(19) **United States**

(12) **Patent Application Publication** (10) Pub. No.: **US 2025/0263744 A1**

THOMPSON

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

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

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

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

(21) Appl. No.: **18/964,155**

(22) Filed: **Nov. 29, 2024**

### Related U.S. Application Data

(62) Division of application No. 18/582,222, filed on 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 NGF 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). 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.

[0009] 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.

[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. 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.

[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. 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.

[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. 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.

[0013] 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.

[0014] 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.

[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 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.

[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 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.

[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 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.

[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 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

[0019] 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.

[0020] 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.

[0021] 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.

[0022] As used therein, the term "ameliorate" refers to improve and/or to make better and/or to make more satisfactory.

[0023] 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.

[0024] 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.

[0025] 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.

[0026] As used therein, the term "endogenous" refers to the production and/or modification of a molecule that originates within a subject.

[0027] 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.

[0028] 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.

[0029] 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.

[0030] 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.

[0031] 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.

[0032] 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.

[0033] As used herein, 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.

[0034] 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.

[0035] 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.

[0036] 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.

[0037] In some embodiments of the present disclosure, the target biomolecule is TLR3-Fc.

[0038] In some embodiments of the present disclosure, the target biomolecule is TLR9-Fc.

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

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

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

[0042] 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.

[0043] 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.

[0044] 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.

[0045] 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.

[0046] 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.

[0047] In some embodiments of the present disclosure, the delivery vehicle of the RP used for gene therapy may be a protein coat.

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

[0049] 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 $1\times10^{16}$ $TCID_{50}$/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 $1\times10^{13}$ $TCID_{50}$/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 $1\times10^{16}$ TCP/kg.

[0050] 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' TTCTAGAATAATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTTA

ACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTTGTATCATGCTA

TTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATAAATCCTGGTTGCTGTCTCTTT

ATGAGGAGTTGTGGCCCGTTGTCAGGCAACGTGGCGTGGTGTGCACTGTGTTTGCTGACG

CAACCCCCACTGGTTGGGGCATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTT

TCCCCCTCCCTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCCGCTGCTGGACAG

GGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGAAATCATCGTCCTTTC

CTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGACGTCCTTCTGCTACGTCC

CTTCGGCCCTCAATCCAGCGGACCTTCCTTCCCGCGGCCTGCTGCCGGCTCTGCGGCCTC

TTCCGCGTCTTCGCCTTCGCCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCCTCCCCGC

CTAAGCTTATCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAAA

TAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGCATTCTAGTTGT

GGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGGATCTCGACCTCGACTAGAGCA

TGGCTACGTAGATAAGTAGCATGGCGGGTTAATCATTAACTACAAGGAACCCCTAGTGAT

GGAGTTGGCCACTCCCTCTCTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGT

CGCCCGACGCCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCCAGCTGGC

GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCG

AATGGAATTCCAGACGATTGAGCGTCAAAATGTAGGTATTTCCATGAGCGTTTTTCCTGT

TGCAATGGCTGGCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTGAGTTC

TTCTACTCAGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTT

GCGTGATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTCAGGA

TTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCCCGCTC

TGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGCGCCCT

GTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGACCGCTACACTTG

CCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCG

GCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCTTTAC

GGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAGTGGGCCATCGCCCT

GATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACTCTTGT

TCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTTTTGATTTATAAGGGATTT

TGCCGATTTCGGCCTATTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATT

TTAACAAAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTTTTGG

GGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGTTTTACGATTACCGT

TCATCGATTCTCTTGTTTGCTCCAGACTCTCAGGCAATGACCTGATAGCCTTTGTAGAGA

CCTCTCAAAAATAGCTACCCTCTCCGGCATGAATTTATCAGCTAGAACGGTTGAATATCA

TATTGATGGTGATTTGACTGTCTCCGGCCTTTCTCACCCGTTTGAATCTTTACCTACACA

TTACTCAGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTTTATCCTTGCGTTGA

AATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTTGGTACAACCGATTT

AGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGCTAATTCTTTGCCTTGCCTGTATGA

TTTATTGGATGTTGGAATTCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGGTATTT

```
CACACCGCATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGC

CCCGACACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCG

CTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGGTTTTCACCGTCAT

CACCGAAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCA

TGATAATAATGGTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCC

CTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCT

GATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTCG

CCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCACCCAGAAACGCTGG

TGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACATCGAACTGGATC

TCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGATGAGCA

CTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAAC

TCGGTCGCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACAGAAA

AGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTG

ATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTT

TTTTGCACAACATGGGGGATCATGTAACTCGCCTTGATCGTTGGGAACCGGAGCTGAATG

AAGCCATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGC

GCAAACTATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGA

TGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTA

TTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGC

CAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGG

ATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGT

CAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTTAAAA

GGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTT

CGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTT

TTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCTACCAGCGGTGGTTTGTT

TGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGA

TACCAAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAG

CACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATA

AGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTCGG

GCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGA

GATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACA

GGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAA

ACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACTTGAGCGTCGATTTT

TGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTAC

GGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCCTGCGTTATCCCCTGATT

CTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGA

CCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTC

TCCCCGCGCGTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACTGAGGC

CGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGGTCGCCCGGCCTCAGTGAGCGAGCG
```

-continued

AGCGCGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCCTTGTAGTTAATGATTAA

CCCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGGAG

TTCCGCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCCCCGC

CCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGA

CGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCAT

ATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTATGCC

CAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCT

ATTACCATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCCCCCTCC

CCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTGTGCAGCGATGGGGGCGGGG

GGGGGGGGGGCGCGCGCCAGGCGGGGGGGGCGGGGCGAGGGGGGGGCGGGGCGAGGCGG

AGAGGTGCGGCGGCAGCCAATCAGAGCGGCGCGCTCCGAAAGTTTCCTTTTATGGCGAGG

CGGCGGCGGCGGCGGCCCTATAAAAAGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCGC

TGCCTTCGCCCCGTGCCCCGCTCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTCTGACTG

ACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTTTGGCGCCTCCCGCGGG

CGCCCCCCTCCTCACGGCGAGCGCTGCCACGTCAGACGAAGGGCGCAGCGAGCGTCCTGA

TCCTTCCGCCCGGACGCTCAGGACAGCGGCCCGCTGCTCATAAGACTCGGCCTTAGAACC

CCAGTATCAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTT

CTTTCCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCGGAGGG

ATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTCATGTTTTCTTTT

TTTTTCTACAGGTCCTGGGTGACGAACAGGGTACCGCCACC 3'

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

GGCCGTGTCCCTGAAGATCGCAGCCTTCAACATCCAGACATTTGGGGAGACCAAGATGTC

CAATGCCACCCTCGTCAGCTACATTGTGCAGATCCTGAGCCGCTATGACATCGCCCTGGT

CCAGGAGGTCAGAGACAGCCACCTGACTGCCGTGGGGAAGCTGCTGGACAACCTCAATCA

GGATGCACCAGACACCTATCACTACGTGGTCAGTGAGCCACTGGGACGGAACAGCTATAA

GGAGCGCTACCTGTTCGTGTACAGGCCTGACCAGGTGTCTGCGGTGGACAGCTACTACTA

CGATGATGGCTGCGAGCCCTGCGGGAACGACACCTTCAACCGAGAGCCAGCCATTGTCAG

GTTCTTCTCCCGGTTCACAGAGGTCAGGGAGTTTGCCATTGTTCCCCTGCATGCGGCCCC

GGGGGACGCAGTAGCCGAGATCGACGCTCTCTATGACGTCTACCTGGATGTCCAAGAGAA

ATGGGGCTTGGAGGACGTCATGTTGATGGGCGACTTCAATGCGGGCTGCAGCTATGTGAG

ACCCTCCCAGTGGTCATCCATCCGCCTGTGGACAAGCCCCACCTTCCAGTGGCTGATCCC

CGACAGCGCTGACACCACAGCTACACCCACGCACTGTGCCTATGACAGGATCGTGGTTGC

AGGGATGCTGCTCCGAGGCGCCGTTGTTCCCGACTCGGCTCTTCCCTTTAACTTCCAGGC

TGCCTATGGCCTGAGTGACCAACTGGCCCAAGCCATCAGTGACCACTATCCAGTGGAGGT

GATGCTGAAGGGCGGATCAGGCGGATCACCCAAATCTTGTGACAAAACTCACACATGCCC

ACCGTGCCCAGCACCTGAACTCCTGGGGGGACCGTCAGTCTTCCTCTTCCCCCCAAAACC

CAAGGACACCCTCATGATCTCCCGGACCCCTGAGGTCACATGCGTGGTGGTGGACGTGAG

CCACGAAGACCCTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATGC

-continued

CAAGACAAAGCCGCGGGAGGAGCAGTACAACAGCACGTACCGTGTGGTCAGCGTCCTCAC

CGTCCTGCACCAGGACTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAGC

CCTCCCAGCCCCCATCGAGAAAACCATCTCCAAAGCCAAAGGGCAGCCCCGAGAACCACA

GGTGTACACCCTGCCCCCATCCCGGGAGGAGATGACCAAGAACCAGGTCAGCCTGACCTG

CCTGGTCAAAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGGGAGAGCAATGGGCAGCC

GGAGAACAACTACAAGACCACGCCTCCCGTGCTGGACTCCGACGGCTCCTTCTTCCTCTA

CAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGGAACGTCTTCTCATGCTCCGT

GATGCATGAGGCTCTGCACAACCACTACACGCAGAAGAGCCTCTCCCTGTCTCCGGGTAA

ATAG 3'

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

CGCGAGCAGCACCACCAAATGCACCGTGAGCCATGAAGTGGCGGATTGCAGCCATCTGAA

ACTGACCCAGGTGCCGGATGATCTGCCGACCAACATTACCGTGCTGAACCTGACCCATAA

CCAGCTGCGCCGCCTGCCGGCGGCGAACTTTACCCGCTATAGCCAGCTGACCAGCCTGGA

TGTGGGCTTTAACACCATTAGCAAACTGGAACCGGAACTGTGCCAGAAACTGCCGATGCT

GAAAGTGCTGAACCTGCAGCATAACGAACTGAGCCAGCTGAGCGATAAAACCTTTGCGTT

TTGCACCAACCTGACCGAACTGCATCTGATGAGCAACAGCATTCAGAAAATTAAAAACAA

CCCGTTTGTGAAACAGAAAAACCTGATTACCCTGGATCTGAGCCATAACGGCCTGAGCAG

CACCAAACTGGGCACCCAGGTGCAGCTGGAAAAACCTGCAGGAACTGCTGCTGAGCAACAA

CAAAATTCAGGCGCTGAAAAGCGAAGAACTGGATATTTTTGCGAACAGCAGCCTGAAAAA

ACTGGAACTGAGCAGCAACCAGATTAAAGAATTTAGCCCGGGCTGCTTTCATGCGATTGG

CCGCCTGTTTGGCCTGTTTCTGAACAACGTGCAGCTGGGCCCGAGCCTGACCGAAAAACT

GTGCCTGGAACTGGCGAACACCAGCATTCGCAACCTGAGCCTGAGCAACAGCCAGCTGAG

CACCACCAGCAACACCACCTTTCTGGGGCCTGAAATGGACCAACCTGACCATGCTGGATCT

GAGCTATAACAACCTGAACGTGGTGGGCAACGATAGCTTTGCGTGGCTGCCGCAGCTGGA

ATATTTTTTTCTGGAATATAACAACATTCAGCATCTGTTTAGCCATAGCCTGCATGGCCT

GTTTAACGTGCGCTATCTGAACCTGAAACGCAGCTTTACCAAACAGAGCATTAGCCTGGC

GAGCCTGCCGAAAATTGATGATTTTAGCTTTCAGTGGCTGAAATGCCTGGAACATCTGAA

CATGGAAGATAACGATATTCCGGGCATTAAAAGCAACATGTTTACCGGCCTGATTAACCT

GAAATATCTGAGCCTGAGCAACAGCTTTACCAGCCTGCGCACCCTGACCAACGAAACCTT

TGTGAGCCTGGCGCATAGCCCGCTGCATATTCTGAACCTGACCAAAAACAAAATTAGCAA

AATTGAAAGCGATGCGTTTAGCTGGCTGGGCCATCTGGAAGTGCTGGATCTGGGCCTGAA

CGAAATTGGCCAGGAACTGACCGGCCAGGAATGGCGCGGCCTGGAAAACATTTTTGAAAT

TTATCTGAGCTATAACAAATATCTGCAGCTGACCCGCAACAGCTTTGCGCTGGTGCCGAG

CCTGCAGCGCCTGATGCTGCGCCGCGTGGCGCTGAAAAACGTGGATAGCAGCCCGAGCCC

GTTTCAGCCGCTGCGCAACCTGACCATTCTGGATCTGAGCAACAACAACATTGCGAACAT

TAACGATGATATGCTGGAAGGCCTGGAAAAACTGGAAATTCTGGATCTGCAGCATAACAA

CCTGGCGCGCCTGTGGAAACATGCGAACCCGGGCGGCCCGATTTATTTTCTGAAAGGCCT

GAGCCATCTGCATATTCTGAACCTGGAAAGCAACGGCTTTGATGAAATTCCGGTGGAAGT

GTTTAAAGATCTGTTTGAACTGAAAATTATTGATCTGGGCCTGAACAACCTGAACACCCT

-continued

GCCGGCGAGCGTGTTTAACAACCAGGTGAGCCTGAAAAGCCTGAACCTGCAGAAAAACCT

GATTACCAGCGTGGAAAAAAAGTGTTTGGCCCGGCGTTTCGCAACCTGACCGAACTGGA

TATGCGCTTTAACCCGTTTGATTGCACCTGCGAAAGCATTGCGTGGTTTGTGAACTGGAT

TAACGAAACCCATACCAACATTCCGGAACTGAGCAGCCATTATCTGTGCAACACCCCGCC

GCATTATCATGGCTTTCCGGTGCGCCTGTTTGATACCAGCAGCTGCAAAGATAGCGCGCC

GTTTGAACTGTTTTTTATGATTAACACCAGCATTCTGCTGATTTTTATTTTTATTGTGCT

GCTGATTCATTTTGAAGGCTGGCGCATTAGCTTTTATTGGAACGTGAGCGTGCATCGCGT

GCTGGGCTTTAAAGAAATTGATCGCCAGACCGAACAGTTTGAATATGCGGCGTATATTAT

TCATGCGTATAAAGATAAAGATTGGGTGTGGGAACATTTTAGCAGCATGGAAAAAGAAGA

TCAGAGCCTGAAATTTTGCCTGGAAGAACGCGATTTTGAAGCGGGCGTGTTTGAACTGGA

AGCGATTGTGAACAGCATTAAACGCAGCCGCAAAATTATTTTTGTGATTACCCATCATCT

GCTGAAAGATCCGCTGTGCAAACGCTTTAAAGTGCATCATGCGGTGCAGCAGGCGATTGA

ACAGAACCTGGATAGCATTATTCTGGTGTTTCTGGAAGAAATTCCGGATTATAAACTGAA

CCATGCGCTGTGCCTGCGCCGCGGCATGTTTAAAAGCCATTGCATTCTGAACTGGCCGGT

GCAGAAAGAACGCATTGGCGCGTTTCGCCATAAACTGCAGGTGGCGCTGGGCAGCAAAAA

CAGCGTGCATGGGCGGATCAGGCGGATCACCCAAATCTTGTGACAAAACTCACACATGCC

CACCGTGCCCAGCACCTGAACTCCTGGGGGGACCGTCAGTCTTCCTCTTCCCCCCAAAAC

CCAAGGACACCCTCATGATCTCCCGGACCCCTGAGGTCACATGCGTGGTGGTGGACGTGA

GCCACGAAGACCCTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATG

CCAAGACAAAGCCGCGGGAGGAGCAGTACAACAGCACGTACCGTGTGGTCAGCGTCCTCA

CCGTCCTGCACCAGGACTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAG

CCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAAGCCAAAGGGCAGCCCCGAGAACCAC

