



Illumina, Inc.
9885 Towne Centre Drive
San Diego, CA 92121 USA
tel 858.202.4500
fax 858.202.4545
www.illumina.com

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Customer Solutions
858-202-4566

Oligonucleotide sequences for TruSeq™ RNA and DNA Sample Prep Kits¹

TruSeq Universal Adapter

5' AATGATACGGCGACCACCGAGATCTACACTCTTTCCCTACACGACGCTCTTCCGATCT

TruSeq Adapters

TruSeq Adapter, Index 1

5' GATCGGAAGAGCACACGTCTGAACTCCAGTCACATCACGATCTCGTATGCCGTCTTCTGCTTG

TruSeq Adapter, Index 2

5' GATCGGAAGAGCACACGTCTGAACTCCAGTCACCGATGTATCTCGTATGCCGTCTTCTGCTTG

TruSeq Adapter, Index 3

5' GATCGGAAGAGCACACGTCTGAACTCCAGTCACTTAGGCATCTCGTATGCCGTCTTCTGCTTG

TruSeq Adapter, Index 4

5' GATCGGAAGAGCACACGTCTGAACTCCAGTCACTGACCAATCTCGTATGCCGTCTTCTGCTTG

TruSeq Adapter, Index 5

5' GATCGGAAGAGCACACGTCTGAACTCCAGTCACACAGTGATCTCGTATGCCGTCTTCTGCTTG

TruSeq Adapter, Index 6

5' GATCGGAAGAGCACACGTCTGAACTCCAGTCACGCCAATATCTCGTATGCCGTCTTCTGCTTG

TruSeq Adapter, Index 7

5' GATCGGAAGAGCACACGTCTGAACTCCAGTCACCAGATCATCTCGTATGCCGTCTTCTGCTTG

TruSeq Adapter, Index 8

5' GATCGGAAGAGCACACGTCTGAACTCCAGTCACACTTGAATCTCGTATGCCGTCTTCTGCTTG

TruSeq Adapter, Index 9

5' GATCGGAAGAGCACACGTCTGAACTCCAGTCACGATCAGATCTCGTATGCCGTCTTCTGCTTG

TruSeq Adapter, Index 10

5' GATCGGAAGAGCACACGTCTGAACTCCAGTCACTAGCTTATCTCGTATGCCGTCTTCTGCTTG

TruSeq Adapter, Index 11

5' GATCGGAAGAGCACACGTCTGAACTCCAGTCACGGCTACATCTCGTATGCCGTCTTCTGCTTG

TruSeq Adapter, Index 12

5' GATCGGAAGAGCACACGTCTGAACTCCAGTCACCTTGAATCTCGTATGCCGTCTTCTGCTTG

Oligonucleotide sequences for TruSeq Small RNA Sample Prep Kits

RNA 5' Adapter (RA5), part # 15013205

5' GUUCAGAGUUCUACAGUCCGACGAUC

RNA 3' Adapter (RA3), part # 15013207

5' TGGAATTCTCGGGTGCCAAGG

RNA RT Primer (RTP), part # 15013981

5' GCCTTGGCACCCGAGAATTCCA

RNA PCR Primer (RP1), part # 15005505

5' AATGATACGGCGACCACCGAGATCTACACGTTTCAGAGTTCTACAGTCCGA

¹ For TruSeq process control sequences, see Appendix.

RNA PCR Primer, Index 1 (RPI1)

CAAGCAGAAGACGGCATAACGAGATCGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 2 (RPI2)

CAAGCAGAAGACGGCATAACGAGATACATCGGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 3 (RPI3)

CAAGCAGAAGACGGCATAACGAGATGCCTAAGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 4 (RPI4)

CAAGCAGAAGACGGCATAACGAGATTGGTCAGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 5 (RPI5)

CAAGCAGAAGACGGCATAACGAGATCACTGTGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 6 (RPI6)

CAAGCAGAAGACGGCATAACGAGATATTGGCGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 7 (RPI7)

CAAGCAGAAGACGGCATAACGAGATGATCTGGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 8 (RPI8)

CAAGCAGAAGACGGCATAACGAGATTCAAGTGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 9 (RPI9)

CAAGCAGAAGACGGCATAACGAGATCTGATCGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 10 (RPI10)

CAAGCAGAAGACGGCATAACGAGATAAGCTAGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 11 (RPI11)

CAAGCAGAAGACGGCATAACGAGATGTAGCCGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 12 (RPI12)

CAAGCAGAAGACGGCATAACGAGATTACAAGGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 13 (RPI13)

CAAGCAGAAGACGGCATAACGAGATTTGACTGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 14 (RPI14)

CAAGCAGAAGACGGCATAACGAGATGGAAGTGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 15 (RPI15)

CAAGCAGAAGACGGCATAACGAGATTGACATGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 16 (RPI16)

CAAGCAGAAGACGGCATAACGAGATGGACGGGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 17 (RPI17)

CAAGCAGAAGACGGCATAACGAGATCTCTACGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 18 (RPI18)

CAAGCAGAAGACGGCATAACGAGATGCGGACGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 19 (RPI19)

CAAGCAGAAGACGGCATAACGAGATTTTCACGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 20 (RPI20)

CAAGCAGAAGACGGCATAACGAGATGGCCACGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 21 (RPI21)

CAAGCAGAAGACGGCATAACGAGATCGAAACGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 22 (RPI22)

CAAGCAGAAGACGGCATAACGAGATCGTACGGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 23 (RPI23)

CAAGCAGAAGACGGCATAACGAGATCCACTCGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 24 (RPI24)

CAAGCAGAAGACGGCATAACGAGATGCTACCGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 25 (RPI25)

CAAGCAGAAGACGGCATAACGAGATATCAGTGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 26 (RPI26)

CAAGCAGAAGACGGCATAACGAGATGCTCATGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 27 (RPI27)

CAAGCAGAAGACGGCATAACGAGATAGGAATGTGACTGGAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 28 (RPI28)

CAAGCAGAAGACGGCATAACGAGATCTTTTGGTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 29 (RPI29)

CAAGCAGAAGACGGCATAACGAGATTAGTTGGTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 30 (RPI30)

