

FIG. 1A

P2086 Non-lipidated Variant Nucleic Acid Sequences

>A04 Variant Nucleic Acid Sequence (SEQ ID NO: 1)
 TGCAGCAGCGAGGCGGCGGTGTGCGCCGCGACATCGGCACGGGCTTGCCGATGCACTAACTGCGCCGCTCGACC
 ATAAAGACAAAAGGTTTGAAATCCCTGACATTGGAAAGACTCCAATTCGCCAAAACGGAAACACTGACCCCTGTGCGCACAAAGGTGC
 GGAAAAAACTTTCAAAGCCGGCGACAAAGACAAACAGCCCTCAACACACGGGCAAACTGAAGAACGACAAAAATCAGCCGCTTCGAC
 TTCGTGCAAAAAATCGAAAGTGGACGGACAAACCATCACACTGGCAAGCGGCAATTTCAAATATACAAAAACAGACCACTCCG
 CCGTCGTTGCCCTACAGATTGAAAAAATCAACAACCCCGACAAAAATCGACAGCCTGATAAACCAACGCTCCTTCCCTTGTGAG
 CGGTTTGGCGGAGAACATACCGCCTTCAACCAACTGCCCGCGACAAAGCCGAGTATCACGGCAAAGCATTCAGCTCCGAC
 GATGCCGGCGGAAAACTGACCTATACCATAGATTTTGCCGCCAAAACAGGGACACGGCAAAATCGAAACACCTGAAAAACACCCG
 AGCAAAATGTCGAGCTTGCCGCCCGCGAACTCAAAGCAGATGAAAAATCACACGCCGTCAATTTGGGCGACACGCGCTACGG
 CAGCGAAGAAAAAGGCACCTTACCACCTCGCCCTTTTCGGCGACCGGCCCAAGAAATCGCCGGCTCGGCAACCGTGAAGATA
 GGGGAAAAGGTTACGAAATCGGCATCGCCCGCAACAGTAG

1/22

>A05 Variant Nucleic Acid Sequence (SEQ ID NO: 2)
 TGCAGCAGCGGAAAGCGGAGGCGGCGGTGTGCGCCGCGACATCGGCACAGGGCTTGCCGATGCACTAACTGCGCCGC
 TCGACCATAAAGACAAAGGTTTGAAATCCCTGACATTGGAAGACTCCATTTCCCAAAACGGAAACACTGACCCCTGTGCGCACAA
 AGGTGCGGAAAAAATTCAAAGTCGGCGACAAAGACAAACAGTCTCAATACAGGCAAAATTGAAAGAACGACAAAAATCAGCCGC
 TTCGACTTTGTGCAAAAAATCGAAAGTGGACGGACAAACCATCACGCTGGCAAGCGCGAATTTCAAATATACAAAAACAGGACC
 ACTCCGCCGCTGCTGCCCTACAGATTGAAAAAATCAACAACCCCGACAAAAATCGACAGCCTGATAAACCAACGCTCCTTCCT
 TGTACGCGGTTTGGGCGGAGAACATACCGCCCTTCAACCAACTGCCCAGCGGCAAAAGCCGAGTATCACGGCAAGCATTCAGC
 TCCGACGATGCCGGCGGAAAACTGACCTATACCATAGATTTTGCCGCCAAACAGGACACGGCAAAATCGAACACCTGAAAA
 CACCCGAGCAGAAATGTCGAGCTTGCCCTCCGCCGAACTCAAAGCAGATGAAAAATCACACGCCGTCAATTTGGGCGACACGCG
 CTACGGCAGCGAAGAAAAAGGCACCTTACCACCTCGCTCTTTTCGGCGACCGGCCCAAGAAATCGCCGGCTCGGCAACCGTG
 AAGATAAGGGAAAAAGGTTACGAAATCGGCATCGCCCGCAACAGTAG

FIG. 1B

>A12 Variant Nucleic Acid Sequence (SEQ ID NO: 3)
 TGCAGCAGCGAGCGCGGTGTGCGCCGCGACATCGCGCGGGGCTTGCCGATGCACCTAACCGCACCGCTCGACCATAAAG
 ACAAAAAGTTTGCAGTCTTTGACGCTGGATCAGTCCGTGAGGAAAAACGAGAAAACTGAAGCTGGCGGCACAAAGTGGGAAAA
 AACTTATGAAAACGGCGACAGCCTCAATACGGGCAAAATTGAAGAACGACAAAGTCAGCCGCTTCGACTTTATCCGTCAAATC
 GAAGTGGACGGACAAACCATCACGCTGGCAAGCGGGAATTTCAAATATACAAACAGAACCACTCCGCCGTCGTTGCCCTAC
 AGATTGAAAAAATCAACAACCCCGACAAAATCGACAGCCTGATAAACCAACGCTCCTTCCCTTGTCAAGCGGTTTGGGCGGAGA
 ACATACCGCCTTCAACCAACTGCCCTGACGGCAAGCCGAGTATCACGGCAAAAGCATTCAGCTCCGACGACCCGAAACGGCAGG
 CTGCACTACTCCATTGATTTTACCAAAAAACAGGGTTACGGCAGAAATCGAACACCTGAAAAACGCCCCGAGCAGAAATGTCGAGC
 TTGCCCTCCGCCGAACCTCAAAGCAGATGAAAAATCACACGCCGTCAATTTTGGCGACACGCGCTACGCGGCGGAGAAAAAGG
 CACTTACCACTCGCCCTTTTTCGGCGACCGGCCCAAGAAATCGCCGGCTCGGCAACCGTGAAGATAAGGGAAAAAGGTTTCAC
 GAAATCGGCATCGCCGGCAACAGTAG

2/22

>A12-2 Variant Nucleic Acid Sequence (SEQ ID NO: 4)
 TGCAGCAGCGAGGGCGGTGTGCGCCGCGACATTTGGTGCGGGGCTTGCCGATGCACCTAACCGCACCGCTCGACCATAAAG
 ACAAAAAGTTTGCAGTCTTTGACGCTGGATCAGTCCGTGAGGAAAAACGAGAAAACTGAAGCTGGCGGCACAAAGTGGGAAAA
 AACTTATGAAAACGGCGACAGCCTCAATACGGGCAAAATTGAAGAACGACAAAGTCAGCCGCTTCGACTTTATCCGTCAAATC
 GAAGTGGACGGACAAACCATCACGCTGGCAAGCGGGAATTTCAAATATACAAACAGAACCACTCCGCCGTCGTTGCCCTAC
 AGATTGAAAAAATCAACAACCCCGACAAAATCGACAGCCTGATAAACCAACGCTCCTTCCCTTGTCAAGCGGTTTGGGCGGAGA
 ACATACCGCCTTCAACCAACTGCCCTGACGGCAAGCCGAGTATCACGGCAAAAGCATTCAGCTCCGACGACCCGAAACGGCAGG
 CTGCACTACTCCATTGATTTTACCAAAAAACAGGGTTACGGCAGAAATCGAACACCTGAAAAACGCCCCGAGCAGAAATGTCGAGC
 TTGCCCTCCGCCGAACCTCAAAGCAGATGAAAAATCACACGCCGTCAATTTTGGCGGACACGCGCTACGCGGCGGAGAAAAAGG
 CACTTACCACTCGCCCTTTTTCGGCGACCGGCCCAAGAAATCGCCGGCTCGGCAACCGTGAAGATAAGGGAAAAAGGTTTCAC
 GAAATCGGCATCGCCGGCAACAGTAG

