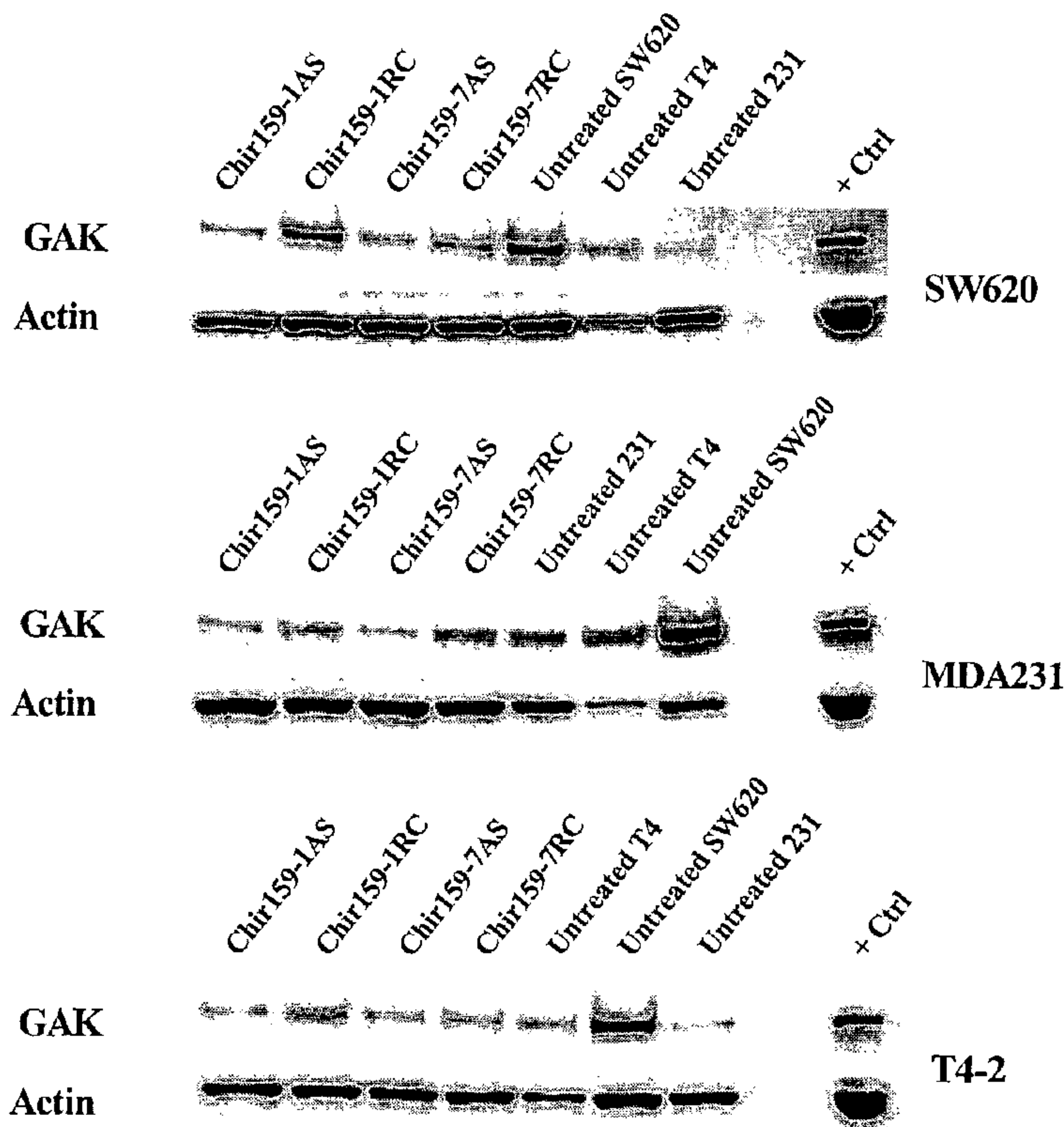




(86) Date de dépôt PCT/PCT Filing Date: 2003/01/08  
 (87) Date publication PCT/PCT Publication Date: 2003/07/17  
 (85) Entrée phase nationale/National Entry: 2004/06/30  
 (86) N° demande PCT/PCT Application No.: US 2003/000657  
 (87) N° publication PCT/PCT Publication No.: 2003/057926  
 (30) Priorité/Priority: 2002/01/08 (60/345,637) US

(51) Cl.Int.<sup>7</sup>/Int.Cl.<sup>7</sup> C12Q 1/68, A61K 31/07, A01N 43/04,  
C07H 21/04  
 (71) Demandeur/Applicant:  
CHIRON CORPORATION, US  
 (72) Inventeur/Inventor:  
HANSEN, RHONDA, US  
 (74) Agent: BORDEN LADNER GERVAIS LLP

(54) Titre : PRODUITS GENIQUES A EXPRESSION DIFFERENCIEE DANS DES CELLULES CANCEREUSES DU SEIN  
ET METHODES D'UTILISATION ASSOCIEES  
 (54) Title: GENE PRODUCTS DIFFERENTIALLY EXPRESSED IN CANCEROUS BREAST CELLS AND THEIR  
METHODS OF USE



(57) Abrégé/Abstract:

The present invention provides polynucleotides, as well as polypeptides encoded thereby, that are differentially expressed in breast cancer cells. These polynucleotides are useful in a variety of diagnostic and therapeutic methods. The present invention further provides methods of reducing growth of breast cancer cells. These methods are useful for treating breast cancer.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
17 July 2003 (17.07.2003)

PCT

(10) International Publication Number  
**WO 03/057926 A1**

(51) International Patent Classification<sup>7</sup>: **C12Q 1/68**,  
A01N 43/04, C07H 21/04, A61K 31/07

[US/US]; 3400 Richmond Parkway Apt 1224, Richmond,  
CA 94806 (US).

(21) International Application Number: PCT/US03/00657

(74) Agent: **KEDDIE, James, S.**; BOZICEVIC, FIELD &  
FRANCIS LLP, 200 Middlefield Road, Suite 200, Menlo  
Park, CA 94025 (US).

(22) International Filing Date: 8 January 2003 (08.01.2003)

(25) Filing Language: English

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,  
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,  
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,  
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,  
MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE,  
SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,  
VC, VN, YU, ZA, ZM, ZW.

(26) Publication Language: English

(30) Priority Data:  
60/345,637 8 January 2002 (08.01.2002) US

(71) Applicant (*for all designated States except US*): **CHIRON  
CORPORATION** [US/US]; 4560 Horton Street - R440,  
Emeryville, CA 94608 (US).

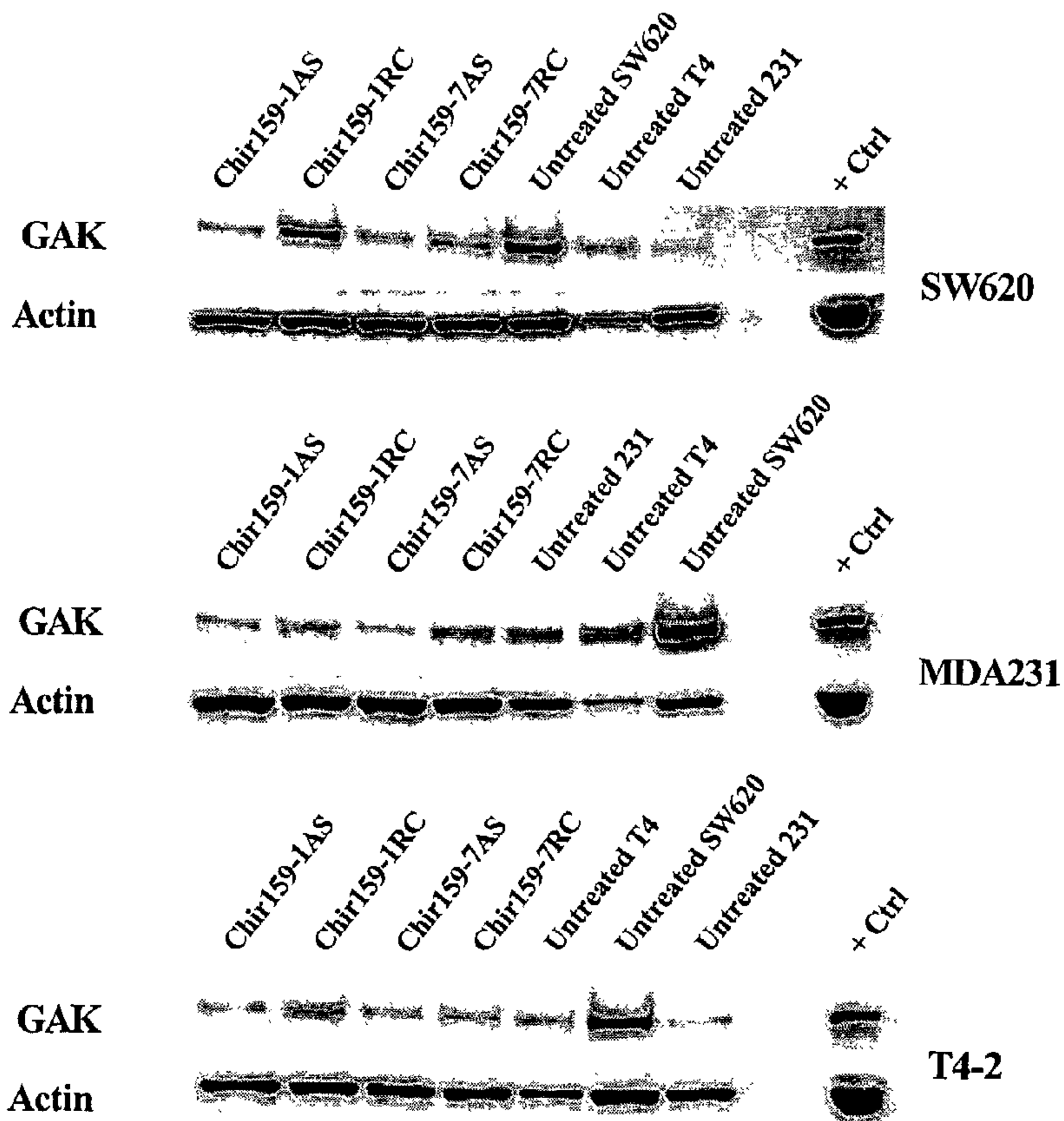
(84) Designated States (*regional*): ARIPO patent (GH, GM,  
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),  
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,

(72) Inventor; and

(75) Inventor/Applicant (*for US only*): **HANSEN, Rhonda**

[Continued on next page]

(54) Title: GENE PRODUCTS DIFFERENTIALLY EXPRESSED IN CANCEROUS BREAST CELLS AND THEIR METHODS OF USE



(57) Abstract: The present invention provides polynucleotides, as well as polypeptides encoded thereby, that are differentially expressed in breast cancer cells. These polynucleotides are useful in a variety of diagnostic and therapeutic methods. The present invention further provides methods of reducing growth of breast cancer cells. These methods are useful for treating breast cancer.

WO 03/057926 A1

**WO 03/057926 A1**



ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

**Published:**

— *with international search report*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## **GENE PRODUCTS DIFFERENTIALLY EXPRESSED IN CANCEROUS BREAST CELLS AND THEIR METHODS OF USE**

### **STATEMENT OF RIGHTS OF INVENTION**

5           The United States Government has certain rights in this invention pursuant to a CRADA (BG98-053) between Chiron Corporation and the University of California, which operates the Lawrence Berkeley National Laboratory for the United States Department of Energy under Contract No. DE-AC03-76SF00098.

### **CROSS-REFERENCING**

10           This patent application claims the benefit of U.S. provisional application serial number 60/345,637 filed January 8, 2002, which application is incorporated by reference in its entirety.

### **FIELD OF THE INVENTION**

15           The present invention relates to polynucleotides of human origin in substantially isolated form and gene products that are differentially expressed in breast cancer cells, and uses thereof.

### **BACKGROUND OF THE INVENTION**

20           Cancer, like many diseases, is not the result of a single, well-defined cause, but rather can be viewed as several diseases, each caused by different aberrations in informational pathways, that ultimately result in apparently similar pathologic phenotypes. Identification of polynucleotides that correspond to genes that are differentially expressed in cancerous, pre-cancerous, or low metastatic potential cells relative to normal cells of the same tissue type, provides the basis for diagnostic tools, facilitates drug discovery by providing for targets for candidate agents, and further serves to identify therapeutic targets for cancer therapies that are more tailored for the type of cancer to be treated.

25           Identification of differentially expressed gene products also furthers the understanding of the progression and nature of complex diseases such as cancer, and is key to identifying the genetic factors that are responsible for the phenotypes associated with development of, for example, the metastatic phenotype. Identification of gene products that are differentially expressed at various stages, and in various types of cancers, can both provide for early diagnostic tests, and further serve as therapeutic targets. Additionally, the

30

product of a differentially expressed gene can be the basis for screening assays to identify chemotherapeutic agents that modulate its activity (e.g. its expression, biological activity, and the like).

5 Early disease diagnosis is of central importance to halting disease progression, and reducing morbidity. Analysis of a patient's tumor to identify the gene products that are differentially expressed, and administration of therapeutic agent(s) designed to modulate the activity of those differentially expressed gene products, provides the basis for more specific, rational cancer therapy that may result in diminished adverse side effects relative to conventional therapies. Furthermore, confirmation that a tumor poses less risk to the patient 10 (e.g., that the tumor is benign) can avoid unnecessary therapies. In short, identification of genes and the encoded gene products that are differentially expressed in cancerous cells can provide the basis of therapeutics, diagnostics, prognostics, therapeutics, and the like.

Breast cancer is a leading cause of death among women. One of the priorities in breast cancer research is the discovery of new biochemical markers that can be used for 15 diagnosis, prognosis and monitoring of breast cancer. The prognostic usefulness of these markers depends on the ability of the marker to distinguish between patients with breast cancer who require aggressive therapeutic treatment and patients who should be monitored.

While the pathogenesis of breast cancer is unclear, transformation of non-tumorigenic breast epithelium to a malignant phenotype may be the result of genetic factors, 20 especially in women under 30 (Miki, et al., Science, 266: 66-71, 1994). However, it is likely that other, non-genetic factors are also significant in the etiology of the disease. Regardless of its origin, breast cancer morbidity increases significantly if a lesion is not detected early in its progression. Thus, considerable effort has focused on the elucidation of early cellular events surrounding transformation in breast tissue. Such effort has led to the identification 25 of several potential breast cancer markers.

Thus, the identification of new markers associated with breast cancer, and the identification of genes involved in transforming cells into the cancerous phenotype, remains a significant goal in the management of this disease. In exemplary aspects, the invention described herein provides breast cancer diagnostics, prognostics, therapeutics, and 30 therapeutics based upon polynucleotides and/or their encoded gene products.

#### SUMMARY OF THE INVENTION

The present invention provides methods and compositions useful in detection of cancerous cells, identification of agents that modulate the phenotype of cancerous cells, and

identification of therapeutic targets for chemotherapy of cancerous cells. Cancerous breast cells are of particular interest in each of these aspects of the invention. More specifically, the invention provides polynucleotides in substantially isolated form, as well as polypeptides encoded thereby, that are differentially expressed in breast cancer cells. Also provided are antibodies that specifically bind the encoded polypeptides. These polynucleotides, polypeptides and antibodies are thus useful in a variety of diagnostic, therapeutic, and drug discovery methods. In some embodiments, a polynucleotide that is differentially expressed in breast cancer cells can be used in diagnostic assays to detect breast cancer cells. In other embodiments, a polynucleotide that is differentially expressed in breast cancer cells, and/or a polypeptide encoded thereby, is itself a target for therapeutic intervention.

Accordingly, in one aspect the invention provides a method for detecting a cancerous breast cell. In general, the method involves contacting a test sample obtained from a cell that is suspected of being a breast cancer cell with a probe for detecting a gene product differentially expressed in breast cancer. Many embodiments of the invention involve a gene identifiable or comprising a sequence selected from the group consisting of SEQ ID NOS: 1-499, contacting the probe and the gene product for a time sufficient for binding of the probe to the gene product; and comparing a level of binding of the probe to the sample with a level of probe binding to a control sample obtained from a control breast cell of known cancerous state. A modulated (i.e. increased or decreased) level of binding of the probe in the test breast cell sample relative to the level of binding in a control sample is indicative of the cancerous state of the test breast cell. In certain embodiments, the level of binding of the probe in the test cell sample, usually in relation to at least one control gene, is similar to binding of the probe to a cancerous cell sample. In certain other embodiments, the level of binding of the probe in the test cell sample, usually in relation to at least one control gene, is different, i.e. opposite, to binding of the probe to a non-cancerous cell sample. In specific embodiments, the probe is a polynucleotide probe and the gene product is nucleic acid. In other specific embodiments, the gene product is a polypeptide. In further embodiments, the gene product or the probe is immobilized on an array.

In another aspect, the invention provides a method for assessing the cancerous phenotype (*e.g.*, metastasis, metastatic potential, aberrant cellular proliferation, and the like) of a breast cell comprising detecting expression of a gene product in a test breast cell sample, wherein the gene comprises a sequence selected from the group consisting of SEQ ID NOS: 1-499; and comparing a level of expression of the gene product in the test breast cell sample with a level of expression of the gene in a control cell sample. Comparison of the level of

expression of the gene in the test cell sample relative to the level of expression in the control cell sample is indicative of the cancerous phenotype of the test cell sample. In specific embodiments, detection of gene expression is by detecting a level of an RNA transcript in the test cell sample. In other specific embodiments detection of expression of the gene is by  
5 detecting a level of a polypeptide in a test sample.

In another aspect, the invention provides a method for suppressing or inhibiting a cancerous phenotype of a cancerous cell, the method comprising introducing into a mammalian cell an expression modulatory agent (e.g. an antisense molecule, small molecule, antibody, neutralizing antibody, inhibitory RNA molecule, etc.) to inhibition of expression  
10 of a gene identified by a sequence selected from the group consisting of SEQ ID NOS: 1-499. Inhibition of expression of the gene inhibits development of a cancerous phenotype in the cell. In specific embodiments, the cancerous phenotype is metastasis, aberrant cellular proliferation relative to a normal cell, or loss of contact inhibition of cell growth. In the context of this invention "expression" of a gene is intended to encompass the expression of  
15 an activity of a gene product, and, as such, inhibiting expression of a gene includes inhibiting the activity of a product of the gene.

In another aspect, the invention provides a method for assessing the tumor burden of a subject, the method comprising detecting a level of a differentially expressed gene product in a test sample from a subject suspected of or having a tumor, the differentially expressed  
20 gene product comprising a sequence selected from the group consisting of SEQ ID NOS: 1-499. Detection of the level of the gene product in the test sample is indicative of the tumor burden in the subject.

In another aspect, the invention provides a method for identifying a gene product as a target for a cancer therapeutic, the method comprising contacting a cancerous cell expressing  
25 a candidate gene product with an anti-cancer agent, wherein the candidate gene product corresponds to a sequence selected from the group consisting of SEQ ID NOS: 1-499; and analyzing the effect of the anti-cancer agent upon a biological activity of the candidate gene product and/or upon a cancerous phenotype of the cancerous cell. Modulation of the biological activity of the candidate gene product and modulation of the cancerous phenotype  
30 of the cancerous cell indicates the candidate gene product is a target for a cancer therapeutic. In specific embodiments, the cancerous cell is a cancerous breast cell. In other specific embodiments, the inhibitor is an antisense oligonucleotide. In further embodiments, the cancerous phenotype is aberrant cellular proliferation relative to a normal cell, or colony formation due to loss of contact inhibition of cell growth.

In another aspect, the invention provides a method for identifying agents that modulate (i.e. increase or decrease) the biological activity of a gene product differentially expressed in a cancerous cell, the method comprising contacting a candidate agent with a differentially expressed gene product, the differentially expressed gene product  
5 corresponding to a sequence selected from the group consisting of SEQ ID NOS: 1-499; and detecting a modulation in a biological activity of the gene product relative to a level of biological activity of the gene product in the absence of the candidate agent. In specific embodiments, the detecting is by identifying an increase or decrease in expression of the differentially expressed gene product. In other specific embodiments, the gene product is  
10 mRNA or cDNA prepared from the mRNA gene product. In further embodiments, the gene product is a polypeptide.

In another aspect, the invention provides a method of inhibiting growth of a tumor cell by modulating expression of a gene product, where the gene product is encoded by a gene identified by a sequence selected from the group consisting of: SEQ ID NOS:1-499.

15 The invention provides a method of determining the cancerous state of a cell, comprising detecting a level of a product of a gene in a test cell wherein said gene is defined by a sequence selected from a group consisting of SEQ ID NOS:1-499 wherein the cancerous state of the test cell is indicated by detection of said level and comparison to a control level of said gene product. In certain embodiments of this method, the gene product  
20 is a nucleic acid or a polypeptide. In certain embodiments of this method, the gene product is immobilized on an array. In one embodiment of this method, the control level is a level of said gene product associated with a control cell of known cancerous state. In other embodiments of this method, the known cancerous state is a non-cancerous state. In another embodiment of this method, the level differs from the control level by at least two fold,  
25 indicating the test cell is not of the same cancerous state as that indicated by the control level.

The invention also provides a method for detecting a cancerous breast cell in a sample. This method involves detecting a level of a product of a gene in a test sample obtained from a subject wherein said gene is defined by a sequence selected from a group  
30 consisting of SEQ ID NOS:1-499, wherein the presence of a cancerous breast cell or metastasized breast cancer cell is indicated by detection of said level and comparison to a control level of said gene product. In certain embodiments of this method, the sample is a sample of breast tissue. In certain other embodiments of this method, the sample is selected from the group consisting of a liver, brain, kidney, lung, bone and skin sample. In one



embodiment of this method, the cancerous breast cell is a metastasized cancerous breast cell. In certain other embodiments of the method, the control level is a level of said gene product associated with a control sample containing cells of known cancerous state. In another embodiment, the known cancerous state is a non-cancerous state.

5           The invention also provides a method for suppressing a cancerous phenotype of a cancerous mammalian cell comprising introducing into said cancerous cell an antisense polynucleotide for inhibition of expression of a gene defined by a sequence selected from the group consisting of SEQ ID NOS: 1-499, wherein inhibition of expression of said gene suppresses development of said cancerous phenotype. In many embodiments of the method,  
10 the cancerous phenotype is metastatic. In certain embodiments of the method, the cancerous phenotype is aberrant cellular proliferation relative to a normal cell. In other embodiments of the method, the cancerous phenotype is loss of contact inhibition of cell growth. In certain other embodiments of the method, the cancerous phenotype is aberrant cellular proliferation of a metastasized breast cancer cell relative to a normal cell.

15           The invention further provides a method for assessing the tumor burden of a subject. This method involves detecting a level of a differentially expressed gene product in a test sample from a subject suspected of having a tumor, the differentially expressed gene product comprising a sequence selected from the group consisting of SEQ ID NOS: 1-499; wherein detection of the level of the gene product in the test sample is indicative of the tumor burden  
20 in the subject.

          The method further provides a method for identifying a gene product as a target for a cancer therapeutic. This method involves contacting a cancerous cell expressing a candidate gene product with an anti-cancer agent, wherein the candidate gene product corresponds to a sequence selected from the group consisting of SEQ ID NOS: 1-499; and analyzing the  
25 effect of the anti-cancer agent upon a biological activity of the candidate gene product and upon a cancerous phenotype of the cancerous cell; wherein modulation of the biological activity of the candidate gene product and modulation of the cancerous phenotype of the cancerous cell indicates the candidate gene product is a target for a cancer therapeutic. In certain embodiments of this method, the cancerous cell is a cancerous breast cell. In other  
30 embodiments of this method, the inhibitor is an antisense oligonucleotide. In certain other embodiments of this method, the cancerous phenotype is aberrant cellular proliferation relative to a normal cell. In another embodiment of this method, the cancerous phenotype is colony formation due to loss of contact inhibition of growth.

The invention further provides a method for identifying agents that decrease biological activity of a gene product differentially expressed in a cancerous cell, the method comprising: contacting a candidate agent with a differentially expressed gene product, the differentially expressed gene product corresponding to a sequence selected from the group consisting of SEQ ID NOS: 1-499; and detecting a decrease in a biological activity of the gene product relative to a level of biological activity of the gene product in the absence of the candidate agent. In certain embodiments of this method, the detecting step is by detection of a decrease in expression of the differentially expressed gene product. In certain other embodiments of this method, the gene product is mRNA or a cDNA prepared from the mRNA gene product. In other embodiments of the invention, the gene product is a polypeptide.

The invention further provides a method of inhibiting growth of a tumor cell by modulating expression of a gene product, the gene product being encoded by a gene identified by a sequence selected from the group consisting of: SEQ ID NOS:1-499.

These and other objects, advantages, and features of the invention will become apparent to those persons skilled in the art upon reading the details of the invention as more fully described below.

#### BRIEF DESCRIPTION OF THE FIGURES

Fig. 1 is three panels of autoradiographs showing expression of GAK polypeptide in different cell lines.

Fig. 2 is a graph of a hydropathy plot and a table showing the hydrophobic regions of DKFZp566I133.

Fig. 3 is six panels of photographs of MDA-231 cells exposed to C180-7, C180-8 and positive control antisense (AS) and control (RC) oligonucleotides.

Fig. 4 is an alignment of spot ID 22793 and spot ID 26883.

Fig. 5 is a figure of three sequence alignments showing the mapping of each of three sequences onto VMP1 (DKFZ).

## DETAILED DESCRIPTION OF THE INVENTION

The present invention provides polynucleotides, as well as polypeptides encoded thereby, that are differentially expressed in breast cancer cells. Methods are provided in which these polynucleotides and polypeptides are used for detecting and reducing the growth of breast cancer cells. Also provided are methods in which the polynucleotides and polypeptides of the invention are used in a variety of diagnostic and therapeutic applications for breast cancer.

Before the present invention is described, it is to be understood that this invention is not limited to particular embodiments described, as such may, of course, vary. It is also to be understood that the terminology used herein is for the purpose of describing particular embodiments only, and is not intended to be limiting.

Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. Although any methods and materials similar or equivalent to those described herein can be used in the practice or testing of the present invention, the preferred methods and materials are now described. All publications and patent applications mentioned herein are incorporated herein by reference to disclose and describe the methods and/or materials in connection with which the publications are cited.

It must be noted that as used herein and in the appended claims, the singular forms "a", "and", and "the" include plural referents unless the context clearly dictates otherwise. Thus, for example, reference to "a polynucleotide" includes a plurality of such polynucleotides and reference to "the breast cancer cell" includes reference to one or more cells and equivalents thereof known to those skilled in the art, and so forth.

The publications and applications discussed herein are provided solely for their disclosure prior to the filing date of the present application. Nothing herein is to be construed as an admission that the present invention is not entitled to antedate such publication by virtue of prior invention. Further, the dates of publication provided may be different from the actual publication dates which may need to be independently confirmed.

### Definitions

The terms "polynucleotide" and "nucleic acid", used interchangeably herein, refer to polymeric forms of nucleotides of any length, either ribonucleotides or deoxynucleotides. Thus, these terms include, but are not limited to, single-, double-, or multi-stranded DNA or RNA, genomic DNA, cDNA, DNA-RNA hybrids, or a polymer comprising purine and

pyrimidine bases or other natural, chemically or biochemically modified, non-natural, or derivatized nucleotide bases. These terms further include, but are not limited to, mRNA or cDNA that comprise intronic sequences (see, *e.g.*, Niwa et al. (1999) *Cell* 99(7):691-702). The backbone of the polynucleotide can comprise sugars and phosphate groups (as may typically be found in RNA or DNA), or modified or substituted sugar or phosphate groups. Alternatively, the backbone of the polynucleotide can comprise a polymer of synthetic subunits such as phosphoramidites and thus can be an oligodeoxynucleoside phosphoramidate or a mixed phosphoramidate-phosphodiester oligomer. Peyrottes *et al.* (1996) *Nucl. Acids Res.* 24:1841-1848; Chaturvedi *et al.* (1996) *Nucl. Acids Res.* 24:2318-2323. A polynucleotide may comprise modified nucleotides, such as methylated nucleotides and nucleotide analogs, uracyl, other sugars, and linking groups such as fluororibose and thioate, and nucleotide branches. The sequence of nucleotides may be interrupted by non-nucleotide components. A polynucleotide may be further modified after polymerization, such as by conjugation with a labeling component. Other types of modifications included in this definition are caps, substitution of one or more of the naturally occurring nucleotides with an analog, and introduction of means for attaching the polynucleotide to proteins, metal ions, labeling components, other polynucleotides, or a solid support. The term “polynucleotide” also encompasses peptidic nucleic acids (Pooga et al *Curr Cancer Drug Targets.* (2001) 1:231-9).

A “gene product” is a biopolymeric product that is expressed or produced by a gene. A gene product may be, for example, an unspliced RNA, an mRNA, a splice variant mRNA, a polypeptide, a post-translationally modified polypeptide, a splice variant polypeptide etc. Also encompassed by this term is biopolymeric products that are made using an RNA gene product as a template (*i.e.* cDNA of the RNA). A gene product may be made enzymatically, recombinantly, chemically, or within a cell to which the gene is native. In many embodiments, if the gene product is proteinaceous, it exhibits a biological activity. In many embodiments, if the gene product is a nucleic acid, it can be translated into a proteinaceous gene product that exhibits a biological activity.

A composition (*e.g.* a polynucleotide, polypeptide, antibody, or host cell) that is “isolated” or “in substantially isolated form” refers to a composition that is in an environment different from that in which the composition naturally occurs. For example, a polynucleotide that is in substantially isolated form is outside of the host cell in which the polynucleotide naturally occurs, and could be a purified fragment of DNA, could be part of a heterologous vector, or could be contained within a host cell that is not a host cell from

which the polynucleotide naturally occurs. The term "isolated" does not refer to a genomic or cDNA library, whole cell total protein or mRNA preparation, genomic DNA preparation, or an isolated human chromosome. A composition which is in substantially isolated form is usually substantially purified.

5 As used herein, the term "substantially purified" refers to a compound (*e.g.*, a polynucleotide, a polypeptide or an antibody, etc.) that is removed from its natural environment and is usually at least 60% free, preferably 75% free, and most preferably 90% free from other components with which it is naturally associated. Thus, for example, a composition containing A is "substantially free of" B when at least 85% by weight of the  
10 total A+B in the composition is A. Preferably, A comprises at least about 90% by weight of the total of A+B in the composition, more preferably at least about 95% or even 99% by weight. In the case of polynucleotides, "A" and "B" may be two different genes positioned on different chromosomes or adjacently on the same chromosome, or two isolated cDNA species, for example.

15 The terms "polypeptide" and "protein", interchangeably used herein, refer to a polymeric form of amino acids of any length, which can include coded and non-coded amino acids, chemically or biochemically modified or derivatized amino acids, and polypeptides having modified peptide backbones. The term includes fusion proteins, including, but not limited to, fusion proteins with a heterologous amino acid sequence, fusions with  
20 heterologous and homologous leader sequences, with or without N-terminal methionine residues; immunologically tagged proteins; and the like.

"Heterologous" refers to materials that are derived from different sources (*e.g.*, from different genes, different species, etc.).

As used herein, the terms "a gene that is differentially expressed in a breast cancer  
25 cell," and "a polynucleotide that is differentially expressed in a breast cancer cell" are used interchangeably herein, and generally refer to a polynucleotide that represents or corresponds to a gene that is differentially expressed in a cancerous breast cell when compared with a cell of the same cell type that is not cancerous, *e.g.*, mRNA is found at levels at least about 25%, at least about 50% to about 75%, at least about 90%, at least about 1.5-fold, at least about 2-  
30 fold, at least about 5-fold, at least about 10-fold, or at least about 50-fold or more, different (*e.g.*, higher or lower). The comparison can be made in tissue, for example, if one is using in situ hybridization or another assay method that allows some degree of discrimination among cell types in the tissue. The comparison may also or alternatively be made between cells removed from their tissue source.

"Differentially expressed polynucleotide" as used herein refers to a nucleic acid molecule (RNA or DNA) comprising a sequence that represents a differentially expressed gene, *e.g.*, the differentially expressed polynucleotide comprises a sequence (*e.g.*, an open reading frame encoding a gene product; a non-coding sequence) that uniquely identifies a differentially expressed gene so that detection of the differentially expressed polynucleotide in a sample is correlated with the presence of a differentially expressed gene in a sample. "Differentially expressed polynucleotides" is also meant to encompass fragments of the disclosed polynucleotides, *e.g.*, fragments retaining biological activity, as well as nucleic acids homologous, substantially similar, or substantially identical (*e.g.*, having about 90% sequence identity) to the disclosed polynucleotides.

By "cyclin G associated kinase", or "GAK" is meant any polypeptide composition that exhibits cyclin G associated kinase activity. Examples of cyclin G associated kinase include the polypeptide defined by NCBI accession number XM\_003450, NM\_005255, NP\_005246 and NM\_031030. Assays for determining whether a polypeptide has cyclin G associated kinase activity are described in Ausubel et al., eds., 1998, Current Protocols in Molecular Biology, John Wiley & Sons, NY. Variants of the human cyclin G associated kinase that retain biological activity may be produced by, *inter alia*, substituting amino acids that are in equivalent positions between two cyclin G associated kinases, such as the cyclin G associated kinases from rat and humans.

With regard to cyclin G associated kinases, further references of interest include: Kanaoka et al, FEBS Lett. 1997 Jan 27;402(1):73-80; Kimura et al, Genomics. 1997 Sep 1;44(2):179-87; Greener et al, J Biol Chem. 2000 Jan 14;275(2):1365-70; and Korolchuk et al, Traffic. 2002 Jun;3(6):428-39.

"DKFZP566I133" and "DKFZ" are used interchangeably herein to refer to a polypeptide composition that exhibits DKFZP566I133 activity. Assays for determining whether a polypeptide has DKFZP566I133 activity (*i.e.* for determining whether DKFZP566I133 may have intracytoplasmic vacuole promoting activity) are described in Dusetti et al, (Biochem Biophys Res Commun. 2002 Jan 18;290(2):641-9). Variants of the DKFZP566I133 that retain biological activity may be produced by, *inter alia*, substituting amino acids that are in equivalent positions between two DKFZP566I133, such as the DKFZp566I133 from rat and humans. DKFZ is also known as VMP1, or vacuole membrane protein 1.

Alternatively, "DKFZP566I133", or "DKFZ" refers to an amino acid sequence defined by NCBI accession number NP\_112200, AAH09758, NM\_138839, and

NM\_030938, polynucleotides encoding the amino acid sequences set forth in these accession numbers (SEQ ID NO:512 and SEQ ID NO:513, respectively).

In addition, "DKFZP566I133", or "DKFZ" refers to the polynucleotide sequences represented by Spot ID NOS 22793, 26883 and 27450 (SEQ ID NOS: 274-275 and SEQ ID  
5 NOS: 276-277 and SEQ ID NOS:459-460, respectively). Figure 4 shows an alignment between Spot ID NOS: 22793, 26883 and VMP1 (NM\_030938) (i.e. DKFZ), identifying a VMP1 or DKFZ gene product as corresponding to these spot IDs. Figure 5 depicts fragments of Spot ID NOS 22793, 26883, 27450 which align with VMP1 (SEQ ID NOS  
10 514, 515, and 516 respectively). These fragments, or their encoded products, may also be used as a DKFZ identifying sequence.

"Corresponds to" or "represents" when used in the context of, for example, a polynucleotide or sequence that "corresponds to" or "represents" a gene means that at least a portion of a sequence of the polynucleotide is present in the gene or in the nucleic acid gene product (e.g., mRNA or cDNA). A subject nucleic acid may also be "identified" by a  
15 polynucleotide if the polynucleotide corresponds to or represents the gene. Several genes identified by the polynucleotides of the sequence listing may be found in table 1. Genes identified by a polynucleotide may have all or a portion of the identifying sequence wholly present within an exon of a genomic sequence of the gene, or different portions of the sequence of the polynucleotide may be present in different exons (e.g., such that the  
20 contiguous polynucleotide sequence is present in an mRNA, either pre- or post-splicing, that is an expression product of the gene). In some embodiments, the polynucleotide may represent or correspond to a gene that is modified in a cancerous cell relative to a normal cell. The gene in the cancerous cell may contain a deletion, insertion, substitution, or translocation relative to the polynucleotide and may have altered regulatory sequences, or  
25 may encode a splice variant gene product, for example. The gene in the cancerous cell may be modified by insertion of an endogenous retrovirus, a transposable element, or other naturally occurring or non-naturally occurring nucleic acid. In most cases, a polynucleotide corresponds to or represents a gene if the sequence of the polynucleotide is most identical to the sequence of a gene or its product (e.g. mRNA or cDNA) as compared to other genes or  
30 their products. In most embodiments, the most identical gene is determined using a sequence comparison of a polynucleotide to a database of polynucleotides (e.g. GenBank) using the BLAST program at default settings. For example, if the most similar gene in the human genome to an exemplary polynucleotide is the protein kinase C gene, the exemplary polynucleotide corresponds to protein kinase C. In most cases, the sequence of a fragment of

an exemplary polynucleotide is at least 95%, 96%, 97%, 98%, 99% or up to 100% identical to a sequence of at least 15, 20, 25, 30, 35, 40, 45, or 50 contiguous nucleotides of a corresponding gene or its product (mRNA or cDNA), when nucleotides that are "N" represent G, A, T or C.

5 An "identifying sequence" is a minimal fragment of a sequence of contiguous nucleotides that uniquely identifies or defines a polynucleotide sequence or its complement. In many embodiments, a fragment of a polynucleotide uniquely identifies or defines a polynucleotide sequence or its complement. In some embodiments, the entire contiguous sequence of a gene, cDNA, EST, or other provided sequence is an identifying sequence.

10 "Diagnosis" as used herein generally includes determination of a subject's susceptibility to a disease or disorder, determination as to whether a subject is presently affected by a disease or disorder, prognosis of a subject affected by a disease or disorder (*e.g.*, identification of pre-metastatic or metastatic cancerous states, stages of cancer, or responsiveness of cancer to therapy), and use of therametrics (*e.g.*, monitoring a subject's condition to provide information as to the effect or efficacy of therapy).

15 As used herein, the term "a polypeptide associated with breast cancer" refers to a polypeptide encoded by a polynucleotide that is differentially expressed in a breast cancer cell. Several examples of polypeptides associated with breast cancer are shown in Table 1.

20 The term "biological sample" encompasses a variety of sample types obtained from an organism and can be used in a diagnostic or monitoring assay. The term encompasses blood and other liquid samples of biological origin, solid tissue samples, such as a biopsy specimen or tissue cultures or cells derived therefrom and the progeny thereof. The term encompasses samples that have been manipulated in any way after their procurement, such as by treatment with reagents, solubilization, or enrichment for certain components. The term encompasses a clinical sample, and also includes cells in cell culture, cell supernatants, cell lysates, serum, plasma, biological fluids, and tissue samples.

25 The terms "treatment", "treating", "treat" and the like are used herein to generally refer to obtaining a desired pharmacologic and/or physiologic effect. The effect may be prophylactic in terms of completely or partially preventing a disease or symptom thereof and/or may be therapeutic in terms of a partial or complete stabilization or cure for a disease and/or adverse effect attributable to the disease. "Treatment" as used herein covers any treatment of a disease in a mammal, particularly a human, and includes: (a) preventing the disease or symptom from occurring in a subject which may be predisposed to the disease or symptom but has not yet been diagnosed as having it; (b) inhibiting the disease symptom,



i.e., arresting its development; or (c) relieving the disease symptom, i.e., causing regression of the disease or symptom.

The terms "individual," "subject," "host," and "patient," used interchangeably herein and refer to any mammalian subject for whom diagnosis, treatment, or therapy is desired, particularly humans. Other subjects may include cattle, dogs, cats, guinea pigs, rabbits, rats, mice, horses, and the like.

A "host cell", as used herein, refers to a microorganism or a eukaryotic cell or cell line cultured as a unicellular entity which can be, or has been, used as a recipient for a recombinant vector or other transfer polynucleotides, and include the progeny of the original cell which has been transfected. It is understood that the progeny of a single cell may not necessarily be completely identical in morphology or in genomic or total DNA complement as the original parent, due to natural, accidental, or deliberate mutation.

The terms "cancer", "neoplasm", "tumor", and "carcinoma", are used interchangeably herein to refer to cells which exhibit relatively autonomous growth, so that they exhibit an aberrant growth phenotype characterized by a significant loss of control of cell proliferation. In general, cells of interest for detection or treatment in the present application include precancerous (*e.g.*, benign), malignant, pre-metastatic, metastatic, and non-metastatic cells. Detection of cancerous cells is of particular interest.

The term "normal" as used in the context of "normal cell," is meant to refer to a cell of an untransformed phenotype or exhibiting a morphology of a non-transformed cell of the tissue type being examined.

"Cancerous phenotype" generally refers to any of a variety of biological phenomena that are characteristic of a cancerous cell, which phenomena can vary with the type of cancer. The cancerous phenotype is generally identified by abnormalities in, for example, cell growth or proliferation (*e.g.*, uncontrolled growth or proliferation), regulation of the cell cycle, cell mobility, cell-cell interaction, or metastasis, etc.

"Therapeutic target" generally refers to a gene or gene product that, upon modulation of its activity (*e.g.*, by modulation of expression, biological activity, and the like), can provide for modulation of the cancerous phenotype.

As used throughout, "modulation" is meant to refer to an increase or a decrease in the indicated phenomenon (*e.g.*, modulation of a biological activity refers to an increase in a biological activity or a decrease in a biological activity).

## POLYNUCLEOTIDE COMPOSITIONS

The present invention provides isolated polynucleotides that represent genes that are differentially expressed in breast cancer cells. The polynucleotides, as well as polypeptides encoded thereby, find use in a variety of therapeutic and diagnostic methods.

5 The scope of the invention with respect to compositions containing the isolated polynucleotides useful in the methods described herein includes, but is not necessarily limited to, polynucleotides having a sequence set forth in any one of the polynucleotide sequences provided herein; polynucleotides obtained from the biological materials described herein or other biological sources (particularly human sources) by hybridization under  
10 stringent conditions (particularly conditions of high stringency); genes corresponding to the provided polynucleotides; cDNAs corresponding to the provided polynucleotides; variants of the provided polynucleotides and their corresponding genes, particularly those variants that retain a biological activity of the encoded gene product (*e.g.*, a biological activity ascribed to a gene product corresponding to the provided polynucleotides as a result of the assignment  
15 of the gene product to a protein family(ies) and/or identification of a functional domain present in the gene product). Other nucleic acid compositions contemplated by and within the scope of the present invention will be readily apparent to one of ordinary skill in the art when provided with the disclosure here. "Polynucleotide" and "nucleic acid" as used herein with reference to nucleic acids of the composition is not intended to be limiting as to the  
20 length or structure of the nucleic acid unless specifically indicated.

The invention features polynucleotides that represent genes that are expressed in human tissue, specifically human breast tissue, particularly polynucleotides that are differentially expressed in cancerous breast cells. Nucleic acid compositions described herein of particular interest are at least about 15 bp in length, at least about 30 bp in length,  
25 at least about 50 bp in length, at least about 100 bp, at least about 200 bp in length, at least about 300 bp in length, at least about 500 bp in length, at least about 800 bp in length, at least about 1 kb in length, at least about 2.0 kb in length, at least about 3.0 kb in length, at least about 5 kb in length, at least about 10 kb in length, at least about 50kb in length and are usually less than about 200 kb in length. These polynucleotides (or polynucleotide  
30 fragments) have uses that include, but are not limited to, diagnostic probes and primers as starting materials for probes and primers, as discussed herein.

The subject polynucleotides usually comprise a sequence set forth in any one of the polynucleotide sequences provided herein, for example, in the sequence listing, incorporated by reference in a table (*e.g.* by an NCBI accession number), a cDNA deposited at the

A.T.C.C., or a fragment or variant thereof. A "fragment" or "portion" of a polynucleotide is a contiguous sequence of residues at least about 10 nt to about 12 nt, 15 nt, 16 nt, 18 nt or 20 nt in length, usually at least about 22 nt, 24 nt, 25 nt, 30 nt, 40 nt, 50 nt, 60nt, 70 nt, 80 nt, 90 nt, 100 nt to at least about 150 nt, 200 nt, 250 nt, 300 nt, 350 nt, 400 nt, 500 nt, 800 nt or up to about 1000 nt, 1500 or 2000 nt in length. In some embodiments, a fragment of a polynucleotide is the coding sequence of a polynucleotide. A fragment of a polynucleotide may start at position 1 (i.e. the first nucleotide) of a nucleotide sequence provided herein, or may start at about position 10, 20, 30, 50, 75, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, 1000, 1500 or 2000, or an ATG translational initiation codon of a nucleotide sequence provided herein. In this context "about" includes the particularly recited value or a value larger or smaller by several (5, 4, 3, 2, or 1) nucleotides. The described polynucleotides and fragments thereof find use as hybridization probes, PCR primers, BLAST probes, or as an identifying sequence, for example.

The subject nucleic acids may be variants or degenerate variants of a sequence provided herein. In general, a variants of a polynucleotide provided herein have a fragment of sequence identity that is greater than at least about 65%, greater than at least about 70%, greater than at least about 75%, greater than at least about 80%, greater than at least about 85%, or greater than at least about 90%, 95%, 96%, 97%, 98%, 99% or more (i.e. 100%) as compared to an identically sized fragment of a provided sequence. as determined by the Smith-Waterman homology search algorithm as implemented in MPSRCH program (Oxford Molecular). For the purposes of this invention, a preferred method of calculating percent identity is the Smith-Waterman algorithm. Global DNA sequence identity should be greater than 65% as determined by the Smith-Waterman homology search algorithm as implemented in MPSRCH program (Oxford Molecular) using an gap search with the following search parameters: gap open penalty, 12; and gap extension penalty, 1.

The subject nucleic acid compositions include full-length cDNAs or mRNAs that encompass an identifying sequence of contiguous nucleotides from any one of the polynucleotide sequences provided herein.