CAAGCAGAAGACGGCATAACGAGATCCGGTGGTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 31 (RPI31)

CAAGCAGAAGACGGCATAACGAGATATCGTGGTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 32 (RPI32)

CAAGCAGAAGACGGCATAACGAGATTGAGTGGTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 33 (RPI33)

CAAGCAGAAGACGGCATAACGAGATCGCCTGGTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 34 (RPI34)

CAAGCAGAAGACGGCATAACGAGATGCCATGGTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 35 (RPI35)

CAAGCAGAAGACGGCATAACGAGATAAAATGGTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 36 (RPI36)

CAAGCAGAAGACGGCATAACGAGATTGTTGGTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 37 (RPI37)

CAAGCAGAAGACGGCATAACGAGATATCCGGTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 38 (RPI38)

CAAGCAGAAGACGGCATAACGAGATAGCTAGGTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 39 (RPI39)

CAAGCAGAAGACGGCATAACGAGATGTATAGGTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 40 (RPI40)

CAAGCAGAAGACGGCATAACGAGATTCTGAGGTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 41 (RPI41)

CAAGCAGAAGACGGCATAACGAGATGTCGTGCTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 42 (RPI42)

CAAGCAGAAGACGGCATAACGAGATCGATTAGTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 43 (RPI43)

CAAGCAGAAGACGGCATAACGAGATGCTGTAGTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 44 (RPI44)

CAAGCAGAAGACGGCATAACGAGATATTATAGTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 45 (RPI45)

CAAGCAGAAGACGGCATAACGAGATGAATGAGTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 46 (RPI46)

CAAGCAGAAGACGGCATAACGAGATTCGGGAGTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 47 (RPI47)

CAAGCAGAAGACGGCATAACGAGATCTTCGAGTGAAGTTCCTTGGCACCCGAGAATTCCA

RNA PCR Primer, Index 48 (RPI48)