FIG. 1C

>A22 Variant Nucleic Acid Sequence (SEQ ID NO: 5)
 TGCAGCAGCGGAGCGGGGTGTGCGCCGCGACATCGGCGCGGGGCTTGCCGATGCACATAACCGCACCGCTCGACCATAAAG
 ACAAAAAGTTTGAGTCTTTGACGCTGGATCAGTCCGTGAGGAAAAACGAGAAAACTGAGCTGGCGCACAAAGGTGCGGAAAA
 AACTTATGGAACGGCGACAGCCTCAATACGGGCAAAATTGAAGAACGACAAAGTCAAGCCGCTTCGACTTTATCCGTCAAATC
 GAAGTGGACGGCAGCTCATTTACCTTGAGAGCGGAGAGTTCCAAAATATACAAACAGGACCACTCCGCCGCTCGTTGCCCTAC
 AGATTGAAAAAATCAACACCCCGACAAAAATCGACAGCCTGATAAACCAACGCTCTTCTTGTCAAGCGTTTGGGTGGAGA
 ACATACCGCCTTCAACCAACTGCCAGCGGCAAGCCGAGTATCACGGCAAAAGCATTCAGCTCCGACGATGCTGGCGGAAAA
 CTGACCTATACCATAGATTTCGCCGCCAAACAGGACACGGCAAAATCGAACACTTGAAAAACACCCGAGCAAAATGTCGAGC
 TTGCCCTCCGCCGAACTCAAAGCAGATGAAAAATCACACGCCGTCTTTTGGGCGACACGCGCTACGCGCGCGAAGAAAAAGG
 CACTTACCACCTCGCCCTTTTCGGCGACCGGCCCAAGAAATCGCCGGCTCGGCAACCGTGAAGATAAGGAAAAAGTTTCAC
 GAAATCGGCATCGCCGGCAACAGTAG

3/22

>B02 Variant Nucleic Acid Sequence (SEQ ID NO: 6)
 TGCAGCAGCGGAGCGGGGAAAGCGGAGCGGGGTGTGCGCCGCGGACATCGGCGCGGGGCTTGCCGATGCACATAACCGCAC
 CGCTCGACCATAAAGACAAAGGTTTGAATCCCTGACATTGGAAGACTCCATTTCCCAAAACGGAAACACTGACCCCTGTCCGC
 ACAAGTTCGGAAAGAACTTTCAAAAGCCGGCACAAGACAACAGTCTCAACACAGGCAAACTGAAAGAACGACAAAAATCAGC
 CGCTTCGACTTTATCCGTCAAATCGAAGTGGACGGCGAGCTCATTTACCTTGGAGAGCGGAGAGTTCCAAAGTGTACAAACAAA
 GCCATTCCGCCCTTAACCGCCCTTCAGACCGAGCAAGTACAAGACTCGGAGCATTCGGGAAGATGGTTGCGAAACGCCAGTT
 CAGAAATCGCGCATAGTGGCGGAACATACATCTTTTGACAAGCTTCCCAAAAGACGTCAATGGCGACATATCGCGGGACGGCG
 TTCGGTTTCAGACGATGCCGGCGGAAACTGACCTACACCATAGATTTCGCCGCCAAGCAGGGACACGGCAAAATCGAACATT
 TGAAATCGCCTGAACCTCAATGTGACCTGGCCGCCCGGATATCAAGCCGGATGAAAAACACCATGCCCCTCATCAGCGGTTTC
 CGTCCCTTTACAACCAAGCCGAGAAAGGAGTTACTCTCTAGGCATCTTTGGCGGGCAAGCCAGGAAAGTTGCCCGCAGCGCG
 GAAGTGAAACCGCAACGGCATACGCCATATCGGTCTTGCCGCCAAGCAATAA

FIG. 1D

>B03 Variant Nucleic Acid Sequence (SEQ ID NO: 7)
TGCAGCAGCGAGCGCGGTGTCCGCCGACATCGCGCGGGGCTTGCCGATGCACTAACCGCACCGCTCGACCATAAAG
ACAAAAGTTTGCAGTCTTTGACGCTGGATCAGTCCGTGAGGAAAAACGAGAAAACTGAAGCTGGCGGCACAAAGTGGGAAAA
AACTTATGGAACCGCGACAGCCTTAATACGGGCAAAATTGAAGAACGACAAAGTCAGCCGTTTCGACTTTATCCGTCAAATC
GAAGTGGACGGGAGCTCATTAACCTTGGAGAGCGGAGAGTTCCAAGTGTAACAAACAAAGCCATTCCGCCCTTAACCGCCCTTC
AGACCGAGCAAGAACAGATCCAGAGCATTCGGGGAAGATGGTTGCGAAACGCCGGTTCAAAAATCGGCGACATAGCGGGCGGA
ACATACATCTTTTGACAAAGCTTCCCAAAGACGTCATGGCGACATATCGCGGACGGCGTTCGGTTCAGACGATGCCGGCGGA
AACTGACCTATACTATAGATTTTGTCTGCCAAACAGGGACACGGCAAAATCGAAACATTTGAAATCGCCCGAACTCAAATGTCG
AGCTTGCCACCGCCTATATCAAGCCGGATGAAAAACACCATGCCGTCATCAGCGGTTCCGTCTTTTACAATCAAGACGAGAA
AGGCAGTTACTCCCTCGGTATCTTTTGGCGGGCAAGCCAGGAAAGTTGCCGGCAGCGGGAAGTGGAACCCGCAACCGGCATA
CACCATATCGGTCTTTGCCGCCCAAGCAATAA

4/22

>B09 Variant Nucleic Acid Sequence (SEQ ID NO: 8)
TGCAGCAGCGAGGGGCGGTGTCCGCCGCCGACATCGGTGCGGGGCTTGCCGATGCACTAACCGCACCGCTCGACCATAAAG
ACAAAGGTTTGCAGTCTTTAACGCTGGATCAGTCCGTGAGGAAAAACGAGAAAACTGAAGCTGGCGGCACAAAGTGGGAAAA
AACTTATGGAACCGCGACAGCCTTAATACGGGCAAAATTGAAGAACGACAAAGTCAGCCGTTTCGACTTTATCCGTCAAATC
GAAGTGGACGGGAAGCTCATTAACCTTGGAGAGCGGAGAGTTCCAAGTGTAACAAACAAAGCCATTCCGCCCTTAACCGCCCTTC
AGACCGAGCAAGTACAAGACTCGGAGGATTCGGGGAAGATGGTTGCGAAACGCCAGTTCAGAAATCGGCGACATAGCGGGCGGA
ACATACATCTTTTGACAAAGCTTCCCAAAGCGGCGAGTCCGACATATCGCGGACGGCGTTCGGTTCAGACGATGCTGGCGGA
AAACTGACCTATACTATAGATTTCCCGCGCAAGCAGGACACGGCAAAATCGAAACATTTGAAATCGCCCGAACTCAAATGTCG
AGCTTGCCACCGCCTATATCAAGCCGGATGAAAAACGCCATGCCGTTATCAGCGGTTCCGTCTTTTACAACCAAGACGAGAA
AGGCAGTTACTCCCTCGGTATCTTTTGGCGGGCAAGCCAGGAAAGTTGCCGGCAGCGGGAAGTGGAACCCGCAACCGGCATA
CACCATATCGGTCTTTGCCGCCCAAGCAGTAA

