US 20250263739A1

(19) **United States**

(12) **Patent Application Publication**

THOMPSON

(10) **Pub. No.: US 2025/0263739 A1**

(43) **Pub. Date: Aug. 21, 2025**

(54) **PLASMID ENCODING A TLR9 AND FC FUSION PROTEIN**

(71) Applicant: **Wyvern Pharmaceuticals Inc.**, Calgary (CA)

(72) Inventor: **Bradley G. THOMPSON**, Calgary (CA)

(21) Appl. No.: **18/582,222**

(22) Filed: **Feb. 20, 2024**

Publication Classification

(51) **Int. Cl.**

C12N 15/86	(2006.01)
C07K 14/48	(2006.01)
C07K 14/62	(2006.01)
C07K 14/705	(2006.01)
C12N 9/22	(2006.01)

(52) **U.S. Cl.**

CPC ***C12N 15/86*** (2013.01); ***C07K 14/48*** (2013.01); ***C07K 14/62*** (2013.01); ***C07K 14/705*** (2013.01); ***C07K 14/70596*** (2013.01); ***C12N 9/22*** (2013.01); *C07K 2319/30* (2013.01); *C12N 2750/14143* (2013.01); *C12N 2800/00* (2013.01)

(57) **ABSTRACT**

Some embodiments of the present disclosure relate to one or more compositions that upregulate the production of one or more sequences of mRNA. The sequences of mRNA may encode for translation of a target biomolecule, thereby causing an increase in bioavailability of the target biomolecule within a subject that is administered the one or more compositions. In some embodiments of the present disclosure, the target biomolecule is a fusion protein with an Fc fragment, such as a toll-like receptor 3-Fc (TLR3-Fc). In some embodiments of the present disclosure, the target biomolecule is toll-like receptor 9-Fc (TLR9-Fc). In some embodiments of the present disclosure, the target biomolecule is deoxyribonuclease I-Fc (DNAse I-Fc). In some embodiments of the present disclosure, the target biomolecule is neural growth factor-Fc (NGF-Fc). In some embodiments of the present disclosure, the target biomolecule is insulin-Fc.

Specification includes a Sequence Listing.

PLASMID ENCODING A TLR9 AND FC FUSION PROTEIN

[0001] This application contains a Sequence Listing electronically submitted via Patent Center to the United States Patent and Trademark Office as an XML Document file entitled "A8149440US-Sequence Listing.xml" created on 2024 Feb. 8 and having a size of 68,245 bytes. The information contained in the Sequence Listing is incorporated by reference herein.

TECHNICAL FIELD

[0002] The present disclosure generally relates to compositions for regulating the production of fusion proteins. In particular, the present disclosure relates to compositions for regulating gene expression and, consequently, the production of fusion proteins.

BACKGROUND

[0003] Bioactive molecules, including toll-like receptors, enzymes, and hormones, are necessary for the homeostatic control of biological systems.

[0004] When bioactive molecules are over-expressed, under-expressed or mis-expressed, homeostasis is lost, and disease is often the result.

[0005] As such, it may be desirable to establish therapies, treatments and/or interventions that address when homeostasis and the regulation of bioactive molecules are lost in order to prevent or treat the resulting disease.

SUMMARY

[0006] Some embodiments of the present disclosure relate to one or more compositions that upregulate the production of one or more sequences of mRNA. The sequences of mRNA may encode for translation of a target biomolecule, thereby causing an increase in bioavailability of the target biomolecule within a subject that is administered the one or more compositions. In some embodiments of the present disclosure, the target biomolecule is a fusion protein with an Fc fragment, such as a toll-like receptor 3-Fc (TLR3-Fc). In some embodiments of the present disclosure, the target biomolecule is toll-like receptor 9-Fc (TLR9-Fc). In some embodiments of the present disclosure, the target biomolecule is deoxyribonuclease I-Fc (DNAse I-Fc). In some embodiments of the present disclosure, the target biomolecule is neural growth factor-Fc (NGF-Fc). In some embodiments of the present disclosure, the target biomolecule is insulin-Fc.

[0007] In some embodiments of the present disclosure the compositions comprise a plasmid of deoxyribonucleic acid (DNA) that includes one or more insert sequences of nucleic acids that encode for the production of mRNA and a backbone sequence of nucleic acids that facilitates introduction of the one or more insert sequences into one or more of a subject's cells where it is expressed and/or replicated. Expression of the one or more insert sequences by one or more cells of the subject results in an increased production of the mRNA and, consequently, increased translation of the target biomolecule by one or more of the subject's cells.

[0008] Some embodiments of the present disclosure relate to a recombinant plasmid (RP).

[0009] In some embodiments of the present disclosure, the RP comprises a nucleotide sequence of SEQ ID NO. 1 and SEQ ID NO. 2. The RP comprises a nucleotide sequence encoding one or more nucleotide sequences encoding an mRNA sequence that encodes for the fusion protein TLR3-Fc.

[0010] Some embodiments of the present disclosure relate to a recombinant plasmid. In some embodiments of the present disclosure, the RP comprises a nucleotide sequence of SEQ ID NO. 1 and SEQ ID NO. 3. The RP comprises a nucleotide sequence encoding one or more nucleotide sequences encoding an mRNA sequence that encodes for the fusion protein TLR9-Fc.

[0011] Some embodiments of the present disclosure relate to a recombinant plasmid. In some embodiments of the present disclosure, the RP comprises a nucleotide sequence of SEQ ID NO. 1 and SEQ ID NO. 4. The RP comprises a nucleotide sequence encoding one or more nucleotide sequences encoding an mRNA sequence that encodes for the fusion protein DNAse I-Fc.

[0012] Some embodiments of the present disclosure relate to a recombinant plasmid. In some embodiments of the present disclosure, the RP comprises a nucleotide sequence of SEQ ID NO. 1 and SEQ ID NO. 5. The RP comprises a nucleotide sequence encoding one or more nucleotide sequences encoding an mRNA sequence that encodes for the fusion protein NGF-Fc.

[0013] Some embodiments of the present disclosure relate to a recombinant plasmid. In some embodiments of the present disclosure, the RP comprises a nucleotide sequence of SEQ ID NO. 1 and SEQ ID NO. 6. The RP comprises a nucleotide sequence encoding one or more nucleotide sequences encoding an mRNA sequence that encodes for the fusion protein insulin-Fc.

[0014] Some embodiments of the present disclosure relate to a method of making a composition/target cell complex. The method comprising a step of administering a RP comprising SEQ ID NO. 1 and one of SEQ ID NO. 2, SEQ ID NO. 3, SEQ ID NO. 4, SEQ ID NO. 5 or SEQ ID NO. 6 to a target cell for forming the composition/target cell complex, wherein the composition/target cell complex causes the target cell to increase production of one or more sequences of mRNA that increases production of a target biomolecule.

[0015] Embodiments of the present disclosure relate to at least one approach for inducing endogenous production of one or more sequences of mRNA that encodes for a target biomolecule, for example TLR3-Fc. A first approach utilizes gene vectors containing nucleotide sequences for increasing the endogenous production of one or more sequences of mRNA, which are complete or partial sequences and/or combinations thereof of TLR3-Fc, which can be administered to a subject to increase the subject's production of one or more sequences of the mRNA.

[0016] Embodiments of the present disclosure relate to at least one approach for inducing endogenous production of one or more sequences of mRNA that encodes for a target biomolecule, for example TLR9-Fc. A first approach utilizes gene vectors containing nucleotide sequences for increasing the endogenous production of one or more sequences of mRNA, which are complete or partial sequences and/or combinations thereof of TLR9-Fc, which can be administered to a subject to increase the subject's production of one or more sequences of the mRNA.

[0017] Embodiments of the present disclosure relate to at least one approach for inducing endogenous production of one or more sequences of mRNA that encodes for a target biomolecule, for example DNAse I-Fc. A first approach utilizes gene vectors containing nucleotide sequences for increasing the endogenous production of one or more sequences of mRNA, which are complete or partial sequences and/or combinations thereof of DNAse I-Fc, which can be administered to a subject to increase the subject's production of one or more sequences of the mRNA.

[0018] Embodiments of the present disclosure relate to at least one approach for inducing endogenous production of one or more sequences of mRNA that encodes for a target biomolecule, for example NGF-Fc. A first approach utilizes gene vectors containing nucleotide sequences for increasing the endogenous production of one or more sequences of mRNA, which are complete or partial sequences and/or combinations thereof of NGF-Fc, which can be administered to a subject to increase the subject's production of one or more sequences of the mRNA.

[0019] Embodiments of the present disclosure relate to at least one approach for inducing endogenous production of one or more sequences of mRNA that encodes for a target biomolecule, for example insulin-Fc. A first approach utilizes gene vectors containing nucleotide sequences for increasing the endogenous production of one or more sequences of mRNA, which are complete or partial sequences and/or combinations thereof of insulin-Fc, which can be administered to a subject to increase the subject's production of one or more sequences of the mRNA.

DETAILED DESCRIPTION

[0020] Unless defined otherwise, all technical and scientific terms used therein have the meanings that would be commonly understood by one of skill in the art in the context of the present description. Although any methods and materials similar or equivalent to those described therein can also be used in the practice or testing of the present disclosure, the preferred compositions, methods and materials are now described. All publications mentioned therein are incorporated therein by reference to disclose and describe the methods and/or materials in connection with which the publications are cited.

[0021] As used therein, the singular forms "a", "an", and "the" include plural references unless the context clearly dictates otherwise. For example, reference to "a composition" includes one or more compositions and reference to "a subject" or "the subject" includes one or more subjects.

[0022] As used therein, the terms "about" or "approximately" refer to within about 25%, preferably within about 20%, preferably within about 15%, preferably within about 10%, preferably within about 5% of a given value or range. It is understood that such a variation is always included in any given value provided therein, whether or not it is specifically referred to.

[0023] As used therein, the term "ameliorate" refers to improve and/or to make better and/or to make more satisfactory.

[0024] As used therein, the term "cell" refers to a single cell as well as a plurality of cells or a population of the same cell type or different cell types. Administering a composition to a cell includes in vivo, in vitro and ex vivo administrations and/or combinations thereof.

[0025] As used therein, the term "complex" refers to an association, either direct or indirect, between one or more particles of a composition and one or more target cells. This association results in a change in the metabolism of the target cell. As used therein, the phrase "change in metabolism" refers to an increase or a decrease in the one or more target cells' production of one or more proteins, and/or any post-translational modifications of one or more proteins.

[0026] As used therein, the term "composition" refers to a substance that, when administered to a subject, causes one or more chemical reactions and/or one or more physical reactions and/or one or more physiological reactions and/or one or more immunological reactions in the subject. In some embodiments of the present disclosure, the composition is a plasmid vector.

[0027] As used therein, the term "endogenous" refers to the production and/or modification of a molecule that originates within a subject.

[0028] As used therein, the term "exogenous" refers to a molecule that is within a subject but that did not originate within the subject. As used therein, the terms "production", "producing" and "produce" refer to the synthesis and/or replication of DNA, the transcription of one or more sequences of RNA, the translation of one or more amino acid sequences, the post-translational modifications of an amino acid sequence, and/or the production of one or more regulatory molecules that can influence the production and/or functionality of an effector molecule or an effector cell. For clarity, "production" is also used therein to refer to the functionality of a regulatory molecule, unless the context reasonably indicates otherwise.

[0029] As used therein, the term "subject" refers to any therapeutic target that receives the composition. The subject can be a vertebrate, for example, a mammal including a human. The term "subject" does not denote a particular age or sex. The term "subject" also refers to one or more cells of an organism, an in vitro culture of one or more tissue types, an in vitro culture of one or more cell types, ex vivo preparations, and/or a sample of biological materials such as tissue, and/or biological fluids.

[0030] As used therein, the term "target biomolecule" refers to a protein-Fc fusion molecule that is found within a subject. A biomolecule may be endogenous or exogenous to a subject.

[0031] As used therein, the term "target cell" refers to one or more cells and/or cell types that are affected, either directly or indirectly, by a biomolecule.

[0032] As used therein, the term "therapeutically effective amount" refers to the amount of the composition used that is of sufficient quantity to ameliorate, treat and/or inhibit one or more of a disease, disorder or a symptom thereof. The "therapeutically effective amount" will vary depending on the composition used, the route of administration of the composition and the severity of the disease, disorder or symptom thereof. The subject's age, weight and genetic make-up may also influence the amount of the composition that will be a therapeutically effective amount.

[0033] As used therein, the terms "treat", "treatment" and "treating" refer to obtaining a desired pharmacologic and/or physiologic effect. The effect may be prophylactic in terms of completely or partially preventing an occurrence of a disease, disorder or symptom thereof and/or the effect may be therapeutic in providing a partial or complete amelioration or inhibition of a disease, disorder, or symptom thereof. Additionally, the term "treatment" refers to any treatment of a disease, disorder, or symptom thereof in a subject and includes: (a) preventing the disease from occurring in a subject which may be predisposed to the disease but has not yet been diagnosed as having it; (b) inhibiting the disease, i.e., arresting its development; and (c) ameliorating the disease.

[0034] As used therein, the terms "unit dosage form" and "unit dose" refer to a physically discrete unit that is suitable as a unitary dose for patients. Each unit contains a predetermined quantity of the composition and optionally, one or more suitable pharmaceutically acceptable carriers, one or more excipients, one or more additional active ingredients, or combinations thereof. The amount of composition within each unit is a therapeutically effective amount.

[0035] Where a range of values is provided therein, it is understood that each intervening value, to the tenth of the unit of the lower limit unless the context clearly dictates otherwise, between the upper and lower limit of that range and any other stated or intervening value in that stated range, is encompassed within the disclosure. The upper and lower limits of these smaller ranges may independently be included in the smaller ranges, and are also, encompassed within the disclosure, subject to any specifically excluded limit in the stated range. Where the stated range includes one or both of the limits, ranges excluding either or both of those included limits are also included in the disclosure.

[0036] In some embodiments of the present disclosure, a composition is a recombinant plasmid (RP) for introducing genetic material, such as one or more nucleotide sequences, into a target cell for reproduction or transcription of an insert that comprises one or more nucleotide sequences that are carried within the RP. In some embodiments of the present disclosure, the RP is delivered without a carrier, by a viral vector, by a protein coat, or by a lipid vesicle. In some embodiments of the present disclosure, the vector is an adeno-associated virus vector.

[0037] In some embodiments of the present disclosure, the insert comprises one or more nucleotide sequences that encode for production of at least one sequence of mRNA that increases the production of target biomolecules, such as a fusion protein with an Fc fragment. An Fc fragment is the distal portion of the heavy chain of an antibody.

[0038] In some embodiments of the present disclosure, the target biomolecule is TLR3-Fc.

[0039] In some embodiments of the present disclosure, the target biomolecule is TLR9-Fc.

[0040] In some embodiments of the present disclosure, the target biomolecule is DNAse I-Fc.

[0041] In some embodiments of the present disclosure, the target biomolecule is NGF-Fc.

[0042] In some embodiments of the present disclosure, the target biomolecule is insulin-Fc.

[0043] Some embodiments of the present disclosure relate to a composition that can be administered to a subject with a condition that results, directly or indirectly, from the dysregulated production of a biomolecule. When a therapeutically effective amount of the composition is administered to the subject, the subject may change production and/or functionality of one or more biomolecules.

[0044] In some embodiments of the present disclosure, the subject may respond to receiving the therapeutic amount of the composition by changing production and/or functionality of one or more intermediary molecules by changing production of one or more DNA sequences, one or more RNA sequences, and/or one or more proteins that regulate the levels and/or functionality of the one or more intermediary molecules. The one or more intermediary molecules regulate the subject's levels and/or functionality of the one or more biomolecules.

[0045] In some embodiments of the present disclosure, administering a therapeutic amount of the composition to a subject upregulates the production, functionality or both one or more sequences of mRNA that each encode for one or more biomolecules.

[0046] In some embodiments of the present disclosure, the composition is an RP that may be used for gene therapy. The gene therapy is useful for increasing the subject's endogenous production of one or more sequences of mRNA that encode for a target biomolecule. For example, the RP can contain one or more nucleotide sequences that cause increased production of one or more nucleotide sequences that cause an increased production of one or more mRNA sequences that encode for one biomolecule, such as TLR3-Fc, TLR9-Fc, DNAse I-Fc, NGF-Fc or insulin-Fc.

[0047] In some embodiments of the present disclosure, the delivery vehicle of the RP used for gene therapy may be a vector that comprises a virus that can be enveloped, or not (unenveloped), replication effective or not (replication ineffective), or combinations thereof. In some embodiments of the present disclosure, the vector is a virus that is not enveloped and not replication effective. In some embodiments of the present disclosure, the vector is a virus of the Parvoviridae family. In some embodiments of the present disclosure, the vector is a virus of the genus Dependoparvovirus. In some embodiments of the present disclosure, the vector is an adeno-associated virus (AAV). In some embodiments of the present disclosure, the vector is a recombinant AAV. In some embodiments of the present disclosure, the vector is a recombinant AAV6.2FF.

[0048] In some embodiments of the present disclosure, the delivery vehicle of the RP used for gene therapy may be a protein coat.

[0049] In some embodiments of the present disclosure, the delivery vehicle of the RP used for gene therapy may be a lipid vesicle.

[0050] The embodiments of the present disclosure also relate to administering a therapeutically effective amount of the composition. In some embodiments of the present disclosure, the therapeutically effective amount of the composition that is administered to a patient is between about 10 and about 1×10^{16} $TCID_{50}$/kg (50% tissue culture infective dose per kilogram of the patient's body mass). In some embodiments of the present disclosure, the therapeutically effective amount of the composition that is administered to the patient is about 1×10^{13} $TCID_{50}$/kg. In some embodiments of the present disclosure, the therapeutically effective amount of the composition that is administered to a patient is measured in TPC/kg (total particle count of the composition per kilogram of the patient's body mass). In some embodiments of the present disclosure, the therapeutically effective amount of the composition is between about 10 and about 1×10^{16} TCP/kg.

[0051] Some embodiments of the present disclosure relate to an adeno-associated virus (AAV) genome consisting of a RP that when operable inside a target cell will cause the target cell to produce a mRNA sequence that upregulates production of a biomolecule, with examples being TLR3-Fc, TLR9-Fc, DNAse I-Fc, NGF-Fc, or insulin-Fc. The RP is comprised of AAV2 inverted terminal repeats (ITRs), a composite CASI promoter, and a human growth hormone

(HGH) signal peptide followed by a mRNA expression cassette encoding for TLR3-Fc, TLR9-Fc, DNAse I-Fc, NGF-Fc, or insulin-Fc, followed by a Woodchuck Hepatitis Virus post-transcriptional regulatory element (WPRE) and a Simian virus 40 (SV40) polyadenylation (polyA) signal.

```
SEQ ID NO. 1 (backbone sequence No. 1):
5'

TTCTAGAATAATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTT

AACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTTGTATCATG

CTATTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATAAATCCTGGTTGCTGTCT

CTTTATGAGGAGTTGTGGCCCGTTGTCAGGCAACGTGGCGTGGTGTGCACTGTGTTT

GCTGACGCAACCCCCACTGGTTGGGGCATTGCCACCACCTGTCAGCTCCTTTCCGGG

ACTTTCGCTTTCCCCCTCCCTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCC

GCTGCTGGACAGGGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGA

AATCATCGTCCTTTCCTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGAC

GTCCTTCTGCTACGTCCCTTCGGCCCTCAATCCAGCGGACCTTCCTTCCCGCGGCCTG

CTGCCGGCTCTGCGGCCTCTTCCGCGTCTTCGCCTTCGCCCTCAGACGAGTCGGATCT

CCCTTTGGGCCGCCTCCCCGCCTAAGCTTATCGATACCGTCGAGATCTAACTTGTTTA

TTGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTCACAAATAAAG

CATTTTTTTCACTGCATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCAT

GTCTGGATCTCGACCTCGACTAGAGCATGGCTACGTAGATAAGTAGCATGGCGGGTT

AATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCTCTGCGCGC

TCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGACGCCCGGGCTTTGCCC

GGGCGGCCTCAGTGAGCGAGCGAGCGCGCCAGCTGGCGTAATAGCGAAGAGGCCC

GCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGAATTCCAGA

CGATTGAGCGTCAAAATGTAGGTATTTCCATGAGCGTTTTTCCTGTTGCAATGGCTG

GCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTC

AGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTG

ATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTCAGGATT

CTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCCCGCTC

TGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGCG

CCCTGTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGACCGC

TACACTTGCCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCC

ACGTTCGCCGGCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGA

TTTAGTGCTTTACGGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGT

AGTGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCT

TTAATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTC

TTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTATTGGTTAAAAAATGAGCTGATT

TAACAAAAATTTAACGCGAATTTTAACAAAATATTAACGTTTACAATTTAAATATTT

GCTTATACAATCTTCCTGTTTTTGGGGCTTTTCTGATTATCAACCGGGGTACATATGA

TTGACATGCTAGTTTTACGATTACCGTTCATCGATTCTCTTGTTTGCTCCAGACTCTC
```

-continued

AGGCAATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCTCTCCGGC

ATGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTGACTGTCTCC

GGCCTTTCTCACCCGTTTGAATCTTTACCTACACATTACTCAGGCATTGCATTTAAAA

TATATGAGGGTTCTAAAAATTTTTATCCTTGCGTTGAAATAAAGGCTTCTCCCGCAA

AAGTATTACAGGGTCATAATGTTTTTGGTACAACCGATTTAGCTTTATGCTCTGAGG

CTTTATTGCTTAATTTTGCTAATTCTTTGCCTTGCCTGTATGATTTATTGGATGTTGGA

ATTCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGGTATTTCACACCGCATATGG

TGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGACACCCG

CCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCGCTTACAGA

CAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGGTTTTCACCGTCATCACCG

AAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCATG

ATAATAATGGTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACC

CCTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAAC

CCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCC

GTGTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCACCCAGAA

ACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACAT

CGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTT

TCCAATGATGAGCACTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGAC

GCCGGGCAAGAGCAACTCGGTCGCCGCATACACTATTCTCAGAATGACTTGGTTGAG

TACTCACCAGTCACAGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATG

CAGTGCTGCCATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGAT

CGGAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTAACTC

GCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGACGAGCGTGAC

ACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAACTATTAACTGGCGAACT

ACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGC

AGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCTGATAAATCTGG

AGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGC

CCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGA

AATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGAC

CAAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTTAAAAGGA

TCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTC

GTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTT

TTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCTACCAGCGGTGGT

TTGTTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAG

AGCGCAGATACCAAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAA

GAACTCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC

TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGA

TAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGC

GAACGACCTACACCGAACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACG

-continued

CTTCCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAG

GAGAGCGCACGAGGGAGCTTCCAGGGGGAAACGCCTGGTATCTTTATAGTCCTGTC

GGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGG

AGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGG

CCTTTTGCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTATTAC

CGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGCGCAGCGAGT

CAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTCTCCCCGCGCGT

TGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACTGAGGCCGCCCGGG

CAAAGCCCGGGCGTCGGGCGACCTTTGGTCGCCCGGCCTCAGTGAGCGAGCGAGCG

CGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCCTTGTAGTTAATGATTAAC

CCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGG

AGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACC

CCCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTT

TCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATC

AAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCG

CCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTA

CGTATTAGTCATCGCTATTACCATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTC

CCCATCTCCCCCCCCTCCCCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTG

TGCAGCGATGGGGGCGGGGGGGGGGGGGGGGCGCGCGCCAGGCGGGGCGGGGGGGG

GCGAGGGGCGGGGCGGGGCGAGGCGGAGAGGTGCGGCGGCAGCCAATCAGAGCGG

CGCGCTCCGAAAGTTTCCTTTTATGGCGAGGCGGCGGCGGCGGCGGCCCTATAAAA

AGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCGCTGCCTTCGCCCCGTGCCCCGC

TCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTCTGACTGACCGCGTTACTAAAACAG

GTAAGTCCGGCCTCCGCGCCGGGTTTTGGCGCCTCCCGCGGGCGCCCCCCTCCTCAC

GGCGAGCGCTGCCACGTCAGACGAAGGGCGCAGCGAGCGTCCTGATCCTTCCGCCC

GGACGCTCAGGACAGCGGCCCGCTGCTCATAAGACTCGGCCTTAGAACCCCAGTAT

CAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTTCTTT

CCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCGGAGGG

ATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTCATGTTTTCTT

TTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACCGCCACC

3'

SEQ ID NO. 2 (mRNA expression cassette No. 2 - TLR3-Fc):
5'

ATGAGGGGCATGAAGCTGCTGGGGGCGCTGCTGGCACTGGCGGCCCT

ACTGCAGGGGGCCGTGTCCCTGAAGATCGCAGCCTTCAACATCCAGACATTTGGGG

AGACCAAGATGTCCAATGCCACCCTCGTCAGCTACATTGTGCAGATCCTGAGCCGCT

ATGACATCGCCCTGGTCCAGGAGGTCAGAGACAGCCACCTGACTGCCGTGGGGAAG

CTGCTGGACAACCTCAATCAGGATGCACCAGACACCTATCACTACGTGGTCAGTGA

GCCACTGGGACGGAACAGCTATAAGGAGCGCTACCTGTTCGTGTACAGGCCTGACC

AGGTGTCTGCGGTGGACAGCTACTACTACGATGATGGCTGCGAGCCCTGCGGGAAC

-continued

GACACCTTCAACCGAGAGCCAGCCATTGTCAGGTTCTTCTCCCGGTTCACAGAGGTC

AGGGAGTTTGCCATTGTTCCCCTGCATGCGGCCCCGGGGGACGCAGTAGCCGAGAT

CGACGCTCTCTATGACGTCTACCTGGATGTCCAAGAGAAATGGGGCTTGGAGGACGT

CATGTTGATGGGCGACTTCAATGCGGGCTGCAGCTATGTGAGACCCTCCCAGTGGTC

ATCCATCCGCCTGTGGACAAGCCCCACCTTCCAGTGGCTGATCCCCGACAGCGCTGA

CACCACAGCTACACCCACGCACTGTGCCTATGACAGGATCGTGGTTGCAGGGATGCT

GCTCCGAGGCGCCGTTGTTCCCGACTCGGCTCTTCCCTTTAACTTCCAGGCTGCCTAT

GGCCTGAGTGACCAACTGGCCCAAGCCATCAGTGACCACTATCCAGTGGAGGTGAT

GCTGAAGGGCGGATCAGGCGGATCACCCAAATCTTGTGACAAAACTCACACATGCC

CACCGTGCCCAGCACCTGAACTCCTGGGGGGACCGTCAGTCTTCCTCTTCCCCCCAA

AACCCAAGGACACCCTCATGATCTCCCGGACCCCTGAGGTCACATGCGTGGTGGTG

GACGTGAGCCACGAAGACCCTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGA

GGTGCATAATGCCAAGACAAAGCCGCGGGAGGAGCAGTACAACAGCACGTACCGT

GTGGTCAGCGTCCTCACCGTCCTGCACCAGGACTGGCTGAATGGCAAGGAGTACAA

GTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAAG

CCAAAGGGCAGCCCCGAGAACCACAGGTGTACACCCTGCCCCCATCCCGGGAGGAG

ATGACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGA

CATCGCCGTGGAGTGGGAGAGCAATGGGCAGCCGGAGAACAACTACAAGACCACG

CCTCCCGTGCTGGACTCCGACGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGAC

AAGAGCAGGTGGCAGCAGGGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCT

GCACAACCACTACACGCAGAAGAGCCTCTCCCTGTCTCCGGGTAAATAG

3'