CAAGCAGAAGACGGCATAACGAGATTGCCGAGTGAAGTTCCTTGGCACCCGAGAATTCCA

Oligonucleotide sequences for Genomic DNA**Adapters**

5 ' P-GATCGGAAGAGCTCGTATGCCGTCTTCTGCTTG

5 ' AACTCTTTCCCTACACGACGCTCTTCCGATCT

PCR Primers

5 ' AATGATACGGCGACCACCGAGATCTACACTCTTTCCCTACACGACGCTCTTCCGATCT

5 ' CAAGCAGAAGACGGCATAACGAGCTCTTCCGATCT

Genomic DNA Sequencing Primer

5 ' ACACTCTTTCCCTACACGACGCTCTTCCGATCT

Paired End DNA oligonucleotide sequences

PE Adapters

5 ' P-GATCGGAAGAGCGGTTCAGCAGGAATGCCGAG

5 ' ACACTCTTTCCCTACACGACGCTCTTCCGATCT

PE PCR Primer 1.0

5 ' AATGATACGGCGACCACCGAGATCTACACTCTTTCCCTACACGACGCTCTTCCGATCT

PE PCR Primer 2.0

5 ' CAAGCAGAAGACGGCATACGAGATCGGTCTCGGCATTCTGCTGAACCGCTCTTCCGATCT

PE Read 1 Sequencing Primer

5 ' ACACTCTTTCCCTACACGACGCTCTTCCGATCT

PE Read 2 Sequencing Primer

5 ' CGGTCTCGGCATTCTGCTGAACCGCTCTTCCGATCT

Oligonucleotide sequences for the Multiplexing Sample Prep Oligo Only Kit

Multiplexing Adapters

5 ' P-GATCGGAAGAGCACACGTCT

5 ' ACACTCTTTCCCTACACGACGCTCTTCCGATCT

Multiplexing PCR Primer 1.0

5 ' AATGATACGGCGACCACCGAGATCTACACTCTTTCCCTACACGACGCTCTTCCGATCT

Multiplexing PCR Primer 2.0

5 ' GTGACTGGAGTTCAGACGTGTGCTCTTCCGATCT

Multiplexing Read 1 Sequencing Primer

5 ' ACACTCTTTCCCTACACGACGCTCTTCCGATCT

Multiplexing Index Read Sequencing Primer

5 ' GATCGGAAGAGCACACGTCTGAACTCCAGTCAC

Multiplexing Read 2 Sequencing Primer

5 ' GTGACTGGAGTTCAGACGTGTGCTCTTCCGATCT

PCR Primer, Index 1

CAAGCAGAAGACGGCATACGAGATCGTGATGTGACTGGAGTTC

PCR Primer, Index 2

CAAGCAGAAGACGGCATACGAGATACATCGGTGACTGGAGTTC

PCR Primer, Index 3

CAAGCAGAAGACGGCATACGAGATGCCTAAGTGACTGGAGTTC

PCR Primer, Index 4

CAAGCAGAAGACGGCATACGAGATTGGTCAGTGACTGGAGTTC

PCR Primer, Index 5

CAAGCAGAAGACGGCATACGAGATCACTGTGTGACTGGAGTTC

PCR Primer, Index 6

CAAGCAGAAGACGGCATACGAGATATTGGCGTGACTGGAGTTC

PCR Primer, Index 7

CAAGCAGAAGACGGCATACGAGATGATCTGGTGACTGGAGTTC

PCR Primer, Index 8

CAAGCAGAAGACGGCATACGAGATTCAAGTGTGACTGGAGTTC

PCR Primer, Index 9

CAAGCAGAAGACGGCATACGAGATCTGATCGTGACTGGAGTTC

PCR Primer, Index 10

CAAGCAGAAGACGGCATACGAGATAAGCTAGTGACTGGAGTTC

PCR Primer, Index 11

CAAGCAGAAGACGGCATACGAGATGTAGCCGTGACTGGAGTTC

PCR Primer, Index 12

CAAGCAGAAGACGGCATACGAGATTACAAGGTGACTGGAGTTC

Oligonucleotide sequences for the v1 and v1.5 Small RNA Kits**RT Primer**

5 ' CAAGCAGAAGACGGCATACGA

5' RNA Adapter

5 ' GUUCAGAGUUCUACAGUCCGACGAUC

3' RNA Adapter

5 ' P-UCGUAUGCCGUCUUCUGCUUGUIdT

v1.5 Small RNA 3' Adapter

5 ' /5rApp/ATCTCGTATGCCGTCTTCTGCTTG/3ddC/

Small RNA PCR Primer 1

5 ' CAAGCAGAAGACGGCATACGA

Small RNA PCR Primer 2

5 ' AATGATACGGCGACCACCGACAGGTTTCAGAGTTCTACAGTCCGA

Small RNA Sequencing Primer

5 ' CGACAGGTTTCAGAGTTCTACAGTCCGACGATC

Appendix: Process Controls for TruSeq™ RNA, DNA and Exome Products²

CTE2 - 150bp

ATCCTGCAGATGCATCCAGTACTAGTATGGCCCGGGGGATCCTACGTTCCAAATGCAGCGAGCT
CGTATAACCCTTTAAGAGTTGCTCTTTTTGTTTGGTAAGTTGCAAATCGAAGTTTTAGATTGAG
TTCTACGTCGAGCGGCCGCGAT

CTE2 - 250bp

ATCCTGCAGATGCATCCAGTACTAGTATGGCCCGGGGGATCCTTATCTGTCAAAACCGCTAATG
TCCGTTCTAAGACCGTCTGGAGAACACTTGCCCATCAGTGCTTTTGAACCTTTTTTTCACAGGT
CCCTTCCGATTACACTGAGAAGCTGACCACACCTGCTAGAAGATGGAGGTATGCAGCCCGTTAG
TAGGAGTAATACTACCCAGCTTATAACCCTCAAACGTAGGGCAGATGGCGGCCGCGAT

CTE2 - 350bp

ATCCTGCAGATGCATCCAGTACTAGTATGGCCCGGGGGATCCTAGAGACCATTTCGCGATTCCAT
GAGACTCCAAGGGTTCTGCACAACCTTATGCACCTCTATTAGATCATTGTGTTCTACGAAGCCTG
GACTGCATTACATATTCAACAACCATGAGAAGAGCGGAATAGATGGCCGGATGTTTGGTGGC
TTTGATATATTGTGAGGAGCATTGCGAACCTAGAGCTGTCCGGTCAAATAACCCCTCACAAT
AAGTGTAATGTCATGGGATAATCAAAGACTAAGGGAGGGCTTTTATAGAAGGCGTGAGGTCAT
GCTATCCCCCTCTGAAGACGCGGCCGCGAT

CTE2 - 450bp

ATCCTGCAGATGCATCCAGTACTAGTATGGCCCGGGGGATCCGTATACGTTTCTAATTTGTAGT
TAACGGTTGGATACCACTTTGAGGCATGTAATATGGTACTGAGCTTCGGCACAGGGCTCAAATT
GCATCATTAATGTCTCCGATGTGGCTATATGTCATGGATAAAGGCAGCCCCCTATATCTTTTT
TTGTGGCAGCATGGGTCCATCAAAGCAATTATTCAGGGTCTTAATGACCTCCACAGCTCTAAAC
GTAATTCATCTGGCTTTGCCTGTACTTACTTCCTCCATGAAAAAAGTGTTGATAATGCTCATA
ATGCTGCCCAGCAATTTCTCCCTTCTCAAGACTATTCTGGCTTCCTGGGTACTTAAAAACAGG
GCTTAGAGTATGGCTGCTGACAAAATTGCACTCTAAACGCTAGCTTAGGTCTTCTGCGGCCGCG
AT

CTE2 - 550bp

ATCCTGCAGATGCATCCAGTACTAGTATGGCCCGGGGGATCCGTAGCTATCGTTCGCGAGAAA
GTTAGTAGACACACAGGACCCAGGCGTGCAAGTCAATTTAGCTGACTACACCGATTCTGGTTA
AAAGAGCCTATGGCCACCCTTATTTTAGAGAAAAAAAACACACCTCTAATGTGTTGGGCACTA
GAAAAAGCTAACTACCTAGTCCGTTTCTGGACGACTTCATTGGGAATAACATACCCCCACTGT
GATTAAGACTGGCACTGTCCTAATGCTTTCTTCAATAGGTTTGGCTCATGTGTGATTCCCTCTG
GCAAACCTTATAGAGGACAAGCAGAATAAACCAATTCAAGGTCGTTGTAGCTGAAGGCTGGCCT
GCCTGACAGTTAATTATGAGCATGTCTTGCCCTTCATGGTGGATATTCACAGCTGAAAGTGGTA
TTGGCATTTTTTTCTGAGGACACAACGAGGAAATCTGATAAATACGGCCACCTGAAGTCTAGCT
CGGAGTTAACAATTTACCACGTTTAGAGCGGCCGCGAT

CTE2 - 650bp

ATCCTGCAGATGCATCCAGTACTAGTATGGCCCGGGGGATCCGCTCGCACTTAGCCTGTAAAGG
GGTTCGCGCTCGTCTAGTCTGTGCTGTTGCCTGGATAGTAAATTATCATGGTACAACTTTTAA
GAGCCAGTTAAATGGAGATGGATTTAAAAAGAGTTATTGTAAAGTCTCCCCAGGTGTGTCTTA
AATATCCCAACAGATTGCCCTGGCCTGACCCCTAAATGCAATTTTGGGATTCCCTTTTAGTTG
CTTTCATTAATAATGTACCAGCGCAGTAAAAAAGCACAAAGTATATTGTTTATGTAACCTACTA
TCTCATTTGCACTGGTTACATGGCAGCTTCAGACTGACTAAACTACACTTTTCCCACCATGGT

² Patent pending

TCAAAGATCAACAGAACTGGGCCAACAAAAGCAATTTTTTCATGTGGTCTAACTACCAACTTAT
TATGAGTTAAGTTACTTTTAGGTTTAAAATCACAGCAGTTTTTCCCTCCACACCTCCCAGAGAT
ACTTTTCAGGGTGGCTAAACTTGGCTAAAGGCTTCCGGACCAACCCTTGTTTCTTTATGGTGCTT
GTGTCCTGACAACCGCGTAAGGCATGGAAATTCAGCTATTTATCCGATCGTTTATATGGGCGTG
CGGCCGCGAT

