US 20250263716A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2025/0263716 A1**

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

(54) **COMPOSITION FOR REGULATING PRODUCTION OF INTERFERING RIBONUCLEIC ACID**

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

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

(21) Appl. No.: **18/582,272**

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

Publication Classification

(51) **Int. Cl.**

C12N 15/113 (2010.01)

C12N 15/86 (2006.01)

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

CPC ***C12N 15/1138*** (2013.01); ***C12N 15/86*** (2013.01); *C12N 2310/141* (2013.01); *C12N 2750/14143* (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 micro-interfering ribonucleic acid (miRNA). The sequences of miRNA may be complimentary to a sequence of target messenger RNA (mRNA) that encodes for translation of a target biomolecule and the miRNA can cause the target mRNA to be degraded or inactivated, thereby causing a decrease in bioavailability of the target biomolecule because it is degraded or inactivated by the miRNA, thereby decreasing the 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 serotonin receptor, such as serotonin receptor 5HT1a, 5HT1b, 5HT1d, 5HT1e, 5HT1f, 5HT2a, 5HT2b, 5HT2c, 5HT3, 5HT4, 5HT6, or 5HT7.

Specification includes a Sequence Listing.

COMPOSITION FOR REGULATING PRODUCTION OF INTERFERING RIBONUCLEIC ACID

[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 "A8149441US-Sequence Listing.xml" created on 2024 Feb. 12 and having a size of 110,545 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 production of interfering ribonucleic acid (RNA). In particular, the present disclosure relates to compositions for regulating gene expression and therefore, the production of interfering RNA, that will suppress serotonin receptor expression.

BACKGROUND

[0003] Bioactive molecules, including complements and factors, 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 regulation of bioactive molecules is lost 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 micro-interfering ribonucleic acid (miRNA). The sequences of miRNA may be complimentary to a sequence of target messenger RNA (mRNA) that encodes for translation of a target biomolecule and the miRNA can cause the target mRNA to be degraded or inactivated, thereby causing a decrease in bioavailability of the target biomolecule because it is degraded or inactivated by the miRNA, thereby decreasing the 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 serotonin receptor. In some embodiments of the present disclosure, the target biomolecule is a serotonin receptor such as serotonin receptor 5HT1a. In some embodiments of the present disclosure, the target biomolecule is a serotonin receptor such as serotonin receptor 5HT1b. In some embodiments of the present disclosure, the target biomolecule is a serotonin receptor such as serotonin receptor 5HT1c. In some embodiments of the present disclosure, the target biomolecule is a serotonin receptor such as serotonin receptor 5HT1d. In some embodiments of the present disclosure, the target biomolecule is a serotonin receptor such as serotonin receptor 5HT1e. In some embodiments of the present disclosure, the target biomolecule is a serotonin receptor such as serotonin receptor 5HT1f. In some embodiments of the present disclosure, the target biomolecule is a serotonin receptor such as serotonin receptor 5HT2a. In some embodiments of the present disclosure, the target biomolecule is a serotonin receptor such as serotonin receptor 5HT2b. In some embodiments of the present disclosure, the target biomolecule is a serotonin receptor such as serotonin receptor 5HT2c. In some embodiments of the present disclosure, the target biomolecule is a serotonin receptor such as serotonin receptor 5HT3. In some embodiments of the present disclosure, the target biomolecule is a serotonin receptor such as serotonin receptor 5HT4. In some embodiments of the present disclosure, the target biomolecule is a serotonin receptor such as serotonin receptor 5HT6. In some embodiments of the present disclosure, the target biomolecule is a serotonin receptor such as serotonin receptor 5HT7.

[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 miRNA 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 miRNA and, therefore, decreased translation or production of the target biomolecule by one or more of the subject's cells.

[0008] Some embodiments of the present disclosure relate to compositions that upregulate the production of miRNA that degrades, or causes degradation of, or inactivates or causes the inactivation of, the target mRNA of the target biomolecule.

[0009] Some embodiments of the present disclosure relate to a recombinant plasmid (RP).

[0010] 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 a miRNA sequence that targets the mRNA of serotonin receptor 5HT1a.

[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. 3. The RP comprises a nucleotide sequence encoding one or more nucleotide sequences encoding a miRNA sequence that targets the mRNA of serotonin receptor 5HT1b.

[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. 4. The RP comprises a nucleotide sequence encoding one or more nucleotide sequences encoding a miRNA sequence that targets the mRNA of serotonin receptor 5HT1d.

[0013] Some embodiments of the present disclosure relate to a recombinant plasmid. In some embodiments of the present disclosure, the RP comprises a nucleotide sequence of SEQ ID NO. 1 and SEQ ID NO. 5. The RP comprises a nucleotide sequence encoding one or more nucleotide sequences encoding a miRNA sequence that targets the mRNA of serotonin receptor 5HT1e.

[0014] 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 a miRNA sequence that targets the mRNA of serotonin receptor 5HT1f.

[0015] 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. 7. The RP comprises a nucleotide sequence encoding one or more nucleotide sequences encoding a miRNA sequence that targets the mRNA of serotonin receptor 5HT2a.

[0016] 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. 8. The RP comprises a nucleotide sequence encoding one or more nucleotide sequences encoding a miRNA sequence that targets the mRNA of serotonin receptor 5HT2b.

[0017] 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. 9. The RP comprises a nucleotide sequence encoding one or more nucleotide sequences encoding a miRNA sequence that targets the mRNA of serotonin receptor 5HT2c.

[0018] 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. 10. The RP comprises a nucleotide sequence encoding one or more nucleotide sequences encoding a miRNA sequence that targets the mRNA of serotonin receptor 5HT3.

[0019] 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. 11. The RP comprises a nucleotide sequence encoding one or more nucleotide sequences encoding a miRNA sequence that targets the mRNA of serotonin receptor 5HT4.

[0020] 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. 12. The RP comprises a nucleotide sequence encoding one or more nucleotide sequences encoding a miRNA sequence that targets the mRNA of serotonin receptor 5HT6.

[0021] 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. 13 The RP comprises a nucleotide sequence encoding one or more nucleotide sequences encoding a miRNA sequence that targets the mRNA of serotonin receptor 5HT7.

[0022] 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, SEQ ID NO. 6, SEQ ID NO. 7, SEQ ID NO. 8, SEQ ID NO. 9, SEQ ID NO. 10, SEQ ID NO. 11, SEQ ID NO. 12, or SEQ ID NO. 13 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 miRNA that decreases production of a target biomolecule.

[0023] Embodiments of the present disclosure relate to at least one approach for inducing endogenous production of one or more sequences of miRNA that target and silence the mRNA of a target biomolecule, for example serotonin receptor 5HT1a. A first approach utilizes gene vectors containing nucleotide sequences for increasing the endogenous production of one or more sequences of miRNA, which are complete or partial sequences and/or combinations thereof, that target and silence the mRNA of serotonin receptor 5HT1a, which can be administered to a subject to increase the subject's production of one or more sequences of the miRNA.

[0024] Embodiments of the present disclosure relate to at least one approach for inducing endogenous production of one or more sequences of miRNA that target and silence the mRNA of a target biomolecule, for example serotonin receptor 5HT1b. A first approach utilizes gene vectors containing nucleotide sequences for increasing the endogenous production of one or more sequences of miRNA, which are complete or partial sequences and/or combinations thereof, that target and silence the mRNA of serotonin receptor 5HT1b, which can be administered to a subject to increase the subject's production of one or more sequences of the miRNA.

[0025] Embodiments of the present disclosure relate to at least one approach for inducing endogenous production of one or more sequences of miRNA that target and silence the mRNA of a target biomolecule, for example serotonin receptor 5HT1d. A first approach utilizes gene vectors containing nucleotide sequences for increasing the endogenous production of one or more sequences of miRNA, which are complete or partial sequences and/or combinations thereof, that target and silence the mRNA of serotonin receptor 5HT1d, which can be administered to a subject to increase the subject's production of one or more sequences of the miRNA.

[0026] Embodiments of the present disclosure relate to at least one approach for inducing endogenous production of one or more sequences of miRNA that target and silence the mRNA of a target biomolecule, for example serotonin receptor 5HT1e. A first approach utilizes gene vectors containing nucleotide sequences for increasing the endogenous production of one or more sequences of miRNA, which are complete or partial sequences and/or combinations thereof, that target and silence the mRNA of serotonin receptor 5HT1e, which can be administered to a subject to increase the subject's production of one or more sequences of the miRNA.

[0027] Embodiments of the present disclosure relate to at least one approach for inducing endogenous production of one or more sequences of miRNA that target and silence the mRNA of a target biomolecule, for example serotonin receptor 5HT1f. A first approach utilizes gene vectors containing nucleotide sequences for increasing the endogenous production of one or more sequences of miRNA, which are complete or partial sequences and/or combinations thereof, that target and silence the mRNA of serotonin receptor 5HT1f, which can be administered to a subject to increase the subject's production of one or more sequences of the miRNA.

[0028] Embodiments of the present disclosure relate to at least one approach for inducing endogenous production of one or more sequences of miRNA that target and silence the mRNA of a target biomolecule, for example serotonin receptor 5HT2a. A first approach utilizes gene vectors containing nucleotide sequences for increasing the endogenous

production of one or more sequences of miRNA, which are complete or partial sequences and/or combinations thereof, that target and silence the mRNA of serotonin receptor 5HT2a, which can be administered to a subject to increase the subject's production of one or more sequences of the miRNA.

[0029] Embodiments of the present disclosure relate to at least one approach for inducing endogenous production of one or more sequences of miRNA that target and silence the mRNA of a target biomolecule, for example serotonin receptor 5HT2b. A first approach utilizes gene vectors containing nucleotide sequences for increasing the endogenous production of one or more sequences of miRNA, which are complete or partial sequences and/or combinations thereof, that target and silence the mRNA of serotonin receptor 5HT2b, which can be administered to a subject to increase the subject's production of one or more sequences of the miRNA.

[0030] Embodiments of the present disclosure relate to at least one approach for inducing endogenous production of one or more sequences of miRNA that target and silence the mRNA of a target biomolecule, for example serotonin receptor 5HT2c. A first approach utilizes gene vectors containing nucleotide sequences for increasing the endogenous production of one or more sequences of miRNA, which are complete or partial sequences and/or combinations thereof, that target and silence the mRNA of serotonin receptor 5HT2c, which can be administered to a subject to increase the subject's production of one or more sequences of the miRNA.

[0031] Embodiments of the present disclosure relate to at least one approach for inducing endogenous production of one or more sequences of miRNA that target and silence the mRNA of a target biomolecule, for example serotonin receptor 5HT3. A first approach utilizes gene vectors containing nucleotide sequences for increasing the endogenous production of one or more sequences of miRNA, which are complete or partial sequences and/or combinations thereof, that target and silence the mRNA of serotonin receptor 5HT3 which can be administered to a subject to increase the subject's production of one or more sequences of the miRNA.

[0032] Embodiments of the present disclosure relate to at least one approach for inducing endogenous production of one or more sequences of miRNA that target and silence the mRNA of a target biomolecule, for example serotonin receptor 5HT4 A first approach utilizes gene vectors containing nucleotide sequences for increasing the endogenous production of one or more sequences of miRNA, which are complete or partial sequences and/or combinations thereof, that target and silence the mRNA of serotonin receptor 5HT4, which can be administered to a subject to increase the subject's production of one or more sequences of the miRNA.

[0033] Embodiments of the present disclosure relate to at least one approach for inducing endogenous production of one or more sequences of miRNA that target and silence the mRNA of a target biomolecule, for example serotonin receptor 5HT6. A first approach utilizes gene vectors containing nucleotide sequences for increasing the endogenous production of one or more sequences of miRNA, which are complete or partial sequences and/or combinations thereof, that target and silence the mRNA of serotonin receptor 5HT6, which can be administered to a subject to increase the subject's production of one or more sequences of the miRNA.

[0034] Embodiments of the present disclosure relate to at least one approach for inducing endogenous production of one or more sequences of miRNA that target and silence the mRNA of a target biomolecule, for example serotonin receptor 5HT7. A first approach utilizes gene vectors containing nucleotide sequences for increasing the endogenous production of one or more sequences of miRNA, which are complete or partial sequences and/or combinations thereof, that target and silence the mRNA of serotonin receptor 5HT7, which can be administered to a subject to increase the subject's production of one or more sequences of the miRNA.

DETAILED DESCRIPTION

[0035] 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 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.

[0036] 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.

[0037] 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.

[0038] As used therein, the term "ameliorate" refers to improve and/or to make better and/or to make more satisfactory.

[0039] 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.

[0040] 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.

[0041] 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 biological reactions in the subject. In some embodiments of the present disclosure, the composition is a plasmid vector.

[0042] As used therein, the term "endogenous" refers to the production and/or modification of a molecule that originates within a subject.

[0043] 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.

[0044] 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.

[0045] As used therein, the term "target biomolecule" refers to a serotonin receptor that is found within a subject. A biomolecule may be endogenous or exogenous to a subject and when bioavailable the biomolecule may inhibit or stimulate a biological process within the subject.

[0046] As used therein, the term "target cell" refers to one or more cells and/or cell types that are deleteriously affected, either directly or indirectly, by a dysregulated biomolecule. The term "target cell" also refers to cells that are not deleteriously affected but that are the cells in which it is desired that the composition interacts.

[0047] 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.

[0048] 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.

[0049] As used therein, the terms "unit dosage form" and "unit dose" refer to a physically discrete unit that is suitable as a unitary dose for patients. Each unit contains a predetermined quantity of the composition and optionally, one or more suitable pharmaceutically acceptable carriers, one or more excipients, one or more additional active ingredients, or combinations thereof. The amount of composition within each unit is a therapeutically effective amount.

[0050] 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.

[0051] 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 (AAV) vector.

[0052] 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 miRNA that decreases the production of target biomolecules. The miRNA may, directly or indirectly, bind to and degrade the target mRNA or otherwise inactivate the target mRNA so that less or none of the target-biomolecule protein is produced.

[0053] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT1a.

[0054] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT1b.

[0055] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT1d.

[0056] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT1e.

[0057] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT1f.

[0058] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT2a.

[0059] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT2b.

[0060] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT2c.

[0061] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT3.

[0062] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT4.

[0063] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT6.

[0064] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT7.

[0065] In some embodiments of the present disclosure, the insert comprises one or more nucleotide sequences that each encode for one or more miRNA sequences that may be complimentary to and degrade, or cause degradation of, mRNA of the target biomolecule.

[0066] 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 production of a dysregulated 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.

[0067] 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.

[0068] 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 miRNA that each target the mRNA of one or more target biomolecules. In some embodiments of the present disclosure, there are one, two, three, four, five, or six miRNA sequences that each are complimentary to and degrade, or cause degradation of, one biomolecule, such as the mRNA of serotonin receptor 5HT1a, serotonin receptor 5HT1b, serotonin receptor 5HT1d, serotonin receptor 5HT1e, serotonin receptor 5HT1f, serotonin receptor 5HT2a, serotonin receptor 5HT2b, serotonin receptor 5HT2c, serotonin receptor 5HT3, serotonin receptor 5HT4, serotonin receptor 5HT6, or serotonin receptor 5HT7. In some embodiments of the present disclosure, the composition may comprise multiple copies of the same nucleotide sequence of miRNA.

[0069] 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 miRNA that target the mRNA of 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 miRNA sequences that are each complimentary to and degrade, or cause degradation of, or inactivate, or cause inactivation of, one biomolecule, such as serotonin receptor 5HT1a, serotonin receptor 5HT1b, serotonin receptor 5HT1d, serotonin receptor 5HT1e, serotonin receptor 5HT1f, serotonin receptor 5HT2a, serotonin receptor 5HT2b, serotonin receptor 5HT2c, serotonin receptor 5HT3, serotonin receptor 5HT4, serotonin receptor 5HT6, or serotonin receptor 5HT7.

[0070] In some embodiments of the present disclosure, the delivery vehicle of the RP used for gene therapy may be a vector that is comprised of 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.

[0071] In some embodiments of the present disclosure, the delivery vehicle of the RP used for gene therapy may be a protein coat.

[0072] In some embodiments of the present disclosure, the delivery vehicle of the RP used for gene therapy may be a lipid vesicle.

[0073] The embodiments of the present disclosure also relate to administering a therapeutically effective amount of the composition. In some embodiments of the present disclosure, the therapeutically effective amount of the composition that is administered to a patient is between about 10 and about 1×10^{16} $TCID_{50}$/kg (50% tissue culture infective dose per kilogram of the patient's body mass). In some embodiments of the present disclosure, the therapeutically effective amount of the composition that is administered to the patient is about 1×10^{13} $TCID_{50}$/kg. In some embodiments of the present disclosure, the therapeutically effective amount of the composition that is administered to a patient is measured in TPC/kg (total particle count of the composition per kilogram of the patient's body mass). In some embodiments the therapeutically effective amount of the composition is between about 10 and about 1×10^{16} TCP/kg.

[0074] 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 miRNA sequence that downregulates production of a biomolecule, with examples being serotonin receptor 5HT1a, serotonin receptor 5HT1b, serotonin receptor 5HT1d, serotonin receptor 5HT1e, serotonin receptor 5HT1f, serotonin receptor 5HT2a, serotonin receptor 5HT2b, serotonin receptor 5HT2c, serotonin receptor 5HT3, serotonin receptor 5HT4, serotonin receptor 5HT6, or serotonin receptor 5HT7. The RP is comprised of AAV2 inverted terminal repeats (ITRs), a composite CASI promoter, a human growth hormone (HGH) signal peptide followed by a miRNA expression cassette containing up to six different miRNAs targeting the mRNA of serotonin receptor 5HT1a, serotonin receptor 5HT1b, serotonin receptor 5HT1d, serotonin receptor 5HT1e, serotonin receptor 5HT1f, serotonin receptor 5HT2a, serotonin receptor 5HT2b, serotonin receptor 5HT2c, serotonin receptor 5HT3, serotonin receptor 5HT4, serotonin receptor 5HT6, or serotonin receptor 5HT7, 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' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTT

AACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTT

GTATCATGCTATTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATA

AATCCTGGTTGCTGTCTCTTTATGAGGAGTTGTGGCCCGTTGTCAGGCAA

CGTGGCGTGGTGTGCACTGTGTTTGCTGACGCAACCCCCACTGGTTGGGG

CATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTTTCCCCCTCC

CTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCCGCTGCTGGACA

GGGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGAAATC

ATCGTCCTTTCCTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCG

-continued

GGACGTCCTTCTGCTACGTCCCTTCGGCCCTCAATCCAGCGGACCTTCCT

TCCCGCGGCCTGCTGCCGGCTCTGCGGCCTCTTCCGCGTCTTCGCCTTCG

CCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCCTCCCCGCCTAAGCTTA

TCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAA

ATAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGC

ATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGG

ATCTCGACCTCGACTAGAGCATGGCTACGTAGATAAGTAGCATGGCGGGT

TAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCT

CTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGACG

CCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCAGCTGGC

GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGC

CTGAATGGCGAATGGCGATTCCGTTGCAATGGCTGGCGGTAATATTGTTC

TGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTCAGGCAAGT

GATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTGA

TGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTC

AGGATTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTG

TTTAGCTCCCGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGT

CAAAGCAACCATAGTACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGT

GTGGTGGTTACGCGCAGCGTGACCGCTACACTTGCCAGCGCCCTAGCGCC

CGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCGGCTTTC

CCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCT

TTACGGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAG

TGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCA

CGTTCTTTAATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCT

ATCTCGGTCTATTCTTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTA

TTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATTTTAACA

AAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTT

TTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGT

TTTACGATTACCGTTCATCGATTCTCTTGTTTGCTCCAGACTCTCAGGCA

ATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCTCTCCG

GCATGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTG

ACTGTCTCCGGCCTTTCTCACCCGTTTGAATCTTTACCTACACATTACTC

AGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTTTATCCTTGCG

TTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTT

GGTACAACCGATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGC

TAATTCTTTGCCTTGCCTGTATGATTTATTGGATGTTGGAATTCCTGATG

CGGTATTTTCTCCTTACGCATCTGTGCGGTATTTCACACCGCATATGGTG

CACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGAC

ACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCA

-continued

TCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAG

GTTTTCACCGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATAC

GCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTTCTTAGACGTCA

GGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTT

CTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAA

TGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGT

GTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCA

CCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCAC

GAGTGGGTTACATCGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGT

TTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCT

ATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTC

GCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACA

GAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGC

CATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCG

GAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTA

ACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGA

CGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAAC

TATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGAC

TGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCC

GGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTC

GCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTA

GTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACA

GATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACC

AAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTT

AAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCC

TTAACGTGAGTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCA

AAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAA

ACAAAAAAACCACCGCTACCAGCGGTGGTTTGTTTGCCGGATCAAGAGCT

ACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGATACCAA

ATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCT

GTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC

TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGT

TACCGGATAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAG

CCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGA

GCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATC

CGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGG

GGAAACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACT

TGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAA

ACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTT

-continued

GCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTAT

TACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGC

GCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCG

CCTCTCCCCGCGCGTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGC

TCGCTCACTGAGGCCGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGG

TCGCCCGGCCTCAGTGAGCGAGCGAGCGCGCAGAGAGGGAGTGGCCAACT

CCATCACTAGGGGTTCCTTGTAGTTAATGATTAACCCGCCATGCTACTTA

TCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGGAGTTCCGC

GTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCC

CCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAG

GGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCAC

TTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGT

CAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTAT

GGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACC

ATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCCCC

CTCCCCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTGTGCAG

CGATGGGGGCGGGGGGGGGGGGGGGCGCGCGCCAGGCGGGGCGGGGGGGG

GCGAGGGGCGGGGCGGGGCGAGGCGGAGAGGTGCGGCGGCAGCCAATCAG

AGCGGCGCGCTCCGAAAGTTTCCTTTTATGGCGAGGCGGCGGCGGCGGCG

GCCCTATAAAAAGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCGCTGCC

TTCGCCCCGTGCCCCGCTCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTC

TGACTGACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTT

TGGCGCCTCCCGCGGGCGCCCCCCTCCTCACGGCGAGCGCTGCCACGTCA

GACGAAGGGCGCAGCGAGCGTCCTGATCCTTCCGCCCGGACGCTCAGGAC

AGCGGCCCGCTGCTCATAAGACTCGGCCTTAGAACCCCAGTATCAGCAGA

AGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTTCTTT

CCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGC

GGAGGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCAT

GTTCATGTTTTCTTTTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTAC

C 3'

SEQ ID NO. 2 (miRNA expression cassette No. 2-serotonin receptor 5HT1a):
5' GCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGA

CTGCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATAC

CGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGATCAATCGGA

TTGCGGTAATCGCGTTTTGGCCTCTGACTGACGCGATTACCGATCCGATT

GATCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTC

TAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGATCTTTGCTAAATTGGTG

CACGCGTTTTGGCCTCTGACTGACGCGTGCACCATTAGCAAAGATCAGGA

CACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGG

-continued

AGGCTTGCTGAAGGCTGTATGCTGACTTCAATCACAATTCCAGCGCCGTT

TTGGCCTCTGACTGACGGCGCTGGAAGTGATTGAAGTCAGGACACAAGGC

CTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 3 (miRNA expression cassette No. 3-serotonin receptor 5HT1b):
5' GCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGA

CTGCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATAC

CGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGTAATCTTTCG

CTGGCTGCAGTTCGTTTTGGCCTCTGACTGACGAACTGCAGCGCGAAAGA

TTACAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTC

TAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTGTTAATGCTGATGTCAC

GCTGCGTTTTGGCCTCTGACTGACGCAGCGTGACCAGCATTAACACAGGA

CACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGG

AGGCTTGCTGAAGGCTGTATGCTGTTCACCTGGTTAACACATACACCGTT

TTGGCCTCTGACTGACGGTGTATGTGAACCAGGTGAACAGGACACAAGGC

CTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 4 (miRNA expression cassette No. 4-serotonin receptor 5HT1d):
5' GCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGA

CTGCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATAC

CGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGATTTCTTCCT

GTGCGCTTTCGCCGTTTTGGCCTCTGACTGACGGCGAAAGCGCAGGAAGA

AATCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTC

TAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGAGAATAATCAGATCAGCA

CGCTCGTTTTGGCCTCTGACTGACGAGCGTGCTGCTGATTATTCTCAGGA

CACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGG

AGGCTTGCTGAAGGCTGTATGCTGTAATCAGGCTGAATTCAGATAGCGTT

TTGGCCTCTGACTGACGCTATCTGAACAGCCTGATTACAGGACACAAGGC

CTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 5 (miRNA expression cassette No. 5-serotonin receptor 5HT1e):
5' GCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGA

CTGCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATAC

CGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGATAATCACCG

CTGCAGGTTCAGCGTTTTGGCCTCTGACTGACGCTGAACCTGGCGGTGAT

TATCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTC

TAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTTCAATCGCGTATTGGTA

ATCGCGTTTTGGCCTCTGACTGACGCGATTACCAACGCGATTGAACAGGA

CACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGG

AGGCTTGCTGAAGGCTGTATGCTGTGATCATGCTGAAAATGGTGCACGTT

TTGGCCTCTGACTGACGTGCACCATTCAGCATGATCACAGGACACAAGGC

CTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

-continued

SEQ ID NO. 6 (miRNA expression cassette No. 6-serotonin receptor 5HT1f):
5' GCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGA

CTGCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATAC

CGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGAGGTAATATC

CTGACGCTCAGCCGTTTTGGCCTCTGACTGACGGCTGAGCGTGGATATTA

CCTCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTC

TAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTACAGAATCAGATAATCA

GCGCCGTTTTGGCCTCTGACTGACGGCGCTGATTCTGATTCTGTACAGGA

CACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGG

AGGCTTGCTGAAGGCTGTATGCTGTCATGTTTAAAAATTCGCTGCGCGTT

TTGGCCTCTGACTGACGCGCAGCGAATTTAAACATGACAGGACACAAGGC

CTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 7 (miRNA expression cassette No. 7-serotonin receptor 5HT2a):
5' GCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGA

CTGCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATAC

CGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGATGAATCGGG

TTGTCTGAATCGCGTTTTGGCCTCTGACTGACGCGATTCAGAACCCGATT

CATCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTC

TAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGAACACTTTGCTATATCAT

CCTGCGTTTTGGCCTCTGACTGACGCAGGATGATAGCAAAGTGTTCAGGA

CACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGG

AGGCTTGCTGAAGGCTGTATGCTGTTCTGTTCGTTAAGCTAATGCTCGTT

TTGGCCTCTGACTGACGAGCATTAGCAACGAACAGAACAGGACACAAGGC

CTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 8 (miRNA expression cassette No. 8-serotonin receptor 5HT2b):
5' GCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGA

CTGCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATAC

CGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGGAGCATTAGC

AATGCGAACAGAAGTTTTGGCCTCTGACTGACTTCTGTTCGTTGCTAATG

CTCCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTC

TAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGAAACATAATGGATTCAGC

AGCGCGTTTTGGCCTCTGACTGACGCGCTGCTGACCATTATGTTTCAGGA

CACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGG

AGGCTTGCTGAAGGCTGTATGCTGTTATCTTTGCGAAGCTGCCATCCGTT

TTGGCCTCTGACTGACGGATGGCAGCCGCAAAGATAACAGGACACAAGGC

CTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 9 (miRNA expression cassette No. 9-serotonin receptor 5HT2c):
5' GCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGA

CTGCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATAC

-continued

CGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGGCTCCTCCAC

TTGGTGGTTTGGTTTTGGCCTCTGACTGACGCGGCAACATTCTGGTGATT

ACAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTA

GCCTGGAGGCTTGCTGAAGGCTGTATGCTGTCATAATCGCTATTTGGTGC

GGCGTTTTGGCCTCTGACTGACGCCGCACCAAAGCGATTATGACAGGACA

CAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAG

GCTTGCTGAAGGCTGTATGCTGTTCTGATCCTGAAGTTCGGGTTCGTTTT

GGCCTCTGACTGACGAACCCGAACCAGGATCAGAACAGGACACAAGGCCT

GTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 10 (miRNA expression cassette No. 10-serotonin receptor 5HT3):
5' GCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGA

CTGCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATAC

CGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGAAATCTTCCG

GTGGTTCCACTGCGTTTTGGCCTCTGACTGACGCAGTGGAACCCGGAAGA

TTTCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTC

TAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGATATCCTGAATATGGTAT

GCAGCGTTTTGGCCTCTGACTGACGCTGCATACCATTCAGGATATCAGGA

CACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGG

AGGCTTGCTGAAGGCTGTATGCTGTTTAAAGCTCAAACGCGTTCGCCGTT

TTGGCCTCTGACTGACGGCGAACGCGTGAGCTTTAAACAGGACACAAGGC

CTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 11 (miRNA expression cassette No. 11-serotonin receptor 5HT4):
5' GCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGA

CTGCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATAC

CGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGTAATAAAGGT

CTGGGAATCACCCGTTTTGGCCTCTGACTGACGGGTGATTCCGACCTTTA

TTACAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTC

TAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTAATACGCCAGATCACCA

TCAGCGTTTTGGCCTCTGACTGACGCTGATGGTGCTGGCGTATTACAGGA

CACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGG

AGGCTTGCTGAAGGCTGTATGCTGATACAGAAACGAAGGTTCAGGCCGTT

TTGGCCTCTGACTGACGGCCTGAACCCGTTTCTGTATCAGGACACAAGGC

CTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 12 (miRNA expression cassette No. 12-serotonin receptor 5HT6):
5' GCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGA

CTGCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATAC

CGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGTCAGATCGCT

GTGGTAAACAGGCGTTTTGGCCTCTGACTGACGCCTGTTTACCAGCGATC

TGACAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTC

-continued

TAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGAGAATCAGATCAGATAGC

GATCCGTTTTGGCCTCTGACTGACGGATCGCTATCTGCTGATTCTCAGGA

CACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGG

AGGCTTGCTGAAGGCTGTATGCTGAAACATGCCAACAGCAGAATGCCGTT

TTGGCCTCTGACTGACGGCATTCTGCTGGGCATGTTTCAGGACACAAGGC

CTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 13 (miRNA expression cassette No. 13-serotonin receptor 5HT7):
5' GCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGA

CTGCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATAC

CGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGACAATCAGAT

ATGGTTGCTCGGCGTTTTGGCCTCTGACTGACGCCGAGCAACTATCTGAT

TGTCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTC

TAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTTTCACAATGCATCGTTC

AGCGCGTTTTGGCCTCTGACTGACGCGCTGAACGGCATTGTGAAACAGGA

CACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGG

AGGCTTGCTGAAGGCTGTATGCTGACAATAATGCCAACAGGGTGGTCGTT

TTGGCCTCTGACTGACGACCACCCTGGGCATTATTGTCAGGACACAAGGC

CTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 14 = SEQ ID NO. 1 + SEQ ID NO. 2
5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTT

AACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTT

GTATCATGCTATTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATA

AATCCTGGTTGCTGTCTCTTTATGAGGAGTTGTGGCCCGTTGTCAGGCAA

CGTGGCGTGGTGTGCACTGTGTTTGCTGACGCAACCCCCACTGGTTGGGG

CATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTTTCCCCCTCC

CTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCCGCTGCTGGACA

GGGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGAAATC

ATCGTCCTTTCCTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCG

GGACGTCCTTCTGCTACGTCCCTTCGGCCCTCAATCCAGCGGACCTTCCT

TCCCGCGGCCTGCTGCCGGCTCTGCGGCCTCTTCCGCGTCTTCGCCTTCG

CCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCCTCCCCGCCTAAGCTTA

TCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAA

ATAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGC

ATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGG

ATCTCGACCTCGACTAGAGCATGGCTACGTAGATAAGTAGCATGGCGGGT

TAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCT

CTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGACG

CCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCAGCTGGC

GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGC

-continued

CTGAATGGCGAATGGCGATTCCGTTGCAATGGCTGGCGGTAATATTGTTC

TGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTCAGGCAAGT

GATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTGA

TGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTC

AGGATTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTG

TTTAGCTCCCGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGT

CAAAGCAACCATAGTACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGT

GTGGTGGTTACGCGCAGCGTGACCGCTACACTTGCCAGCGCCCTAGCGCC

CGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCGGCTTTC

CCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCT

TTACGGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAG

TGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCA

CGTTCTTTAATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCT

ATCTCGGTCTATTCTTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTA

TTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATTTTAACA

AAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTT

TTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGT

TTTACGATTACCGTTCATCGATTCTCTTGTTTGCTCCAGACTCTCAGGCA

ATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCTCTCCG

GCATGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTG

ACTGTCTCCGGCCTTTCTCACCCGTTTGAATCTTTACCTACACATTACTC

AGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTTTATCCTTGCG

TTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTT

GGTACAACCGATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGC

TAATTCTTTGCCTTGCCTGTATGATTTATTGGATGTTGGAATTCCTGATG

CGGTATTTTCTCCTTACGCATCTGTGCGGTATTTCACACCGCATATGGTG

CACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGAC

ACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCA

TCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAG

GTTTTCACCGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATAC

GCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTTCTTAGACGTCA

GGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTT

CTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAA

TGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGT

GTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCA

CCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCAC

GAGTGGGTTACATCGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGT

TTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCT

ATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTC

-continued

GCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACA

GAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGC

CATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCG

GAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTA

ACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGA

CGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAAC

TATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGAC

TGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCC

GGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTC

GCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTA

GTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACA

GATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACC

AAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTT

AAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCC

TTAACGTGAGTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCA

AAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAA

ACAAAAAAACCACCGCTACCAGCGGTGGTTTGTTTGCCGGATCAAGAGCT

ACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGATACCAA

ATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCT

GTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC

TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGT

TACCGGATAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAG

CCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGA

GCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATC

CGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGG

GGAAACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACT

TGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAA

ACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTT

GCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTAT

TACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGC

GCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCG

CCTCTCCCCGCGCGTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGC

TCGCTCACTGAGGCCGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGG

TCGCCCGGCCTCAGTGAGCGAGCGAGCGCGCAGAGAGGGAGTGGCCAACT

CCATCACTAGGGGTTCCTTGTAGTTAATGATTAACCCGCCATGCTACTTA

TCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGGAGTTCCGC

GTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCC

CCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAG

GGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCAC

-continued

TTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGT

CAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTAT

GGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACC

ATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCCCC

CTCCCCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTGTGCAG

CGATGGGGGCGGGGGGGGGGGGGGGCGCGCGCCAGGCGGGGCGGGGGGGG

GCGAGGGGCGGGGGGGGCGAGGCGGAGAGGTGCGGCGGCAGCCAATCAGA

GCGGCGCGCTCCGAAAGTTTCCTTTTATGGCGAGGCGGCGGCGGCGGCGG

CCCTATAAAAAGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCGCTGCCT

TCGCCCCGTGCCCCGCTCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTCT

GACTGACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTTT

GGCGCCTCCCGCGGGCGCCCCCCTCCTCACGGCGAGCGCTGCCACGTCAG

ACGAAGGGCGCAGCGAGCGTCCTGATCCTTCCGCCCGGACGCTCAGGACA

GCGGCCCGCTGCTCATAAGACTCGGCCTTAGAACCCCAGTATCAGCAGAA

GGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTTCTTTC

CAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCG

GAGGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATG

TTCATGTTTTCTTTTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACC

GCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGACT

GCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACCG

TCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGATCAATCGGATT

GCGGTAATCGCGTTTTGGCCTCTGACTGACGCGATTACCGATCCGATTGA

TCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTA

GCCTGGAGGCTTGCTGAAGGCTGTATGCTGATCTTTGCTAAATTGGTGCA

CGCGTTTTGGCCTCTGACTGACGCGTGCACCATTAGCAAAGATCAGGACA

CAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAG

GCTTGCTGAAGGCTGTATGCTGACTTCAATCACAATTCCAGCGCCGTTTT

GGCCTCTGACTGACGGCGCTGGAAGTGATTGAAGTCAGGACACAAGGCCT

GTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 15 = SEQ ID NO. 1 + SEQ ID NO. 3

5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTT

AACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTT

GTATCATGCTATTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATA

AATCCTGGTTGCTGTCTCTTTATGAGGAGTTGTGGCCCGTTGTCAGGCAA

CGTGGCGTGGTGTGCACTGTGTTTGCTGACGCAACCCCCACTGGTTGGGG

CATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTTTCCCCCTCC

CTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCCGCTGCTGGACA

GGGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGAAATC

ATCGTCCTTTCCTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCG

GGACGTCCTTCTGCTACGTCCCTTCGGCCCTCAATCCAGCGGACCTTCCT

-continued

TCCCGCGGCCTGCTGCCGGCTCTGCGGCCTCTTCCGCGTCTTCGCCTTCG

CCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCCTCCCCGCCTAAGCTTA

TCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAA

ATAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGC

ATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGG

ATCTCGACCTCGACTAGAGCATGGCTACGTAGATAAGTAGCATGGCGGGT

TAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCT

CTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGACG

CCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCAGCTGGC

GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGC

CTGAATGGCGAATGGCGATTCCGTTGCAATGGCTGGCGGTAATATTGTTC

TGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTCAGGCAAGT

GATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTGA

TGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTC

AGGATTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTG

TTTAGCTCCCGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGT

CAAAGCAACCATAGTACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGT

GTGGTGGTTACGCGCAGCGTGACCGCTACACTTGCCAGCGCCCTAGCGCC

CGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCGGCTTTC

CCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCT

TTACGGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAG

TGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCA

CGTTCTTTAATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCT

ATCTCGGTCTATTCTTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTA

TTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATTTTAACA

AAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTT

TTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGT

TTTACGATTACCGTTCATCGATTCTCTTGTTTGCTCCAGACTCTCAGGCA

ATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCTCTCCG

GCATGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTG

ACTGTCTCCGGCCTTTCTCACCCGTTTGAATCTTTACCTACACATTACTC

AGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTTTATCCTTGCG

TTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTT

GGTACAACCGATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGC

TAATTCTTTGCCTTGCCTGTATGATTTATTGGATGTTGGAATTCCTGATG

CGGTATTTTCTCCTTACGCATCTGTGCGGTATTTCACACCGCATATGGTG

CACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGAC

ACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCA

TCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAG

-continued

GTTTTCACCGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATAC

GCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTTCTTAGACGTCA

GGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTT

CTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAA

TGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGT

GTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCA

CCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCAC

GAGTGGGTTACATCGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGT

TTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCT

ATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTC

GCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACA

GAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGC

CATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCG

GAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTA

ACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGA

CGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAAC

TATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGAC

TGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCC

GGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTC

GCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTA

GTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACA

GATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACC

AAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTT

AAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCC

TTAACGTGAGTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCA

AAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAA

ACAAAAAAACCACCGCTACCAGCGGTGGTTTGTTTGCCGGATCAAGAGCT

ACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGATACCAA

ATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCT

GTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC

TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGT

TACCGGATAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAG

CCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGA

GCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATC

CGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGG

GGAAACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACT

TGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAA

ACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTT

GCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTAT

-continued

TACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGC

GCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCG

CCTCTCCCCGCGCGTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGC

TCGCTCACTGAGGCCGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGG

TCGCCCGGCCTCAGTGAGCGAGCGAGCGCGCAGAGAGGGAGTGGCCAACT

CCATCACTAGGGGTTCCTTGTAGTTAATGATTAACCCGCCATGCTACTTA

TCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGGAGTTCCGC

GTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCC

CCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAG

GGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCAC

TTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGT

CAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTAT

GGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACC

ATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCCCC

CTCCCCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTGTGCAG

CGATGGGGGCGGGGGGGGGGGGGGGCGCGCGCCAGGCGGGGCGGGGGGGG

GCGAGGGGCGGGGGGGGCGAGGCGGAGAGGTGCGGCGGCAGCCAATCAGA

GCGGCGCGCTCCGAAAGTTTCCTTTTATGGCGAGGCGGCGGCGGCGGCGG

CCCTATAAAAAGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCGCTGCCT

TCGCCCCGTGCCCCGCTCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTCT

GACTGACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTTT

GGCGCCTCCCGCGGGCGCCCCCCTCCTCACGGCGAGCGCTGCCACGTCAG

ACGAAGGGCGCAGCGAGCGTCCTGATCCTTCCGCCCGGACGCTCAGGACA

GCGGCCCGCTGCTCATAAGACTCGGCCTTAGAACCCCAGTATCAGCAGAA

GGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTTCTTTC

CAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCG

GAGGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATG

TTCATGTTTTCTTTTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACC

GCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGACT

GCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACCG

TCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGTAATCTTTCGCT

GGCTGCAGTTCGTTTTGGCCTCTGACTGACGAACTGCAGCGCGAAAGATT

ACAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTA

GCCTGGAGGCTTGCTGAAGGCTGTATGCTGTGTTAATGCTGATGTCACGC

TGCGTTTTGGCCTCTGACTGACGCAGCGTGACCAGCATTAACACAGGACA

CAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAG

GCTTGCTGAAGGCTGTATGCTGTTCACCTGGTTAACACATACACCGTTTT

GGCCTCTGACTGACGGTGTATGTGAACCAGGTGAACAGGACACAAGGCCT

GTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

-continued

SEQ ID NO. 16 = SEQ ID NO. 1 + SEQ ID NO. 4

5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTT

AACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTT

GTATCATGCTATTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATA

AATCCTGGTTGCTGTCTCTTTATGAGGAGTTGTGGCCCGTTGTCAGGCAA

CGTGGCGTGGTGTGCACTGTGTTTGCTGACGCAACCCCCACTGGTTGGGG

CATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTTTCCCCCTCC

CTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCCGCTGCTGGACA

GGGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGAAATC

ATCGTCCTTTCCTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCG

GGACGTCCTTCTGCTACGTCCCTTCGGCCCTCAATCCAGCGGACCTTCCT

TCCCGCGGCCTGCTGCCGGCTCTGCGGCCTCTTCCGCGTCTTCGCCTTCG

CCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCCTCCCCGCCTAAGCTTA

TCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAA

ATAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGC

ATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGG

ATCTCGACCTCGACTAGAGCATGGCTACGTAGATAAGTAGCATGGCGGGT

TAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCT

CTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGACG

CCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCAGCTGGC

GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGC

CTGAATGGCGAATGGCGATTCCGTTGCAATGGCTGGCGGTAATATTGTTC

TGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTCAGGCAAGT

GATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTGA

TGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTC

AGGATTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTG

TTTAGCTCCCGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGT

CAAAGCAACCATAGTACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGT

GTGGTGGTTACGCGCAGCGTGACCGCTACACTTGCCAGCGCCCTAGCGCC

CGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCGGCTTTC

CCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCT

TTACGGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAG

TGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCA

CGTTCTTTAATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCT

ATCTCGGTCTATTCTTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTA

TTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATTTTAACA

AAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTT

TTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGT

TTTACGATTACCGTTCATCGATTCTCTTGTTTGCTCCAGACTCTCAGGCA

-continued

ATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCTCTCCG

GCATGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTG

ACTGTCTCCGGCCTTTCTCACCCGTTTGAATCTTTACCTACACATTACTC

AGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTTTATCCTTGCG

TTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTT

GGTACAACCGATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGC

TAATTCTTTGCCTTGCCTGTATGATTTATTGGATGTTGGAATTCCTGATG

CGGTATTTTCTCCTTACGCATCTGTGCGGTATTTCACACCGCATATGGTG

CACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGAC

ACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCA

TCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAG

GTTTTCACCGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATAC

GCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTTCTTAGACGTCA

GGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTT

CTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAA

TGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGT

GTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCA

CCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCAC

GAGTGGGTTACATCGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGT

TTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCT

ATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTC

GCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACA

GAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGC

CATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCG

GAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTA

ACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGA

CGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAAC

TATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGAC

TGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCC

GGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTC

GCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTA

GTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACA

GATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACC

AAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTT

AAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCC

TTAACGTGAGTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCA

AAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAA

ACAAAAAAACCACCGCTACCAGCGGTGGTTTGTTTGCCGGATCAAGAGCT

ACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGATACCAA

-continued

ATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCT

GTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC

TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGT

TACCGGATAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAG

CCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGA

GCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATC

CGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGG

GGAAACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACT

TGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAA

ACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTT

GCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTAT

TACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGC

GCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCG

CCTCTCCCCGCGCGTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGC

TCGCTCACTGAGGCCGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGG

TCGCCCGGCCTCAGTGAGCGAGCGAGCGCGCAGAGAGGGAGTGGCCAACT

CCATCACTAGGGGTTCCTTGTAGTTAATGATTAACCCGCCATGCTACTTA

TCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGGAGTTCCGC

GTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCC

CCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAG

GGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCAC

TTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGT

CAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTAT

GGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACC

ATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCCCC

CTCCCCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTGTGCAG

CGATGGGGGCGGGGGGGGGGGGGGCGCGCGCCAGGCGGGGCGGGGGGGG

GCGAGGGGCGGGGCGGGGCGAGGCGGAGAGGTGCGGCGGCAGCCAATCAG

AGCGGCGCGCTCCGAAAGTTTCCTTTTATGGCGAGGCGGCGGCGGCGGCG

GCCCTATAAAAAGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCGCTGCC

TTCGCCCCGTGCCCCGCTCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTC

TGACTGACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTT

TGGCGCCTCCCGCGGGCGCCCCCCTCCTCACGGCGAGCGCTGCCACGTCA

GACGAAGGGCGCAGCGAGCGTCCTGATCCTTCCGCCCGGACGCTCAGGAC

AGCGGCCCGCTGCTCATAAGACTCGGCCTTAGAACCCCAGTATCAGCAGA

AGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTTCTTT

CCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGC

GGAGGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCAT

GTTCATGTTTTCTTTTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTAC

-continued

CGCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGAC

TGCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACC

GTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGATTTCTTCCTG

TGCGCTTTCGCCGTTTTGGCCTCTGACTGACGGCGAAAGCGCAGGAAGAA

ATCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCT

AGCCTGGAGGCTTGCTGAAGGCTGTATGCTGAGAATAATCAGATCAGCAC

GCTCGTTTTGGCCTCTGACTGACGAGCGTGCTGCTGATTATTCTCAGGAC

ACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGA

GGCTTGCTGAAGGCTGTATGCTGTAATCAGGCTGAATTCAGATAGCGTTT

TGGCCTCTGACTGACGCTATCTGAACAGCCTGATTACAGGACACAAGGCC

TGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 17 = SEQ ID NO. 1 + SEQ ID NO. 5

5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTT

AACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTT

GTATCATGCTATTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATA

AATCCTGGTTGCTGTCTCTTTATGAGGAGTTGTGGCCCGTTGTCAGGCAA

CGTGGCGTGGTGTGCACTGTGTTTGCTGACGCAACCCCCACTGGTTGGGG

CATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTTTCCCCCTCC

CTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCCGCTGCTGGACA

GGGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGAAATC

ATCGTCCTTTCCTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCG

GGACGTCCTTCTGCTACGTCCCTTCGGCCCTCAATCCAGCGGACCTTCCT

TCCCGCGGCCTGCTGCCGGCTCTGCGGCCTCTTCCGCGTCTTCGCCTTCG

CCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCCTCCCCGCCTAAGCTTA

TCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAA

ATAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGC

ATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGG

ATCTCGACCTCGACTAGAGCATGGCTACGTAGATAAGTAGCATGGCGGGT

TAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCT

CTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGACG

CCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCAGCTGGC

GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGC

CTGAATGGCGAATGGCGATTCCGTTGCAATGGCTGGCGGTAATATTGTTC

TGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTCAGGCAAGT

GATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTGA

TGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTC

AGGATTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTG

TTTAGCTCCCGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGT

CAAAGCAACCATAGTACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGT

GTGGTGGTTACGCGCAGCGTGACCGCTACACTTGCCAGCGCCCTAGCGCC

-continued

CGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCGGCTTTC

CCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCT

TTACGGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAG

TGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCA

CGTTCTTTAATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCT

ATCTCGGTCTATTCTTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTA

TTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATTTTAACA

AAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTT

TTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGT

TTTACGATTACCGTTCATCGATTCTCTTGTTTGCTCCAGACTCTCAGGCA

ATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCTCTCCG

GCATGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTG

ACTGTCTCCGGCCTTTCTCACCCGTTTGAATCTTTACCTACACATTACTC

AGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTTTATCCTTGCG

TTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTT

GGTACAACCGATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGC

TAATTCTTTGCCTTGCCTGTATGATTTATTGGATGTTGGAATTCCTGATG

CGGTATTTTCTCCTTACGCATCTGTGCGGTATTTCACACCGCATATGGTG

CACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGAC

ACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCA

TCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAG

GTTTTCACCGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATAC

GCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTTCTTAGACGTCA

GGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTT

CTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAA

TGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGT

GTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCA

CCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCAC

GAGTGGGTTACATCGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGT

TTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCT

ATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTC

GCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACA

GAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGC

CATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCG

GAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTA

ACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGA

CGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAAC

TATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGAC

TGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCC

-continued

GGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTC

GCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTA

GTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACA

GATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACC

AAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTT

AAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCC

TTAACGTGAGTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCA

AAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAA

ACAAAAAAACCACCGCTACCAGCGGTGGTTTGTTTGCCGGATCAAGAGCT

ACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGATACCAA

ATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCT

GTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC

TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGT

TACCGGATAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAG

CCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGA

GCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATC

CGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGG

GGAAACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACT

TGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAA

ACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTT

GCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTAT

TACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGC

GCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCG

CCTCTCCCCGCGCGTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGC

TCGCTCACTGAGGCCGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGG

TCGCCCGGCCTCAGTGAGCGAGCGAGCGCGCAGAGAGGGAGTGGCCAACT

CCATCACTAGGGGTTCCTTGTAGTTAATGATTAACCCGCCATGCTACTTA

TCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGGAGTTCCGC

GTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCC

CCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAG

GGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCAC

TTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGT

CAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTAT

GGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACC

ATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCCCC

CTCCCCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTGTGCAG

CGATGGGGGCGGGGGGGGGGGGGGCGCGCGCCAGGCGGGGCGGGGGGGG

GCGAGGGGCGGGGCGGGGCGAGGCGGAGAGGTGCGGCGGCAGCCAATCAG

AGCGGCGCGCTCCGAAAGTTTCCTTTTATGGCGAGGCGGCGGCGGCGCG

-continued

GCCCTATAAAAAGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCGCTGCC

TTCGCCCCGTGCCCCGCTCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTC

TGACTGACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTT

TGGCGCCTCCCGCGGGCGCCCCCCTCCTCACGGCGAGCGCTGCCACGTCA

GACGAAGGGCGCAGCGAGCGTCCTGATCCTTCCGCCCGGACGCTCAGGAC

AGCGGCCCGCTGCTCATAAGACTCGGCCTTAGAACCCCAGTATCAGCAGA

AGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTTCTTT

CCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGC

GGAGGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCAT

GTTCATGTTTTCTTTTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTAC

CGCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGAC

TGCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACC

GTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGATAATCACCGC

TGCAGGTTCAGCGTTTTGGCCTCTGACTGACGCTGAACCTGGCGGTGATT

ATCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCT

AGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTTCAATCGCGTATTGGTAA

TCGCGTTTTGGCCTCTGACTGACGCGATTACCAACGCGATTGAACAGGAC

ACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGA

GGCTTGCTGAAGGCTGTATGCTGTGATCATGCTGAAAATGGTGCACGTTT

TGGCCTCTGACTGACGTGCACCATTCAGCATGATCACAGGACACAAGGCC

TGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 18 = SEQ ID NO. 1 + SEQ ID NO. 6

5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTT

AACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTT

GTATCATGCTATTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATA

AATCCTGGTTGCTGTCTCTTTATGAGGAGTTGTGGCCCGTTGTCAGGCAA

CGTGGCGTGGTGTGCACTGTGTTTGCTGACGCAACCCCCACTGGTTGGGG

CATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTTTCCCCCTCC

CTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCCGCTGCTGGACA

GGGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGAAATC

ATCGTCCTTTCCTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCG

GGACGTCCTTCTGCTACGTCCCTTCGGCCCTCAATCCAGCGGACCTTCCT

TCCCGCGGCCTGCTGCCGGCTCTGCGGCCTCTTCCGCGTCTTCGCCTTCG

CCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCCTCCCCGCCTAAGCTTA

TCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAA

ATAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGC

ATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGG

ATCTCGACCTCGACTAGAGCATGGCTACGTAGATAAGTAGCATGGCGGGT

TAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCT

-continued

CTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGACG

CCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCAGCTGGC

GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGC

CTGAATGGCGAATGGCGATTCCGTTGCAATGGCTGGCGGTAATATTGTTC

TGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTCAGGCAAGT

GATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTGA

TGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTC

AGGATTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTG

TTTAGCTCCCGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGT

CAAAGCAACCATAGTACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGT

GTGGTGGTTACGCGCAGCGTGACCGCTACACTTGCCAGCGCCCTAGCGCC

CGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCGGCTTTC

CCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCT

TTACGGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAG

TGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCA

CGTTCTTTAATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCT

ATCTCGGTCTATTCTTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTA

TTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATTTTAACA

AAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTT

TTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGT

TTTACGATTACCGTTCATCGATTCTCTTGTTTGCTCCAGACTCTCAGGCA

ATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCTCTCCG

GCATGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTG

ACTGTCTCCGGCCTTTCTCACCCGTTTGAATCTTTACCTACACATTACTC

AGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTTTATCCTTGCG

TTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTT

GGTACAACCGATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGC

TAATTCTTTGCCTTGCCTGTATGATTTATTGGATGTTGGAATTCCTGATG

CGGTATTTTCTCCTTACGCATCTGTGCGGTATTTCACACCGCATATGGTG

CACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGAC

ACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCA

TCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAG

GTTTTCACCGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATAC

GCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTTCTTAGACGTCA

GGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTT

CTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAA

TGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGT

GTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCA

CCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCAC

-continued

GAGTGGGTTACATCGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGT

TTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCT

ATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTC

GCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACA

GAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGC

CATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCG

GAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTA

ACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGA

CGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAAC

TATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGAC

TGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCC

GGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTC

GCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTA

GTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACA

GATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACC

AAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTT

AAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCC

TTAACGTGAGTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCA

AAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAA

ACAAAAAAACCACCGCTACCAGCGGTGGTTTGTTTGCCGGATCAAGAGCT

ACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGATACCAA

ATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCT

GTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC

TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGT

TACCGGATAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAG

CCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGA

GCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATC

CGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGG

GGAAACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACT

TGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAA

ACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTT

GCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTAT

TACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGC

GCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCG

CCTCTCCCCGCGCGTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGC

TCGCTCACTGAGGCCGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGG

TCGCCCGGCCTCAGTGAGCGAGCGAGCGCGCAGAGAGGGAGTGGCCAACT

CCATCACTAGGGGTTCCTTGTAGTTAATGATTAACCCGCCATGCTACTTA

TCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGGAGTTCCGC

-continued

GTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCC

CCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAG

GGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCAC

TTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGT

CAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTAT

GGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACC

ATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCCCC

CTCCCCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTGTGCAG

CGATGGGGGCGGGGGGGGGGGGGGGCGCGCGCCAGGCGGGGGGGGCGGGG

CGAGGGGCGGGGCGGGGCGAGGCGGAGAGGTGCGGCGGCAGCCAATCAGA

GCGGCGCGCTCCGAAAGTTTCCTTTTATGGCGAGGCGGCGGCGGCGGCGG

CCCTATAAAAAGCGAAGCGCGCGGGGGGGGAGTCGCTGCGCGCTGCCTTC

GCCCCGTGCCCCGCTCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTCTGA

CTGACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTTTGG

CGCCTCCCGCGGGCGCCCCCCTCCTCACGGCGAGCGCTGCCACGTCAGAC

GAAGGGCGCAGCGAGCGTCCTGATCCTTCCGCCCGGACGCTCAGGACAGC

GGCCCGCTGCTCATAAGACTCGGCCTTAGAACCCCAGTATCAGCAGAAGG

ACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTTCTTTCCA

GAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCGGA

GGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTT

CATGTTTTCTTTTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACCGC

CACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGACTGC

TGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACCGTC

GCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGAGGTAATATCCTGA

CGCTCAGCCGTTTTGGCCTCTGACTGACGGCTGAGCGTGGATATTACCTC

AGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGC

CTGGAGGCTTGCTGAAGGCTGTATGCTGTACAGAATCAGATAATCAGCGC

CGTTTTGGCCTCTGACTGACGGCGCTGATTCTGATTCTGTACAGGACACA

AGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGGC

TTGCTGAAGGCTGTATGCTGTCATGTTTAAAAATTCGCTGCGCGTTTTGG

CCTCTGACTGACGCGCAGCGAATTTAAACATGACAGGACACAAGGCCTGT

TACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 19 = SEQ ID NO. 1 + SEQ ID NO. 7

5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTT

AACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTT

GTATCATGCTATTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATA

AATCCTGGTTGCTGTCTCTTTATGAGGAGTTGTGGCCCGTTGTCAGGCAA

CGTGGCGTGGTGTGCACTGTGTTTGCTGACGCAACCCCCACTGGTTGGGG

CATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTTTCCCCCTCC

CTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCCGCTGCTGGACA

-continued

GGGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGAAATC

ATCGTCCTTTCCTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCG

GGACGTCCTTCTGCTACGTCCCTTCGGCCCTCAATCCAGCGGACCTTCCT

TCCCGCGGCCTGCTGCCGGCTCTGCGGCCTCTTCCGCGTCTTCGCCTTCG

CCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCCTCCCCGCCTAAGCTTA

TCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAA

ATAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGC

ATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGG

ATCTCGACCTCGACTAGAGCATGGCTACGTAGATAAGTAGCATGGCGGGT

TAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCT

CTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGACG

CCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCAGCTGGC

GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGC

CTGAATGGCGAATGGCGATTCCGTTGCAATGGCTGGCGGTAATATTGTTC

TGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTCAGGCAAGT

GATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTGA

TGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTC

AGGATTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTG

TTTAGCTCCCGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGT

CAAAGCAACCATAGTACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGT

GTGGTGGTTACGCGCAGCGTGACCGCTACACTTGCCAGCGCCCTAGCGCC

CGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCGGCTTTC

CCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCT

TTACGGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAG

TGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCA

CGTTCTTTAATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCT

ATCTCGGTCTATTCTTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTA

TTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATTTTAACA

AAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTT

TTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGT

TTTACGATTACCGTTCATCGATTCTCTTGTTTGCTCCAGACTCTCAGGCA

ATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCTCTCCG

GCATGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTG

ACTGTCTCCGGCCTTTCTCACCCGTTTGAATCTTTACCTACACATTACTC

AGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTTTATCCTTGCG

TTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTT

GGTACAACCGATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGC

TAATTCTTTGCCTTGCCTGTATGATTTATTGGATGTTGGAATTCCTGATG

CGGTATTTTCTCCTTACGCATCTGTGCGGTATTTCACACCGCATATGGTG

-continued

CACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGAC

ACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCA

TCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAG

GTTTTCACCGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATAC

GCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTTCTTAGACGTCA

GGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTT

CTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAA

TGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGT

GTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCA

CCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCAC

GAGTGGGTTACATCGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGT

TTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCT

ATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTC

GCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACA

GAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGC

CATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCG

GAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTA

ACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGA

CGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAAC

TATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGAC

TGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCC

GGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTC

GCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTA

GTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACA

GATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACC

AAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTT

AAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCC

TTAACGTGAGTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCA

AAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAA

ACAAAAAAACCACCGCTACCAGCGGTGGTTTGTTTGCCGGATCAAGAGCT

ACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGATACCAA

ATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCT

GTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC

TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGT

TACCGGATAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAG

CCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGA

GCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATC

CGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGG

GGAAACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACT

-continued

TGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAA

ACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTT

GCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTAT

TACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGC

GCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCG

CCTCTCCCCGCGCGTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGC

TCGCTCACTGAGGCCGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGG

TCGCCCGGCCTCAGTGAGCGAGCGAGCGCGCAGAGAGGGAGTGGCCAACT

CCATCACTAGGGGTTCCTTGTAGTTAATGATTAACCCGCCATGCTACTTA

TCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGGAGTTCCGC

GTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCC

CCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAG

GGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCAC

TTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGT

CAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTAT

GGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACC

ATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCCCC

CTCCCCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTGTGCAG

CGATGGGGGCGGGGGGGGGGGGGGGCGCGCGCCAGGCGGGGCGGGGGGGG

GCGAGGGGCGGGGCGGGGCGAGGCGGAGAGGTGCGGCGGCAGCCAATCAG

AGCGGCGCGCTCCGAAAGTTTCCTTTTATGGCGAGGCGGCGGCGGCGGCG

GCCCTATAAAAAGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCGCTGCC

TTCGCCCCGTGCCCCGCTCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTC

TGACTGACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTT

TGGCGCCTCCCGCGGGCGCCCCCCTCCTCACGGCGAGCGCTGCCACGTCA

GACGAAGGGCGCAGCGAGCGTCCTGATCCTTCCGCCCGGACGCTCAGGAC

AGCGGCCCGCTGCTCATAAGACTCGGCCTTAGAACCCCAGTATCAGCAGA

AGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTTCTTT

CCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGC

GGAGGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCAT

GTTCATGTTTTCTTTTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTAC

CGCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGAC

TGCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACC

GTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGATGAATCGGGT

TGTCTGAATCGCGTTTTGGCCTCTGACTGACGCGATTCAGAACCCGATTC

ATCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCT

AGCCTGGAGGCTTGCTGAAGGCTGTATGCTGAACACTTTGCTATATCATC

CTGCGTTTTGGCCTCTGACTGACGCAGGATGATAGCAAAGTGTTCAGGAC

ACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGA

-continued

GGCTTGCTGAAGGCTGTATGCTGTTCTGTTCGTTAAGCTAATGCTCGTTT

TGGCCTCTGACTGACGAGCATTAGCAACGAACAGAACAGGACACAAGGCC

TGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 20 = SEQ ID NO. 1 + SEQ ID NO. 8