FIG. 1E

>B22 Variant Nucleic Acid Sequence (SEQ ID NO: 9)
 TGCAGCAGCGGAGGCGGTGTGCGCCGCGACATCGGCGCGGTGCTTGCCGATGCACATAACCGCACCCGCTCGACCATAAAG
 ACAAAGTTTGCAGTCTTTGACGCTGGATCAGTCCGTGATCAGGAAAAACGAGAAACTGAAGCTGGCGGCACAAAGTGCGGAAAA
 AACTTATGGAACCGCGACAGCCTCAATACGGGCAAAATTGAAGAACGACAAGGTCAAGCGCTTCGACTTTATCCGTCAAATC
 GAAGTGGACGGCAGCTCATTACCTTGGAGACGGAGAGTTCCAAGTGTACAAACAAGCCATTCCGCCCTTAACCGCCCTTC
 AGACCGAGCAAGTACAAGATTCCGAGCATTCAGGGAAGATGGTTGCGAAACGCCAGTTCAGAAATCGGCGATATAGCGGGTGA
 ACATACATCTTTTGACAAAGCTTCCCGAAGCGCGGCGACATATCGCGGGACGGCATTCGGTTCAGACGATGCCAGTGGA
 AAAC TGACCTACACCATAGATTTCGCCGCAAGCAGGGACACGGCAAAATCGAACATTTGAAATCGCCAGAACTCAATGTTG
 ACCTGGCCGCTCCGATATCAAGCCGGATAAAACGCCATGCCGTCAATCAGCGGTTCCGTCTTTACAAACCAAGCCGAGAA
 AGGCAGTTACTCTCTAGGCATCTTTGGCGGCAAGCCAGGAAGTTGCCGGCAGCGAGAAGTGGAACCGCAACCGGCATATA
 CGCCATATCGGTCTTGCCGCCCAAGCAGTAA

5/22

>B24 Variant Nucleic Acid Sequence (SEQ ID NO: 10)
 TGCAGCAGCGGAGGCGGTGTGCGCCGCGACATCGGTGCGGGGCTTGCCGATGCACATAACCGCACCCGCTCGACCATAAAG
 ACAAAGTTTGCAGTCTTTGACGCTGGATCAGTCCGTGATCAGGAAAAACGAGAAACTGAAGCTGGCGGCACAAAGTGCGGAAAA
 AACTTATGGAACCGGTGACAGCCTCAATACGGGCAAAATTGAAGAACGACAAGGTCAAGCGCTTCGACTTTATCCGCCAAATC
 GAAGTGGACGGCAGCTCATTACCTTGGAGAGTGGAGAGTTCCAAGTATACAAACAAGCCATTCCGCCCTTAACCGCCCTTC
 AGACCGAGCAAAATACAAGATTCCGAGCATTCGGGAAGATGGTTGCGAAACGCCAGTTCAGAAATCGGCGACATAGCGGGCGA
 ACATACATCTTTTGACAAAGCTTCCCGAAGCGCGGCGACATATCGCGGGACGGCGTTCGGTTCAGACGATGCCGGCGGA
 AAAC TGACCTACACCATAGATTTCGCCGCAAGCAGGGAAACGGCAAAATCGAACATTTGAAATCGCCAGAACTCAATGTCG
 ACCTGGCCGCGCGGATATCAAGCCGGATGGAACGCCATGCCGTCAATCAGCGGTTCCGTCTTTACAAACCAAGCCGAGAA
 AGGCAGTTACTCTCTCGGTATCTTTGGCGGAAAAAGCCAGGAAGTTGCCGGCAGCGGGAAGTGGAACCGTAAACCGGCATA
 CGCCATATCGGCCTTGCCGCCCAAGCAATAA

FIG. 1F

>B44 Variant Nucleic Acid Sequence (SEQ ID NO: 11)
TGCAGCAGCGGAGCGGGAAGCGGAGCGGGGTGTGCGCGCCGACATCGGCGGGGGCTTGCCGATGCACATAACCGCAC
CGCTCGACCATAAAGACAAAGGTTTGAAATCCCTGACATTGGAAGACTCCATTTCGCCAAAACGGAACACTGACCCCTGTCCGGC
ACAAAGTGCAGAAAGAACTTTCAAAGCCGGCGACAAAGACAACAGTCTCAACACAGGCAAACTGAAGAACGACAAAAATCAGC
CGCTTCGACTTTATCCGTCAAATCGAAGTGGACGGGCAAGCTCATTAACCTTGGAGAGCGGAGAGTTCCAAGTGTACAAACAAA
GCCATTCCGCCCTTAACCGCCCTTCAGACCCGAGCAAGTACAAGACTCGGAGCATTCGCGGAAGATGGTTGCGAAAACGCCAGTT
CAGAATCGCGACATAGTGGCGAACATACATCTTTTGGCAAGCTTCCCAAAGACGTCATGGCGACATATCGCGGACGGCG
TTCGGTTCAGACGATGCCGGCGGAAAACCTGACCTACACCATAGATTTCGCCGCCCAAGCAGGGACACGGCAAAATCGAACATT
TGAAATCGCCAGAACTCAATGTGACCTGGCCCGCCGATATCAAGCCGGATGAAAAACACCATGCCGTTCATCAGCGGTTTC
CGTCCCTTTACAAACCAAGCCGAGAAAGGCAAGTTACTCTCTAGGCATCTTTTGGCGGGCAAGCCAGGAAGTTGCCGGCAGCGCG
GAAGTGGAAACCGCAACCGCATACGCCATATCGGTCTTTGCCGCCCAAGCAATAA

FIG. 2A

P2086 Non-lipidated Variant Amino Acid Sequences

>A04 Variant Amino Acid Sequence (SEQ ID NO: 12)
 CSSGGGGGVAADIGTGLADALTAPLDHKDKGLKSLTLEDSIPQNGTLTLSAQGAECTFKAGDKDNSLNTGKLKNDKISRFD
FVQKIEVDGQTITLASGEFQIYKQDHSAVVALQIEKINNPDKIDSLINQRSFLVSGLGGEHTAFNQLPGDKAEYHGKAFSSD
 DAGGKLTYTIDFAAKQGHGKIEHLKTPEQNVNELAAAEKSHAVILGDTRYGSEEEKGTYYHLALFGDRAQEIAGSATVKI
 GEKVHEIGIAGKQ

>A05 Variant Amino Acid Sequence (SEQ ID NO: 13)
 CSSGSGSGGGVAADIGTGLADALTAPLDHKDKGLKSLTLEDSISQNGTLTLSAQGAECTFKVGDKNLSLNTGKLKNDKISR
 FDFVQKIEVDGQTITLASGEFQIYKQDHSAVVALQIEKINNPDKIDSLINQRSFLVSGLGGEHTAFNQLPSGKAEYHGKAFS
 SDDAGGKLTYTIDFAAKQGHGKIEHLKTPEQNVNELASAEKSHAVILGDTRYGSEEEKGTYYHLALFGDRAQEIAGSATV
 KIREKVHEIGIAGKQ

>A12 Variant Amino Acid Sequence (SEQ ID NO: 14)
 CSSGGGGGVAADIGAGLADALTAPLDHKDKSLQSLTLDQSVRKNEKLLAAQGAECTYGNNGDSLNTGKLKNDKVSRRDFIRQI
EVDGQTITLASGEFQIYKQNHSAVVALQIEKINNPDKIDSLINQRSFLVSGLGGEHTAFNQLPDGKAEYHGKAFSSDDPNGR
 LHYSIDFTKKQGYGRIEHLKTPEQNVNELASAEKSHAVILGDTRYGSEEEKGTYYHLALFGDRAQEIAGSATVKIREKVH
 EIGIAGKQ

>A22 Variant Amino Acid Sequence (SEQ ID NO: 15)
 CSSGGGGGVAADIGAGLADALTAPLDHKDKSLQSLTLDQSVRKNEKLLAAQGAECTYGNNGDSLNTGKLKNDKVSRRDFIRQI
EVDGQLITLESGEFQIYKQDHSAVVALQIEKINNPDKIDSLINQRSFLVSGLGGEHTAFNQLPSGKAEYHGKAFSSDDAGGK
 LTYTIDFAAKQGHGKIEHLKTPEQNVNELASAEKSHAVILGDTRYGSEEEKGTYYHLALFGDRAQEIAGSATVKIREKVH
 EIGIAGKQ