AGGTGTACACCCTGCCCCCATCCCGGGAGGAGATGACCAAGAACCAGGTCAGCCTGACCT

GCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGGGAGAGCAATGGGCAGC

CGGAGAACAACTACAAGACCACGCCTCCCGTGCTGGACTCCGACGGCTCCTTCTTCCTCT

ACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGGAACGTCTTCTCATGCTCCG

TGATGCATGAGGCTCTGCACAACCACTACACGCAGAAGAGCCTCTCCCTGTCTCCGGGTA

AATAG 3'

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

CCGTGTCCATGGGCTTTTGCCGCAGCGCGCTGCATCCGCTGAGCCTGCTGGTGCAGGCGA

TTATGCTGGCGATGACCCTGGCGCTGGGCACCCTGCCGGCGTTTCTGCCGTGCGAACTGC

AGCCGCATGGCCTGGTGAACTGCAACTGGCTGTTTCTGAAAAGCGTGCCGCATTTTAGCA

TGGCGGCGCCGCGCGGCAACGTGACCAGCCTGAGCCTGAGCAGCAACCGCATTCATCATC

TGCATGATAGCGATTTTGCGCATCTGCCGAGCCTGCGCCATCTGAACCTGAAATGGAACT

GCCCGCCGGTGGGCCTGAGCCCGATGCATTTTCCGTGCCATATGACCATTGAACCGAGCA

CCTTTCTGGCGGTGCCGACCCTGGAAGAACTGAACCTGAGCTATAACAACATTATGACCG

-continued

```
TGCCGGCGCTGCCGAAAAGCCTGATTAGCCTGAGCCTGAGCCATACCAACATTCTGATGC

TGGATAGCGCGAGCCTGGCGGGCCTGCATGCGCTGCGCTTTCTGTTTATGGATGGCAACT

GCTATTATAAAAACCCGTGCCGCCAGGCGCTGGAAGTGGCGCCGGGCGCGCTGCTGGGCC

TGGGCAACCTGACCCATCTGAGCCTGAAATATAACAACCTGACCGTGGTGCCGCGCAACC

TGCCGAGCAGCCTGGAATATCTGCTGCTGAGCTATAACCGCATTGTGAAACTGGCGCCGG

AAGATCTGGCGAACCTGACCGCGCTGCGCGTGCTGGATGTGGGCGGCAACTGCCGCCGCT

GCGATCATGCGCCGAACCCGTGCATGGAATGCCCGCGCCATTTTCCGCAGCTGCATCCGG

ATACCTTTAGCCATCTGAGCCGCCTGGAAGGCCTGGTGCTGAAAGATAGCAGCCTGAGCT

GGCTGAACGCGAGCTGGTTTCGCGGCCTGGGCAACCTGCGCGTGCTGGATCTGAGCGAAA

ACTTTCTGTATAAATGCATTACCAAAACCAAAGCGTTTCAGGGCCTGACCCAGCTGCGCA

AACTGAACCTGAGCTTTAACTATCAGAAACGCGTGAGCTTTGCGCATCTGAGCCTGGCGC

CGAGCTTTGGCAGCCTGGTGGCGCTGAAAGAACTGGATATGCATGGCATTTTTTTTCGCA

GCCTGGATGAAACCACCCTGCGCCCGCTGGCGCGCCTGCCGATGCTGCAGACCCTGCGCC

TGCAGATGAACTTTATTAACCAGGCGCAGCTGGGCATTTTTCGCGCGTTTCCGGGCCTGC

GCTATGTGGATCTGAGCGATAACCGCATTAGCGGCGCGAGCGAACTGACCGCGACCATGG

GCGAAGCGGATGGCGGCGAAAAAGTGTGGCTGCAGCCGGGCGATCTGGCGCCGGCGCCGG

TGGATACCCCGAGCAGCGAAGATTTTCGCCCGAACTGCAGCACCCTGAACTTTACCCTGG

ATCTGAGCCGCAACAACCTGGTGACCGTGCAGCCGGAAATGTTTGCGCAGCTGAGCCATC

TGCAGTGCCTGCGCCTGAGCCATAACTGCATTAGCCAGGCGGTGAACGGCAGCCAGTTTC

TGCCGCTGACCGGCCTGCAGGTGCTGGATCTGAGCCATAACAAACTGGATCTGTATCATG

AACATAGCTTTACCGAACTGCCGCGCCTGGAAGCGCTGGATCTGAGCTATAACAGCCAGC

CGTTTGGCATGCAGGGCGTGGGCCATAACTTTAGCTTTGTGGCGCATCTGCGCACCCTGC

GCCATCTGAGCCTGGCGCATAACAACATTCATAGCCAGGTGAGCCAGCAGCTGTGCAGCA

CCAGCCTGCGCGCGCTGGATTTTAGCGGCAACGCGCTGGGCCATATGTGGGCGGAAGGCG

ATCTGTATCTGCATTTTTTTCAGGGCCTGAGCGGCCTGATTTGGCTGGATCTGAGCCAGA

ACCGCCTGCATACCCTGCTGCCGCAGACCCTGCGCAACCTGCCGAAAAGCCTGCAGGTGC

TGCGCCTGCGCGATAACTATCTGGCGTTTTTTAAATGGTGGAGCCTGCATTTTCTGCCGA

AACTGGAAGTGCTGGATCTGGCGGGCAACCAGCTGAAAGCGCTGACCAACGGCAGCCTGC

CGGCGGGCACCCGCCTGCGCCGCCTGGATGTGAGCTGCAACAGCATTAGCTTTGTGGCGC

CGGGCTTTTTTAGCAAAGCGAAAGAACTGCGCGAACTGAACCTGAGCGCGAACGCGCTGA

AAACCGTGGATCATAGCTGGTTTGGCCCGCTGGCGAGCGCGCTGCAGATTCTGGATGTGA

GCGCGAACCCGCTGCATTGCGCGTGCGGCGCGGCGTTTATGGATTTTCTGCTGGAAGTGC

AGGCGGCGGTGCCGGGCCTGCCGAGCGCGCGTGAAATGCGGCAGCCCGGGCCAGCTGCAGG

GCCTGAGCATTTTTGCGCAGGATCTGCGCCTGTGCCTGGATGAAGCGCTGAGCTGGGATT

GCTTTGCGCTGAGCCTGCTGGCGGTGGCGCTGGGCCTGGGCGTGCCGATGCTGCATCATC

TGTGCGGCTGGGATCTGTGGTATTGCTTTCATCTGTGCCTGGCGTGGCTGCCGTGGCGCG

GCCGCCAGAGCGGCCGCGATGAAGATGCGCTGCCGTATGATGCGTTTGTGGTGTTTGATA

AAACCCAGAGCGCGGTGGCGGATTGGGTGTATAACGAACTGCGCGGCCAGCTGGAAGAAT

GCCGCGGCCGCTGGGCGCTGCGCCTGTGCCTGGAAGAACGCGATTGGCTGCCGGGCAAAA
```

-continued

CCCTGTTTGAAAACCTGTGGGCGAGCGTGTATGGCAGCCGCAAAACCCTGTTTGTGCTGG

CGCATACCGATCGCGTGAGCGGCCTGCTGCGCGCGAGCTTTCTGCTGGCGCAGCAGCGCC

TGCTGGAAGATCGCAAAGATGTGGTGGTGCTGGTGATTCTGAGCCCGGATGGCCGCCGCA

GCCGCTATGTGCGCCTGCGCCAGCGCCTGTGCCGCCAGAGCGTGCTGCTGTGGCCGCATC

AGCCGAGCGGCCAGCGCAGCTTTTGGGCGCAGCTGGGCATGGCGCTGACCCGCGATAACC

ATCATTTTTATAACCGCAACTTTTGCCAGGGCCCGACCGCGGAAGGGCGGATCAGGCGGA

TCACCCAAATCTTGTGACAAAACTCACACATGCCCACCGTGCCCAGCACCTGAACTCCTG

GGGGGACCGTCAGTCTTCCTCTTCCCCCCAAAACCCAAGGACACCCTCATGATCTCCCGG

ACCCCTGAGGTCACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAAGTTC

AACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCGCGGGAGGAGCAG

TACAACAGCACGTACCGTGTGGTCAGCGTCCTCACCGTCCTGCACCAGGACTGGCTGAAT

GGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGAAAACC

ATCTCCAAAGCCAAAGGGCAGCCCCGAGAACCACAGGTGTACACCCTGCCCCCATCCCGG

GAGGAGATGACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGC

GACATCGCCGTGGAGTGGGAGAGCAATGGGCAGCCGGAGAACAACTACAAGACCACGCCT

CCCGTGCTGGACTCCGACGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGACAAGAGC

AGGTGGCAGCAGGGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAACCAC

TACACGCAGAAGAGCCTCTCCCTGTCTCCGGGTAAATAG 3'

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

CCGTGTCCATGAGCATGCTGTTTTATACCCTGATTACCGCGTTTCTGATTGGCATTCAGG

CGGAACCGCATAGCGAAAGCAACGTGCCGGCGGGCCATACCATTCCGCAGGCGCATTGGA

CCAAACTGCAGCATAGCCTGGATACCGCGCTGCGCCGCGCGCGCAGCGCGCCGGCGGCGG

CGATTGCGGCGCGCGTGGCGGGCCAGACCCGCAACATTACCGTGGATCCGCGCCTGTTTA

AAAAACGCCGCCTGCGCAGCCCGCGCGTGCTGTTTAGCACCCAGCCGCCGCGCGAAGCGG

CGGATACCCAGGATCTGGATTTTGAAGTGGGCGGCGCGGCGCCGTTTAACCGCACCCATC

GCAGCAAACGCAGCAGCAGCCATCCGATTTTTCATCGCGGCGAATTTAGCGTGTGCGATA

GCGTGAGCGTGTGGGTGGGCGATAAAACCACCGCGACCGATATTAAAGGCAAAGAAGTGA

TGGTGCTGGGCGAAGTGAACATTAACAACAGCGTGTTTAAACAGTATTTTTTTGAAACCA

AATGCCGCGATCCGAACCCGGTGGATAGCGGCTGCCGCGGCATTGATAGCAAACATTGGA

ACAGCTATTGCACCACCACCCATACCTTTGTGAAAGCGCTGACCATGGATGGCAAACAGG

CGGCGTGGCGCTTTATTCGCATTGATACCGCGTGCGTGTGCGTGCTGAGCCGCAAAGCGG

TGCGCCGCGCGGGCGGATCAGGCGGATCACCCAAATCTTGTGACAAAACTCACACATGCC

CACCGTGCCCAGCACCTGAACTCCTGGGGGGACCGTCAGTCTTCCTCTTCCCCCCAAAAC

CCAAGGACACCCTCATGATCTCCCGGACCCCTGAGGTCACATGCGTGGTGGTGGACGTGA

GCCACGAAGACCCTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATG

CCAAGACAAAGCCGCGGGAGGAGCAGTACAACAGCACGTACCGTGTGGTCAGCGTCCTCA

CCGTCCTGCACCAGGACTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAG

CCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAAGCCAAAGGGCAGCCCCGAGAACCAC

-continued

AGGTGTACACCCTGCCCCCATCCCGGGAGGAGATGACCAAGAACCAGGTCAGCCTGACCT

GCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGGGAGAGCAATGGGCAGC

CGGAGAACAACTACAAGACCACGCCTCCCGTGCTGGACTCCGACGGCTCCTTCTTCCTCT

ACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGGAACGTCTTCTCATGCTCCG

TGATGCATGAGGCTCTGCACAACCACTACACGCAGAAGAGCCTCTCCCTGTCTCCGGGTA

AATAG 3'

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

CCGTGTCCATGGCGCTGTGGATGCGCCTGCTGCCGCTGCTGGCGCTGCTGGCGCTGTGGG

GCCCGGATCCGGCGGCGGCGTTTGTGAACCAGCATCTGTGCGGCAGCCATCTGGTGGAAG

CGCTGTATCTGGTGTGCGGCGAACGCGGCTTTTTTTATACCCCGAAAACCCGCCGCGAAG

CGGAAGATCTGCAGGTGGGCCAGGTGGAACTGGGCGGCGGCCCGGGCGCGGGCAGCCTGC

AGCCGCTGGCGCTGGAAGGCAGCCTGCAGAAACGCGGCATTGTGGAACAGTGCTGCACCA

GCATTTGCAGCCTGTATCAGCTGGAAAACTATTGCAACGGGCGGATCAGGCGGATCACCC

AAATCTTGTGACAAAACTCACACATGCCCACCGTGCCCAGCACCTGAACTCCTGGGGGGA

CCGTCAGTCTTCCTCTTCCCCCCAAAACCCAAGGACACCCTCATGATCTCCCGGACCCCT

GAGGTCACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAAGTTCAACTGG

TACGTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCGCGGGAGGAGCAGTACAAC

AGCACGTACCGTGTGGTCAGCGTCCTCACCGTCCTGCACCAGGACTGGCTGAATGGCAAG

GAGTACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGAAAACCATCTCC

AAAGCCAAAGGGCAGCCCCGAGAACCACAGGTGTACACCCTGCCCCCATCCCGGGAGGAG

ATGACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATC

GCCGTGGAGTGGGAGAGCAATGGGCAGCCGGAGAACAACTACAAGACCACGCCTCCCGTG

CTGGACTCCGACGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGG

CAGCAGGGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACG

CAGAAGAGCCTCTCCCTGTCTCCGGGTAAATAG 3'