SEQ ID NO. 3 (mRNA expression cassette No. 3 - TLR9-Fc):
5'

GCCAGACCCTGCCGTGCATTTATTTTTGGGGCGGCCTGCTGCCGTTTGGCATGCTGTG

CGCGAGCAGCACCACCAAATGCACCGTGAGCCATGAAGTGGCGGATTGCAGCCATC

TGAAACTGACCCAGGTGCCGGATGATCTGCCGACCAACATTACCGTGCTGAACCTG

ACCCATAACCAGCTGCGCCGCCTGCCGGCGGCGAACTTTACCCGCTATAGCCAGCTG

ACCAGCCTGGATGTGGGCTTTAACACCATTAGCAAACTGGAACCGGAACTGTGCCA

GAAACTGCCGATGCTGAAAGTGCTGAACCTGCAGCATAACGAACTGAGCCAGCTGA

GCGATAAAACCTTTGCGTTTTGCACCAACCTGACCGAACTGCATCTGATGAGCAACA

GCATTCAGAAAATTAAAAACAACCCGTTTGTGAAACAGAAAAACCTGATTACCCTG

GATCTGAGCCATAACGGCCTGAGCAGCACCAAACTGGGCACCCAGGTGCAGCTGGA

AAACCTGCAGGAACTGCTGCTGAGCAACAACAAAATTCAGGCGCTGAAAAGCGAAG

AACTGGATATTTTTGCGAACAGCAGCCTGAAAAAACTGGAACTGAGCAGCAACCAG

ATTAAAGAATTTAGCCCGGGCTGCTTTCATGCGATTGGCCGCCTGTTTGGCCTGTTTC

TGAACAACGTGCAGCTGGGCCCGAGCCTGACCGAAAAACTGTGCCTGGAACTGGCG

AACACCAGCATTCGCAACCTGAGCCTGAGCAACAGCCAGCTGAGCACCACCAGCAA

CACCACCTTTCTGGGCCTGAAATGGACCAACCTGACCATGCTGGATCTGAGCTATAA

-continued

CAACCTGAACGTGGTGGGCAACGATAGCTTTGCGTGGCTGCCGCAGCTGGAATATTT

TTTTCTGGAATATAACAACATTCAGCATCTGTTTAGCCATAGCCTGCATGGCCTGTTT

AACGTGCGCTATCTGAACCTGAAACGCAGCTTTACCAAACAGAGCATTAGCCTGGC

GAGCCTGCCGAAAATTGATGATTTTAGCTTTCAGTGGCTGAAATGCCTGGAACATCT

GAACATGGAAGATAACGATATTCCGGGCATTAAAAGCAACATGTTTACCGGCCTGA

TTAACCTGAAATATCTGAGCCTGAGCAACAGCTTTACCAGCCTGCGCACCCTGACCA

ACGAAACCTTTGTGAGCCTGGCGCATAGCCCGCTGCATATTCTGAACCTGACCAAAA

ACAAAATTAGCAAAATTGAAAGCGATGCGTTTAGCTGGCTGGGCCATCTGGAAGTG

CTGGATCTGGGCCTGAACGAAATTGGCCAGGAACTGACCGGCCAGGAATGGCGCGG

CCTGGAAAACATTTTTGAAATTTATCTGAGCTATAACAAATATCTGCAGCTGACCCG

CAACAGCTTTGCGCTGGTGCCGAGCCTGCAGCGCCTGATGCTGCGCCGCGTGGCGCT

GAAAAACGTGGATAGCAGCCCGAGCCCGTTTCAGCCGCTGCGCAACCTGACCATTC

TGGATCTGAGCAACAACAACATTGCGAACATTAACGATGATATGCTGGAAGGCCTG

GAAAAACTGGAAATTCTGGATCTGCAGCATAACAACCTGGCGCGCCTGTGGAAACA

TGCGAACCCGGGCGGCCCGATTTATTTTCTGAAAGGCCTGAGCCATCTGCATATTCT

GAACCTGGAAAGCAACGGCTTTGATGAAATTCCGGTGGAAGTGTTTAAAGATCTGTT

TGAACTGAAAATTATTGATCTGGGCCTGAACAACCTGAACACCCTGCCGGCGAGCGT

GTTTAACAACCAGGTGAGCCTGAAAAGCCTGAACCTGCAGAAAAACCTGATTACCA

GCGTGGAAAAAAAAGTGTTTGGCCCGGCGTTTCGCAACCTGACCGAACTGGATATG

CGCTTTAACCCGTTTGATTGCACCTGCGAAAGCATTGCGTGGTTTGTGAACTGGATT

AACGAAACCCATACCAACATTCCGGAACTGAGCAGCCATTATCTGTGCAACACCCC

GCCGCATTATCATGGCTTTCCGGTGCGCCTGTTTGATACCAGCAGCTGCAAAGATAG

CGCGCCGTTTGAACTGTTTTTTATGATTAACACCAGCATTCTGCTGATTTTTATTTTTA

TTGTGCTGCTGATTCATTTTGAAGGCTGGCGCATTAGCTTTTATTGGAACGTGAGCGT

GCATCGCGTGCTGGGCTTTAAAGAAATTGATCGCCAGACCGAACAGTTTGAATATGC

GGCGTATATTATTCATGCGTATAAAGATAAAGATTGGGTGTGGGAACATTTTAGCAG

CATGGAAAAAGAAGATCAGAGCCTGAAATTTTGCCTGGAAGAACGCGATTTTGAAG

CGGGCGTGTTTGAACTGGAAGCGATTGTGAACAGCATTAAACGCAGCCGCAAAATT

ATTTTTGTGATTACCCATCATCTGCTGAAAGATCCGCTGTGCAAACGCTTTAAAGTG

CATCATGCGGTGCAGCAGGCGATTGAACAGAACCTGGATAGCATTATTCTGGTGTTT

CTGGAAGAAATTCCGGATTATAAACTGAACCATGCGCTGTGCCTGCGCCGCGGCATG

TTTAAAAGCCATTGCATTCTGAACTGGCCGGTGCAGAAAGAACGCATTGGCGCGTTT

CGCCATAAACTGCAGGTGGCGCTGGGCAGCAAAAACAGCGTGCATGGGCGGATCAG

GCGGATCACCCAAATCTTGTGACAAAACTCACACATGCCCACCGTGCCCAGCACCTG

AACTCCTGGGGGGACCGTCAGTCTTCCTCTTCCCCCCAAAACCCAAGGACACCCTCA

TGATCTCCCGGACCCCTGAGGTCACATGCGTGGTGGTGGACGTGAGCCACGAAGAC

CCTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGAC

AAAGCCGCGGGAGGAGCAGTACAACAGCACGTACCGTGTGGTCAGCGTCCTCACCG

TCCTGCACCAGGACTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAA

-continued

GCCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAAGCCAAAGGGCAGCCCCGAGA

ACCACAGGTGTACACCCTGCCCCCATCCCGGGAGGAGATGACCAAGAACCAGGTCA

GCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGGGAG

AGCAATGGGCAGCCGGAGAACAACTACAAGACCACGCCTCCCGTGCTGGACTCCGA

CGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGG

GGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACGCAGA

AGAGCCTCTCCCTGTCTCCGGGTAAATAG

3'

SEQ ID NO. 4 (miRNA expression cassette No. 4 - DNAse I-Fc):
5'

ATGAGGGGCATGAAGCTGCTGGGGGCGCTGCTGGCACTGGCGGCCCTACTGCAGGG

GGCCGTGTCCATGGGCTTTTGCCGCAGCGCGCTGCATCCGCTGAGCCTGCTGGTGCA

GGCGATTATGCTGGCGATGACCCTGGCGCTGGGCACCCTGCCGGCGTTTCTGCCGTG

CGAACTGCAGCCGCATGGCCTGGTGAACTGCAACTGGCTGTTTCTGAAAAGCGTGCC

GCATTTTAGCATGGCGGCGCCGCGCGGCAACGTGACCAGCCTGAGCCTGAGCAGCA

ACCGCATTCATCATCTGCATGATAGCGATTTTGCGCATCTGCCGAGCCTGCGCCATC

TGAACCTGAAATGGAACTGCCCGCCGGTGGGCCTGAGCCCGATGCATTTTCCGTGCC

ATATGACCATTGAACCGAGCACCTTTCTGGCGGTGCCGACCCTGGAAGAACTGAAC

CTGAGCTATAACAACATTATGACCGTGCCGGCGCTGCCGAAAAGCCTGATTAGCCTG

AGCCTGAGCCATACCAACATTCTGATGCTGGATAGCGCGAGCCTGGCGGGCCTGCA

TGCGCTGCGCTTTCTGTTTATGGATGGCAACTGCTATTATAAAAACCCGTGCCGCCA

GGCGCTGGAAGTGGCGCCGGGCGCGCTGCTGGGCCTGGGCAACCTGACCCATCTGA

GCCTGAAATATAACAACCTGACCGTGGTGCCGCGCAACCTGCCGAGCAGCCTGGAA

TATCTGCTGCTGAGCTATAACCGCATTGTGAAACTGGCGCCGGAAGATCTGGCGAAC

CTGACCGCGCTGCGCGTGCTGGATGTGGGCGGCAACTGCCGCCGCTGCGATCATGC

GCCGAACCCGTGCATGGAATGCCCGCGCCATTTTCCGCAGCTGCATCCGGATACCTT

TAGCCATCTGAGCCGCCTGGAAGGCCTGGTGCTGAAAGATAGCAGCCTGAGCTGGC

TGAACGCGAGCTGGTTTCGCGGCCTGGGCAACCTGCGCGTGCTGGATCTGAGCGAA

AACTTTCTGTATAAATGCATTACCAAAACCAAAGCGTTTCAGGGCCTGACCCAGCTG

CGCAAACTGAACCTGAGCTTTAACTATCAGAAACGCGTGAGCTTTGCGCATCTGAGC

CTGGCGCCGAGCTTTGGCAGCCTGGTGGCGCTGAAAGAACTGGATATGCATGGCATT

TTTTTTCGCAGCCTGGATGAAACCACCCTGCGCCCGCTGGCGCGCCTGCCGATGCTG

CAGACCCTGCGCCTGCAGATGAACTTTATTAACCAGGCGCAGCTGGGCATTTTTCGC

GCGTTTCCGGGCCTGCGCTATGTGGATCTGAGCGATAACCGCATTAGCGGCGCGAGC

GAACTGACCGCGACCATGGGCGAAGCGGATGGCGGCGAAAAAGTGTGGCTGCAGC

CGGGCGATCTGGCGCCGGCGCCGGTGGATACCCCGAGCAGCGAAGATTTTCGCCCG

AACTGCAGCACCCTGAACTTTACCCTGGATCTGAGCCGCAACAACCTGGTGACCGTG

CAGCCGGAAATGTTTGCGCAGCTGAGCCATCTGCAGTGCCTGCGCCTGAGCCATAAC

TGCATTAGCCAGGCGGTGAACGGCAGCCAGTTTCTGCCGCTGACCGGCCTGCAGGT

GCTGGATCTGAGCCATAACAAACTGGATCTGTATCATGAACATAGCTTTACCGAACT

-continued

GCCGCGCCTGGAAGCGCTGGATCTGAGCTATAACAGCCAGCCGTTTGGCATGCAGG

GCGTGGGCCATAACTTTAGCTTTGTGGCGCATCTGCGCACCCTGCGCCATCTGAGCC

TGGCGCATAACAACATTCATAGCCAGGTGAGCCAGCAGCTGTGCAGCACCAGCCTG

CGCGCGCTGGATTTTAGCGGCAACGCGCTGGGCCATATGTGGGCGGAAGGCGATCT

GTATCTGCATTTTTTTCAGGGCCTGAGCGGCCTGATTTGGCTGGATCTGAGCCAGAA

CCGCCTGCATACCCTGCTGCCGCAGACCCTGCGCAACCTGCCGAAAAGCCTGCAGGT

GCTGCGCCTGCGCGATAACTATCTGGCGTTTTTTAAATGGTGGAGCCTGCATTTTCTG

CCGAAACTGGAAGTGCTGGATCTGGCGGGCAACCAGCTGAAAGCGCTGACCAACGG

CAGCCTGCCGGCGGGCACCCGCCTGCGCCGCCTGGATGTGAGCTGCAACAGCATTA

GCTTTGTGGCGCCGGGCTTTTTTAGCAAAGCGAAAGAACTGCGCGAACTGAACCTGA

GCGCGAACGCGCTGAAAACCGTGGATCATAGCTGGTTTGGCCCGCTGGCGAGCGCG

CTGCAGATTCTGGATGTGAGCGCGAACCCGCTGCATTGCGCGTGCGGCGCGGCGTTT

ATGGATTTTCTGCTGGAAGTGCAGGCGGCGGTGCCGGGCCTGCCGAGCCGCGTGAA

ATGCGGCAGCCCGGGCCAGCTGCAGGGCCTGAGCATTTTTGCGCAGGATCTGCGCCT

GTGCCTGGATGAAGCGCTGAGCTGGGATTGCTTTGCGCTGAGCCTGCTGGCGGTGGC

GCTGGGCCTGGGCGTGCCGATGCTGCATCATCTGTGCGGCTGGGATCTGTGGTATTG

CTTTCATCTGTGCCTGGCGTGGCTGCCGTGGCGCGGCCGCCAGAGCGGCCGCGATGA

AGATGCGCTGCCGTATGATGCGTTTGTGGTGTTTGATAAAACCCAGAGCGCGGTGGC

GGATTGGGTGTATAACGAACTGCGCGGCCAGCTGGAAGAATGCCGCGGCCGCTGGG

CGCTGCGCCTGTGCCTGGAAGAACGCGATTGGCTGCCGGGCAAAACCCTGTTTGAA

AACCTGTGGGCGAGCGTGTATGGCAGCCGCAAAACCCTGTTTGTGCTGGCGCATACC

GATCGCGTGAGCGGCCTGCTGCGCGCGAGCTTTCTGCTGGCGCAGCAGCGCCTGCTG

GAAGATCGCAAAGATGTGGTGGTGCTGGTGATTCTGAGCCCGGATGGCCGCCGCAG

CCGCTATGTGCGCCTGCGCCAGCGCCTGTGCCGCCAGAGCGTGCTGCTGTGGCCGCA

TCAGCCGAGCGGCCAGCGCAGCTTTTGGGCGCAGCTGGGCATGGCGCTGACCCGCG

ATAACCATCATTTTTATAACCGCAACTTTTGCCAGGGCCCGACCGCGGAAGGGCGGA

TCAGGCGGATCACCCAAATCTTGTGACAAAACTCACACATGCCCACCGTGCCCAGC

ACCTGAACTCCTGGGGGGACCGTCAGTCTTCCTCTTCCCCCCAAAACCCAAGGACAC

CCTCATGATCTCCCGGACCCCTGAGGTCACATGCGTGGTGGTGGACGTGAGCCACGA

AGACCCTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCA

AGACAAAGCCGCGGGAGGAGCAGTACAACAGCACGTACCGTGTGGTCAGCGTCCTC

ACCGTCCTGCACCAGGACTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAA

CAAAGCCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAAGCCAAAGGGCAGCCCC

GAGAACCACAGGTGTACACCCTGCCCCCATCCCGGGAGGAGATGACCAAGAACCAG

GTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGG

GAGAGCAATGGGCAGCCGGAGAACAACTACAAGACCACGCCTCCCGTGCTGGACTC

CGACGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGC

-continued

AGGGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACGC

AGAAGAGCCTCTCCCTGTCTCCGGGTAAATAG

3'

SEQ ID NO. 5 (mRNA expression cassette No. 5 - NGF-Fc):
5'

ATGAGGGGCATGAAGCTGCTGGGGGCGCTGCTGGCACTGGCGGCCCTACTGCAGGG

GGCCGTGTCCATGAGCATGCTGTTTTATACCCTGATTACCGCGTTTCTGATTGGCATT

CAGGCGGAACCGCATAGCGAAAGCAACGTGCCGGCGGGCCATACCATTCCGCAGGC

GCATTGGACCAAACTGCAGCATAGCCTGGATACCGCGCTGCGCCGCGCGCGCAGCG

CGCCGGCGGCGGCGATTGCGGCGCGCGTGGCGGGCCAGACCCGCAACATTACCGTG

GATCCGCGCCTGTTTAAAAAACGCCGCCTGCGCAGCCCGCGCGTGCTGTTTAGCACC

CAGCCGCCGCGCGAAGCGGCGGATACCCAGGATCTGGATTTTGAAGTGGGCGGCGC

GGCGCCGTTTAACCGCACCCATCGCAGCAAACGCAGCAGCAGCCATCCGATTTTTCA

TCGCGGCGAATTTAGCGTGTGCGATAGCGTGAGCGTGTGGGTGGGCGATAAAACCA

CCGCGACCGATATTAAAGGCAAAGAAGTGATGGTGCTGGGCGAAGTGAACATTAAC

AACAGCGTGTTTAAACAGTATTTTTTTGAAACCAAATGCCGCGATCCGAACCCGGTG

GATAGCGGCTGCCGCGGCATTGATAGCAAACATTGGAACAGCTATTGCACCACCAC

CCATACCTTTGTGAAAGCGCTGACCATGGATGGCAAACAGGCGGCGTGGCGCTTTAT

TCGCATTGATACCGCGTGCGTGTGCGTGCTGAGCCGCAAAGCGGTGCGCCGCGCGG

GCGGATCAGGCGGATCACCCAAATCTTGTGACAAAACTCACACATGCCCACCGTGC

CCAGCACCTGAACTCCTGGGGGGACCGTCAGTCTTCCTCTTCCCCCCAAAACCCAAG

GACACCCTCATGATCTCCCGGACCCCTGAGGTCACATGCGTGGTGGTGGACGTGAGC

CACGAAGACCCTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAA

TGCCAAGACAAAGCCGCGGGAGGAGCAGTACAACAGCACGTACCGTGTGGTCAGCG

TCCTCACCGTCCTGCACCAGGACTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTC

TCCAACAAAGCCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAAGCCAAAGGGCA

GCCCCGAGAACCACAGGTGTACACCCTGCCCCCATCCCGGGAGGAGATGACCAAGA

ACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCCGTGG

AGTGGGAGAGCAATGGGCAGCCGGAGAACAACTACAAGACCACGCCTCCCGTGCTG

GACTCCGACGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGG

CAGCAGGGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTAC

ACGCAGAAGAGCCTCTCCCTGTCTCCGGGTAAATAG

3'

SEQ ID NO. 6 (mRNA expression cassette No. 6 - insulin-Fc):
5'

ATGAGGGGCATGAAGCTGCTGGGGGCGCTGCTGGCACTGGCGGCCCTACTGCAGGG

GGCCGTGTCCATGGCGCTGTGGATGCGCCTGCTGCCGCTGCTGGCGCTGCTGGCGCT

GTGGGGCCCGGATCCGGCGGCGGCGTTTGTGAACCAGCATCTGTGCGGCAGCCATC

TGGTGGAAGCGCTGTATCTGGTGTGCGGCGAACGCGGCTTTTTTTATACCCCGAAAA

CCCGCCGCGAAGCGGAAGATCTGCAGGTGGGCCAGGTGGAACTGGGCGGCGGCCCG

-continued

GGCGCGGGCAGCCTGCAGCCGCTGGCGCTGGAAGGCAGCCTGCAGAAACGCGGCAT

TGTGGAACAGTGCTGCACCAGCATTTGCAGCCTGTATCAGCTGGAAAACTATTGCAA

CGGGCGGATCAGGCGGATCACCCAAATCTTGTGACAAAACTCACACATGCCCACCG

TGCCCAGCACCTGAACTCCTGGGGGGACCGTCAGTCTTCCTCTTCCCCCCAAAACCC

AAGGACACCCTCATGATCTCCCGGACCCCTGAGGTCACATGCGTGGTGGTGGACGT

GAGCCACGAAGACCCTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGC

ATAATGCCAAGACAAAGCCGCGGGAGGAGCAGTACAACAGCACGTACCGTGTGGTC

AGCGTCCTCACCGTCCTGCACCAGGACTGGCTGAATGGCAAGGAGTACAAGTGCAA

GGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAAGCCAAAG

GGCAGCCCCGAGAACCACAGGTGTACACCCTGCCCCCATCCCGGGAGGAGATGACC

AAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCC

GTGGAGTGGGAGAGCAATGGGCAGCCGGAGAACAACTACAAGACCACGCCTCCCGT

GCTGGACTCCGACGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAG

GTGGCAGCAGGGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAACCA

CTACACGCAGAAGAGCCTCTCCCTGTCTCCGGGTAAATAG

3'

SEQ ID NO: 7 = SEQ ID NO: 1 + SEQ ID NO: 2
5'

TTCTAGAATAATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTT

AACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTTGTATCATG

CTATTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATAAATCCTGGTTGCTGTCT

CTTTATGAGGAGTTGTGGCCCGTTGTCAGGCAACGTGGCGTGGTGTGCACTGTGTTT

GCTGACGCAACCCCCACTGGTTGGGGCATTGCCACCACCTGTCAGCTCCTTTCCGGG

ACTTTCGCTTTCCCCCTCCCTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCC

GCTGCTGGACAGGGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGA

AATCATCGTCCTTTCCTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGAC

GTCCTTCTGCTACGTCCCTTCGGCCCTCAATCCAGCGGACCTTCCTTCCCGCGGCCTG

CTGCCGGCTCTGCGGCCTCTTCCGCGTCTTCGCCTTCGCCCTCAGACGAGTCGGATCT

CCCTTTGGGCCGCCTCCCCGCCTAAGCTTATCGATACCGTCGAGATCTAACTTGTTTA

TTGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTCACAAATAAAG

CATTTTTTTCACTGCATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCAT

GTCTGGATCTCGACCTCGACTAGAGCATGGCTACGTAGATAAGTAGCATGGCGGGTT

AATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCTCTGCGCGC

TCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGACGCCCGGGCTTTGCCC

GGGCGGCCTCAGTGAGCGAGCGAGCGCGCCAGCTGGCGTAATAGCGAAGAGGCCC

GCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGAATTCCAGA

CGATTGAGCGTCAAAATGTAGGTATTTCCATGAGCGTTTTTCCTGTTGCAATGGCTG

GCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTC

AGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTG

-continued

ATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTCAGGATT

CTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCCCGCTC

TGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGCG

CCCTGTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGACCGC

TACACTTGCCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCC

ACGTTCGCCGGCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGA

TTTAGTGCTTTACGGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGT

AGTGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCT

TTAATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTC

TTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTATTGGTTAAAAAATGAGCTGATT

TAACAAAAATTTAACGCGAATTTTAACAAAATATTAACGTTTACAATTTAAATATTT

GCTTATACAATCTTCCTGTTTTTGGGGCTTTTCTGATTATCAACCGGGGTACATATGA

TTGACATGCTAGTTTTACGATTACCGTTCATCGATTCTCTTGTTTGCTCCAGACTCTC

AGGCAATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCTCTCCGGC

ATGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTGACTGTCTCC

GGCCTTTCTCACCCGTTTGAATCTTTACCTACACATTACTCAGGCATTGCATTTAAAA

TATATGAGGGTTCTAAAAATTTTTATCCTTGCGTTGAAATAAAGGCTTCTCCCGCAA

AAGTATTACAGGGTCATAATGTTTTTGGTACAACCGATTTAGCTTTATGCTCTGAGG

CTTTATTGCTTAATTTTGCTAATTCTTTGCCTTGCCTGTATGATTTATTGGATGTTGGA

ATTCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGGTATTTCACACCGCATATGG

TGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGACACCCG

CCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCGCTTACAGA

CAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGGTTTTCACCGTCATCACCG

AAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCATG

ATAATAATGGTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACC

CCTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAAC

CCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCC

GTGTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCACCCAGAA

ACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACAT

CGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTT

TCCAATGATGAGCACTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGAC

GCCGGGCAAGAGCAACTCGGTCGCCGCATACACTATTCTCAGAATGACTTGGTTGAG

TACTCACCAGTCACAGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATG

CAGTGCTGCCATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGAT

CGGAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTAACTC

GCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGACGAGCGTGAC

ACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAACTATTAACTGGCGAACT

ACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGC

AGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCTGATAAATCTGG

-continued

AGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGC

CCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGA

AATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGAC

CAAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTTAAAAGGA

TCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTC

GTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTT

TTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCTACCAGCGGTGGT

TTGTTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAG

AGCGCAGATACCAAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAA

GAACTCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC

TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGA

TAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGC

GAACGACCTACACCGAACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACG

CTTCCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAG

GAGAGCGCACGAGGGAGCTTCCAGGGGGAAACGCCTGGTATCTTTATAGTCCTGTC

GGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGG

AGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGG

CCTTTTGCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTATTAC

CGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGCGCAGCGAGT

CAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTCTCCCCGCGCGT

TGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACTGAGGCCGCCCGGG

CAAAGCCCGGGCGTCGGGCGACCTTTGGTCGCCCGGCCTCAGTGAGCGAGCGAGCG

CGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCCTTGTAGTTAATGATTAAC

CCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGG

AGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACC

CCCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTT

TCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATC

AAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCG

CCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTA

CGTATTAGTCATCGCTATTACCATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTC

CCCATCTCCCCCCCCTCCCCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTG

TGCAGCGATGGGGGCGGGGGGGGGGGGGGGCGCGCGCCAGGCGGGGCGGGGGGGG

GCGAGGGGCGGGGCGGGGCGAGGCGGAGAGGTGCGGCGGCAGCCAATCAGAGCGG

CGCGCTCCGAAAGTTTCCTTTTATGGCGAGGCGGCGGCGGCGGCGGCCCTATAAAA

AGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCGCTGCCTTCGCCCCGTGCCCCGC

TCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTCTGACTGACCGCGTTACTAAAACAG