FIG. 2B

>B02 Variant Amino Acid Sequence (SEQ ID NO: 16)
 CSSGGGGGGVAAADIGAGLADALTAPLDHKDKGLKSLTLEDSISQNGTLTLSAQGAERTFKAGDKDNSLNTGKLNKNDKIS
RFDFIRQIEVDGQLITLESGEFQVYKQSHSALTALQTEQVQDSEHSGKMVAKRQFRIGDIAGEHTSFDKLPKDVMTYRGTA
 FGSDDAGGKLTYTIDFAAKQGHGKIEHLKSPELNVDLAAADIKPDEKHHAVISGSVLYNQAEKGSYSLGIFGGQAQEVAGSA
 EVETANGIRHIGLAAKQ

>B03 Variant Amino Acid Sequence (SEQ ID NO: 17)
 CSSGGGGVAAADIGAGLADALTAPLDHKDKSLQSLTLDQSVRKNEKLKLAQAQGAEKTYGNGDSLNTGKLNKDVSRFDFIRQI
EVDGQLITLESGEFQVYKQSHSALTALQTEQVQDPEHSGKMVAKRRFKIGDIAGEHTSFDKLPKDVMTYRGTAFGSDDAGG
 KLTYYTIDFAAKQGHGKIEHLKSPELNVELATAYIKPDEKHHAVISGSVLYNQDEKGSYSLGIFGGQAQEVAGSAEVEETANGI
 HHIGLAAKQ

>B09 Variant Amino Acid Sequence (SEQ ID NO: 18)
 CSSGGGGVAAADIGAGLADALTAPLDHKDKGLQSLTLDQSVRKNEKLKLAQAQGAEKTYGNGDSLNTGKLNKDVSRFDFIRQI
 EVDGKLITLESGEFQVYKQSHSALTALQTEQVQDSEDSGKMVAKRQFRIGDIAGEHTSFDKLPKGSATYRGTAFGSDDAGG
 KLTYYTIDFAAKQGHGKIEHLKSPELNVELATAYIKPDEKRRHAVISGSVLYNQDEKGSYSLGIFGGQAQEVAGSAEVEETANGI
 HHIGLAAKQ

>B22 Variant Amino Acid Sequence (SEQ ID NO: 19)
 CSSGGGGVAAADIGAVLADALTAPLDHKDKSLQSLTLDQSVRKNEKLKLAQAQGAEKTYGNGDSLNTGKLNKDVSRFDFIRQI
EVDGQLITLESGEFQVYKQSHSALTALQTEQVQDSEHSGKMVAKRQFRIGDIAGEHTSFDKLPPEGGRATYRGTAFGSDDASG
 KLTYYTIDFAAKQGHGKIEHLKSPELNVDLAAADIKPDKKRHAVISGSVLYNQAEKGSYSLGIFGGQAQEVAGSAEVEETANGI
 RHIGLAAKQ

FIG. 2C

>B24 Variant Amino Acid Sequence (SEQ ID NO: 20)
CSSGGGVAAADIGAGLADALTAPLDHKDKGLQSLTLDQSVRKNEKCLKLAAQQAECTYGNGLSLNTGKLKNDKVSRRDFIRQI
EVDGQLITLESGEFQVYKQSHSALTAFQTEQIQDSEHSGKMVAKRQFRIGDIAGEHTSFDKLPEGGRATYRGTAFGSDDAGG
KLTYTIDFAAKQNGKIEHLKSPELNVDLAAADIKPDGKRHAVISGSVLYNQAEKGSYSLGIFGGKAQEVAGSAEVKTVNGI
RHIGLAAKQ

>B44 Variant Amino Acid Sequence (SEQ ID NO: 21)
CSSGGGSGGGVAAADIGAGLADALTAPLDHKDKGLKSLTLED^SISQNGTLTLSAQQAERTTFKAGDKDNSLNTGKLKNDKIS
RFDFIRQIEVDGQLITLESGEFQVYKQSHSALTALQTEQVQDSEHSGKMVAKRQFRIGDIVGEHTSFGKLPKDVMATYRGTA
FGSDDAGGKLTYTIDFAAKQGGHGKIEHLKSPELNVDLAAADIKPDEKHHAVISGSVLYNQAEKGSYSLGIFGGQAQEVAGSA
EVTANGIRHIGLAAKQ

