



US 20250263724A1

(19) **United States**

(12) **Patent Application Publication**
THOMPSON

(10) **Pub. No.: US 2025/0263724 A1**

(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
(US)

(21) Appl. No.: **18/970,549**

(22) Filed: **Dec. 5, 2024**

Related U.S. Application Data

(62) Division of application No. 18/582,272, filed on 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 complementary 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). 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.

[0010] Some embodiments of the present disclosure relate to a recombinant plasmid. In some embodiments of the present disclosure, the RP comprises a nucleotide sequence of SEQ ID NO. 1 and SEQ ID NO. 3. The RP comprises a nucleotide sequence encoding one or more nucleotide sequences encoding a miRNA sequence that targets the mRNA of serotonin receptor 5HT1b.

[0011] Some embodiments of the present disclosure relate to a recombinant plasmid. In some embodiments of the present disclosure, the RP comprises a nucleotide sequence of SEQ ID NO. 1 and SEQ ID NO. 4. The RP comprises a nucleotide sequence encoding one or more nucleotide sequences encoding a miRNA sequence that targets the mRNA of serotonin receptor 5HT1d.

[0012] Some embodiments of the present disclosure relate to a recombinant plasmid. In some embodiments of the present disclosure, the RP comprises a nucleotide sequence of SEQ ID NO. 1 and SEQ ID NO. 5. The RP comprises a nucleotide sequence encoding one or more nucleotide sequences encoding a miRNA sequence that targets the mRNA of serotonin receptor 5HT1e.

[0013] Some embodiments of the present disclosure relate to a recombinant plasmid. In some embodiments of the present disclosure, the RP comprises a nucleotide sequence of SEQ ID NO. 1 and SEQ ID NO. 6. The RP comprises a nucleotide sequence encoding one or more nucleotide sequences encoding a miRNA sequence that targets the mRNA of serotonin receptor 5HT1f.

[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. 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.

[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. 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.

[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. 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.

[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. 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.

[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. 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.

[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. 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.

[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. 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.

[0021] 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.

[0022] 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.

[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 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.

[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 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.

[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 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.

[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 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.

[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 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.

[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 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.

[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 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.

[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 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.

[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 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.

[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 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.

[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 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

[0034] 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.

[0035] 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.

[0036] 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.

[0037] As used therein, the term "ameliorate" refers to improve and/or to make better and/or to make more satisfactory.

[0038] 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.

[0039] 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.

[0040] 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.

[0041] As used therein, the term "endogenous" refers to the production and/or modification of a molecule that originates within a subject.

[0042] 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.

[0043] 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.

[0044] 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.

[0045] 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.

[0046] 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.

[0047] 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.

[0048] 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.

[0049] 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.

[0050] 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.

[0051] 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.

[0052] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT1a.

[0053] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT1b.

[0054] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT1d.

[0055] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT1e.

[0056] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT1f.

[0057] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT2a.

[0058] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT2b.

[0059] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT2c.

[0060] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT3.

[0061] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT4.

[0062] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT6.

[0063] In some embodiments of the present disclosure, the target biomolecule is serotonin receptor 5HT7.

[0064] 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.

[0065] 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 adminis-

tered to the subject, the subject may change production and/or functionality of one or more biomolecules.

[0066] 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.

[0067] 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.

[0068] 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.

[0069] 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 embodi-

ments 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.

[0070] In some embodiments of the present disclosure, the delivery vehicle of the RP used for gene therapy may be a protein coat.

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

[0072] 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} TCID₅₀/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} TCID₅₀/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.

[0073] 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' AATCAACCTCTGGATTACAAATTTGTGAAGATTGACTGGTATTCTTAACATATGTT

GCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTGTATCATGCTATTGCTTCC

CGTATGGCTTTCATTTTCTCTCCTGTATAAATCCTGGTTGCTGCTCTTTATGAGGAG

TTGTGGCCCGTTGTCAAGCAACGTGGCGTGGTGTGCACTGTGTTTGCTGACGCAACCCCC

ACTGGTTGGGCGATTGCCACCACTGTGAGCTCCTTTCGGGACTTTCGCTTTCCCCCTC

- continued

CCTATTGCCACGGCGGAACATCATCGCCGCTGCCCTGCCCCGCTGCTGGACAGGGGCTCGG
CTGTTGGGCACTGACAATTCCGTGGTGTGTGCGGGAAATCATCGTCCTTTCCTTGGCTG
CTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGACGTCCTTCTGTACGTCCCTTCGGCC
CTCAATCCAGCGGACCTTCCTTCCCGCGGCTGCTGCGGCTCTGCGGCTCTTCCGCGT
CTTCGCCTTCGCCTCAGACGAGTCGGATCTCCCTTGGGCCGCTCCCGCCTAAGCTT
ATCGATACCGTCGAGATCTAACTGTTTATTGCAGCTTATAATGGTTACAAATAAGCAA
TAGCATCACAAATTCACAAATAAAGCATTTTTTCACTGCATTCTAGTTGTGGTTTGTG
CAAATCATCAATGTATCTTATCATGTCTGGATCTCGACCTCGACTAGAGCATGGCTACG
TAGATAAGTAGCATGGCGGGTTAATCATTAACAAGGAACCCCTAGTGATGGAGTTGG
CCACTCCCTCTCTGCGGCTCGCTCGCTCACTGAGGCGGGCGACAAAGGTCGCCCGAC
GCCCCGGCTTTGCCGGGCGGCTCAGTGAGCGAGCGAGCGCGCAGCTGGCGTAATAGCG
AAGAGGCCCGCACCCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGAT
TCCGTTGCAATGGCTGGCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTG
AGTTCTTCTACTCAGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTT
AATTTGCGTGATGGACAGACTCTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCT
CAGGATTCTGGCGTACCGTTCTGTCTAAAATCCCTTAAATCGGCCTCCTGTTTAGCTCC
CGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGC
GCCCCGTAGCGCGCATTAAGCGCGGCGGGTGTGGTGTACGCGCAGCGTGACCGCTAC
ACTTGCCAGCGCCCTAGCGCCGCTCCTTTCGCTTTCTTCCCTTCCTTCTCGCCACGTT
CGCCGGCTTTCCCGCTCAAGCTCTAAATCGGGGCTCCCTTAGGGTTCCGATTTAGTGC
TTTACGGCACCTCGACCCCAAAAACTTGATTAGGGTGATGGTTACGTAGTGGCCATC
GCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACT
CTTGTTCCAACTGGAACAACACTCAACCTATCTCGGTCTATTCTTTGATTTATAAGG
GATTTTGCCGATTTCGGCTATTGGTTAAAAATGAGCTGATTTAACAAAAATTTAACGC
GAATTTTAAAAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCGTGTT
TTTGGGGCTTTTCTGATTATCAACCGGGTACATATGATTGACATGCTAGTTTTACGATT
ACCGTTTCATCGATTCTTGTGTTGCTCCAGACTCTCAGGCAATGACCTGATAGCCTTGT
AGAGACCTCTCAAAAATAGCTACCTCTCCGGCATGAATTTATCAGCTAGAACGTTGAA
TATCATATTGATGGTGATTGACTGTCTCCGGCTTCTCACCCGTTTGAATCTTTACCT
ACACATTACTCAGGCATTGCATTTAAAAATATATGAGGGTTCTAAAAATTTTATCCTTGC
GTTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTTGGTACAACC
GATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGCTAATCTTTGCCTTGCCTG
TATGATTTATTGGATGTTGGAATTCCTGATGCGGTATTTCTCCTTACGCATCTGTGCGG
TATTTACACCCGATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAG
CCAGCCCCGACACCCGCCAACCCGCTGACGCGCCTGACGGGCTTGTCTGCTCCCGC
ATCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTACAGAGTTTTTCACC
GTCATCACCGAAACGCGGAGACGAAAGGGCCTCGTGATACGCCATTTTTTATAGGTTAA
TGTCATGATAAATAGGTTTCTTAGACGTGAGGTGGCACTTTTCGGGGAATGTGCGCGG
AACCCTATTTGTTTATTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATA

-continued

ACCCGTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCG
TGTCGCCCTTATTCCCTTTTTTGCGGCATTGCTTCTCTGTTTTTGCTCACCCAGAAAC
GCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTACATCGAACT
GGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGAT
GAGCACTTTTAAAGTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGA
GCAACTCGGTGCGCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCAC
AGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCAT
GAGTGATAAAGTGCAGGCACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAAC
CGCTTTTTTGACACAACATGGGGGATCATGTAACGCGCTTGATCGTTGGGAACCGGAGCT
GAATGAAGCCATACCAACGACGAGCGTGACACCACGATGCCGTAGCAATGGCAACAAC
GTTGCGCAAACTATTAAGTGGCAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGA
CTGGATGGAGGCGGATAAAGTTGCAGGACCCTTCTGCGCTCGGCCCTTCCGGCTGGCTG
GTTTATGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACT
GGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGAGTCAGGCAAC
TATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTA
ACTGTCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAACTTCATTTTAAATT
TAAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGA
GTTTTCTGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCC
TTTTTTCTGCGCGTAATCTGCTGCTTGCAACAAAAAACACCGCTACCAGCGGTGGT
TTGTTTCCGGATCAAGAGCTACCAACTCTTTTCCGAAGGTAAGTGGCTTCAGCAGAGC
GCAGATACCAAACTGTCCTTCTAGTGAGCCGTAGTTAGGCCACCCTTCAAGAACTC
TGTAGCACCGCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGG
CGATAAGTCGTGCTTACC GGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCG
GTCGGGCTGAACGGGGGTTCTGTGCACACAGCCAGCTTGGAGCGAACGACCTACACCGA
ACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGC
GGACAGGTATCCGTAAGCGGCAGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCAGG
GGGAAACGCTTGGTATCTTTATAGTCTGTCGGGTTTCGCCACCTCTGACTGAGCGTCG
ATTTTGTGATGCTCGTCAGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCTT
TTTACGGTTCTCGGCTTTTGCTGGCTTTTGCTCACATGTTCTTCTCGCTTATCCCC
TGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGAGCCG
AACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACC
GCCTCTCCCCGCGCTTGGCCGATTCAATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACT
GAGGCCGCCCGGGCAAGCCCGGCGTCGGGCGACCTTTGGTCGCCCGGCTCAGTGAGC
GAGCGAGCGCGCAGAGAGGAGTGGCCAACTCCATCACTAGGGGTTCTTGTAGTTAATG
ATTAACCCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAG
TGGAGTTCCGCGTTACATAACTTACGTTAAATGGCCGCTGGCTGACCGCCCAACGACC
CCCCCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCC
ATTGACGTCAATGGGTGGAGTATTTACGGTAACTGCCCACTTGGCAGTACATCAAGTGT
ATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTTGGCATT

-continued

ATGCCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACGTATTAGTCA
 TCGCTATTACCATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCC
 CCTCCCCACCCCAATTTTGTATTTATTTATTTTAAATTATTTTGTGCAGCGATGGGGG
 CGGGGGGGGGGGGGCGCGCCAGGCGGGCGGGGGGGGGCGAGGGGCGGGGCGGGG
 GAGGCGGAGAGGTGCGGCGGCAGCCAATCAGAGCGGCGCTCCGAAAGTTTCCTTTAT
 GGCGAGGCGGCGGCGGCGGCGCTATAAAAAGCGAAGCGCGGCGGGCGGGAGTCGC
 TGGCGCTGCCTTCGCCCCGTGCCCGCTCCGCCGCGCCTCGCGCCGCCCGCCCGGCT
 CTGACTGACCGGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTTGGCGCCTC
 CCGCGGGCGCCCCCTCTCACGGCGAGCGCTGCCACGTGACAGGAAGGCGCAGCGAGC
 GTCTGTATCCTTCGCCCGGACGCTCAGGACAGCGGCCCGCTGCTCATAAGACTCGGCCT
 TAGAACCCAGTATCAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCAC
 TGGTTTTCTTCCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGCGATTCTG
 CGGAGGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTTCATGTT
 TTCTTTTTTTTCTACAGGTCTGGGTGACGAACAGGGTACC 3'

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

CTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGG
 CTTGCTGAAGGCTGTATGCTGATCAATCGGATTGCGGTAATCGCGTTTTGGCCTCTGACT
 GACGCGATTACCGATCCGATTGATCAGGACACAAGGCCTGTTACTAGCACTCACATGGAA
 CAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGATCTTTGCTAAATTGGT
 GCACGCGTTTTGGCCTCTGACTGACGCGTGCAACATTAGCAAAGATCAGGACACAAGGCC
 TGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTA
 TGCTGACTTCAATCACAATTCCAGCGCGTTTTTGGCCTCTGACTGACGCGCTGGAAGTG
 ATTGAAGTCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAG
 AAT 3'

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

CTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGG
 CTTGCTGAAGGCTGTATGCTGTAATCTTTCGCTGGCTGCAGTTCGTTTTGGCCTCTGACT
 GACGAACTGCAGCGCGAAAGATTACAGGACACAAGGCCTGTTACTAGCACTCACATGGAA
 CAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTGTTAATGCTGATGTCA
 CGCTGCGTTTTGGCCTCTGACTGACGCGAGCTGACAGCATTAAACAGGACACAAGGCC
 TGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTA
 TGCTGTTACCTGGTTAACACATACACCGTTTTTGGCCTCTGACTGACGGTGTATGTGAAC
 CAGGTGAACAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAG
 AAT 3'

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

CTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGG
 CTTGCTGAAGGCTGTATGCTGATTTCTTCTGTGCGCTTTCGCCGTTTTGGCCTCTGACT
 GACGGCGAAGCGCAGGAAGAAATCAGGACACAAGGCCTGTTACTAGCACTCACATGGAA

- continued

CAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGAGAATAATCAGATCAGC
ACGCTCGTTTTGGCCTCTGACTGACGAGCGTGTCTGATTATTCTCAGGACACAAGGCC
TGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTA
TGCTGTAATCAGGCTGAATTCAGATAGCGTTTTGGCCTCTGACTGACGCTATCTGAACAG
CCTGATTACAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAG
AAT 3'

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

CTGCCTTGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGG
CTTGCTGAAGGCTGTATGCTGATAATCACCGCTGCAGGTTTTCAGCGTTTTGGCCTCTGACT
GACGCTGAACCTGGCGGTGATTATCAGGACACAAGGCCTGTTACTAGCACTCACATGGAA
CAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTTCAATCGCGTATTGGT
AATCGCGTTTTGGCCTCTGACTGACGCGATTACCAACGCGATTGAACAGGACACAAGGCC
TGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTA
TGCTGTGATCATGCTGAAAATGGTGCACGTTTTGGCCTCTGACTGACGTGCACCATTCAG
CATGATCACAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAG
AAT 3'

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

CTGCCTTGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGG
CTTGCTGAAGGCTGTATGCTGAGGTAATATCCTGACGCTCAGCCGTTTTGGCCTCTGACT
GACGGCTGAGCGTGGATATTACCTCAGGACACAAGGCCTGTTACTAGCACTCACATGGAA
CAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTACAGAATCAGATAATC
AGCGCCGTTTTGGCCTCTGACTGACGGCGCTGATTCTGATTCTGTACAGGACACAAGGCC
TGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTA
TGCTGTATGTTTAAATTCGCTGCGCGTTTTGGCCTCTGACTGACGCGCAGCGAATTT
AAACATGACAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAG
AAT 3'

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

CTGCCTTGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGG
CTTGCTGAAGGCTGTATGCTGATGAATCGGGTTGTCTGAATCGCGTTTTGGCCTCTGACT
GACGCGATTGAGAACCCGATTATCAGGACACAAGGCCTGTTACTAGCACTCACATGGAA
CAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGAACACTTTGCTATATCA
TCCTGCGTTTTGGCCTCTGACTGACGCGAGGATGATAGCAAAGTTCAGGACACAAGGCC
TGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTA
TGCTGTTCTGTTTAAAGCTAATGCTCGTTTTGGCCTCTGACTGACGAGCATTAGCAAC
GAACAGAACAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAG
AAT 3'

-continued

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

CTGCCTTGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGG
CTTGCTGAAGGCTGTATGCTGGAGCATTAGCAATGCGAACAGAAGTTTGGCCTCTGACT
GACTTCTGTTCTGTGCTAATGCTCCAGGACACAAGGCCTGTTACTAGCACTCACATGGAA
CAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGAAACATAATGGATTAG
CAGCGCGTTTTGGCCTCTGACTGACGCGCTGCTGACCATTATGTTTCAGGACACAAGGCC
TGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTA
TGCTGTTATCTTTGCGAAGCTGCCATCCGTTTGGCCTCTGACTGACGGATGGCAGCCGC
AAAGATAACAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAG
AAT 3'

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

CTGCCTTGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGG
CTTGCTGAAGGCTGTATGCTGGCTCCTCCACTTGGTGGTTTGGTTTTGGCCTCTGACTGA
CGCGCAACATTCTGGTGATTACAGGACACAAGGCCTGTTACTAGCACTCACATGGAACA
AATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTCATAATCGTATTTGGTG
CGCGCTTTTGGCCTCTGACTGACGCCGACCAAAGCGATTATGACAGGACACAAGGCCTG
TTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATG
CTGTTCTGATCCTGAAGTTCGGGTTGTTTTGGCCTCTGACTGACGAACCCGAACCAGGA
TCAGAACAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAA
T 3'

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

CTGCCTTGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGG
CTTGCTGAAGGCTGTATGCTGAAATCTCCGGTGGTTCCACTGCGTTTTGGCCTCTGACT
GACGAGTGGAAACCGGAAGATTTAGGACACAAGGCCTGTTACTAGCACTCACATGGAA
CAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGATATCCTGAATATGGTA
TGCAGCGTTTTGGCCTCTGACTGACGCTGCATACCATTAGGATATCAGGACACAAGGCC
TGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTA
TGCTGTTTAAAGCTCAAACGCGTTCGCCGTTTTGGCCTCTGACTGACGGCGAACGCGTGA
GCTTTAAACAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAG
AAT 3'

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

CTGCCTTGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGG
CTTGCTGAAGGCTGTATGCTGTAATAAAGGCTCGGGAATACCCGTTTTGGCCTCTGACT
GACGGTGATTCGACCTTTATTACAGGACACAAGGCCTGTTACTAGCACTCACATGGAA
CAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTAATACGCCAGATCACC
ATCAGCGTTTTGGCCTCTGACTGACGCTGATGGTGCTGGCGTATTACAGGACACAAGGCC
TGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTA

-continued

TGCTGATACAGAAACGAAGGTTTCAGGCCGTTTGGCCTCTGACTGACGGCCTGAACCCGT

TTCTGTATCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAG

AAT ' 5'

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

CTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGG

CTTGCTGAAGGCTGTATGCTGTGAGATCGCTGTGGTAAACAGGCGTTTGGCCTCTGACT

GACGCTGTGTTTACCAGCGATCTGACAGGACACAAGGCCTGTTACTAGCACTCACATGGAA

CAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGAGAATCAGATCAGATAG

CGATCCGTTTGGCCTCTGACTGACGGATCGCTATCTGCTGATTCTCAGGACACAAGGCC

TGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTA

TGCTGAAACATGCCAACAGCAGAATGCCGTTTGGCCTCTGACTGACGGCATTCTGCTGG

GCATGTTTCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAG

AAT 3'

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

CTGCCTTGGCTCCAGGAGGGCTCCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGG

CTTGCTGAAGGCTGTATGCTGACAATCAGATATGGTTGCTCGGCGTTTGGCCTCTGACT

GACGCCGAGCAACTATCTGATTGTCAGGACACAAGGCCTGTTACTAGCACTCACATGGAA

CAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTTTCAATGCATCGTT

CAGCGCGTTTGGCCTCTGACTGACGCGCTGAACGGCATTGTGAAACAGGACACAAGGCC

TGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTA

TGCTGACAATAATGCCAACAGGGTGGTCGTTTGGCCTCTGACTGACGACCCCTGGGC

ATTATTGTCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAG

AAT 3'

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

GCTCCTTTTACGCTATGTGGATACGCTGCTTAAATGCCTTTGTATCATGCTATTGCTTCC

CGTATGGCTTTTCAATTTCTCCTCTGTATAAATCCTGGTTGCTGTCTTTATGAGGAG

TTGTGGCCCGTTGTGAGCAACGTGGCGTGGTGTGCACTGTGTTGCTGACGCAACCCCC

ACTGGTTGGGGCATTGCCACCACCTGTCAGCTCCTTCCGGGACTTTCGCTTTCCCCCTC

CCTATTGCCACGGCGGAATCATCGCCGCTGCCTTGCCCGCTGCTGGACAGGGGCTCGG

CTGTTGGGCACTGACAATTCGGTGGTGTGTCGGGAAATCATCGTCCTTTCTTGGCTG

CTCGCCTGTGTTGCCACCTGGATTCTGCGCGGACGTCCTTCTGCTACGTCCTTTCGGCC

CTCAATCCAGCGACCTTCCTTCCCGCGGCTGCTGCGGCTCTGCGGCTCTTCCGCGT

CTTCGCCTTCGCCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCTCCCCGCTAAGCTT

ATCGATACCGTCGAGATCTAATTTGTTTATGTCAGCTTATAATGGTTACAAATAAGCAA

TAGCATCACAATTTCAAAATAAAGCATTTTTTCACTGCATTCTAGTTGTGGTTTGTG

CAAACTCATCAATGTATCTTATCATGTCTGGATCTCGACCTCGACTAGAGCATGGCTACG

TAGATAAGTAGCATGGCGGTTAATCATTAACACAAGGAACCCCTAGTGATGGAGTTGG

- continued

CCACTCCCTCTCTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCAGAC
GCCCCGGGCTTTGCCCGGGCGGCCTCAGTGAGCGAGCGAGCGCGCAGCTGGCGTAATAGCG
AAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGAT
TCCGTTGCAATGGCTGGCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTG
AGTTCTTCTACTCAGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTT
AATTTGCGTGATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCT
CAGGATTCTGGCGTACCGTTCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCC
CGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGC
GCCCTGTAGCGCGCATTAAAGCGCGCGGGTGTGGTGGTTACGCGCAGCGTGACCGCTAC
ACTTGCCAGCGCCCTAGCGCCCGCTCCTTTTCGCTTTCTTCCTTCCTTTCTCGCCACGTT
CGCCGGCTTTCCCGCTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGC
TTTACGGCACCTCGACCCCAAAAACTTGATTAGGGTGATGGTTACGTAGTGGGCCATC
GCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACT
CTTGTTCCAACTGGAACAACACTCAACCTATCTCGGTCTATTCTTTGATTTATAAGG
GATTTTGCGGATTTTCGGCTATTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGC
GAATTTTAACAAAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTT
TTTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGTTTTACGATT
ACCGTTATCGATTCTCTGTTTGCTCCAGACTCTCAGGCAATGACCTGATAGCCTTTGT
AGAGACCTCTCAAAAATAGCTACCTCTCCGGCATGAATTTATCAGCTAGAACGTTGAA
TATCATATTGATGGTGATTTGACTGTCTCCGGCTTTCTCACCCGTTTGAATCTTTACCT
ACACATTACTCAGGCATTGCATTTAAATATATGAGGGTTCTAAAAATTTTATCCTTGC
GTTGAAATAAAGGCTTCTCCCGCAAAGTATTACAGGGTCATAATGTTTTTGGTACAACC
GATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGCTAATCTTTGCCTTGCCCTG
TATGATTTATTGGATGTTGGAATTCCTGATGCGGTATTTTCTCCTACGCATCTGTGCGG
TATTTACACCGCATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAG
CCAGCCCCGACACCCGCCAACCCGCTGACGCGCCTGACGGGCTTGTCTGCTCCCGC
ATCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTGAGAGTTTTCACC
GTCATCACCGAAACGCGGAGACGAAAGGGCCTCGTGATACGCCTATTTTATAGGTTAA
TGTCATGATAATAATGGTTTCTTAGACGTGAGGTGGCACTTTTCGGGGAATGTGCGCGG
AACCCTATTTGTTTATTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATA
ACCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCG
TGTCGCCCTTATTCCTTTTTCGCGCATTTTGCCCTTCCTGTTTTGCTCACCCAGAAAC
GCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTACATCGAACT
GGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGACGTTTTCCAATGAT
GAGCACTTTTAAAGTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGA
GCAACTCGGTGCGCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCAC
AGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGTGCCATAACCAT
GAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAAC
CGCTTTTTTGCAACATGGGGGATCATGTAACGCGCTTGATCGTTGGGAACCGGAGCT

-continued

GAATGAAGCCATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAAC
GTTGCGCAAACTATTAACTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGA
CTGGATGGAGGCGGATAAAGTTGCAGGACCACCTTCTGCGCTCGGCCCTCCGGCTGGCTG
GTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACT
GGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAAC
TATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTA
ACTGTCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAACTTCATTTTTAATT
TAAAAGGATCTAGGTGAAGATCCTTTTGATAATCTCATGACAAAATCCCTTAACGTGA
GTTTTCTGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCC
TTTTTTCTGCGCGTAATCTGCTGCTTGCAACAAAAAACCACCGCTACCAGCGGTGGT
TTGTTTCCGGATCAAGAGCTACCAACTCTTTTCCGAAGGTAAGTGGCTTCAGCAGAGC
GCAGATACAAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACCTTCAAGAACTC
TGTAGCACCGCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGG
CGATAAGTCGTCTTACCAGGTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCG
GTCGGGCTGAACGGGGGTTCTGTCACACAGCCAGCTTGGAGCGAACGACCTACACCGA
ACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGC
GGACAGGTATCCGGTAAGCGGCAGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCAGG
GGGAAACGCCTGGTATCTTTATAGTCCTGTGGGTTTCGCCACCTCTGACTTGAGCGTCG
ATTTTTGTGATGCTCGTCAGGGGGCGGAGCCTATGGAACCGCCAGCAACGCGGCCTT
TTTACGGTTCCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCTGCGTTATCCCC
TGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGAGCCG
AACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACC
GCCTCTCCCCGCGCGTTGGCCGATTCAATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACT
GAGGCCGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGGTCGCCCGGCTCAGTGAGC
GAGCGAGCGCGCAGAGAGGAGTGGCCAACTCCATCACTAGGGGTTCTTGTAAGTTAATG
ATTAACCCGCCATGTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAG
TGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCGCTGGCTGACCGCCCAACGACC
CCCGCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCC
ATTGACGTCAATGGGTGGAGTATTTACGGTAACTGCCCACTTGGCAGTACATCAAGTGT
ATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCGCTGGCATT
ATGCCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACGTATTAGTCA
TCGCTATTACCATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCC
CCTCCCCACCCCAATTTTGTATTTATTTATTTTAAATTATTTTGTGCAGCGATGGGGG
GGGGGGGGGGGGGGCGCGCCAGGCGGGGGGGGGGGGGGGGAGGGGGGGGGCGGGGGG
AGCGCGAGAGGTGCGCGGCGAGCCAATCAGAGCGGCGCGCTCCGAAAGTTTCTTTTATG
GCGAGGCGGCGGCGGCGGCGCTATAAAAAGCGAAGCGCGGCGGGCGGGAGTCGCT
GCGCGCTGCCTTCGCCCCGTGCCCCGCTCCGCGCGCGCTCGCGCCGCCCCCGCGCTC
TGACTGACCGCTTACTAAAACAGGTAAGTCCGGCTCCGCGCGGGTTTGGCGCCTCC
CGCGGCGCCCCCTCTCACGGCGAGCGCTGCCACGTACAGACGAAGGGCGCAGCGAGCG

- continued

TCCTGATCCTTCCGCCCCGACGCTCAGGACAGCGCCCCGCTGCTCATAAGACTCGGCCTT
AGAACCCAGTATCAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACT
GGTTTTCTTCCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGC
GGAGGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTTCATGTTT
TCTTTTTTTTTTCTACAGGTCTTGGGTGACGAACAGGGTACCGCCACCATGGCCACCGGCT
CTCGCACAGCCTGCTGCTGGCTTTCGGACTGCTGTGCCTGCCTTGGCTCCAGGAGGGCT
CCGCCGCTAGCATCGATAACCGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGA
TCAATCGGATTGCGGTAATCGCGTTTGGCCTCTGACTGACGCGATTACCGATCCGATTG
ATCAGGACACAAGGCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGG
CTTGCTGAAGGCTGTATGCTGATCTTTGCTAAATGGTGCACGCGTTTTGGCCTCTGACT
GACGCGTGCACCATTAGCAAAGATCAGGACACAAGGCTGTTACTAGCACTCACATGGAA
CAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGACTTCAATCACAAATCC
AGCGCCGTTTTGGCCTCTGACTGACGGCGCTGGAAGTGATTGAAGTCAGGACACAAGGCC
TGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

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

5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTTAACATGTT
GCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTTGTATCATGCTATTGCTTCC
CGTATGGCTTTTCATTTCTCCTCCTTGATAAAATCCTGGTTGCTGTCTCTTTATGAGGAG
TTGTGGCCCGTTGTGAGCAACGTGGCGTGGTGTGCACTGTGTTTGTGACGCAACCCCC
ACTGTTGGGGCACTTGCCACCACCTGTGAGCTCCTTTCCGGGACTTTCGCTTTCCCCCTC
CCTATTGCCACGGCGGAATCATCGCCGCTGCCTTGCCCGCTGCTGGACAGGGGCTCGG
CTGTTGGGCACTGACAATTCCGTGGTGTGTGCGGGAATCATCGTCCTTTCTTGCTG
CTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGACGTCTTCTGCTACGTCCCTTCGGCC
CTCAATCCAGCGACCTTCCTTCCCGCGGCTGCTGCGGCTCTGCGGCTCTTCCGCGT
CTTCGCCCTTCGCCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCTCCCCGCTAAGCTT
ATCGATACCGTCGAGATCTAACTTGTATTGTCAGCTTATAATGGTTACAAATAAAGCAA
TAGCATCACAAATTCACAAATAAAGCATTTTTTTCACTGCATTCTAGTTGTGGTTTGTG
CAAATCATCAATGTATCTTATCATGTCTGGATCTCGACCTCGACTAGAGCATGGCTACG
TAGATAAGTAGCATGGCGGGTAATCATTAATAACAAGGAACCCCTAGTGATGGAGTTGG
CCACTCCCTCTCTGCGGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGAC
GCCCCGGCTTTGCCCGGGCGGCTCAGTGAGCGAGCGAGCGCGCAGCTGGCGTAATAGCG
AAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGAT
TCCGTTGCAATGGCTGGCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTG
AGTTCTTCTACTCAGGCAAGTATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTT
AATTTGCGTGATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCT
CAGGATTCTGGCGTACCGTTCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCC
CGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGC
GCCCTGTAGCGCGCATTAAGCGCGGCGGTGTGGTGTACGCGCAGCGTGACCGCTAC
ACTTGCCAGCGCCCTAGCGCCCGCTCCTTTCTGCTTTCTTCCCTTCCTTTCTCGCCACGTT
CGCCGGCTTTCCCGCTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGC

- continued

TTTACGGCACCTCGACCCCAAAAACTTGATTAGGGTGATGGTTACGTAGTGGGCCATC
GCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACT
CTTGTTCCAACTGGAACAACACTCAACCTATCTCGGTCTATTCTTTGATTTATAAGG
GATTTTGCCGATTTCGGCTATTGGTTAAAAATGAGCTGATTTAACAAAAATTTAACGC
GAATTTTAAACAAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTT
TTTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGTTTTACGATT
ACCGTTCATCGATTCTCTTGTGTTGCTCCAGACTCTCAGGCAATGACCTGATAGCCTTTGT
AGAGACCTCTCAAAAATAGCTACCTCTCCGGCATGAATTTATCAGCTAGAACGGTTGAA
TATCATATTGATGGTGATTGACTGTCTCCGGCTTTCTCACCCGTTTGAATCTTTACCT
ACACATTACTCAGGCATTGCATTAAAAATATATGAGGGTTCTAAAAATTTTATCCTTGC
GTTGAAATAAAGGCTTCTCCCGCAAAGTATTACAGGGTCATAATGTTTTTGGTACAACC
GATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGCTAATCTTTGCCTTGCCCTG
TATGATTTATTGGATGTTGGAATTCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGG
TATTTACACCCGCATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAG
CCAGCCCCGACACCCGCCAACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGC
ATCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGGTTTTCACC
GTCATCACCGAAACGCGGAGACGAAAGGGCCTCGTGATACGCCTATTTTATAGGTTAA
TGTCATGATAATAATGGTTTCTTAGACGTGAGGTGGCACTTTTCGGGGAATGTGCGCGG
AACCCTTATTGTTTTATTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATA
ACCTGTATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCGG
TGTCGCCCTTATTCCTTTTTTTCGGCATTTTGCCCTTCTGTTTTTGCTCACCCAGAAAC
GCTGGTGAAAGTAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACATCGAACT
GGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTTCGCCCCGAAGAACGTTTTCCAATGAT
GAGCACTTTTAAAGTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGA
GCAACTCGGTGCGGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCAC
AGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCAT
GAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAAC
CGCTTTTTTGCAACAATGGGGGATCATGTAACCTCGCCTTGATCGTTGGGAACCGGAGCT
GAATGAAGCCATACCAAACGACGAGCGTGACACCAGATGCCTGTAGCAATGGCAACAAC
GTTGCGCAAACTATTAACCTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGA
CTGGATGGAGGCGGATAAAGTTGCAGGACCATTCTGCGCTCGGCCCTTCCGGTGGCTG
GTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACT
GGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGAGTCAGGCAAC
TATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTA
ACTGTCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAACTTCATTTTAAATT
TAAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGA
GTTTTCTGTTCCACTGAGCGTCAGACCCGCTAGAAAAGATCAAAGGATCTTCTTGAGATCC
TTTTTTCTGCGCGTAATCTGCTGCTTGCAACAAAAAACACCGCTACCAGCGGTGGT
TTGTTTGGCGGATCAAGAGCTACCAACTCTTTTCCGAAGGTAACGGCTTCAGCAGAGC

- continued

GCAGATACCAAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACCTTCAAGAACTC
TGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGG
CGATAAGTCGTGCTTACC GGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCG
GTCGGGCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGCGAACGACCTACACCGA
ACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGC
GGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGG
GGGAAACGCCTGGTATCTTTATAGTCCTGTGGGGTTTCGCCACCTCTGACTGAGCGTCG
ATTTTTGTGATGCTCGTCAGGGGGCGGAGCCTATGGA AAAACGCCAGCAACGCGGCCTT
TTTACGGTTCCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCCTGCGTTATCCCC
TGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGAGCCG
AACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACC
GCCTCTCCCCGCGCTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACT
GAGGCCGCGCCGGGCAAGCCCGGGCGTCGGGCGACCTTTGGTCGCGCCGCTCAGTGAGC
GAGCGAGCGCGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCTTGTAGTTAATG
ATTAACCCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAG
TGGAGTTCCGCTTACATAACTTACGGTAAATGGCCGCTGGCTGACCGCCCAACGACC
CCCCCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCC
ATTGACGTCAATGGGTGGAGTATTTACGGTAACTGCCCACTTGGCAGTACATCAAGTGT
ATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCGCTTGGCATT
ATGCCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACGTATTAGTCA
TCGCTATTACCATGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCATCTCCCCC
CCTCCCCACCCCCAATTTTGTATTTATTATTTTAAATTATTTTGTGCAGCGATGGGGG
CGGGGGGGGGGGGGCGCGCCAGGCGGGCGGGCGGGCGAGGGCGGGGGCGGGGCGGGG
GAGGCGGAGAGGTGCGGCGGCAGCCAATCAGAGCGGCGCTCCGAAAGTTTCCTTTTAT
GGCGAGGCGGCGGCGGCGGCGCTTATAAAAAGCGAAGCGCGGCGGGCGGGAGTCGC
TGCGCGCTGCCTTCGCCCCGTGCCCCGCTCCGCCGCGCCTCGCGCCGCCCGCCCGGCT
CTGACTGACCGGCTTACTAAAACAGTAAGTCCGGCCTCCGCGCGGGTTTGGCGCCTC
CCGCGGGCGCCCCCTCTCACGGCGAGCGCTGCCACGTACAGCAAGGGCGCAGCGAGC
GTCTGTATCCTTCCGCCCGGACGCTCAGGACAGCGGCCGCTGCTCATAAGACTCGGCCT
TAGAACCCAGTATCAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCAC
TGGTTTTCTTTCCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGCGATTCTG
CGGAGGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCCTCTACTAACCATGTTTATGTT
TTCTTTTTTTTCTACAGGTCTGGGTGACGAACAGGGTACCGCCACCATGGCCACCGGC
TCTCGCACAAAGCTGCTGCTGGCTTTTCGACTGCTGTGCTGCTTGGCTCCAGGAGGGC
TCCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTG
TAATCTTTTCGCTGGCTGCAGTTCGTTTTGGCCTCTGACTGACGAACCTGCAGCGCAAAGA
TTACAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAG
GCTTGCTGAAGGCTGTATGCTGTGTTAATGCTGATGTCAGCTGCGTTTTGGCCTCTGAC
TGACGCGAGCTGACCAGCATTAAACAGGACACAAGGCCTGTACTAGCACTCACATGGA

-continued

ACAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTTCACCTGGTTAACAC
ATACACCGTTTTGGCCTCTGACTGACGGTGTATGTGAACCAGGTGAACAGGACACAAGGC
CTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