GTAAGTCCGGCCTCCGCGCCGGGTTTTGGCGCCTCCCGCGGGCGCCCCCCTCCTCAC

GGCGAGCGCTGCCACGTCAGACGAAGGGCGCAGCGAGCGTCCTGATCCTTCCGCCC

GGACGCTCAGGACAGCGGCCCGCTGCTCATAAGACTCGGCCTTAGAACCCCAGTAT

-continued

CAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTTCTTT

CCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCGGAGGG

ATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTCATGTTTTCTT

TTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACCGCCACCATGAGGGGCATGAA

GCTGCTGGGGGCGCTGCTGGCACTGGCGGCCCTACTGCAGGGGGCCGTGTCCCTGA

AGATCGCAGCCTTCAACATCCAGACATTTGGGGAGACCAAGATGTCCAATGCCACC

CTCGTCAGCTACATTGTGCAGATCCTGAGCCGCTATGACATCGCCCTGGTCCAGGAG

GTCAGAGACAGCCACCTGACTGCCGTGGGGAAGCTGCTGGACAACCTCAATCAGGA

TGCACCAGACACCTATCACTACGTGGTCAGTGAGCCACTGGGACGGAACAGCTATA

AGGAGCGCTACCTGTTCGTGTACAGGCCTGACCAGGTGTCTGCGGTGGACAGCTACT

ACTACGATGATGGCTGCGAGCCCTGCGGGAACGACACCTTCAACCGAGAGCCAGCC

ATTGTCAGGTTCTTCTCCCGGTTCACAGAGGTCAGGGAGTTTGCCATTGTTCCCCTGC

ATGCGGCCCCGGGGGACGCAGTAGCCGAGATCGACGCTCTCTATGACGTCTACCTG

GATGTCCAAGAGAAATGGGGCTTGGAGGACGTCATGTTGATGGGCGACTTCAATGC

GGGCTGCAGCTATGTGAGACCCTCCCAGTGGTCATCCATCCGCCTGTGGACAAGCCC

CACCTTCCAGTGGCTGATCCCCGACAGCGCTGACACCACAGCTACACCCACGCACTG

TGCCTATGACAGGATCGTGGTTGCAGGGATGCTGCTCCGAGGCGCCGTTGTTCCCGA

CTCGGCTCTTCCCTTTAACTTCCAGGCTGCCTATGGCCTGAGTGACCAACTGGCCCA

AGCCATCAGTGACCACTATCCAGTGGAGGTGATGCTGAAGGGCGGATCAGGCGGAT

CACCCAAATCTTGTGACAAAACTCACACATGCCCACCGTGCCCAGCACCTGAACTCC

TGGGGGGACCGTCAGTCTTCCTCTTCCCCCCAAAACCCAAGGACACCCTCATGATCT

CCCGGACCCCTGAGGTCACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAG

GTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCC

GCGGGAGGAGCAGTACAACAGCACGTACCGTGTGGTCAGCGTCCTCACCGTCCTGC

ACCAGGACTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAGCCCTC

CCAGCCCCCATCGAGAAAACCATCTCCAAAGCCAAAGGGCAGCCCCGAGAACCACA

GGTGTACACCCTGCCCCCATCCCGGGAGGAGATGACCAAGAACCAGGTCAGCCTGA

CCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGGGAGAGCAAT

GGGCAGCCGGAGAACAACTACAAGACCACGCCTCCCGTGCTGGACTCCGACGGCTC

CTTCTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGGAACG

TCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACGCAGAAGAGCC

TCTCCCTGTCTCCGGGTAAATAG

3'

SEQ ID NO: 8 = SEQ ID NO: 1 + SEQ ID NO: 3
5'

TTCTAGAATAATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTT

AACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTTGTATCATG

CTATTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATAAATCCTGGTTGCTGTCT

CTTTATGAGGAGTTGTGGCCCGTTGTCAGGCAACGTGGCGTGGTGTGCACTGTGTTT

GCTGACGCAACCCCCACTGGTTGGGGCATTGCCACCACCTGTCAGCTCCTTTCCGGG

-continued

ACTTTCGCTTTCCCCCTCCCTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCC

GCTGCTGGACAGGGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGA

AATCATCGTCCTTTCCTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGAC

GTCCTTCTGCTACGTCCCTTCGGCCCTCAATCCAGCGGACCTTCCTTCCCGCGGCCTG

CTGCCGGCTCTGCGGCCTCTTCCGCGTCTTCGCCTTCGCCCTCAGACGAGTCGGATCT

CCCTTTGGGCCGCCTCCCCGCCTAAGCTTATCGATACCGTCGAGATCTAACTTGTTTA

TTGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTCACAAATAAAG

CATTTTTTTCACTGCATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCAT

GTCTGGATCTCGACCTCGACTAGAGCATGGCTACGTAGATAAGTAGCATGGCGGGTT

AATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCTCTGCGCGC

TCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGACGCCCGGGCTTTGCCC

GGGCGGCCTCAGTGAGCGAGCGAGCGCGCCAGCTGGCGTAATAGCGAAGAGGCCC

GCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGAATTCCAGA

CGATTGAGCGTCAAAATGTAGGTATTTCCATGAGCGTTTTTCCTGTTGCAATGGCTG

GCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTC

AGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTG

ATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTCAGGATT

CTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCCCGCTC

TGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGCG

CCCTGTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGACCGC

TACACTTGCCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCC

ACGTTCGCCGGCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGA

TTTAGTGCTTTACGGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGT

AGTGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCT

TTAATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTC

TTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTATTGGTTAAAAAATGAGCTGATT

TAACAAAAATTTAACGCGAATTTTAACAAAATATTAACGTTTACAATTTAAATATTT

GCTTATACAATCTTCCTGTTTTTGGGGCTTTTCTGATTATCAACCGGGGTACATATGA

TTGACATGCTAGTTTTACGATTACCGTTCATCGATTCTCTTGTTTGCTCCAGACTCTC

AGGCAATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCTCTCCGGC

ATGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTGACTGTCTCC

GGCCTTTCTCACCCGTTTGAATCTTTACCTACACATTACTCAGGCATTGCATTTAAAA

TATATGAGGGTTCTAAAAATTTTTATCCTTGCGTTGAAATAAAGGCTTCTCCCGCAA

AAGTATTACAGGGTCATAATGTTTTTGGTACAACCGATTTAGCTTTATGCTCTGAGG

CTTTATTGCTTAATTTTGCTAATTCTTTGCCTTGCCTGTATGATTTATTGGATGTTGGA

ATTCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGGTATTTCACACCGCATATGG

TGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGACACCCG

CCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCGCTTACAGA

CAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGGTTTTCACCGTCATCACCG

-continued

AAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCATG

ATAATAATGGTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACC

CCTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAAC

CCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCC

GTGTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCACCCAGAA

ACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACAT

CGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTT

TCCAATGATGAGCACTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGAC

GCCGGGCAAGAGCAACTCGGTCGCCGCATACACTATTCTCAGAATGACTTGGTTGAG

TACTCACCAGTCACAGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATG

CAGTGCTGCCATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGAT

CGGAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTAACTC

GCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGACGAGCGTGAC

ACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAACTATTAACTGGCGAACT

ACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGC

AGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCTGATAAATCTGG

AGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGC

CCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGA

AATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGAC

CAAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTTAAAAGGA

TCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTC

GTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTT

TTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCTACCAGCGGTGGT

TTGTTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAG

AGCGCAGATACCAAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAA

GAACTCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC

TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGA

TAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGC

GAACGACCTACACCGAACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACG

CTTCCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAG

GAGAGCGCACGAGGGAGCTTCCAGGGGGAAACGCCTGGTATCTTTATAGTCCTGTC

GGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGGG

AGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGG

CCTTTTGCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTATTAC

CGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGCGCAGCGAGT

CAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTCTCCCCGCGCGT

TGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACTGAGGCCGCCCGGG

CAAAGCCCGGGCGTCGGGCGACCTTTGGTCGCCCGGCCTCAGTGAGCGAGCGAGCG

CGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCCTTGTAGTTAATGATTAAC

-continued

CCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGG

AGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACC

CCCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTT

TCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATC

AAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCG

CCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTA

CGTATTAGTCATCGCTATTACCATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTC

CCCATCTCCCCCCCCTCCCCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTG

TGCAGCGATGGGGGCGGGGGGGGGGGGGGGGCGCGCGCCAGGCGGGGCGGGGGGGG

GCGAGGGGGGGGCGGGGCGAGGCGGAGAGGTGCGGCGGCAGCCAATCAGAGCGG

CGCGCTCCGAAAGTTTCCTTTTATGGCGAGGCGGCGGCGGCGGCGGCCCTATAAAA

AGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCGCTGCCTTCGCCCCGTGCCCCGC

TCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTCTGACTGACCGCGTTACTAAAACAG

GTAAGTCCGGCCTCCGCGCCGGGTTTTGGCGCCTCCCGCGGGCGCCCCCCTCCTCAC

GGCGAGCGCTGCCACGTCAGACGAAGGGCGCAGCGAGCGTCCTGATCCTTCCGCCC

GGACGCTCAGGACAGCGGCCCGCTGCTCATAAGACTCGGCCTTAGAACCCCAGTAT

CAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTTCTTT

CCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCGGAGGG

ATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTCATGTTTTCTT

TTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACCGCCACCGCCAGACCCTGCCG

TGCATTTATTTTTGGGGCGGCCTGCTGCCGTTTGGCATGCTGTGCGCGAGCAGCACC

ACCAAATGCACCGTGAGCCATGAAGTGGCGGATTGCAGCCATCTGAAACTGACCCA

GGTGCCGGATGATCTGCCGACCAACATTACCGTGCTGAACCTGACCCATAACCAGCT

GCGCCGCCTGCCGGCGGCGAACTTTACCCGCTATAGCCAGCTGACCAGCCTGGATGT

GGGCTTTAACACCATTAGCAAACTGGAACCGGAACTGTGCCAGAAACTGCCGATGC

TGAAAGTGCTGAACCTGCAGCATAACGAACTGAGCCAGCTGAGCGATAAAACCTTT

GCGTTTTGCACCAACCTGACCGAACTGCATCTGATGAGCAACAGCATTCAGAAAATT

AAAAACAACCCGTTTGTGAAACAGAAAAACCTGATTACCCTGGATCTGAGCCATAA

CGGCCTGAGCAGCACCAAACTGGGCACCCAGGTGCAGCTGGAAAACCTGCAGGAAC

TGCTGCTGAGCAACAACAAAATTCAGGCGCTGAAAAGCGAAGAACTGGATATTTTT

GCGAACAGCAGCCTGAAAAAACTGGAACTGAGCAGCAACCAGATTAAAGAATTTAG

CCCGGGCTGCTTTCATGCGATTGGCCGCCTGTTTGGCCTGTTTCTGAACAACGTGCA

GCTGGGCCCGAGCCTGACCGAAAAACTGTGCCTGGAACTGGCGAACACCAGCATTC

GCAACCTGAGCCTGAGCAACAGCCAGCTGAGCACCACCAGCAACACCACCTTTCTG

GGCCTGAAATGGACCAACCTGACCATGCTGGATCTGAGCTATAACAACCTGAACGT

GGTGGGCAACGATAGCTTTGCGTGGCTGCCGCAGCTGGAATATTTTTTTCTGGAATA

TAACAACATTCAGCATCTGTTTAGCCATAGCCTGCATGGCCTGTTTAACGTGCGCTA

TCTGAACCTGAAACGCAGCTTTACCAAACAGAGCATTAGCCTGGCGAGCCTGCCGA

AAATTGATGATTTTAGCTTTCAGTGGCTGAAATGCCTGGAACATCTGAACATGGAAG

-continued

ATAACGATATTCCGGGCATTAAAAGCAACATGTTTACCGGCCTGATTAACCTGAAAT

ATCTGAGCCTGAGCAACAGCTTTACCAGCCTGCGCACCCTGACCAACGAAACCTTTG

TGAGCCTGGCGCATAGCCCGCTGCATATTCTGAACCTGACCAAAAACAAAATTAGC

AAAATTGAAAGCGATGCGTTTAGCTGGCTGGGCCATCTGGAAGTGCTGGATCTGGG

CCTGAACGAAATTGGCCAGGAACTGACCGGCCAGGAATGGCGCGGCCTGGAAAACA

TTTTTGAAATTTATCTGAGCTATAACAAATATCTGCAGCTGACCCGCAACAGCTTTG

CGCTGGTGCCGAGCCTGCAGCGCCTGATGCTGCGCCGCGTGGCGCTGAAAAACGTG

GATAGCAGCCCGAGCCCGTTTCAGCCGCTGCGCAACCTGACCATTCTGGATCTGAGC

AACAACAACATTGCGAACATTAACGATGATATGCTGGAAGGCCTGGAAAAACTGGA

AATTCTGGATCTGCAGCATAACAACCTGGCGCGCCTGTGGAAACATGCGAACCCGG

GCGGCCCGATTTATTTTCTGAAAGGCCTGAGCCATCTGCATATTCTGAACCTGGAAA

GCAACGGCTTTGATGAAATTCCGGTGGAAGTGTTTAAAGATCTGTTTGAACTGAAAA

TTATTGATCTGGGCCTGAACAACCTGAACACCCTGCCGGCGAGCGTGTTTAACAACC

AGGTGAGCCTGAAAAGCCTGAACCTGCAGAAAAACCTGATTACCAGCGTGGAAAAA

AAAGTGTTTGGCCCGGCGTTTCGCAACCTGACCGAACTGGATATGCGCTTTAACCCG

TTTGATTGCACCTGCGAAAGCATTGCGTGGTTTGTGAACTGGATTAACGAAACCCAT

ACCAACATTCCGGAACTGAGCAGCCATTATCTGTGCAACACCCCGCCGCATTATCAT

GGCTTTCCGGTGCGCCTGTTTGATACCAGCAGCTGCAAAGATAGCGCGCCGTTTGAA

CTGTTTTTTATGATTAACACCAGCATTCTGCTGATTTTTATTTTTATTGTGCTGCTGAT

TCATTTTGAAGGCTGGCGCATTAGCTTTTATTGGAACGTGAGCGTGCATCGCGTGCT

GGGCTTTAAAGAAATTGATCGCCAGACCGAACAGTTTGAATATGCGGCGTATATTAT

TCATGCGTATAAAGATAAAGATTGGGTGTGGGAACATTTTAGCAGCATGGAAAAAG

AAGATCAGAGCCTGAAATTTTGCCTGGAAGAACGCGATTTTGAAGCGGGCGTGTTTG

AACTGGAAGCGATTGTGAACAGCATTAAACGCAGCCGCAAAATTATTTTTGTGATTA

CCCATCATCTGCTGAAAGATCCGCTGTGCAAACGCTTTAAAGTGCATCATGCGGTGC

AGCAGGCGATTGAACAGAACCTGGATAGCATTATTCTGGTGTTTCTGGAAGAAATTC

CGGATTATAAACTGAACCATGCGCTGTGCCTGCGCCGCGGCATGTTTAAAAGCCATT

GCATTCTGAACTGGCCGGTGCAGAAAGAACGCATTGGCGCGTTTCGCCATAAACTGC

AGGTGGCGCTGGGCAGCAAAAACAGCGTGCATGGGCGGATCAGGCGGATCACCCA

AATCTTGTGACAAAACTCACACATGCCCACCGTGCCCAGCACCTGAACTCCTGGGGG

GACCGTCAGTCTTCCTCTTCCCCCCAAAACCCAAGGACACCCTCATGATCTCCCGGA

CCCCTGAGGTCACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAAG

TTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCGCGGGA

GGAGCAGTACAACAGCACGTACCGTGTGGTCAGCGTCCTCACCGTCCTGCACCAGG

ACTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCC

CCCATCGAGAAAACCATCTCCAAAGCCAAAGGGCAGCCCCGAGAACCACAGGTGTA

CACCCTGCCCCCATCCCGGGAGGAGATGACCAAGAACCAGGTCAGCCTGACCTGCC

TGGTCAAAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGGGAGAGCAATGGGCAG

CCGGAGAACAACTACAAGACCACGCCTCCCGTGCTGGACTCCGACGGCTCCTTCTTC

-continued

CTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGGAACGTCTTCTC

ATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACGCAGAAGAGCCTCTCCCT

GTCTCCGGGTAAATAG

3'

SEQ ID NO: 9 = SEQ ID NO: 1 + SEQ ID NO: 4
5'

TTCTAGAATAATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTT

AACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTTGTATCATG

CTATTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATAAATCCTGGTTGCTGTCT

CTTTATGAGGAGTTGTGGCCCGTTGTCAGGCAACGTGGCGTGGTGTGCACTGTGTTT

GCTGACGCAACCCCCACTGGTTGGGGCATTGCCACCACCTGTCAGCTCCTTTCCGGG

ACTTTCGCTTTCCCCCTCCCTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCC

GCTGCTGGACAGGGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGA

AATCATCGTCCTTTCCTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGAC

GTCCTTCTGCTACGTCCCTTCGGCCCTCAATCCAGCGGACCTTCCTTCCCGCGGCCTG

CTGCCGGCTCTGCGGCCTCTTCCGCGTCTTCGCCTTCGCCCTCAGACGAGTCGGATCT

CCCTTTGGGCCGCCTCCCCGCCTAAGCTTATCGATACCGTCGAGATCTAACTTGTTTA

TTGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTCACAAATAAAG

CATTTTTTTCACTGCATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCAT

GTCTGGATCTCGACCTCGACTAGAGCATGGCTACGTAGATAAGTAGCATGGCGGGTT

AATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCTCTGCGCGC

TCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGACGCCCGGGCTTTGCCC

GGGCGGCCTCAGTGAGCGAGCGAGCGCGCCAGCTGGCGTAATAGCGAAGAGGCCC

GCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGAATTCCAGA

CGATTGAGCGTCAAAATGTAGGTATTTCCATGAGCGTTTTTCCTGTTGCAATGGCTG

GCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTC

AGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTG

ATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTCAGGATT

CTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCCCGCTC

TGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGCG

CCCTGTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGACCGC

TACACTTGCCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCC

ACGTTCGCCGGCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGA

TTTAGTGCTTTACGGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGT

AGTGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCT

TTAATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTC

TTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTATTGGTTAAAAAATGAGCTGATT

TAACAAAAATTTAACGCGAATTTTAACAAAATATTAACGTTTACAATTTAAATATTT

GCTTATACAATCTTCCTGTTTTTGGGGCTTTTCTGATTATCAACCGGGGTACATATGA

-continued

TTGACATGCTAGTTTTACGATTACCGTTCATCGATTCTCTTGTTTGCTCCAGACTCTC

AGGCAATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCTCTCCGGC

ATGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTGACTGTCTCC

GGCCTTTCTCACCCGTTTGAATCTTTACCTACACATTACTCAGGCATTGCATTTAAAA

TATATGAGGGTTCTAAAAATTTTTATCCTTGCGTTGAAATAAAGGCTTCTCCCGCAA

AAGTATTACAGGGTCATAATGTTTTTGGTACAACCGATTTAGCTTTATGCTCTGAGG

CTTTATTGCTTAATTTTGCTAATTCTTTGCCTTGCCTGTATGATTTATTGGATGTTGGA

ATTCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGGTATTTCACACCGCATATGG

TGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGACACCCG

CCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCGCTTACAGA

CAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGGTTTTCACCGTCATCACCG

AAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCATG

ATAATAATGGTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACC

CCTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAAC

CCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCC

GTGTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCACCCAGAA

ACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACAT

CGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTT

TCCAATGATGAGCACTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGAC

GCCGGGCAAGAGCAACTCGGTCGCCGCATACACTATTCTCAGAATGACTTGGTTGAG

TACTCACCAGTCACAGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATG

CAGTGCTGCCATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGAT

CGGAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTAACTC

GCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGACGAGCGTGAC

ACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAACTATTAACTGGCGAACT

ACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGC

AGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCTGATAAATCTGG

AGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGC

CCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGA

AATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGAC

CAAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTTAAAAGGA

TCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTC

GTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTT

TTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCTACCAGCGGTGGT

TTGTTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAG

AGCGCAGATACCAAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAA

GAACTCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC

TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGA

TAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGC

-continued

GAACGACCTACACCGAACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACG

CTTCCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAG

GAGAGCGCACGAGGGAGCTTCCAGGGGGAAACGCCTGGTATCTTTATAGTCCTGTC

GGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGG

AGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGG

CCTTTTGCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTATTAC

CGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGCGCAGCGAGT

CAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTCTCCCCGCGCGT

TGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACTGAGGCCGCCCGGG

CAAAGCCCGGGCGTCGGGCGACCTTTGGTCGCCCGGCCTCAGTGAGCGAGCGAGCG

CGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCCTTGTAGTTAATGATTAAC

CCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGG

AGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACC

CCCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTT

TCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATC

AAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCG

CCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTA

CGTATTAGTCATCGCTATTACCATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTC

CCCATCTCCCCCCCCTCCCCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTG

TGCAGCGATGGGGGCGGGGGGGGGGGGGGGCGCGCGCCAGGCGGGGCGGGGGGGG

GCGAGGGGCGGGGCGGGGCGAGGCGGAGAGGTGCGGCGGCAGCCAATCAGAGCGG

CGCGCTCCGAAAGTTTCCTTTTATGGCGAGGCGGCGGCGGCGGCGGCCCTATAAAA

AGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCGCTGCCTTCGCCCCGTGCCCCGC

TCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTCTGACTGACCGCGTTACTAAAACAG