10/22

FIG. 3

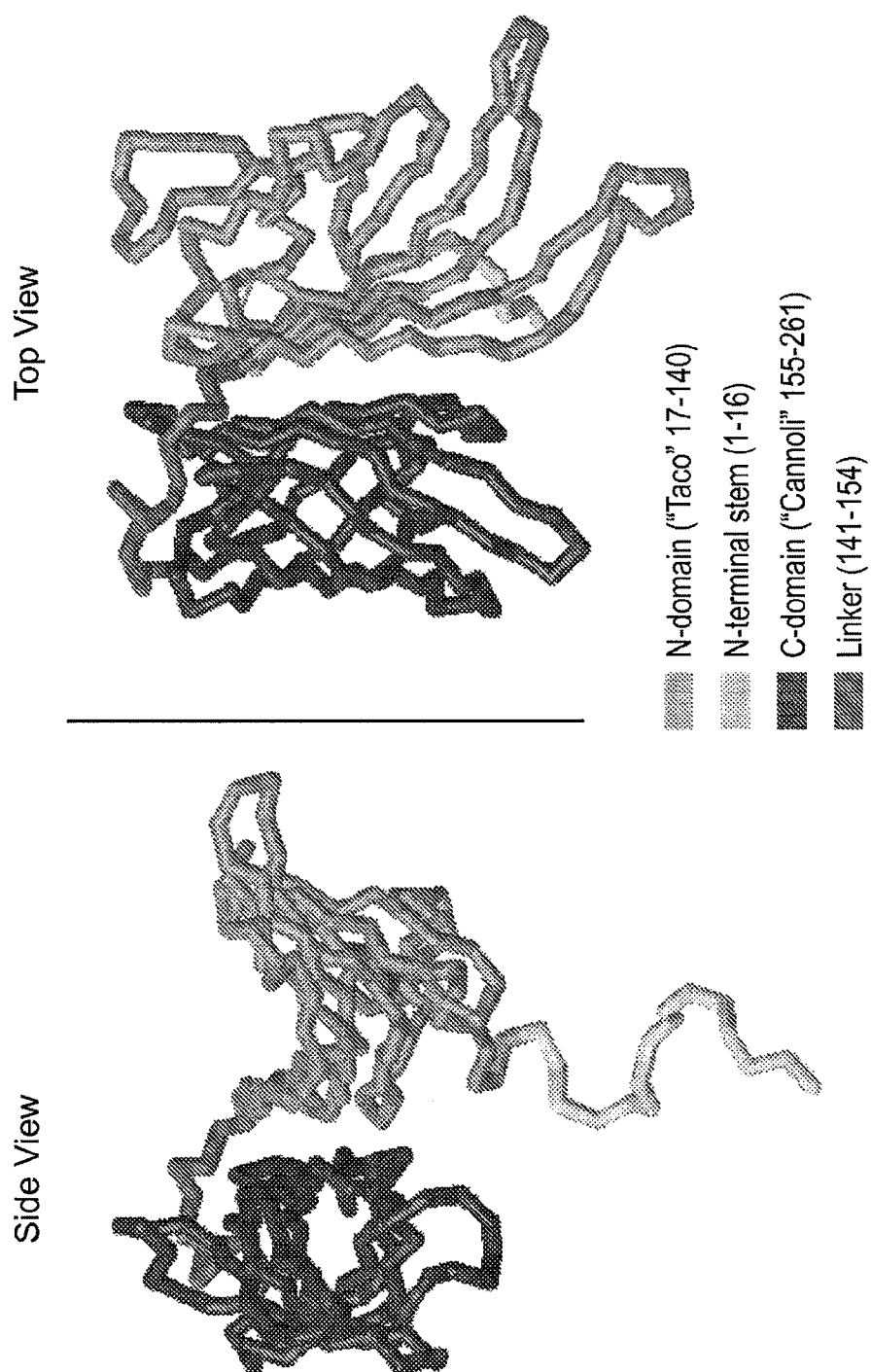
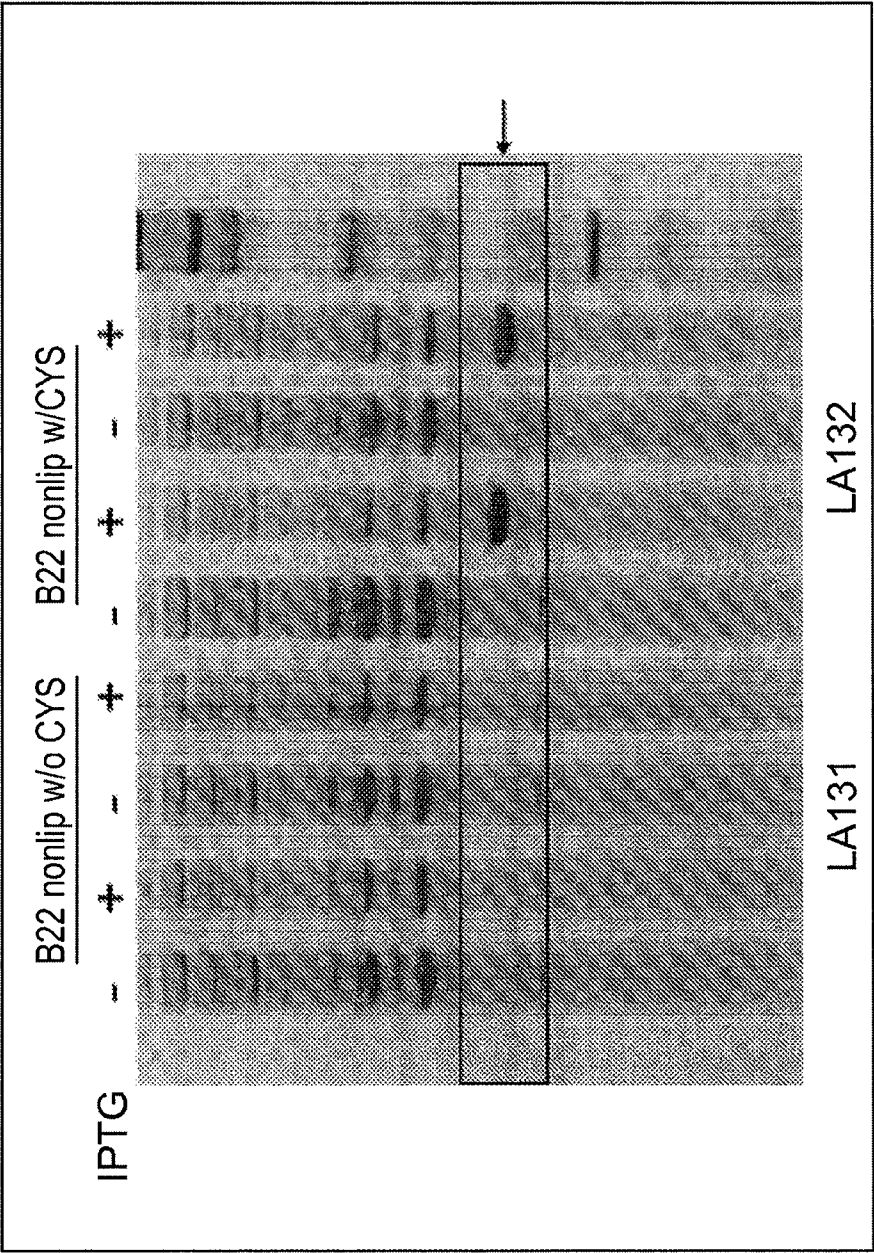


FIG. 4

Removal of N-terminal Cys Results in Loss of Expression in *E. coli*



Similar results were obtained for the CYS-minus A22 construct.

12/22

FIG. 5

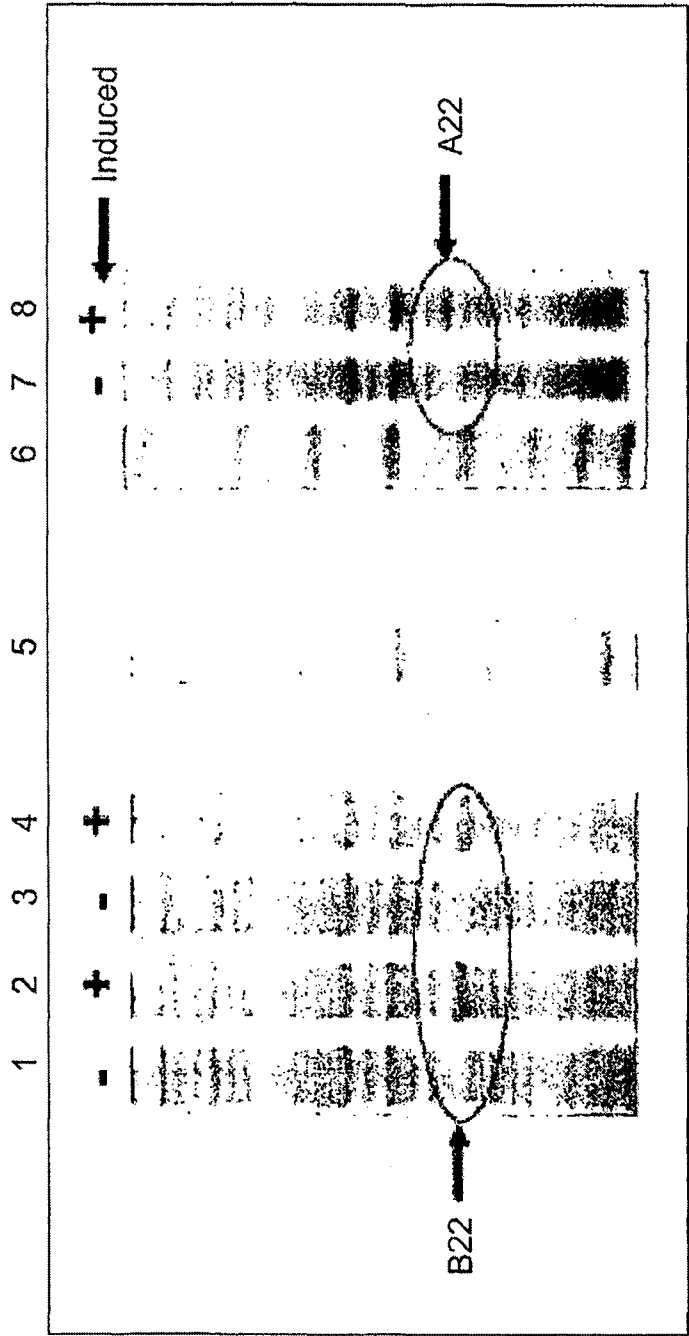
Effect of Gly/Ser Stalk Length on Non-lipidated ORF2086 Variant Expression

Protein Variant	Coomassie Expression w/o N-term Cys	Extra Gly/Ser?
B01 CSSGGGSGGGVTDIGTGLADALTAP	Yes	Yes (+5)
B44 CSSGGGSGGGVAAADIGAGLADALTAP	Yes	Yes (+5)
A05 CSSGGGSGGGVAAADIGTGLADALTAP	Yes	Yes (+4)
A22 CSSGGGSGVAAADIGAGLADALTAP	No*	No
B22 CSSGGGSGVAAADIGAVLADALTAP	No*	No
A19 CSSGGGSGVAAADIGAGLADALTAP	No*	No