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

5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTTAACATGTT
GCTCCTTTTACGCTATGTGGATACGCTGCTTAAATGCCTTTGTATCATGCTATTGCTTCC
CGTATGGCTTTTCATTTTCTCCTCTGTATAAATCCTGGTTGCTGTCTCTTTATGAGGAG
TTGTGGCCCGTTGTGAGCAACGTGGCGTGGTGTGCACTGTGTTTGTGACGCAACCCCC
ACTGGTTGGGGCATTGCCACCACCTGTCAGCTCCTTTCCGGGACTTTCGCTTTCCCCCTC
CCTATTGCCACGGCGGAACATCGCCGCTGCCTTGCCCGCTGCTGGACAGGGGCTCGG
CTGTTGGGCACTGACAATTCCTGGTGTGTGCGGGAATCATCGTCCTTTCTTGCTG
CTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGACGTCCTTCTGCTACGTCCTTTCGGCC
CTCAATCCAGCGACCTTCCTTCCCGCGGCTGCTGCGGCTCTGCGGCTCTTCCGCGT
CTTCGCTTCGCGCTCAGACGAGTCGGATCTCCCTTTGGGCGCCTCCCGCCTAAGCTT
ATCGATACCGTCGAGATCTAACTTGTTTATGTCAGCTTATAATGGTTACAAATAAGCAA
TAGCATCACAATTTACAAATAAAGCATTTTTTCACTGCATTCTAGTTGTGGTTTGTG
CAAACCTCATCAATGTATCTTATCATGTCTGGATCTCGACCTCGACTAGAGCATGGCTACG
TAGATAAGTAGCATGGCGGTTAATCATTAACATAAGGAACCCCTAGTGATGGAGTTGG
CCACTCCCTCTCTGCGGCTCGCTCGCTCACTGAGGCGGGCGACCAAAGGTGCGCCGAC
GCCCCGGCTTTGCCGGGCGGCTCAGTGAGCGAGCGAGCGCGCAGCTGGCGTAATAGCG
AAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGAT
TCCGTTGCAATGGCTGGCGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTG
AGTTCTTCTACTCAGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTT
AATTTGCGTGATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCT
CAGGATTCTGGCGTACCGTTCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCC
CGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGC
GCCCTGTAGCGCGCATTAAGCGCGGCGGTGTGGTGGTTACGCGCAGCGTGACCGCTAC
ACTTGCCAGCGCCCTAGCGCCGCTCCTTTGCTTTCTTCCCTTCCTTTCTCGCCACGTT
CGCCGGCTTTCCCGCTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGC
TTTACGGCACCTCGACCCCAAAAACTTGATTAGGGTGATGGTTACGCTAGTGGGCCATC
GCCCTGATAGACGGTTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACT
CTTGTTCCAACTGGAACAACACTCAACCTATCTCGGTCTATTCTTTGATTTATAAGG
GATTTTGCGGATTTTCGGCTATTGGTTAAAAATGAGCTGATTTAACAAAAATTAACGC
GAATTTTAACAAAATATTAACGTTTACAATTTAAATATTGCTTATACAATCTTCCGTGTT
TTTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGTTTTACGATT
ACCGTTTCATCGATTCTTGTGTTGCTCCAGACTCTCAGGCAATGACCTGATAGCCTTTGT
AGAGACCTCTCAAAAATAGCTACCCTCTCCGGCATGAATTTATCAGCTAGAACGGTTGAA
TATCATATTGATGGTGATTGACTGTCTCCGGCCTTCTCACCCGTTTGAATCTTTACCT
ACACATTACTCAGGCATTGCATTTAAAAATATATGAGGGTTCTAAAAATTTTATCCTTGC

- continued

GTTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTTGGTACAACC
GATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGCTAATCTTTGCCTTGCTG
TATGATTTATGGATGTTGGAATTCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGG
TATTTACACCCGATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAG
CCAGCCCCGACACCCGCCAACCCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGC
ATCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTGAGAGTTTTCACC
GTTCATCACCAGAACGCGGAGACGAAAGGGCCTCGTGATACGCCTATTTTATAGGTTAA
TGTCATGATAATAATGGTTTCTTAGACGTGAGTGGCACTTTTCGGGAAATGTGCGCGG
AACCCCTATTGTTTTATTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATA
ACCCGTATAAATGCTTCAATAATATTGAAAAGGAAGAGTATGAGTATTCAACATTTCCG
TGTCGCCCTTATTCCTTTTTTGCAGCATTTTGCTTCTGTTTTTGCTCACCAGAAAC
GCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTACATCGAACT
GGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGAT
GAGCACTTTTAAAGTCTGCTATGTGGCGCGTATTATCCCGTATTGACGCCGGGCAAGA
GCAACTCGGTGCGCCGATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCAC
AGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGTGCCATAACCAT
GAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAAC
CGCTTTTTTGCAACAATGGGGGATCATGTAACCTGCTTGGTGGGAACCGGAGCT
GAATGAAGCCATACCAAACGACGAGCGTGACACCAGATGCCGTAGCAATGGCAACAAC
GTTGCGCAAACTATTAAGTGGCAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGA
CTGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTG
GTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACT
GGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGAGTCAGGCAAC
TATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTA
ACTGTCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAACTTCATTTTAAATT
TAAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGA
GTTTTCTGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCC
TTTTTTTCTGCGCGTAATCTGCTGCTTGCAACAAAAAACCACCGCTACCAGCGGTGGT
TTGTTGCGGATCAAGAGCTACCAACTCTTTTCCGAAGGTAAGTGGCTTCAGCAGAGC
GCAGATACCAAACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTC
TGTAGCACCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGG
CGATAAGTCGTGCTTACCGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCG
GTCGGGCTGAACGGGGGTTCTGTGCACACAGCCAGCTTGGAGCGAACGACTACACCGA
ACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGC
GGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGG
GGGAAACGCCCTGGTATCTTTATAGTCTGTGCGGTTTCGCCACCTCTGACTTGAGCGTCG
ATTTTTGTGATGCTCGTCAGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCTT
TTTACGGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCTGCGTTATCCCC
TGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGAGCCG

-continued

AACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACC
GCCTCTCCCCGCGCGTTGGCCGATTCAATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACT
GAGGCCGCGCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGGTCGCGCCGGCCTCAGTGAGC
GAGCGAGCGCGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTTCCTTGTAAGTTAATG
ATTAACCCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAG
TGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCGCGCTGGCTGACCGCCCAACGACC
CCCGCCCATTTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCC
ATTGACGTCAATGGGTGGAGTATTTACGGTAACTGCCCACTTGGCAGTACATCAAGTGT
ATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCGCGCTGGCATT
ATGCCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACGTATTAGTCA
TCGCTATTACCATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCC
CCTCCCCACCCCCAATTTTGTATTTATTTATTTTAAATTTTGTGCAGCGATGGGGG
CGGGGGGGGGGGGGCGCGCCAGGCGGGCGGGGGGGGGCGAGGGCGGGGCGGGGCGGGG
GAGGCGGAGAGGTGCGGCGGCAGCCAATCAGAGCGGCGCGCTCCGAAAGTTTCCTTTTAT
GGCGAGGCGGCGGCGGCGGCGCTATAAAAAGCGAAGCGCGGCGGGCGGGAGTCGC
TGCGCGCTGCCTTCGCCCCGTGCCCCGCTCCGCGCGCGCTCGCGCCGCGCCCGCGGCT
CTGACTGACCGGCTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGGTTTGGCGCCTC
CCGCGGGCGCCCCCTCTCACGGCGAGCGCTGCCACGTACAGCAAGGGCGCAGCGAGC
GTCCTGATCCTTCCGCGCGACGCTCAGGACAGCGGCGCGCTGCTCATAAGACTCGGCCT
TAGAACCCCAGTATCAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCAC
TGGTTTTCTTTCCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGCGATTCTG
CGGAGGGATCTCCGTGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTTCATGTT
TTCTTTTTTTTTCTACAGGTCTGGGTGACGAACAGGGTACCGCCACCATGGCCACCGGC
TCTCGCACAAAGCTGCTGCTGGCTTTTCGGAAGTGTGCTGCTTGGCTCCAGGAGGGC
TCCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTG
ATTTCTTCTGTGCGCTTTCGCGGTTTTGGCCTCTGACTGACGGCGAAAGCGCAGGAAGA
AATCAGGACACAAGGCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAG
GCTTGCTGAAGGCTGTATGCTGAGAATAATCAGATCAGCACGCTCGTTTTGGCCTCTGAC
TGACGAGCGTGCTGTGATTATTCTCAGGACACAAGGCTGTTACTAGCACTCACATGGA
ACAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTAATCAGGCTGAATTC
AGATAGCGTTTTTGGCCTCTGACTGACGCTATCTGAACAGCCTGATTACAGGACACAAGGC
CTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 17 = SEQ ID NO. 1 + SEQ ID NO. 5
5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTTAACATGTT
GCTCCTTTTACGCTATGTGGATACGCTGCTTAAATGCCTTTGTATCATGCTATTGCTTCC
CGTATGGCTTTTCAATTTCTCCTCTTGTATAAATCCTGGTTGCTGCTCTTTATGAGGAG
TTGTGGCCCGTTGTGAGCAACGTGGCGTGGTGTGCACTGTGTTTGCTGACGCAACCCCC
ACTGGTTGGGGCATTGCCACCACCTGTGAGCTCCTTTCCGGGACTTTCGCTTTCCCCCTC
CCTATTGCCACGGCGGAACATCGCCGCGCTGCCCTTGGCCGCTGCTGGACAGGGGCTCGG
CTGTTGGGCACTGACAATTCGCTGGTGTGTCGGGGAATCATCGTCCTTTCTTGGCTG

- continued

CTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGACGTCCTTCTGCTACGTCCCTTCGGCC
CTCAATCCAGCGGACCTTCCTTCCCGCGGCTGCTGCCGGCTCTGCGGCCTTCCGCGT
CTTCGCCTTCGCCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCTCCCGCCTAAGCTT
ATCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAAATAAGCAA
TAGCATCACAAATTCACAAATAAAGCATTTTTTCACTGCATTCTAGTTGTGGTTTGT
CAAACCTCATCAATGTATCTTATCATGTCTGGATCTCGACCTCGACTAGAGCATGGCTACG
TAGATAAGTAGCATGGGGTTAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGC
CACTCCCTCTCTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGTCGCCCAGC
CCCGGGCTTTGCCCGGGCGGCTCAGTGAGCGAGCGAGCGCGAGCTGGCGTAATAGCGA
AGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGATT
CCGTTGCAATGGCTGGCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTGA
GTTCTTCTACTCAGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTA
ATTTGCGTGATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAAACTTCTC
AGGATTCTGGCGTACCGTTCTGTCTAAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCCC
GCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGCG
CCCTGTAGCGGCGCATTAAAGCGCGGCGGTGTGGTGTTACGCGCAGCGTGACCGCTACA
CTTGCCAGCGCCCTAGCGCCCGCTCCTTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTT
GCCGCTTTTCCCGCTCAAGCTCTAAATCGGGGCTCCCTTTAGGGTTCGGATTTAGTGCT
TTACGGCACCTCGACCCCAAAAACTTGATTAGGGTGATGGTTACGTTAGTGGCCATCG
CCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACTC
TTGTTCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTTTGATTTATAAGGG
ATTTTGCCGATTTTCGGCTATTGGTTAAAAATGAGCTGATTTAACAAAAATTTAACCG
AATTTTAACAAAATATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTTT
TTGGGGCTTTTCTGATTATCAACCGGGTACATATGATTGACATGCTAGTTTTACGATTA
CCGTTTCATCGATTCTCTTGTGTTGCTCCAGACTCTCAGGCAATGACCTGATAGCCTTTGTA
GAGACCTCTCAAAAATAGCTACCTCTCCGGCATGAATTTATCAGCTAGAACGGTTGAAT
ATCATATTGATGGTGATTTGACTGTCTCCGGCCTTTCTACCCGTTTGAATCTTTACCTA
CACATTACTCAGGCATTGCATTTAAAAATATATGAGGGTTCTAAAAATTTTATCCTTGCG
TTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTTGGTACAACCG
ATTTAGCTTTTATGCTCTGAGGCTTTATTGCTTAATTTGCTAATCTTTGCCTTGCTGT
ATGATTTATTGGATGTTGGAATCCTGATGCGGTATTTCTCCTTACGCATCTGTGCGGT
ATTTACACCGCATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGC
CAGCCCCGACACCCGCCAACCCGCTGACGCGCCTGACGGGCTTGCTGCTCCCGCA
TCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTAGAGGTTTTACCG
TCATCACCGAAACGCGGAGACGAAAGGCCTCGTGATACGCCTATTTTTATAGTTAAT
GTCATGATAATAATGGTTTCTTAGACGTGAGTGACCTTTTCGGGAAATGTGCGCGGA
ACCCCTATTTGTTTATTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAA
CCCTGATAAATGCTTCAATAATTTGAAAAAGGAAGAGTATGAGTATTCACATTTCCGT
GTCGCCCTTATTCCTTTTTCGCGCATTTTGCCTTCTGTTTTTGTCTACCCAGAAACG

- continued

CTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTACATCGAACTG
GATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGATG
AGCACTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAG
CAACTCGGTGCGCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACA
GAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCATG
AGTGATAACACTGCGGCCAACTTACTTCTGACACGATCGGAGGACCGAAGGAGCTAACC
GCTTTTTTGCACAACATGGGGGATCATGTAACCTCGCCTTGATCGTTGGGAACCGGAGCTG
AATGAAGCCATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACG
TTGCGCAAACCTATTAACTGGCGAACTACTTACTCTAGCTTCCCGCAACAATTAATAGAC
TGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCGGCTGGCTGG
TTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTG
GGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGAGTCAGGCAACT
ATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAA
CTGTCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAAACCTTCATTTTAAATTT
AAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAATCCCTTAACGTGAG
TTTTCTGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCT
TTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAACACCGCTACCAGCGGTGGTT
TGTTTGGCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACCTGGCTTCAGCAGAGCG
CAGATACCAAATACTGTCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCT
GTAGCACCGCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGC
GATAAGTCGTGTCTTACCAGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCGG
TCGGGCTGAACGGGGGTTCTGTGCACACAGCCAGCTTGGAGCGAACGACCTACACCGAA
CTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCG
GACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGG
GGAAACGCCTGTTATCTTTATAGTCCTGTGCGGTTTCGCCACCTCTGACTTGAGCGTCGA
TTTTTGTGATGCTCGTCAGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGCCTTT
TTACGGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCTGCGTTATCCCT
GATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCGAGCCGA
ACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCG
CCTCTCCCGCGCGTGGCCGATTCTTAATGCAGCAGCTGCGCGCTCGCTCGCTCACTG
AGGCCCGCCGGGCAAAGCCCGGGCGTCGGGCGACCTTGGTTCGCCGGCCTCAGTGAGCG
AGCGAGCGCGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCTTGTAGTTAATGA
TTAACCCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGT
GGAGTTCGCGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACCC
CCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCA
TTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTA
TCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGGCATT
TGCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCAT
CGCTATTACCATGGTGCAGGTGAGCCCCAGTTCTGCTTCACTCTCCCATCTCCCCCCC

- continued

CTCCCCACCCCAATTTTGTATTATTTATTTTAAATTATTTTGTGCAGCGATGGGGGC
GGGGGGGGGGGGGGCGCGCCAGGCGGGGCGGGGGGGGGCGAGGGGCGGGGCGGGGCG
AGGCGGAGAGGTGCGGCGGCGAGCCAATCAGAGCGGCGCGCTCCGAAAGTTTCCTTTTATG
GCGAGGCGGCGGCGGCGGCGCCCTATAAAAAGCGAAGCGCGGCGGGGAGTCGCT
GCGCGCTGCCTTCGCCCCGTGCCCCGCTCCGCGCGCGCTCGCGCGCGCGCCCCGGCTC
TGA CTGACCGCTTACTAAAACAGGTAAGTCCGGCTCCGCGCGGGTTTGGCGCTCC
CGCGGCGCCCCCTCTCACGGCGAGCGCTGCCACGTGAGACGAAGGCGCGAGCGAGCG
TCCTGATCCTTCGCGCGGACGCTCAGGACAGCGCGCGCTGCTCATAAGACTCGGCCTT
AGAACCCAGTATCAGCAGAAGGACATTTAGGACGGGACTTGGGTGACTCTAGGGCACT
GGTTTTCTTCCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGC
GGAGGGATCTCCGTGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTTATGTTT
TCTTTTTTTTTTACAGGTCTGGGTGACGAACAGGTTACCGCCACCATGGCCACCGGCT
CTCGCACAGCCTGCTGCTGGCTTTCGGACTGCTGTGCCTGCCTTGGCTCCAGGAGGGCT
CCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGA
TAATCACCCTGCAGGTTTACGCTTTTGGCTCTGACTGACGCTGAACCTGGCGGTGATT
ATCAGGACACAAGGCTGTTACTAGCACTACATGGAACAAATGGCCTCTAGCCTGGAGG
CTTGCTGAAGGCTGTATGCTGTTCAATCGCGTATTGGTAATCGCGTTTTGGCTCTGACT
GACGCGATTACCAACGCGATTGAACAGGACACAAGGCTGTTACTAGCACTACATGGAA
CAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTGATCATGCTGAAAATG
GTGCACGTTTTGGCTCTGACTGACGTGCACCATTCAGCATGATCACAGGACACAAGGCC
TGTTACTAGCACTACATGGAACAAATGGCCTCTCTAGAAT 3'

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

5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTTAACATGTT
GCTCCTTTTACGCTATGTGGATACGCTGCTTAAATGCCTTTGTATCATGCTATTGCTTCC
CGTATGGCTTTCATTTCTCCTTGTATAAATCCTGGTTGCTGCTCTTTATGAGGAG
TTGTGGCCCGTTGTGAGCAACGTGCGTGGTGTGCACTGTGTTTGTGACGCAACCCCC
ACTGGTTGGGGCATGGCCACCACCTGTGAGCTCCTTCCGGGACTTTCGCTTTCCCCCTC
CCTATTGCCACGGCGGAATCATCGCCGCTGCCTTGCCCGCTGCTGGACAGGGGCTCGG
CTGTTGGGCACTGACAATTCCGTGGTGTGTCGGGAAATCATCGTCCTTTCCTTGGCTG
CTCGCCTGTGTTGCCACCTGGATTCTGCGCGGACGTCCTTCTGCTACGTCCTTCGGCC
CTCAATCCAGCGACCTTCCTTCCCGCGGCTGCTGCCGGCTCTGCGGCTCTTCCGCGT
CTTCGCCTTCGCCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCTCCCGCTAAGCTT
ATCGATACCGTCGAGATCTAACTTGTTTATGCGCTTATAATGGTTACAAATAAGCAA
TAGCATCACAATTTCAAAATAAAGCATTTTTTCACTGCATTCTAGTTGTGGTTTGTG
CAAATCATCAATGTATCTTATCATGTCTGGATCTCGACCTCGACTAGAGCATGGCTACG
TAGATAAGTAGCATGGCGGTTAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGG
CCACTCCCTCTCTGCGGCTCGCTCGCTCACTGAGGCGGGCGACCAAAGGTCGCCGAC
GCCCCGGCTTTGCCGGGCGGCTCAGTGAGCGAGCGAGCGCGCAGCTGGCGTAATAGCG
AAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGAT

- continued

TCCGTTGCAATGGCTGGCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTG
AGTTCTTCTACTCAGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTT
AATTTGCGTGATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCT
CAGGATTCTGGCGTACCGTTCCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCC
CGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGC
GCCCTGTAGCGCGCATTAAAGCGCGCGGGTGTGGTGGTTACGCGCAGCGTGACCGCTAC
ACTTGCCAGCGCCCTAGCGCCCGCTCCTTTTCGCTTTCTTCCTTCCTTTCTCGCCACGTT
CGCCGGCTTTCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGC
TTTACGGCACCTCGACCCCAAAAACTTGATTAGGGTGATGGTTACGTAGTGGGCCATC
GCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACT
CTTGTTCCAACTGGAACAACACTCAACCTATCTCGGTCTATTCTTTGATTTATAAGG
GATTTTGCCGATTTCGGCCTATTGGTTAAAAATGAGCTGATTTAACAAAAATTAACGC
GAATTTTAACAAAATATTAACGTTTACAATTTAAATATTGCTTATACAATCTTCCTGTT
TTTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGTTTTACGATT
ACCGTTCATCGATTCTCTGTTTGCTCCAGACTCTCAGGCAATGACCTGATAGCCTTTGT
AGAGACCTCTCAAAAATAGCTACCTCTCCGGCATGAATTTATCAGCTAGAACGGTTGAA
TATCATATTGATGGTGATTTGACTGTCTCCGGCTTTCTCACCCTTTGAATCTTTACCT
ACACATTACTCAGGCATTGCATTTAAATATATGAGGGTTCTAAAAATTTTATCCTTGC
GTTGAAATAAAGGCTTCTCCCGAAAAGTATTACAGGGTCATAATGTTTTTGGTACAACC
GATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGCTAATCTTTGCCTTGCCCTG
TATGATTTATTGGATGTTGGAATTCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGG
TATTTACACCCGATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAG
CCAGCCCCGACACCCGCCAACCCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGC
ATCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGGTTTTCACC
GTCATCACCGAAACGCGGAGACGAAAGGGCCTCGTGATACGCCTATTTTATAGGTTAA
TGTCATGATAAATAGGTTTCTTAGACGTGAGGTGGCACTTTTCGGGAAATGTGCGCGG
AACCCTTATTGTTTATTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATA
ACCTGATAAATGCTTCAATAATATTGAAAAAGGAAGATATGAGTATTCAACATTTCG
TGTCGCCCTTATTCCTTTTTTTCGCGCATTTTGCCCTTCCTGTTTTGCTCACCAGAAAC
GCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTACATCGAACT
GGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGAT
GAGCACTTTTAAAGTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGA
GCAACTCGGTGCGCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCAC
AGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCAT
GAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAAC
CGCTTTTTTGCAACAATGGGGGATCATGTAACCTCGCCTTGATCGTTGGGAACCGGAGCT
GAATGAAGCCATACCAAACGACGAGCGTGACACCAGATGCCTGTAGCAATGGCAACAAC
GTTGCGCAAACTATTAACCTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGA
CTGGATGGAGCGGATAAAGTTGCAGGACCCTTCTGCGCTCGGCCCTTCCGGCTGGCTG

- continued

GTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACT
GGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGAGTCAGGCAAC
TATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTA
ACTGTCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAACTTCATTTTAAATT
TAAAAGGATCTAGGTGAAGATCCTTTTGATAATCTCATGACCAAAATCCCTTAACGTGA
GTTTTCTGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCC
TTTTTTTCTGCGCGTAATCTGCTGCTTGCAACAAAAAACACCGCTACCAGCGGTGGT
TTGTTTCCGGATCAAGAGCTACCAACTCTTTTCCGAAGTAAGTGGCTTCAGCAGAGC
GCAGATACAAATACTGCTCTCTAGTGTAGCCGTAGTTAGGCCACCACCTCAAGAACTC
TGTAGCACCGCTACATACCTCGCTCTGCTAATCTGTTACCAGTGGCTGCTGCCAGTGG
CGATAAGTCGTCTTACCAGGTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCG
GTCGGGCTGAACGGGGGTTCTGTCACACAGCCAGCTTGGAGCGAACGACCTACACCGA
ACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGC
GGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCAGG
GGGAAACGCCTGGTATCTTTATAGTCCTGTCTGGGTTTCGCCACCTCTGACTGAGCGTCG
ATTTTGTGATGCTCGTCAGGGGGCGGAGCCTATGGAACCGCCAGCAACGCGGCCTT
TTTACGGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTCTGCGTTATCCCC
TGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGAGCCG
AACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACC
GCCTCTCCCCGCGGTTGGCCGATTCAATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACT
GAGGCCGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGGTCGCGCGCCTCAGTGAGC
GAGCGAGCGCGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCTTGTAGTTAATG
ATTAACCCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAG
TGGAGTTCTCGGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACC
CCCGCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCC
ATTGACGTCAATGGTGGAGTATTTACGGTAACTGCCCCACTTGGCAGTACATCAAGTGT
ATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGGCATT
ATGCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCA
TCGCTATTACCATGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCC
CCTCCCCACCCCAATTTTGTATTTATTTATTTTAAATTATTTTGTGACGATGGGGG
GGGGGGGGGGGGCGCGGCCAGGCGGGCGGGGGGGGGCGAGGGGGGGCGGGGGCGA
GGCGGAGAGGTGCGCGCGCAGCCAATCAGAGCGCGCGCTCCGAAAGTTTCCTTTTATGG
CGAGGCGCGCGCGCGGCCCTATAAAAAGCGAAGCGCGCGCGGGCGGGAGTCGCTG
CGCGTGCCTTCGCCCCGTGCCCCGCTCCGCCGCGCCTCGCGCGCCGCCCCCGGCTCT
GACTGACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCGGGTTTGGCGCCTCCC
GCGGGCGCCCCCTCTCACGGCGAGCGCTGCCACGTGAGACGAAGGGCGCAGCGAGCGT
CCTGATCCTTCCGCCCGGACGCTCAGGACAGCGGCCGCTGCTCATAAGACTCGGCCTTA
GAACCCAGTATCAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTG
GTTTTCTTCCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGCG

- continued

GAGGGATCTCCGTGGGGCGGTGAACGCCGATGATGCTCTACTAACCATGTTTCATGTTTT
CTTTTTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACCGCCACCATGGCCACCGGCTC
TCGCACAAGCCTGCTGCTGGCTTTCGGACTGCTGTGCCTGCCTTGGCTCCAGGAGGGCTC
CGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGGCTTGTGAAGGCTGTATGCTGAG
GTAATATCCTGACGCTCAGCCGTTTTGGCCTCTGACTGACGGCTGAGCGTGGATATTACC
TCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGGC
TTGCTGAAGGCTGTATGCTGTACAGAATCAGATAATCAGCGCCGTTTTGGCCTCTGACTG
ACGGCGCTGATTCTGATTCTGTACAGGACACAAGCCTGTTACTAGCACTCACATGGAAC
AAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTATGTTTAAAAATTCGC
TGCGCGTTTTGGCCTCTGACTGACGCGCAGCGAATTAAACATGACAGGACACAAGGCCT
GTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

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

5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTTAACATATGTT
GCTCCTTTTACGCTATGTGGATACGCTGCTTAAATGCCTTTGTATCATGCTATTGCTTCC
CGTATGGCTTTTCATTTCTCCTCCTTGATAAAATCCTGGTTGCTGTCTCTTTATGAGGAG
TTGTGGCCCGTTGTGAGCAACGTGGCGTGGTGTGCACTGTGTTTGCTGACGCAACCCCC
ACTGTTTGGGGCATTGCCACCACCTGTGAGCTCCTTTCGGGACTTTCGCTTTCCCCCTC
CCTATTGCCACGGCGGAATCATCGCCGCTGCTTGCCCGCTGCTGGACAGGGGCTCGG
CTGTTGGGCACTGACAATTCCGTGGTGTGTCGGGGAATCATCGTCCTTTCCTTGCGTG
CTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGACGTCTTCTGTACGTCCCTTCGGCC
CTCAATCCAGCGACCTTCCTTCCCGCGGCTGCTGCGGCTCTGCGGCTCTTCCGCGT
CTTCGCCCTTCGCCCTCAGACGAGTCGGATCTCCCTTTGGGCCCTCCCCGCTAAGCTT
ATCGATACCGTCGAGATCTAACTTGTTTATTGACGCTTATAATGGTTACAAATAAGCAA
TAGCATCACAATTTACAAATAAAGCATTTTTTCACTGCATTCTAGTTGTGGTTTGTG
CAAATCATCAATGTATCTTATCATGTCTGGATCTCGACCTCGACTAGAGCATGGCTACG
TAGATAAGTAGCATGGCGGTTAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGG
CCACTCCCTCTCTGCGGCTCGCTCGCTCACTGAGGCCGGGCGACAAAGGTGCGCCGAC
GCCCCGGCTTTGCCCGGGCGGCTCAGTGAGCGAGCGAGCGCGCAGCTGGCGTAATAGCG
AAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGAT
TCCGTTGCAATGGCTGGCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTG
AGTTCTTCTACTCAGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTT
AATTTGCGTGATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCT
CAGGATTCTGGCGTACCGTTCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCC
CGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGC
GCCCTGTAGCGCGCATTAAGCGCGGCGGTGTGGTGGTTACGCGCAGCGTGACCGCTAC
ACTTGCCAGCGCCCTAGCGCCGCTCCTTTGCTTTCTTCCCTTCCTTTCTCGCCACGTT
CGCCGGCTTTCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGC
TTTACGGCACCTCGACCCCAAAAACTTGATTAGGGTGATGGTTACGTAGTGGGCCATC
GCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACT
CTTGTTCCAACTGGAACAACACTCAACCTATCTCGGTCTATTCTTTGATTATAAGG

- continued

GATTTTGGCCGATTTCGGCCTATTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGC
GAATTTTAACAAAAATTAACGTTTACAATTTAAATATTGCTTATACAATCTTCCTGTT
TTTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGTTTTACGATT
ACCGTTTCATCGATTCTCTGTTTGTCTCCAGACTCTCAGGCAATGACCTGATAGCCTTTGT
AGAGACCTCTCAAAAAATAGCTACCCTCTCCGGCATGAATTTATCAGCTAGAACGGTTGAA
TATCATATTGATGGTGATTGACTGTCTCCGGCCTTCTCACCCGTTTGAATCTTTACCT
ACACATTACTCAGGCATTGCATTAAAAATATATGAGGGTTCTAAAAATTTTATCCTTGC
GTTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTTGGTACAACC
GATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGCTAATCTTTGCCTTGCCCTG
TATGATTTATGGATGTTGGAATTCCTGATGCGGTATTTCTCCTTACGCATCTGTGCGG
TATTTACACCCGCATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAG
CCAGCCCCGACACCCGCCAACCCCGCTGACGCGCCTGACGGGCTTGTCTGCTCCCGC
ATCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGGTTTTCACC
GTCATCACCGAACGCGGAGACGAAAGGGCCTCGTGATACGCCTATTTTATAGGTTAA
TGTCATGATAATAATGGTTTCTTAGACGTCAAGTGGCACTTTTCGGGGAATGTGCGCGG
AACCCTTATTGTTTATTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATA
ACCTGATAAATGCTTCAATAATATTGAAAAAGGAAGATATGAGTATTCAACATTTCCG
TGTCGCCCTTATTCCTTTTTTTCGCGCATTTTGCCCTCTCTGTTTTTGCTCACCCAGAAAC
GCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTACATCGAACT
GGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTTCGCCCCGAAGAACGTTTTCCAATGAT
GAGCACTTTTAAAGTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGA
GCAACTCGGTGCGCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCAC
AGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGTGCCATAACCAT
GAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAAC
CGCTTTTTTGCAACAATGGGGGATCATGTAACCTCGCCTTGATCGTTGGGAACCGGAGCT
GAATGAAGCCATACCAAACGACGAGCGTGACACCAGATGCCTGTAGCAATGGCAACAAC
GTTGCGCAAACTATTAACCTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGA
CTGGATGGAGGCGGATAAAGTTGCAGGACCCTTCTGCGCTCGGCCCTTCCGGCTGGCTG
GTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACT
GGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGAGTCAGGCAAC
TATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTTGGTA
ACTGTCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAACCTTCATTTTAAATT
TAAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGA
GTTTTCTGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCC
TTTTTTTCTGCGCGTAATCTGCTGCTTGCAACAAAAAACCACCGCTACCAGCGGTGGT
TTGTTTGGCGGATCAAGAGCTACCAACTCTTTTCCGAAGGTAAGTGGCTTCAGCAGAGC
GCAGATACAAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCCTTCAAGAACTC
TGAGCACCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGG
CGATAAGTCGTCTTACC GGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCG

- continued

GTCGGGCTGAACGGGGGGTTTCGTGCACACAGCCCAGCTTGGAGCGAACGACCTACACCGA
ACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGC
GGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGG
GGGAAACGCCTGGTATCTTTATAGTCCTGTTCGGGTTTCGCCACCTCTGACTTGAGCGTCG
ATTTTGTGATGCTCGTCAGGGGGCGGAGCCTATGGAACACGCCAGCAACGCGGCCTT
TTTACGGTTCCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTCTCGCTTATCCCC
TGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGAGCCG
AACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACC
GCCTCTCCCCGCGCTTGGCCGATTCATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACT
GAGGCCGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGGTCGCCCGGCCTCAGTGAGC
GAGCGAGCGCGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCTTGTAGTTAATG
ATTAACCCGCCATGTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAG
TGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACC
CCCCGCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCC
ATTGACGTCAATGGGTGGAGTATTTACGGTAACTGCCCACTTGGCAGTACATCAAGTGT
ATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTTGGCATT
ATGCCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACGTATTAGTCA
TCGCTATTACCATGTGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCC
CCTCCCCACCCCCAATTTTGTATTTATTTATTTTAAATTTTGTGCAGCGATGGGGG
CGGGGGGGGGGGGGCGCGCCAGGCGGGCGGGCGGGCGAGGGGGGGCGGGGCG
AGCGCGAGAGGTGCGCGCGCAGCCAATCAGAGCGCGCGCTCCGAAAGTTTCTTTTATG
GCGAGGCGCGCGCGCGCGCCCTATAAAAAGCGAAGCGCGCGCGGGCGGGAGTTCGCT
GCGCGCTGCCTTCGCCCCGTGCCCCGCTCCGCGCGCGCTCGCGCCGCCCGCCCCGGCTC
TGACTGACCGCGTTACTAAAACAGGTAAGTCCGGCTCCGCGCGGGTTTGGCGCCTCC
CGCGGGCGCCCCCTCACGGCGAGCGCTGCCACGTACAGCAAGGGCGCAGCGAGCG
TCCTGATCCTTCGCCCGGACGCTCAGGACAGCGCCCGCTGCTCATAAGACTCGGCCTT
AGAACCCAGTATCAGCAGAAGGACATTTAGGACGGGACTTGGGTGACTCTAGGGCACT
GGTTTTCTTTCCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGC
GGAGGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTTATGTTT
TCTTTTTTTTTCTACAGGTCTTGGGTGACGAACAGGGTACCGCCACCATGGCCACCGGCT
CTCGCACAGCCTGTCTGTGGCTTTCGGACTGCTGTGCCTGCCTTGGCTCCAGGAGGGCT
CCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGA
TGAATCGGGTTGTCTGAATCGGTTTTGGCCTCTGACTGACGCGATTGAGAACCAGGATTC
ATCAGGACACAAGGCTGTACTAGCACTACATGGAACAAATGGCCTCTAGCCTGGAGG
CTTGCTGAAGGCTGTATGCTGAACACTTTGCTATATCATCTCGGTTTTGGCCTCTGACT
GACGCAAGGATGATAGCAAAGTGTTCAGGACACAAGGCTGTACTAGCACTCACATGGAA
CAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTTCTGTTTCGTTAAGCTA
ATGCTCGTTTTGGCCTCTGACTGACGAGCATTAGCAACGAACAGAACAGGACACAAGGCC
TGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3 '

-continued

SEQ ID NO. 20 = SEQ ID NO. 1 + SEQ ID NO. 8
5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTTAACATATGTT
GCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTTGTATCATGCTATTGCTTCC
CGTATGGCTTTTCATTTTCTCCTCCTTGTATAAATCCTGGTTGCTGTCTCTTTATGAGGAG
TTGTGGCCCGTTGTGAGCAACGTGGCGTGGTGTGCACTGTGTTTGTCTGACGCAACCCCC
ACTGTTTGGGGCATTGCCACCACCTGTGAGCTCCTTTCCGGGACTTTCGCTTTCCCCCTC
CCTATTGCCACGGCGGAACATCGCCGCCCTGCCTTGCCCGCTGCTGGACAGGGGCTCGG
CTGTTGGGCACTGACAATTCCGTGGTGTGTCGGGGAATCATCGTCCTTTCTTGGCTG
CTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGACGTCTTCTGCTACGTCCCTTCGGCC
CTCAATCCAGCGACCTTCCTTCCCGCGGCTGCTGCCGGCTCTGCGGCTCTTCCGCGT
CTTCGCCCTTCGCCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCTCCCGCCTAAGCTT
ATCGATACCGTCGAGATCTAACTTGTTTATGCACTTATAATGGTTACAAATAAAGCAA
TAGCATCACAATTTACAAATAAAGCATTTTTTCACTGCATTCTAGTTGTGGTTTGTGTC
CAAACTCATCAATGTATCTTATCATGTCTGGATCTCGACCTCGACTAGAGCATGGCTACG
TAGATAAGTAGCATGGGGTTAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGGC
CACTCCCTCTCTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGTCGCCCCGACG
CCCGGGCTTTGCCCGGGCGGCTCAGTGAGCGAGCGAGCGCGAGCTGGCGTAATAGCGA
AGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGATT
CCGTTGCAATGGCTGGCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTGA
GTTCTTCTACTCAGCAAGTGATGTTATTACTAATCAAGAAGTATTGCGACAACGGTTA
ATTTGCGTGATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCTC
AGGATTCTGGCGTACCGTTCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCCC
GCTCTGATTCTAACAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGCG
CCCTGTAGCGGCGCATTAAAGCGCGCGGTTGTTGGTTACGCGCAGCGTGACCGCTACA
CTTGCCAGCGCCCTAGCGCCCGCTCCTTTTCGCTTTCTTCCCTTCTTTCTGCCACGTTT
GCCGGCTTTTCCCGCTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGCT
TTACGGCACCTCGACCCCAAAAACCTTGATTAGGGTGATGGTTACGCTAGTGGGCCATCG
CCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACTC
TTGTTCCAAACTGGAACAACACTCAACCCTATCTCGGTCTATTCTTTTGATTTATAAGGG
ATTTTGCCGATTTTCGGCTATTGGTTAAAAATGAGCTGATTAAACAAAAATTAACGCG
AATTTTAACAAAATATTAACTTTACAATTTAAATATTGCTTATACAATCTTCCTGTTT
TTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGTTTACGATTA
CCGTTTCATCGATTCTCTTGTGTTGCTCCAGACTCTCAGGCAATGACCTGATAGCCTTTGTA
GAGACCTCTCAAAAATAGCTACCTCTCCGGCATGAATTTATCAGCTAGAACGGTTGAAT
ATCATATTGATGGTGATTTGACTGTCTCCGGCCTTCTCACCCGTTTGAATCTTACCTA
CACATTACTCAGGCATTGCATTTAAAAATATAGAGGTTCTAAAAATTTTATCCTTGCG
TTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTTGGTACAACCG
ATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTGCTAATCTTTGCCTTGCCTGT
ATGATTTATTGGATGTTGGAATCCTGATGCGGTATTTCTCCTTACGCATCTGTGCGGT