5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTT

AACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTT

GTATCATGCTATTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATA

AATCCTGGTTGCTGTCTCTTTATGAGGAGTTGTGGCCCGTTGTCAGGCAA

CGTGGCGTGGTGTGCACTGTGTTTGCTGACGCAACCCCCACTGGTTGGGG

CATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTTTCCCCCTCC

CTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCCGCTGCTGGACA

GGGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGAAATC

ATCGTCCTTTCCTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCG

GGACGTCCTTCTGCTACGTCCCTTCGGCCCTCAATCCAGCGGACCTTCCT

TCCCGCGGCCTGCTGCCGGCTCTGCGGCCTCTTCCGCGTCTTCGCCTTCG

CCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCCTCCCCGCCTAAGCTTA

TCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAA

ATAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGC

ATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGG

ATCTCGACCTCGACTAGAGCATGGCTACGTAGATAAGTAGCATGGCGGGT

TAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCT

CTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGACG

CCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCAGCTGGC

GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGC

CTGAATGGCGAATGGCGATTCCGTTGCAATGGCTGGCGGTAATATTGTTC

TGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTCAGGCAAGT

GATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTGA

TGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTC

AGGATTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTG

TTTAGCTCCCGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGT

CAAAGCAACCATAGTACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGT

GTGGTGGTTACGCGCAGCGTGACCGCTACACTTGCCAGCGCCCTAGCGCC

CGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCGGCTTTC

CCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCT

TTACGGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAG

TGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCA

CGTTCTTTAATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCT

ATCTCGGTCTATTCTTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTA

TTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATTTTAACA

-continued

AAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTT

TTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGT

TTTACGATTACCGTTCATCGATTCTCTTGTTTGCTCCAGACTCTCAGGCA

ATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCTCTCCG

GCATGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTG

ACTGTCTCCGGCCTTTCTCACCCGTTTGAATCTTTACCTACACATTACTC

AGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTTTATCCTTGCG

TTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTT

GGTACAACCGATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGC

TAATTCTTTGCCTTGCCTGTATGATTTATTGGATGTTGGAATTCCTGATG

CGGTATTTTCTCCTTACGCATCTGTGCGGTATTTCACACCGCATATGGTG

CACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGAC

ACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCA

TCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAG

GTTTTCACCGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATAC

GCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTTCTTAGACGTCA

GGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTT

CTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAA

TGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGT

GTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCA

CCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCAC

GAGTGGGTTACATCGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGT

TTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCT

ATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTC

GCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACA

GAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGC

CATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCG

GAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTA

ACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGA

CGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAAC

TATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGAC

TGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCC

GGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTC

GCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTA

GTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACA

GATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACC

AAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTT

AAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCC

TTAACGTGAGTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCA

-continued

AAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAA

ACAAAAAAACCACCGCTACCAGCGGTGGTTTGTTTGCCGGATCAAGAGCT

ACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGATACCAA

ATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCT

GTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC

TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGT

TACCGGATAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAG

CCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGA

GCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATC

CGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGG

GGAAACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACT

TGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAA

ACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTT

GCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTAT

TACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGC

GCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCG

CCTCTCCCCGCGCGTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGC

TCGCTCACTGAGGCCGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGG

TCGCCCGGCCTCAGTGAGCGAGCGAGCGCGCAGAGAGGGAGTGGCCAACT

CCATCACTAGGGGTTCCTTGTAGTTAATGATTAACCCGCCATGCTACTTA

TCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGGAGTTCCGC

GTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCC

CCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAG

GGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCAC

TTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGT

CAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTAT

GGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACC

ATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCCCC

CTCCCCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTGTGCAG

CGATGGGGGCGGGGGGGGGGGGGGGCGCGCGCCAGGCGGGGCGGGGGGGG

GCGAGGGGCGGGGGGGGCGAGGCGGAGAGGTGCGGCGGCAGCCAATCAGA

GCGGCGCGCTCCGAAAGTTTCCTTTTATGGCGAGGCGGCGGCGGCGGCGG

CCCTATAAAAAGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCGCTGCCT

TCGCCCCGTGCCCCGCTCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTCT

GACTGACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTTT

GGCGCCTCCCGCGGGCGCCCCCCTCCTCACGGCGAGCGCTGCCACGTCAG

ACGAAGGGCGCAGCGAGCGTCCTGATCCTTCCGCCCGGACGCTCAGGACA

GCGGCCCGCTGCTCATAAGACTCGGCCTTAGAACCCCAGTATCAGCAGAA

GGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTTCTTTC

-continued

CAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCG

GAGGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATG

TTCATGTTTTCTTTTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACC

GCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGACT

GCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACCG

TCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGGAGCATTAGCAA

TGCGAACAGAAGTTTTGGCCTCTGACTGACTTCTGTTCGTTGCTAATGCT

CCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTA

GCCTGGAGGCTTGCTGAAGGCTGTATGCTGAAACATAATGGATTCAGCAG

CGCGTTTTGGCCTCTGACTGACGCGCTGCTGACCATTATGTTTCAGGACA

CAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAG

GCTTGCTGAAGGCTGTATGCTGTTATCTTTGCGAAGCTGCCATCCGTTTT

GGCCTCTGACTGACGGATGGCAGCCGCAAAGATAACAGGACACAAGGCCT

GTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 21 = SEQ ID NO. 1 + SEQ ID NO. 9

5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTT

AACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTT

GTATCATGCTATTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATA

AATCCTGGTTGCTGTCTCTTTATGAGGAGTTGTGGCCCGTTGTCAGGCAA

CGTGGCGTGGTGTGCACTGTGTTTGCTGACGCAACCCCCACTGGTTGGGG

CATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTTTCCCCCTCC

CTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCCGCTGCTGGACA

GGGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGAAATC

ATCGTCCTTTCCTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCG

GGACGTCCTTCTGCTACGTCCCTTCGGCCCTCAATCCAGCGGACCTTCCT

TCCCGCGGCCTGCTGCCGGCTCTGCGGCCTCTTCCGCGTCTTCGCCTTCG

CCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCCTCCCCGCCTAAGCTTA

TCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAA

ATAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGC

ATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGG

ATCTCGACCTCGACTAGAGCATGGCTACGTAGATAAGTAGCATGGCGGGT

TAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCT

CTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGACG

CCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCAGCTGGC

GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGC

CTGAATGGCGAATGGCGATTCCGTTGCAATGGCTGGCGGTAATATTGTTC

TGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTCAGGCAAGT

GATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTGA

TGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTC

AGGATTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTG

-continued

TTTAGCTCCCGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGT

CAAAGCAACCATAGTACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGT

GTGGTGGTTACGCGCAGCGTGACCGCTACACTTGCCAGCGCCCTAGCGCC

CGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCGGCTTTC

CCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCT

TTACGGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAG

TGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCA

CGTTCTTTAATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCT

ATCTCGGTCTATTCTTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTA

TTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATTTTAACA

AAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTT

TTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGT

TTTACGATTACCGTTCATCGATTCTCTTGTTTGCTCCAGACTCTCAGGCA

ATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCTCTCCG

GCATGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTG

ACTGTCTCCGGCCTTTCTCACCCGTTTGAATCTTTACCTACACATTACTC

AGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTTTATCCTTGCG

TTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTT

GGTACAACCGATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGC

TAATTCTTTGCCTTGCCTGTATGATTTATTGGATGTTGGAATTCCTGATG

CGGTATTTTCTCCTTACGCATCTGTGCGGTATTTCACACCGCATATGGTG

CACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGAC

ACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCA

TCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAG

GTTTTCACCGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATAC

GCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTTCTTAGACGTCA

GGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTT

CTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAA

TGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGT

GTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCA

CCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCAC

GAGTGGGTTACATCGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGT

TTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCT

ATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTC

GCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACA

GAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGC

CATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCG

GAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTA

ACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGA

-continued

CGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAAC

TATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGAC

TGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCC

GGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTC

GCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTA

GTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACA

GATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACC

AAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTT

AAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCC

TTAACGTGAGTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCA

AAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAA

ACAAAAAAACCACCGCTACCAGCGGTGGTTTGTTTGCCGGATCAAGAGCT

ACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGATACCAA

ATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCT

GTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC

TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGT

TACCGGATAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAG

CCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGA

GCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATC

CGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGG

GGAAACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACT

TGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAA

ACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTT

GCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTAT

TACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGC

GCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCG

CCTCTCCCCGCGCGTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGC

TCGCTCACTGAGGCCGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGG

TCGCCCGGCCTCAGTGAGCGAGCGAGCGCGCAGAGAGGGAGTGGCCAACT

CCATCACTAGGGGTTCCTTGTAGTTAATGATTAACCCGCCATGCTACTTA

TCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGGAGTTCCGC

GTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCC

CCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAG

GGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCAC

TTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGT

CAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTAT

GGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACC

ATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCCCC

CTCCCCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTGTGCAG

-continued

CGATGGGGGCGGGGGGGGGGGGGGGCGCGCGCCAGGCGGGGCGGGGGGGG

GCGAGGGGCGGGGCGGGGCGAGGCGGAGAGGTGCGGCGGCAGCCAATCAG

AGCGGCGCGCTCCGAAAGTTTCCTTTTATGGCGAGGCGGCGGCGGCGGCG

GCCCTATAAAAAGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCGCTGCC

TTCGCCCCGTGCCCCGCTCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTC

TGACTGACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTT

TGGCGCCTCCCGCGGGCGCCCCCCTCCTCACGGCGAGCGCTGCCACGTCA

GACGAAGGGCGCAGCGAGCGTCCTGATCCTTCCGCCCGGACGCTCAGGAC

AGCGGCCCGCTGCTCATAAGACTCGGCCTTAGAACCCCAGTATCAGCAGA

AGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTTCTTT

CCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGC

GGAGGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCAT

GTTCATGTTTTCTTTTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTAC

CGCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGAC

TGCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACC

GTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGGCTCCTCCACT

TGGTGGTTTGGTTTTGGCCTCTGACTGACGCGGCAACATTCTGGTGATTA

CAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAG

CCTGGAGGCTTGCTGAAGGCTGTATGCTGTCATAATCGCTATTTGGTGCG

GCGTTTTGGCCTCTGACTGACGCCGCACCAAAGCGATTATGACAGGACAC

AAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGG

CTTGCTGAAGGCTGTATGCTGTTCTGATCCTGAAGTTCGGGTTCGTTTTG

GCCTCTGACTGACGAACCCGAACCAGGATCAGAACAGGACACAAGGCCTG

TTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 22 = SEQ ID NO. 1 + SEQ ID NO. 10

5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTT

AACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTT

GTATCATGCTATTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATA

AATCCTGGTTGCTGTCTCTTTATGAGGAGTTGTGGCCCGTTGTCAGGCAA

CGTGGCGTGGTGTGCACTGTGTTTGCTGACGCAACCCCCACTGGTTGGGG

CATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTTTCCCCCTCC

CTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCCGCTGCTGGACA

GGGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGAAATC

ATCGTCCTTTCCTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCG

GGACGTCCTTCTGCTACGTCCCTTCGGCCCTCAATCCAGCGGACCTTCCT

TCCCGCGGCCTGCTGCCGGCTCTGCGGCCTCTTCCGCGTCTTCGCCTTCG

CCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCCTCCCCGCCTAAGCTTA

TCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAA

ATAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGC

-continued

ATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGG

ATCTCGACCTCGACTAGAGCATGGCTACGTAGATAAGTAGCATGGCGGGT

TAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCT

CTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGACG

CCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCAGCTGGC

GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGC

CTGAATGGCGAATGGCGATTCCGTTGCAATGGCTGGCGGTAATATTGTTC

TGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTCAGGCAAGT

GATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTGA

TGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTC

AGGATTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTG

TTTAGCTCCCGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGT

CAAAGCAACCATAGTACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGT

GTGGTGGTTACGCGCAGCGTGACCGCTACACTTGCCAGCGCCCTAGCGCC

CGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCGGCTTTC

CCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCT

TTACGGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAG

TGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCA

CGTTCTTTAATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCT

ATCTCGGTCTATTCTTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTA

TTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATTTTAACA

AAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTT

TTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGT

TTTACGATTACCGTTCATCGATTCTCTTGTTTGCTCCAGACTCTCAGGCA

ATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCTCTCCG

GCATGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTG

ACTGTCTCCGGCCTTTCTCACCCGTTTGAATCTTTACCTACACATTACTC

AGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTTTATCCTTGCG

TTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTT

GGTACAACCGATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGC

TAATTCTTTGCCTTGCCTGTATGATTTATTGGATGTTGGAATTCCTGATG

CGGTATTTTCTCCTTACGCATCTGTGCGGTATTTCACACCGCATATGGTG

CACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGAC

ACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCA

TCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAG

GTTTTCACCGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATAC

GCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTTCTTAGACGTCA

GGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTT

CTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAA

-continued

TGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGT

GTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCA

CCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCAC

GAGTGGGTTACATCGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGT

TTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCT

ATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTC

GCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACA

GAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGC

CATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCG

GAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTA

ACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGA

CGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAAC

TATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGAC

TGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCC

GGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTC

GCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTA

GTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACA

GATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACC

AAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTT

AAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCC

TTAACGTGAGTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCA

AAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAA

ACAAAAAAACCACCGCTACCAGCGGTGGTTTGTTTGCCGGATCAAGAGCT

ACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGATACCAA

ATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCT

GTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC

TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGT

TACCGGATAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAG

CCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGA

GCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATC

CGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGG

GGAAACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACT

TGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAA

ACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTT

GCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTAT

TACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGC

GCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCG

CCTCTCCCCGCGCGTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGC

TCGCTCACTGAGGCCGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGG

-continued

TCGCCCGGCCTCAGTGAGCGAGCGAGCGCGCAGAGAGGGAGTGGCCAACT

CCATCACTAGGGGTTCCTTGTAGTTAATGATTAACCCGCCATGCTACTTA

TCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGGAGTTCCGC

GTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCC

CCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAG

GGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCAC

TTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGT

CAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTAT

GGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACC

ATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCCCC

CTCCCCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTGTGCAG

CGATGGGGGCGGGGGGGGGGGGGGCGCGCGCCAGGCGGGGCGGGGGGGG

GCGAGGGGCGGGGCGGGGCGAGGCGGAGAGGTGCGGCGGCAGCCAATCAG

AGCGGCGCGCTCCGAAAGTTTCCTTTTATGGCGAGGCGGCGGCGGCGGCG

GCCCTATAAAAAGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCGCTGCC

TTCGCCCCGTGCCCCGCTCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTC

TGACTGACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTT

TGGCGCCTCCCGCGGGCGCCCCCCTCCTCACGGCGAGCGCTGCCACGTCA

GACGAAGGGCGCAGCGAGCGTCCTGATCCTTCCGCCCGGACGCTCAGGAC

AGCGGCCCGCTGCTCATAAGACTCGGCCTTAGAACCCCAGTATCAGCAGA

AGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTTCTTT

CCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGC

GGAGGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCAT

GTTCATGTTTTCTTTTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTAC

CGCCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGAC

TGCTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACC

GTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGAAATCTTCCGG

TGGTTCCACTGCGTTTTGGCCTCTGACTGACGCAGTGGAACCCGGAAGAT

TTCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCT

AGCCTGGAGGCTTGCTGAAGGCTGTATGCTGATATCCTGAATATGGTATG

CAGCGTTTTGGCCTCTGACTGACGCTGCATACCATTCAGGATATCAGGAC

ACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGA

GGCTTGCTGAAGGCTGTATGCTGTTTAAAGCTCAAACGCGTTCGCCGTTT

TGGCCTCTGACTGACGGCGAACGCGTGAGCTTTAAACAGGACACAAGGCC

TGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 23 = SEQ ID NO:. 1 + SEQ ID NO. 11
5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTT

AACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTT

GTATCATGCTATTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATA

AATCCTGGTTGCTGTCTCTTTATGAGGAGTTGTGGCCCGTTGTCAGGCAA

-continued

CGTGGCGTGGTGTGCACTGTGTTTGCTGACGCAACCCCCACTGGTTGGGG

CATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTTTCCCCCTCC

CTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCCGCTGCTGGACA

GGGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGAAATC

ATCGTCCTTTCCTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCG

GGACGTCCTTCTGCTACGTCCCTTCGGCCCTCAATCCAGCGGACCTTCCT

TCCCGCGGCCTGCTGCCGGCTCTGCGGCCTCTTCCGCGTCTTCGCCTTCG

CCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCCTCCCCGCCTAAGCTTA

TCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAA

ATAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGC

ATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGG

ATCTCGACCTCGACTAGAGCATGGCTACGTAGATAAGTAGCATGGCGGGT

TAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCT

CTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGACG

CCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCAGCTGGC

GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGC

CTGAATGGCGAATGGCGATTCCGTTGCAATGGCTGGCGGTAATATTGTTC

TGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTCAGGCAAGT

GATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTGA

TGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTC

AGGATTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTG

TTTAGCTCCCGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGT

CAAAGCAACCATAGTACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGT

GTGGTGGTTACGCGCAGCGTGACCGCTACACTTGCCAGCGCCCTAGCGCC

CGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCGGCTTTC

CCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCT

TTACGGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAG

TGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCA

CGTTCTTTAATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCT

ATCTCGGTCTATTCTTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTA

TTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATTTTAACA

AAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTT

TTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGT

TTTACGATTACCGTTCATCGATTCTCTTGTTTGCTCCAGACTCTCAGGCA

ATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCTCTCCG

GCATGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTG

ACTGTCTCCGGCCTTTCTCACCCGTTTGAATCTTTACCTACACATTACTC

AGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTTTATCCTTGCG

TTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTT

-continued

GGTACAACCGATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGC

TAATTCTTTGCCTTGCCTGTATGATTTATTGGATGTTGGAATTCCTGATG

CGGTATTTTCTCCTTACGCATCTGTGCGGTATTTCACACCGCATATGGTG

CACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGAC

ACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCA

TCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAG

GTTTTCACCGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATAC

GCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTTCTTAGACGTCA

GGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTT

CTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAA

TGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGT

GTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCA

CCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCAC

GAGTGGGTTACATCGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGT

TTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCT

ATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTC

GCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACA

GAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGC

CATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCG

GAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTA

ACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGA

CGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAAC

TATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGAC

TGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCC

GGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTC

GCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTA

GTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACA

GATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACC

AAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTT

AAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCC

TTAACGTGAGTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCA

AAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAA

ACAAAAAAACCACCGCTACCAGCGGTGGTTTGTTTGCCGGATCAAGAGCT

ACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGATACCAA

ATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCT

GTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC

TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGT

TACCGGATAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAG

CCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGA

-continued

GCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATC

CGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGG

GGAAACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACT

TGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAA

ACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTT

GCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTAT

TACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGC

GCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCG

CCTCTCCCCGCGCGTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGC

TCGCTCACTGAGGCCGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGG

TCGCCCGGCCTCAGTGAGCGAGCGAGCGCGCAGAGAGGGAGTGGCCAACT

CCATCACTAGGGGTTCCTTGTAGTTAATGATTAACCCGCCATGCTACTTA

TCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGGAGTTCCGC

GTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCC

CCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAG

GGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCAC

TTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGT

CAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTAT

GGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACC

ATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCCCC

CTCCCCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTGTGCAG

CGATGGGGGCGGGGGGGGGGGGGGCGCGCGCCAGGCGGGGGGGGCGGGG

CGAGGGGGGGGCGGGGCGAGGCGGAGAGGTGCGGCGGCAGCCAATCAGAG

CGGCGCGCTCCGAAAGTTTCCTTTTATGGCGAGGCGGCGGCGGCGGCGGC

CCTATAAAAAGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCGCTGCCTT

CGCCCCGTGCCCCGCTCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTCTG

ACTGACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTTTG

GCGCCTCCCGCGGGCGCCCCCCTCCTCACGGCGAGCGCTGCCACGTCAGA

CGAAGGGCGCAGCGAGCGTCCTGATCCTTCCGCCCGGACGCTCAGGACAG

CGGCCCGCTGCTCATAAGACTCGGCCTTAGAACCCCAGTATCAGCAGAAG

GACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTTCTTTCC

AGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCGG

AGGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGT

TCATGTTTTCTTTTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACCG

CCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGACTG

CTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACCGT

CGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGTAATAAAGGTCTG

GGAATCACCCGTTTTGGCCTCTGACTGACGGGTGATTCCGACCTTTATTA

CAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAG

-continued

CCTGGAGGCTTGCTGAAGGCTGTATGCTGTAATACGCCAGATCACCATCA

GCGTTTTGGCCTCTGACTGACGCTGATGGTGCTGGCGTATTACAGGACAC

AAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGG

CTTGCTGAAGGCTGTATGCTGATACAGAAACGAAGGTTCAGGCCGTTTTG

GCCTCTGACTGACGGCCTGAACCCGTTTCTGTATCAGGACACAAGGCCTG

TTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 24 = SEQ ID NO. 1 + SEQ ID NO. 12

5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTT

AACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTT

GTATCATGCTATTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATA

AATCCTGGTTGCTGTCTCTTTATGAGGAGTTGTGGCCCGTTGTCAGGCAA

CGTGGCGTGGTGTGCACTGTGTTTGCTGACGCAACCCCCACTGGTTGGGG

CATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTTTCCCCCTCC

CTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCCGCTGCTGGACA

GGGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGAAATC

ATCGTCCTTTCCTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCG

GGACGTCCTTCTGCTACGTCCCTTCGGCCCTCAATCCAGCGGACCTTCCT

TCCCGCGGCCTGCTGCCGGCTCTGCGGCCTCTTCCGCGTCTTCGCCTTCG

CCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCCTCCCCGCCTAAGCTTA

TCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAA

ATAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGC

ATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGG

ATCTCGACCTCGACTAGAGCATGGCTACGTAGATAAGTAGCATGGCGGGT

TAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCT

CTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGACG

CCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCAGCTGGC

GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGC

CTGAATGGCGAATGGCGATTCCGTTGCAATGGCTGGCGGTAATATTGTTC

TGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTCAGGCAAGT

GATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTGA

TGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTC

AGGATTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTG

TTTAGCTCCCGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGT

CAAAGCAACCATAGTACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGT

GTGGTGGTTACGCGCAGCGTGACCGCTACACTTGCCAGCGCCCTAGCGCC

CGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCGGCTTTC

CCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCT

TTACGGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAG

TGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCA

-continued

CGTTCTTTAATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCT

ATCTCGGTCTATTCTTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTA

TTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATTTTAACA

AAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTT

TTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGT

TTTACGATTACCGTTCATCGATTCTCTTGTTTGCTCCAGACTCTCAGGCA

ATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCTCTCCG

GCATGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTG

ACTGTCTCCGGCCTTTCTCACCCGTTTGAATCTTTACCTACACATTACTC

AGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTTTATCCTTGCG

TTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTT

GGTACAACCGATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGC

TAATTCTTTGCCTTGCCTGTATGATTTATTGGATGTTGGAATTCCTGATG

CGGTATTTTCTCCTTACGCATCTGTGCGGTATTTCACACCGCATATGGTG

CACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGAC

ACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCA

TCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAG

GTTTTCACCGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATAC

GCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTTCTTAGACGTCA

GGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTT

CTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAA

TGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGT

GTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCA

CCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCAC

GAGTGGGTTACATCGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGT

TTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCT

ATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTC

GCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACA

GAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGC

CATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCG

GAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTA

ACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGA

CGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAAC

TATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGAC

TGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCC

GGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTC

GCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTA

GTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACA

GATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACC

-continued

AAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTT

AAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCC

TTAACGTGAGTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCA

AAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAA

ACAAAAAAACCACCGCTACCAGCGGTGGTTTGTTTGCCGGATCAAGAGCT

ACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGATACCAA

ATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCT

GTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC

TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGT

TACCGGATAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAG

CCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGA

GCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATC

CGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGG

GGAAACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACT

TGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAA

ACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTT

GCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTAT

TACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGC

GCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCG

CCTCTCCCCGCGCGTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGC

TCGCTCACTGAGGCCGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGG

TCGCCCGGCCTCAGTGAGCGAGCGAGCGCGCAGAGAGGGAGTGGCCAACT

CCATCACTAGGGGTTCCTTGTAGTTAATGATTAACCCGCCATGCTACTTA

TCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGGAGTTCCGC

GTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCC

CCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAG

GGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCAC

TTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGT

CAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTAT

GGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACC

ATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCCCC

CTCCCCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTGTGCAG

CGATGGGGGCGGGGGGGGGGGGGGGCGCGCGCCAGGCGGGGGGGGGGGG

CGAGGGGCGGGGGGGGCGAGGCGGAGAGGTGCGGCGGCAGCCAATCAGAG

CGGCGCGCTCCGAAAGTTTCCTTTTATGGCGAGGCGGCGGCGGCGGCGGC

CCTATAAAAAGCGAAGCGCGCGGCGGGCGGGAGTCGCTGCGCGCTGCCTT

CGCCCCGTGCCCCGCTCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTCTG

ACTGACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTTTG

GCGCCTCCCGCGGGCGCCCCCCTCCTCACGGCGAGCGCTGCCACGTCAGA

-continued

CGAAGGGCGCAGCGAGCGTCCTGATCCTTCCGCCCGGACGCTCAGGACAG

CGGCCCGCTGCTCATAAGACTCGGCCTTAGAACCCCAGTATCAGCAGAAG

GACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTTCTTTCC

AGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCGG

AGGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGT

TCATGTTTTCTTTTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACCG

CCACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGACTG

CTGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACCGT

CGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGTCAGATCGCTGTG

GTAAACAGGCGTTTTGGCCTCTGACTGACGCCTGTTTACCAGCGATCTGA

CAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAG

CCTGGAGGCTTGCTGAAGGCTGTATGCTGAGAATCAGATCAGATAGCGAT

CCGTTTTGGCCTCTGACTGACGGATCGCTATCTGCTGATTCTCAGGACAC

AAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGG

CTTGCTGAAGGCTGTATGCTGAAACATGCCAACAGCAGAATGCCGTTTTG

GCCTCTGACTGACGGCATTCTGCTGGGCATGTTTCAGGACACAAGGCCTG

TTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 25 = SEQ ID NO. 1 + SEQ ID NO. 13

5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTT

AACTATGTTGCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTT

GTATCATGCTATTGCTTCCCGTATGGCTTTCATTTTCTCCTCCTTGTATA

AATCCTGGTTGCTGTCTCTTTATGAGGAGTTGTGGCCCGTTGTCAGGCAA

CGTGGCGTGGTGTGCACTGTGTTTGCTGACGCAACCCCCACTGGTTGGGG

CATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTTTCCCCCTCC

CTATTGCCACGGCGGAACTCATCGCCGCCTGCCTTGCCCGCTGCTGGACA

GGGGCTCGGCTGTTGGGCACTGACAATTCCGTGGTGTTGTCGGGGAAATC

ATCGTCCTTTCCTTGGCTGCTCGCCTGTGTTGCCACCTGGATTCTGCGCG

GGACGTCCTTCTGCTACGTCCCTTCGGCCCTCAATCCAGCGGACCTTCCT

TCCCGCGGCCTGCTGCCGGCTCTGCGGCCTCTTCCGCGTCTTCGCCTTCG

CCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCCTCCCCGCCTAAGCTTA

TCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAA

ATAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGC

ATTCTAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGG

ATCTCGACCTCGACTAGAGCATGGCTACGTAGATAAGTAGCATGGCGGGT

TAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCT

CTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGACG

CCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCAGCTGGC

GTAATAGCGAAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGC

CTGAATGGCGAATGGCGATTCCGTTGCAATGGCTGGCGGTAATATTGTTC

TGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTCAGGCAAGT

-continued

GATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTGA

TGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTC

AGGATTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTG

TTTAGCTCCCGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGT

CAAAGCAACCATAGTACGCGCCCTGTAGCGGCGCATTAAGCGCGGCGGGT

GTGGTGGTTACGCGCAGCGTGACCGCTACACTTGCCAGCGCCCTAGCGCC

CGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTTCGCCGGCTTTC

CCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCT

TTACGGCACCTCGACCCCAAAAAACTTGATTAGGGTGATGGTTCACGTAG

TGGGCCATCGCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCA

CGTTCTTTAATAGTGGACTCTTGTTCCAAACTGGAACAACACTCAACCCT

ATCTCGGTCTATTCTTTTGATTTATAAGGGATTTTGCCGATTTCGGCCTA

TTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATTTTAACA

AAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTT

TTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGT

TTTACGATTACCGTTCATCGATTCTCTTGTTTGCTCCAGACTCTCAGGCA

ATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCTCTCCG

GCATGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTG

ACTGTCTCCGGCCTTTCTCACCCGTTTGAATCTTTACCTACACATTACTC

AGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTTTATCCTTGCG

TTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTT

GGTACAACCGATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGC

TAATTCTTTGCCTTGCCTGTATGATTTATTGGATGTTGGAATTCCTGATG

CGGTATTTTCTCCTTACGCATCTGTGCGGTATTTCACACCGCATATGGTG

CACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGAC

ACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCA

TCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAG

GTTTTCACCGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATAC

GCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTTCTTAGACGTCA

GGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTT

CTAAATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAA

TGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGT

GTCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTTTGCTCA

CCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCAC

GAGTGGGTTACATCGAACTGGATCTCAACAGCGGTAAGATCCTTGAGAGT

TTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACTTTTAAAGTTCTGCT

ATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTC

GCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACA

GAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGC

-continued

CATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCG

GAGGACCGAAGGAGCTAACCGCTTTTTTGCACAACATGGGGGATCATGTA

ACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGA

CGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAAC

TATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGAC

TGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCC

GGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTC

GCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTA

GTTATCTACACGACGGGGAGTCAGGCAACTATGGATGAACGAAATAGACA

GATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACC

AAGTTTACTCATATATACTTTAGATTGATTTAAAACTTCATTTTTAATTT

AAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCC

TTAACGTGAGTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCA

AAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAA

ACAAAAAAACCACCGCTACCAGCGGTGGTTTGTTTGCCGGATCAAGAGCT

ACCAACTCTTTTTCCGAAGGTAACTGGCTTCAGCAGAGCGCAGATACCAA

ATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCT

GTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGC

TGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGT

TACCGGATAAGGCGCAGCGGTCGGGCTGAACGGGGGGTTCGTGCACACAG

CCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGA

GCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATC

CGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGG

GGAAACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACT

TGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAA

ACGCCAGCAACGCGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTT

GCTCACATGTTCTTTCCTGCGTTATCCCCTGATTCTGTGGATAACCGTAT

TACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGC

GCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCG

CCTCTCCCCGCGCGTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGC

TCGCTCACTGAGGCCGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGG

TCGCCCGGCCTCAGTGAGCGAGCGAGCGCGCAGAGAGGGAGTGGCCAACT

CCATCACTAGGGGTTCCTTGTAGTTAATGATTAACCCGCCATGCTACTTA

TCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGTGGAGTTCCGC

GTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCC

CCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAG

GGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCAC

TTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACGT

CAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTAT

-continued

GGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACC

ATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCCCC

CTCCCCACCCCCAATTTTGTATTTATTTATTTTTTAATTATTTTGTGCAG

CGATGGGGGCGGGGGGGGGGGGGGGCGCGCGCCAGGCGGGGGGGGGGGGG

CGAGGGGCGGGGGGGGCGAGGCGGAGAGGTGCGGCGGCAGCCAATCAGAG

CGGCGCGCTCCGAAAGTTTCCTTTTATGGCGAGGCGGCGGCGGCGGCGGC

CCTATAAAAAGCGAAGCGCGCGGCGGGGGGAGTCGCTGCGCGCTGCCTTC

GCCCCGTGCCCCGCTCCGCCGCCGCCTCGCGCCGCCCGCCCCGGCTCTGA

CTGACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTTTGG

CGCCTCCCGCGGGCGCCCCCCTCCTCACGGCGAGCGCTGCCACGTCAGAC

GAAGGGCGCAGCGAGCGTCCTGATCCTTCCGCCCGGACGCTCAGGACAGC

GGCCCGCTGCTCATAAGACTCGGCCTTAGAACCCCAGTATCAGCAGAAGG

ACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGTTTTCTTTCCA

GAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCGGA

GGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTT

CATGTTTTCTTTTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACCGC

CACCATGGCCACCGGCTCTCGCACAAGCCTGCTGCTGGCTTTCGGACTGC

TGTGCCTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACCGTC

GCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGACAATCAGATATGG

TTGCTCGGCGTTTTGGCCTCTGACTGACGCCGAGCAACTATCTGATTGTC

AGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGC

CTGGAGGCTTGCTGAAGGCTGTATGCTGTTTCACAATGCATCGTTCAGCG

CGTTTTGGCCTCTGACTGACGCGCTGAACGGCATTGTGAAACAGGACACA

AGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGGC

TTGCTGAAGGCTGTATGCTGACAATAATGCCAACAGGGTGGTCGTTTTGG

CCTCTGACTGACGACCACCCTGGGCATTATTGTCAGGACACAAGGCCTGT

TACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

[0075] 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 miRNA expression cassettes may be connected at the 3' end of SEQ ID NO. 1, as shown in SEQ ID NO. 14, SEQ ID NO. 15, SEQ ID NO. 16, SEQ ID NO. 17, SEQ ID NO. 18, SEQ ID NO. 19, SEQ ID NO. 20, SEQ ID NO. 21, SEQ ID NO. 22, SEQ ID NO. 23, SEQ ID NO. 24 and SEQ ID NO. 25, or at the 5' end of SEQ ID NO. 1.

[0076] 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 decreased 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 miRNA 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 miRNA 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 miRNA 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 miRNA expression cassettes causes the desired result.