GTAAGTCCGGCCTCCGCGCCGGGTTTTGGCGCCTCCCGCGGGCGCCCCCCTCCTCAC

GGCGAGCGCTGCCACGTCAGACGAAGGGCGCAGCGAGCGTCCTGATCCTTCCGCCC

GGACGCTCAGGACAGCGGCCCGCTGCTCATAAGACTCGGCCTTAGAACCCCAGTAT

CAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTTCTTT

CCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCGGAGGG

ATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTCATGTTTTCTT

TTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACCGCCACCATGAGGGGCATGAA

GCTGCTGGGGGCGCTGCTGGCACTGGCGGCCCTACTGCAGGGGGCCGTGTCCATGG

GCTTTTGCCGCAGCGCGCTGCATCCGCTGAGCCTGCTGGTGCAGGCGATTATGCTGG

CGATGACCCTGGCGCTGGGCACCCTGCCGGCGTTTCTGCCGTGCGAACTGCAGCCGC

ATGGCCTGGTGAACTGCAACTGGCTGTTTCTGAAAAGCGTGCCGCATTTTAGCATGG

CGGCGCCGCGCGGCAACGTGACCAGCCTGAGCCTGAGCAGCAACCGCATTCATCAT

CTGCATGATAGCGATTTTGCGCATCTGCCGAGCCTGCGCCATCTGAACCTGAAATGG

AACTGCCCGCCGGTGGGCCTGAGCCCGATGCATTTTCCGTGCCATATGACCATTGAA

CCGAGCACCTTTCTGGCGGTGCCGACCCTGGAAGAACTGAACCTGAGCTATAACAA

-continued

CATTATGACCGTGCCGGCGCTGCCGAAAAGCCTGATTAGCCTGAGCCTGAGCCATAC

CAACATTCTGATGCTGGATAGCGCGAGCCTGGCGGGCCTGCATGCGCTGCGCTTTCT

GTTTATGGATGGCAACTGCTATTATAAAAACCCGTGCCGCCAGGCGCTGGAAGTGGC

GCCGGGCGCGCTGCTGGGCCTGGGCAACCTGACCCATCTGAGCCTGAAATATAACA

ACCTGACCGTGGTGCCGCGCAACCTGCCGAGCAGCCTGGAATATCTGCTGCTGAGCT

ATAACCGCATTGTGAAACTGGCGCCGGAAGATCTGGCGAACCTGACCGCGCTGCGC

GTGCTGGATGTGGGCGGCAACTGCCGCCGCTGCGATCATGCGCCGAACCCGTGCAT

GGAATGCCCGCGCCATTTTCCGCAGCTGCATCCGGATACCTTTAGCCATCTGAGCCG

CCTGGAAGGCCTGGTGCTGAAAGATAGCAGCCTGAGCTGGCTGAACGCGAGCTGGT

TTCGCGGCCTGGGCAACCTGCGCGTGCTGGATCTGAGCGAAAACTTTCTGTATAAAT

GCATTACCAAAACCAAAGCGTTTCAGGGCCTGACCCAGCTGCGCAAACTGAACCTG

AGCTTTAACTATCAGAAACGCGTGAGCTTTGCGCATCTGAGCCTGGCGCCGAGCTTT

GGCAGCCTGGTGGCGCTGAAAGAACTGGATATGCATGGCATTTTTTTTCGCAGCCTG

GATGAAACCACCCTGCGCCCGCTGGCGCGCCTGCCGATGCTGCAGACCCTGCGCCTG

CAGATGAACTTTATTAACCAGGCGCAGCTGGGCATTTTTCGCGCGTTTCCGGGCCTG

CGCTATGTGGATCTGAGCGATAACCGCATTAGCGGCGCGAGCGAACTGACCGCGAC

CATGGGCGAAGCGGATGGCGGCGAAAAAGTGTGGCTGCAGCCGGGCGATCTGGCGC

CGGCGCCGGTGGATACCCCGAGCAGCGAAGATTTTCGCCCGAACTGCAGCACCCTG

AACTTTACCCTGGATCTGAGCCGCAACAACCTGGTGACCGTGCAGCCGGAAATGTTT

GCGCAGCTGAGCCATCTGCAGTGCCTGCGCCTGAGCCATAACTGCATTAGCCAGGC

GGTGAACGGCAGCCAGTTTCTGCCGCTGACCGGCCTGCAGGTGCTGGATCTGAGCC

ATAACAAACTGGATCTGTATCATGAACATAGCTTTACCGAACTGCCGCGCCTGGAAG

CGCTGGATCTGAGCTATAACAGCCAGCCGTTTGGCATGCAGGGCGTGGGCCATAACT

TTAGCTTTGTGGCGCATCTGCGCACCCTGCGCCATCTGAGCCTGGCGCATAACAACA

TTCATAGCCAGGTGAGCCAGCAGCTGTGCAGCACCAGCCTGCGCGCGCTGGATTTTA

GCGGCAACGCGCTGGGCCATATGTGGGCGGAAGGCGATCTGTATCTGCATTTTTTTC

AGGGCCTGAGCGGCCTGATTTGGCTGGATCTGAGCCAGAACCGCCTGCATACCCTGC

TGCCGCAGACCCTGCGCAACCTGCCGAAAAGCCTGCAGGTGCTGCGCCTGCGCGAT

AACTATCTGGCGTTTTTTAAATGGTGGAGCCTGCATTTTCTGCCGAAACTGGAAGTG

CTGGATCTGGCGGGCAACCAGCTGAAAGCGCTGACCAACGGCAGCCTGCCGGCGGG

CACCCGCCTGCGCCGCCTGGATGTGAGCTGCAACAGCATTAGCTTTGTGGCGCCGGG

CTTTTTTAGCAAAGCGAAAGAACTGCGCGAACTGAACCTGAGCGCGAACGCGCTGA

AAACCGTGGATCATAGCTGGTTTGGCCCGCTGGCGAGCGCGCTGCAGATTCTGGATG

TGAGCGCGAACCCGCTGCATTGCGCGTGCGGCGCGGCGTTTATGGATTTTCTGCTGG

AAGTGCAGGCGGCGGTGCCGGGCCTGCCGAGCCGCGTGAAATGCGGCAGCCCGGGC

CAGCTGCAGGGCCTGAGCATTTTTGCGCAGGATCTGCGCCTGTGCCTGGATGAAGCG

CTGAGCTGGGATTGCTTTGCGCTGAGCCTGCTGGCGGTGGCGCTGGGCCTGGGCGTG

CCGATGCTGCATCATCTGTGCGGCTGGGATCTGTGGTATTGCTTTCATCTGTGCCTGG

CGTGGCTGCCGTGGCGCGGCCGCCAGAGCGGCCGCGATGAAGATGCGCTGCCGTAT

-continued

GATGCGTTTGTGGTGTTTGATAAAACCCAGAGCGCGGTGGCGGATTGGGTGTATAAC

GAACTGCGCGGCCAGCTGGAAGAATGCCGCGGCCGCTGGGCGCTGCGCCTGTGCCT

GGAAGAACGCGATTGGCTGCCGGGCAAAACCCTGTTTGAAAACCTGTGGGCGAGCG

TGTATGGCAGCCGCAAAACCCTGTTTGTGCTGGCGCATACCGATCGCGTGAGCGGCC

TGCTGCGCGCGAGCTTTCTGCTGGCGCAGCAGCGCCTGCTGGAAGATCGCAAAGAT

GTGGTGGTGCTGGTGATTCTGAGCCCGGATGGCCGCCGCAGCCGCTATGTGCGCCTG

CGCCAGCGCCTGTGCCGCCAGAGCGTGCTGCTGTGGCCGCATCAGCCGAGCGGCCA

GCGCAGCTTTTGGGCGCAGCTGGGCATGGCGCTGACCCGCGATAACCATCATTTTTA

TAACCGCAACTTTTGCCAGGGCCCGACCGCGGAAGGGCGGATCAGGCGGATCACCC

AAATCTTGTGACAAAACTCACACATGCCCACCGTGCCCAGCACCTGAACTCCTGGGG

GGACCGTCAGTCTTCCTCTTCCCCCCAAAACCCAAGGACACCCTCATGATCTCCCGG

ACCCCTGAGGTCACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAA

GTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCGCGGG

AGGAGCAGTACAACAGCACGTACCGTGTGGTCAGCGTCCTCACCGTCCTGCACCAG

GACTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGC

CCCCATCGAGAAAACCATCTCCAAAGCCAAAGGGCAGCCCCGAGAACCACAGGTGT

ACACCCTGCCCCCATCCCGGGAGGAGATGACCAAGAACCAGGTCAGCCTGACCTGC

CTGGTCAAAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGGGAGAGCAATGGGCA

GCCGGAGAACAACTACAAGACCACGCCTCCCGTGCTGGACTCCGACGGCTCCTTCTT

CCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGGAACGTCTTCT

CATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACGCAGAAGAGCCTCTCCC

TGTCTCCGGGTAAATAG

3'

SEQ ID NO: 10 = SEQ ID NO: 1 + SEQ ID NO: 5
5'

TTCTAGAATAATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTT

AACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTTGTATCATG

CTATTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATAAATCCTGGTTGCTGTCT

CTTTATGAGGAGTTGTGGCCCGTTGTCAGGCAACGTGGCGTGGTGTGCACTGTGTTT

GCTGACGCAACCCCCACTGGTTGGGGCATTGCCACCACCTGTCAGCTCCTTTCCGGG

ACTTTCGCTTTCCCCCTCCCTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCC

GCTGCTGGACAGGGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGA

AATCATCGTCCTTTCCTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGAC

GTCCTTCTGCTACGTCCCTTCGGCCCTCAATCCAGCGGACCTTCCTTCCCGCGGCCTG

CTGCCGGCTCTGCGGCCTCTTCCGCGTCTTCGCCTTCGCCCTCAGACGAGTCGGATCT

CCCTTTGGGCCGCCTCCCCGCCTAAGCTTATCGATACCGTCGAGATCTAACTTGTTTA

TTGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTCACAAATAAAG

CATTTTTTTCACTGCATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCAT

GTCTGGATCTCGACCTCGACTAGAGCATGGCTACGTAGATAAGTAGCATGGCGGGTT

AATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCTCTGCGCGC

-continued

TCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGACGCCCGGGCTTTGCCC

GGGCGGCCTCAGTGAGCGAGCGAGCGCGCCAGCTGGCGTAATAGCGAAGAGGCCC

GCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGAATTCCAGA

CGATTGAGCGTCAAAATGTAGGTATTTCCATGAGCGTTTTTCCTGTTGCAATGGCTG

GCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTC

AGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTG

ATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTCAGGATT

CTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCCCGCTC

TGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGCG

CCCTGTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGACCGC

TACACTTGCCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCC

ACGTTCGCCGGCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGA

TTTAGTGCTTTACGGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGT

AGTGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCT

TTAATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTC

TTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTATTGGTTAAAAAATGAGCTGATT

TAACAAAAATTTAACGCGAATTTTAACAAAATATTAACGTTTACAATTTAAATATTT

GCTTATACAATCTTCCTGTTTTTGGGGCTTTTCTGATTATCAACCGGGGTACATATGA

TTGACATGCTAGTTTTACGATTACCGTTCATCGATTCTCTTGTTTGCTCCAGACTCTC

AGGCAATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCTCTCCGGC

ATGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTGACTGTCTCC

GGCCTTTCTCACCCGTTTGAATCTTTACCTACACATTACTCAGGCATTGCATTTAAAA

TATATGAGGGTTCTAAAAATTTTTATCCTTGCGTTGAAATAAAGGCTTCTCCCGCAA

AAGTATTACAGGGTCATAATGTTTTTGGTACAACCGATTTAGCTTTATGCTCTGAGG

CTTTATTGCTTAATTTTGCTAATTCTTTGCCTTGCCTGTATGATTTATTGGATGTTGGA

ATTCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGGTATTTCACACCGCATATGG

TGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGACACCCG

CCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCGCTTACAGA

CAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGGTTTTCACCGTCATCACCG

AAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCATG

ATAATAATGGTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACC

CCTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAAC

CCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCC

GTGTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCACCCAGAA

ACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACAT

CGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTT

TCCAATGATGAGCACTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGAC

GCCGGGCAAGAGCAACTCGGTCGCCGCATACACTATTCTCAGAATGACTTGGTTGAG

TACTCACCAGTCACAGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATG

-continued

CAGTGCTGCCATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGAT

CGGAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTAACTC

GCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGACGAGCGTGAC

ACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAACTATTAACTGGCGAACT

ACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGC

AGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCTGATAAATCTGG

AGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGC

CCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGA

AATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGAC

CAAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTTAAAAGGA

TCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTC

GTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTT

TTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCTACCAGCGGTGGT

TTGTTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAG

AGCGCAGATACCAAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAA

GAACTCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC

TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGA

TAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGC

GAACGACCTACACCGAACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACG

CTTCCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAG

GAGAGCGCACGAGGGAGCTTCCAGGGGGAAACGCCTGGTATCTTTATAGTCCTGTC

GGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGG

AGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGG

CCTTTTGCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTATTAC

CGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGCGCAGCGAGT

CAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTCTCCCCGCGCGT

TGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACTGAGGCCGCCCGGG

CAAAGCCCGGGCGTCGGGCGACCTTTGGTCGCCCGGCCTCAGTGAGCGAGCGAGCG

CGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCCTTGTAGTTAATGATTAAC

CCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGG

AGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACC

CCCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTT

TCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATC

AAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCG

CCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTA

CGTATTAGTCATCGCTATTACCATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTC

CCCATCTCCCCCCCCTCCCCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTG

TGCAGCGATGGGGGCGGGGGGGGGGGGGGGCGCGCGCCAGGCGGGGCGGGGCGGG

GCGAGGGGCGGGGCGGGGCGAGGCGGAGAGGTGCGGCGGCAGCCAATCAGAGCGG

-continued

CGCGCTCCGAAAGTTTCCTTTTATGGCGAGGCGGCGGCGGCGGCGGCCCTATAAAA

AGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCGCTGCCTTCGCCCCGTGCCCCGC

TCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTCTGACTGACCGCGTTACTAAAACAG

GTAAGTCCGGCCTCCGCGCCGGGTTTTGGCGCCTCCCGCGGGCGCCCCCCTCCTCAC

GGCGAGCGCTGCCACGTCAGACGAAGGGCGCAGCGAGCGTCCTGATCCTTCCGCCC

GGACGCTCAGGACAGCGGCCCGCTGCTCATAAGACTCGGCCTTAGAACCCCAGTAT

CAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTTCTTT

CCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCGGAGGG

ATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTCATGTTTTCTT

TTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACCGCCACCATGAGGGGCATGAA

GCTGCTGGGGGCGCTGCTGGCACTGGCGGCCCTACTGCAGGGGGCCGTGTCCATGA

GCATGCTGTTTTATACCCTGATTACCGCGTTTCTGATTGGCATTCAGGCGGAACCGC

ATAGCGAAAGCAACGTGCCGGCGGGCCATACCATTCCGCAGGCGCATTGGACCAAA

CTGCAGCATAGCCTGGATACCGCGCTGCGCCGCGCGCGCAGCGCGCCGGCGGCGGC

GATTGCGGCGCGCGTGGCGGGCCAGACCCGCAACATTACCGTGGATCCGCGCCTGT

TTAAAAAACGCCGCCTGCGCAGCCCGCGCGTGCTGTTTAGCACCCAGCCGCCGCGC

GAAGCGGCGGATACCCAGGATCTGGATTTTGAAGTGGGCGGCGCGGCGCCGTTTAA

CCGCACCCATCGCAGCAAACGCAGCAGCAGCCATCCGATTTTTCATCGCGGCGAATT

TAGCGTGTGCGATAGCGTGAGCGTGTGGGTGGGCGATAAAACCACCGCGACCGATA

TTAAAGGCAAAGAAGTGATGGTGCTGGGCGAAGTGAACATTAACAACAGCGTGTTT

AAACAGTATTTTTTTGAAACCAAATGCCGCGATCCGAACCCGGTGGATAGCGGCTGC

CGCGGCATTGATAGCAAACATTGGAACAGCTATTGCACCACCACCCATACCTTTGTG

AAAGCGCTGACCATGGATGGCAAACAGGCGGCGTGGCGCTTTATTCGCATTGATAC

CGCGTGCGTGTGCGTGCTGAGCCGCAAAGCGGTGCGCCGCGCGGGCGGATCAGGCG

GATCACCCAAATCTTGTGACAAAACTCACACATGCCCACCGTGCCCAGCACCTGAAC

TCCTGGGGGGACCGTCAGTCTTCCTCTTCCCCCCAAAACCCAAGGACACCCTCATGA

TCTCCCGGACCCCTGAGGTCACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCT

GAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGACAAA

GCCGCGGGAGGAGCAGTACAACAGCACGTACCGTGTGGTCAGCGTCCTCACCGTCC

TGCACCAGGACTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAGCC

CTCCCAGCCCCCATCGAGAAAACCATCTCCAAAGCCAAAGGGCAGCCCCGAGAACC

ACAGGTGTACACCCTGCCCCCATCCCGGGAGGAGATGACCAAGAACCAGGTCAGCC

TGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGGGAGAGC

AATGGGCAGCCGGAGAACAACTACAAGACCACGCCTCCCGTGCTGGACTCCGACGG

CTCCTTCTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGGA

-continued

ACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACGCAGAAGA

GCCTCTCCCTGTCTCCGGGTAAATAG

3'

SEQ ID NO: 11 = SEQ ID NO: 1 + SEQ ID NO: 6
5'

TTCTAGAATAATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTT

AACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTTGTATCATG

CTATTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATAAATCCTGGTTGCTGTCT

CTTTATGAGGAGTTGTGGCCCGTTGTCAGGCAACGTGGCGTGGTGTGCACTGTGTTT

GCTGACGCAACCCCCACTGGTTGGGGCATTGCCACCACCTGTCAGCTCCTTTCCGGG

ACTTTCGCTTTCCCCCTCCCTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCC

GCTGCTGGACAGGGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGA

AATCATCGTCCTTTCCTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGAC

GTCCTTCTGCTACGTCCCTTCGGCCCTCAATCCAGCGGACCTTCCTTCCCGCGGCCTG

CTGCCGGCTCTGCGGCCTCTTCCGCGTCTTCGCCTTCGCCCTCAGACGAGTCGGATCT

CCCTTTGGGCCGCCTCCCCGCCTAAGCTTATCGATACCGTCGAGATCTAACTTGTTTA

TTGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTCACAAATAAAG

CATTTTTTTCACTGCATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCAT

GTCTGGATCTCGACCTCGACTAGAGCATGGCTACGTAGATAAGTAGCATGGCGGGTT

AATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCTCTGCGCGC

TCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGACGCCCGGGCTTTGCCC

GGGCGGCCTCAGTGAGCGAGCGAGCGCGCCAGCTGGCGTAATAGCGAAGAGGCCC

GCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGAATTCCAGA

CGATTGAGCGTCAAAATGTAGGTATTTCCATGAGCGTTTTTCCTGTTGCAATGGCTG

GCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTC

AGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTG

ATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTCAGGATT

CTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCCCGCTC

TGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGCG

CCCTGTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGACCGC

TACACTTGCCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCC

ACGTTCGCCGGCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGA

TTTAGTGCTTTACGGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGT

AGTGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCT

TTAATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTC

TTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTATTGGTTAAAAAATGAGCTGATT

TAACAAAAATTTAACGCGAATTTTAACAAAATATTAACGTTTACAATTTAAATATTT

GCTTATACAATCTTCCTGTTTTTGGGGCTTTTCTGATTATCAACCGGGGTACATATGA

TTGACATGCTAGTTTTACGATTACCGTTCATCGATTCTCTTGTTTGCTCCAGACTCTC

-continued

AGGCAATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCTCTCCGGC

ATGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTGACTGTCTCC

GGCCTTTCTCACCCGTTTGAATCTTTACCTACACATTACTCAGGCATTGCATTTAAAA

TATATGAGGGTTCTAAAAATTTTTATCCTTGCGTTGAAATAAAGGCTTCTCCCGCAA

AAGTATTACAGGGTCATAATGTTTTTGGTACAACCGATTTAGCTTTATGCTCTGAGG

CTTTATTGCTTAATTTTGCTAATTCTTTGCCTTGCCTGTATGATTTATTGGATGTTGGA

ATTCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGGTATTTCACACCGCATATGG

TGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGACACCCG

CCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCGCTTACAGA

CAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGGTTTTCACCGTCATCACCG

AAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCATG

ATAATAATGGTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACC

CCTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAAC

CCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCC

GTGTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCACCCAGAA

ACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACAT

CGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTT

TCCAATGATGAGCACTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGAC

GCCGGGCAAGAGCAACTCGGTCGCCGCATACACTATTCTCAGAATGACTTGGTTGAG

TACTCACCAGTCACAGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATG

CAGTGCTGCCATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGAT

CGGAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTAACTC

GCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGACGAGCGTGAC

ACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAACTATTAACTGGCGAACT

ACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGC

AGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCTGATAAATCTGG

AGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGC

CCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGA

AATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGAC

CAAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTTAAAAGGA

TCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTC

GTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTT

TTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCTACCAGCGGTGGT

TTGTTTGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAG

AGCGCAGATACCAAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAA

GAACTCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC

TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGA

TAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGC

GAACGACCTACACCGAACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACG

-continued

CTTCCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAG

GAGAGCGCACGAGGGAGCTTCCAGGGGGAAACGCCTGGTATCTTTATAGTCCTGTC

GGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGG

AGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGG

CCTTTTGCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTATTAC

CGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGCGCAGCGAGT

CAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTCTCCCCGCGCGT

TGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACTGAGGCCGCCCGGG

CAAAGCCCGGGCGTCGGGCGACCTTTGGTCGCCCGGCCTCAGTGAGCGAGCGAGCG

CGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCCTTGTAGTTAATGATTAAC

CCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGG

AGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACC

CCCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTT

TCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATC

AAGTGTATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCG

CCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTA

CGTATTAGTCATCGCTATTACCATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTC

CCCATCTCCCCCCCCTCCCCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTG

TGCAGCGATGGGGGCGGGGGGGGGGGGGGCGCGCGCCAGGCGGGGGGGGGGG

GCGAGGGGCGGGGCGGGGCGAGGCGGAGAGGTGCGGCGGCAGCCAATCAGAGCGG

CGCGCTCCGAAAGTTTCCTTTTATGGCGAGGCGGCGGCGGCGGCGGCCCTATAAAA

AGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCGCTGCCTTCGCCCCGTGCCCCGC

TCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTCTGACTGACCGCGTTACTAAAACAG

GTAAGTCCGGCCTCCGCGCCGGGTTTTGGCGCCTCCCGCGGGCGCCCCCCTCCTCAC

GGCGAGCGCTGCCACGTCAGACGAAGGGCGCAGCGAGCGTCCTGATCCTTCCGCCC

GGACGCTCAGGACAGCGGCCCGCTGCTCATAAGACTCGGCCTTAGAACCCCAGTAT

CAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTTCTTT

CCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCGGAGGG

ATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTCATGTTTTCTT

TTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACCGCCACCATGAGGGGCATGAA

GCTGCTGGGGGCGCTGCTGGCACTGGCGGCCCTACTGCAGGGGGCCGTGTCCATGG

CGCTGTGGATGCGCCTGCTGCCGCTGCTGGCGCTGCTGGCGCTGTGGGGCCCGGATC

CGGCGGCGGCGTTTGTGAACCAGCATCTGTGCGGCAGCCATCTGGTGGAAGCGCTGT

ATCTGGTGTGCGGCGAACGCGGCTTTTTTTATACCCCGAAAACCCGCCGCGAAGCGG

AAGATCTGCAGGTGGGCCAGGTGGAACTGGGCGGCGGCCCGGGCGCGGGCAGCCTG

CAGCCGCTGGCGCTGGAAGGCAGCCTGCAGAAACGCGGCATTGTGGAACAGTGCTG

CACCAGCATTTGCAGCCTGTATCAGCTGGAAAACTATTGCAACGGGCGGATCAGGC

GGATCACCCAAATCTTGTGACAAAACTCACACATGCCCACCGTGCCCAGCACCTGA

ACTCCTGGGGGGACCGTCAGTCTTCCTCTTCCCCCCAAAACCCAAGGACACCCTCAT

-continued

GATCTCCCGGACCCCTGAGGTCACATGCGTGGTGGTGGACGTGAGCCACGAAGACC

CTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGACA

AAGCCGCGGGAGGAGCAGTACAACAGCACGTACCGTGTGGTCAGCGTCCTCACCGT

CCTGCACCAGGACTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAG

CCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAAGCCAAAGGGCAGCCCCGAGAA

CCACAGGTGTACACCCTGCCCCCATCCCGGGAGGAGATGACCAAGAACCAGGTCAG

CCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGGGAGA

GCAATGGGCAGCCGGAGAACAACTACAAGACCACGCCTCCCGTGCTGGACTCCGAC

GGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGG

GAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACGCAGAA

GAGCCTCTCCCTGTCTCCGGGTAAATAG

3'

[0052] As will be appreciated by those skilled in the art, because the recombinant plasmid is a circular vector, the one or more sequences of the mRNA expression cassettes may be connected at the 3' end of SEQ ID NO. 1, as shown in SEQ ID NO. 7-11 or at the 5' end of SEQ ID NO. 1.

[0053] As will be appreciated by those skilled in the art, a perfect match of nucleotides with each of the miRNA expression cassette sequences is not necessary in order to have the desired result of increased bioavailability of the target biomolecule as a result of the target cell producing the miRNA sequence that will bind to and degrade the mRNA of the target biomolecule. In some embodiments of the present disclosure, about 80% to about 100% nucleotide sequence matching with each of the mRNA expression cassettes causes the desired result. In some embodiments of the present disclosure, about 85% to about 100% nucleotide sequence matching with each of the mRNA expression cassettes causes the desired result. In some embodiments of the present disclosure, about 90% to about 100% nucleotide sequence matching with each of the mRNA expression cassettes causes the desired result. In some embodiments of the present disclosure, about 95% to about 100% nucleotide sequence matching with each of the mRNA expression cassettes causes the desired result.

Example 1—Expression Cassette

[0054] Expression cassettes for expressing mRNA were synthesized. The synthesized miRNA expression cassettes were cloned into the pAVA-00200 plasmid backbone containing the CASI promoter, multiple cloning site (MCS), Woodchuck Hepatitis Virus post-transcriptional regulatory element (WPRE), and Simian virus 40 (SV40) polyadenylation (polyA) sequence, all flanked by the AAV2 inverted terminal repeats (ITR). pAVA-00200 was cut with the restriction enzymes KpnI and XbaI in the MCS and separated on a 1% agarose gel. The band of interest was excised and purified using a gel extraction kit. Each mRNA expression cassette was amplified by polymerase chain reaction (PCR) using Taq polymerase and the PCR products were gel purified and the bands on interest were also excised and purified using a gel extraction kit. These PCR products contained the mRNA expression cassettes in addition to 15 base pair 5' and 3' overhangs that aligned with the ends of the linearized pAVA-00200 backbone. Using in-fusion cloning, the amplified mRNA expression cassettes are integrated with the pAVA-00200 backbone via homologous recombination. The resulting RP contained the following: 5' ITR, CASI promoter, miRNA expression cassette, WPRE, SV40 polyA and ITR 3'.