CTE2 - 750bp

ATCCTGCAGATGCATCCAGTACTAGTATGGCCCGGGGGATCCTTGGACCGTTAATTCATATATC
GAAGTAGCAGGTTGTTGCCCGCCTGATGTTGCCACTACTTGCTCATGACAGTTTTTTTAGGCA
ATGCAAACTACTATTTGATATTTTTTTCCAAGTACAGTTGTAGGGTACTCCTTATACTGATTCT
TCTGAGCCTGTACGGGGAGCATTAGGTACTGATGTAGTAGGAGTTGAGCTTCACAAATTCACCA
GGTAAGCCCAAATTTATTTTCTGCTTGGACAGGTCCACCTCACATGGGTCTGTCTAATATATTA
AAAGAGGGATTTTCTTTGCTGTATTGCAGCCAGTATATCTGTTACTTACAGTAGTAGTCCATT
ATTGCTGGCCTAGGGGCTTTTGTCTCTACACGAACACCACTCTGTAAAATTTGAGGTCGTCTT
AGAGTCAAACCATTTCATGGAGCGCTCTGTGCATCTACCAACTATCGCTAAGCATTCACTTGGTT
GGTTTAAGTGGAGGCAACTCCATTATCTTCTAGCATACCCTTCCCAGGCTACATGTAGAAAGAG
ATCTGTTGGGCCCACTATTTTTTCACCCAGGGAAGCCTACTTTAGTTATAGCTTGCCAGAGAT
TTTTCTGTGTCATGTAGAAGTCATCCACTTTTAACACCAGGAGGTGGATGTGGGGCCAGGAAATA
TGCAATAACGATACGGGACTTCTAACAGTGACTCGCGGCCGCGAT

CTE2 - 850bp

ATCCTGCAGATGCATCCAGTACTAGTATGGCCCGGGGGATCCTTAAGTCGTGTCCTTCTCCTAC
GATCTTGTGAACGATGGATATTTTCTTTCTAAACTTTAAACAAACAGTGGAGAGATGTTGTTGT
GTGTGGAACGACGCTTAGCCTACCGAGGAAGATCCAGACTACAATAGAATATGTGGCCAAAAC
CTCCGCAACTTCAGCAGCAAAAAGGATATTATTGACATAACCTCCTCACAAAAAGTACACAAAT
GGCTAAATAACAGAGCCCTCTTTTTACTAGGGAAATGGTGGATGTGGACTTTAGAATTTAAGA
TAATAAAGCTCTTGATCCCAATGTTATTTCCATGTGAGGGACATTAAATTGAGTAACCTTTGCC
ACATACCCTCTCCAGAGTCCATTCTCTAAACTTGAAGCTCCGCCCTTTTTACGCACATTAG
GCTTCCAATTACGGTCAATGGTCTTGAAGATTGGGAGCTTTTGAAGAGTAATAAGAACCATCAC
AAAAAGGAACCCAGAAGCCGGGAGTGTCTACCAAAAAAATTCAAGGGTAAAAAAAAGTGACAT
TTTCTCCTGTTTTTTTACACATGATTTTGAATGCTGATGGGTCCACGTCCAGCTCTAAAGGTAGG
TTCATGGTTCTCCAAAGTTGCTTTCTTGTGAGAATTGAGCCACATCAGGTAGGTGGGGAAGTAG
ATCAGTGAGGATGCTTCACATGTGTGGGCACTGGGAACAGAATGCTTCAATAACACGAGCTGAC
GAGGGCCCGCTATGAAAAAAAAGATTCTCTGTGCCCTTGGCGCCTCCGCACTTAAAGAATTGA
TGACCGTGCGGCCGCGAT

CTE1 - 123bp

GATCCTACGTTCCAAATGCAGCGAGCTCGTATAACCCTTTAAGAGTTGCTCTTTTTGTTTGGTA
AGTTGCAAATCGAAGTTTTAGATTGAGTTCTACGTCGAGCGGCCGCGATATCCTGCAGATGCA

CTE1 - 223bp

GATCCTTATCTGTCAAAACCGCTAATGTCCGTTCTAAGACCGTCTGGAGAACACTTGCCCATCA
GTGCTTTTGAACCTTTTTTTTACAGGTCCCTTCCGATTACACTGAGAAGCTGACCACACCTGCT
AGAAGATGGAGGTATGCAGCCCGTTAGTAGGAGTAATACTACCCAGCTTATAACCCTCAAACGT
AGGGCAGATGGCGGCCGCGATATCCTGCAGATGCA

CTE1 - 323bp

GATCCTAGAGACCATTTCGCGATTCCATGAGACTCCAAGGGTTCTGCACAACTTATGCACCTCTA
TTAGATCATTGTGTTCTACGAAGCCTGGACTGCATTACATATTACAACCAACATGAGAAGAGC
GGAATAGATGGCCGGATGTTTGGTGGCTTTGATATATTGTGAGGAGCATTGCGAACCTTAGAGC
TGTCGGTCAAATAACCCCTCACATAAGTGTAATGTCATGGGATAATCAAAAGACTAAGGGA

GGGCTTTTATAGAAGGCGTGAGGTCATGCTATCCCCCTCTGAAGACGCGGCCGCGATATCCTGC
AGATGCA

CTE1 - 423bp

GATCCGTATACGTTTCTAATTTGTAGTTAACGGTTGGATACCACTTTGAGGCATGTAATATGGT
ACTGAGCTTCGGCACAGGGCTCAAATTGCATCATTAAATGTCTCCGATGTGGCTATATGTCATG
GATAAAGGCAGCCCCCTATATCTTTTTTTGTGGCAGCATGGGTCCATCAAAGCAATTATTCAGG
GTCTTAATGACCTCCACAGCTCTAAACGTAATTCATCTGGCTTTGCCTGTACTTACTTCCTCCA
TGAAAAAAGTGTGATAATGCTCATAATGCTGCCAGCAATTTCTCCCTTCTCAAGACTATT
CTGGCTTCCTGGGTACTTAAAAACAGGGCTTAGAGTATGGCTGCTGACAAAATTGCACTCTAAA
CGCTAGCTTAGGTCTTCTGCGGCCGCGATATCCTGCAGATGCA