Example 1—Expression Cassette

[0077] Expression cassettes for expressing miRNA 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 miRNA 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 miRNA 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 miRNA expression cassettes were 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: 25
SEQ ID NO: 1 moltype = DNA length = 5799
FEATURE Location/Qualifiers
source 1..5799
mol_type = other DNA
organism = synthetic construct
SEQUENCE: 1

```
aatcaacctc tggattacaa aatttgtgaa agattgactg gtattcttaa ctatgttgct  60
ccttttacgc tatgtggata cgctgcttta atgcctttgt atcatgctat tgcttcccgt  120
atggctttca ttttctcctc cttgtataaa tcctggttgc tgtctcttta tgaggagttg  180
tggcccgttg tcaggcaacg tggcgtggtg tgcactgtgt ttgctgacgc aacccccact  240
ggttggggca ttgccaccac ctgtcagctc ctttccggga ctttcgcttt ccccctccct  300
attgccacgg cggaactcat cgccgcctgc cttgcccgct gctggacagg ggctcggctg  360
ttgggcactg acaattccgt ggtgttgtcg gggaaatcat cgtcctttcc ttggctgctc  420
gcctgtgttg ccacctggat tctgcgcggg acgtccttct gctacgtccc ttcggccctc  480
aatccagcgg accttccttc ccgcggcctg ctgccggctc tgcggcctct tccgcgtctt  540
cgccttcgcc ctcagacgag tcggatctcc ctttgggccg cctccccgcc taagcttatc  600
gataccgtcg agatctaact tgtttattgc agcttataat ggttacaaat aaagcaatag  660
catcacaaat ttcacaaata aagcattttt ttcactgcat tctagttgtg gtttgtccaa  720
actcatcaat gtatcttatc atgtctggat ctcgacctcg actagagcat ggctacgtag  780
ataagtagca tggcgggtta atcattaact acaaggaacc cctagtgatg gagttggcca  840
ctccctctct gcgcgctcgc tcgctcactg aggccgggcg accaaaggtc gcccgacgcc  900
cgggctttgc ccgggcggcc tcagtgagcg agcgagcgcg cagctggcgt aatagcgaag  960
aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa tggcgattcc  1020
gttgcaatgg ctggcggtaa tattgttctg gatattacca gcaaggccga tagtttgagt  1080
tcttctactc aggcaagtga tgttattact aatcaaagaa gtattgcgac aacggttaat  1140
ttgcgtgatg gacagactct tttactcggt ggcctcactg attataaaaa cacttctcag  1200
gattctggcg taccgttcct gtctaaaatc cctttaatcg gcctcctgtt tagctcccgc  1260
tctgattcta acgaggaaag cacgttatac gtgctcgtca aagcaaccat agtacgcgcc  1320
ctgtagcggc gcattaagcg cggcgggtgt ggtggttacg cgcagcgtga ccgctacact  1380
tgccagcgcc ctagcgcccg ctcctttcgc tttcttccct tcctttctcg ccacgttcgc  1440
cggctttccc cgtcaagctc taaatcgggg gctcccttta gggttccgat ttagtgcttt  1500
acggcacctc gaccccaaaa aacttgatta gggtgatggt tcacgtagtg ggccatcgcc  1560
ctgatagacg gtttttcgcc ctttgacgtt ggagtccacg ttctttaata gtggactctt  1620
gttccaaact ggaacaacac tcaaccctat ctcggtctat tcttttgatt tataagggat  1680
tttgccgatt tcggcctatt ggttaaaaaa tgagctgatt taacaaaaat ttaacgcgaa  1740
ttttaacaaa atattaacgt ttacaattta aatatttgct tatacaatct tcctgttttt  1800
ggggcttttc tgattatcaa ccggggtaca tatgattgac atgctagttt tacgattacc  1860
gttcatcgat tctcttgttt gctccagact ctcaggcaat gacctgatag cctttgtaga  1920
gacctctcaa aaatagctac cctctccggc atgaatttat cagctagaac ggttgaatat  1980
catattgatg gtgatttgac tgtctccggc ctttctcacc cgtttgaatc tttacctaca  2040
cattactcag gcattgcatt taaaatatat gagggttcta aaaatttta tccttgcgtt  2100
gaaataaagg cttctcccgc aaaagtatta cagggtcata atgtttttgg tacaaccgat  2160
ttagctttat gctctgaggc tttattgctt aattttgcta attctttgcc ttgcctgtat  2220
gatttattgg atgttggaat tcctgatgcg gtattttctc cttacgcatc tgtgcggtat  2280
ttcacaccgc atatggtgca ctctcagtac aatctgctct gatgccgcat agttaagcca  2340
gccccgacac ccgccaacac ccgctgacgc gccctgacgg gcttgtctgc tcccggcatc  2400
cgcttacaga caagctgtga ccgtctccgg gagctgcatg tgtcagaggt tttcaccgtc  2460
atcaccgaaa cgcgcgagac gaaagggcct cgtgatacgc ctatttttat aggttaatgt  2520
catgataata atggtttctt agacgtcagg tggcactttt cggggaaatg tgcgcggaac  2580
ccctatttgt ttatttttct aaatacattc aaatatgtat ccgctcatga gacaataacc  2640
ctgataaatg cttcaataat attgaaaaag gaagagtatg agtattcaac atttccgtgt  2700
```

-continued

```
cgcccttatt ccctttttg cggcattttg ccttcctgtt tttgctcacc cagaaacgct  2760
ggtgaaagta aaagatgctg aagatcagtt gggtgcacga gtgggttaca tcgaactgga  2820
tctcaacagc ggtaagatcc ttgagagttt tcgccccgaa gaacgttttc caatgatgag  2880
cacttttaaa gttctgctat gtggcgcggt attatcccgt attgacgccg ggcaagagca  2940
actcggtcgc cgcatacact attctcagaa tgacttggtt gagtactcac cagtcacaga  3000
aaagcatctt acggatggca tgacagtaag agaattatgc agtgctgcca taaccatgag  3060
tgataacact gcggccaact tacttctgac aacgatcgga ggaccgaagg agctaaccgc  3120
ttttttgcac aacatggggg atcatgtaac tcgccttgat cgttgggaac cggagctgaa  3180
tgaagccata ccaaacgacg agcgtgacac cacgatgcct gtagcaatgg caacaacgtt  3240
gcgcaaacta ttaactggcg aactacttac tctagcttcc cggcaacaat taatagactg  3300
gatggaggcg gataaagttg caggaccact tctgcgctcg gcccttccgg ctggctggtt  3360
tattgctgat aaatctggag ccggtgagcg tgggtctcgc ggtatcattg cagcactggg  3420
gccagatggt aagccctccc gtatcgtagt tatctacacg acggggagtc aggcaactat  3480
ggatgaacga aatagacaga tcgctgagat aggtgcctca ctgattaagc attggtaact  3540
gtcagaccaa gtttactcat atatacttta gattgattta aaacttcatt tttaatttaa  3600
aaggatctag gtgaagatcc tttttgataa tctcatgacc aaaatccctt aacgtgagtt  3660
ttcgttccac tgagcgtcag accccgtaga aaagatcaaa ggatcttctt gagatccttt  3720
ttttctgcgc gtaatctgct gcttgcaaac aaaaaaacca ccgctaccag cggtggtttg  3780
tttgccggat caagagctac caactctttt tccgaaggta actggcttca gcagagcgca  3840
gataccaaat actgtccttc tagtgtagcc gtagttaggc caccacttca agaactctgt  3900
agcaccgcct acatacctcg ctctgctaat cctgttacca gtggctgctg ccagtggcga  3960
taagtcgtgt cttaccgggt tggactcaag acgatagtta ccggataagg cgcagcggtc  4020
gggctgaacg gggggttcgt gcacacagcc cagcttggag cgaacgacct acaccgaact  4080
gagataccta cagcgtgagc tatgagaaag cgccacgctt cccgaaggga gaaaggcgga  4140
caggtatccg gtaagcggca gggtcggaac aggagagcgc acgagggagc ttccaggggg  4200
aaacgcctgg tatctttata gtcctgtcgg gtttcgccac ctctgacttg agcgtcgatt  4260
tttgtgatgc tcgtcagggg ggcggagcct atggaaaaac gccagcaacg cggccttttt  4320
acggttcctg gccttttgct ggccttttgc tcacatgttc tttcctgcgt tatcccctga  4380
ttctgtggat aaccgtatta ccgcctttga gtgagctgat accgctcgcc gcagccgaac  4440
gaccgagcgc agcgagtcag tgagcgagga agcggaagag cgcccaatac gcaaaccgcc  4500
tctccccgcg cgttggccga ttcattaatg cagcagctgc gcgctcgctc gctcactgag  4560
gccgcccggg caaagcccgg gcgtcgggcg acctttggtc gcccggcctc agtgagcgag  4620
cgagcgcgca gagagggagt ggccaactcc atcactaggg gttccttgta gttaatgatt  4680
aacccgccat gctacttatc tacgtagcca tgctctagga cattgattat tgactagtgg  4740
agttccgcgt tacataactt acggtaaatg gcccgcctgg ctgaccgccc aacgaccccc  4800
gcccattgac gtcaataatg acgtatgttc ccatagtaac gccaataggg actttccatt  4860
gacgtcaatg ggtggagtat ttacggtaaa ctgcccactt ggcagtacat caagtgtatc  4920
atatgccaag tacgcccccc attgacgtca atgacggtaa atggcccgcc tggcattatg  4980
cccagtacat gaccttatgg gactttccta cttggcagta catctacgta ttagtcatcg  5040
ctattaccat ggtcgaggtg agccccacgt tctgcttcac tctccccatc tccccccccc  5100
ccccacccc aattttgtat ttatttattt tttaattatt ttgtgcagcg atgggggcgg  5160
gggggggggg gggcgcgcgc caggcggggc ggggcggggc gaggggcggg gcggggcgag  5220
gcggagaggt gcggcggcag ccaatcagag cggcgcgctc cgaaagtttc cttttatggc  5280
gaggcggcgg cggcggcggc cctataaaaa gcgaagcgcg cggcgggcgg gagtcgctgc  5340
gcgctgcctt cgccccgtgc cccgctccgc cgccgcctcg cgccgcccgc cccggctctg  5400
actgaccgcg ttactaaaac aggtaagtcc ggcctccgcg ccgggttttg gcgcctcccg  5460
cgggcgcccc cctcctcacg gcgagcgctg ccacgtcaga cgaagggcgc agcgagcgtc  5520
ctgatccttc cgcccggacg ctcaggacag cggcccgctg ctcataagac tcggccttag  5580
aaccccagta tcagcagaag gacattttag gacgggactt gggtgactct agggcactgg  5640
ttttctttcc agagagcgga acaggcgagg aaaagtagtc ccttctcggc gattctgcgg  5700
agggatctcc gtggggcggt gaacgccgat gatgcctcta ctaaccatgt tcatgttttc  5760
ttttttttte tacaggtcct gggtgacgaa cagggtacc                          5799
```

```
SEQ ID NO: 2           moltype = DNA  length = 540
FEATURE                Location/Qualifiers
source                 1..540
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 2
gccaccatgg ccaccggctc tcgcacaagc ctgctgctgg ctttcggact gctgtgcctg  60
ccttggctcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt  120
gctgaaggct gtatgctgat caatcggatt gcggtaatcg cgttttggcc tctgactgac  180
gcgattaccg atccgattga tcaggacaca aggcctgtta ctagcactca catggaacaa  240
atggcctcta gcctggaggc ttgctgaagg ctgtatgctg atctttgcta aattggtgca  300
cgcgttttgg cctctgactg acgcgtgcac cattagcaaa gatcaggaca caaggcctgt  360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgctgaa ggctgtatgc  420
tgacttcaat cacaattcca gcgccgtttt ggcctctgac tgacggcgct ggaagtgatt  480
gaagtcagga cacaaggcct gttactagca ctcacatgga acaaatggcc tctctagaat  540

SEQ ID NO: 3           moltype = DNA  length = 540
FEATURE                Location/Qualifiers
source                 1..540
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 3
gccaccatgg ccaccggctc tcgcacaagc ctgctgctgg ctttcggact gctgtgcctg  60
```

-continued

```
ccttggctcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt  120
gctgaaggct gtatgctgta atctttcgct ggctgcagtt cgttttggcc tctgactgac  180
gaactgcagc gcgaaagatt acaggacaca aggcctgtta ctagcactca catggaacaa  240
atggcctcta gcctggaggc ttgctgaagg ctgtatgctg tgttaatgct gatgtcacgc  300
tgcgttttgg cctctgactg acgcagcgtg accagcatta acacaggaca caaggcctgt  360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgctgaa ggctgtatgc  420
tgttcacctg gttaacacat acaccgtttt ggcctctgac tgacggtgta tgtgaaccag  480
gtgaacagga cacaaggcct gttactagca ctcacatgga acaaatggcc tctctagaat  540

SEQ ID NO: 4           moltype = DNA  length = 540
FEATURE                Location/Qualifiers
source                 1..540
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 4
gccaccatgg ccaccggctc tcgcacaagc ctgctgctgg ctttcggact gctgtgcctg  60
ccttggctcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt  120
gctgaaggct gtatgctgat ttcttcctgt gcgctttcgc cgttttggcc tctgactgac  180
ggcgaaagcg caggaagaaa tcaggacaca aggcctgtta ctagcactca catggaacaa  240
atggcctcta gcctggaggc ttgctgaagg ctgtatgctg agaataatca gatcagcacg  300
ctcgttttgg cctctgactg acgagcgtgc tgctgattat tctcaggaca caaggcctgt  360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgctgaa ggctgtatgc  420
tgtaatcagg ctgaattcag atagcgtttt ggcctctgac tgacgctatc tgaacagcct  480
gattacagga cacaaggcct gttactagca ctcacatgga acaaatggcc tctctagaat  540

SEQ ID NO: 5           moltype = DNA  length = 540
FEATURE                Location/Qualifiers
source                 1..540
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 5
gccaccatgg ccaccggctc tcgcacaagc ctgctgctgg ctttcggact gctgtgcctg  60
ccttggctcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt  120
gctgaaggct gtatgctgat aatcaccgct gcaggttcag cgttttggcc tctgactgac  180
gctgaacctg gcggtgatta tcaggacaca aggcctgtta ctagcactca catggaacaa  240
atggcctcta gcctggaggc ttgctgaagg ctgtatgctg ttcaatcgcg tattggtaat  300
cgcgttttgg cctctgactg acgcgattac caacgcgatt gaacaggaca caaggcctgt  360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgctgaa ggctgtatgc  420
tgtgatcatg ctgaaaatgg tgcacgtttt ggcctctgac tgacgtgcac cattcagcat  480
gatcacagga cacaaggcct gttactagca ctcacatgga acaaatggcc tctctagaat  540

SEQ ID NO: 6           moltype = DNA  length = 540
FEATURE                Location/Qualifiers
source                 1..540
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 6
gccaccatgg ccaccggctc tcgcacaagc ctgctgctgg ctttcggact gctgtgcctg  60
ccttggctcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt  120
gctgaaggct gtatgctgag gtaatatcct gacgctcagc cgttttggcc tctgactgac  180
ggctgagcgt ggatattacc tcaggacaca aggcctgtta ctagcactca catggaacaa  240
atggcctcta gcctggaggc ttgctgaagg ctgtatgctg tacagaatca gataatcagc  300
gccgttttgg cctctgactg acggcgctga ttctgattct gtacaggaca caaggcctgt  360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgctgaa ggctgtatgc  420
tgtcatgttt aaaaattcgc tgcgcgtttt ggcctctgac tgacgcgcag cgaatttaaa  480
catgacagga cacaaggcct gttactagca ctcacatgga acaaatggcc tctctagaat  540

SEQ ID NO: 7           moltype = DNA  length = 540
FEATURE                Location/Qualifiers
source                 1..540
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 7
gccaccatgg ccaccggctc tcgcacaagc ctgctgctgg ctttcggact gctgtgcctg  60
ccttggctcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt  120
gctgaaggct gtatgctgat gaatcgggtt gtctgaatcg cgttttggcc tctgactgac  180
gcgattcaga acccgattca tcaggacaca aggcctgtta ctagcactca catggaacaa  240
atggcctcta gcctggaggc ttgctgaagg ctgtatgctg aacactttgc tatatcatcc  300
tgcgttttgg cctctgactg acgcaggatg atagcaaagt gttcaggaca caaggcctgt  360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgctgaa ggctgtatgc  420
tgttctgttc gttaagctaa tgctcgtttt ggcctctgac tgacgagcat tagcaacgaa  480
cagaacagga cacaaggcct gttactagca ctcacatgga acaaatggcc tctctagaat  540

SEQ ID NO: 8           moltype = DNA  length = 540
FEATURE                Location/Qualifiers
source                 1..540
```

-continued

```
                     mol_type = other DNA
                     organism = synthetic construct
SEQUENCE: 8
gccaccatgg ccaccggctc tcgcacaagc ctgctgctgg ctttcggact gctgtgcctg  60
ccttggctcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt  120
gctgaaggct gtatgctgga gcattagcaa tgcgaacaga agttttggcc tctgactgac  180
ttctgttcgt tgctaatgct ccaggacaca aggcctgtta ctagcactca catggaacaa  240
atggcctcta gcctggaggc ttgctgaagg ctgtatgctg aaacataatg gattcagcag  300
cgcgttttgg cctctgactg acgcgctgct gaccattatg tttcaggaca caaggcctgt  360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgctgaa ggctgtatgc  420
tgttatcttt gcgaagctgc catccgtttt ggcctctgac tgacggatgg cagccgcaaa  480
gataacagga cacaaggcct gttactagca ctcacatgga acaaatggcc tctctagaat  540

SEQ ID NO: 9          moltype = DNA  length = 538
FEATURE               Location/Qualifiers
source                1..538
                      mol_type = other DNA
                      organism = synthetic construct
SEQUENCE: 9
gccaccatgg ccaccggctc tcgcacaagc ctgctgctgg ctttcggact gctgtgcctg  60
ccttggctcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt  120
gctgaaggct gtatgctggc tcctccactt ggtggtttgg ttttggcctc tgactgacgc  180
ggcaacattc tggtgattac aggacacaag gcctgttact agcactcaca tggaacaaat  240
ggcctctagc ctggaggctt gctgaaggct gtatgctgtc ataatcgcta tttggtgcgg  300
cgttttggcc tctgactgac gccgcaccaa agcgattatg acaggacaca aggcctgtta  360
ctagcactca catggaacaa atggcctcta gcctggaggc ttgctgaagg ctgtatgctg  420
ttctgatcct gaagttcggg ttcgttttgg cctctgactg acgaacccga accaggatca  480
gaacaggaca caaggcctgt tactagcact cacatggaac aaatggcctc tctagaat    538

SEQ ID NO: 10         moltype = DNA  length = 540
FEATURE               Location/Qualifiers
source                1..540
                      mol_type = other DNA
                      organism = synthetic construct
SEQUENCE: 10
gccaccatgg ccaccggctc tcgcacaagc ctgctgctgg ctttcggact gctgtgcctg  60
ccttggctcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt  120
gctgaaggct gtatgctgaa atcttccggt ggttccactg cgttttggcc tctgactgac  180
gcagtggaac ccggaagatt tcaggacaca aggcctgtta ctagcactca catggaacaa  240
atggcctcta gcctggaggc ttgctgaagg ctgtatgctg atatcctgaa tatggtatgc  300
agcgttttgg cctctgactg acgctgcata ccattcagga tatcaggaca caaggcctgt  360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgctgaa ggctgtatgc  420
tgtttaaagc tcaaacgcgt tcgccgtttt ggcctctgac tgacggcgaa cgcgtgagct  480
ttaaacagga cacaaggcct gttactagca ctcacatgga acaaatggcc tctctagaat  540

SEQ ID NO: 11         moltype = DNA  length = 540
FEATURE               Location/Qualifiers
source                1..540
                      mol_type = other DNA
                      organism = synthetic construct
SEQUENCE: 11
gccaccatgg ccaccggctc tcgcacaagc ctgctgctgg ctttcggact gctgtgcctg  60
ccttggctcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt  120
gctgaaggct gtatgctgta ataaaggtct gggaatcacc cgttttggcc tctgactgac  180
gggtgattcc gacctttatt acaggacaca aggcctgtta ctagcactca catggaacaa  240
atggcctcta gcctggaggc ttgctgaagg ctgtatgctg taatacgcca gatcaccatc  300
agcgttttgg cctctgactg acgctgatgg tgctggcgta ttacaggaca caaggcctgt  360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgctgaa ggctgtatgc  420
tgatacagaa acgaaggttc aggccgtttt ggcctctgac tgacggcctg aacccgtttc  480
tgtatcagga cacaaggcct gttactagca ctcacatgga acaaatggcc tctctagaat  540

SEQ ID NO: 12         moltype = DNA  length = 540
FEATURE               Location/Qualifiers
source                1..540
                      mol_type = other DNA
                      organism = synthetic construct
SEQUENCE: 12
gccaccatgg ccaccggctc tcgcacaagc ctgctgctgg ctttcggact gctgtgcctg  60
ccttggctcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt  120
gctgaaggct gtatgctgtc agatcgctgt ggtaaacagg cgttttggcc tctgactgac  180
gcctgtttac cagcgatctg acaggacaca aggcctgtta ctagcactca catggaacaa  240
atggcctcta gcctggaggc ttgctgaagg ctgtatgctg agaatcagat cagatagcga  300
tccgttttgg cctctgactg acggatcgct atctgctgat tctcaggaca caaggcctgt  360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgctgaa ggctgtatgc  420
tgaaacatgc caacagcaga atgccgtttt ggcctctgac tgacggcatt ctgctgggca  480
tgtttcagga cacaaggcct gttactagca ctcacatgga acaaatggcc tctctagaat  540
```

-continued

SEQ ID NO: 13 moltype = DNA length = 540
FEATURE Location/Qualifiers
source 1..540
mol_type = other DNA
organism = synthetic construct
SEQUENCE: 13
gccaccatgg ccaccggctc tcgcacaagc ctgctgctgg ctttcggact gctgtgcctg 60
ccttggctcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt 120
gctgaaggct gtatgctgac aatcagatat ggttgctcgg cgttttggcc tctgactgac 180
gccgagcaac tatctgattg tcaggacaca aggcctgtta ctagcactca catggaacaa 240
atggcctcta gcctggaggc ttgctgaagg ctgtatgctg tttcacaatg catcgttcag 300
cgcgttttgg cctctgactg acgcgctgaa cggcattgtg aaacaggaca caaggcctgt 360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgctgaa ggctgtatgc 420
tgacaataat gccaacaggg tggtcgtttt ggcctctgac tgacgaccac cctgggcatt 480
attgtcagga cacaaggcct gttactagca ctcacatgga acaaatggcc tctctagaat 540

SEQ ID NO: 14 moltype = DNA length = 6339
FEATURE Location/Qualifiers
source 1..6339
mol_type = other DNA
organism = synthetic construct
SEQUENCE: 14
aatcaacctc tggattacaa aatttgtgaa agattgactg gtattcttaa ctatgttgct 60
ccttttacgc tatgtggata cgctgcttta atgcctttgt atcatgctat tgcttcccgt 120
atggctttca ttttctcctc cttgtataaa tcctggttgc tgtctcttta tgaggagttg 180
tggcccgttg tcaggcaacg tggcgtggtg tgcactgtgt ttgctgacgc aacccccact 240
ggttggggca ttgccaccac ctgtcagctc ctttccggga ctttcgcttt ccccctccct 300
attgccacgg cggaactcat cgccgcctgc cttgcccgct gctggacagg ggctcggctg 360
ttgggcactg acaattccgt ggtgttgtcg gggaaatcat cgtcctttcc ttggctgctc 420
gcctgtgttg ccacctggat tctgcgcggg acgtccttct gctacgtccc ttcggccctc 480
aatccagcgg accttccttc ccgcggcctg ctgccggctc tgcggcctct tccgcgtctt 540
cgccttcgcc ctcagacgag tcggatctcc ctttgggccg cctccccgcc taagcttatc 600
gataccgtcg agatctaact tgtttattgc agcttataat ggttacaaat aaagcaatag 660
catcacaaat ttcacaaata aagcattttt ttcactgcat tctagttgtg gtttgtccaa 720
actcatcaat gtatcttatc atgtctggat ctcgacctcg actagagcat ggctacgtag 780
ataagtagca tggcgggtta atcattaact acaaggaacc cctagtgatg gagttggcca 840
ctccctctct gcgcgctcgc tcgctcactg aggccgggcg accaaaggtc gcccgacgcc 900
cgggctttgc ccgggcggcc tcagtgagcg agcgagcgcg cagctggcgt aatagcgaag 960
aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa tggcgattcc 1020
gttgcaatgg ctggcggtaa tattgttctg gatattacca gcaaggccga tagtttgagt 1080
tcttctactc aggcaagtga tgttattact aatcaaagaa gtattgcgac aacggttaat 1140
ttgcgtgatg gacagactct tttactcggt ggcctcactg attataaaaa cacttctcag 1200
gattctggcg taccgttcct gtctaaaatc cctttaatcg gcctcctgtt tagctcccgc 1260
tctgattcta acgaggaaag cacgttatac gtgctcgtca aagcaaccat agtacgcgcc 1320
ctgtagcggc gcattaagcg cggcgggtgt ggtggttacg cgcagcgtga ccgctacact 1380
tgccagcgcc ctagcgcccg ctcctttcgc tttcttccct tcctttctcg ccacgttcgc 1440
cggctttccc cgtcaagctc taaatcgggg gctcccttta gggttccgat ttagtgcttt 1500
acggcacctc gaccccaaaa aacttgatta gggtgatggt tcacgtagtg ggccatcgcc 1560
ctgatagacg gtttttcgcc ctttgacgtt ggagtccacg ttctttaata gtggactctt 1620
gttccaaact ggaacaacac tcaaccctat ctcggtctat tcttttgatt tataagggat 1680
tttgccgatt tcggcctatt ggttaaaaaa tgagctgatt taacaaaaat ttaacgcgaa 1740
ttttaacaaa atattaacgt ttacaattta aatatttgct tatacaatct tcctgttttt 1800
ggggcttttc tgattatcaa ccggggtaca tatgattgac atgctagttt tacgattacc 1860
gttcatcgat tctcttgttt gctccagact ctcaggcaat gacctgatag cctttgtaga 1920
gacctctcaa aaatagctac cctctccggc atgaatttat cagctagaac ggttgaatat 1980
catattgatg gtgatttgac tgtctccggc ctttctcacc cgtttgaatc tttacctaca 2040
cattactcag gcattgcatt taaaatatat gagggttcta aaaatttttа tccttgcgtt 2100
gaaataaagg cttctcccgc aaaagtatta cagggtcata atgtttttgg tacaaccgat 2160
ttagctttat gctctgaggc tttattgctt aattttgcta attctttgcc ttgcctgtat 2220
gatttattgg atgttggaat tcctgatgcg gtattttctc cttacgcatc tgtgcggtat 2280
ttcacaccgc atatggtgca ctctcagtac aatctgctct gatgccgcat agttaagcca 2340
gccccgacac ccgccaacac ccgctgacgc gccctgacgg gcttgtctgc tcccggcatc 2400
cgcttacaga caagctgtga ccgtctccgg gagctgcatg tgtcagaggt tttcaccgtc 2460
atcaccgaaa cgcgcgagac gaaagggcct cgtgatacgc ctatttttat aggttaatgt 2520
catgataata atggtttctt agacgtcagg tggcactttt cggggaaatg tgcgcggaac 2580
ccctatttgt ttatttttct aaatacattc aaatatgtat ccgctcatga gacaataacc 2640
ctgataaatg cttcaataat attgaaaaag gaagagtatg agtattcaac atttccgtgt 2700
cgcccttatt ccctttttтg cggcattttg ccttcctgtt tttgctcacc cagaaacgct 2760
ggtgaaagta aaagatgctg aagatcagtt gggtgcacga gtgggttaca tcgaactgga 2820
tctcaacagc ggtaagatcc ttgagagttt tcgccccgaa gaacgttttc caatgatgag 2880
cacttttaaa gttctgctat gtggcgcggt attatcccgt attgacgccg ggcaagagca 2940
actcggtcgc cgcatacact attctcagaa tgacttggtt gagtactcac cagtcacaga 3000
aaagcatctt acggatggca tgacagtaag agaattatgc agtgctgcca taaccatgag 3060
tgataacact gcggccaact tacttctgac aacgatcgga ggaccgaagg agctaaccgc 3120
ttttttgcac aacatggggg atcatgtaac tcgccttgat cgttgggaac cggagctgaa 3180

-continued

```
tgaagccata ccaaacgacg agcgtgacac cacgatgcct gtagcaatgg caacaacgtt  3240
gcgcaaacta ttaactggcg aactacttac tctagcttcc cggcaacaat taatagactg  3300
gatggaggcg gataaagttg caggaccact tctgcgctcg gcccttccgg ctggctggtt  3360
tattgctgat aaatctggag ccggtgagcg tgggtctcgc ggtatcattg cagcactggg  3420
gccagatggt aagccctccc gtatcgtagt tatctacacg acggggagtc aggcaactat  3480
ggatgaacga aatagacaga tcgctgagat aggtgcctca ctgattaagc attggtaact  3540
gtcagaccaa gtttactcat atatacttta gattgattta aaacttcatt tttaatttaa  3600
aaggatctag gtgaagatcc tttttgataa tctcatgacc aaaatccctt aacgtgagtt  3660
ttcgttccac tgagcgtcag accccgtaga aaagatcaaa ggatcttctt gagatccttt  3720
ttttctgcgc gtaatctgct gcttgcaaac aaaaaaacca ccgctaccag cggtggtttg  3780
tttgccggat caagagctac caactctttt tccgaaggta actggcttca gcagagcgca  3840
gataccaaat actgtccttc tagtgtagcc gtagttaggc caccacttca agaactctgt  3900
agcaccgcct acatacctcg ctctgctaat cctgttacca gtggctgctg ccagtggcga  3960
taagtcgtgt cttaccgggt tggactcaag acgatagtta ccggataagg cgcagcggtc  4020
gggctgaacg gggggttcgt gcacacagcc cagcttggag cgaacgacct acaccgaact  4080
gagatacctа cagcgtgagc tatgagaaag cgccacgctt cccgaaggga gaaaggcgga  4140
caggtatccg gtaagcggca gggtcggaac aggagagcgc acgagggagc ttccaggggg  4200
aaacgcctgg tatctttata gtcctgtcgg gtttcgccac ctctgacttg agcgtcgatt  4260
tttgtgatgc tcgtcagggg ggcggagcct atggaaaaac gccagcaacg cggccttttt  4320
acggttcctg gccttttgct ggccttttgc tcacatgttc tttcctgcgt tatcccctga  4380
ttctgtggat aaccgtatta ccgcctttga gtgagctgat accgctcgcc gcagccgaac  4440
gaccgagcgc agcgagtcag tgagcgagga agcggaagag cgcccaatac gcaaaccgcc  4500
tctccccgcg cgttggccga ttcattaatg cagcagctgc gcgctcgctc gctcactgag  4560
gccgcccggg caaagcccgg gcgtcgggcg acctttggtc gcccggcctc agtgagcgag  4620
cgagcgcgca gagagggagt ggccaactcc atcactaggg gttccttgta gttaatgatt  4680
aacccgccat gctacttatc tacgtagcca tgctctagga cattgattat tgactagtgg  4740
agttccgcgt tacataactt acggtaaatg gcccgcctgg ctgaccgccc aacgacccccc  4800
gcccattgac gtcaataatg acgtatgttc ccatagtaac gccaataggg actttccatt  4860
gacgtcaatg ggtggagtat ttacggtaaa ctgcccactt ggcagtacat caagtgtatc  4920
atatgccaag tacgcccccc attgacgtca atgacggtaa atggcccgcc tggcattatg  4980
cccagtacat gaccttatgg gactttccta cttggcagta catctacgta ttagtcatcg  5040
ctattaccat ggtcgaggtg agccccacgt tctgcttcac tctcccccatc tccccccccc  5100
ccccacccccc aattttgtat ttatttattt tttaattatt ttgtgcagcg atgggggcgg  5160
gggggggggg gggcgcgcgc caggcggggc ggggcggggc gaggggcggg gcggggcgag  5220
gcggagaggt gcggcggcag ccaatcagag cggcgcgctc cgaaagtttc cttttatggc  5280
gaggcggcgg cggcggcggc cctataaaaa gcgaagcgcg cggcgggcgg gagtcgctgc  5340
gcgctgcctt cgccccgtgc cccgctccgc cgccgcctcg cgccgcccgc cccggctctg  5400
actgaccgcg ttactaaaac aggtaagtcc ggcctccgcg ccgggttttg gcgcctcccg  5460
cgggcgcccc cctcctcacg gcgagcgctg ccacgtcaga cgaagggcgc agcgagcgtc  5520
ctgatccttc cgcccggacg ctcaggacag cggcccgctg ctcataagac tcggccttag  5580
aaccccagta tcagcagaag gacattttag gacgggactt gggtgactct agggcactgg  5640
ttttctttcc agagagcgga acaggcgagg aaaagtagtc ccttctcggc gattctgcgg  5700
agggatctcc gtggggcggt gaacgccgat gatgcctcta ctaaccatgt tcatgttttc  5760
ttttttttтc tacaggtcct gggtgacgaa cagggtaccg ccaccatggc caccggctct  5820
cgcacaagcc tgctgctggc tttcggactg ctgtgcctgc cttggctcca ggagggctcc  5880
gccgctagca tcgataccgt cgctatgtgc tggaggcttg ctgaaggctg tatgctgatc  5940
aatcggattg cggtaatcgc gttttggcct ctgactgacg cgattaccga tccgattgat  6000
caggacacaa ggcctgttac tagcactcac atggaacaaa tggcctctag cctggaggct  6060
tgctgaaggc tgtatgctga tctttgctaa attggtgcac gcgttttggc ctctgactga  6120
cgcgtgcacc attagcaaag atcaggacac aaggcctgtt actagcactc acatggaaca  6180
aatggcctct agcctggagg cttgctgaag gctgtatgct gacttcaatc acaattccag  6240
cgccgttttg gcctctgact gacggcgctg gaagtgattg aagtcaggac acaaggcctg  6300
ttactagcac tcacatggaa caaatggcct ctctagaat                         6339
```