- continued

ATTTACACCCGCATATGGTGCACCTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGC
CAGCCCCGACACCCGCCAACCCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGCA
TCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTGAGAGTTTTCACCG
TCATCACCGAAACGCGGAGACGAAAGGGCCTCGTGATACGCCATTTTTATAGTTAAT
GTCATGATAAATAGTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAATGTGCGCGGA
ACCCCTATTTGTTTATTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATAA
CCCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGT
GTCGCCCTTATTCCTTTTTCGCGCATTTTGCTTCTGTTTTTGTCTACCCAGAAACG
CTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTACATCGAACTG
GATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGATG
AGCACTTTTAAAGTTCGTCTATGTGGCGCGTATTATCCCGTATTGACGCCGGCAAGAG
CAACTCGGTGCGCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACA
GAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCATG
AGTGATAACACTGCGGCCAATTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAACC
GCTTTTTTGACAACATGGGGGATCATGTAACCTGCCTTGATCGTTGGGAACCGGAGCTG
AATGAAGCCATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAACG
TTGCGCAAACATTAAGTGGCGAACTACTTACTCTAGCTTCCCGCAACAATTAATAGAC
TGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCGGCTGGCTGG
TTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTG
GGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGAGTCAGGCAACT
ATGGATGAACGAAATAGACAGATCGCTGAGTAGGTGCCTCACTGATTAAGCATTGGTAA
CTGTGAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAACTTCATTTTAAATTT
AAAAGGATCTAGGTGAAGATCCTTTTGATAATCTCATGACCAAATCCCTTAACGTGAG
TTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCT
TTTTTTCTGCGCGTAATCTGCTGCTTGCAACAAAAAACACCGCTACCAGCGTGGTT
TGTTTGCCGGATCAAGAGCTACCAACTCTTTTCCGAAGGTAACTGGCTTCAGCAGAGCG
CAGATACCAAATACTGTCTTCTAGTGTAGCGTAGTTAGGCCACCACTTCAAGAACTCT
GTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGC
GATAAGTCGTGCTTACCAGGTTGGACTCAAGACGATAGTTACCAGGATAAGGCGCAGCGG
TCGGGCTGAACGGGGGTTCTGTGCACACAGCCAGCTTGGAGCGAACGACCTACACCGAA
CTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCG
GACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGG
GGAAACGCCTGTTATCTTTATAGTCCTGTGCGGTTTCGCCACCTCTGACTTGAGCGTCGA
TTTTTGTGATGCTGCTCAGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGCCTTT
TTACGGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCTGCGTTATCCCT
GATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGAGCCGA
ACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCG
CCTCTCCCGCGCGTGGCCGATTCAATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACTG
AGGCCGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGGTCCCGGCCTCAGTGAGCG

-continued

AGCGAGCGCGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCCCTGTAGTTAATGA
TTAACCCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAGT
GGAGTTCGCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCC
CCGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCA
TTGACGTCAATGGGTGGAGTATTTACGGTAACTGCCCACTTGGCAGTACATCAAGTGTA
TCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATT
TGCCCAAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCAT
CGCTATTACCATGCTGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCATCTCCCCC
CTCCCCACCCCAATTTTGTATTATTTATTTTAAATTATTTGTGACGCGATGGGGG
GGGGGGGGGGGGCGCGCCAGGCGGGGGGGCGGGGCGAGGGGCGGGGGGGCGAGG
CGGAGAGGTGCGGCGGAGCCAAATCAGAGCGCGCGCTCCGAAAGTTTCCTTTTATGGCG
AGGCGGCGGCGCGCGCGCCCTATAAAAAGCGAAGCGCGCGGCGGGGAGTTCGCTGCG
CGCTGCCCTTCGCCCCGTGCCCCGCTCCGCCGCGCCTCGCGCCGCCCCCGGCTCTGA
CTGACCGCGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCCGGTTTGGCGCCTCCCGC
GGCGCCCCCTCCTCACGGCGAGCGCTGCCACGTACAGCAAGGGCGCAGCGAGCGTCC
TGATCCTTCGCCCCGACGCTCAGGACAGCGCCCGCTGCTCATAAGACTCGGCCTTAGA
ACCCAGTATCAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACTGGT
TTTCTTTCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGCGCATTTGCGGA
GGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTTCATGTTTCT
TTTTTTTTCTACAGTCTCTGGGTGACGAACAGGGTACCGCCACCATGGCCACCGGCTCTC
GCACAAGCCTGCTGCTGGCTTTCGGACTGCTGTGCCTGCTTGGCTCCAGGAGGCTCCG
CCGCTAGCATCGATACCGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGGAGC
ATTAGCAATGCGAACAGAAGTTTGGCCTCTGACTGACTTCTGTTGTTGCTAATGCTCC
AGGACACAAGGCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGGCTT
GCTGAAGGCTGTATGCTGAAACATAATGGATTGAGCAGCGGTTTGGCCTCTGACTGAC
GCGCTGCTGACCATTATGTTTTCAGGACACAAGGCTGTTACTAGCACTCACATGGAACAA
ATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTTATCTTTGCGAAGCTGCCA
TCCGTTTTGGCCTCTGACTGACGGATGGCAGCCGCAAGATAACAGGACACAAGGCTGT
TACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

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

5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTTAACATATGTT
GCTCCTTTTACGCTATGTGGATACGCTGCTTAAATGCCTTTGTATCATGCTATTGCTTCC
CGTATGGCTTTTCAATTTCTCCTTGTATAAAATCCTGGTTGCTGCTCTTTATGAGGAG
TTGTGGCCCGTTGTGAGCAACGTGGCGTGGTGTGCACTGTGTTTGTGACGCAACCCCC
ACTGGTTGGGGCATTGCCACCACCTGTGAGCTCCTTCCGGGACTTTCGCTTTCCCCCTC
CCTATTGCCACGGCGGAATCATCGCCGCTGCCCTTGCCCGCTGCTGGACAGGGGCTCGG
CTGTTGGGCACTGACAATTCGGTGGTGTGTCGGGAAATCATCGTCCTTTCCTTGGCTG
CTCGCCTGTGTTGCCACCTGGATTCTGCGCGGACGTCCTTCTGCTACGTCCTTTCGGCC
CTCAATCCAGCGGACCTTCCTTCCCGGGCTGCTGCCGGCTCTGCCGGCTCTTCCGCGT
CTTCGCTTCGCGCTCAGACGAGTCGGATCTCCCTTTGGGCCGCTCCCGCCTAAGCTT

- continued

ATCGATACCGTCGAGATCTAACTTGTTTATTGCAGCTTATAATGGTTACAAATAAAGCAA
TAGCATCACAAATTCACAAATAAAGCATTTTTTCTACTGCATTCTAGTTGTGGTTTGTC
CAAACCTCATCAATGTATCTTATCATGTCTGGATCTCGACCTCGACTAGAGCATGGCTACG
TAGATAAGTAGCATGGCGGGTTAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGG
CCACTCCCTCTCTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGAC
GCCCCGGGCTTTGCCGGGCGGCTCAGTGAGCGAGCGAGCGCGCAGCTGGCGTAATAGCG
AAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGAT
TCCGTTGCAATGGCTGGCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTG
AGTTCTTCTACTCAGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTT
AATTTGCGTGATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACTTCT
CAGGATTCTGGCGTACCGTTCTGTCTAAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCC
CGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGC
GCCCTGTAGCGCGCATTAAAGCGCGCGGGTGTTGGTTACGCGCAGCGTGACCGCTAC
ACTTGCCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCTTCCTTCCTTTCTCGCCACGTT
CGCCGGCTTTCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGC
TTTACGGCACCTCGACCCCAAAAACTTGATTAGGGTGATGGTTACGTAGTGGGCCATC
GCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACT
CTTGTTCCAACTGGAACAACACTCAACCTATCTCGGTCTATTCTTTGATTATAAGG
GATTTTGCCGATTTCGGCTATTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGC
GAATTTTAACAAAATATTAACGTTTACAATTTAAATATTGCTTATACAATCTTCCGTGT
TTTGGGGCTTTTCTGATTATCAACCGGGTACATATGATTGACATGCTAGTTTTACGATT
ACCGTTTCATCGATTCTCTGTTTGCTCCAGACTCTCAGGCAATGACCTGATAGCCTTTGT
AGAGACCTCTCAAAAATAGCTACCTCTCCGGCATGAATTTATCAGCTAGAACGTTGAA
TATCATATTGATGGTGATTTGACTGTCTCCGGCTTTCTCACCCGTTTGAATCTTTACCT
ACACATTACTCAGGCATTGCATTTAAAAATATAGAGGGTTCTAAAAATTTTATCCTTGC
GTTGAAATAAAGGCTTCTCCCGAAAAGTATTACAGGGTCATAATGTTTTTGGTACAACC
GATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGCTAATCTTTGCCTTGCCCTG
TATGATTTATTGGATGTTGGAATTCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGG
TATTTACACCCGATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAG
CCAGCCCCGACACCCGCCAACCCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGC
ATCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTACAGAGTTTTCACC
GTCATCACCGAAACGCGGAGACGAAAGGGCCTCGTGATACGCCATTTTTTATAGGTTAA
TGTCATGATAAATAGGTTTCTTAGACGTGAGGTGGCACTTTTCGGGGAATGTGCGCGG
AACCCTATTGTGTTATTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATA
ACCTGATAAATGCTTCAATAATATTGAAAAAGGAAGATATGAGTATTCAACATTTCCG
TGTCGCCCTTATTCCTTTTTTGCGGCATTGTCCTTCTGTTTTGCTCAGCCAGAAAC
GCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACATCGAACT
GGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGACGTTTTCCAATGAT
GAGCACTTTTAAAGTCTGCTATGTGGCGGGTATTATCCCGTATTGACGCCGGCAAGA

- continued

GCAACTCGGTGCGCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCAC
AGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGTGCCATAACCAT
GAGTGATAAAGTACTGCGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAAC
CGCTTTTTTGACACAACATGGGGGATCATGTAACGCGCTTGATCGTTGGGAACCGGAGCT
GAATGAAGCCATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAAC
GTTGCGCAAACTATTAAGTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGA
CTGGATGGAGGCGGATAAAGTTGCAGGACCCTTCTGCGCTCGGCCCTTCCGGCTGGCTG
GTTTATGTGATATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACT
GGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGAGTCAGGCAAC
TATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTA
ACTGTCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAACTTCATTTTAAATT
TAAAGGATCTAGGTGAAGATCCTTTTGATAATCTCATGACCAAAATCCCTTAACGTGA
GTTTTCGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAGGATCTTCTTGAGATCC
TTTTTTCTGCGCGTAATCTGCTGCTTGCAAAACAAAAAACACCGCTACCAGCGGTGGT
TTGTTGCGGATCAAGAGCTACCAACTCTTTTCCGAAGTAAGTGGCTTCAGCAGAGC
GCAGATACCAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCCTTCAAGAACTC
TGAGCACCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGG
CGATAAGTCGTCTTACCCTGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCG
GTCGGGCTGAACGGGGGTTCTGTCACACAGCCAGCTTGGAGCGAACGACCTACACCGA
ACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGC
GGACAGGTATCCGTAAGCGCGCAGGTCGGAACAGGAGAGCGCACGAGGAGCTTCCAGG
GGGAAACGCTTGGTATCTTTATAGTCCTGTGCGGTTTCGCCACCTCTGACTGAGCGTCG
ATTTTGTGATGCTCGTCAGGGGGCGGAGCCTATGGAACCGCCAGCAACGCGGCCTT
TTTACGGTTCCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCTGCGTTATCCCC
TGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGAGCCG
AACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAAAC
GCCTCTCCCCGCGCTTGGCCGATTCAATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACT
GAGGCCGCCCGGCAAGCCCGGCGCTCGGGCGACCTTTGGTCGCGCGCCTCAGTGAGC
GAGCGAGCGCGCAGAGAGGAGTGGCCAACTCCATCACTAGGGGTTCTTGTAGTTAATG
ATTAACCCGCCATGTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAG
TGGAGTTCCGCTTACATAACTTACGTAATGGCCCGCTGGCTGACCGCCCAACGACC
CCCCCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCC
ATTGACGTCAATGGGTGGAGTATTTACGTAAGTGGCCACTTGGCAGTACATCAAGTGT
ATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTTGGCATT
ATGCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCA
TCGCTATTACCATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCC
CCTCCCCACCCCCAATTTTGTATTTATTTATTTTAAATATTTTGTGACGATGGGGG
CGGGGGGGGGGGGGCGCGCCAGGCGGGGCGGGGCGGGGCGAGGGGCGGGGCGGGG
GAGGCGGAGAGGTGCGGCGGCAGCCAATCAGAGCGGCGCTCCGAAAGTTTCCTTTTAT

GGCGAGGCGGGCGGCGGCGGCCCTATAAAAAGCGAAGCGCGCGGGCGGGAGTCGC
TGCGCGCTGCCCTTCGCCCGCTGCCCGCTCCGCCGCCGCTCGCGCCGCCGCCCGCGCT
CTGACTGACC CGCTTACTAAACAGGTAAGTCGGCCTCCGCGCCGGGTTTGGCGCCTC
CCGCGGGCGCCCCCTCTCACGGCGAGCGCTGCCACGTCAGACGAAGGGCGCAGCAGC
GTCCTGATCCTTCCGCCCGAGCTCAGGACAGCGGCCCGCTGCTCATAAGACTCGGCCT
TAGAACCCAGTATCAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCAC
TGGTTTTCTTTCCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGCGGATTCTG
CGGAGGGATCTCGTGCGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTTCATGTT
TTCTTTTTTTTTCTACAGGTCCTGGGTGACGAACAGGGTACCGCCACCATTGGCCACCGGC
TCTCGCACAAAGCCTGCTGCTGGCTTTTCGACTGCTGTGCCTGCCTTGGCTCCAGGAGGC
TCCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTG
GCTCCTCCACTTGGTGGTTTGGTTTTGGCCTCTGACTGACGCGGCAACATTCTGGTGATT
ACAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGGC
TTGCTGAAGGCTGTATGCTGTCTATAATCGCTATTTGGTGCGGCGTTTTGGCCTCTGACTG
ACGCCGACACCAAAGCGATTATGACAGGACACAAGGCCTGTTACTAGCACTCACATGGAAC
AAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTTCTGATCCTGAAGTTGCG
GGTTCGTTTTGGCCTCTGACTGACGAACCCGAACAGGATCAGAACAGGACACAAGGCCT
GTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 22 = SEQ ID NO. 1 + SEQ ID NO. 10
5' AATCAACCTCTGGATTACAAAATTGTGAAAGATTGACTGGTATTCCTTAACATATGTTT
GCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTTGTATCATGCTATTGCTTCC
CGTATGGCTTTTCATTTTCTCCTCCTTGATATAAATCCTGGTTGCTGTCTCTTTATGAGGAG
TTGTGGCCCGTTGTGCAGGCAACGTGGCGTGGTGTGCACGTGTTTGTGACGCAACCCCTC
ACTGGTTGGGGCATTGCCACCACCTGTCACTCCTTTCCGGGACTTTTCGCTTTCCCCCTC
CCTATTGCCACGGCGGAACATCATGCCGCTGCTCTGCCCGCTGCTGGACAGGGGCTCGG
CTGTTGGGCACTGACAATCCGTGGTGTGTCGGGAAATCATCGTCTTTCTTTGGCTG
CTCGCCTGTGTTGCCACCTGGATTCTGCGCGGACGCTCTTCTGCTACGTCCTTTCGGCC
CTCAATCCAGCGGACCTTCCTTCCCGCGGCTGCTGCCGGCTCTGCGGCTCTTCCCGCT
CTTCGCCTTCGCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCTCCCGCCTAAGCTT
ATCGATACCGTCGAGATCTAACTGTTTATTGTCAGCTTATAATGGTTACAAATAAAGCAA
TAGCATCAAAATTTCAAAATAAAGCATTTTTTTCAGTCACTTCTAGTTGTGGTTTGTC
CAAACATCATCAATGTATCTTATCATGTCTGGATCTCGACCTCGACTAGAGCATGGCTACG
TAGATAAGTAGCATGGCGGGTTAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGG
CCACTCCCTCTCTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCGAC
GCCCGGGCTTTGCCCGGGCGGCTCAGTGAGCGAGCGAGCGCAGCTGGCGTAATAGCG
AAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGAT
TCCGTTGCAATGGCTGCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTG
AGTTCTCTACTCAGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTT
AATTTCGTGATGGACAGACTCTTTTACTCGTGGGCTCACTGATTATAAAAACACTTCT

- continued

CAGGATTCTGGCGTACCGTTCCCTGTCTAAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCC
CGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGC
GCCCTGTAGCGCGCATTAAAGCGCGCGGGTGTGGTGGTTACGCGCAGCGTGACCGCTAC
ACTTGCCAGCGCCCTAGCGCCCGCTCCTTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTT
CGCCGGCTTTCCCGCTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGC
TTTACGGCACCTCGACCCCAAAAACTTGATTAGGGTGATGGTTACGTAGTGGGCCATC
GCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACT
CTTGTTCCAACTGGAACAACACTCAACCTATCTCGGTCTATTCTTTGATTTATAAGG
GATTTTGGCGATTTCGGCTATTGGTTAAAAATGAGCTGATTTAACAAAAATTTAACGC
GAATTTTAACAAAAATTAACGTTTACAATTTAAATATTTGCTTATACAATCTTCCTGTT
TTTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGTTTTACGATT
ACCGTTCATCGATTCTCTTGTGTTGCTCCAGACTCTCAGGCAATGACCTGATAGCCTTTGT
AGAGACCTCTCAAAAAAGCTACCTCTCCGGCATGAATTTATCAGCTAGAACGGTTGAA
TATCATATTGATGGTGATTTGACTGTCTCCGGCTTTCTCACCCGTTTGAATCTTTACCT
ACACATTACTCAGGCATTGCATTAAAAATATATGAGGGTTCTAAAAATTTTATCCTTGC
GTTGAAATAAAGGCTTCTCCCGAAAAGTATTACAGGGTCATAATGTTTTTGGTACAACC
GATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGCTAATCTTTGCCTTGCCCTG
TATGATTTATTGGATGTTGGAATTCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGG
TATTTACACCCGATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAG
CCAGCCCCGACACCCGCCAACCCCGCTGACGCGCCTGACGGGCTTGTCTGCTCCCGC
ATCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGTTTTCACC
GTCATCACCGAAACGCGGAGACGAAAGGGCCTCGTGATACGCCTATTTTATAGGTTAA
TGTCATGATAATAATGGTTTCTTAGACGTGAGGTGGCACTTTTCGGGGAATGTGCGCGG
AACCCTTATTGTTTATTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATA
ACCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCG
TGTCGCCCTTATTCCTTTTTTTCGCGCATTTTGCCTTCTGTTTTTGTCTACCCAGAAAC
GCTGGTGAAAGTAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTACATCGAACT
GGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGAT
GAGCACTTTTAAAGTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGCAAGA
GCAACTCGGTGCGCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCAC
AGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCAT
GAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAAC
CGCTTTTTTGCAACAATGGGGGATCATGTAACCTCGCCTTGATCGTTGGGAACCGGAGCT
GAATGAAGCCATACCAAACGACGAGCGTGACACCACGATGCCTGTAGCAATGGCAACAAC
GTTGCGCAAACTATTAACCTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGA
CTGGATGGAGGCGGATAAAGTTGCAGGACCCTTCTGCGCTCGGCCCTTCCGGCTGGCTG
GTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACT
GGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAAC
TATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTTGGTA

-continued

ACTGTCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAACCTTCATTTTAAATT
TAAAAGGATCTAGGTGAAGATCCTTTTGGATAATCTCATGACCAAAATCCCTTAACGTGA
GTTTTTCGTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCC
TTTTTTTCTGCGCGTAATCTGCTGCTTGCAAAACAAAAAACACCGCTACCAGCGGTGGT
TTGTTTGCCGATCAAGAGCTACCAACTCTTTTCCGAAGGTAAGTGGCTTCAGCAGAGC
GCAGATACCAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACCTCAAGAACTC
TGTAGCACCGCTACATACCTCGCTCTGCTAATCTGTTACCAGTGGCTGCTGCCAGTGG
CGATAAGTCGTGCTTACCAGGTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCG
GTCGGGCTGAACGGGGGTTCTGTGCACACAGCCAGCTTGGAGCGAACGACCTACACCGA
ACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGC
GGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCAGG
GGGAAACGCCTGGTATCTTTATAGTCCTGTGCGGTTTCGCCACCTCTGACTGAGCGTCG
ATTTTGTGATGCTCGTCAGGGGGCGGAGCCTATGGAACCGCCAGCAACGCGGCCTT
TTTACGGTTCCTGGCCTTTTGTGCGCTTTTGTCTACATGTTCTTCTGCGTTATCCCC
TGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGAGCCG
AACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACC
GCCTCTCCCCGCGCTTGGCCGATTCAATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACT
GAGGCCGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGGTCGCCCCGCTCAGTGAGC
GAGCGAGCGCGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGTTTCTTGTAGTTAATG
ATTAACCCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAG
TGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACC
CCCGCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCC
ATTGACGTCAATGGTGGAGTATTTACGGTAACTGCCCCACTTGGCAGTACATCAAGTGT
ATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTTGGCATT
ATGCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCA
TCGCTATTACCATGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCC
CCTCCCCACCCCCAATTTTGTATTTATTTATTTTAAATTATTTTGTGCAGCGATGGGGG
CGGGGGGGGGGGGGCGCGCCAGGCGGGGGGGGGGGCGAGGGGCGGGGCGGGGCG
AGCGCGAGAGGTGCGCGCGCAGCCAATCAGAGCGGCGCGCTCCGAAAGTTTCTTTTATG
GCGAGGCGGCGCGCGCGCGCCCTATAAAAAGCGAAGCGCGCGGCGGGAGTCGCT
GCGCGCTGCCTTCGCCCCGTGCCCCGCTCCGCGCGCGCTCGCGCCGCCCGCCCCGGCTC
TGACTGACCGCTTACTAAAACAGGTAAGTCCGGCTTCGCGCGGGTTTGGCGCCTCC
CGCGGCGCCCCCTTCAACGGCGAGCGCTGCCACGTACAGCAAGGGCGCAGCGAGCG
TCCTGATCCTTCGCCCGGACGCTCAGGACAGCGGCCGCTGCTCATAAGACTCGGCCTT
AGAACCCAGTATCAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACT
GGTTTTCTTCCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGC
GGAGGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTTATGTTT
TCTTTTTTTTTTACAGGTCTTGGGTGACGAACAGGGTACCGCCACCATGGCCACCGGCT
CTCGCACAGCCTGCTGCTGGCTTTCGGACTGCTGTGCCTGCCTTGGCTCCAGGAGGGCT

- continued

CCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGA
AATCTTCCGGTGGTTCCACTGCGTTTTGGCCTCTGACTGACGCAGTGGAACCCGGAAGAT
TTCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAGG
CTTGCTGAAGGCTGTATGCTGATATCCTGAATATGGTATGCAGCGTTTTGGCCTCTGACT
GACGCTGCATACCAATTAGGATATCAGGACACAAGGCCTGTTACTAGCACTCACATGGAA
CAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGTTTAAAGCTCAAACGCG
TTCGCCGTTTTGGCCTCTGACTGACGGCGAACGCGTGAGCTTTAAACAGGACACAAGGCC
TGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 23 = SEQ ID NO. 1 + SEQ ID NO. 11

5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTTAACATATGTT
GCTCCTTTTACGCTATGTGGATACGCTGCTTAAATGCCTTTGTATCATGCTATTGCTTCC
CGTATGGCTTTTCAATTTCTCCTCCTTGATAAAATCCTGGTTGCTGTCTCTTTATGAGGAG
TTGTGGCCCGTTGTGAGCAACGTGGCGTGGTGTGCACTGTGTTTGCTGACGCAACCCCC
ACTGTTGGGGCATTGCCACCACCTGTGAGCTCCTTTCCGGGACTTTCGCTTTCCCCCTC
CCTATTGCCACGGCGGAATCATCGCCGCTGCTTGCCCGCTGCTGGACAGGGGCTCGG
CTGTTGGGCACTGACAATTCCGTGGTGTGTCGGGAAATCATCGTCCTTTCTTGCTG
CTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGACGTCCTTCTGTACGTCCTTCGGCC
CTCAATCCAGCGACCTTCCTTCCCGCGGCTGCTGCGGCTCTGCGGCTCTTCCGCGT
CTTCGCTTCGCGCTCAGACGAGTCGGATCTCCCTTTGGCGGCTCCCCGCTAAGCTT
ATCGATACCGTCGAGATCTAACTTGTTTATGCACTTATAATGGTTACAAATAAAGCAA
TAGCATCACAATTTACAAATAAAGCATTTTTTTCACTGCATTCTAGTTGTGGTTTGTG
CAAATCATCAATGTATCTTATCATGTCTGGATCTCGACCTCGACTAGAGCATGGCTACG
TAGATAAGTAGCATGGCGGTTAATCATTAACACAAGGAACCCCTAGTGATGGAGTTGG
CCACTCCCTCTCTGCGGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTGCGCCGAC
GCCCCGGCTTTGCCCGGGCGGCTCAGTGAGCGAGCGAGCGCGCAGCTGGCGTAATAGCG
AAGAGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGAT
TCCGTTGCAATGGCTGGCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTG
AGTTCTTCTACTCAGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTT
AATTTGCGTGATGGACAGACTCTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCT
CAGGATTCTGGCGTACCGTTCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCC
CGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGC
GCCCTGTAGCGCGCATTAAGCGCGGCGGTGTTGGTTACGCGCAGCGTGACCGCTAC
ACTTGCCAGCGCCCTAGCGCCGCTCCTTTGCTTTCTTCCCTTCCTTTCTCGCCACGTT
CGCCGGCTTTCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGC
TTTACGGCACCTCGACCCCAAAAACTTGATTAGGGTGATGGTTACGTAGTGGGCCATC
GCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACT
CTTGTTCCAACTGGAACAACACTCAACCTATCTCGGTCTATTCTTTGATTTATAAGG
GATTTTGGCGATTTCGGCTATTGGTTAAAAAATGAGCTGATTTAACAAAAATTAACGC
GAATTTTAACAAAATATTAACGTTTACAATTTAAATATTGCTTATACAATCTTCTGTT
TTGGGGCTTTTCTGATTATCAACGGGGTACATATGATTGACATGCTAGTTTTACGATT

- continued

ACCGTTCATCGATTCTCTTGTGCTCCAGACTCTCAGGCAATGACCTGATAGCCTTTGT
AGAGACCTCTCAAAAATAGCTACCCCTCTCCGGCATGAATTTATCAGCTAGAACGGTTGAA
TATCATATTGATGGTGATTGACTGTCTCCGGCCTTCTCACCCGTTTGAATCTTTACCT
ACACATTACTCAGGCATTGCATTAAAAATATATGAGGGTTCTAAAAATTTTATCCTTGC
GTTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTTGGTACAACC
GATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGCTAATCTTTGCCTTGCCCTG
TATGATTTATTGGATGTTGGAATTCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGG
TATTTACACCCGCATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAG
CCAGCCCCGACACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGC
ATCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTCAGAGTTTTCACC
GTCATCACCAGAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTATAGGTTAA
TGTCATGATAATAATGGTTTCTTAGACGTGAGTGGCACTTTTCGGGAAATGTGCGCGG
AACCCTTATTGTTTATTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATA
ACCTGATAAATGCTTCAATAATATTGAAAAAGGAAGATATGAGTATTCAACATTTCCG
TGTCGCCCTTATTCCTTTTTTTCGCGCATTTTGCCCTTCTGTTTTTGCTCACCAGAAAC
GCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTACATCGAACT
GGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGAT
GAGCACTTTTAAAGTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGA
GCAACTCGGTGCGCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCAC
AGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGAGTGCTGCCATAACCAT
GAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAAC
CGCTTTTTTGCAACAACATGGGGGATCATGTAACCTCGCCTTGATCGTTGGGAACCGAGCT
GAATGAAGCCATACCAAACGACGAGCGTGACACCAGATGCCTGTAGCAATGGCAACAAC
GTTGCGCAAACTATTAACCTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGA
CTGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTG
GTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACT
GGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGAGTCAGGCAAC
TATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTA
ACTGTCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAACTTCATTTTAAATT
TAAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGA
GTTTTCTGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCC
TTTTTTTCTGCGCGTAATCTGCTGCTTGCAACAAAAAACCACCGCTACCAGCGGTGGT
TTGTTTGC CGATCAAGAGCTACCAACTCTTTTCCGAAGGTAAGTGGCTTCAGCAGAGC
GCAGATACCAATACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTC
TGTAGACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGG
CGATAAGTCGTGCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCG
GTCGGGCTGAACGGGGGTTCTGTGCACACAGCCAGCTTGGAGCGAACGACTACACCGA
ACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGC
GGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGACGAGGGAGCTTCAGG

- continued

GGGAAACGCCTGGTATCTTTATAGTCCTGTCGGGTTTCGCCACCTCTGACTTGAGCGTCG
ATTTTGTGATGCTCGTCAGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCTT
TTTACGGTTCCTGGCCTTTTGTGGCCTTTTGTCTACATGTTCTTCTCGCTTATCCCC
TGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGAGCCG
AACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACC
GCCTCTCCCCGCGCTTGGCCGATTCAATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACT
GAGGCCGCCCGGGCAAAGCCCGGGCGTCGGGCGACCTTTGGTCGCCCGGCCTCAGTGAGC
GAGCGAGCGCGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCTTGTAGTTAATG
ATTAACCCGCCATGCTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAG
TGGAGTTCCGCGTTACATAACTTACGTTAAATGGCCCGCTGGCTGACCGCCCAACGACC
CCCCCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCC
ATTGACGTCAATGGGTGGAGTATTTACGGTAACTGCCCACTTGGCAGTACATCAAGTGT
ATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTTGGCATT
ATGCCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACGTATTAGTCA
TCGCTATTACCATGGTCGAGGTGAGCCCCAGTTCTGCTTCACTCTCCCCATCTCCCCC
CCTCCCCACCCCCAATTTTGTATTTATTATTTTAAATTATTTTGTGCAGCGATGGGGG
CGGGGGGGGGGGGGCGCGCCAGGCGGGCGGGGGGGGGCGAGGGGCGGGGCGGGG
GAGGCGGAGAGGTGCGGCGGCAGCCAATCAGAGCGCGCTCCGAAAGTTTCTTTTAT
GGCGAGGCGGCGGCGGCGGCGCTTATAAAAAGCGAAGCGCGCGGCGGGGAGTCTGC
TGCGCGCTGCCTTCGCCCCGTGCCCCGTCCGCGCGCGCTCGCGCGCGCGCCCCGGCT
CTGACTGACCGGCTTACTAAAACAGGTAAGTCCGGCTCCGCGCGGGTTTGGCGCCTC
CCGCGGGCGCCCCCTCTCACGGCGAGCGCTGCCACGTACAGCAAGGGCGCAGCGAGC
GTCTGTATCCTTCGCCCCGACGCTCAGGACAGCGGCGCGCTGCTCATAAGACTCGGCCT
TAGAACCACAGTATCAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCAC
TGGTTTTCTTTCCAGAGAGCGAACAGGCGAGGAAAAGTAGTCCCTTCTCGCGATTCTG
CGGAGGGATCTCCGTGGGCGGTGAACGCCGATGATGCCCTCTACTAACCATGTTTCATGTT
TTCTTTTTTTTTCTACAGGTCCTGGGTGACGAACAGGTACCGCCACCATGGCCACCGGC
TCTCGCACAAAGCCTGCTGCTGGCTTTTCGACTGCTGTGCCTGCCTTGGCTCCAGGAGGGC
TCCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTG
TAATAAAGGTCTGGGAATCACCCGTTTTTGGCCTCTGACTGACGGGTGATTCCGACCTTTA
TTACAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAG
GCTTGCTGAAGGCTGTATGCTGTAATACGCCAGATCACCATCAGCGTTTTTGGCCTCTGAC
TGACGCTGATGGTGCTGGCGTATTACAGGACACAAGGCCTGTTACTAGCACTCACATGGA
ACAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGATACAGAAACGAAGGT
TCAGGCCGTTTTTGGCCTCTGACTGACGGCCTGAACCCGTTTTCTGTATCAGGACACAAGGC
CTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

SEQ ID NO. 24 = SEQ ID NO. 1 + SEQ ID NO. 12
5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTTAACATGTT
GCTCCTTTTACGCTATGTGGATACGCTGCTTAAATGCCTTTGTATCATGCTATTGCTTCC

- continued

CGTATGGCTTTTCATTTCTCCTCCTTGATAAAATCCTGGTTGCTGTCCTTTATGAGGAG
TTGTGGCCCGTTGTGAGGCAACGTGGCGTGGTGTGCACTGTGTTTGTCTGACGCAACCCCC
ACTGTTTGGGGCATTGGCCACCACCTGTGAGCTCCTTTCCGGGACTTTCGCTTTCCCCCTC
CCTATTGCCACGGCGGAACATCATCGCCGCTGCCTTGCCCGCTGCTGGACAGGGGCTCGG
CTGTTGGGCACTGACAATTCCGTGGTGTGTCGGGGAATCATCGTCCTTTCTTGGCTG
CTCGCCTGTGTTGCCACCTGGATTCTGCGCGGGACGTCTTCTGCTACGTCCCTTCGGCC
CTCAATCCAGCGGACCTTCCTTCCCGCGGCTGCTGCCGGCTCTGCGGCTCTTCCGCGT
CTTCGCCTTCGCCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCTCCCCGCTAAGCTT
ATCGATACCGTCGAGATCTAACTTGTTTATGCACTTATAATGGTTACAAATAAAGCAA
TAGCATCACAATTTACAAATAAAGCATTTTTTCACTGCATTCTAGTTGTGGTTTGTG
CAAACTCATCAATGTATCTTATCATGTCTGGATCTCGACCTCGACTAGAGCATGGCTACG
TAGATAAGTAGCATGGCGGGTTAATCATTAACTACAAGGAACCCCTAGTGATGGAGTTGG
CCACTCCCTCTCTGCGGCTCGCTCGCTCACTGAGGCCGGGCGACAAAGGTGCCCCGAC
GCCCCGGCTTTGCCGGGCGGCTCAGTGAGCGAGCGAGCGCGCAGCTGGCGTAATAGCG
AAGAGGCCCGCACCGGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGAT
TCCGTTGCAATGGCTGGCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTG
AGTTCTTCTACTCAGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTT
AATTTGCGTGATGGACAGACTCTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCT
CAGGATTCTGGCGTACCGTTCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCC
CGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGC
GCCCTGTAGCGCGCATTAAGCGCGGCGGTGTTGGTTTACGCGCAGCGTGACCGCTAC
ACTTGCCAGCGCCCTAGCGCCCGCTCCTTTGCTTTCTTCCCTTCCTTTCTCGCCACGTT
CGCCGGCTTTCCCGCTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGC
TTTACGGCACCTCGACCCCAAAAACTTGATTAGGGTGATGGTTACGTAGTGGGCCATC
GCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACT
CTGTTCCAAACCTGGAACAACACTCAACCTATCTCGGTCTATTCTTTGATTTATAAGG
GATTTTGCGGATTTGCGCTATTGGTTAAAAATGAGCTGATTTAACAAAAATTTAACGC
GAATTTTAAAAATATTAACGTTTACAATTTAAATATTGCTTATACAATCTTCTGTGTT
TTTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGTTTTACGATT
ACCGTTTCATCGATTCTTGTGTTGCTCCAGACTCTCAGGCAATGACCTGATAGCCTTTGT
AGAGACCTCTCAAAAATAGCTACCTCTCCGGCATGAATTTATCAGCTAGAACGTTGAA
TATCATATTGATGGTGATTTGACTGTCTCCGGCCTTCTCACCCGTTTGAATCTTTACCT
ACACATTACTCAGGCATTGCATTTAAAAATATGAGGGTTCTAAAAATTTTATCCTTGC
GTTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTTGGTACAACC
GATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGCTAATCTTTGCCTTGCCCTG
TATGATTTATTGGATGTTGGAATTCCTGATGCGGTATTTCTCCTTACGCATCTGTGCGG
TATTTACACCCGATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAG
CCAGCCCCGACACCCGCCAACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGC
ATCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTGAGAGTTTTCACC

- continued

GTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTATAGGTTAA
TGTCATGATAATAATGGTTTCTTAGACGTCAAGTGGCACTTTTCGGGGAATGTGCGCGG
AACCCCTATTGTGTTATTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATA
ACCCGTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCG
TGTCGCCCTTATTCCTTTTTTGCGGCATTTTGCTTCTCTGTTTTGCTCAGCCAGAAAC
GCTGGTGAAAGTAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTTACATCGAACT
GGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTGCCCCGAAGAACGTTTTCCAATGAT
GAGCACTTTTAAAGTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGA
GCAACTCGGTGCGCCGATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCAC
AGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCAT
GAGTGATAAAGTGGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAAC
CGCTTTTTTGCAACAATGGGGGATCATGTAACGCGCTTGATCGTTGGGAACCGGAGCT
GAATGAAGCCATACCAAACGACGAGCGTGACACCAGATGCCTGTAGCAATGGCAACAAC
GTTGCGCAAACTATTAAGTGGCAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGA
CTGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTG
GTTTATGTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACT
GGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGAGTCAGGCAAC
TATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTA
ACTGTCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAACTTCATTTTAAATT
TAAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGA
GTTTTCTGTTCCACTGAGCGTCAGACCCGCTAGAAAAGATCAAAGGATCTTCTTGAGATCC
TTTTTTCTGCGCGTAATCTGCTGCTTGCAACAAAAAACACCGCTACCAGCGGTGGT
TTGTTGCGGATCAAGAGCTACCAACTCTTTTCCGAAGGTAAGTGGCTTCAGCAGAGC
GCAGATACCAATACTGTCCTTCTAGTGAGCCGTAGTTAGGCCACCACTTCAAGAACTC
TGTAGCACCGCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGG
CGATAAGTCGTGCTTACCGGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCG
GTCGGGCTGAACGGGGGTTCTGTGCACACAGCCAGCTTGGAGCGAACGACCTACACCGA
ACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCGAAGGGAGAAAGGC
GGACAGGTATCCGTAAGCGGCGAGGTGGAACAGGAGAGCGCACGAGGGAGCTTCCAGG
GGGAAACGCCTGGTATCTTTATAGTCTGTCGGGTTTCGCCACCTCTGACTTGAGCGTCG
ATTTTTGTGATGCTCGTCAGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCTT
TTTACGGTTCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCTGCGTTATCCCC
TGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGAGCCG
AACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACC
GCCTCTCCCCGCGCGTTGGCCGATTCAATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACT
GAGGCCGCGCGGCAAGCCCGGCGCTCGGGCGACCTTTGGTCGCGCGCCTCAGTGAGC
GAGCGAGCGCGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCTTGTAGTTAATG
ATTAACCCGCCATGTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAG
TGGAGTTCGCGTTACATAACTTACGGTAAATGGCCGCGCTGGCTGACCGCCCAACGACC