As discussed above, the polynucleotides useful in the methods described herein also include polynucleotide variants having sequence similarity or sequence identity. Nucleic acids having sequence similarity are detected by hybridization under low stringency conditions, for example, at 50°C and 10XSSC (0.9 M saline/0.09 M sodium citrate) and remain bound when subjected to washing at 55°C in 1XSSC. Sequence identity can be determined by hybridization under high stringency conditions, for example, at 50°C or

higher and 0.1XSSC (9 mM saline/0.9 mM sodium citrate). Hybridization methods and conditions are well known in the art, see, *e.g.*, USPN 5,707,829. Nucleic acids that are substantially identical to the provided polynucleotide sequences, *e.g.* allelic variants, genetically altered versions of the gene, *etc.*, bind to the provided polynucleotide sequences  
5 under stringent hybridization conditions. By using probes, particularly labeled probes of DNA sequences, one can isolate homologous or related genes. The source of homologous genes can be any species, *e.g.* primate species, particularly human; rodents, such as rats and mice; canines, felines, bovines, ovines, equines, yeast, nematodes, *etc.*

In one embodiment, hybridization is performed using a fragment of at least 15  
10 contiguous nucleotides (nt) of at least one of the polynucleotide sequences provided herein. That is, when at least 15 contiguous nt of one of the disclosed polynucleotide sequences is used as a probe, the probe will preferentially hybridize with a nucleic acid comprising the complementary sequence, allowing the identification and retrieval of the nucleic acids that uniquely hybridize to the selected probe. Probes from more than one polynucleotide  
15 sequence provided herein can hybridize with the same nucleic acid if the cDNA from which they were derived corresponds to one mRNA.

Polynucleotides contemplated for use in the invention also include those having a sequence of naturally occurring variants of the nucleotide sequences (*e.g.*, degenerate variants (*e.g.*, sequences that encode the same polypeptides but, due to the degenerate nature  
20 of the genetic code, different in nucleotide sequence), allelic variants, *etc.*). Variants of the polynucleotides contemplated by the invention are identified by hybridization of putative variants with nucleotide sequences disclosed herein, preferably by hybridization under stringent conditions. For example, by using appropriate wash conditions, variants of the polynucleotides described herein can be identified where the allelic variant exhibits at most  
25 about 25-30% base pair (bp) mismatches relative to the selected polynucleotide probe. In general, allelic variants contain 15-25% bp mismatches, and can contain as little as even 5-15%, or 2-5%, or 1-2% bp mismatches, as well as a single bp mismatch.

The invention also encompasses homologs corresponding to any one of the polynucleotide sequences provided herein, where the source of homologous genes can be  
30 any mammalian species, *e.g.*, primate species, particularly human; rodents, such as rats; canines, felines, bovines, ovines, equines, yeast, nematodes, *etc.* Between mammalian species, *e.g.*, human and mouse, homologs generally have substantial sequence similarity, *e.g.*, at least 75% sequence identity, usually at least 80%, at least 85, at least 90%, at least 95%, at least 96%, at least 97%, at least 98%, at least 99% or even 100% identity between

nucleotide sequences. Sequence similarity is calculated based on a reference sequence, which may be a subset of a larger sequence, such as a conserved motif, coding region, flanking region, *etc.* A reference sequence will usually be at least about a fragment of a polynucleotide sequence and may extend to the complete sequence that is being compared.

5 Algorithms for sequence analysis are known in the art, such as gapped BLAST, described in Altschul, et al. *Nucleic Acids Res.* (1997) 25:3389-3402, or TeraBLAST available from TimeLogic Corp. (Crystal Bay, Nevada).

Moreover, representative examples of polynucleotide fragments of the invention (useful, for example, as probes), include, for example, fragments comprising, or alternatively  
10 consisting of, a sequence from about nucleotide number 1-50, 51-100, 101-150, 151-200, 201-250, 251-300, 301-350, 351-400, 401-450, 451-500, 501-550, 551-600, 651-700, 701-750, 751-800, 800-850, 851-900, 901-950, 951-1000, 1001-1050, 1051-1100, 1101-1150, 1151-1200, 1201-1250, 1251-1300, 1301-1350, 1351-1400, 1401-1450, 1451-1500, 1501-1550, 1551-1600, 1601-1650, 1651-1700, 1701-1750, 1751-1800, 1801-1850, 1851-1900,  
15 1901-1950, 1951-2000, 2001-2050, 2051-2100, 2101-2150, 2151-2200, 2201-2250, 2251-2300, 2301-2350, 2351-2400, 2401-2450, 2451-2500, 2501-2550, 2551-2600, 2601-2650, 2651-2700, 2701-2750, 2751-2800, 2801-2850, 2851-2900, 2901-2950, 2951-3000, 3001-3050, 3051-3100, 3101-3150, 3151-3200, 3201-3250, 3251-3300, 3301-3350, 3351-3400, 3401-3450, 3451-3500, 3501-3550, 3551-3600, 3601-3650, 3651-3700, 3701-3750, 3751-  
20 3800, 3801-3850, 3851-3900, 3901-3950, 3951-4000, 4001-4050, 4051-4100, 4101-4150, 4151-4200, 4201-4250, 4251-4300, 4301-4350, 4351-4400, 4401-4450, 4451-4500, 4501-4550, 4551-4600, 4601-4650, 4651-4700, 4701-4750, 4751-4800, 4801-4850, 4851-4900, 4901-4950, 4951-5000, 5001-5050, 5051-5100, 5101-5150, 5151-5200, 5201-5250, 5251-5300, 5301-5350, 5351-5400, 5401-5450, 5451-5500, 5501-5550, 5551-5600, 5601-5650,  
25 5651-5700, 5701-5750, 5751-5800, 5801-5850, 5851-5900, 5901-5950, 5951-6000, 6001-6050, 6051-6100, 6101-6150, and 6151 of a subject nucleic acid, or the complementary strand thereto. In this context "about" includes the particularly recited range or a range larger or smaller by several (5, 4, 3, 2, or 1) nucleotides, at either terminus or at both termini. In some embodiments, these fragments encode a polypeptide which has a functional activity  
30 (e.g., biological activity) whereas in other embodiments, these fragments are probes, or starting materials for probes. Polynucleotides which hybridize to one or more of these nucleic acid molecules under stringent hybridization conditions or alternatively, under lower stringency conditions, are also encompassed by the invention, as are polypeptides encoded by these polynucleotides or fragments.

The subject nucleic acids can be cDNAs or genomic DNAs, as well as fragments thereof, particularly fragments that encode a biologically active gene product and/or are useful in the methods disclosed herein (e.g., in diagnosis, as a unique identifier of a differentially expressed gene of interest, etc.). The term "cDNA" as used herein is intended to include all nucleic acids that share the arrangement of sequence elements found in native mature mRNA species, where sequence elements are exons and 3' and 5' non-coding regions. Normally mRNA species have contiguous exons, with the intervening introns, when present, being removed by nuclear RNA splicing, to create a continuous open reading frame encoding a polypeptide. mRNA species can also exist with both exons and introns, where the introns may be removed by alternative splicing. Furthermore it should be noted that different species of mRNAs encoded by the same genomic sequence can exist at varying levels in a cell, and detection of these various levels of mRNA species can be indicative of differential expression of the encoded gene product in the cell.

A genomic sequence of interest comprises the nucleic acid present between the initiation codon and the stop codon, as defined in the listed sequences, including all of the introns that are normally present in a native chromosome. It can further include the 3' and 5' untranslated regions found in the mature mRNA. It can further include specific transcriptional and translational regulatory sequences, such as promoters, enhancers, *etc.*, including about 1 kb, but possibly more, of flanking genomic DNA at either the 5' and 3' end of the transcribed region. The genomic DNA can be isolated as a fragment of 100 kbp or smaller; and substantially free of flanking chromosomal sequence. The genomic DNA flanking the coding region, either 3' and 5', or internal regulatory sequences as sometimes found in introns, contains sequences required for proper tissue, stage-specific, or disease-state specific expression.

The nucleic acid compositions of the subject invention can encode all or a part of the naturally-occurring polypeptides. Double or single stranded fragments can be obtained from the DNA sequence by chemically synthesizing oligonucleotides in accordance with conventional methods, by restriction enzyme digestion, by PCR amplification, *etc.*

Probes specific to the polynucleotides described herein can be generated using the polynucleotide sequences disclosed herein. The probes are usually a fragment of a polynucleotide sequences provided herein. The probes can be synthesized chemically or can be generated from longer polynucleotides using restriction enzymes. The probes can be labeled, for example, with a radioactive, biotinylated, or fluorescent tag. Preferably, probes are designed based upon an identifying sequence of any one of the polynucleotide sequences

provided herein. More preferably, probes are designed based on a contiguous sequence of one of the subject polynucleotides that remain unmasked following application of a masking program for masking low complexity (*e.g.*, XBLAST, RepeatMasker, etc.) to the sequence., *i.e.*, one would select an unmasked region, as indicated by the polynucleotides outside the  
5 poly-n stretches of the masked sequence produced by the masking program.

The polynucleotides of interest in the subject invention are isolated and obtained in substantial purity, generally as other than an intact chromosome. Usually, the polynucleotides, either as DNA or RNA, will be obtained substantially free of other naturally-occurring nucleic acid sequences that they are usually associated with, generally  
10 being at least about 50%, usually at least about 90% pure and are typically “recombinant”, *e.g.*, flanked by one or more nucleotides with which it is not normally associated on a naturally occurring chromosome.

The polynucleotides described herein can be provided as a linear molecule or within a circular molecule, and can be provided within autonomously replicating molecules  
15 (vectors) or within molecules without replication sequences. Expression of the polynucleotides can be regulated by their own or by other regulatory sequences known in the art. The polynucleotides can be introduced into suitable host cells using a variety of techniques available in the art, such as transferrin polycation-mediated DNA transfer, transfection with naked or encapsulated nucleic acids, liposome-mediated DNA transfer,  
20 intracellular transportation of DNA-coated latex beads, protoplast fusion, viral infection, electroporation, gene gun, calcium phosphate-mediated transfection, and the like.

The nucleic acid compositions described herein can be used to, for example, produce polypeptides, as probes for the detection of mRNA in biological samples (*e.g.*, extracts of human cells) or cDNA produced from such samples, to generate additional copies of the  
25 polynucleotides, to generate ribozymes or antisense oligonucleotides, and as single stranded DNA probes or as triple-strand forming oligonucleotides. The probes described herein can be used to, for example, determine the presence or absence of any one of the polynucleotide provided herein or variants thereof in a sample. These and other uses are described in more detail below.

30

#### POLYPEPTIDES AND VARIANTS THEREOF

The present invention further provides polypeptides encoded by polynucleotides that represent genes that are differentially expressed in breast cancer cells. Such polypeptides are referred to herein as “polypeptides associated with breast cancer.” The polypeptides can be

used to generate antibodies specific for a polypeptide associated with breast cancer, which antibodies are in turn useful in diagnostic methods, prognostics methods, therametric methods, and the like as discussed in more detail herein. Polypeptides are also useful as targets for therapeutic intervention, as discussed in more detail herein.

5           The polypeptides contemplated by the invention include those encoded by the disclosed polynucleotides and the genes to which these polynucleotides correspond, as well as nucleic acids that, by virtue of the degeneracy of the genetic code, are not identical in sequence to the disclosed polynucleotides. Further polypeptides contemplated by the invention include polypeptides that are encoded by polynucleotides that hybridize to  
10 polynucleotide of the sequence listing. Thus, the invention includes within its scope a polypeptide encoded by a polynucleotide having the sequence of any one of the polynucleotide sequences provided herein, or a variant thereof.

          In general, the term "polypeptide" as used herein refers to both the full length polypeptide encoded by the recited polynucleotide, the polypeptide encoded by the gene  
15 represented by the recited polynucleotide, as well as portions or fragments thereof.

"Polypeptides" also includes variants of the naturally occurring proteins, where such variants are homologous or substantially similar to the naturally occurring protein, and can be of an origin of the same or different species as the naturally occurring protein (*e.g.*, human, murine, or some other species that naturally expresses the recited polypeptide, usually a  
20 mammalian species). In general, variant polypeptides have a sequence that has at least about 80%, usually at least about 90%, and more usually at least about 98% sequence identity with a differentially expressed polypeptide described herein, as measured by BLAST 2.0 using the parameters described above. The variant polypeptides can be naturally or non-naturally glycosylated, *i.e.*, the polypeptide has a glycosylation pattern that differs from the  
25 glycosylation pattern found in the corresponding naturally occurring protein.

          The invention also encompasses homologs of the disclosed polypeptides (or fragments thereof) where the homologs are isolated from other species, *i.e.* other animal or plant species, where such homologs, usually mammalian species, *e.g.* rodents, such as mice, rats; domestic animals, *e.g.*, horse, cow, dog, cat; and humans. By "homolog" is meant a  
30 polypeptide having at least about 35%, usually at least about 40% and more usually at least about 60% amino acid sequence identity to a particular differentially expressed protein as identified above, where sequence identity is determined using the BLAST 2.0 algorithm, with the parameters described *supra*.



In general, the polypeptides of interest in the subject invention are provided in a non-naturally occurring environment, *e.g.* are separated from their naturally occurring environment. In certain embodiments, the subject protein is present in a composition that is enriched for the protein as compared to a cell or extract of a cell that naturally produces the protein. As such, isolated polypeptide is provided, where by “isolated” or “in substantially isolated form” is meant that the protein is present in a composition that is substantially free of other polypeptides, where by substantially free is meant that less than 90%, usually less than 60% and more usually less than 50% of the composition is made up of other polypeptides of a cell that the protein is naturally found.

Also within the scope of the invention are variants; variants of polypeptides include mutants, fragments, and fusions. Mutants can include amino acid substitutions, additions or deletions. The amino acid substitutions can be conservative amino acid substitutions or substitutions to eliminate non-essential amino acids, such as to alter a glycosylation site, a phosphorylation site or an acetylation site, or to minimize misfolding by substitution or deletion of one or more cysteine residues that are not necessary for function. Conservative amino acid substitutions are those that preserve the general charge, hydrophobicity/hydrophilicity, and/or steric bulk of the amino acid substituted.

Variants can be designed so as to retain or have enhanced biological activity of a particular region of the protein (*e.g.*, a functional domain and/or, where the polypeptide is a member of a protein family, a region associated with a consensus sequence). For example, muteins can be made which are optimized for increased antigenicity, *i.e.* amino acid variants of a polypeptide may be made that increase the antigenicity of the polypeptide. Selection of amino acid alterations for production of variants can be based upon the accessibility (interior vs. exterior) of the amino acid (*see, e.g., Go et al, Int. J. Peptide Protein Res.* (1980) 15:211), the thermostability of the variant polypeptide (*see, e.g., Querol et al., Prot. Eng.* (1996) 9:265), desired glycosylation sites (*see, e.g., Olsen and Thomsen, J. Gen. Microbiol.* (1991) 137:579), desired disulfide bridges (*see, e.g., Clarke et al., Biochemistry* (1993) 32:4322; and *Wakarchuk et al., Protein Eng.* (1994) 7:1379), desired metal binding sites (*see, e.g., Toma et al., Biochemistry* (1991) 30:97, and *Haezebrouck et al., Protein Eng.* (1993) 6:643), and desired substitutions within proline loops (*see, e.g., Masul et al., Appl. Env. Microbiol.* (1994) 60:3579). Cysteine-depleted muteins can be produced as disclosed in USPN 4,959,314. Variants also include fragments of the polypeptides disclosed herein, particularly biologically active fragments and/or fragments corresponding to functional domains. Fragments of interest will typically be at least about 10 aa to at least about 15 aa in

length, usually at least about 50 aa in length, and can be as long as 300 aa in length or longer, but will usually not exceed about 1000 aa in length, where the fragment will have a stretch of amino acids that is identical to a polypeptide encoded by a polynucleotide having a sequence of any one of the polynucleotide sequences provided herein, or a homolog thereof.

5 The protein variants described herein are encoded by polynucleotides that are within the scope of the invention. The genetic code can be used to select the appropriate codons to construct the corresponding variants.

A fragment of a subject polypeptide is, for example, a polypeptide having an amino acid sequence which is a portion of a subject polypeptide e.g. a polypeptide encoded by a subject polynucleotide that is identified by any one of the sequence of SEQ ID  
10 NOS 1 - 499 or its complement. The polypeptide fragments of the invention are preferably at least about 9 aa, at least about 15 aa, and more preferably at least about 20 aa, still more preferably at least about 30 aa, and even more preferably, at least about 40 aa, at least about 50 aa, at least about 75 aa, at least about 100 aa, at least about 125 aa or at least about 150 aa  
15 in length. A fragment "at least 20 aa in length," for example, is intended to include 20 or more contiguous amino acids from, for example, the polypeptide encoded by a cDNA, in a cDNA clone contained in a deposited library, or a nucleotide sequence shown in SEQ ID NOS:1-499 or the complementary stand thereof. In this context "about" includes the particularly recited value or a value larger or smaller by several (5, 4, 3, 2, or 1) amino acids.  
20 These polypeptide fragments have uses that include, but are not limited to, production of antibodies as discussed herein. Of course, larger fragments (e.g., at least 150, 175, 200, 250, 500, 600, 1000, or 2000 amino acids in length) are also encompassed by the invention.

Moreover, representative examples of polypeptides fragments of the invention (useful in, for example, as antigens for antibody production), include, for example,  
25 fragments comprising, or alternatively consisting of, a sequence from about amino acid number 1-10, 5-10, 10-20, 21-31, 31-40, 41-61, 61-81, 91-120, 121-140, 141-162, 162-200, 201-240, 241-280, 281- 320, 321-360, 360-400, 400-450, 451-500, 500-600, 600-700, 700-800, 800-900 and the like. In this context "about" includes the particularly recited range or a range larger or smaller by several (5, 4, 3, 2, or 1) amino acids, at either terminus or at both  
30 termini. In some embodiments, these fragments has a functional activity (e.g., biological activity) whereas in other embodiments, these fragments may be used to make an antibody.

Further polypeptide variants may are described in PCT publications WO/00-55173, WO/01-07611 and WO/02-16429

## VECTORS, HOST CELLS AND PROTEIN PRODUCTION

The present invention also relates to vectors containing the polynucleotide of the present invention, host cells, and the production of polypeptides by recombinant techniques. The vector may be, for example, a phage, plasmid, viral, or retroviral vector. Retroviral  
5 vectors may be replication competent or replication defective. In the latter case, viral propagation generally will occur only in complementing host cells.

The polynucleotides of the invention may be joined to a vector containing a selectable marker for propagation in a host. Generally, a plasmid vector is introduced in a precipitate, such as a calcium phosphate precipitate, or in a complex with a charged lipid. If  
10 the vector is a virus, it may be packaged in vitro using an appropriate packaging cell line and then transduced into host cells.

The polynucleotide insert should be operatively linked to an appropriate promoter, such as the phage lambda PL promoter, the *E. coli* lac, trp, phoA and tac promoters, the SV40 early and late promoters and promoters of retroviral LTRs, to name a few. Other  
15 suitable promoters will be known to the skilled artisan. The expression constructs will further contain sites for transcription initiation, termination, and, in the transcribed region, a ribosome binding site for translation. The coding portion of the transcripts expressed by the constructs will preferably include a translation initiating codon at the beginning and a  
20 termination codon (UAA, UGA or UAG) appropriately positioned at the end of the polypeptide to be translated.

As indicated, the expression vectors will preferably include at least one selectable marker. Such markers include dihydrofolate reductase, G418 or neomycin resistance for eukaryotic cell culture and tetracycline, kanamycin or ampicillin resistance genes for culturing in *E. coli* and other bacteria.

25 Representative examples of appropriate hosts include, but are not limited to, bacterial cells, such as *E. coli*, *Streptomyces* and *Salmonella typhimurium* cells; fungal cells, such as yeast cells (e.g., *Saccharomyces cerevisiae* or *Pichia pastoris* (ATCC Accession No. 201178)); insect cells such as *Drosophila* S2 and *Spodoptera Sf9* cells; animal cells such as CHO, COS, 293, and Bowes melanoma cells; and plant cells. 5 Appropriate culture mediums  
30 and conditions for the above-described host cells are known in the art.

Among vectors preferred for use in bacteria include pQE70, pQE60 and pQE-9, available from QIAGEN, Inc.; pBluescript vectors, Phagescript vectors, pNHSA, pNH16a, pNH18A, pNH46A, available from Stratagene Cloning Systems, Inc.; and ptrc99a, pKK223-3, pKK223-3, pDR540, pRITS available from Pharmacia Biotech, Inc. Among preferred

eukaryotic vectors are pWLNEO, pSV2CAT, pOG44, pXT1 and pSG available from Stratagene; and pSVK3, pBPV, pMSG and pSVL available from Pharmacia. Preferred expression vectors for use in yeast systems include, but are not limited to pYES2, pYDI, pTEF1/Zeo, pYES2/GS, pPICZ, pGAPZ, pGAPZalph, pPIC9, pPIC3.5, pHIL-D2, pHIL-S1, 5 pPIC3.5K, pPIC9K, and PAO815 (all available from Invitrogen, Carload, CA). Other suitable vectors will be readily apparent to the skilled artisan.

Nucleic acids of interest may be cloned into a suitable vector by route methods. Suitable vectors include plasmids, cosmids, recombinant viral vectors e.g. retroviral vectors, YACs, BACs and the like, phage vectors.

10 Introduction of the construct into the host cell can be effected by calcium phosphate transfection, DEAE-dextran mediated transfection, cationic lipid-mediated transfection, electroporation, transduction, infection, or other methods. Such methods are described in many standard laboratory manuals, such as Davis et al., Basic Methods In Molecular Biology (1986). It is specifically contemplated that the polypeptides of the present invention 15 may in fact be expressed by a host cell lacking a recombinant vector.

A polypeptide of this invention can be recovered and purified from recombinant cell cultures by well-known methods including ammonium sulfate or ethanol precipitation, acid extraction, anion or cation exchange chromatography, phosphocellulose chromatography, hydrophobic interaction chromatography, affinity chromatography, hydroxylapatite 20 chromatography and lectin chromatography. Most preferably, high performance liquid chromatography ("HPLC") is employed for purification.

Polypeptides of the present invention can also be recovered from: products purified from natural sources, including bodily fluids, tissues and cells, whether directly isolated or cultured; products of chemical synthetic procedures; and products produced by recombinant 25 techniques from a prokaryotic or eukaryotic host, including, for example, bacterial, yeast higher plant, insect, and mammalian cells. Depending upon the host employed in a recombinant production procedure, the polypeptides of the present invention may be glycosylated or may be non-glycosylated. In addition, polypeptides of the invention may also include an initial modified methionine residue, in some cases as a result of host 30 mediated processes. Thus, it is well known in the art that the N-terminal methionine encoded by the translation initiation codon generally is removed with high efficiency from any protein after translation in all eukaryotic cells. While the N-terminal methionine on most proteins also is efficiently removed in most prokaryotes, for some proteins, this prokaryotic

removal process is inefficient, depending on the nature of the amino acid to which the N-terminal methionine is covalently linked.

Suitable methods and compositions for polypeptide expression may be found in PCT publications WO/00-55173, WO/01-07611 and WO/02-16429.

5 In addition, polypeptides of the invention can be chemically synthesized using techniques known in the art (e.g., see Creighton, 1983, *Proteins: Structures and Molecular Principles*, W.H. Freeman & Co., N.Y., and Hunkapiller et al., *Nature*, 310:105-111 (1984)). For example, a polypeptide corresponding to a fragment of a polypeptide can be synthesized by use of a peptide synthesizer. Furthermore, if desired, nonclassical amino acids or  
10 chemical amino acid analogs can be introduced as a substitution or addition into the polypeptide sequence. Non-classical amino acids include, but are not limited to, to the D-isomers of the common amino acids, 2,4-diaminobutyric acid,  $\alpha$ -amino isobutyric acid, 4-aminobutyric acid, Abu, 2-amino butyric acid,  $\gamma$ -Abu,  $\epsilon$ -Ahx, 6-amino hexanoic acid, Aib, 2-amino isobutyric acid, 3-amino propionic acid, ornithine, norleucine, norvaline, 5  
15 hydroxyproline, sarcosine, citrulline, homocitrulline, cysteic acid, t-butylglycine, t-butylalanine, phenylglycine, cyclohexylalanine,  $\beta$ -alanine, fluoro-amino acids, designer amino acids such as  $\beta$ -methyl amino acids, Ca-methyl amino acids, Na-methyl amino acids, and amino acid analogs in general. Furthermore, the amino acid can be D (dextrorotary) or L (levorotary).

20 Non-naturally occurring variants may be produced using art-known mutagenesis techniques, which include, but are not limited to oligonucleotide mediated mutagenesis, alanine scanning, PCR mutagenesis, site directed mutagenesis (see, e.g., Carter et al., *Nucl. Acids Res.* 73:4331 (1986); and Zoller et al., *Nucl. Acids Res.* 70:6487 (1982)), cassette mutagenesis (see, e.g., Wells et al., *Gene* 34:315 (1985)), restriction selection mutagenesis  
25 (see, e.g., Wells et al., *Philos. Trans. R. Soc. London SerA* 377:415 (1986)).

Scanning amino acid analysis can also be employed to identify one or more amino acids along a contiguous sequence. Among the preferred scanning amino acids are relatively small neutral amino acids. Such amino acids include alanine, glycine, serine and cysteine. Alanine is typically a preferred scanning amino acid among this group because it eliminates  
30 the side-chain beyond the beta-carbon and is less likely to alter the main-chain conformation of the variant. Alanine is also typically preferred because it is the most common amino acid. If alanine substituting does not yield adequate amounts of variant, an isoteric amino acid can be used.

Any cysteine residue not involved in maintaining the proper conformation of a polypeptide may also be substituted, generally with serine, to improve the oxidative stability of the molecule and prevent aberrant crosslinking. Conversely, cysteine bonds may be added to the polypeptide to improve its stability.

5 The invention additionally, encompasses polypeptides of the present invention which are differentially modified during or after translation, e.g., by glycosylation, acetylation, phosphorylation, amidation, derivatization by known protecting/blocking groups, proteolytic cleavage, linkage to an antibody molecule or other cellular ligand, etc. Any of numerous chemical modifications may be carried out by known techniques, including but not limited, 10 to specific chemical cleavage by cyanogen bromide, trypsin, chymotrypsin, papain, V8 protease, NaBH<sub>4</sub>; acetylation, formylation, oxidation, reduction; metabolic synthesis in the presence of tunicamycin; etc.

Additional post-translational modifications encompassed by the invention include, for example, e.g., N-linked or O-linked carbohydrate chains, processing of N-terminal or C- 15 terminal ends), attachment of chemical moieties to the amino acid backbone, chemical modifications of N-linked or O-linked carbohydrate chains, and addition or deletion of an N-terminal methionine residue as a result of procaryotic host cell expression. The polypeptides may also be modified with a detectable label, such as an enzymatic, fluorescent, isotopic or affinity label to allow for detection and isolation of the protein.

20 Also provided by the invention are chemically modified derivatives of the polypeptides of the invention which may provide additional advantages such as increased solubility, stability and circulating time of the polypeptide, or decreased immunogenicity (see U.S. Patent No. 4,179,337). The chemical moieties for derivitization may be selected from water soluble polymers such as polyethylene glycol, ethylene glycol/propylene glycol 25 copolymers, carboxymethylcellulose, dextran, polyvinyl alcohol and the like. The 5 polypeptides may be modified at random positions within the molecule, or at predetermined positions within the molecule and may include one, two, three or more attached chemical moieties.

Suitable methods and compositions for production of modified polypeptides may be 30 found in PCT publications WO/00-55173, WO/01-07611 and WO/02-16429.

#### ANTIBODIES AND OTHER POLYPEPTIDE OR POLYNUCLEOTIDE BINDING MOLECULES

The present invention further provides antibodies, which may be isolated antibodies, that are specific for a polypeptide encoded by a polynucleotide described herein and/or a

polypeptide of a gene that corresponds to a polynucleotide described herein. Antibodies can be provided in a composition comprising the antibody and a buffer and/or a pharmaceutically acceptable excipient. Antibodies specific for a polypeptide associated with breast cancer are useful in a variety of diagnostic and therapeutic methods, as discussed in  
5 detail herein.

Gene products, including polypeptides, mRNA (particularly mRNAs having distinct secondary and/or tertiary structures), cDNA, or complete gene, can be prepared and used for raising antibodies for experimental, diagnostic, and therapeutic purposes. Antibodies may be used to identify a gene corresponding to a polynucleotide. The polynucleotide or related  
10 cDNA is expressed as described above, and antibodies are prepared. These antibodies are specific to an epitope on the polypeptide encoded by the polynucleotide, and can precipitate or bind to the corresponding native protein in a cell or tissue preparation or in a cell-free extract of an in vitro expression system.

#### Antibodies

15 Further polypeptides of the invention relate to antibodies and T-cell antigen receptors (TCR) which immunospecifically bind a subject polypeptide, subject polypeptide fragment, or variant thereof, and/or an epitope thereof (as determined by immunoassays well known in the art for assaying specific antibody-antigen binding). Antibodies of the invention include, but are not limited to, polyclonal, monoclonal, multispecific, human, humanized or chimeric  
20 antibodies, single chain antibodies, Fab fragments, F(ab') fragments, fragments produced by a Fab expression library, anti-idiotypic (anti-Id) antibodies (including, e.g., anti-Id antibodies to antibodies of the invention), and epitope-binding fragments of any of the above. The term "antibody," as used herein, refers to immunoglobulin molecules and immunologically active portions of immunoglobulin molecules, i.e., molecules that contain an antigen binding site  
25 that immunospecifically binds an antigen. The immunoglobulin molecules of the invention can be of any type (e.g., IgG, IgE, IgM, IgD, IgA and IgY), class (e.g., IgG1, IgG2, IgG3, IgG4, IgA1 and IgA2) or subclass of immunoglobulin molecule.

Most preferably the antibodies are human antigen-binding antibody fragments of the present invention and include, but are not limited to, Fab, Fab' and F(ab')<sub>2</sub>, Fd, single-chain  
30 Fvs (scFv), single-chain antibodies, disulfide-linked Fvs (sdFv) and fragments comprising either a V<sub>L</sub> or V<sub>H</sub> domain. Antigen-binding antibody fragments, including single-chain antibodies, may comprise the variable region(s) alone or in combination with the entirety or a portion of the following: hinge region, C<sub>H</sub>1, C<sub>H</sub>2, and C<sub>H</sub>3 domains. Also included in the

invention are antigen-binding fragments also comprising any combination of variable region(s) with a hinge region, C<sub>H1</sub>, C<sub>H2</sub>, and C<sub>H3</sub> domains. The antibodies of the invention may be from any animal origin including birds and mammals. Preferably, the antibodies are human, murine (e.g., mouse and rat), donkey, ship rabbit, goat, guinea pig, camel, horse, or chicken.

5 As used herein, "human" antibodies include antibodies having the amino acid sequence of a human immunoglobulin and include antibodies isolated from, human immunoglobulin libraries or from animals transgenic for one or more human immunoglobulin and that do not express endogenous immunoglobulins, as described infra and, for example in, U.S. Patent No. 5,939,598 by Kucherlapati et al.

10 The antibodies of the present invention may be monospecific, bispecific, trispecific or of greater multispecificity. Multispecific antibodies may be specific for different epitopes of a polypeptide of the present invention or may be specific for both a polypeptide of the present invention as well as for a heterologous epitope, such as a heterologous polypeptide or solid support material. See, e.g., PCT publications WO 93/17715; WO 92/08802; WO 91/00360; 15 WO 92/05793; Tutt, et al., J. Immunol. 147:60-69 (1991); U.S. Patent Nos. 4,474,893; 4,714,681; 4,925,648; 5,573,920; 5,601,819; Kostelny et al., J. Immunol. 148:1547-1553 (1992).

Antibodies of the present invention may be described or specified in terms of the epitope(s) or portion(s) of a polypeptide of the present invention which they recognize or 20 specifically bind. The epitope(s) or polypeptide portion(s) may be specified as described herein, e.g., by N-terminal and C-terminal positions, or by size in contiguous amino acid residues. Antibodies which specifically bind any epitope or polypeptide of the present invention may also be excluded. Therefore, the present invention includes antibodies that specifically bind polypeptides of the present invention, and allows for the exclusion of the 25 same.

Antibodies of the present invention may also be described or specified in terms of their cross-reactivity. Antibodies that do not bind any other analog, ortholog, or homolog of a polypeptide of the present invention are included. Antibodies that bind polypeptides with at least 95%, at least 90%, at least 85%, at least 80%, at least 75%, at least 70%, at least 65%, at 30 least 60%, at least 55%, and at least 50% identity (as calculated using methods known in the art and described herein) to a polypeptide of the present invention are also included in the present invention. In specific embodiments, antibodies of the present invention cross-react with murine, rat and/or rabbit homologs of human proteins and the corresponding epitopes thereof. Antibodies that do not bind polypeptides with less than 95%, less than 90%, less than



85%, less than 80%, less than 75%, less than 70%, less than 65%, less than 60%, less than 55%, and less than 50% identity (as calculated using methods known in the art and described herein) to a polypeptide of the present invention are also included in the present invention. In a specific embodiment, the above-described cross-reactivity is with respect to any single  
5 specific antigenic or immunogenic polypeptide, or combination(s) of 2, 3, 4, 5, or more of the specific antigenic and/or immunogenic polypeptides disclosed herein. Further included in the present invention are antibodies which bind polypeptides encoded by polynucleotides which hybridize to a polynucleotide of the present invention under stringent hybridization conditions (as described herein). Antibodies of the present invention may also be described or  
10 specified in terms of their binding affinity to a polypeptide of the invention. Preferred binding affinities include those with a dissociation constant or  $K_d$  less than  $5 \times 10^{-2}$  M,  $10^{-2}$  M,  $5 \times 10^{-3}$  M,  $10^{-3}$  M,  $5 \times 10^{-4}$  M,  $10^{-4}$  M,  $5 \times 10^{-5}$  M,  $10^{-5}$  M,  $5 \times 10^{-6}$  M,  $10^{-6}$  M,  $5 \times 10^{-7}$  M,  $10^{-7}$  M,  $5 \times 10^{-8}$  M,  $10^{-8}$  M,  $5 \times 10^{-9}$  M,  $10^{-9}$  M,  $5 \times 10^{-10}$  M,  $10^{-10}$  M,  $5 \times 10^{-11}$  M,  $10^{-11}$  M,  $5 \times 10^{-12}$  M,  $10^{-12}$  M,  $5 \times 10^{-13}$  M,  $10^{-13}$  M,  $5 \times 10^{-14}$  M,  $10^{-14}$  M,  $5 \times 10^{-15}$  M, or  $10^{-15}$  M.

15 The invention also provides antibodies that competitively inhibit binding of an antibody to an epitope of the invention as determined by any method known in the art for determining competitive binding, for example, the immunoassays described herein. In preferred embodiments, the antibody competitively inhibits binding to the epitope by at least 95%, at least 90%, at least 85 %, at least 80%, at least 75%, at least 70%, at least 60%, or at  
20 least 50%.

Methods for making screening, humanizing, and modifying different types of antibody are well known in the art and may be found in PCT publications WO/00-55173, WO/01-07611 and WO/02-16429.

25 Antibodies of the present invention may act as agonists or antagonists of the polypeptides of the present invention. For example, the present invention includes antibodies which disrupt the receptor/ligand interactions with the polypeptides of the invention either partially or fully. Preferably, antibodies of the present invention bind an antigenic epitope disclosed herein, or a portion thereof. The invention features both receptor-specific antibodies and ligand-specific antibodies. The invention also features receptor-specific antibodies which do not  
30 prevent ligand binding but prevent receptor activation. Receptor activation (i.e., signaling) may be determined by techniques described herein or otherwise known in the art. For example, receptor activation can be determined by detecting the phosphorylation (e.g., tyrosine or serine/threonine) of the receptor or its substrate by immunoprecipitation followed by western blot analysis (for example, as described supra). In specific embodiments, antibodies are provided

that inhibit ligand activity or receptor activity by at least 95%, at least 90%, at least 85%, at least 80%, at least 75%, at least 70%, at least 60%, or at least 50% of the activity in absence of the antibody.

The invention also features receptor-specific antibodies which both prevent ligand  
5 binding and receptor activation as well as antibodies that recognize the receptor-ligand complex, and, preferably, do not specifically recognize the unbound receptor or the unbound ligand. Likewise, included in the invention are neutralizing antibodies which bind the ligand and prevent binding of the ligand to the receptor, as well as antibodies which bind the ligand, thereby preventing receptor activation, but do not prevent the ligand from binding the receptor.  
10 Further included in the invention are antibodies which activate the receptor. These antibodies may act as receptor agonists, i.e., potentiate or activate either all or a subset of the biological activities of the ligand-mediated receptor activation, for example, by inducing dimerization of the receptor. The antibodies may be specified as agonists, antagonists or inverse agonists for biological activities comprising the specific biological activities of the peptides of the invention  
15 disclosed herein. The above antibody agonists can be made using methods known in the art. See, e.g., PCT publication WO 96/40281; U.S. Patent No. 5,811,097; Deng et al., Blood 92(6): 1981-1988 (1998); Chen et al., Cancer Res. 58(16):3668-4998 (1998); Harrop et al., J. Immunol. 161(4): 1786-1794 (1998); Zhu et al., Cancer Res. 58(15):3209-3214 (1998); Yoon et al., J. Immunol. 160(7):3 170-3179 (1998); Prat et al., J. Cell. Sci. 11 1(Pt2):237-247 (1998);  
20 Pitard et al., J. Immunol. Methods 205(2): 177-190 (1997); Liautard et al., Cytokine 9(4):233-241 (1997); Carlson et al., J. Biol. Chem. 272(I 7): 11295-1 1301 (1997); Taryman et al., Neuron 14(4):755-762 (1995); Muller et al., Structure 6(9): 1153-1167 (1998); Bartunek et al., Cytokine 8(1):14-20 (1996) (which are all incorporated by reference herein in their entirety).

Antibodies of the present invention may be used, for example, but not limited to, to  
25 purify, detect, and target the polypeptides of the present invention, including both in vitro and in vivo diagnostic and therapeutic methods. For example, the antibodies have use in immunoassays for qualitatively and quantitatively measuring levels of the polypeptides of the present invention in biological samples. See, e.g., Harlow et al., Antibodies: A Laboratory Manual, (Cold Spring Harbor Laboratory Press, 2nd ed. 1988) (incorporated by reference herein in its entirety).

30 Further methods and compositions involving antibodies may be found in PCT publications WO/00-55173, WO/01-07611 and WO/02-16429.

#### *Polynucleotides Encoding Antibodies*

The invention further provides polynucleotides comprising a nucleotide sequence encoding an antibody of the invention and fragments thereof. The invention also

encompasses polynucleotides that hybridize under stringent or alternatively, under lower stringency hybridization conditions, e.g., as defined supra, to polynucleotides that encode an antibody, preferably, that specifically binds to a polypeptide of the invention, preferably, an antibody that binds to a subject polypeptide.

5           The polynucleotides may be obtained, and the nucleotide sequence of the polynucleotides determined, by any method known in the art. For example, if the nucleotide sequence of the antibody is known, a polynucleotide encoding the antibody may be assembled from chemically synthesized oligonucleotides (e.g., as described in Kutmeier et al., *BioTechniques* 17:242 (1994)). which, briefly, involves the synthesis of overlapping  
10 oligonucleotides containing portions of the sequence encoding the antibody, annealing and ligating of those oligonucleotides, and then amplification of the ligated oligonucleotides by PCR.

          Alternatively, a polynucleotide encoding an antibody may be generated from nucleic acid from a suitable source. If a clone containing a nucleic acid encoding a particular antibody is not available, but the sequence of the antibody molecule is known, a nucleic acid encoding the  
15 immunoglobulin may be chemically synthesized or obtained from a suitable source (e.g., an antibody cDNA library, or a cDNA library generated from, or nucleic acid, preferably poly A+ RNA, isolated from, any tissue or cells expressing the antibody, such as hybridoma cells selected to express an antibody of the invention) by PCR amplification using synthetic primers hybridizable to the 3' and 5' ends of the sequence or by cloning using an oligonucleotide probe  
20 specific for the particular gene sequence to identify, e.g., a cDNA clone from a cDNA library that encodes the antibody. Amplified nucleic acids generated by ' PCR may then be cloned into replicable cloning vectors using any method well known in the art.

          Once the nucleotide sequence and corresponding amino acid sequence of the antibody is determined, the nucleotide sequence of the antibody may be manipulated using methods well  
25 known in the art for the manipulation of nucleotide sequences, e.g., recombinant DNA techniques, site directed mutagenesis, PCR, etc. (see, for example, the techniques described in Sambrook et al., 1990, *Molecular Cloning, A Laboratory Manual*, 2d Ed., Cold Spring Harbor Laboratory, Cold Spring Harbor, NY and Ausubel et al., eds., 1998, *Current Protocols in Molecular Biology*, John Wiley & Sons, NY, which are both incorporated by reference herein in their entirety), to  
30 generate antibodies having a different amino acid sequence, for example to create amino acid substitutions, deletions, and/or insertions.

#### *Methods of Producing Antibodies*

          The antibodies of the invention can be produced by any method known in the art for the synthesis of antibodies, in particular, by chemical synthesis or preferably, by recombinant

expression techniques. Recombinant expression of an antibody of the invention, or fragment, derivative or analog thereof, (e.g., a heavy or light chain of an antibody of the invention or a single chain antibody of the invention), requires construction of an expression vector containing a polynucleotide that encodes the antibody. Once a polynucleotide encoding an antibody molecule or a heavy or light chain of an antibody, or portion thereof (preferably containing the heavy or light chain variable domain), of the invention has been obtained, the vector for the production of the antibody molecule may be produced by recombinant DNA technology using techniques well known in the art. Thus, methods for preparing a protein by expressing a polynucleotide containing an antibody encoding nucleotide sequence are described herein. Methods which are well known to those skilled in the art can be used to construct expression vectors containing antibody coding sequences and appropriate transcriptional and translational control signals. These methods include, for example, in vitro recombinant DNA techniques, synthetic techniques, and in vivo genetic recombination. The invention, thus, provides replicable vectors comprising a nucleotide sequence encoding an antibody molecule of the invention, or a heavy or light chain thereof, or a heavy or light chain variable domain, operably linked to a promoter. Such vectors may include the nucleotide sequence encoding the constant region of the antibody molecule (see, e.g., PCT Publication WO 86/05807; PCT Publication WO 89/01036; and U.S. Patent No. 5,122,464) and the variable domain of the antibody may be cloned into such a vector for expression of the entire heavy or light chain.

The expression vector is transferred to a host cell by conventional techniques and the transfected cells are then cultured by conventional techniques to produce an antibody of the invention. Thus, the invention includes host cells containing a polynucleotide encoding an antibody of the invention, or a heavy or light chain thereof, or a single chain antibody of the invention, operably linked to a heterologous promoter. In preferred embodiments for the expression of double-chained antibodies, vectors encoding both the heavy and light chains may be co-expressed in the host cell for expression of the entire immunoglobulin molecule, as detailed below.

A variety of host-expression vector systems may be utilized to express the antibody molecules of the invention. Such host-expression systems represent vehicles by which the coding sequences of interest may be produced and subsequently purified, but also represent cells which may, when transformed or transfected with the appropriate nucleotide coding sequences, express an antibody molecule of the invention in situ. These include but are not limited to microorganisms such as bacteria (e.g., *E. coli*, *B. subtilis*) transformed with recombinant bacteriophage DNA, plasmid DNA or cosmid DNA expression vectors containing antibody

coding sequences; yeast (e.g., *Saccharomyces*, *Pichia*) transformed with recombinant yeast expression vectors containing antibody coding sequences; insect cell systems infected with recombinant virus expression vectors (e.g., baculovirus) containing antibody coding sequences; plant cell systems infected with recombinant virus expression vectors (e.g., cauliflower mosaic virus, CaMV; tobacco mosaic virus, TMV) or transformed with recombinant plasmid expression vectors (e.g., Ti plasmid) containing antibody coding sequences; or mammalian cell systems (e.g., COS, CHO, BHK, 293, 3T3 cells) harboring recombinant expression constructs containing promoters derived from the genome of mammalian cells (e.g., metallothionein promoter) or from mammalian viruses (e.g., the adenovirus late promoter; the vaccinia virus 7.5K promoter). Preferably, bacterial cells such as *Escherichia coli*, and more preferably, eukaryotic cells, especially for the expression of whole recombinant antibody molecule, are used for the expression of a recombinant antibody molecule. For example, mammalian cells such as Chinese hamster ovary cells (CHO), in conjunction with a vector such as the major intermediate early gene promoter element from human cytomegalovirus is an effective expression system for antibodies (Foecking et al., *Gene* 45:101 (1986); Cockett et al., *Bio/Technology* 8:2 (1990)).

In bacterial systems, a number of expression vectors may be advantageously selected depending upon the use intended for the antibody molecule being expressed. For example, when a large quantity of such a protein is to be produced, for the generation of pharmaceutical compositions of an antibody molecule, vectors which direct the expression of high levels of fusion protein products that are readily purified may be desirable. Such vectors include, but are not limited, to the *E. coli* expression vector pUR278 (Ruther et al., *EMBO J.* 2:1791 (1983)), in which the antibody coding sequence may be ligated individually into the vector in frame with the lac Z coding region so that a fusion protein is produced; pIN vectors (Inouye & Inouye, *Nucleic Acids Res.* 13:3101-3109 (1985); Van Heeke & Schuster, *J. Biol. Chem.* 24:5503-5509 (1989)); and the like. pGEX vectors may also be used to express foreign polypeptides as fusion proteins with glutathione S-transferase (GST). In general, such fusion proteins are soluble and can easily be purified from lysed cells by adsorption and binding to matrix glutathione-agarose beads followed by elution in the presence of free glutathione. The pGEX vectors are designed to include thrombin or factor Xa protease cleavage sites so that the cloned target gene product can be released from the GST moiety.

In an insect system, *Autographa californica* nuclear polyhedrosis virus (AcNPV) is used as a vector to express foreign genes. The virus grows in *Spodoptera frugiperda* cells. The antibody coding sequence may be cloned individually into non-essential regions (for

example the polyhedrin gene) of the virus and placed under control of an AcNPV promoter (for example the polyhedrin promoter).

In mammalian host cells, a number of viral-based expression systems may be utilized. In cases where an adenovirus is used as an expression vector, the antibody coding sequence of interest may be ligated to an adenovirus transcription/translation control complex, e.g., the late promoter and tripartite leader sequence. This chimeric gene may then be inserted in the adenovirus genome by in vitro or in vivo recombination. Insertion in a non-essential region of the viral genome (e.g., region E1 or E3) will result in a recombinant virus that is viable and capable of expressing the antibody molecule in infected hosts, (e.g., see Logan & Shenk, Proc. Natl. Acad. Sci. USA 81:355-359 (1984)). Specific initiation signals may also be required for efficient translation of inserted antibody coding sequences. These signals include the ATG initiation codon and adjacent sequences. Furthermore, the initiation codon must be in phase with the reading frame of the desired coding sequence to ensure translation of the entire insert. These exogenous translational control signals and initiation codons can be of a variety of origins, both natural and synthetic. The efficiency of expression may be enhanced by the inclusion of appropriate transcription enhancer elements, transcription terminators, etc. (see Bittner et al., Methods in Enzymol. 153:51-544 (1987)).

Antibodies production is well known in the art. Exemplary methods and compositions for making antibodies may be found in PCT publications WO/00-55173, WO/01-07611 and WO/02-16429.