SEQ ID NO: 15 moltype = DNA length = 6339
FEATURE Location/Qualifiers
source 1..6339
mol_type = other DNA
organism = synthetic construct

SEQUENCE: 15

```
aatcaacctc tggattacaa aatttgtgaa agattgactg gtattcttaa ctatgttgct  60
ccttttacgc tatgtggata cgctgcttta atgcctttgt atcatgctat tgcttcccgt  120
atggctttca ttttctcctc cttgtataaa tcctggttgc tgtctcttta tgaggagttg  180
tggcccgttg tcaggcaacg tggcgtggtg tgcactgtgt ttgctgacgc aacccccact  240
ggttggggca ttgccaccac ctgtcagctc ctttccggga ctttcgcttt ccccctccct  300
attgccacgg cggaactcat cgccgcctgc cttgcccgct gctggacagg ggctcggctg  360
ttgggcactg acaattccgt ggtgttgtcg gggaaatcat cgtcctttcc ttggctgctc  420
gcctgtgttg ccacctggat tctgcgcggg acgtccttct gctacgtccc ttcggccctc  480
aatccagcgg accttccttc ccgcggcctg ctgccggctc tgcggcctct tccgcgtctt  540
cgccttcgcc ctcagacgag tcggatctcc ctttgggccg cctccccgcc taagcttatc  600
gataccgtcg agatctaact tgtttattgc agcttataat ggttacaaat aaagcaatag  660
catcacaaat ttcacaaata aagcattttt ttcactgcat tctagttgtg gtttgtccaa  720
actcatcaat gtatcttatc atgtctggat ctcgacctcg actagagcat ggctacgtag  780
ataagtagca tggcgggtta atcattaact acaaggaacc cctagtgatg gagttggcca  840
ctccctctct gcgcgctcgc tcgctcactg aggccgggcg accaaaggtc gcccgacgcc  900
cgggctttgc ccgggcggcc tcagtgagcg agcgagcgcg cagctggcgt aatagcgaag  960
```

-continued

```
aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa tggcgattcc  1020
gttgcaatgg ctggcggtaa tattgttctg gatattacca gcaaggccga tagtttgagt  1080
tcttctactc aggcaagtga tgttattact aatcaaagaa gtattgcgac aacggttaat  1140
ttgcgtgatg gacagactct tttactcggt ggcctcactg attataaaaa cacttctcag  1200
gattctggcg taccgttcct gtctaaaatc cctttaatcg gcctcctgtt tagctcccgc  1260
tctgattcta acgaggaaag cacgttatac gtgctcgtca aagcaaccat agtacgcgcc  1320
ctgtagcggc gcattaagcg cggcgggtgt ggtggttacg cgcagcgtga ccgctacact  1380
tgccagcgcc ctagcgcccg ctcctttcgc tttcttccct tcctttctcg ccacgttcgc  1440
cggctttccc cgtcaagctc taaatcgggg gctcccttta gggttccgat ttagtgcttt  1500
acggcacctc gaccccaaaa aacttgatta gggtgatggt tcacgtagtg ggccatcgcc  1560
ctgatagacg gtttttcgcc ctttgacgtt ggagtccacg ttctttaata gtggactctt  1620
gttccaaact ggaacaacac tcaaccctat ctcggtctat tcttttgatt tataagggat  1680
tttgccgatt tcggcctatt ggttaaaaaa tgagctgatt taacaaaaat ttaacgcgaa  1740
ttttaacaaa atattaacgt ttacaattta aatatttgct tatacaatct tcctgttttt  1800
ggggcttttc tgattatcaa ccggggtaca tatgattgac atgctagttt tacgattacc  1860
gttcatcgat tctcttgttt gctccagact ctcaggcaat gacctgatag cctttgtaga  1920
gacctctcaa aaatagctac cctctccggc atgaatttat cagctagaac ggttgaatat  1980
catattgatg gtgatttgac tgtctccggc ctttctcacc cgtttgaatc tttacctaca  2040
cattactcag gcattgcatt taaaatatat gagggttcta aaaatttta tccttgcgtt  2100
gaaataaagg cttctcccgc aaaagtatta cagggtcata atgtttttgg tacaaccgat  2160
ttagctttat gctctgaggc tttattgctt aattttgcta attctttgcc ttgcctgtat  2220
gatttattgg atgttggaat tcctgatgcg gtattttctc cttacgcatc tgtgcggtat  2280
ttcacaccgc atatggtgca ctctcagtac aatctgctct gatgccgcat agttaagcca  2340
gccccgacac ccgccaacac ccgctgacgc gccctgacgg gcttgtctgc tcccggcatc  2400
cgcttacaga caagctgtga ccgtctccgg gagctgcatg tgtcagaggt tttcaccgtc  2460
atcaccgaaa cgcgcgagac gaaagggcct cgtgatacgc ctatttttat aggttaatgt  2520
catgataata atggtttctt agacgtcagg tggcactttt cggggaaatg tgcgcggaac  2580
ccctatttgt ttatttttct aaatacattc aaatatgtat ccgctcatga gacaataacc  2640
ctgataaatg cttcaataat attgaaaaag gaagagtatg agtattcaac atttccgtgt  2700
cgcccttatt ccctttttttg cggcattttg ccttcctgtt tttgctcacc cagaaacgct  2760
ggtgaaagta aaagatgctg aagatcagtt gggtgcacga gtgggttaca tcgaactgga  2820
tctcaacagc ggtaagatcc ttgagagttt tcgccccgaa gaacgttttc caatgatgag  2880
cacttttaaa gttctgctat gtggcgcggt attatcccgt attgacgccg ggcaagagca  2940
actcggtcgc cgcatacact attctcagaa tgacttggtt gagtactcac cagtcacaga  3000
aaagcatctt acggatggca tgacagtaag agaattatgc agtgctgcca taaccatgag  3060
tgataacact gcggccaact tacttctgac aacgatcgga ggaccgaagg agctaaccgc  3120
ttttttgcac aacatggggg atcatgtaac tcgccttgat cgttgggaac cggagctgaa  3180
tgaagccata ccaaacgacg agcgtgacac cacgatgcct gtagcaatgg caacaacgtt  3240
gcgcaaacta ttaactggcg aactacttac tctagcttcc cggcaacaat taatagactg  3300
gatggaggcg gataaagttg caggaccact tctgcgctcg gcccttccgg ctggctggtt  3360
tattgctgat aaatctggag ccggtgagcg tgggtctcgc ggtatcattg cagcactggg  3420
gccagatggt aagccctccc gtatcgtagt tatctacacg acggggagtc aggcaactat  3480
ggatgaacga aatagacaga tcgctgagat aggtgcctca ctgattaagc attggtaact  3540
gtcagaccaa gtttactcat atatacttta gattgattta aaacttcatt tttaatttaa  3600
aaggatctag gtgaagatcc tttttgataa tctcatgacc aaaatccctt aacgtgagtt  3660
ttcgttccac tgagcgtcag accccgtaga aaagatcaaa ggatcttctt gagatccttt  3720
ttttctgcgc gtaatctgct gcttgcaaac aaaaaaacca ccgctaccag cggtggtttg  3780
tttgccggat caagagctac caactctttt tccgaaggta actggcttca gcagagcgca  3840
gataccaaat actgtccttc tagtgtagcc gtagttaggc caccacttca agaactctgt  3900
agcaccgcct acatacctcg ctctgctaat cctgttacca gtggctgctg ccagtggcga  3960
taagtcgtgt cttaccgggt tggactcaag acgatagtta ccggataagg cgcagcggtc  4020
gggctgaacg gggggttcgt gcacacagcc cagcttggag cgaacgacct acaccgaact  4080
gagatacctа cagcgtgagc tatgagaaag cgccacgctt cccgaaggga gaaaggcgga  4140
caggtatccg gtaagcggca gggtcggaac aggagagcgc acgagggagc ttccaggggg  4200
aaacgcctgg tatctttata gtcctgtcgg gtttcgccac ctctgacttg agcgtcgatt  4260
tttgtgatgc tcgtcagggg ggcggagcct atggaaaaac gccagcaacg cggccttttt  4320
acggttcctg gccttttgct ggccttttgc tcacatgttc tttcctgcgt tatcccctga  4380
ttctgtggat aaccgtatta ccgcctttga gtgagctgat accgctcgcc gcagccgaac  4440
gaccgagcgc agcgagtcag tgagcgagga agcggaagag cgcccaatac gcaaaccgcc  4500
tctccccgcg cgttggccga ttcattaatg cagcagctgc gcgctcgctc gctcactgag  4560
gccgcccggg caaagcccgg gcgtcgggcg acctttggtc gcccggcctc agtgagcgag  4620
cgagcgcgca gagagggagt ggccaactcc atcactaggg gttccttgta gttaatgatt  4680
aacccgccat gctacttatc tacgtagcca tgctctagga cattgattat tgactagtgg  4740
agttccgcgt tacataactt acggtaaatg gcccgcctgg ctgaccgccc aacgacccсc  4800
gcccattgac gtcaataatg acgtatgttc ccatagtaac gccaataggg actttccatt  4860
gacgtcaatg ggtggagtat ttacggtaaa ctgcccactt ggcagtacat caagtgtatc  4920
atatgccaag tacgcccccт attgacgtca atgacggtaa atggcccgcc tggcattatg  4980
cccagtacat gaccttatgg gactttccta cttggcagta catctacgta ttagtcatcg  5040
ctattaccat ggtcgaggtg agccccacgt tctgcttcac tctccccatc tccccccccт  5100
ccccaccccc aattttgtat ttatttattt tttaattatt ttgtgcagcg atgggggcgg  5160
gggggggggg gggcgcgcgc caggcggggc ggggcggggc gaggggcggg gcggggcgag  5220
gcggagaggt gcggcggcag ccaatcagag cggcgcgctc cgaaagtttc cttttatggc  5280
gaggcggcgg cggcggcggc cctataaaaa gcgaagcgcg cggcgggcgg gagtcgctgc  5340
gcgctgcctt cgccccgtgc cccgctccgc cgccgcctcg cgccgcccgc cccggctctg  5400
actgaccgcg ttactaaaac aggtaagtcc ggcctccgcg ccgggttttg gcgcctcccg  5460
cgggcgcccc cctcctcacg gcgagcgctg ccacgtcaga cgaagggcgc agcgagcgtc  5520
```

-continued

```
ctgatccttc cgcccggacg ctcaggacag cggcccgctg ctcataagac tcggccttag  5580
aaccccagta tcagcagaag gacattttag gacgggactt gggtgactct agggcactgg  5640
ttttctttcc agagagcgga acaggcgagg aaaagtagtc ccttctcggc gattctgcgg  5700
agggatctcc gtggggcggt gaacgccgat gatgcctcta ctaaccatgt tcatgttttc  5760
ttttttttte tacaggtcct gggtgacgaa cagggtaccg ccaccatggc caccggctct  5820
cgcacaagcc tgctgctggc tttcggactg ctgtgcctgc cttggctcca ggagggctcc  5880
gccgctagca tcgataccgt cgctatgtgc tggaggcttg ctgaaggctg tatgctgtaa  5940
tctttcgctg gctgcagttc gttttggcct ctgactgacg aactgcagcg cgaaagatta  6000
caggacacaa ggcctgttac tagcactcac atggaacaaa tggcctctag cctggaggct  6060
tgctgaaggc tgtatgctgt gttaatgctg atgtcacgct gcgttttggc ctctgactga  6120
cgcagcgtga ccagcattaa cacaggacac aaggcctgtt actagcactc acatggaaca  6180
aatggcctct agcctggagg cttgctgaag gctgtatgct gttcacctgg ttaacacata  6240
caccgttttg gcctctgact gacggtgtat gtgaaccagg tgaacaggac acaaggcctg  6300
ttactagcac tcacatggaa caaatggcct ctctagaat                         6339

SEQ ID NO: 16          moltype = DNA  length = 6339
FEATURE                Location/Qualifiers
source                 1..6339
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 16
aatcaacctc tggattacaa aatttgtgaa agattgactg gtattcttaa ctatgttgct  60
ccttttacgc tatgtggata cgctgcttta atgcctttgt atcatgctat tgcttcccgt  120
atggctttca ttttctcctc cttgtataaa tcctggttgc tgtctcttta tgaggagttg  180
tggcccgttg tcaggcaacg tggcgtggtg tgcactgtgt ttgctgacgc aacccccact  240
ggttggggca ttgccaccac ctgtcagctc ctttccggga ctttcgcttt ccccctccct  300
attgccacgg cggaactcat cgccgcctgc cttgcccgct gctggacagg ggctcggctg  360
ttgggcactg acaattccgt ggtgttgtcg gggaaatcat cgtcctttcc ttggctgctc  420
gcctgtgttg ccacctggat tctgcgcggg acgtccttct gctacgtccc ttcggccctc  480
aatccagcgg accttccttc ccgcggcctg ctgccggctc tgcggcctct tccgcgtctt  540
cgccttcgcc ctcagacgag tcggatctcc ctttgggccg cctccccgcc taagcttatc  600
gataccgtcg agatctaact tgtttattgc agcttataat ggttacaaat aaagcaatag  660
catcacaaat ttcacaaata aagcattttt ttcactgcat tctagttgtg gtttgtccaa  720
actcatcaat gtatcttatc atgtctggat ctcgacctcg actagagcat ggctacgtag  780
ataagtagca tggcgggtta atcattaact acaaggaacc cctagtgatg gagttggcca  840
ctccctctct gcgcgctcgc tcgctcactg aggccgggcg accaaaggtc gcccgacgcc  900
cgggctttgc ccgggcggcc tcagtgagcg agcgagcgcg cagctggcgt aatagcgaag  960
aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa tggcgattcc  1020
gttgcaatgg ctggcggtaa tattgttctg gatattacca gcaaggccga tagtttgagt  1080
tcttctactc aggcaagtga tgttattact aatcaaagaa gtattgcgac aacggttaat  1140
ttgcgtgatg gacagactct tttactcggt ggcctcactg attataaaaa cacttctcag  1200
gattctggcg taccgttcct gtctaaaatc cctttaatcg gcctcctgtt tagctcccgc  1260
tctgattcta acgaggaaag cacgttatac gtgctcgtca aagcaaccat agtacgcgcc  1320
ctgtagcggc gcattaagcg cggcgggtgt ggtggttacg cgcagcgtga ccgctacact  1380
tgccagcgcc ctagcgcccg ctcctttcgc tttcttccct tcctttctcg ccacgttcgc  1440
cggctttccc cgtcaagctc taaatcgggg gctcccttta gggttccgat ttagtgcttt  1500
acggcacctc gaccccaaaa aacttgatta gggtgatggt tcacgtagtg ggccatcgcc  1560
ctgatagacg gtttttcgcc ctttgacgtt ggagtccacg ttctttaata gtggactctt  1620
gttccaaact ggaacaacac tcaaccctat ctcggtctat tcttttgatt tataagggat  1680
tttgccgatt tcggcctatt ggttaaaaaa tgagctgatt taacaaaaat ttaacgcgaa  1740
ttttaacaaa atattaacgt ttacaattta aatatttgct tatacaatct tcctgttttt  1800
ggggctttte tgattatcaa ccggggtaca tatgattgac atgctagttt tacgattacc  1860
gttcatcgat tctcttgttt gctccagact ctcaggcaat gacctgatag cctttgtaga  1920
gacctctcaa aaatagctac cctctccggc atgaatttat cagctagaac ggttgaatat  1980
catattgatg gtgatttgac tgtctccggc ctttctcacc cgtttgaatc tttacctaca  2040
cattactcag gcattgcatt taaaatatat gagggttcta aaaatttttа tccttgcgtt  2100
gaaataaagg cttctcccgc aaaagtatta cagggtcata atgtttttgg tacaaccgat  2160
ttagctttat gctctgaggc tttattgctt aattttgcta attctttgcc ttgcctgtat  2220
gatttattgg atgttggaat tcctgatgcg gtattttctc cttacgcatc tgtgcggtat  2280
ttcacaccgc atatggtgca ctctcagtac aatctgctct gatgccgcat agttaagcca  2340
gccccgacac ccgccaacac ccgctgacgc gccctgacgg gcttgtctgc tcccggcatc  2400
cgcttacaga caagctgtga ccgtctccgg gagctgcatg tgtcagaggt tttcaccgtc  2460
atcaccgaaa cgcgcgagac gaaagggcct cgtgatacgc ctatttttat aggttaatgt  2520
catgataata atggtttctt agacgtcagg tggcactttt cggggaaatg tgcgcggaac  2580
ccctatttgt ttatttttct aaatacattc aaatatgtat ccgctcatga gacaataacc  2640
ctgataaatg cttcaataat attgaaaaag gaagagtatg agtattcaac atttccgtgt  2700
cgcccttatt cccttttttg cggcattttg ccttcctgtt tttgctcacc cagaaacgct  2760
ggtgaaagta aaagatgctg aagatcagtt gggtgcacga gtgggttaca tcgaactgga  2820
tctcaacagc ggtaagatcc ttgagagttt tcgccccgaa gaacgttttc caatgatgag  2880
cacttttaaa gttctgctat gtggcgcggt attatcccgt attgacgccg ggcaagagca  2940
actcggtcgc cgcatacact attctcagaa tgacttggtt gagtactcac cagtcacaga  3000
aaagcatctt acggatggca tgacagtaag agaattatgc agtgctgcca taaccatgag  3060
tgataacact gcggccaact tacttctgac aacgatcgga ggaccgaagg agctaaccgc  3120
ttttttgcac aacatggggg atcatgtaac tcgccttgat cgttgggaac cggagctgaa  3180
tgaagccata ccaaacgacg agcgtgacac cacgatgcct gtagcaatgg caacaacgtt  3240
gcgcaaacta ttaactggcg aactacttac tctagcttcc cggcaacaat taatagactg  3300
```

-continued

```
gatggaggcg gataaagttg caggaccact tctgcgctcg gcccttccgg ctggctggtt  3360
tattgctgat aaatctggag ccggtgagcg tgggtctcgc ggtatcattg cagcactggg  3420
gccagatggt aagccctccc gtatcgtagt tatctacacg acggggagtc aggcaactat  3480
ggatgaacga aatagacaga tcgctgagat aggtgcctca ctgattaagc attggtaact  3540
gtcagaccaa gtttactcat atatacttta gattgattta aaacttcatt tttaatttaa  3600
aaggatctag gtgaagatcc tttttgataa tctcatgacc aaaatccctt aacgtgagtt  3660
ttcgttccac tgagcgtcag accccgtaga aaagatcaaa ggatcttctt gagatccttt  3720
ttttctgcgc gtaatctgct gcttgcaaac aaaaaaacca ccgctaccag cggtggtttg  3780
tttgccggat caagagctac caactctttt tccgaaggta actggcttca gcagagcgca  3840
gataccaaat actgtccttc tagtgtagcc gtagttaggc caccacttca agaactctgt  3900
agcaccgcct acatacctcg ctctgctaat cctgttacca gtggctgctg ccagtggcga  3960
taagtcgtgt cttaccgggt tggactcaag acgatagtta ccggataagg cgcagcggtc  4020
gggctgaacg gggggttcgt gcacacagcc cagcttggag cgaacgacct acaccgaact  4080
gagataccta cagcgtgagc tatgagaaag cgccacgctt cccgaaggga gaaaggcgga  4140
caggtatccg gtaagcggca gggtcggaac aggagagcgc acgagggagc ttccaggggg  4200
aaacgcctgg tatctttata gtcctgtcgg gtttcgccac ctctgacttg agcgtcgatt  4260
tttgtgatgc tcgtcagggg ggcggagcct atggaaaaac gccagcaacg cggccttttt  4320
acggttcctg gccttttgct ggccttttgc tcacatgttc tttcctgcgt tatcccctga  4380
ttctgtggat aaccgtatta ccgcctttga gtgagctgat accgctcgcc gcagccgaac  4440
gaccgagcgc agcgagtcag tgagcgagga agcggaagag cgcccaatac gcaaaccgcc  4500
tctccccgcg cgttggccga ttcattaatg cagcagctgc gcgctcgctc gctcactgag  4560
gccgcccggg caaagcccgg gcgtcgggcg acctttggtc gcccggcctc agtgagcgag  4620
cgagcgcgca gagagggagt ggccaactcc atcactaggg gttccttgta gttaatgatt  4680
aacccgccat gctacttatc tacgtagcca tgctctagga cattgattat tgactagtgg  4740
agttccgcgt tacataactt acggtaaatg gcccgcctgg ctgaccgccc aacgacccca  4800
gcccattgac gtcaataatg acgtatgttc ccatagtaac gccaatagggg actttccatt  4860
gacgtcaatg ggtggagtat ttacggtaaa ctgcccactt ggcagtacat caagtgtatc  4920
atatgccaag tacgcccccc attgacgtca atgacggtaa atggcccgcc tggcattatg  4980
cccagtacat gaccttatgg gactttccta cttggcagta catctacgta ttagtcatcg  5040
ctattaccat ggtcgaggtg agccccacgt tctgcttcac tctccccatc tccccccccc  5100
ccccacccc aattttgtat ttatttattt tttaattatt ttgtgcagcg atgggggcgg  5160
gggggggggg gggcgcgcgc caggcggggc ggggcggggc gaggggcggg gcggggcgag  5220
gcggagaggt gcggcggcag ccaatcagag cggcgcgctc cgaaagtttc cttttatggc  5280
gaggcggcgg cggcggcggc cctataaaaa gcgaagcgcg cggcgggcgg gagtcgctgc  5340
gcgctgcctt cgccccgtgc cccgctccgc cgccgcctcg cgccgcccgc cccggctctg  5400
actgaccgcg ttactaaaac aggtaagtcc ggcctccgcg ccgggttttg gcgcctcccg  5460
cgggcgcccc cctcctcacg gcgagcgctg ccacgtcaga cgaagggcgc agcgagcgtc  5520
ctgatccttc cgcccggacg ctcaggacag cggcccgctg ctcataagac tcggccttag  5580
aaccccagta tcagcagaag gacattttag gacgggactt gggtgactct agggcactgg  5640
ttttctttcc agagagcgga acaggcgagg aaaagtagtc ccttctcggc gattctgcgg  5700
agggatctcc gtggggcggt gaacgccgat gatgcctcta ctaaccatgt tcatgttttc  5760
ttttttttte tacaggtcct gggtgacgaa cagggtaccg ccaccatggc caccggctct  5820
cgcacaagcc tgctgctggc tttcggactg ctgtgcctgc cttggctcca ggagggctcc  5880
gccgctagca tcgataccgt cgctatgtgc tggaggcttg ctgaaggctg tatgctgatt  5940
tcttcctgtg cgctttcgcc gttttggcct ctgactgacg gcgaaagcgc aggaagaaat  6000
caggacacaa ggcctgttac tagcactcac atggaacaaa tggcctctag cctggaggct  6060
tgctgaaggc tgtatgctga gaataatcag atcagcacgc tcgttttggc ctctgactga  6120
cgagcgtgct gctgattatt ctcaggacac aaggcctgtt actagcactc acatggaaca  6180
aatggcctct agcctggagg cttgctgaag gctgtatgct gtaatcaggc tgaattcaga  6240
tagcgttttg gcctctgact gacgctatct gaacagcctg attacaggac acaaggcctg  6300
ttactagcac tcacatggaa caaatggcct ctctagaat                         6339

SEQ ID NO: 17          moltype = DNA  length = 6339
FEATURE                Location/Qualifiers
source                 1..6339
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 17
aatcaacctc tggattacaa aatttgtgaa agattgactg gtattcttaa ctatgttgct  60
ccttttacgc tatgtggata cgctgcttta atgcctttgt atcatgctat tgcttcccgt  120
atggctttca ttttctcctc cttgtataaa tcctggttgc tgtctcttta tgaggagttg  180
tggcccgttg tcaggcaacg tggcgtggtg tgcactgtgt ttgctgacgc aacccccact  240
ggttggggca ttgccaccac ctgtcagctc ctttccggga ctttcgcttt ccccctccct  300
attgccacgg cggaactcat cgccgcctgc cttgcccgct gctggacagg ggctcggctg  360
ttgggcactg acaattccgt ggtgttgtcg gggaaatcat cgtcctttcc ttggctgctc  420
gcctgtgttg ccacctggat tctgcgcggg acgtccttct gctacgtccc ttcggccctc  480
aatccagcgg accttccttc ccgcggcctg ctgccggctc tgcggcctct tccgcgtctt  540
cgccttcgcc ctcagacgag tcggatctcc ctttgggccg cctccccgcc taagcttatc  600
gataccgtcg agatctaact tgtttattgc agcttataat ggttacaaat aaagcaatag  660
catcacaaat ttcacaaata aagcattttt ttcactgcat tctagttgtg gtttgtccaa  720
actcatcaat gtatcttatc atgtctggat ctcgacctcg actagagcat ggctacgtag  780
ataagtagca tggcgggtta atcattaact acaaggaacc cctagtgatg gagttggcca  840
ctccctctct gcgcgctcgc tcgctcactg aggccgggcg accaaaggtc gcccgacgcc  900
cgggctttgc ccgggcggcc tcagtgagcg agcgagcgcg cagctggcgt aatagcgaag  960
aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa tggcgattcc  1020
gttgcaatgg ctggcggtaa tattgttctg gatattacca gcaaggccga tagtttgagt  1080
```

-continued

```
tcttctactc aggcaagtga tgttattact aatcaaagaa gtattgcgac aacggttaat  1140
ttgcgtgatg gacagactct tttactcggt ggcctcactg attataaaaa cacttctcag  1200
gattctggcg taccgttcct gtctaaaatc cctttaatcg gcctcctgtt tagctcccgc  1260
tctgattcta acgaggaaag cacgttatac gtgctcgtca aagcaaccat agtacgcgcc  1320
ctgtagcggc gcattaagcg cggcgggtgt ggtggttacg cgcagcgtga ccgctacact  1380
tgccagcgcc ctagcgcccg ctcctttcgc tttcttccct tcctttctcg ccacgttcgc  1440
cggctttccc cgtcaagctc taaatcgggg gctcccttta gggttccgat ttagtgcttt  1500
acggcacctc gaccccaaaa aacttgatta gggtgatggt tcacgtagtg ggccatcgcc  1560
ctgatagacg gtttttcgcc ctttgacgtt ggagtccacg ttctttaata gtggactctt  1620
gttccaaact ggaacaacac tcaaccctat ctcggtctat tcttttgatt tataagggat  1680
tttgccgatt tcggcctatt ggttaaaaaa tgagctgatt taacaaaaat ttaacgcgaa  1740
ttttaacaaa atattaacgt ttacaattta aatatttgct tatacaatct tcctgttttt  1800
ggggcttttc tgattatcaa ccggggtaca tatgattgac atgctagttt tacgattacc  1860
gttcatcgat tctcttgttt gctccagact ctcaggcaat gacctgatag cctttgtaga  1920
gacctctcaa aaatagctac cctctccggc atgaatttat cagctagaac ggttgaatat  1980
catattgatg gtgatttgac tgtctccggc ctttctcacc cgtttgaatc tttacctaca  2040
cattactcag gcattgcatt taaaatatat gagggttcta aaaatttttа tccttgcgtt  2100
gaaataaagg cttctcccgc aaaagtatta cagggtcata atgtttttgg tacaaccgat  2160
ttagctttat gctctgaggc tttattgctt aattttgcta attctttgcc ttgcctgtat  2220
gatttattgg atgttggaat tcctgatgcg gtattttctc cttacgcatc tgtgcggtat  2280
ttcacaccgc atatggtgca ctctcagtac aatctgctct gatgccgcat agttaagcca  2340
gccccgacac ccgccaacac ccgctgacgc gccctgacgg gcttgtctgc tcccggcatc  2400
cgcttacaga caagctgtga ccgtctccgg gagctgcatg tgtcagaggt tttcaccgtc  2460
atcaccgaaa cgcgcgagac gaaagggcct cgtgatacgc ctatttttat aggttaatgt  2520
catgataata atggtttctt agacgtcagg tggcactttt cggggaaatg tgcgcggaac  2580
ccctatttgt ttatttttct aaatacattc aaatatgtat ccgctcatga gacaataacc  2640
ctgataaatg cttcaataat attgaaaaag gaagagtatg agtattcaac atttccgtgt  2700
cgcccttatt cccttttttg cggcattttg ccttcctgtt tttgctcacc cagaaacgct  2760
ggtgaaagta aaagatgctg aagatcagtt gggtgcacga gtgggttaca tcgaactgga  2820
tctcaacagc ggtaagatcc ttgagagttt tcgccccgaa gaacgttttc caatgatgag  2880
cacttttaaa gttctgctat gtggcgcggt attatcccgt attgacgccg ggcaagagca  2940
actcggtcgc cgcatacact attctcagaa tgacttggtt gagtactcac cagtcacaga  3000
aaagcatctt acggatggca tgacagtaag agaattatgc agtgctgcca taaccatgag  3060
tgataacact gcggccaact tacttctgac aacgatcgga ggaccgaagg agctaaccgc  3120
ttttttgcac aacatggggg atcatgtaac tcgccttgat cgttgggaac cggagctgaa  3180
tgaagccata ccaaacgacg agcgtgacac cacgatgcct gtagcaatgg caacaacgtt  3240
gcgcaaacta ttaactggcg aactacttac tctagcttcc cggcaacaat taatagactg  3300
gatggaggcg gataaagttg caggaccact tctgcgctcg gcccttccgg ctggctggtt  3360
tattgctgat aaatctggag ccggtgagcg tgggtctcgc ggtatcattg cagcactggg  3420
gccagatggt aagccctccc gtatcgtagt tatctacacg acggggagtc aggcaactat  3480
ggatgaacga aatagacaga tcgctgagat aggtgcctca ctgattaagc attggtaact  3540
gtcagaccaa gtttactcat atatacttta gattgattta aaacttcatt tttaatttaa  3600
aaggatctag gtgaagatcc tttttgataa tctcatgacc aaaatccctt aacgtgagtt  3660
ttcgttccac tgagcgtcag accccgtaga aaagatcaaa ggatcttctt gagatccttt  3720
ttttctgcgc gtaatctgct gcttgcaaac aaaaaaacca ccgctaccag cggtggtttg  3780
tttgccggat caagagctac caactctttt tccgaaggta actggcttca gcagagcgca  3840
gataccaaat actgtccttc tagtgtagcc gtagttaggc caccacttca agaactctgt  3900
agcaccgcct acatacctcg ctctgctaat cctgttacca gtggctgctg ccagtggcga  3960
taagtcgtgt cttaccgggt tggactcaag acgatagtta ccggataagg cgcagcggtc  4020
gggctgaacg gggggttcgt gcacacagcc cagcttggag cgaacgacct acaccgaact  4080
gagataccta cagcgtgagc tatgagaaag cgccacgctt cccgaaggga gaaaggcgga  4140
caggtatccg gtaagcggca gggtcggaac aggagagcgc acgagggagc ttccagggggg  4200
aaacgcctgg tatctttata gtcctgtcgg gtttcgccac ctctgacttg agcgtcgatt  4260
tttgtgatgc tcgtcagggg ggcggagcct atggaaaaac gccagcaacg cggccttttt  4320
acggttcctg gccttttgct ggccttttgc tcacatgttc tttcctgcgt tatcccctga  4380
ttctgtggat aaccgtatta ccgcctttga gtgagctgat accgctcgcc gcagccgaac  4440
gaccgagcgc agcgagtcag tgagcgagga agcggaagag cgcccaatac gcaaaccgcc  4500
tctccccgcg cgttggccga ttcattaatg cagcagctgc gcgctcgctc gctcactgag  4560
gccgcccggg caaagcccgg gcgtcgggcg acctttggtc gcccggcctc agtgagcgag  4620
cgagcgcgca gagagggagt ggccaactcc atcactaggg gttccttgta gttaatgatt  4680
aacccgccat gctacttatc tacgtagcca tgctctagga cattgattat tgactagtgg  4740
agttccgcgt tacataactt acggtaaatg gcccgcctgg ctgaccgccc aacgacccccc  4800
gcccattgac gtcaataatg acgtatgttc ccatagtaac gccaatagggg actttccatt  4860
gacgtcaatg ggtggagtat ttacggtaaa ctgcccactt ggcagtacat caagtgtatc  4920
atatgccaag tacgcccccc attgacgtca atgacggtaa atggcccgcc tggcattatg  4980
cccagtacat gaccttatgg gactttccta cttggcagta catctacgta ttagtcatcg  5040
ctattaccat ggtcgaggtg agccccacgt tctgcttcac tctccccatc tccccccccc  5100
ccccaccccc aattttgtat ttatttattt tttaattatt ttgtgcagcg atgggggcgg  5160
gggggggggg gggcgcgcgc caggcggggc ggggcggggc gaggggcggg gcggggcgag  5220
gcggagaggt gcggcggcag ccaatcagag cggcgcgctc cgaaagtttc cttttatggc  5280
gaggcggcgg cggcggcggc cctataaaaa gcgaagcgcg cggcgggcgg gagtcgctgc  5340
gcgctgcctt cgccccgtgc cccgctccgc cgccgcctcg cgccgcccgc cccggctctg  5400
actgaccgcg ttactaaaac aggtaagtcc ggcctccgcg ccgggttttg gcgcctcccg  5460
cgggcgcccc cctcctcacg gcgagcgctg ccacgtcaga cgaagggcgc agcgagcgtc  5520
ctgatccttc cgcccggacg ctcaggacag cggcccgctg ctcataagac tcggccttag  5580
aaccccagta tcagcagaag gacattttag gacgggactt gggtgactct agggcactgg  5640
```