CTE1 - 523bp

GATCCGTTAGCTATCGTTCGCGAGAAAGTTAGTAGACACACAGGACCCAGGCGTGCAAGTCAAT
TTCAGCTGACTACACCGATTCTGGTTAAAAGAGCCTATGGCCACCCTTATTTTAGAGAAAAAAA
ACCACACCTCTAATGTGTTGGGCACTAGAAAAAGCTAACTACCTAGTCCGTTTCTGGACGACTT
CATTGGGAATAACATACCCCCCACTGTGATTAAGACTGGCACTGTCTAATGCTTTCTTCAATA
GGTTTGGCTCATGTGTGATTCCCTCTGGCAAACCTTATAGAGGACAAGCAGAATAAACCAATTCA
AGGTCGTTGTAGCTGAAGGCCTGGCCTGCCTGACAGTTAATTATGAGCATGTCTTGCCCTTCAT
GGTGGATATTCACAGCTGAAAGTGGTATTGGCATTTTTTTTCTGAGGACACAACGAGGAAATCTG
ATAAATACGGCCACCTGAAGTCTAGCTCGGAGTTAACAAATTTACCACGTTTAGAGCGGCCGCGA
TATCCTGCAGATGCA

CTE1 - 623bp

GATCCGCTCGCACTTAGCCTGTAAAGGGGTTTCGCGCTCGTCTAGTCTGTGCTGTTGCCTGGATA
GTAAATTATCATGGTACAACTTTTAAAGAGCCAGTTAAATGGAGATGGATTTAAAAGAGTTAT
TGTAAGTCTCCCCAGGTGTGTCATTAAATATCCCAACAGATTGCCCTGGCCTGACCCCCCTAAA
TGCAATTTTGGGATTCCCTTTTAGTTGCTTTCATTAAATGTACCAGCGCAGTAAAAAAGCAC
AAAGTATATTGTTTATGTAACCTCACTATCTCATTTCGACTGGTTACATGGCAGCTTCAGACTGA
CTAAACTACACTTTTCCCACCATGGTTCAAAGATCAACAGAACTGGGCCAACAAAAGCAATTT
TTTCATGTGGTCTAACTACCAACTTATTATGAGTTAAGTTACTTTTAGGTTTAAATCACAGCA
GTTTTTCCCTCCACACCTCCCAGAGATACTTTCAGGGTGGCTAAACTTGGCTAAAGGCTTCCGG
ACCAACCCTTGTTTCTTTATGGTGCTTGTGTCTGACAACCGCGTAAGGCATGGAAATTCAGCT
ATTTATCCGATCGTTTATATGGGCGTGCGGCCGCGATATCCTGCAGATGCA

CTE1 - 723bp

GATCCTTGGACCGTTAATTCATATATCGAAGTAGCAGGTTGTTGCCCCGCCTGATGTTGCCACT
ACTTGCTCATGACAGTTTTTTTTAGGCAATGCAAACTACTATTTGATATTTTTTCCAAGTACAG
TTGTAGGGTACTCCTTATACTGATTCTTCTGAGCCTGTACGGGGAGCATTAGGTACTGATGTAG
TAGGAGTTGAGCTTCACAAATTCACCAGGTAAGCCCAAATTTATTTTCTGCTTGGACAGGTCCA
CCTCACATGGGTCTGTCTAATATATTTAAAGAGGGATTTTCTTTGCTGTATTGCAGCCCAGTAT
ATCTGTTACTTACAGTAGTAGTCCATTATTGCTGGCCTAGGGGCTTTTGCTCCTACACGAACAC
CACTCTGTAAATTTGAGGTCGTCCTTAGAGTCAAACCATTTCATGGAGCGCTCTGTGCATCTAC
CAACTATCGCTAAGCATTCACTTGGTTGGTTTAAAGTGGAGGCAACTCCATTATCTTCTAGCATA
CCCTTCCCAGGCTACATGTAGAAAGAGATCTGTTGGGCCCCACTATTTTTTCACCCAGGGAAGC
CTACTTTAGTTATAGCTTGCCAGAGATTTTCTGTGTCTGATGAGAAGTCATCCACTTTTAACACC
AGGAGGTGGATGTGGGGCCAGGAAATATGTCAATAACGATACGGGACTTCTAACAGTGACTCGC
GGCCGCGATATCCTGCAGATGCA

CTE1 - 823bp

GATCCTTAAGTCGTGTCCTTCTCCTACGATCTTGTGAACGATGGATATTTTCTTTCTAACTTT
AAACAAACAGTGGAGAGATGTTGTTGTGTGTGGAACGACGCTTAGCCTACCGAGGAAGATCCAG

ACTACAATAGAATATGTGGCCAAAACCTCTCCGCAACTTCAGCAGCAAAAAGGATATTATTGACA
TAACCTCCTCACAAAAAGTACACAAATGGCTAAATAACAGAGCCCCTCTTTTTACTAGGGAAAT
GGTGGATGTGGACTTTAGAATTTAAGATAATAAAGCTCTTGATCCCAATGTTATTTCCATGTGA
GGGACATTAAATTGAGTAACCTTTGCCACATACCCTCTCCAGAGTCCATTCTCTAAAACCTTGA
AGCTCCGCCCTTTTTACGCACATTAGGCTTCCAATTACGGTCAATGGTCTTGAAGATTGGGAG
CTTTTGAAGAGTAATAAGAACCATCACAAAAAGGAACCCAGAAGCCGGGAGTGTCTACCAAAAA
AATTCAAGGGTTAAAAAAAAGTGACATTTTCTCCTGTTTTTTACACATGATTTTGAATGCTGAT
GGGTCCACGTCCAGCTCTAAAGGTAGGTTTCATGGTTCTCCAAAGTTGCTTTCTTGTCAGAATTG
AGCCACATCAGGTAGGTGGGGAAGTAGATCAGTGAGGATGCTTCACATGTGTGGGCACTGGGAA
CAGAATGCTTCAATAACACGAGCTGACGAGGGCCCGCTATGAAAAAAAAGATTCTCTGTGCCCC
CTGGCGCCTCCGCACTTAAAGAATTGATGACCGTGCGGCCGCGATATCCTGCAGATGCA