#### *Immunophenotyping*

The antibodies of the invention may be utilized for immunophenotyping of cell lines and biological samples. The translation product of the gene of the present invention may be useful as a cell specific marker, or more specifically as a cellular marker that is differentially expressed at various stages of differentiation and/or maturation of particular cell types. Monoclonal antibodies directed against a specific epitope, or combination of epitopes, will allow for the screening of cellular populations expressing the marker. Various techniques can be utilized using monoclonal antibodies to screen for cellular populations expressing the marker(s), and include magnetic separation using antibody-coated magnetic beads, "panning" with antibody attached to a solid matrix (i.e., plate), and flow cytometry (See, e.g., U.S. Patent 5,985,660; and Morrison *et al.* *Cell*, 96:737-49 (1999)).

These techniques allow for the screening of particular populations of cells, such as might be found with hematological malignancies (i.e. minimal residual disease (MRD) in acute leukemic patients) and "non-self cells in transplantations to prevent Graft-versus-Host

Disease (GVHD). Alternatively, these techniques allow for the screening of hematopoietic stem and progenitor cells capable of undergoing proliferation and/or differentiation, as might be found in human umbilical cord blood.

*Assays For Antibody Binding*

5           The antibodies of the invention may be assayed for immunospecific binding by any method known in the art. The immunoassays which can be used include but are not limited to competitive and non-competitive assay systems using techniques such as western blots, radioimmunoassays, ELISA (enzyme linked immunosorbent assay), "sandwich" immunoassays, immunoprecipitation assays, precipitin reactions, gel diffusion precipitin  
10 reactions, immunodiffusion assays, agglutination assays, complement-fixation assays, immunoradiometric assays, fluorescent immunoassays, protein A immunoassays, to name but a few. Such assays are routine and well known in the art (see, e.g., Ausubel et al, eds, 1994, Current Protocols in Molecular Biology, Vol. 1, John Wiley & Sons, Inc., New York, which is incorporated by reference herein in its entirety). Exemplary immunoassays are described briefly  
15 below (but are not intended by way of limitation).

          Immunoprecipitation protocols generally comprise lysing a population of cells in a lysis buffer such as R1PA buffer (1% NP-40 or Triton X- 100, 1% sodium deoxycholate, 0.1% SDS, 0.15 M NaCl, 0.01 M sodium phosphate at pH 7.2, 1% Trasylol) supplemented with protein phosphatase and/or protease inhibitors (e.g., EDTA, PMSF, aprotinin, sodium vanadate), adding  
20 the antibody of interest to the cell lysate, incubating for a period of time (e.g., 1-4 hours) at 4° C, adding protein A and/or protein G sepharose beads to the cell lysate, incubating for about an hour or more at 4° C, washing the beads in lysis buffer and resuspending the beads in SDS/sample buffer. The ability of the antibody of interest to immunoprecipitate a particular antigen can be assessed by, e.g., western blot analysis. One of skill in the art would be knowledgeable as to the  
25 parameters that can be modified to increase the binding of the antibody to an antigen and decrease the background (e.g., pre-clearing the cell lysate with sepharose beads). For further discussion regarding immunoprecipitation protocols see, e.g., Ausubel et al, eds, 1994, Current Protocols in Molecular Biology, Vol. 1, John Wiley & Sons, Inc., New York at 10.16.1.

          Western blot analysis generally comprises preparing protein samples, electrophoresis of the  
30 protein samples in a polyacrylamide gel (e.g., 8%- 20% SDS-PAGE depending on the molecular weight of the antigen), transferring the protein sample from the polyacrylamide gel to a membrane such as nitrocellulose, PVDF or nylon, blocking the membrane in blocking solution (e.g., PBS with 3% BSA or non-fat milk), washing the membrane in washing buffer (e.g., PBS-Tween 20), blocking the membrane with primary antibody (the antibody of interest) diluted in blocking

buffer, washing the membrane in washing buffer, blocking the membrane with a secondary antibody (which recognizes the primary antibody, e.g., an anti-human antibody) conjugated to an enzymatic substrate (e.g., horseradish peroxidase or alkaline phosphatase) or radioactive molecule (e.g.,  $^{32}\text{P}$  or  $^{125}\text{I}$ ) diluted in blocking buffer, washing the membrane in wash buffer, and detecting the presence of the antigen. One of skill in the art would be knowledgeable as to the parameters that can be modified to increase the signal detected and to reduce the background noise. For further discussion regarding western blot protocols see, e.g., Ausubel et al, eds, 1994, Current Protocols in Molecular Biology, Vol. 1, John Wiley & Sons, Inc., New York at 10.8.1.

ELISAs comprise preparing antigen, coating the well of a 96 well microtiter plate with the antigen, adding the antibody of interest conjugated to a detectable compound such as an enzymatic substrate (e.g., horseradish peroxidase or alkaline phosphatase) to the well and incubating for a period of time, and detecting the presence of the antigen. In ELISAs the antibody of interest does not have to be conjugated to a detectable compound; instead, a second antibody (which recognizes the antibody of interest) conjugated to a detectable compound may be added to the well. Further, instead of coating the well with the antigen, the antibody may be coated to the well. In this case, a second antibody conjugated to a detectable compound may be added following the addition of the antigen of interest to the coated well. One of skill in the art would be knowledgeable as to the parameters that can be modified to increase the signal detected as well as other variations of ELISAs known in the art. For further discussion regarding ELISAs see, e.g., Ausubel et al, eds, 1994, Current Protocols in Molecular Biology, Vol. 1, John Wiley & Sons, Inc., New York at 11.2.1.

The binding affinity of an antibody to an antigen and the off-rate of an antibody-antigen interaction can be determined by competitive binding assays. One example of a competitive binding assay is a radioimmunoassay comprising the incubation of labeled antigen (e.g.,  $^3\text{H}$  or  $^{125}\text{I}$ ) with the antibody of interest in the presence of increasing amounts of unlabeled antigen, and the detection of the antibody bound to the labeled antigen. The affinity of the antibody of interest for a particular antigen and the binding off-rates can be determined from the data by scatchard plot analysis. Competition with a second antibody can also be determined using radioimmunoassays. In this case, the antigen is incubated with antibody of interest conjugated to a labeled compound (e.g.,  $^3\text{H}$  or  $^{125}\text{I}$ ) in the presence of increasing amounts of an unlabeled second antibody.

#### *Therapeutic Uses*

The present invention is further directed to antibody-based therapies which involve administering antibodies of the invention to an animal, preferably a mammal, and most



preferably a human, patient for treating one or more of the disclosed diseases, disorders, or conditions. Therapeutic compounds of the invention include, but are not limited to, antibodies of the invention (including fragments, analogs and derivatives thereof as described herein) and nucleic acids encoding antibodies of the invention (including fragments, analogs and derivatives thereof and anti-idiotypic antibodies as described herein). The antibodies of the invention can be used to treat, inhibit or prevent diseases, disorders or conditions associated with aberrant expression and/or activity of a polypeptide of the invention, including, but not limited to, any one or more of the diseases, disorders, or conditions described herein. The treatment and/or prevention of diseases, disorders, or conditions associated with aberrant expression and/or activity of a polypeptide of the invention includes, but is not limited to, alleviating symptoms associated with those diseases, disorders or conditions. Antibodies of the invention may be provided in pharmaceutically acceptable compositions as known in the art or as described herein.

A summary of the ways in which the antibodies of the present invention may be used therapeutically includes binding polynucleotides or polypeptides of the present invention locally or systemically in the body or by direct cytotoxicity of the antibody, e.g. as mediated by complement (CDC) or by effector cells (ADCC). Some of these approaches are described in more detail below. Armed with the teachings provided herein, one of ordinary skill in the art will know how to use the antibodies of the present invention for diagnostic, monitoring or therapeutic purposes without undue experimentation.

The antibodies of this invention may be advantageously utilized in combination with other monoclonal or chimeric antibodies, or with lymphokines or hematopoietic growth factors (such as, e.g., IL-2, IL-3 and IL-7), for example, which serve to increase the number or activity of effector cells which interact with the antibodies.

The antibodies of the invention may be administered alone or in combination with other types of treatments (e.g., radiation therapy, chemotherapy, hormonal therapy, immunotherapy and anti-tumor agents). Generally, administration of products of a species origin or species reactivity (in the case of antibodies) that is the same species as that of the patient is preferred. Thus, in a preferred embodiment, human antibodies, fragments derivatives, analogs, or nucleic acids, are administered to a human patient for therapy or prophylaxis.

It is preferred to use high affinity and/or potent in vivo inhibiting and/or neutralizing antibodies against polypeptides or polynucleotides of the present invention, fragments or regions thereof, for both immunoassays directed to and therapy of disorders related to polynucleotides or polypeptides, including fragments thereof, of the present invention. Such antibodies, fragments, or regions, will preferably have an affinity for polynucleotides or

polypeptides of the invention, including fragments thereof. Preferred binding affinities include those with a dissociation constant or  $K_d$  less than  $5 \times 10^{-2}$  M,  $10^{-2}$  M,  $5 \times 10^{-3}$  M,  $10^{-3}$  M,  $5 \times 10^{-4}$  M,  $10^{-4}$  M,  $5 \times 10^{-5}$  M,  $10^{-5}$  M,  $5 \times 10^{-6}$  M,  $10^{-6}$  M,  $5 \times 10^{-7}$  M,  $10^{-7}$  M,  $5 \times 10^{-8}$  M,  $10^{-8}$  M,  $5 \times 10^{-9}$  M,  $10^{-9}$  M,  $5 \times 10^{-10}$  M,  $10^{-10}$  M,  $5 \times 10^{-11}$  M,  $10^{-11}$  M,  $5 \times 10^{-12}$  M,  $10^{-12}$  M,  $5 \times 10^{-13}$  M,  $10^{-13}$  M,  $5 \times 10^{-14}$  M,  $10^{-14}$  M,  $5 \times 10^{-15}$  M, or  $10^{-15}$  M.

## KITS

Also provided by the subject invention are kits for practicing the subject methods, as described above. The subject kits include at least one or more of: a subject nucleic acid, isolated polypeptide or an antibody thereto. Other optional components of the kit include: restriction enzymes, control primers and plasmids; buffers, cells, carriers adjuvants etc. The nucleic acids of the kit may also have restrictions sites, multiple cloning sites, primer sites, etc to facilitate their ligation other plasmids. The various components of the kit may be present in separate containers or certain compatible components may be precombined into a single container, as desired. In many embodiments, kits with unit doses of the active agent, e.g. in oral or injectable doses, are provided. In certain embodiments, controls, such as samples from a cancerous or non-cancerous cell are provided by the invention. Further embodiments of the kit include an antibody for a subject polypeptide and a chemotherapeutic agent to be used in combination with the polypeptide as a treatment.

In addition to above-mentioned components, the subject kits typically further include instructions for using the components of the kit to practice the subject methods. The instructions for practicing the subject methods are generally recorded on a suitable recording medium. For example, the instructions may be printed on a substrate, such as paper or plastic, etc. As such, the instructions may be present in the kits as a package insert, in the labeling of the container of the kit or components thereof (i.e., associated with the packaging or subpackaging) etc. In other embodiments, the instructions are present as an electronic storage data file present on a suitable computer readable storage medium, e.g. CD-ROM, diskette, etc. In yet other embodiments, the actual instructions are not present in the kit, but means for obtaining the instructions from a remote source, e.g. via the internet, are provided. An example of this embodiment is a kit that includes a web address where the instructions can be viewed and/or from which the instructions can be downloaded. As with the instructions, this means for obtaining the instructions is recorded on a suitable substrate.

## COMPUTER-RELATED EMBODIMENTS

In general, a library of polynucleotides is a collection of sequence information, which information is provided in either biochemical form (*e.g.*, as a collection of polynucleotide molecules), or in electronic form (*e.g.*, as a collection of polynucleotide sequences stored in a computer-readable form, as in a computer system and/or as part of a computer program).  
5 The sequence information of the polynucleotides can be used in a variety of ways, *e.g.*, as a resource for gene discovery, as a representation of sequences expressed in a selected cell type (*e.g.*, cell type markers), and/or as markers of a given disease or disease state. For example, in the instant case, the sequences of polynucleotides and polypeptides  
10 corresponding to genes differentially expressed in cancer, particular in breast cancer, as well as the nucleic acid and amino acid sequences of the genes themselves, can be provided in electronic form in a computer database.

In general, a disease marker is a representation of a gene product that is present in all cells affected by disease either at an increased or decreased level relative to a normal cell  
15 (*e.g.*, a cell of the same or similar type that is not substantially affected by disease). For example, a polynucleotide sequence in a library can be a polynucleotide that represents an mRNA, polypeptide, or other gene product encoded by the polynucleotide, that is either overexpressed or underexpressed in a cancerous breast cell affected by cancer relative to a normal (*i.e.*, substantially disease-free) breast cell.

20 The nucleotide sequence information of the library can be embodied in any suitable form, *e.g.*, electronic or biochemical forms. For example, a library of sequence information embodied in electronic form comprises an accessible computer data file (or, in biochemical form, a collection of nucleic acid molecules) that contains the representative nucleotide sequences of genes that are differentially expressed (*e.g.*, overexpressed or underexpressed)  
25 as between, for example, i) a cancerous cell and a normal cell; ii) a cancerous cell and a dysplastic cell; iii) a cancerous cell and a cell affected by a disease or condition other than cancer; iv) a metastatic cancerous cell and a normal cell and/or non-metastatic cancerous cell; v) a malignant cancerous cell and a non-malignant cancerous cell (or a normal cell) and/or vi) a dysplastic cell relative to a normal cell. Other combinations and comparisons of  
30 cells affected by various diseases or stages of disease will be readily apparent to the ordinarily skilled artisan. Biochemical embodiments of the library include a collection of nucleic acids that have the sequences of the genes in the library, where the nucleic acids can correspond to the entire gene in the library or to a fragment thereof, as described in greater detail below.

The polynucleotide libraries of the subject invention generally comprise sequence information of a plurality of polynucleotide sequences, where at least one of the polynucleotides has a sequence of any of sequence described herein. By plurality is meant at least 2, usually at least 3 and can include up to all of the sequences described herein. The length and number of polynucleotides in the library will vary with the nature of the library, *e.g.*, if the library is an oligonucleotide array, a cDNA array, a computer database of the sequence information, etc.

Where the library is an electronic library, the nucleic acid sequence information can be present in a variety of media. "Media" refers to a manufacture, other than an isolated nucleic acid molecule, that contains the sequence information of the present invention. Such a manufacture provides the genome sequence or a subset thereof in a form that can be examined by means not directly applicable to the sequence as it exists in a nucleic acid. For example, the nucleotide sequence of the present invention, *e.g.* the nucleic acid sequences of any of the polynucleotides of the sequences described herein, can be recorded on computer readable media, *e.g.* any medium that can be read and accessed directly by a computer. Such media include, but are not limited to: magnetic storage media, such as a floppy disc, a hard disc storage medium, and a magnetic tape; optical storage media such as CD-ROM; electrical storage media such as RAM and ROM; and hybrids of these categories such as magnetic/optical storage media.

One of skill in the art can readily appreciate how any of the presently known computer readable mediums can be used to create a manufacture comprising a recording of the present sequence information. "Recorded" refers to a process for storing information on computer readable medium, using any such methods as known in the art. Any convenient data storage structure can be chosen, based on the means used to access the stored information. A variety of data processor programs and formats can be used for storage, *e.g.* word processing text file, database format, *etc.* In addition to the sequence information, electronic versions of libraries comprising one or more sequence described herein can be provided in conjunction or connection with other computer-readable information and/or other types of computer-readable files (*e.g.*, searchable files, executable files, *etc.*, including, but not limited to, for example, search program software, *etc.*).

By providing the nucleotide sequence in computer readable form, the information can be accessed for a variety of purposes. Computer software to access sequence information (*e.g.* the NCBI sequence database) is publicly available. For example, the gapped BLAST (Altschul *et al.*, *Nucleic Acids Res.* (1997) 25:3389-3402) and BLAZE

(Brutlag *et al.*, *Comp. Chem.* (1993) 17:203) search algorithms on a Sybase system, or the TeraBLAST (TimeLogic, Crystal Bay, Nevada) program optionally running on a specialized computer platform available from TimeLogic, can be used to identify open reading frames (ORFs) within the genome that contain homology to ORFs from other organisms.

5 As used herein, "a computer-based system" refers to the hardware means, software means, and data storage means used to analyze the nucleotide sequence information of the present invention. The minimum hardware of the computer-based systems of the present invention comprises a central processing unit (CPU), input means, output means, and data storage means. A skilled artisan can readily appreciate that any one of the currently  
10 available computer-based system are suitable for use in the present invention. The data storage means can comprise any manufacture comprising a recording of the present sequence information as described above, or a memory access means that can access such a manufacture.

"Search means" refers to one or more programs implemented on the computer-based  
15 system, to compare a target sequence or target structural motif, or expression levels of a polynucleotide in a sample, with the stored sequence information. Search means can be used to identify fragments or regions of the genome that match a particular target sequence or target motif. A variety of known algorithms are publicly known and commercially available, *e.g.* MacPattern (EMBL), TeraBLAST (TimeLogic), BLASTN and BLASTX (NCBI). A  
20 "target sequence" can be any polynucleotide or amino acid sequence of six or more contiguous nucleotides or two or more amino acids, preferably from about 10 to 100 amino acids or from about 30 to 300 nt. A variety of means for comparing nucleic acids or polypeptides may be used to compare accomplish a sequence comparison (*e.g.*, to analyze target sequences, target motifs, or relative expression levels) with the data storage means. A  
25 skilled artisan can readily recognize that any one of the publicly available homology search programs can be used to search the computer based systems of the present invention to compare of target sequences and motifs. Computer programs to analyze expression levels in a sample and in controls are also known in the art.

A "target structural motif," or "target motif," refers to any rationally selected  
30 sequence or combination of sequences in which the sequence(s) are chosen based on a three-dimensional configuration that is formed upon the folding of the target motif, or on consensus sequences of regulatory or active sites. There are a variety of target motifs known in the art. Protein target motifs include, but are not limited to, enzyme active sites and signal sequences, kinase domains, receptor binding domains, SH2 domains, SH3 domains,

phosphorylation sites, protein interaction domains, transmembrane domains, etc. Nucleic acid target motifs include, but are not limited to, hairpin structures, promoter sequences and other expression elements such as binding sites for transcription factors.

5 A variety of structural formats for the input and output means can be used to input and output the information in the computer-based systems of the present invention. One format for an output means ranks the relative expression levels of different polynucleotides. Such presentation provides a skilled artisan with a ranking of relative expression levels to determine a gene expression profile. A gene expression profile can be generated from, for example, a cDNA library prepared from mRNA isolated from a test cell suspected of being  
10 cancerous or pre-cancerous, comparing the sequences or partial sequences of the clones against the sequences in an electronic database, where the sequences of the electronic database represent genes differentially expressed in a cancerous cell, *e.g.*, a cancerous breast cell. The number of clones having a sequence that has substantial similarity to a sequence that represents a gene differentially expressed in a cancerous cell is then determined, and the  
15 number of clones corresponding to each of such genes is determined. An increased number of clones that correspond to differentially expressed gene is present in the cDNA library of the test cell (relative to, for example, the number of clones expected in a cDNA of a normal cell) indicates that the test cell is cancerous.

As discussed above, the “library” as used herein also encompasses biochemical  
20 libraries of the polynucleotides of the sequences described herein, *e.g.*, collections of nucleic acids representing the provided polynucleotides. The biochemical libraries can take a variety of forms, *e.g.*, a solution of cDNAs, a pattern of probe nucleic acids stably associated with a surface of a solid support (*i.e.*, an array) and the like. Of particular interest are nucleic acid arrays in which one or more of the genes described herein is represented by  
25 a sequence on the array. By array is meant an article of manufacture that has at least a substrate with at least two distinct nucleic acid targets on one of its surfaces, where the number of distinct nucleic acids can be considerably higher, typically being at least 10 nt, usually at least 20 nt and often at least 25 nt. A variety of different array formats have been developed and are known to those of skill in the art. The arrays of the subject invention find  
30 use in a variety of applications, including gene expression analysis, drug screening, mutation analysis and the like, as disclosed in the above-listed exemplary patent documents.

In addition to the above nucleic acid libraries, analogous libraries of polypeptides are also provided, where the polypeptides of the library will represent at least a portion of the polypeptides encoded by a gene corresponding to a sequence described herein.

## DIAGNOSTIC AND OTHER METHODS INVOLVING DETECTION OF DIFFERENTIALLY EXPRESSED GENES

The present invention provides methods of using the polynucleotides described herein in, for example, diagnosis of cancer and classification of cancer cells according to expression profiles. In specific non-limiting embodiments, the methods are useful for detecting breast cancer cells, facilitating diagnosis of cancer and the severity of a cancer (*e.g.*, tumor grade, tumor burden, and the like) in a subject, facilitating a determination of the prognosis of a subject, and assessing the responsiveness of the subject to therapy (*e.g.*, by providing a measure of therapeutic effect through, for example, assessing tumor burden during or following a chemotherapeutic regimen). Detection can be based on detection of a polynucleotide that is differentially expressed in a breast cancer cell, and/or detection of a polypeptide encoded by a polynucleotide that is differentially expressed in a breast cancer cell ("a polypeptide associated with breast cancer"). The detection methods of the invention can be conducted *in vitro* or *in vivo*, on isolated cells, or in whole tissues or a bodily fluid, *e.g.*, blood, plasma, serum, urine, and the like).

In general, methods of the invention involving detection of a gene product (*e.g.*, mRNA, cDNA generated from such mRNA, and polypeptides) involve contacting a sample with a probe specific for the gene product of interest. "Probe" as used herein in such methods is meant to refer to a molecule that specifically binds a gene product of interest (*e.g.*, the probe binds to the target gene product with a specificity sufficient to distinguish binding to target over non-specific binding to non-target (background) molecules). "Probes" include, but are not necessarily limited to, nucleic acid probes (*e.g.*, DNA, RNA, modified nucleic acid, and the like), antibodies (*e.g.*, antibodies, antibody fragments that retain binding to a target epitope, single chain antibodies, and the like), or other polypeptide, peptide, or molecule (*e.g.*, receptor ligand) that specifically binds a target gene product of interest.

The probe and sample suspected of having the gene product of interest are contacted under conditions suitable for binding of the probe to the gene product. For example, contacting is generally for a time sufficient to allow binding of the probe to the gene product (*e.g.*, from several minutes to a few hours), and at a temperature and conditions of osmolarity and the like that provide for binding of the probe to the gene product at a level that is sufficiently distinguishable from background binding of the probe (*e.g.*, under conditions that minimize non-specific binding). Suitable conditions for probe-target gene

product binding can be readily determined using controls and other techniques available and known to one of ordinary skill in the art.

In this embodiment, the probe can be an antibody or other polypeptide, peptide, or molecule (*e.g.*, receptor ligand) that specifically binds a target polypeptide of interest.

5 The detection methods can be provided as part of a kit. Thus, the invention further provides kits for detecting the presence and/or a level of a polynucleotide that is differentially expressed in a breast cancer cell (*e.g.*, by detection of an mRNA encoded by the differentially expressed gene of interest), and/or a polypeptide encoded thereby, in a biological sample. Procedures using these kits can be performed by clinical laboratories, experimental laboratories, medical practitioners, or private individuals. The kits of the invention for detecting a polypeptide encoded by a polynucleotide that is differentially expressed in a breast cancer cell comprise a moiety that specifically binds the polypeptide, which may be a specific antibody. The kits of the invention for detecting a polynucleotide that is differentially expressed in a breast cancer cell comprise a moiety that specifically hybridizes to such a polynucleotide. The kit may optionally provide additional components that are useful in the procedure, including, but not limited to, buffers, developing reagents, labels, reacting surfaces, means for detection, control samples, standards, instructions, and interpretive information.

15 Detecting a polypeptide encoded by a polynucleotide that is differentially expressed in a breast cancer cell

In some embodiments, methods are provided for a detecting breast cancer cell by detecting in a cell, particularly a breast cell, a polypeptide encoded by a gene differentially expressed in a breast cancer cell. Any of a variety of known methods can be used for detection, including, but not limited to, immunoassay, using an antibody specific for the encoded polypeptide, *e.g.*, by enzyme-linked immunosorbent assay (ELISA), radioimmunoassay (RIA), and the like; and functional assays for the encoded polypeptide, *e.g.*, binding activity or enzymatic activity.

For example, an immunofluorescence assay can be easily performed on cells without first isolating the encoded polypeptide. The cells are first fixed onto a solid support, such as a microscope slide or microtiter well. This fixing step can permeabilize the cell membrane. The permeabilization of the cell membrane permits the polypeptide-specific probe (*e.g.*, antibody) to bind. Alternatively, where the polypeptide is secreted or membrane-bound, or is otherwise accessible at the cell-surface (*e.g.*, receptors, and other molecule stably-



associated with the outer cell membrane or otherwise stably associated with the cell membrane, such permeabilization may not be necessary.

Next, the fixed cells are exposed to an antibody specific for the encoded polypeptide. To increase the sensitivity of the assay, the fixed cells may be further exposed to a second  
5 antibody, which is labeled and binds to the first antibody, which is specific for the encoded polypeptide. Typically, the secondary antibody is detectably labeled, e.g., with a fluorescent marker. The cells which express the encoded polypeptide will be fluorescently labeled and easily visualized under the microscope. See, for example, Hashido *et al.* (1992) *Biochem. Biophys. Res. Comm.* 187:1241-1248.

10 As will be readily apparent to the ordinarily skilled artisan upon reading the present specification, the detection methods and other methods described herein can be varied. Such variations are within the intended scope of the invention. For example, in the above detection scheme, the probe for use in detection can be immobilized on a solid support, and the test sample contacted with the immobilized probe. Binding of the test sample to the  
15 probe can then be detected in a variety of ways, e.g., by detecting a detectable label bound to the test sample.

The present invention further provides methods for detecting the presence of and/or measuring a level of a polypeptide in a biological sample, which polypeptide is encoded by a polynucleotide that represents a gene differentially expressed in cancer, particularly in a  
20 polynucleotide that represents a gene differentially cancer cell, using a probe specific for the encoded polypeptide. In this embodiment, the probe can be an antibody or other polypeptide, peptide, or molecule (e.g., receptor ligand) that specifically binds a target polypeptide of interest.

The methods generally comprise: a) contacting the sample with an antibody specific  
25 for a differentially expressed polypeptide in a test cell; and b) detecting binding between the antibody and molecules of the sample. The level of antibody binding (either qualitative or quantitative) indicates the cancerous state of the cell. For example, where the differentially expressed gene is increased in cancerous cells, detection of an increased level of antibody binding to the test sample relative to antibody binding level associated with a normal cell  
30 indicates that the test cell is cancerous.

Suitable controls include a sample known not to contain the encoded polypeptide; and a sample contacted with an antibody not specific for the encoded polypeptide, e.g., an anti-idiotypic antibody. A variety of methods to detect specific antibody-antigen interactions are known in the art and can be used in the method, including, but not limited to, standard

immunohistological methods, immunoprecipitation, an enzyme immunoassay, and a radioimmunoassay.

In general, the specific antibody will be detectably labeled, either directly or indirectly. Direct labels include radioisotopes; enzymes whose products are detectable (e.g.,  
5 luciferase,  $\beta$ -galactosidase, and the like); fluorescent labels (e.g., fluorescein isothiocyanate, rhodamine, phycoerythrin, and the like); fluorescence emitting metals, e.g.,  $^{152}\text{Eu}$ , or others of the lanthanide series, attached to the antibody through metal chelating groups such as EDTA; chemiluminescent compounds, e.g., luminol, isoluminol, acridinium salts, and the like; bioluminescent compounds, e.g., luciferin, aequorin (green fluorescent protein), and the  
10 like.

The antibody may be attached (coupled) to an insoluble support, such as a polystyrene plate or a bead. Indirect labels include second antibodies specific for antibodies specific for the encoded polypeptide ("first specific antibody"), wherein the second antibody is labeled as described above; and members of specific binding pairs, e.g., biotin-avidin, and  
15 the like. The biological sample may be brought into contact with and immobilized on a solid support or carrier, such as nitrocellulose, that is capable of immobilizing cells, cell particles, or soluble proteins. The support may then be washed with suitable buffers, followed by contacting with a detectably-labeled first specific antibody. Detection methods are known in the art and will be chosen as appropriate to the signal emitted by the detectable label.  
20 Detection is generally accomplished in comparison to suitable controls, and to appropriate standards.

In some embodiments, the methods are adapted for use *in vivo*, e.g., to locate or identify sites where breast cancer cells are present. In these embodiments, a detectably-labeled moiety, e.g., an antibody, which is specific for a breast cancer-associated polypeptide  
25 is administered to an individual (e.g., by injection), and labeled cells are located using standard imaging techniques, including, but not limited to, magnetic resonance imaging, computed tomography scanning, and the like. In this manner, breast cancer cells are differentially labeled.

Detecting a polynucleotide that represents a gene differentially expressed in a breast  
30 cancer cell

In some embodiments, methods are provided for detecting a breast cancer cell by detecting expression in the cell of a transcript or that is differentially expressed in a breast cancer cell. Any of a variety of known methods can be used for detection, including, but not limited to, detection of a transcript by hybridization with a polynucleotide that hybridizes to

a polynucleotide that is differentially expressed in a breast cancer cell; detection of a transcript by a polymerase chain reaction using specific oligonucleotide primers; *in situ* hybridization of a cell using as a probe a polynucleotide that hybridizes to a gene that is differentially expressed in a breast cancer cell and the like.

5 In many embodiments, the levels of a subject gene product are measured. By measured is meant qualitatively or quantitatively estimating the level of the gene product in a first biological sample either directly (e.g. by determining or estimating absolute levels of gene product) or relatively by comparing the levels to a second control biological sample. In many embodiments the second control biological sample is obtained from an individual not  
10 having not having breast cancer. As will be appreciated in the art, once a standard control level of gene expression is known, it can be used repeatedly as a standard for comparison. Other control samples include samples of cancerous breast tissue.

The methods can be used to detect and/or measure mRNA levels of a gene that is differentially expressed in a breast cancer cell. In some embodiments, the methods  
15 comprise: a) contacting a sample with a polynucleotide that corresponds to a differentially expressed gene described herein under conditions that allow hybridization; and b) detecting hybridization, if any. Detection of differential hybridization, when compared to a suitable control, is an indication of the presence in the sample of a polynucleotide that is differentially expressed in a breast cancer cell. Appropriate controls include, for example, a  
20 sample that is known not to contain a polynucleotide that is differentially expressed in a breast cancer cell. Conditions that allow hybridization are known in the art, and have been described in more detail above.

Detection can also be accomplished by any known method, including, but not limited to, *in situ* hybridization, PCR (polymerase chain reaction), RT-PCR (reverse transcription-  
25 PCR), and "Northern" or RNA blotting, arrays, microarrays, etc, or combinations of such techniques, using a suitably labeled polynucleotide. A variety of labels and labeling methods for polynucleotides are known in the art and can be used in the assay methods of the invention. Specific hybridization can be determined by comparison to appropriate controls.

30 Polynucleotide generally comprising at least 12 contiguous nt of a polynucleotide provided herein, as shown in the Sequence Listing or of the sequences of the genes corresponding to the polynucleotides of the Sequence Listing, are used for a variety of purposes, such as probes for detection of and/or measurement of, transcription levels of a polynucleotide that is differentially expressed in a breast cancer cell. Additional disclosure

about preferred regions of the disclosed polynucleotide sequences is found in the Examples. A probe that hybridizes specifically to a polynucleotide disclosed herein should provide a detection signal at least 2-, 5-, 10-, or 20-fold higher than the background hybridization provided with other unrelated sequences. It should be noted that "probe" as used in this context of detection of nucleic acid is meant to refer to a polynucleotide sequence used to detect a differentially expressed gene product in a test sample. As will be readily appreciated by the ordinarily skilled artisan, the probe can be detectably labeled and contacted with, for example, an array comprising immobilized polynucleotides obtained from a test sample (*e.g.*, mRNA). Alternatively, the probe can be immobilized on an array and the test sample detectably labeled. These and other variations of the methods of the invention are well within the skill in the art and are within the scope of the invention.

Labeled nucleic acid probes may be used to detect expression of a gene corresponding to the provided polynucleotide. In Northern blots, mRNA is separated electrophoretically and contacted with a probe. A probe is detected as hybridizing to an mRNA species of a particular size. The amount of hybridization can be quantitated to determine relative amounts of expression, for example under a particular condition. Probes are used for *in situ* hybridization to cells to detect expression. Probes can also be used *in vivo* for diagnostic detection of hybridizing sequences. Probes are typically labeled with a radioactive isotope. Other types of detectable labels can be used such as chromophores, fluorophores, and enzymes. Other examples of nucleotide hybridization assays are described in WO92/02526 and USPN 5,124,246.

PCR is another means for detecting small amounts of target nucleic acids, methods for which may be found in Sambrook, *et al.* Molecular Cloning: A Laboratory Manual, CSH Press 1989, pp.14.2-14.33.

A detectable label may be included in the amplification reaction. Suitable detectable labels include fluorochromes, (*e.g.* fluorescein isothiocyanate (FITC), rhodamine, Texas Red, phycoerythrin, allophycocyanin, 6-carboxyfluorescein (6-FAM), 2',7'-dimethoxy-4',5'-dichloro-6-carboxyfluorescein, 6-carboxy-X-rhodamine (ROX), 6-carboxy-2',4',7',4,7-hexachlorofluorescein (HEX), 5-carboxyfluorescein (5-FAM) or N,N,N',N'-tetramethyl-6-carboxyrhodamine (TAMRA)), radioactive labels, (*e.g.*  $^{32}\text{P}$ ,  $^{35}\text{S}$ ,  $^3\text{H}$ , *etc.*), and the like. The label may be a two stage system, where the polynucleotides is conjugated to biotin, haptens, *etc.* having a high affinity binding partner, *e.g.* avidin, specific antibodies, *etc.*, where the binding partner is conjugated to a detectable label. The label may be conjugated to one or

both of the primers. Alternatively, the pool of nucleotides used in the amplification is labeled, so as to incorporate the label into the amplification product.

### Arrays

Polynucleotide arrays provide a high throughput technique that can assay a large  
5 number of polynucleotides or polypeptides in a sample. This technology can be used as a tool to test for differential expression.

A variety of methods of producing arrays, as well as variations of these methods, are known in the art and contemplated for use in the invention. For example, arrays can be created by spotting polynucleotide probes onto a substrate (*e.g.*, glass, nitrocellulose, *etc.*) in  
10 a two-dimensional matrix or array having bound probes. The probes can be bound to the substrate by either covalent bonds or by non-specific interactions, such as hydrophobic interactions.

Samples of polynucleotides can be detectably labeled (*e.g.*, using radioactive or fluorescent labels) and then hybridized to the probes. Double stranded polynucleotides,  
15 comprising the labeled sample polynucleotides bound to probe polynucleotides, can be detected once the unbound portion of the sample is washed away. Alternatively, the polynucleotides of the test sample can be immobilized on the array, and the probes detectably labeled. Techniques for constructing arrays and methods of using these arrays are described in, for example, Schena *et al.* (1996) *Proc Natl Acad Sci U S A.* 93(20):10614-9;  
20 Schena *et al.* (1995) *Science* 270(5235):467-70; Shalon *et al.* (1996) *Genome Res.* 6(7):639-45, USPN 5,807,522, EP 799 897; WO 97/29212; WO 97/27317; EP 785 280; WO 97/02357; USPN 5,593,839; USPN 5,578,832; EP 728 520; USPN 5,599,695; EP 721 016; USPN 5,556,752; WO 95/22058; and USPN 5,631,734. In most embodiments, the “probe” is detectably labeled. In other embodiments, the probe is immobilized on the array and not  
25 detectably labeled.

Arrays can be used, for example, to examine differential expression of genes and can be used to determine gene function. For example, arrays can be used to detect differential expression of a gene corresponding to a polynucleotide described herein, where expression is compared between a test cell and control cell (*e.g.*, cancer cells and normal cells). For  
30 example, high expression of a particular message in a cancer cell, which is not observed in a corresponding normal cell, can indicate a cancer specific gene product. Exemplary uses of arrays are further described in, for example, Pappalarado *et al.*, *Sem. Radiation Oncol.* (1998) 8:217; and Ramsay, *Nature Biotechnol.* (1998) 16:40. Furthermore, many variations on methods of detection using arrays are well within the skill in the art and within the scope

of the present invention. For example, rather than immobilizing the probe to a solid support, the test sample can be immobilized on a solid support which is then contacted with the probe.

5           DIAGNOSIS, PROGNOSIS, ASSESSMENT OF THERAPY (THERAMETRICS), AND  
MANAGEMENT OF CANCER

The polynucleotides described herein, as well as their gene products and corresponding genes and gene products, are of particular interest as genetic or biochemical markers (e.g., in blood or tissues) that will detect the earliest changes along the  
10    carcinogenesis pathway and/or to monitor the efficacy of various therapies and preventive interventions.

For example, the level of expression of certain polynucleotides can be indicative of a poorer prognosis, and therefore warrant more aggressive chemo- or radio-therapy for a patient or vice versa. The correlation of novel surrogate tumor specific features with  
15    response to treatment and outcome in patients can define prognostic indicators that allow the design of tailored therapy based on the molecular profile of the tumor. These therapies include antibody targeting, antagonists (e.g., small molecules), and gene therapy.

Determining expression of certain polynucleotides and comparison of a patient's profile with known expression in normal tissue and variants of the disease allows a  
20    determination of the best possible treatment for a patient, both in terms of specificity of treatment and in terms of comfort level of the patient. Surrogate tumor markers, such as polynucleotide expression, can also be used to better classify, and thus diagnose and treat, different forms and disease states of cancer. Two classifications widely used in oncology that can benefit from identification of the expression levels of the genes corresponding to the  
25    polynucleotides described herein are staging of the cancerous disorder, and grading the nature of the cancerous tissue.

The polynucleotides that correspond to differentially expressed genes, as well as their encoded gene products, can be useful to monitor patients having or susceptible to cancer to detect potentially malignant events at a molecular level before they are detectable at a gross  
30    morphological level. In addition, the polynucleotides described herein, as well as the genes corresponding to such polynucleotides, can be useful as therametrics, e.g., to assess the effectiveness of therapy by using the polynucleotides or their encoded gene products, to assess, for example, tumor burden in the patient before, during, and after therapy.

Furthermore, a polynucleotide identified as corresponding to a gene that is differentially expressed in, and thus is important for, one type of cancer can also have implications for development or risk of development of other types of cancer, e.g., where a polynucleotide represents a gene differentially expressed across various cancer types. Thus, 5 for example, expression of a polynucleotide corresponding to a gene that has clinical implications for breast cancer can also have clinical implications for metastatic breast cancer, colon cancer, or ovarian cancer.

Staging. Staging is a process used by physicians to describe how advanced the cancerous state is in a patient. Staging assists the physician in determining a prognosis, 10 planning treatment and evaluating the results of such treatment. Staging systems vary with the types of cancer, but generally involve the following “TNM” system: the type of tumor, indicated by T; whether the cancer has metastasized to nearby lymph nodes, indicated by N; and whether the cancer has metastasized to more distant parts of the body, indicated by M. Generally, if a cancer is only detectable in the area of the primary lesion without having 15 spread to any lymph nodes it is called Stage I. If it has spread only to the closest lymph nodes, it is called Stage II. In Stage III, the cancer has generally spread to the lymph nodes in near proximity to the site of the primary lesion. Cancers that have spread to a distant part of the body, such as the liver, bone, brain or other site, are Stage IV, the most advanced stage.

20 The polynucleotides and corresponding genes and gene products described herein can facilitate fine-tuning of the staging process by identifying markers for the aggressiveness of a cancer, e.g. the metastatic potential, as well as the presence in different areas of the body. Thus, a Stage II cancer with a polynucleotide signifying a high metastatic potential cancer can be used to change a borderline Stage II tumor to a Stage III tumor, justifying 25 more aggressive therapy. Conversely, the presence of a polynucleotide signifying a lower metastatic potential allows more conservative staging of a tumor.

One type of breast cancer is ductal carcinoma in situ (DCIS): DCIS is when the breast cancer cells are completely contained within the breast ducts (the channels in the breast that carry milk to the nipple), and have not spread into the surrounding breast tissue. 30 This may also be referred to as non-invasive or intraductal cancer, as the cancer cells have not yet spread into the surrounding breast tissue and so usually have not spread into any other part of the body.

Lobular carcinoma in situ breast cancer (LCIS) means that cell changes are found in the lining of the lobules of the breast. It can be present in both breasts. It is also referred to as non-invasive cancer as it has not spread into the surrounding breast tissue.

Invasive breast cancer can be staged as follows: Stage 1 tumours: these measure less than two centimetres. The lymph glands in the armpit are not affected and there are no signs that the cancer has spread elsewhere in the body; Stage 2 tumours: these measure between two and five centimetres, or the lymph glands in the armpit are affected, or both. However, there are no signs that the cancer has spread further; Stage 3 tumours: these are larger than five centimetres and may be attached to surrounding structures such as the muscle or skin. The lymph glands are usually affected, but there are no signs that the cancer has spread beyond the breast or the lymph glands in the armpit; Stage 4 tumours: these are of any size, but the lymph glands are usually affected and the cancer has spread to other parts of the body. This is secondary breast cancer.

Grading of cancers. Grade is a term used to describe how closely a tumor resembles normal tissue of its same type. The microscopic appearance of a tumor is used to identify tumor grade based on parameters such as cell morphology, cellular organization, and other markers of differentiation. As a general rule, the grade of a tumor corresponds to its rate of growth or aggressiveness, with undifferentiated or high-grade tumors generally being more aggressive than well-differentiated or low-grade tumors.

The polynucleotides of the Sequence Listing, and their corresponding genes and gene products, can be especially valuable in determining the grade of the tumor, as they not only can aid in determining the differentiation status of the cells of a tumor, they can also identify factors other than differentiation that are valuable in determining the aggressiveness of a tumor, such as metastatic potential.

Low grade means that the cancer cells look very like the normal cells of the breast. They are usually slowly growing and are less likely to spread. In high grade tumors the cells look very abnormal. They are likely to grow more quickly and are more likely to spread.

Assessment of proliferation of cells in tumor. The differential expression level of the polynucleotides described herein can facilitate assessment of the rate of proliferation of tumor cells, and thus provide an indicator of the aggressiveness of the rate of tumor growth. For example, assessment of the relative expression levels of genes involved in cell cycle can provide an indication of cellular proliferation, and thus serve as a marker of proliferation.



### Detection of breast cancer.

The polynucleotides corresponding to genes that exhibit the appropriate expression pattern can be used to detect breast cancer in a subject. Breast cancer is one of the most common neoplasms in women, and prevention and early detection are key factors in  
5 controlling and curing breast cancer. The expression of appropriate polynucleotides can be used in the diagnosis, prognosis and management of breast cancer. Detection of breast cancer can be determined using expression levels of any of these sequences alone or in combination with the levels of expression of other known cancer genes. Determination of the aggressive nature and/or the metastatic potential of a breast cancer can be determined by  
10 comparing levels of one or more gene products of the genes corresponding to the polynucleotides described herein, and comparing total levels of another sequence known to vary in cancerous tissue, *e.g.*, expression of p53, DCC, ras, FAP (see, *e.g.*, Fearon ER, *et al.*, *Cell* (1990) 61(5):759; Hamilton SR *et al.*, *Cancer* (1993) 72:957; Bodmer W, *et al.*, *Nat Genet.* (1994) 4(3):217; Fearon ER, *Ann N Y Acad Sci.* (1995) 768:101). For example,  
15 development of breast cancer can be detected by examining the level of expression of a gene corresponding to a polynucleotides described herein to the levels of oncogenes (*e.g.* ras) or tumor suppressor genes (*e.g.* FAP or p53). Thus expression of specific marker polynucleotides can be used to discriminate between normal and cancerous breast tissue, to discriminate between breast cancers with different cells of origin, to discriminate between  
20 breast cancers with different potential metastatic rates, etc. For a review of other markers of cancer, see, *e.g.*, Hanahan et al. (2000) *Cell* 100:57-70.

### Treatment of breast cancer

The invention further provides methods for reducing growth of breast cancer cells. The methods provide for decreasing the expression of a gene that is differentially expressed  
25 in a breast cancer cell or decreasing the level of and/or decreasing an activity of a breast cancer-associated polypeptide. In general, the methods comprise contacting a breast cancer cell with a substance that modulates (1) expression of a gene that is differentially expressed in breast cancer; or (2) a level of and/or an activity of a breast cancer-associated polypeptide.

“Reducing growth of breast cancer cells” includes, but is not limited to, reducing  
30 proliferation of breast cancer cells, and reducing the incidence of a non-cancerous breast cell becoming a cancerous breast cell. Whether a reduction in breast cancer cell growth has been achieved can be readily determined using any known assay, including, but not limited to, [<sup>3</sup>H]-thymidine incorporation; counting cell number over a period of time; detecting and/or measuring a marker associated with breast cancer (*e.g.*, PSA).

The present invention provides methods for treating breast cancer, generally comprising administering to an individual in need thereof a substance that reduces breast cancer cell growth, in an amount sufficient to reduce breast cancer cell growth and treat the breast cancer. Whether a substance, or a specific amount of the substance, is effective in  
5 treating breast cancer can be assessed using any of a variety of known diagnostic assays for breast cancer, including, but not limited to, proctoscopy, rectal examination, biopsy, contrast radiographic studies, CAT scan, and detection of a tumor marker associated with breast cancer in the blood of the individual (*e.g.*, PSA (breast-specific antigen)). The substance can be administered systemically or locally. Thus, in some embodiments, the substance is  
10 administered locally, and breast cancer growth is decreased at the site of administration. Local administration may be useful in treating, *e.g.*, a solid tumor.

A substance that reduces breast cancer cell growth can be targeted to a breast cancer cell. Thus, in some embodiments, the invention provides a method of delivering a drug to a breast cancer cell, comprising administering a drug-antibody complex to a subject, wherein  
15 the antibody is specific for a breast cancer-associated polypeptide, and the drug is one that reduces breast cancer cell growth, a variety of which are known in the art. Targeting can be accomplished by coupling (*e.g.*, linking, directly or via a linker molecule, either covalently or non-covalently, so as to form a drug-antibody complex) a drug to an antibody specific for a breast cancer-associated polypeptide. Methods of coupling a drug to an antibody are well  
20 known in the art and need not be elaborated upon herein.