*Yes if add back N-term Cys

FIG. 7

Codon Optimization Increases Expression of Non-lipidated B22 and A22 Variants



N-terminal B09 Gly codon changes applied to B22 and A22

FIG. 8A

> SEQ ID NO: 43

AGCTCTGGAGGTGGAGGAGCGGGGGGTGGAGTTCAGCAGACATTGGAGCAGGATTAGCAGATGCACGTACGGCACCCGT
TGGATCATAAAGACAAAGGCTTGAAATCGCTTACCTTAGAAGATTCTATTTCACAAAAATGGCACCCCTTACCTTGTCCGGGCA
AGGCGCTGAACGTACTTTTAAAGCCGGTGACAAAGATAATAGCTTAAATACAGGTAAACTCAAAAATGATAAAATCTCGCGT
TTTGATTTTCATTTCGTCAAATCGAAGTAGATGGCCAACTTATTACATTAGAAAAGCGGTGAATTCCAAAGTATATAAACAAATCCC
A'TTCAGCACTTACAGCATTGCAAAACCGAACAGGTCCAAAGACTCAGAACAT'TCCGGCAAAAATGGTAGCTAAACGTCAAT'TCCG
CATCGGTGACATTGTCGGTGAACATACAAAGCTTCGGAAAAATTACCAAAAGATGTGATGGCGACCTATCGCGGTACGGCATTT
GGATCAGATGATGCAGCGGGTAAATTAACTTATACAAATTGACTTTGCAGCAAAACACAGGACATGGCAAAAATTGAACATTTAA
AATCTCCCGAACCTTAACGTAGATCTCGCAGCAGCAGATATTAAACCAGATGAAAAACACACCGCAGTCATTTTCAGGTTTCAGT
TTTATACAAATCAGGCAGAAAAAGGTTTCGTACTCTTTAGGTATTTTGGCGGGCAAGCTCAAGAAAGTTGCAGGTAGCGCAGAA
GTAGAAAACGGCAAAATGGCATTCGTACACATTGGGTTAGCGGGCAAAACAATAA

> SEQ ID NO: 44

SSGGGSGGGGVAADIGAGLADALTAPLDHKDKGLKSLTLEDSISQNGTLLSAQGAERTFKAGDKDNSLNTGKLKNDKISR
FDFIRQIEVDGQLITLESGEFQYKQSHSALTALQTEQVQDSEHSCKMVAKRQFRIGDIVGEHTSFGKLPKDVMATYRGTA
GSDDAGGKLTYYTIDFAAKQGHGKIEHLKSPELNVDLAAADIKPDEKHHAVISGSVLNQAEEKGSYSLGIFGGQAQEVAGSAE
VETANGIRHIGLAAKQ.

FIG. 8B

> SEQ ID NO: 51

AGCAGCGGAGGCGGGAAGCGGAGGCGGGGGTGTGCGCCCGGACATCGGCGCGGGGCTTGCCGATGCACATAACCGCACCCG
TCGACCATAAAGACAAAGGTTTGAATCCCTGACATTGGAAGACTCCATTTCCTCAAAACGGAACACTGACCCCTGTCTGGCACA
AGGTGCGGAAAGAACTTTCAAAAGCCGGCGACAAAGACAAACAGTCTCAACACAGGCAAACTGAAAGAACGACAAAATCAGCCGC
TTCGACTTTATCCGTCAAATCGAAGTGGACGGGCGAGCTCATTTACCTTGGAGAGCGGAGAGTTCCAAAGTGTAACAACAAGCC
ATTCCGCCCTTAACCGCCCTTCAGACCGAGCAAGTACAAGACTCGGAGCATTCGGGAAGATGGTTGCGAAACGCCAGTTTCA
AATCGCGACATAGTGGCGGAACATACATCTTTTGGCAAGCTTCCCAAGACGTCAATGGCGACATATCGCGGACGCGGCTTC
GGTTCAGACGATGCCGGCGGAAACTGACCTACACCATAGATTTCGCCGCCCAAGCAGGGACACGGCAAAATCGAAACATTTGA
AATCGCCAGAACTCAATGTGTGACCTGGCCGCCGCGATATCAAGCCGGATGAAACACCATGCCCCTCATCAGCGGTTCCGT
CCTTTACAACCAAGCCGAGAAAGCCAGTTACTCTCTAGGCATCTTTGGCGGGCAAGCCCAAGGAGTTGCCGGCAGCGCGGAA
GTGGAACCGCAACGGCATACGCCATATATCGGTCTTTGCCGCCAAGCAATAA

> SEQ ID NO: 45

AGCTCTGGAGGTGGAGGAAGCGGGGCGGTGGAGTTGCAGCAGACATTTGAGCAGGATTAGCAGATGCACATGACGGCACCCGT
TGGATCATAAAGACAAAGGCTTGCAAGTCGCTTACCTTAGATCAGTCTGTCTCAGGAAAAAATGAGAAACTTAAAGTTGGCGGGCA
AGCGCTGAAAAAAGCTTATGGAAACGGTGACAGCTTAAATACAGGTAAACTCAAAAATGATAAAGTCTCGCGTTTGTGATTTC
ATTCTCAAATCGAAAGTAGATGGCAAGCTTATTACATTAGAAAGCGGTGAATTCCAAGTATATAAACAATCCCATTCAGCAC
TTACAGCATTTGCAAAACCGAACAGGTCCAAGACTCAGAAGATTCCGGCAAAATGCTAGCTAAACGTCAATTCCGCATCGGTGA
CATTCGGGTGAACATACAAGCTTCGACAAATTACCAAAAGCGGCGAGTCGACCTATTCGGGTACGGCATTTGGATCAGAT
GATCGAGCGGTAAATTAACTTATACAAATTGACTTTGCAGCAAAACAAAGACATGGCAAAATTTGAACATTTAAATACTCCCCG
AACTTAACGTAGAGCTCGCAACCGCATATATTAAACCATGAAAAACGCCACGAGTCATTTTCAGGTTTCAGTTTATACAA
TCAGGACGAAAAAGGTTCTGACTCTTTAGGTATTTTGGCGGGCAAGCTCAAGAAAGTTGCAGGTAGCGCAGAAAGTAGAAACG
GCAAAATGGCATTCACCACATTGGGTTAGCGGGCAACAATAA

FIG. 8C

>SEQ ID NO: 50

SSGGGSGGGVAAADIGAGLADALTAPLDHKDKGLQLTLDDQSVRKNEKCLKLAAQGAEKTYGNGDSLNTGKLNKNDKVSFRFD
FIRQIEVDGKLITLESGEFQYKQSHSALTALQTEQVQDSEDSGKMVAKRQFRIGDIAGEHTSFDKLPKGGSATYRGTAFG
SDDAGGKLTYTIDFAAKQGHGKIEHLKSPELNVELATAYIKPDEKRHAVISGSVLYNQDEKGSYSGLIFGGQQAQEVAGSAE
VETANGIHHIGLAAKQ