-continued

```
ttttctttcc agagagcgga acaggcgagg aaaagtagtc ccttctcggc gattctgcgg  5700
agggatctcc gtggggcggt gaacgccgat gatgcctcta ctaaccatgt tcatgttttc  5760
ttttttttte tacaggtcct gggtgacgaa cagggtaccg ccaccatggc caccggctct  5820
cgcacaagcc tgctgctggc tttcggactg ctgtgcctgc cttggctcca ggagggctcc  5880
gccgctagca tcgataccgt cgctatgtgc tggaggcttg ctgaaggctg tatgctgata  5940
atcaccgctg caggttcagc gttttggcct ctgactgacg ctgaacctgg cggtgattat  6000
caggacacaa ggcctgttac tagcactcac atggaacaaa tggcctctag cctggaggct  6060
tgctgaaggc tgtatgctgt tcaatcgcgt attggtaatc gcgttttggc ctctgactga  6120
cgcgattacc aacgcgattg aacaggacac aaggcctgtt actagcactc acatggaaca  6180
aatggcctct agcctggagg cttgctgaag gctgtatgct gtgatcatgc tgaaaatggt  6240
gcacgttttg gcctctgact gacgtgcacc attcagcatg atcacaggac acaaggcctg  6300
ttactagcac tcacatggaa caaatggcct ctctagaat                         6339

SEQ ID NO: 18          moltype = DNA  length = 6339
FEATURE                Location/Qualifiers
source                 1..6339
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 18
aatcaacctc tggattacaa aatttgtgaa agattgactg gtattcttaa ctatgttgct  60
ccttttacgc tatgtggata cgctgcttta atgcctttgt atcatgctat tgcttcccgt  120
atggctttca ttttctcctc cttgtataaa tcctggttgc tgtctcttta tgaggagttg  180
tggcccgttg tcaggcaacg tggcgtggtg tgcactgtgt ttgctgacgc aacccccact  240
ggttggggca ttgccaccac ctgtcagctc ctttccggga ctttcgcttt ccccctccct  300
attgccacgg cggaactcat cgccgcctgc cttgcccgct gctggacagg ggctcggctg  360
ttgggcactg acaattccgt ggtgttgtcg gggaaatcat cgtcctttcc ttggctgctc  420
gcctgtgttg ccacctggat tctgcgcggg acgtccttct gctacgtccc ttcggccctc  480
aatccagcgg accttccttc ccgcggccctg ctgccggctc tgcggcctct tccgcgtctt  540
cgccttcgcc ctcagacgag tcggatctcc ctttgggccg cctccccgcc taagcttatc  600
gataccgtcg agatctaact tgtttattgc agcttataat ggttacaaat aaagcaatag  660
catcacaaat ttcacaaata aagcattttt ttcactgcat tctagttgtg gtttgtccaa  720
actcatcaat gtatcttatc atgtctggat ctcgacctcg actagagcat ggctacgtag  780
ataagtagca tggcgggtta atcattaact acaaggaacc cctagtgatg gagttggcca  840
ctccctctct gcgcgctcgc tcgctcactg aggccgggcg accaaaggtc gcccgacgcc  900
cgggctttgc ccgggcggcc tcagtgagcg agcgagcgcg cagctggcgt aatagcgaag  960
aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa tggcgattcc  1020
gttgcaatgg ctggcggtaa tattgttctg gatattacca gcaaggccga tagtttgagt  1080
tcttctactc aggcaagtga tgttattact aatcaaagaa gtattgcgac aacggttaat  1140
ttgcgtgatg gacagactct tttactcggt ggcctcactg attataaaaa cacttctcag  1200
gattctggcg taccgttcct gtctaaaatc cctttaatcg gcctcctgtt tagctcccgc  1260
tctgattcta acgaggaaag cacgttatac gtgctcgtca aagcaaccat agtacgcgcc  1320
ctgtagcggc gcattaagcg cggcgggtgt ggtggttacg cgcagcgtga ccgctacact  1380
tgccagcgcc ctagcgcccg ctcctttcgc tttcttccct tcctttctcg ccacgttcgc  1440
cggctttccc cgtcaagctc taaatcgggg gctcccttta gggttccgat ttagtgcttt  1500
acggcacctc gaccccaaaa aacttgatta gggtgatggt tcacgtagtg ggccatcgcc  1560
ctgatagacg gtttttcgcc ctttgacgtt ggagtccacg ttctttaata gtggactctt  1620
gttccaaact ggaacaacac tcaaccctat ctcggtctat tcttttgatt tataagggat  1680
tttgccgatt tcggcctatt ggttaaaaaa tgagctgatt taacaaaaat ttaacgcgaa  1740
ttttaacaaa atattaacgt ttacaattta aatatttgct tatacaatct tcctgttttt  1800
ggggcttttc tgattatcaa ccggggtaca tatgattgac atgctagttt tacgattacc  1860
gttcatcgat tctcttgttt gctccagact ctcaggcaat gacctgatag cctttgtaga  1920
gacctctcaa aaatagctac cctctccggc atgaatttat cagctagaac ggttgaatat  1980
catattgatg gtgatttgac tgtctccggc ctttctcacc cgtttgaatc tttacctaca  2040
cattactcag gcattgcatt taaaatatat gagggttcta aaaatttta tccttgcgtt  2100
gaaataaagg cttctcccgc aaaagtatta cagggtcata atgtttttgg tacaaccgat  2160
ttagctttat gctctgaggc tttattgctt aattttgcta attctttgcc ttgcctgtat  2220
gatttattgg atgttggaat tcctgatgcg gtattttctc cttacgcatc tgtgcggtat  2280
ttcacaccgc atatggtgca ctctcagtac aatctgctct gatgccgcat agttaagcca  2340
gccccgacac ccgccaacac ccgctgacgc gccctgacgg gcttgtctgc tcccggcatc  2400
cgcttacaga caagctgtga ccgtctccgg gagctgcatg tgtcagaggt tttcaccgtc  2460
atcaccgaaa cgcgcgagac gaaagggcct cgtgatacgc ctatttttat aggttaatgt  2520
catgataata atggtttctt agacgtcagg tggcactttt cggggaaatg tgcgcggaac  2580
ccctatttgt ttatttttct aaatacattc aaatatgtat ccgctcatga gacaataacc  2640
ctgataaatg cttcaataat attgaaaaag gaagagtatg agtattcaac atttccgtgt  2700
cgcccttatt cccttttttg cggcattttg ccttcctgtt tttgctcacc cagaaacgct  2760
ggtgaaagta aaagatgctg aagatcagtt gggtgcacga gtgggttaca tcgaactgga  2820
tctcaacagc ggtaagatcc ttgagagttt tcgccccgaa gaacgttttc caatgatgag  2880
cacttttaaa gttctgctat gtggcgcggt attatcccgt attgacgccg ggcaagagca  2940
actcggtcgc cgcatacact attctcagaa tgacttggtt gagtactcac cagtcacaga  3000
aaagcatctt acggatggca tgacagtaag agaattatgc agtgctgcca taaccatgag  3060
tgataacact gcggccaact tacttctgac aacgatcgga ggaccgaagg agctaaccgc  3120
ttttttgcac aacatggggg atcatgtaac tcgccttgat cgttgggaac cggagctgaa  3180
tgaagccata ccaaacgacg agcgtgacac cacgatgcct gtagcaatgg caacaacgtt  3240
gcgcaaacta ttaactggcg aactacttac tctagcttcc cggcaacaat taatagactg  3300
gatggaggcg gataaagttg caggaccact tctgcgctcg gcccttccgg ctggctggtt  3360
tattgctgat aaatctggag ccggtgagcg tgggtctcgc ggtatcattg cagcactggg  3420
```

-continued

```
gccagatggt aagccctccc gtatcgtagt tatctacacg acggggagtc aggcaactat  3480
ggatgaacga aatagacaga tcgctgagat aggtgcctca ctgattaagc attggtaact  3540
gtcagaccaa gtttactcat atatacttta gattgattta aaacttcatt tttaatttaa  3600
aaggatctag gtgaagatcc tttttgataa tctcatgacc aaaatccctt aacgtgagtt  3660
ttcgttccac tgagcgtcag accccgtaga aaagatcaaa ggatcttctt gagatccttt  3720
ttttctgcgc gtaatctgct gcttgcaaac aaaaaaacca ccgctaccag cggtggtttg  3780
tttgccggat caagagctac caactctttt tccgaaggta actggcttca gcagagcgca  3840
gataccaaat actgtccttc tagtgtagcc gtagttaggc caccacttca agaactctgt  3900
agcaccgcct acatacctcg ctctgctaat cctgttacca gtggctgctg ccagtggcga  3960
taagtcgtgt cttaccgggt tggactcaag acgatagtta ccggataagg cgcagcggtc  4020
gggctgaacg gggggttcgt gcacacagcc cagcttggag cgaacgacct acaccgaact  4080
gagataccta cagcgtgagc tatgagaaag cgccacgctt cccgaaggga gaaaggcgga  4140
caggtatccg gtaagcggca gggtcggaac aggagagcgc acgagggagc ttccaggggg  4200
aaacgcctgg tatctttata gtcctgtcgg gtttcgccac ctctgacttg agcgtcgatt  4260
tttgtgatgc tcgtcagggg ggcggagcct atggaaaaac gccagcaacg cggccttttt  4320
acggttcctg gccttttgct ggccttttgc tcacatgttc tttcctgcgt tatcccctga  4380
ttctgtggat aaccgtatta ccgcctttga gtgagctgat accgctcgcc gcagccgaac  4440
gaccgagcgc agcgagtcag tgagcgagga agcggaagag cgcccaatac gcaaaccgcc  4500
tctccccgcg cgttggccga ttcattaatg cagcagctgc gcgctcgctc gctcactgag  4560
gccgcccggg caaagcccgg gcgtcgggcg acctttggtc gcccggcctc agtgagcgag  4620
cgagcgcgca gagagggagt ggccaactcc atcactaggg gttccttgta gttaatgatt  4680
aacccgccat gctacttatc tacgtagcca tgctctagga cattgattat tgactagtgg  4740
agttccgcgt tacataactt acggtaaatg gcccgcctgg ctgaccgccc aacgacccca  4800
gcccattgac gtcaataatg acgtatgttc ccatagtaac gccaataggg actttccatt  4860
gacgtcaatg ggtggagtat ttacggtaaa ctgcccactt ggcagtacat caagtgtatc  4920
atatgccaag tacgcccccc attgacgtca atgacggtaa atggcccgcc tggcattatg  4980
cccagtacat gaccttatgg gactttccta cttggcagta catctacgta ttagtcatcg  5040
ctattaccat ggtcgaggtg agccccacgt tctgcttcac tctccccatc tccccccccc  5100
ccccaccccc aattttgtat ttatttattt tttaattatt ttgtgcagcg atgggggcgg  5160
gggggggggg gggcgcgcgc caggcggggc ggggcggggc gaggggcggg gcggggcgag  5220
gcggagaggt gcggcggcag ccaatcagag cggcgcgctc cgaaagtttc cttttatggc  5280
gaggcggcgg cggcggcggc cctataaaaa gcgaagcgcg cggcgggcgg gagtcgctgc  5340
gcgctgcctt cgccccgtgc cccgctccgc cgccgcctcg cgccgcccgc cccggctctg  5400
actgaccgcg ttactaaaac aggtaagtcc ggcctccgcg ccgggttttg gcgcctcccg  5460
cgggcgcccc cctcctcacg gcgagcgctg ccacgtcaga cgaagggcgc agcgagcgtc  5520
ctgatccttc cgcccggacg ctcaggacag cggcccgctg ctcataagac tcggccttag  5580
aaccccagta tcagcagaag gacattttag gacgggactt gggtgactct agggcactgg  5640
ttttctttcc agagagcgga acaggcgagg aaaagtagtc ccttctcggc gattctgcgg  5700
agggatctcc gtggggcggt gaacgccgat gatgcctcta ctaaccatgt tcatgttttc  5760
ttttttttc tacaggtcct gggtgacgaa cagggtaccg ccaccatggc caccggctct  5820
cgcacaagcc tgctgctggc tttcggactg ctgtgcctgc cttggctcca ggagggctcc  5880
gccgctagca tcgataccgt cgctatgtgc tggaggcttg ctgaaggctg tatgctgagg  5940
taatatcctg acgctcagcc gttttggcct ctgactgacg gctgagcgtg gatattacct  6000
caggacacaa ggcctgttac tagcactcac atggaacaaa tggcctctag cctggaggct  6060
tgctgaaggc tgtatgctgt acagaatcag ataatcagcg ccgttttggc ctctgactga  6120
cggcgctgat tctgattctg tacaggacac aaggcctgtt actagcactc acatggaaca  6180
aatggcctct agcctggagg cttgctgaag gctgtatgct gtcatgttta aaaattcgct  6240
gcgcgttttg gcctctgact gacgcgcagc gaatttaaac atgacaggac acaaggcctg  6300
ttactagcac tcacatggaa caaatggcct ctctagaat                         6339

SEQ ID NO: 19          moltype = DNA  length = 6339
FEATURE                Location/Qualifiers
source                 1..6339
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 19
aatcaacctc tggattacaa aatttgtgaa agattgactg gtattcttaa ctatgttgct  60
ccttttacgc tatgtggata cgctgcttta atgcctttgt atcatgctat tgcttcccgt  120
atggctttca ttttctcctc cttgtataaa tcctggttgc tgtctcttta tgaggagttg  180
tggcccgttg tcaggcaacg tggcgtggtg tgcactgtgt ttgctgacgc aacccccact  240
ggttggggca ttgccaccac ctgtcagctc ctttccggga ctttcgcttt ccccctccct  300
attgccacgg cggaactcat cgccgcctgc cttgcccgct gctggacagg ggctcggctg  360
ttgggcactg acaattccgt ggtgttgtcg gggaaatcat cgtcctttcc ttggctgctc  420
gcctgtgttg ccacctggat tctgcgcggg acgtccttct gctacgtccc ttcggccctc  480
aatccagcgg accttccttc ccgcggcctg ctgccggctc tgcggcctct tccgcgtctt  540
cgccttcgcc ctcagacgag tcggatctcc ctttgggccg cctccccgcc taagcttatc  600
gataccgtcg agatctaact tgtttattgc agcttataat ggttacaaat aaagcaatag  660
catcacaaat ttcacaaata aagcattttt ttcactgcat tctagttgtg gtttgtccaa  720
actcatcaat gtatcttatc atgtctggat ctcgacctcg actagagcat ggctacgtag  780
ataagtagca tggcgggtta atcattaact acaaggaacc cctagtgatg gagttggcca  840
ctccctctct gcgcgctcgc tcgctcactg aggccgggcg accaaaggtc gcccgacgcc  900
cgggctttgc ccgggcggcc tcagtgagcg agcgagcgcg cagctggcgt aatagcgaag  960
aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa tggcgattcc  1020
gttgcaatgg ctggcggtaa tattgttctg gatattacca gcaaggccga tagtttgagt  1080
tcttctactc aggcaagtga tgttattact aatcaaagaa gtattgcgac aacggttaat  1140
ttgcgtgatg gacagactct tttactcggt ggcctcactg attataaaaa cacttctcag  1200
```

-continued

```
gattctggcg taccgttcct gtctaaaatc cctttaatcg gcctcctgtt tagctcccgc  1260
tctgattcta acgaggaaag cacgttatac gtgctcgtca aagcaaccat agtacgcgcc  1320
ctgtagcggc gcattaagcg cggcgggtgt ggtggttacg cgcagcgtga ccgctacact  1380
tgccagcgcc ctagcgcccg ctcctttcgc tttcttccct tcctttctcg ccacgttcgc  1440
cggctttccc cgtcaagctc taaatcgggg gctcccttta gggttccgat ttagtgcttt  1500
acggcacctc gaccccaaaa aacttgatta gggtgatggt tcacgtagtg ggccatcgcc  1560
ctgatagacg gtttttcgcc ctttgacgtt ggagtccacg ttctttaata gtggactctt  1620
gttccaaact ggaacaacac tcaaccctat ctcggtctat tcttttgatt tataagggat  1680
tttgccgatt tcggcctatt ggttaaaaaa tgagctgatt taacaaaaat ttaacgcgaa  1740
ttttaacaaa atattaacgt ttacaattta aatatttgct tatacaatct tcctgttttt  1800
ggggcttttc tgattatcaa ccggggtaca tatgattgac atgctagttt tacgattacc  1860
gttcatcgat tctcttgttt gctccagact ctcaggcaat gacctgatag cctttgtaga  1920
gacctctcaa aaatagctac cctctccggc atgaatttat cagctagaac ggttgaatat  1980
catattgatg gtgatttgac tgtctccggc ctttctcacc cgtttgaatc tttacctaca  2040
cattactcag gcattgcatt taaaatatat gagggttcta aaaatttta tccttgcgtt  2100
gaaataaagg cttctcccgc aaaagtatta cagggtcata atgtttttgg tacaaccgat  2160
ttagctttat gctctgaggc tttattgctt aattttgcta attctttgcc ttgcctgtat  2220
gatttattgg atgttggaat tcctgatgcg gtattttctc cttacgcatc tgtgcggtat  2280
ttcacaccgc atatggtgca ctctcagtac aatctgctct gatgccgcat agttaagcca  2340
gccccgacac ccgccaacac ccgctgacgc gccctgacgg gcttgtctgc tcccggcatc  2400
cgcttacaga caagctgtga ccgtctccgg gagctgcatg tgtcagaggt tttcaccgtc  2460
atcaccgaaa cgcgcgagac gaaagggcct cgtgatacgc ctatttttat aggttaatgt  2520
catgataata atggtttctt agacgtcagg tggcactttt cggggaaatg tgcgcggaac  2580
ccctatttgt ttatttttct aaatacattc aaatatgtat ccgctcatga gacaataacc  2640
ctgataaatg cttcaataat attgaaaaag gaagagtatg agtattcaac atttccgtgt  2700
cgcccttatt ccctttttttg cggcattttg ccttcctgtt tttgctcacc cagaaacgct  2760
ggtgaaagta aaagatgctg aagatcagtt gggtgcacga gtgggttaca tcgaactgga  2820
tctcaacagc ggtaagatcc ttgagagttt tcgccccgaa gaacgttttc caatgatgag  2880
cacttttaaa gttctgctat gtggcgcggt attatcccgt attgacgccg ggcaagagca  2940
actcggtcgc cgcatacact attctcagaa tgacttggtt gagtactcac cagtcacaga  3000
aaagcatctt acggatggca tgacagtaag agaattatgc agtgctgcca taaccatgag  3060
tgataacact gcggccaact tacttctgac aacgatcgga ggaccgaagg agctaaccgc  3120
ttttttgcac aacatggggg atcatgtaac tcgccttgat cgttgggaac cggagctgaa  3180
tgaagccata ccaaacgacg agcgtgacac cacgatgcct gtagcaatgg caacaacgtt  3240
gcgcaaacta ttaactggcg aactacttac tctagcttcc cggcaacaat taatagactg  3300
gatggaggcg gataaagttg caggaccact tctgcgctcg gcccttccgg ctggctggtt  3360
tattgctgat aaatctggag ccggtgagcg tgggtctcgc ggtatcattg cagcactggg  3420
gccagatggt aagccctccc gtatcgtagt tatctacacg acggggagtc aggcaactat  3480
ggatgaacga aatagacaga tcgctgagat aggtgcctca ctgattaagc attggtaact  3540
gtcagaccaa gtttactcat atatacttta gattgattta aaacttcatt tttaatttaa  3600
aaggatctag gtgaagatcc tttttgataa tctcatgacc aaaatccctt aacgtgagtt  3660
ttcgttccac tgagcgtcag accccgtaga aaagatcaaa ggatcttctt gagatccttt  3720
ttttctgcgc gtaatctgct gcttgcaaac aaaaaaacca ccgctaccag cggtggtttg  3780
tttgccggat caagagctac caactctttt tccgaaggta actggcttca gcagagcgca  3840
gataccaaat actgtccttc tagtgtagcc gtagttaggc caccacttca agaactctgt  3900
agcaccgcct acatacctcg ctctgctaat cctgttacca gtggctgctg ccagtggcga  3960
taagtcgtgt cttaccgggt tggactcaag acgatagtta ccggataagg cgcagcggtc  4020
gggctgaacg gggggttcgt gcacacagcc cagcttggag cgaacgacct acaccgaact  4080
gagatacctа cagcgtgagc tatgagaaag cgccacgctt cccgaaggga gaaaggcgga  4140
caggtatccg gtaagcggca gggtcggaac aggagagcgc acgagggagc ttccaggggg  4200
aaacgcctgg tatctttata gtcctgtcgg gtttcgccac ctctgacttg agcgtcgatt  4260
tttgtgatgc tcgtcagggg ggcggagcct atggaaaaac gccagcaacg cggccttttt  4320
acggttcctg gccttttgct ggccttttgc tcacatgttc tttcctgcgt tatcccctga  4380
ttctgtggat aaccgtatta ccgcctttga gtgagctgat accgctcgcc gcagccgaac  4440
gaccgagcgc agcgagtcag tgagcgagga agcggaagag cgcccaatac gcaaaccgcc  4500
tctccccgcg cgttggccga ttcattaatg cagcagctgc gcgctcgctc gctcactgag  4560
gccgcccggg caaagcccgg gcgtcgggcg acctttggtc gcccggcctc agtgagcgag  4620
cgagcgcgca gagagggagt ggccaactcc atcactaggg gttccttgta gttaatgatt  4680
aacccgccat gctacttatc tacgtagcca tgctctagga cattgattat tgactagtgg  4740
agttccgcgt tacataactt acggtaaatg gcccgcctgg ctgaccgccc aacgacccсc  4800
gcccattgac gtcaataatg acgtatgttc ccatagtaac gccaataggg actttccatt  4860
gacgtcaatg ggtggagtat ttacggtaaa ctgcccactt ggcagtacat caagtgtatc  4920
atatgccaag tacgcccccc attgacgtca atgacggtaa atggcccgcc tggcattatg  4980
cccagtacat gaccttatgg gactttccta cttggcagta catctacgta ttagtcatcg  5040
ctattaccat ggtcgaggtg agccccacgt tctgcttcac tctccccatc tccccccccc  5100
ccccaccccc aattttgtat ttatttattt tttaattatt ttgtgcagcg atgggggcgg  5160
gggggggggg gggcgcgcgc caggcggggc ggggcggggc gaggggcggg gcggggcgag  5220
gcggagaggt gcggcggcag ccaatcagag cggcgcgctc cgaaagtttc cttttatggc  5280
gaggcggcgg cggcggcggc cctataaaaa gcgaagcgcg cggcgggcgg gagtcgctgc  5340
gcgctgcctt cgccccgtgc cccgctccgc cgccgcctcg cgccgcccgc cccggctctg  5400
actgaccgcg ttactaaaac aggtaagtcc ggcctccgcg ccgggttttg gcgcctcccg  5460
cgggcgcccc cctcctcacg gcgagcgctg ccacgtcaga cgaagggcgc agcgagcgtc  5520
ctgatccttc cgcccggacg ctcaggacag cggcccgctg ctcataagac tcggccttag  5580
aaccccagta tcagcagaag gacattttag gacgggactt gggtgactct agggcactgg  5640
ttttctttcc agagagcgga acaggcgagg aaaagtagtc ccttctcggc gattctgcgg  5700
agggatctcc gtggggcggt gaacgccgat gatgcctcta ctaaccatgt tcatgttttc  5760
```

-continued

```
ttttttttttc tacaggtcct gggtgacgaa cagggtaccg ccaccatggc caccggctct  5820
cgcacaagcc tgctgctggc tttcggactg ctgtgcctgc cttggctcca ggagggctcc  5880
gccgctagca tcgataccgt cgctatgtgc tggaggcttg ctgaaggctg tatgctgatg  5940
aatcgggttg tctgaatcgc gttttggcct ctgactgacg cgattcagaa cccgattcat  6000
caggacacaa ggcctgttac tagcactcac atggaacaaa tggcctctag cctggaggct  6060
tgctgaaggc tgtatgctga acactttgct atatcatcct gcgttttggc ctctgactga  6120
cgcaggatga tagcaaagtg ttcaggacac aaggcctgtt actagcactc acatggaaca  6180
aatggcctct agcctggagg cttgctgaag gctgtatgct gttctgttcg ttaagctaat  6240
gctcgttttg gcctctgact gacgagcatt agcaacgaac agaacaggac acaaggcctg  6300
ttactagcac tcacatggaa caaatggcct ctctagaat                         6339

SEQ ID NO: 20          moltype = DNA  length = 6339
FEATURE                Location/Qualifiers
source                 1..6339
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 20
aatcaacctc tggattacaa aatttgtgaa agattgactg gtattcttaa ctatgttgct  60
ccttttacgc tatgtggata cgctgcttta atgcctttgt atcatgctat tgcttcccgt  120
atggctttca ttttctcctc cttgtataaa tcctggttgc tgtctcttta tgaggagttg  180
tggcccgttg tcaggcaacg tggcgtggtg tgcactgtgt ttgctgacgc aacccccact  240
ggttggggca ttgccaccac ctgtcagctc ctttccggga ctttcgcttt ccccctccct  300
attgccacgg cggaactcat cgccgcctgc cttgcccgct gctggacagg ggctcggctg  360
ttgggcactg acaattccgt ggtgttgtcg gggaaatcat cgtcctttcc ttggctgctc  420
gcctgtgttg ccacctggat tctgcgcggg acgtccttct gctacgtccc ttcggccctc  480
aatccagcgg accttccttc ccgcggccctg ctgccggctc tgcggcctct tccgcgtctt  540
cgccttcgcc ctcagacgag tcggatctcc ctttgggccg cctccccgcc taagcttatc  600
gataccgtcg agatctaact tgtttattgc agcttataat ggttacaaat aaagcaatag  660
catcacaaat ttcacaaata aagcattttt ttcactgcat tctagttgtg gtttgtccaa  720
actcatcaat gtatcttatc atgtctggat ctcgacctcg actagagcat ggctacgtag  780
ataagtagca tggcgggtta atcattaact acaaggaacc cctagtgatg gagttggcca  840
ctccctctct gcgcgctcgc tcgctcactg aggccgggcg accaaaggtc gcccgacgcc  900
cgggctttgc ccgggcggcc tcagtgagcg agcgagcgcg cagctggcgt aatagcgaag  960
aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa tggcgattcc  1020
gttgcaatgg ctggcggtaa tattgttctg gatattacca gcaaggccga tagtttgagt  1080
tcttctactc aggcaagtga tgttattact aatcaaagaa gtattgcgac aacggttaat  1140
ttgcgtgatg gacagactct tttactcggt ggcctcactg attataaaaa cacttctcag  1200
gattctggcg taccgttcct gtctaaaatc cctttaatcg gcctcctgtt tagctcccgc  1260
tctgattcta acgaggaaag cacgttatac gtgctcgtca aagcaaccat agtacgcgcc  1320
ctgtagcggc gcattaagcg cggcgggtgt ggtggttacg cgcagcgtga ccgctacact  1380
tgccagcgcc ctagcgcccg ctcctttcgc tttcttccct tcctttctcg ccacgttcgc  1440
cggctttccc cgtcaagctc taaatcgggg gctcccttta gggttccgat ttagtgcttt  1500
acggcacctc gaccccaaaa aacttgatta gggtgatggt tcacgtagtg ggccatcgcc  1560
ctgatagacg gtttttcgcc ctttgacgtt ggagtccacg ttctttaata gtggactctt  1620
gttccaaact ggaacaacac tcaaccctat ctcggtctat tcttttgatt tataagggat  1680
tttgccgatt tcggcctatt ggttaaaaaa tgagctgatt taacaaaaat ttaacgcgaa  1740
ttttaacaaa atattaacgt ttacaattta aatatttgct tatacaatct tcctgttttt  1800
ggggctttttc tgattatcaa ccggggtaca tatgattgac atgctagttt tacgattacc  1860
gttcatcgat tctcttgttt gctccagact ctcaggcaat gacctgatag cctttgtaga  1920
gacctctcaa aaatagctac cctctccggc atgaatttat cagctagaac ggttgaatat  1980
catattgatg gtgatttgac tgtctccggc ctttctcacc cgtttgaatc tttacctaca  2040
cattactcag gcattgcatt taaaatatat gagggttcta aaaatttttа tccttgcgtt  2100
gaaataaagg cttctcccgc aaaagtatta cagggtcata atgtttttgg tacaaccgat  2160
ttagctttat gctctgaggc tttattgctt aattttgcta attctttgcc ttgcctgtat  2220
gatttattgg atgttggaat tcctgatgcg gtattttctc cttacgcatc tgtgcggtat  2280
ttcacaccgc atatggtgca ctctcagtac aatctgctct gatgccgcat agttaagcca  2340
gccccgacac ccgccaacac ccgctgacgc gccctgacgg gcttgtctgc tcccggcatc  2400
cgcttacaga caagctgtga ccgtctccgg gagctgcatg tgtcagaggt tttcaccgtc  2460
atcaccgaaa cgcgcgagac gaaagggcct cgtgatacgc ctatttttat aggttaatgt  2520
catgataata atggtttctt agacgtcagg tggcactttt cggggaaatg tgcgcggaac  2580
ccctatttgt ttatttttct aaatacattc aaatatgtat ccgctcatga gacaataacc  2640
ctgataaatg cttcaataat attgaaaaag gaagagtatg agtattcaac atttccgtgt  2700
cgcccttatt cccttttttg cggcattttg ccttcctgtt tttgctcacc cagaaacgct  2760
ggtgaaagta aaagatgctg aagatcagtt gggtgcacga gtgggttaca tcgaactgga  2820
tctcaacagc ggtaagatcc ttgagagttt tcgccccgaa gaacgttttc caatgatgag  2880
cacttttaaa gttctgctat gtggcgcggt attatcccgt attgacgccg ggcaagagca  2940
actcggtcgc cgcatacact attctcagaa tgacttggtt gagtactcac cagtcacaga  3000
aaagcatctt acggatggca tgacagtaag agaattatgc agtgctgcca taaccatgag  3060
tgataacact gcggccaact tacttctgac aacgatcgga ggaccgaagg agctaaccgc  3120
ttttttgcac aacatggggg atcatgtaac tcgccttgat cgttgggaac cggagctgaa  3180
tgaagccata ccaaacgacg agcgtgacac cacgatgcct gtagcaatgg caacaacgtt  3240
gcgcaaacta ttaactggcg aactacttac tctagcttcc cggcaacaat taatagactg  3300
gatggaggcg gataaagttg caggaccact tctgcgctcg gcccttccgg ctggctggtt  3360
tattgctgat aaatctggag ccggtgagcg tgggtctcgc ggtatcattg cagcactggg  3420
gccagatggt aagccctccc gtatcgtagt tatctacacg acggggagtc aggcaactat  3480
ggatgaacga aatagacaga tcgctgagat aggtgcctca ctgattaagc attggtaact  3540
```