#### Tumor classification and patient stratification

The invention further provides for methods of classifying tumors, and thus grouping or "stratifying" patients, according to the expression profile of selected differentially expressed genes in a tumor. Differentially expressed genes can be analyzed for correlation  
25 with other differentially expressed genes in a single tumor type or across tumor types. Genes that demonstrate consistent correlation in expression profile in a given cancer cell type (*e.g.*, in a breast cancer cell or type of breast cancer) can be grouped together, *e.g.*, when one gene is overexpressed in a tumor, a second gene is also usually overexpressed. Tumors can then be classified according to the expression profile of one or more genes  
30 selected from one or more groups.

The tumor of each patient in a pool of potential patients can be classified as described above. Patients having similarly classified tumors can then be selected for participation in an investigative or clinical trial of a cancer therapeutic where a homogeneous population is desired. The tumor classification of a patient can also be used in assessing the efficacy of a

cancer therapeutic in a heterogeneous patient population. In addition, therapy for a patient having a tumor of a given expression profile can then be selected accordingly.

In another embodiment, differentially expressed gene products (*e.g.*, polypeptides or polynucleotides encoding such polypeptides) may be effectively used in treatment through vaccination. The growth of cancer cells is naturally limited in part due to immune surveillance. Stimulation of the immune system using a particular tumor-specific antigen enhances the effect towards the tumor expressing the antigen. An active vaccine comprising a polypeptide encoded by the cDNA of this invention would be appropriately administered to subjects having an alteration, *e.g.*, overabundance, of the corresponding RNA, or those predisposed for developing cancer cells with an alteration of the same RNA. Polypeptide antigens are typically combined with an adjuvant as part of a vaccine composition. The vaccine is preferably administered first as a priming dose, and then again as a boosting dose, usually at least four weeks later. Further boosting doses may be given to enhance the effect. The dose and its timing are usually determined by the person responsible for the treatment.

The invention also encompasses the selection of a therapeutic regimen based upon the expression profile of differentially expressed genes in the patient's tumor. For example, a tumor can be analyzed for its expression profile of the genes corresponding to SEQ ID NOS:1-499 as described herein, *e.g.*, the tumor is analyzed to determine which genes are expressed at elevated levels or at decreased levels relative to normal cells of the same tissue type. The expression patterns of the tumor are then compared to the expression patterns of tumors that respond to a selected therapy. Where the expression profiles of the test tumor cell and the expression profile of a tumor cell of known drug responsiveness at least substantially match (*e.g.*, selected sets of genes at elevated levels in the tumor of known drug responsiveness and are also at elevated levels in the test tumor cell), then the therapeutic agent selected for therapy is the drug to which tumors with that expression pattern respond.

#### Pattern matching in diagnosis using arrays

In another embodiment, the diagnostic and/or prognostic methods of the invention involve detection of expression of a selected set of genes in a test sample to produce a test expression pattern (TEP). The TEP is compared to a reference expression pattern (REP), which is generated by detection of expression of the selected set of genes in a reference sample (*e.g.*, a positive or negative control sample). The selected set of genes includes at least one of the genes of the invention, which genes correspond to the polynucleotide sequences described herein. Of particular interest is a selected set of genes that includes gene differentially expressed in the disease for which the test sample is to be screened.

## IDENTIFICATION OF THERAPEUTIC TARGETS AND ANTI-CANCER THERAPEUTIC AGENTS

The present invention also encompasses methods for identification of agents having the ability to modulate activity of a differentially expressed gene product, as well as methods for identifying a differentially expressed gene product as a therapeutic target for treatment of cancer, especially breast cancer.

Identification of compounds that modulate activity of a differentially expressed gene product can be accomplished using any of a variety of drug screening techniques. Such agents are candidates for development of cancer therapies. Of particular interest are screening assays for agents that have tolerable toxicity for normal, non-cancerous human cells. The screening assays of the invention are generally based upon the ability of the agent to modulate an activity of a differentially expressed gene product and/or to inhibit or suppress phenomenon associated with cancer (*e.g.*, cell proliferation, colony formation, cell cycle arrest, metastasis, and the like).

Screening of candidate agents

Screening assays can be based upon any of a variety of techniques readily available and known to one of ordinary skill in the art. In general, the screening assays involve contacting a cancerous cell (preferably a cancerous cell such as a cancerous breast cell) with a candidate agent, and assessing the effect upon biological activity of a differentially expressed gene product. The effect upon a biological activity can be detected by, for example, detection of expression of a gene product of a differentially expressed gene (*e.g.*, a decrease in mRNA or polypeptide levels, would in turn cause a decrease in biological activity of the gene product). Alternatively or in addition, the effect of the candidate agent can be assessed by examining the effect of the candidate agent in a functional assay. For example, where the differentially expressed gene product is an enzyme, then the effect upon biological activity can be assessed by detecting a level of enzymatic activity associated with the differentially expressed gene product. The functional assay will be selected according to the differentially expressed gene product. In general, where the differentially expressed gene is increased in expression in a cancerous cell, agents of interest are those that decrease activity of the differentially expressed gene product.

Assays described *infra* can be readily adapted in the screening assay embodiments of the invention. Exemplary assays useful in screening candidate agents include, but are not limited to, hybridization-based assays (*e.g.*, use of nucleic acid probes or primers to assess expression levels), antibody-based assays (*e.g.*, to assess levels of polypeptide gene products), binding assays (*e.g.*, to detect interaction of a candidate agent with a differentially

expressed polypeptide, which assays may be competitive assays where a natural or synthetic ligand for the polypeptide is available), and the like. Additional exemplary assays include, but are not necessarily limited to, cell proliferation assays, antisense knockout assays, assays to detect inhibition of cell cycle, assays of induction of cell death/apoptosis, and the like.

5 Generally such assays are conducted *in vitro*, but many assays can be adapted for *in vivo* analyses, *e.g.*, in an animal model of the cancer.

#### Identification of therapeutic targets

In another embodiment, the invention contemplates identification of differentially expressed genes and gene products as therapeutic targets. In some respects, this is the  
10 converse of the assays described above for identification of agents having activity in modulating (*e.g.*, decreasing or increasing) activity of a differentially expressed gene product.

In this embodiment, therapeutic targets are identified by examining the effect(s) of an agent that can be demonstrated or has been demonstrated to modulate a cancerous phenotype  
15 (*e.g.*, inhibit or suppress or prevent development of a cancerous phenotype). Such agents are generally referred to herein as an "anti-cancer agent", which agents encompass chemotherapeutic agents. For example, the agent can be an antisense oligonucleotide that is specific for a selected gene transcript. For example, the antisense oligonucleotide may have a sequence corresponding to a sequence of a differentially expressed gene described herein,  
20 *e.g.*, a sequence of one of SEQ ID NOS:1-499.

Assays for identification of therapeutic targets can be conducted in a variety of ways using methods that are well known to one of ordinary skill in the art. For example, a test cancerous cell that expresses or overexpresses a differentially expressed gene is contacted with an anti-cancer agent, the effect upon a cancerous phenotype and a biological activity of  
25 the candidate gene product assessed. The biological activity of the candidate gene product can be assayed by examining, for example, modulation of expression of a gene encoding the candidate gene product (*e.g.*, as detected by, for example, an increase or decrease in transcript levels or polypeptide levels), or modulation of an enzymatic or other activity of the gene product. The cancerous phenotype can be, for example, cellular proliferation, loss of  
30 contact inhibition of growth (*e.g.*, colony formation), tumor growth (*in vitro* or *in vivo*), and the like. Alternatively or in addition, the effect of modulation of a biological activity of the candidate target gene upon cell death/apoptosis or cell cycle regulation can be assessed.

Inhibition or suppression of a cancerous phenotype, or an increase in cell death or apoptosis as a result of modulation of biological activity of a candidate gene product

indicates that the candidate gene product is a suitable target for cancer therapy. Assays described infra can be readily adapted for assays for identification of therapeutic targets. Generally such assays are conducted *in vitro*, but many assays can be adapted for *in vivo* analyses, *e.g.*, in an appropriate, art-accepted animal model of the cancer.

5           Candidate agents

The term "agent" as used herein describes any molecule, *e.g.* protein or pharmaceutical, with the capability of modulating a biological activity of a gene product of a differentially expressed gene. Generally a plurality of assay mixtures are run in parallel with different agent concentrations to obtain a differential response to the various concentrations. Typically, one of these concentrations serves as a negative control, *i.e.* at zero concentration or below the level of detection.

Candidate agents encompass numerous chemical classes, though typically they are organic molecules, preferably small organic compounds having a molecular weight of more than 50 and less than about 2,500 daltons. Candidate agents comprise functional groups necessary for structural interaction with proteins, particularly hydrogen bonding, and typically include at least an amine, carbonyl, hydroxyl or carboxyl group, preferably at least two of the functional chemical groups. The candidate agents often comprise cyclical carbon or heterocyclic structures and/or aromatic or polyaromatic structures substituted with one or more of the above functional groups. Candidate agents are also found among biomolecules including, but not limited to: peptides, saccharides, fatty acids, steroids, purines, pyrimidines, derivatives, structural analogs or combinations thereof.

Candidate agents are obtained from a wide variety of sources including libraries of synthetic or natural compounds. For example, numerous means are available for random and directed synthesis of a wide variety of organic compounds and biomolecules, including expression of randomized oligonucleotides and oligopeptides. Alternatively, libraries of natural compounds in the form of bacterial, fungal, plant and animal extracts (including extracts from human tissue to identify endogenous factors affecting differentially expressed gene products) are available or readily produced. Additionally, natural or synthetically produced libraries and compounds are readily modified through conventional chemical, physical and biochemical means, and may be used to produce combinatorial libraries. Known pharmacological agents may be subjected to directed or random chemical modifications, such as acylation, alkylation, esterification, amidification, *etc.* to produce structural analogs.

Exemplary candidate agents of particular interest include, but are not limited to, antisense and RNAi polynucleotides, and antibodies, soluble receptors, and the like. Antibodies and soluble receptors are of particular interest as candidate agents where the target differentially expressed gene product is secreted or accessible at the cell-surface (*e.g.*,  
5 receptors and other molecule stably-associated with the outer cell membrane).

For method that involve RNAi (RNA interference), a double stranded RNA (dsRNA) molecule is usually used. The dsRNA is prepared to be substantially identical to at least a segment of a subject polynucleotide (*e.g.* a cDNA or gene). In general, the dsRNA is selected to have at least 70%, 75%, 80%, 85% or 90% sequence identity with the subject  
10 polynucleotide over at least a segment of the candidate gene. In other instances, the sequence identity is even higher, such as 95%, 97% or 99%, and in still other instances, there is 100% sequence identity with the subject polynucleotide over at least a segment of the subject polynucleotide. The size of the segment over which there is sequence identity can vary depending upon the size of the subject polynucleotide. In general, however, there is  
15 substantial sequence identity over at least 15, 20, 25, 30, 35, 40 or 50 nucleotides. In other instances, there is substantial sequence identity over at least 100, 200, 300, 400, 500 or 1000 nucleotides; in still other instances, there is substantial sequence identity over the entire length of the subject polynucleotide, *i.e.*, the coding and non-coding region of the candidate gene.

20 Because only substantial sequence similarity between the subject polynucleotide and the dsRNA is necessary, sequence variations between these two species arising from genetic mutations, evolutionary divergence and polymorphisms can be tolerated. Moreover, as described further *infra*, the dsRNA can include various modified or nucleotide analogs.

Usually the dsRNA consists of two separate complementary RNA strands. However,  
25 in some instances, the dsRNA may be formed by a single strand of RNA that is self-complementary, such that the strand loops back upon itself to form a hairpin loop. Regardless of form, RNA duplex formation can occur inside or outside of a cell.

The size of the dsRNA that is utilized varies according to the size of the subject polynucleotide whose expression is to be suppressed and is sufficiently long to be effective  
30 in reducing expression of the subject polynucleotide in a cell. Generally, the dsRNA is at least 10-15 nucleotides long. In certain applications, the dsRNA is less than 20, 21, 22, 23, 24 or 25 nucleotides in length. In other instances, the dsRNA is at least 50, 100, 150 or 200 nucleotides in length. The dsRNA can be longer still in certain other applications, such as at least 300, 400, 500 or 600 nucleotides. Typically, the dsRNA is not longer than 3000

nucleotides. The optimal size for any particular subject polynucleotide can be determined by one of ordinary skill in the art without undue experimentation by varying the size of the dsRNA in a systematic fashion and determining whether the size selected is effective in interfering with expression of the subject polynucleotide.

5 dsRNA can be prepared according to any of a number of methods that are known in the art, including *in vitro* and *in vivo* methods, as well as by synthetic chemistry approaches.

*In vitro methods.* Certain methods generally involve inserting the segment corresponding to the candidate gene that is to be transcribed between a promoter or pair of promoters that are oriented to drive transcription of the inserted segment and then utilizing  
10 an appropriate RNA polymerase to carry out transcription. One such arrangement involves positioning a DNA fragment corresponding to the candidate gene or segment thereof into a vector such that it is flanked by two opposable polymerase-specific promoters that can be same or different. Transcription from such promoters produces two complementary RNA strands that can subsequently anneal to form the desired dsRNA. Exemplary plasmids for  
15 use in such systems include the plasmid (PCR 4.0 TOPO) (available from Invitrogen). Another example is the vector pGEM-T (Promega, Madison, WI) in which the oppositely oriented promoters are T7 and SP6; the T3 promoter can also be utilized.

In a second arrangement, DNA fragments corresponding to the segment of the subject polynucleotide that is to be transcribed is inserted both in the sense and antisense  
20 orientation downstream of a single promoter. In this system, the sense and antisense fragments are cotranscribed to generate a single RNA strand that is self-complementary and thus can form dsRNA.

Various other *in vitro* methods have been described. Examples of such methods include, but are not limited to, the methods described by Sadher et al. (Biochem. Int.  
25 14:1015, 1987); by Bhattacharyya (Nature 343:484, 1990); and by Livache, et al. (U.S. Patent No. 5,795,715), each of which is incorporated herein by reference in its entirety.

Single-stranded RNA can also be produced using a combination of enzymatic and organic synthesis or by total organic synthesis. The use of synthetic chemical methods enable one to introduce desired modified nucleotides or nucleotide analogs into the dsRNA.

30 *In vivo methods.* dsRNA can also be prepared *in vivo* according to a number of established methods (see, e.g., Sambrook, et al. (1989) Molecular Cloning: A Laboratory Manual, 2<sup>nd</sup> ed.; Transcription and Translation (B.D. Hames, and S.J. Higgins, Eds., 1984); DNA Cloning, volumes I and II (D.N. Glover, Ed., 1985); and Oligonucleotide Synthesis (M.J. Gait, Ed., 1984, each of which is incorporated herein by reference in its entirety).



Once the single-stranded RNA has been formed, the complementary strands are allowed to anneal to form duplex RNA. Transcripts are typically treated with DNAase and further purified according to established protocols to remove proteins. Usually such purification methods are not conducted with phenol:chloroform. The resulting purified  
5 transcripts are subsequently dissolved in RNAase free water or a buffer of suitable composition.

dsRNA is generated by annealing the sense and anti-sense RNA in vitro. Generally, the strands are initially denatured to keep the strands separate and to avoid self-annealing. During the annealing process, typically certain ratios of the sense and antisense strands are  
10 combined to facilitate the annealing process. In some instances, a molar ratio of sense to antisense strands of 3:7 is used; in other instances, a ratio of 4:6 is utilized; and in still other instances, the ratio is 1:1.

The buffer composition utilized during the annealing process can in some instances affect the efficacy of the annealing process and subsequent transfection procedure. While  
15 some have indicated that the buffered solution used to carry out the annealing process should include a potassium salt such as potassium chloride (e.g. at a concentration of about 80 mM). In some embodiments, the buffer is substantially potassium free. Once single-stranded RNA has annealed to form duplex RNA, typically any single-strand overhangs are removed using an enzyme that specifically cleaves such overhangs (e.g., RNAase A or RNAase T).

20 Once the dsRNA has been formed, it is introduced into a reference cell, which can include an individual cell or a population of cells (e.g., a tissue, an embryo and an entire organism). The cell can be from essentially any source, including animal, plant, viral, bacterial, fungal and other sources. If a tissue, the tissue can include dividing or nondividing and differentiated or undifferentiated cells. Further, the tissue can include germ line cells  
25 and somatic cells. Examples of differentiated cells that can be utilized include, but are not limited to, neurons, glial cells, blood cells, megakaryocytes, lymphocytes, macrophages, neutrophils, eosinophils, basophils, mast cells, leukocytes, granulocytes, keratinocytes, adipocytes, osteoblasts, osteoclasts, hepatocytes, cells of the endocrine or exocrine glands, fibroblasts, myocytes, cardiomyocytes, and endothelial cells. The cell can be an individual  
30 cell of an embryo, and can be a blastocyte or an oocyte.

Certain methods are conducted using model systems for particular cellular states (e.g., a disease). For instance, certain methods provided herein are conducted with a cancer cell lines that serves as a model system for investigating genes that are correlated with various cancers.

A number of options can be utilized to deliver the dsRNA into a cell or population of cells such as in a cell culture, tissue or embryo. For instance, RNA can be directly introduced intracellularly. Various physical methods are generally utilized in such instances, such as administration by microinjection (see, e.g., Zernicka-Goetz, et al. (1997) Development 124:1133-1137; and Wianny, et al. (1998) Chromosoma 107: 430-439).

Other options for cellular delivery include permeabilizing the cell membrane and electroporation in the presence of the dsRNA, liposome-mediated transfection, or transfection using chemicals such as calcium phosphate. A number of established gene therapy techniques can also be utilized to introduce the dsRNA into a cell. By introducing a viral construct within a viral particle, for instance, one can achieve efficient introduction of an expression construct into the cell and transcription of the RNA encoded by the construct.

If the dsRNA is to be introduced into an organism or tissue, gene gun technology is an option that can be employed. This generally involves immobilizing the dsRNA on a gold particle which is subsequently fired into the desired tissue. Research has also shown that mammalian cells have transport mechanisms for taking in dsRNA (see, e.g., Asher, et al. (1969) Nature 223:715-717). Consequently, another delivery option is to administer the dsRNA extracellularly into a body cavity, interstitial space or into the blood system of the mammal for subsequent uptake by such transport processes. The blood and lymph systems and the cerebrospinal fluid are potential sites for injecting dsRNA. Oral, topical, parenteral, rectal and intraperitoneal administration are also possible modes of administration.

The composition introduced can also include various other agents in addition to the dsRNA. Examples of such agents include, but are not limited to, those that stabilize the dsRNA, enhance cellular uptake and/or increase the extent of interference. Typically, the dsRNA is introduced in a buffer that is compatible with the composition of the cell into which the RNA is introduced to prevent the cell from being shocked. The minimum size of the dsRNA that effectively achieves gene silencing can also influence the choice of delivery system and solution composition.

Sufficient dsRNA is introduced into the tissue to cause a detectable change in expression of a target gene (assuming the candidate gene is in fact being expressed in the cell into which the dsRNA is introduced) using available detection methodologies. Thus, in some instances, sufficient dsRNA is introduced to achieve at least a 5-10% reduction in candidate gene expression as compared to a cell in which the dsRNA is not introduced. In other instances, inhibition is at least 20, 30, 40 or 50%. In still other instances, the inhibition

is at least 60, 70, 80, 90 or 95%. Expression in some instances is essentially completely inhibited to undetectable levels.

The amount of dsRNA introduced depends upon various factors such as the mode of administration utilized, the size of the dsRNA, the number of cells into which dsRNA is administered, and the age and size of an animal if dsRNA is introduced into an animal. An appropriate amount can be determined by those of ordinary skill in the art by initially administering dsRNA at several different concentrations for example, for example. In certain instances when dsRNA is introduced into a cell culture, the amount of dsRNA introduced into the cells varies from about 0.5 to 3  $\mu\text{g}$  per  $10^6$  cells.

A number of options are available to detect interference of candidate gene expression (i.e., to detect candidate gene silencing). In general, inhibition in expression is detected by detecting a decrease in the level of the protein encoded by the candidate gene, determining the level of mRNA transcribed from the gene and/or detecting a change in phenotype associated with candidate gene expression.

#### USE OF POLYPEPTIDES TO SCREEN FOR PEPTIDE ANALOGS AND ANTAGONISTS

Polypeptides encoded by differentially expressed genes identified herein can be used to screen peptide libraries to identify binding partners, such as receptors, from among the encoded polypeptides. Peptide libraries can be synthesized according to methods known in the art (*see, e.g.*, USPN 5,010,175 and WO 91/17823).

Agonists or antagonists of the polypeptides of the invention can be screened using any available method known in the art, such as signal transduction, antibody binding, receptor binding, mitogenic assays, chemotaxis assays, etc. The assay conditions ideally should resemble the conditions under which the native activity is exhibited *in vivo*, that is, under physiologic pH, temperature, and ionic strength. Suitable agonists or antagonists will exhibit strong inhibition or enhancement of the native activity at concentrations that do not cause toxic side effects in the subject. Agonists or antagonists that compete for binding to the native polypeptide can require concentrations equal to or greater than the native concentration, while inhibitors capable of binding irreversibly to the polypeptide can be added in concentrations on the order of the native concentration.

Such screening and experimentation can lead to identification of a polypeptide binding partner, such as a receptor, encoded by a gene or a cDNA corresponding to a polynucleotide described herein, and at least one peptide agonist or antagonist of the binding partner. Such agonists and antagonists can be used to modulate, enhance, or inhibit receptor

function in cells to which the receptor is native, or in cells that possess the receptor as a result of genetic engineering. Further, if the receptor shares biologically important characteristics with a known receptor, information about agonist/antagonist binding can facilitate development of improved agonists/antagonists of the known receptor.

5

#### VACCINES AND USES

The differentially expressed nucleic acids and polypeptides produced by the nucleic acids of the invention can also be used to modulate primary immune response to prevent or treat cancer. Every immune response is a complex and intricately regulated sequence of

10

events involving several cell types. It is triggered when an antigen enters the body and encounters a specialized class of cells called antigen-presenting cells (APCs). These APCs capture a minute amount of the antigen and display it in a form that can be recognized by antigen-specific helper T lymphocytes. The helper (Th) cells become activated and, in turn, promote the activation of other classes of lymphocytes, such as B cells or cytotoxic T cells.

15

The activated lymphocytes then proliferate and carry out their specific effector functions, which in many cases successfully activate or eliminate the antigen. Thus, activating the immune response to a particular antigen associated with a cancer cell can protect the patient from developing cancer or result in lymphocytes eliminating cancer cells expressing the antigen.

20

Gene products, including polypeptides, mRNA (particularly mRNAs having distinct secondary and/or tertiary structures), cDNA, or complete gene, can be prepared and used in vaccines for the treatment or prevention of hyperproliferative disorders and cancers. The nucleic acids and polypeptides can be utilized to enhance the immune response, prevent tumor progression, prevent hyperproliferative cell growth, and the like. Methods for

25

selecting nucleic acids and polypeptides that are capable of enhancing the immune response are known in the art. Preferably, the gene products for use in a vaccine are gene products which are present on the surface of a cell and are recognizable by lymphocytes and antibodies.

30

The gene products may be formulated with pharmaceutically acceptable carriers into pharmaceutical compositions by methods known in the art. The composition is useful as a vaccine to prevent or treat cancer. The composition may further comprise at least one co-immunostimulatory molecule, including but not limited to one or more major histocompatibility complex (MHC) molecules, such as a class I or class II molecule, preferably a class I molecule. The composition may further comprise other stimulator

molecules including B7.1, B7.2, ICAM-1, ICAM-2, LFA-1, LFA-3, CD72 and the like, immunostimulatory polynucleotides (which comprise an 5'-CG-3' wherein the cytosine is unmethylated), and cytokines which include but are not limited to IL-1 through IL-15, TNF- $\alpha$ , IFN- $\gamma$ , RANTES, G-CSF, M-CSF, IFN- $\alpha$ , CTAP III, ENA-78, GRO, I-309, PF-4, IP-10, 5 LD-78, MGSA, MIP-1 $\alpha$ , MIP-1 $\beta$ , or combination thereof, and the like for immunopotiation. In one embodiment, the immunopotentiators of particular interest are those that facilitate a Th1 immune response.

The gene products may also be prepared with a carrier that will protect the gene products against rapid elimination from the body, such as a controlled release formulation, 10 including implants and microencapsulated delivery systems. Biodegradable polymers can be used, such as ethylene vinyl acetate, polyanhydrides, polyglycolic acid, collagen, polyorthoesters, polylactic acid, and the like. Methods for preparation of such formulations are known in the art.

In the methods of preventing or treating cancer, the gene products may be 15 administered via one of several routes including but not limited to transdermal, transmucosal, intravenous, intramuscular, subcutaneous, intradermal, intraperitoneal, intrathecal, intrapleural, intrauterine, rectal, vaginal, topical, intratumor, and the like. For transmucosal or transdermal administration, penetrants appropriate to the barrier to be permeated are used in the formulation. Such penetrants are generally known in the art, and 20 include, for example, administration bile salts and fusidic acid derivatives. In addition, detergents may be used to facilitate permeation. Transmucosal administration may be by nasal sprays or suppositories. For oral administration, the gene products are formulated into conventional oral administration form such as capsules, tablets, elixirs and the like.

The gene product is administered to a patient in an amount effective to prevent or 25 treat cancer. In general, it is desirable to provide the patient with a dosage of gene product of at least about 1 pg per Kg body weight, preferably at least about 1 ng per Kg body weight, more preferably at least about 1  $\mu$ g or greater per Kg body weight of the recipient. A range of from about 1 ng per Kg body weight to about 100 mg per Kg body weight is preferred although a lower or higher dose may be administered. The dose is effective to prime, 30 stimulate and/or cause the clonal expansion of antigen-specific T lymphocytes, preferably cytotoxic T lymphocytes, which in turn are capable of preventing or treating cancer in the recipient. The dose is administered at least once and may be provided as a bolus or a continuous administration. Multiple administrations of the dose over a period of several weeks to months may be preferable. Subsequent doses may be administered as indicated.

In another method of treatment, autologous cytotoxic lymphocytes or tumor infiltrating lymphocytes may be obtained from a patient with cancer. The lymphocytes are grown in culture, and antigen-specific lymphocytes are expanded by culturing in the presence of the specific gene products alone or in combination with at least one co-immunostimulatory molecule with cytokines. The antigen-specific lymphocytes are then infused back into the patient in an amount effective to reduce or eliminate the tumors in the patient. Cancer vaccines and their uses are further described in USPN 5,961,978; USPN 5,993,829; USPN 6,132,980; and WO 00/38706.

## 10 PHARMACEUTICAL COMPOSITIONS AND USES

Pharmaceutical compositions can comprise polypeptides, receptors that specifically bind a polypeptide produced by a differentially expressed gene (*e.g.*, antibodies, or polynucleotides (including antisense nucleotides and ribozymes) of the claimed invention in a therapeutically effective amount. The compositions can be used to treat primary tumors as well as metastases of primary tumors. In addition, the pharmaceutical compositions can be used in conjunction with conventional methods of cancer treatment, *e.g.*, to sensitize tumors to radiation or conventional chemotherapy.

Where the pharmaceutical composition comprises a receptor (such as an antibody) that specifically binds to a gene product encoded by a differentially expressed gene, the receptor can be coupled to a drug for delivery to a treatment site or coupled to a detectable label to facilitate imaging of a site comprising breast cancer cells. Methods for coupling antibodies to drugs and detectable labels are well known in the art, as are methods for imaging using detectable labels.

The term “therapeutically effective amount” as used herein refers to an amount of a therapeutic agent to treat, ameliorate, or prevent a desired disease or condition, or to exhibit a detectable therapeutic or preventative effect. The effect can be detected by, for example, chemical markers or antigen levels. Therapeutic effects also include reduction in physical symptoms, such as decreased body temperature.

The precise effective amount for a subject will depend upon the subject's size and health, the nature and extent of the condition, and the therapeutics or combination of therapeutics selected for administration. Thus, it is not useful to specify an exact effective amount in advance. However, the effective amount for a given situation is determined by routine experimentation and is within the judgment of the clinician. For purposes of the present invention, an effective dose will generally be from about 0.01 mg/kg to 50 mg/kg or

0.05 mg/kg to about 10 mg/kg of the DNA constructs in the individual to which it is administered.

A pharmaceutical composition can also contain a pharmaceutically acceptable carrier. The term "pharmaceutically acceptable carrier" refers to a carrier for administration of a therapeutic agent, such as antibodies or a polypeptide, genes, and other therapeutic agents. The term refers to any pharmaceutical carrier that does not itself induce the production of antibodies harmful to the individual receiving the composition, and which can be administered without undue toxicity. Suitable carriers can be large, slowly metabolized macromolecules such as proteins, polysaccharides, polylactic acids, polyglycolic acids, polymeric amino acids, amino acid copolymers, lipid aggregates and inactive virus particles. Such carriers are well known to those of ordinary skill in the art. Pharmaceutically acceptable carriers in therapeutic compositions can include liquids such as water, saline, glycerol and ethanol. Auxiliary substances, such as wetting or emulsifying agents, pH buffering substances, and the like, can also be present in such vehicles.

Typically, the therapeutic compositions are prepared as injectables, either as liquid solutions or suspensions; solid forms suitable for solution in, or suspension in, liquid vehicles prior to injection can also be prepared. Liposomes are included within the definition of a pharmaceutically acceptable carrier. Pharmaceutically acceptable salts can also be present in the pharmaceutical composition, e.g., mineral acid salts such as hydrochlorides, hydrobromides, phosphates, sulfates, and the like; and the salts of organic acids such as acetates, propionates, malonates, benzoates, and the like. A thorough discussion of pharmaceutically acceptable excipients is available in *Remington: The Science and Practice of Pharmacy* (1995) Alfonso Gennaro, Lippincott, Williams, & Wilkins.

## DELIVERY METHODS

Once formulated, the compositions contemplated by the invention can be (1) administered directly to the subject (e.g., as polynucleotide, polypeptides, small molecule agonists or antagonists, and the like); or (2) delivered ex vivo, to cells derived from the subject (e.g., as in *ex vivo* gene therapy). Direct delivery of the compositions will generally be accomplished by parenteral injection, e.g., subcutaneously, intraperitoneally, intravenously or intramuscularly, intratumoral or to the interstitial space of a tissue. Other modes of administration include oral and pulmonary administration, suppositories, and transdermal applications, needles, and gene guns or hyposprays. Dosage treatment can be a single dose schedule or a multiple dose schedule.

Methods for the ex vivo delivery and reimplantation of transformed cells into a subject are known in the art and described in *e.g.*, International Publication No. WO 93/14778. Examples of cells useful in ex vivo applications include, for example, stem cells, particularly hematopoietic, lymph cells, macrophages, dendritic cells, or tumor cells.

5 Generally, delivery of nucleic acids for both ex vivo and in vitro applications can be accomplished by, for example, dextran-mediated transfection, calcium phosphate precipitation, polybrene mediated transfection, protoplast fusion, electroporation, encapsulation of the polynucleotide(s) in liposomes, and direct microinjection of the DNA into nuclei, all well known in the art.

10 Once differential expression of a gene corresponding to a polynucleotide described herein has been found to correlate with a proliferative disorder, such as neoplasia, dysplasia, and hyperplasia, the disorder can be amenable to treatment by administration of a therapeutic agent based on the provided polynucleotide, corresponding polypeptide or other corresponding molecule (*e.g.*, antisense, ribozyme, etc.). In other embodiments, the disorder  
15 can be amenable to treatment by administration of a small molecule drug that, for example, serves as an inhibitor (antagonist) of the function of the encoded gene product of a gene having increased expression in cancerous cells relative to normal cells or as an agonist for gene products that are decreased in expression in cancerous cells (*e.g.*, to promote the activity of gene products that act as tumor suppressors).

20 The dose and the means of administration of the inventive pharmaceutical compositions are determined based on the specific qualities of the therapeutic composition, the condition, age, and weight of the patient, the progression of the disease, and other relevant factors. For example, administration of polynucleotide therapeutic composition agents includes local or systemic administration, including injection, oral administration,  
25 particle gun or catheterized administration, and topical administration. In general, the therapeutic polynucleotide composition contains an expression construct comprising a promoter operably linked to a polynucleotide of at least 12, 22, 25, 30, or 35 contiguous nt of the polynucleotide disclosed herein. Various methods can be used to administer the therapeutic composition directly to a specific site in the body. For example, a small  
30 metastatic lesion is located and the therapeutic composition injected several times in several different locations within the body of the tumor. Alternatively, arteries which serve a tumor are identified, and the therapeutic composition injected into such an artery, in order to deliver the composition directly into the tumor. A tumor that has a necrotic center is aspirated and the composition injected directly into the now empty center of the tumor. The



antisense composition is directly administered to the surface of the tumor, for example, by topical application of the composition. X-ray imaging is used to assist in certain of the above delivery methods.

Targeted delivery of therapeutic compositions containing an antisense  
5 polynucleotide, subgenomic polynucleotides, or antibodies to specific tissues can also be used. Receptor-mediated DNA delivery techniques are described in, for example, Findeis et al., Trends Biotechnol. (1993) 11:202; Chiou et al., Gene Therapeutics: Methods And Applications Of Direct Gene Transfer (J.A. Wolff, ed.) (1994); Wu et al., J. Biol. Chem. (1988) 263:621; Wu et al., J. Biol. Chem. (1994) 269:542; Zenke et al., Proc. Natl. Acad. Sci. (USA) (1990) 87:3655; Wu et al., J. Biol. Chem. (1991) 266:338. Therapeutic  
10 compositions containing a polynucleotide are administered in a range of about 100 ng to about 200 mg of DNA for local administration in a gene therapy protocol. Concentration ranges of about 500 ng to about 50 mg, about 1  $\mu$ g to about 2 mg, about 5  $\mu$ g to about 500  $\mu$ g, and about 20  $\mu$ g to about 100  $\mu$ g of DNA can also be used during a gene therapy  
15 protocol. Factors such as method of action (e.g., for enhancing or inhibiting levels of the encoded gene product) and efficacy of transformation and expression are considerations that will affect the dosage required for ultimate efficacy of the antisense subgenomic polynucleotides.

Where greater expression is desired over a larger area of tissue, larger amounts of  
20 antisense subgenomic polynucleotides or the same amounts readministered in a successive protocol of administrations, or several administrations to different adjacent or close tissue portions of, for example, a tumor site, may be required to effect a positive therapeutic outcome. In all cases, routine experimentation in clinical trials will determine specific ranges for optimal therapeutic effect. For polynucleotide related genes encoding  
25 polypeptides or proteins with anti-inflammatory activity, suitable use, doses, and administration are described in USPN 5,654,173.

The therapeutic polynucleotides and polypeptides of the present invention can be delivered using gene delivery vehicles. The gene delivery vehicle can be of viral or non-viral origin (see generally, Jolly, Cancer Gene Therapy (1994) 1:51; Kimura, Human Gene  
30 Therapy (1994) 5:845; Connelly, Human Gene Therapy (1995) 1:185; and Kaplitt, Nature Genetics (1994) 6:148). Expression of such coding sequences can be induced using endogenous mammalian or heterologous promoters. Expression of the coding sequence can be either constitutive or regulated.

Viral-based vectors for delivery of a desired polynucleotide and expression in a desired cell are well known in the art. Exemplary viral-based vehicles include, but are not limited to, recombinant retroviruses (see, e.g., WO 90/07936; WO 94/03622; WO 93/25698; WO 93/25234; USPN 5, 219,740; WO 93/11230; WO 93/10218; USPN 4,777,127; GB  
5 Patent No. 2,200,651; EP 0 345 242; and WO 91/02805), alphavirus-based vectors (e.g., Sindbis virus vectors, Semliki forest virus (ATCC VR-67; ATCC VR-1247), Ross River virus (ATCC VR-373; ATCC VR-1246) and Venezuelan equine encephalitis virus (ATCC VR-923; ATCC VR-1250; ATCC VR 1249; ATCC VR-532), and adeno-associated virus (AAV) vectors (see, e.g., WO 94/12649, WO 93/03769; WO 93/19191; WO 94/28938;  
10 WO 95/11984 and WO 95/00655). Administration of DNA linked to killed adenovirus as described in Curiel, *Hum. Gene Ther.* (1992) 3:147 can also be employed.

Non-viral delivery vehicles and methods can also be employed, including, but not limited to, polycationic condensed DNA linked or unlinked to killed adenovirus alone (see, e.g., Curiel, *Hum. Gene Ther.* (1992) 3:147); ligand-linked DNA (see, e.g., Wu, *J. Biol. Chem.* (1989) 264:16985); eukaryotic cell delivery vehicles cells (see, e.g., USPN  
15 5,814,482; WO 95/07994; WO 96/17072; WO 95/30763; and WO 97/42338) and nucleic charge neutralization or fusion with cell membranes. Naked DNA can also be employed. Exemplary naked DNA introduction methods are described in WO 90/11092 and USPN  
20 5,422,120; WO 95/13796; WO 94/23697; WO 91/14445; and EP 0524968. Additional approaches are described in Philip, *Mol. Cell Biol.* (1994) 14:2411, and in Woffendin, *Proc. Natl. Acad. Sci.* (1994) 91:1581.

Further non-viral delivery suitable for use includes mechanical delivery systems such as the approach described in Woffendin *et al.*, *Proc. Natl. Acad. Sci. USA* (1994)  
25 91(24):11581. Moreover, the coding sequence and the product of expression of such can be delivered through deposition of photopolymerized hydrogel materials or use of ionizing radiation (see, e.g., USPN 5,206,152 and WO 92/11033). Other conventional methods for gene delivery that can be used for delivery of the coding sequence include, for example, use of hand-held gene transfer particle gun (see, e.g., USPN 5,149,655); use of ionizing radiation  
30 for activating transferred gene (see, e.g., USPN 5,206,152 and WO 92/11033).

#### EXAMPLES

The following examples are put forth so as to provide those of ordinary skill in the art with a complete disclosure and description of how to make and use the present invention,

and are not intended to limit the scope of what the inventors regard as their invention nor are they intended to represent that the experiments below are all or the only experiments performed. Efforts have been made to ensure accuracy with respect to numbers used (e.g. amounts, temperature, etc.) but some experimental errors and deviations should be accounted for. Unless indicated otherwise, parts are parts by weight, molecular weight is weight average molecular weight, temperature is in degrees Centigrade, and pressure is at or near atmospheric.

#### EXAMPLE 1:

##### SOURCE OF BIOLOGICAL MATERIALS

10 The cells used for detecting differential expression of breast cancer related genes were those previously described for the HMT-3522 tumor reversion model, disclosed in U.S. Patent Nos. 5,846,536 and 6,123,941, herein incorporated by reference. The model utilizes both non-tumorigenic (HMT-3522 S1) and tumorigenic (HMT-3522 T4-2) cells derived by serial passaging from a single reduction mammoplasty. In two dimensional (2D)  
15 monolayers on plastic, both S1 and T4-2 cells display similar morphology. But in three dimensional (3D) matrigel cultures, S1 form phenotypically normal mammary tissue structures while T4-2 cells fail to organize into these structures and instead disseminate into the matrix. This assay was designated as a tumor reversion model, in that the T4-2 cells can be induced to form S1-like structures in 3D by treatment with beta-1 integrin or EGFR  
20 blocking antibodies, or by treating with a chemical inhibitor of the EGFR signaling pathway (tyrohostin AG 1478). These treated T4-2 cells, called T4R cells, are non-tumorigenic.

#### EXAMPLE 2:

##### CELL GROWTH AND RNA ISOLATION

Growth of Cells 2D and 3D for Microarray Experiments: HMT3522 S1 and T4-2  
25 cells were grown 2D and 3D and T4-2 cells reverted with anti-EGFR, anti-beta 1 integrin, or tyrohostin AG 1478 as previously described (Weaver et al J Cell Biol. 137:231-45, 1997; and Wang et al PNAS 95:14821-14826, 1998). Anti-EGFR (mAb 225) was purchased from Oncogene and introduced into the matrigel at the time of gelation at a concentration of 4 ug/ml purified mouse IgG1. Anti-beta 1 integrin (mAb AIIB2) was a gift from C. Damsky  
30 at the University of California at San Francisco and was also introduced into the matrigel at the time of gelation at a concentration of 100 ug/ml ascites protein (which corresponds to 4-10 ug/ml purified rat IgG1). Tyrohostin AG 1478 was purchased from Calbiochem and used at a concentration of 100 nM.

Isolation of RNA for Microarray Experiments: RNA was prepared from: S1 passage 60 2D cultures; T4-2 passage 41 2D cultures; S1 passage 59 3D cultures; and T4-2 and T4-2 revertant (with anti-EGFR, anti-beta 1 integrin, and tyrophostin) passage 35 3D cultures.

All RNA for microarray experiments was isolated using the commercially available  
5 RNeasy Mini Kit from Qiagen. Isolation of total RNA from cells grown 2D was performed as instructed in the kit handbook. Briefly, media was aspirated from the cells and kit Buffer RLT was added directly to the flask. The cell lysate was collected with a rubber cell scraper, and the lysate passed 5 times through a 20-G needle fitted to a syringe. One volume of 70%  
10 ethanol was added to the homogenized lysate and mixed well by pipetting. Up to 700 ul of sample was applied to an RNeasy mini spin column sitting in a 2-ml collection tube and centrifuged for 15 seconds at >8000 x g. 700 ul Buffer RW1 was added to the column and centrifuged for 15 seconds at >8000 x g to wash. The column was transferred to a new collection tube. 500 ul Buffer RPE was added to the column and centrifuged for 15 seconds at >8000 x g to wash. Another 500 ul Buffer RPE was added to the column for additional  
15 washing, and the column centrifuged for 2 minutes at maximum speed to dry. The column was transferred to a new collection tube and RNA eluted from the column with 30 ul RNase-free water by centrifuging for 1 minute at >8000 x g.

Isolation of total RNA from cells grown 3D was performed as described above, except cells were isolated from matrigel prior to RNA isolation. The cells were isolated as  
20 colonies from matrigel using ice-cold PBS/EDTA (0.01 M sodium phosphate pH 7.2 containing 138 mM sodium chloride and 5 mM EDTA). See Weaver et al, J Cell Biol 137:231-245, 1997; and Wang et al. PNAS 95:14821-14826, 1998.

### EXAMPLE 3:

#### DETECTION AND IDENTIFICATION OF GENES EXHIBITING DIFFERENTIAL EXPRESSION

25 The relative expression levels of a selected sequence (which in turn is representative of a single transcript) were examined in the tumorigenic versus non-tumorigenic cell lines described above, following culturing of the cells (S1, T4-2 and T4R) in either two-dimensional (2D) monolayers or three-dimensional (3D) matrigel cultures as described above. Differential expression for a selected sequence was assessed by hybridizing mRNA  
30 from S1 and T4-2 2D cultures, and S1, T4-2 and T4R 3D cultures to microarray chips as described below, as follows: Exp1 = T4-2 2D/S1 2D; Exp2 = T4-2 3D/S1 3D; Exp3 = S1 3D/S1 2D; Exp4 = T4-2 3D/T4-2 2D; Exp5 = T4-2 3D/T4R (anti-EGFR) 3D; Exp6 = T4-2 3D/T4R (anti-beta1 integrin) 3D; and Exp7 = T4-2 3D/T4R (tyrophostin AG 1478) 3D.

Each array used had an identical spatial layout and control spot set. Each microarray was divided into two areas, each area having an array with, on each half, twelve groupings of 32 x 12 spots for a total of about 9,216 spots on each array. The two areas are spotted identically which provide for at least two duplicates of each clone per array. Spotting was accomplished using PCR amplified products from 0.5kb to 2.0 kb and spotted using a  
5 Molecular Dynamics Gen III spotter according to the manufacturer's recommendations. The first row of each of the 24 regions on the array had about 32 control spots, including 4 negative control spots and 8 test polynucleotides.

The test polynucleotides were spiked into each sample before the labeling reaction  
10 with a range of concentrations from 2-600 pg/slide and ratios of 1:1. For each array design, two slides were hybridized with the test samples reverse-labeled in the labeling reaction. This provided for about 4 duplicate measurements for each clone, two of one color and two of the other, for each sample.

Identification Of Differentially Expressed Genes: "Differentially expressed" in the  
15 context of the present example meant that there was a difference in expression of a particular gene between tumorigenic vs. non-tumorigenic cells, or cells grown in three-dimensional culture vs. cells grown in two-dimensional culture. To identify differentially expressed genes, total RNA was first reverse transcribed into cDNA using a primer containing a T7 RNA polymerase promoter, followed by second strand DNA synthesis. cDNA was then  
20 transcribed *in vitro* to produce antisense RNA using the T7 promoter-mediated expression (see, *e.g.*, Luo *et al.* (1999) *Nature Med* 5:117-122), and the antisense RNA was then converted into cDNA. The second set of cDNAs were again transcribed *in vitro*, using the T7 promoter, to provide antisense RNA. Optionally, the RNA was again converted into cDNA, allowing for up to a third round of T7-mediated amplification to produce more  
25 antisense RNA. Thus the procedure provided for two or three rounds of *in vitro* transcription to produce the final RNA used for fluorescent labeling.

Fluorescent probes were generated by first adding control RNA to the antisense RNA mix, and producing fluorescently labeled cDNA from the RNA starting material. Fluorescently labeled cDNAs prepared from tumorigenic RNA sample were compared to  
30 fluorescently labeled cDNAs prepared from non-tumorigenic cell RNA sample. For example, the cDNA probes from the non-tumorigenic cells were labeled with Cy3 fluorescent dye (green) and the cDNA probes prepared from the tumorigenic cells were labeled with Cy5 fluorescent dye (red).

The differential expression assay was performed by mixing equal amounts of probes from tumorigenic cells and non-tumorigenic cells, and/or cells grown in 3D vs. those grown in 2D. The arrays were prehybridized by incubation for about 2 hrs at 60°C in 5X SSC/0.2% SDS/1 mM EDTA, and then washed three times in water and twice in isopropanol.

5 Following prehybridization of the array, the probe mixture was then hybridized to the array under conditions of high stringency (overnight at 42°C in 50% formamide, 5X SSC, and 0.2% SDS). After hybridization, the array was washed at 55°C three times as follows: 1) first wash in 1X SSC/0.2% SDS; 2) second wash in 0.1X SSC/0.2% SDS; and 3) third wash in 0.1X SSC.

10 The arrays were then scanned for green and red fluorescence using a Molecular Dynamics Generation III dual color laser-scanner/detector. The images were processed using BioDiscovery Autogene software, and the data from each scan set normalized to provide for a ratio of expression relative to non-tumorigenic or tumorigenic cells grown two-dimensionally or three-dimensionally. Data from the microarray experiments was analyzed  
15 according to the algorithms described in U.S. application serial no. 60/252,358, filed November 20, 2000, by E.J. Moler, M.A. Boyle, and F.M. Randazzo, and entitled "Precision and accuracy in cDNA microarray data," which application is specifically incorporated herein by reference.