> SEQ ID NO: 46

AGCTCTGGAGGTGGAGGAGTTGCAGCAGACATTGGAGCGAGGATTAGCAGATGCACGTGACGGCACCCGTTGGATCATAAAGAC
AAAGGCTTGCAGTCGCTTACCTTAGATCAGTCTGTCTCAGGAAAAATGAGAAACTTAAGTTGGCGGCGCAAGGCGCTGAAAAA
ACTTATGGAAACGGTGACAGCTTAAATACAGGTAAACTCAAAAAATGATAAAGTCTCGCGTTTGTATTTTCATTCGTCAAATC
GAAGTAGATGGCAAGCTTATTACATTAGAAAGCGGTGAATTCCAAAGTATATAAACAAATCCCATTCAGCACCTTACAGCATTG
CAAACCGAACAGGTCCAAAGACTCAGAAAGATTCCGGCAAAATGGTAGCTAAACGTCAATTCGCGCATCGGTGACATTCGCGGT
GAACATACAAGCTTCGACAAAATTACCAAAAGCGGCAGTGCACCTATCGCGGTACGGCATTTGGATCAGATGATGCAGGC
GGTAAATTAACTTATACAATTGACTTTTGCAGCAAAACAAGGACATGGCAAAATTGAACATTTAAAAATCTCCCGAACTTAAC
GTAGAGCTCGCAACCGCATATATTAAACAGATGAAAAACGCCACGCGAGTCATTTTCAGGTTTCAGTTTATACAATCAGGAC
GAAAAAGGTTTCGTACTCTTTTAGGTAATTTTGGCGGCAAGCTCAAGAAAGTTGCAGGTAGCGCAGAAAGTAGAAAAACGGCAAAAT
GGCATTCACCACATTGGGTTAGCGGCGGAAACAATAA

18/22

FIG. 8D**>SEQ ID NO: 47**

AGCAGCGGGGGCGGTGGAGTTGCAGCAGACATTTGGAGCAGGATTAGCAGATGCACCTGACGGCACCGTTGGATCATAAAGACA
AAGGTTGCAGTCGCTTACCTTAGATCAGTCTGTCAAGAAAATGAGAAAACCTTAAGTTGGCGGCGCAAGCGCTGAAAAAAC
TTATGGAACCGGTGACAGCTTAAATACAGGTAAACTCAAAAATGATAAAGTCTCGCGTTTGAATTCATTCGTCAAATCGAA
GTAGATGGCAAGCTTATTACATTAGAAAAGCGGTGAATTCCAAGTATATAACAATCCCATTCAGCACTTACAGCATTTGCAAA
CCGAACAGGTCCAAGACTCAGAAGATTCCGGCAAAATGGTAGCTAAACGTCAATTCGGCATCGGTGACATTCGGGGTGAACA
TACAAAGCTTCGACAAATTACCAAAAAGCGGCGAGTGGACCTATCGCGGTACGGCATTTGGATCAGATGATGCAGGGCGGTAAA
TTAACTTATACAAATTGACTTTGCAGCAAAAACAAGGACATGGCAAAATTGAACATTTAAAATCTCCCGAACTTAACGTAGAGC
TCGCAACCGCATATATTAAACAGATGAAAAACGCCACGCAGTCAATTCAGGTTTCAAGTTTATACAATCAGGACGAAAAAGG
TTCGTACTCTTTTAGGTATTTTGGCGGGCAAGCTCAAGAAAGTTGCAGGTAGCGCAGAAAGTAGAAAACGGCAAAATGGCATTCAC
CACATTGGGTTAGCGGCGAAACAATAA

>SEQ ID NO: 48

AGCAGCGGAGGGGGGTGTGCGCCCGGACATCGGTGCGGGGCTTGCCGATGCACCTAACCGCACCGCTCGACCATAAAGACA
AAGGTTTCAGTCTTTAAACACTGGATCAGTCCGTCAAGAAAACGAGAAAACCTGAAGCTGGCGGCACAAGTGCGGAAAAAAC
TTATGGAACCGCGACAGCCTTAATACGGGCAAAATTGAAGAACGACAAAGTCAAGCGCTTCGACTTTATCCGTCAAATCGAA
GTGGACGGGAAGCTCATTACCTTGGAGAGCGGAGAGTTCCAAGTGTACAAACAAGCCATTCGGCCCTTAACCGCCCTTCAGA
CCGAGCAAGTACAAGACTCGGAGGATTCGGGAAGATGGTTGCGAAACGCCAGTTCAGAAATCGCGACATAGCGGGCGAACA
TACATCTTTTGACAAAGCTTCCCAAAGCGGCGAGTGGCACATATCGCGGGACGGCGTTCGGTTTCAGACGATGCTGGCGGAAAA
CTGACCTATACTATAGATTTCGCCGCCAAGCAGGGACACGGCAAAATCGAACATTTGAAATCGCCCGAACTCAATGTCGAGC
TTGCCACCGCCATATCAAGCCGATGAAAAACGCCATGCCGTTATCAGCGGTTCCGTCCTTTACAAACCAAGACGAGAAAGG
CAGTTACTCCCTCGGTATCTTTGGCGGGCAAGCCAGGAAGTTGCCGGCAGCGGGAAGTGGAAACCGCAACCGGCATACAC
CATATCGGTCTTGCCGCCCAAGCAGTAA

FIG. 8E

>SEQ ID NO: 49

SSGGGVAADIGAGLADALTAPLDHKDKGLQSLTLDQSVRKNEKCLKLAAQGAEKTYGNGDSLNTGKLKNDKVSRLFIRQIE
VDGKLITLESGEFQVYKQSHSALTALQTEQVQDSEDSGKMVAKRQFRIGDIAGEHTSFDKLPKGSATYRGTAFGSD
DAGGKLTYYTIDFAAKQGHGKIEHLKSPELNVELATAYIKPDEKRHAVISGSVLYNQDEKGSYSLGIFGGQAQEVAGSAEIVET
ANGIHIGLAAKQ

>SEQ ID NO: 54

AGCAGCGGAAGCGGAAGCGGGGTGTCGCCGCCGACATCGGCACAGGGCTTGCCGATGCCTAACTGCGCCGCTCG
ACCATAAAGACAAAGGTTTGAAATCCCTGACATTGGAAGACTCCATTTCCTCCAAAACGGAACACTGACCCCTGTCTGGCACAAAG
TGCGGAAAAAACTTTCAAAGTCGGCGACAAAAGACACAGTCTCAATACAGGCAAAATTGAAGAACGACAAAAATCAGCCGCTTC
GACTTTGTGCAAAAAATCGAAGTGGACGACAAACCATCACGCTGCAAGCGCGCAATTTCAAAATATACAAAACAGGACCACT
CCGCCGTCTGTGCCCTACAGATTGAAAAAATCAACAACCCCGACAAAAATCGACAGCCTGATAAACCAACGCTCCTTCCTTGT
CAGCGGTTTGGCGGAGAACATACCGCCCTTCAACCAACTGCCCGAGCGGCAAAAGCCGAGTATCACGGCAAAAGCATTCAGCTCC
GACGATGCCGGGAAAACTGACCTATACCATAGATTTCGCCGCCAAACAGGACACGCGCAAAATCGAAACACCTGAAAAACAC
CCGAGCAGAAATGTCGAGCTTGCCCTCCGCCGAACCTCAAAGCAGATGAAAAATCACACGCCGCTCATTTTGGCGGACACGCGCTA
CGGCAGCGAAGAAAAAGGCACCTTACCACCTCGCTCTTTTCGGCGACCGAGCCCAAGAAATCGCCGCTCGGCAACCCGTGAAG
ATAAGGGAAAAGGTTACCGAAATCGGCATCGCCGGCAACACAGTAG

>SEQ ID NO: 55

SSGSGSGGGVAADIGTGLADALTAPLDHKDKGLKSLTLEDSISQNGTLTLQAQGAEKTFKVGDKDNLNTGKLKNDKISR
DFVQKIEVDGQITITLASGEFQIYKQDHSVVALQIEKINPNPKIDSLINQRSFLVSLGGEHTAFNQLPSCKAIEYHGKAFSS
DDAGGKLTYYTIDFAAKQGHGKIEHLKTPEQNVELASAEELKADEKSHAVILGDTTRYGSEEKGTYYHLALFGDRAQEIAGSATVK
IREKVHEIGIACKQ.

