAGCGGGTCACCGAGCTGCAAG
AACTCTTCTCACGCGCGTCGGGCTCGACATCGGCAAGGTGTGGGTGCGGGACGACGGCGCAGCAGTGGCGGTCTGGA
CCACGCCGGAGAGCGTCGAAGCGGGGGCGGTGTTGCGCGAGATCGGCCCCGCGCATGGCCGAGTTGAGCGGTTCCCGGC
TGGCCGCGCAGCAACAGATGGAAGGCCTCTGGCGCCGACCGGCCCAAGGAGCCCGCGTGGTTCTTGCCACCGTCG
GCGTCTCGCCCCGACCACCAGGGCAAGGTCTGGGCAGCGCCGTCGTGCTCCCCGAGTGAGGCGGGCCGAGCGCGCCG
GGGTGCCCCGCTTCTTGAGACCTCCGCGCCCCGCAACCTCCCCTTCTACGAGCGGCTCGGCTTACCGTACCCGCCGA
CGTCGAGGTGCCCCAAGGACCGCGCACTTGGTGCATGACCCGCAAGCCCGGTGCCTGACGCCCCGCCCCACGACCCGCA
GCGCCCCGACCGAAAGGAGCGCACGACCCCATGCATCGATGATCTAGAGCTCGCTGATCAGCCTCGACTGTGCCTTCTA
GTTGCCAGCCATCTGTTGTTTGGCCCTCCCCCGTGCTTCTTGACCCTGGAAGGTGCCACTCCCCTGTCTTTCTTAAT
AAAATGAGGAAATTGCATCGCATTGTCTGAGTAGGTGTCAATTCTATTCTGGGGGTGGGGTGGGGCAGGACAGCAAGG
GGGAGGATTGGGAAGACAATAGCAGGCATGCTGGGGATGCGGTGGGCTCTATGGCTTCTGAGGCGGAAAGAACCAGC
TTGATTACCCTGTTATCCCTACTCGACCTCGAGGGCGCGCCATTTAAATGGCCAGCGAGGCCGGTACCCAATTCGCCCT
ATAGCTGTTTGTCTCTCCCCATCCAATGATGGCTGCTTATAAAAGAAAGACAACCTCCAACCTCCATAGCAAGATGGCCA
ACACCTCTGACTCCATTGTTCTCTCTCCACGACCCCTAACCAATGAGTGCTTCCAAGTCTTGCTTTGTCTTGGCCTTCAG
CTTCACTTTCACCCTGGGCCTTCTCTGTCCAATCCAATACTTCTGACAGAGGCCTGGGAAATTTGCATAGGAGAAAGGA
GAAAAGCAAAAGACAGTGAAGGTTATGGGGCCCTGACAGAGCCATGATCAGTAAAGTGCAGAGTGATGGGGAGGTCTC
ACAGAGCATGACACTGGAAGACAACCTACCAAGACATTGGAGAGTCTCCCCTGTGACATATAGAATATAAAATGTGTT
CTGCGTTCCATTAATCTTGACCTATGCTGTGCCAAAGTGCTTCTGTTAAAATACACTTTGGAAGACATTGCATATTATG
TCCCTTCTTAGAGTCATGGGGTCATGTTAGTGTCTATAAGGTCTGAGAATTAGGACCTTTTGGCTTAATTACTACAGC
AATTAACTTAATTATTTGATGATACCTATATATTTGCTTTTCATGAAACACTTACAAATCTCTCATAGAACTTAGCATG
GTTTTTCTCCCGGGGAATCATCTTCATACCATGGAGTACTACCCTATGACATCATAAGATGCCACCCTCTTCAAGCCC
CTATGAAGCCAACCTGGGGTGAAGTGCCAGAGGTGACTGATGATCCGTCATCCAGGACAGATTTTGCATTCTGCTCCCC

TCCCCACCTCACTTATCCTACTGGAACAGACACCTGGAGGAGCCTGCCCCATCTCCAAGGTGGGCGGGGAGAAAGAGA
CCCTTGATGTGTTCCCACACCACACCGACCCCAAGCAGTAATGAAATTTCTGCCCTCAGCAAGACAGGATTCTCAGGTC
CTGGCAAGATATACACTGAGAAGTCTGTGGTTCTCTGGGCTTCCCGGAACTCTATGCTAACTTTGTATGGTTTTACATTG
TATGCATCTCACTATGGCCCGGGCCTCTCTCCTCATCCCAATCCTGTTACTGGGAGGGATGGAAAACCCAAGAGAAGGG
ATATTTGTATTGTGAGTATTGCATTTTTGGGAGTGCTGTGGCTATCTGGGACTCCTGGATGCCCCAACAGGCCTTTGAT
TCTTCTGCCTCTCTCCTCTTGATCTTTCTTACCCTCTGCTTCCCCAAGTGCAGTTGAGGTACTATGCAGTGCCTCCGCCTC
ACTCCAAACATGGGAATTCAATCTCAGAGGAGGTAAGAAGTGGGGAGAAGCCAAGACTCAGCAATAGACGATAATTG
CTCCTGGGATTGCCCCTAACACCATTTACCTAGAAAGGACCAAGTTTGGATCCTGAAGCCCAGTGGAGCACCATTC