SEQUENCE LISTING

```
Sequence total quantity: 11
SEQ ID NO: 1           moltype = DNA  length = 5861
FEATURE                Location/Qualifiers
source                 1..5861
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 1
ttctagaata atcaacctct ggattacaaa atttgtgaaa gattgactgg tattcttaac  60
tatgttgctc cttttacgct atgtggatac gctgctttaa tgcctttgta tcatgctatt  120
gcttcccgta tggctttcat tttctcctcc ttgtataaat cctggttgct gtctctttat  180
gaggagttgt ggcccgttgt caggcaacgt ggcgtggtgt gcactgtgtt tgctgacgca  240
acccccactg gttggggcat tgccaccacc tgtcagctcc tttccgggac tttcgctttc  300
cccctcccta ttgccacggc ggaactcatc gccgcctgcc ttgcccgctg ctggacaggg  360
gctcggctgt tgggcactga caattccgtg gtgttgtcgg ggaaatcatc gtcctttcct  420
tggctgctcg cctgtgttgc cacctggatt ctgcgcggga cgtccttctg ctacgtccct  480
tcggccctca atccagcgga ccttccttcc cgcggcctgc tgccggctct gcggcctctt  540
ccgcgtcttc gccttcgccc tcagacgagt cggatctccc tttgggccgc ctccccgcct  600
```

-continued

```
aagcttatcg ataccgtcga gatctaactt gtttattgca gcttataatg gttacaaata  660
aagcaatagc atcacaaatt tcacaaataa agcatttttt tcactgcatt ctagttgtgg  720
tttgtccaaa ctcatcaatg tatcttatca tgtctggatc tcgacctcga ctagagcatg  780
gctacgtaga taagtagcat ggcgggttaa tcattaacta caaggaaccc ctagtgatgg  840
agttggccac tccctctctg cgcgctcgct cgctcactga ggccgggcga ccaaaggtcg  900
cccgacgccc gggctttgcc cgggcggcct cagtgagcga gcgagcgcgc cagctggcgt  960
aatagcgaag aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa  1020
tggaattcca gacgattgag cgtcaaaatg taggtatttc catgagcgtt tttcctgttg  1080
caatggctgg cggtaatatt gttctggata ttaccagcaa ggccgatagt ttgagttctt  1140
ctactcaggc aagtgatgtt attactaatc aaagaagtat tgcgacaacg gttaatttgc  1200
gtgatggaca gactctttta ctcggtggcc tcactgatta taaaaacact tctcaggatt  1260
ctggcgtacc gttcctgtct aaaatccctt taatcggcct cctgtttagc tcccgctctg  1320
attctaacga ggaaagcacg ttatacgtgc tcgtcaaagc aaccatagta cgcgccctgt  1380
agcggcgcat taagcgcggc gggtgtggtg gttacgcgca gcgtgaccgc tacacttgcc  1440
agcgccctag cgcccgctcc tttcgctttc ttcccttcct ttctcgccac gttcgccggc  1500
tttccccgtc aagctctaaa tcgggggctc cctttagggt tccgatttag tgctttacgg  1560
cacctcgacc ccaaaaaact tgattagggt gatggttcac gtagtgggcc atcgccctga  1620
tagacggttt ttcgcccttt gacgttggag tccacgttct ttaatagtgg actcttgttc  1680
caaactggaa caacactcaa ccctatctcg gtctattctt ttgatttata agggattttg  1740
ccgatttcgg cctattggtt aaaaaatgag ctgatttaac aaaaatttaa cgcgaatttt  1800
aacaaaatat taacgtttac aatttaaata tttgcttata caatcttcct gtttttgggg  1860
cttttctgat tatcaaccgg ggtacatatg attgacatgc tagttttacg attaccgttc  1920
atcgattctc ttgtttgctc cagactctca ggcaatgacc tgatagcctt tgtagagacc  1980
tctcaaaaat agctaccctc tccggcatga atttatcagc tagaacggtt gaatatcata  2040
ttgatggtga tttgactgtc tccggccttt ctcacccgtt tgaatcttta cctacacatt  2100
actcaggcat tgcatttaaa atatatgagg gttctaaaaa tttttatcct tgcgttgaaa  2160
taaaggcttc tcccgcaaaa gtattacagg gtcataatgt ttttggtaca accgatttag  2220
ctttatgctc tgaggcttta ttgcttaatt ttgctaattc tttgccttgc ctgtatgatt  2280
tattggatgt tggaattcct gatgcggtat tttctcctta cgcatctgtg cggtatttca  2340
caccgcatat ggtgcactct cagtacaatc tgctctgatg ccgcatagtt aagccagccc  2400
cgacacccgc caacacccgc tgacgcgccc tgacgggctt gtctgctccc ggcatccgct  2460
tacagacaag ctgtgaccgt ctccgggagc tgcatgtgtc agaggttttc accgtcatca  2520
ccgaaacgcg cgagacgaaa gggcctcgtg atacgcctat ttttataggt taatgtcatg  2580
ataataatgg tttcttagac gtcaggtggc acttttcggg gaaatgtgcg cggaacccct  2640
atttgtttat ttttctaaat acattcaaat atgtatccgc tcatgagaca ataaccctga  2700
taaatgcttc aataatattg aaaaaggaag agtatgagta ttcaacattt ccgtgtcgcc  2760
cttattccct tttttgcggc attttgcctt cctgtttttg ctcacccaga aacgctggtg  2820
aaagtaaaag atgctgaaga tcagttgggt gcacgagtgg gttacatcga actggatctc  2880
aacagcggta agatccttga gagttttcgc cccgaagaac gttttccaat gatgagcact  2940
tttaaagttc tgctatgtgg cgcggtatta tcccgtattg acgccgggca agagcaactc  3000
ggtcgccgca tacactattc tcagaatgac ttggttgagt actcaccagt cacagaaaag  3060
catcttacgg atggcatgac agtaagagaa ttatgcagtg ctgccataac catgagtgat  3120
aacactgcgg ccaacttact tctgacaacg atcggaggac cgaaggagct aaccgctttt  3180
ttgcacaaca tgggggatca tgtaactcgc cttgatcgtt gggaaccgga gctgaatgaa  3240
gccataccaa acgacgagcg tgacaccacg atgcctgtag caatggcaac aacgttgcgc  3300
aaactattaa ctggcgaact acttactcta gcttcccggc aacaattaat agactggatg  3360
gaggcggata aagttgcagg accacttctg cgctcggccc ttccggctgg ctggtttatt  3420
gctgataaat ctggagccgg tgagcgtggg tctcgcggta tcattgcagc actggggcca  3480
gatggtaagc cctcccgtat cgtagttatc tacacgacgg ggagtcaggc aactatggat  3540
gaacgaaata gacagatcgc tgagataggt gcctcactga ttaagcattg gtaactgtca  3600
gaccaagttt actcatatat actttagatt gatttaaaac ttcattttta atttaaaagg  3660
atctaggtga agatcctttt tgataatctc atgaccaaaa tcccttaacg tgagttttcg  3720
ttccactgag cgtcagaccc cgtagaaaag atcaaaggat cttcttgaga tccttttttt  3780
ctgcgcgtaa tctgctgctt gcaaacaaaa aaaccaccgc taccagcggt ggtttgtttg  3840
ccggatcaag agctaccaac tctttttccg aaggtaactg gcttcagcag agcgcagata  3900
ccaaatactg tccttctagt gtagccgtag ttaggccacc acttcaagaa ctctgtagca  3960
ccgcctacat acctcgctct gctaatcctg ttaccagtgg ctgctgccag tggcgataag  4020
tcgtgtctta ccgggttgga ctcaagacga tagttaccgg ataaggcgca gcggtcgggc  4080
tgaacggggg gttcgtgcac acagcccagc ttggagcgaa cgacctacac cgaactgaga  4140
tacctacagc gtgagctatg agaaagcgcc acgcttcccg aagggagaaa ggcggacagg  4200
tatccggtaa gcggcagggt cggaacagga gagcgcacga gggagcttcc agggggaaac  4260
gcctggtatc tttatagtcc tgtcgggttt cgccacctct gacttgagcg tcgatttttg  4320
tgatgctcgt caggggggcg gagcctatgg aaaaacgcca gcaacgcggc ctttttacgg  4380
ttcctggcct tttgctggcc ttttgctcac atgttctttc ctgcgttatc ccctgattct  4440
gtggataacc gtattaccgc ctttgagtga gctgataccg ctcgccgcag ccgaacgacc  4500
gagcgcagcg agtcagtgag cgaggaagcg gaagagcgcc caatacgcaa accgcctctc  4560
cccgcgcgtt ggccgattca ttaatgcagc agctgcgcgc tcgctcgctc actgaggccg  4620
cccgggcaaa gcccgggcgt cgggcgacct ttggtcgccc ggcctcagtg agcgagcgag  4680
cgcgcagaga gggagtggcc aactccatca ctaggggttc cttgtagtta atgattaacc  4740
cgccatgcta cttatctacg tagccatgct ctaggacatt gattattgac tagtggagtt  4800
ccgcgttaca taacttacgg taaatggccc gcctggctga ccgcccaacg acccccgccc  4860
attgacgtca ataatgacgt atgttcccat agtaacgcca atagggactt tccattgacg  4920
tcaatgggtg gagtatttac ggtaaactgc ccacttggca gtacatcaag tgtatcatat  4980
gccaagtacg ccccctattg acgtcaatga cggtaaatgg cccgcctggc attatgccca  5040
gtacatgacc ttatgggact ttcctacttg gcagtacatc tacgtattag tcatcgctat  5100
taccatggtc gaggtgagcc ccacgttctg cttcactctc cccatctccc ccccctcccc  5160
```

-continued

```
acccccaatt ttgtatttat ttattttttta attattttgt gcagcgatgg gggcgggggg  5220
gggggggggc gcgcgccagg cggggcgggg cggggcgagg ggcggggcgg ggcgaggcgg  5280
agaggtgcgg cggcagccaa tcagagcggc gcgctccgaa agtttccttt tatggcgagg  5340
cggcggcggc ggcggcccta taaaaagcga agcgcgcggc gggcgggagt cgctgcgcgc  5400
tgccttcgcc ccgtgccccg ctccgccgcc gcctcgcgcc gcccgccccg gctctgactg  5460
accgcgttac taaaacaggt aagtccggcc tccgcgccgg gttttggcgc ctcccgcggg  5520
cgccccccctc ctcacggcga gcgctgccac gtcagacgaa gggcgcagcg agcgtcctga  5580
tccttccgcc cggacgctca ggacagcggc ccgctgctca taagactcgg ccttagaacc  5640
ccagtatcag cagaaggaca ttttaggacg ggacttgggt gactctaggg cactggtttt  5700
ctttccagag agcggaacag gcgaggaaaa gtagtccctt ctcggcgatt ctgcggaggg  5760
atctccgtgg ggcggtgaac gccgatgatg cctctactaa ccatgttcat gttttctttt  5820
tttttctaca ggtcctgggt gacgaacagg gtaccgccac c                     5861

SEQ ID NO: 2           moltype = DNA  length = 1560
FEATURE                Location/Qualifiers
source                 1..1560
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 2
atgaggggca tgaagctgct gggggcgctg ctggcactgg cggccctact gcagggggcc  60
gtgtccctga agatcgcagc cttcaacatc cagacatttg ggagagacca gatgtccaat  120
gccaccctcg tcagctacat tgtgcagatc ctgagccgct atgacatcgc cctggtccag  180
gaggtcagag acagccacct gactgccgtg gggaagctgc tggacaacct caatcaggat  240
gcaccagaca cctatcacta cgtggtcagt gagccactgg gacggaacag ctataaggag  300
cgctacctgt tcgtgtacag gcctgaccag gtgtctgcgg tggacagcta ctactacgat  360
gatggctgcg agccctgcgg gaacgacacc ttcaaccgag agccagccat tgtcaggttc  420
ttctcccggt tcacagaggt cagggagttt gccattgttc ccctgcatgc ggcccccgggg  480
gacgcagtag ccgagatcga cgctctctat gacgtctacc tggatgtcca agagaaatgg  540
ggcttggagg acgtcatgtt gatgggcgac ttcaatgcgg gctgcagcta tgtgagaccc  600
tcccagtggt catccatccg cctgtggaca agccccacct tccagtggct gatccccgac  660
agcgctgaca ccacagctac acccacgcac tgtgcctatg acaggatcgt ggttgcaggg  720
atgctgctcc gaggcgccgt tgttcccgac tcggctcttc cctttaactt ccaggctgcc  780
tatggcctga gtgaccaact ggcccaagcc atcagtgacc actatccagt ggaggtgatg  840
ctgaagggcg gatcaggcgg atcacccaaa tcttgtgaca aaactcacac atgcccaccg  900
tgcccagcac ctgaactcct ggggggaccg tcagtcttcc tcttcccccc aaaacccaag  960
gacaccctca tgatctcccg gacccctgag gtcacatgcg tggtggtgga cgtgagccac  1020
gaagaccctg aggtcaagtt caactggtac gtggacggcg tggaggtgca taatgccaag  1080
acaaagccgc gggaggagca gtacaacagc acgtaccgtg tggtcagcgt cctcaccgtc  1140
ctgcaccagg actggctgaa tggcaaggag tacaagtgca aggtctccaa caaagccctc  1200
ccagcccccca tcgagaaaac catctccaaa gccaaagggc agccccgaga accacaggtg  1260
tacaccctgc ccccatcccg ggaggagatg accaagaacc aggtcagcct gacctgcctg  1320
gtcaaaggct tctatcccag cgacatcgcc gtggagtggg agagcaatgg gcagccggag  1380
aacaactaca agaccacgcc tcccgtgctg gactccgacg gctccttctt cctctacagc  1440
aagctcaccg tggacaagag caggtggcag caggggaacg tcttctcatg ctccgtgatg  1500
catgaggctc tgcacaacca ctacacgcag aagagcctct ccctgtctcc gggtaaatag  1560

SEQ ID NO: 3           moltype = DNA  length = 3423
FEATURE                Location/Qualifiers
source                 1..3423
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 3
gccagaccct gccgtgcatt tatttttggg gcggcctgct gccgtttggc atgctgtgcg  60
cgagcagcac caccaaatgc accgtgagcc atgaagtggc ggattgcagc catctgaaac  120
tgacccaggt gccggatgat ctgccgacca acattaccgt gctgaacctg acccataacc  180
agctgcgccg cctgccggcg gcgaacttta cccgctatag ccagctgacc agcctggatg  240
tgggctttaa caccattagc aaactggaac cggaactgtg ccagaaactg ccgatgctga  300
aagtgctgaa cctgcagcat aacgaactga gccagctgag cgataaaacc tttgcgtttt  360
gcaccaacct gaccgaactg catctgatga gcaacagcat tcagaaaatt aaaaacaacc  420
cgtttgtgaa acagaaaaac ctgattaccc tggatctgag ccataacggc ctgagcagca  480
ccaaactggg cacccaggtg cagctggaaa acctgcagga actgctgctg agcaacaaca  540
aaattcaggc gctgaaaagc gaagaactgg atatttttgc gaacagcagc ctgaaaaaac  600
tggaactgag cagcaaccag attaaagaat ttagcccggg ctgctttcat gcgattggcc  660
gcctgtttgg cctgtttctg aacaacgtgc agctgggccc gagcctgacc gaaaaactgt  720
gcctggaact ggcgaacacc agcattcgca acctgagcct gagcaacagc cagctgagca  780
ccaccagcaa caccaccttt ctgggcctga aatggaccaa cctgaccatg ctggatctga  840
gctataacaa cctgaacgtg gtgggcaacg atagctttgc gtggctgccg cagctggaat  900
atttttttct ggaatataac aacattcagc atctgtttag ccatagcctg catggcctgt  960
ttaacgtgcg ctatctgaac ctgaaacgca gctttaccaa acagagcatt agcctggcga  1020
gcctgccgaa aattgatgat tttagctttc agtggctgaa atgcctggaa catctgaaca  1080
tggaagataa cgatattccg ggcattaaaa gcaacatgtt taccggcctg attaacctga  1140
aatatctgag cctgagcaac agctttacca gcctgcgcac cctgaccaac gaaacctttg  1200
tgagcctggc gcatagcccg ctgcatattc tgaacctgac caaaaacaaa attagcaaaa  1260
ttgaaagcga tgcgtttagc tggctgggcc atctggaagt gctggatctg ggcctgaacg  1320
aaattggcca ggaactgacc ggccaggaat ggcgcggcct ggaaaacatt tttgaaattt  1380
atctgagcta taacaaatat ctgcagctga cccgcaacag ctttgcgctg gtgccgagcc  1440
```

-continued

```
tgcagcgcct gatgctgcgc cgcgtggcgc tgaaaaacgt ggatagcagc ccgagcccgt  1500
ttcagccgct gcgcaacctg accattctgg atctgagcaa caacaacatt gcgaacatta  1560
acgatgatat gctggaaggc ctggaaaaac tggaaattct ggatctgcag cataacaacc  1620
tggcgcgcct gtggaaacat gcgaacccgg gcggcccgat ttatttttctg aaaggcctga  1680
gccatctgca tattctgaac ctggaaagca acggctttga tgaaattccg gtggaagtgt  1740
ttaaagatct gtttgaactg aaaattattg atctgggcct gaacaacctg aacaccctgc  1800
cggcgagcgt gtttaacaac caggtgagcc tgaaaagcct gaacctgcag aaaaacctga  1860
ttaccagcgt ggaaaaaaaa gtgtttggcc cggcgtttcg caacctgacc gaactggata  1920
tgcgctttaa cccgtttgat tgcacctgcg aaagcattgc gtggtttgtg aactggatta  1980
acgaaaccca taccaacatt ccggaactga gcagccatta tctgtgcaac accccgccgc  2040
attatcatgg ctttccggtg cgcctgtttg ataccagcag ctgcaaagat agcgcgccgt  2100
ttgaactgtt ttttatgatt aacaccagca ttctgctgat ttttattttt attgtgctgc  2160
tgattcattt tgaaggctgg cgcattagct tttattggaa cgtgagcgtg catcgcgtgc  2220
tgggctttaa agaaattgat cgccagaccg aacagtttga atatgcggcg tatattattc  2280
atgcgtataa agataaagat tgggtgtggg aacattttag cagcatggaa aaagaagatc  2340
agagcctgaa attttgcctg gaagaacgcg attttgaagc gggcgtgttt gaactggaag  2400
cgattgtgaa cagcattaaa cgcagccgca aaattatttt tgtgattacc catcatctgc  2460
tgaaagatcc gctgtgcaaa cgctttaaag tgcatcatgc ggtgcagcag gcgattgaac  2520
agaacctgga tagcattatt ctggtgtttc tggaagaaat tccggattat aaactgaacc  2580
atgcgctgtg cctgcgccgc ggcatgttta aaagccattg cattctgaac tggccggtgc  2640
agaaagaacg cattggcgcg tttcgccata aactgcaggt ggcgctgggc agcaaaaaca  2700
gcgtgcatgg gcggatcagg cggatcaccc aaatcttgtg acaaaactca cacatgccca  2760
ccgtgcccag cacctgaact cctgggggga ccgtcagtct tcctcttccc cccaaaaccc  2820
aaggacaccc tcatgatctc ccggacccct gaggtcacat gcgtggtggt ggacgtgagc  2880
cacgaagacc ctgaggtcaa gttcaactgg tacgtggacg gcgtggaggt gcataatgcc  2940
aagacaaagc cgcgggagga gcagtacaac agcacgtacc gtgtggtcag cgtcctcacc  3000
gtcctgcacc aggactggct gaatggcaag gagtacaagt gcaaggtctc caacaaagcc  3060
ctcccagccc ccatcgagaa aaccatctcc aaagccaaag ggcagccccg agaaccacag  3120
gtgtacaccc tgcccccatc ccgggaggag atgaccaaga accaggtcag cctgacctgc  3180
ctggtcaaag gcttctatcc cagcgacatc gccgtggagt gggagagcaa tgggcagccg  3240
gagaacaact acaagaccac gcctcccgtg ctggactccg acggctcctt cttcctctac  3300
agcaagctca ccgtggacaa gagcaggtgg cagcagggga acgtcttctc atgctccgtg  3360
atgcatgagg ctctgcacaa ccactacacg cagaagagcc tctccctgtc tccgggtaaa  3420
tag                                                                 3423

SEQ ID NO: 4            moltype = DNA  length = 3877
FEATURE                 Location/Qualifiers
source                  1..3877
                        mol_type = other DNA
                        organism = synthetic construct
SEQUENCE: 4
atgaggggca tgaagctgct gggggcgctg ctggcactgg cggccctact gcaggggggcc  60
gtgtccatgg gcttttgccg cagcgcgctg catccgctga gcctgctggt gcaggcgatt  120
atgctggcga tgaccctggc gctgggcacc ctgccggcgt ttctgccgtg cgaactgcag  180
ccgcatggcc tggtgaactg caactggctg tttctgaaaa gcgtgccgca ttttagcatg  240
gcggcgccgc gcggcaacgt gaccagcctg agcctgagca gcaaccgcat tcatcatctg  300
catgatagcg attttgcgca tctgccgagc ctgcgccatc tgaacctgaa atggaactgc  360
ccgccggtgg gcctgagccc gatgcatttt ccgtgccata tgaccattga accgagcacc  420
tttctggcgg tgccgaccct ggaagaactg aacctgagct ataacaacat tatgaccgtg  480
ccggcgctgc cgaaaagcct gattagcctg agcctgagcc ataccaacat tctgatgctg  540
gatagcgcga gcctggcggg cctgcatgcg ctgcgctttc tgtttatgga tggcaactgc  600
tattataaaa acccgtgccg ccaggcgctg gaagtggcgc cgggcgcgct gctgggcctg  660
ggcaacctga cccatctgag cctgaaatat aacaacctga ccgtggtgcc gcgcaacctg  720
ccgagcagcc tggaatatct gctgctgagc tataaccgca ttgtgaaact ggcgccggaa  780
gatctggcga acctgaccgc gctgcgcgtg ctggatgtgg gcggcaactg ccgccgctgc  840
gatcatgcgc cgaacccgtg catggaatgc ccgcgccatt ttccgcagct gcatccggat  900
acctttagcc atctgagccg cctggaaggc ctggtgctga aagatagcag cctgagctgg  960
ctgaacgcga gctggtttcg cggcctgggc aacctgcgcg tgctggatct gagcgaaaac  1020
tttctgtata aatgcattac caaaaccaaa gcgtttcagg gcctgaccca gctgcgcaaa  1080
ctgaacctga gctttaacta tcagaaacgc gtgagctttg cgcatctgag cctggcgccg  1140
agctttggca gcctggtggc gctgaaagaa ctggatatgc atggcatttt ttttcgcagc  1200
ctggatgaaa ccaccctgcg cccgctggcg cgcctgccga tgctgcagac cctgcgcctg  1260
cagatgaact ttattaacca ggcgcagctg ggcatttttc gcgcgtttcc gggcctgcgc  1320
tatgtggatc tgagcgataa ccgcattagc ggcgcgagcg aactgaccgc gaccatgggc  1380
gaagcggatg gcggcgaaaa agtgtggctg cagccgggcg atctggcgcc ggcgccggtg  1440
gataccccga gcagcgaaga ttttcgcccg aactgcagca ccctgaactt taccctggat  1500
ctgagccgca acaacctggt gaccgtgcag ccggaaatgt ttgcgcagct gagccatctg  1560
cagtgcctgc gcctgagcca taactgcatt agccaggcgg tgaacggcag ccagtttctg  1620
ccgctgaccg gcctgcaggt gctggatctg agccataaca aactggatct gtatcatgaa  1680
catagcttta ccgaactgcc gcgcctggaa gcgctggatc tgagctataa cagccagccg  1740
tttggcatgc agggcgtggg ccataacttt agctttgtgg cgcatctgcg caccctgcgc  1800
catctgagcc tggcgcataa caacattcat agccaggtga gccagcagct gtgcagcacc  1860
agcctgcgcg cgctggattt tagcggcaac gcgctgggcc atatgtgggc ggaaggcgat  1920
ctgtatctgc atttttttca gggcctgagc ggcctgattt ggctggatct gagccagaac  1980
cgcctgcata ccctgctgcc gcagaccctg cgcaacctgc cgaaaagcct gcaggtgctg  2040
cgcctgcgcg ataactatct ggcgtttttt aaatggtgga gcctgcattt tctgccgaaa  2100
```

-continued

```
ctggaagtgc tggatctggc gggcaaccag ctgaaagcgc tgaccaacgg cagcctgccg  2160
gcgggcaccc gcctgcgccg cctggatgtg agctgcaaca gcattagctt tgtggcgccg  2220
ggctttttta gcaaagcgaa agaactgcgc gaactgaacc tgagcgcgaa cgcgctgaaa  2280
accgtggatc atagctggtt tggcccgctg gcgagcgcgc tgcagattct ggatgtgagc  2340
gcgaacccgc tgcattgcgc gtgcggcgcg gcgtttatgg attttctgct ggaagtgcag  2400
gcggcggtgc cgggcctgcc gagccgcgtg aaatgcggca gcccgggcca gctgcagggc  2460
ctgagcattt ttgcgcagga tctgcgcctg tgcctggatg aagcgctgag ctgggattgc  2520
tttgcgctga gcctgctggc ggtggcgctg ggcctgggcg tgccgatgct gcatcatctg  2580
tgcggctggg atctgtggta ttgctttcat ctgtgcctgg cgtggctgcc gtggcgcggc  2640
cgccagagcg gccgcgatga agatgcgctg ccgtatgatg cgtttgtggt gtttgataaa  2700
acccagagcg cggtggcgga ttgggtgtat aacgaactgc gcggccagct ggaagaatgc  2760
cgcggccgct gggcgctgcg cctgtgcctg gaagaacgcg attggctgcc gggcaaaacc  2820
ctgtttgaaa acctgtgggc gagcgtgtat ggcagccgca aaaccctgtt tgtgctggcg  2880
cataccgatc gcgtgagcgg cctgctgcgc gcgagctttc tgctggcgca gcagcgcctg  2940
ctggaagatc gcaaagatgt ggtggtgctg gtgattctga gcccggatgg ccgccgcagc  3000
cgctatgtgc gcctgcgcca gcgcctgtgc cgccagagcg tgctgctgtg gccgcatcag  3060
ccgagcggcc agcgcagctt ttgggcgcag ctgggcatgg cgctgacccg cgataaccat  3120
catttttata accgcaactt ttgccagggc ccgaccgcgg aagggcggat caggcggatc  3180
acccaaatct tgtgacaaaa ctcacacatg cccaccgtgc ccagcacctg aactcctggg  3240
gggaccgtca gtcttcctct tccccccaaa acccaaggac accctcatga tctcccggac  3300
ccctgaggtc acatgcgtgg tggtggacgt gagccacgaa gaccctgagg tcaagttcaa  3360
ctggtacgtg gacggcgtgg aggtgcataa tgccaagaca aagccgcggg aggagcagta  3420
caacagcacg taccgtgtgg tcagcgtcct caccgtcctg caccaggact ggctgaatgg  3480
caaggagtac aagtgcaagg tctccaacaa agccctccca gcccccatcg agaaaaccat  3540
ctccaaagcc aaagggcagc cccgagaacc acaggtgtac accctgcccc catcccggga  3600
ggagatgacc aagaaccagg tcagcctgac ctgcctggtc aaaggcttct atcccagcga  3660
catcgccgtg gagtgggaga gcaatgggca gccggagaac aactacaaga ccacgcctcc  3720
cgtgctggac tccgacggct ccttcttcct ctacagcaag ctcaccgtgg acaagagcag  3780
gtggcagcag gggaacgtct tctcatgctc cgtgatgcat gaggctctgc acaaccacta  3840
cacgcagaag agcctctccc tgtctccggg taaatag                          3877

SEQ ID NO: 5            moltype = DNA  length = 1503
FEATURE                 Location/Qualifiers
source                  1..1503
                        mol_type = other DNA
                        organism = synthetic construct
SEQUENCE: 5
atgaggggca tgaagctgct gggggcgctg ctggcactgg cggccctact gcaggggggcc  60
gtgtccatga gcatgctgtt ttataccctg attaccgcgt ttctgattgg cattcaggcg  120
gaaccgcata gcgaaagcaa cgtgccggcg ggccatacca ttccgcaggc gcattggacc  180
aaactgcagc atagcctgga taccgcgctg cgccgcgcgc gcagcgcgcc ggcggcggcg  240
attgcggcgc gcgtggcggg ccagacccgc aacattaccg tggatccgcg cctgtttaaa  300
aaacgccgcc tgcgcagccc gcgcgtgctg tttagcaccc agccgccgcg cgaagcggcg  360
gatacccagg atctggattt tgaagtgggc ggcgcggcgc cgtttaaccg cacccatcgc  420
agcaaacgca gcagcagcca tccgattttt catcgcggcg aatttagcgt gtgcgatagc  480
gtgagcgtgt gggtgggcga taaaaccacc gcgaccgata ttaaaggcaa agaagtgatg  540
gtgctgggcg aagtgaacat taacaacagc gtgtttaaac agtatttttt tgaaaccaaa  600
tgccgcgatc cgaacccggt ggatagcggc tgccgcggca ttgatagcaa acattggaac  660
agctattgca ccaccaccca tacctttgtg aaagcgctga ccatggatgg caaacaggcg  720
gcgtggcgct ttattcgcat tgataccgcg tgcgtgtgcg tgctgagccg caaagcggtg  780
cgccgcgcgg gcggatcagg cggatcaccc aaatcttgtg acaaaactca cacatgccca  840
ccgtgcccag cacctgaact cctgggggga ccgtcagtct tcctcttccc cccaaaaccc  900
aaggacaccc tcatgatctc ccggacccct gaggtcacat gcgtggtggt ggacgtgagc  960
cacgaagacc ctgaggtcaa gttcaactgg tacgtggacg gcgtggaggt gcataatgcc  1020
aagacaaagc cgcgggagga gcagtacaac agcacgtacc gtgtggtcag cgtcctcacc  1080
gtcctgcacc aggactggct gaatggcaag gagtacaagt gcaaggtctc caacaaagcc  1140
ctcccagccc ccatcgagaa aaccatctcc aaagccaaag ggcagccccg agaaccacag  1200
gtgtacaccc tgcccccatc ccgggaggag atgaccaaga accaggtcag cctgacctgc  1260
ctggtcaaag gcttctatcc cagcgacatc gccgtggagt gggagagcaa tgggcagccg  1320
gagaacaact acaagaccac gcctcccgtg ctggactccg acggctcctt cttcctctac  1380
agcaagctca ccgtggacaa gagcaggtgg cagcagggga acgtcttctc atgctccgtg  1440
atgcatgagg ctctgcacaa ccactacacg cagaagagcc tctccctgtc tccgggtaaa  1500
tag                                                               1503

SEQ ID NO: 6            moltype = DNA  length = 1111
FEATURE                 Location/Qualifiers
source                  1..1111
                        mol_type = other DNA
                        organism = synthetic construct
SEQUENCE: 6
atgaggggca tgaagctgct gggggcgctg ctggcactgg cggccctact gcaggggggcc  60
gtgtccatgg cgctgtggat gcgcctgctg ccgctgctgg cgctgctggc gctgtggggc  120
ccggatccgg cggcggcgtt tgtgaaccag catctgtgcg gcagccatct ggtggaagcg  180
ctgtatctgg tgtgcggcga acgcggcttt ttttataccc cgaaaacccg ccgcgaagcg  240
gaagatctgc aggtgggcca ggtggaactg ggcggcggcc cgggcgcggg cagcctgcag  300
ccgctggcgc tggaaggcag cctgcagaaa cgcggcattg tggaacagtg ctgcaccagc  360
```