The experiment was repeated, this time labeling the two probes with the opposite  
20 color in order to perform the assay in both "color directions." Each experiment was sometimes repeated with two more slides (one in each color direction). The level of fluorescence for each sequence on the array expressed as a ratio of the geometric mean of 8 replicate spots/genes from the four arrays or 4 replicate spots/gene from 2 arrays or some other permutation. The data were normalized using the spiked positive controls present in  
25 each duplicated area, and the precision of this normalization was included in the final determination of the significance of each differential. The fluorescence intensity of each spot was also compared to the negative controls in each duplicated area to determine which spots have detected significant expression levels in each sample.

A statistical analysis of the fluorescent intensities was applied to each set of duplicate  
30 spots to assess the precision and significance of each differential measurement, resulting in a p-value testing the null hypothesis that there is no differential in the expression level between the tumorigenic and non-tumorigenic cells or cells grown two-dimensionally versus three-dimensionally. During initial analysis of the microarrays, the hypothesis was accepted if  $p > 10^{-3}$ , and the differential ratio was set to 1.000 for those spots. All other spots have a

significant difference in expression between the two samples compared. For example, if the tumorigenic sample has detectable expression and the non-tumorigenic does not, the ratio is truncated at 1000 since the value for expression in the non-tumorigenic sample would be zero, and the ratio would not be a mathematically useful value (e.g., infinity). If the non-tumorigenic sample has detectable expression and the tumorigenic does not, the ratio is truncated to 0.001, since the value for expression in the tumor sample would be zero and the ratio would not be a mathematically useful value. These latter two situations are referred to herein as "on/off." Database tables were populated using a 95% confidence level ( $p > 0.05$ ).

In general, a polynucleotide is said to represent a significantly differentially expressed gene between two samples when there is detectable levels of expression in at least one sample and the ratio value is greater than at least about 1.2 fold, at least about 1.5 fold, or at least about 2 fold, where the ratio value is calculated using the method described above.

A differential expression ratio of 1 indicates that the expression level of the gene in tumorigenic cells was not statistically different from expression of that gene in the specific non-tumorigenic cells compared. A differential expression ratio significantly greater than 1 in tumorigenic breast cells relative to non-tumorigenic breast cells indicates that the gene is increased in expression in tumorigenic cells relative to non-tumorigenic cells, suggesting that the gene plays a role in the development of the tumorigenic phenotype, and may be involved in promoting metastasis of the cell. Detection of gene products from such genes can provide an indicator that the cell is cancerous, and may provide a therapeutic and/or diagnostic target. Likewise, a differential expression ratio significantly less than 1 in tumorigenic breast cells relative to non-tumorigenic breast cells indicates that, for example, the gene is involved in suppression of the tumorigenic phenotype. Increasing activity of the gene product encoded by such a gene, or replacing such activity, can provide the basis for chemotherapy. Such gene can also serve as markers of cancerous cells, e.g., the absence or decreased presence of the gene product in a breast cell relative to a non-tumorigenic breast cell indicates that the cell is cancerous.

Using the above methodology, three hundred and sixty-seven (367) genes or products thereof were identified from 20,000 chip clones analyzed as being overexpressed 2-fold or more in one or more of these experiments, with a p-value of 0.001 or less. These identified genes or products thereof are listed in Table 1, according to the Spot ID of the spotted polynucleotide, the Sample ID, the corresponding GenBank Accession Number (No.), the GenBank description (if available) for the corresponding Genbank Accession Number, and

the GenBank score (p-value; the probability that the association between the SEQ ID NO. and the gene or product thereof occurred by chance). The polynucleotide and polypeptide sequences, as provided by any disclosed Genbank entries are herein incorporated by reference to the corresponding Genbank accession number. The differential hybridization results from the seven differential expression microarray experiments listed above are provided in Table 2, where sequences have a measurement corresponding to its ratio of expression in the 7 experiments, e.g. spot ID 10594 is 2.2-fold overexpressed in 3D T4-2 cells as compared to 3D S1 cells. SEQ ID NOS:1-499, representing the sequences corresponding to the spot Ids listed in Tables 1 and 2 are provided in the sequence listing. Table 11 is a lookup table showing the relationship between the spot Ids (i.e. the nucleic acids spotted on the microarray) and the sequences provided in the sequence listing.

#### EXAMPLE 4

##### CYCLIN G ASSOCIATED KINASE (GAK)

A gene or product thereof called cyclin G associated kinase, or GAK, was identified as being overexpressed in 3D T4-2 cultures relative to both 3D S1 cultures (ratio: 7.9296) and 2D T4-2 cultures (ratio: 34.6682) (Sample ID RG:1056692:10012:C11, Spot ID 19990). GAK corresponds to Genbank Accession number XM\_003450.

#### EXAMPLE 5

##### ANTISENSE REGULATION OF GAK EXPRESSION

Additional functional information on GAK was generated using antisense knockout technology. A number of different oligonucleotides complementary to GAK mRNA were designed (AS) with corresponding controls (RC): GGAATCACCGCTTTGCCATCTTCAA (SEQ ID NO:500; CHIR159-1AS, gak:P1868AS), AACTTCTACCGTTTCGCCACTAAGG (SEQ ID NO:501; CHIR159-1RC, gak:P1868RC); GACCGTGTACTGCGTGTCGTGCG (SEQ ID NO:502; CHIR159-7AS, gak:P0839AS) and GCGTGCTGTGCGTCATGTGCCAG (SEQ ID NO:502; CHIR159-7RC, gak:P0839RC), and tested for their ability to suppress expression of GAK in human malignant colorectal carcinoma SW620 cells, human breast cancer MDA231 cells, and human breast cancer T4-2 cells. For each transfection mixture, a carrier molecule, preferably a lipitoid or cholesterol, was prepared to a working concentration of 0.5 mM in water, sonicated to yield a uniform solution, and filtered through a 0.45  $\mu$ m PVDF membrane. The antisense or control oligonucleotide was then prepared to a working concentration of 100  $\mu$ M in sterile Millipore water. The oligonucleotide was further diluted in OptiMEM™ (Gibco/BRL), in a microfuge



tube, to 2  $\mu$ M, or approximately 20  $\mu$ g oligo/ml of OptiMEM™. In a separate microfuge tube, lipitoid or cholesterol, typically in the amount of about 1.5-2 nmol lipitoid/ $\mu$ g antisense oligonucleotide, was diluted into the same volume of OptiMEM™ used to dilute the oligonucleotide. The diluted antisense oligonucleotide was immediately added to the  
5 diluted lipitoid and mixed by pipetting up and down. Oligonucleotide was added to the cells to a final concentration of 300 nM.

The level of target mRNA (GAK) in the transfected cells was quantitated in the cancer cell lines using the methods using primers CHIR159\_2896  
(GCCGTCTTCAGGCAACAACACTCCCA; SEQ ID NO: 504; forward) and CHIR159\_3089  
10 (TGCTGGACGAGGCTGTCATCTTGC; SEQ ID NO:505; reverse). RNA was extracted as above according to manufacturer's directions.

Quantitative PCR (qPCR) was performed by first isolating the RNA from the above mentioned tissue/cells using a Qiagen RNeasy mini prep kit. A total of 0.5 micrograms of RNA was used to generate a first strand cDNA using Stratagene MuLV Reverse  
15 Transcriptase, using recommended concentrations of buffer, enzyme, and Rnasin. Concentrations and volumes of dNTP, and oligo dT, or random hexamers were lower than recommended to reduce the level of background primer dimerization in the qPCR.

The cDNA is then used for qPCR to determine the levels of expression of GAK using the GeneAmp 7000 by ABI as recommended by the manufacturer. Primers for actin were  
20 also used in order to normalized the values, and eliminate possible variations in cDNA template concentrations, pipetting error, etc.

For each 20  $\mu$ l reaction, extracted RNA (generally 0.2-1  $\mu$ g total) was placed into a sterile 0.5 or 1.5 ml microcentrifuge tube, and water was added to a total volume of 12.5  $\mu$ l. To each tube was added 7.5  $\mu$ l of a buffer/enzyme mixture, prepared by mixing (in the order  
25 listed) 2.5  $\mu$ l H<sub>2</sub>O, 2.0  $\mu$ l 10X reaction buffer, 10  $\mu$ l oligo dT (20 pmol), 1.0  $\mu$ l dNTP mix (10 mM each), 0.5  $\mu$ l RNAsin® (20u) (Ambion, Inc., Hialeah, FL), and 0.5  $\mu$ l MMLV reverse transcriptase (50u) (Ambion, Inc.). The contents were mixed by pipetting up and down, and the reaction mixture was incubated at 42°C for 1 hour. The contents of each tube were centrifuged prior to amplification.

30 An amplification mixture was prepared by mixing in the following order: 1X PCR buffer II, 3 mM MgCl<sub>2</sub>, 140  $\mu$ M each dNTP, 0.175 pmol each oligo, 1:50,000 dil of SYBR® Green, 0.25 mg/ml BSA, 1 unit *Taq* polymerase, and H<sub>2</sub>O to 20  $\mu$ l. (PCR buffer II is available in 10X concentration from Perkin-Elmer, Norwalk, CT). In 1X concentration it contains 10 mM Tris pH 8.3 and 50 mM KCl. SYBR® Green (Molecular Probes, Eugene,

OR) is a dye which fluoresces when bound to double stranded DNA. As double stranded PCR product is produced during amplification, the fluorescence from SYBR® Green increases. To each 20 µl aliquot of amplification mixture, 2 µl of template RT was added, and amplification was carried out according to standard protocols.

5 Table 3 shows that the antisense oligonucleotides described above reduced expression of GAK mRNA as compared to controls in all three cell lines. GAK mRNA reduction ranged from about 50% to about 90%, as compared to cells transfected with reverse (i.e. sense) control oligonucleotides.

Table 3: antisense regulation of GAK mRNA

Oligo	Cell Line	Gene Message	Actin Message	Ratio	Percent KO
CHIR159-1AS	SW620	0.0923	0.669	0.138	90.7
CHIR159-1RC	SW620	1.01	0.680	1.49	
CHIR159-7AS	SW620	0.0555	0.678	0.082	85.4
CHIR159-7RC	SW620	0.335	0.598	0.560	
CHIR159-1AS	MDA231	0.358	0.687	0.521	59.3
CHIR159-1RC	MDA231	1.00	0.784	1.28	
CHIR159-7AS	MDA231	0.262	0.674	0.389	69.4
CHIR159-7RC	MDA231	0.840	0.659	1.27	
CHIR159-1AS	T4-2	0.307	0.707	0.434	72.9
CHIR159-1RC	T4-2	1.23	0.770	1.60	
CHIR159-7AS	T4-2	0.214	0.649	0.330	49.8
CHIR159-7RC	T4-2	0.506	0.770	0.657	

10

Reduction of GAK protein by antisense polynucleotides in SW620, MDA231 and T4-2 was confirmed using an antibody that specifically recognizes GAK. Figure 1 shows a western (i.e. protein) blot of protein extracts of the above cell lines decorated with anti-GAK antibodies. GAK protein expression is reduced in cell lines receiving GAK antisense oligonucleotides.

15

## EXAMPLE 6

## ROLE OF GAK IN ANCHORAGE INDEPENDENT CELL GROWTH

The effect of GAK gene expression upon anchorage-independent cell growth of SW620 and MBA-231 cells was measured by colony formation in soft agar. Soft agar assays were performed by first coating a non-tissue culture treated plate with PolyHEMA to prevent cells from attaching to the plate. Non-transfected cells were harvested using 0.05% trypsin and washing twice in media. The cells are counted using a hemacytometer and resuspended to  $10^4$  per ml in media. 50  $\mu$ l aliquots are placed in poly-HEMA coated 96-well plates and transfected. For each transfection mixture, a carrier molecule, preferably a lipitoid or cholesterol, was prepared to a working concentration of 0.5 mM in water, sonicated to yield a uniform solution, and filtered through a 0.45  $\mu$ m PVDF membrane. The antisense or control oligonucleotide was then prepared to a working concentration of 100  $\mu$ M in sterile Millipore water. The oligonucleotide was further diluted in OptiMEM™ (Gibco/BRL), in a microfuge tube, to 2  $\mu$ M, or approximately 20  $\mu$ g oligo/ml of OptiMEM™. In a separate microfuge tube, lipitoid or cholesterol, typically in the amount of about 1.5-2 nmol lipitoid/ $\mu$ g antisense oligonucleotide, was diluted into the same volume of OptiMEM™ used to dilute the oligonucleotide. The diluted antisense oligonucleotide was immediately added to the diluted lipitoid and mixed by pipetting up and down. Oligonucleotide was added to the cells to a final concentration of 300 nM. Following transfection (~30 minutes), 3% GTG agarose is added to the cells for a final concentration of 0.35% agarose. After the cell layer agar solidifies, 100  $\mu$ l of media is dribbled on top of each well. Colonies form in 7 days. For a read-out of growth, 20  $\mu$ l of Alamar Blue is added to each well and the plate is shaken for 15 minutes. Fluorecence readings (530nm excitation 590 nm emission) are taken after incubation for 6-24 hours.

The data presented in Table 4 shows that the application of GAK antisense oligonucleotides to SW620 and MDA 231 cells results in inhibition of colony formation and shows that GAK plays a role in production anchorage-independent cell growth. Table 4 shows the average fluorecence reading for several experiments. The standard deviation (St. Dev) of the fluorecence reading and coefficient of variation (%CV) is also shown.

Table 4: GAK and anchorage-independent cell growth.

Oligo	Cell Line	Average	St. Dev	%CV
Blank	SW620	12868.17	208.78	1.78
Untreated	SW620	31075.17	1944.36	7.66
Pos Control	SW620	5717.17	1108.71	23.75
Neg Control	SW620	7576.17	465.95	7.63
Chir159-1AS	SW620	9701.5	2281.36	28.8
Chir159-1RC	SW620	17765.5	1958.45	13.5
Blank	MDA231	12726.83	232.45	2
Untreated	MDA231	87272.17	0	0
Pos Control	MDA231	10645.17	1591.08	18.31
Neg Control	MDA231	24159.5	2850.58	14.45
Chir159-1AS	MDA231	8613.5	4852.76	69
Chir159-1RC	MDA231	17859.17	1535.55	10.53

## EXAMPLE 7

## DKFZP566I133 (DKFZ)

Several previously uncharacterized genes were identified as being induced in these experiments. One such gene was represented by two spots, Spot ID Nos 22793 and 26883 (gene assignment DKFZp566I133). This gene was expressed at a ratio of about 2.2 in two 2-dimensional (2D) T4-2 vs. 2D S1 experiments, and also at a ratio of about 2 when 3-dimensional (3D) T4-2 cells were compared to the various tumor reversion cultures. However, the ratio of expression increased to an average of 3.2 when 3-dimensional (3D) T4-2 cultures were compared to 2D S1 cultures. In contrast, there was essentially no difference in expression levels when 3D S1 cultures were compared to 2D S1 cultures, suggesting that expression of this gene is specifically elevated in the tumorigenic cell line T4-2, and even further elevated when the tumorigenic cell line is grown in three dimensional cultures (see Table 5).

Table 5.

Spot	2D T4-2/ ID	3D T42/ 3D S1	3D S1/ 2D S1	3D T4-2/ 2D T4-2	3D T4-2/ EGFRAb	3D T4-2/ B1 integrin Ab	3D T4-2/ Tyr
22893	1.90387	2.64711	0.522161	1	2.17956	1.75287	2.055538
26883	2.43428	3.74613	0.524466	1	2.467573	2.029468	2.002817

These array data were confirmed by qPCR using the methods described above and the gene specific PCR primers CHIR180\_1207 ACAGGGAGAAA ACTGGTTGTCCTGG (SEQ ID NO:506; Forward) and CHIR180\_1403 AAGGCAGAACCCATCCACTCCAA (SEQ ID NO:507; Reverse). Independent cultures were used for these experiments, and data was normalized to B-catenin. These data are shown in Table 6.

Table 6.

2D.S1	2D.T4-2	3D.S1	3D.T4-2	3D.EGFR Ab	3D.B1 Integrin Ab	3D.Tyr
0.165	0.421	0.14	0.475	0.231	0.175	0.174

DKFZ corresponds to Genbank Accession numbers NP\_112200, AAH09758, and NM\_030938. Orthologs of DKFZ are identified in species other than Homo sapiens include NM\_138839 from *Rattus norvegicus*.

Analysis of the sequence of DKFZ using a transmembrane helix prediction algorithm (Sonhammer, et al, A hidden Markov model for predicting transmembrane helices in protein sequences, In Proc. of Sixth Int. Conf. on Intelligent Systems for Molecular Biology, p. 175-82, Ed. J. Glasgow, T. Littlejohn, F. Major, R. Lathrop, D. Sankoff, and C. Sensen, Menlo Park, CA: AAAI Press, 1998) indicates that the DKFZ protein has six transmembrane regions (Fig.2), and, as such, is likely to be a transmembrane protein.

## EXAMPLE 8

### ANTISENSE REGULATION OF DKFZ EXPRESSION

Additional functional information on DKFZ was generated using antisense knockout technology. A number of different oligonucleotides complementary to DKFZ mRNA were designed (AS) with corresponding controls (RC): GCTGCTGGATTCGTTTGGCATAACT (SEQ ID NO: 508; CHIR180-7AS, DKFZp566I1:P1301AS),

TCAATACGGTTTGCTTAGGTCGTCG (SEQ ID NO:509; CHIR180-7RC, DKFZp566I1:P1301RC), TCTCCTCTGAGTTCAACCGCTGCT (SEQ ID NO:510; CHIR180-8AS, DKFZp566I1:P1320AS) and TCGTCGCCAACTTGAGTCTCCTCT (SEQ ID NO:511; CHIR180-8RC, DKFZp566I1:P1320AS), and tested for their ability to suppress  
 5 expression of DKFZ in human malignant colorectal carcinoma SW620 cells, human breast cancer MDA231 cells, and human breast cancer T4-2 cells, as described above.

Table 7 shows that the antisense (AS) oligonucleotides described above reduced expression of DKFZ mRNA as compared to controls in all three cell lines. DKFZ mRNA reduction ranged from about 95% to about 99%, as compared to cells transfected with  
 10 reverse (i.e. sense) control (RC) oligonucleotides.

Table 7: antisense regulation of DKFZ mRNA

Oligo	Cell Line	Gene Message	Actin Message	Ratio	Percent KO
CHIR180-7AS	SW620	0.0157	0.772	0.020	99.3
CHIR180-7RC	SW620	1.99	0.736	2.70	
CHIR180-8AS	SW620	0.0387	0.681	0.057	97.9
CHIR180-8RC	SW620	1.89	0.703	2.69	
CHIR180-7AS	MDA231	0.0471	3.58	0.013	98.5
CHIR180-7RC	MDA231	1.99	2.33	0.854	
CHIR180-8AS	MDA231	0.00935	1.74	0.00537	99.5
CHIR180-8RC	MDA231	1.14	1.01	1.13	
CHIR180-7AS	T4-2	0.119	0.667	0.178	95.4
CHIR180-7RC	T4-2	2.8	0.728	3.85	
CHIR180-8AS	T4-2	0.0852	0.751	0.113	95.6
CHIR180-8RC	T4-2	1.6	0.620	2.58	

## EXAMPLE 9

## EFFECT OF DKFZ EXPRESSION ON CELL PROLIFERATION

The effect of gene expression on the inhibition of cell proliferation was assessed in metastatic breast cancer cell line MDA-231 and breast cancer cell line T4-2.

5 Cells were plated to approximately 60-80% confluency in 96-well dishes. Antisense or reverse control oligonucleotide was diluted to 2  $\mu$ M in OptiMEM™ and added to OptiMEM™ into which a delivery vehicle, preferably a lipitoid or cholesterol, had been diluted. The oligo/delivery vehicle mixture was then further diluted into medium with serum on the cells. The final concentration of oligonucleotide for all experiments was 300 nM, and  
10 the final ratio of oligo to delivery vehicle for all experiments was 1.5 nmol lipitoid/ $\mu$ g oligonucleotide.

Antisense oligonucleotides were prepared. Cells were transfected for 4 hours or overnight at 37°C and the transfection mixture was replaced with fresh medium. Plates are incubated for 4 days, with a plate harvested for each day0-day4. To determine differences in  
15 cell number, a CyQuant Cell Proliferation Assay kit (Molecular Probes) was used per manufacturer's instructions. Fluorecence readings (480nm excitation 520 nm emission) are taken after incubation for 5 minutes.

The results of these assays are shown in Tables 7A and 8. The data show that DKFZ antisense polynucleotides significantly reduce cell proliferation as compared to controls,  
20 and, as such, DKFZ plays a role in production or maintenance of the cancerous phenotype in cancerous breast cells.

Table 7A:

## Cell proliferation

Oligo	Cell Line	Ave Day0	Ave Day1	Ave Day2	Av3 Day3	Ave Day4
Untreated	MDA231	4233	4858	9544	10981	16776
Untreated	MDA231	3849	4036	8686	9855	14865
Pos Control	MDA231	3630	2236	3564	4536	7477
Neg Control	MDA231	4913	5127	8331	8887	13620
CHIR180-7AS	MDA231	3848	3476	6942	8715	11925
CHIR180-7RC	MDA231	4895	4700	8484	10318	14226
Untreated	T4-2	4062	3389	5438	10579	15617
Untreated	T4-2	4209	3802	6346	11802	16275
Pos Control	T4-2	3985	2712	4081	6404	9685
Neg Control	T4-2	4051	3901	4356	9425	12964
CHIR180-7AS	T4-2	3792	3201	3849	7376	10911
CHIR180-7RC	T4-2	3967	3840	4321	8382	12293



Table 8

Oligo	Standard Deviations					P-Value of T-Test				
	Day 0	Day 1	Day 2	Day 3	Day 4	Day0	Day1	Day2	Day3	Day4
Untreated	337	269	299	697	1333	0.1306	0.1063	0.1804	0.0926	0.1225
Untreated	99	631	867	547	1047	0.1306	0.1063	0.1804	0.0926	0.1225
Pos Control	94	118	89	441	974	0.0000	0.0001	0.0003	0.0001	0.0010
Neg Control	2	252	697	195	780	0.0000	0.0001	0.0003	0.0001	0.0010
CHIR180-7 AS	292	16	435	398	418	0.0072	0.0276	0.0059	0.0140	0.0028
CHIR180-7 RC	208	6	244	533	440	0.0072	0.0276	0.0059	0.0140	0.0028
Untreated	64	283	789	1593	1226	0.2550	0.0921	0.1257	0.2794	0.4352
Untreated	22	158	205	577	478	0.2550	0.0921	0.1257	0.2794	0.4352
Pos Control	122	213	6	475	957	0.4320	0.0065	0.2624	0.0051	0.0293
Neg Control	47	335	464	809	1417	0.4320	0.0065	0.2624	0.0051	0.0293
CHIR180-7 AS	170	679	263	127	1330	0.2638	0.0976	0.3516	0.0040	0.0039
CHIR180-7 RC	22	453	646	579	884	0.2638	0.0976	0.3516	0.0040	0.0039

## EXAMPLE 10

5

## ROLE OF DKFZ IN ANCHORAGE INDEPENDENT CELL GROWTH

The effect of DKFZ gene expression upon anchorage-independent cell growth of MDA435 and MCF7 human breast cancer cells was measured by colony formation in soft agar. Soft agar assays were conducted by the method described for GAK, above.

The data presented in Table 9 shows that the application of DKFZ antisense oligonucleotides to MDA435 and MCF7 cells results in inhibition of colony formation and shows that DKFZ plays a role in anchorage-independent cell growth of cancer cells. Table 9 shows the average fluorescence reading for several experiments. The standard deviation (St. Dev) of the fluorescence reading and coefficient of variation (%CV) and probability (P-value) is also shown.

Table 9

Oligo	Cell Line	Average	St. Dev	%CV	P-Value
Untreated	MDA435	31190	5838	19	0.1342
Untreated	MDA435	38623	3620	9	0.1342
Pos Control	MDA435	4776	818	17	0.0156
Neg Control	MDA435	16315	481	3	0.0156
Chir180-7AS	MDA435	21161	3439	16	0.0274
Chir180-7RC	MDA435	28868	1902	7	0.0274
Untreated	MCF7	18954	1478	8	0.1476
Untreated	MCF7	14383	4163	29	0.1476
Pos Control	MCF7	1036	194	19	0.0036
Neg Control	MCF7	9478	2382	25	0.0036
Chir180-7AS	MCF7	4752	2002	42	0.0139
Chir180-7RC	MCF7	9570	18	0	0.0139

The effect of DKFZ gene expression upon invasiveness of MDA231 human breast cancer cells was measured by a matrigel assay. A 3-dimensional reconstituted basement membrane culture of cells was generated as described previously (Peterson et al., (1992) *Proc. Natl. Acad. Sci. USA* 89:9064-9068) using a commercially prepared reconstituted basement membrane (Matrigel; Collaborative Research, Waltham, MA) and examined using methods well known in the art.

Table 10 (quantitated using Alamar Blue similar to the soft agar assay) and Figure 3 provides exemplary results of the Matrigel invasion/motility assay to test the invasiveness of

MDA231 cells with reduced expression of DKFZ. In general, these data show that a reduction in the expression of DKFZ significantly decreases the invasiveness of MDA231 cells.

Table 10:

Oligo	Cell Line	Average	St. Dev	%CV	P-Value
Untreated	MDA231	28316	13663	48	0.9080
Untreated	MDA231	26840	15669	58	0.9080
Pos Control	MDA231	2756	487	18	0.0002
Neg Control	MDA231	14301	1386	10	0.0002
Chir180-7AS	MDA231	10508	1963	19	0.0287
Chir180-7RC	MDA231	14310	153	1	0.0287

5

## EXAMPLE 11

## EXPRESSION OF DKFZ IN CANCER TISSUES

The following peptides were used for polyclonal antibody production: peptide 809: gvhqqyvqriek (SEQ ID NO:380), corresponding to amino acids 97-108 of the DKFZ protein and peptide 810: sgaepddeeyqef (SEQ ID NO:381), corresponding to amino acids 215-227 of the DKFZ protein.

10

Antibodies specific for DKFZ are used in FACS and immunolocalization analysis to show that DKFZ is associated with membrane, and up-regulated in cancer tissues of biopsies from cancer patients.

15

Further, antibodies specific for DKFZ are used to modulate DKFZ activity in cancerous breast, and is further used, alone or conjugated to a toxic moiety, as a treatment for breast cancer.

20

While the present invention has been described with reference to the specific embodiments thereof, it should be understood by those skilled in the art that various changes may be made and equivalents may be substituted without departing from the true spirit and scope of the invention. In addition, many modifications may be made to adapt a particular situation, material, composition of matter, process, process step or steps, to the objective, spirit and scope of the present invention. All such modifications are intended to be within the scope of the claims appended hereto

Table 1

SPOTID	SAMPLE ID	GENBANK NO	GENBANK DESCRIPTION	GENBANK SCORE
10594	I:1871362:05B01:A04	M62994	Homo sapiens thyroid autoantigen (truncated actin-binding protein) mRNA, complete cds	8.6E-36
21851	M00055153A:A12			
20990	I:1986550:13B02:G12	XM 005667	Homo sapiens lipocalin 2 (oncogene 24p3) (LCN2), mRNA	0
18641	I:3473302:09A01:A09	AB046098	Macaca fascicularis brain cDNA, clone:QccE-15843	5.8E-57
17229	I:1506962:09A01:G01	AL365454	Homo sapiens mRNA full length insert cDNA clone EUROIMAGE 926491	2.6E-110
25930	035JN020.F01	AJ010446	Homo sapiens mRNA for immunoglobulin kappa light chain, anti-RhD, therad 24	0
20701	RG:730349:10010:G12	U28387	Human hexokinase II pseudogene, complete cds	0
20346	RG:1839794:10015:E11	U28387	Human hexokinase II pseudogene, complete cds	0
21247	M00054680C:A06	U28387	Human hexokinase II pseudogene, complete cds	9.9E-80
23062	M00056353C:E10	XM 011013	Homo sapiens filamin B, beta (actin-binding protein-278) (FLNB), mRNA	0
25666	035Jn031.B01	AF191633	Homo sapiens filamin (FLNB) gene, exon 48 and complete cds	0
19001	I:2171401:09A02:E09	AF123887	Homo sapiens ERO1L (ERO1L) mRNA, partial cds	3.3E-104
10897	I:1852047:02A01:A10	U22384	Human lysyl oxidase gene, partial cds	0
1960	M00023297B:A10	M33376	Human pseudo-chlordecone reductase mRNA, complete cds	0
26381	035JN029.H02	AB037838	Homo sapiens mRNA for KIAA1417 protein, partial cds	0
26719	035JN030.A02	X68277	H.sapiens CL 100 mRNA for protein tyrosine phosphatase	0
27152	037XN007.A09	XM 048479	Homo sapiens hypothetical protein FLJ14642 (FLJ14642), mRNA	7.3E-58
10926	I:2047770:08B02:G04	AK000969	Homo sapiens cDNA FLJ10107 fis, clone HEMBA1002583	3.8E-94
28980	035JN003.C12	XM 027456	Homo sapiens hypothetical gene supported by AK000584 (LOC89942), mRNA	0
1236	M00022024A:F02			
29350	035JN008.D06	XM 043864	Homo sapiens phosphoinositide-3-kinase, regulatory subunit, polypeptide 1 (p85 alpha) (PIK3R1), mRNA	0
26242	035JN015.B02	AL137717	Homo sapiens mRNA; cDNA DKFZp434J1630 (from clone DKFZp434J1630)	2.6E-70
4098	M00001439D:C09	BC002446	Homo sapiens, MRJ gene for a member of the DNAJ protein family, clone MGC:1152 IMAGE:3346070, mRNA, complete cds	0
17432	I:1965049:16B02:D07	XM 051165	Homo sapiens DKFZP586A0522 protein (DKFZP586A0522), mRNA	0
1785	SL198	XM 051165	Homo sapiens DKFZP586A0522 protein (DKFZP586A0522), mRNA	0
28856	035JN032.E11	X62996	H.sapiens mitochondrial genome (consensus sequence)	0
18791	RG:229957:10007:D03	D42042	Human mRNA for KIAA0085 gene, partial cds	0
22950	M00056922C:C09			
1882	M00022196B:D09	Z29083	H.sapiens 5T4 gene for 5T4 Oncofetal antigen	0
23886	M00055408A:F10			
24995	M00055215C:E11	XM 012880	Homo sapiens hypothetical protein MGC1936 (MGC1936), mRNA	0
24477	M00055510B:F08	AF240697	Homo sapiens retinol dehydrogenase homolog isoform-2 (RDH) mRNA, complete cds	0

Table 1

SPOTID	SAMPLE ID	GENBANK NO	GENBANK DESCRIPTION	GENBANK SCORE
21681	M00056771C:A12	X02152	Human mRNA for lactate dehydrogenase-A (LDH-A, EC 1.1.1.27)	0
9557	I:1335140:05A02:C08	X02152	Human mRNA for lactate dehydrogenase-A (LDH-A, EC 1.1.1.27)	0
22033	M00056574B:A07			
873	M00007979C:C05	X00663	Human mRNA fragment for epidermal growth factor (EGF) receptor	0
17144	RG:25254:10004:D07	M97675	Human transmembrane receptor (ror1) mRNA, complete cds	0
26970	035JN015.F09	AF097514	Homo sapiens stearoyl-CoA desaturase (SCD) mRNA, complete cds	0
21402	M00054507C:D07			
27074	035Jn031.B03	AF061741	Homo sapiens retinal short-chain dehydrogenase/reductase retSDR1 mRNA, complete cds	0
10963	I:1258790:05A02:B10	AF072752	Homo sapiens ten integrin EGF-like repeat domains protein precursor (ITGBL1) mRNA, complete cds	0
29525	035JN026.D12			
25514	035JN011.F01	U62961	Human succinyl CoA:3-oxoacid CoA transferase precursor (OXCT) mRNA, complete cds	0
26612	035JN016.C08	NM_000240	Homo sapiens monoamine oxidase A (MAOA), nuclear gene encoding mitochondrial protein, mRNA	0
24600	M00055490C:G11	U57059	Homo sapiens Apo-2 ligand mRNA, complete cds	0
9741	I:3126828:12A02:G02	U37518	Human TNF-related apoptosis inducing ligand TRAIL mRNA, complete cds	0
23689	M00054752A:E11	XM_001468	Homo sapiens S100 calcium-binding protein A10 (annexin II ligand, calpactin I, light polypeptide (p11)) (S100A10), mRNA	0
22352	M00042842B:E02	XM_001468	Homo sapiens S100 calcium-binding protein A10 (annexin II ligand, calpactin I, light polypeptide (p11)) (S100A10), mRNA	0
23806	RG:2007319:20003:G10			
12285	I:1404669:04A01:G12	BC002517	Homo sapiens, Pirin, clone MGC:2083 IMAGE:3140037, mRNA, complete cds	0
27638	035JN011.D10	AK002155	Homo sapiens cDNA FLJ11293 fis, clone PLACE1009670, highly similar to Homo sapiens genethonin 1 mRNA	0
9663	I:2488567:11A02:H08	XM_006027	Homo sapiens brain-derived neurotrophic factor (BDNF), mRNA	0
26850	035JN003.B03	XM_031551	Homo sapiens similar to carbohydrate (N-acetylglucosamine-6-O) sulfotransferase 2 (H. sapiens) (LOC90414), mRNA	0
10204	I:1491445:02B01:F09	AF131765	Homo sapiens clone 24833 nonsyndromic hearing impairment protein mRNA sequence, complete cds	0
1318	2192-6			
25922	035JN020.B01	AB020673	Homo sapiens mRNA for KIAA0866 protein, complete cds	0
26347	035JN025.G02			
20361	I:395116:17A02:E05			
28672	035JN012.A05	AF126181	Homo sapiens breast cancer-associated gene 1 protein (BCG1) mRNA, complete cds	0
25520	035JN011.A07	D86956	Human mRNA for KIAA0201 gene, complete cds	0
1723	M00005694A:A09	BC001980	Homo sapiens, clone IMAGE:3462291, mRNA	0

Table 1

SPOTID	SAMPLE ID	GENBANK NO	GENBANK DESCRIPTION	GENBANK SCORE
28863	037XN002.A05			
25526	035JN011.D07	<u>AF086281</u>	Homo sapiens full length insert cDNA clone ZD45G11	0
27936	035JN008.A04	<u>X59445</u>	H.sapiens mRNA for colon carcinoma Manganese Superoxide Dismutase	0
26851	035JN001.C03	<u>XM 033944</u>	Homo sapiens superoxide dismutase 2, mitochondrial (SOD2), mRNA	0
25107	M00054825A:E04	<u>AF075061</u>	Homo sapiens full length insert cDNA YP07G10	0
24912	M00054505D:D06	<u>AF075061</u>	Homo sapiens full length insert cDNA YP07G10	0
25169	M00055510D:D04	<u>M11167</u>	Human 28S ribosomal RNA gene	1.2E-76
25600	035JN023.A01	<u>BC003107</u>	Homo sapiens, inhibitor of DNA binding 3, dominant negative helix-loop-helix protein, clone MGC:1988 IMAGE:3543936, mRNA, complete	0
28706	035JN016.B05	<u>X55181</u>	Human ETS2 gene, 3'end	0
26377	035JN029.F02	<u>Y14436</u>	Homo sapiens mRNA for phosphatidic acid phosphatase type 2	0
19460	I:438655:14B02:B04	<u>AF007133</u>	Homo sapiens clone 23764 mRNA sequence	4.5E-113
25243	RG:1667183:10014:F12	<u>BC000013</u>	Homo sapiens, insulin-like growth factor binding protein 3, clone MGC:2305 IMAGE:3506666, mRNA, complete cds	0
20018	I:1213574:17B01:A11	<u>AB037925</u>	Homo sapiens MAIL mRNA, complete cds	3.7E-106
918	M00026895D:H03	<u>BC006433</u>	Homo sapiens, Ras-related GTP-binding protein, clone MGC:13077 IMAGE:3835186, mRNA, complete cds	0
25027	RG:1983823:20002:B06			
29089	035JN017.B06	<u>XM 037534</u>	Homo sapiens phosphodiesterase 7A (PDE7A), mRNA	0
9141	I:1347384:02A02:C07	<u>U78579</u>	Human type I phosphatidylinositol-4-phosphate 5-kinase beta (STM7) mRNA, partial cds	0
12005	I:1259230:05A01:C06	<u>D87075</u>	Human mRNA for KIAA0238 gene, partial cds	0
12148	I:3360476:03B01:B12	<u>XM 040922</u>	Homo sapiens interleukin 13 receptor, alpha 2 (IL13RA2), mRNA	0
17394	RG:1943755:10016:A07	<u>AF346607</u>	Homo sapiens interleukin-1 receptor associated kinase 1b (IRAK) mRNA, complete cds, alternatively spliced	0
27017	035JN021.F03	<u>XM 051742</u>	Homo sapiens spermine synthase (SMS), mRNA	0
25809	035JN002.B07	<u>XM 009699</u>	Homo sapiens nuclear receptor interacting protein 1 (NRIP1), mRNA	0
8719	I:2600080:10A01:H01	<u>XM 009665</u>	Homo sapiens Kreisler (mouse) maf-related leucine zipper homolog (KRML), mRNA	0
21030	RG:1714832:10015:C06	<u>XM 029957</u>	Homo sapiens Rab acceptor 1 (prenylated) (RABAC1), mRNA	0
11436	I:1470085:03B01:F05	<u>XM 038976</u>	Homo sapiens N-ethylmaleimide-sensitive factor attachment protein, alpha (NAPA), mRNA	0
10374	I:1513989:03B02:C03	<u>XM 009010</u>	Homo sapiens complement component 3 (C3), mRNA	1.4E-96
19037	I:417827:15A01:G10	<u>X79538</u>	H.sapiens nuk_34 mRNA for translation initiation factor	1.9E-28
398	M00027016A:C05	<u>XM 031470</u>	Homo sapiens aldolase C, fructose-bisphosphate (ALDOC), mRNA	4E-62
18773	I:1211682:14A02:C09	<u>XM 008477</u>	Homo sapiens aldolase C, fructose-bisphosphate (ALDOC), mRNA	0
3583	M00023407B:C10			
3418	M00001470A:C03	<u>XM 043951</u>	Homo sapiens CDP-diacylglycerol--inositol 3-phosphatidyltransferase (phosphatidylinositol synthase) (CDIPT), mRNA	0

**Table 1**

SPOTID	SAMPLE ID	GENBANK NO	GENBANK DESCRIPTION	GENBANK SCORE
18985	I:1402615:09A02:E03	AF191148	Homo sapiens type I transmembrane protein Fn14 mRNA, complete cds	7.9E-64
25861	035JN010.D01	XM_047975	Homo sapiens hydroxyacyl glutathione hydrolase (HAGH), mRNA	0
3317	M00003974D:E04	AF136185	Homo sapiens collagen type XVII (COL17A1) gene, 3' UTR, long form	0
8743	I:1858905:04A01:D01	U36775	Human ribonuclease 4 gene, partial cds	2.1E-57
26240	035JN015.A02	XM_007493	Homo sapiens ribonuclease, RNase A family, 4 (RNASE4), mRNA	0
28562	037XN007.B11	X00947	Human alpha 1-antichymotrypsin gene fragment	0
16877	I:2362945:15A01:C07	XM_029378	Homo sapiens checkpoint suppressor 1 (CHES1), mRNA	1.9E-91
25955	035JN022.C01	AF035620	Homo sapiens BRCA1-associated protein 2 (BRAP2) mRNA, complete cds	0
26308	035JN023.C02	XM_041470	Homo sapiens zinc finger protein 145 (Kruppel-like, expressed in promyelocytic leukemia) (ZNF145), mRNA	0
4140	2239-4	X03083	Human lactate dehydrogenase-A gene exon 7 and 3' flanking region	0
3436	2239-1	X03083	Human lactate dehydrogenase-A gene exon 7 and 3' flanking region	0
25612	035JN023.G01	M94856	Human fatty acid binding protein homologue (PA-FABP) mRNA, complete cds	0
12257	I:1448135:04A01:A06	X15535	H.sapiens lysosomal acid phosphatase gene (EC 3.1.3.2) Exon 11	0
9111	I:1958902:04A02:D07	D87258	Homo sapiens mRNA for serin protease with IGF-binding motif, complete cds	0
17620	I:875567:15B01:B08	XM_045326	Homo sapiens MAX-interacting protein 1 (MXI1), mRNA	0
26025	035JN030.F01	XM_032511	Homo sapiens procollagen-proline, 2-oxoglutarate 4-dioxygenase (proline 4-hydroxylase), alpha polypeptide I (P4HA1), mRNA	0
19271	RG:686684:10010:D04	AF005216	Homo sapiens receptor-associated tyrosine kinase (JAK2) mRNA, complete cds	0
4151	2035-1	D87953	Human mRNA for RTP, complete cds	0
26569	035JN010.F02	AB004788	Homo sapiens mRNA for BNIP3L, complete cds	0
10344	I:2859338:11B02:D03	XM_005052	Homo sapiens angiopoietin 1 (ANGPT1), mRNA	1.3E-97
832	M00021649B:D05	XM_004628	Homo sapiens hypoxia-inducible protein 2 (HIG2), mRNA	0
12071	I:1798283:06A01:D06	S72481	pantophysin [human, keratinocyte line HaCaT, mRNA, 2106 nt]	0
12271	I:1445767:04A01:H06	X12701	H.sapiens mRNA for endothelial plasminogen activator inhibitor PAI	1.8E-130
11433	I:1526282:03A01:E05	XM_033627	Homo sapiens glycoprotein (transmembrane) nmb (GPNMB), mRNA	3.7E-117
20917	RG:222350:10007:C12	X00663	Human mRNA fragment for epidermal growth factor (EGF) receptor	1.7E-122
25810	035JN004.B07	X00588	Human mRNA for precursor of epidermal growth factor receptor	0
12039	I:3506985:07A01:D06	M24795	Human CD36 antigen mRNA, complete cds	0
25499	035JN005.G07	XM_028224	Homo sapiens N-acetylglucosamine-phosphate mutase (AGM1), mRNA	0
25557	035JN013.D07	BC010135	Homo sapiens, cyclin C, clone IMAGE:4106819, mRNA	0
9917	I:1283532:05A01:G09	XM_004148	Homo sapiens 5T4 oncofetal trophoblast glycoprotein (5T4), mRNA	2.4E-70

Table 1

SPOTID	SAMPLE ID	GENBANK NO	GENBANK DESCRIPTION	GENBANK SCORE
19505	RG:204653:10007:A10	<u>XM 003789</u>	Homo sapiens colony stimulating factor 1 receptor, formerly McDonough feline sarcoma viral (v-fms) oncogene homolog (CSF1R), mRNA	0
17491	RG:277866:10008:B07	<u>XM 003789</u>	Homo sapiens colony stimulating factor 1 receptor, formerly McDonough feline sarcoma viral (v-fms) oncogene homolog (CSF1R), mRNA	0
10683	I:1686726:06A01:F10	<u>XM 003789</u>	Homo sapiens colony stimulating factor 1 receptor, formerly McDonough feline sarcoma viral (v-fms) oncogene homolog (CSF1R), mRNA	0
1936	M00008020C:H09	<u>X68277</u>	H.sapiens CL 100 mRNA for protein tyrosine phosphatase	0
828	M00021638B:F03	<u>X68277</u>	H.sapiens CL 100 mRNA for protein tyrosine phosphatase	0
9558	I:1824443:05B02:C08	<u>XM 003708</u>	Homo sapiens gamma-aminobutyric acid (GABA) A receptor, pi (GABRP), mRNA	0
20164	I:1997963:14B02:B05	<u>XM 003631</u>	Homo sapiens solute carrier family 25 (mitochondrial carrier; adenine nucleotide translocator), member 4 (SLC25A4), mRNA	0
969	NIH50_40026	<u>BC008664</u>	Homo sapiens, clone MGC:9281 IMAGE:3871960, mRNA, complete cds	0
9910	I:1805840:05B01:C09	<u>XM 003399</u>	Homo sapiens mannosidase, beta A, lysosomal (MANBA), mRNA	0
2427	M00005767D:B03	<u>XM 047441</u>	Homo sapiens RAP1, GTP-GDP dissociation stimulator 1 (RAP1GDS1), mRNA	0
19990	RG:1056692:10012:C11	<u>XM 003450</u>	Homo sapiens cyclin G associated kinase (GAK), mRNA	0
20605	I:690313:16A01:G12	<u>XM 011152</u>	Homo sapiens insulin-like growth factor binding protein 7 (IGFBP7), mRNA	0
10650	I:2456393:07B01:E10	<u>AK001580</u>	Homo sapiens cDNA FLJ10718 fis, clone NT2RP3001096, weakly similar to Rattus norvegicus leprecan mRNA	0
25963	035JN022.G01	<u>X53002</u>	Human mRNA for integrin beta-5 subunit	0
25562	035JN015.F07	<u>X53002</u>	Human mRNA for integrin beta-5 subunit	0
9377	I:2782593:12A01:A02	<u>X60656</u>	H.sapiens mRNA for elongation factor 1-beta	1.4E-46
17618	I:707667:15B01:A08	<u>XM 002273</u>	Homo sapiens inhibitor of DNA binding 2, dominant negative helix-loop-helix protein (ID2), mRNA	3.5E-117
12136	I:3208994:03B01:D06	<u>U16267</u>	Human AMP deaminase isoform L, alternatively spliced (AMPD2) mRNA, exons 1A, 2 and 3, partial cds	0
17373	I:1538189:14A02:G07	<u>XM 046818</u>	Homo sapiens similar to receptor tyrosine kinase-like orphan receptor 1 (H. sapiens) (LOC92711), mRNA	8.3E-123
18577	RG:503209:10010:A09	<u>XM 049305</u>	Homo sapiens Lysosomal-associated multispinning membrane protein-5 (LAPTM5), mRNA	0
3143	M00001605D:C02	<u>BC003107</u>	Homo sapiens, inhibitor of DNA binding 3, dominant negative helix-loop-helix protein, clone MGC:1988 IMAGE:3543936, mRNA, complete	1.7E-88
17737	RG:155066:10006:E02	<u>AL050147</u>	Homo sapiens mRNA; cDNA DKFZp586E0820 (from clone DKFZp586E0820); partial cds	0
20029	I:1923613:17A01:G11	<u>AF113123</u>	Homo sapiens carbonyl reductase mRNA, complete cds	0
18537	NIH50_40304	<u>BC001380</u>	Homo sapiens, succinate dehydrogenase complex, subunit A, flavoprotein (Fp), clone MGC:1484 IMAGE:3051442, mRNA, complete cds	0