CTA - 150bp

GGGGGATCCTACGTTCCAAATGCAGCGAGCTCGTATAACCCTTTAAGAGTTGCTCTTTTTGTTT
GGTAAGTTGCAAATCGAAGTTTTAGATTGAGTTCTACGTCGAGCGGCCGCGATATCCTGCAGAT
GCATCCAGTACTAGTATGGCCC

CTA - 250bp

GGGGGATCCTTATCTGTCAAACCGCTAATGTCCGTTCTAAGACCGTCTGGAGAACACTTGCCC
ATCAGTGCTTTTTGAACCTTTTTTTCACAGGTCCCTTCCGATTACACTGAGAAGCTGACCACACC
TGCTAGAAGATGGAGGTATGCAGCCCGTTAGTAGGAGTAATACTACCCAGCTTATAACCCTCAA
ACGTAGGGCAGATGGCGGCCGCGATATCCTGCAGATGCATCCAGTACTAGTATGGCCC

CTA - 350bp

GGGGGATCCTAGAGACCATTTCGCGATTCCATGAGACTCCAAGGGTTCTGCACAACTTATGCACC
TCTATTAGATCATTGTGTTCTACGAAGCCTGGACTGCATTACATATTCACAACCAACATGAGAA
GAGCGGAATAGATGGCCGGATGTTTGGTGGCTTTGATATATTGTGAGGAGCATTGCGAACCTTA
GAGCTGTCCGGTCAAATAACCCCTCACATAAGTGTAATGTCATGGGATAATCAAAGACTAA
GGGAGGGCTTTTATAGAAGGCGTGAGGTCATGCTATCCCCCTCTGAAGACGCGGCCGCGATATC
CTGCAGATGCATCCAGTACTAGTATGGCCC

CTA - 450bp

GGGGGATCCGTATACGTTTCTAATTTGTAGTTAACGGTTGGATACCACTTTGAGGCATGTAATA
TGGTACTGAGCTTCGGCACAGGGCTCAAATTGCATCATTAAATGTCTCCGATGTGGCTATATGT
CATGGATAAAGGCAGCCCCCTATATCTTTTTTTGTGGCAGCATGGGTCCATCAAAGCAATTATT
CAGGGTCTTAATGACCTCCACAGCTCTAAACGTAATTCATCTGGCTTTGCCTGTACTTACTTCC
TCCATGAAAAAAGTGTTGATAATGCTCATAATGCTGCCAGCAATTTCTCCCTTCTCAAGAC
TATTCTGGCTTCTGGGTACTTAAAAACAGGGCTTAGAGTATGGCTGCTGACAAAATTGCACTC
TAAACGCTAGCTTAGGTCTTCTGCGGCCGCGATATCCTGCAGATGCATCCAGTACTAGTATGGC
CC

CTA - 550bp

GGGGGATCCGTTAGCTATCGTTCGCGAGAAAGTTAGTAGACACACAGGACCCAGGCGTGCAAGT
CAATTTTCAGCTGACTACACCGATTCTGGTTAAAAGAGCCTATGGCCACCCTTATTTTAGAGAAA
AAAAACCACACCTCTAATGTGTTGGGCACTAGAAAAAGCTAACTACCTAGTCCGTTTCTGGACG
ACTTCATTGGGAATAACATACCCCCCACTGTGATTAAAGACTGGCACTGTCCTAATGCTTTCTTC
AATAGGTTTGGCTCATGTGTGATTCCCTCTGGCAAACCTTATAGAGGACAAGCAGAATAAACCAA
TTCAAGGTCGTTGTAGCTGAAGGCCTGGCCTGCCTGACAGTTAATTATGAGCATGTCTTGCCCT
TCATGGTGGATATTCACAGCTGAAAGTGATTGGCATTTTTTTCTGAGGACACAACGAGGAAA
TCTGATAAATACGGCCACCTGAAGTCTAGCTCGGAGTTAACAATTTACCACGTTTAGAGCGGCC
GCGATATCCTGCAGATGCATCCAGTACTAGTATGGCCC

CTA - 650bp

GGGGGATCCGCTCGCACTTAGCCTGTAAAGGGGTTTCGCGCTCGTCTAGTCTGTGCTGTTGCCTG
GATAGTAAATTATCATGGTACAAACTTTTTAAGAGCCAGTTAAATGGAGATGGATTTAAAAAGAG
TTATTGTAAAGTCTCCCCAGGTGTGTCATTAAATATCCCAACAGATTGCCCTGGCCTGACCCCC
TAAATGCAATTTTGGGATTCCCTTTTAGTTGCTTTTCATTAAAAATGTACCAGCGCAGTAAAAAA
GCACAAAGTATATTGTTTATGTAACCTCACTATCTCATTTGCACTGGTTACATGGCAGCTTCAGA
CTGACTAAAACCTACACTTTTCCCACCATGGTTCAAAGATCAACAGAACTGGGCCAACAAAAGCA
ATTTTTTTCATGTGGTCTAACTACCAACTTATTATGAGTTAAGTTACTTTTAGGTTTAAAAATCAC
AGCAGTTTTTCCCTCCACACCTCCCAGAGATACTTTCAGGGTGGCTAAACTTGGCTAAAGGCTT
CCGGACCAACCCTTGTTTCTTTATGGTGCTTGTGTCTGACAACCGCGTAAGGCATGGAAATTC
AGCTATTTATCCGATCGTTTATATGGGCGTGCGGCCGCGATATCCTGCAGATGCATCCAGTACT
AGTATGGCCC