-continued

CCCCCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCC
ATTGACGTCAATGGGTGGAGTATTTACGGTAAGCTGCCCACTTGGCAGTACATCAAGTGT
ATCATATGCCAAGTACGCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGGCATT
ATGCCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACGTATTAGTCA
TCGTATTACCATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCC
CCTCCCCACCCCAATTTTGTATTTATTTATTTTAAATTATTTTGTGCAGCGATGGGGG
CGGGGGGGGGGGGGCGCGCCAGGCGGGGGGGGGGGCGAGGGGCGGGGCGGGGCG
AGGCGGAGAGGTGCGGCGGCGAGCAATCAGAGCGGCGCGCTCCGAAAGTTTCCTTTTATG
GCGAGGCGGCGGCGGCGGCGGCTATAAAAAGCGAAGCGCGGCGGGGCGGGAGTCGCT
GCGCGCTGCCTTCGCCCCGTGCCCCGCTCCGCGCGCGCTCGCGCGCGCGCGCGCGCTC
TGACTGACCGCTTACTAAAACAGGTAAGTCCGGCTCCGCGCGGGTTTTGGCGCTCC
CGCGGCGCGCCCCCTCTCACGGCGAGCGCTGCCACGTGAGCGAAGGGCGCAGCGAGCG
TCCTGATCCTTCGCGCCGACGCTCAGGACAGCGCGCGCTGCTCATAAGACTCGGCCTT
AGAACCCAGTATCAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCACT
GGTTTTCTTCCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTGC
GGAGGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTTCATGTTT
TCTTTTTTTTTCTACAGTCTTGGGTGACGAACAGGTTACCGCCACCATGGCCACCGGT
CTCGCACAAAGCTGTGCTGGCTTTCGGACTGCTGTGCCTGCCTTGGCTCCAGGAGGGCT
CCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTGT
CAGATCGCTGTGGTAAACAGGCGTTTTGGCCTCTGACTGACGCTGTTTACCAGCGATCT
GACAGGACACAAGGCTGTACTAGCACTACATGGAACAAATGGCCTCTAGCCTGGAGG
CTTGCTGAAGGCTGTATGCTGAGAATCAGATCAGATAGCGATCCGTTTTGGCCTCTGACT
GACGGATCGCTATCTGCTGATTCTCAGGACACAAGGCTGTACTAGCACTACATGGAA
CAAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGAAACATGCCAACAGCAG
AATGCCGTTTTGGCCTCTGACTGACGGCATTCGCTGGGCATGTTTCAGGACACAAGGCC
TGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

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

5' AATCAACCTCTGGATTACAAAATTTGTGAAAGATTGACTGGTATTCTTAACATGTT
GCTCCTTTTACGCTATGTGGATACGCTGCTTTAATGCCTTTGTATCATGCTATTGCTTCC
CGTATGGCTTTTCATTTTCTCCTTGTATAAATCCTGGTTGCTGTCTTTTATGAGGAG
TTGTGGCCCGTTGTGAGCAACGTGCGTGGTGTGCACTGTGTTTGTGACGCAACCCCC
ACTGGTTGGGGCATTGCCACCACCTGTGAGCTCCTTCCGGGACTTTCGCTTTCCCCCTC
CCTATTGCCACGGCGGAATCATCGCCGCTGCCCTTGCCCGCTGCTGGACAGGGGCTCGG
CTGTTGGGCACTGACAATTCGGTGGTGTGTCGGGGAATCATCGTCCTTTCTTGGCTG
CTCGCTGTGTTGCCACCTGGATTCTGCGCGGACGTCCTTCTGTACGTCCTTCGGCC
CTCAATCCAGCGACCTTCCTTCCGCGGCTGCTGCCGGCTCTGCGGCTCTTCCGCGT
CTTCGCCTTCGCCCTCAGACGAGTCGGATCTCCCTTTGGGCCGCTCCCCGCTAAGCTT
ATCGATACCGTCGAGATCTAACTTGTATTGTCAGCTTATAATGGTTACAAATAAGCAA
TAGCATCACAATTTACAAATAAAGCATTTTTTCACTGCATTCTAGTTGTGGTTTGTGTC
CAAACTCATCAATGTATCTTATCATGTCTGGATCTCGACCTCGACTAGAGCATGGCTACG

- continued

TAGATAAGTAGCATGGCGGGTTAATCATTAACACAAGGAACCCCTAGTGATGGAGTTGG
CCACTCCCTCTCTGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCGAC
GCCCCGGGCTTTGCCCGGGCGGCTCAGTGAGCGAGCGAGCGCGCAGCTGGCGTAATAGCG
AAGAGGCCCGCACCCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGAT
TCCGTTGCAATGGCTGGCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTG
AGTTCTTCTACTCAGGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTT
AATTTGCGTGATGGACAGACTCTTTTACTCGGTGGCCTCACTGATTATAAAAACACTTCT
CAGGATTCTGGCGTACCGTTCTGTCTAAAATCCCTTTAATCGGCCTCCTGTTTAGCTCC
CGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCTCGTCAAAGCAACCATAGTACGC
GCCCTGTAGCGCGCATTAAAGCGCGCGGGTGTGGTGGTTACGCGCAGCGTGACCGCTAC
ACTTGCCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCTTCCCTTCCTTTCTCGCCACGTT
CGCCGGCTTTCCCGCTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAGTGC
TTTACGGCACCTCGACCCCAAAAAAATTGATTAGGGTGATGGTTCACGTAGTGGGCCATC
GCCCTGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACT
CTTGTTCCAACTGGAACAACACTCAACCTATCTCGGTCTATTCTTTGATTTATAAGG
GATTTTGCCGATTTCGGCCTATTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGC
GAATTTTAACAAAATATTAACGTTTACAATTTAAATATTGCTTATACAATCTTCCTGTT
TTTGGGGCTTTTCTGATTATCAACCGGGGTACATATGATTGACATGCTAGTTTTACGATT
ACCGTTTCATCGATTCTCTGTTTGCTCCAGACTCTCAGGCAATGACCTGATAGCCTTTGT
AGAGACCTCTCAAAAATAGCTACCTCTCCGGCATGAATTTATCAGCTAGAACGGTTGAA
TATCATATTGATGGTGATTTGACTGTCTCCGGCTTTCTCACCCGTTTGAATCTTTACCT
ACACATTACTCAGGCATTGCATTTAAAAATATATGAGGGTTCTAAAAATTTTATCCTTGC
GTTGAAATAAAGGCTTCTCCCGAAAAGTATTACAGGGTCATAATGTTTTTGGTACAACC
GATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGCTAATCTTTGCCTTGCCCTG
TATGATTTATTGGATGTTGGAATTCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGG
TATTTACACCCGATATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAG
CCAGCCCCGACACCCGCCAACCCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGC
ATCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTGAGAGGTTTTCACC
GTCATCACCGAAACGCGGAGACGAAAGGGCCTCGTGATACGCCATTTTTTATAGGTTAA
TGTCATGATAATAATGGTTTCTTAGACGTCAGGTGGCACTTTTCGGGGAATGTGCGCGG
AACCCTATTGTTTTATTTTCTAAATACATTCAAATATGTATCCGCTCATGAGACAATA
ACCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCG
TGTCGCCCTTATTCCTTTTTTTCGCGCATTTTGCCCTTCTGTTTTTGCTCACCCAGAAAC
GCTGGTGAAAGTAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTACATCGAACT
GGATCTCAACAGCGGTAAGATCCTTGAGAGTTTTTCGCCCCGAAGAACGTTTTCCAATGAT
GAGCACTTTTAAAGTCTGCTATGTGGCGCGGTATTATCCCGTATTGACGCCGGGCAAGA
GCAACTCGGTGCGCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCAC
AGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCAT
GAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAAC

- continued

CGCTTTTTTGCACAACATGGGGGATCATGTAACGCGCTTGATCGTTGGGAACCGGAGCT
GAATGAAGCCATACCAAACGACGAGCGTGACACCAGATGCCTGTAGCAATGGCAACAAC
GTTGCGCAAACTATTAACGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGA
CTGGATGGAGGCGGATAAAGTTGCAGGACCATTCTGCGCTCGGCCCTCCGGCTGGCTG
GTTTATGTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACT
GGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGAGTCAGGCAAC
TATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAGCATTGGTA
ACTGTCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAACTTCATTTTTAATT
TAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGA
GTTTTCTGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCC
TTTTTTCTGCGCGTAATCTGCTGCTTGCAACAAAAAACACCGCTACCAGCGGTGGT
TTGTTTCCGGATCAAGAGCTACCAACTCTTTTCCGAAGTAAGTGGCTTCAGCAGAGC
GCAGATACCAAATACTGTCCTTCTAGTGAGCCGTAGTTAGGCCACCACCTCAAGAACTC
TGTAGCACCGCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGG
CGATAAGTCGTCTTACC GGTTGGACTCAAGACGATAGTTACCGGATAAGGCGCAGCG
GTCGGGCTGAACGGGGGTTCTGTCACACAGCCAGCTTGGAGCGAACGACCTACACCGA
ACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGC
GGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGAGCTTCCAGG
GGGAAACGCCTGGTATCTTTATAGTCCTGTGCGGTTTCGCCACCTCTGACTGAGCGTCG
ATTTTTGTGATGCTCGTCAGGGGGCGGAGCCTATGGAAAAACGCCAGCAACGCGGCCTT
TTTACGGTTCCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCTGCGTTATCCCC
TGATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGAGCCG
AACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACC
GCCTCTCCCCGCGCGTTGGCCGATTCAATTAATGCAGCAGCTGCGCGCTCGCTCGCTCACT
GAGGCCGCCCGGGCAAGCCCGGGCGTCGGGCGACCTTTGGTCGCGCGCCTCAGTGAGC
GAGCGAGCGCGCAGAGAGGGAGTGGCCAACTCCATCACTAGGGGTTCTTGTAGTTAATG
ATTAACCCGCCATGTACTTATCTACGTAGCCATGCTCTAGGACATTGATTATTGACTAG
TGGAGTTCCGCGTTACATAACTTACGGTAAATGGCCCGCTGGCTGACCGCCCAACGACC
CCCGCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCC
ATTGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGT
ATCATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCTGGCATT
ATGCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCA
TCGCTATTACCATGGTCGAGGTGAGCCCCACGTTCTGCTTCACTCTCCCCATCTCCCCC
CCTCCCCACCCCAATTTTGTATTTATTTATTTTAAATTATTTTGTGACGATGGGGG
CGGGGGGGGGGGGGCGCGCCAGGCGGGCGGGGGGGGGCGAGGGGCGGGGCGGGG
GAGGCGGAGAGGTGCGGCGGCAGCCAATCAGAGCGGCGCGCTCCGAAAGTTTCCTTTAT
GGCGAGGCGGCGGCGGCGGCGCTATAAAAAGCGAAGCGCGGCGGGCGGGAGTCGC
TGCGCGCTGCCTTCGCCCCGTGCCCGCTCCGCGCGGCTCGCGCGCGCGCGCGCGCT
CTGACTGACCGGTTACTAAAACAGGTAAGTCCGGCCTCCGCGCGGGTTTTGGCGCCTC

- continued

```

CCGCGGGCGCCCCCTCTCACGGCGAGCGCTGCCACGTGACAGCAAGGGCGCAGCGAGC
GTCTTGATCCTTCCGCCCGGACGCTCAGGACAGCGGCCCGCTGCTCATAAGACTCGGCCT
TAGAACCCAGTATCAGCAGAAGGACATTTTAGGACGGGACTTGGGTGACTCTAGGGCAC
TGGTTTTTCTTCCAGAGAGCGGAACAGGCGAGGAAAAGTAGTCCCTTCTCGGCGATTCTG
CGGAGGGATCTCCGTGGGGCGGTGAACGCCGATGATGCCTCTACTAACCATGTTTCATGTT
TTCTTTTTTTTTTCTACAGGTCTGGGTGACGAACAGGGTACCGCCACCATGGCCACCGGC
TCTCGCACAAAGCCTGCTGCTGGCTTTCGGACTGCTGTGCCTGCCTGGCTCCAGGAGGGC
TCCGCCGCTAGCATCGATACCGTCGCTATGTGCTGGAGGCTTGCTGAAGGCTGTATGCTG
ACAATCAGATATGGTGTGCTCGGCGTTTTGGCCTCTGACTGACGCCGAGCAACTATCTGAT
TGTCAGGACACAAGGCCTGTTACTAGCACTCACATGGAACAAATGGCCTCTAGCCTGGAG
GCTTGCTGAAGGCTGTATGCTGTTTCAATGCATCGTTCAGCGCGTTTTGGCCTCTGAC
TGACGCGCTGAACGGCATTGTGAAACAGGACACAAGGCCTGTTACTAGCACTCACATGGA
ACAAATGGCCTCTAGCCTGGAGGCTTGCTGAAGGCTGTATGCTGACAATAATGCCAACAG
GGTGGTCGTTTTGGCCTCTGACTGACGACCACCTGGGCATTATTGTGAGGACACAAGGC
CTGTTACTAGCACTCACATGGAACAAATGGCCTCTCTAGAAT 3'

```

[0074] 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.

[0075] 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

[0076] 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 of 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

```

-continued

| | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|------|
| aatcaaccto | tggattacaa | aatttgtgaa | agattgactg | gtattcttaa | ctatgttget | 60 |
| ccttttacgc | tatgtggata | cgtgctttaa | atgcctttgt | atcatgctat | tgettcccg | 120 |
| atggcctttca | ttttctcctc | cctgtataaa | tectgtgtgc | tgtctcttta | tgaggagtgt | 180 |
| tgcccgcttg | tcaggcaacg | tggcgtgggt | tgcactgtgt | ttgctgacgc | aacccccact | 240 |
| ggttggggca | ttgccaccac | ctgtcagctc | ctttccggga | ctttcgcttt | ccccctccct | 300 |
| attggccacgg | cggaaactat | cgcgcgctgc | cttgcccgct | gctggacagg | ggctcggtct | 360 |
| ttggggcactg | acaattccgt | ggtgtgtgtc | gggaaatcat | cgtcctttcc | ttggtgtctc | 420 |
| gcctgtgttg | ccacotggat | tctgcgcggg | acgtccttct | gctacgtccc | ttcggccctc | 480 |
| aatccagcgg | accttccttc | cgcgcgctgc | ctgcgcgctc | tgccgctctc | ttccgctctt | 540 |
| cgccttcgcc | ctcagacgag | tcggatctcc | ctttgggccc | cctccccgcc | taagcttacc | 600 |
| gataccgtcg | agatctaact | tgtttattgc | agcttataat | ggttacaaat | aaagcaatag | 660 |
| catcacaat | ttcacaaata | aagcatTTTT | ttcactgcat | tctagtgtgt | gtttgtccaa | 720 |
| actcatcaat | gtatcttatc | atgtctggat | ctcgacctcg | actagagcat | ggctacgtag | 780 |
| ataagttagca | tgccgggtta | atcataaact | acaaggaaac | cctagtgtatg | gagttggcca | 840 |
| ctccctctct | gcgcgctcgc | tcgctcactg | aggccgggcg | accaaaagtc | gcccagacgc | 900 |
| cgggctttgc | cggggcgccg | tcagtgcgcg | agcgagcgcg | cagctggcgt | aatagcgaag | 960 |
| aggcccgac | cgatcgccct | tcaccaacgt | tgccgagcct | gaatggcgaa | tgccgattcc | 1020 |
| gttgcaatgg | ctggcggttaa | tattgttctg | gatattacca | gcaaggccga | tagtttgagt | 1080 |
| tcttctactc | aggcaagtga | tgttattact | aatcaaaaga | gtattgcgac | aacgggtaat | 1140 |
| ttgcgtgatg | gacagactct | tttactcgg | ggcctcactg | attataaaaa | caactctcag | 1200 |
| gattctggcg | taccgttctc | gtctaaaaat | cctttaaatcg | gcctcctggt | tagctcccgc | 1260 |
| tctgattcta | acagggaaag | acggtatata | gtgctcgtca | aagcaaccat | agtacgcgc | 1320 |
| ctgtagcggc | gcattaaagc | cggcggtgtg | gggtgttacg | cgcagcgtga | ccgctacact | 1380 |
| tgccagcgcc | ctagcgcccg | ctcctttcgc | ttctctccct | tcctttctcg | ccacgttcgc | 1440 |
| cggctttccc | cgtcaagctc | taaatcgggg | gctcccttta | gggttccgat | ttagtgtttt | 1500 |
| acggcaccto | gaccccaaaa | aaacttgatta | gggtgatgg | tcacgtatgt | ggccactcgc | 1560 |
| ctgatagacg | gtttttcgcc | ctttgacgtt | ggagtccacg | ttctttaata | gtggactcct | 1620 |
| gttccaaact | ggaacaacac | tcaaccctat | ctcggtctat | tttttgatt | tataagggat | 1680 |
| tttgccgatt | tcggcctatt | gggtaaaaaa | tgagctgatt | taacaaaaat | ttaacgcgaa | 1740 |
| ttttaacaaa | atattaaact | ttacaattta | aatatttgc | tatacaatct | tcctgttttt | 1800 |
| ggggcttttc | tgatttatcaa | cgggggtaca | tatgattgac | atgctagtgt | tacgattacc | 1860 |
| gttcatcgat | tctcttgttt | gctccagact | ctcaggcaat | gacctgatag | cctttgtaga | 1920 |
| gacctctcaa | aaatagctac | cctctccggc | atgaatttat | cagctagaac | gggtgaatat | 1980 |
| catattgatg | gtgatttgac | gtctccggc | ctttctcacc | cgtttgaatc | tttacctaca | 2040 |
| cattactcag | gcatttgatt | taaaaatata | gaggggttcta | aaaattttta | tccttgcggt | 2100 |
| gaaataaagg | cttctcccg | aaaagtatta | cagggctcata | atgtttttgg | tacaaccgat | 2160 |
| ttagctttat | gctctgaggg | tttattgctt | aattttgcta | attccttgcc | ttgcctggtat | 2220 |
| gatttattgg | atgtttggaat | tcctgatgcg | gtattttctc | cttacgcctc | tgtgcgggat | 2280 |
| ttcacaccgc | atatgggtga | ctctcagtag | aatctgctct | gatgcgcgat | agttaaagcca | 2340 |
| gccccgacac | ccgccaaac | ccgtgcacgc | gccctgacgc | gcttgcctgc | tcgccgcctc | 2400 |
| cgccttacaga | caagctgtga | ccgtctccgg | gagctgcctg | tgctcagaggt | tttcaccgct | 2460 |
| atcacccgaa | ccgcgcgagc | gaaagggcct | cgtgatacgc | ctatttttat | aggttaaatgt | 2520 |
| catgataata | atggttttct | gaagctcagg | tggaactttt | cggggaaatg | tgccgcggaac | 2580 |
| ccctatttgt | ttatttttct | aaatacatct | aaatatgtat | ccgctcatga | gacaataacc | 2640 |
| ctgataaatg | cttcaataat | attgaaaaag | gaagagtagt | agttatcaac | atttcctggt | 2700 |
| cgccttattt | cccttttttg | cggcattttg | ccttctcgtt | tttgcctacc | cagaaaacgt | 2760 |
| gggtgaaagt | aaagatgctg | aagatcagtt | gggtgcacga | gtgggttaca | tcgaactgga | 2820 |
| tctcaacagc | ggtaagatcc | ttgagagttt | tcgccccgaa | gaacgttttc | caatgatgag | 2880 |
| caacttttaa | gttctgctat | attatcccg | attgacgcgc | ggcaagagca | ggcaagagca | 2940 |
| actcggctgc | gcatacact | attctcagaa | tgacttggtt | gagtagctac | cagtagcaga | 3000 |
| aaagcatcct | acggatggca | tgacagtaag | agaattatgc | agtgcgtcca | taaccatgag | 3060 |
| tgataaacat | cgcccaact | tactctgac | aacgatcgga | ggaccgaaag | agctaaccgc | 3120 |
| ttttttgcac | aacatggggg | atcatgtaac | tcgccttgat | cgttgggaac | cggagctgaa | 3180 |
| tgaagccata | ccaaacgacg | agcgtgacac | cacgatgcct | gtagcaatgg | caacaacgtt | 3240 |
| gcgcaaaact | ttaactggcg | aactacttac | tctagcttcc | cggcaacaat | taatagactg | 3300 |
| gatggaggcg | gataaagtgt | caggaccact | tctgcgctcg | gcccttccgg | ctggctggtt | 3360 |
| tattgctgat | aaatctggag | ccgggtgagc | tgggtctcgc | ggatcatctg | cagcactggg | 3420 |
| gccagatggt | aagccttccc | gtatcgtagt | tatctacacg | acggggagtc | aggcaactat | 3480 |
| ggatgaacga | aatagacaga | tcgctgagat | agggtcctca | ctgattaaag | attggtaact | 3540 |
| gtcagaccaa | gtttactcat | atatacttta | gattgattta | aaacttcatt | tttaatttaa | 3600 |
| aaagatctag | gtgaagatcc | tttttgataa | tctcatgacc | aaaatccctt | aacgtgagtt | 3660 |
| ttcgttccac | tgagcgtcag | accccgtaga | aaagatcaaa | ggatcttctt | gagatccttt | 3720 |
| ttttctgcgc | gtaatctgct | gcttgcaaac | aaaaaaacca | ccgtaccag | cgttggtttg | 3780 |
| tttgccggat | caagagctac | caactctttt | tcggaaggta | actggcttca | gcagagcgca | 3840 |
| gataccaaat | actgtccttc | tagtgtagcc | gtagttaggc | caccacttca | agaactctgt | 3900 |
| agcacccgct | acatacctcg | ctctgcta | cctgttacca | gtggctgctg | ccagtggcga | 3960 |
| taagtcgtgt | cttaccgggt | tggactcaag | acgatagtta | ccggataaag | cgcagcggtc | 4020 |
| gggtggaacg | gggggttcgt | gcacacagcc | cagcttgga | cgaacgacct | acaccgaact | 4080 |
| gagataccta | cagcgtgagc | tatgagaaag | cgccacgctt | cccgaaggga | gaaaggcgga | 4140 |
| caggtatccg | gtaagcgga | gggtcggaac | aggagagcgc | acgagggagc | ttccaggggg | 4200 |
| aaacgcctgg | tactcttata | gtcctgtcgg | gtttcgcac | ctctgacttg | agcgtcgatt | 4260 |
| tttgtgatgc | tcgtcagggg | ggcggagcct | atggaaaaac | gccagcaacg | cggccttttt | 4320 |
| acggttcctg | gccttttgct | ggccttttgc | tcacatgttc | tttctcgtct | tatcccctga | 4380 |
| ttctgtggat | aaccgtatta | cgccttttga | gtgagctgat | accgctcgcc | gcagccgaac | 4440 |
| gaccgagcgc | agcgagtcag | tgagcgagga | agcggaagag | cgcccaatac | gcaaacgcgc | 4500 |
| tctccccgcg | cgttggccga | ttcattaatg | cagcagctgc | gcgctcgctc | gctcactgag | 4560 |

-continued

```

gccgcccggg caaagcccgg gcgtcggggc acctttggtc gcccgggctc agtgagcgag 4620
cgagcgcgca gagagggagt ggccaactcc atcactaggg gttccttgta gttaatgatt 4680
aaccgcgcat gctacttatc tacgtagcca tgctctagga cattgattat tgactagtgg 4740
agttccgcgt tacataactt acggtaaatg gcccgccctgg ctgaccgccc aacgaccccc 4800
gccattgac gtcaataatg acgtatgttc ccatagtaac gccaataggg actttccatt 4860
gacgtcaatg ggtggagtat ttacggtaaa ctgccacctt ggcagtcacat caagtgtatc 4920
atatgccaa gacgcccctt attgacgtca atgacggtaa atggcccggc tggcattatg 4980
cccagtcacat gaccttatgg gactttccta ctgggcagta catctacgta ttagtcattcg 5040
ctattaccat ggtcgagggt agccccacgt tctgcttcac tctcccatc tccccccct 5100
ccccaccccc aattttgtat ttatttattt tttaattatt ttgtgcagcg atggggggcg 5160
gggggggggg gggcgcgcg cgaggggggg gggggcgggg gagggggcggg gcggggcgag 5220
gcggagaggt gcggcgcgag ccaatcagag cggcgcgctc cgaaagtctc cttttatggc 5280
gagggcgggc cgggcggggc cctataaaaa gcgaagcgcg cggcgggggg gactcgctgc 5340
gcgtgcctt cgccccgtgc cccgctccgc cgccgctcgc cgccgcccgc cccggctctg 5400
actgaccgcg ttactaaaac aggttaagtcc ggccctccgc cggggttttg gcgcctccgc 5460
cgggcgcccc cctcctcacg gcgagcgctg ccacgtcaga cgaagggcgc agcgagcgct 5520
ctgactcttc cgcccgagc ctcaggacag cggcccgctg ctcataagac tcggccttag 5580
aaccocagta tcagcagaag gacattttag gacgggacct gggtgactct agggcactgg 5640
ttttcttttc agagagcgga acaggcgagg aaaagtagtc ccttctcggc gattctgcgg 5700
agggatctcc gtggggcggt gaacgcgat gatgcctcta ctaaccatgt tcatgttttc 5760
tttttttttc tacaggctct ggtgtacgaa 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 gctgtgcttg 60
ccttggctcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggagggtt 120
gctgaaggct gtatgctgat caatcggatt cgggtaatcg cgttttggcc tctgactgac 180
gcgattaccg atccgattga tcaggacaca aggcctgtta ctgacctca catggaacaa 240
atggcctcta gcctggaggc ttgctgaagg ctgtatgctg atctttgcta aattggtgca 300
cgcgttttgg cctctgactg acgcgtgcac cattagcaaa gatcaggaca caaggcctgt 360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgcgtgaa ggctgtatgc 420
tgacttcaat cacaattcca gcgcggtttt ggccctctgac tgacggcgct ggaagtgtat 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 gctgtgcttg 60
ccttggctcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggagggtt 120
gctgaaggct gtatgctgta atctttcgtt ggctgcagtt cgttttggcc tctgactgac 180
gaactgcagc gcgaaagatt acaggacaca aggcctgtta ctgacctca catggaacaa 240
atggcctcta gcctggaggc ttgctgaagg ctgtatgctg tgttaatgct gatgtcacgc 300
tcggttttgg cctctgactg acgcagcgctg accagcatta acacaggaca caaggcctgt 360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgcgtgaa ggctgtatgc 420
tggtcacctg gttaacacat acaccgtttt ggccctctgac tgacgggtgta 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 gctgtgcttg 60
ccttggctcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggagggtt 120
gctgaaggct gtatgctgat ttcttcctgt gcgctttcgc cgttttggcc tctgactgac 180
ggcgaaagcg caggaagaaa tcaggacaca aggcctgtta ctgacctca catggaacaa 240
atggcctcta gcctggaggc ttgctgaagg ctgtatgctg agaataatca gatcagcacg 300
ctcgttttgg cctctgactg acgagcgctg tgctgattat tctcaggaca caaggcctgt 360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgcgtgaa ggctgtatgc 420
tgtaatcagg ctgaattcag atagcgtttt ggccctctgac 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

```

-continued

```

gccaccatgg ccacgggctc tcgcacaagc ctgctgctgg ctttcggact gctgtgacctg 60
ccttggctcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt 120
gctgaaggct gtatgctgat aatcacgct gcaggttcag cgttttggcc tctgactgac 180
gctgaacctg gcggtgatta tcaggacaca aggcctgtta ctgactca catggaacaa 240
atggcctcta gcctggagggc ttgctgaagg ctgtatgctg ttcaatcgcg tattggtaat 300
cgcgttttgg cctctgactg acgcgattac caacgcgatt gaacaggaca caaggcctgt 360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgcgtgaa ggctgtatgc 420
tgtgatcatg ctgaaaatgg tgcacgtttt ggccctctgac 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 ccacgggctc tcgcacaagc ctgctgctgg ctttcggact gctgtgacctg 60
ccttggctcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt 120
gctgaaggct gtatgctgat gtaatacct gacgctcagc cgttttggcc tctgactgac 180
ggctgagcgt gatattacc tcaggacaca aggcctgtta ctgactca catggaacaa 240
atggcctcta gcctggagggc ttgctgaagg ctgtatgctg tacagaatca gataatcagc 300
gcggttttgg cctctgactg acggcctga ttctgattct gtacaggaca caaggcctgt 360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgcgtgaa ggctgtatgc 420
tgtcatgttt aaaaattcgc tgcgcgtttt ggccctctgac tgacgcgcag cgaattttaa 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 ccacgggctc tcgcacaagc ctgctgctgg ctttcggact gctgtgacctg 60
ccttggctcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt 120
gctgaaggct gtatgctgat gaatcgggtt gtctgaatcg cgttttggcc tctgactgac 180
cgatttcaga acccgattca tcaggacaca aggcctgtta ctgactca catggaacaa 240
atggcctcta gcctggagggc ttgctgaagg ctgtatgctg aacactttgc tatatcatcc 300
tgcgttttgg cctctgactg acgcaggatg atagcaaatg gtacaggaca caaggcctgt 360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgcgtgaa ggctgtatgc 420
tgttctgttc gtttaagctaa tgctcgtttt ggccctctgac tgacgagcat tagcaacgaa 480
cagaacagga cacaaggcct gttactagca ctcacatgga acaaatggcc tctctagaat 540

```

```

SEQ ID NO: 8          moltype = DNA length = 540
FEATURE              Location/Qualifiers
source                1..540
                      mol_type = other DNA
                      organism = synthetic construct

```

```

SEQUENCE: 8
gccaccatgg ccacgggctc tcgcacaagc ctgctgctgg ctttcggact gctgtgacctg 60
ccttggctcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt 120
gctgaaggct gtatgctgga gcattagcaa tcgcaacaga agttttggcc tctgactgac 180
ttctgttcgt gctaatgct ccaggacaca aggcctgtta ctgactca catggaacaa 240
atggcctcta gcctggagggc ttgctgaagg ctgtatgctg aaacataatg gattcagcag 300
cgcgttttgg cctctgactg acgcgctgct gaccattatg ttccaggaca caaggcctgt 360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgcgtgaa ggctgtatgc 420
tgttatcttt gcgaagctgc catccgtttt ggccctctgac 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 ccacgggctc tcgcacaagc ctgctgctgg ctttcggact gctgtgacctg 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 ataactcgcta tttggtgagg 300
cgttttggcc tctgactgac gccgcaccaa agcgattatg acaggacaca aggcctgtta 360
ctagcactca catggaacaa atggcctcta gcctggagggc ttgctgaagg ctgtatgctg 420
ttctgatcct gaagtctggg ttgcgttttg cctctgactg acgaaccoga accaggatca 480
gaacaggaca caaggcctgt tactagcact cacatggaac aaatggcctc tctagaat 538

```

```

SEQ ID NO: 10         moltype = DNA length = 540
FEATURE              Location/Qualifiers

```


-continued

```

source                1..540
                      mol_type = other DNA
                      organism = synthetic construct

SEQUENCE: 10
gccaccatgg ccacgggtc tcgcacaagc ctgctgctgg ctttcggact gctgtgctg 60
ccttgggtcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt 120
gctgaaggct gtatgtctgaa atcttcgggt ggttccactg cgttttggcc tctgactgac 180
gcagtggaaac ccggaagatt tcaggacaca aggcctgtta ctagcaactca catggaacaa 240
atggcctcta gcctggaggc ttgctgaagg ctgtatgctg atatcctgaa tatggatgac 300
agcgttttgg cctctgactg acgctgcata ccattcagga tatcaggaca caaggcctgt 360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgcctgaa ggctgtatgc 420
tgtttaaagc tcaaacgcgt tcgccgtttt ggccctctgac tgacggcgaa cgctgagct 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 ccacgggtc tcgcacaagc ctgctgctgg ctttcggact gctgtgctg 60
ccttgggtcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt 120
gctgaaggct gtatgtctgta ataaaggctc gggaaatcac cgttttggcc tctgactgac 180
gggtgattcc gacctttatt acaggacaca aggcctgtta ctagcaactca catggaacaa 240
atggcctcta gcctggaggc ttgctgaagg ctgtatgctg taatacgcca gatcaccatc 300
agcgttttgg cctctgactg acgctgatgg tgctggcgta ttacaggaca caaggcctgt 360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgcctgaa ggctgtatgc 420
tgatacagaa acgaaggctt aggcctgttt ggccctctgac tgacggcctg aacccttttc 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 ccacgggtc tcgcacaagc ctgctgctgg ctttcggact gctgtgctg 60
ccttgggtcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt 120
gctgaaggct gtatgtctgtc agatcgctgt ggtaaacagg cgttttggcc tctgactgac 180
gcctgtttac cagcgatctg acaggacaca aggcctgtta ctagcaactca catggaacaa 240
atggcctcta gcctggaggc ttgctgaagg ctgtatgctg agaatcagat cagatagcga 300
tcogttttgg cctctgactg acggatcgct atctgctgat tctcaggaca caaggcctgt 360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgcctgaa ggctgtatgc 420
tgaaacatgc caacagcaga atgcggtttt ggccctctgac tgacggcatt ctgctgggca 480
tgtttcagga cacaaggcct gttactagca ctcacatgga acaaatggcc tctctagaat 540

SEQ ID NO: 13         moltype = DNA length = 540
FEATURE              Location/Qualifiers
source                1..540
                      mol_type = other DNA
                      organism = synthetic construct