-continued

```
gtcagaccaa gtttactcat atatacttta gattgattta aaacttcatt tttaatttaa  3600
aaggatctag gtgaagatcc tttttgataa tctcatgacc aaaatccctt aacgtgagtt  3660
ttcgttccac tgagcgtcag accccgtaga aaagatcaaa ggatcttctt gagatccttt  3720
ttttctgcgc gtaatctgct gcttgcaaac aaaaaaacca ccgctaccag cggtggtttg  3780
tttgccggat caagagctac caactctttt tccgaaggta actggcttca gcagagcgca  3840
gataccaaat actgtccttc tagtgtagcc gtagttaggc caccacttca agaactctgt  3900
agcaccgcct acatacctcg ctctgctaat cctgttacca gtggctgctg ccagtggcga  3960
taagtcgtgt cttaccgggt tggactcaag acgatagtta ccggataagg cgcagcggtc  4020
gggctgaacg gggggttcgt gcacacagcc cagcttggag cgaacgacct acaccgaact  4080
gagataccta cagcgtgagc tatgagaaag cgccacgctt cccgaaggga gaaaggcgga  4140
caggtatccg gtaagcggca gggtcggaac aggagagcgc acgagggagc ttccaggggg  4200
aaacgcctgg tatctttata gtcctgtcgg gtttcgccac ctctgacttg agcgtcgatt  4260
tttgtgatgc tcgtcagggg ggcggagcct atggaaaaac gccagcaacg cggccttttt  4320
acggttcctg gccttttgct ggccttttgc tcacatgttc tttcctgcgt tatcccctga  4380
ttctgtggat aaccgtatta ccgcctttga gtgagctgat accgctcgcc gcagccgaac  4440
gaccgagcgc agcgagtcag tgagcgagga agcggaagag cgcccaatac gcaaaccgcc  4500
tctccccgcg cgttggccga ttcattaatg cagcagctgc gcgctcgctc gctcactgag  4560
gccgcccggg caaagcccgg gcgtcgggcg acctttggtc gcccggcctc agtgagcgag  4620
cgagcgcgca gagagggagt ggccaactcc atcactaggg gttccttgta gttaatgatt  4680
aacccgccat gctacttatc tacgtagcca tgctctagga cattgattat tgactagtgg  4740
agttccgcgt tacataactt acggtaaatg gcccgcctgg ctgaccgccc aacgacccca  4800
gcccattgac gtcaataatg acgtatgttc ccatagtaac gccaatagggg actttccatt  4860
gacgtcaatg ggtggagtat ttacggtaaa ctgcccactt ggcagtacat caagtgtatc  4920
atatgccaag tacgcccccc attgacgtca atgacggtaa atggcccgcc tggcattatg  4980
cccagtacat gaccttatgg gactttccta cttggcagta catctacgta ttagtcatcg  5040
ctattaccat ggtcgaggtg agccccacgt tctgcttcac tctccccatc tccccccccc  5100
ccccaccccc aattttgtat ttatttattt tttaattatt ttgtgcagcg atgggggcgg  5160
gggggggggg gggcgcgcgc caggcggggc ggggcggggc gaggggcggg gcggggcgag  5220
gcggagaggt gcggcggcag ccaatcagag cggcgcgctc cgaaagtttc cttttatggc  5280
gaggcggcgg cggcggcggc cctataaaaa gcgaagcgcg cggcgggcgg gagtcgctgc  5340
gcgctgcctt cgccccgtgc cccgctccgc cgccgcctcg cgccgcccgc cccggctctg  5400
actgaccgcg ttactaaaac aggtaagtcc ggcctccgcg ccgggttttg gcgcctcccg  5460
cgggcgcccc cctcctcacg gcgagcgctg ccacgtcaga cgaagggcgc agcgagcgtc  5520
ctgatccttc cgcccggacg ctcaggacag cggcccgctg ctcataagac tcggccttag  5580
aaccccagta tcagcagaag gacattttag gacgggactt gggtgactct agggcactgg  5640
ttttctttcc agagagcgga acaggcgagg aaaagtagtc ccttctcggc gattctgcgg  5700
agggatctcc gtggggcggt gaacgccgat gatgcctcta ctaaccatgt tcatgttttc  5760
ttttttttte tacaggtcct gggtgacgaa cagggtaccg ccaccatggc caccggctct  5820
cgcacaagcc tgctgctggc tttcggactg ctgtgcctgc cttggctcca ggagggctcc  5880
gccgctagca tcgataccgt cgctatgtgc tggaggcttg ctgaaggctg tatgctggag  5940
cattagcaat gcgaacagaa gttttggcct ctgactgact tctgttcgtt gctaatgctc  6000
caggacacaa ggcctgttac tagcactcac atggaacaaa tggcctctag cctggaggct  6060
tgctgaaggc tgtatgctga aacataatgg attcagcagc gcgttttggc ctctgactga  6120
cgcgctgctg accattatgt ttcaggacac aaggcctgtt actagcactc acatggaaca  6180
aatggcctct agcctggagg cttgctgaag gctgtatgct gttatctttg cgaagctgcc  6240
atccgttttg gcctctgact gacggatggc agccgcaaag ataacaggac acaaggcctg  6300
ttactagcac tcacatggaa caaatggcct ctctagaat                         6339

SEQ ID NO: 21          moltype = DNA  length = 6337
FEATURE                Location/Qualifiers
source                 1..6337
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 21
aatcaacctc tggattacaa aatttgtgaa agattgactg gtattcttaa ctatgttgct  60
ccttttacgc tatgtggata cgctgcttta atgcctttgt atcatgctat tgcttcccgt  120
atggctttca ttttctcctc cttgtataaa tcctggttgc tgtctcttta tgaggagttg  180
tggcccgttg tcaggcaacg tggcgtggtg tgcactgtgt ttgctgacgc aacccccact  240
ggttggggca ttgccaccac ctgtcagctc ctttccggga ctttcgcttt ccccctccct  300
attgccacgg cggaactcat cgccgcctgc cttgcccgct gctggacagg ggctcggctg  360
ttgggcactg acaattccgt ggtgttgtcg gggaaatcat cgtcctttcc ttggctgctc  420
gcctgtgttg ccacctggat tctgcgcggg acgtccttct gctacgtccc ttcggccctc  480
aatccagcgg accttccttc ccgcggcctg ctgccggctc tgcggcctct tccgcgtctt  540
cgccttcgcc ctcagacgag tcggatctcc ctttgggccg cctccccgcc taagcttatc  600
gataccgtcg agatctaact tgtttattgc agcttataat ggttacaaat aaagcaatag  660
catcacaaat ttcacaaata aagcattttt ttcactgcat tctagttgtg gtttgtccaa  720
actcatcaat gtatcttatc atgtctggat ctcgacctcg actagagcat ggctacgtag  780
ataagtagca tggcgggtta atcattaact acaaggaacc cctagtgatg gagttggcca  840
ctccctctct gcgcgctcgc tcgctcactg aggccgggcg accaaaggtc gcccgacgcc  900
cgggctttgc ccgggcggcc tcagtgagcg agcgagcgcg cagctggcgt aatagcgaag  960
aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa tggcgattcc  1020
gttgcaatgg ctggcggtaa tattgttctg gatattacca gcaaggccga tagtttgagt  1080
tcttctactc aggcaagtga tgttattact aatcaaagaa gtattgcgac aacggttaat  1140
ttgcgtgatg gacagactct tttactcggt ggcctcactg attataaaaa cacttctcag  1200
gattctggcg taccgttcct gtctaaaatc cctttaatcg gcctcctgtt tagctcccgc  1260
tctgattcta acgaggaaag cacgttatac gtgctcgtca aagcaaccat agtacgcgcc  1320
```

-continued

```
ctgtagcggc gcattaagcg cggcgggtgt ggtggttacg cgcagcgtga ccgctacact  1380
tgccagcgcc ctagcgcccg ctcctttcgc tttcttccct tcctttctcg ccacgttcgc  1440
cggctttccc cgtcaagctc taaatcgggg gctcccttta gggttccgat ttagtgcttt  1500
acggcacctc gaccccaaaa aacttgatta gggtgatggt tcacgtagtg ggccatcgcc  1560
ctgatagacg gtttttcgcc ctttgacgtt ggagtccacg ttctttaata gtggactctt  1620
gttccaaact ggaacaacac tcaaccctat ctcggtctat tcttttgatt tataagggat  1680
tttgccgatt tcggcctatt ggttaaaaaa tgagctgatt taacaaaaat ttaacgcgaa  1740
ttttaacaaa atattaacgt ttacaattta aatatttgct tatacaatct tcctgttttt  1800
ggggcttttc tgattatcaa ccggggtaca tatgattgac atgctagttt tacgattacc  1860
gttcatcgat tctcttgttt gctccagact ctcaggcaat gacctgatag cctttgtaga  1920
gacctctcaa aaatagctac cctctccggc atgaatttat cagctagaac ggttgaatat  1980
catattgatg gtgatttgac tgtctccggc ctttctcacc cgtttgaatc tttacctaca  2040
cattactcag gcattgcatt taaaatatat gagggttcta aaaatttttа tccttgcgtt  2100
gaaataaagg cttctcccgc aaaagtatta cagggtcata atgtttttgg tacaaccgat  2160
ttagctttat gctctgaggc tttattgctt aattttgcta attctttgcc ttgcctgtat  2220
gatttattgg atgttggaat tcctgatgcg gtatttttctc cttacgcatc tgtgcggtat  2280
ttcacaccgc atatggtgca ctctcagtac aatctgctct gatgccgcat agttaagcca  2340
gccccgacac ccgccaacac ccgctgacgc gccctgacgg gcttgtctgc tcccggcatc  2400
cgcttacaga caagctgtga ccgtctccgg gagctgcatg tgtcagaggt tttcaccgtc  2460
atcaccgaaa cgcgcgagac gaaagggcct cgtgatacgc ctatttttat aggttaatgt  2520
catgataata atggtttctt agacgtcagg tggcactttt cggggaaatg tgcgcggaac  2580
ccctatttgt ttatttttct aaatacattc aaatatgtat ccgctcatga gacaataacc  2640
ctgataaatg cttcaataat attgaaaaag gaagagtatg agtattcaac atttccgtgt  2700
cgcccttatt ccctttttтg cggcattttg ccttcctgtt tttgctcacc cagaaacgct  2760
ggtgaaagta aaagatgctg aagatcagtt gggtgcacga gtgggttaca tcgaactgga  2820
tctcaacagc ggtaagatcc ttgagagttt tcgccccgaa gaacgttttc caatgatgag  2880
cacttttaaa gttctgctat ggtggcgcggt attatcccgt attgacgccg ggcaagagca  2940
actcggtcgc cgcatacact attctcagaa tgacttggtt gagtactcac cagtcacaga  3000
aaagcatctt acggatggca tgacagtaag agaattatgc agtgctgcca taaccatgag  3060
tgataacact gcggccaact tacttctgac aacgatcgga ggaccgaagg agctaaccgc  3120
ttttttgcac aacatggggg atcatgtaac tcgccttgat cgttgggaac cggagctgaa  3180
tgaagccata ccaaacgacg agcgtgacac cacgatgcct gtagcaatgg caacaacgtt  3240
gcgcaaacta ttaactggcg aactacttac tctagcttcc cggcaacaat taatagactg  3300
gatggaggcg gataaagttg caggaccact tctgcgctcg gcccttccgg ctggctggtt  3360
tattgctgat aaatctggag ccggtgagcg tgggtctcgc ggtatcattg cagcactggg  3420
gccagatggt aagccctccc gtatcgtagt tatctacacg acggggagtc aggcaactat  3480
ggatgaacga aatagacaga tcgctgagat aggtgcctca ctgattaagc attggtaact  3540
gtcagaccaa gtttactcat atatacttta gattgattta aaacttcatt tttaatttaa  3600
aaggatctag gtgaagatcc tttttgataa tctcatgacc aaaatccctt aacgtgagtt  3660
ttcgttccac tgagcgtcag accccgtaga aaagatcaaa ggatcttctt gagatccttt  3720
ttttctgcgc gtaatctgct gcttgcaaac aaaaaaacca ccgctaccag cggtggtttg  3780
tttgccggat caagagctac caactctttt tccgaaggta actggcttca gcagagcgca  3840
gataccaaat actgtccttc tagtgtagcc gtagttaggc caccacttca agaactctgt  3900
agcaccgcct acatacctcg ctctgctaat cctgttacca gtggctgctg ccagtggcga  3960
taagtcgtgt cttaccgggt tggactcaag acgatagtta ccggataagg cgcagcggtc  4020
gggctgaacg gggggttcgt gcacacagcc cagcttggag cgaacgacct acaccgaact  4080
gagataccta cagcgtgagc tatgagaaag cgccacgctt cccgaaggga gaaaggcgga  4140
caggtatccg gtaagcggca gggtcggaac aggagagcgc acgagggagc ttccaggggg  4200
aaacgcctgg tatctttata gtcctgtcgg gtttcgccac ctctgacttg agcgtcgatt  4260
tttgtgatgc tcgtcagggg ggcggagcct atggaaaaac gccagcaacg cggccttttt  4320
acggttcctg gccttttgct ggccttttgc tcacatgttc tttcctgcgt tatcccctga  4380
ttctgtggat aaccgtatta ccgcctttga gtgagctgat accgctcgcc gcagccgaac  4440
gaccgagcgc agcgagtcag tgagcgagga agcggaagag cgcccaatac gcaaaccgcc  4500
tctccccgcg cgttggccga ttcattaatg cagcagctgc gcgctcgctc gctcactgag  4560
gccgcccggg caaagcccgg gcgtcgggcg acctttggtc gcccggcctc agtgagcgag  4620
cgagcgcgca gagagggagt ggccaactcc atcactaggg gttccttgta gttaatgatt  4680
aacccgccat gctacttatc tacgtagcca tgctctagga cattgattat tgactagtgg  4740
agttccgcgt tacataactt acggtaaatg gcccgcctgg ctgaccgccc aacgacccсc  4800
gcccattgac gtcaataatg acgtatgttc ccatagtaac gccaatagggg actttccatt  4860
gacgtcaatg ggtggagtat ttacggtaaa ctgcccactt ggcagtacat caagtgtatc  4920
atatgccaag tacgcccccт attgacgtca atgacggtaa atggcccgcc tggcattatg  4980
cccagtacat gaccttatgg gactttccta cttggcagta catctacgta ttagtcatcg  5040
ctattaccat ggtcgaggtg agccccacgt tctgcttcac tctccccatc tccccccccт  5100
ccccaccccc aattttgtat ttatttattt tttaattatt ttgtgcagcg atgggggcgg  5160
ggggggggag gggcgcgcgc caggcggggc ggggcggggc gaggggcggg gcggggcgag  5220
gcggagaggt gcggcggcag ccaatcagag cggcgcgctc cgaaagtttc cttttatggc  5280
gaggcggcgg cggcggcggc cctataaaaa gcgaagcgcg cggcgggcgg gagtcgctgc  5340
gcgctgcctt cgccccgtgc cccgctccgc cgccgcctcg cgccgcccgc cccggctctg  5400
actgaccgcg ttactaaaac aggtaagtcc ggcctccgcg ccgggttttg gcgcctcccg  5460
cgggcgcccc cctcctcacg gcgagcgctg ccacgtcaga cgaagggcgc agcgagcgtc  5520
ctgatccttc cgcccggacg ctcaggacag cggcccgctg ctcataagac tcggccttag  5580
aaccccagta tcagcagaag gacattttag gacgggactt gggtgactct agggcactgg  5640
ttttctttcc agagagcgga acaggcgagg aaaagtagtc ccttctcggc gattctgcgg  5700
agggatctcc gtggggcggt gaacgccgat gatgcctcta ctaaccatgt tcatgttttc  5760
ttttttttтc tacaggtcct gggtgacgaa cagggtaccg ccaccatggc caccggctct  5820
cgcacaagcc tgctgctggc tttcggactg ctgtgcctgc cttggctcca ggagggctcc  5880
```

-continued

```
gccgctagca tcgataccgt cgctatgtgc tggaggcttg ctgaaggctg tatgctggct  5940
cctccacttg gtggtttggt tttggcctct gactgacgcg gcaacattct ggtgattaca  6000
ggacacaagg cctgttacta gcactcacat ggaacaaatg gcctctagcc tggaggcttg  6060
ctgaaggctg tatgctgtca taatcgctat ttggtgcggc gttttggcct ctgactgacg  6120
ccgcaccaaa gcgattatga caggacacaa ggcctgttac tagcactcac atggaacaaa  6180
tggcctctag cctggaggct tgctgaaggc tgtatgctgt tctgatcctg aagttcgggt  6240
tcgttttggc ctctgactga cgaacccgaa ccaggatcag aacaggacac aaggcctgtt  6300
actagcactc acatggaaca aatggcctct ctagaat                           6337

SEQ ID NO: 22          moltype = DNA  length = 6339
FEATURE                Location/Qualifiers
source                 1..6339
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 22
aatcaacctc tggattacaa aatttgtgaa agattgactg gtattcttaa ctatgttgct  60
ccttttacgc tatgtggata cgctgcttta atgcctttgt atcatgctat tgcttcccgt  120
atggctttca ttttctcctc cttgtataaa tcctggttgc tgtctcttta tgaggagttg  180
tggcccgttg tcaggcaacg tggcgtggtg tgcactgtgt ttgctgacgc aacccccact  240
ggttggggca ttgccaccac ctgtcagctc ctttccggga ctttcgcttt ccccctccct  300
attgccacgg cggaactcat cgccgcctgc cttgcccgct gctggacagg ggctcggctg  360
ttgggcactg acaattccgt ggtgttgtcg gggaaatcat cgtcctttcc ttggctgctc  420
gcctgtgttg ccacctggat tctgcgcggg acgtccttct gctacgtccc ttcggccctc  480
aatccagcgg accttccttc ccgcggcctg ctgccggctc tgcggcctct tccgcgtctt  540
cgccttcgcc ctcagacgag tcggatctcc ctttgggccg cctccccgcc taagcttatc  600
gataccgtcg agatctaact tgtttattgc agcttataat ggttacaaat aaagcaatag  660
catcacaaat ttcacaaata aagcattttt ttcactgcat tctagttgtg gtttgtccaa  720
actcatcaat gtatcttatc atgtctggat ctcgacctcg actagagcat ggctacgtag  780
ataagtagca tggcgggtta atcattaact acaaggaacc cctagtgatg gagttggcca  840
ctccctctct gcgcgctcgc tcgctcactg aggccgggcg accaaaggtc gcccgacgcc  900
cgggctttgc ccgggcggcc tcagtgagcg agcgagcgcg cagctggcgt aatagcgaag  960
aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa tggcgattcc  1020
gttgcaatgg ctggcggtaa tattgttctg gatattacca gcaaggccga tagtttgagt  1080
tcttctactc aggcaagtga tgttattact aatcaaagaa gtattgcgac aacggttaat  1140
ttgcgtgatg gacagactct tttactcggt ggcctcactg attataaaaa cacttctcag  1200
gattctggcg taccgttcct gtctaaaatc cctttaatcg gcctcctgtt tagctcccgc  1260
tctgattcta acgaggaaag cacgttatac gtgctcgtca aagcaaccat agtacgcgcc  1320
ctgtagcggc gcattaagcg cggcgggtgt ggtggttacg cgcagcgtga ccgctacact  1380
tgccagcgcc ctagcgcccg ctcctttcgc tttcttccct tcctttctcg ccacgttcgc  1440
cggctttccc cgtcaagctc taaatcgggg gctcccttta gggttccgat ttagtgcttt  1500
acggcacctc gaccccaaaa aacttgatta gggtgatggt tcacgtagtg ggccatcgcc  1560
ctgatagacg gtttttcgcc ctttgacgtt ggagtccacg ttctttaata gtggactctt  1620
gttccaaact ggaacaacac tcaaccctat ctcggtctat tcttttgatt tataagggat  1680
tttgccgatt tcggcctatt ggttaaaaaa tgagctgatt taacaaaaat ttaacgcgaa  1740
ttttaacaaa atattaacgt ttacaattta aatatttgct tatacaatct tcctgttttt  1800
ggggcttttc tgattatcaa ccggggtaca tatgattgac atgctagttt tacgattacc  1860
gttcatcgat tctcttgttt gctccagact ctcaggcaat gacctgatag cctttgtaga  1920
gacctctcaa aaatagctac cctctccggc atgaatttat cagctagaac ggttgaatat  1980
catattgatg gtgatttgac tgtctccggc ctttctcacc cgtttgaatc tttacctaca  2040
cattactcag gcattgcatt taaaatatat gagggttcta aaaatttttа tccttgcgtt  2100
gaaataaagg cttctcccgc aaaagtatta cagggtcata atgtttttgg tacaaccgat  2160
ttagctttat gctctgaggc tttattgctt aattttgcta attctttgcc ttgcctgtat  2220
gatttattgg atgttggaat tcctgatgcg gtatttttctc cttacgcatc tgtgcggtat  2280
ttcacaccgc atatggtgca ctctcagtac aatctgctct gatgccgcat agttaagcca  2340
gccccgacac ccgccaacac ccgctgacgc gccctgacgg gcttgtctgc tcccggcatc  2400
cgcttacaga caagctgtga ccgtctccgg gagctgcatg tgtcagaggt tttcaccgtc  2460
atcaccgaaa cgcgcgagac gaaagggcct cgtgatacgc ctatttttat aggttaatgt  2520
catgataata atggtttctt agacgtcagg tggcactttt cggggaaatg tgcgcggaac  2580
ccctatttgt ttatttttct aaatacattc aaatatgtat ccgctcatga gacaataacc  2640
ctgataaatg cttcaataat attgaaaaag gaagagtatg agtattcaac atttccgtgt  2700
cgcccttatt cccttttttg cggcattttg ccttcctgtt tttgctcacc cagaaacgct  2760
ggtgaaagta aaagatgctg aagatcagtt gggtgcacga gtgggttaca tcgaactgga  2820
tctcaacagc ggtaagatcc ttgagagttt tcgccccgaa gaacgttttc caatgatgag  2880
cacttttaaa gttctgctat gtggcgcggt attatcccgt attgacgccg ggcaagagca  2940
actcggtcgc cgcatacact attctcagaa tgacttggtt gagtactcac cagtcacaga  3000
aaagcatctt acggatggca tgacagtaag agaattatgc agtgctgcca taaccatgag  3060
tgataacact gcggccaact tacttctgac aacgatcgga ggaccgaagg agctaaccgc  3120
ttttttgcac aacatggggg atcatgtaac tcgccttgat cgttgggaac cggagctgaa  3180
tgaagccata ccaaacgacg agcgtgacac cacgatgcct gtagcaatgg caacaacgtt  3240
gcgcaaacta ttaactggcg aactacttac tctagcttcc cggcaacaat taatagactg  3300
gatggaggcg gataaagttg caggaccact tctgcgctcg gcccttccgg ctggctggtt  3360
tattgctgat aaatctggag ccggtgagcg tgggtctcgc ggtatcattg cagcactggg  3420
gccagatggt aagccctccc gtatcgtagt tatctacacg acggggagtc aggcaactat  3480
ggatgaacga aatagacaga tcgctgagat aggtgcctca ctgattaagc attggtaact  3540
gtcagaccaa gtttactcat atatacttta gattgattta aaacttcatt tttaatttaa  3600
aaggatctag gtgaagatcc tttttgataa tctcatgacc aaaatccctt aacgtgagtt  3660
```

-continued

```
ttcgttccac tgagcgtcag accccgtaga aaagatcaaa ggatcttctt gagatccttt  3720
ttttctgcgc gtaatctgct gcttgcaaac aaaaaaacca ccgctaccag cggtggtttg  3780
tttgccggat caagagctac caactctttt tccgaaggta actggcttca gcagagcgca  3840
gataccaaat actgtccttc tagtgtagcc gtagttaggc caccacttca agaactctgt  3900
agcaccgcct acatacctcg ctctgctaat cctgttacca gtggctgctg ccagtggcga  3960
taagtcgtgt cttaccgggt tggactcaag acgatagtta ccggataagg cgcagcggtc  4020
gggctgaacg gggggttcgt gcacacagcc cagcttggag cgaacgacct acaccgaact  4080
gagataccta cagcgtgagc tatgagaaag cgccacgctt cccgaaggga gaaaggcgga  4140
caggtatccg gtaagcggca gggtcggaac aggagagcgc acgagggagc ttccaggggg  4200
aaacgcctgg tatctttata gtcctgtcgg gtttcgccac ctctgacttg agcgtcgatt  4260
tttgtgatgc tcgtcagggg ggcggagcct atggaaaaac gccagcaacg cggccttttt  4320
acggttcctg gccttttgct ggccttttgc tcacatgttc tttcctgcgt tatcccctga  4380
ttctgtggat aaccgtatta ccgcctttga gtgagctgat accgctcgcc gcagccgaac  4440
gaccgagcgc agcgagtcag tgagcgagga agcggaagag cgcccaatac gcaaaccgcc  4500
tctccccgcg cgttggccga ttcattaatg cagcagctgc gcgctcgctc gctcactgag  4560
gccgcccggg caaagcccgg gcgtcgggcg acctttggtc gcccggcctc agtgagcgag  4620
cgagcgcgca gagagggagt ggccaactcc atcactaggg gttccttgta gttaatgatt  4680
aacccgccat gctacttatc tacgtagcca tgctctagga cattgattat tgactagtgg  4740
agttccgcgt tacataactt acggtaaatg gcccgcctgg ctgaccgccc aacgacccca  4800
gcccattgac gtcaataatg acgtatgttc ccatagtaac gccaataggg actttccatt  4860
gacgtcaatg ggtggagtat ttacggtaaa ctgcccactt ggcagtacat caagtgtatc  4920
atatgccaag tacgcccccc attgacgtca atgacggtaa atggcccgcc tggcattatg  4980
cccagtacat gaccttatgg gactttccta cttggcagta catctacgta ttagtcatcg  5040
ctattaccat ggtcgaggtg agccccacgt tctgcttcac tctccccatc tccccccccc  5100
ccccaccccc aattttgtat ttatttattt tttaattatt ttgtgcagcg atgggggcgg  5160
gggggggggg gggcgcgcgc caggcggggc ggggcggggc gaggggcggg gcggggcgag  5220
gcggagaggt gcggcggcag ccaatcagag cggcgcgctc cgaaagtttc cttttatggc  5280
gaggcggcgg cggcggcggc cctataaaaa gcgaagcgcg cggcgggcgg gagtcgctgc  5340
gcgctgcctt cgccccgtgc cccgctccgc cgccgcctcg cgccgcccgc cccggctctg  5400
actgaccgcg ttactaaaac aggtaagtcc ggcctccgcg ccgggttttg gcgcctcccg  5460
cgggcgcccc cctcctcacg gcgagcgctg ccacgtcaga cgaagggcgc agcgagcgtc  5520
ctgatccttc cgcccggacg ctcaggacag cggcccgctg ctcataagac tcggccttag  5580
aaccccagta tcagcagaag gacattttag gacgggactt gggtgactct agggcactgg  5640
ttttctttcc agagagcgga acaggcgagg aaaagtagtc ccttctcggc gattctgcgg  5700
agggatctcc gtggggcggt gaacgccgat gatgcctcta ctaaccatgt tcatgttttc  5760
ttttttttc tacaggtcct gggtgacgaa cagggtaccg ccaccatggc caccggctct  5820
cgcacaagcc tgctgctggc tttcggactg ctgtgcctgc cttggctcca ggagggctcc  5880
gccgctagca tcgataccgt cgctatgtgc tggaggcttg ctgaaggctg tatgctgaaa  5940
tcttccggtg gttccactgc gttttggcct ctgactgacg cagtggaacc cggaagattt  6000
caggacacaa ggcctgttac tagcactcac atggaacaaa tggcctctag cctggaggct  6060
tgctgaaggc tgtatgctga tatcctgaat atggtatgca gcgttttggc ctctgactga  6120
cgctgcatac cattcaggat atcaggacac aaggcctgtt actagcactc acatggaaca  6180
aatggcctct agcctggagg cttgctgaag gctgtatgct gtttaaagct caaacgcgtt  6240
cgccgttttg gcctctgact gacggcgaac gcgtgagctt taaacaggac acaaggcctg  6300
ttactagcac tcacatggaa caaatggcct ctctagaat                         6339

SEQ ID NO: 23          moltype = DNA  length = 6339
FEATURE                Location/Qualifiers
source                 1..6339
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 23
aatcaacctc tggattacaa aatttgtgaa agattgactg gtattcttaa ctatgttgct  60
ccttttacgc tatgtggata cgctgcttta atgcctttgt atcatgctat tgcttcccgt  120
atggctttca ttttctcctc cttgtataaa tcctggttgc tgtctcttta tgaggagttg  180
tggcccgttg tcaggcaacg tggcgtggtg tgcactgtgt ttgctgacgc aacccccact  240
ggttggggca ttgccaccac ctgtcagctc ctttccggga ctttcgcttt ccccctccct  300
attgccacgg cggaactcat cgccgcctgc cttgcccgct gctggacagg ggctcggctg  360
ttgggcactg acaattccgt ggtgttgtcg gggaaatcat cgtcctttcc ttggctgctc  420
gcctgtgttg ccacctggat tctgcgcggg acgtccttct gctacgtccc ttcggccctc  480
aatccagcgg accttccttc ccgcggcctg ctgccggctc tgcggcctct tccgcgtctt  540
cgccttcgcc ctcagacgag tcggatctcc ctttgggccg cctccccgcc taagcttatc  600
gataccgtcg agatctaact tgtttattgc agcttataat ggttacaaat aaagcaatag  660
catcacaaat ttcacaaata aagcattttt ttcactgcat tctagttgtg gtttgtccaa  720
actcatcaat gtatcttatc atgtctggat ctcgacctcg actagagcat ggctacgtag  780
ataagtagca tggcgggtta atcattaact acaaggaacc cctagtgatg gagttggcca  840
ctccctctct gcgcgctcgc tcgctcactg aggccgggcg accaaaggtc gcccgacgcc  900
cgggctttgc ccgggcggcc tcagtgagcg agcgagcgcg cagctggcgt aatagcgaag  960
aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa tggcgattcc  1020
gttgcaatgg ctggcggtaa tattgttctg gatattacca gcaaggccga tagtttgagt  1080
tcttctactc aggcaagtga tgttattact aatcaaagaa gtattgcgac aacggttaat  1140
ttgcgtgatg gacagactct tttactcggt ggcctcactg attataaaaa cacttctcag  1200
gattctggcg taccgttcct gtctaaaatc cctttaatcg gcctcctgtt tagctcccgc  1260
tctgattcta acgaggaaag cacgttatac gtgctcgtca aagcaaccat agtacgcgcc  1320
ctgtagcggc gcattaagcg cggcgggtgt ggtggttacg cgcagcgtga ccgctacact  1380
tgccagcgcc ctagcgcccg ctcctttcgc tttcttccct tcctttctcg ccacgttcgc  1440
```