Table 1

SPOTID	SAMPLE ID	GENBANK NO	GENBANK DESCRIPTION	GENBANK SCORE
10090	NIH50_40304			
12102	I:2832414:11B01:C06	<u>XM_048045</u>	Homo sapiens katanin p80 (WD40-containing) subunit B 1 (KATNB1), mRNA	0
8487	I:1375115:05A01:D01	<u>BC001174</u>	Homo sapiens, exostoses (multiple) 1, clone MGC:2129 IMAGE:3502232, mRNA, complete cds	0
9252	I:1673876:06B01:B02	<u>BC000917</u>	Homo sapiens, clone MGC:5184 IMAGE:3048750, mRNA, complete cds	0
25605	035JN021.D01	<u>BC000671</u>	Homo sapiens, claudin 4, clone MGC:1778 IMAGE:3349211, mRNA, complete cds	0
29652	M00001610C:D05	<u>BC000588</u>	Homo sapiens, HIRA-interacting protein 3, clone MGC:1814 IMAGE:3345739, mRNA, complete cds	0
10858	I:2458933:04B01:E04	<u>X97544</u>	H.sapiens mRNA for TIM17 preprotein translocase	8.7E-62
1261	M00023419C:B06	<u>U89606</u>	Human pyridoxal kinase mRNA, complete cds	0
4156	2243-4	<u>X93334</u>	Homo sapiens mitochondrial DNA, complete genome	0
3452	2243-1	<u>X93334</u>	Homo sapiens mitochondrial DNA, complete genome	0
2748	2242-6	<u>X93334</u>	Homo sapiens mitochondrial DNA, complete genome	0
2046	2248-3	<u>X93334</u>	Homo sapiens mitochondrial DNA, complete genome	0
2044	2242-4	<u>X93334</u>	Homo sapiens mitochondrial DNA, complete genome	0
1342	2248-2	<u>X93334</u>	Homo sapiens mitochondrial DNA, complete genome	0
1326	2244-3	<u>X93334</u>	Homo sapiens mitochondrial DNA, complete genome	0
9981	I:1720149:06A01:G09	<u>AF069604</u>	Homo sapiens myosin light chain kinase isoform 4 (MLCK) mRNA, partial cds	0
27917	035JN002.H04	<u>XM_015978</u>	Homo sapiens hypothetical protein FLJ22969 (FLJ22969), mRNA	1.8E-92
8488	I:1808529:05B01:D01	<u>AJ293647</u>	Homo sapiens partial IL4RA gene for interleukin-4 receptor alfa chain, exon 11, ECSSQV allele	1.1E-125
22793	M00057283C:D06	<u>AF161410</u>	Homo sapiens HSPC292 mRNA, partial cds	0
26883	035JN005.C03	<u>AF161410</u>	Homo sapiens HSPC292 mRNA, partial cds	0
11540	I:1909488:10B01:B11	<u>XM_027739</u>	Homo sapiens duodenal cytochrome b (FLJ23462), mRNA	0
17707	I:489882:14A01:F02	<u>X99474</u>	H.sapiens mRNA for chloride channel, CIC-6c	0
20649	NIH50_41452	<u>Z14136</u>	H.sapiens gene for spermidine/spermine N1-acetyltransferase	0
24004	M00056163C:H09	<u>AF107495</u>	Homo sapiens FWP001 and putative FWP002 mRNA, complete cds	0
11836	I:1806769:01B02:F11	<u>X93036</u>	H.sapiens mRNA for MAT8 protein	0
24932	M00054963C:C09	<u>M26152</u>	Homo sapiens serum amyloid A (SAA) mRNA, complete cds	0
19143	RG:149960:10006:D04	<u>AK003448</u>	Mus musculus 18 days embryo cDNA, RIKEN full-length enriched library, clone:1110004P15, full insert sequence	8.9E-21
26257	035JN013.B08	<u>J04056</u>	Human carbonyl reductase mRNA, complete cds	0
21239	M00054679B:B03	<u>J02619</u>	Human Z type alpha-1-antitrypsin gene, complete cds (exons 2-5)	0
16959	I:1426031:14B01:B07	<u>AY035783</u>	Homo sapiens laminin 5 beta 3 subunit (LAMB3) mRNA, complete cds	3.8E-121

Table 1

SPOTID	SAMPLE ID	GENBANK NO	GENBANK DESCRIPTION	GENBANK SCORE
2568	M00022158D:C11	<u>XM_036609</u>	Homo sapiens laminin, beta 3 (nicein (125kD), kalinin (140kD), BM600 (125kD)) (LAMB3), mRNA	0
25936	035JN020.A07	<u>XM_036608</u>	Homo sapiens laminin, beta 3 (nicein (125kD), kalinin (140kD), BM600 (125kD)) (LAMB3), mRNA	0
23041	M00054797C:G10	<u>XM_046649</u>	Homo sapiens nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, alpha (NFKBIA), mRNA	0
9206	I:1822716:05B01:C08	<u>BC008059</u>	Homo sapiens, clone IMAGE:2967491, mRNA	0
25105	M00054824C:H04	<u>BC009110</u>	Homo sapiens, clone MGC:17355 IMAGE:3453825, mRNA, complete cds	0
24779	M00057061D:G07			
22451	M00043372B:B06	<u>X00947</u>	Human alpha 1-antichymotrypsin gene fragment	0
22291	M00054785D:G05	<u>X00947</u>	Human alpha 1-antichymotrypsin gene fragment	0
21143	M00055146A:D11			
24751	M00054676B:D07	<u>X03083</u>	Human lactate dehydrogenase-A gene exon 7 and 3' flanking region	0
24294	M00056163D:E01	<u>X03083</u>	Human lactate dehydrogenase-A gene exon 7 and 3' flanking region	9.4E-110
24006	M00056163D:E01	<u>X03083</u>	Human lactate dehydrogenase-A gene exon 7 and 3' flanking region	0
25678	035Jn031.H01	<u>AK001670</u>	Homo sapiens cDNA FLJ10808 fis, clone NT2RP4000879, weakly similar to UBIQUITIN-ACTIVATING ENZYME E1	4.9E-53
22027	M00056534C:E08	<u>XM_003512</u>	Homo sapiens amphiregulin (schwannoma-derived growth factor) (AREG), mRNA	0
29495	035JN022.E12	<u>D83761</u>	Homo sapiens mRNA for mother against dpp (Mad) related protein, complete cds	0
24577	M00056654B:G02	<u>XM_038306</u>	Homo sapiens dual specificity phosphatase 6 (DUSP6), mRNA	0
23527	M00055865C:D04			
17090	I:341491:13B01:A01	<u>BC004490</u>	Homo sapiens, v-fos FBJ murine osteosarcoma viral oncogene homolog, clone MGC:11074 IMAGE:3688670, mRNA, complete cds	3.8E-98
25137	M00057167A:C07			
23772	M00056360A:E07	<u>BC004490</u>	Homo sapiens, v-fos FBJ murine osteosarcoma viral oncogene homolog, clone MGC:11074 IMAGE:3688670, mRNA, complete cds	0
1659	M00001350B:D10	<u>BC004490</u>	Homo sapiens, v-fos FBJ murine osteosarcoma viral oncogene homolog, clone MGC:11074 IMAGE:3688670, mRNA, complete cds	0
8497	I:2170638:05A01:A07	<u>BC006169</u>	Homo sapiens, Similar to SH3-domain binding protein 5 (BTK-associated), clone MGC:13234 IMAGE:4025362, mRNA, complete cds	5.2E-125
25272	M00054621A:D09	<u>AF161435</u>	Homo sapiens HSPC317 mRNA, partial cds	0
21216	M00056194B:G06	<u>XM_002844</u>	Homo sapiens procollagen-lysine, 2-oxoglutarate 5-dioxygenase (lysine hydroxylase) 2 (PLOD2), mRNA	0
11939	I:2938757:02A02:B05	<u>D43767</u>	Human mRNA for chemokine, complete cds	0
9191	I:1421929:05A01:D02	<u>X63629</u>	H.sapiens mRNA for p cadherin	2.4E-90
3429	2024-3	<u>AF002697</u>	Homo sapiens E1B 19K/Bcl-2-binding protein Nip3 mRNA, nuclear gene encoding mitochondrial protein, complete cds	0
2725	2024-1	<u>AF002697</u>	Homo sapiens E1B 19K/Bcl-2-binding protein Nip3 mRNA, nuclear gene encoding mitochondrial protein, complete cds	0

Table 1

SPOTID	SAMPLE ID	GENBANK NO	GENBANK DESCRIPTION	GENBANK SCORE
19923	I:1001356:13A01:B11	<u>BC006318</u>	Homo sapiens, erythrocyte membrane protein band 4.9 (dematin), clone MGC:12740 IMAGE:4125804, mRNA, complete cds	1.7E-103
20457	I:1923289:19A01:E06	<u>XM_035603</u>	Homo sapiens gap junction protein, beta 5 (connexin 31.1) (GJB5), mRNA	0
24773	M00057055D:B11			
24119	M00042886D:H10	<u>BC006260</u>	Homo sapiens, Similar to N-myc downstream regulated, clone MGC:11293 IMAGE:3946764, mRNA, complete cds	4.4E-114
3908	M00027080A:E06	<u>M60756</u>	Human histone H2B.1 mRNA, 3' end	0
8560	I:2346704:06B01:H01	<u>AJ000334</u>	Homo sapiens mRNA for cytosolic asparaginyl-tRNA synthetase	0
24588	M00055411A:C10	<u>L19779</u>	Homo sapiens histone H2A.2 mRNA, complete cds	0
4047	M00007997C:B08	<u>XM_009091</u>	Homo sapiens glycogen synthase 1 (muscle) (GYS1), mRNA	0
28344	035JN011.E11	<u>XM_050471</u>	Homo sapiens glycogen synthase 1 (muscle) (GYS1), mRNA	0
27561	035JN001.F04	<u>XM_001472</u>	Homo sapiens v-jun avian sarcoma virus 17 oncogene homolog (JUN), mRNA	0
3272	M00022165C:E12	<u>NM_001024</u>	Homo sapiens ribosomal protein S21 (RPS21), mRNA	0
26735	035JN030.A08	<u>XM_010408</u>	Homo sapiens RAB9-like protein (RAB9L), mRNA	0
24900	M00054500D:C08	<u>BC004427</u>	Homo sapiens, proteasome (prosome, macropain) subunit, alpha type, 7, clone MGC:3755 IMAGE:2819923, mRNA, complete cds	0
9472	I:2510171:04B01:H08	<u>X04503</u>	Human SLPI mRNA fragment for secretory leucocyte protease inhibitor	0
9979	I:1623318:06A01:F09	<u>L31409</u>	Homo sapiens creatine transporter mRNA, complete cds	2.2E-45
21996	M00042467B:B04	<u>L00160</u>	Human phosphoglycerate kinase (pgk) mRNA, exons 2 to last	0
22312	M00055035D:F05			
11327	I:3139773:05A01:H11	<u>L00160</u>	Human phosphoglycerate kinase (pgk) mRNA, exons 2 to last	2.6E-21
18240	RG:1927470:10015:H08	<u>V00572</u>	Human mRNA encoding phosphoglycerate kinase	0
21922	M00054848A:D12	<u>AF139065</u>	Homo sapiens desmoplakin I mRNA, partial cds	0
22290	M00057002D:H01			
10390	I:1405391:03B02:C09	<u>AF056979</u>	Homo sapiens clone YAN1 interferon-gamma receptor mRNA, complete cds	0
2212	M00008098B:F06	<u>U19247</u>	Homo sapiens interferon-gamma receptor alpha chain gene, exon 7 and complete cds	0
20213	RG:221172:10007:C11	<u>S74774</u>	p59fyn(T)=OKT3-induced calcium influx regulator [human, Jurkat J6 T cell line, mRNA Partial, 1605 nt]	2.9E-103
24955	M00055929D:D04			
19574	I:635178:13B02:C10	<u>XM_033944</u>	Homo sapiens superoxide dismutase 2, mitochondrial (SOD2), mRNA	0
19969	RG:501476:10010:A05	<u>U14394</u>	Human tissue inhibitor of metalloproteinases-3 mRNA, complete cds	0
8570	I:1696224:06B01:E07	<u>X70684</u>	C.aethiops mRNA for heat shock protein 70	5.6E-25
18519	I:1997703:13A01:D09	<u>X52947</u>	Human mRNA for cardiac gap junction protein	0
9616	I:3200341:06B02:H02	<u>Y00106</u>	Human gene for beta-adrenergic receptor (beta-2 subtype)	0

Table 1

SPOTID	SAMPLE ID	GENBANK NO	GENBANK DESCRIPTION	GENBANK SCORE
22334	M00055067D:H12			
17459	I:2056395:13A02:B07	<u>M77349</u>	Human transforming growth factor-beta induced gene product (BIGH3) mRNA, complete cds	2.5E-121
25193	M00056763B:A12	<u>X68277</u>	H.sapiens CL 100 mRNA for protein tyrosine phosphatase	0
25191	M00056763B:A12	<u>X68277</u>	H.sapiens CL 100 mRNA for protein tyrosine phosphatase	0
9448	I:2455617:04B01:D02	<u>XM_051799</u>	Homo sapiens guanosine monophosphate reductase (GMPR), mRNA	0
25224	RG:950682:10003:D06	<u>BC002536</u>	Homo sapiens, phosphofructokinase, platelet, clone MGC:2192 IMAGE:3140233, mRNA, complete cds	0
20218	RG:2158297:10016:E11	<u>BC002536</u>	Homo sapiens, phosphofructokinase, platelet, clone MGC:2192 IMAGE:3140233, mRNA, complete cds	0
3089	NIH50_26184	<u>D25328</u>	Human mRNA for platelet-type phosphofructokinase, complete cds	2E-108
23985	NIH50_26184			
19953	NIH50_26184	<u>D25328</u>	Human mRNA for platelet-type phosphofructokinase, complete cds	2E-108
11506	NIH50_26184			
22362	M00056349A:F08	<u>M10546</u>	Human mitochondrial DNA, fragment M1, encoding transfer RNAs, cytochrome oxidase I, and 2 URFs	1.2E-86
25516	035JN011.G01	<u>XM_011470</u>	Homo sapiens myristoylated alanine-rich protein kinase C substrate (MARCKS, 80K-L) (MACS), mRNA	0
25757	037XN005.H07	<u>AF017116</u>	Homo sapiens type-2 phosphatidic acid phosphohydrolase (PAP2) mRNA, complete cds	0
24814	M00042773B:E09	<u>M17733</u>	Human thymosin beta-4 mRNA, complete cds	0
21994	M00042465B:E04	<u>M17733</u>	Human thymosin beta-4 mRNA, complete cds	0
27117	037XN001.H03	<u>BC001631</u>	Homo sapiens, prothymosin beta 4, clone MGC:2219 IMAGE:3536637, mRNA, complete cds	0
24681	NIH50_41452			
22745	M00056592A:B08	<u>NM_003739</u>	Homo sapiens aldo-keto reductase family 1, member C3 (3-alpha hydroxysteroid dehydrogenase, type II) (AKR1C3), mRNA	0
24233	M00055873C:B06			
2001	M00001381A:F03	<u>XM_035387</u>	Homo sapiens ribosomal protein, large, P1 (RPLP1), mRNA	0
21179	NIH50_43550			
17147	NIH50_43550	<u>AK026515</u>	Homo sapiens cDNA: FLJ22862 fis, clone KAT01966, highly similar to HSLDHAR Human mRNA for lactate dehydrogenase-A	0
8700	NIH50_43550			
21214	M00056193B:D06	<u>BC006260</u>	Homo sapiens, Similar to N-myc downstream regulated, clone MGC:11293 IMAGE:3946764, mRNA, complete cds	0
26422	037XN003.D08	<u>BC006260</u>	Homo sapiens, Similar to N-myc downstream regulated, clone MGC:11293 IMAGE:3946764, mRNA, complete cds	0
22837	M00055891C:B09			
21965	M00057029A:G09			
25541	035JN013.D01	<u>AK026310</u>	Homo sapiens cDNA: FLJ22657 fis, clone HSI07791, highly similar to HUMCYB5 Human cytochrome b5 mRNA	0

Table 1

SPOTID	SAMPLE ID	GENBANK NO	GENBANK DESCRIPTION	GENBANK SCORE
18302	I:1738248:09B02:G08	XM 016114	Homo sapiens hypothetical protein FLJ22501 (FLJ22501), mRNA	0
24049	M00054706B:G04	AF107495	Homo sapiens FWP001 and putative FWP002 mRNA, complete cds	0
26326	035JN023.D08	AK025906	Homo sapiens cDNA: FLJ22253 fis, clone HRC02763	0
2254	M00004085C:C02	AK025703	Homo sapiens cDNA: FLJ22050 fis, clone HEP09454	0
10296	I:2868216:07B02:D09	AK025703	Homo sapiens cDNA: FLJ22050 fis, clone HEP09454	0
20044	I:2547084:09B01:F05	XM 016847	Homo sapiens hypothetical protein FLJ22002 (FLJ22002), mRNA	0
28806	035JN028.D05	AK025504	Homo sapiens cDNA: FLJ21851 fis, clone HEP01962	0
17566	I:446969:17B02:G07	AK023217	Homo sapiens cDNA FLJ13155 fis, clone NT2RP3003433	2E-115
19005	I:2674167:09A02:G09	AK022968	Homo sapiens cDNA FLJ12906 fis, clone NT2RP2004373	0
3567	M00023369D:C05			
21983	M00057081B:H03			
458	M00022134B:E08	XM 037412	Homo sapiens hypothetical gene supported by BC008993 (LOC91283), mRNA	0
22331	M00057138A:E11			
21411	M00055833D:B03			
22972	M00056956D:B01			
24533	RG:1643392:10014:C11			
24853	M00056617D:F07	AK020869	Mus musculus adult retina cDNA, RIKEN full-length enriched library, clone:A930017A02, full insert sequence	6.5E-59
23753	M00054915A:G02			
21502	M00056193B:D06			
18180	RG:39422:10005:B02			
23918	M00056278C:E03			
24144	RG:1982961:20001:H05			
19996	RG:1283072:10012:F11	BC009107	Homo sapiens, clone MGC:17352 IMAGE:3449913, mRNA, complete cds	0
11528	I:1899534:10B01:D05			
20506	I:1969044:18B01:E12	AB048286	Homo sapiens GS1999full mRNA, complete cds	0
23833	RG:1656861:10014:E10			
20042	I:1873176:09B01:E05	BC001909	Homo sapiens, clone IMAGE:3537447, mRNA, partial cds	0
24977	M00055820D:F01			
11646	I:1723142:08B02:G11	AK014612	Mus musculus 0 day neonate skin cDNA, RIKEN full-length enriched library, clone:4633401105, full insert sequence	4.6E-45
24872	RG:773612:10011:D06			
10577	I:2174196:08A01:A10			
21710	RG:1091554:10003:G01			
18556	RG:31082:10004:F09			
29433	035JN014.F12	AK001805	Homo sapiens cDNA FLJ10943 fis, clone OVARC1001360	0
29273	037XN005.F12			
28763	035JN018.G11	AJ310543	Homo sapiens mRNA for EGLN1 protein	1.9E-40
27887	RG:2364147:8119908:A10			
27450	035JN032.F09			
27255	035JN006.E09	XM 027456	Homo sapiens hypothetical gene supported by AK000584 (LOC89942), mRNA	1.2E-57

Table 1

SPOTID	SAMPLE ID	GENBANK NO	GENBANK DESCRIPTION	GENBANK SCORE
27226	035JN004.F09			
26550	035JN008.D08			
26508	035JN004.G02			
26483	RG:2377371:8119908:C08			
26334	035JN023.H08	<u>AF364547</u>	Homo sapiens methylmalonyl-CoA epimerase mRNA, complete cds; nuclear gene for mitochondrial product	0
26027	035JN030.G01			
25977	035JN022.F07			
25965	035JN022.H01			
25844	035JN008.C07			
25834	035JN008.F01	<u>AB048289</u>	Bos taurus lae mRNA for lipoate-activating enzyme, complete cds	3.1E-35
25816	035JN004.E07			
25746	037XN007.B07			
25742	037XN007.H01			
25741	037XN005.H01			
25712	037XN003.A07			
25642	035Jn027.F01			
25621	035JN021.D07	<u>AK027321</u>	Homo sapiens cDNA FLJ14415 fis, clone HEMBA1004889, weakly similar to Human C3f mRNA	0
25614	035JN023.H01			
25603	035JN021.C01			
25556	035JN015.C07			
25555	035JN013.C07			
25540	035JN015.C01			
23576	RG:1984769:20002:D10			
22566	RG:1996656:20003:C03			
9036	DD182			
4164	M00007932B:E06			
4146	2179-5			
4091	M00026845A:E01			
4072	M00023398A:G12			
4022	M00022127D:B06			
3965	M00005406A:f04			
3954	M00005400B:E1			
3872	M00007974D:B04			
3869	M00003868C:A03			
3838	M00007052A:C09	<u>XM_048272</u>	Homo sapiens similar to Ras-related GTP-binding protein (H. sapiens) (LOC92951), mRNA	0
3806	2168-2			
3798	2138-4			
3792	2171-5			
3788	2156-4			
3767	M00001355D:H12			
3458	M00007160D:E10			
3251	M00005471A:a04			
3194	DF821			
3102	2167-1			
3094	2138-3			
2671	M00023431A:D02			
2634	M00008025D:A04			
2567	M00008061B:A12			
2317	M00001502D:E09			
1958	M00023296B:B09			
1680	2169-5			

**Table 1**

SPOTID	SAMPLE ID	GENBANK NO	GENBANK DESCRIPTION	GENBANK SCORE
1625	M00001542C:G08			
1445	M00023335C:C09			
1320	2207-5			
974	2161-1			
726	DO15			
718	ER418			
703	M00004189D:A11			
652	M00007070A:C08			
630	2203-2			
593	M00001373A:A06	<u>X93036</u>	H.sapiens mRNA for MAT8 protein	0
532	M00022005A:H05			
272	2168-5			
256	M00001406C:H12			
57	M00023371B:H02			

Table 2

SEQ ID NO.	SPOT ID	2D T4-2/ 2D S1	3D T4-2/ 3D S1	3D S1/ 2D S1	3D T4-2/ 2D T4-2	3D T4-2/ EGFR Ab	3D T4-2/ B1 Integrin Ab	3D T4-2/ Tyr
1	10594	0.6	2.2	0.6	1.9	3.0	1.0	2.9
2	21851	1.0	1.0	1.0	3.5	1.3	1.0	1.0
3	20990	1.6	4.6	1.0	1.5	1.0	1.0	1.0
4	18641	1.0	0.6	2.6	1.7	1.0	1.6	1.0
5	17229	0.3	0.8	1.0	2.1	1.0	1.0	1.0
6	25930	1.0	1.0	1.0	1.0	1.0	1.0	1.0
7	20701	1.6	2.9	1.3	2.7	4.5	1.9	5.8
8	20346	1.7	2.7	1.4	2.6	4.3	2.0	5.2
9	21247	1.0	4.4	1.5	3.0	3.4	2.6	4.7
10	23062	0.6	2.5	0.6	1.8	3.3	1.4	2.7
11	25666	1.0	2.9	0.6	2.0	3.6	1.0	2.3
12	19001	8.5	14.2	1.0	1.0	4.8	1.7	8.0
13	10897	1.0	3.1	4.5	1000.0	13.3	4.6	18.4
14	1960	0.3	1.5	3.0	13.7	3.9	2.4	4.9
15	26381	1.0	1.0	1.0	0.9	1.0	1.0	1.0
16	26719	0.4	1.0	0.6	2.8	1.2	1.7	1.0
17	27152	4.2	3.0	2.2	1.5	1.3	1.0	1.3
18	10926	0.7	1.9	0.9	2.1	3.7	1.5	3.3
19	28980	0.6	1.4	1.0	2.4	1.0	1.0	1.0
20	1236	1.0	2.8	0.8	2.1	2.2	1.8	3.2
21	29350	0.5	0.6	1.2	2.1	1.4	1.0	1.0
22	26242	1.0	1.0	0.6	2.2	1.0	1.0	2.0
23	4098	1.4	3.9	0.6	2.1	2.7	1.3	3.1
24	17432	0.4	0.3	2.4	2.1	0.3	0.9	0.3
25	1785	0.5	0.4	2.4	2.0	0.3	1.0	0.3
26	28856	8.5	0.9	2.5	0.3	0.6	1.0	0.5
27	18791	1.0	0.2	0.3	4.1	1.0	1.0	1.3
28	22950	3.9	4.1	1.2	1.0	2.1	1.0	2.4
29	1882	2.4	4.1	0.9	1.8	3.2	1.5	4.7
30	23886	1.0	1.0	1.2	2.1	1.0	1.0	1.0
31	24995	2.0	1.6	2.1	1.0	1.0	1.0	1.0
32	24477	1.0	1.9	1.0	4.2	2.7	1.3	1.8
33	21681	1.7	7.1	0.6	2.0	2.8	1.0	3.6
34	9557	1.6	7.5	0.8	1.0	3.0	1.0	2.5
35	22033	2.8	3.7	1.0	0.9	2.2	1.0	2.7
36	873	1.0	4.0	1.0	2.7	1.7	1.0	1.0
37	17144	1.0	0.5	3.6	1.4	1.0	1.0	1.0
38	26970	6.0	15.3	0.2	0.6	2.9	1.0	5.4
39	21402	0.2	1.0	2.8	6.9	2.4	1.0	3.6
40	27074	1.7	2.5	2.3	3.2	1.6	1.0	2.0
41	10963	0.5	0.3	2.1	0.5	1.0	1.0	0.7
42	29525	0.6	1.0	0.7	2.4	1.7	1.3	1.0
43	25514	1000.0	1.0	1.0	1.0	0.5	1.0	1.0
44	26612	0.4	0.5	1.6	2.8	0.8	1.0	0.8
45	24600	1.6	2.7	1.0	2.0	1.0	1.2	1.4
46	9741	2.3	5.0	1.0	2.2	1.7	1.0	1.0
47	23689	1.0	2.6	0.8	1.8	2.3	1.0	2.7
48	22352	1.0	2.9	0.7	1.6	2.4	1.0	2.4
49	23806	1.0	0.4	1.3	2.3	1.0	1.4	1.4
50	12285	1.0	1.0	1.0	1.0	0.8	1.0	0.5
51	27638	0.6	1.0	0.8	2.2	2.1	1.0	1.0
52	9663	1.0	1.0	1.0	1000.0	1.0	1.0	1.0
53	26850	1.0	0.2	9.1	2.1	1.3	1.6	2.2



Table 2

SEQ ID NO.	SPOT ID	2D T4-2/ 2D S1	3D T4-2/ 3D S1	3D S1/ 2D S1	3D T4-2/ 2D T4-2	3D T4-2/ EGFR Ab	3D T4-2/ B1 Integrin Ab	3D T4-2/ Tyr
54	10204	2.9	2.3	0.8	0.6	3.1	1.4	2.4
55	1318	2.0	0.9	2.3	0.5	0.6	1.1	0.7
56	25922	1.0	0.8	1.0	1.0	1.0	1.0	1.0
57	26347	1.0	1.0	1.0	1.0	1.0	1.0	1.0
58	20361	1.0	1.0	1.0	2.0	1.0	1.0	1.0
59	28672	0.6	2.1	0.6	2.1	1.4	1.0	1.7
60	25520	0.5	0.3	2.3	1.3	1.0	0.7	0.5
61	1723	1.0	0.5	5.1	3.5	1.0	3.1	1.0
62	28863	0.8	1.3	1.0	2.3	1.7	1.7	1.7
63	25526	5.9	1.7	1.0	0.6	0.6	0.7	0.4
64	27936	1.0	1.0	3.2	3.1	1.9	3.1	1.5
65	26851	1.0	0.7	3.2	2.7	1.6	2.4	1.3
66	25107	1.0	5.8	1.0	2.6	2.6	1.6	2.6
67	24912	1.0	2.9	1.0	2.4	1.6	1.3	1.8
68	25169	1.0	0.7	2.5	1.5	1.0	1.0	1.0
69	25600	1.6	1.4	2.9	2.1	0.7	0.9	0.5
70	28706	0.2	0.5	0.6	2.1	1.3	1.2	1.0
71	26377	0.6	0.3	2.2	1.0	1.2	1.3	1.0
72	19460	2.4	1.5	2.5	1.3	1.0	1.0	0.8
73	25243	1.0	0.7	2.2	1.0	1.0	1.0	1.0
74	20018	1.0	1.0	1.0	2.6	1.0	1.0	1.0
75	918	1.0	1.7	1.3	2.1	2.0	1.6	2.4
76	25027	1.0	1.0	1.0	1.0	1.0	1.0	1.0
77	29089	0.6	0.5	0.8	2.1	1.0	1.0	1.0
78	9141	1.0	1.0	1.0	1.0	1.0	1.0	1.0
79	12005	1.0	1.0	2.2	1.0	1.0	1.0	1.0
80	12148	1.0	1.0	1.0	1.0	1.0	1.0	1.0
81	17394	0.4	0.6	2.1	2.0	1.0	1.0	1.0
82	27017	2.8	3.3	0.8	1.0	2.4	1.8	2.8
83	25809	1.0	1.0	1000.0	1.0	1.0	1.0	1.0
84	8719	0.1	1.0	2.3	2.1	0.4	0.5	0.3
85	21030	0.4	1.0	1.3	2.1	1.4	1.6	1.4
86	11436	0.7	0.4	2.0	1.0	0.6	0.8	0.6
87	10374	1.5	1.5	3.5	2.7	0.4	1.0	0.3
88	19037	3.0	3.3	0.9	1.5	2.7	1.4	3.7
89	398	1.6	6.9	1.1	3.3	2.4	1.0	4.5
90	18773	1.9	5.1	1.0	3.9	3.8	2.0	6.1
91	3583	0.5	0.7	1.0	2.0	2.5	1.0	1.5
92	3418	1.8	3.2	1.2	2.4	1.6	1.0	1.2
93	18985	9.2	3.1	1.0	0.6	2.3	1.1	2.5
94	25861	3.4	1.5	2.0	0.8	0.8	0.9	0.6
95	3317	0.9	2.3	1.0	3.4	1.9	1.0	1.0
96	8743	0.2	0.7	1.0	4.3	1.8	1.0	1.7
97	26240	0.2	1.0	1.0	5.3	1.9	1.9	1.1
98	28562	0.3	0.2	2.0	1.0	0.5	0.5	0.6
99	16877	1.0	2.6	1.1	2.6	1.7	1.5	1.3
100	25955	1.0	1.0	1.0	1.0	1.0	1.0	1.0
101	26308	0.2	0.4	1.0	2.2	0.7	0.8	0.6
102	4140	1.9	6.7	0.7	2.1	3.0	1.0	3.5
103	3436	1.8	6.3	0.6	2.2	3.1	1.3	3.3
104	25612	1.0	12.5	1.0	1.0	2.1	1.0	2.9
105	12257	1.0	1.0	2.0	1.0	0.8	0.9	0.8
106	9111	0.5	0.5	2.2	1.3	1.5	1.0	0.7

**Table 2**

SEQ ID NO.	SPOT ID	2D T4-2/ 2D S1	3D T4-2/ 3D S1	3D S1/ 2D S1	3D T4-2/ 2D T4-2	3D T4-2/ EGFR Ab	3D T4-2/ B1 Integrin Ab	3D T4-2/ Tyr
107	17620	0.3	0.8	1.0	3.2	2.7	2.1	1.0
108	26025	1.0	2.9	1.1	2.2	2.3	1.0	2.6
109	19271	0.5	1.3	0.7	2.2	1.6	1.2	1.5
110	4151	0.4	4.2	1.2	11.1	4.2	1.0	2.9
111	26569	0.7	2.2	0.8	2.9	2.3	1.7	2.6
112	10344	1.0	1.0	1.0	1.0	1.0	1.0	1.0
113	832	1.0	3.3	1.0	2.4	3.7	2.2	4.0
114	12071	1.8	1.5	2.2	1.0	1.3	0.8	1.4
115	12271	0.6	4.9	1.9	14.9	20.8	4.0	24.1
116	11433	0.5	0.4	5.7	3.0	1.7	1.8	1.0
117	20917	1.0	2.8	0.9	2.6	1.7	1.4	1.7
118	25810	1.1	3.8	1.0	2.9	1.5	1.3	1.5
119	12039	1.0	1.0	3.6	1.0	1.0	1.0	1.0
120	25499	1.0	1.0	1.0	1.0	1.0	1.0	1.0
121	25557	1.0	1.8	1.0	0.8	1.0	1.0	1.0
122	9917	2.5	2.7	0.7	1.6	3.8	1.2	3.6
123	19505	0.4	1.7	0.7	3.8	1.7	1.6	1.4
124	17491	0.6	1.7	0.7	2.5	1.6	1.3	1.4
125	10683	0.4	1.9	0.6	3.6	1.7	1.4	1.1
126	1936	0.2	0.6	0.6	3.1	1.0	1.8	1.0
127	828	0.1	1.0	0.5	3.0	1.0	1.7	1.2
128	9558	1.0	1.0	1.0	1.0	1.0	1.0	1.0
129	20164	2.0	1.1	2.5	1.7	1.0	1.0	0.8
130	969	1.0	1.0	2.7	1.0	1.0	1.5	0.7
131	9910	0.4	1.0	0.8	3.2	1.9	1.3	1.4
132	2427	1.3	0.7	3.0	2.8	0.8	1.9	1.0
133	19990	1.0	7.9	2.8	34.7	1.0	1.0	1.0
134	20605	3.0	1.2	2.1	1.0	1.3	1.2	0.8
135	10650	0.5	1.7	0.5	2.9	2.8	0.6	3.4
136	25963	2.6	3.5	0.7	1.0	3.3	1.0	2.3
137	25562	3.2	5.9	0.7	1.0	4.2	1.0	4.8
138	9377	0.6	1.0	1.0	2.1	1.9	2.0	1.6
139	17618	1.0	0.7	2.3	3.2	0.8	0.7	0.8
140	12136	1.0	1.0	3.8	1.0	1.0	1.0	1.0
141	17373	1.0	0.4	6.1	2.4	1.0	1.0	1.0
142	18577	1.0	0.3	0.3	4.6	1.0	1.0	1.0
143	3143	1.7	1.3	2.6	2.3	0.7	1.0	0.5
144	17737	6.1	0.7	3.4	0.3	0.5	1.3	0.4
145	20029	1.0	0.6	2.3	1.0	1.0	1.0	0.5
146	18537	1.0	1.3	2.1	2.6	1.3	1.0	1.2
147	10090	1.0	1.7	2.1	2.8	1.5	1.0	1.2
148	12102	1.0	1.0	3.9	1.0	1.0	1.0	1.0
149	8487	4.7	2.4	1.0	1.0	2.3	1.1	2.2
150	9252	1.3	3.8	0.3	1.0	2.1	1.6	2.5
151	25605	1.0	1.0	1.0	1.0	0.5	0.5	1.0
152	29652	1.0	2.9	1.5	2.9	2.0	1.5	2.1
153	10858	1.0	0.8	2.0	1.0	1.0	1.0	0.7
154	1261	0.2	0.6	1.0	2.9	0.8	0.8	0.9
155	4156	12.4	0.8	3.1	0.2	0.6	1.0	0.3
156	3452	10.6	0.8	2.8	0.3	0.6	1.0	0.4
157	2748	10.8	0.8	3.1	0.2	0.5	1.0	0.4
158	2046	9.2	1.0	2.4	0.3	0.5	1.2	0.4
159	2044	11.7	0.8	2.8	0.2	0.6	1.4	0.4

**Table 2**

SEQ ID NO.	SPOT ID	2D T4-2/ 2D S1	3D T4-2/ 3D S1	3D S1/ 2D S1	3D T4-2/ 2D T4-2	3D T4-2/ EGFR Ab	3D T4-2/ B1 Integrin Ab	3D T4-2/ Tyr
160	1342	10.5	0.9	2.8	0.2	0.5	1.2	0.4
161	1326	12.2	1.0	2.7	0.2	0.5	1.0	0.4
162	9981	0.2	1.5	0.3	2.5	1.2	1.6	0.5
163	27917	1.9	2.5	0.5	1.0	2.1	1.4	2.3
164	8488	4.3	2.4	1.0	0.5	2.9	0.9	3.6
165	22793	1.9	2.6	0.5	1.0	2.2	1.8	2.1
166	26883	2.4	3.7	0.5	1.0	2.5	2.0	2.0
167	11540	0.7	1.0	1.3	2.8	0.8	1.0	0.5
168	17707	1.0	0.6	2.6	1.0	1.0	1.0	1.0
169	20649	2.3	2.6	0.5	0.4	3.0	1.0	3.1
170	24004	1.0	2.5	1.8	3.6	2.3	1.0	2.8
171	11836	1.2	5.0	0.9	3.7	1.3	1.0	0.8
172	24932	1.8	0.8	6.5	2.1	0.8	1.0	0.5
173	19143	0.6	1.6	0.7	2.0	1.7	1.2	1.4
174	26257	1.9	1.3	2.2	1.7	0.7	1.0	0.6
175	21239	9.4	9.2	0.5	0.4	2.4	1.0	2.7
176	16959	0.6	2.1	0.8	2.1	3.0	1.4	2.5
177	2568	0.7	1.9	0.7	2.2	3.0	1.3	2.4
178	25936	1.0	2.4	0.7	2.0	3.1	1.5	2.4
179	23041	0.7	1.0	2.1	2.6	1.0	1.4	1.0
180	9206	5.7	1.8	4.6	1.0	1.0	0.7	0.9
181	25105	1.6	1.3	2.1	1.0	1.0	0.7	0.8
182	24779	1.0	1.0	1.0	2.9	2.3	1.4	1.2
183	22451	1.0	0.2	2.1	1.0	1.4	0.6	1.0
184	22291	0.2	0.2	2.1	1.0	0.6	0.6	0.5
185	21143	1.0	7.2	0.7	2.0	2.6	1.1	2.4
186	24751	1.7	5.0	0.7	2.1	2.4	1.3	4.0
187	24294	1.7	3.9	0.8	2.4	2.6	1.1	3.9
188	24006	1.7	6.3	0.8	2.5	2.4	1.0	4.0
189	25678	1.0	1.0	1.0	1.0	1.0	1.0	1.0
190	22027	8.7	7.0	0.4	0.2	5.1	2.0	5.2
191	29495	1.0	1.0	1.0	1.0	1.0	1.0	1.0
192	24577	6.8	3.2	0.8	0.4	3.8	1.3	2.1
193	23527	0.3	2.1	1.6	6.4	2.7	2.1	3.4
194	17090	1.0	4.9	0.7	2.3	3.1	2.3	3.6
195	25137	1.0	1.0	0.4	3.8	1.0	2.5	4.1
196	23772	0.6	6.8	0.5	3.7	12.6	3.6	9.2
197	1659	1.0	7.5	0.3	3.2	17.8	4.1	20.3
198	8497	1.3	0.4	2.2	0.5	1.0	1.0	1.0
199	25272	8.0	6.0	1.0	0.6	2.2	1.0	2.9
200	21216	1.0	1.0	0.6	2.0	2.5	2.0	2.2
201	11939	1.0	1.0	1.0	1.0	1.0	1.0	1.0
202	9191	1.8	2.2	1.3	1.1	2.2	1.0	2.0
203	3429	0.7	3.4	0.8	3.5	3.0	1.5	3.7
204	2725	0.8	3.4	1.0	3.4	2.6	1.6	4.1
205	19923	1.0	1.1	2.9	1.0	1.7	1.4	1.2
206	20457	1.0	2.0	1.0	2.3	2.9	1.0	2.3
207	24773	0.2	1.0	0.8	2.0	1.6	1.0	1.0
208	24119	0.2	4.6	1.1	15.9	2.7	1.0	3.4
209	3908	0.3	0.5	1.1	2.3	1.7	1.0	1.0
210	8560	1.9	0.7	2.2	0.5	1.0	1.0	0.7
211	24588	0.3	0.5	1.0	2.0	1.0	1.0	1.4
212	4047	0.5	1.2	1.0	2.1	1.9	1.0	1.8

**Table 2**

SEQ ID NO.	SPOT ID	2D T4-2/ 2D S1	3D T4-2/ 3D S1	3D S1/ 2D S1	3D T4-2/ 2D T4-2	3D T4-2/ EGFR Ab	3D T4-2/ B1 Integrin Ab	3D T4-2/ Tyr
213	28344	0.8	1.0	1.0	2.0	1.7	1.5	2.7
214	27561	1.0	1.0	1.0	2.4	1.2	1.2	1.3
215	3272	0.6	0.8	1.0	2.1	1.3	1.6	1.0
216	26735	1.0	1.0	1.0	1.0	1.0	1.0	1.0
217	24900	0.3	0.8	2.9	5.7	2.2	1.1	3.0
218	9472	2.2	5.0	1.0	2.0	1.5	0.8	1.7
219	9979	1.3	3.3	1.5	3.9	3.4	1.4	2.5
220	21996	1.0	4.7	1.0	3.4	2.5	1.0	2.4
221	22312	1.2	4.4	1.2	3.3	2.2	1.1	2.2
222	11327	1.4	6.2	1.4	2.7	2.7	1.0	2.2
223	18240	2.0	4.5	1.0	2.2	2.1	1.0	2.7
224	21922	0.7	1.4	0.8	2.1	1.8	1.0	1.3
225	22290	0.7	1.6	0.9	2.1	1.5	1.2	1.3
226	10390	1.3	1.0	2.6	1.6	0.8	1.0	0.6
227	2212	1.9	1.0	2.8	1.0	0.6	1.6	0.8
228	20213	0.4	1.0	1.0	1.0	1.0	1.0	1.0
229	24955	0.9	2.9	1.0	3.3	0.8	0.8	1.0
230	19574	1.0	0.6	3.7	3.1	1.5	2.6	1.4
231	19969	1.0	1.0	1.0	3.1	1.0	1.0	1.0
232	8570	0.4	1.2	1.0	2.6	1.2	0.8	0.6
233	18519	3.5	2.9	2.6	1.8	1.8	1.0	2.0
234	9616	0.6	2.0	1.0	2.3	1.2	1.2	1.0
235	22334	0.2	0.7	2.9	8.5	1.7	1.1	3.4
236	17459	0.1	0.7	2.7	18.8	4.0	1.3	4.6
237	25193	1.0	0.8	1.0	2.3	1.0	1.3	1.0
238	25191	0.2	0.8	0.7	2.5	1.3	1.5	1.2
239	9448	0.6	1.0	1.0	2.3	0.8	0.8	0.5
240	25224	5.6	14.4	1.0	2.3	6.0	1.5	9.6
241	20218	6.1	12.3	0.7	1.7	5.6	1.6	9.0
242	3089	7.0	15.7	0.7	2.3	7.3	1.8	8.0
243	23985	5.8	17.2	0.9	2.1	6.8	1.8	8.1
244	19953	6.2	13.5	0.8	1.8	6.4	1.7	10.4
245	11506	4.1	13.3	1.0	1.4	4.4	1.6	7.2
246	22362	1.0	0.7	4.1	2.1	1.2	1.8	1.0
247	25516	0.7	10.1	0.4	4.0	14.7	4.7	8.1
248	25757	0.6	0.4	2.4	1.0	1.0	1.3	0.9
249	24814	0.5	2.8	0.3	1.0	3.5	1.4	4.4
250	21994	0.5	3.2	0.3	1.0	3.6	1.0	4.3
251	27117	1.0	2.8	0.3	1.0	3.9	1.0	4.9
252	24681	1.8	2.6	0.6	0.5	3.2	1.5	3.0
253	22745	0.3	2.4	1.4	8.1	2.8	2.3	3.5
254	24233	1.9	3.9	1.3	2.3	1.3	0.8	2.2
255	2001	1.0	1.0	1.5	2.1	1.0	1.0	1.0
256	21179	2.0	7.9	0.7	1.9	2.1	1.0	4.3
257	17147	1.3	4.3	0.7	1.7	2.4	1.2	3.9
258	8700	1.5	7.3	0.7	1.6	3.1	1.0	2.7
259	21214	0.3	5.4	1.2	15.5	3.1	1.0	3.6
260	26422	0.4	3.7	1.0	12.7	3.9	1.0	3.3
261	22837	0.7	1.0	2.1	2.4	1.2	1.5	0.9
262	21965	1.0	1.0	1.0	2.2	2.4	1.0	1.0
263	25541	4.5	2.7	2.7	0.8	1.0	1.3	0.8
264	18302	1.1	0.9	2.1	1.0	1.0	1.0	1.0
265	24049	1.0	2.6	1.5	2.5	2.3	1.4	2.4

**Table 2**

SEQ ID NO.	SPOT ID	2D T4-2/ 2D S1	3D T4-2/ 3D S1	3D S1/ 2D S1	3D T4-2/ 2D T4-2	3D T4-2/ EGFR Ab	3D T4-2/ B1 Integrin Ab	3D T4-2/ Tyr
266	26326	9.2	1.5	3.2	0.7	0.7	0.9	1.0
267	2254	1.6	3.3	1.0	2.8	2.0	1.1	3.1
268	10296	0.9	1.7	2.9	5.0	2.1	1.0	1.3
269	20044	1.0	0.8	2.0	1.0	1.0	1.0	1.0
270	28806	2.8	1.1	2.1	1.0	0.9	1.2	0.8
271	17566	7.5	4.2	0.7	0.5	2.5	1.0	2.5
272	19005	1.0	0.8	1.0	2.1	1.0	1.0	1.0
273	3567	1.0	1.0	1.0	1.0	1.0	1.0	1.0
274	21983	0.1	1.0	3.1	25.6	3.4	1.0	4.7
275	458	1.0	2.1	0.6	1.0	1.6	2.1	2.3
276	22331	0.6	2.1	0.4	1.0	2.2	1.0	2.8
277	21411	0.7	1.5	1.0	2.5	1.0	1.0	1.0
278	22972	1.0	2.2	0.5	1.0	2.2	1.4	2.4
279	24533	1.0	2.5	1.0	2.0	2.0	2.7	3.2
280	24853	1.0	2.6	2.1	2.1	2.4	1.3	2.1
281	23753	0.7	1.5	1.3	2.1	2.0	1.7	2.3
282	21502	0.3	4.8	1.0	10.8	2.6	1.0	2.9
283	18180	0.3	0.8	0.8	2.4	0.9	1.4	0.7
284	23918	0.7	2.3	0.4	1.0	2.4	1.2	3.5
285	24144	1.0	1.0	1.0	1.0	1.0	1.6	1.0
286	19996	1.5	2.5	0.7	1.2	2.1	0.9	2.5
287	11528	1.0	1.0	1.0	2.1	1.0	1.0	1.0
288	20506	2.2	0.9	3.2	0.8	1.3	1.6	1.0
289	23833	1.0	0.5	2.1	1.0	1.0	1.0	0.7
290	20042	3.8	1.6	2.3	0.8	1.0	1.0	1.0
291	24977	1.0	1.0	2.1	1.0	2.3	1.4	1.4
292	11646	1.0	1.0	0.8	1000.0	1.0	1.0	1.7
293	24872	1.0	1.4	0.8	2.5	1.4	1.2	1.3
294	10577	1.0	1.0	1.0	1.0	1.0	1.0	1.0
295	21710	1.0	0.2	2.2	0.7	1.6	1.0	1.2
296	18556	0.0	1.0	1.0	1.0	1.0	1.0	1.0
297	29433	1.0	0.5	1.0	2.1	1.0	1.0	1.0
298	29273	1.0	2.2	1.0	2.2	1.0	1.3	1.0
299	28763	1.6	2.7	1.0	2.2	1.8	1.3	2.5
300	27887	0.1	0.2	1.1	2.7	0.8	1.0	0.6
301	27450	2.6	11.3	0.2	1.0	4.4	3.3	7.3
302	27255	0.6	1.6	0.8	2.3	1.7	1.4	1.5
303	27226	1.0	1.3	1.0	2.6	1.8	1.0	1.0
304	26550	4.2	17.9	0.2	1.0	6.9	2.9	9.2
305	26508	1.0	1.4	1.0	1.0	1.0	1.0	1.0
306	26483	1.2	2.2	0.6	1.0	2.1	1.4	2.7
307	26334	1.0	0.5	3.0	1.0	0.6	0.8	0.5
308	26027	1.0	1.0	1.0	1.5	1.0	1.0	1.0
309	25977	1.0	1.0	1.0	1.0	1.0	1.0	1.0
310	25965	1.0	1.0	1.0	1.0	1.0	1.0	1.0
311	25844	1.0	1.0	1.0	1.0	1.0	1.0	1.0
312	25834	1000.0	1.0	1.0	1.0	0.4	1.0	1.0
313	25816	1.0	1.0	1.0	1.0	1.0	1.0	1.0
314	25746	1.0	1.0	1.0	1.0	1.0	1.0	1.0
315	25742	1.0	1.0	1.0	1.0	0.5	1.0	1.0
316	25741	1.0	1.0	1.0	1.0	1.0	1.0	1.0
317	25712	1.0	1.0	1.0	1.0	1.0	1.0	1.0
318	25642	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Table 2