SEQUENCE: 13
gccaccatgg ccacgggtc tcgcacaagc ctgctgctgg ctttcggact gctgtgctg 60
ccttgggtcc aggagggctc cgccgctagc atcgataccg tcgctatgtg ctggaggctt 120
gctgaaggct gtatgtctgac aatcagatat ggttgcctcg cgttttggcc tctgactgac 180
gccagagcaac tatctgattg tcaggacaca aggcctgtta ctagcaactca catggaacaa 240
atggcctcta gcctggaggc ttgctgaagg ctgtatgctg tttcacaatg catcgttcag 300
cgcgttttgg cctctgactg acgcgctgaa cggcattgtg aaacaggaca caaggcctgt 360
tactagcact cacatggaac aaatggcctc tagcctggag gcttgcctgaa ggctgtatgc 420
tgacaataat gccaacaggg ttgtcgtttt ggccctctgac 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 tatgttgata cgctgcttta atgcctttgt atcatgctat tgcctcccgt 120
atggccttca tttctctcct cctgtataaa tcctgggttg tgtctcttta tgaggagtgt 180
tggcccggtg tcaggcaacg tggcgtgggt tgcactgtgt ttgctgacgc aacccccact 240
ggttggggca ttgccaccac ctgtcagctc ctttcgggga ctttcgcttt cccctccctc 300
attgccacgg cggaactcat cgccgcctgc cttgcccgct gctggacagg ggctcggtgt 360
ttgggcactg acaattccgt ggtgtgtgtc gggaaatcat cgtcctttcc ttggctgctc 420
gcctgtgttg ccacctggat tctgcgcggg acgtccttct gctacgtccc ttccggcctc 480

```

-continued

| | | | | | | |
|-------------|-------------|--------------|-------------|-------------|-------------|------|
| aatccagcgg | accttccctc | cgcgggctg | ctgcggctc | tgcggcctc | tccggtctt | 540 |
| cgccctcgcc | ctcagacgag | tcggatctcc | ctttgggccc | cctccccgc | taagcttatc | 600 |
| gataccgctg | agatctaact | tgtttattgc | agcttataat | ggttacaaat | aaagcaatag | 660 |
| catcacaaat | ttcacaaaata | aaagcttttt | ttcactgcat | tctagtgtgt | gtttgtccaa | 720 |
| actcatcaat | gtatcttatac | atgtctggat | ctcgacctcg | actagagcat | ggctacgtag | 780 |
| ataagtagca | tggcgggtta | atcattaact | acaaggaacc | cctagtgtatg | gagttggcca | 840 |
| ctccctctct | cgcgcgtcgc | tcgctcactg | aggccggggc | accaaagggtc | gcccgaagcc | 900 |
| cgggctttgc | cggggcgccc | tcagtgcgag | agcgagcgcg | cagctggcgt | aatagcgaag | 960 |
| aggcccgccg | cgatcgccct | tcoccaacagt | tgcgcagcct | gaatggcgaa | tggcgattcc | 1020 |
| gttgcaatgg | ctggcggtta | tattgttctg | gatattacca | gcaaggccga | tagtttgagt | 1080 |
| tcttctactc | aggcaagtga | tgttattact | aatcaaaagaa | gtattgcgac | aacggttaat | 1140 |
| ttgcgtgatg | gacagactct | tttactcggg | ggcctcactg | attataaaaa | cacttctcag | 1200 |
| gattctggcg | taccgttctc | gtctaaaatc | cctttaatcg | gcctcctggt | tagctccgcg | 1260 |
| tctgattcta | acagggaaag | cacgttatatac | gtgctcgta | aagcaaccat | agtagcgcgc | 1320 |
| ctgtagcggc | gcattaaagc | cggcgggtgt | gggtgttacg | cgcagcgtga | ccgctacact | 1380 |
| tgcacgccc | ctagcgccc | ctccttccgc | ttcttctcgc | tccttctcgc | ccaggttcgc | 1440 |
| cggctttccc | cgtcaagctc | taaaatcggg | gctcccttta | gggttccgat | ttagtctctt | 1500 |
| acggcacctc | gaccccaaaa | aaacttgatta | gggtgatggt | tcacgtagtgt | ggccatcgcc | 1560 |
| ctgataagac | gtttttcgcc | ctttgacgtt | ggagtcacgc | ttctttaata | gtggactcct | 1620 |
| gttccaaact | ggaacaacac | tcaccctat | ctcggctctat | tcctttgatt | tataagggat | 1680 |
| tttgcgatt | tcggcctatt | gggtaaaaaa | tgagctgatt | taacaaaaat | ttaacgcgaa | 1740 |
| ttttaacaaa | atattaacgt | ttacaattta | aatatttgct | tatacaatct | tcctgttttt | 1800 |
| ggggcttttc | tgattatcaa | cgggggtaca | tatgattgac | atgctagtgt | tacgattacc | 1860 |
| gttcattcgat | tctctgtttt | gctccagact | ctcaggcaat | gacctgatag | cctttgttaga | 1920 |
| gaactctcaa | aaatagctac | cctctccggc | atgaatttat | cagctagaac | ggttgaatat | 1980 |
| catattgatg | gtgatttgac | tgtctccggc | ctttctcacc | cgtttgaatc | tttacctaca | 2040 |
| cattactcag | gcatttgcat | taaaatatat | gagggttcta | aaaaatttta | tccttgcggt | 2100 |
| gaaataaagg | cttctccgcg | aaaagtatta | cagggtcata | atgttttggg | tacaaccgat | 2160 |
| ttagctttat | gcctctaggc | tttattgctt | aattttgcta | attctttgce | ttgcctgcat | 2220 |
| gatttattgg | atgttggaat | tctctgatcg | gtattttctc | cttaccgcatc | tgtgcgggat | 2280 |
| ttcacaccgc | atatggtgca | ctctcagtag | aatctgctct | gatgcccgat | agttaaagcca | 2340 |
| gccccgacac | ccgcacaacac | ccgctgacgc | gcccgtgacgc | gcttgctgc | tcccggcatc | 2400 |
| cgcttacaga | caagctgtga | cgtctccggg | gagctgcatg | tgtcagaggt | tttcaccgctc | 2460 |
| atcacccgaa | atgcgcgagac | gaaaggccct | cgtgatacgc | ctatttttat | aggttaaatgt | 2520 |
| catgataata | atgggtttctt | agacgtcagg | tggcactttt | cggggaaatg | tgcgcgggac | 2580 |
| cctattttgt | ttatttttct | aaatacatct | aaatatgtat | ccgctcatga | gacaataacc | 2640 |
| ctgataaatg | cttcaataat | attgaaaaag | gaagagtatg | agtattcaac | atttccgtgt | 2700 |
| cgccttattt | cccttttttg | cggcattttg | ccttctggtt | tttgctcacc | cagaaaacgct | 2760 |
| gggtgaaagt | aaagatgctg | aagatcagtt | gggtgcacga | gtgggttaca | tcgaactgga | 2820 |
| tctcaacagc | ggtaagatct | ttagagtttt | tcgccccgaa | gaacgttttc | caatgatgag | 2880 |
| cacttttaaa | gttctgctat | gtggcgcggt | attatcccg | attgacgcgc | ggcaagagca | 2940 |
| actcggctcg | cgcatacaact | attctcagaa | tgaacttggt | gagtaactcac | cagtcacaga | 3000 |
| aaagcatctt | acgtagggca | tgacagtaag | agaattatgc | agtgtgccca | taaccatgag | 3060 |
| tgataaacact | cgggccaact | tacttctgac | aacgatcgga | ggaccgaagg | agctaaccgc | 3120 |
| ttttttgcac | aacatggggg | atcatgtaac | tcgccttgat | cgttggggaa | cggagctgaa | 3180 |
| tgaagccata | ccaaacgacg | acgctgacac | cacgatgcct | gtagcaatgg | caacaacggt | 3240 |
| gcgcaaaact | ttaactggcg | aactacttac | tctagcttcc | cggcaacaat | taatagactg | 3300 |
| gatggaggcg | gataaagtgt | caggaccact | ctcgcgctcg | gcccttccgg | ctggctgggt | 3360 |
| tattgctgat | aaatctggag | cgggtgagcg | tgggtctcgc | ggtatcattg | cagcactggg | 3420 |
| gccagatggt | aagccctccc | gtatcgtagt | tatctacacg | acggggagtc | aggcaactat | 3480 |
| ggatgaacga | aatagacaga | tcgctgagat | agggtccctca | ctgattaaag | attggtaact | 3540 |
| gtcagaccaa | gtttactcat | atatacttta | gattgattta | aaacttcatt | tttaatttaa | 3600 |
| aaggatctag | gtgaagatcc | tttttgataa | tctcatgacc | aaaaatccct | aacgtgagtt | 3660 |
| ttcgtttccac | tgagcgtcag | accocgtaga | aaagatcaaa | ggatcttctt | gagatccttt | 3720 |
| ttttctcgcg | gtaactgtct | gcttgcaaac | aaaaaaacca | cgcctaccag | cgggtggtttg | 3780 |
| tttgccggat | caagagctac | caactctttt | tcggaaggta | actggcttca | gcagagcgca | 3840 |
| gataccaaat | actgtccttc | tagtgtagcc | gtagttaggc | caccacttca | agaactctgt | 3900 |
| agcacccgct | acatacctcg | ctctgcta | cctgttacc | gtgctgctg | ccagtgccga | 3960 |
| taagtcgtgt | cttaccgggt | tggactcaag | acgatagtta | cgggataagg | cgcagcggtc | 4020 |
| gggctgaacg | gggggttcgt | gcacacagcc | cagcttgag | cgaacgacct | acaccgaact | 4080 |
| gagataccta | cacgctgagc | tatgagaaag | cgccacgctt | cccgaaggga | gaaaggcgga | 4140 |
| caggtatccg | gtaagcgcca | gggtcggaac | aggagagcgc | acgagggagc | ttccaggggg | 4200 |
| aaacgcctgg | tatctttata | gtcctgtcgg | gtttcgccac | ctctgacttg | agcgtcgatt | 4260 |
| tttgtgatgc | tcgtcagggg | ggcggagcct | atggaaaaac | gccagcaaac | cggccttttt | 4320 |
| acggttcctg | gccttttgct | ggccttttgc | tcacatgttc | tttctgctg | tatcccttga | 4380 |
| ttctgtggat | aacggtatta | cgccttttga | gtgagctgat | accgctgcgc | gcagccgaac | 4440 |
| gaccgagcgc | agcgagtcag | tgagcgagga | agcggaagag | cgcccaatac | gcaaacggcc | 4500 |
| tctccccgcg | cgttggccga | ttcattaatg | cagcagctgc | gcgctcgctc | gctcactgag | 4560 |
| gcccggccgg | caaagcccg | gcgtcgggcg | accttttggtc | gcccggcctc | agtgagcgag | 4620 |
| cgagcgcgca | gagagggagt | ggccaactcc | atcactaggg | gttctctgta | gttaatgatt | 4680 |
| aaaccgcat | gtactctatc | tacgtagcca | tgctctagga | cattgattat | tgactagtgg | 4740 |
| agttccgcgt | tacataactt | acggtaaatg | gcccgcctgg | ctgaccgcgc | aacgaccccc | 4800 |
| gcccattgac | gtcaataatg | acgtatgttc | ccatagtaac | gccaataggg | actttccatt | 4860 |
| gacgtcaatg | gggtggagtat | ttacggtaaa | ctgcccactt | ggcagtagat | caagtgtatc | 4920 |
| atatgccaa | tacgccccct | attgacgtca | atgacggtaa | atggcccgcc | tggcattatg | 4980 |
| cccagtagat | gaccttatgg | gactttctta | cttggcagta | catctacgta | ttagtcatcg | 5040 |

-continued

| | | | | | | |
|------------|------------|-------------|-------------|------------|-------------|------|
| ctattaccat | ggctgaggtg | agccccacgt | tctgtttcac | tctcccccac | tccccccct | 5100 |
| ccccaccccc | aatttttgat | ttattttatt | tttaattatt | ttgtgcagcg | atgggggagg | 5160 |
| gggggggggg | ggggcgcgcg | caggcggggc | ggggcggggc | gaggggcggg | gcggggcgag | 5220 |
| gcgagagagt | gcgcgcgag | ccaatcagag | cgcgcgctc | cgaaagtctc | cttttatggc | 5280 |
| gaggcgggcg | cgggcgggcg | cctataaaaa | gcgaagcgcg | cgggcgggcg | gagtcgctgc | 5340 |
| gcgtgcctct | cgccccgtgc | cccgctccgc | cgccgcctcg | cgccgcggcg | cccggtctctg | 5400 |
| actgaccgcg | ttactaaaac | aggttaagtcc | ggcctccgcg | cggggttttg | gcgcctcccg | 5460 |
| cgggcgcccc | cctcctcacg | gcgagcgctg | ccacgtcaga | cgaaggcgcg | agcgagcgctc | 5520 |
| ctgacccctc | cgcccgagcg | ctcaggacag | cgcccgctcg | ctcataagac | tcggcccttag | 5580 |
| aaacccagta | tcagcagaag | gacattttag | gacgggactt | gggtgactct | agggcactgg | 5640 |
| ttttcttttc | agagagcgga | acaggcgagg | aaaagttagtc | cctctcggcg | gattctcgga | 5700 |
| agggatctcc | gtggggcggt | gaacgcccgt | gatgcctcta | ctaaccatgt | tcattgttttc | 5760 |
| tttttttttc | tcagggtcct | gggtgacgaa | cagggtaccg | ccaccatggc | caccggctctc | 5820 |
| cgcacaagcc | tgcctctggc | tttcggactg | ctgtgcctgc | cttggctcca | ggagggtctc | 5880 |
| gcccgtagca | tcgataccgt | cgctatgtgc | tggaggcttg | ctgaaggctg | tatgtctgatc | 5940 |
| aatcggtatg | cggttaatgc | gttttggcct | ctgactgacg | cgattaccga | tccgattgat | 6000 |
| caggacacaa | ggcctgttac | tagcactcac | atggaacaaa | tggcctctag | cctggaggctc | 6060 |
| tgctgaaggc | tgtatgtctg | tctttgctaa | attggtgcac | gcgttttggc | ctctgactga | 6120 |
| cgcggtgcac | attagcaaac | atcaggacac | aaggcctgtt | actagcactc | acaattggaac | 6180 |
| aatggcctct | agcctggagg | cttgcgtgaag | 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 | aattttgtgaa | agattgactg | gtattcttaa | ctatgttgct | 60 |
| ccttttaccg | tatgtggata | cgtgctttta | atgcctttgt | atcatgctat | tgcttcccg | 120 |
| atggctttca | ttttctcttc | ctgtgataaa | tcttggttgc | tgctctctta | tgaggagtgt | 180 |
| tggccgcttg | tcaggcaacg | tggcgtgggt | tgcaactgtg | ttgtgcagcg | aaaccccaact | 240 |
| ggttggggca | ttgcccaccac | ctgtcagctc | ctttccggga | ctttcgcttt | ccccccacct | 300 |
| attgccacgg | cggaactcat | cgccgcctgc | cttgcccgct | gctggacagg | ggctcggtcg | 360 |
| tggggcactg | acaattccgt | gggtgtgtcg | gggaaatcat | cgtcctttcc | ttgggtgctc | 420 |
| gcctgtgttg | ccacctggat | tctgcgcggg | acgtccttct | gctacgtccc | ttcgccctc | 480 |
| aatccagcgg | accttctctc | ccgcggcctg | ctgcgggctc | tgccggctct | tcgcgctct | 540 |
| cgcccttcgc | ctcagacgag | tgggatctcc | ctttggggcg | cctcccccgc | taagcttatc | 600 |
| gataccgtcg | agattcaact | tgtttattgc | agcttataat | ggttacaagt | aaagcaatag | 660 |
| catcacaaat | ttcacaaata | aagcattttt | ttcactgcat | tctagtgtgt | gtttgtccaa | 720 |
| actcatcaat | gtatcttatc | atgtctggat | ctcgacctcg | actagagcat | ggctacgtag | 780 |
| ataagttaga | ttgcgggtta | atcattaact | acaaggaaac | cctagttagt | gagttggcca | 840 |
| ctccctctct | gcccgcctgc | tcgctcactg | aggccggggc | accaaaagtc | gcccgcagcc | 900 |
| cgggctttgc | cgggggggcg | tcagtgagcg | agcgagcgcg | cagctggcgt | aatagcgaag | 960 |
| aggcccgcac | cgatcgccct | tcccacacgt | tgccgagcct | gaatggcgaa | tggcgattcc | 1020 |
| gttgcaatgg | ctggcggtta | tattgttctg | gatattacca | gcaaggccga | tagtttgagt | 1080 |
| tcttctactc | aggaagtgta | tgttattact | aatcaaaaga | gtattgcgac | aacgggtta | 1140 |
| ttgcgtgatg | tacagactct | tttactcggt | ggcctcactg | attataaaaa | cacttctcag | 1200 |
| gattctggcg | taccgttctc | gtctaaaaat | cctttaatcg | gcctcctggt | tagctcccg | 1260 |
| tctgattcta | acgaggaag | cacgttatat | gtgctcgtca | aagcaaccat | agtagcgcc | 1320 |
| ctgtagcgcg | gcattaaagg | cgccgggtgt | gggtggttac | cgacgctga | ccgctacact | 1380 |
| tgccagcgcc | ctagcgcccg | cctccttctc | tttcttccct | tcctttctcg | ccacgttctc | 1440 |
| cggttttccc | cgtcaagctc | taaatcgggg | gctcccttta | gggttccgat | ttagtgtctt | 1500 |
| acggcacctc | gaccccaaaa | aacttgatta | gggtgatggg | tcacgttagt | ggccatcgcc | 1560 |
| ctgatatagc | gttttttcgc | ctttgacgtt | ggagtcacag | ttctttaata | gtggactctt | 1620 |
| gttccaaact | ggaacaacac | tcaaccctat | ctcggcttat | tcttttgatt | tataagggat | 1680 |
| tttgccgatt | tcggcctatt | ggttaaaaaa | tgagctgatt | taacaaaaat | ttaacgcgaa | 1740 |
| ttttaacaaa | atattaacgt | ttacaattta | aatatttgct | tatacaatct | tcctgttttt | 1800 |
| ggggcttttc | tgattatcaa | ccgggggtaca | tatgattgac | atgctagtgt | tacgattacc | 1860 |
| gttcatcgat | tctcttggtt | gctccagact | ctcaggcaat | gacctgtag | cctttgtaga | 1920 |
| gacctctcaa | aaatagctac | cctctccggc | atgaatttat | cagctagaac | gggtgaatat | 1980 |
| catattgatg | gtgatttgac | tgtctccggc | ctttctcacc | cgtttgaatc | tttacctaca | 2040 |
| cattactcag | gcattgcat | taaaatatat | gagggttcta | aaaattttta | tccttgcggt | 2100 |
| gaaataaagg | cttctcccg | aaaagtatta | cagggtcata | atgttttttg | tacaaccgat | 2160 |
| ttagctttat | gctctgagcg | tttattgctt | aattttgcta | attctttgct | ttgctgtgat | 2220 |
| gatttattgg | atgtttgga | tctctgatcg | gtattttctc | cttacgcgac | tgtgcgggat | 2280 |
| ttcacaccgc | atatgggtga | ctctcagtac | aatctgctct | gatgcgcgat | agttaagcca | 2340 |
| gccccgacac | ccgccaacac | ccgctgacgc | gccctgacgg | gcttgctctg | tcgccggcatc | 2400 |
| cgcttacaga | caagctgtga | ccgtctccgg | gagctgcgat | tgtcagaggt | tttcaccgctc | 2460 |
| atcaccgaaa | cgccgagagc | gaaaggccct | cgtgatacgc | ctatttttat | aggttaatgt | 2520 |
| catgataata | atggtttctt | agacgtcagg | tggcactttt | cggggaaatg | tgcgcggaac | 2580 |
| ccctatttgt | ttatttttct | aaatacatc | aaatatgtat | ccgctcatga | gacaataacc | 2640 |
| ctgataaatg | cttcaataat | attgaaaaag | gaagagtatg | agtatccaac | atttccgtgt | 2700 |
| cgcccttatt | cccttttttg | cggcattttg | ccttctctgt | tttgctcacc | cagaaacgct | 2760 |
| ggtgaaagta | aaagatgctg | aagatcagtt | gggtgcacga | gtgggttaca | tcgaactgga | 2820 |

-continued

```

tctcaacagc ggtaagatcc ttgagagttt tcgccccgaa gaacgttttc caatgatgag 2880
cactttttaa gttctgctat gtggcgcggt attatoccg attgacgccg ggcaagagca 2940
actcggctcg cgcatacact attctcagaa tgacttggtt gactactcac cagtcacaga 3000
aaagcatctt cgggatggca tgacagtaag agaattatgc agtgctgcc taacctgag 3060
tgataaacct cgggccaact tacttctgac aacgatcggg ggaccgaagg agctaaccgc 3120
ttttttgcac aacatggggg atcatgtaac tcgccttgat cggtgggaac cggagctgaa 3180
tgaagccata ccaaacgacg agcgtgacac cacgatgcct gtagcaatgg caacaacgtt 3240
gcgcaaaact ttaactggcg aactacttac tctagcttcc cggaacaat taatagactg 3300
gatggaggcg gataaagtgt caggaccact tctgcgctcg gcccttcggt ctggctgggt 3360
tattgctgat aaactctggg ccggtgagcg tgggtctcgc ggtatcattg cagcactggg 3420
gccagatggt aagccctccc gtatcgtagt tatctacacg acggggagtc aggcactat 3480
ggatgaacga aatagacaga tcgctgagat aggtgcctca ctgattaagc attggtaact 3540
gtcagaccac gtttactcat atatacttta gattgattta aaacttcatt ttaatttaa 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 tccgaaggtg actggcttca gcagagcgca 3840
gataccaaat actgtccttc tagtgtagcc gtatgttagc caccacttca agaactctgt 3900
agcaccgcct acatacctcg cctgtctaata cctgttacca gtggtgctgt ccagtggcg 3960
taagtctgtg cttaaccgggt tggactcaag acgatagtta ccggataagg cgcagcggtc 4020
gggctgaacg ggggggtcgt gcacacagcc cagcttgagg cgaacgacct acaccgaact 4080
gagatacctc cagcgtgagc tatgagaaag cgccacgctt ccgaaggga gaaaggcgga 4140
caggtatccg gtaagcgga gggctcggaac aggagagcgc acgagggagc ttcagggggg 4200
aaacgccttg tatctttata gtctctcggg gtttcgccac ctctgacttg agcgtcgatt 4260
tttgtgatgc gcctcagggg ggcggagcct atggaaaaac gccagcaacg cgcctttttt 4320
acggttcctg cctttttgct ggctttttgc tcacatgttc tttcctgctg tatccctga 4380
ttctgtggtt aaccgtatta ccgcctttga gtgagctgat accgctcgcc gcagccgaac 4440
gaccgagcgc agcagtgtag tgagcgagga agcgggaagc cgcccaatc gcaaacgcgc 4500
tctcccccgc cgttggcgga ttcattaatg cagcagctgc gcgctcgctc gctcactgag 4560
gccgccccgg caaagcccg gcttcgggag acccttggtc gcccgccctc agtgagcgag 4620
cgagcgcgca gagaggaggt ggccaaactcc atcactaggg gttccttgta gttaatgatt 4680
aaccgcctat gctacttacc tacgtagcca tgctctagga cattgattat tgactagtgg 4740
agttcccgct tacataactt acggtaaatg gcccgccctg ctgaccgccc aacgaccccc 4800
gccattgac gtcataatg acgtatgttc ccatagtaac gccaataggg actttccatt 4860
gacgtcaatg ggtggagtat ttacggtaaa ctgcccactt ggcagtagac caagtgtatc 4920
atatgccaa gtagccccct attgacgtca atgacggtaa atggcccgcc tggcattatg 4980
cccagtacat gactttatgg gactttccta cttggcagta catctacgta ttagtcatcg 5040
ctattaccat ggtcgagggt agccccacgt tctgettacc tctcccatc tccccccct 5100
ccccaccccc aattttgtat ttatttattt tttaattatt ttgtgcagcg atggggggcg 5160
gggggggggg gggcgcgcg cagggcgggg gggggcgggg gaggggcggg gcggggcgag 5220
gcggagaggt gcggcgcgag ccaatcagag cggcgcgctc cgaaggttcc cttttatggc 5280
gaggcgggcg cggcgggcg cctataaaaa gcgaagcgcg cggcgggcgg gactcgctgc 5340
gcgctgcctt gcgcccgctg cccgctccgc cgccgctcgc cgccgcccgc cccggtcctg 5400
actgaccgag ttactaaaac aggttaagtcc ggcctccgcg ccgggttttg gcgctccgcg 5460
cgggcgcccc cctcctcagc gcgagcgctg ccaagtcaga cgaaggcgcg agcagcgctc 5520
ctgactcctc cgcccgagag ctcaggacag cggcccgctg ctcataagac tcggccttag 5580
aaccacagta tcagcagaag gacattttag gacgggactt gggtagctct agggcactgg 5640
ttttctttcc agagagcgga acaggcgagg aaaagtagtc ccttctcggc gattctcgcg 5700
agggatctcc gtggggcggt gacgcccgat gatgctcta ctaaccatgt tcatgttttc 5760
tttttttttc tacaggctct gggtagcgaa cagggtaccg ccaccatggc caccgctct 5820
cgcacaaagc tgctgctggc ttccgactg ctgtgcctgc cttggctcca ggagggtcc 5880
gcgctagca tcgataccgt cgtatgtgc tggaggcttg ctgaaggctg tatgctgtaa 5940
tctttcgtg gctgcagttc gttttggcct ctgactgacg aactgcagcg cgaagatta 6000
caggacacaa ggctgtgtac tagcactcac atggaacaaa tggcctctag cctggaggct 6060
tgctgaaggc tgtatgctgt gttaatgctg atgtcacgct gcgttttggc ctctgactga 6120
cgcagcgtag ccagcattaa cacaggacac aaggcctgtt actagcactc acatggaaca 6180
aatggcctct agcctggagg cttgctgaag gctgtatgct gttcacctgg ttaacacata 6240
caccgttttg gcctctgact gacgggtgat gtgaaccagg tgaaccaggac 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 aattttgtgaa agattgactg gtattcttaa ctatgttgct 60
cctttttacg tatgtggata cgtcgcttta atgcctttgt atcatgctat tgcttccgct 120
atggctttca ttttctcttc cttgtataaa tcctgggtgc tgtctcttta tgaggagtgt 180
tggcccgctg tcaggcaacg tggcgtgggt tgcactgtgt ttgctgacgc aacccccact 240
ggttggggca ttgccaccac ctgtcagctc ctttccggga ctttgcgttt cccctccct 300
attgccacgg cggaactcat cgcgcctgc cttgcccgt gctggacagg ggtcggctg 360
ttgggcactg acaattccgt ggtgtgtgct gggaaatcat cgtcctttcc ttggctgctc 420
gcctgtgttg ccacctggat tctgcgcggg acgtccttct gctacgtccc ttcgccctc 480
aatccagcgg accttccctc cgcgcgctg ctgcggctc tgccggctct tccgctctt 540
cgcttccgcc ctcagacgag tcggatctcc ctttgggccc cctccccgcc taagcttatc 600

```

-continued

| | | | | | | |
|-------------|-------------|------------|------------|-------------|-------------|------|
| gataccgctcg | agatctaact | tgtttattgc | agcttataat | ggttacaat | aaagcaatag | 660 |
| catcacaaat | ttcacaaata | aagcattttt | ttcactgcat | tctagtgtg | gtttgtocaa | 720 |
| actcatcaat | gtatcttata | atgtctggat | ctcgacctcg | actagagcat | ggctacgtag | 780 |
| ataagtagca | tggcgggtta | atcattaact | acaaggaacc | cctagtgtg | gagttggcca | 840 |
| ctccctctct | gcgcgctcgc | tcgctcactg | aggccgggcg | accaaaggct | gcccgacgcc | 900 |
| cgggctttgc | cggggcgcc | tcagtgcgcg | agcgagcgcg | cagctggcgt | aatagcgaag | 960 |
| aggcccgcc | cgatcgccct | tcccaacagt | tgcgcagcct | gaatggcgaa | tggcgattcc | 1020 |
| gttgcaatgg | ctggcggtaa | tattgttctg | gatattacca | gcaaggcoga | tagtttgagt | 1080 |
| tcttctactc | aggcaagtga | tgttattact | aatcaaaaga | gtattgcgac | aacggttaat | 1140 |
| ttgcgtgatg | gacagactct | tttactcggg | ggcctcactg | attataaaaa | cacttctcag | 1200 |
| gattctggcg | taccgttctc | gtctaaaatc | cctttaactg | gcctcctgtt | tagctccgcg | 1260 |
| tctgattcta | acgaggaaag | cacgttatac | gtgctcgta | aagcaaccat | agtacgcgcg | 1320 |
| ctgtagcgcg | gcattaaagg | cggcggggtg | ggtggttacg | cgcagcgtga | ccgctacact | 1380 |
| tggcagcgcc | ctagcgcccg | ctcctttcgc | ttcttctcct | tcctttctcg | ccacggttcg | 1440 |
| cggctttccc | cgtcaagctc | taaatcgggg | gctcccttta | gggttccgat | ttagtgtctt | 1500 |
| acggcacctc | gaccccaaaa | aacttgatta | gggtgatggg | tcacgtatgt | ggccatcgcc | 1560 |
| ctgatagacg | gttttttcgc | ctttgacgtt | ggagtccacg | ttcttttaata | gtggactctt | 1620 |
| gttccaaact | ggacaacac | tcaaccctat | ctcggctcat | tcctttgatt | tataagggat | 1680 |
| tttgcgcat | tcggcctatt | gggtaaaaaa | tgagctgatt | taacaaaaat | ttacgcgaa | 1740 |
| ttttacaaaa | atattaacgt | ttacaattta | aatatttgct | tatacaatct | tcctgttttt | 1800 |
| ggggcttttc | tgatttatcaa | cgggggtaca | tatgattgac | atgctagtgt | tacgattacc | 1860 |
| gttcatcgat | tctcttggtt | gctccagact | ctcaggcaat | gacgtgatag | cctttgtaga | 1920 |
| gacctctcaa | aaatagctac | ctctccggcg | atgaatttat | cagctagaac | gggtgaatat | 1980 |
| catattgatg | gtgatttgac | tgtctccggc | ctttctcacc | cggttgaaac | tttacctaca | 2040 |
| cattactcag | gcattgcatt | taaaaatat | gagggttcta | aaaattttta | tccttgcggt | 2100 |
| gaaataaagg | cttctccgcg | aaaagtatta | cagggtcata | atgttttttg | tacaaccgat | 2160 |
| ttagctttat | gctctgagcg | tttattgctt | aattttgcta | attctttgct | ttgcctgtat | 2220 |
| gatttattgg | atgttggaat | tcctgatgcg | gtattttctc | cttacgcac | tgtgcgggat | 2280 |
| ttcacaccgc | atatgggtgca | ctctcagtac | aatctgctct | gatgccgcac | agttaaagcca | 2340 |
| gccccgacac | cgcgcaacac | cgcctgacgc | gccctgacgg | gcttgctcgc | tcgccgcatc | 2400 |
| cgttacaga | caagctgtga | cgtctccgg | gagctgcacg | tgtcagaggt | tttcacgctc | 2460 |
| atcacccgaaa | cgcgcgagac | gaaaggccct | cgtgatacgc | ctatttttat | aggttaatgt | 2520 |
| catgataata | atgggttctt | agacgtcagg | tggcactttt | cggggaaatg | tcgcgcggaac | 2580 |
| ccctatttgt | ttatttttct | aaatacattc | aaatatgtat | cgcctcatga | gacaataacc | 2640 |
| ctgataaatg | cttcaataat | attgaaaaag | gaagagtatg | agttattcaac | atttccgtgt | 2700 |
| cgcccttatt | cccttttttg | cggcattttg | ccttctcgtt | tttgctcacc | cagaaacgct | 2760 |
| ggtgaaagta | aaagatgcg | aagatcagtt | gggtgcacga | gtgggttaca | tcgaactgga | 2820 |
| tctcaacagc | ggtaagatcc | ttgagagtgt | tcgccccgaa | gaacgttttc | caatgatgag | 2880 |
| cacttttaaa | gttctgctat | gtggcgcggt | attatcccg | attgacgcgc | ggcaagagca | 2940 |
| actcggctcg | cgcatacaat | attctcagaa | tgacttggtt | gagtaactac | cagtcacaga | 3000 |
| aaagcatctt | acggatggca | tgacagtaag | agaattatgc | agtgcctgca | taaccatgag | 3060 |
| tgataaacct | cgcggcaact | tacttctgac | aacgatcgga | ggacccgaag | agctaaccgc | 3120 |
| ttttttgcac | aacatggggg | atcatgtaac | tcgccttgat | cgttgggaac | cggagctgaa | 3180 |
| tgaagccata | ccaaacgacg | agcgtgacac | cacgatgcct | gtagcaatgg | caacaacggt | 3240 |
| gcgcaaaact | ttaactggcg | aactacttac | tctagcttcc | cggcaacaat | taatagactg | 3300 |
| gatggagcg | gataaagtgt | caggaccact | ctcgcgctcg | gcccttcgcg | ctggctgggt | 3360 |
| tattgctgat | aaatctggag | cgggtgagcg | tgggtctcgc | gggtatcattg | cagcaactggg | 3420 |
| cccgatgggt | aagccctccc | gtatcgtagt | tatctacacg | acggggagtc | aggcaactat | 3480 |
| ggatgaacga | aatagacaga | tcgctgagat | aggtgcctca | ctgattaaag | attggttaact | 3540 |
| gtcagaccaa | gtttactcat | atatacttta | gattgattta | aaacttcatt | tttaatttaa | 3600 |
| aaggatctag | tggaagatcc | tttttgataa | tctcatgacc | aaaatccctt | aacgtgagtt | 3660 |
| ttcgttccac | tgcgctcag | accccgtaga | aaagatcaaa | ggatcttctt | gagatccttt | 3720 |
| ttttctgcgc | gtaatctgct | gcttgcaaac | aaaaaaacca | ccgctaccag | cgggtggtttg | 3780 |
| tttgcgggat | caagagctac | caactctttt | tccgaaggta | actggcttca | gcagagcgca | 3840 |
| gataccaaat | actgtccttc | tagtttagcc | gtagttagcc | caccacttca | agaactctgt | 3900 |
| agcaccgcct | acatacctcg | ctctgctaat | cctgttacca | gtggctgctg | ccagtggcga | 3960 |
| taagtcgtgt | cttaccgggt | tggactcaag | acgatagtta | ccggataaag | cgcagcggtc | 4020 |
| gggctgaacg | gggggttcgt | gcacacagcc | cagcttgagg | cgaacgacct | acaccgaact | 4080 |
| gagataccta | cagcgtgagc | tatgagaaag | cgcacgcctt | cccgaaggga | gaaaggcgga | 4140 |
| caggtatccg | gtaagcggca | gggtcggaac | aggagagcgc | acgagggagc | ttccaggggg | 4200 |
| aaacgcctgg | tatctttata | gtctctcg | gtttcgcac | ctctgacttg | agcgtcgatt | 4260 |
| tttgtgatgc | tcgtcagggg | ggcggagcct | atggaaaaac | gccagcaacg | cggccttttt | 4320 |
| acggttcctg | gccttttgct | ggccttttgc | tcacatgttc | tttctcgtgt | tatcccccta | 4380 |
| ttctgtggat | aaccgtatta | cgccttttga | gtgagctgat | accgctcgcc | gcagccgaac | 4440 |
| gaccgagcgc | agcgagtcag | tgagcgagga | agcggaagag | cgcccaatac | gcaaacgcgc | 4500 |
| tctcccccg | cgttggccga | ttcattaatg | cagcagctgc | gcgctcgctc | gctcactgag | 4560 |
| gcccggcg | caaagccgg | gcgtcgggcg | acctttggtc | gcccgccctc | agtgagcgag | 4620 |
| cgagcgcgca | gagaggaggt | ggccaactcc | atcactaggg | gttctctgta | gttaatgatt | 4680 |
| aaccgcgat | gctacttata | tacgtagcca | tgtcttagga | cattgattat | tgactagtgg | 4740 |
| agttccgcgt | tacataactt | acggtaaatg | gcccgcctgg | ctgacggccc | aacgaccccc | 4800 |
| gcccattgac | ggtcaataatg | acgtatgttc | ccatagtaac | gccaataggg | actttccatt | 4860 |
| gacgtcaatg | gttgaggat | ttacggtaaa | ctgcccactt | ggcagtaac | caagtgtatc | 4920 |
| atatgccaa | tacgccccct | attgacgtca | atgacggtaa | atggcccgcc | tggcatttatg | 4980 |
| cccagtagat | gaccttatgg | gactttccta | cttggcagta | catctacgta | ttagtcatcg | 5040 |
| ctattaccat | ggtcgagggt | agccccacgt | tctgcttca | tctcccatc | tccccccct | 5100 |
| ccccaccccc | aattttgtat | ttattttatt | tttaattatt | ttgtgcagcg | atggggcg | 5160 |

-continued

```

gggggggggg gggcgcgcg caggcggggc gggggcgggg gagggggcgg gcggggcgag 5220
gaggagaggt gggcgggcag ccaatcagag cggcgcgctc cgaaagtttc cttttatggc 5280
gaggcgggcg gggcgggcgg cctataaaaa gcgaagcgcg cggcgggcgg gagtcgctgc 5340
gcgctgcctt cgccccgtgc ccgctccgc cgccgctcg cgccgcccgc ccggtctcg 5400
actgaccggt ttactaaaac aggtaatgct ccgctccgc cggggttttg gcgctcccg 5460
cgggcgcccc cctcctcagc gcgagcgctg ccaagtcaga cgaagggcgc agcgagcgctc 5520
ctgacctctc cgcccggaag ctcaggacag cggcccgctg ctcataagac tcggccttag 5580
aaccacagta tcagcagaag gacattttag gacgggactt gggtagctct agggcactgg 5640
ttttctttcc agagagcgga acaggcgagg aaaagtagtc ccttctcggc gattctgcgg 5700
agggatctcc gtggggcggt gaacggcgat gatgcctcta ctaaccatgt tcatgttttc 5760
tttttttttc tacaggctct gggtagcaga cagggtaccg ccaccatggc caccggctct 5820
cgacacagcc tgctgctggc ttccggactg ctgtgcctgc cttggctcca ggagggtcc 5880
gcccgtagca tcgataccgt cgctatgtgc tggaggcttg ctgaaggctg tatgtgatt 5940
tcttctgtg gttttggcct ctgactgacg gcgaaagcgc aggaagaaat 6000
caggacacaa ggctgtttac tagcactcac atggaacaaa tggcctctag cctggaggct 6060
tgctgaaggg tgtatgctga gaataatcag atcagcacgc tcgttttggc ctctgactga 6120
cgagcgctgt gctgattatt ctcaggacac aaggcctgtt actagcactc acatggaaaca 6180
aatggcctct agcctggagg ctgtctgaag gctgtatgct gtaatcaggc tgaattcaga 6240
tagcgttttg gcctctgact cagcgtatct 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 ttatgtggata cgtgctttta atgcctttgt atcatgctat tgcctcccg 120
atggctttca tttctcctc cttgtataaa tcttggttgc tgcctcttta tgaggagttg 180
tggcccggtg tcaggcaacg tggcgtggtg tgcactgtgt ttgctgacgc aacccccac 240
ggttggggca ttgccaccac ctgtcagctc ctttcggga ctttcgctt cccctccct 300
attgccacgg cggaactcat cgccgctgc cttgcgcgt gctggacagg ggctcggtg 360
ttgggcactg acaattccgt ggtgtgtgcg gggaaatcat cgtcctttcc ttggtgctc 420
gctgtgtgtg ccacctggat tctgcgcggg acgtccttct gctacgtccc ttcggccctc 480
aatccagcgg acctctcttc cgccgcgctg ctgcgcgtcc tgcggcctct tccgctctt 540
cgcttccgcc ctcagacgag tcggatctcc ctttgggcgc cctcccgccc taagcttatc 600
gataccgtcg agatctaaat tgtttattgc agcttataat gggtacaaat aaagcaatag 660
catcacaaat ttcacaaata aagcattttt ttcactgcat tctagtgtg gtttgtccaa 720
actcatcaat gtatcttatc atgtctggat ctgcacctcg actagacat ggctacgtag 780
ataagtagca tggcgggtta atcattaaat acaaggaacc cctagttagt gagttggcca 840
ctccctctct gcgcgctcgc tgcctcactg aggcggggcg accaaaggct gcccgacgcc 900
cgggctttgc ccggcgcgcg ccaagtgcgc cagctggcgt aatagcgaag 960
agggccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa tggcgattcc 1020
gttgcaatgg ctggcggtta ttatgttctg gatattacca gcaaggcgga tagtttgagt 1080
tcttctactc aggcgaagtga tgttattact aatcaagaa gtattgcgac aacggttaat 1140
ttgctgatg gcagactct tttactcggg ggcctcactg attataaaaa cacttctcag 1200
gattctggcg tacggttctt gtcataaaat cctttaatcg gcctcctgtt tagctccgcg 1260
tctgattcta acgaggaag caggttatac gtgctcgta aagcaacct agtacggccc 1320
ctgtagcggc gcattaaagc cggcggggtg ggtggttacg cgcagcgtga ccgctacact 1380
tgccagcgcc ctagcgcccg cctccttcgc tttctccctc tcctttctcg ccacgttcgc 1440
cggttttccc gctcaagctc taaatcgggg gctcccttta ggttccgat ttagtgttt 1500
acggcacctc gacccccaaa aacttgatta ggggtgaggt tcacgtagt ggccatcgcc 1560
ctgataagcg gtttttcgcc ctttgacgtt ggagtccacg ttctttaata gtggactctt 1620
gttccaaact ggaacacac tcaacctat ctcggtctat tcttttgatt tataagggat 1680
tttgcgatt tcggcctatt ggttaaaaaa tgagctgatt taacaaaaat ttaacgcgaa 1740
ttttaacaaa atattaaagt ttacaattta aatatttgct tatacaatct tctgttttt 1800
ggggcttttc tgattatcaa ccgggggtaca tatgattgac atgctagtgt tacgattacc 1860
gttcatcgat tctctgtgtt gctccagact ctcaggcaat gacctgtag cctttgtaga 1920
gacctctcaa aaatagctac cctctccggc atgaatttat cagctagaac ggttgaatat 1980
catattgatg gtgatttgac tgtctccggc ctttctcacc cgtttgaatc ttacctaca 2040
cattactcag gcattgcatt taaaaatat gaggggttcta aaaattttta tctttgcgtt 2100
gaaataaagg cttctccgcg aaaagtatta cagggtcata atgttttttg tacaaccgat 2160
ttagctttat gctctgaggg tttattgctt aattttgcta attctttgce ttgctgtat 2220
gatttattgg atgttggaat tctgtatgcy gtattttctc cttacgcate tgtgcgggat 2280
ttcacaccgc atatggtgca ctctcagtac aatctgctct gatgcccat agttaagcca 2340
gcccgcacac ccgccaacac ccgctgacgc gccctgacgg gctgtgtcgc tccggcctac 2400
cgcttacaga caagctgtga ccgtctccgg gagctgcatg tgcagagggt ttccaccgtc 2460
atcccgaaa cgcgcgagac gaaagggcct cgtgatacgc ctatttttat aggttaatgt 2520
catgataata atggtttctt agacgtcagg tggcactttt cgggggaaatg tgcgcggaac 2580
ccctatttgt ttatttttct aaatacattc aaatatgtat ccgctcatga gacaataacc 2640
ctgataaatg cttcaataat attgaaaaag gaagagtagt agtattcaac atttccgtgt 2700
cgcccttatt cctttttttg cggcattttt ccttctgtt tttgctcacc cagaaacgct 2760
ggtgaaagta aaagatgctg aagatcagtt ggggtgcaga gtgggttaca tcgaactgga 2820
tctcaacagc gtaagatcc ttgagagttt tcgcccggaa gaacgttttc caatgatgag 2880
cacttttaaa gttctgctat gtggcgcggt attatccgct attgacggcg ggcaagagca 2940

```

-continued