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

ACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTTGTATCATGCTA

TTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATAAATCCTGGTTGCTGTCTCTTT

ATGAGGAGTTGTGGCCCGTTGTCAGGCAACGTGGCGTGGTGTGCACTGTGTTTGCTGACG

CAACCCCCACTGGTTGGGGCATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTT

TCCCCCTCCCTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCCGCTGCTGGACAG

GGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGAAATCATCGTCCTTTC

CTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGACGTCCTTCTGCTACGTCC

CTTCGGCCCTCAATCCAGCGGACCTTCCTTCCCGCGGCCTGCTGCCGGCTCTGCGGCCTC

TTCCGCGTCTTCGCCTTCGCCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCCTCCCCGC

CTAAGCTTATCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAAA

TAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGCATTCTAGTTGT

GGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGGATCTCGACCTCGACTAGAGCA

-continued
TGGCTACGTAGATAAGTAGCATGGCGGGTTAATCATTAACTACAAGGAACCCCTAGTGAT

GGAGTTGGCCACTCCCTCTCTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGT

CGCCCGACGCCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCCAGCTGGC

GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCG

AATGGAATTCCAGACGATTGAGCGTCAAAATGTAGGTATTTCCATGAGCGTTTTTCCTGT

TGCAATGGCTGGCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTGAGTTC

TTCTACTCAGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTT

GCGTGATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTCAGGA

TTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCCCGCTC

TGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGCGCCCT

GTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGACCGCTACACTTG

CCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCG

GCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCTTTAC

GGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAGTGGGCCATCGCCCT

GATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACTCTTGT

TCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTTTTGATTTATAAGGGATTT

TGCCGATTTCGGCCTATTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATT

TTAACAAAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTTTTGG

GGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGTTTTACGATTACCGT

TCATCGATTCTCTTGTTTGCTCCAGACTCTCAGGCAATGACCTGATAGCCTTTGTAGAGA

CCTCTCAAAAATAGCTACCCTCTCCGGCATGAATTTATCAGCTAGAACGGTTGAATATCA

TATTGATGGTGATTTGACTGTCTCCGGCCTTTCTCACCCGTTTGAATCTTTACCTACACA

TTACTCAGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTTTATCCTTGCGTTGA

AATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTTGGTACAACCGATTT

AGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGCTAATTCTTTGCCTTGCCTGTATGA

TTTATTGGATGTTGGAATTCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGGTATTT

CACACCGCATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGC

CCCGACACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCG

CTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGGTTTTCACCGTCAT

CACCGAAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCA

TGATAATAATGGTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCC

CTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCT

GATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTCG

CCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCACCCAGAAACGCTGG

TGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACATCGAACTGGATC

TCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGATGAGCA

CTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAAC

TCGGTCGCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACAGAAA

AGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTG

-continued

ATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTT

TTTTGCACAACATGGGGGATCATGTAACTCGCCTTGATCGTTGGGAACCGGAGCTGAATG

AAGCCATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGC

GCAAACTATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGA

TGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTA

TTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGC

CAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGG

ATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGT

CAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTTAAAA

GGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTT

CGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTT

TTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCTACCAGCGGTGGTTTGTT

TGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGA

TACCAAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAG

CACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATA

AGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTCGG

GCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGA

GATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACA

GGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAA

ACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACTTGAGCGTCGATTTT

TGTGATGCTCGTCAGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTAC

GGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCCTGCGTTATCCCCTGATT

CTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGA

CCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTC

TCCCCGCGCGTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACTGAGGC

CGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGGTCGCCCGGCCTCAGTGAGCGAGCG

AGCGCGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCCTTGTAGTTAATGATTAA

CCCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGGAG

TTCCGCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCCCCGC

CCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGA

CGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCAT

ATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTATGCC

CAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCT

ATTACCATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCCCCCTCC

CCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTGTGCAGCGATGGGGGCGGGG

GGGGGGGGGGGCGCGCGCCAGGCGGGGGGGGGGGGGCGAGGGGCGGGGCGGGGCGAGGCG

GAGAGGTGCGGCGGCAGCCAATCAGAGCGGCGCGCTCCGAAAGTTTCCTTTTATGGCGAG

GCGGCGGCGGCGGCGCCCTATAAAAAGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCG

CTGCCTTCGCCCCGTGCCCCGCTCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTCTGACT

GACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTTTGGCGCCTCCCGCGG

GCGCCCCCCTCCTCACGGCGAGCGCTGCCACGTCAGACGAAGGGCGCAGCGAGCGTCCTG

ATCCTTCCGCCCGGACGCTCAGGACAGCGGCCCGCTGCTCATAAGACTCGGCCTTAGAAC

CCCAGTATCAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTT

TCTTTCCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCGGAGG

GATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTCATGTTTTCTTT

TTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACCGCCACCATGAGGGGCATGAAGCTG

CTGGGGGCGCTGCTGGCACTGGCGGCCCTACTGCAGGGGGCCGTGTCCCTGAAGATCGCA

GCCTTCAACATCCAGACATTTGGGGAGACCAAGATGTCCAATGCCACCCTCGTCAGCTAC

ATTGTGCAGATCCTGAGCCGCTATGACATCGCCCTGGTCCAGGAGGTCAGAGACAGCCAC

CTGACTGCCGTGGGGAAGCTGCTGGACAACCTCAATCAGGATGCACCAGACACCTATCAC

TACGTGGTCAGTGAGCCACTGGGACGGAACAGCTATAAGGAGCGCTACCTGTTCGTGTAC

AGGCCTGACCAGGTGTCTGCGGTGGACAGCTACTACTACGATGATGGCTGCGAGCCCTGC

GGGAACGACACCTTCAACCGAGAGCCAGCCATTGTCAGGTTCTTCTCCCGGTTCACAGAG

GTCAGGGAGTTTGCCATTGTTCCCCTGCATGCGGCCCCGGGGGACGCAGTAGCCGAGATC

GACGCTCTCTATGACGTCTACCTGGATGTCCAAGAGAAATGGGGCTTGGAGGACGTCATG

TTGATGGGCGACTTCAATGCGGGCTGCAGCTATGTGAGACCCTCCCAGTGGTCATCCATC

CGCCTGTGGACAAGCCCCACCTTCCAGTGGCTGATCCCCGACAGCGCTGACACCACAGCT

ACACCCACGCACTGTGCCTATGACAGGATCGTGGTTGCAGGGATGCTGCTCCGAGGCGCC

GTTGTTCCCGACTCGGCTCTTCCCTTTAACTTCCAGGCTGCCTATGGCCTGAGTGACCAA

CTGGCCCAAGCCATCAGTGACCACTATCCAGTGGAGGTGATGCTGAAGGGCGGATCAGGC

GGATCACCCAAATCTTGTGACAAAACTCACACATGCCCACCGTGCCCAGCACCTGAACTC

CTGGGGGGACCGTCAGTCTTCCTCTTCCCCCCAAAACCCAAGGACACCCTCATGATCTCC

CGGACCCCTGAGGTCACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAAG

TTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCGCGGGAGGAG

CAGTACAACAGCACGTACCGTGTGGTCAGCGTCCTCACCGTCCTGCACCAGGACTGGCTG

AATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGAAA

ACCATCTCCAAAGCCAAAGGGCAGCCCCGAGAACCACAGGTGTACACCCTGCCCCCATCC

CGGGAGGAGATGACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCC

AGCGACATCGCCGTGGAGTGGGAGAGCAATGGGCAGCCGGAGAACAACTACAAGACCACG

CCTCCCGTGCTGGACTCCGACGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGACAAG

AGCAGGTGGCAGCAGGGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAAC

CACTACACGCAGAAGAGCCTCTCCCTGTCTCCGGGTAAATAG 3'

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

ACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTTGTATCATGCTA

TTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATAAATCCTGGTTGCTGTCTCTTT

ATGAGGAGTTGTGGCCCGTTGTCAGGCAACGTGGCGTGGTGTGCACTGTGTTTGCTGACG

CAACCCCCACTGGTTGGGGCATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTT

TCCCCCTCCCTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCCGCTGCTGGACAG

-continued

```
GGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGAAATCATCGTCCTTTC

CTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGACGTCCTTCTGCTACGTCC

CTTCGGCCCTCAATCCAGCGGACCTTCCTTCCCGCGGCCTGCTGCCGGCTCTGCGGCCTC

TTCCGCGTCTTCGCCTTCGCCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCCTCCCCGC

CTAAGCTTATCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAAA

TAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGCATTCTAGTTGT

GGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGGATCTCGACCTCGACTAGAGCA

TGGCTACGTAGATAAGTAGCATGGCGGGTTAATCATTAACTACAAGGAACCCCTAGTGAT

GGAGTTGGCCACTCCCTCTCTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGT

CGCCCGACGCCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCCAGCTGGC

GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCG

AATGGAATTCCAGACGATTGAGCGTCAAAATGTAGGTATTTCCATGAGCGTTTTTCCTGT

TGCAATGGCTGGCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTGAGTTC

TTCTACTCAGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTT

GCGTGATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTCAGGA

TTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCCCGCTC

TGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGCGCCCT

GTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGACCGCTACACTTG

CCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCG

GCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCTTTAC

GGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAGTGGGCCATCGCCCT

GATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACTCTTGT

TCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTTTTGATTTATAAGGGATTT

TGCCGATTTCGGCCTATTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATT

TTAACAAAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTTTTGG

GGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGTTTTACGATTACCGT

TCATCGATTCTCTTGTTTGCTCCAGACTCTCAGGCAATGACCTGATAGCCTTTGTAGAGA

CCTCTCAAAAATAGCTACCCTCTCCGGCATGAATTTATCAGCTAGAACGGTTGAATATCA

TATTGATGGTGATTTGACTGTCTCCGGCCTTTCTCACCCGTTTGAATCTTTACCTACACA

TTACTCAGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTTTATCCTTGCGTTGA

AATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTTGGTACAACCGATTT

AGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGCTAATTCTTTGCCTTGCCTGTATGA

TTTATTGGATGTTGGAATTCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGGTATTT

CACACCGCATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGC

CCCGACACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCG

CTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGGTTTTCACCGTCAT

CACCGAAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCA

TGATAATAATGGTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCC

CTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCT
```

-continued

```
GATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTCG

CCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCACCCAGAAACGCTGG

TGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACATCGAACTGGATC

TCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGATGAGCA

CTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAAC

TCGGTCGCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACAGAAA

AGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTG

ATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTT

TTTTGCACAACATGGGGGATCATGTAACTCGCCTTGATCGTTGGGAACCGGAGCTGAATG

AAGCCATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGC

GCAAACTATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGA

TGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTA

TTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGC

CAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGG

ATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGT

CAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTTAAAA

GGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTT

CGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTT

TTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCTACCAGCGGTGGTTTGTT

TGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGA

TACCAAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAG

CACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATA

AGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTCGG

GCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGA

GATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACA

GGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAA

ACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACTTGAGCGTCGATTTT

TGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTAC

GGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCCTGCGTTATCCCCTGATT

CTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGA

CCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTC

TCCCCGCGCGTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACTGAGGC

CGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGGTCGCCCGGCCTCAGTGAGCGAGCG

AGCGCGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCCTTGTAGTTAATGATTAA

CCCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGGAG

TTCCGCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCCCCGC

CCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGA

CGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCAT

ATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTATGCC
```