-continued

```
atttgcagcc tgtatcagct ggaaaactat tgcaacgggc ggatcaggcg gatcacccaa  420
atcttgtgac aaaactcaca catgcccacc gtgcccagca cctgaactcc tggggggacc  480
gtcagtcttc ctcttccccc caaaacccaa ggacaccctc atgatctccc ggacccctga  540
ggtcacatgc gtggtggtgg acgtgagcca cgaagaccct gaggtcaagt tcaactggta  600
cgtggacggc gtggaggtgc ataatgccaa gacaaagccg cgggaggagc agtacaacag  660
cacgtaccgt gtggtcagcg tcctcaccgt cctgcaccag gactggctga atggcaagga  720
gtacaagtgc aaggtctcca acaaagccct cccagccccc atcgagaaaa ccatctccaa  780
agccaaaggg cagccccgag aaccacaggt gtacaccctg cccccatccc gggaggagat  840
gaccaagaac caggtcagcc tgacctgcct ggtcaaaggc ttctatccca gcgacatcgc  900
cgtggagtgg gagagcaatg ggcagccgga gaacaactac aagaccacgc ctcccgtgct  960
ggactccgac ggctccttct tcctctacag caagctcacc gtggacaaga gcaggtggca  1020
gcaggggaac gtcttctcat gctccgtgat gcatgaggct ctgcacaacc actacacgca  1080
gaagagcctc tccctgtctc cgggtaaata g                                 1111

SEQ ID NO: 7            moltype = DNA  length = 7421
FEATURE                 Location/Qualifiers
source                  1..7421
                        mol_type = other DNA
                        organism = synthetic construct
SEQUENCE: 7
ttctagaata atcaacctct ggattacaaa atttgtgaaa gattgactgg tattcttaac  60
tatgttgctc cttttacgct atgtggatac gctgctttaa tgcctttgta tcatgctatt  120
gcttcccgta tggctttcat tttctcctcc ttgtataaat cctggttgct gtctctttat  180
gaggagttgt ggcccgttgt caggcaacgt ggcgtggtgt gcactgtgtt tgctgacgca  240
acccccactg gttggggcat tgccaccacc tgtcagctcc tttccgggac tttcgctttc  300
cccctcccta ttgccacggc ggaactcatc gccgcctgcc ttgcccgctg ctggacaggg  360
gctcggctgt tgggcactga caattccgtg gtgttgtcgg ggaaatcatc gtcctttcct  420
tggctgctcg cctgtgttgc cacctggatt ctgcgcggga cgtccttctg ctacgtccct  480
tcggccctca atccagcgga ccttccttcc cgcggcctgc tgccggctct gcggcctctt  540
ccgcgtcttc gccttcgccc tcagacgagt cggatctccc tttgggccgc ctccccgcct  600
aagcttatcg ataccgtcga gatctaactt gtttattgca gcttataatg gttacaaata  660
aagcaatagc atcacaaatt tcacaaataa agcatttttt tcactgcatt ctagttgtgg  720
tttgtccaaa ctcatcaatg tatcttatca tgtctggatc tcgacctcga ctagagcatg  780
gctacgtaga taagtagcat ggcgggttaa tcattaacta caaggaaccc ctagtgatgg  840
agttggccac tccctctctg cgcgctcgct cgctcactga ggccgggcga ccaaaggtcg  900
cccgacgccc gggctttgcc cgggcggcct cagtgagcga gcgagcgcgc cagctggcgt  960
aatagcgaag aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa  1020
tggaattcca gacgattgag cgtcaaaatg taggtatttc catgagcgtt tttcctgttg  1080
caatggctgg cggtaatatt gttctggata ttaccagcaa ggccgatagt ttgagttctt  1140
ctactcaggc aagtgatgtt attactaatc aaagaagtat tgcgacaacg gttaatttgc  1200
gtgatggaca gactctttta ctcggtggcc tcactgatta taaaaacact tctcaggatt  1260
ctggcgtacc gttcctgtct aaaatccctt taatcggcct cctgtttagc tcccgctctg  1320
attctaacga ggaaagcacg ttatacgtgc tcgtcaaagc aaccatagta cgcgccctgt  1380
agcggcgcat taagcgcggc gggtgtggtg gttacgcgca gcgtgaccgc tacacttgcc  1440
agcgccctag cgcccgctcc tttcgctttc ttcccttcct ttctcgccac gttcgccggc  1500
tttccccgtc aagctctaaa tcgggggctc cctttagggt tccgatttag tgctttacgg  1560
cacctcgacc ccaaaaaact tgattagggt gatggttcac gtagtgggcc atcgccctga  1620
tagacggttt ttcgcccttt gacgttggag tccacgttct ttaatagtgg actcttgttc  1680
caaactggaa caacactcaa ccctatctcg gtctattctt ttgatttata agggattttg  1740
ccgatttcgg cctattggtt aaaaaatgag ctgatttaac aaaaatttaa cgcgaatttt  1800
aacaaaatat taacgtttac aatttaaata tttgcttata caatcttcct gtttttgggg  1860
cttttctgat tatcaaccgg ggtacatatg attgacatgc tagttttacg attaccgttc  1920
atcgattctc ttgtttgctc cagactctca ggcaatgacc tgatagcctt tgtagagacc  1980
tctcaaaaat agctaccctc tccggcatga atttatcagc tagaacggtt gaatatcata  2040
ttgatggtga tttgactgtc tccggccttt ctcacccgtt tgaatcttta cctacacatt  2100
actcaggcat tgcatttaaa atatatgagg gttctaaaaa tttttatcct tgcgttgaaa  2160
taaaggcttc tcccgcaaaa gtattacagg gtcataatgt ttttggtaca accgatttag  2220
ctttatgctc tgaggcttta ttgcttaatt ttgctaattc tttgccttgc ctgtatgatt  2280
tattggatgt tggaattcct gatgcggtat tttctcctta cgcatctgtg cggtatttca  2340
caccgcatat ggtgcactct cagtacaatc tgctctgatg ccgcatagtt aagccagccc  2400
cgacacccgc caacacccgc tgacgcgccc tgacgggctt gtctgctccc ggcatccgct  2460
tacagacaag ctgtgaccgt ctccgggagc tgcatgtgtc agaggttttc accgtcatca  2520
ccgaaacgcg cgagacgaaa gggcctcgtg atacgcctat ttttataggt taatgtcatg  2580
ataataatgg tttcttagac gtcaggtggc acttttcggg gaaatgtgcg cggaacccct  2640
atttgtttat ttttctaaat acattcaaat atgtatccgc tcatgagaca ataaccctga  2700
taaatgcttc aataatattg aaaaaggaag agtatgagta ttcaacattt ccgtgtcgcc  2760
cttattccct tttttgcggc attttgcctt cctgtttttg ctcacccaga aacgctggtg  2820
aaagtaaaag atgctgaaga tcagttgggt gcacgagtgg gttacatcga actggatctc  2880
aacagcggta agatccttga gagttttcgc cccgaagaac gttttccaat gatgagcact  2940
tttaaagttc tgctatgtgg cgcggtatta tcccgtattg acgccgggca agagcaactc  3000
ggtcgccgca tacactattc tcagaatgac ttggttgagt actcaccagt cacagaaaag  3060
catcttacgg atggcatgac agtaagagaa ttatgcagtg ctgccataac catgagtgat  3120
aacactgcgg ccaacttact tctgacaacg atcggaggac cgaaggagct aaccgctttt  3180
ttgcacaaca tgggggatca tgtaactcgc cttgatcgtt gggaaccgga gctgaatgaa  3240
gccataccaa acgacgagcg tgacaccacg atgcctgtag caatggcaac aacgttgcgc  3300
aaactattaa ctggcgaact acttactcta gcttcccggc aacaattaat agactggatg  3360
```

-continued

```
gaggcggata aagttgcagg accacttctg cgctcggccc ttccggctgg ctggtttatt  3420
gctgataaat ctggagccgg tgagcgtggg tctcgcggta tcattgcagc actggggcca  3480
gatggtaagc cctcccgtat cgtagttatc tacacgacgg ggagtcaggc aactatggat  3540
gaacgaaata gacagatcgc tgagataggt gcctcactga ttaagcattg gtaactgtca  3600
gaccaagttt actcatatat actttagatt gatttaaaac ttcattttta atttaaaagg  3660
atctaggtga agatcctttt tgataatctc atgaccaaaa tcccttaacg tgagttttcg  3720
ttccactgag cgtcagaccc cgtagaaaag atcaaaggat cttcttgaga tccttttttt  3780
ctgcgcgtaa tctgctgctt gcaaacaaaa aaaccaccgc taccagcggt ggtttgtttg  3840
ccggatcaag agctaccaac tctttttccg aaggtaactg gcttcagcag agcgcagata  3900
ccaaatactg tccttctagt gtagccgtag ttaggccacc acttcaagaa ctctgtagca  3960
ccgcctacat acctcgctct gctaatcctg ttaccagtgg ctgctgccag tggcgataag  4020
tcgtgtctta ccgggttgga ctcaagacga tagttaccgg ataaggcgca gcggtcgggc  4080
tgaacggggg gttcgtgcac acagcccagc ttggagcgaa cgacctacac cgaactgaga  4140
tacctacagc gtgagctatg agaaagcgcc acgcttcccg aagggagaaa ggcggacagg  4200
tatccggtaa gcggcagggt cggaacagga gagcgcacga gggagcttcc agggggaaac  4260
gcctggtatc tttatagtcc tgtcgggttt cgccacctct gacttgagcg tcgatttttg  4320
tgatgctcgt caggggggcg gagcctatgg aaaaacgcca gcaacgcggc ctttttacgg  4380
ttcctggcct tttgctggcc ttttgctcac atgttctttc ctgcgttatc ccctgattct  4440
gtggataacc gtattaccgc ctttgagtga gctgataccg ctcgccgcag ccgaacgacc  4500
gagcgcagcg agtcagtgag cgaggaagcg gaagagcgcc caatacgcaa accgcctctc  4560
cccgcgcgtt ggccgattca ttaatgcagc agctgcgcgc tcgctcgctc actgaggccg  4620
cccgggcaaa gcccgggcgt cgggcgacct ttggtcgccc ggcctcagtg agcgagcgag  4680
cgcgcagaga gggagtggcc aactccatca ctaggggttc cttgtagtta atgattaacc  4740
cgccatgcta cttatctacg tagccatgct ctaggacatt gattattgac tagtggagtt  4800
ccgcgttaca taacttacgg taaatggccc gcctggctga ccgcccaacg acccccgccc  4860
attgacgtca ataatgacgt atgttcccat agtaacgcca atagggactt tccattgacg  4920
tcaatgggtg gagtatttac ggtaaactgc ccacttggca gtacatcaag tgtatcatat  4980
gccaagtacg ccccctattg acgtcaatga cggtaaatgg cccgcctggc attatgccca  5040
gtacatgacc ttatgggact ttcctacttg gcagtacatc tacgtattag tcatcgctat  5100
taccatggtc gaggtgagcc ccacgttctg cttcactctc cccatctccc ccccctcccc  5160
acccccaatt ttgtatttat ttatttttta attattttgt gcagcgatgg gggcgggggg  5220
gggggggggc gcgcgccagg cggggcgggg cggggcgagg ggcggggcgg ggcgaggcgg  5280
agaggtgcgg cggcagccaa tcagagcggc gcgctccgaa agtttccttt tatggcgagg  5340
cggcggcggc ggcggcccta taaaaagcga agcgcgcggc gggcgggagt cgctgcgcgc  5400
tgccttcgcc ccgtgccccg ctccgccgcc gcctcgcgcc gcccgccccg gctctgactg  5460
accgcgttac taaaacaggt aagtccggcc tccgcgccgg gttttggcgc ctcccgcggg  5520
cgcccccctc ctcacggcga gcgctgccac gtcagacgaa gggcgcagcg agcgtcctga  5580
tccttccgcc cggacgctca ggacagcggc ccgctgctca taagactcgg ccttagaacc  5640
ccagtatcag cagaaggaca ttttaggacg ggacttgggt gactctaggg cactggtttt  5700
ctttccagag agcggaacag gcgaggaaaa gtagtccctt ctcggcgatt ctgcggaggg  5760
atctccgtgg ggcggtgaac gccgatgatg cctctactaa ccatgttcat gttttctttt  5820
tttttctaca ggtcctgggt gacgaacagg gtaccgccac catgaggggc atgaagctgc  5880
tgggggcgct gctggcactg gcggccctac tgcagggggc cgtgtccctg aagatcgcag  5940
ccttcaacat ccagacattt ggggagacca agatgtccaa tgccaccctc gtcagctaca  6000
ttgtgcagat cctgagccgc tatgacatcg ccctggtcca ggaggtcaga gacagccacc  6060
tgactgccgt ggggaagctg ctggacaacc tcaatcagga tgcaccagac acctatcact  6120
acgtggtcag tgagccactg ggacggaaca gctataagga gcgctacctg ttcgtgtaca  6180
ggcctgacca ggtgtctgcg gtggacagct actactacga tgatggctgc gagccctgcg  6240
ggaacgacac cttcaaccga gagccagcca ttgtcaggtt cttctcccgg ttcacagagg  6300
tcagggagtt tgccattgtt cccctgcatg cggccccggg ggacgcagta gccgagatcg  6360
acgctctcta tgacgtctac ctggatgtcc aagagaaatg gggcttggag gacgtcatgt  6420
tgatgggcga cttcaatgcg ggctgcagct atgtgagacc ctcccagtgg tcatccatcc  6480
gcctgtggac aagccccacc ttccagtggc tgatccccga cagcgctgac accacagcta  6540
cacccacgca ctgtgcctat gacaggatcg tggttgcagg gatgctgctc cgaggcgccg  6600
ttgttcccga ctcggctctt ccctttaact tccaggctgc ctatggcctg agtgaccaac  6660
tggcccaagc catcagtgac cactatccag tggaggtgat gctgaagggc ggatcaggcg  6720
gatcacccaa atcttgtgac aaaactcaca catgcccacc gtgcccagca cctgaactcc  6780
tgggggggacc gtcagtcttc ctcttccccc caaaacccaa ggacaccctc atgatctccc  6840
ggacccctga ggtcacatgc gtggtggtgg acgtgagcca cgaagaccct gaggtcaagt  6900
tcaactggta cgtggacggc gtggaggtgc ataatgccaa gacaaagccg cgggaggagc  6960
agtacaacag cacgtaccgt gtggtcagcg tcctcaccgt cctgcaccag gactggctga  7020
atggcaagga gtacaagtgc aaggtctcca acaaagccct cccagccccc atcgagaaaa  7080
ccatctccaa agccaaaggg cagccccgag aaccacaggt gtacaccctg cccccatccc  7140
gggaggagat gaccaagaac caggtcagcc tgacctgcct ggtcaaaggc ttctatccca  7200
gcgacatcgc cgtggagtgg gagagcaatg ggcagccgga gaacaactac aagaccacgc  7260
ctcccgtgct ggactccgac ggctccttct tcctctacag caagctcacc gtggacaaga  7320
gcaggtggca gcaggggaac gtcttctcat gctccgtgat gcatgaggct ctgcacaacc  7380
actacacgca gaagagcctc tccctgtctc cgggtaaata g                     7421

SEQ ID NO: 8           moltype = DNA  length = 9284
FEATURE                Location/Qualifiers
source                 1..9284
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 8
ttctagaata atcaacctct ggattacaaa atttgtgaaa gattgactgg tattcttaac  60
```

-continued

```
tatgttgctc cttttacgct atgtggatac gctgctttaa tgcctttgta tcatgctatt  120
gcttcccgta tggctttcat tttctcctcc ttgtataaat cctggttgct gtctctttat  180
gaggagttgt ggcccgttgt caggcaacgt ggcgtggtgt gcactgtgtt tgctgacgca  240
acccccactg gttggggcat tgccaccacc tgtcagctcc tttccgggac tttcgctttc  300
cccctcccta ttgccacggc ggaactcatc gccgcctgcc ttgcccgctg ctggacaggg  360
gctcggctgt tgggcactga caattccgtg gtgttgtcgg ggaaatcatc gtcctttcct  420
tggctgctcg cctgtgttgc cacctggatt ctgcgcggga cgtccttctg ctacgtccct  480
tcggccctca atccagcgga ccttccttcc cgcggcctgc tgccggctct gcggcctctt  540
ccgcgtcttc gccttcgccc tcagacgagt cggatctccc tttgggccgc ctccccgcct  600
aagcttatcg ataccgtcga gatctaactt gtttattgca gcttataatg gttacaaata  660
aagcaatagc atcacaaatt tcacaaataa agcatttttt tcactgcatt ctagttgtgg  720
tttgtccaaa ctcatcaatg tatcttatca tgtctggatc tcgacctcga ctagagcatg  780
gctacgtaga taagtagcat ggcgggttaa tcattaacta caaggaaccc ctagtgatgg  840
agttggccac tccctctctg cgcgctcgct cgctcactga ggccgggcga ccaaaggtcg  900
cccgacgccc gggctttgcc cgggcggcct cagtgagcga gcgagcgcgc cagctggcgt  960
aatagcgaag aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa  1020
tggaattcca gacgattgag cgtcaaaatg taggtatttc catgagcgtt tttcctgttg  1080
caatggctgg cggtaatatt gttctggata ttaccagcaa ggccgatagt ttgagttctt  1140
ctactcaggc aagtgatgtt attactaatc aaagaagtat tgcgacaacg gttaatttgc  1200
gtgatggaca gactctttta ctcggtggcc tcactgatta taaaaacact tctcaggatt  1260
ctggcgtacc gttcctgtct aaaatccctt taatcggcct cctgtttagc tcccgctctg  1320
attctaacga ggaaagcacg ttatacgtgc tcgtcaaagc aaccatagta cgcgccctgt  1380
agcggcgcat taagcgcggc gggtgtggtg gttacgcgca gcgtgaccgc tacacttgcc  1440
agcgccctag cgcccgctcc tttcgctttc ttcccttcct ttctcgccac gttcgccggc  1500
tttccccgtc aagctctaaa tcgggggctc cctttagggt tccgatttag tgctttacgg  1560
cacctcgacc ccaaaaaact tgattagggt gatggttcac gtagtgggcc atcgccctga  1620
tagacggttt ttcgcccttt gacgttggag tccacgttct ttaatagtgg actcttgttc  1680
caaactggaa caacactcaa ccctatctcg gtctattctt ttgatttata agggattttg  1740
ccgatttcgg cctattggtt aaaaaatgag ctgatttaac aaaaatttaa cgcgaatttt  1800
aacaaaatat taacgtttac aatttaaata tttgcttata caatcttcct gtttttgggg  1860
cttttctgat tatcaaccgg ggtacatatg attgacatgc tagttttacg attaccgttc  1920
atcgattctc ttgtttgctc cagactctca ggcaatgacc tgatagcctt tgtagagacc  1980
tctcaaaaat agctaccctc tccggcatga atttatcagc tagaacggtt gaatatcata  2040
ttgatggtga tttgactgtc tccggccttt ctcacccgtt tgaatcttta cctacacatt  2100
actcaggcat tgcatttaaa atatatgagg gttctaaaaa tttttatcct tgcgttgaaa  2160
taaaggcttc tcccgcaaaa gtattacagg gtcataatgt ttttggtaca accgatttag  2220
ctttatgctc tgaggcttta ttgcttaatt ttgctaattc tttgccttgc ctgtatgatt  2280
tattggatgt tggaattcct gatgcggtat tttctcctta cgcatctgtg cggtatttca  2340
caccgcatat ggtgcactct cagtacaatc tgctctgatg ccgcatagtt aagccagccc  2400
cgacacccgc caacacccgc tgacgcgccc tgacgggctt gtctgctccc ggcatccgct  2460
tacagacaag ctgtgaccgt ctccgggagc tgcatgtgtc agaggttttc accgtcatca  2520
ccgaaacgcg cgagacgaaa gggcctcgtg atacgcctat ttttataggt taatgtcatg  2580
ataataatgg tttcttagac gtcaggtggc acttttcggg gaaatgtgcg cggaacccct  2640
atttgtttat ttttctaaat acattcaaat atgtatccgc tcatgagaca ataaccctga  2700
taaatgcttc aataatattg aaaaaggaag agtatgagta ttcaacattt ccgtgtcgcc  2760
cttattccct tttttgcggc attttgcctt cctgtttttg ctcacccaga aacgctggtg  2820
aaagtaaaag atgctgaaga tcagttgggt gcacgagtgg gttacatcga actggatctc  2880
aacagcggta agatccttga gagttttcgc cccgaagaac gttttccaat gatgagcact  2940
tttaaagttc tgctatgtgg cgcggtatta tcccgtattg acgccgggca agagcaactc  3000
ggtcgccgca tacactattc tcagaatgac ttggttgagt actcaccagt cacagaaaag  3060
catcttacgg atggcatgac agtaagagaa ttatgcagtg ctgccataac catgagtgat  3120
aacactgcgg ccaacttact tctgacaacg atcggaggac cgaaggagct aaccgctttt  3180
ttgcacaaca tgggggatca tgtaactcgc cttgatcgtt gggaaccgga gctgaatgaa  3240
gccataccaa acgacgagcg tgacaccacg atgcctgtag caatggcaac aacgttgcgc  3300
aaactattaa ctggcgaact acttactcta gcttcccggc aacaattaat agactggatg  3360
gaggcggata aagttgcagg accacttctg cgctcggccc ttccggctgg ctggtttatt  3420
gctgataaat ctggagccgg tgagcgtggg tctcgcggta tcattgcagc actggggcca  3480
gatggtaagc cctcccgtat cgtagttatc tacacgacgg ggagtcaggc aactatggat  3540
gaacgaaata gacagatcgc tgagataggt gcctcactga ttaagcattg gtaactgtca  3600
gaccaagttt actcatatat actttagatt gatttaaaac ttcattttta atttaaaagg  3660
atctaggtga agatcctttt tgataatctc atgaccaaaa tcccttaacg tgagttttcg  3720
ttccactgag cgtcagaccc cgtagaaaag atcaaaggat cttcttgaga tccttttttt  3780
ctgcgcgtaa tctgctgctt gcaaacaaaa aaaccaccgc taccagcggt ggtttgtttg  3840
ccggatcaag agctaccaac tctttttccg aaggtaactg gcttcagcag agcgcagata  3900
ccaaatactg tccttctagt gtagccgtag ttaggccacc acttcaagaa ctctgtagca  3960
ccgcctacat acctcgctct gctaatcctg ttaccagtgg ctgctgccag tggcgataag  4020
tcgtgtctta ccgggttgga ctcaagacga tagttaccgg ataaggcgca gcggtcgggc  4080
tgaacggggg gttcgtgcac acagcccagc ttggagcgaa cgacctacac cgaactgaga  4140
tacctacagc gtgagctatg agaaagcgcc acgcttcccg aagggagaaa ggcggacagg  4200
tatccggtaa gcggcagggt cggaacagga gagcgcacga gggagcttcc agggggaaac  4260
gcctggtatc tttatagtcc tgtcgggttt cgccacctct gacttgagcg tcgatttttg  4320
tgatgctcgt caggggggcg gagcctatgg aaaaacgcca gcaacgcggc ctttttacgg  4380
ttcctggcct tttgctggcc ttttgctcac atgttctttc ctgcgttatc ccctgattct  4440
gtggataacc gtattaccgc ctttgagtga gctgataccg ctcgccgcag ccgaacgacc  4500
gagcgcagcg agtcagtgag cgaggaagcg gaagagcgcc caatacgcaa accgcctctc  4560
cccgcgcgtt ggccgattca ttaatgcagc agctgcgcgc tcgctcgctc actgaggccg  4620
```