SEQ ID NO.	SPOT ID	2D T4-2/ 2D S1	3D T4-2/ 3D S1	3D S1/ 2D S1	3D T4-2/ 2D T4-2	3D T4-2/ EGFR Ab	3D T4-2/ B1 Integrin Ab	3D T4-2/ Tyr
319	25621	0.6	0.8	2.1	2.0	1.3	1.2	1.0
320	25614	1.0	1.0	1.0	1.0	1.0	1.0	1.0
321	25603	1.0	1.0	1.0	1.0	1.0	1.0	1.0
322	25556	1.8	0.7	1.0	0.8	1.0	1.0	1.0
323	25555	1.0	2.9	1.0	1.0	1.5	1.3	1.0
324	25540	1.0	1.0	1.0	1.2	1.0	1.0	1.0
325	23576	0.0	1.0	1.0	1.0	1.0	1.5	1.4
326	22566	1.0	1.0	1.0	1.0	1.0	1.3	1.0
327	9036	1.9	3.8	0.6	1.8	2.6	1.3	3.1
328	4164	1.0	1.0	2.2	1.0	1.5	1.0	0.9
329	4146	0.8	3.7	0.9	4.4	3.3	1.0	4.3
330	4091	1.0	1.0	1.0	2.5	1.7	1.0	0.9
331	4072	1.0	1.0	2.1	1.0	5.9	2.0	5.1
332	4022	3.5	4.5	0.8	1.0	3.0	1.0	3.2
333	3965	1.9	5.6	0.4	1.0	5.5	2.3	4.1
334	3954	1.0	2.7	1.3	3.6	2.8	1.9	2.6
335	3872	1.0	3.2	1.3	2.8	4.0	1.8	3.9
336	3869	1.0	1.0	5.8	3.8	1.0	0.7	0.6
337	3838	1.0	1.6	1.2	2.0	2.6	1.7	1.9
338	3806	0.6	2.6	0.9	3.7	3.0	1.0	3.4
339	3798	10.2	0.9	2.9	0.3	0.7	1.0	0.4
340	3792	1.0	1.0	1.0	2.7	2.9	1.0	2.5
341	3788	1.7	5.4	1.2	3.4	2.5	1.3	2.7
342	3767	1.1	2.2	0.7	1.7	2.5	1.0	2.5
343	3458	1.2	3.3	0.7	2.0	2.6	1.0	2.2
344	3251	0.4	0.5	1.4	2.7	1.4	1.0	1.0
345	3194	1.0	2.3	1.3	3.1	2.2	1.3	3.2
346	3102	0.5	3.2	1.0	4.8	2.9	1.0	2.3
347	3094	11.5	0.8	2.7	0.3	0.6	1.0	0.4
348	2671	0.8	1.6	1.0	2.2	2.8	1.9	1.0
349	2634	0.9	2.8	0.4	1.0	3.8	1.7	4.0
350	2567	4.6	3.3	0.8	0.6	2.6	1.0	3.3
351	2317	1.0	1.0	2.4	1.0	1.0	1.0	1.1
352	1958	0.3	0.6	1.0	2.6	0.9	0.8	0.9
353	1680	0.3	4.7	1.0	17.7	2.7	1.0	4.5
354	1625	2.2	7.8	0.5	1.8	3.1	1.7	3.4
355	1445	0.2	0.6	1.0	2.7	0.8	0.9	0.9
356	1320	4.9	1.0	2.4	0.4	0.6	1.2	0.5
357	974	0.6	3.1	1.1	3.2	2.4	1.4	3.7
358	726	1.0	1.0	1.0	1.0	1.0	1.0	1.0
359	718	0.4	2.6	0.5	2.7	1.6	1.0	1.0
360	703	1.0	4.1	1.0	2.4	1.6	1.0	1.7
361	652	2.8	4.4	1.6	2.3	1.0	1.6	1.0
362	630	6.9	1.0	2.2	0.3	0.6	1.0	0.5
363	593	1.0	4.3	1.0	2.3	1.0	1.0	1.0
364	532	1.3	4.7	1.0	2.4	2.6	2.2	4.0
365	272	0.7	2.7	0.9	3.1	2.4	1.3	4.3
366	256	0.6	3.2	0.5	1.9	2.8	1.0	3.4
367	57	0.5	1.4	1.0	2.3	0.9	1.0	0.7

**Table 11**

<b>SEQ ID NO</b>	<b>SPOT ID</b>
1	10594
2	21851
3	20990
4	18641
5	19037
6	398
7	18773
8	3583
9	3418
10	145306
11	3418
12	3418
13	18985
14	17229
15	25930
16	25930
17	20701
18	20346
19	20346
20	21247
21	21247
22	23062
23	25666
24	25666
25	19001
26	10897
27	10897
28	10897
29	1960
30	146262
31	26381
32	26381
33	26719
34	26719
35	27152
36	10926
37	28980
38	1236
39	29350
40	29350

**Table 11**

<b>SEQ ID NO</b>	<b>SPOT ID</b>
41	26242
42	4098
43	145253
44	4098
45	17432
46	17432
47	1785
48	1785
49	1785
50	28856
51	28856
52	18791
53	18791
54	22950
55	22950
56	1882
57	23886
58	24995
59	24995
60	24477
61	21681
62	21681
63	9557
64	9557
65	22033
66	873
67	17144
68	26970
69	26970
70	21402
71	27074
72	27074
73	10963
74	10963
75	29525
76	29525
77	25514
78	25514
79	26612
80	26612



**Table 11**

<b>SEQ ID NO</b>	<b>SPOT ID</b>
81	24600
82	9741
83	9741
84	9741
85	23689
86	23689
87	22352
88	23806
89	12285
90	27638
91	27638
92	9663
93	9663
94	26850
95	10204
96	10204
97	10204
98	25922
99	25922
100	26347
101	26347
102	20361
103	20361
104	28672
105	28672
106	25520
107	25520
108	1723
109	1723
110	28863
111	25526
112	25526
113	27936
114	27936
115	26851
116	25107
117	25107
118	25107
119	24912
120	24912

**Table 11**

<b>SEQ ID NO</b>	<b>SPOT ID</b>
121	25169
122	25600
123	25600
124	28706
125	28706
126	26377
127	26377
128	19460
129	25243
130	20018
131	20018
132	918
133	25027
134	29089
135	29089
136	9141
137	9141
138	9141
139	12005
140	12148
141	12148
142	17394
143	27017
144	27017
145	25809
146	8719
147	8719
148	21030
149	21030
150	11436
151	11436
152	10374
153	10374
154	25861
155	25861
156	3317
157	3317
158	8743
159	26240
160	26240

**Table 11**

<b>SEQ ID NO</b>	<b>SPOT ID</b>
161	28562
162	16877
163	25955
164	26308
165	26308
166	4140
167	3436
168	25612
169	25612
170	12257
171	12257
172	9111
173	9111
174	17620
175	26025
176	26025
177	19271
178	4151
179	4151
180	26569
181	26569
182	10344
183	10344
184	10344
185	832
186	832
187	12071
188	12071
189	12271
190	11433
191	20917
192	25810
193	12039
194	12039
195	25499
196	25499
197	25557
198	25557
199	9917
200	19505

**Table 11**

<b>SEQ ID NO</b>	<b>SPOT ID</b>
201	17491
202	10683
203	10683
204	1936
205	828
206	9558
207	9558
208	20164
209	969
210	969
211	9910
212	2427
213	19990
214	20605
215	20605
216	10650
217	10650
218	25963
219	25963
220	25562
221	25562
222	3429
223	2725
224	19923
225	20457
226	20457
227	24773
228	24119
229	3908
230	3908
231	8560
232	8560
233	9377
234	9377
235	17618
236	12136
237	17373
238	18577
239	18577
240	3143

**Table 11**

<b>SEQ ID NO</b>	<b>SPOT ID</b>
241	17737
242	17737
243	20029
244	20029
245	18537
246	18537
247	12102
248	12102
249	8487
250	9252
251	9252
252	25605
253	25605
254	29652
255	10858
256	1261
257	4156
258	4156
259	3452
260	3452
261	2748
262	2046
263	2046
264	2044
265	2044
266	1342
267	1342
268	1326
269	1326
270	9981
271	9981
272	27917
273	8488
274	22793
275	22793
276	26883
277	26883
278	11540
279	17707
280	20649

**Table 11**

<b>SEQ ID NO</b>	<b>SPOT ID</b>
281	20649
282	24004
283	24004
284	11836
285	11836
286	11836
287	24932
288	19143
289	19143
290	26257
291	26257
292	21239
293	21239
294	16959
295	2568
296	25936
297	25936
298	23041
299	9206
300	25105
301	25105
302	24779
303	22451
304	22451
305	22291
306	22291
307	21143
308	24751
309	24751
310	24294
311	24294
312	24006
313	24006
314	25678
315	25678
316	22027
317	29495
318	29495
319	24577
320	24577

**Table 11**

<b>SEQ ID NO</b>	<b>SPOT ID</b>
321	24577
322	23527
323	17090
324	25137
325	23772
326	1659
327	8497
328	25272
329	21216
330	21216
331	21216
332	11939
333	11939
334	11939
335	9191
336	3429
337	24588
338	4047
339	28344
340	28344
341	27561
342	3272
343	26735
344	26735
345	24900
346	24900
347	9472
348	9472
349	9979
350	21996
351	22312
352	11327
353	18240
354	18240
355	21922
356	21922
357	22290
358	10390
359	10390
360	2212

**Table 11**

<b>SEQ ID NO</b>	<b>SPOT ID</b>
361	20213
362	20213
363	24955
364	19574
365	19969
366	8570
367	18519
368	9616
369	9616
370	17459
371	17459
372	25193
373	25193
374	25193
375	25191
376	22566
377	4164
378	4146
379	4072
380	4022
381	3954
382	3838
383	3806
384	3798
385	3792
386	3788
387	3458
388	3194
389	3102
390	25191
391	25191
392	9448
393	9448
394	25224
395	20218
396	3089
397	3089
398	19953
399	19953
400	22362



**Table 11**

<b>SEQ ID NO</b>	<b>SPOT ID</b>
401	25516
402	25516
403	25757
404	24814
405	21994
406	27117
407	22745
408	24233
409	2001
410	2001
411	2001
412	17147
413	21214
414	21214
415	21214
416	26422
417	21965
418	25541
419	25541
420	18302
421	18302
422	24049
423	24049
424	26326
425	26326
426	2254
427	162502
428	10296
429	20044
430	28806
431	17566
432	17566
433	19005
434	3567
435	159223
436	3567
437	3567
438	458
439	21411
440	22972

**Table 11**

<b>SEQ ID NO</b>	<b>SPOT ID</b>
441	24853
442	21502
443	18180
444	23918
445	24144
446	19996
447	11528
448	20506
449	20506
450	23833
451	20042
452	20042
453	11646
454	10577
455	10577
456	18556
457	29433
458	28763
459	27450
460	27450
461	27255
462	26550
463	26550
464	26508
465	26334
466	26334
467	26027
468	26027
469	25977
470	25977
471	25965
472	25965
473	25844
474	25844
475	25834
476	25816
477	25746
478	25712
479	25621
480	25621

**Table 11**

<b>SEQ ID NO</b>	<b>SPOT ID</b>
481	25614
482	25614
483	25603
484	25603
485	25556
486	25556
487	25555
488	25555
489	3094
490	2567
491	1958
492	1680
493	1445
494	1320
495	974
496	652
497	630
498	593
499	256

## SEQUENCE LISTING

<110> Hansen, Rhonda

<120> GENE PRODUCTS DIFFERENTIALLY EXPRESSED  
IN CANCEROUS BREAST CELLS AND THEIR METHODS OF USE

<130> 2300-17767WO

<150> 60/345,637

<151> 2002-01-08

<160> 516

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 114

<212> DNA

<213> Homo sapiens

<220>

<221> misc\_feature

<222> 70

<223> n = A,T,C or G

<400> 1

```
catcctcgga cgccagcaag gtgacctcta agggggcagg gctctcaaag gcctttgtgg 60
gccagaaggn aaggttcctt cctggtggac tgcagcaaag ctggctccaa catg      114
```

<210> 2

<211> 430

<212> DNA

<213> Homo sapiens

<400> 2

```
gggactcgcc acctcctctt gcacccctgc caggcccagc agccaccaca ggccttgctt 60
cctcggccct gaaatcatgc ccctaggtct cctgtggctg ggcctagccc tgttgggggc 120
tctgcatgcc caggcccagc actccacctc agacctgatc ccagcccac ctctgaacaa 180
ggtccctctg cagcagaact tgcaggacaa ccaattccag ggaagtggg atgtggtacg 240
cctggcaggg aatgcaattc tcagagaaga caaagaccgc caaaagatgt atgccaccat 300
ctatgagctg aaagaagaca agagctacaa tgtcacctcc gtcctgttta ggaaaaagaa 360
gtgtgactac tggatcacga cttttgttcc aggttgccag cccggcgagt tcacgctggg 420
caacattaag                                     430
```

<210> 3

<211> 527

<212> DNA

<213> Homo sapiens

<400> 3

```
ctgctaatac agccctggct gtggaatcct tcaccgtctc agctggatc agccccagcc 60
tgccttgtgc catatctcag cttggatctc tgctagagtc cccccaacca tatatcatag 120
agttgaaatca caatgagacc gttggctttg aatttgagtc gttggttccc atggtgagat 180
gcttgtaag actttatact tgggtcaatc tctcacttta tttttagtaa ccatttgaaa 240
tcctaggatg tgcttgttct ggaaggatga catgggcca gactgaacaa gtcagcttga 300
tgatcttaaa tgatggaagt ataggacgtt gcttatatta aaacaaggga aggacacaaa 360
atggaatgac tgcttagtcc tttctcagat actcttaaaa caatttttta ttgttaaatt 420
tgtggtaata catggtcaca accgtggatc aaacaaggtc agtctaaagt ggcaggtcct 480
aggtgtgacc tgataccacc accctttgtg gcagcaccgg gctggac      527
```

WO 03/057926

PCT/US03/00657

<210> 4  
 <211> 262  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 186, 188  
 <223> n = A,T,C or G

<400> 4  
 ccggcctcgt ggaccagcct gggctctcgc tggaggaagt ggcttgcaag gaggcttggg 60  
 aggagtgtgg ctaccacttg gccccctctg atctgcgccg ggtcgccaca tactggctctg 120  
 gagtgggact gactggctcc agacagacca tgttctacac agaggtgaca gatgccccagc 180  
 gtacgntncc aggtgggggc ctggtggagg aggggtgagct cattgaggtg gtgcacctgc 240  
 ccctggaagg cgcccaggcc tt 262

<210> 5  
 <211> 201  
 <212> DNA  
 <213> Homo sapiens

<400> 5  
 gccactgaaa atccttgтта aaaaccagat cacaaatctg gggctcttgg tcccattgga 60  
 gaaggaagga agagcctcaa aataagtgtg cacccatgca catattcagg aacagcttgt 120  
 ttagtcttta cactttgcct gaaagttgct tctcctcgtc cctttgtgtg cctgggtggc 180  
 ctcggccctg tgcgttgcca a 201

<210> 6  
 <211> 621  
 <212> DNA  
 <213> Homo sapiens

<400> 6  
 tgagggtccc cgctcagctc ctggggctcc tgctactctg gctccgaggt gccagatgtg 60  
 acatccagat gaccagctct ccatectccc tgtctgcatc tgttgagac agagtcacca 120  
 tcgcttgccg ggcaagtcag agcattggca tctatttaaa ttggatcaa caaaaaccag 180  
 ggaaagcccc taaactcctg atctatgatt catccagatt gcaaagtggg gtcccatcaa 240  
 ggttcagtgg cagtggaggt gggacacact tcaactctcac catcagcagt ctgcaacctg 300  
 aagatttagc aacttactac tgtcaacaag ggtacagtac acctggcacc ttcggccaag 360  
 ggacacgact ggaaattaaa cgaactgtgg ctgcaccatc tgtcttcac ttcccgccat 420  
 ctgatgagca gttgaaatct ggaactgcct ctgtttgtgtg cctgctgaat aacttctatc 480  
 ccagagaggc caaagtacag tggaaggtgg ataacgccct ccaatcgggt aactcccagg 540  
 aggggtgtca cagagcagga cagcaaggac agcacctaca gcctcagcag caccctgacg 600  
 ctgagcaaag cagactacga g 621

<210> 7  
 <211> 548  
 <212> DNA  
 <213> Homo sapiens

<400> 7  
 gacagcatgg acatgagggt ccccgctcag ctcttggggc tctgctact ctggctccga 60  
 ggtgccagat gtgacatcca gatgaccag tctccatcct ccctgtctgc atctgttgga 120  
 gacagagtca ccatcgcttg ccgggcaagt cagagcattg gcatctattt aaattggtat 180  
 caacaaaaac cagggaaagc ccctaaactc ctgatctatg attcatccag attgcaaagt 240  
 ggggtcccat caaggttcag tggcagtgga ggtgggacac acttcactct caccatcagc 300  
 agtctgcaac ctgaagattt agcaacttac tactgtcaac aagggtacag tacacctggc 360  
 accttcggcc aagggacacg actggaaatt aaacgaactg tggctgcacc atctgtcttc 420  
 atcttcccgc catctgatga gcagttgaaa tctggaactg cctctgttgt gtgcctgctg 480  
 aataacttct atcccagaga ggccaaagta cagtgggaagg tggataacgc cctccaatcg 540  
 ggtaactc 548

WO 03/057926

PCT/US03/00657

<210> 8  
 <211> 430  
 <212> DNA  
 <213> Homo sapiens

<400> 8  
 tatacacaac atttatttca aactattggg agggatgaga gtggcttaaa aacttccatc 60  
 cctacttttc aagagtgacg ttgattctga atctgaaagc ccgcctctgt cctaaaatac 120  
 aaacaagcac agacattaac cctggatact atatgataaa gagggatgta actattgaat 180  
 tggatacaag gatcagaatg gaaagaaact cacgatgaaa ttgaacctgg tttttgtata 240  
 tttatcaaac ttgtgctgag aatagtgtct gattatacga cttttaagca aagttgggtg 300  
 taattaggtg aaaacagccc aggtcctccc gggagcacag aggggctagg ggctggctct 360  
 tctcgtttgc tctagtcttg ctttgctgtc tgggtgtagct cctctgctgc tcccatctgc 420  
 actaattgac 430

<210> 9  
 <211> 493  
 <212> DNA  
 <213> Homo sapiens

<400> 9  
 ctcactattt ggaatttggc cctcgaggcc aagaattcgg cacgaggcgg cacgagggtg 60  
 aactattgaa ttggatacaa ggatcagaat ggaaagaaac tcacgatgaa attgaacctg 120  
 gtttttgtat atttatcaaa cttgtgctga gaatagtgtc tgattatacg acttttaagc 180  
 aaagttgggt gtaattaggt gaaaacagcc caggtcctcc cgggagcaca gaggggctag 240  
 gggctggctc ttctcgtttg ctctagtctt gctttgctgt ctgggtgtagc tcctctgctg 300  
 ctcccatctg cactaattga cccaaaacgt gggatatttc tgctacacaa aagccaaaag 360  
 gtttcatgta gattttagtt cactaaaggg tgcccacaaa atagagatta attttaactt 420  
 aaattttaag cttgaagatt aggtactatc tgtgaagtta cacttttttt ttttttttaa 480  
 aaggaaaaaa tgt 493

<210> 10  
 <211> 472  
 <212> DNA  
 <213> Homo sapiens

<400> 10  
 cggcacgagg tgtaactatt gaattggata caaggatcag aatggaaaga aactcacgat 60  
 gaaattgaac ctggtttttg tatatttata aaacttgtgc tgagaatagt gtctgattat 120  
 acgactttta agcaaagttg ggtgtaatta ggtgaaaaca gccaggtcc tcccgggagc 180  
 acagaggggc taggggctgg tccttctcgt ttgctctagt cttgctttgc tgtctgggtg 240  
 agctcctctg ctgctcccat ctgcactaat tgacccaaaa cgtgggtatt tcctgctaca 300  
 caaaagccaa aaggtttcat gtagatttta gttcactaaa gggtgccac aaaatagaga 360  
 ttaattttaa cttaaatttt aagcttgaag attaggtact atctgtgaag ttacactttt 420  
 ttattttttt ttaaaggtag agatgtgtgt gtgtgtaggt attaaagatg tg 472

<210> 11  
 <211> 271  
 <212> DNA  
 <213> Homo sapiens

<400> 11  
 gtttttcttt tttttataca caacatttat ttcaaactat tgggagggat gagagtggct 60  
 taaaaacttc catccctact tttcaagagt gcagttgatt ctggggggga aagcccgcct 120  
 ctgtcctaaa atacaaacaa gcacagacat taaacctgga tactatatga taaagaggga 180  
 tgtaactatt gaattggata caaggatcag aatggaaaga aactcacgat gaaattgaac 240  
 ctggtttttg tatatttata aaacttgtgc t 271

<210> 12  
 <211> 343  
 <212> DNA

WO 03/057926

PCT/US03/00657

&lt;213&gt; Homo sapiens

&lt;400&gt; 12

```

gtttttcttt tttttataca caacatttat ttcaaactat tgggagggat gagagtggct 60
taaaaacttc catccctact ttcaacgagt gcagctgatt ctgaatctga aagccccgct 120
ctgtcctaaa atacaaacac gcacagacat tagacctgga tactatatga tacagaggga 180
tgtaactatt gaattggata cacggatcac aatggaaaga aactcacgat gaaattgaac 240
ctggcttttg tatatttatc aaacttgtgc tgagaatagc gcctgattat acgactttta 300
agcaaagctg ggtgtaatta ggtgaaaaca gcccacgtcc tcc 343

```

&lt;210&gt; 13

&lt;211&gt; 345

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 13

```

agtggcgagc aggttcccac ttgccaaaga tcccttttaa ccaacactag cccttgtttt 60
taacacacgc tccagccctt catcagcctg ggcagtctta ccaaaatggt taaagtgatc 120
tcagaggggc ccatggatta acgccctcat cccaaggctc gtcccatgac ataacactcc 180
acacccgccc cagccaactt catgggtcac tttttctgga aaataatgat ctgtacagac 240
aggacagaat gaaactcctg cgggtctttg gcctgaaagt tgggaatggt tgggggagag 300
aagggcagca gcttattggt ggtcttttca ccattggcag aaacg 345

```

&lt;210&gt; 14

&lt;211&gt; 401

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 14

```

ttttccaagt ccgtttcagt cccttccttg gtctgaagaa attctgcagt ggcgagcagt 60
ttcccacttg ccaaagatcc cttttaacca aactagccc ttgtttttaa cacacgctcc 120
agcccttcat cagcctgggc agtcttacca aatgttttaa agtgatctca gaggggcccc 180
tggattaacg ccctcatccc aaggtcgctc ccatgacata aactccaca cccgccccag 240
ccaacttcat gggtcacttt ttctggaaaa taatgatctg tacagacagg acagaatgaa 300
actcctgcgg ctctttggcc tgaaagttgg gaatggttgg gggagagaag ggcagcagct 360
tattggtggt cttttcacca ttggcagaaa cagtgagagc t 401

```

&lt;210&gt; 15

&lt;211&gt; 442

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 15

```

ggcagccggc ccacatgtct ctcaagtacc tgtcccctcg ctctggtgat tatttcttgc 60
agaatcacca cacgagacca tcccggcagt catggttttg ctttagtttt ccaagtccgt 120
ttcagtcctt tccttgggtc gaagaaattc tgcagtggcg agcagtttcc cacttgccaa 180
agatcccttt taaccaacac tagcccttgt ttttaacaca cgctccagcc cttcatcagc 240
ctgggcagtc ttaccaaagt gtttaaagtg atctcagagg ggcccatgga ttaacgccct 300
catcccaagg tccgtcccat gacataacac tccacacccg ccccagccaa cttcatgggt 360
cactttttct ggaaaataat gatctgtaca gacaggacag aatgaaactc ctgcggtctc 420
ttggcctgaa agtgggaatg gt 442

```

&lt;210&gt; 16

&lt;211&gt; 256

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; 96

&lt;223&gt; n = A,T,C or G

WO 03/057926

PCT/US03/00657

&lt;400&gt; 16

```

gaatatgtag atttgcttct taatcctgag cgctacactg gttacaaggg accagatgct 60
tggaataat ggaatgtcat ctacgaagaa aactgnntta agccacagac cattaaaaga 120
ccttaaatcc tttggcttct ggtcaagggg caagtgaaga gaacactttt tacagttggc 180
tagaaggtct ctgtgtagaa aaaagagctt ctacagactt atatctggcc tacatgcaag 240
ccattaatgt gcattt                                     256

```

&lt;210&gt; 17

&lt;211&gt; 405

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 17

```

attctgtgat ttatttgaaa ctgtgaaacc atgtgccata atagaatttt gagaattttg 60
cttttaccta aattcaagaa aatgaaatta cacttttaag ttagtgggtgc ttaagcataa 120
tttttcctat attaaccagt attaaaatct caagtaagat tttccagtgc cagaacatgt 180
taggtggaat tttaaaagtg cctcggcatc ctgtattaca tgtcatagaa ttgtaaagtc 240
aaacatcaatt actagtaatc attctgcact cactgggtgc atagcatggg tagaggggct 300
agagatggac agtcatcaac tggcggatat agcggtagat atgatcctta gccaccaggg 360
cacaagctta ccagtagaca atacagacag agcttttggt gagct                                     405

```

&lt;210&gt; 18

&lt;211&gt; 447

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 18

```

tgtgatttca tttgaaactg tgaaacctat tgccataata gaattttgag aattttgctt 60
ttacctaat tcaagaaaat gaaattacac ttttaagtta gtggtgctta agcataattt 120
ttcctatatt aaccagtatt aaaatctcaa gtaagatttt ccagtgccag aacatgtag 180
gtggaatttt aaaagtgcct cggcatcctg tattacatgt catagaattg taaagtcaac 240
atcaattact agtaatcatt ctgcactcac tgggtgcata gcatggtag aggggctaga 300
gatggacagt catcaactgg cggatatagc ggtacatatg atccttagcc accagggcac 360
aagcttacca gtagacaata cagacagagc ttttggtgag ctgtaactga gctatggaat 420
agcttctttg atgtacctct ttgcctt                                     447

```

&lt;210&gt; 19

&lt;211&gt; 294

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 19

```

tgtgatttca tttgaaactg tgaaacctat tgccataata gaattttgag aattttgctt 60
ttacctaat tcaagaaaat gaaattacac ttttaagtta gtggtgctta agcataattt 120
ttcctatatt aaccagtatt aaaatctcaa gtaagatttt ccagtgccag aacatgtag 180
gtggaatttt aaaagtgcct cggcatcctg tattacatgt catagaattg taaagtcaac 240
atcaattact agtaatcatt ctgcactcac tgggtgcata gcatggtag aggg          294

```

&lt;210&gt; 20

&lt;211&gt; 562

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 20

```

aggagcaggt tggactggcc atccgaagca agattgcaga tggcagtgtg aagagagaag 60
acatattcta cacttcaaag ctttggagca attccatcg accagagttg gtccgaccag 120
ccttggaag gtcactgaaa aatcttcaat tggactatgt tgacctctat cttattcatt 180
ttccagtgtc tgtaaagcca ggtgaggaag tgatcccaa agatgaaaat ggaaaatac 240
tatttgacac agtggatctc tgtgccacat gggaggccat ggagaagtgt aaagatgcag 300
gattggccaa gtccatcggg gtgtccaact tcaaccacag gctgctggag atgatcctca 360
acaagccagg gctcaagtac aagcctgtct gcaaccaggg ggaatgtcat cttacttca 420
accagagaaa actgctggat ttctgcaagt caaaagacat tgttctgggt gcctatagtg 480

```



WO 03/057926

PCT/US03/00657

ctctgggatc ccatcgagaa gaaccatggg tggaccgaa ctccccggtg ctcttggagg 540  
 acccagtcct ttgtgccttg gc 562

<210> 21  
 <211> 721  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 626, 685, 696  
 <223> n = A,T,C or G

<400> 21  
 ggcacgagat gaggagcagg ttggactggc catccgaagc aagattgcag atggcagtgt 60  
 gaagagagaa gacatattct acacttcaaa gctttggagc aattcccatc gaccagagtt 120  
 ggtcccgacc agccttggaa aggtcactga aaaatcttca attggactat gttgacctct 180  
 atcttattca ttttccagtg tctgtaaagc caggtgagga agtgatcca aaagatgaaa 240  
 atggaaaaat actatctgac acagtggatc tctgtgccac atgggaggcc atggagaagt 300  
 gtaaagatgc aggattggcc aagtccatcg ggggtgtccaa cttcaaccac aggctgctgg 360  
 agatgatcct caacaagcca gggctcaagt acaagcctgt ctgcaaccag gtggaatgtc 420  
 atccttactt caaccagaga aaactgctgg atttctgcaa gtcaaaagac attgttctgg 480  
 ttgcctatag tgctctggga tcccatcgag aagaaccatg ggtggaccg aactccccgg 540  
 tgctcttggg ggaccagtc ctttgtgcct tggcaaaaa gcacaagcga accccaccct 600  
 gattgccttg cgctaccagc ttgcancgtg gggttgtggt cctggccaag agcttcaatg 660  
 agcacgcatc agacagaacg tgcangtgtt tgaatncagt tgacttcaga aggagatgaa 720  
 a 721

<210> 22  
 <211> 496  
 <212> DNA  
 <213> Homo sapiens

<400> 22  
 agatgataac cagaagtctg catttgaagt tcacaaaagt aatcaagctc aaacagttag 60  
 tgagaggcag aagaacagac ctaaactctg taaaaaagga aaaaatatta ggaagatga 120  
 tcctgtaaga atgttgcaaa ctggtgcaaa gaaattcgac ttcagtaatt tgagtagtag 180  
 gttagatgga gtcagatttg aaaatgaaaa aaattaatgt tattgccaag aactctgta 240  
 ataaactgaa gctaagtcag aaaaaatggt tgtttgctag atcccaatgg agaaaagtgt 300  
 gtaactgctc ctgctcaggt ctctgctctt caccataaag acattgctct gtctttggtt 360  
 gctgcaagtg atggagctac agtctgtgtt accacaaggg gagatattta cttacttgca 420  
 gactatcagt gcaagaagat ggcttctaaa cagttgaact tgaaaaaagt tcttgtgtct 480  
 gggggtcata tggaat 496

<210> 23  
 <211> 549  
 <212> DNA  
 <213> Homo sapiens

<400> 23  
 ctgcatttga agttcacaaa agtaatcaag ctcaaacagt tagtgagagg cagaagagca 60  
 gacctaaatc ttgtaaaaaa ggaaaaaata ttagggaaga tgatcctgta agaatggtgc 120  
 aaactggtgc aaagaaattc gacttcagta atttgagtag taggttagat ggagtcagat 180  
 ttgaaaatga aaaaaattaa tgttattgcc aagaacactg gtaataaact gaagctaagt 240  
 cagaaaaaat ggttgtttgc tagatcccaa tggagaaaag tgtgtaactg ctctcgtca 300  
 ggtctctgct cttcaccata aagacattgc tctgtctttg gttgctgcaa gtgatggagc 360  
 tacagtctgt gttaccacaa ggggagatat ttacttactt gcagactatc agtgcaagaa 420  
 gatggcttct aaacagttga acttgaaaaa agttcttgtg tctgggggtc atatggaata 480  
 caaggttgat cctgaacatt tgaagaaaaa tgggggtcaa aaaatttgca ttcttgcaat 540  
 ggatggagc 549

<210> 24

WO 03/057926

PCT/US03/00657

<211> 55  
 <212> DNA  
 <213> Homo sapiens

<400> 24  
 gtgtctgcct tcacaaatgt cattgtctac tcctagaaga accaaatacc tcaat 55

<210> 25  
 <211> 498  
 <212> DNA  
 <213> Homo sapiens

<400> 25  
 tccttattta ttttaacttca cccgagttcc tctgggtttc taagcagtta tggatgatgac 60  
 ttagcgtcaa gacatttgct gaactcagca cattcgggac caatatatag tgggtacatc 120  
 aagttcatct gacaaaatgg ggcagaagag aaaggactca gtgtgtgatc cggtttcttt 180  
 ttgctcgccc ctgttttttg tagaatctct tcatgcttga catacctacc agtattatc 240  
 ccgacgacac atatacatat gagaatatac cttatttatt tttgtgtagg tgtctgcctt 300  
 cacaaatgtc attgtctact cctagaagaa ccaaatacct caatttttgt ttttgagtac 360  
 tgtactatcc tgtaaataata tcttaagcag gtttgtttcc agcactgatg gaaaatacca 420  
 gtggtggggt ttttttttagt tgccacagtt gtatggttgc tgattattta tgacccgaaa 480  
 aatataattc ttctccta 498

<210> 26  
 <211> 325  
 <212> DNA  
 <213> Homo sapiens

<400> 26  
 gtcgctgcct ctggggggcgc tgtacaccgc ggccgctcgcg gcttttagtgc tgtacaagtg 60  
 tgtggggggg ggagatgaaa ctgcggttct ccaccaggag gcaagcaagc agcagccact 120  
 gcagtcagag caacagctgg cccagttgac acaacagctg gccagacag agcagcacct 180  
 gaacaacctg atggcccagc tggaccccct ttttgagccg tgtgactact ctggctggag 240  
 cccagcagga gcttctgaac atgaagctat ggaccatcca cgagctgctg caagatagca 300  
 agccggacaa ggatatggag gcttc 325

<210> 27  
 <211> 166  
 <212> DNA  
 <213> Homo sapiens

<400> 27  
 gaatccagca tcttaaagtt gcatatgtgt agcactaatg tttcttttta aatagttggg 60  
 ggaaaatgac ctagaaaacc aaattgcagt ttggtagcca aaattaactc ttggtttatt 120  
 tgtcctttgt gtgtgaaaag tcctactatt ccgtgctgca gacttc 166

<210> 28  
 <211> 501  
 <212> DNA  
 <213> Homo sapiens

<400> 28  
 tttttttttt tttttttttt tttttcgcag ctgaattaca tttactgtac aaagaacggt 60  
 tcggagagaa ccaggaaatgg cggagtgtct aacagcagcg cgggtagtgt tgatgccgtg 120  
 aatgcaggac catccaggtc ctcaaagtct gcgaggtttg ttcataatcc caaacaaggg 180  
 ccctgctggc agcaacagga cagggtggggc caggacaggg aagctggagc aggaggccag 240  
 tgtctttggg ggctgtggca gggccgctg cctgggggtc ccttactcat ctggtagttc 300  
 atgcaggcca cggccctcat ctcccaggaa cgggccatgg ggcgagtcca ctggtgccca 360  
 gtaacaccct ccgtgggacc accttgggaa gcatgtgccg cggagtccac cacggggggg 420  
 cctgggtccc gggagggtc cttctgcgtg ctggccatgt cgtgccgcac ggcctgagga 480  
 caggaggtag aggtgagcac c 501

WO 03/057926

PCT/US03/00657

<210> 29  
 <211> 149  
 <212> DNA  
 <213> Homo sapiens

<400> 29  
 cgtcccggag gtgcggtgtg gggcaccggg cggggccgcg ggaaccggcg ccccacggag 60  
 ctgctgctgt cagaccaacc ccgggcccc atcatcactg cgccgcgctt tcaggcgccg 120  
 agaactaccg ttcccggcat gccatgaaa 149

<210> 30  
 <211> 475  
 <212> DNA  
 <213> Homo sapiens

<400> 30  
 agcagtaaac agggctgcta tgccctgctct gtagtggtgg acggcgaagt aaagcattgt 60  
 gtcataaaca aaacagcaac tggctatggc ttgcccagagc cctataactt gtacagctct 120  
 ctgaaagaac tgggtgctaca ttaccaacac acctcccttg tgcagcacia cgactccctc 180  
 aatgtcacac tagcctacc agtatatgca cagcagaggc gatgaagcgc ttactctttg 240  
 atccttctcc tgaagttcag ccaccctgag gcctctggaa agcaaagggc tcctctccag 300  
 tctgatctgt gaattgagct gcagaaacga agccatcttt ctttgatgg gactagagct 360  
 ttctttcaca aaaaagaagt aggggaagac atgcagccta aggctgtatg atgaccacac 420  
 gttcctaagc tggagtgcct atcccttctt tttctttttt tctttggttt aattt 475

<210> 31  
 <211> 570  
 <212> DNA  
 <213> Homo sapiens

<400> 31  
 cttttttttt tttttttttt tactggcatc ctgtacattt acttttaaaa aaggataaca 60  
 aaaatgaata ttaacaaaaa tccgggacaa caatattttc aagcaacaaa aactgggggtg 120  
 ggggaagctta ttctgaaggt acatttaaaa ctgaaataac aacttaatga aaattaagaa 180  
 ttgcatagcg ctgtgaattt agccttcagc aaaacaaaac agaagctatt tggattgat 240  
 acaaatccat ctatttgata gttagtcac caatattatg tacatatttt atatactgaa 300  
 tgtcatttta agtcctggtt tccaaactcc atttttctgt tgctggggtt ttgttttttg 360  
 acaagttaaa cactttctgg cactttctat gacagaattt cttctgaaca tacatgaact 420  
 gacattctcc caaagcgtcc cttgtgagtg gacgcgcctt tctgctacat atcgttcatt 480  
 tgttacaaaa tgaataatc cacagtgcga tgtgtctggg tccaccgtgc acagcaacat 540  
 ccaggctaaa ccaggctgga ccaaacttc 570

<210> 32  
 <211> 645  
 <212> DNA  
 <213> Homo sapiens

<400> 32  
 tccgagcgtc gggagcctgt ggaagagaag agcgcgcggg cgacagttaa acaggcccga 60  
 ggcagagaaa ccgccctagc agctctcgcg cgcccgggtg aggcggcggg tgctgcggag 120  
 gtccgtgcac agactgcttt gcctgttggt gctcttcgga ggcggcgatc cccgaaggcg 180  
 agctgaaata cggctgcagg ctacaatttg cagccgacga ttaaggaaga cgacgagcgg 240  
 gagagggtgg ccaccctcat ggagcgcttg tgctcggatg gcttcgcatt tccccattac 300  
 tacattaaac cgtatcatct gaagaggatc cacagagctg tcttacgtgg taatctggag 360  
 aaactgaagt accttctgct cacgtattat gacgccaata agagagacag gaaggaaagg 420  
 actgccctac atttggcctg tgccactggc caaccggaaa tggtagatct cctgggtgtc 480  
 agaagatgtg agcttaacct ctgcgaccgt gaagacagga cacctctgat caaggctgta 540  
 caactgagggc aggaggcttg tgcaactctt ctgctgcaaa tggcgccgat ccaaatatta 600  
 cggatgtctt tggaaggact gctctgcact acgctgtgta taatg 645

<210> 33  
 <211> 572

WO 03/057926

PCT/US03/00657

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 33

```

ctaactgagt aacattcatg aaatgaggct ttctgtggcg gcgtagtggt tgggaattaga 60
aggtaattca gtagagtgta acttagagaa tattgcaagt gacacattga atcctgcccg 120
tcagggcacc ttttcctcag agcaatccgg ccacacgaat agaaggctgt cgtgaatcac 180
atcagatgta aaatcattcc ttctgtttac tcttttaatt ttcacccctt gcaggtagtg 240
caaattcaac ttcaaatatg gtgtagggtt tgctagattc catatTTTTT tcttggattt 300
ttgctaatta ttttttagcaa aaaatTTTTT ctcaagtggca ccctccctag tgtccatggg 360
ttagggccat gctggggaaa acggggccgt atttacacac gcgcaaaaca cccagagacg 420
gcacaaggag gttgaactca tgtttcagtt cgcgaaacatt gactccttac gaaagtcact 480
tcattctaac tagatgcgcc cacttctggt cattatTTTc tttgcatgat gtattgcttc 540
ttcacgTTTT gTTTTtattg agcacggagt ag 572

```

&lt;210&gt; 34

&lt;211&gt; 701

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

```

<222> 34, 41, 43, 52, 58, 72, 180, 204, 205, 211, 214, 228, 243,
253, 269, 271, 295, 315, 343, 429, 439, 457, 483, 517, 529,
546, 554, 555, 557, 560, 561, 565, 627, 632, 637, 644, 655,
659, 662, 672, 680, 689, 690, 698

```

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 34

```

ggcacgaggc taactgtgta acatttatga aatntgctct ntntggcggc gnaggggncg 60
gaatgagaag gnaattcagt agagtgtaac ttagagaata ttgcaaggga cacattgaat 120
cctgcccgtc agggcacctt ttccctcagag caatccggcc acacgaatag aaggctgcgn 180
gaatcacatc agatgtaaaa tcannccctc nggngactct ttttaattntc atcctttgca 240
ggnagggcaa atncaacttc aaatatggng naggttttgc tagattccat attnttttct 300
tggatttttg ctaantattt ttagcaaaaa atttttgctc agnggcaccc tccctagtgt 360
ccatgggtta gggccatgct ggggaaaacg ggccggtatt tacacacgcg caaaacaccc 420
agagacgna caaggaggnt gaactcatgt ttcagtncgc gaacattgac tccttacgaa 480
agncaactca ttctaactag atgcgcccac ttctggncat tattacgant gcatgaagga 540
ttgctncttc acgnntnggn nttantgagc acgggagtag aaattccagg gctggcttga 600
catcttccct gcatgctccc tcccagngga cngtccntcc cttncacatg agganctgnc 660
gnccatggtg gnttttctcn ttgggcctnn tgggactngg a 701

```

&lt;210&gt; 35

&lt;211&gt; 300

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 35

```

gctaactgag taacattcat gaaatgaggc tttctgtggc ggcgtagtgt ttggaattag 60
aaggtaattc agtagagtgt aacttagaga atattgcaag tgacacattg aatcctgccc 120
gtcagggcac cttttcctca gagcaatccg gccacacgaa tagaaggctg tcgtgaatca 180
catcagatgt aaaatcattc cttctgttta ctcttttaat tttcatcctt tgcaggtagt 240
gcaaattcaa cttcaaatat ggtgtagggt ttgctagatt ccatatTTTT ttcttggatt 300

```

&lt;210&gt; 36

&lt;211&gt; 374

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 36

```

tggtagcct gcaggtaccg gtccggaatt cccgggtcga cccacgcgtc cggaggggctc 60

```

WO 03/057926

PCT/US03/00657

```

ctggagaatg ggttacccca gttgtcttat ttaaattgggt acccatcaga ttttaatttt 120
atcttctctt tgagagcttg gtaataagaa gcacttaaat cactccaaag aagactttaa 180
aaagggagca gtgaaaaggt cttaataatt tattgattga attaagaaat actagctaata 240
taagaatctg agtctaaaca gcacagattt tttctttctg cttttaaatt gtgttttaa 300
aaaagagaca gggggctggg cgtggtggct cacgcctgta atcctagcac tttgggaggc 360
cgaggcgggt ggat 374

```

```

<210> 37
<211> 290
<212> DNA
<213> Homo sapiens

```

```

<400> 37
gaggggtcct ggagaaatgg gttaccccag ttgtcttatt taaatgggta cccatcagat 60
tttaatttta tcttctcttt gagagcttgg taataagaag cacttaaatc actccaaaga 120
agactttaa aagggagcag tgaaaaggtc ttaataattt attgattgaa ttaagaaata 180
ctagctaatt aagaatctga gtctaaacag cacagatttt ttctttctgc ttttaaattg 240
tgttttaaaa aaagagacag ggggctgggc gtggtggctc acgcctgtaa 290

```

```

<210> 38
<211> 405
<212> DNA
<213> Homo sapiens

```

```

<400> 38
gccctttcga gcgcccgccc gggcaggtac ctgggattac aggcaccac caccacgcct 60
ggctaatttt tttttgtatc ttttagtagg ttttgccatg ttggccaggc tggctttaa 120
ctcctacctc gtgatccacc cgcctcggcc ccccaaagtg ctaggaccac aggcgtgagc 180
caccacgcc agccccctgt ctctttttt aaaacacaat ttaaagcag aaagaaaaa 240
tctgtgctgt ttagactcag attcttaatt agctagtatt tcttaattca atcaataaat 300
tattaagacc ttttactgc tccttttta aagtcttctt tggagtgatt taagtgcctc 360
ttattaccaa gctctcaaag agaagataaa attaaaatct gatgg 405

```

```

<210> 39
<211> 736
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> 2, 3, 4, 5, 6, 7, 8, 9, 14, 15, 16, 17, 18, 19, 20, 21, 22,
23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36,
37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50,
51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64,
65
<223> n = A,T,C or G

```

```

<221> misc_feature
<222> 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80,
81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94,
95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107,
108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118
<223> n = A,T,C or G