-continued

```
cggctttccc cgtcaagctc taaatcgggg gctcccttta gggttccgat ttagtgcttt  1500
acggcacctc gaccccaaaa aacttgatta gggtgatggt tcacgtagtg ggccatcgcc  1560
ctgatagacg gtttttcgcc ctttgacgtt ggagtccacg ttctttaata gtggactctt  1620
gttccaaact ggaacaacac tcaaccctat ctcggtctat tcttttgatt tataagggat  1680
tttgccgatt tcggcctatt ggttaaaaaa tgagctgatt taacaaaaat ttaacgcgaa  1740
ttttaacaaa atattaacgt ttacaattta aatatttgct tatacaatct tcctgttttt  1800
ggggcttttc tgattatcaa ccggggtaca tatgattgac atgctagttt tacgattacc  1860
gttcatcgat tctcttgttt gctccagact ctcaggcaat gacctgatag cctttgtaga  1920
gacctctcaa aaatagctac cctctccggc atgaatttat cagctagaac ggttgaatat  1980
catattgatg gtgatttgac tgtctccggc ctttctcacc cgtttgaatc tttacctaca  2040
cattactcag gcattgcatt taaaatatat gagggttcta aaaatttta tccttgcgtt  2100
gaaataaagg cttctcccgc aaaagtatta cagggtcata atgtttttgg tacaaccgat  2160
ttagctttat gctctgaggc tttattgctt aattttgcta attctttgcc ttgcctgtat  2220
gatttattgg atgttggaat tcctgatgcg gtatttttctc cttacgcatc tgtgcggtat  2280
ttcacaccgc atatggtgca ctctcagtac aatctgctct gatgccgcat agttaagcca  2340
gccccgacac ccgccaacac ccgctgacgc gccctgacgg gcttgtctgc tcccggcatc  2400
cgcttacaga caagctgtga ccgtctccgg gagctgcatg tgtcagaggt tttcaccgtc  2460
atcaccgaaa cgcgcgagac gaaagggcct cgtgatacgc ctatttttat aggttaatgt  2520
catgataata atggtttctt agacgtcagg tggcactttt cggggaaatg tgcgcggaac  2580
ccctatttgt ttatttttct aaatacattc aaatatgtat ccgctcatga gacaataacc  2640
ctgataaatg cttcaataat attgaaaaag gaagagtatg agtattcaac atttccgtgt  2700
cgcccttatt ccctttttttg cggcattttg ccttcctgtt tttgctcacc cagaaacgct  2760
ggtgaaagta aaagatgctg aagatcagtt gggtgcacga gtgggttaca tcgaactgga  2820
tctcaacagc ggtaagatcc ttgagagttt tcgccccgaa gaacgttttc caatgatgag  2880
cacttttaaa gttctgctat gtggcgcggt attatcccgt attgacgccg ggcaagagca  2940
actcggtcgc cgcatacact attctcagaa tgacttggtt gagtactcac cagtcacaga  3000
aaagcatctt acggatggca tgacagtaag agaattatgc agtgctgcca taaccatgag  3060
tgataacact gcggccaact tacttctgac aacgatcgga ggaccgaagg agctaaccgc  3120
ttttttgcac aacatggggg atcatgtaac tcgccttgat cgttgggaac cggagctgaa  3180
tgaagccata ccaaacgacg agcgtgacac cacgatgcct gtagcaatgg caacaacgtt  3240
gcgcaaacta ttaactggcg aactacttac tctagcttcc cggcaacaat taatagactg  3300
gatggaggcg gataaagttg caggaccact tctgcgctcg gcccttccgg ctggctggtt  3360
tattgctgat aaatctggag ccggtgagcg tgggtctcgc ggtatcattg cagcactggg  3420
gccagatggt aagccctccc gtatcgtagt tatctacacg acggggagtc aggcaactat  3480
ggatgaacga aatagacaga tcgctgagat aggtgcctca ctgattaagc attggtaact  3540
gtcagaccaa gtttactcat atatacttta gattgattta aaacttcatt tttaatttaa  3600
aaggatctag gtgaagatcc tttttgataa tctcatgacc aaaatccctt aacgtgagtt  3660
ttcgttccac tgagcgtcag accccgtaga aaagatcaaa ggatcttctt gagatccttt  3720
ttttctgcgc gtaatctgct gcttgcaaac aaaaaaacca ccgctaccag cggtggtttg  3780
tttgccggat caagagctac caactctttt tccgaaggta actggcttca gcagagcgca  3840
gataccaaat actgtccttc tagtgtagcc gtagttaggc caccacttca agaactctgt  3900
agcaccgcct acatacctcg ctctgctaat cctgttacca gtggctgctg ccagtggcga  3960
taagtcgtgt cttaccgggt tggactcaag acgatagtta ccggataagg cgcagcggtc  4020
gggctgaacg gggggttcgt gcacacagcc cagcttggag cgaacgacct acaccgaact  4080
gagatacctа cagcgtgagc tatgagaaag cgccacgctt cccgaaggga gaaaggcgga  4140
caggtatccg gtaagcggca gggtcggaac aggagagcgc acgagggagc ttccaggggg  4200
aaacgcctgg tatctttata gtcctgtcgg gtttcgccac ctctgacttg agcgtcgatt  4260
tttgtgatgc tcgtcagggg ggcggagcct atggaaaaac gccagcaacg cggccttttt  4320
acggttcctg gccttttgct ggccttttgc tcacatgttc tttcctgcgt tatcccctga  4380
ttctgtggat aaccgtatta ccgcctttga gtgagctgat accgctcgcc gcagccgaac  4440
gaccgagcgc agcgagtcag tgagcgagga agcggaagag cgcccaatac gcaaaccgcc  4500
tctccccgcg cgttggccga ttcattaatg cagcagctgc gcgctcgctc gctcactgag  4560
gccgcccggg caaagcccgg gcgtcgggcg acctttggtc gcccggcctc agtgagcgag  4620
cgagcgcgca gagagggagt ggccaactcc atcactaggg gttccttgta gttaatgatt  4680
aacccgccat gctacttatc tacgtagcca tgctctagga cattgattat tgactagtgg  4740
agttccgcgt tacataactt acggtaaatg gcccgcctgg ctgaccgccc aacgaccccc  4800
gcccattgac gtcaataatg acgtatgttc ccatagtaac gccaataggg actttccatt  4860
gacgtcaatg ggtggagtat ttacggtaaa ctgcccactt ggcagtacat caagtgtatc  4920
atatgccaag tacgcccccc attgacgtca atgacggtaa atggcccgcc tggcattatg  4980
cccagtacat gaccttatgg gactttccta cttggcagta catctacgta ttagtcatcg  5040
ctattaccat ggtcgaggtg agccccacgt tctgcttcac tctccccatc tccccccccc  5100
ccccaccccc aattttgtat ttatttattt tttaattatt ttgtgcagcg atgggggcgg  5160
gggggggggg gggcgcgcgc caggcggggc ggggcggggc gaggggcggg gcggggcgag  5220
gcggagaggt gcggcggcag ccaatcagag cggcgcgctc cgaaagtttc cttttatggc  5280
gaggcggcgg cggcggcggc cctataaaaa gcgaagcgcg cggcgggcgg gagtcgctgc  5340
gcgctgcctt cgccccgtgc cccgctccgc cgccgcctcg cgccgcccgc cccggctctg  5400
actgaccgcg ttactaaaac aggtaagtcc ggcctccgcg ccgggttttg gcgcctcccg  5460
cgggcgcccc cctcctcacg gcgagcgctg ccacgtcaga cgaagggcgc agcgagcgtc  5520
ctgatccttc cgcccggacg ctcaggacag cggcccgctg ctcataagac tcggccttag  5580
aaccccagta tcagcagaag gacattttag gacgggactt gggtgactct agggcactgg  5640
ttttctttcc agagagcgga acaggcgagg aaaagtagtc ccttctcggc gattctgcgg  5700
agggatctcc gtggggcggt gaacgccgat gatgcctcta ctaaccatgt tcatgttttc  5760
ttttttttte tacaggtcct gggtgacgaa cagggtaccg ccaccatggc caccggctct  5820
cgcacaagcc tgctgctggc tttcggactg ctgtgcctgc cttggctcca ggagggctcc  5880
gccgctagca tcgataccgt cgctatgtgc tggaggcttg ctgaaggctg tatgctgtaa  5940
taaaggtctg ggaatcaccc gttttggcct ctgactgacg ggtgattccg acctttatta  6000
```

-continued

```
caggacacaa ggcctgttac tagcactcac atggaacaaa tggcctctag cctggaggct  6060
tgctgaaggc tgtatgctgt aatacgccag atcaccatca gcgttttggc ctctgactga  6120
cgctgatggt gctggcgtat tacaggacac aaggcctgtt actagcactc acatggaaca  6180
aatggcctct agcctggagg cttgctgaag gctgtatgct gatacagaaa cgaaggttca  6240
ggccgttttg gcctctgact gacggcctga acccgtttct gtatcaggac acaaggcctg  6300
ttactagcac tcacatggaa caaatggcct ctctagaat                         6339

SEQ ID NO: 24          moltype = DNA  length = 6339
FEATURE                Location/Qualifiers
source                 1..6339
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 24
aatcaacctc tggattacaa aatttgtgaa agattgactg gtattcttaa ctatgttgct  60
ccttttacgc tatgtggata cgctgcttta atgcctttgt atcatgctat tgcttcccgt  120
atggctttca ttttctcctc cttgtataaa tcctggttgc tgtctcttta tgaggagttg  180
tggcccgttg tcaggcaacg tggcgtggtg tgcactgtgt ttgctgacgc aacccccact  240
ggttggggca ttgccaccac ctgtcagctc ctttccggga ctttcgcttt ccccctccct  300
attgccacgg cggaactcat cgccgcctgc cttgcccgct gctggacagg ggctcggctg  360
ttgggcactg acaattccgt ggtgttgtcg gggaaatcat cgtcctttcc ttggctgctc  420
gcctgtgttg ccacctggat tctgcgcggg acgtccttct gctacgtccc ttcggccctc  480
aatccagcgg accttccttc ccgcggccctg ctgccggctc tgcggcctct tccgcgtctt  540
cgccttcgcc ctcagacgag tcggatctcc ctttgggccg cctccccgcc taagcttatc  600
gataccgtcg agatctaact tgtttattgc agcttataat ggttacaaat aaagcaatag  660
catcacaaat ttcacaaata aagcattttt ttcactgcat tctagttgtg gtttgtccaa  720
actcatcaat gtatcttatc atgtctggat ctcgacctcg actagagcat ggctacgtag  780
ataagtagca tggcgggtta atcattaact acaaggaacc cctagtgatg gagttggcca  840
ctccctctct gcgcgctcgc tcgctcactg aggccgggcg accaaaggtc gcccgacgcc  900
cgggctttgc ccgggcggcc tcagtgagcg agcgagcgcg cagctggcgt aatagcgaag  960
aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa tggcgattcc  1020
gttgcaatgg ctggcggtaa tattgttctg gatattacca gcaaggccga tagtttgagt  1080
tcttctactc aggcaagtga tgttattact aatcaaagaa gtattgcgac aacggttaat  1140
ttgcgtgatg gacagactct tttactcggt ggcctcactg attataaaaa cacttctcag  1200
gattctggcg taccgttcct gtctaaaatc cctttaatcg gcctcctgtt tagctcccgc  1260
tctgattcta acgaggaaag cacgttatac gtgctcgtca aagcaaccat agtacgcgcc  1320
ctgtagcggc gcattaagcg cggcgggtgt ggtggttacg cgcagcgtga ccgctacact  1380
tgccagcgcc ctagcgcccg ctcctttcgc tttcttccct tcctttctcg ccacgttcgc  1440
cggctttccc cgtcaagctc taaatcgggg gctcccttta gggttccgat ttagtgcttt  1500
acggcacctc gaccccaaaa aacttgatta gggtgatggt tcacgtagtg ggccatcgcc  1560
ctgatagacg gtttttcgcc ctttgacgtt ggagtccacg ttctttaata gtggactctt  1620
gttccaaact ggaacaacac tcaaccctat ctcggtctat tcttttgatt tataagggat  1680
tttgccgatt tcggcctatt ggttaaaaaa tgagctgatt taacaaaaat ttaacgcgaa  1740
ttttaacaaa atattaacgt ttacaattta aatatttgct tatacaatct tcctgttttt  1800
ggggcttttc tgattatcaa ccggggtaca tatgattgac atgctagttt tacgattacc  1860
gttcatcgat tctcttgttt gctccagact ctcaggcaat gacctgatag cctttgtaga  1920
gacctctcaa aaatagctac cctctccggc atgaatttat cagctagaac ggttgaatat  1980
catattgatg gtgatttgac tgtctccggc ctttctcacc cgtttgaatc tttacctaca  2040
cattactcag gcattgcatt taaaatatat gagggttcta aaaatttta tccttgcgtt  2100
gaaataaagg cttctcccgc aaaagtatta cagggtcata atgtttttgg tacaaccgat  2160
ttagctttat gctctgaggc tttattgctt aattttgcta attctttgcc ttgcctgtat  2220
gatttattgg atgttggaat tcctgatgcg gtattttctc cttacgcatc tgtgcggtat  2280
ttcacaccgc atatggtgca ctctcagtac aatctgctct gatgccgcat agttaagcca  2340
gccccgacac ccgccaacac ccgctgacgc gccctgacgg gcttgtctgc tcccggcatc  2400
cgcttacaga caagctgtga ccgtctccgg gagctgcatg tgtcagaggt tttcaccgtc  2460
atcaccgaaa cgcgcgagac gaaagggcct cgtgatacgc ctatttttat aggttaatgt  2520
catgataata atggtttctt agacgtcagg tggcactttt cggggaaatg tgcgcggaac  2580
ccctatttgt ttatttttct aaatacattc aaatatgtat ccgctcatga gacaataacc  2640
ctgataaatg cttcaataat attgaaaaag gaagagtatg agtattcaac atttccgtgt  2700
cgcccttatt cccttttttg cggcattttg ccttcctgtt tttgctcacc cagaaacgct  2760
ggtgaaagta aaagatgctg aagatcagtt gggtgcacga gtgggttaca tcgaactgga  2820
tctcaacagc ggtaagatcc ttgagagttt tcgccccgaa gaacgttttc caatgatgag  2880
cacttttaaa gttctgctat gtggcgcggt attatcccgt attgacgccg ggcaagagca  2940
actcggtcgc cgcatacact attctcagaa tgacttggtt gagtactcac cagtcacaga  3000
aaagcatctt acggatggca tgacagtaag agaattatgc agtgctgcca taaccatgag  3060
tgataacact gcggccaact tacttctgac aacgatcgga ggaccgaagg agctaaccgc  3120
ttttttgcac aacatggggg atcatgtaac tcgccttgat cgttgggaac cggagctgaa  3180
tgaagccata ccaaacgacg agcgtgacac cacgatgcct gtagcaatgg caacaacgtt  3240
gcgcaaacta ttaactggcg aactacttac tctagcttcc cggcaacaat taatagactg  3300
gatggaggcg gataaagttg caggaccact tctgcgctcg gcccttccgg ctggctggtt  3360
tattgctgat aaatctggag ccggtgagcg tgggtctcgc ggtatcattg cagcactggg  3420
gccagatggt aagccctccc gtatcgtagt tatctacacg acggggagtc aggcaactat  3480
ggatgaacga aatagacaga tcgctgagat aggtgcctca ctgattaagc attggtaact  3540
gtcagaccaa gtttactcat atatacttta gattgattta aaacttcatt tttaatttaa  3600
aaggatctag gtgaagatcc tttttgataa tctcatgacc aaaatccctt aacgtgagtt  3660
ttcgttccac tgagcgtcag accccgtaga aaagatcaaa ggatcttctt gagatccttt  3720
ttttctgcgc gtaatctgct gcttgcaaac aaaaaaacca ccgctaccag cggtggtttg  3780
```

-continued

```
tttgccggat caagagctac caactctttt tccgaaggta actggcttca gcagagcgca  3840
gataccaaat actgtccttc tagtgtagcc gtagttaggc caccacttca agaactctgt  3900
agcaccgcct acatacctcg ctctgctaat cctgttacca gtggctgctg ccagtggcga  3960
taagtcgtgt cttaccgggt tggactcaag acgatagtta ccggataagg cgcagcggtc  4020
gggctgaacg gggggttcgt gcacacagcc cagcttggag cgaacgacct acaccgaact  4080
gagataccta cagcgtgagc tatgagaaag cgccacgctt cccgaaggga gaaaggcgga  4140
caggtatccg gtaagcggca gggtcggaac aggagagcgc acgagggagc ttccaggggg  4200
aaacgcctgg tatctttata gtcctgtcgg gtttcgccac ctctgacttg agcgtcgatt  4260
tttgtgatgc tcgtcagggg ggcggagcct atggaaaaac gccagcaacg cggccttttt  4320
acggttcctg gccttttgct ggccttttgc tcacatgttc tttcctgcgt tatcccctga  4380
ttctgtggat aaccgtatta ccgcctttga gtgagctgat accgctcgcc gcagccgaac  4440
gaccgagcgc agcgagtcag tgagcgagga agcggaagag cgcccaatac gcaaaccgcc  4500
tctccccgcg cgttggccga ttcattaatg cagcagctgc gcgctcgctc gctcactgag  4560
gccgcccggg caaagcccgg gcgtcgggcg acctttggtc gcccggcctc agtgagcgag  4620
cgagcgcgca gagagggagt ggccaactcc atcactaggg gttccttgta gttaatgatt  4680
aacccgccat gctacttatc tacgtagcca tgctctagga cattgattat tgactagtgg  4740
agttccgcgt tacataactt acggtaaatg gcccgcctgg ctgaccgccc aacgacccca  4800
gcccattgac gtcaataatg acgtatgttc ccatagtaac gccaatagggg actttccatt  4860
gacgtcaatg ggtggagtat ttacggtaaa ctgcccactt ggcagtacat caagtgtatc  4920
atatgccaag tacgcccccc attgacgtca atgacggtaa atggcccgcc tggcattatg  4980
cccagtacat gaccttatgg gactttccta cttggcagta catctacgta ttagtcatcg  5040
ctattaccat ggtcgaggtg agccccacgt tctgcttcac tctccccatc tccccccccc  5100
ccccacccc aattttgtat ttatttattt tttaattatt ttgtgcagcg atgggggcgg  5160
gggggggggg gggcgcgcgc caggcggggc ggggcggggc gaggggcggg gcggggcgag  5220
gcggagaggt gcggcggcag ccaatcagag cggcgcgctc cgaaagtttc cttttatggc  5280
gaggcggcgg cggcggcggc cctataaaaa gcgaagcgcg cggcgggcgg gagtcgctgc  5340
gcgctgcctt cgccccgtgc cccgctccgc cgccgcctcg cgccgcccgc cccggctctg  5400
actgaccgcg ttactaaaac aggtaagtcc ggcctccgcg ccgggttttg gcgcctcccg  5460
cgggcgcccc cctcctcacg gcgagcgctg ccacgtcaga cgaagggcgc agcgagcgtc  5520
ctgatccttc cgcccggacg ctcaggacag cggcccgctg ctcataagac tcggccttag  5580
aaccccagta tcagcagaag gacatttag gacgggactt gggtgactct agggcactgg  5640
ttttctttcc agagagcgga acaggcgagg aaaagtagtc ccttctcggc gattctgcgg  5700
agggatctcc gtggggcggt gaacgccgat gatgcctcta ctaaccatgt tcatgttttc  5760
ttttttttte tacaggtcct gggtgacgaa cagggtaccg ccaccatggc caccggctct  5820
cgcacaagcc tgctgctggc tttcggactg ctgtgcctgc cttggctcca ggagggctcc  5880
gccgctagca tcgataccgt cgctatgtgc tggaggcttg ctgaaggctg tatgctgtca  5940
gatcgctgtg gtaaacaggc gttttggcct ctgactgacg cctgtttacc agcgatctga  6000
caggacacaa ggcctgttac tagcactcac atggaacaaa tggcctctag cctggaggct  6060
tgctgaaggc tgtatgctga gaatcagatc agatagcgat ccgttttggc ctctgactga  6120
cggatcgcta tctgctgatt ctcaggacac aaggcctgtt actagcactc acatggaaca  6180
aatggcctct agcctggagg cttgctgaag gctgtatgct gaaacatgcc aacagcagaa  6240
tgccgttttg gcctctgact gacggcattc tgctgggcat gtttcaggac acaaggcctg  6300
ttactagcac tcacatggaa caaatggcct ctctagaat                         6339

SEQ ID NO: 25          moltype = DNA  length = 6339
FEATURE                Location/Qualifiers
source                 1..6339
                       mol_type = other DNA
                       organism = synthetic construct
SEQUENCE: 25
aatcaacctc tggattacaa aatttgtgaa agattgactg gtattcttaa ctatgttgct  60
ccttttacgc tatgtggata cgctgcttta atgcctttgt atcatgctat tgcttcccgt  120
atggctttca ttttctcctc cttgtataaa tcctggttgc tgtctcttta tgaggagttg  180
tggcccgttg tcaggcaacg tggcgtggtg tgcactgtgt ttgctgacgc aaccccccact  240
ggttggggca ttgccaccac ctgtcagctc ctttccggga ctttcgcttt ccccctccct  300
attgccacgg cggaactcat cgccgcctgc cttgcccgct gctggacagg ggctcggctg  360
ttgggcactg acaattccgt ggtgttgtcg gggaaatcat cgtcctttcc ttggctgctc  420
gcctgtgttg ccacctggat tctgcgcggg acgtccttct gctacgtccc ttcggccctc  480
aatccagcgg accttccttc ccgcggcctg ctgccggctc tgcggcctct tccgcgtctt  540
cgccttcgcc ctcagacgag tcggatctcc ctttgggccg cctccccgcc taagcttatc  600
gataccgtcg agatctaact tgtttattgc agcttataat ggttacaaat aaagcaatag  660
catcacaaat ttcacaaata aagcattttt ttcactgcat tctagttgtg gtttgtccaa  720
actcatcaat gtatcttatc atgtctggat ctcgacctcg actagagcat ggctacgtag  780
ataagtagca tggcgggtta atcattaact acaaggaacc cctagtgatg gagttggcca  840
ctccctctct gcgcgctcgc tcgctcactg aggccgggcg accaaaggtc gcccgacgcc  900
cgggctttgc ccgggcggcc tcagtgagcg agcgagcgcg cagctggcgt aatagcgaag  960
aggcccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa tggcgattcc  1020
gttgcaatgg ctggcggtaa tattgttctg gatattacca gcaaggccga tagtttgagt  1080
tcttctactc aggcaagtga tgttattact aatcaaagaa gtattgcgac aacggttaat  1140
ttgcgtgatg gacagactct tttactcggt ggcctcactg attataaaaa cacttctcag  1200
gattctggcg taccgttcct gtctaaaatc cctttaatcg gcctcctgtt tagctcccgc  1260
tctgattcta acgaggaaag cacgttatac gtgctcgtca aagcaaccat agtacgcgcc  1320
ctgtagcggc gcattaagcg cggcgggtgt ggtggttacg cgcagcgtga ccgctacact  1380
tgccagcgcc ctagcgcccg ctcctttcgc tttcttccct tcctttctcg ccacgttcgc  1440
cggctttccc cgtcaagctc taaatcgggg gctcccttta gggttccgat ttagtgcttt  1500
acggcacctc gaccccaaaa aacttgatta gggtgatggt tcacgtagtg ggccatcgcc  1560
```

-continued

```
ctgatagacg gtttttcgcc ctttgacgtt ggagtccacg ttctttaata gtggactctt  1620
gttccaaact ggaacaacac tcaaccctat ctcggtctat tcttttgatt tataagggat  1680
tttgccgatt tcggcctatt ggttaaaaaa tgagctgatt taacaaaaat ttaacgcgaa  1740
ttttaacaaa atattaacgt ttacaattta aatatttgct tatacaatct tcctgttttt  1800
ggggcttttc tgattatcaa ccggggtaca tatgattgac atgctagttt tacgattacc  1860
gttcatcgat tctcttgttt gctccagact ctcaggcaat gacctgatag cctttgtaga  1920
gacctctcaa aaatagctac cctctccggc atgaatttat cagctagaac ggttgaatat  1980
catattgatg gtgatttgac tgtctccggc ctttctcacc cgtttgaatc tttacctaca  2040
cattactcag gcattgcatt taaaatatat gagggttcta aaaattttta tccttgcgtt  2100
gaaataaagg cttctcccgc aaaagtatta cagggtcata atgtttttgg tacaaccgat  2160
ttagctttat gctctgaggc tttattgctt aattttgcta attctttgcc ttgcctgtat  2220
gatttattgg atgttggaat tcctgatgcg gtattttctc cttacgcatc tgtgcggtat  2280
ttcacaccgc atatggtgca ctctcagtac aatctgctct gatgccgcat agttaagcca  2340
gccccgacac ccgccaacac ccgctgacgc gccctgacgg gcttgtctgc tcccggcatc  2400
cgcttacaga caagctgtga ccgtctccgg gagctgcatg tgtcagaggt tttcaccgtc  2460
atcaccgaaa cgcgcgagac gaaagggcct cgtgatacgc ctatttttat aggttaatgt  2520
catgataata atggtttctt agacgtcagg tggcactttt cggggaaatg tgcgcggaac  2580
ccctatttgt ttatttttct aaatacattc aaatatgtat ccgctcatga gacaataacc  2640
ctgataaatg cttcaataat attgaaaaag gaagagtatg agtattcaac atttccgtgt  2700
cgcccttatt cccttttttg cggcattttg ccttcctgtt tttgctcacc cagaaacgct  2760
ggtgaaagta aaagatgctg aagatcagtt gggtgcacga gtgggttaca tcgaactgga  2820
tctcaacagc ggtaagatcc ttgagagttt tcgccccgaa gaacgttttc caatgatgag  2880
cacttttaaa gttctgctat gtggcgcggt attatcccgt attgacgccg ggcaagagca  2940
actcggtcgc cgcatacact attctcagaa tgacttggtt gagtactcac cagtcacaga  3000
aaagcatctt acggatggca tgacagtaag agaattatgc agtgctgcca taaccatgag  3060
tgataacact gcggccaact tacttctgac aacgatcgga ggaccgaagg agctaaccgc  3120
ttttttgcac aacatggggg atcatgtaac tcgccttgat cgttgggaac cggagctgaa  3180
tgaagccata ccaaacgacg agcgtgacac cacgatgcct gtagcaatgg caacaacgtt  3240
gcgcaaacta ttaactggcg aactacttac tctagcttcc cggcaacaat taatagactg  3300
gatggaggcg gataaagttg caggaccact tctgcgctcg gcccttccgg ctggctggtt  3360
tattgctgat aaatctggag ccggtgagcg tgggtctcgc ggtatcattg cagcactggg  3420
gccagatggt aagccctccc gtatcgtagt tatctacacg acggggagtc aggcaactat  3480
ggatgaacga aatagacaga tcgctgagat aggtgcctca ctgattaagc attggtaact  3540
gtcagaccaa gtttactcat atatacttta gattgattta aaacttcatt tttaatttaa  3600
aaggatctag gtgaagatcc tttttgataa tctcatgacc aaaatccctt aacgtgagtt  3660
ttcgttccac tgagcgtcag accccgtaga aaagatcaaa ggatcttctt gagatccttt  3720
ttttctgcgc gtaatctgct gcttgcaaac aaaaaaacca ccgctaccag cggtggtttg  3780
tttgccggat caagagctac caactctttt tccgaaggta actggcttca gcagagcgca  3840
gataccaaat actgtccttc tagtgtagcc gtagttaggc caccacttca agaactctgt  3900
agcaccgcct acatacctcg ctctgctaat cctgttacca gtggctgctg ccagtggcga  3960
taagtcgtgt cttaccgggt tggactcaag acgatagtta ccggataagg cgcagcggtc  4020
gggctgaacg gggggttcgt gcacacagcc cagcttggag cgaacgacct acaccgaact  4080
gagataccta cagcgtgagc tatgagaaag cgccacgctt cccgaaggga gaaaggcgga  4140
caggtatccg gtaagcggca gggtcggaac aggagagcgc acgagggagc ttccagggag  4200
aaacgcctgg tatctttata gtcctgtcgg gtttcgccac ctctgacttg agcgtcgatt  4260
tttgtgatgc tcgtcagggg ggcggagcct atggaaaaac gccagcaacg cggccttttt  4320
acggttcctg gccttttgct ggccttttgc tcacatgttc tttcctgcgt tatcccctga  4380
ttctgtggat aaccgtatta ccgcctttga gtgagctgat accgctcgcc gcagccgaac  4440
gaccgagcgc agcgagtcag tgagcgagga agcggaagag cgcccaatac gcaaaccgcc  4500
tctccccgcg cgttggccga ttcattaatg cagcagctgc gcgctcgctc gctcactgag  4560
gccgcccggg caaagcccgg gcgtcgggcg acctttggtc gcccggcctc agtgagcgag  4620
cgagcgcgca gagagggagt ggccaactcc atcactaggg gttccttgta gttaatgatt  4680
aacccgccat gctacttatc tacgtagcca tgctctagga cattgattat tgactagtgg  4740
agttccgcgt tacataactt acggtaaatg gcccgcctgg ctgaccgccc aacgacccca  4800
gcccattgac gtcaataatg acgtatgttc ccatagtaac gccaataggg actttccatt  4860
gacgtcaatg ggtggagtat ttacggtaaa ctgcccactt ggcagtacat caagtgtatc  4920
atatgccaag tacgcccccc attgacgtca atgacggtaa atggcccgcc tggcattatg  4980
cccagtacat gaccttatgg gactttccta cttggcagta catctacgta ttagtcatcg  5040
ctattaccat ggtcgaggtg agccccacgt tctgcttcac tctccccatc tccccccccc  5100
ccccaccccc aattttgtat ttatttattt tttaattatt ttgtgcagcg atgggggcgg  5160
gggggggggg gggcgcgcgc caggcggggc ggggcggggc gaggggcggg gcggggcgag  5220
gcggagaggt gcggcggcag ccaatcagag cggcgcgctc cgaaagtttc cttttatggc  5280
gaggcggcgg cggcggcggc cctataaaaa gcgaagcgcg cggcgggcgg gagtcgctgc  5340
gcgctgcctt cgccccgtgc cccgctccgc cgccgcctcg cgccgcccgc cccggctctg  5400
actgaccgcg ttactaaaac aggtaagtcc ggcctccgcg ccgggttttg gcgcctcccg  5460
cgggcgcccc cctcctcacg gcgagcgctg ccacgtcaga cgaagggcgc agcgagcgtc  5520
ctgatccttc cgcccggacg ctcaggacag cggcccgctg ctcataagac tcggccttag  5580
aaccccagta tcagcagaag gacattttag gacgggactt gggtgactct agggcactgg  5640
ttttctttcc agagagcgga acaggcgagg aaaagtagtc ccttctcggc gattctgcgg  5700
agggatctcc gtggggcggt gaacgccgat gatgcctcta ctaaccatgt tcatgttttc  5760
ttttttttcc tacaggtcct gggtgacgaa cagggtaccg ccaccatggc caccggctct  5820
```

-continued

```
cgcacaagcc tgctgctggc tttcggactg ctgtgcctgc cttggctcca ggagggctcc  5880
gccgctagca tcgataccgt cgctatgtgc tggaggcttg ctgaaggctg tatgctgaca  5940
atcagatatg gttgctcggc gttttggcct ctgactgacg ccgagcaact atctgattgt  6000
caggacacaa ggcctgttac tagcactcac atggaacaaa tggcctctag cctggaggct  6060
tgctgaaggc tgtatgctgt ttcacaatgc atcgttcagc gcgttttggc ctctgactga  6120
cgcgctgaac ggcattgtga aacaggacac aaggcctgtt actagcactc acatggaaca  6180
aatggcctct agcctggagg cttgctgaag gctgtatgct gacaataatg ccaacagggt  6240
ggtcgttttg gcctctgact gacgaccacc ctgggcatta ttgtcaggac acaaggcctg  6300
ttactagcac tcacatggaa caaatggcct ctctagaat                         6339
```

1. A composition that comprises a recombinant plasmid (RP) that comprises a sequence of nucleotides that is SEQ ID NO. 10.

2. (canceled)

3. (canceled)

4. (canceled)

5. (canceled)

6. (canceled)

7. (canceled)

8. (canceled)

9. (canceled)

10. (canceled)

11. (canceled)

12. (canceled)

13. (canceled)

14. (canceled)

15. The composition of claim **1**, wherein the RP is encased in a viral vector.

16. The composition of claim **15**, wherein the viral vector is one of: a double stranded DNA virus, a single stranded DNA virus, a single stranded RNA virus, or a double stranded RNA virus.

17. The composition of claim **16**, wherein the viral vector is an adeno-associated virus.

18. The composition of claim **1** wherein the serotonin receptor is serotonin receptor 5HT3.

19. A composition that comprises a recombinant plasmid (RP) with a sequence of nucleotides that is SEQ ID NO. 22.

20. (canceled)

21. The composition of claim **1**, wherein the RP is encased in a protein coat, a lipid vesicle, or any combination thereof.

* * * * *