```

actcggctcgc cgcatacact attctcagaa tgacttgggt gagtactcac cagtcacaga 3000
aaagcatcctt acggatggca tgacagtaag agaattatgc agtgctgcca taacctgag 3060
tgataacact cgcggccaact tacttctgac aacgatcgga ggaccgaagg agctaaccgc 3120
ttttttgcac aacatggggg atcatgtaac tcgccttgat cgttgggaac cggagctgaa 3180
tgaagccata ccaaacgacg agcgtgacac cacgatgcct gtacgaatgg caacaacgtt 3240
gcgcaaaacta ttaactggcg aactacttac tctagcttcc cggcaacaat taatagactg 3300
gatggaggcg gataaagttg caggaccact tctgcgctcg gcccttccgg ctggctggtt 3360
tattgctgat aaatctggag cgggtgagcg tgggtctcgc ggatcattg cagcactggg 3420
gccagatggt aagcctccc gtatcgtagt tatctacacg acggggagtc aggcaactat 3480
ggatgaacga aatagacaga tcgctgagat aggtgcctca ctgattaagc attggttaact 3540
gtcagaccaa gtttactcat atatacttta gattgattta aaacttcatt ttttaatttaa 3600
aaggatctag gtgaagatcc tttttgataa tctcatgacc aaaatccctt aacgtgagtt 3660
ttcgttccac tgagcgtcac acccgtaga aaagatcaaa ggatcttctt gagatccttt 3720
ttttctgcgc gtaatctgct gcttgcaaac cgcctaccag cgttggtttg 3780
tttgccggat caagagctac caactctttt tccgaaggtta actggcttca gcagagcgca 3840
gataccaaat actgtccttc tagttagcgc gtagttaggc caccacttca agaactctgt 3900
agcacccgct acatcctcgc ctctgctaat cctgttaccg gtggctgctg ccagtggcga 3960
taagtctgtt cttaccgggt tggactcaag acgatagtta ccggataaagg cgcagcggtc 4020
gggctgaacg ggggggttctg gcacacagcc cagcttggag cgaacgaact acaccgaact 4080
gagataccta cagcgtgagc tatgagaaa cgcacgctt cccgaaggga gaaaggcgga 4140
caggatccgc gtaagcggca gggtcggaac aggagagcgc acgagggagc ttcagggggg 4200
aaacgcctgg tatctttata gtctgtcgg gtttcgccac ctctgacttg agcgtcgatt 4260
tttgtgatgc tcgtcagggg ggcggagcct atggaaaaac gccagcaacg cggccttttt 4320
acggttcctg gcccttttgc ggccttttgc tcacatgttc tttcctcgct tatcccttga 4380
ttctgtggat aaccgtatta ccgcctttga gtgagctgat accgctcgcc gcagccgaac 4440
gaccgagcgc agcgagtcag tgagcgagga agcggaaagag cgcaccaatc gcaaacgcc 4500
tctccccgcg cgttggccga ttcattaatg cagcagctgc gcgctcgctc gctcactgag 4560
gccgcccggg caaagccggg gcgtcgggcg accttgggtc gcccgccctc agtgagcga 4620
cgagcgcgca gagaggagat ggcacactcc atcactaggg gttccttga gttaatgatt 4680
aaccgcgat gctactatc tacgtagcca tgccttagga cattgattat tgactagtgg 4740
agttccgcgt tacataaatg acggtaaatg gcccgctgg ctgaccgcgc aacgaacccc 4800
gcccattgac tcaataatg acgtatgttc ccatagtaac gccaataggg actttccatt 4860
gacgtcaatg ggtggagtat ttacggtaaa ctgcccactt ggcagtagat caagtgtatc 4920
atatgccaa gacgccctct attgacgtca atgacggtaa atggcccgc tggaattatg 4980
cccagtagat gaccttatgg gaccttccca ctgggcagta catctacgta ttagtcatcg 5040
ctattaccat ggtcgagggt agccccacgt tctgcttacc tctccccatc tccccccct 5100
ccccacccc aattttgtat ttattatttt ttgtgacagc atggggggcg 5160
gggggggggg gggcgcgcg caggcggggg ggggcggggg gagggggcg gggggcgag 5220
gcggagaggt gcggcgcgag ccaatcagag cggcgcgctc cgaaagtctc cttttatggc 5280
gaggcgcgcg cggcgcgcg cctataaaaa gcgaagcgcg cggcgggcgg gactcgtgc 5340
gcgtgcctt gcgcccgctg cccgcctcgc cccgcctcgc cccgcctcgc cccgcctcgc 5400
actgacgcg ttaactaaa aggtaaagtc ggcctcgcgc cggggttttg gcgcctccgc 5460
cggcgccccc cctcctcacg gcgagcgctg ccacgtcaga cgaaggcgcg agcgaagcgc 5520
ctgatccttc cgcgccgagc ctacggacag cggcccgctg ctcataagac tcggccttag 5580
aaccacagta tcagcagaag gacattttag gacgggactt ggggtgactc agggcactgg 5640
ttttctttc agagagcgga acaggcgagg aaaagtagtc ccttctcggc gattctcgcg 5700
agggatctcc gtggggcggt gaaacgcgat gatgcctcta ctaacctgt tcatgttttc 5760
ttttttttc tacaggtcct ggttgacgaa cagggtaccg ccacctaggc caccggctct 5820
cgcaacaagc ttctctggc ctctgagact ctgtgcctgc cttggctcca ggagggtcc 5880
gccgtagaca tcgataccgt cgetatgtgc tggaggcttg ctgaaggctg tatgctgata 5940
atcacccgtg caggttcagc gttttggcct ctgactgacg ctgaacctgg cgttgattat 6000
caggacacaa ggcctgttac tagcactcac atggaacaaa tggcctctag cctggaggct 6060
tgctgaagcg tggatgtgt tcaatcgcgt attggtaatc gcgttttggc ctctgactga 6120
cgcgattacc aacgcgatg aacaggacac aaggcctgtt actagcactc acatggaaca 6180
aatggcctct agcctggagg cttgctgaag gctgtatgct gtgatcatgc tgaatatggt 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 aattttgtga agattgactg gtattcttaa ctatgttgct 60
ccttttacgc tatgtggata cgctgcttta atgcctttgt atcatgctat tgcttcccgt 120
atggctttca tttctcctc cttgtataaa tccctggctg tgtctcttta tgaggagttg 180
tggcccgttg ttcaggcaacg tggcgtgggt tgcactgtgt ttgctgacgc aacccccact 240
ggttggggca ttgccaccac ctgtcagctc ctttccggga ctttctgttt cccctccct 300
attgccacgg cggaaactcat cgcgcgctgc cttgcccgct gctggacagg ggctcggtcg 360
ttgggcactg ccaattccgt ggtgtgtgcg gggaaatcat cgtcctttcc ttggctgctc 420
gacctgtgtg accactggat tctgcgcggg acgtccttct gctacgtccc ttgggcccct 480
aatccagcgg accttctctc ccgcgcgctg ctgcgggctc tggcgctctt tccgcgtctt 540
cgcttccgcc ctacagcagc tgggatctcc ctttgggccc cctccccgcg taagcttacc 600
gataccgtcg agactaact tgtttattgc agcttataat gggtacaaat aaagcaatag 660
catcacaaat ttcacaaata aagcattttt ttcactgcac tctagtgtgt gtttgcocaa 720

```

-continued

| | | | | | | |
|-------------|-------------|-------------|-------------|------------|-------------|------|
| actcatcaat | gtatcttata | atgtctggat | ctcgacctcg | actagagcat | ggctacgtag | 780 |
| ataagtagca | tggcgggtta | atcattaact | acaaggaacc | cctagtgatg | gagttggcca | 840 |
| ctccctctct | gcgcgctcgc | tcgctcactg | aggcggggcg | accaaggctc | gcccagcgcc | 900 |
| cgggctttgc | cggggcgccc | tcagtgcgcg | agcgagcgcg | cagctggcgt | aatagcggaag | 960 |
| agggccgcac | cgatcgccct | tcccaacagt | tgccgagcct | gaatggcgaa | tggcgattcc | 1020 |
| gttgcaatgg | ctggcggttaa | tattgttctg | gatattacca | gcaaggccga | tagtttgagt | 1080 |
| tcttctactc | aggcaagtga | tgttattact | aatcaagaa | gtattgcgac | aacggttaat | 1140 |
| ttgcgtgatg | gacagactct | tttactcggg | ggcctcactg | attataaaaa | cacttctcag | 1200 |
| gattctgcgc | taccgttcct | gtctaaaaac | cctttaactg | gcctcctggt | tagctcccgc | 1260 |
| tctgattcta | acgaggaag | cacgttatac | gtgctcgta | aagcaaccat | agtacgcgc | 1320 |
| ctgtagcggc | gcattaagcg | cggcggggtg | ggtaggttac | cgcagcgta | ccgctacact | 1380 |
| tgccagcgcc | ctagcgcccg | ctcctttcgc | ttctctccct | tcctttctcg | ccacgttcgc | 1440 |
| cggctttccc | cgtcaagctc | taaatcgggg | gctcccttta | gggttccgat | ttagtgcttt | 1500 |
| acggcacctc | gaccccaaaa | aaacttgatta | gggtgatggg | tcacgtagtg | ggccatcgcc | 1560 |
| ctgtagacgc | gtttttcgcc | ctttgacgtt | ggagtccagc | ttctttaata | gtggactcct | 1620 |
| gttccaaact | ggaacaacac | tcaaccctat | ctcgggtctat | ttttttgatt | tataagggat | 1680 |
| tttgcgatt | tcggcctatt | gggttaaaaa | tgagctgatt | taacaaaaat | ttaacgcgaa | 1740 |
| ttttaacaaa | atatttaagc | ttacaattta | aatatttgct | tatacaactc | tcctgttttt | 1800 |
| ggggcttttc | tgattatcaa | cgggggtaca | tatgattgac | atgctagttt | tacgattacc | 1860 |
| gttcatcgat | tctcttgttt | gctccagact | ctcaggcaat | gacctgatag | cctttgtaga | 1920 |
| gacctctcaa | aaatagctac | cctctccggc | atgaatttat | cagctagaac | gggtgaatat | 1980 |
| catattgatg | gtgatttgac | tgtctccggc | ctttctcacc | cgtttgaatc | tttacctaca | 2040 |
| cattactcag | gcatttgcat | taaaaatata | gaggggttcta | aaaattttta | tccttgcggt | 2100 |
| gaaataaagg | cttctcccg | aaaagtatta | cagggctcata | atgtttttgg | tacaaccgat | 2160 |
| ttagctttat | gctctgaggc | tttattgctt | aattttgcta | attctttgct | ttgcctgcat | 2220 |
| gatttattgg | atgtttggaat | tccctgatcg | gtattttctc | cttacgcata | tgtgcgggat | 2280 |
| ttcacaccgc | atatgggtga | ctctcagtag | aatctgctct | gatgcgcgat | agttaagcca | 2340 |
| gccccgacac | ccgcccaacac | cgcctgacgc | gcccgtgacg | gcttgcctgc | tcggcgcatc | 2400 |
| cgtctacaga | caagctgtga | cgcctccggg | gagctgcata | tgtcagaggt | tttcaccgct | 2460 |
| atcacccgaa | cgcgcgagac | gaaagggcct | cgtgatacgc | ctatttttat | aggttaatgt | 2520 |
| catgataata | atggttttct | agacgtcagg | tggcactttt | cggggaaatg | tgcgcggaac | 2580 |
| ccctatttgt | ttatttttct | aaatacatct | aaatatgtat | cgcctcatga | gacaataacc | 2640 |
| ctgataaagt | cttcaataat | attgaaaaag | gaagagtagt | agtattcaac | atttccgtgt | 2700 |
| cgcccttatt | cccttttttg | cggaattttg | ccttctcgtt | tttgctcacc | cagaaacgct | 2760 |
| ggtgaaagta | aaagatgctg | aagatcagtt | gggtgcacga | gtgggttaca | tcgaactgga | 2820 |
| tctcaacagc | ggtaagatcc | ttgagagttt | tcgccccgaa | gaacggtttc | caatgatgag | 2880 |
| cacttttaaa | gttctgctat | gtggcgcggt | attatcccg | attgacgcgc | ggcaagagca | 2940 |
| actcggctcg | gcatacact | attctcagaa | tgaactgggt | gagtagctac | cagtcacaga | 3000 |
| aaagcatcct | acggatggca | tgacagtaag | agaattatgc | agtgcctcca | taaccatgag | 3060 |
| tgataaacct | cggcccaact | tacttctgac | aacgatcgga | ggaccgaaag | agctaaccgc | 3120 |
| ttttttgcac | aacatggggg | atcatgtaac | tcgcttgat | cgttgggaac | cggagctgaa | 3180 |
| tgaagccata | ccaaacgacg | agcgtgacac | cacgatgcct | gtagcaatgg | caaccaactt | 3240 |
| cgccaaacta | ttaactggcg | aactactttac | tctagcttcc | cggcaacaat | taatagactg | 3300 |
| gatggaggcg | gataaagtgt | caggaccact | tctgcgctcg | gcccttccgg | ctggctgggt | 3360 |
| tattgctgat | aaatctggag | cgggtgagcg | tgggtctcgc | ggatcatctg | cagcactggg | 3420 |
| gcagatgggt | aagccctccc | gtactgtagt | tatctacacg | acggggagtc | aggcaactat | 3480 |
| ggatgaacga | aatagacaga | tcgctgagat | aggtagctca | ctgattaaag | attggtaact | 3540 |
| gtcagaccaa | gtttactcat | atatacttta | gattgattta | aaacttcatt | tttaatttaa | 3600 |
| aaggatctag | tgaaagatcc | tttttgataa | tctcatgacc | aaaatccctt | aacgtgagtt | 3660 |
| ttcgttccac | tgagcgtcag | accccgtaga | aaagatcaaa | ggatcttctt | gagatccttt | 3720 |
| ttttctgcgc | gtaactctgt | gcttgcaaac | aaaaaaacca | ccgtaccag | cggtaggtttg | 3780 |
| tttgccggaat | caagagctac | caactctttt | tcggaaggta | actgggttca | gcagagcgca | 3840 |
| gatacccaat | actgtccttc | tagttagacc | gtagttaggc | caccacttca | agaactctgt | 3900 |
| agcacccgct | acatacctcg | ctctgctaata | cctgttacc | gtggctgctg | ccagtggcga | 3960 |
| taagtctgtg | cttaccgggt | tggactcaag | acgatagtta | cggataaagg | cgcagcggtc | 4020 |
| gggctgaacg | gggggttcgt | gcacacagcc | cagcttggag | cgaacgacct | acaccgaaact | 4080 |
| gagataccta | cagcgtgagc | tatgagaaag | cgcacgcgtt | cccgaaggga | gaaaggcgga | 4140 |
| caggatctcg | gtaagcggca | gggtcggaa | aggagagcgc | acgagggagc | ttccaggggg | 4200 |
| aaacgcctgg | tatctttata | gtcctgtcgg | gtttcgccac | ctctgacttg | agcgtcgatt | 4260 |
| tttgtgatgc | tcgtcagggg | ggcggagcct | atggaaaaac | gccagcaacg | cggccttttt | 4320 |
| acggttcctg | ggcttttgc | ggccttttgc | tcacatgttc | tttctgctg | tatccctga | 4380 |
| ttctgtggat | aaacgtatta | cgccttttga | gtgagctgat | accgctcgcc | gcagccgaac | 4440 |
| gaccgagcgc | agcaggtcag | tgagcgagga | agcgaagag | cgcccaatac | gcaaacggcc | 4500 |
| tctccccgcg | cgttggccga | ttcattaatg | cagcagctgc | gcgctcgctc | gctcactgag | 4560 |
| gcgcggcggg | caaagccggg | gcgtcggg | acctttggct | gcccggtctc | agtgagcgag | 4620 |
| cgagcgcgca | gagagggagt | ggccaactcc | atcactaggg | gttcttggta | gttaatgatt | 4680 |
| aaccgcgcat | gctacttate | tacgtagcca | tgctctagga | cattgattat | tgactagtgg | 4740 |
| agttccgcgt | tacataactt | acggtaaatg | gccgcgctgg | ctgaccgccc | aacgaccccc | 4800 |
| gcccattgac | gtcaataatg | acgtatgttc | ccatagtaac | gccaataggg | actttccatt | 4860 |
| gacgtcaatg | ggtggaggtat | ttacgtgtaa | ctgcccactt | ggcagtagat | caagtgtatc | 4920 |
| atatgccaa | tacgccccct | attgacgtca | atgacggtaa | atggcccgcc | tggcattatg | 4980 |
| cccagtagat | gaccttatgg | gaccttccca | cttggcagta | catctacgta | ttagtcatcg | 5040 |
| ctattaccat | ggtagaggtg | agccccacgt | tctgcttcac | tctcccatc | ccccccccct | 5100 |
| ccccaccccc | aaattttgat | ttattttatt | tttaattatt | ttgtgcagcg | atggggggcg | 5160 |
| gggggggggg | gggcgcgcgc | caggcggggc | ggggcggggc | gagggggggg | gcggggcgag | 5220 |
| gcggagaggt | gcggcgccag | ccaatcagag | cggcgcgctc | cgaaagtctt | cttttatggc | 5280 |

-continued

| | | | | | | |
|------------|-------------|-------------|------------|------------|------------|------|
| gaggcgccg | cggcgccg | cctataaaaa | gcgaagcg | cggcgccg | gagtcgctg | 5340 |
| gcgctgcctt | cgcccgctg | cccgctccgc | cgccgcctcg | cgccgcgcgc | cccgctctg | 5400 |
| actgaccg | ttactaaaac | aggtaagtcc | ggcctccgcg | cgggttttg | gcgcctccgc | 5460 |
| cggcgccg | cctcctcacg | gcgagcgctg | ccacgtcaga | cgaagggcgc | agcgagcgtc | 5520 |
| ctgatacctt | cgcccgga | ctcaggacag | cgcccgctg | ctcataagac | tcggccttag | 5580 |
| aaacccagta | tcagcagaag | gacatttttag | gacgggactt | gggtgactct | agggcactgg | 5640 |
| ttttctttcc | agagagcgga | acaggcgagg | aaaagtagtc | ccttctcgcc | gattctgctg | 5700 |
| agggatctcc | gtggggcggt | gaacgcgat | gatgcctcta | ctaaccatgt | tcagtgtttc | 5760 |
| tttttttttc | tacaggctct | gggtgacgaa | cagggtaccg | ccaccatggc | caccgctct | 5820 |
| cgcacaagcc | tgtctgtggc | tttcggactg | ctgtgcctgc | cttggctcca | ggagggtctc | 5880 |
| gcgctagca | tcgataccgt | cgctatgtgc | tggaggcttg | ctgaaggctg | tatgctgagg | 5940 |
| taatatcctg | acgctcagcc | gttttgccct | ctgactgacg | gctgagcgtg | gatattacct | 6000 |
| caggacacaa | ggcctgttat | tagcactcac | atggaacaaa | tggcctctag | cctggaggct | 6060 |
| tgctgaagcg | tgatgtctgt | acagatacag | ataatcagcg | cgtttttggc | ctctgactga | 6120 |
| cggcgctgat | tctgatctctg | tacaggacac | aaggcctgtt | actagcactc | acatggaaca | 6180 |
| aatggcctct | agcctggagg | cttgcgtgaag | gctgtatgct | gtcatgttta | aaaatcgcct | 6240 |
| gcgctgtttg | 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 | aattttgtgaa | agattgactg | gtattcttaa | ctatgtttgct | 60 |
| cctttttacg | tatgtggata | cgctgcttta | atgccttttg | atcatgctat | tgcttcccg | 120 |
| atggctttta | ttttctcctc | cttgtataaa | tcttggttgc | tgtctcttta | tgaggagtgt | 180 |
| tggcccgctg | tcaggcaacg | tggcggtggt | tgcactgtgt | ttgctgacgc | aaacccact | 240 |
| ggttggggca | ttgccaccac | ctgtcagctc | ctttccggga | ctttcgcttt | ccccctccct | 300 |
| attggccagg | cggaaactat | cgcgcctgc | cttgcctgct | gctggacagg | ggctcggtg | 360 |
| ttgggcactg | acaattccgt | gggtgtgtcg | gggaaatcat | cgtcctttcc | ttggctgctc | 420 |
| gcctgtgttg | ccacctggat | cttcgcgcgg | acgtccttct | gctacgtccc | ttcgccctc | 480 |
| aatccagcgg | accttctctc | cgcgcgcctg | ctgcgcgctc | tgcggcctct | tcgcgctctt | 540 |
| cgccttcgcc | ctcagacgag | tcggatctcc | ctttgggccc | cctcccccgc | taagcttatc | 600 |
| gataccgtcg | agatctaact | tgtttattgc | agcttataat | ggttacaaat | aaagcaatag | 660 |
| catcacaaat | ttcacaaaata | aagcaattttt | ttcactgcat | tctagtgtgt | gtttgtccaa | 720 |
| actcatcaat | gtatcttatc | atgtctggat | ctcgacctcg | actagagcat | ggctacgtag | 780 |
| ataagtagca | tggcgggtta | atcattaact | acaaggaaac | cctagtgtatg | gagttggcca | 840 |
| ctccctctct | gcgcgctcgc | tcgctcactg | aggccggggc | accaaaggtc | gcccgaagcc | 900 |
| cgggctttgc | ccggggcgcc | tcagtgcagc | agcgagcgcg | cagctggcgt | aatagcgaag | 960 |
| aggcccgac | cgatcgccct | tcaccaacgt | tgcgcagcct | gaatggcgaa | tggcgattcc | 1020 |
| gttgcaatgg | ctggcggtta | tattgtttctg | gatattacca | gcaaggccga | tagtttgagt | 1080 |
| tcttctactc | aggcaagtga | tgttattact | aatcaagaa | gtattgcgac | aacggttaat | 1140 |
| ttgcgtgatg | gacagactct | tttactcggt | ggcctcactg | attataaaaa | cacttctcag | 1200 |
| gattctggcg | tacggttctc | gtctaaaatc | cctttaatcg | gcctcctgtt | tagctcccg | 1260 |
| tctgatctta | acgaggaaag | cagcttatac | gtgctcgta | aagcaaccat | agtacgcgcc | 1320 |
| ctgtagcggc | gcattaaagg | cggcggggtg | gggtggttac | cgcagcgtga | ccgctacact | 1380 |
| tgccagcgcc | ctagcgcccg | ctcctttcgc | tttcttccct | tcctttctcg | ccacgttcgc | 1440 |
| cggctttccc | cgtcaagctc | taaaatcggg | gctcccttta | gggttccgat | ttagtgtctt | 1500 |
| acggcacctc | gaccccaaaa | aacttgatta | gggtgatggt | tcacgtagtgt | ggccatcgcc | 1560 |
| ctgataagcg | gtttttcgcc | ctttgacgtt | ggagtcacag | ttctttaata | gtggactcct | 1620 |
| gtttccaaat | ggaacaacac | tcaaccttat | ctcggtctat | tccttttgatt | tataagggat | 1680 |
| tttgccgatt | tcggcctatt | gggttaaaaa | tgagctgatt | taacaaaaat | ttaacgcgaa | 1740 |
| ttttaacaaa | atattaacgt | ttacaattta | aatatttgct | tatacaatct | tcctgttttt | 1800 |
| ggggcttttc | tgattatcaa | ccggggtaca | tatgattgac | atgctagtgt | tacgattacc | 1860 |
| gttcacgat | tctctgtgtt | gctccagact | ctcaggcaat | gacctgtag | cctttgtaga | 1920 |
| gacctctcaa | aaatagctac | cctctccggc | atgaatttat | cagctagaac | ggttgaatat | 1980 |
| catattgatg | gtgatttgac | tgtctccggc | ctttctcacc | cgtttgaatc | tttacctaca | 2040 |
| cattactcag | gcatttgcat | taaaatatat | gagggttcta | aaaattttta | tccttgctgt | 2100 |
| gaaataaagg | cttctcccg | aaaagtatta | cagggtcata | atgttttttg | tacaacccat | 2160 |
| ttagctttat | gctctgaggc | tttattgctt | aattttgcta | attctttgct | ttgctgtgat | 2220 |
| gatttattgg | atgttggaat | tcttgatgct | gtattttctc | cttacgcac | tgtgcgggat | 2280 |
| ttcacaccgc | atatggtgca | ctctcagtag | aatctgctct | gatgcgcgat | agttaagcca | 2340 |
| gcgccgacac | ccgccaacac | ccgctgacgc | gccctgacgg | gcttgctctg | tcgccgcac | 2400 |
| cgtctacaga | caagctgtga | cgtctccgg | gagctgcacg | tgtcagaggt | tttcaccgtc | 2460 |
| atcacccgaa | cgcgcgagac | gaaagggcct | cgtgatacgc | ctatttttat | aggttaatgt | 2520 |
| catgataata | atggtttctt | agacgtcagg | tggcactttt | cgggggaatg | tgcgcggaac | 2580 |
| ccctatttgt | ttattttttc | aaatacatct | aaatatgtat | ccgctcatga | gacaataacc | 2640 |
| ctgataaatg | cctcaataat | attgaaaaag | gaagagtatg | agttatcaac | atttccgtgt | 2700 |
| cgcctctatt | cccttttttg | cggcattttg | ccttctctgt | tttgctcacc | cagaaacgct | 2760 |
| ggtgaaagta | aaagatgctg | aagatcagtt | gggtgcacga | gtgggttaca | tcgaaactgga | 2820 |
| tctcaacagc | ggtgaagatc | ttgagagttt | tcgccccgaa | gaacgttttc | caatgatgag | 2880 |
| cacttttaaa | gttctgctat | gtggcgcggt | attatcccg | attgacgcgc | ggcaagagca | 2940 |
| actcggctcg | cgcatacaat | attctcagaa | tgacttggtt | gagtaactac | cagtcacaga | 3000 |
| aaagcatctt | acggatggca | tgacagtaag | agaattatgc | agtgcgtcca | taaccatgag | 3060 |

-continued

| | | | | | | |
|-------------|-------------|-------------|-------------|------------|-------------|------|
| tgataaact | gcgcccaact | tactttctgac | aacgatcgga | ggaccgaagg | agctaaccgc | 3120 |
| ttttttgcac | aacatggggg | atcatgtaac | tgccttgat | cggtgggaac | cggagctgaa | 3180 |
| tgaagccata | ccaaacgacg | agcgtgacac | cacgatgcct | gtagcaatgg | caacaacgtt | 3240 |
| gcgcaacta | ttaactggcg | aactacttac | tctagcttcc | cggcaacaat | taatagactg | 3300 |
| gatggaggcg | gataaagtgt | caggaccact | tctgcgctcg | gcccttcggg | ctggctgggt | 3360 |
| tattgctgat | aaatctggag | cgggtgagcg | tgggtctcgc | ggatcattg | cagcactggg | 3420 |
| gccagatggt | aagccctccc | gtatcgtagt | tatctacacg | acggggagtc | aggcaactat | 3480 |
| ggatgaacga | aatagacaga | tcgctgagat | agggtcccca | ctgattaaag | attggtaact | 3540 |
| gtcagaccaa | gtttactcat | atatacttta | gattgattta | aaacttcatt | tttaatttaa | 3600 |
| aaggatctag | gtgaagatcc | tttttgataa | tctcatgacc | aaaatccctt | aacgtgagtt | 3660 |
| ttcgtttccac | tgagcgtcag | accccgtaga | aaagatcaaa | ggatcttctt | gagatccttt | 3720 |
| ttttctgcgc | gtaatctgct | gcttgcaaac | aaaaaaacca | ccgctaccag | cgggtggtttg | 3780 |
| tttgcgggat | caagagctac | caactctttt | tccgaaggta | actggcttca | gcagagcgca | 3840 |
| gataccaaat | actgtccttc | tagtgtagcc | gtagttaggc | caccacttca | agaactctgt | 3900 |
| agcaccgcct | acatacctcg | ctctgcta | cctgttacca | gtggctgctg | ccagtggcga | 3960 |
| taagtctgtg | cttaccgggt | tggaactcaag | acgatagtta | ccggataagg | cgcagcggtc | 4020 |
| gggctgaacg | gtgggttctg | gcacacagcc | cagcttgagg | cgaacgacct | acaccgaact | 4080 |
| gagataccta | cagcgtgagc | tatgagaaag | cgccacgctt | cccgaaggga | gaaaggcgga | 4140 |
| caggatctcg | gtaagcggca | gggtcggaac | aggagagcgc | acgagggagc | ttccaggggg | 4200 |
| aaacgcctcg | gtactttata | gtcctgtcgg | gtttcgccac | ctctgacttg | agcgtcgatt | 4260 |
| tttgtgatgc | tcgtcagggg | ggcggagcct | atggaaaaac | gccagcaacg | cggccttttt | 4320 |
| acggttcctg | gccctttgtc | ggccttttgc | tcacatgttc | ttctctgctg | tatcccttga | 4380 |
| ttctgtggat | aaecgtatta | ccgcctttga | gtgagctgat | accgctcgcc | gcagccgaac | 4440 |
| gaccgagcgc | agcaggtcag | tgagcgagga | agcgggaagag | cgcccaatac | gcaaacccgc | 4500 |
| tctccccgcg | cattggccga | ttcataatg | cagcagctgc | gcgctcgctc | gctcactgag | 4560 |
| gcccgcctcg | caaagccggg | gcgtcgggcg | acctttggtc | gcccgccctc | agtgagcgag | 4620 |
| cgagcgcgca | gagaggaggt | ggccaaactcc | atcactaggg | gttccttgta | gttaatgatt | 4680 |
| aaaccgcat | tactacttat | tacgtagcca | tgccttagga | cattgattat | tgactagtgg | 4740 |
| agttccgcgt | gtcataactt | acggtaaatg | gcccgcctgg | ctgaccgccc | aaagaccccc | 4800 |
| gcccattgac | gtcaataatg | acttatgttc | ccatagtaac | gccaataggg | actttccatt | 4860 |
| gacgtcaatg | gggtggatgt | ttacggtaaa | ctgcccaact | ggcagtaac | caagtgtatc | 4920 |
| atatgccaa | tacgccccct | attgacgtca | atgacggtaa | atggccccgc | tgccattatg | 4980 |
| cccagtagac | gaccttatgg | gactttccta | cttgccagta | catctacgta | ttagtcatcg | 5040 |
| ctattaccat | ggcgcagggt | agccccacgt | tctgcttcac | tctccccatc | tccccccctc | 5100 |
| ccccaccccc | aatttttgtat | ttattttatt | tttaattatt | ttgtgcagcg | atggggggcg | 5160 |
| gggggggggg | ggggcgcgcg | caggcggggc | ggggcggggc | gagggggcgg | gcggggcgag | 5220 |
| gcggagaggt | gcggcgcgag | ccaatcacag | cggcgcgctc | cgaaggttcc | cttttatggc | 5280 |
| gaggcgcgcg | cggcgcgcg | cctataaaaa | gcgaagcgcg | cggcgggcgg | gagtcgctgc | 5340 |
| cgctgccttc | cgcgcccgtc | ccgcctccgc | cgcgcctcgc | cgccgcgcgc | cccggctctg | 5400 |
| actgaccgcg | ttactaaaac | aggtaagtcc | ggcctccgcg | cgggtttttg | gcgcctccgc | 5460 |
| cggcgcccc | cctcctcacg | gcgagcgctg | ccacgtcaga | cgaagggcgc | agcgagcgctc | 5520 |
| ctgacccctc | cgcgccgagc | ctcaggacag | cggcccgctg | ctcataagac | tcggcccttag | 5580 |
| aaacccagta | tcagcagaag | gacattttag | gacgggactt | gggtgactct | agggcactgg | 5640 |
| ttttcttttc | agagagcgga | acaggcgagg | aaaagtagtc | ccttctcggc | gattctcgcg | 5700 |
| agggatctcc | gtggggcggt | gaacgcgat | gatgcctcta | ctaaccatgt | tcatgttttc | 5760 |
| tttttttttc | tacaggtcct | gggtgacgaa | cagggtaccg | ccaccatggc | caccggctct | 5820 |
| cgcacaagcc | tgctgctggc | tttcggactg | ctgtgcctgc | cttggctcca | ggagggctcc | 5880 |
| gcgcgtagca | tcgataccgt | cgttatgtgc | tggaggcttg | ctgaaggctg | tatgctgatg | 5940 |
| aatcgggttg | tcgaatcgc | gttttggcct | ctgactgacg | cgattcagaa | cccgaattcat | 6000 |
| caggacacaa | ggcctgttac | tagcactcac | atggaacaaa | tggcctctag | cctggaggct | 6060 |
| tgctgaaggg | tgtatgctga | acactttgct | atatcatcct | gcgttttggc | ctctgactga | 6120 |
| cgcaggatga | tagcaaatgt | ttcaggacac | aaggcctgtt | actagcactc | acatggaaca | 6180 |
| aatggcctct | agcctggagg | cttgctgaag | gctgtatgct | gttctgttcg | ttaagetaat | 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 | aattttgtgaa | agattgactg | gtattcttaa | ctatgttgct | 60 |
| ccttttacgc | tatgtggata | cgtctgttta | atgcctttgt | atcatgctat | tgcttcccgt | 120 |
| atggctttca | ttttctcctc | cttgataaaa | tcttggttgc | tgtctcttta | tgaggagtgtg | 180 |
| tgccccgttg | tcaggcaaac | tggcgtggtg | tgcactgtgt | ttgctgacgc | aacccccact | 240 |
| ggttggggca | ttgccaccac | ctgtcagctc | ctttccggga | ctttcgtctt | ccccctccct | 300 |
| attgccacgg | cggaaactcat | cgcgcctcgc | cttgcccgtc | gctggacagg | ggctcggctg | 360 |
| ttgggcactg | acaattccgt | ggtgttgtcg | gggaaatcat | cgtcctttcc | ttggtgcttc | 420 |
| gctgtgtttg | ccactcggat | tctgcgcggg | acgtccttct | gctacgtccc | ttcggccctc | 480 |
| aatccagcgg | accttccttc | cgcggcctc | ctgcggcctc | tgcggcctct | tccgcgtctt | 540 |
| cgccttcgcc | ctcagacgag | tcggatctcc | ctttggggcg | cctccccgcc | taagcttatc | 600 |
| gataccgtcg | agatctaaat | tgtttattgc | agcttataat | ggttacaaat | aaagcaatag | 660 |
| catcacaaat | ttcacaaaa | aagcattttt | ttcactgcac | tctagttgtg | gtttgtccaa | 720 |
| actcatcaat | gtatcttctc | atgtctggat | ctcgacctcg | actagagcat | ggctacgtag | 780 |
| ataagtagca | tggcgggtta | atcataaact | acaaggaacc | cctagtgtatg | gagttggcca | 840 |

-continued

| | | | | | | |
|-------------|-------------|------------|------------|-------------|-------------|------|
| ctccctctct | gcgcgctcgc | tcgctcactg | aggcggggcg | accaaaggtc | gcccgacgcc | 900 |
| cgggctttgc | ccgggcgggc | tcagtgcg | agcgagcgcg | cagctggcgt | aatagcgaag | 960 |
| aggcccgac | cgatcgccct | tcccaacagt | tgcgcagcct | gaatggcgaa | tggcgattcc | 1020 |
| gttgcaatgg | ctggcggtta | tattgttctg | gatattacca | gcaaggccga | tagtttgagt | 1080 |
| tcttctactc | aggcaagtga | tgttattact | aatcaaaaga | gtattgcgac | aacggttaat | 1140 |
| ttgcgtgatg | gacagactct | tttactcggg | ggcctcactg | attataaaaa | cacttctcag | 1200 |
| gattctggcg | taccgttctc | gtctaaaatc | cctttaatcg | gcctcctgtt | tagctccgcg | 1260 |
| tctgattcta | acgaggaag | cacgttatac | gtgctcgta | aagcaaccat | agtacgcgcc | 1320 |
| ctgtagcggc | gcattaaagc | cggcggtgtg | ggtggttacg | cgcagcgtga | ccgctacact | 1380 |
| tgcagcgcc | ctagcgcccg | ctccttccg | tttcttccct | tcctttctcg | ccaggttcgc | 1440 |
| cggcttttcc | cgtaagctc | taaaatcg | gctcccttta | gggttccgat | ttagtgcctt | 1500 |
| acggcacctc | gaccccaaaa | aacttgatta | gggtgatggt | tcacgtagtg | ggccatcgcc | 1560 |
| ctgatagacg | gtttttcgcc | ctttgacgtt | ggagtccacg | ttctttaata | gtggactctt | 1620 |
| gttccaaact | ggaacaacac | tcaaccctat | ctcggtctat | tccttttgatt | tataagggat | 1680 |
| tttgccgatt | tcggcctatt | gggtaaaaaa | tgagctgatt | taacaaaaat | ttaacgcgaa | 1740 |
| ttttaacaaa | tgattaaact | ttacaattta | aataatttgc | tatacaatct | tcctgttttt | 1800 |
| ggggcttttc | tgattatcaa | ccggggtaca | tatgattgac | atgctagttt | tacgattacc | 1860 |
| gttcatcgat | tctcttgttt | gctccagact | ctcaggcaat | gacctgtag | cctttgtaga | 1920 |
| gaacctctca | aaatagctac | cctctccggc | atgaatttat | cagctagaac | ggttgaatat | 1980 |
| catattgatg | gtgatttgac | tgtctccggc | ctttctcacc | cgtttgaatc | tttacctaca | 2040 |
| cattactcag | gcattgcatt | taaaatatat | gagggttcta | aaaaatttta | tccttgcggt | 2100 |
| gaaataaagg | cttctcccg | aaaagtatta | cagggtcata | atgttttggg | tacaaccgat | 2160 |
| ttagctttat | gctctgagcg | tttattgctt | aattttgcta | attctttgce | ttgcctgtat | 2220 |
| gatttattgg | atgttggaat | tcttgatcgc | gtattttctc | cttacgcac | tgtgcgggat | 2280 |
| ttcacaccgc | atatggtgca | ctctcagtac | aatctgctct | gatgcgcgat | agttaagcca | 2340 |
| gccccgacac | gcgccaacac | ccgctgacgc | gccctgacgg | gcttgctctg | tcgccgcac | 2400 |
| gccttacaga | caagctgtga | cgtctccgg | gagctgcacg | tgtcagaggt | ttcacccgtc | 2460 |
| atcacccgaa | gcgcgagac | gaaaggccct | cgtgatacgc | ctatttttat | aggttaaatgt | 2520 |
| catgataata | atggtttctt | agacgtcagg | tggcactttt | cggggaaatg | tgcgcggaac | 2580 |
| ccctatttgt | ttatttttct | aaatacatte | aaatatgtat | ccgctcatga | gacaataacc | 2640 |
| ctgataaatg | cttcaaatat | attgaaaaag | gaagagtatg | agttattcaac | atttccgtgt | 2700 |
| cgcctcttat | cccttttttg | cggcattttg | ccttctctgt | tttgctcacc | cagaaaacgt | 2760 |
| ggtgaaagta | aaagatgctg | aagatcagtt | gggtgcacga | gtgggttaca | tcgaactgga | 2820 |
| tctcaacagc | ggttaagatcc | ttgagagttt | tcgccccgaa | gaacgttttc | caatgatgag | 2880 |
| cacttttaaa | gttctgctat | gtggcgcggt | attatcccg | attgacgcgc | ggcaagagca | 2940 |
| actcggctcg | cgcatacact | attctcagaa | tgaacttggt | gagtaactac | cagtcacaga | 3000 |
| aaagcatctt | acggatggca | tgacagtaag | agaattatgc | agtctgcca | taaccatgag | 3060 |
| tgataaacct | gcggccaaact | tacttctgac | aacgatcgga | ggaccgaagg | agctaaccgc | 3120 |
| ttttttgcac | aacatggggg | atcatgtaac | tcgccttgat | cgttggggaa | cggagctgaa | 3180 |
| tgaagccata | ccaaacgacg | agcgtgacac | cacgatgcct | gtagcaatgg | caacaacggt | 3240 |
| gcgcaaaact | ttaactggcg | aactacttac | tctagcttcc | cggcaacaat | taatagactg | 3300 |
| gatggaggcg | gataaagtgg | caggaccact | ctcgctcg | gcccttccgg | ctggctgggt | 3360 |
| tattgctgat | aaatctggat | cgggtgagcg | tgggtctcgc | ggtatcattg | cagcactggg | 3420 |
| gccagatggt | aagccctccc | gtatcgtagt | tatctacacg | acggggagtc | aggcaactat | 3480 |
| ggatgaacga | aatagacaga | tcgctgagat | agggtccctc | ctgattaagg | attggttaact | 3540 |
| gtcagaccaa | gtttactcat | atatacttta | gattgattta | aaacttcatt | tttaatttaa | 3600 |
| aaggatctag | gtgaagatcc | tttttgataa | tctcatgacc | aaaatccctt | aacgtgagtt | 3660 |
| tctgttccac | tgagcgtcag | accocgtaga | aaagatcaaa | ggatcttctt | gagatccttt | 3720 |
| ttttctgcgc | gtaatctgct | gcttgcaaac | aaaaaaacca | cgcctaccag | cgggtggtttg | 3780 |
| tttgccggat | caagagctac | caactctttt | tcggaaggta | actggcttca | gcagagcgca | 3840 |
| gataccaaat | actgctcttc | tagttagacc | gtagttaggc | caccacttca | agaactctgt | 3900 |
| agcaccgcct | acatacctcg | ctctgcta | cctgttacc | gtggtgctg | ccagtggcg | 3960 |
| taagtcgtgt | cttaccgggt | tggactcaag | acgatagtta | ccggataagg | cgcagcggtc | 4020 |
| gggtggaacg | gggggttctg | gcacacagcc | cagcttgag | cgaacgacct | acaccgaact | 4080 |
| gagataacct | cagcgtgagc | tatgagaaag | cgccacgctt | ccggaaggga | gaaaggcgga | 4140 |
| caggtatccg | gtaagcggca | gggtcggaac | aggagagcgc | acgagggagc | ttccaggggg | 4200 |
| aaacgcctgg | tatctttata | gtcctgctcg | gtttcgccac | ctctgacttg | agcgtcgatt | 4260 |
| tttgtagtgc | tcgtcagggg | gcgggagcct | atggaaaaac | gccagcaacg | cggccttttt | 4320 |
| acggttctcg | gccttttctg | ggccttttgc | tcacatgttc | tttctcgct | tatcccttga | 4380 |
| ttctgtggat | aacgctatta | ccgcctttga | gtgagctgat | accgctcgcc | gcagccgaac | 4440 |
| gaccgagcgc | agcgagtcag | tgagcgagga | agcggaaag | cgcccaatac | gcaaacgcgc | 4500 |
| tctccccgcg | cgttgggcca | ttcattaatg | cagcagctgc | gcgctcgctc | gctcactgag | 4560 |
| gcgcggcgcg | caaagccggg | gcgtcgggcg | acctttggtc | gcccgccctc | agtgagcgag | 4620 |
| cgagcgcgca | gagagggagt | ggccaactcc | atcactaggg | gttccttgta | gttaatgatt | 4680 |
| aaaccgcctat | gctacttate | tacgtagcca | tgtctagga | cattgattat | tgactagtgg | 4740 |
| agttccgcgt | tacataactt | acggtaaatg | gcccgccctg | ctgaccgccc | aacgaccccc | 4800 |
| gcccattgac | gtcaataatg | acgtatgttc | ccatagtaac | gccaataggg | actttccatt | 4860 |
| gacgtcaatg | ggtggagtat | ttacggtaaa | ctgcccactt | ggcagtagat | caagtgtatc | 4920 |
| atatgccaa | tacgccccct | attgacgtca | atgacggtaa | atggcccgcc | tggcattatg | 4980 |
| cccagtagat | gaccttatgg | gactttccta | cttgccagta | catctacgta | ttagtcatcg | 5040 |
| ctattaccat | ggtcgaggtg | agccccacgt | tctgcttcc | tctccccate | tccccccct | 5100 |
| ccccaccccc | aatttttgat | ttattttatt | tttaattatt | ttgtgcagcg | atggggggcg | 5160 |
| gggggggggg | gggcgcgcgc | caggcggggc | ggggcggggc | gagggggcg | gcggggcgag | 5220 |
| gcggagaggt | gcggcgcgag | ccaatcagag | cggcgcgctc | cgaaggttcc | cttttatggc | 5280 |
| gaggcgcgcg | cggcgcgcg | cctataaaaa | gcgaagcgcg | cggcgggcg | gagtcgctgc | 5340 |
| gcgctgcctt | cgccccgtgc | ccgcctccgc | cgcgcgctcg | cgcgcgcccc | cccggtctgc | 5400 |

-continued