-continued

```
CAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCT

ATTACCATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCCCCCTCC

CCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTGTGCAGCGATGGGGGCGGGG

GGGGGGGGGGGCGCGCGCCAGGCGGGGGGGGGGGGGCGAGGGGCGGGGCGGGGCGAGGCG

GAGAGGTGCGGCGGCAGCCAATCAGAGCGGCGCGCTCCGAAAGTTTCCTTTTATGGCGAG

GCGGCGGCGGCGGCGCCCTATAAAAAGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCG

CTGCCTTCGCCCCGTGCCCCGCTCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTCTGACT

GACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTTTGGCGCCTCCCGCGG

GCGCCCCCCTCCTCACGGCGAGCGCTGCCACGTCAGACGAAGGGCGCAGCGAGCGTCCTG

ATCCTTCCGCCCGGACGCTCAGGACAGCGGCCCGCTGCTCATAAGACTCGGCCTTAGAAC

CCCAGTATCAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTT

TCTTTCCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCGGAGG

GATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTCATGTTTTCTTT

TTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACCGCCACCGCCAGACCCTGCCGTGCA

TTTATTTTTGGGGCGGCCTGCTGCCGTTTGGCATGCTGTGCGCGAGCAGCACCACCAAAT

GCACCGTGAGCCATGAAGTGGCGGATTGCAGCCATCTGAAACTGACCCAGGTGCCGGATG

ATCTGCCGACCAACATTACCGTGCTGAACCTGACCCATAACCAGCTGCGCCGCCTGCCGG

CGGCGAACTTTACCCGCTATAGCCAGCTGACCAGCCTGGATGTGGGCTTTAACACCATTA

GCAAACTGGAACCGGAACTGTGCCAGAAACTGCCGATGCTGAAAGTGCTGAACCTGCAGC

ATAACGAACTGAGCCAGCTGAGCGATAAAACCTTTGCGTTTTGCACCAACCTGACCGAAC

TGCATCTGATGAGCAACAGCATTCAGAAAATTAAAAACAACCCGTTTGTGAAACAGAAAA

ACCTGATTACCCTGGATCTGAGCCATAACGGCCTGAGCAGCACCAAACTGGGCACCCAGG

TGCAGCTGGAAAACCTGCAGGAACTGCTGCTGAGCAACAACAAAATTCAGGCGCTGAAAA

GCGAAGAACTGGATATTTTTGCGAACAGCAGCCTGAAAAAACTGGAACTGAGCAGCAACC

AGATTAAAGAATTTAGCCCGGGCTGCTTTCATGCGATTGGCCGCCTGTTTGGCCTGTTTC

TGAACAACGTGCAGCTGGGCCCGAGCCTGACCGAAAAACTGTGCCTGGAACTGGCGAACA

CCAGCATTCGCAACCTGAGCCTGAGCAACAGCCAGCTGAGCACCACCAGCAACACCACCT

TTCTGGGCCTGAAATGGACCAACCTGACCATGCTGGATCTGAGCTATAACAACCTGAACG

TGGTGGGCAACGATAGCTTTGCGTGGCTGCCGCAGCTGGAATATTTTTTTCTGGAATATA

ACAACATTCAGCATCTGTTTAGCCATAGCCTGCATGGCCTGTTTAACGTGCGCTATCTGA

ACCTGAAACGCAGCTTTACCAAACAGAGCATTAGCCTGGCGAGCCTGCCGAAAATTGATG

ATTTTAGCTTTCAGTGGCTGAAATGCCTGGAACATCTGAACATGGAAGATAACGATATTC

CGGGCATTAAAAGCAACATGTTTACCGGCCTGATTAACCTGAAATATCTGAGCCTGAGCA

ACAGCTTTACCAGCCTGCGCACCCTGACCAACGAAACCTTTGTGAGCCTGGCGCATAGCC

CGCTGCATATTCTGAACCTGACCAAAAACAAAATTAGCAAAATTGAAAGCGATGCGTTTA

GCTGGCTGGGCCATCTGGAAGTGCTGGATCTGGGCCTGAACGAAATTGGCCAGGAACTGA

CCGGCCAGGAATGGCGCGGCCTGGAAAACATTTTTGAAATTTATCTGAGCTATAACAAAT

ATCTGCAGCTGACCCGCAACAGCTTTGCGCTGGTGCCGAGCCTGCAGCGCCTGATGCTGC

GCCGCGTGGCGCTGAAAAACGTGGATAGCAGCCCGAGCCCGTTTCAGCCGCTGCGCAACC
```

-continued

TGACCATTCTGGATCTGAGCAACAACAACATTGCGAACATTAACGATGATATGCTGGAAG

GCCTGGAAAAACTGGAAATTCTGGATCTGCAGCATAACAACCTGGCGCGCCTGTGGAAAC

ATGCGAACCCGGGCGGCCCGATTTATTTTCTGAAAGGCCTGAGCCATCTGCATATTCTGA

ACCTGGAAAGCAACGGCTTTGATGAAATTCCGGTGGAAGTGTTTAAAGATCTGTTTGAAC

TGAAAATTATTGATCTGGGCCTGAACAACCTGAACACCCTGCCGGCGAGCGTGTTTAACA

ACCAGGTGAGCCTGAAAAGCCTGAACCTGCAGAAAAAACCTGATTACCAGCGTGGAAAAAA

AAGTGTTTGGCCCGGCGTTTCGCAACCTGACCGAACTGGATATGCGCTTTAACCCGTTTG

ATTGCACCTGCGAAAGCATTGCGTGGTTTGTGAACTGGATTAACGAAACCCATACCAACA

TTCCGGAACTGAGCAGCCATTATCTGTGCAACACCCCGCCGCATTATCATGGCTTTCCGG

TGCGCCTGTTTGATACCAGCAGCTGCAAAGATAGCGCGCCGTTTGAACTGTTTTTTATGA

TTAACACCAGCATTCTGCTGATTTTTATTTTTATTGTGCTGCTGATTCATTTTGAAGGCT

GGCGCATTAGCTTTTATTGGAACGTGAGCGTGCATCGCGTGCTGGGCTTTAAAGAAATTG

ATCGCCAGACCGAACAGTTTGAATATGCGGCGTATATTATTCATGCGTATAAAGATAAAG

ATTGGGTGTGGGAACATTTTAGCAGCATGGAAAAAGAAGATCAGAGCCTGAAATTTTGCC

TGGAAGAACGCGATTTTGAAGCGGGCGTGTTTGAACTGGAAGCGATTGTGAACAGCATTA

AACGCAGCCGCAAAATTATTTTTGTGATTACCCATCATCTGCTGAAAGATCCGCTGTGCA

AACGCTTTAAAGTGCATCATGCGGTGCAGCAGGCGATTGAACAGAACCTGGATAGCATTA

TTCTGGTGTTTCTGGAAGAAATTCCGGATTATAAACTGAACCATGCGCTGTGCCTGCGCC

GCGGCATGTTTAAAAGCCATTGCATTCTGAACTGGCCGGTGCAGAAAGAACGCATTGGCG

CGTTTCGCCATAAACTGCAGGTGGCGCTGGGCAGCAAAAACAGCGTGCATGGGCGGATCA

GGCGGATCACCCAAATCTTGTGACAAAACTCACACATGCCCACCGTGCCCAGCACCTGAA

CTCCTGGGGGGACCGTCAGTCTTCCTCTTCCCCCCAAAACCCAAGGACACCCTCATGATC

TCCCGGACCCCTGAGGTCACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTC

AAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCGCGGGAG

GAGCAGTACAACAGCACGTACCGTGTGGTCAGCGTCCTCACCGTCCTGCACCAGGACTGG

CTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAG

AAAACCATCTCCAAAGCCAAAGGGCAGCCCCGAGAACCACAGGTGTACACCCTGCCCCCA

TCCCGGGAGGAGATGACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTAT

CCCAGCGACATCGCCGTGGAGTGGGAGAGCAATGGGCAGCCGGAGAACAACTACAAGACC

ACGCCTCCCGTGCTGGACTCCGACGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGAC

AAGAGCAGGTGGCAGCAGGGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCAC

AACCACTACACGCAGAAGAGCCTCTCCCTGTCTCCGGGTAAATAG 3'

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

ACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTTGTATCATGCTA

TTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATAAATCCTGGTTGCTGTCTCTTT

ATGAGGAGTTGTGGCCCGTTGTCAGGCAACGTGGCGTGGTGTGCACTGTGTTTGCTGACG

CAACCCCCACTGGTTGGGGCATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTT

TCCCCCTCCCTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCCGCTGCTGGACAG

-continued

```
GGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGAAATCATCGTCCTTTC

CTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGACGTCCTTCTGCTACGTCC

CTTCGGCCCTCAATCCAGCGGACCTTCCTTCCCGCGGCCTGCTGCCGGCTCTGCGGCCTC

TTCCGCGTCTTCGCCTTCGCCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCCTCCCCGC

CTAAGCTTATCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAAA

TAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGCATTCTAGTTGT

GGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGGATCTCGACCTCGACTAGAGCA

TGGCTACGTAGATAAGTAGCATGGCGGGTTAATCATTAACTACAAGGAACCCCTAGTGAT

GGAGTTGGCCACTCCCTCTCTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGT

CGCCCGACGCCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCCAGCTGGC

GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCG

AATGGAATTCCAGACGATTGAGCGTCAAAATGTAGGTATTTCCATGAGCGTTTTTCCTGT

TGCAATGGCTGGCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTGAGTTC

TTCTACTCAGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTT

GCGTGATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTCAGGA

TTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCCCGCTC

TGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGCGCCCT

GTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGACCGCTACACTTG

CCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCG

GCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCTTTAC

GGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAGTGGGCCATCGCCCT

GATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACTCTTGT

TCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTTTTGATTTATAAGGGATTT

TGCCGATTTCGGCCTATTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATT

TTAACAAAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTTTTGG

GGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGTTTTACGATTACCGT

TCATCGATTCTCTTGTTTGCTCCAGACTCTCAGGCAATGACCTGATAGCCTTTGTAGAGA

CCTCTCAAAAATAGCTACCCTCTCCGGCATGAATTTATCAGCTAGAACGGTTGAATATCA

TATTGATGGTGATTTGACTGTCTCCGGCCTTTCTCACCCGTTTGAATCTTTACCTACACA

TTACTCAGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTTTATCCTTGCGTTGA

AATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTTGGTACAACCGATTT

AGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGCTAATTCTTTGCCTTGCCTGTATGA

TTTATTGGATGTTGGAATTCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGGTATTT

CACACCGCATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGC

CCCGACACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCG

CTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGGTTTTCACCGTCAT

CACCGAAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCA

TGATAATAATGGTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCC

CTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCT
```

-continued
GATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTCG

CCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCACCCAGAAACGCTGG

TGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACATCGAACTGGATC

TCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGATGAGCA

CTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAAC

TCGGTCGCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACAGAAA

AGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTG

ATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTT

TTTTGCACAACATGGGGGATCATGTAACTCGCCTTGATCGTTGGGAACCGGAGCTGAATG

AAGCCATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGC

GCAAACTATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGA

TGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTA

TTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGC

CAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGG

ATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGT

CAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTTAAAA

GGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTT

CGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTT

TTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCTACCAGCGGTGGTTTGTT

TGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGA

TACCAAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAG

CACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATA

AGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTCGG

GCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGA

GATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACA

GGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAA

ACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACTTGAGCGTCGATTTT

TGTGATGCTCGTCAGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTAC

GGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCCTGCGTTATCCCCTGATT

CTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGA

CCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTC

TCCCCGCGCGTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACTGAGGC

CGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGGTCGCCCGGCCTCAGTGAGCGAGCG

AGCGCGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCCTTGTAGTTAATGATTAA

CCCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGGAG

TTCCGCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCCCCGC

CCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGA

CGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCAT

ATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTATGCC

-continued
```
CAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCT

ATTACCATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCCCCCTCC

CCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTGTGCAGCGATGGGGGCGGGG

GGGGGGGGGGGCGCGCGCCAGGCGGGGCGGGGGGGGGCGAGGGGCGGGGCGGGGCGAGGC

GGAGAGGTGCGGCGGCAGCCAATCAGAGCGGCGCGCTCCGAAAGTTTCCTTTTATGGCGA

GGCGGCGGCGGCGGCGGCCCTATAAAAAGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGC

GCTGCCTTCGCCCCGTGCCCCGCTCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTCTGAC

TGACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTTTGGCGCCTCCCGCG

GGCGCCCCCTCCTCACGGCGAGCGCTGCCACGTCAGACGAAGGGCGCAGCGAGCGTCCT

GATCCTTCCGCCCGGACGCTCAGGACAGCGGCCCGCTGCTCATAAGACTCGGCCTTAGAA

CCCCAGTATCAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTT

TTCTTTCCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCGGAG

GGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTCATGTTTTCTT

TTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACCGCCACCATGAGGGGCATGAAGCT

GCTGGGGGCGCTGCTGGCACTGGCGGCCCTACTGCAGGGGGCCGTGTCCATGGGCTTTTG

CCGCAGCGCGCTGCATCCGCTGAGCCTGCTGGTGCAGGCGATTATGCTGGCGATGACCCT

GGCGCTGGGCACCCTGCCGGCGTTTCTGCCGTGCGAACTGCAGCCGCATGGCCTGGTGAA

CTGCAACTGGCTGTTTCTGAAAAGCGTGCCGCATTTTAGCATGGCGGCGCCGCGCGGCAA

CGTGACCAGCCTGAGCCTGAGCAGCAACCGCATTCATCATCTGCATGATAGCGATTTTGC

GCATCTGCCGAGCCTGCGCCATCTGAACCTGAAATGGAACTGCCCGCCGGTGGGCCTGAG

CCCGATGCATTTTCCGTGCCATATGACCATTGAACCGAGCACCTTTCTGGCGGTGCCGAC

CCTGGAAGAACTGAACCTGAGCTATAACAACATTATGACCGTGCCGGCGCTGCCGAAAAG

CCTGATTAGCCTGAGCCTGAGCCATACCAACATTCTGATGCTGGATAGCGCGAGCCTGGC

GGGCCTGCATGCGCTGCGCTTTCTGTTTATGGATGGCAACTGCTATTATAAAAACCCGTG

CCGCCAGGCGCTGGAAGTGGCGCCGGGCGCGCTGCTGGGCCTGGGCAACCTGACCCATCT

GAGCCTGAAATATAACAACCTGACCGTGGTGCCGCGCAACCTGCCGAGCAGCCTGGAATA

TCTGCTGCTGAGCTATAACCGCATTGTGAAACTGGCGCCGGAAGATCTGGCGAACCTGAC

CGCGCTGCGCGTGCTGGATGTGGGCGGCAACTGCCGCCGCTGCGATCATGCGCCGAACCC

GTGCATGGAATGCCCGCGCCATTTTCCGCAGCTGCATCCGGATACCTTTAGCCATCTGAG

CCGCCTGGAAGGCCTGGTGCTGAAAGATAGCAGCCTGAGCTGGCTGAACGCGAGCTGGTT

TCGCGGCCTGGGCAACCTGCGCGTGCTGGATCTGAGCGAAAACTTTCTGTATAAATGCAT

TACCAAAACCAAAGCGTTTCAGGGCCTGACCCAGCTGCGCAAACTGAACCTGAGCTTTAA

CTATCAGAAACGCGTGAGCTTTGCGCATCTGAGCCTGGCGCCGAGCTTTGGCAGCCTGGT

GGCGCTGAAAGAACTGGATATGCATGGCATTTTTTTTCGCAGCCTGGATGAAACCACCCT

GCGCCCGCTGGCGCGCCTGCCGATGCTGCAGACCCTGCGCCTGCAGATGAACTTTATTAA

CCAGGCGCAGCTGGGCATTTTTCGCGCGTTTCCGGGCCTGCGCTATGTGGATCTGAGCGA

TAACCGCATTAGCGGCGCGAGCGAACTGACCGCGACCATGGGCGAAGCGGATGGCGGCGA

AAAAGTGTGGCTGCAGCCGGGCGATCTGGCGCCGGCGCCGGTGGATACCCCGAGCAGCGA

AGATTTTCGCCCGAACTGCAGCACCCTGAACTTTACCCTGGATCTGAGCCGCAACAACCT
```

```
GGTGACCGTGCAGCCGGAAATGTTTGCGCAGCTGAGCCATCTGCAGTGCCTGCGCCTGAG

CCATAACTGCATTAGCCAGGCGGTGAACGGCAGCCAGTTTCTGCCGCTGACCGGCCTGCA

GGTGCTGGATCTGAGCCATAACAAACTGGATCTGTATCATGAACATAGCTTTACCGAACT

GCCGCGCCTGGAAGCGCTGGATCTGAGCTATAACAGCCAGCCGTTTGGCATGCAGGGCGT

GGGCCATAACTTTAGCTTTGTGGCGCATCTGCGCCACCCTGCGCCATCTGAGCCTGGCGCA

TAACAACATTCATAGCCAGGTGAGCCAGCAGCTGTGCAGCACCAGCCTGCGCGCGCTGGA

TTTTAGCGGCAACGCGCTGGGCCATATGTGGGCGGAAGGCGATCTGTATCTGCATTTTTT

TCAGGGCCTGAGCGGCCTGATTTGGCTGGATCTGAGCCAGAACCGCCTGCATACCCTGCT

GCCGCAGACCCTGCGCAACCTGCCGAAAAGCCTGCAGGTGCTGCGCCTGCGCGATAACTA

TCTGGCGTTTTTTAAATGGTGGAGCCTGCATTTTCTGCCGAAACTGGAAGTGCTGGATCT

GGCGGGCAACCAGCTGAAAGCGCTGACCAACGGCAGCCTGCCGGCGGGCACCCGCCTGCG

CCGCCTGGATGTGAGCTGCAACAGCATTAGCTTTGTGGCGCCGGGCTTTTTTAGCAAAGC

GAAAGAACTGCGCGAACTGAACCTGAGCGCGAACGCGCTGAAAACCGTGGATCATAGCTG

GTTTGGCCCGCTGGCGAGCGCGCTGCAGATTCTGGATGTGAGCGCGAACCCGCTGCATTG

CGCGTGCGGCGCGGCGTTTATGGATTTTCTGCTGGAAGTGCAGGCGGCGGTGCCGGGCCT

GCCGAGCCGCGTGAAATGCGGCAGCCCGGGCCAGCTGCAGGGCCTGAGCATTTTTGCGCA

GGATCTGCGCCTGTGCCTGGATGAAGCGCTGAGCTGGGATTGCTTTGCGCTGAGCCTGCT

GGCGGTGGCGCTGGGCCTGGGCGTGCCGATGCTGCATCATCTGTGCGGCTGGGATCTGTG

GTATTGCTTTCATCTGTGCCTGGCGTGGCTGCCGTGGCGCGACCGCCAGAGCGGCCGCGA

TGAAGATGCGCTGCCGTATGATGCGTTTGTGGTGTTTGATAAAACCCAGAGCGCGGTGGC

GGATTGGGTGTATAACGAACTGCGCGGCCAGCTGGAAGAATGCCGCGGCCGCTGGGCGCT

GCGCCTGTGCCTGGAAGAACGCGATTGGCTGCCGGGCAAAACCCTGTTTGAAAACCTGTG

GGCGAGCGTGTATGGCAGCCGCAAAACCCTGTTTGTGCTGGCGCATACCGATCGCGTGAG

CGGCCTGCTGCGCGCGAGCTTTCTGCTGGCGCAGCAGCGCCTGCTGGAAGATCGCAAAGA

TGTGGTGGTGCTGGTGATTCTGAGCCCGGATGGCCGCCGCAGCCGCTATGTGCGCCTGCG

CCAGCGCCTGTGCCGCCAGAGCGTGCTGCTGTGGCCGCATCAGCCGAGCGGCCAGCGCAG

CTTTTTGGGCGCAGCTGGGCATGGCGCTGACCCGCGATAACCATCATTTTTATAACCGCAA

CTTTTTGCCAGGGCCCGACCGCGGAAGGGCGGATCAGGCGGATCACCCAAATCTTGTGACA

AAACTCACACATGCCCACCGTGCCCAGCACCTGAACTCCTGGGGGGACCGTCAGTCTTCC

TCTTCCCCCCAAAACCCAAGGACACCCTCATGATCTCCCGGACCCCTGAGGTCACATGCG

TGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTCAAGTTCAACTGGTACGTGGACGGCG

TGGAGGTGCATAATGCCAAGACAAAGCCGCGGGAGGAGCAGTACAACAGCACGTACCGTG

TGGTCAGCGTCCTCACCGTCCTGCACCAGGACTGGCTGAATGGCAAGGAGTACAAGTGCA

AGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAAGCCAAAGGGC

AGCCCCGAGAACCACAGGTGTACACCCTGCCCCCATCCCGGGAGGAGATGACCAAGAACC

AGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGGG

AGAGCAATGGGCAGCCGGAGAACAACTACAAGACCACGCCTCCCGTGCTGGACTCCGACG

GCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGGAACG

TCTTCTCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACGCAGAAGAGCCTCT
```

-continued

CCCTGTCTCCGGGTAAATAG 3'

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

ACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTTGTATCATGCTA

TTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATAAATCCTGGTTGCTGTCTCTTT

ATGAGGAGTTGTGGCCCGTTGTCAGGCAACGTGGCGTGGTGTGCACTGTGTTTGCTGACG

CAACCCCCACTGGTTGGGGCATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTT

TCCCCCTCCCTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCCGCTGCTGGACAG

GGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGAAATCATCGTCCTTTC

CTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGACGTCCTTCTGCTACGTCC

CTTCGGCCCTCAATCCAGCGGACCTTCCTTCCCGCGGCCTGCTGCCGGCTCTGCGGCCTC

TTCCGCGTCTTCGCCTTCGCCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCCTCCCCGC

CTAAGCTTATCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAAA

TAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGCATTCTAGTTGT

GGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGGATCTCGACCTCGACTAGAGCA

TGGCTACGTAGATAAGTAGCATGGCGGGTTAATCATTAACTACAAGGAACCCCTAGTGAT

GGAGTTGGCCACTCCCTCTCTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGT

CGCCCGACGCCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCCAGCTGGC

GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCG

AATGGAATTCCAGACGATTGAGCGTCAAAATGTAGGTATTTCCATGAGCGTTTTTCCTGT

TGCAATGGCTGGCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTGAGTTC

TTCTACTCAGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTT

GCGTGATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTCAGGA

TTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCCCGCTC

TGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGCGCCCT

GTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGACCGCTACACTTG

CCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCG

GCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCTTTAC

GGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAGTGGGCCATCGCCCT

GATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACTCTTGT

TCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTTTTGATTTATAAGGGATTT

TGCCGATTTCGGCCTATTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATT

TTAACAAAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTTTTGG

GGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGTTTTACGATTACCGT

TCATCGATTCTCTTGTTTGCTCCAGACTCTCAGGCAATGACCTGATAGCCTTTGTAGAGA

CCTCTCAAAAATAGCTACCCTCTCCGGCATGAATTTATCAGCTAGAACGGTTGAATATCA

TATTGATGGTGATTTGACTGTCTCCGGCCTTTCTCACCCGTTTGAATCTTTACCTACACA

TTACTCAGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTTTATCCTTGCGTTGA

AATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTTGGTACAACCGATTT

AGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGCTAATTCTTTGCCTTGCCTGTATGA

-continued

TTTATTGGATGTTGGAATTCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGGTATTT

CACACCGCATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGC

CCCGACACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCG

CTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGGTTTTCACCGTCAT

CACCGAAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCA

TGATAATAATGGTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCC

CTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCT

GATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTCG

CCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCACCCAGAAACGCTGG

TGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACATCGAACTGGATC

TCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGATGAGCA

CTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAAC

TCGGTCGCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACAGAAA

AGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTG

ATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTT

TTTTGCACAACATGGGGGATCATGTAACTCGCCTTGATCGTTGGGAACCGGAGCTGAATG

AAGCCATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGC

GCAAACTATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGA

TGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTA

TTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGC

CAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGG

ATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGT

CAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTTAAAA

GGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTT

CGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTT

TTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCTACCAGCGGTGGTTTGTT

TGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGA

TACCAAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAG

CACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATA

AGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTCGG

GCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGA

GATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACA

GGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAA

ACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACTTGAGCGTCGATTTT

TGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTAC

GGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCCTGCGTTATCCCCTGATT

CTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGA

CCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTC

TCCCCGCGCGTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACTGAGGC

-continued

CGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGGTCGCCCGGCCTCAGTGAGCGAGCG

AGCGCGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCCTTGTAGTTAATGATTAA

CCCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGGAG

TTCCGCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCCCCGC

CCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGA

CGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCAT

ATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTATGCC

CAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCT

ATTACCATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCCCCCTCC

CCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTGTGCAGCGATGGGGGGGGGG

GGGGGGGGGCGCGCGCCAGGCGGGGCGGGGGGGGGCGAGGGGCGGGGCGGGGCGAGGCG

GAGAGGTGCGGCGGCAGCCAATCAGAGCGGCGCGCTCCGAAAGTTTCCTTTTATGGCGAG

GCGGCGGCGGCGGCCCTATAAAAAGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCG

CTGCCTTCGCCCCGTGCCCCGCTCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTCTGACT

GACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTTTGGCGCCTCCCGCGG

GCGCCCCCTCCTCACGGCGAGCGCTGCCACGTCAGACGAAGGGCGCAGCGAGCGTCCTG

ATCCTTCCGCCCGGACGCTCAGGACAGCGGCCCGCTGCTCATAAGACTCGGCCTTAGAAC

CCCAGTATCAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTT

TCTTTCCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCGGAGG

GATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTCATGTTTTCTTT

TTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACCGCCACCATGAGGGGCATGAAGCTG

CTGGGGGCGCTGCTGGCACTGGCGGCCCTACTGCAGGGGGCCGTGTCCATGAGCATGCTG

TTTTATACCCTGATTACCGCGTTTCTGATTGGCATTCAGGCGGAACCGCATAGCGAAAGC

AACGTGCCGGCGGGCCATACCATTCCGCAGGCGCATTGGACCAAACTGCAGCATAGCCTG

GATACCGCGCTGCGCCGCGCGCGCAGCGCGCCGGCGGCGGCGATTGCGGCGCGCGTGGCG

GGCCAGACCCGCAACATTACCGTGGATCCGCGCCTGTTTAAAAAACGCCGCCTGCGCAGC

CCGCGCGTGCTGTTTAGCACCCAGCCGCCGCGCGAAGCGGCGGATACCCAGGATCTGGAT

TTTGAAGTGGGCGGCGCGGCGCCGTTTAACCGCACCCATCGCAGCAAACGCAGCAGCAGC

CATCCGATTTTTCATCGCGGCGAATTTAGCGTGTGCGATAGCGTGAGCGTGTGGGTGGGC

GATAAAACCACCGCGACCGATATTAAAGGCAAAGAAGTGATGGTGCTGGGCGAAGTGAAC

ATTAACAACAGCGTGTTTAAACAGTATTTTTTTGAAACCAAATGCCGCGATCCGAACCCG

GTGGATAGCGGCTGCCGCGGCATTGATAGCAAACATTGGAACAGCTATTGCACCACCACC

CATACCTTTGTGAAAGCGCTGACCATGGATGGCAAACAGGCGGCGTGGCGCTTTATTCGC

ATTGATACCGCGTGCGTGTGCGTGCTGAGCCGCAAAGCGGTGCGCCGCGCGGGCGGATCA

GGCGGATCACCCAAATCTTGTGACAAAACTCACACATGCCCACCGTGCCCAGCACCTGAA

CTCCTGGGGGGACCGTCAGTCTTCCTCTTCCCCCCAAAACCCAAGGACACCCTCATGATC

TCCCGGACCCCTGAGGTCACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCTGAGGTC

AAGTTCAACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCAAGACAAAGCCGCGGGAG

GAGCAGTACAACAGCACGTACCGTGTGGTCAGCGTCCTCACCGTCCTGCACCAGGACTGG

-continued

CTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCCCCATCGAG

AAAACCATCTCCAAAGCCAAAGGGCAGCCCCGAGAACCACAGGTGTACACCCTGCCCCCA

TCCCGGGAGGAGATGACCAAGAACCAGGTCAGCCTGACCTGCCTGGTCAAAGGCTTCTAT

CCCAGCGACATCGCCGTGGAGTGGGAGAGCAATGGGCAGCCGGAGAACAACTACAAGACC

ACGCCTCCCGTGCTGGACTCCGACGGCTCCTTCTTCCTCTACAGCAAGCTCACCGTGGAC

AAGAGCAGGTGGCAGCAGGGGAACGTCTTCTCATGCTCCGTGATGCATGAGGCTCTGCAC

AACCACTACACGCAGAAGAGCCTCTCCCTGTCTCCGGGTAAATAG 3'

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

ACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTTGTATCATGCTA

TTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATAAATCCTGGTTGCTGTCTCTTT

ATGAGGAGTTGTGGCCCGTTGTCAGGCAACGTGGCGTGGTGTGCACTGTGTTTGCTGACG

CAACCCCCACTGGTTGGGGCATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTT

TCCCCCTCCCTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCCGCTGCTGGACAG

GGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGAAATCATCGTCCTTTC

CTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGACGTCCTTCTGCTACGTCC

CTTCGGCCCTCAATCCAGCGGACCTTCCTTCCCGCGGCCTGCTGCCGGCTCTGCGGCCTC

TTCCGCGTCTTCGCCTTCGCCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCCTCCCCGC

CTAAGCTTATCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAAA

TAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGCATTCTAGTTGT

GGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGGATCTCGACCTCGACTAGAGCA

TGGCTACGTAGATAAGTAGCATGGCGGGTTAATCATTAACTACAAGGAACCCCTAGTGAT

GGAGTTGGCCACTCCCTCTCTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGT

CGCCCGACGCCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCCAGCTGGC

GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCG

AATGGAATTCCAGACGATTGAGCGTCAAAATGTAGGTATTTCCATGAGCGTTTTTCCTGT

TGCAATGGCTGGCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTGAGTTC

TTCTACTCAGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTT

GCGTGATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTCAGGA

TTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCCCGCTC

TGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGCGCCCT

GTAGCGGCGCATTAAGCGCGGCGGGTGTGGTGGTTACGCGCAGCGTGACCGCTACACTTG

CCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCG

GCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCTTTAC

GGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAGTGGGCCATCGCCCT

GATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACTCTTGT

TCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTTTTGATTTATAAGGGATTT

TGCCGATTTCGGCCTATTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATT

TTAACAAAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTTTTGG

-continued

```
GGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGTTTTACGATTACCGT

TCATCGATTCTCTTGTTTGCTCCAGACTCTCAGGCAATGACCTGATAGCCTTTGTAGAGA

CCTCTCAAAAATAGCTACCCTCTCCGGCATGAATTTATCAGCTAGAACGGTTGAATATCA

TATTGATGGTGATTTGACTGTCTCCGGCCTTTCTCACCCGTTTGAATCTTTACCTACACA

TTACTCAGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTTTATCCTTGCGTTGA

AATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTTGGTACAACCGATTT

AGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGCTAATTCTTTGCCTTGCCTGTATGA

TTTATTGGATGTTGGAATTCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGGTATTT

CACACCGCATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGC

CCCGACACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCG

CTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGGTTTTCACCGTCAT

CACCGAAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCA

TGATAATAATGGTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCC

CTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCT

GATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTCG

CCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCACCCAGAAACGCTGG

TGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACATCGAACTGGATC

TCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGATGAGCA

CTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAAC

TCGGTCGCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACAGAAA

AGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTG

ATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTT

TTTTGCACAACATGGGGGATCATGTAACTCGCCTTGATCGTTGGGAACCGGAGCTGAATG

AAGCCATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGC

GCAAACTATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGA

TGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTA

TTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGC

CAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGG

ATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGT

CAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTTAAAA

GGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTT

CGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTT

TTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAAACCACCGCTACCAGCGGTGGTTTGTT

TGCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGA

TACCAAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAG

CACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATA

AGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTCGG

GCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGA

GATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACA
```

```
GGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAA

ACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACTTGAGCGTCGATTTT

TGTGATGCTCGTCAGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCTTTTTAC

GGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCCTGCGTTATCCCCTGATT

CTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGA

CCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTC

TCCCCGCGCGTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACTGAGGC

CGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGGTCGCCCGGCCTCAGTGAGCGAGCG

AGCGCGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCCTTGTAGTTAATGATTAA

CCCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGGAG

TTCCGCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCCCCGC

CCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGA

CGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTATCAT

ATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTATGCC

CAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCT

ATTACCATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCCCCCTCC

CCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTGTGCAGCGATGGGGGCGGGG

GGGGGGGGGGGCGCGCGCCAGGCGGGGGGGGGGGGGCGAGGGGCGGGGCGGGGCGAGGCG

GAGAGGTGCGGCGGCAGCCAATCAGAGCGGCGCGCTCCGAAAGTTTCCTTTTATGGCGAG

GCGGCGGCGGCGGCGCCCTATAAAAAGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCG

CTGCCTTCGCCCCGTGCCCCGCTCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTCTGACT

GACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTTTGGCGCCTCCCGCGG

GCGCCCCCCTCCTCACGGCGAGCGCTGCCACGTCAGACGAAGGGCGCAGCGAGCGTCCTG

ATCCTTCCGCCCGGACGCTCAGGACAGCGGCCCGCTGCTCATAAGACTCGGCCTTAGAAC

CCCAGTATCAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTT

TCTTTCCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCGGAGG

GATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTCATGTTTTCTTT

TTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACCGCCACCATGAGGGGCATGAAGCTG

CTGGGGGCGCTGCTGGCACTGGCGGCCCTACTGCAGGGGGCCGTGTCCATGGCGCTGTGG

ATGCGCCTGCTGCCGCTGCTGGCGCTGCTGGCGCTGTGGGGCCCGGATCCGGCGGCGGCG

TTTGTGAACCAGCATCTGTGCGGCAGCCATCTGGTGGAAGCGCTGTATCTGGTGTGCGGC

GAACGCGGCTTTTTTTATACCCCGAAAACCCGCCGCGAAGCGGAAGATCTGCAGGTGGGC

CAGGTGGAACTGGGCGGCGGCCCGGGCGCGGGCAGCCTGCAGCCGCTGGCGCTGGAAGGC

AGCCTGCAGAAACGCGGCATTGTGGAACAGTGCTGCACCAGCATTTGCAGCCTGTATCAG

CTGGAAAACTATTGCAACGGGCGGATCAGGCGGATCACCCAAATCTTGTGACAAAACTCA

CACATGCCCACCGTGCCCAGCACCTGAACTCCTGGGGGGACCGTCAGTCTTCCTCTTCCC

CCCAAAACCCAAGGACACCCTCATGATCTCCCGGACCCCTGAGGTCACATGCGTGGTGGT

GGACGTGAGCCACGAAGACCCTGAGGTCAAGTTCAACTGGTACGTGGACGGCGTGGAGGT

GCATAATGCCAAGACAAAGCCGCGGGAGGAGCAGTACAACAGCACGTACCGTGTGGTCAG
```

-continued
```
CGTCCTCACCGTCCTGCACCAGGACTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTCTC

CAACAAAGCCCTCCCAGCCCCCATCGAGAAAACCATCTCCAAAGCCAAAGGGCAGCCCCG

AGAACCACAGGTGTACACCCTGCCCCCATCCCGGGAGGAGATGACCAAGAACCAGGTCAG

CCTGACCTGCCTGGTCAAAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGGGAGAGCAA

TGGGCAGCCGGAGAACAACTACAAGACCACGCCTCCCGTGCTGGACTCCGACGGCTCCTT

CTTCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGGAACGTCTTCTC

ATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACGCAGAAGAGCCTCTCCCTGTC

TCCGGGTAAATAG 3'
```

[0051] 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.

[0052] 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

[0053] 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
accccactg gttggggcat tgccaccacc tgtcagctcc tttccgggac tttcgctttc   300
ccctccta 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 cggcggcct cagtgagcga gcgagcgcgc cagctggcgt   960
aatagcgaag aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa   1020
tggaattcca gacgattgag cgtcaaaatg taggtatttc catgagcgtt tttcctgttg   1080
```

-continued

```
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  tcggggctc  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  ttttttatcct  tgcgttgaaa  2160
taaaggcttc  tcccgcaaaa  gtattacagg  gtcataatgt  ttttggtaca  accgatttag  2220
ctttatgctc  tgaggcttta  ttgcttaatt  ttgctaattc  tttgccttgc  ctgtatgatt  2280
tattggatgt  tggaattcct  gatgcggtat  ttttctcctta  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  ttcatttta  atttaaaagg  3660
atctaggtga  agatcctttt  tgataatctc  atgaccaaaa  tcccttaacg  tgagttttcg  3720
ttccactgag  cgtcagaccc  cgtagaaaag  atcaaaggat  cttcttgaga  tcctttttt  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  cttttttacgg  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  cccctattg  acgtcaatga  cggtaaatgg  cccgcctggc  attatgccca  5040
gtacatgacc  ttatgggact  ttcctacttg  gcagtacatc  tacgtattag  tcatcgctat  5100
taccatggtc  gaggtgagcc  ccacgttctg  cttcactctc  cccatctccc  cccctcccc  5160
acccccaatt  ttgtatttat  ttatttttta  attattttgt  gcagcgatgg  gggcgggggg  5220
gggggggggc  gcgcgccagg  cggggcgggg  cggggcgagg  ggcggggcgg  ggcgaggcgg  5280
agaggtgcgg  cggcagccaa  tcagagcgga  cgctcgcaa  agtttccttt  tatggcgagg  5340
cggcggcggc  ggcggcccta  taaaaagcga  agcgcgcggc  gggcgggagt  cgctgcgcgc  5400
tgccttcgcc  ccgtgcccg  ctccgccgcc  gcctcgcgcc  gcccgccccg  ctctgactc  5460
accgcgttac  taaaacaggt  aagtccggcc  tccgcgccgg  gttttggcgc  ctcccgcggg  5520
cgcccccctc  ctcacggcga  gcgctgccac  gtcagacgaa  gggcgcagcg  agcgtcctga  5580
tccttccgcc  cggacgctca  ggacagcggc  ccgctgctca  taagactcgg  ccttagaacc  5640
```

-continued

```
ccagtatcag cagaaggaca tttttaggacg ggacttgggt gactctaggg cactggtttt    5700
ctttccagag agcggaacag gcgaggaaaa gtagtcccct ctcggcgatt ctgcggaggg    5760
atctccgtgg ggcggtgaac gccgatgatg cctctactaa ccatgttcat gtttttctttt    5820
ttttttctaca 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 ggggggcgctg ctggcactgg cggccctact gcagggggcc     60
gtgtccctga agatcgcagc cttcaacatc cagacatttg gggagaccaa 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 ggccccgggg    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
ccagccccca 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 tattttttggg gcggcctgct gccgtttggc atgcgtgtgcg     60
cgagcagcac caccaaatgc accgtgagcc atgaagtggc ggattgcagc catctgaaac    120
tgacccaggt gccggatgat ctgccgacca acattaccgt gctgaacctg acccataacc    180
agctgcgccg cctgccggcg gcgaactta cccgctatag cagctgacc agcctgatag    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 tggatctgac 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 gagcgtgacc gaaaaactgt    720
gcctggaact ggcgaacacc agcattcgca acctgagcct gagcaacaac cagctgaacc    780
ccaccagcaa caccaccttt ctgggcctga atggaccaa 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 gaaaaccttttg   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
tgcagcgcct gatgctgcgc cgcgtggcgc tgaaaaacgt ggatagcagc ccgagccgt   1500
ttcagccgct gcgcaacctg accattctgg atctgagcaa caacaacatt gcgaacatta   1560
acgatgatat gctggaaggc ctggaaaaac tggaaaatct ggatctgcag cataacaacc   1620
tggcgcgcct gtggaaacat gcgaacccgg gcggcccgat ttattttctg aaaggcctga   1680
gccatctgca tattctgaac ctggaaagca acgcgtttga tgaattccg gtggaagtgt   1740
ttaaagatct gtttgaactg aaaattattg atctgggcct gaacaacctg aacaccctgc   1800
cggcgagcgt gtttaacaac caggtgagcc tgaaaagcct gaacctgcag aaaaacctga   1860
ttaccagcgt ggaaaaaaaa gtgtttggcc cggcgtttcg caacctgacc gaactggata   1920
```

-continued

```
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 aaagcattg 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 gcagccccg 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

```
atgagggggca tgaagctgct gggggcgctg ctggcactgg cggccctact gcagggggcc 60
gtgtccatgg gctttgccg cagcgcgctg catccgctga gcctgctggt gcaggcgatt 120
atgctggcga tgaccctggc gctgggcacc ctgccggccg ttctgccgtg cgaactgcag 180
ccgcatgcc tggtgaactg caactggctg tttctgaaaa gcgtgccgca ttttagcatg 240
gcggcgccgc gcggcaacgt gaccagcctg agcctgagca gcaaccgcat tcatcatctg 300
catgatagc attttgcgca tctgccgagc ctgcgccatc tgaacctgaa atggaactgc 360
ccgccggtgg gcctgagccc gatgcatttt ccgtgccata tgaccattga accgagcagc 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 gaagtgcgcg gctgggcctg 660
ggcaacctga cccatctgag cctgaaatat aacaacctga ccgtggtgcc cgcgcaacctg 720
ccgagcagcc tggaatatct gctgctgagc tataaccgca ttgtgaaact ggcgccggaa 780
gatctggcga acctgaccgc gctgcgcgtg ctggatgtgg cggcaactg ccgccgctgc 840
gatcatgcgc cgaacccgtg catggaatgc cgcgcgcatt ttccgcagct gcatccgcat 900
accttttagcc atctgagccg cctggaaggc ctggtgctga aagatagcag cctgagctgg 960
ctgaacgcga gctggtttcg cggcctgggc aacctgcgcg tgctggatct gagcgaaaac 1020
tttctgtata aatgcattac caaaaccaaa gcgtttcagg cctgaccca gctgcgcaaa 1080
ctgaacctga gctttaacta tcagaaacgc gtgagctttg cgcatctgag cctggcggca 1140
agctttggca gcctggtggc gctgaaagaa ctggatatgc atggcatttt ttttcgcagc 1200
ctggatgaaa ccaccctgcg cccgctggcc gcctgccga tgctgcagac cctgcgcctg 1260
cagatgaact tattaacca ggcgcagctg ggcatttttc gcgcgtttcc gggcctgcgc 1320
tatgtggatc tgagcgataa aactgcattagc ggcgcgagcc gaccatgggc 1380
gaagcggatg gcggcgaaaa agtgtggctg cagccgggcg atctggcgcc ggcgccggca 1440
gataccccga gcagcgaaga ttttcgcccg aactgcagca ccctgaactt taccctggat 1500
ctgagccgca caacctggt gaccgtgcag ccggaaatgt ttgcgcagct gagccatctg 1560
cagtgcctgc cctgagcca taactgcatt agccaggcgg tgaacggcag ccagtttctg 1620
ccgctgaccg gcctgcaggt gctggatctg agccataaca gcgatatct gtatcatgaa 1680
catagctttta ccgaactgcc gcgcctggaa gcgctggatc tgagctataa cagccagccg 1740
tttggcatgc agggcgtggg ccataacttt agctttgtgg cgcatctgcg caccctgcgc 1800
catctgagcc tggcgcataa caacattcat agccaggtga ccagcagct gtgcagcacc 1860
agcctgcgcg cgctggattt tagcggcaac gcgctgggcc atatgtgggc ggaaggcgat 1920
ctgtatctgc atttttttca gggcgtgagc ggcctgattt tgccagcagaac 1980
cgcctgcata ccctgctgcc gcagaccctg cgcaacctgc gaaaagcct gcaggtgctg 2040
cgcctgcgcg ataactatct ggcgtttttt aaatggtgga gcctgcattt tctgccgaaa 2100
ctggaagtgc tggatctggc gggcaaccag ctgaaagcgc tgaccaacgg cagcctgccg 2160
gcgggcaccc gcctgcgccg cctggatgtg agctgcaaca gcattagctt tgtggcgccg 2220
ggcttttttta gcaaagcgaa agaactgcgc gaactgaacc tgagctacaa cctgcataag 2280
accgtggatc atagctggtt tggcccgctg cgagcgcgc tgcagattct ggatgtgagc 2340
gcgaacccgc tgcattggcg cgtgcggcgcg cgtttatgg attttctgct ggaagtgcag 2400
gcggcgggtg cgggcctgcc gagccgcgtg aaatgcggca gcccgggcca gctgcagggc 2460
ctgagcattt ttgcgcagga tctgcgcctg tgcctgatg aagcgctgag ctgggattgc 2520
tttgcgctga gcctgctggc ggtggcgctg ggcctgggcg tgccgatgct gcatcatctg 2580
```