20/22

FIG. 8F

> SEQ ID NO: 57
SSGGGSGGGVTADIGTGLADALTAPLDHKDKGLKSLTLEDSISQNGTLTLSAQGAECTYNGGDSLNTGKLNKDKVSRFDF
IRQIEVDGQLITLESGEFQVYKQSHSALTALQTEQEQQPEHSEKMWAKRRFRIGDIAGEHTSFDKLPKDVMATYRGTAFGSD
DAGGKLTYTIDFAAKQGHGKIEHLKSPELNVDLAVAYIKPDEKHHAVISGSVLYNQDEKGSYSLSLGFGEKAQEVAGSAEVE
ANGIHHIGLAAKQ

> GenBank AY330406 (SEQ ID NO: 58)
CSSGGGSGGGVTADIGTGLADALTAPLDHKDKGLKSLTLEDSISQNGTLTLSAQGAECTYNGGDSLNTGKLNKDKVSRFDF
FIRQIEVDGQLITLESGEFQVYKQSHSALTALQTEQEQQPEHSEKMWAKRRFRIGDIAGEHTSFDKLPKDVMATYRGTAFGS
DDAGGKLTYTIDFAAKQGHGKIEHLKSPELNVDLAVAYIKPDEKHHAVISGSVLYNQDEKGSYSLSLGFGEKAQEVAGSAEVE
TANGIHHIGLAAKQ

>GenBank FJ184191 (SEQ ID NO: 59)
CSSGGGGAADIGAGLADALTAPLDHKDKGLQSLILDQSVRKNEKLLAAQGAECTYNGGDSLNTGKLNKDKVSRFDFIRQI
EVDGQLITLESGEFQVYKQSHSALTALQTEQVQDSEHSGKMWAKRQFRIGDIAGEHTSFDKLPPEGGRATYRGTAFSDDAGG
KLIYTIIDFAAKQGHGKIEHLKSPELNVDLAAADIKPDEKHHAVISGSVLYNQAEKGSYSLSLGFGGKAQEVAGSAEVKTVNGI
RHIGLAAKQ

> GenBank AY330385 (SEQ ID NO: 60)
CSSGGGGAADIGAGLADALTAPLDHKDKSLQSLTLDQSVRKNEKLLAAQGAECTYNGGDSLNTGKLNKDKVSRFDFIRQI
EVDGQLITLESGEFQVYKQSHSALTALQTEQVQDSEHSGKMWAKRQFRIGDIAGEHTSFDKLPPEGGRATYRGTAFGSDDASG
KLTYTIIDFAAKQGHGKIEHLKSPELNVDLAAADIKPDKKRHAVISGSVLYNQAEKGSYSLSLGFGGQAQEVAGSAEVE
RHIGLAAKQ

FIG. 8G

> SEQ ID NO: 61

GGCAGCAGCGGAGGCGGGTGTCGCCGCCGACATCGGCGCGGTGCTTGCCGATGCACCTAACCGCACCGCTCGACCATAAAG
ACAAAAGTTTGAGTCTTTGACGCTGGATCAGTCCGTACGGAAAAACGAGAAAACCTGAAGCTGGCGGCACAAAGTGGGAAAA
AACTATGGAACCGGCACAGCCTCAATACGGGCAAAATGAAGAACGACAAGGTACGCCGCTTCGACTTTATCCGTCAAATC
GAAGTGGACGGCAGCTCATTTACCTTGGAGAGCGGAGAGTTCCAAAGTGTAACAACAAAGCCATTCCGCCCTTAACCGCCCTTC
AGACCGAGCAAGTACAAGATTCCGGAGCATTCAGGGAAGATGGTTGCCGAAACGCCAGTTTCAGAAATCGGCGATATAGCGGGTGA
ACATAACATCTTTTGACAAAGCTTCCGAAAGCGGCGAGGCGACATATCGCGGACGGCATTCGGTTCAGACGATGCCAGTGGA
AACTGACCTACACCATAGATTTCGCCGCCAAGCAGGGACACGGCAAAATCGAACAATTTGAAATCGCCAGAACTCAATGTTG
ACCTGGCCGCCCTCCGATATCAAGCCGGATAAAAAACGCCATGCCGTTCATCAGCGGTTCCGTCCTTTACAACCAAGCCGAGAA
AGGCACTTACTCTCTAGGCATCTTTGGCGGGCAAGCCAGGAAGTTGCCGGCAGCGCAGAAAGTGGAAACCGCAACCGGCATA
CGCCATATCGGTCTTGCCGCCCAAGCAGTAA

> SEQ ID NO: 62

GSSGGGGVAADIGAVLADALTAPLDHKDSLQSLTLDQSVRKNEKLKLAQAQAEKTYNGDSLNTGKLNKNDKVSFRDFIRQI
EVDGQLITLESGEFQYKQSHSALTALQTEQVQDSEHSGKMVAKRQFRIGDIAGEHTSFDKLPEGGRATYRGTAFGSDDASG
KLTYTIDFAAKQGHGKIEHLKSPELNVDLAASDIKPKDKRHAVISGSVLYNQAEKGSYSLSLIFGGQAQAEVAGSAEVEETANGI
RHIGLAAKQ

22/22

FIG. 8H**> SEQ ID NO: 63**

GGCAGCAGCGGAGCGGGGTGTCGCCGCCGACATCGCGCGGGGGCTTGCCGATGCACCTAACCGCACCGCTCGACCATAAAG
ACAAAAGTTTGCAGTCTTTGACGCTGGATCAGTCCGTCAAGGAAAAACGAGAAAACTGAAGCTGGCGGCACAAGGTGCGGAAAA
AACTTATGAAAACGGCGACAGCCTCAATACGGGCAAAATTGAAGAACGACAAAGTCAAGCCGCTTCGACTTATCCGTCAAAATC
GAAGTGGACGGGCAGCTCATTTACCTTGGAGAGCGGAGAGTTCCAAATATACAAACAGGACCACTCCGCCGTCGTTGCCCTAC
AGATTGAAAAAATCAACAACCCCGACAAAATCGACAGCCTGATAAAACCAACGCTCCTTCTTGTCAAGCGGTTTGGGTGGAGA
ACATAACCGCCTTCAACCAACTGCCCCAGCGCAAGCCGAGTATCACGGCAAGCATTCAGCTCCGACGATGCTGGCGGAAAA
CTGACCTATACCATAGATTTCCGCCGCCAAACAGGGACACGGCAAAATCGAAACACTTGAAAAACACCCGAGCAAAATGTCGAGC
TTGCCCTCCGCAACTCAAAGCAGATGAAAAATCACACGCCGTCATTTTGGCGGACACGCGCTACGGCGCGAAGAAAAAGG
CACTTACCACCTCGCCCTTTTTCGGCGACCGGCCCCAAGAAATCGCCGGCTCGGCAACCGTGAAGATAAGGGAAAAAGGTTTCAC
GAAATCGGCATCGCGCGCAACAGTAA

> SEQ ID NO: 64

GSSGGGVAADIGAGLADALTAPLDHKDKSLQSLTLDQSVRKNEKLKLAQAQGAEKTYNGDSLNTGKLKNDKVSFRDFIRQI
EVDGQLITLESGEFQIYKQDHSVVVALQIEKINNPDKIDSLINQRSFLVSGLGGEHTAFNQLPSGKAEYHGKAFSSDDAGGK
LTYTIDFAAKQGHGKIEHLKTPEQNVELASAEKKADEKSHAVILGDTRYGGEEKGTYHLALFGDRAQEIAGSATVKIREKVH
EIGIAGKQ