```

actgaccgcy ttactaaaac agttaagtcc ggccctccgc cggggttttg gcgcctcccg 5460
cgggcgcccc cctcctcacg gcgagcgctg ccacgtcaga cgaaggcgcg agcgagcgctc 5520
ctgaccccttc cgcccggaag ctcaggacag cggcccgctg ctcataagac tcggcccttag 5580
aaacccagta tcagcagaag gacattttag gacgggactt ggggtgactct agggcactgg 5640
ttttcttttc agagagcgga acaggcgagg aaaagtagtc ccttctcggc gattctgcgg 5700
agggatctcc gtggggcggt gaacgcgat gatgcctcta ctaaccatgt tcatgttttc 5760
tttttttttc tacaggctct ggggtgacgaa cagggtaccg ccaccatggc caccggctct 5820
cgcaacagcc tgcgtctggc tttcggactg ctgtgcctgc cttggctcca ggagggtctc 5880
gcccgtagca tcgataccgt cgtatgtgct tggaggcttg ctgaaggctg tatgtcggag 5940
cattagcaat gcgaacagaa gttttggcct ctgactgact tctgttcgtt gctaatgtct 6000
caggacacaa ggccgtgttac tagcactcac atggaacaaa tggcctctag cctggaggct 6060
tgctgaaggc tgtatgtcga aacataatgg attcagcagc gcgttttggc cctgactgta 6120
cgcgctgctg accattatgt ttccaggacac aaggcctgtt actagcactc acatggaaca 6180
aatggcctct agcctggagg ctgtgtgaag gctgtatgct gttatctttg cgaagctgcc 6240
atccgttttg gcctctgact gacggatggc agccgcaaaag 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 cgtgctttta atgcctttgt atcatgctat tgcttcccg 120
atggctttca tttctctctc ctgtatataa tccctgggtg tgtctcttta tggaggagtg 180
tggcccgctg tcaggcaacg tggcgtgggt tgcactgtgt ttgctgacgc aacccccact 240
ggttggggca tggccacacg ctgtcagctc ctttccggga ctttcgcttt cccctccct 300
attgccacgg cggaactcat cgccgcctgc cttgcccgcg gctggacagg ggctcggctg 360
ttgggcactg acaattccgt ggtgtgtgct gggaaatcat cgtcctttcc ttggctgctc 420
gcctgtgttg ccactcggat tctgcgcggg acgtccttct gctacgtccc ttcggccctc 480
aatccagcgg accttctctc ccgcgcgcct ctgcgcgcctc tgcggcctct tccgcgtctt 540
cgcccttcgc ctcagacgag tgggatctcc ctttgggccc cctccccgcc taagcttatc 600
gataccgtcg agatctaact tgtttattgc agcttataat ggttacaata aaagcaatag 660
catcacaaat ttcacaaata aagcattttt ttcactgcat tctagtgtg gtttgcctaa 720
actcatcaat gtatcttatc atgtctggat ctcgacctcg actagagcat ggctacgtag 780
ataagtacga tggcggggtta atcattaact acaaggaaac ctagtgatg gatttggcca 840
ctccctctct cgccgctcgc tgcctcactg aggcggggcg accaaaggct gcccgacgcc 900
cgggcttttc cggggcgccc tcaagtgcgc agcgagcgcg cagctggcgt aatagcgaag 960
aggcccgcac cgatcgccct tcccacagct tgcgcagcct gaatggcgaa tggcgattcc 1020
gttgcaatgg tggcggttaa tattgttctg gatattacca gcaaggcgga tagtttgagt 1080
tcttctactc aggcgaagtga tgttattact aatcaaaaga gtattgcgac aacggttaat 1140
ttgcgtgatg gacagactct tttactcgtt ggccctcactg attataaaaa cacttctcag 1200
gattctggcg tacggttctc gtctaaaaat cctttaatcg gcctcctgtt tagctccgcg 1260
ctgattctta acgaggaagc caggttatat gtgctcgtca aagcaaccat agtacgcgcc 1320
ctgtagcgcg gcattaagcg ctcgcgggtgt ggtggttacg cgcagcgtga ccgctacact 1380
tgccagcgcc cttagcgcgcg ctcccttctc tctcttctcg ccacgttctc 1440
cggctttccc cgtcaagctc taaatcgggg gctcccttta ggggtccgat ttagtcttt 1500
acggcacctc gaccccaaaa aacttgatta ggggtgatgt tcacgtagtg ggccactgcc 1560
ctgatagacg gtttttcgcc ctttgacgtt ggagtcacag ttctttaata gtggactctt 1620
gttccaaact ggaacaacac tcaaccctat ctcggtctat tcttttgatt tataagggat 1680
tttgccgatt tcggcctatt ggttaaaaaa tgagctgatt taacaaaaat ttaacgcgaa 1740
ttttaacaaa atattaacgt ttacaattta aatatttgc tatacaatct tctgttttt 1800
ggggcttttc tgattatcaa ccggggtaca tatgattgac atgctagtgt tacgattacc 1860
gttcatcgat tctcttgttt cctccagact ctcaggcaat gacctgatag cctttgtaga 1920
gacctctcaa aaatagctac cctctccggc atgaatttat cagctagaac ggttgaatat 1980
catattgatg gtgatttgac tgtctccggc ctttctcacc cgtttgaatc tttacctaca 2040
cattactcag gcattgcatt taaaatatat gagggttcta aaaattttta tcttgcgtt 2100
gaaataaagg cttctccgcg aaaaagtata cagggtcata atgttttttg tacaaccgat 2160
tagcttttat gctctgaggg tttattgctt aattttgcta attctttgcc ttgcctgtat 2220
gatttattgg atgttggaat tctctatgag gtattttctc cttacgcate tgtgcgggat 2280
ttcacaccgc atatgggtgca ctctcagtag aatctgctct gatccgcct agttaagcca 2340
gccccgacac ccgccaacac ccgctgacgc gccctgacgg gcttgtctgc tcccgccatc 2400
cgcttacaga caagctgtga ccgtctccgg gagctgcatg tgtcagaggt tttcaccgtc 2460
atcccgaaaa cgcgcgagac gaagggcct cgtgatacgc ctatttttat aggttaatgt 2520
catgataata atgggtttctt agacgtcagg tggcactttt cggggaaatg tgcgcggaac 2580
ccctatttgt ttatttttct aaatacatct aaatatgtat ccgctcatga gacaataacc 2640
ctgataaatg cttcaataat attgaaaaag gaagagtatg agtattcaac atttccgtgt 2700
cgcccttatt cctttttttg cggcattttt ccttctctgt tttgctcacc cagaaacgct 2760
gggtgaaagt aaagatgctg aagatcagtt ggggtgcaga gtgggttaca tcgaactgga 2820
tctcaacagc ggttaagatcc ttgagagttt tcgccccgaa gaacgttttc caatgatgag 2880
cacttttaaa gttctgtctat gtggcgcggt attatccgct attgacgcgc ggcaagagca 2940
actcggctcg cgcatacact attctcagaa tgacttggtt gactactcac cagtcacaga 3000
aaagcatctt ccggatggga tgacagtaag agaattatgc agtgctgcca taaccatgag 3060
tgataaacct cgggccaact tactctgac aacgatcgga ggacgcgaag agctaaccgc 3120
ttttttgcac aacatggggg atcatgtaac tcgccttgat cgttgggaac cggagctgaa 3180

```

-continued

| | | | | | | |
|-------------|------------|-------------|-------------|------------|-------------|------|
| tgaagccata | ccaaacgacg | agcgtgacac | cacgatgcct | gtagcaatgg | caacaacgtt | 3240 |
| gcgcaaaacta | ttaactggcg | aactactttac | tctagcttcc | cggcaacaat | taatagactg | 3300 |
| gatggaggcg | gataaagtgt | caggaccact | tctgcgctcg | gcccttccgg | ctggctgggt | 3360 |
| tattgctgat | aaatctggag | cgggtgagcg | tgggtctcgc | ggtatcattg | cagcactggg | 3420 |
| gccagatggt | aagccctccc | gtatcgtagt | tatctacacg | acggggagtc | aggcaactat | 3480 |
| ggatgaacga | aatagacaga | tcgctgagat | agggtgcctca | 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 | cgggtggtttg | 3780 |
| tttgccggat | caagagctac | caactctttt | tccgaaggta | actggcttca | gcagagcgca | 3840 |
| gataccaaat | actgtccttc | tagttagacc | gtagttaggc | caccacttca | agaactctgt | 3900 |
| agcaccgcct | acatacctcg | ctctgcta | cctgttacca | gtggtgctg | ccagtggcga | 3960 |
| taagtctggt | cttaccgggt | tggactcaag | acgatagtta | cggataagg | cgcagcggtc | 4020 |
| gggctgaacg | gggggttctg | gcacacagcc | cagcttggag | cgaacgacct | acaccgaact | 4080 |
| gagataccta | cagcgtgagc | tatgagaaag | cgccacgctt | cccgaaggga | gaaaggcggga | 4140 |
| caggatccg | gtaagcggca | gggtcggaac | aggagagcgc | acgagggagc | ttccaggggg | 4200 |
| aaacgcctgg | tatctttata | gtcctgtcgg | gtttcgccac | ctctgacttg | agcgtcgatt | 4260 |
| tttgtgatgc | tcgtcagggg | ggcggagcct | atggaaaaac | gccagcaacg | cggccttttt | 4320 |
| acggttccctg | gccttttctg | ggccttttgc | tcacatgttc | tttctgctg | tatccccctga | 4380 |
| ttctgtggt | aacgtatta | ccgcctttga | gtgagctgat | accgctcgcc | gcagccgaac | 4440 |
| gaccgagcgc | agcagtgctg | tgagcgagga | agcgggaagag | cgcaccaatc | gcaaacgcgc | 4500 |
| tctccccgcg | cgttggcgga | ttcattaagt | cagcagctgc | gcgctcgctc | gctcactgag | 4560 |
| gcccgcggcg | caaagcccg | gcgtcgggcg | acctttgtgc | gcccgccctc | agtgagcgag | 4620 |
| cgagcgcgca | gagagggagt | ggcccaactcc | atcactaggg | gttccttgta | gttaatgatt | 4680 |
| aaaccgccat | gcactctatc | tacgtagcca | tgctctagga | cattgattat | tgactagtgg | 4740 |
| agttccgcgt | tacataactt | acggtaaatg | gcccgccctg | ctgaccgccc | aacgaccccc | 4800 |
| gcccattgac | gtcaataagt | acgtatgttc | ccatagtaac | gccaataggg | actttccatt | 4860 |
| gagtcgaatg | ggtggagtat | ttacggtaaa | ctgcccactt | ggcagtagat | caagtgtatc | 4920 |
| atatgccaa | tacgccccct | attgacgtca | atgacggtaa | atggcccgc | tggcattatg | 4980 |
| cccagttacat | gaccttatgg | gactttccta | cttggcagta | catctacgta | ttagtcatcg | 5040 |
| ctattaccat | ggtcgaggtg | agccccacgt | tctgcttcc | tctccccatc | ttccccccct | 5100 |
| ccccaccccc | aattttgtat | ttatttattt | tttaattatt | ttgtgcagcg | atggggggcg | 5160 |
| gggggggggg | gggcgcgcgc | caggcggggc | ggggcggggc | gagggggcg | gcggggcgag | 5220 |
| gaggagaggt | gcggcgcgag | ccaatcagag | cggcgcgctc | cgaaggttcc | cttttatggc | 5280 |
| gaggcgggcg | cgggcgggcg | cctataaaaa | gcgaagcgcg | cggcgggcg | gagtcgctgc | 5340 |
| gcgctgcctt | cgccccgtgc | cccgctccgc | cgcgcctcgc | cgcgcgccgc | cccggctctg | 5400 |
| actgaccgcg | ttactaaaac | aggtaagtcc | ggcctccgcg | cggggttttg | gcgcctcccg | 5460 |
| ggggcgcccc | cctcctcaag | gcgagcgctg | ccaagtcaga | cgaagggcgc | agcgagcgctc | 5520 |
| ctgatctctc | cgcccggaag | ctcaggacag | cggcccgctg | ctcataagac | tcggccttag | 5580 |
| aaacccagta | tcagcagaag | gacattttag | gacgggactt | gggtgactct | agggcactgg | 5640 |
| ttttctttcc | agagagcgga | acaggcgagg | aaaagtagtc | ccttctcggc | gattctcgcg | 5700 |
| agggatctcc | gtggggcggt | gaacgccgat | gatgcctcta | ctaaccatgt | tcattgtttc | 5760 |
| tttttttttc | tacaggtcct | gggtgacgaa | cagggtagcg | ccaccatggc | caccggtctc | 5820 |
| cgacacaagc | tgctgctggc | tttcggactg | ctgtgcctgc | cttggctcca | ggagggtctc | 5880 |
| gcgcctagca | tcgataccgt | cgtcatgtgc | tggaggcttg | ctgaaggctg | tatgctggct | 5940 |
| cctccacttg | gtgggttggt | tttgccctct | gactgacgcg | gcaacattct | ggtgattaca | 6000 |
| ggacacaagg | cctgttacta | gcactcacat | ggaacaaatg | gcctctagcc | tggaggcttg | 6060 |
| ctgaaggctg | tatgtgtca | taatcgctat | ttggtgcggc | gttttggcct | ctgactgacg | 6120 |
| cgcacccaaa | gcgattatga | caggacacaa | ggcctgttac | tagcactcac | atggaacaaa | 6180 |
| tggcctctag | cctggagggt | tgctgaaggc | tgtatgctgt | tctgatcctg | aagttcgggt | 6240 |
| tcgttttggc | ctctgactga | gcaacccgaa | ccaggatcag | aacaggacac | aaggcctggt | 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 | tggtattacaa | aattttgtgaa | agattgactg | gtattcttaa | ctatgttgc | 60 |
| ccttttacgc | tatgtggata | cgctgcttta | atgcctttgt | atcatgctat | tgttcccgt | 120 |
| atggctttca | ttttctcttc | cttgataaaa | tcttggttgc | tgtctcttta | tgaggagttg | 180 |
| tggccggttg | tcaggcaaac | tggcgtgggt | tgcactgtgt | ttgctgacgc | aacccccact | 240 |
| ggttggggca | ttgccaaccac | ctgtcagctc | ctttccggga | ctttcgcttt | ccccctccct | 300 |
| attgccacgg | cggaaactcat | cgcgcctgc | cttgcccgc | gctggacagg | ggctcggctg | 360 |
| tgtggcactg | acaattccgt | ggtgtgtgtg | gggaaatcat | cgtcctttcc | ttggctgtctc | 420 |
| gcctgtgttg | ccacctggat | tctgcgcggg | acgtccttct | gctacgtccc | ttcgcccttc | 480 |
| aatccagcgg | accttctctc | cgcgggctg | ctgcggctc | tgcggcctct | ttcgctctct | 540 |
| cgccttgcgc | ctcagacgag | tggatctccc | ctttggggcg | cctccccgc | taagcttatc | 600 |
| gataccgtcg | agacttaact | tgtttattgc | agcttataat | ggttacaat | aaagcaatag | 660 |
| catcacaaat | ttcacaaata | aagcattttt | ttcactgcat | tctagtgtgt | gtttgtccaa | 720 |
| actcatcaat | gtatcttatc | atgtctggat | ctcgacctcg | actagagcat | ggctacgtag | 780 |
| ataagtagca | tggcgggtta | atcattaact | acaaggaacc | cctagtgtatg | gagttggcca | 840 |
| ctccctctct | gcgcgctcgc | tcgctcactg | aggccggggc | accaaaggtc | gcccagcgcc | 900 |
| cgggctttgc | ccggggcgcc | tcagttagcg | agcgagcgcg | cagctggcgt | aatagcgga | 960 |

-continued

| | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|------|
| agggccgcac | cgatgcgcct | tcccaacagt | tgcgcagcct | gaatggcgaa | tggcgattcc | 1020 |
| gttgcaatgg | ctggcggtaa | tattgttctg | gatattacca | gcaaggcoga | tagtttgagt | 1080 |
| tcttctactc | aggcaagtga | tgttattact | aatcaaaaga | gtattgcgac | aacggttaat | 1140 |
| ttgcgtgatg | gacagactct | tttactcggg | ggcctcactg | attataaaaa | cacttctcag | 1200 |
| gattctggcg | taccgttccct | gtctaaaatc | cctttaatcg | gcctcctggt | tagctcccgc | 1260 |
| tctgattcta | acgaggaag | cacgttatac | gtgctcgtea | aagcaaccat | agtacgcgcc | 1320 |
| ctgtagcggc | gcattaagcg | cggcgggtgt | gggtggttacg | cgcagcgtga | ccgctacact | 1380 |
| tgccagcgcc | ctagcgcgcc | ctcctttcgc | ttcttccct | tcctttctcg | ccacgttcgc | 1440 |
| cggctttccc | cgtaagctc | taaatcgggg | gctcccttta | gggttccgat | ttagtgtttt | 1500 |
| acggcacctc | gaccccaaaa | aacttgatta | gggtgatggt | tcacgtagt | ggccatcgcc | 1560 |
| ctgatagacg | gtttttcgcc | ctttgacgtt | ggagtccacg | ttctttaata | gtggactctt | 1620 |
| gttccaaact | ggaacaacac | tcaaccctat | ctcggctctat | tcttttgatt | tataagggat | 1680 |
| tttgcgatt | tcggcctatt | gggtaaaaaa | tgagctgatt | taacaaaaat | ttaacgcgaa | 1740 |
| ttttaacaaa | atatttaacgt | ttacaattta | aatatttgct | tatacaatct | tcctgttttt | 1800 |
| ggggcttttc | tgattatcaa | cgggggtaca | tatgattgac | atgctagttt | tacgattacc | 1860 |
| gttcatcgat | tctctgtttt | gctccagact | ctcaggcaat | gacctgatag | cctttgtaga | 1920 |
| gaacctctca | aaatagctac | ctctccggc | atgaatttat | cagctagaac | ggttgaatat | 1980 |
| catattgatg | gtgatttgac | tgtctccggc | ctttctcacc | cgtttgaatc | tttacctaca | 2040 |
| cattactcag | gcattcgcatt | taaaatatat | gagggttcta | aaaattttta | tccttgcggt | 2100 |
| gaaataaagg | tctctccgc | aaaagtatta | caggggtcata | atgtttttgg | tacaacccgat | 2160 |
| ttagctttat | gctctgagcg | tttattgctt | aattttgcta | attctttgcc | ttgcctgtat | 2220 |
| gatttattgg | atggttgaat | ctctgatcg | gtattttctc | cttacgcac | tgtgcgggat | 2280 |
| ttcacaccgc | atatggtgca | ctctcagta | aatctgctct | gatgccgcac | agtttaagcca | 2340 |
| gccccgcac | ccgccaacac | ccgctgacgc | gccctgacgg | gcttgtctgc | ttccggcatc | 2400 |
| cgttacaga | caagctgtga | cgtctccgg | gagctgcatg | tgtcagaggt | tttaccgcgc | 2460 |
| atcacccgaaa | ccgcgcagac | gaaagggcct | ctgtatacgc | ctatttttat | aggttaatgt | 2520 |
| catgataata | atgggtttctt | agacgtcagg | tggcactttt | cggggaaatg | tgcgcgggaa | 2580 |
| ccctatttgt | ttatttttct | aaatacattc | aaatatgtat | ccgctcatga | gacaataacc | 2640 |
| ctgataaatg | cttcaataat | attgaaaaag | gaagagtatg | agtatccaac | atttccgtgt | 2700 |
| cgcccttatt | cccttttttg | cggcattttg | ccttccctgtt | tttgctcacc | cagaaaacgt | 2760 |
| gggtgaaagta | aaagatgcgt | aaagatgcgt | gggtgcacga | gtgggttaca | tcgaactgga | 2820 |
| tctcaacagc | ggtaagatcc | ttgagagtgt | tcgccccgaa | gaacgttttc | caatgatgag | 2880 |
| cacttttaaa | gttctgtctat | gtggcgcggt | attatcccg | attgacgcgc | ggcaagagca | 2940 |
| actcggctcg | cgcatacact | attctcagaa | tgacttggtt | gagtaactcac | cagtcacaga | 3000 |
| aaagcatctt | acggatggca | tgacagtaag | agaattatgc | agtgcctcca | taaccatgag | 3060 |
| tgataaacct | gcggccaact | tacttctgac | aacgatcgga | ggaccgaagg | agctaaccgc | 3120 |
| ttttttgcac | aacatggggg | atcatgtaac | tcgccttgat | cgttgggaa | cggagctgaa | 3180 |
| tgaagccata | ccaaacgacg | agcgtgacac | cacgatgcct | gtagcaatgg | caacaacgtt | 3240 |
| gcgcaaaact | ttaactggcg | aactacttac | tctagcttcc | cggcaacaat | taatagactg | 3300 |
| gatggagcg | gataaagtgt | caggaccact | ctcgcgctcg | gcccttccgg | ctggctgggt | 3360 |
| tattgctgat | aaatctggag | ccgggtgagc | tgggtctcgc | ggatcatttg | cagcactggg | 3420 |
| gccagatggt | aagccctccc | gtatcgtagt | tatctacacg | acggggagtc | aggcaactat | 3480 |
| ggatgaacga | aatagacaaga | tcgctgagat | agggtcccca | ctgattaaag | attggttaact | 3540 |
| gtcagaccaa | gtttactcat | atatacttta | gattgattta | aaacttcatt | tttaatttaa | 3600 |
| aaggatctag | gtgaagatcc | tttttgataa | tctcatgacc | aaaatccctt | aacgtgagtt | 3660 |
| ttcgttccac | tgagcgtcag | accccgtaga | aaagatcaaa | ggatcttctt | gagatccttt | 3720 |
| ttttctgcgc | gtaactgtct | gcttgcaaac | aaaaaaacca | ccgctaccag | cgggtggtttg | 3780 |
| tttgcggat | caagagctac | caactctttt | tccgaaggt | actggctcca | gcagagcgca | 3840 |
| gatacccaat | actgtccttc | tagtttaggc | gtagtttaggc | caccacttca | agaactctgt | 3900 |
| agcaccgcct | acatacctcg | ctctgcta | cctgttacc | gtggctgctg | ccagtggcga | 3960 |
| taagtctgt | cttaccgggt | tggaactcaag | acgatagtta | cgggataagg | cgcagcggtc | 4020 |
| gggtgaaag | gggggttcgt | gcacacagcc | cagcttgag | cgaacgaact | acaccgaact | 4080 |
| gagataccta | cagcgtgagc | tatgagaaa | cggcacgctt | cccgaaggga | gaaaggcgga | 4140 |
| caggtatccg | gtaagcggca | gggtcggaac | aggagagcgc | acgagggagc | ttccaggggg | 4200 |
| aaacgcctgg | tatctttata | gtcctgtcgg | gtttcgcac | ctctgacttg | agcgtcgatt | 4260 |
| tttgtgatgc | tcgtcagggg | ggcggagcct | atggaaaaac | gccagcaacg | cggccttttt | 4320 |
| acggttcctg | gccttttctg | ggccttttgc | tcacatgttc | tttctgctg | tatcccttga | 4380 |
| ttctgtggat | aacggtatta | ccgcctttga | gtgagctgat | accgctcgcc | gcagccgaac | 4440 |
| gaccgagcgc | agcagatcag | tgagcgagga | agcgggaag | cgcccaatac | gcaaacccgc | 4500 |
| tctccccgcg | cgttgccgca | ttcattaatg | cagcagctgc | gcgctcgctc | gctcactgag | 4560 |
| gccgcccggg | caaagccggg | cgctcggcg | accttttgct | gcccgccctc | agtgagcgag | 4620 |
| cagagcgcga | gagagggagt | ggccaaactc | atcactaggg | gttctctgta | gttaatgatt | 4680 |
| aaccgcctat | gctactatc | tacgtagcca | tgtcttagga | cattgatgat | tgactagtgg | 4740 |
| agttccgcgt | tacataactt | acggtaaatg | gcccgccctg | ctgaccgccc | aacgaccccc | 4800 |
| gccattgac | gtcaataatg | acgtatgttc | ccatagtaac | gccaataggg | actttccatt | 4860 |
| gacgtcaatg | gggtggagtat | ttacggtaaa | ctgcccactt | ggcagtaac | caagtgtatc | 4920 |
| atatgccaa | tacgccccct | attgacgtca | atgacggtaa | atggcccgcc | tggcattatg | 4980 |
| cccagtcac | gaccttatg | gactttccta | cttggcagta | catctacgta | ttagtcatcg | 5040 |
| ctattaccat | ggctgaggtg | agccccacgt | tctgcttcac | tctccccatc | ttccccccct | 5100 |
| ccccaccccc | aattttgtat | ttatttattt | tttaattatt | tttgtgacgc | atggggggcg | 5160 |
| gggggggggg | gggcgcgcgc | caggcggggc | ggggcggggc | gagggggcg | gcggggcgag | 5220 |
| gcggagaggt | gcggcgccag | ccaatcagag | cggcgcgctc | cgaaagtctc | cttttatggc | 5280 |
| gaggcggcg | cggcgcgcc | cctataaaaa | gcgaagcgcg | cggcgggcg | gagtcgctgc | 5340 |
| gcgctgcctt | cgcgccgtgc | cccgcctcgc | cgcgcctcgc | cgcgcgccgc | cccgcctcgc | 5400 |
| actgaccgcg | ttactaaaac | aggtaagtcc | ggcctccgcg | cgggtttttg | gcgcctccgc | 5460 |
| cgggcgcccc | cctcctcag | gcgagcgctg | ccacgtcaga | cgaagggcgc | agcagcgctc | 5520 |

-continued

| | | | | | | |
|------------|------------|-------------|------------|------------|-------------|------|
| ctgatecttc | cgcccgagc | ctcaggacag | cgcccgctg | ctcataagac | tcggccttag | 5580 |
| aaacccagta | tcagcagaag | gacatttttag | gacgggactt | gggtgactct | agggcactgg | 5640 |
| tttttttttc | agagagcgga | acaggcgagg | aaaagtagtc | ccttctcggc | gattctgcgg | 5700 |
| agggatctcc | gtggggcggt | gaacgcccga | gatgcctcta | ctaaccatgt | tcattgtttc | 5760 |
| tttttttttc | tacaggctct | gggtgacgaa | cagggtaccg | ccaccatggc | caccggctct | 5820 |
| cgacacaagc | tgtctgctgc | tttcggactg | ctgtgcctgc | cttggtccca | ggagggtccc | 5880 |
| gcccgtagca | tcgataccgt | cgctatgtgc | tggaggcttg | ctgaaggctg | tatgctgaaa | 5940 |
| tcctccgggt | gttccactgc | gttttggcct | ctgactgacg | cagtggaaac | cggaagattt | 6000 |
| caggacacaa | ggcctgttac | tagcactcac | atggaacaaa | tggcctctag | cctggaggct | 6060 |
| tgtgaaggc | tgtatgctga | tatcctgaat | atggtatgca | gcgttttggc | ctctgactga | 6120 |
| cgctgcatac | cattcaggat | atcaggacac | aaggcctgtt | actagcactc | acatggaaaca | 6180 |
| aatggcctct | agcctggagg | cttctggaag | gctgtatgct | gtttaaagct | caaacgcgtt | 6240 |
| gcgcgttttg | gcctctgact | gacggcgaa | 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 | tgttcccctg | 120 |
| atggctttca | ttttctcttc | cttgataaaa | tccctggtgc | tgtctcttta | tgaggagtgt | 180 |
| tggccggttg | tcaggcaacg | tggcgtggtg | tgcactgtgt | ttgctgacgc | aaaccccaact | 240 |
| gggtggggca | ttgccaccac | ctgtcagctc | ctttccggga | ctttcgcttt | ccccctccct | 300 |
| attgccacgg | cggaactcat | cgccgcctgc | cttgcccgct | gctggacagg | ggctcggctg | 360 |
| ttgggcaact | acaattccgt | ggtgtgtgtc | gggaatcat | cgtcctttcc | ttggtgtctc | 420 |
| gctgtgtgtg | ccacctggat | tctgcgcggg | acgtccttct | gctacgtccc | ttcgccctcc | 480 |
| aatccagcgg | accttctctc | cgccgcgctg | ctgcgcgctc | tgcggcctct | tccgctctct | 540 |
| cgcttccgcc | ctcagacgag | tcggatctcc | ctttgggccc | cctccccgcc | taagcttatc | 600 |
| gataccgtcg | agatctaaat | tgtttattgc | agcttataat | ggttacaaaat | aaagcaatag | 660 |
| catcacaaat | ttcacaaaaa | aagcattttt | ttcactgcat | tctagtgtgtg | gtttgtccaa | 720 |
| actcatcaat | gtatcttatc | atgtctggat | ctcgacctcg | actagacgat | ggctacgtag | 780 |
| ataagtagca | tggcgggtta | atcattaaat | acaaggaacc | cctagtgtatg | gagttggcca | 840 |
| ctccctctct | gcgcgctcgc | tcgctcactg | agggccggcg | accaaaaggct | gcccgcacgc | 900 |
| cgggctttgc | ccgggcggcc | tcagtgcgag | agcgcgcgcg | cagctggcgt | aatagcgaag | 960 |
| agggccgcac | cgatccgccc | ttcccaacagt | tgcgcagcct | gaatggcgaa | tgccgacttc | 1020 |
| gttgcaatgg | ctggcggtaa | tattgttctg | gatattacca | gcaaggccga | tagtttgagt | 1080 |
| ttctctactc | agggcaagtga | gtttattact | aatcaaaaga | gtattgcgac | aacgggtaat | 1140 |
| ttgcgtgatg | gacagactct | tttactcggg | ggcctcactg | attataaaaa | cactttctcag | 1200 |
| gattctggcg | taccgttccc | gtctaaaaatc | cctttaatcg | gcctcctggt | tagctcccgc | 1260 |
| tctgattcta | acgaggaaga | cacgttatac | gtgctcgta | aagcaaccat | agtcacgcgc | 1320 |
| ctgtagcggc | gcattaaagc | cggcgggtgt | gggtggttacg | cgcagcgtga | ccgctacact | 1380 |
| tgcacgcgc | ctagcgcggc | ctcctttcgc | ttctctccct | tcctttctcg | ccacgttcgc | 1440 |
| cggctttccc | cgtcaagctc | taaaatcggg | gctcccttta | gggttccgat | ttagtgcctt | 1500 |
| acggcacctc | gacccccaaa | aacttgatta | gggtgatggt | tcacgtatgt | ggccatcgcc | 1560 |
| ctgatagacg | gtttttcgcc | ccttgacgtt | ggagtcacag | ttctttaata | gtggactctt | 1620 |
| gttccaaact | ggacacaacac | ttcaacctat | ctcggcttat | ctttttgatt | tataagggat | 1680 |
| tttgccgatt | tcggcctatt | gggttaaaaa | tgagctgatt | taacaaaaat | ttaacgcgaa | 1740 |
| ttttaacaaa | atattaaact | ttacaattta | aatatttgct | tatacaatct | tctgtttttt | 1800 |
| ggggcttttc | tgattatcaa | ccggggtaca | tatgattgac | atgctagtgt | tacgattacc | 1860 |
| gttcatcgat | tctcttgttt | gctccagact | ctcaggcaat | gacctgatag | cctttgtaga | 1920 |
| gacctctcaa | aaatagctac | cctctccggc | atgaatttat | cagctagaac | gggtgaatat | 1980 |
| catattgatg | gtgatttgac | tgtctccggc | ctttctcacc | cgtttgaatc | tttacctaca | 2040 |
| cattactcag | gcattgcatt | taaaaatat | gaggggttcta | aaaaattttta | tccttgcgtt | 2100 |
| gaaataaagg | cttctcccg | aaaagtatta | cagggtcata | atgtttttgg | tacaaccgat | 2160 |
| ttagctttat | gctctgaggc | tttattgctt | aattttgcta | attctttgcc | ttgctcgtat | 2220 |
| gatttatttg | atgttggaat | tcctgatgcg | gtattttctc | cttacgcatac | tgtgcgggat | 2280 |
| ttcacaccgc | atatggtgca | ctctcagtag | aatctgctct | gatgcgcgat | agtttaagcca | 2340 |
| gccccgacac | ccgccaacac | ccgctgacgc | gccctgacgc | gcttgctctg | tcccggcact | 2400 |
| cgcttacaga | caagctgtga | ccgtctccgg | gagctgcata | tgtcagaggt | tttcaccgtc | 2460 |
| atcacccgaa | cgccgcgagc | gaaaggccct | cgtgatacgc | ctatttttat | aggttaaatgt | 2520 |
| catgataata | atgggtttct | agacgtcagg | tggcactttt | cggggaaatg | tgccgcggaac | 2580 |
| ccctatttgt | ttatttttct | aaatacattc | aaatatgtat | ccgctcatga | gacaataacc | 2640 |
| ctgataaatg | cttcaataat | attgaaaaag | gaagagtagt | agtattcaac | atttccgtgt | 2700 |
| cgcccttatt | cccttttttg | cggcattttg | ccttctctgt | tttgctcacc | cagaaacgct | 2760 |
| gggtgaaagt | aaagatgctg | aagatcagtt | gggtgcacga | gtgggttaca | tcgaactgga | 2820 |
| tctcaacagc | ggtaagatcc | ttgagagttt | tcgccccgaa | gaacgttttc | caatgatgag | 2880 |
| cacttttaaa | gttctgctat | gtggcgcggt | attatcccg | attgacgccg | ggcaagagca | 2940 |
| actcggctcg | cgatacaact | attctcagaa | tgaacttggt | gagtaactcac | cagtcacaga | 3000 |
| aaagcatctt | acggatggca | tgacagtaag | agaattatgc | agtgctgcca | taacctgag | 3060 |
| tgataaacct | gcccgaacac | tacttctgac | aacgatcgga | ggaccgaagg | agctaaccgc | 3120 |
| ttttttgcac | aacatggggg | atcatgtaac | tcgccttgat | cgttggggaa | cggagctgaa | 3180 |
| tgaaagccata | ccaaacgacg | agcgtgacac | cacgatgcct | gtagcaatgg | caacaacgct | 3240 |
| gcgcaaaact | ttaactggcg | aactacttac | tctagcttcc | cggcaacaat | taatagactg | 3300 |

-continued