-continued

```
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 cctgcgtcgc gcgagctttc tgctggcgca gcagcgcagc  2940
ctggaagatc gcaaagatgt ggtggtgctg gtgattctga gcccggatgg ccgccgcagc  3000
cgctatgtgc gcctgcgcca gcgcctgtgc cgccagagcg tgctgctgtg gccgcatcag  3060
ccgagcggcc agcgcagctt ttgggcgcag ctgggcatgg cgctgacccg cgataaccat  3120
cattttata  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 gcagggggcc   60
gtgtccatga gcatgctgtt ttataccctg attaccgcgt ttctgattgg cattcaggcg  120
gaaccgcata gcgaaagcaa cgtgccggcg ggccatacca ttccgcaggc gcattggaca  180
aaactgcagc atagcctgga taccgcgctg cgccgcggcg gcagcgcgcc ggcggcggcg  240
attgcggcgc gcgtggcggg ccagacccgc aacattaccg tggatccgcg cctgtttaaa  300
aaacgccgcc tgcgcagccc gcgcgtgctg tttagcaccc agcgccgcg cgaagcggcg  360
gatacccagg atctggattt tgaagtgggc ggcgcgggcc 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 cggatccacc caaatcttgtg acaaaactca cacatgccca  840
ccgtgcccag cacctgaact cctgggggga ccgtcagtct tcctcttccc cccaaaaccc  900
aaggacaccc tcatgatctc ccggaccct 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 gcagccccg 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 gcagggggcc   60
gtgtccatgg cgctgtggat gcgcctgctg ccgctgctgg cgctgctggc gctgtggggc  120
ccggatccgg cggcggcgtt tgtgaaccag catctgtgcg gcagccatct ggtggaagcg  180
ctgtatctgg tgtgcggcga acgcggcttt ttttataccc gaaaacccg ccgcgaagcg  240
gaagatctgc aggtgggcca ggtggaactg ggcggcggcc cggggcgcgg gcagcctgcag  300
ccgctgcgc tggaaggcag cctgcagaaa cgcggcattg tggaacagtg ctgcaccagc  360
atttgcagcc tgtatcagct ggaaaaactat 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 cggggaggagc agtacaacag  660
cacgtaccgt gtggtcagcg tcctcaccgt cctgcaccag gactggctga atggcaagga  720
gtacaagtgc aaggtctcca acaaagccct cccagccccc atcgagaaaa ccatctccaa  780
agccaaaggg cagcccgag aaccacaggt gtacaccctg cccccatccc gggaggagat  840
```

-continued

```
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
accccccactg 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 gcgcgggcga ccaaaggtcg    900
cccgacgccc gggctttgcc cgggcggcct cagtgagcga gcgagcgcgc agctggcgt    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 tcggggctc 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
```

-continued

```
ccggatcaag agctaccaac tcttttttccg aaggtaactg gcttcagcag agcgcagata    3900
ccaaatactg tcctttctagt 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 gcggcaggg cggaacagga gagcgcacga gggagcttcc agggggaaac    4260
gcctggtatc tttatagtcc tgtcgggttt cgccacctct gacttgagcg tcgattttttg    4320
tgatgctcgt cagggggggcg gagcctatgg aaaaacgcca gcaacgcggc cttttttacgg    4380
ttcctggcct tttgctggcc ttttgctcac atgttcttttc 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 ccattgacg    4920
tcaatgggtg gagtatttac ggtaaactgc ccacttggca gtacatcaag tgtatcatat    4980
gccaagtacg cccccctattg acgtcaatga cggtaaatgg cccgcctggc attatgccca    5040
gtacatgacc ttatgggact ttcctacttg gcagtacatc tacgtattag tcatcgctat    5100
taccatggtc gaggtgagcc ccacgttctg cttcactctc cccatctccc ccccctcccc    5160
accccaatt ttgtatttat ttatttttgt attattttgt gcagcgatgg gggcggggggg    5220
ggggggggggc gcgcgccagg cggggcgggg cgggcgcgagg ggcgggcgcg gggcgaggcgg    5280
agaggtgcgg cggcagccaa tcagagcggc gcgctccgaa agtttcctttt tatggcgagg    5340
cggcggcggc ggcggcccta taaaaagcga agcgcgcggc gggcgggagt cgctgcgcgc    5400
tgccttcgcc ccgtgccccg ctccgccgcc gcctcgcgcc gcccgccccg gctctgactg    5460
accgcgttac taaaacaggt aagtccggcc tccgcgccgg gttttggcgc ctcccgcgttg    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 gtttttctttt    5820
tttttctaca ggtcctgggt gacgaacagg gtaccgccac catgaggggc atgaagctgc    5880
tgggggcgct gctggcactg gcgggcccta ctgcaggggc cgtgtccctg aagatcgcag    5940
ccttcaacat ccagacattt ggggagacca agatgtccaa gtccaccctc 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
tgatggggac cttcaatgcg ggctgcagct atgtgagacc ctcccagtgg tcatccatcc    6480
gcctgtggac aagccccacc ttccagtggc tgatccccga cagcgctgac accacagcta    6540
cacccacgca ctgtgcctat gacaggatcg tggttcaggg gatgctgctc cgaggcgccg    6600
ttgttccccga ctcggctctt cccttttaact tccaggctgc ctatgccctg agtgaccaac    6660
tggcccaagc catcagtgac cactatccag tggaggtgat gctgaagggc ggatcaggcg    6720
gatcacccaa atcttgtgac aaaactcaca tgcccaccgt gcccagca cctgaactcc    6780
tgggggggacc gtcagtcttc ctcttcccccc caaaacccaa ggacaccctc atgatctccc    6840
ggaccccctga ggtcacatgc gtggtggtgg acgtgagcca cgaagaccct gaggtcaagt    6900
tcaactggta cgtggacggc gtggaggtgc ataatgccaa gacaaagccg cgggaggagc    6960
agtacaacag cacgtaccgt gtggtcagcg tcctcaccgt cctgcaccag gactggctga    7020
atggcaagga gtacaagtgc aaggtctcca caaagcccct 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
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
ccctctccta ttgccacggc ggaactcatc gccgcctgcc ttgcccgctg ctggacaggg    360
ctcggctgt tgggcactga caattccgtg gtgttgtcgg ggaaatcatc gtcctttcct    420
tggctgctcg cctgtgttgc cacctggatt ctgcgcggga cgtccttctg ctacgtccct    480
tcggccctca atccagcgga ccttcctttcc cgcggcctgc tgccggctct gcggcctcttt    540
```

-continued

```
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 cgggcgtcgc cagtgagcga gcgagcgcgc cagctggcgt  960
aatagcgaag aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa  1020
tggaattcca gacgattgag cgtcaaaatg taggtatttc catgagcgtt tttcctgttg  1080
caatggctgc cggtaatatt gttctggata ttaccagcaa ggccgatagt ttgagttctt  1140
ctactcaggc aagtgatgtt attactaatc aaagaagtat tgcgacaacg gttaatttgc  1200
gtgatggaca gactcttta 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 gttttttgggg  1860
cttttctgat tatcaaccgg ggtacatatg attgacatgc tagttttacg attaccgttc  1920
atcgatttct 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 aagccagcc  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 ataaccctc  2700
taaatgcttc aataatattg aaaaaggaag agtatgagta ttcaacattt ccgtgtcgcc  2760
cttattcct 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 ttcatttttta 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 cctgattct  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
cgccatgaca cttatctacg tagccatgct ctaggacatt gattattgac tagtggagtt  4800
ccgcgttaca taacttacgg taaatggccc gcctgctga ccgcccaacg accccgcccc  4860
attgacgtca ataatgacgt atgttcccat agtaacgcca atagggactt ccattacg  4920
tcaatgggtg gagtatttac ggtaaactgc ccacttggca gtacatcaag tgtatcatat  4980
gccaagtacg ccccctattg acgtcaatga cggtaaatgg cccgcctggc attatgccca  5040
gtacatgacc ttatgggact ttcctacttg gcagtacatc tacgtattag tcatcgctat  5100
```

-continued

```
taccatggtc gaggtgagcc ccacgttctg cttcactctc cccatctccc cccctcccc    5160
accccaatt ttgtatttat ttattttta attattttgt gcagcgatgg gggcggggg     5220
gggggggggc gcgcgccagg cggggcgggg cggggcgagg ggcgggcggg ggcgaggcgg   5280
agaggtgcgg cggcagccaa tcagagcggc gcgctccgaa agtttccttt tatggcgagg   5340
cggcggcggc ggcggcccta taaaaagcga agcgcgcggc gggcgggagt cgctgcgcgc   5400
tgccttcgcc ccgtgcccg ctccgccgcc gcctcgccgc gcccgccccg gctctgactg    5460
accgcgttac taaaacaggt aagtccggcac tccgccgcgg gtttggcgc ctcccgcggg    5520
cgcccccctc ctcacggcga gcgctgccac gtcagacgaa gggcgcagcg agcgtcctga   5580
tccttccgcc cggacgctca ggacagcggc ccgctgctca taagactcgg ccttagaacc   5640
ccagtatcag cagaaggaca tttttaggacg 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
ttattttttgg ggcggcctgc tgccgtttgg catgctgtgc gcgagcagca ccaccaaatg   5940
caccgtgagc catgaagtgg cggattgcag ccatctgaaa ctgaccagg 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 gatattttg cgaacagcag cctgaaaaaa ctggaactga gcgacaacca   6480
gattaaagaa tttagcccgg gctgctttca tgcgattggc cgcctgtttg gcctgtttct   6540
gaacaacgtg cagctgggcc cgagcctgac cgaaaaactg tgcctggaac tggcgaacac   6600
cagcattcgc aacctgagcc tgagcaacag ccagctgagc accaccagca acaccacctt   6660
tctggccctg aaatggacca acctgaccat gctggatctg agctataaaca acctgaacgt   6720
ggtgggcaac gatagctttg cgtggctgcc gcagctggaa tattttttc tggaatataa    6780
caacattcag catctgtttta gccatagcct gcatggcctg tttaacgtgc gctatctgaa   6840
cctgaaacgc agctttacca aacagagcat tagcctggcg agcctgccga aaattgatga   6900
ttttagcttt cagtggctga atgcctgga 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 ttttgaaatt tatctgagct ataacaaata   7260
tctgcagctg acccgcaaca gctttgcgct ggtgccgagc ctgcagcgcc tgatgctgcg   7320
ccgcgtggcc ctgaaaaacg tggatagcag cccgagcccg tttcagcgcg tgcgcaacct   7380
gaccattctg gatctgagca caacaacat tgcgaacatt aacgatgata tgctggaagg    7440
cctggaaaaa ctggaaattc tggatctgca gcataacaac ggcgcgccgc tgtggaaaca   7500
tgcgaacccg ggcggcccga tttatttctc gaaaggcctg agccatctgc atattctgaa   7560
cctggaaagc aacggctttg atgaaattcc ggtggaagtg tttaaagatc tgtttgaact   7620
gaaaattatt gatctgggcc tgaacaacct gaacacctg ccggcgagcg tgtttaacaa    7680
ccaggtgagc ctgaaaagcc tgaacctgca gaaaaaccg 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 tagcgcggc tttgaactgt ttttttatga    7980
taacaccagc attctgctga tttttttatt tattgtgctg ctgattcatt ttgaaggctg   8040
gcgcattagc tttttattgga acgtgagcgt gcatcgcgtg ctgggcttta aagaaattga   8100
tcgccagacc gaacagtttg aatatgcggc gtatattatt catgcgtata aagataaaga   8160
ttgggtgtgg gaacattta gcagcatgga aaaagaagat cagagcctga aatttttgcct   8220
ggaagaacgc gattttgaag cgggcgtgtt tgaactggaa gcgattgtga acagcattaa   8280
acgcagccgc aaaattattt ttgtgattac ccatcatctg ctgaaagatc gctgtgcaa    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 gcggatcag    8580
gcggatcacc caaatcttgt gacaaaactc acacatgccc accgtgccca gcacctgaac   8640
tcctgggggg accgtcagtc ttcctcttcc ccccaaaacc caaggacacc ctcatgatct   8700
cccggacccc tgaggtcaca tgcgtgtgg 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 tgaccaag aaccaggtca gcctgacctg cctggtcaaa ggcttctatc     9060
ccagcgacat cgccgtggag tgggagagca atgggcagcc ggagaacaac tacaagacca   9120
cgcctcccgt gctggactcc gacggctcct tcttcctcta cagcaagctc accgtggaca   9180
gagcaggtg 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
```

-continued

```
SEQUENCE: 9
ttctagaata atcaacctct ggattacaaa atttgtgaaa gattgactgg tattcttaac    60
tatgttgctc cttttacgct atgtggatac gctgctttaa tgcctttgta tcatgctatt   120
gcttccgta tggctttcat tttctcctcc ttgtataaat cctggttgct gtctctttat   180
gaggagttgt ggcccgttgt caggcaacgt ggcgtggtgt gcactgtgtt tgctgacgca   240
accccactg 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 ttcctgttg  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 taatcgcctt 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 agttgcagg 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 tcctttttt  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
gtggataacg gtattaccgc ctttgagtga gctgataccg ctcgccgcag ccgaacgacc  4500
```