CTA - 750bp

GGGGGATCCTTGGACCGTTAATTCATATATCGAAGTAGCAGGTTGTTGCCCCGCTGATGTTGC
CACTACTTGCTCATGACAGTTTTTTTTAGGCAATGCAAACCTACTATTTGATATTTTTTCCAAGT
ACAGTTGTAGGGTACTCCTTATACTGATTCTTCTGAGCCTGTACGGGGAGCATTAGGTACTGAT
GTAGTAGGAGTTGAGCTTCACAAATTCACCAGGTAAGCCCAAATTTATTTTCTGCTTGGACAGG
TCCACCTCACATGGGTCTGTCTAATATATTAAGAGGGATTTTCTTTGCTGTATTGCAGCCCA
GTATATCTGTTACTTACAGTAGTAGTCCATTATTGCTGGCCTAGGGGCTTTTGCTCCTACACGA
ACACCACTCTGTAAAATTTGAGGTGCTCCTTAGAGTCAAACCATTCATGGAGCGCTCTGTGCAT
CTACCAACTATCGCTAAGCATTCACTTGGTTGGTTTAAAGTGGAGGCAACTCCATTATCTTCTAG
CATACCCTTCCCAGGCTACATGTAGAAAAGAGATCTGTTGGGCCCACTATTTTTTCACCCAGGG
AAGCCTACTTTAGTTATAGCTTGCCAGAGATTTTCTGTGTATGTAGAAGTCATCCACTTTTAA
CACCAGGAGGTGGATGTGGGGCCAGGAAATATGTCAATAACGATACGGGACTTCTAACAGTGAC
TCGCGGCCGCGATATCCTGCAGATGCATCCAGTACTAGTATGGCCC

CTA - 850bp

GGGGGATCCTTAAGTCGTGTCCTTCTCCTACGATCTTGTGAACGATGGATATTTTCTTTCTAAA
CTTTAAACAAACAGTGGAGAGATGTTGTTGTGTGTGGAACGACGCTTAGCCTACCGAGGAAGAT
CCAGACTACAATAGAATATGTGGCCAAAACCTCTCCGCAACTTCAGCAGCAAAAAGGATATTATT
GACATAACCTCCTCACAAAAAGTACACAAATGGCTAAATAACAGAGCCCCTCTTTTTACTAGGG
AAATGGTGGATGTGGACTTTAGAATTTAAGATAATAAAGCTCTTGATCCCAATGTTATTTCCAT
GTGAGGGACATTAAATTGAGTAACCTTTGCCACATACCCTCTCCCAGAGTCCATTCTCTAAAAC
TTGAAGCTCCGCCCCCTTTTTACGCACATTAGGCTTCCAATTACGGTCAATGGTCTTGAAGATTG
GGAGCTTTTGAAGAGTAATAAGAACCATCACAAAAAGGAACCCAGAAGCCGGGAGTGTCTACCA
AAAAAATTCAAGGGTTAAAAAAAAGTGACATTTTCTCCTGTTTTTTACACATGATTTTGAATGC
TGATGGGTCCACGTCCAGCTCTAAAGGTAGGTTTCATGGTTCTCCAAAGTTGCTTTCTTGTGAGA
ATTGAGCCACATCAGGTAGGTGGGGAAGTAGATCAGTGAGGATGCTTCACATGTGTGGGCACTG
GGAACAGAATGCTTCAATAACACGAGCTGACGAGGGCCCGCTATGAAAAAAAAGATTCTCTGTG
CCCCCTGGCGCCTCCGCACTTAAAGAATTGATGACCGTGCGGCCGCGATATCCTGCAGATGCAT
CCAGTACTAGTATGGCCC

CTL - 150bp

AGTATGGCCCGGGGGATCCTACGTTCCAAATGCAGCGAGCTCGTATAACCCTTTAAGAGTTGCT
CTTTTTGTTTGGTAAGTTGCAAATCGAAGTTTTAGATTGAGTTCTACGTCGAGCGGCCGCGATA
TCCTGCAGATGCATCCAGTACA

CTL - 250bp

AGTATGGCCCGGGGGATCCTTATCTGTCAAACCGCTAATGTCCGTTCTAAGACCGTCTGGAGA
ACACTTGCCCATCAGTGCTTTTGAACCTTTTTTTCACAGGTCCCTTCCGATTACACTGAGAAGC
TGACCACACCTGCTAGAAGATGGAGGTATGCAGCCCGTTAGTAGGAGTAATACTACCCAGCTTA
TAACCCTCAAACGTAGGGCAGATGGCGGCCGCGATATCCTGCAGATGCATCCAGTACA

CTL - 350bp

AGTATGGCCCGGGGGATCCTAGAGACCATTTCGCGATTCCATGAGACTCCAAGGGTTCTGCACAA
CTTATGCACCTCTATTAGATCATTGTGTTCTACGAAGCCTGGACTGCATTACATATTCACAACC
AACATGAGAAGAGCGGAATAGATGGCCGGATGTTTGGTGGCTTTGATATATTGTGAGGAGCATT
GCGAACCTAGAGCTGTCCGGTCAAATAACCCCTCACAAATAAGTGAATGTCATGGGATAATC
AAAAGACTAAGGGAGGGCTTTTATAGAAGGCGTGAGGTCATGCTATCCCCCTCTGAAGACGCGG
CCGCGATATCCTGCAGATGCATCCAGTACA

CTL - 450bp

AGTATGGCCCGGGGGATCCGTATACGTTTCTAATTTGTAGTTAACGGTTGGATACCACTTTGAG
GCATGTAATATGGTACTGAGCTTCGGCACAGGGCTCAAATTGCATCATTAAATGTCTCCGATGT
GGCTATATGTCATGGATAAAGGCAGCCCCCTATATCTTTTTTTGTGGCAGCATGGGTCCATCAA
AGCAATTATTCAGGGTCTTAATGACCTCCACAGCTCTAAACGTAATTCATCTGGCTTTGCCTGT
ACTTACTTCCTCCATGAAAAAAGTGTTGATAATGCTCATAATGCTGCCAGCAATTTCTCCC
TTCTCAAGACTATTCTGGCTTCCTGGGTACTTAAAAACAGGGCTTAGAGTATGGCTGCTGACAA
AATTGCACTCTAAACGCTAGCTTAGGTCTTCTGCGGCCGCGATATCCTGCAGATGCATCCAGTA
CA