-continued

```
cccgggcaaa gcccgggcgt cgggcgacct ttggtcgccc ggcctcagtg agcgagcgag  4680
cgcgcagaga gggagtggcc aactccatca ctaggggttc cttgtagtta atgattaacc  4740
cgccatgcta cttatctacg tagccatgct ctaggacatt gattattgac tagtggagtt  4800
ccgcgttaca taacttacgg taaatggccc gcctggctga ccgcccaacg acccccgccc  4860
attgacgtca ataatgacgt atgttcccat agtaacgcca atagggactt tccattgacg  4920
tcaatgggtg gagtatttac ggtaaactgc ccacttggca gtacatcaag tgtatcatat  4980
gccaagtacg ccccctattg acgtcaatga cggtaaatgg cccgcctggc attatgccca  5040
gtacatgacc ttatgggact ttcctacttg gcagtacatc tacgtattag tcatcgctat  5100
taccatggtc gaggtgagcc ccacgttctg cttcactctc cccatctccc ccccctcccc  5160
acccccaatt ttgtatttat ttatttttta attattttgt gcagcgatgg gggcgggggg  5220
gggggggggc gcgcgccagg cggggcgggg cggggcgagg ggcggggcgg ggcgaggcgg  5280
agaggtgcgg cggcagccaa tcagagcggc gcgctccgaa agtttccttt tatggcgagg  5340
cggcggcggc ggcggcccta taaaaagcga agcgcgcggc gggcgggagt cgctgcgcgc  5400
tgccttcgcc ccgtgccccg ctccgccgcc gcctcgcgcc gcccgccccg gctctgactg  5460
accgcgttac taaaacaggt aagtccggcc tccgcgccgg gttttggcgc ctcccgcggg  5520
cgccccccctc ctcacggcga gcgctgccac gtcagacgaa gggcgcagcg agcgtcctga  5580
tccttccgcc cggacgctca ggacagcggc ccgctgctca taagactcgg ccttagaacc  5640
ccagtatcag cagaaggaca ttttaggacg ggacttgggt gactctaggg cactggtttt  5700
ctttccagag agcggaacag gcgaggaaaa gtagtccctt ctcggcgatt ctgcggaggg  5760
atctccgtgg ggcggtgaac gccgatgatg cctctactaa ccatgttcat gttttctttt  5820
tttttctaca ggtcctgggt gacgaacagg gtaccgccac cgccagaccc tgccgtgcat  5880
ttatttttgg ggcggcctgc tgccgtttgg catgctgtgc gcgagcagca ccaccaaatg  5940
caccgtgagc catgaagtgg cggattgcag ccatctgaaa ctgacccagg tgccggatga  6000
tctgccgacc aacattaccg tgctgaacct gacccataac cagctgcgcc gcctgccggc  6060
ggcgaacttt acccgctata gccagctgac cagcctggat gtgggcttta acaccattag  6120
caaactggaa ccggaactgt gccagaaact gccgatgctg aaagtgctga acctgcagca  6180
taacgaactg agccagctga gcgataaaac ctttgcgttt tgcaccaacc tgaccgaact  6240
gcatctgatg agcaacagca ttcagaaaat taaaaacaac ccgtttgtga aacagaaaaa  6300
cctgattacc ctggatctga gccataacgg cctgagcagc accaaactgg gcacccaggt  6360
gcagctggaa aacctgcagg aactgctgct gagcaacaac aaaattcagg cgctgaaaag  6420
cgaagaactg gatatttttg cgaacagcag cctgaaaaaa ctggaactga gcagcaacca  6480
gattaaagaa tttagcccgg gctgctttca tgcgattggc cgcctgtttg gcctgtttct  6540
gaacaacgtg cagctgggcc cgagcctgac cgaaaaactg tgcctggaac tggcgaacac  6600
cagcattcgc aacctgagcc tgagcaacag ccagctgagc accaccagca acaccacctt  6660
tctgggcctg aaatggacca acctgaccat gctggatctg agctataaca acctgaacgt  6720
ggtgggcaac gatagctttg cgtggctgcc gcagctggaa tatttttttc tggaatataa  6780
caacattcag catctgttta gccatagcct gcatggcctg tttaacgtgc gctatctgaa  6840
cctgaaacgc agctttacca aacagagcat tagcctggcg agcctgccga aaattgatga  6900
ttttagcttt cagtggctga aatgcctgga acatctgaac atggaagata acgatattcc  6960
gggcattaaa agcaacatgt ttaccggcct gattaacctg aaatatctga gcctgagcaa  7020
cagctttacc agcctgcgca ccctgaccaa cgaaaccttt gtgagcctgg cgcatagccc  7080
gctgcatatt ctgaacctga ccaaaaacaa aattagcaaa attgaaagcg atgcgtttag  7140
ctggctgggc catctggaag tgctggatct gggcctgaac gaaattggcc aggaactgac  7200
cggccaggaa tggcgcggcc tggaaaacat tttgaaatt tatctgagct ataacaaata  7260
tctgcagctg acccgcaaca gctttgcgct ggtgccgagc ctgcagcgcc tgatgctgcg  7320
ccgcgtggcg ctgaaaaacg tggatagcag cccgagcccg tttcagcccgc tgcgcaacct  7380
gaccattctg gatctgagca acaacaacat tgcgaacatt aacgatgata tgctggaagg  7440
cctggaaaaa ctggaaattc tggatctgca gcataacaac ctggcgcgcc tgtggaaaca  7500
tgcgaacccg ggcggcccga tttattttct gaaaggcctg agccatctgc atattctgaa  7560
cctggaaagc aacggctttg atgaaattcc ggtggaagtg tttaaagatc tgtttgaact  7620
gaaaattatt gatctgggcc tgaacaacct gaacaccctg ccggcgagcg tgtttaacaa  7680
ccaggtgagc ctgaaaagcc tgaacctgca gaaaaacctg attaccagcg tggaaaaaaa  7740
agtgtttggc ccggcgtttc gcaacctgac cgaactggat atgcgcttta acccgtttga  7800
ttgcacctgc gaaagcattg cgtggtttgt gaactggatt aacgaaaccc ataccaacat  7860
tccggaactg agcagccatt atctgtgcaa caccccgccg cattatcatg gctttccggt  7920
gcgcctgttt gataccagca gctgcaaaga tagcgcgccg tttgaactgt tttttatgat  7980
taacaccagc attctgctga tttttatttt tattgtgctg ctgattcatt ttgaaggctg  8040
gcgcattagc ttttattgga acgtgagcgt gcatcgcgtg ctgggcttta aagaaattga  8100
tcgccagacc gaacagtttg aatatgcggc gtatattatt catgcgtata aagataaaga  8160
ttgggtgtgg gaacatttta gcagcatgga aaaagaagat cagagcctga aattttgcct  8220
ggaagaacgc gattttgaag cgggcgtgtt tgaactggaa gcgattgtga acagcattaa  8280
acgcagccgc aaaattattt ttgtgattac ccatcatctg ctgaaagatc cgctgtgcaa  8340
acgctttaaa gtgcatcatg cggtgcagca ggcgattgaa cagaacctgg atagcattat  8400
tctggtgttt ctggaagaaa ttccggatta taaactgaac catgcgctgt gcctgcgccg  8460
cggcatgttt aaaagccatt gcattctgaa ctggccggtg cagaaagaac gcattggcgc  8520
gtttcgccat aaactgcagg tggcgctggg cagcaaaaac agcgtgcatg ggcggatcag  8580
gcggatcacc caaatcttgt gacaaaactc acacatgccc accgtgccca gcacctgaac  8640
tcctgggggg accgtcagtc ttcctcttcc ccccaaaacc caaggacacc ctcatgatct  8700
cccggacccc tgaggtcaca tgcgtggtgg tggacgtgag ccacgaagac cctgaggtca  8760
agttcaactg gtacgtggac ggcgtggagg tgcataatgc caagacaaag ccgcgggagg  8820
agcagtacaa cagcacgtac cgtgtggtca gcgtcctcac cgtcctgcac caggactggc  8880
tgaatggcaa ggagtacaag tgcaaggtct ccaacaaagc cctcccagcc cccatcgaga  8940
aaaccatctc caaagccaaa gggcagcccc gagaaccaca ggtgtacacc ctgcccccat  9000
cccgggagga gatgaccaag aaccaggtca gcctgacctg cctggtcaaa ggcttctatc  9060
ccagcgacat cgccgtggag tgggagagca atgggcagcc ggagaacaac tacaagacca  9120
cgcctcccgt gctggactcc gacggctcct tcttcctcta cagcaagctc accgtggaca  9180
```

-continued

```
agagcaggtg gcagcagggg aacgtcttct catgctccgt gatgcatgag gctctgcaca  9240
accactacac gcagaagagc ctctccctgt ctccgggtaa atag                   9284

SEQ ID NO: 9           moltype = DNA  length = 9738
FEATURE                Location/Qualifiers
source                 1..9738
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 9
ttctagaata atcaacctct ggattacaaa atttgtgaaa gattgactgg tattcttaac  60
tatgttgctc cttttacgct atgtggatac gctgctttaa tgcctttgta tcatgctatt  120
gcttcccgta tggctttcat tttctcctcc ttgtataaat cctggttgct gtctctttat  180
gaggagttgt ggcccgttgt caggcaacgt ggcgtggtgt gcactgtgtt tgctgacgca  240
acccccactg gttggggcat tgccaccacc tgtcagctcc tttccgggac tttcgctttc  300
cccctcccta ttgccacggc ggaactcatc gccgcctgcc ttgcccgctg ctggacaggg  360
gctcggctgt tgggcactga caattccgtg gtgttgtcgg ggaaatcatc gtcctttcct  420
tggctgctcg cctgtgttgc cacctggatt ctgcgcggga cgtccttctg ctacgtccct  480
tcggccctca atccagcgga ccttccttcc cgcggcctgc tgccggctct gcggcctctt  540
ccgcgtcttc gccttcgccc tcagacgagt cggatctccc tttgggccgc ctccccgcct  600
aagcttatcg ataccgtcga gatctaactt gtttattgca gcttataatg gttacaaata  660
aagcaatagc atcacaaatt tcacaaataa agcatttttt tcactgcatt ctagttgtgg  720
tttgtccaaa ctcatcaatg tatcttatca tgtctggatc tcgacctcga ctagagcatg  780
gctacgtaga taagtagcat ggcgggttaa tcattaacta caaggaaccc ctagtgatgg  840
agttggccac tccctctctg cgcgctcgct cgctcactga ggccgggcga ccaaaggtcg  900
cccgacgccc gggctttgcc cgggcggcct cagtgagcga gcgagcgcgc cagctggcgt  960
aatagcgaag aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa  1020
tggaattcca gacgattgag cgtcaaaatg taggtatttc catgagcgtt tttcctgttg  1080
caatggctgg cggtaatatt gttctggata ttaccagcaa ggccgatagt ttgagttctt  1140
ctactcaggc aagtgatgtt attactaatc aaagaagtat tgcgacaacg gttaatttgc  1200
gtgatggaca gactctttta ctcggtggcc tcactgatta taaaaacact tctcaggatt  1260
ctggcgtacc gttcctgtct aaaatccctt taatcggcct cctgtttagc tcccgctctg  1320
attctaacga ggaaagcacg ttatacgtgc tcgtcaaagc aaccatagta cgcgccctgt  1380
agcggcgcat taagcgcggc gggtgtggtg gttacgcgca gcgtgaccgc tacacttgcc  1440
agcgccctag cgcccgctcc tttcgctttc ttcccttcct ttctcgccac gttcgccggc  1500
tttccccgtc aagctctaaa tcgggggctc cctttagggt tccgatttag tgctttacgg  1560
cacctcgacc ccaaaaaact tgattagggt gatggttcac gtagtgggcc atcgccctga  1620
tagacggttt ttcgcccttt gacgttggag tccacgttct ttaatagtgg actcttgttc  1680
caaactggaa caacactcaa ccctatctcg gtctattctt ttgatttata agggattttg  1740
ccgatttcgg cctattggtt aaaaaatgag ctgatttaac aaaaatttaa cgcgaatttt  1800
aacaaaatat taacgtttac aatttaaata tttgcttata caatcttcct gtttttgggg  1860
cttttctgat tatcaaccgg ggtacatatg attgacatgc tagttttacg attaccgttc  1920
atcgattctc ttgtttgctc cagactctca ggcaatgacc tgatagcctt tgtagagacc  1980
tctcaaaaat agctaccctc tccggcatga atttatcagc tagaacggtt gaatatcata  2040
ttgatggtga tttgactgtc tccggccttt ctcacccgtt tgaatcttta cctacacatt  2100
actcaggcat tgcatttaaa atatatgagg gttctaaaaa tttttatcct tgcgttgaaa  2160
taaaggcttc tcccgcaaaa gtattacagg gtcataatgt ttttggtaca accgatttag  2220
ctttatgctc tgaggcttta ttgcttaatt ttgctaattc tttgccttgc ctgtatgatt  2280
tattggatgt tggaattcct gatgcggtat tttctcctta cgcatctgtg cggtatttca  2340
caccgcatat ggtgcactct cagtacaatc tgctctgatg ccgcatagtt aagccagccc  2400
cgacacccgc caacacccgc tgacgcgccc tgacgggctt gtctgctccc ggcatccgct  2460
tacagacaag ctgtgaccgt ctccgggagc tgcatgtgtc agaggttttc accgtcatca  2520
ccgaaacgcg cgagacgaaa gggcctcgtg atacgcctat ttttataggt taatgtcatg  2580
ataataatgg tttcttagac gtcaggtggc acttttcggg gaaatgtgcg cggaacccct  2640
atttgtttat ttttctaaat acattcaaat atgtatccgc tcatgagaca ataaccctga  2700
taaatgcttc aataatattg aaaaaggaag agtatgagta ttcaacattt ccgtgtcgcc  2760
cttattccct tttttgcggc attttgcctt cctgtttttg ctcacccaga aacgctggtg  2820
aaagtaaaag atgctgaaga tcagttgggt gcacgagtgg gttacatcga actggatctc  2880
aacagcggta agatccttga gagttttcgc cccgaagaac gttttccaat gatgagcact  2940
tttaaagttc tgctatgtgg cgcggtatta tcccgtattg acgccgggca agagcaactc  3000
ggtcgccgca tacactattc tcagaatgac ttggttgagt actcaccagt cacagaaaag  3060
catcttacgg atggcatgac agtaagagaa ttatgcagtg ctgccataac catgagtgat  3120
aacactgcgg ccaacttact tctgacaacg atcggaggac cgaaggagct aaccgctttt  3180
ttgcacaaca tgggggatca tgtaactcgc cttgatcgtt gggaaccgga gctgaatgaa  3240
gccataccaa acgacgagcg tgacaccacg atgcctgtag caatggcaac aacgttgcgc  3300
aaactattaa ctggcgaact acttactcta gcttcccggc aacaattaat agactggatg  3360
gaggcggata aagttgcagg accacttctg cgctcggccc ttccggctgg ctggtttatt  3420
gctgataaat ctggagccgg tgagcgtggg tctcgcggta tcattgcagc actggggcca  3480
gatggtaagc cctcccgtat cgtagttatc tacacgacgg ggagtcaggc aactatggat  3540
gaacgaaata gacagatcgc tgagataggt gcctcactga ttaagcattg gtaactgtca  3600
gaccaagttt actcatatat actttagatt gatttaaaac ttcattttta atttaaaagg  3660
atctaggtga agatcctttt tgataatctc atgaccaaaa tcccttaacg tgagttttcg  3720
ttccactgag cgtcagaccc cgtagaaaag atcaaaggat cttcttgaga tccttttttt  3780
ctgcgcgtaa tctgctgctt gcaaacaaaa aaaccaccgc taccagcggt ggtttgtttg  3840
ccggatcaag agctaccaac tctttttccg aaggtaactg gcttcagcag agcgcagata  3900
ccaaatactg tccttctagt gtagccgtag ttaggccacc acttcaagaa ctctgtagca  3960
ccgcctacat acctcgctct gctaatcctg ttaccagtgg ctgctgccag tggcgataag  4020
```

-continued

```
tcgtgtctta ccgggttgga ctcaagacga tagttaccgg ataaggcgca gcggtcgggc  4080
tgaacggggg gttcgtgcac acagcccagc ttggagcgaa cgacctacac cgaactgaga  4140
tacctacagc gtgagctatg agaaagcgcc acgcttcccg aagggagaaa ggcggacagg  4200
tatccggtaa gcggcagggt cggaacagga gagcgcacga gggagcttcc agggggaaac  4260
gcctggtatc tttatagtcc tgtcgggttt cgccacctct gacttgagcg tcgatttttg  4320
tgatgctcgt caggggggcg gagcctatgg aaaaacgcca gcaacgcggc ctttttacgg  4380
ttcctggcct tttgctggcc ttttgctcac atgttctttc ctgcgttatc ccctgattct  4440
gtggataacc gtattaccgc ctttgagtga gctgataccg ctcgccgcag ccgaacgacc  4500
gagcgcagcg agtcagtgag cgaggaagcg gaagagcgcc caatacgcaa accgcctctc  4560
cccgcgcgtt ggccgattca ttaatgcagc agctgcgcgc tcgctcgctc actgaggccg  4620
cccgggcaaa gcccgggcgt cgggcgacct ttggtcgccc ggcctcagtg agcgagcgag  4680
cgcgcagaga gggagtggcc aactccatca ctaggggttc cttgtagtta atgattaacc  4740
cgccatgcta cttatctacg tagccatgct ctaggacatt gattattgac tagtggagtt  4800
ccgcgttaca taacttacgg taaatggccc gcctggctga ccgcccaacg acccccgccc  4860
attgacgtca ataatgacgt atgttcccat agtaacgcca atagggactt tccattgacg  4920
tcaatgggtg gagtatttac ggtaaactgc ccacttggca gtacatcaag tgtatcatat  4980
gccaagtacg ccccctattg acgtcaatga cggtaaatgg cccgcctggc attatgccca  5040
gtacatgacc ttatgggact ttcctacttg gcagtacatc tacgtattag tcatcgctat  5100
taccatggtc gaggtgagcc ccacgttctg cttcactctc cccatctccc ccccctcccc  5160
acccccaatt ttgtatttat ttatttttta attattttgt gcagcgatgg gggcgggggg  5220
gggggggggc gcgcgccagg cggggcgggg cggggcgagg ggcggggcgg ggcgaggcgg  5280
agaggtgcgg cggcagccaa tcagagcggc gcgctccgaa agtttccttt tatggcgagg  5340
cggcggcggc ggcggcccta taaaaagcga agcgcgcggc gggcgggagt cgctgcgcgc  5400
tgccttcgcc ccgtgccccg ctccgccgcc gcctcgcgcc gcccgccccg gctctgactg  5460
accgcgttac taaaacaggt aagtccggcc tccgcgccgg gttttggcgc ctcccgcggg  5520
cgcccccctc ctcacggcga gcgctgccac gtcagacgaa gggcgcagcg agcgtcctga  5580
tccttccgcc cggacgctca ggacagcggc ccgctgctca taagactcgg ccttagaacc  5640
ccagtatcag cagaaggaca ttttaggacg ggacttgggt gactctaggg cactggtttt  5700
ctttccagag agcggaacag gcgaggaaaa gtagtccctt ctcggcgatt ctgcggaggg  5760
atctccgtgg ggcggtgaac gccgatgatg cctctactaa ccatgttcat gttttctttt  5820
tttttctaca ggtcctgggt gacgaacagg gtaccgccac catgaggggc atgaagctgc  5880
tgggggcgct gctggcactg gcggccctac tgcagggggc cgtgtccatg ggcttttgcc  5940
gcagcgcgct gcatccgctg agcctgctgg tgcaggcgat tatgctggcg atgaccctgg  6000
cgctgggcac cctgccggcg tttctgccgt gcgaactgca gccgcatggc ctggtgaact  6060
gcaactggct gtttctgaaa agcgtgccgc attttagcat ggcggcgccg cgcggcaacg  6120
tgaccagcct gagcctgagc agcaaccgca ttcatcatct gcatgatagc gattttgcgc  6180
atctgccgag cctgcgccat ctgaacctga aatggaactg cccgccggtg ggcctgagcc  6240
cgatgcattt tccgtgccat atgaccattg aaccgagcac ctttctggcg gtgccgaccc  6300
tggaagaact gaacctgagc tataacaaca ttatgaccgt gccggcgctg ccgaaaagcc  6360
tgattagcct gagcctgagc cataccaaca ttctgatgct ggatagcgcg agcctggcgg  6420
gcctgcatgc gctgcgcttt ctgtttatgg atggcaactg ctattataaa aacccgtgcc  6480
gccaggcgct ggaagtggcg ccgggcgcgc tgctgggcct gggcaacctg acccatctga  6540
gcctgaaata taacaacctg accgtggtgc cgcgcaacct gccgagcagc ctggaatatc  6600
tgctgctgag ctataaccgc attgtgaaac tggcgccgga agatctggcg aacctgaccg  6660
cgctgcgcgt gctggatgtg ggcggcaact gccgccgctg cgatcatgcg ccgaacccgt  6720
gcatggaatg cccgcgccat tttccgcagc tgcatccgga tacctttagc catctgagcc  6780
gcctggaagg cctggtgctg aaagatagca gcctgagctg gctgaacgcg agctggtttc  6840
gcggcctggg caacctgcgc gtgctggatc tgagcgaaaa ctttctgtat aaatgcatta  6900
ccaaaaccaa agcgtttcag ggcctgaccc agctgcgcaa actgaacctg agctttaact  6960
atcagaaacg cgtgagcttt gcgcatctga gcctggcgcc gagctttggc agcctggtgg  7020
cgctgaaaga actggatatg catggcattt tttttcgcag cctggatgaa accaccctgc  7080
gcccgctggc gcgcctgccg atgctgcaga ccctgcgcct gcagatgaac tttattaacc  7140
aggcgcagct gggcattttt cgcgcgtttc cgggcctgcg ctatgtggat ctgagcgata  7200
accgcattag cggcgcgagc gaactgaccg cgaccatggg cgaagcggat ggcggcgaaa  7260
aagtgtggct gcagccgggc gatctggcgc cggcgccggt ggataccccg agcagcgaag  7320
attttcgccc gaactgcagc accctgaact ttaccctgga tctgagccgc aacaacctgg  7380
tgaccgtgca gccggaaatg tttgcgcagc tgagccatct gcagtgcctg cgcctgagcc  7440
ataactgcat tagccaggcg gtgaacggca gccagtttct gccgctgacc ggcctgcagg  7500
tgctggatct gagccataac aaactggatc tgtatcatga acatagcttt accgaactgc  7560
cgcgcctgga agcgctggat ctgagctata acagccagcc gtttggcatg cagggcgtgg  7620
gccataactt tagctttgtg gcgcatctgc gcaccctgcg ccatctgagc ctggcgcata  7680
acaacattca tagccaggtg agccagcagc tgtgcagcac cagcctgcgc gcgctggatt  7740
ttagcggcaa cgcgctgggc catatgtggg cggaaggcga tctgtatctg catttttttc  7800
agggcctgag cggcctgatt tggctggatc tgagccagaa ccgcctgcat accctgctgc  7860
cgcagaccct gcgcaacctg ccgaaaagcc tgcaggtgct gcgcctgcgc gataactatc  7920
tggcgttttt taaatggtgg agcctgcatt ttctgccgaa actggaagtg ctggatctgg  7980
cgggcaacca gctgaaagcg ctgaccaacg gcagcctgcc ggcgggcacc cgcctgcgcc  8040
gcctggatgt gagctgcaac agcattagct ttgtggcgcc gggctttttt agcaaagcga  8100
aagaactgcg cgaactgaac ctgagcgcga acgcgctgaa aaccgtggat catagctggt  8160
ttggcccgct ggcgagcgcg ctgcagattc tggatgtgag cgcgaacccg ctgcattgcg  8220
cgtgcggcgc ggcgtttatg gattttctgc tggaagtgca ggcggcggtg ccgggcctgc  8280
cgagccgcgt gaaatgcggc agcccgggcc agctgcaggg cctgagcatt tttgcgcagg  8340
atctgcgcct gtgcctggat gaagcgctga gctgggattg ctttgcgctg agcctgctgg  8400
cggtggcgct gggcctgggc gtgccgatgc tgcatcatct gtgcggctgg gatctgtggt  8460
attgctttca tctgtgcctg gcgtggctgc cgtggcgcgg ccgccagagc ggccgcgatg  8520
aagatgcgct gccgtatgat gcgtttgtgg tgtttgataa aacccagagc gcggtggcgg  8580
```