```

gatggaggcg gataaagttg caggaccact tctgcgctcg gcccttcagg ctggttggtt 3360
tattgctgat aaatctggag ccggtgagcg tgggtctcgc ggtatcattg cagcactggg 3420
gccagatggt aagccctccc gtatcgtagt tatctacacg acggggagtc aggcaactat 3480
ggatgaacga aatagacaga tcgctgagat aggtgcctca ctgattaagc attggttaact 3540
gtcagaccac gtttactcat atatacttta gattgattta aaacttcatt ttaattttaa 3600
aaggatctag gtgaagatcc tttttgataa tctcatgacc aaaactccctt aacgtgagtt 3660
tcggtccac tgagcgctcag acccgtaga aaagatcaaa ggatcttctt gagatccttt 3720
ttttctgcgc gtaatctgct gcttgcaaac aaaaaaacca ccgctaccag cgggtggtttg 3780
tttgccgcat caagagctac caactctttt tccgaagcta actggttcca gcagagcgca 3840
gataccaaat actgtccttc tagtgtagcc gtagttaggc caccacttca agaactctgt 3900
agcaccgcct acatacctcg ctctgcta at cctgttacca gtggtctgctg ccagtggcga 3960
taagtcgtgt cttaccgggt tggactcaag acgatagtta ccggataagg cgcagcggtc 4020
gggctgaacg ggggggtcgt gcacacagcc cagcttgagg cgaacgaact acaccgaact 4080
gagataccct cagcgtgagc tatgagaaa gcacacgctt ccggaaggga gaaaggcgga 4140
caggatcccg gtaagcgga gggctcggaac aggagagcgc acgagggagc ttcacggggg 4200
aaacgcctgg tatcttata gtctgtcgg gtttcgccac ctctgacttg agcgtcgatt 4260
tttgatgctc tcgtcagggg ggcggagcct atggaaaaac gccagcaacg cggccttttt 4320
acggttcctg gccctttgct ggccttttgc tcacatgttc tttcctcgct tatccccctga 4380
ttctgtggat aaccgtatta ccgcctttga gtgagctgat accgtcgcg gcagccgaac 4440
gaccgagcgc agcagctcag tgagcgagga agcggaaagag gcgccaatac gcaaacgcgc 4500
tctccccgcg cgttgccgga ttcattaatg cagcagctgc gcgctcgctc gctcactgag 4560
gccgcccggg caaagccggg gcgtcgggcg acctttggtc gcccgccctc agtgagcgag 4620
cgagcgcgca cgaggggagc ggccaactcc atcactaggg gttccttgta gttaatgatt 4680
aaccgcctat gctacttatc tacgtagcca tgccttagga cattgattat tgactagtgg 4740
agttccgctg tacataaact acggtaaatg gccgcctgg ctgaccgccc aacgaacccc 4800
gccattgac gctcaaatg acgtatgttc ccatagtaac gccaataggg actttccatt 4860
cagctcaatg ggtggagtat ttacggtaaa ctgcccactt ggcagtagat caagtgtatc 4920
atatgccaa gacgccctct attgacgtca atgacggtaa atggcccgc tggcattatg 4980
cccagtagat gaccttatgg gaccttccca ctgggcagta catctacgta ttagctatcg 5040
ctattaccat ggtcgagggt agccccactg tctgcttcac tctccccatc tccccccct 5100
ccccacccc aattttgtat ttatttatt ttgtgcagcg atggggcgcg 5160
gggggggggg gggcgcgcg caggcggggg gggggcgggg gagggcgggg gcggggcgag 5220
gcggagaggt gcggcgcgag ccaatcagag cggcgcgctc cgaaagtctc cttttatggc 5280
gaggcgcgcg cgggcgcgcg cctataaaaa gcgaagcgcg cggcgggcgg gactcgctgc 5340
gcgctgcctt cgcctcgctc cccgcctcgc cgccgcctcg cgccgcgcgc cccggtctg 5400
actgaccgcg ttactaaaac aggtaaagtc ggcctccgcg cgggttttgg gcgcctcccg 5460
cggcgccccc cctcctcaag gcgagcgctg ccacgtcaga cgaaggcgcg agcgaagctc 5520
ctgaccttc cgcccgagc ctcaggacag cggcccgctg ctcataagac tcggccttag 5580
aaccacagta tcagcagaag gacattttag gacgggactt gggtagctct agggcactgg 5640
ttttctttc agagagcgga acaggcgagg aaaagtagtc ccttctcgcg gattctcgcg 5700
agggatctcc gtggggcggt gaaagcgcat gatgctcta ctaaccatgt tcatgttttc 5760
ttttttttc tacaggtcct gggtagcgaa cagggtaccg ccaccatggc caccggctct 5820
cgcaacaagc tctgctggc ttctggactg ctgtgctgc cttggctcca ggagggtcc 5880
gcgctagca tcgataccgt cgctatgtgc tggaggcttg ctgaaggctg tatgctgtaa 5940
taaaggctcg ggaatcacc gttttggcct ctgactgacg ggtgattccg acctttatta 6000
caggacacaa ggcctgttac tagcactcac atggaacaaa tggcctctag cctggaggct 6060
tgctgaagcg tgatgtctgt aatacgccag atcaccatca gcgttttggc ctctgactga 6120
cgctgatggt gctggcgat tacaggacac aaggcctgtt actagcactc acatggaaca 6180
aatggcctct agcctggagg ctgtctgaag gctgtatgct gatcacgaaa cgaagggttca 6240
ggcgttttgg gcctctgact gaaggcctga 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 tgcttcccg 120
atggctttca tttctctctc ctgtgataaa tcctggttgc tgtctcttta tgaggagttg 180
tgcccgcttg tcaggcaacg tggcggtggt tgcaactgtg ttgctgacgc aacccccact 240
ggttggggca ttgccaccac ctgtcagctc ctttcgggga ctttgcgttt cccctccct 300
attgccacgg ggaactcatc cgccgcctgc cttgcccgtg gctggacagg ggctcggtcg 360
ttgggcactg acaattccgt ggtgtgtgct gggaaatcat cgtcctttcc ttggctgctc 420
gcctgtgttg ccacctggat tctgcgcggg acgtccttct gctacgtccc ttcggccctc 480
aatccagcgg accttctctc ccgcgccctg ctgcccgtgc tgcggcctct tccggtctt 540
cgcttcgccc ctcagacgag tcgcatctcc ctttggggcg cctccccgcc taagcttatc 600
gataccgtcg agatctaact tgtttattgc agcttataat ggttacaaat aaagcaatag 660
catcacaaat ttccacaaat aagcattttt ttcactgcat tctagtgtgt gtttgtccaa 720
actcatcaat gtatcttata atgtctggat ctgcacctcg actagagcat ggctacgtag 780
ataagtagca tggcgggtta atcattaaat acaaggaaac cctagtgtat gagttggcca 840
ctccctctct gcgcgctcgc tcgctcactg aggcggggcg accaaaggtc gcccgacgcc 900
cgggctttgc ccgggggggc tcagtgcgcg agcgagcgcg cagctggcgt aatagcgaag 960
agggccgcac cgatcgccct tcccaacagt tgcgcagcct gaatggcgaa tggcgattcc 1020
gttgcaatgg ctggcggtta tattgttctg gatattacca gcaaggccga tagtttgagt 1080

```


-continued

| | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|------|
| tcttctactc | aggcaagtga | tgttattact | aatcaaagaa | gtattgcgac | aacggttaat | 1140 |
| ttgcgtgatg | gacagactct | tttactcggg | ggcctcactg | attataaaaa | cacttctcag | 1200 |
| gattctggcg | taccgttcct | gtctaaaatc | cctttaatcg | gcctcctggt | tagctcccgc | 1260 |
| tctgattcta | acgaggaag | cacgttatac | gtgctcgta | aagcaacccat | agtacgcgcc | 1320 |
| ctgtagcggc | gcattaaagc | cggcgggtgt | ggtggttacg | cgcagcgta | ccgctacact | 1380 |
| tgccagcgcc | ctagcgcccg | ctcctttcgc | ttctctccct | tcctttctcg | ccacgttcgc | 1440 |
| cggctttccc | cgtcaagctc | taaactcggg | gctcccttta | gggtccgat | ttagtgcttt | 1500 |
| acggcacctc | gaccccaaaa | aacttgatta | gggtgatggg | tcacgtagtg | ggccatcgcc | 1560 |
| ctgatagacg | gttttttcg | ccttgacgtt | ggagtcacg | ttctttaata | gtggactcct | 1620 |
| gttccaaact | ggaacaacac | tcaaccctat | ctcggctctat | ctttttgatt | tataagggat | 1680 |
| tttgccgatt | tcggcctatt | gggttaaaaa | tgagctgatt | taacaaaaat | ttaacgcgaa | 1740 |
| ttttaacaaa | atattaacgt | ttacaattta | aatatttgct | tatacaatct | tcctgttttt | 1800 |
| ggggcttttc | tgattatcaa | cgggggtaca | tatgattgac | atgctagttt | tacgattacc | 1860 |
| gttcatcgat | tcctttgttt | gctccagact | ctcaggcaat | gacctgatag | cctttgtaga | 1920 |
| gacctctcaa | aaatagctac | cctctccggc | atgaatttat | cagctagaac | gggtgaatat | 1980 |
| catattgatg | gtgatttgac | gtctccggc | ctttctcacc | cgttgaaatc | tttacctaca | 2040 |
| cattactcag | gcattgcatt | tataatata | gagggttcta | aaaattttta | tccttgcggt | 2100 |
| gaaataaagg | cttctcccg | aaaagtatta | cagggctcata | atgtttttgg | tacaaccgat | 2160 |
| ttagctttat | gctctgaggg | ttattgctt | aattttgcta | attctttgct | ttgctgtgat | 2220 |
| gatttattgg | atgtttggaat | tcctgatcgc | gtattttctc | cttacgcac | tgtgcgggat | 2280 |
| ttcacaccgc | atatgggtga | ctctcagtag | aatctgctct | gatgcccgat | agttaaagcca | 2340 |
| gccccgacac | ccgccaacac | cgcctgacgc | gcccgtgacg | gcttgctctg | tcgccgcatc | 2400 |
| cgccttacaga | caagctgtga | cgcgtctcgg | gagctgcatg | tgtcagaggt | tttcaccgct | 2460 |
| atcacccgaaa | cgcgcgagac | gaaagggcct | cgtgatcacg | ctatttttat | aggttaaatgt | 2520 |
| catgataata | atggttttct | agacgtcagg | tggcactttt | cggggaaatg | tgccgcggaac | 2580 |
| ccctatttgt | ttatttttct | aaatacattc | aaatatgtat | ccgctcatga | gacaataacc | 2640 |
| ctgataaatg | cttcaataat | attgaaaaag | gaagagtagt | agtatccaac | atttccgtgt | 2700 |
| cgccttattt | cccttttttg | cggcattttg | ccttctcgtt | tttgcctacc | cagaaacgct | 2760 |
| gggtgaaagta | aaagatgctg | aagatcagtt | gggtgcacga | gtgggttaca | tcgaaactgga | 2820 |
| tctcaacacg | ggtaagatcc | ttgagagttt | tcgccccgaa | gaacggtttc | caatgatgag | 2880 |
| cacttttaaa | gtctctgctat | gtggcgggtt | attatcccg | attgacgcgc | ggcaagagca | 2940 |
| actcggctcg | gcctacactc | attctcagaa | tgaactgggt | gagtaactac | cagtcacaga | 3000 |
| aaagcatctt | acggatggca | tgacagtaag | agaattatgc | agtgcctcca | taacctgag | 3060 |
| tgataaacat | cgcgcgaact | tactctgac | aacgatcgga | ggaccgaaag | agctaaccgc | 3120 |
| ttttttgcac | aacatggggg | atcatgtaac | tcgcttgat | cgttggggaa | cggagctgaa | 3180 |
| tgaagccata | ccaaacgacg | agcgtgacac | cacgatgcct | gtagcaatgg | caacaacgtt | 3240 |
| gcgcaaaact | ttaactggcg | aactactttc | cttagcttcc | cggcaacaat | taatagactg | 3300 |
| gatggaggcg | gataaaagt | caggaccact | tctgcgctcg | gcccttcggg | ctggctgggt | 3360 |
| tattgctgat | aaatctggag | cgggtgagcg | tgggtctcgc | ggatcatctg | cagcactggg | 3420 |
| ccagatgggt | aagccctccc | gtatcgtagt | tatctacacg | acggggagtc | aggcaactat | 3480 |
| ggatgaacga | aatagacaga | tcgctgagat | agggtcctca | ctgattaaag | attggtaact | 3540 |
| gtcagaccaa | gtttactcat | ataactttta | gattgattta | aaacttcatt | tttaatttaa | 3600 |
| aaagatctag | gtgaagatcc | tttttgataa | tctcatgacc | aaaatccctt | aacgtgagtt | 3660 |
| ttcgttccac | tgagcgtcag | accccgtaga | aaagatcaaa | ggatcctctt | gagatccttt | 3720 |
| ttttctgcgc | gtaactctgt | gcttgcaaac | aaaaaaacca | ccgtaccag | cgggtgggtt | 3780 |
| tttgccggat | caagagctac | caactctttt | tcggaaggta | actggcttca | gcagagcgca | 3840 |
| gatacccaat | actgtccttc | tagttagacc | gtagttaggc | caccacttca | agaactctgt | 3900 |
| agcacccgct | acatacctcg | ctctgcta | cctgttacc | gtggctgctg | ccagtggcga | 3960 |
| taagtctgtg | cttaccgggt | ggactcaag | acgatagtta | ccggataaag | cgcagcggtc | 4020 |
| gggctgaacg | gggggttcgt | gcacacagcc | cagcttgagg | cgaacgacct | acaccgaact | 4080 |
| gagatactac | cagcgtgagc | tatgagaaag | cgccacgctt | cccgaaaggga | gaaaggcgga | 4140 |
| caggatctcg | ttaagcggca | gggtcggaa | aggagagcgc | acgagggagc | ttccaggggg | 4200 |
| aaacgcctgg | tatctttata | gtcctgtcgg | gtttcgccac | ctctgacttg | agcgtcgatt | 4260 |
| tttgtagatg | tcgtcagggg | ggcggagcct | atggaaaaac | gccagcaacg | cggccttttt | 4320 |
| acgggttctg | gccttttctg | ggccttttgc | tcacatgttc | tttctgctg | tatcccttga | 4380 |
| ttctgtggat | aacccgtatta | ggccttttga | gtgagctgat | accgctcgcc | gcagccgaac | 4440 |
| gaccgagcgc | agcgagtcag | tgagcgagga | agcggaagag | cgcccaatac | gcaaacccgc | 4500 |
| tctccccgcg | cgttgcccca | ttcattaatg | cagcagctgc | gcgctcgctc | gctcaactga | 4560 |
| gcccggccgg | caaagcccg | gcgtcggg | acctttggct | gcccggcctc | agtgagcgag | 4620 |
| cgagcgcgca | gagaggaggt | ggccaaactc | atcactaggg | gttccttgta | gttaatgatt | 4680 |
| aaaccgccaat | gctacttate | tacgtagcca | tgctctagga | cattgattat | tgactagtgg | 4740 |
| agttccgcgt | tacataactt | acggtaaatg | gcccgcctgg | ctgaccgccc | aacgaccccc | 4800 |
| gcccattgac | gtcaataatg | acgtatgttc | ccatagtaac | gccaataggg | actttccatt | 4860 |
| gacgtcaatg | gggtggagat | ttacggtaaa | ctgcccactt | ggcagtagat | caagtgtatc | 4920 |
| atatgccaa | tacgccccct | attgacgtca | atgacggtaa | atggcccgcg | tgccattatg | 4980 |
| cccagtagat | gaccttatgg | gactttccta | cttgccagta | catctacgta | ttagtcatcg | 5040 |
| ctattaccat | ggtagaggtg | agccccacgt | tctgcttca | tctcccatc | tcccccccct | 5100 |
| ccccaccccc | aattttgtat | ttatttattt | ttgtgcagcg | atggggcgcg | atggggcgcg | 5160 |
| gggggggggg | ggggcgcgcg | caggcggggg | ggggcggggg | gagggggcg | gagggggcg | 5220 |
| gaggagaggt | gaggcgcgag | ccaatcagag | cggcgcgctc | cgaaggttcc | cttttatggc | 5280 |
| gaggcgggcg | cggcgggcg | cctataaaaa | cggaagcgcg | cggcgggcg | gagtcgctgc | 5340 |
| gcgctgcctt | gcgcccgtgc | cccgcctcgc | cgcgcctcgc | cgcgcgcgc | cccgcctcgc | 5400 |
| actgaccgcg | ttactaaaac | aggtaagtcc | ggcctccgcg | cgggttttgg | gcgcctccgc | 5460 |
| cgggcgcccc | cctcctcag | gcgagcgctg | ccacgtcaga | cgaagggcgc | agcgagcgct | 5520 |
| ctgatccttc | cgcgcgagcg | ctcaggacag | cggcccgctg | ctcataagac | tcggccttag | 5580 |
| aaaccagcta | tcagcagaag | gacatttttag | gacgggactt | gggtgactct | agggcactgg | 5640 |

-continued

| | | | | | | |
|------------|------------|-------------|------------|------------|------------|------|
| ttttcttttc | agagagcgga | acaggcgagg | aaaagtagtc | ccttctcgcc | gattctgcgg | 5700 |
| agggatctcc | gtggggcggt | gaacgcgat | gatgcctcta | ctaaccatgt | tcatgttttc | 5760 |
| tttttttttc | tacaggctct | gggtgacgaa | cagggtaccg | ccaccatggc | caccgctct | 5820 |
| cgcacaagcc | tgtctgtggc | tttcggactg | ctgtgcctgc | cttggctcca | ggagggctcc | 5880 |
| gcgcctagca | tcgataccgt | cgtatgtgct | tggaggcttg | ctgaaggctg | tatgctgtca | 5940 |
| gatcgtctgt | gtaaacaggc | gttttggcct | ctgactgacg | cctgtttacc | agcgtctga | 6000 |
| caggacacaa | ggcctgttac | tagcactcac | atggaacaaa | tggcctctag | cctggaggct | 6060 |
| tgtgaaggc | tgtatgctga | gaatcagatc | agatagcgat | ccgttttggc | ctctgactga | 6120 |
| cggatcgcta | tctgctgatt | ctcaggacac | aaggcctgtt | actagcactc | acatggaaca | 6180 |
| aatggcctct | agcctggagg | cttgcctgaag | gctgtatgct | gaaacatgcc | aacagcagaa | 6240 |
| tgccgttttg | gcctctgatt | gacggcattc | tgtggggcat | 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 | cgtctgttta | atgcctttgt | atcatgctat | tgcttcccgt | 120 |
| atggctttca | ttttctcctc | cttgtataaa | tcctgggtgc | tgtctcttta | tgaggagtgt | 180 |
| tggcccggtg | tcaggcaacg | tggcgtgggt | tgcactgtgt | ttgctgacgc | aaacccact | 240 |
| ggttggggca | ttgccaccac | ctgtcagctc | ctttccggga | ctttcgcttt | ccccctccct | 300 |
| attggccagg | ggcaactcat | gcgcgcctgc | cttgcccctgc | gctggacagg | ggctcggctg | 360 |
| tggggcactg | acaattccgt | gggtgtgtcg | gggaaatcat | cgtcctttcc | ttggctgctc | 420 |
| gcctgtgttg | ccacctggat | tctgcgcggg | acgtccttct | gctacgtccc | ttcggccctc | 480 |
| aatccagcgg | accttccctc | ccgcggcctg | ctgcgggctc | tgcggcctct | tccgcgtctt | 540 |
| cgccttcgcc | ctcagacgag | tcggatctcc | ctttggggcg | cctcccgcgc | taagcttacc | 600 |
| gataccgtcg | agatctaact | tggttattgc | agcttataat | ggttacaaat | aaagcaatag | 660 |
| catcacaaat | ttcacaaaata | aagcattttt | ttcactgcat | tctagtgtgt | gtttgtccaa | 720 |
| actcatcaat | gtatcttacc | atgtctggat | ctcgacctcg | actagagcat | ggctacgtag | 780 |
| ataagtagca | tggcgggtta | atcattaact | acaaggaaac | cctagtgtatg | gagttggcca | 840 |
| ctccctctct | gcgcgctcgc | tcgctcactg | aggcggggcg | accaaaggtc | gcccgacgcc | 900 |
| cgggctttgc | ccgggcgggc | tcagttagcg | agcgagcgcg | cagctggcgt | aatagcgaag | 960 |
| aggcccgcac | cgatcgccct | tcccaacagt | tgcgcagcct | gaatggcgaa | tggcgattcc | 1020 |
| gttgcaatgg | ctggcggtta | tattgttctg | gatattacca | gcaaggccga | tagtttgagt | 1080 |
| tcttctactc | aggcaagtga | tgttattact | aatcaaaaga | gtattgcgac | aacggttaat | 1140 |
| ttgcgtgatg | gacagactct | tttactcggg | ggcctcactg | attataaaaa | cacttctcag | 1200 |
| gattctggcg | taccgttccct | gtctaaaatc | cctttaatcg | gcctcctgtt | tagctcccgc | 1260 |
| tctgattcta | acgaggaag | acggttatac | gtgctcgta | aagcaaccat | agtacgcgcc | 1320 |
| ctgtagcgcg | gcattaaagc | cggcgggtgt | gggtggttac | cgcagcgtga | ccgctacact | 1380 |
| tgcacgcgcc | ctagcgcccg | ctcctttcgc | tttcttccct | tcctttctcg | ccacgttcgc | 1440 |
| cggctttccc | cgtcaagctc | taaatcgggg | gctcccttta | gggttccgat | ttagtgtctt | 1500 |
| acggcacctc | gaccccaaaa | aacttgatta | gggtgatggg | tcacgtagtgt | ggccatcgcc | 1560 |
| ctgtagagcg | gtttttcgcc | ctttgacggt | ggagtcacac | ttctttaata | gtggactcct | 1620 |
| gttccaaact | gggaacaacac | tcaaccttat | ctcgggtctat | tccttttgatt | tataagggat | 1680 |
| tttgcgattt | tcggcctatt | gggtaaaaaa | tgagctgatt | taacaaaaat | ttaacgcgaa | 1740 |
| ttttaacaaa | atattaaact | ttacaattta | aatatttgct | tatacaatct | tcctgttttt | 1800 |
| ggggcttttc | tgattatcaa | ccgggggtaca | tatgattgac | atgctagtgt | tacgattacc | 1860 |
| gttcactgat | tctctgtgtt | gctccagact | ctcaggcaat | gacctgatag | cctttgtaga | 1920 |
| gaacctctca | aaatagctac | ctctccggc | atgaatttat | cagctagaac | ggttgaatat | 1980 |
| catattgatg | gtgatttgac | tgtctccggc | ctttctcacc | cgtttgaatc | tttacctaca | 2040 |
| cattactcag | gcattgcatt | taaaaatat | gaggggtcta | aaaattttta | tccttgcgtt | 2100 |
| gaaataaagg | cttctcccg | aaaagtatta | cagggtcata | atgttttttg | tacaaccgat | 2160 |
| ttagctttat | gctctgaggg | tttattgctt | aattttgcta | attctttgct | ttgctgtgat | 2220 |
| gatttattgg | atgttggaat | tcttgatgct | gtattttctc | cttacgcac | tgtgcgggat | 2280 |
| ttcacaccgc | atatggtgca | ctctcagtac | aatctgctct | gatgccgcac | agtttaagcca | 2340 |
| gccccgacac | ccgccaacac | ccgctgacgc | gcccctgacg | gcttgtctgc | tcocggcatc | 2400 |
| cgcttacaga | caagctgtga | ccgtctccgg | gagctgcatg | tgtcagaggt | tttcaccgtc | 2460 |
| atcaccgaaa | ccgcgcgagc | gaaaggccct | cgtgatacgc | ctatttttat | aggttaatgt | 2520 |
| catgataata | atgggtttct | agacgtcagg | tggcactttt | cggggaaatg | tgcgcggaac | 2580 |
| ccctatttgt | ttatttttct | aaatacatct | aaatatgtat | ccgctcatga | gacaataacc | 2640 |
| ctgataaatg | cttcaataat | attgaaaaag | gaagagtatg | agtatccaac | atttccgtgt | 2700 |
| cgcccttatt | cccttttttg | cggcattttg | ccttctgtgt | tttgcctacc | cagaaacgct | 2760 |
| ggtgaaagta | aaagatgctg | aagatcagtt | gggtgcacga | gtgggttaca | tcgaactgga | 2820 |
| tctcaacagc | ggtaagatcc | ttgagagttt | tcgccccgaa | gaacgttttc | caatgatgag | 2880 |
| cacttttaaa | gttctgctat | gtggcgcggt | attatcccg | attgacgcgc | ggcaagagca | 2940 |
| actcggctcg | cgcatacact | attctcagaa | tgacttggtt | gagtactcac | cagtcacaga | 3000 |
| aaagcatctt | acggatggca | tgacagtaag | agaattatgc | agtgtctcca | taaccatgag | 3060 |
| tgataaacct | cgcgccaact | tacttctgac | aacgatcgga | ggaccgaaag | agctaaccgc | 3120 |
| ttttttgcac | aacatggggg | atcatgtaac | tcgcttggat | cgttgggaac | cggagctgaa | 3180 |
| tgaagccata | ccaaacgacg | agcgtgacac | cacgatgcct | gtagcaatgg | caacaacgtt | 3240 |
| gcgcaaaact | ttaactggcg | aactacttac | tctagcttcc | cggaacaact | taatagactg | 3300 |
| gatggaggcg | gataaagttg | caggaccact | tctgcgctcg | gccttccgg | ctggctgggt | 3360 |
| tattgctgat | aaatctggag | ccgggtgagc | tgggtctcgc | gggtatcattg | 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 | ggatctctct | gagatccttt | 3720 |
| ttttctgcgc | gtaatctgct | gcttgcaaac | aaaaaaacca | ccgctaccag | cgggtggttg | 3780 |
| tttgcgggat | caagagctac | caactctttt | tccgaaggta | actggcttca | gcagagcgca | 3840 |
| gataccaaat | actgtccttc | tagttagacc | gtagttaggc | caccacttca | agaactctgt | 3900 |
| agcaccgcct | acatacctcg | ctctgctaata | cctgttacca | gtggctgctg | ccagtggcga | 3960 |
| taagtcgtgt | cttaccgggt | tggactcaag | acgatagtta | ccggataagg | cgcagcggtc | 4020 |
| gggctgaacg | gggggttcgt | gcacacagcc | cagcttgagc | cgaacgacct | acaccgaact | 4080 |
| gagataccta | cagcgtgagc | tatgagaaag | cgccacgctt | cccgaaggga | gaaaggcgga | 4140 |
| caggtatccg | gtaagcggca | gggtcggaac | aggagagcgc | acgagggagc | ttccaggggg | 4200 |
| aaacgcctcg | tatctttata | gtcctgtcgg | gtttcgccac | ctctgacttg | agcgtcgatt | 4260 |
| tttgtgatgc | tcgtcagggg | ggcggagcct | atggaaaaac | gccagcaacg | cggccttttt | 4320 |
| acggttcctg | gccttttgct | ggccttttgc | tcacatgttc | ttctctgctg | tatcccctga | 4380 |
| ttctgtggat | aaacgtatta | ccgccttttg | gtgagctgat | accgctcgcc | gcagccgaac | 4440 |
| gaccgagcgc | agcgagtcag | tgagcgagga | agcggaaagc | cgcccaatac | gcaaacccgc | 4500 |
| tctccccgcg | cgttgccoga | ttcataatg | cagcagctgc | gcgctcgctc | gctcactgag | 4560 |
| gcccgcgggg | caaagccggg | gcgtcggggc | acctttggtc | gcccggcctc | agtgagcgag | 4620 |
| cgagcgcgca | gagagggagt | ggccaaactcc | atcactaggg | gttccttgta | gttaatgatt | 4680 |
| aaaccgccat | gtaacttatc | tacgtagcca | tgccttagga | cattgattat | tgactagtgg | 4740 |
| agttccgcgt | tacataaact | acggtaaatg | gcccgcctgg | ctgaccgccc | aaacgacccc | 4800 |
| gcccattgac | gtcaataatg | acgatgtgtc | ccatagtaac | gccaataggg | actttccatt | 4860 |
| gacgtcaatg | gggtgagtat | ttacggtaaa | ctgcccactt | ggcagtaacat | caagtgtatc | 4920 |
| atatgccaaag | tacgcccctc | attgacgtca | atgacggtaa | atggcccgcg | tggcattatg | 4980 |
| cccagtagat | gaccttatgg | gactttccta | cttgccagta | catctacgta | ttagtcatcg | 5040 |
| ctattaccat | ggtcgaggtg | agccccacgt | tctgcttcac | tctccccatc | ccccccccct | 5100 |
| ccccaccccc | aatttttgat | ttattttatt | tttaattatt | ttgtgcagcg | atggggggcg | 5160 |
| gggggggggg | ggggcgcgcg | caggcggggg | ggggcggggg | gagggggcgg | gcggggcgag | 5220 |
| gcggagaggt | gcggcgcgcg | ccaatcacag | cggcgcgctc | cgaaggttcc | cttttatggc | 5280 |
| gaggcgcgcg | cggcgcgcgcg | cctataaaaa | gcgaagcgcg | cggcgggcgg | gagtcgctgc | 5340 |
| gcgctgcctt | cgccccgctg | ccgcgtccgc | cgccgcctcg | cgccgcgcgc | cccggctctg | 5400 |
| actgacgcg | ttactaaaac | aggtaaagtc | ggcctccgcg | ccgggttttg | gcgcctcccg | 5460 |
| cgggcgcccc | cctcctcagc | gcgtagcgtg | ccacgtcaga | cgaagggcgc | agcgagcgtc | 5520 |
| ctgacccctc | cgcccggaag | ctcaggacag | cggcccgcgt | ctcataagac | tcggccctag | 5580 |
| aaacccagta | tcagcagaag | gacattttag | gacgggactt | gggtgactct | agggcactgg | 5640 |
| ttttctttcc | agagagcgga | acaggcgagg | aaaagtagtc | cctctctcgc | gattctgcgg | 5700 |
| agggatctcc | gtggggcggt | gaacgcgat | gatgcctcta | ctaaccatgt | tcatgttttc | 5760 |
| tttttttttc | tacaggtcct | gggtgacgaa | cagggtaccg | ccaccatggc | caccggctct | 5820 |
| cgcacaagcc | tgcgtctggc | tttcggactg | ctgtgcctgc | cttggctcca | ggagggctcc | 5880 |
| gcccgtagca | tcgataccgt | cgtatgtgtc | tggaggcttg | ctgaaggctg | tatgctgaca | 5940 |
| atcagatatg | gttctcggc | gttttggcct | ctgactgacg | ccgagcaact | atctgattgt | 6000 |
| caggacacaa | ggcctgttac | tagcactcac | atggaaacaa | tggcctctag | cctggaggct | 6060 |
| tgtctgaagg | tgtatgctgt | ttcacaatgc | atcgtctcag | gcgttttgcc | ctctgactga | 6120 |
| cgcgctgaac | ggcatttgta | aacaggacac | aaggcctgtt | actagcactc | acatggaaca | 6180 |
| aatggcctct | agcctggagg | cttgctgaag | gctgtatgct | gacaataatg | ccaacagggt | 6240 |
| ggtcggtttg | gcctctgact | gacgaccacc | ctgggcatta | ttgtcaggac | acaaggcctg | 6300 |
| ttactagcac | tcacatggaa | caaatggcct | ctctagaat | | | 6339 |

The invention claimed is:

1. A composition that comprises a recombinant plasmid (RP) a sequence of nucleotides that encode micro-interfering ribonucleic acid (miRNA) that binds to and inactivates and/or degrades messenger ribonucleic acid (mRNA) that encodes for a serotonin receptor, wherein the sequence of nucleotides comprises 95-100% the same nucleotide sequence as SEQ ID NO. 7.

2. The composition of claim 1, wherein the sequence of nucleotides is configured to be delivered to a target cell that has expressed the serotonin receptor.

3. The composition of claim 1, wherein the sequence of nucleotides is encased in a protein coat, a lipid vesicle, or any combination thereof.

4. The composition of claim 1, wherein the sequence of nucleotides is encased in a viral vector.

5. The composition of claim 4, 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.

6. The composition of claim 4, wherein the viral vector is an adeno-associated virus.

7. The composition of claim 1 wherein the serotonin receptor is serotonin receptor 5HT2a.

8. A composition that comprises a recombinant plasmid (RP) with a sequence of nucleotides for encoding a sequence of micro-interfering ribonucleic acid (miRNA) that binds to and degrades and/or inactivates messenger ribonucleic acid (mRNA) that encodes for a serotonin receptor, wherein the sequence of nucleotides comprises 95-100% of the same nucleotide sequence as SEQ ID NO. 19.

* * * * *