CTL - 550bp

AGTATGGCCCGGGGGATCCGTTAGCTATCGTTCGCGAGAAAGTTAGTAGACACACAGGACCCAG
GCGTGCAAGTCAATTTTCAGCTGACTACACCGATTCTGGTTAAAAGAGCCTATGGCCACCCTTAT
TTTAGAGAAAAAAACCACACCTCTAATGTGTTGGGCACTAGAAAAAGCTAACTACCTAGTCCG
TTTCTGGACGACTTCATTGGGAATAACATACCCCCCACTGTGATTAAGACTGGCACTGTCCTAA
TGCTTTCTTCAATAGGTTTGGCTCATGTGTGATTCCCTCTGGCAAACCTTATAGAGGACAAGCAG
AATAAACCAATTCAAGGTCGTTGTAGCTGAAGGCCTGGCCTGCCTGACAGTTAATTATGAGCAT
GTCTTGCCCTTCATGGTGGATATTCACAGCTGAAAGTGTTATTGGCATTTTTTTCTGAGGACAC
AACGAGGAAATCTGATAAATACGGCCACCTGAAGTCTAGCTCGGAGTTAACAATTTACCACGTT
TAGAGCGGCCGCGATATCCTGCAGATGCATCCAGTACA

CTL - 650bp

AGTATGGCCCGGGGGATCCGCTCGCACTTAGCCTGTAAAGGGTTTCGCGCTCGTCTAGTCTGTG
CTGTTGCCTGGATAGTAAATTATCATGGTACAACTTTTTAAGAGCCAGTTAAATGGAGATGGAT
TTAAAAAGAGTTATTGTAAAGTCTCCCCAGGTGTGTCAATTAATATCCCAACAGATTGCCCTGG
CCTGACCCCCCTAAATGCAATTTTGGGATTCCCTTTTAGTTGCTTTTCAATTAATGTACCAGCGC
AGTAAAAAAAGCACAAAGTATATTGTTTATGTAACCTCACTATCTCATTTGCACTGGTTACATGG
CAGCTTCAGACTGACTAAAACCTACACTTTTCCACCATGGTTCAAAGATCAACAGAACTGGGCC
AACAAAAGCAATTTTTTTCATGTGGTCTAACTACCAACTTATTATGAGTTAAGTTACTTTTAGGT
TTAAATCACAGCAGTTTTTCCCTCCACACCTCCAGAGATACTTTCAGGGTGGCTAACTTGG
CTAAAGGCTTCCGGACCAACCCTTGTTTCTTTATGGTGCTTGTGTCTGACAACCGCGTAAGGC
ATGGAAATTCAGCTATTTATCCGATCGTTTATATGGGCGTGCGGCCGCGATATCCTGCAGATGC
ATCCAGTACA

CTL - 750bp

AGTATGGCCCGGGGGATCCTTGGACCGTTAATTCATATATCGAAGTAGCAGGTTGTTGCCCCGC
CTGATGTTGCCACTACTTGCTCATGACAGTTTTTTTAGGCAATGCAAACCTACTATTTGATATTT
TTTTCCAAGTACAGTTGTAGGGTACTCCTTATACTGATTCTTCTGAGCCTGTACGGGGAGCATT

AGGTA CTGATGTAGTAGGAGTTGAGCTTCACAAATTCACCAGGTAAGCCCAAATTTATTTTCTG
CTTGGACAGGTCCACCTCACATGGGTCTGTCTAATATATTAAGAGGGATTTTCTTTGCTGTA
TTGCAGCCCAGTATATCTGTTACTTACAGTAGTAGTCCATTATTGCTGGCCTAGGGGCTTTTGC
TCCTACACGAACACCACTCTGTAAAATTTGAGGTCGTCCTTAGAGTCAAACCATTTCATGGAGCG
CTCTGTGCATCTACCAACTATCGCTAAGCATTCACTTGGTTGGTTTAAGTGGAGGCAACTCCAT
TATCTTCTAGCATACCCTTCCCAGGCTACATGTAGAAAAGAGATCTGTTGGGCCCCACTATTTT
TCACCCAGGGAAGCCTACTTTAGTTATAGCTTGCCAGAGATTTTCTGTGTCATGTAGAAGTCAT
CCACTTTTAACACCAGGAGGTGGATGTGGGGCCAGGAAATATGTCAATAACGATACGGGACTTC
TAACAGTGA CTGCGGCCGCGATATCCTGCAGATGCATCCAGTACA

CTL - 850bp

AGTATGGCCCGGGGGATCCTTAAGTCGTGTCTTCTCCTACGATCTTGTGAACGATGGATATTT
TCTTTCTAACTTTAAACAAACAGTGGAGAGATGTTGTTGTGTGTGGAACGACGCTTAGCCTAC
CGAGGAAGATCCAGACTACAATAGAATATGTGGCCAAAACCTCCGCAACTTCAGCAGCAAAAA
GGATATTATTGACATAACCTCCTCACAAAAAGTACACAAATGGCTAAATAACAGAGCCCCCTCTT
TTTACTAGGGAAATGGTGGATGTGGACTTTAGAATTTAAGATAATAAAGCTCTTGATCCCAATG
TTATTTCCATGTGAGGGACATTAAATTGAGTAACCTTTGCCACATACCCTCTCCCAGAGTCCAT
TCTCTAAAACCTTGAAGCTCCGCCCCTTTTTACGCACATTAGGCTTCCAATTACGGTCAATGGTC
TTGAAGATTGGGAGCTTTTTGAAGAGTAATAAGAACCATCACAAAAAGGAACCCAGAAGCCGGGA
GTGTCTACCAAAAAAATTCAAGGGTTAAAAAAAAGTGACATTTTCTCCTGTTTTTTACACATGA
TTTTGAATGCTGATGGGTCCACGTCCAGCTCTAAAGGTAGGTTTCATGGTTCTCCAAAGTTGCTT
TCTTGTGAGAATTGAGCCACATCAGGTAGGTGGGGAAGTAGATCAGTGAGGATGCTTCACATGT
GTGGGCACTGGGAACAGAATGCTTCAATAACACGAGCTGACGAGGGCCCGCTATGAAAAAAAAG
ATTCTCTGTGCCCCCTGGCGCCTCCGCACTTAAAGAATTGATGACCGTGCGGCCGCGATATCCT
GCAGATGCATCCAGTACA