-continued

```
attgggtgta taacgaactg cgcggccagc tggaagaatg ccgcggccgc tgggcgctgc  8640
gcctgtgcct ggaagaacgc gattggctgc cgggcaaaac cctgtttgaa aacctgtggg  8700
cgagcgtgta tggcagccgc aaaaccctgt ttgtgctggc gcataccgat cgcgtgagcg  8760
gcctgctgcg cgcgagcttt ctgctggcgc agcagcgcct gctggaagat cgcaaagatg  8820
tggtggtgct ggtgattctg agcccggatg gccgccgcag ccgctatgtg cgcctgcgcc  8880
agcgcctgtg ccgccagagc gtgctgctgt ggccgcatca gccgagcggc cagcgcagct  8940
tttgggcgca gctgggcatg gcgctgaccc gcgataacca tcatttttat aaccgcaact  9000
tttgccaggg cccgaccgcg gaagggcgga tcaggcggat cacccaaatc ttgtgacaaa  9060
actcacacat gcccaccgtg cccagcacct gaactcctgg ggggaccgtc agtcttcctc  9120
ttccccccaa aacccaagga caccctcatg atctcccgga cccctgaggt cacatgcgtg  9180
gtggtggacg tgagccacga agaccctgag gtcaagttca actggtacgt ggacggcgtg  9240
gaggtgcata atgccaagac aaagccgcgg gaggagcagt acaacagcac gtaccgtgtg  9300
gtcagcgtcc tcaccgtcct gcaccaggac tggctgaatg gcaaggagta caagtgcaag  9360
gtctccaaca aagccctccc agcccccatc gagaaaacca tctccaaagc caaagggcag  9420
ccccgagaac cacaggtgta caccctgccc ccatcccggg aggagatgac caagaaccag  9480
gtcagcctga cctgcctggt caaaggcttc tatcccagcg acatcgccgt ggagtgggag  9540
agcaatgggc agccggagaa caactacaag accacgcctc ccgtgctgga ctccgacggc  9600
tccttcttcc tctacagcaa gctcaccgtg gacaagagca ggtggcagca ggggaacgtc  9660
ttctcatgct ccgtgatgca tgaggctctg cacaaccact acacgcagaa gagcctctcc  9720
ctgtctccgg gtaaatag                                                9738

SEQ ID NO: 10          moltype = DNA  length = 7364
FEATURE                Location/Qualifiers
source                 1..7364
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 10
ttctagaata atcaacctct ggattacaaa atttgtgaaa gattgactgg tattcttaac  60
tatgttgctc cttttacgct atgtggatac gctgctttaa tgcctttgta tcatgctatt  120
gcttcccgta tggctttcat tttctcctcc ttgtataaat cctggttgct gtctctttat  180
gaggagttgt ggcccgttgt caggcaacgt ggcgtggtgt gcactgtgtt tgctgacgca  240
acccccactg gttggggcat tgccaccacc tgtcagctcc tttccgggac tttcgctttc  300
cccctcccta ttgccacggc ggaactcatc gccgcctgcc ttgcccgctg ctggacaggg  360
gctcggctgt tgggcactga caattccgtg gtgttgtcgg ggaaatcatc gtcctttcct  420
tggctgctcg cctgtgttgc cacctggatt ctgcgcggga cgtccttctg ctacgtccct  480
tcggccctca atccagcgga ccttccttcc cgcggcctgc tgccggctct gcggcctctt  540
ccgcgtcttc gccttcgccc tcagacgagt cggatctccc tttgggccgc ctccccgcct  600
aagcttatcg ataccgtcga gatctaactt gtttattgca gcttataatg gttacaaata  660
aagcaatagc atcacaaatt tcacaaataa agcatttttt tcactgcatt ctagttgtgg  720
tttgtccaaa ctcatcaatg tatcttatca tgtctggatc tcgacctcga ctagagcatg  780
gctacgtaga taagtagcat ggcgggttaa tcattaacta caaggaaccc ctagtgatgg  840
agttggccac tccctctctg cgcgctcgct cgctcactga ggccgggcga ccaaaggtcg  900
cccgacgccc gggctttgcc cgggcggcct cagtgagcga gcgagcgcgc cagctggcgt  960
aatagcgaag aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa  1020
tggaattcca gacgattgag cgtcaaaatg taggtatttc catgagcgtt tttcctgttg  1080
caatggctgg cggtaatatt gttctggata ttaccagcaa ggccgatagt ttgagttctt  1140
ctactcaggc aagtgatgtt attactaatc aaagaagtat tgcgacaacg gttaatttgc  1200
gtgatggaca gactctttta ctcggtggcc tcactgatta taaaaacact tctcaggatt  1260
ctggcgtacc gttcctgtct aaaatccctt taatcggcct cctgtttagc tcccgctctg  1320
attctaacga ggaaagcacg ttatacgtgc tcgtcaaagc aaccatagta cgcgccctgt  1380
agcggcgcat taagcgcggc gggtgtggtg gttacgcgca gcgtgaccgc tacacttgcc  1440
agcgccctag cgcccgctcc tttcgctttc ttcccttcct ttctcgccac gttcgccggc  1500
tttccccgtc aagctctaaa tcgggggctc cctttagggt tccgatttag tgctttacgg  1560
cacctcgacc ccaaaaaact tgattagggt gatggttcac gtagtgggcc atcgccctga  1620
tagacggttt ttcgcccttt gacgttggag tccacgttct ttaatagtgg actcttgttc  1680
caaactggaa caacactcaa ccctatctcg gtctattctt ttgatttata agggattttg  1740
ccgatttcgg cctattggtt aaaaaatgag ctgatttaac aaaaatttaa cgcgaatttt  1800
aacaaaatat taacgtttac aatttaaata tttgcttata caatcttcct gtttttgggg  1860
cttttctgat tatcaaccgg ggtacatatg attgacatgc tagttttacg attaccgttc  1920
atcgattctc ttgtttgctc cagactctca ggcaatgacc tgatagcctt tgtagagacc  1980
tctcaaaaat agctaccctc tccggcatga atttatcagc tagaacggtt gaatatcata  2040
ttgatggtga tttgactgtc tccggccttt ctcacccgtt tgaatcttta cctacacatt  2100
actcaggcat tgcatttaaa atatatgagg gttctaaaaa tttttatcct tgcgttgaaa  2160
taaaggcttc tcccgcaaaa gtattacagg gtcataatgt ttttggtaca accgatttag  2220
ctttatgctc tgaggcttta ttgcttaatt ttgctaattc tttgccttgc ctgtatgatt  2280
tattggatgt tggaattcct gatgcggtat tttctcctta cgcatctgtg cggtatttca  2340
caccgcatat ggtgcactct cagtacaatc tgctctgatg ccgcatagtt aagccagccc  2400
cgacacccgc caacacccgc tgacgcgccc tgacgggctt gtctgctccc ggcatccgct  2460
tacagacaag ctgtgaccgt ctccgggagc tgcatgtgtc agaggttttc accgtcatca  2520
ccgaaacgcg cgagacgaaa gggcctcgtg atacgcctat ttttataggt taatgtcatg  2580
ataataatgg tttcttagac gtcaggtggc acttttcggg gaaatgtgcg cggaacccct  2640
atttgtttat ttttctaaat acattcaaat atgtatccgc tcatgagaca ataaccctga  2700
taaatgcttc aataatattg aaaaaggaag agtatgagta ttcaacattt ccgtgtcgcc  2760
cttattccct tttttgcggc attttgcctt cctgtttttg ctcacccaga aacgctggtg  2820
aaagtaaaag atgctgaaga tcagttgggt gcacgagtgg gttacatcga actggatctc  2880
aacagcggta agatccttga gagttttcgc cccgaagaac gttttccaat gatgagcact  2940
```

-continued

```
tttaaagttc tgctatgtgg cgcggtatta tcccgtattg acgccgggca agagcaactc  3000
ggtcgccgca tacactattc tcagaatgac ttggttgagt actcaccagt cacagaaaag  3060
catcttacgg atggcatgac agtaagagaa ttatgcagtg ctgccataac catgagtgat  3120
aacactgcgg ccaacttact tctgacaacg atcggaggac cgaaggagct aaccgctttt  3180
ttgcacaaca tgggggatca tgtaactcgc cttgatcgtt gggaaccgga gctgaatgaa  3240
gccataccaa acgacgagcg tgacaccacg atgcctgtag caatggcaac aacgttgcgc  3300
aaactattaa ctggcgaact acttactcta gcttcccggc aacaattaat agactggatg  3360
gaggcggata aagttgcagg accacttctg cgctcggccc ttccggctgg ctggtttatt  3420
gctgataaat ctggagccgg tgagcgtggg tctcgcggta tcattgcagc actggggcca  3480
gatggtaagc cctcccgtat cgtagttatc tacacgacgg ggagtcaggc aactatggat  3540
gaacgaaata gacagatcgc tgagataggt gcctcactga ttaagcattg gtaactgtca  3600
gaccaagttt actcatatat actttagatt gatttaaaac ttcattttta atttaaaagg  3660
atctaggtga agatcctttt tgataatctc atgaccaaaa tcccttaacg tgagttttcg  3720
ttccactgag cgtcagaccc cgtagaaaag atcaaaggat cttcttgaga tccttttttt  3780
ctgcgcgtaa tctgctgctt gcaaacaaaa aaaccaccgc taccagcggt ggtttgtttg  3840
ccggatcaag agctaccaac tctttttccg aaggtaactg gcttcagcag agcgcagata  3900
ccaaatactg tccttctagt gtagccgtag ttaggccacc acttcaagaa ctctgtagca  3960
ccgcctacat acctcgctct gctaatcctg ttaccagtgg ctgctgccag tggcgataag  4020
tcgtgtctta ccgggttgga ctcaagacga tagttaccgg ataaggcgca gcggtcgggc  4080
tgaacggggg gttcgtgcac acagcccagc ttggagcgaa cgacctacac cgaactgaga  4140
tacctacagc gtgagctatg agaaagcgcc acgcttcccg aagggagaaa ggcggacagg  4200
tatccggtaa gcggcagggt cggaacagga gagcgcacga gggagcttcc agggggaaac  4260
gcctggtatc tttatagtcc tgtcgggttt cgccacctct gacttgagcg tcgatttttg  4320
tgatgctcgt caggggggcg gagcctatgg aaaaacgcca gcaacgcggc ctttttacgg  4380
ttcctggcct tttgctggcc ttttgctcac atgttctttc ctgcgttatc ccctgattct  4440
gtggataacc gtattaccgc ctttgagtga gctgataccg ctcgccgcag ccgaacgacc  4500
gagcgcagcg agtcagtgag cgaggaagcg gaagagcgcc caatacgcaa accgcctctc  4560
cccgcgcgtt ggccgattca ttaatgcagc agctgcgcgc tcgctcgctc actgaggccg  4620
cccgggcaaa gcccgggcgt cgggcgacct ttggtcgccc ggcctcagtg agcgagcgag  4680
cgcgcagaga gggagtggcc aactccatca ctaggggttc cttgtagtta atgattaacc  4740
cgccatgcta cttatctacg tagccatgct ctaggacatt gattattgac tagtggagtt  4800
ccgcgttaca taacttacgg taaatggccc gcctggctga ccgcccaacg acccccgccc  4860
attgacgtca ataatgacgt atgttcccat agtaacgcca atagggactt tccattgacg  4920
tcaatgggtg gagtatttac ggtaaactgc ccacttggca gtacatcaag tgtatcatat  4980
gccaagtacg ccccctattg acgtcaatga cggtaaatgg cccgcctggc attatgccca  5040
gtacatgacc ttatgggact ttcctacttg gcagtacatc tacgtattag tcatcgctat  5100
taccatggtc gaggtgagcc ccacgttctg cttcactctc cccatctccc ccccctcccc  5160
acccccaatt ttgtatttat ttatttttta attattttgt gcagcgatgg gggcgggggg  5220
gggggggggc gcgcgccagg cggggcgggg cggggcgagg ggcggggcgg ggcgaggcgg  5280
agaggtgcgg cggcagccaa tcagagcggc gcgctccgaa agtttccttt tatggcgagg  5340
cggcggcggc ggcggcccta taaaaagcga agcgcgcggc gggcgggagt cgctgcgcgc  5400
tgccttcgcc ccgtgccccg ctccgccgcc gcctcgcgcc gcccgccccg gctctgactg  5460
accgcgttac taaaacaggt aagtccggcc tccgcgccgg gttttggcgc ctcccgcggg  5520
cgccccccctc ctcacggcga gcgctgccac gtcagacgaa gggcgcagcg agcgtcctga  5580
tccttccgcc cggacgctca ggacagcggc ccgctgctca taagactcgg ccttagaacc  5640
ccagtatcag cagaaggaca ttttaggacg ggacttgggt gactctaggg cactggtttt  5700
ctttccagag agcggaacag gcgaggaaaa gtagtccctt ctcggcgatt ctgcggaggg  5760
atctccgtgg ggcggtgaac gccgatgatg cctctactaa ccatgttcat gttttctttt  5820
tttttctaca ggtcctgggt gacgaacagg gtaccgccac catgaggggc atgaagctgc  5880
tgggggcgct gctggcactg gcggccctac tgcagggggc cgtgtccatg agcatgctgt  5940
tttataccct gattaccgcg tttctgattg gcattcaggc ggaaccgcat agcgaaagca  6000
acgtgccggc gggccatacc attccgcagg cgcattggac caaactgcag catagcctgg  6060
ataccgcgct gcgccgcgcg cgcagcgcgc cggcggcggc gattgcggcg cgcgtggcgg  6120
gccagacccg caacattacc gtggatccgc gcctgtttaa aaaacgccgc ctgcgcagcc  6180
cgcgcgtgct gtttagcacc cagccgccgc gcgaagcggc ggatacccag gatctggatt  6240
ttgaagtggg cggcgcggcg ccgtttaacc gcacccatcg cagcaaacgc agcagcagcc  6300
atccgatttt tcatcgcggc gaatttagcg tgtgcgatag cgtgagcgtg tgggtgggcg  6360
ataaaaccac cgcgaccgat attaaaggca aagaagtgat ggtgctgggc gaagtgaaca  6420
ttaacaacag cgtgtttaaa cagtattttt ttgaaaccaa atgccgcgat ccgaacccgg  6480
tggatagcgg ctgccgcggc attgatagca aacattggaa cagctattgc accaccaccc  6540
ataccttttgt gaaagcgctg accatggatg gcaaacaggc ggcgtggcgc tttattcgca  6600
ttgataccgc gtgcgtgtgc gtgctgagcc gcaaagcggt gcgccgcgcg ggcggatcag  6660
gcggatcacc caaatcttgt gacaaaactc acacatgccc accgtgccca gcacctgaac  6720
tcctgggggg accgtcagtc ttcctcttcc ccccaaaacc caaggacacc ctcatgatct  6780
cccggacccc tgaggtcaca tgcgtggtgg tggacgtgag ccacgaagac cctgaggtca  6840
agttcaactg gtacgtggac ggcgtggagg tgcataatgc caagacaaag ccgcgggagg  6900
agcagtacaa cagcacgtac cgtgtggtca gcgtcctcac cgtcctgcac caggactggc  6960
tgaatggcaa ggagtacaag tgcaaggtct ccaacaaagc cctcccagcc cccatcgaga  7020
aaaccatctc caaagccaaa gggcagcccc gagaaccaca ggtgtacacc ctgcccccat  7080
cccgggagga gatgaccaag aaccaggtca gcctgacctg cctggtcaaa ggcttctatc  7140
ccagcgacat cgccgtggag tgggagagca atgggcagcc ggagaacaac tacaagacca  7200
cgcctcccgt gctggactcc gacggctcct tcttcctcta cagcaagctc accgtggaca  7260
agagcaggtg gcagcagggg aacgtcttct catgctccgt gatgcatgag gctctgcaca  7320
accactacac gcagaagagc ctctccctgt ctccgggtaa atag                    7364

SEQ ID NO: 11         moltype = DNA  length = 6972
```

-continued

```
FEATURE                 Location/Qualifiers
source                  1..6972
                        mol_type = other DNA
                        organism = synthetic construct
SEQUENCE: 11
ttctagaata atcaacctct ggattacaaa atttgtgaaa gattgactgg tattcttaac  60
tatgttgctc cttttacgct atgtggatac gctgctttaa tgcctttgta tcatgctatt  120
gcttcccgta tggctttcat tttctcctcc ttgtataaat cctggttgct gtctctttat  180
gaggagttgt ggcccgttgt caggcaacgt ggcgtggtgt gcactgtgtt tgctgacgca  240
acccccactg gttggggcat tgccaccacc tgtcagctcc tttccgggac tttcgctttc  300
cccctcccta ttgccacggc ggaactcatc gccgcctgcc ttgcccgctg ctggacaggg  360
gctcggctgt tgggcactga caattccgtg gtgttgtcgg ggaaatcatc gtcctttcct  420
tggctgctcg cctgtgttgc cacctggatt ctgcgcggga cgtccttctg ctacgtccct  480
tcggccctca atccagcgga ccttccttcc cgcggcctgc tgccggctct gcggcctctt  540
ccgcgtcttc gccttcgccc tcagacgagt cggatctccc tttgggccgc ctccccgcct  600
aagcttatcg ataccgtcga gatctaactt gtttattgca gcttataatg gttacaaata  660
aagcaatagc atcacaaatt tcacaaataa agcatttttt tcactgcatt ctagttgtgg  720
tttgtccaaa ctcatcaatg tatcttatca tgtctggatc tcgacctcga ctagagcatg  780
gctacgtaga taagtagcat ggcgggttaa tcattaacta caaggaaccc ctagtgatgg  840
agttggccac tccctctctg cgcgctcgct cgctcactga ggccgggcga ccaaaggtcg  900
cccgacgccc gggctttgcc cgggcggcct cagtgagcga gcgagcgcgc cagctggcgt  960
aatagcgaag aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa  1020
tggaattcca gacgattgag cgtcaaaatg taggtatttc catgagcgtt tttcctgttg  1080
caatggctgg cggtaatatt gttctggata ttaccagcaa ggccgatagt ttgagttctt  1140
ctactcaggc aagtgatgtt attactaatc aaagaagtat tgcgacaacg gttaatttgc  1200
gtgatggaca gactctttta ctcggtggcc tcactgatta taaaaacact tctcaggatt  1260
ctggcgtacc gttcctgtct aaaatccctt taatcggcct cctgtttagc tcccgctctg  1320
attctaacga ggaaagcacg ttatacgtgc tcgtcaaagc aaccatagta cgcgccctgt  1380
agcggcgcat taagcgcggc gggtgtggtg gttacgcgca gcgtgaccgc tacacttgcc  1440
agcgccctag cgcccgctcc tttcgctttc ttcccttcct ttctcgccac gttcgccggc  1500
tttccccgtc aagctctaaa tcgggggctc cctttagggt tccgatttag tgctttacgg  1560
cacctcgacc ccaaaaaact tgattagggt gatggttcac gtagtgggcc atcgccctga  1620
tagacggttt ttcgcccttt gacgttggag tccacgttct ttaatagtgg actcttgttc  1680
caaactggaa caacactcaa ccctatctcg gtctattctt ttgatttata agggattttg  1740
ccgatttcgg cctattggtt aaaaaatgag ctgatttaac aaaaatttaa cgcgaatttt  1800
aacaaaatat taacgtttac aatttaaata tttgcttata caatcttcct gtttttgggg  1860
cttttctgat tatcaaccgg ggtacatatg attgacatgc tagttttacg attaccgttc  1920
atcgattctc ttgtttgctc cagactctca ggcaatgacc tgatagcctt tgtagagacc  1980
tctcaaaaat agctaccctc tccggcatga atttatcagc tagaacggtt gaatatcata  2040
ttgatggtga tttgactgtc tccggccttt ctcacccgtt tgaatcttta cctacacatt  2100
actcaggcat tgcatttaaa atatatgagg gttctaaaaa tttttatcct tgcgttgaaa  2160
taaaggcttc tcccgcaaaa gtattacagg gtcataatgt ttttggtaca accgatttag  2220
ctttatgctc tgaggcttta ttgcttaatt ttgctaattc tttgccttgc ctgtatgatt  2280
tattggatgt tggaattcct gatgcggtat tttctcctta cgcatctgtg cggtatttca  2340
caccgcatat ggtgcactct cagtacaatc tgctctgatg ccgcatagtt aagccagccc  2400
cgacacccgc caacacccgc tgacgcgccc tgacgggctt gtctgctccc ggcatccgct  2460
tacagacaag ctgtgaccgt ctccgggagc tgcatgtgtc agaggttttc accgtcatca  2520
ccgaaacgcg cgagacgaaa gggcctcgtg atacgcctat ttttataggt taatgtcatg  2580
ataataatgg tttcttagac gtcaggtggc acttttcggg gaaatgtgcg cggaacccct  2640
atttgtttat ttttctaaat acattcaaat atgtatccgc tcatgagaca ataaccctga  2700
taaatgcttc aataatattg aaaaaggaag agtatgagta ttcaacattt ccgtgtcgcc  2760
cttattccct tttttgcggc attttgcctt cctgtttttg ctcacccaga aacgctggtg  2820
aaagtaaaag atgctgaaga tcagttgggt gcacgagtgg gttacatcga actggatctc  2880
aacagcggta agatccttga gagttttcgc cccgaagaac gttttccaat gatgagcact  2940
tttaaagttc tgctatgtgg cgcggtatta tcccgtattg acgccgggca agagcaactc  3000
ggtcgccgca tacactattc tcagaatgac ttggttgagt actcaccagt cacagaaaag  3060
catcttacgg atggcatgac agtaagagaa ttatgcagtg ctgccataac catgagtgat  3120
aacactgcgg ccaacttact tctgacaacg atcggaggac cgaaggagct aaccgctttt  3180
ttgcacaaca tgggggatca tgtaactcgc cttgatcgtt gggaaccgga gctgaatgaa  3240
gccataccaa acgacgagcg tgacaccacg atgcctgtag caatggcaac aacgttgcgc  3300
aaactattaa ctggcgaact acttactcta gcttcccggc aacaattaat agactggatg  3360
gaggcggata aagttgcagg accacttctg cgctcggccc ttccggctgg ctggtttatt  3420
gctgataaat ctggagccgg tgagcgtggg tctcgcggta tcattgcagc actggggcca  3480
gatggtaagc cctcccgtat cgtagttatc tacacgacgg ggagtcaggc aactatggat  3540
gaacgaaata gacagatcgc tgagataggt gcctcactga ttaagcattg gtaactgtca  3600
gaccaagttt actcatatat actttagatt gatttaaaac ttcattttta atttaaaagg  3660
atctaggtga agatcctttt tgataatctc atgaccaaaa tcccttaacg tgagttttcg  3720
ttccactgag cgtcagaccc cgtagaaaag atcaaaggat cttcttgaga tccttttttt  3780
ctgcgcgtaa tctgctgctt gcaaacaaaa aaaccaccgc taccagcggt ggtttgtttg  3840
ccggatcaag agctaccaac tctttttccg aaggtaactg gcttcagcag agcgcagata  3900
ccaaatactg tccttctagt gtagccgtag ttaggccacc acttcaagaa ctctgtagca  3960
ccgcctacat acctcgctct gctaatcctg ttaccagtgg ctgctgccag tggcgataag  4020
tcgtgtctta ccgggttgga ctcaagacga tagttaccgg ataaggcgca gcggtcgggc  4080
tgaacggggg gttcgtgcac acagcccagc ttggagcgaa cgacctacac cgaactgaga  4140
tacctacagc gtgagctatg agaaagcgcc acgcttcccg aagggagaaa ggcggacagg  4200
tatccggtaa gcggcagggt cggaacagga gagcgcacga gggagcttcc agggggaaac  4260
```

-continued

```
gcctggtatc tttatagtcc tgtcgggttt cgccacctct gacttgagcg tcgatttttg  4320
tgatgctcgt caggggggcg gagcctatgg aaaaacgcca gcaacgcggc ctttttacgg  4380
ttcctggcct tttgctggcc ttttgctcac atgttctttc ctgcgttatc ccctgattct  4440
gtggataacc gtattaccgc ctttgagtga gctgataccg ctcgccgcag ccgaacgacc  4500
gagcgcagcg agtcagtgag cgaggaagcg gaagagcgcc caatacgcaa accgcctctc  4560
cccgcgcgtt ggccgattca ttaatgcagc agctgcgcgc tcgctcgctc actgaggccg  4620
cccgggcaaa gcccgggcgt cgggcgacct ttggtcgccc ggcctcagtg agcgagcgag  4680
cgcgcagaga gggagtggcc aactccatca ctaggggttc cttgtagtta atgattaacc  4740
cgccatgcta cttatctacg tagccatgct ctaggacatt gattattgac tagtggagtt  4800
ccgcgttaca taacttacgg taaatggccc gcctggctga ccgcccaacg acccccgccc  4860
attgacgtca ataatgacgt atgttcccat agtaacgcca atagggactt tccattgacg  4920
tcaatgggtg gagtatttac ggtaaactgc ccacttggca gtacatcaag tgtatcatat  4980
gccaagtacg ccccctattg acgtcaatga cggtaaatgg cccgcctggc attatgccca  5040
gtacatgacc ttatgggact ttcctacttg gcagtacatc tacgtattag tcatcgctat  5100
taccatggtc gaggtgagcc ccacgttctg cttcactctc cccatctccc ccccctcccc  5160
acccccaatt ttgtatttat ttatttttta attattttgt gcagcgatgg gggcgggggg  5220
ggggggggc gcgcgccagg cggggcgggg cggggcgagg ggcggggcgg ggcgaggcgg  5280
agaggtgcgg cggcagccaa tcagagcggc gcgctccgaa agtttccttt tatggcgagg  5340
cggcggcggc ggcggcccta taaaaagcga agcgcgcggc gggcgggagt cgctgcgcgc  5400
tgccttcgcc ccgtgccccg ctccgccgcc gcctcgcgcc gcccgccccg gctctgactg  5460
accgcgttac taaaacaggt aagtccggcc tccgcgccgg gttttggcgc ctcccgcggg  5520
cgcccccctc ctcacggcga gcgctgccac gtcagacgaa gggcgcagcg agcgtcctga  5580
tccttccgcc cggacgctca ggacagcggc ccgctgctca taagactcgg ccttagaacc  5640
ccagtatcag cagaaggaca ttttaggacg ggacttgggt gactctaggg cactggtttt  5700
ctttccagag agcggaacag gcgaggaaaa gtagtccctt ctcggcgatt ctgcggaggg  5760
atctccgtgg ggcggtgaac gccgatgatg cctctactaa ccatgttcat gttttctttt  5820
tttttctaca ggtcctgggt gacgaacagg gtaccgccac catgaggggc atgaagctgc  5880
tgggggcgct gctggcactg gcggccctac tgcagggggc cgtgtccatg gcgctgtgga  5940
tgcgcctgct gccgctgctg gcgctgctgg cgctgtgggg cccggatccg gcggcggcgt  6000
ttgtgaacca gcatctgtgc ggcagccatc tggtggaagc gctgtatctg gtgtgcggcg  6060
aacgcggctt tttttatacc ccgaaaaccc gccgcgaagc ggaagatctg caggtgggcc  6120
aggtggaact gggcggcggc ccgggcgcgg gcagcctgca gccgctggcg ctggaaggca  6180
gcctgcagaa acgcggcatt gtggaacagt gctgcaccag catttgcagc ctgtatcagc  6240
tggaaaacta ttgcaacggg cggatcaggc ggatcaccca aatcttgtga caaaactcac  6300
acatgcccac cgtgcccagc acctgaactc ctggggggac cgtcagtctt cctcttcccc  6360
ccaaaaccca aggacaccct catgatctcc cggacccctg aggtcacatg cgtggtggtg  6420
gacgtgagcc acgaagaccc tgaggtcaag ttcaactggt acgtggacgg cgtggaggtg  6480
cataatgcca agacaaagcc gcgggaggag cagtacaaca gcacgtaccg tgtggtcagc  6540
gtcctcaccg tcctgcacca ggactggctg aatggcaagg agtacaagtg caaggtctcc  6600
aacaaagccc tcccagcccc catcgagaaa accatctcca aagccaaagg gcagccccga  6660
gaaccacagg tgtacaccct gcccccatcc cgggaggaga tgaccaagaa ccaggtcagc  6720
ctgacctgcc tggtcaaagg cttctatccc agcgacatcg ccgtggagtg ggagagcaat  6780
gggcagccgg agaacaacta caagaccacg cctcccgtgc tggactccga cggctccttc  6840
ttcctctaca gcaagctcac cgtggacaag agcaggtggc agcaggggaa cgtcttctca  6900
tgctccgtga tgcatgaggc tctgcacaac cactacacgc agaagagcct ctccctgtct  6960
ccgggtaaat ag                                                     6972
```

1. An isolated plasmid comprising messenger ribonucleic acid (mRNA) encoding a fusion protein comprising an extra-cellular domain of a toll-like receptor 9 (TLR9) protein and an Fc domain, wherein the isolated plasmid comprises a nucleotide sequence of SEQ ID NO: 3.

2. (canceled)

3. (canceled)

4. (canceled)

5. (canceled)

6. (canceled)

7. The isolated plasmid of claim **1**, wherein the isolated plasmid is inserted within one or more suitable pharmaceutically acceptable carriers.

8. (canceled)

9. The isolated plasmid of claim **8**, wherein the viral vector is a double stranded DNA virus, a single stranded DNA virus, a single stranded RNA virus, or a double stranded RNA virus.

10. The isolated plasmid of claim **8**, wherein the viral vector is an adeno-associated virus.

11. (canceled)

12. (canceled)

13. (canceled)

14. An isolated plasmid comprising messenger ribonucleic acid (mRNA) encoding a fusion protein comprising an extra-cellular domain of a toll-like receptor 9 (TLR9) protein and an Fc domain, wherein the mRNA isolated plasmid comprises a nucleotide sequence of SEQ ID NO: 8.

* * * * *