-continued

```
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 accccccgcc  4860
attgacgtca ataatgacgt atgttcccat agtaacgcca atagggactt tccattgacg  4920
tcaatgggtg gagtatttac ggtaaactgc ccacttggca gtacatcaag tgtatcatat  4980
gccaagtacg cccectattg acgtcaatga cggtaaatgg cccgcctggc attatgccca  5040
gtacatgacc ttatgggact ttcctacttg gcagtacatc tacgtattag tcatcgctat  5100
taccatggtc gaggtgagcc ccacgttctg cttcactctc cccatctccc ccccctcccc  5160
acccccaatt ttgtatttat ttattttta attattttgt gcagcgatgg gggcgggggg  5220
ggggggggc gcgcgccagg cggggcgggg cggggcgagg ggcgggcgg ggcgaggcgg  5280
agaggtgcgg cggcagccaa tcagagcggc gcgctccgaa agtttccttt tatggcgagg  5340
cggcggcggc ggcggccta taaaaagcga agcgcgcggc gggcgggagt cgctgcgacg  5400
tgccttcgcc ccgtgcccg 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 gtagtcccct ctcggcgatt ctgcggaggg  5760
atctccgtgg ggcggtgaac gccgatgatg cctctactaa ccatgttcat gttttcttt  5820
tttttctaca ggtcctgggt gacgaacagg gtaccgccac catgaggggc atgaagctgg  5880
tgggggcgct gctggcactg gcggccctac tgcaggggag cgtgtccatg ggctttttgcc  5940
gcagcgcgct gcatccgctg agcctgctgg tgcaggcgat tatgctggcg atgaccctgg  6000
cgctgggcac cctgccggcg tttctgccgt gcgaactgca gccgcatggc ctggtgaact  6060
gcaactggct gtttctgaaa agcgtgccgc attttagcat ggcggcgcg cgcggcaacg  6120
tgaccagcct gagcctgagc agcaaccgca ttcatcatct gcatgatagc gattttgcgc  6180
atctgccgag cctgcgccat ctgaacctga aatggaactg cccgcggtg 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
gcatgcgaatg cccgcgccat tttccgcagc tgcatccgga tacctttagc catctgagcc  6780
gcctggaagg cctggtgctg aaaagatagca gcctgagctg gctgaacgcg agctggtttc  6840
gcggcctggc caacctgcgc gtgctggatc tgagcgaaaa ctttctgtat aaatgcatta  6900
ccaaaaccaa agcgtttcag ggcctgaccc agctgcgcaa actgaacctg agctttaact  6960
atcagaaacg cgtgagcttt gcgcatctga gcctggcgcc gagctttggc agcctggtgg  7020
cgctgaaaga actggatatg catgggcattt ttttttcgcag cctggatgaa accaccctgc  7080
gccgctggc gcgcctgccg atgctgcaga ccctgcgcct gcagatgaac tttattaacc  7140
aggcgcagct gggcatttttt cgcgcgtttc cgggcctgcg ctatgtggat ctgagcgata  7200
accgcattag cggcgcgagc gaactgaccg cgaccatggg cgaagcggat ggcggcgaaa  7260
aagtgtggct gcagccgggc gatctggcgc cggcgccggt ggatacccg agcagcgaag  7320
atttttcgccc gaactgcagc accctgaact ttaccctgga tctgagccgc aacaacctgg  7380
tgaccgtgca gccggaaatg tttcgcagc tgagccatct gcagtgcctg cgcctgagcc  7440
ataactgcat tagccaggcg gtgaacggca gccagtttct gccgctgacc ggcctgcagg  7500
tgctggatct gagccataac aaaactggatc tgtatcatga acatagcttt accgaactgc  7560
cgcgcctgga agcgctggat ctgagctata acagccagct gtttggcatg cagggcgtgg  7620
gccataactt tagctttgtg gcgcatctgc gcaccctgcg ccatctgagc ctggcgcata  7680
acaacattca tagccaggtg agccagcagc tgtgcagcac cagcctgcgc gcgctggatt  7740
ttagcggcaa cgcgctgggc catatgtggg cggaaggcga tctgtatctg cattttttttc  7800
agggcctgag cggcctgatt tggctggatc tgagccagaa ccgcctgcat acctgcgtc  7860
cgcagaccct gcgcaacctg ccgaaaagcc tgcaggtgct ggcctgcgc gataactatc  7920
tggcgttttt taaatggtgg agcctgcatt ttctgccgaa actggaagtg ctggatctgg  7980
cgggcaacca gctgaaagcg ctgaccaacg gcagcctgcc ggcggcacc cgcctgcgcc  8040
gcctggatgt gagctgcaac agcattagct ttgtggcgcg gggctttttt agcaaagcga  8100
aagaactgcg cgaactgaac ctgagcgcga acgcgctgaa aaccgtggat catgcctggt  8160
ttggcccgct ggcgagcgcg ctgcagattc tggatgtgag cgcgaacccg ctgcattgcg  8220
cgtgcgcgc ggcgtttatg gattttctgc tggaagtgca ggcggcggtg ccgggcctgc  8280
cgagccgcgt gaaatgcggc agcccgggcc agctgcaggg cctgagcatt tttgcgcagg  8340
atctgcgcct gtgcctggat gaagcgctga ctgggattg ctttgcgctg agctgctgg  8400
cggtggcgct gggcctgggc gtgccgatgc tgcatcatct gtgcggctgg gatctgtgtg  8460
attgctttca tctgtgcctg gcgtggctgc cgtggcgcgg ccgccagagc gccgcgcatg  8520
aagatgcgct gccgtatgat gcgttttgtgg tgtttgataa aacccagagc gcggtggcgg  8580
attgggtgta taacgaactg cgcggccagc tggaagaatg ccgcggccgc tgggcgctgc  8640
gcctgtgcct ggaagaacgc gattggctgc cgggcaaaac cctgtttgaa aacctgtggg  8700
cgagcgtgga tggcagccgc aaaaccctgt ttgtgctggc gcataccgat gatctgtgat  8760
gcctgctgcg cgcgagcttt ctgctggcgc agcagcgcct gctggaagat cgcaaagatg  8820
tggtggtgct ggtggattct agcccggatg gccgccgcag ccgctatgtg cgcctgcgcc  8880
agcgcctgtg ccgccagagc gtgctgctgt ggccgcatca gccgagcggc cagcgcagct  8940
tttgggcgca gctgggcatg gcgctgaccc gcgataacca tcattttttat aaccgcaact  9000
tttgccaggg cccgaccgcg gaagggcgga tcaggcggat cacccaaatc ttgtgacaaa  9060
```

-continued

```
actcacacat gcccaccgtg cccagcacct gaactcctgg ggggaccgtc agtcttcctc   9120
ttcccccaa 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 acagggtgta caccctgccc ccatcccggg aggagatgac caagaaccac   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
accccactg gttggggcat tgccaccacc tgtcagctcc tttccgggac tttcgctttc    300
ccctcccta ttgccacggc ggaactcatc gccgcctgcc ttgccgctg ctggacaggg     360
gctcggctgt tgggcactga caattccgtg gtgttgtcgg ggaaatcatc gtcctttcct   420
tggctgctg cctgtgttgc cacctggatt ctgcgcggga cgtccttctg ctacgtcct     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 ttatacgtgt cgtcaaagc aaccatagta cgcgccctgt    1380
agcggcgcat taagcgcggc gggtgtggtg gttacgcgca gcgtgaccgc tacacttgcc   1440
agcgccctag cgcccgctcc tttcgctttc ttcccttcct ttctcgccac gttcgccggc   1500
tttccccgtc aagctctaaa tcggggctc ccttttaggg ttccgattag 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 gttttttgggg   1860
cttttctgat tatcaaccgg ggtacatatg attgacatgc tagtttttacg attaccgttc   1920
atcgattctc ttgtttgctc cagactctca ggcaatgacc tgatagcctt tgtagagacc   1980
tctcaaaaat agctaccctc tccggcatga aattatcagc tagaacggtt gaatatcata   2040
ttgatggtga tttgactgtc tccggccttt ctcacccgtt tgaatcttta cctacacatt   2100
actcaggcat tgcatttaaa atatatgagg gttctaaaaa tttttatcct tgcgttgaaa   2160
taaaggcttc tcccgcaaaa gtattacagg tcataatgt ttttggtaca accgatttag    2220
ctttatgctc tgaggcttta ttgcttaatt 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 aggaggtttc 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 ttttttgcggc 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 tcctttttt    3780
ctgcgcgtaa tctgctgctt gcaaacaaaa aaaccaccgc taccagcggt ggtttgtttg    3840
ccggatcaag agctaccaac tcttttttccg 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 aggggggaaac    4260
gcctggtatc tttatagtcc tgtcgggttt cgccacctct gacttgagcg tcgatttttg    4320
tgatgctcgt caggggggcg gagcctatgg aaaaacgcca gcaacgcggc cttttttacgg    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
cgccattgcta 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 cccctccc     5160
acccccaatt ttgtatttat ttattttta attattttgt gcagcgatgg gggcggggg    5220
ggggggggc gcgcgccagg cggggcgggg cggggcgagg ggcggggcgg ggcgaggcgg    5280
agaggtgcgg cggcagccaa tcagagcggc gcgctccgaa agtttccttt tatggcgagg    5340
cggcggcggc ggcggcccta taaaaagcga agcgcgcgga gggcgggagt cgctgcgcgc    5400
tgccttcgcc ccgtgccccg ctccgccgcc gcctcgcgcc gcccgccccg gctctgactg    5460
accgcgttac taaaacaggt aagtccggcc tccgcgccgg gttttggcgc ctcccgcggg    5520
cgccccctc ctcacggcga gcgctgccac gtcagacgaa gggcgcagcg agcgtcctga    5580
tccttccgcc cggacgctca ggacagcggc ccgctgctca taagactcgg ccttagaacc    5640
ccagtatcag cagaaggaca tttttaggacg ggacttgggt gactctaggg cactggtttt    5700
ctttccagag agcggaacag gcgaggaaaa gtagtccctt ctcggcgatt ctgcggaggg    5760
atctccgtgg ggcggtgaac gccgatgatg cctctactaa ccatgttcat gtttttctttt    5820
ttttttctaca ggtcctgggt gacgaacagg gtaccgccac catgagggggc atgaagctgc    5880
tgggggggcgct gctggcactg gcgggcccttac tgcaggggggc cgtgtccatg agcatgctgt    5940
tttataccct gattaccgcg tttctgattg gcattcaggc ggaaccgcat agcgaaagca    6000
acgtgccggc gggccatacc attccgcagg cgcattgcac caaactgcag catagcctgg    6060
ataccgcgct gcgccgcgcg cgcagcgcgc cggcggcggc gattgcgcg cgcgtgcgcgg    6120
gccagacccg caacattacc gtggatccgc gcctgtttaa aaaacgccgc ctgcgcagcc    6180
cgcgcgtgct gtttagcacc cagccgcgcg cgaagcggc ggataaccag gatctggatt    6240
ttgaagtggg cggcgcggcg ccgtttaacc gcacccatcg cagcaaacgc agcagcaacgc    6300
atccgatttt tcatcgcggc gaatttagcg tgtgcgatag cgtgagcgtg tgggtgggcg    6360
ataaaaccac cgcgaccgat attaaaggca aagaagtgat ggtgctgggc gaagtgaaca    6420
ttaacaacgc cgtgtttaaa cagtattttt ttgaaaccaa atgccgcgat ccgaacccgg    6480
tggatagcgg ctgccgcgca attgatagca aacattggaa cagctattgc accaccaccc    6540
ataccttgt gaaagcgctg accatggatg gcaaacaggc ggcgtggcgc tttattcgca    6600
ttgataccgc gtgcgtgtgc gtgctggagcc gcaaagcggt gcgccgcgcg gcggatcag    6660
gcggatcacc caaatcttgt gacaaaactc acacatgccc accgtgccca gcacctgaac    6720
tcctggggggg accgtcagtc ttcctcttcc ccccaaaaac 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 tgaccaag 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
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
```

-continued

```
gaggagttgt ggcccgttgt caggcaacgt ggcgtggtgt gcactgtgtt tgctgacgca    240
accccactg gttggggcat tgccaccacc tgtcagctcc tttccgggac tttcgctttc    300
ccctccta ttgccacggc ggaactcatc gccgcctgcc ttgccccgctg 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 agcattttt 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 cggcggcct 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 cgcgccctg    1380
agcggcgcat taagcgcggc gggtgtggtg gttacgcgca gcgtgaccgc tacacttgcc    1440
agcgccctag cgcccgctcc tttcgctttc ttcccttcct ttctcgccac gttcgccggc    1500
tttccccgtc aagctctaaa tcggggggtc 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 tagtttacg 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
cgacaccgc caacaccgc tgacgcgccc tgacgggctt gtctgctccc ggcatccgct    2460
tacagacaag ctgtgaccgt ctccgggagc tgcatgtgtc agaggttttc accgtcatca    2520
ccgaaacgcg cgagacgaaa gggcctcgtg atacgcctat ttttataggt taatgtgtca    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 tcagttgggg 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 tcttttttccg 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 cttttttacgg    4380
ttcctggcct tttgctggcc ttttgctcac atgttcttc 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
```

-continued

```
cgccatgcta cttatctacg tagccatgct ctaggacatt gattattgac tagtggagtt    4800
ccgcgttaca taacttacgg taaatggccc gcctggctga ccgcccaacg accccgcccc    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
accccaatt ttgtatttat ttattttta 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
cgccccctc 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
tggggggcgct gctggcactg gcggccctac tgcaggggggc cgtgtccatg gcgctgtgga    5940
tgcgcctgct gccgctgctg gcgctgctgg cgctgtgggg cccggatccg gcggcggcgt    6000
ttgtgaacca gcatctgtgc ggcagccatc tggtggaagc gctgtatctg gtgtgcggcg    6060
aacgcggctt tttttatacc ccgaaaaccc gccgcgaaag gggaagatctg caggtgggcc    6120
aggtggaact gggcggcggc ccgggcgcgg gcagcctgca gccgctggcg ctggaaggca    6180
gcctgcagaa acgcggcatt gtggaacagt gctgcaccag catttgcagc ctgtatcagc    6240
tggaaaacta ttgcaacggg cggatcaggc ggatcacccа 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
aacaaagcc tcccagcccc catcgagaaa accatctcca aagccaaagg gcagcccga    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 at least one domain of a neural growth factor (NGF) protein and an Fc domain, wherein the isolated plasmid comprises a nucleotide sequence of SEQ ID NO: 5.

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

3. (canceled)

4. (canceled)

5. (canceled)

6. An isolated plasmid comprising messenger ribonucleic acid (mRNA) encoding a fusion protein comprising at least one domain of a neural growth factor (NGF) protein and an Fc domain, wherein the isolated plasmid comprises a nucleotide sequence of SEQ ID NO: 10.

* * * * *