```

```

<221> misc_feature
<222> 119, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636,
637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648,
649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660,
661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671
<223> n = A,T,C or G

```

```

<221> misc_feature

```

WO 03/057926

PCT/US03/00657

<222> 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683,  
684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695,  
696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707,  
708, 709, 710, 711, 712, 713, 714, 729, 736  
<223> n = A,T,C or G

&lt;400&gt; 39

```

gnnnnnnnna gacnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn 60
nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnna 120
cctgggatta caggcaccca ccaccacgcc tggctaattt tttttgtat ctttagtagg 180
gttttgccat gttggccagg ctggtcttta actcctacct cgtgatccac ccgcctcggc 240
ccccaaagt gctaggacca caggcgtgag ccaccacgcc cagccccctg tctctttttt 300
taaaacacaa tttaaagca gaaagaaaa atctgtgctg ttagactca gattcttaat 360
tagctagtat ttcttaattc aatcaataaa ttattaagac cttttcactg ctcccttttt 420
aaagtcttct ttggagtgat ttaagtgctt cttattacca agctctcaa gagaagataa 480
aattaaatc tgatgggtaa ccatttaaat aagacaactg gggtaacca tttctccagg 540
accctctct gcaacagaga gctattctct ttctttggcc tagtaaacct ctgctcttaa 600
cctttaaaaa aaaaaaaaaa gtaccnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn 660
nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnncatagt 720
ggttcctgng tgaaan 736

```

&lt;210&gt; 40

&lt;211&gt; 725

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

<222> 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 15, 16, 17, 18, 19, 20,  
21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34,  
35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48,  
49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62,  
63

&lt;223&gt; n = A,T,C or G

&lt;221&gt; misc\_feature

<222> 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78,  
79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92,  
93, 94, 95, 96, 97, 98, 605, 606, 607, 608, 609, 610, 611,  
612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623

&lt;223&gt; n = A,T,C or G

&lt;221&gt; misc\_feature

<222> 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635,  
636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647,  
648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659,  
660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670

&lt;223&gt; n = A,T,C or G

&lt;221&gt; misc\_feature

<222> 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682,  
683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694,  
695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706,  
707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 40

```

gnnnnnnnnn annnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn 60
nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnac ctgggattac aggcaccac 120
caccacgcct ggctaatttt tttttgtatc ttttagtagg ttttgccatg ttggccaggc 180
tggtctttaa ctctacctc gtgatccacc cgctcggcc ccccaaagtg ctaggaccac 240
aggcgtgagc caccacgccc agccccctgt ctcttttttt aaacacaat ttaaagcag 300

```

WO 03/057926

PCT/US03/00657

```

aaagaaaaaa tctgtgctgt ttagactcag attcttaatt agctagtatt tcttaattca 360
atcaataaat tattaagacc ttttcaactgc tcccttttta aagtcttctt tggagtgatt 420
taagtgcttc ttattaccaa gctctcaaag agaagataaa attaaaatct gatgggtaac 480
catttaaata agacaactgg ggtaacccat ttctccagga cccctctctg caacagagag 540
ctattctctt tctttggcct agtaaacctc tgctcttaac ctttaaaaaa aaaaaaaaag 600
taccnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn 660
nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnggt 720
atccg                                             725

```

<210> 41  
 <211> 474  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 243, 267  
 <223> n = A,T,C or G

```

<400> 41
ccgaaaaaaa agaaccattt ggatacatag gtatggctctg agctatgata tcaattggct 60
tcctaggggtt tatcgtgtga gcacaccata tatttacagt aggaatagac gtagacacac 120
gagcatattt cacctccgct accataatca tcgctatccc caccggcgtc aaagtattta 180
gctgactcgc cacactccac ggaagcaata tgaaatgatc tgctgcagtg ctctgagccc 240
tangattcat ctttcttttc accgtangtg gcctgactgg cattgtatta gcaaactcat 300
cactagacat cgtactacac gacacgtact acgttgtage ccacttccac tatgtcctat 360
caataggagc tgtatttgcc atcataggag gcttcattca ctgatttccc ctattctcag 420
gctacaccct agaccaaacc tacgccaaaa tccatttcac tatcatattc atcg      474

```

<210> 42  
 <211> 540  
 <212> DNA  
 <213> Homo sapiens

```

<400> 42
cataggtatg gtctgagcta tgatatcaat tggcttccta gggtttatcg tgtgagcaca 60
ccatatattt acagtaggaa tagacgtaga cacacgagca tatttcacct ccgctaccat 120
aatcatcgct atccccaccg gcgtcaaagt atttagctga ctgcgccacac tccacggaag 180
caatatgaaa tgatctgctg cagtgcctctg agccctagga ttcatctttc ttttaccctg 240
aggtggcctg actggcattg tattagcaaa ctcatcacta gacatcgtac tacacgacac 300
gtactacggt gtagcccact tccactatgt cctatcaata ggagctgtat ttgccatcat 360
aggaggcttc attcactgat ttcccctatt ctcaggctac accctagacc aaacctacgc 420
caaaatccat ttcactatca tattcatcgg cgtaaactca actttcttcc cacaacactt 480
tctcggccta tccggaatgc cccgacgtta ctcggactac cccgatgcat acaccacatg 540

```

<210> 43  
 <211> 587  
 <212> DNA  
 <213> Homo sapiens

```

<400> 43
gaccatgagt catttagaat agtgataaat agaatacaca gaatagtgat gaaattcaat 60
ttaaaaaatc acgttagcct ccaaaccatt taattcaaat gaacctatca actggatgcc 120
aactctggcg aatgtaggac ctctgagtggt ctgtataatt gttaattcaa atgaaattca 180
tttaaacagt tgacaaactg tcattcaaca attagctcca gtaaataaca gttatttcat 240
cataaaacag tcccttcaaa cacacaattg ttctgctgaa gagttgtcat caacaatcca 300
atgctcacct attcagttgc tctgtgggtca gtgtggctgc atagcagtggt attccatgaa 360
aggagtcatt ttagtgatga gctgccagtc cattcccagg ccaggctgtc gctggccatc 420
cattcagtcg attcagtcct aggcgaatct gttctgcccg aggcttgtgg tcaagcaaaa 480
attcagccct gaaatcaggc acatctgttc gttggactaa acccacaggt tagttcagtc 540
aaagcaggca acccccttgt gggcactgac cctgccactg ggggtcat .      587

```

WO 03/057926

PCT/US03/00657

<210> 44  
 <211> 622  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 491, 541, 556, 561, 568, 578, 585  
 <223> n = A,T,C or G

<400> 44  
 accatgagtc atttagaata gtgataaata gaatacacag aatagtgatg aaattcaatt 60  
 taaaaaatca cgtagcctc caaaccattt aattcaaatg aacctatcaa ctggatgcca 120  
 actctggcga atgtaggacc tctgagtggc tgtataattg ttaattcaaa tgaaattcat 180  
 ttaaacagtt gacaaactgt cattcaacaa ttagctccag taaataacag ttatttcac 240  
 ataaaacagt cccttcaaac acacaattgt tctgctgaag agttgtcatc aacaatccaa 300  
 tgctcaccta ttcagttgct ctgtggctcag tgtggctgca tagcgtggga ttccatgaaa 360  
 ggagtcattt tagtggtgga gctgccagtc cttcccgggc cgggtgtcgc tgggccatcc 420  
 ttcagtcggt tcgtcatagg cgatctgttc tgcccagggg ttgtggctcag gcaaaattca 480  
 gccctgaatt ngggcactct gtctcgttggg ctaaaccccc ggtagttca gtcaaggcgg 540  
 naaccctt gtgggnactg nctggcntt ggggtctngg cggnttggcc gttggggagg 600  
 tttggcccca cggcctctgt gg 622

<210> 45  
 <211> 340  
 <212> DNA  
 <213> Homo sapiens

<400> 45  
 aaggcaggaa tgtcaggcct ctgagcccaa gccaaagccat cgcaccccct gtgacttgca 60  
 cgtatacacc cagatggcct gaagtaactg aagaatcaca aaagaagtga aaaggccctg 120  
 cccgcctca actgatgaca ttccaccatg gtgatttgtt cctgccccac cttactgag 180  
 tgattaacc tgtgaatttc cttctcctgg ctcagaagct cccccactga gcaccttgtg 240  
 acccccgccc ctgcccacca gagaacaacc ccctttgact gtaatttccc atcaccttcc 300  
 caaatcctat aaaacggccc caccctatc tccctttgct 340

<210> 46  
 <211> 394  
 <212> DNA  
 <213> Homo sapiens

<400> 46  
 aaggcaggaa tgtcaggcct ctgagcccaa gccaaagccat cgcaccccct gtgacttgca 60  
 cgtatacacc cagatggcct gaagtaactg aagaatcaca aaagaagtga aaaggccctg 120  
 cccgcctca actgatgaca ttccaccatg gtgatttgtt cctgccccac cttactgag 180  
 tgattaacc tgtgaatttc cttctcctgg ctcagaagct cccccactga gcaccttgtg 240  
 acccccgccc ctgcccacca gagaacaacc ccctttgact gtaatttccc atcaccttcc 300  
 caaatcctat aaaacggccc caccctatc tccctttgct gactctctt ttggactcag 360  
 cccgcctgca cccagggtgaa ataaacagcc atgt 394

<210> 47  
 <211> 246  
 <212> DNA  
 <213> Homo sapiens

<400> 47  
 tagccctgat aggcgctatt ttctcctgg ttttgtatt gaaccgcaag gggataaaaa 60  
 agtggatgca taacatcaga gatgcctgca gggatcacat ggaagggtat cattacagat 120  
 atgaaatcaa tgcggaccgg gggattaaca aacctcagtt ctaactcgga tgtctgagaa 180  
 atattagagg acagaccaag gacaactctg catgagatgt agacttaagc tttatcccta 240  
 ctaggc 246



WO 03/057926

PCT/US03/00657

<210> 48  
 <211> 336  
 <212> DNA  
 <213> Homo sapiens

<400> 48  
 acatatttcc ttttcctcca ttggccacaa tgggctccaa acaaccacat gcagatttta 60  
 caaaaagaaa gttccaaaac tgctcaatca aaagaaagat tcaactctgt gagatgaata 120  
 cacacatcac aacgaagttt ctcagaatgc ttctgtgttg tttttatgtg aagatatttc 180  
 cttttccatc ataggcctct aagtgcacat actatccact tgcagattct acaaaaagag 240  
 tgtttcaaaa ctgctcaatc aaaagaaagt atcaactctg tgaggaaatg cacacatcac 300  
 aaagaagttt ctcagaatga ttctgtgtag ttttta 336

<210> 49  
 <211> 518  
 <212> DNA  
 <213> Homo sapiens

<400> 49  
 cagaagggtc tgcaagatgc tgttcttggc cactttcttt cccacctggg aaggcggcat 60  
 ctatgacttc attggggagt tcatgaaggc cagcgtggat gtgccagacc tgataggtct 120  
 aaaccttgtc atgtcccgga atgccggcaa gggagagtac aagatcatgg ttgctgccct 180  
 gggctgggcc actgctgagc ttattatgtc ccgctgcatt cccctatggg tcggagcccg 240  
 gggcattgag tttgactgga agtacatcca gatgagcata gactccaaca tcagtctggt 300  
 ccattacatc gtcgcgtctg ctccaggtctg gatgataaca cgctatgatc tgtaccacac 360  
 cttccggcca gctgtcctcc tgctgatgtt cctcagtgtc tacaaggcct ttgttatgga 420  
 gaccttcgtc cacctctgct cgctgggcag ttgggcagct ctactggccc gagcagtggg 480  
 aacggggctg ctggccctca acactttggc cctgtatg 518

<210> 50  
 <211> 326  
 <212> DNA  
 <213> Homo sapiens

<400> 50  
 tctgcaagat gctgttcttg gccactttct tteccacctg ggaaggcggc atctatgact 60  
 tcattgggga gttcatgaag gccagcgtgg atgtgccaga cctgataggt ctaaaccttg 120  
 tcatgtcccg gaatgccggc aaggagagat acaagatcat gggttgctgcc ctgggctggg 180  
 ccactgctga gcttattatg tcccgtgca tteccctatg ggctcggagc cggggcattg 240  
 agtttgactg gaagtacatc cagatgagca tagactccaa catcagtctg gtccattaca 300  
 tcgtcgcgtc tgctcaggtc tggatg 326

<210> 51  
 <211> 331  
 <212> DNA  
 <213> Homo sapiens

<400> 51  
 acattgaaaa aagtctagac aaactgaaag gcaataaatc ctatgtgaac atggacctct 60  
 ctccgggtgg agagtgcacg gaccacgctc taacaagtct cttccctaag actcattatg 120  
 ccgctggaaa agatgccaaa attttctgga tacctctgtc tcacatgcca gcagctttgc 180  
 aagacttttt attggtgaaa cagaaagcag agctggctaa tccaaggca gtgtgactca 240  
 gctaaccaca aatgtctcct ccaggctatg aaattggccg atttcaagaa cacatctcct 300  
 tttcaacccc attccttata tgctccaacc g 331

<210> 52  
 <211> 253  
 <212> DNA  
 <213> Homo sapiens

<400> 52

WO 03/057926

PCT/US03/00657

acagaaggga	tcgaagacaa	attgaaggga	gagatgatcg	atctccaaca	tggcagcctt	60
ttccttagaa	caccaaagat	tgtctctggc	aaagactcta	atgtaactgc	aaactccaag	120
ctggtcatta	tcacggctgg	ggcacgtcag	caagagggag	aaagccgtct	taatttggtc	180
cagcgtaacg	tgaacatatt	taaattcatc	attcctaata	ttgtaaaata	cagcccgaac	240
tgcaagttgc	tta					253

&lt;210&gt; 53

&lt;211&gt; 356

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 53

atcgaagaca	aattgaaggg	agagatgatg	gatctccaac	atggcagcct	tttccttaca	60
acaccaaaaga	ttgtctctgg	caaagactat	aatgtaactg	caaactccaa	gctggtcatt	120
atcacggctg	gggcacgtca	gcaagagggg	gaaagccgtc	ttaatttggt	ccagcgtaac	180
gtgaacatat	ttaaattcat	cattcctaaa	gttgtaaaat	acagcccga	ctgcaagttg	240
cttattgttt	caaatccagt	ggatatcttg	acctacgtgg	cttggaagat	aagtggtttt	300
cccaaaaacc	gtggttattg	aagaggttgc	aatctggatt	caaccgcgatt	ccgcta	356

&lt;210&gt; 54

&lt;211&gt; 570

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 54

ccgctgccgc	cgattccgga	tctcattgcc	acgcgcccc	gacgaccgcc	cgacgtgcat	60
tcccgattcc	ttttggttcc	aagtccaata	tggcaactct	aaaggatcag	ctgatttata	120
atcttctaaa	ggaagaacag	acccccaga	ataagattac	agttggtggg	gttgggtgctg	180
ttggcatggc	ctgtgccatc	agtatcttaa	tgaaggactt	ggcagatgaa	cttgctcttg	240
ttgatgtcat	cgaagacaaa	ttgaagggag	agatgatgga	tctccaacat	ggcagccttt	300
tccttagaac	accaaagatt	gtctctggca	aagactataa	tgtaactgca	aactccaagc	360
tggtcattat	cacggctggg	gcacgtcagc	aagagggaga	aagccgtctt	aatttggtcc	420
agcgtaacgt	gaacatattt	aaattcatca	ttcctaattg	tgtaaaatac	agcccgaact	480
gcaagttgct	tattgtttca	aatccagtgg	atatcttgac	ctacgtggct	tggaagataa	540
gtggttttcc	caaaaaccgt	gttattggaa				570

&lt;210&gt; 55

&lt;211&gt; 223

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 55

gccgctgccg	ccgattccgg	atctcattgc	cacgcgcccc	cgacgaccgc	ccgacgtgca	60
ttcccgattc	cttttggttc	caagtccaat	atggcaactc	taaaggatca	gctgatttat	120
aatcttctaa	aggaagaaca	gacccccag	aataagatta	cagttggtgg	ggttggtgct	180
gttggcatgg	cctgtgccat	cagtatctta	atgaaggact	tgg		223

&lt;210&gt; 56

&lt;211&gt; 337

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 56

gatgcccata	agatatggga	agctatgtta	tcaagccata	ttagatatca	agcattaata	60
tggaaataaa	ccagcctggt	tgggtgggctc	ttcacatgga	cgcgcatgaa	at ttgggtgcc	120
gtgactagga	tcgggggacc	tcccttggga	gatcaatccc	ctgtcctcct	gctctttgct	180
ccgtgagaaa	catgcaccta	tggcctcatg	ttctcaaacc	gaccaaacca	agaaacatct	240
caccaatttt	aatccgcct	ggcttgtgag	gccttttgac	cccaattcaa	gtcttttgat	300
accctgtgaa	ttgcacccat	actgccccaga	tggctag			337

&lt;210&gt; 57

&lt;211&gt; 473

WO 03/057926

PCT/US03/00657

<212> DNA  
 <213> Homo sapiens

<400> 57  
 aaagatcaaa gtgctgggct cgggtgcggt cggcacgggtg tataagggac tctggatccc 60  
 agaaggtgag aaagttaaaa ttcccgtcgc tatcaaggaa ttaagagaag caacatctcc 120  
 gaaagccaac aaggaaatcc tcgatgaagc ctacgtgatg gccagcgtgg acaaccccca 180  
 cgtgtgccgc ctgctgggca tctgectcac ctccaccgtg caactcatca cgcagctcat 240  
 gcccttcggc tgcctcctgg actatgtccg ggaacacaaa gacaatattg gctcccagta 300  
 cctgctcaac tgggtgtgtgc agatcgcaaa gggcatgaac tacttggagg accgtcgctt 360  
 ggtgcaccgc gacctggcag ccaggaacgt actggtgaaa acaccgcagc atgtcaagat 420  
 cacagatfff gggctggcca aactgctggg tgcggaagag aaagaatacc atg 473

<210> 58  
 <211> 487  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 7  
 <223> n = A,T,C or G

<400> 58  
 actatnccc aggacatggg accatgctca gctggttgct atcaagacct tgaaagacta 60  
 taacaacccc cagcaatgga tggaaattca acaagaagcc tccctaattg cagaactgca 120  
 ccacccaat attgtctgcc ttctaggtgc cgtcactcag gaacaacctg tgtgcatgct 180  
 ttttgagtat attaatcagg gggatctcca tgagttcctc atcatgagat cccacactc 240  
 tgatgttggc tgcagcagtg atgaagatgg gactgtgaaa tccagcctgg accacggaga 300  
 ttttctgcac attgcaattc agattgcagc tggcatggaa tacctgtcta gtcacttctt 360  
 tgtccacaag gaccttggca gctcgcaata ttttaatcgg agaggcaact ttcatgttaa 420  
 aggttttcag gacttggggg ctttccagag gaaatfttac tccgctgatt tactacaggg 480  
 tacccaa 487

<210> 59  
 <211> 532  
 <212> DNA  
 <213> Homo sapiens

<400> 59  
 atagaagtct gggaaaaaaa taaaaacaga atttgagaac cttggaccac tcctgtccct 60  
 gtagctcagt catcaaagca gaagtctggc tttgctctat taagattgga aatgtacact 120  
 accaaacact cagtccactg ttgagcccca gtgctggaag ggaggaaggc ctttcttctg 180  
 tgttaattgc gtaaaggcta caggggttag cctggactaa aggcatacct gtcttttgag 240  
 ctattcacct cagtagaaaa ggatctaagg gaagatcact gtagtttagt tctggtgacc 300  
 tgtgcaccta ccccttggaa atgtctgctg gtatttctaa ttccacaggt catcagatgc 360  
 ctgcttgata atatataaac aataaaaaca accttcaact cttcctattg taatcgtgtg 420  
 ccatggatct gatctgtacc atgaccctac ataaggctgg atggcacccc aggctgaggg 480  
 cccaatgta tgtgtggctg tgggtgtggg tgggagtgtg tctgctgagt aa 532

<210> 60  
 <211> 608  
 <212> DNA  
 <213> Homo sapiens

<400> 60  
 tacggccggg atagagtctg gaaaaaataa aaacagaatt tgagaacctt ggaccactcc 60  
 tgtccctgta gctcagtcac caaagcagaa gtctggcttt gctctattaa gattggaaat 120  
 gtacactacc aaacactcag tccactgttg agccccagtg ctggaaggga ggaaggcctt 180  
 tcttctgtgt taattgcgta gaggctacag gggttagcct ggactaaagg catccttgtc 240  
 ttttgagcta ttcacctcag tagaaaagga tctaaggga gatcactgta gtttagttct 300  
 gttgacctgt gcacctacc cttggaaatg tctgctggta tttctaattc cacaggtcat 360

WO 03/057926

PCT/US03/00657

cagatgcctg cttgataata tataaacaat aaaaacaacc ttcacttctt cctattgtaa 420  
 tcgtgtgcca tggatctgat ctgtaccatg accctacata aggctggatg gcaccccagg 480  
 ctgagggccc caatgtatgt gtggctgtgg gtgtgggtgg gagtgtgtct gctgagtaag 540  
 gaacacgatt ttcaagattc taaagctcaa ttcaagtgc acattaatga taaactcaga 600  
 tctgatca 608

<210> 61  
 <211> 480  
 <212> DNA  
 <213> Homo sapiens

<400> 61  
 tagatgacac tgatgattct caccagtctt atgagtctca ccattctgat gaatctgatg 60  
 aactggtcac tgatthtccc acggacctgc cagcaaccga agthtttact ccagttgtcc 120  
 ccacagtaga cacatatgat ggccgaggtg atagtgtggt ttatggactg aggtcaaaat 180  
 ctaagaagtt tcgcagacct gacatccagt accctgatgc tacagacgag gacatcacct 240  
 cacacatgga aagcagaggag ttgaatgggt catacaaggc catccccgtt gcccaggacc 300  
 tgaacgcgcc ttctgattgg gacagccgtg ggaaggacag ttatgaaacg agtcagctgg 360  
 atgaccagag tgctgaaacc cacagccaca agcagtcagc attatataag cggaaagcca 420  
 atgatgagag caatgagcat tccgatgtga ttgatagtca ggaactttcc aaagtcagcc 480

<210> 62  
 <211> 440  
 <212> DNA  
 <213> Homo sapiens

<400> 62  
 aggagatccg gcagatgggc actgagtgcc attacttcat ctgtgatgtg ggcaaccggg 60  
 aggaggtgta ccagacggcc aaggccgtcc gggagaagggt gggtgacatc accatcctgg 120  
 tgaacaatgc cgccgtggtc catgggaagg gcctaattgga cagtgatgat gatgccctcc 180  
 tcaagtccca acacatcaac accctgggccc agttctggac caccaaggcc ttcttgccgc 240  
 gtatgctgga gctgcagaat ggccacatcg tgtgcctcaa ctccgtgctg gcaactgtctg 300  
 ccattccccg tgccatcgac taccgcacat ccaaagcgtc agccttcgcc ttcatggaga 360  
 gcctgaccct ggggctgctg gactgtccgg gagtcagcgc caccacagtg ctgcccttcc 420  
 acaccagcac cgagatgttc 440

<210> 63  
 <211> 589  
 <212> DNA  
 <213> Homo sapiens

<400> 63  
 ggcaactgagt gccattactt catctgtgat gtgggcaacc gggaggagggt gtaccagacg 60  
 gccaaaggccg tccgggagaa ggtgggtgac atcaccatcc tggatgaaca tgccgcccgtg 120  
 gtccatggga agggcctaata ggacagtgat gatgatgccc tcctcaagtc ccaacacatc 180  
 aacaccctgg gccagttctg gaccaccaag gccttctctg cgcgtatgct ggagctgcag 240  
 aatggccaca tcgtgtgcct caactccgtg ctggcactgt ctgccatccc cggtgccatc 300  
 gactaccgca catccaaagc gtcagccttc gccttcatgg agagcctgac cctggggctg 360  
 ctggactgtc cgggagtcag cgccaccaca gtgctgccct tccacaccag caccgagatg 420  
 ttccagggca tgagagtcag gtttcccaac ctctttcccc cactgaagcc ggagacgggtg 480  
 gcccgaggga cagtggaagc tgtgcagctc aaccaggccc tcctcctcct cccatggaca 540  
 atgcatgccc tcgttatctt gaaaagcata cttccacagg ctgcactcg 589

<210> 64  
 <211> 313  
 <212> DNA  
 <213> Homo sapiens

<400> 64  
 gcatattgtg ctcggggaag ggthcttgtc attgtgggaa gtgcatttgt tctgctgaag 60  
 agtgggtatat ttctggggag ttctgtgact gtgatgacag agactgacgac aaacatgatg 120

WO 03/057926

PCT/US03/00657

gtctcatttg	tacaggggaat	ggaatatgta	gctgtggaaa	ctgtgaatgc	tgggatggat	180
ggaatggaaa	tgcatgtgaa	atctggcttg	gctcagaata	tccttaacaa	ttacatgaga	240
gaggtctgga	ttcttatttt	ttctgggcca	ttagaacata	taaatgcgaa	ggaaaccatg	300
tatattcacc	act					313

<210> 65  
 <211> 223  
 <212> DNA  
 <213> Homo sapiens

<400> 65						
tgtgaatcag	cagatggcat	attgtgctcg	gggaagggtt	cttgtcattg	tgggaagtgc	60
atttgttctg	ctgaagagtg	gtatatttct	ggggagttct	gtgactgtga	tgacagagac	120
tgcgacaaac	atgatggctc	catttgtaca	gggaatggaa	tatgtagctg	tggaaactgt	180
gaatgctggg	atggatggaa	tggaaatgca	tgtgaaatct	ggc		223

<210> 66  
 <211> 424  
 <212> DNA  
 <213> Homo sapiens

<400> 66						
ggtacagatt	tagagcctgt	aatcccagct	acttgggagt	ctaaggcaag	agaatccctt	60
gaacctggga	ggtggagatt	gcagtgagct	gagatcacac	cattgcccta	cagcctgggt	120
gacagtgaga	ctgccccaa	aaaaaacaaa	agagacagcc	ctagtgatct	tgtaagttgc	180
ctttgggtggg	tcagtctttc	cttttcttaa	agaatagtac	acattgacag	ccaggtagct	240
ctatgatcct	gttctataga	attcaaaaag	tcgacaacct	tcctttgttc	ctttctgttt	300
tctctgccta	cgttagttta	aattggcagt	gtctctgctg	gaataatccc	atctctcttc	360
ctggcttctg	ctgagatggc	tgattaaatc	cttgggtcac	accattatc	tctttatcaa	420
atgg						424

<210> 67  
 <211> 487  
 <212> DNA  
 <213> Homo sapiens

<400> 67						
ctgtaatccc	agctacttgg	gagtctaagg	caagagaatc	ccttgaacct	gggaggtgga	60
gattgcagtg	agctgagatc	acaccattgc	cctacagcct	gggtgacagt	gagactgccc	120
caagaaaaaa	caaaagagac	agccctagtg	atcttgtaag	ttgcccttgg	tgggtcagtc	180
tttctttttc	ttaaagaata	gtacacattg	acagccaggt	agctctatga	tcctgttcta	240
tagaattcaa	aaagtcgaca	accttccttt	gttcctttct	gttttctctg	cctacgttag	300
tttaaattgg	cagtgtctct	gctggaataa	tcccatctct	cttctctggc	tctgctgaga	360
tggctgatta	aatccttggg	tcacacccat	tatctcttta	tcaaattggt	gttcaggcta	420
ggctcagtg	ttcacgcctg	taatcccaac	actttgggag	actgaggagg	gcagatcact	480
tgagctc						487

<210> 68  
 <211> 492  
 <212> DNA  
 <213> Homo sapiens

<400> 68						
agtgcgcac	cgacgctcaa	acgcgcgctc	caaccgcag	cctcctcctg	cctcaccgcc	60
cgaagatggc	ggctctcaaa	ctcctctcct	ccgggcttcg	gctctgcgcc	tctgcccgcg	120
gatctggggc	aacctggtac	aagggatgtg	tttgttcctt	ttccaccagt	gctcatcgcc	180
ataccaagt	ttatacagat	ccagtagaag	ctgtaaaaga	catccctgat	ggtgccacgg	240
ttttggttgg	tggttttggg	ctatgtggaa	ttccagagaa	tcttatagat	gctttactga	300
aaactggagt	aaaaggacta	actgcagtca	gcaacaatgc	aggggttgac	aattttggtt	360
tggggctttt	gcttcgggtc	aagcagataa	aacgcattgt	ctcttcatat	gtgggagaaa	420
atgcagaatt	tgaacgacag	tacttatctg	gtgaattaga	agtggagctg	acaccacagg	480
gcacacttgc	tg					492

WO 03/057926

PCT/US03/00657

<210> 69  
 <211> 494  
 <212> DNA  
 <213> Homo sapiens

<400> 69  
 tttttttttt tttttttttc tccctttata aggcgatgta cataaatctg aggaatatgg 60  
 atgtcttctg gagcaaatgc tccaatatcc acaatttctt caacctctac cactgtgggt 120  
 tctgcagctt tgcacattgg caagttgaaa ttccttgac ttttctgaa aatcacgttt 180  
 cctgctcggg ccgccttcca ggctttcacc aaagcaaat cccctgtaat tgcttcctcc 240  
 aaaataaagt gctgaccatt gaactccctc acctctcttg gcttattggc aatggcaaca 300  
 ctgccatctt tgttgatatt gatgggcat cctccttctt gtaccagggt cccataacct 360  
 gttgggggtg aaaatgcagg aactccagcc ccgcctgac ggatcctctc agcaagtgtg 420  
 ccctgtgggtg tcagctccac ttctaattca ccagataagt actgtcgttc aaattctgca 480  
 ttttctccca cata 494

<210> 70  
 <211> 462  
 <212> DNA  
 <213> Homo sapiens

<400> 70  
 catgatgtat tacaaggagg ctttctggaa gaagaaggat tactgtggct gcatgatcat 60  
 tgaagatgaa gatgctccaa tttcaataac cttggatgac accaagccag atgggtcact 120  
 gcctgccatc atgggcttta ttcttgcccg gaaagctggg cgacttgcta agctacataa 180  
 ggaaataagg aagaagaaaa tctgtgagct ctatgccaaa gtgctgggat cccaagaagc 240  
 ttacatcca gtgcattatg aagagaagaa ctgggtgtgag gagcagtact ctgggggctg 300  
 ctacacggcc tacttccctc ctgggatcat gactcaatat ggaagggatga ttcgtcaacc 360  
 cgtgggcagg attttctttg cgggcacaga gactgccaca aagtggagcg gctacatgga 420  
 aggggcagtt gaggctggag aacgagcagc tagggaggct tt 462

<210> 71  
 <211> 626  
 <212> DNA  
 <213> Homo sapiens

<400> 71  
 catgatgtat tacaaggagg ctttctggaa gaagaaggat tactgtggct gctgatcatt 60  
 gaaaatgaag atgctcaatt tcaataacct tggatgacac caagccagat gggtcactgc 120  
 ctgccatcat gggcttcatt cttgcccgga aagctggctg acttgctaag ctacataagg 180  
 aaataaggaa gaagaaaatc tgtgagctct atgccaaagt gctgggatcc caagaagctt 240  
 tacatccagt gcattatgaa gagaagaact ggtgtgagga gcagtactct gggggctgct 300  
 acacggccta cttccctcct gggatcatga ctcaatatgg aaggggtgatt cgtcaaccgc 360  
 tgggcaggat tttctttgcg ggcacagaga ctgccacaaa gtggagcggc tacatggaag 420  
 gggcagttga ggctggagaa cgagcagcta gggaggctct aatgggtctc gggagggatga 480  
 ccgagaaaaga catctgggta caagaacctg aatcaaagga cgttccagcg gtagaaatca 540  
 cccacacctt ctgggaaagg aacctgccct ctgtttctgg cctgctgaag atcattggat 600  
 ttccacatca gtaactgccc tggggc 626

<210> 72  
 <211> 348  
 <212> DNA  
 <213> Homo sapiens

<400> 72  
 tgggtgaactg gtcattccatg aaaaagggtt ttactacatc tattcccaaa catactttcg 60  
 atttcaggag gaaataaaaag aaaacacaaa gaacgacaaa caaatgggtcc aatatattta 120  
 caaatacaca agttatcctg accctatatt gttgatgaaa agtgctagaa atagttgttg 180  
 gtctaaagat gcagaatatg gactctattc catctatcaa gggggaatat ttgagcttaa 240  
 ggaaaatgac agaatttttg tttctgtaac aatgagcac ttgatagaca tggaccatga 300  
 agccagtttt ttcggggcct ttttagttgg ctaactgacc tggaaaga 348

WO 03/057926

PCT/US03/00657

<210> 73  
 <211> 207  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 122, 123  
 <223> n = A,T,C or G

<400> 73  
 tcaactcagt ggaacacggt tctcccaaac agattttgta attccgaaaa ccacgcatgc 60  
 gcaaacatac gcatacactc ccatgttctt ggacagttta tagctaccat aacctggcat 120  
 tnnccaaaac ataccatggt agactcttgg atacacaagg taattttaga gccacattag 180  
 gatgaacctt ctgaaaaagt tatgcat 207

<210> 74  
 <211> 497  
 <212> DNA  
 <213> Homo sapiens

<400> 74  
 gagcttaagg aaaatgacag aatttttgggt tctgtaacaa atgagcactt gatagacatg 60  
 gaccatgaag ccagtttttt cggggccttt ttagttggct aactgacctg gaaagaaaaa 120  
 gcaataacct caaagtgact attcagtttt caggatgata cactatgaag atgtttcaaa 180  
 aatctgacc aaaacaaaca aacagaaaac agaaaacaaa aaaacctcta tgcaatctga 240  
 gtagagcagc cacacacaaa aaattctaca acacacactg ttctgaaagt gactcactta 300  
 tccaagaaa atgaaattgc tgaaagatct ttcaggactc tacctcatat cagtttgcta 360  
 gcagaaatct agaagactgt cagcttccaa acattaatgc aatggttaac atcttctgtc 420  
 tttataatct actccttgta aagactgtag aagaaagcgc aacaatccat ctctcaagta 480  
 gtgtatcaca gtagtag 497

<210> 75  
 <211> 275  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 96  
 <223> n = A,T,C or G

<400> 75  
 tgagcttaag gaaaatgaca gaatttttgt ttctgtaaca aatgagcact tgatagacat 60  
 ggaccatgaa gccagttttt tcggggcctt tttagntggc taactgacct tggaaagaaa 120  
 aagcaataac ctcaaagtga ctattcagtt ttcaggatga tacactatga agatgtttca 180  
 aaaaatctga ccaaaacaaa caaacagaaa acagaaaaca aaaaaacctc tatgcaatct 240  
 gagtagagca gccacaacca aaaaattcta caaca 275

<210> 76  
 <211> 530  
 <212> DNA  
 <213> Homo sapiens

<400> 76  
 gacagaaggg gcctctccgc cccgcgtcca gctcgcccag ctcgcccagc gtccgcccgc 60  
 cctcggccaa ggcttcaacg gaccacacca aatgcccac tcaaatggaa cacgccatgg 120  
 aaaccatgat gtttacattt cacaaattcg ctggggataa aggctactta acaaaggagg 180  
 acctgagagt actcatggaa aaggagtcc ctggattttt ggaaaatcaa aaagacctc 240  
 tggctgtgga caaataatg aaggacctgg accagtgtag agatggcaaa gtgggcttcc 300  
 agagcttctt ttcctaatt gcgggcctca ccattgcatg taatgactat tttgtagtac 360

WO 03/057926

PCT/US03/00657

acatgaagca gaagggaaag aagtaggcag aatgagcag ttcgctcctc cttgataaga 420  
 gttgtcccaa agggtcgctt aaggaatctg cccacacagct tccccatag aaggatttca 480  
 tgagcagatc aggacactta gcaaatgtaa aaataaaatc taacttcat 530

<210> 77  
 <211> 341  
 <212> DNA  
 <213> Homo sapiens

<400> 77  
 gcctctccgc cccgcgtcca gctcgcccag ctgcccagc gtccgcccgc cctcggccaa 60  
 ggcttcaacg gaccacacca aaatgccatc tcaaatggaa cacgccatgg aaacctgat 120  
 gtttacattt cacaaattcg ctggggataa aggctactta acaaaggagg acctgagagt 180  
 actcatggaa aaggagtcc ctggattttt ggaaaatcaa aaagaccctc tggctgtgga 240  
 caaaataatg aaggacctgg accagtgtag agatggcaaa gtgggcttcc agagcttctt 300  
 ttccctaatt gcgggcctca ccattgcatg taatgactat t 341

<210> 78  
 <211> 350  
 <212> DNA  
 <213> Homo sapiens

<400> 78  
 ggctctccg cccgcgtgc agctcgccca gctcgcccag cgccgcccgc gcctcggcca 60  
 aggcttcaac ggaccacacc aaaatgccat ctcaaatgga acacgccatg gaaacctatga 120  
 tgtttacatt tcacaaattc gctggggata aaggctactt acaaaggagg gacctgagag 180  
 tactcatgga aaaggagtcc cctggatttt tggaaaatca aaaagaccct ctggctgtgg 240  
 aaaaataat gaaggacctg gaccagtgtg gagatggcaa agtgggcttc cagagcttct 300  
 tttccctaatt tgcgggcctc accattgcat gcaatgacta tttttagta 350

<210> 79  
 <211> 171  
 <212> DNA  
 <213> Homo sapiens

<400> 79  
 acagaaggga caaagagatc tggacagaat cgccggacag gtggcagctg ccaacaagaa 60  
 gcattagaac aaacctatgct gggttaataa attgctcat tcgtaaaca aaaaaaaaaa 120  
 aaaaaaaaaa agtttttttt ttttcccccc attttttatt ttttttcccc c 171

<210> 80  
 <211> 389  
 <212> DNA  
 <213> Homo sapiens

<400> 80  
 tggcgtctgt ttctatggag gaaaacaaag caggagaggg gagagtgact gctgggtaag 60  
 gtcttcctcc acctcctttg catctttgct cacatgccag cttctcctgg gcttcacaga 120  
 ccaccaattt ataatttcca tttaaaactt ccattttatt tttttaattt ttatttattt 180  
 atttatttat tacgagatgg ggtttcgctc ttggtgccc aagattgcacc actgcaactgc 240  
 agcctgggtg acagagcgag actttgtcaa aaagaaagaa agaaagaagg aaaggaagga 300  
 aggaaggaag gaaggaagga aaagaaaaga aagggaagaa aaaaagaaaa agaaagaaag 360  
 aaagaaaaaa aaaaaaaagg ggggcccc 389

<210> 81  
 <211> 430  
 <212> DNA  
 <213> Homo sapiens

<400> 81  
 tgagataaca gtggtggagt ggaagtttgc gttggtagag aatgggggag ttaccgctg 60  
 ggaagaatgc agcaatagat tcctagaaac tggccatgag gataaagtgg ttcacgcatg 120



WO 03/057926

PCT/US03/00657

```

gtgggggatt cactgattca gtttgcatag taatggagaa gctgtagaac aatgtggaag 180
aagctgaggt tgtggaacac actgaataaa ataaaggcag tgtgactcca aattcagcca 240
tctgaattgt ttaaatttgc tagtggattt tgtctactgt gcagaaatat atatgtctaa 300
tgtgcagaaa tatatatgtg tgtatgtgtg tatatatatg cacacacaca cagataatgc 360
ttccagtgaa tgtgaacttc ttttcctgt ggcactgatt gacagacttg tgctgatcca 420
ttattacttt                                     430

```

<210> 82  
 <211> 556  
 <212> DNA  
 <213> Homo sapiens

```

<400> 82
tttttttttt tttttttttt ttttttttaa gatattaanaa ttcaggtttt attatttggt 60
cagttataat aatttaagtt aatatttgcg gtattctcag agcaaagatg tatttctgta 120
ccactgtcct gtataaattt gttaccacaag atagtactgt gtatgaaagg agagggaaga 180
gggtgacaga tggaaacgat tgctgtagga cagtccatct ggccagatgc ggtgggggag 240
gggagaagaa gtgggagaga gatggtccta cagatgctcc catgggtaaa tgatgggtgc 300
atccctccct gcagtcgggc tgtgcctgaa cttcacagtc ctctaagagg tgtcattcag 360
gccacctcac tcagcctatg cccaacccca ctcactttcc ctttccttat gggctgcccc 420
cgcaactgac ttccatgggtg attggttctc attaggccct ttgtttctac accagcctta 480
gatcattaag acaaagacgt acttgctacc ctcatagcac ataacaacgc ctggcagatg 540
aaaatcaaac aaaaag                                     556

```

<210> 83  
 <211> 543  
 <212> DNA  
 <213> Homo sapiens

```

<400> 83
tgcagtggac atgtcgggag ggacgggtcac agtccttgaa aagtcctctg atcaaaaggc 60
caactgaagc aatacttcta cgagaccaag tgcaatccca tgggttacac aaaagaaggc 120
tgcaggggca tagacaaaag gcattggaac tcccagtgcc gaactacca gtcgtacgtg 180
cgggccctta ccatggatag caaaaagaga attggctggc gattcataag gatagacact 240
tcttgtgtat gtacattgac cattaanaag ggaagatagt ggatttatgt tgtatagatt 300
agattatatt gagacaaaaa ttatctatct gtatatatac ataacagggt aaattattca 360
gttaagaaaa aaataatttt atgaactgca tgtataaatg aagtttatac agtacagtgg 420
ttctacaatc tattttattgg acatgtccat gaccagaagg gaaacagtca tttgcgcaca 480
acttaaaaag tctgcattac attccttgat aatgttgtgg tttgttgccg ttgccaagaa 540
ctg                                     543

```

<210> 84  
 <211> 242  
 <212> DNA  
 <213> Homo sapiens

```

<400> 84
cggcggcaga caaaaagact gcagtggaca tgtcgggagc gacggtcaca gtccttgaaa 60
aggtcctctg atcaaaaggc caactgaagc aatacttcta cgagaccaag tgcaatccca 120
tgggttacac aaaagaaggc tgcaggggca tagacaaaag gcattggaac tcccagtgcc 180
gaactacca gtcgtacgtg cgggccctta ccatggatag caaaaagaga attggctggc 240
ga                                     242

```

<210> 85  
 <211> 350  
 <212> DNA  
 <213> Homo sapiens

```

<400> 85
tttttttttt tttttttttt tttttttttt tttttttttt tttattatta attatcttct 60
ttattaatac tcacatgtaa cttttgcttt ttacacaaaa gtctgcttta gaagaatgcc 120
tcctcggctt atcatgcccc atggggcttt ttgtttctgg accacttccc ctttctccac 180

```

WO 03/057926

PCT/US03/00657

```

ccccaccccc acatccaaat tactcttaac atgttcacag ataccacgaa tattttgtaa 240
acaagatttg ggttactgga acttgatttc attaacatcc cacttcaaaa tggaaggcag 300
gtggaggaca gggtaagaaa taggagaaag aggacaagag aaggcaaaga 350

```

```

<210> 86
<211> 448
<212> DNA
<213> Homo sapiens

```

```

<400> 86
acagtttaag aagtgggtgac attttgcacg atgaatgacc tgacttttag ccaccaggta 60
ctctttaaac agttttcctt atcagaggcc ctctgtgct ggtgaccag catctgagtt 120
aggttccagc atgtaaagag ctgggagggc ggagaattct tagcatacat tcagacgttt 180
tttctgcaca ataataagtc catctgtcac ttgcattcca ctttttgta catagaaaga 240
gtctgaccct ttaatccaaa aggtcttttt acattgtgaa tgctgtggga aggcaatttc 300
tctgcacaca agaggctacg ttttggaggt gatgtatgtt atttgatgac tgaaaatgaa 360
ctgtaaagtc tcctagagta tattcctctg ctgaacaaaa ttaaacttca aaaaaatcta 420
acagtaacac acccctgctt gggaccct 448

```

```

<210> 87
<211> 586
<212> DNA
<213> Homo sapiens

```

```

<400> 87
aatttacaga acagtttaag aagtgggtgac attttgcacg atgaatgacc tgacttttag 60
ccaccaggta ctctttaaac agttttcctt atcagaggcc ctctgtgct ggtgaccag 120
catctgagtt aggttccagc atgtaaagag ctgggagggc ggagaattct tagcatacat 180
tcagacgttt tttctgcaca ataataagtc catctgtcac ttgcattcca ctttttgta 240
catagaaaga gtctgaccct ttaatccaaa aggtcttttt acattgtgaa tgctgtggga 300
aggcaatttc tctgcacaca agaggctacg ttttggaggt gatgtatgtt atttgatgac 360
tgaaaatgaa ctgtaaagtc tcctagagta tattcctctg ctgaacaaaa ttaaacttca 420
aaaaaatcta acagtaacac acccctgctt gggaccctag ctatatgcat tttatgtgac 480
cttgccatgc ttcagtgaac ataactaattc tatgtctagc acatggtgat ttcctatgta 540
ttctgggtat tctattaaag gaaactttga actatgtcaa aaaaaa 586

```

```

<210> 88
<211> 203
<212> DNA
<213> Homo sapiens

```

```

<400> 88
aatgaattta cagaacagtt taagaagtgg tgacattttg catgatgaat gacctgactt 60
ttagccacca ggtactcttt aaacagtttt ccttatcaga ggcctcctg tgctgggtgac 120
ccagcatctg agttaggttc cagcatgtaa agagctggga gggcggagaa ttcttagcat 180
acattcagac gttttttctg cac 203

```

```

<210> 89
<211> 548
<212> DNA
<213> Homo sapiens

```

```

<400> 89
tgctggaagg cattcgcac tgccggcgag ggcttccgca accggatcgt cttccaggag 60
ttccgccaac gctacgagat cctggcggcg aatgccatcc ccaaaggctt catggacggg 120
aagcaggcct gcattctcat gatcaaagcc ctggaacttg accccaactt atacaggata 180
gggcagagca aaatcttctt ccgaactggc gtcttgccc acctagagga ggagcgagat 240
ttgaagatca ccgatgtcat catggccttc caggcgatgt gtcgtggcta cttggccaga 300
aaggcttttg ccaagaggca gcagcagctg accgccatga aggtgattca gaggaactgc 360
gctgcctacc tcaagctgcg gaactggcag tgggtggaggc ttttcaccaa agtgaagcca 420
ctgctgcagg tgacacggca ggaggaggag atgcaagcca aggaggatga actgcagaag 480
accaaggagc ggcagcagaa ggcagagaat gagcttaagg agctggaaca gaagcactcg 540

```

WO 03/057926

PCT/US03/00657

cagctgac

548

&lt;210&gt; 90

&lt;211&gt; 595

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 90

tgcaatgggg	tgctggaagg	cattcgcac	tgccggcagg	gcttcccca	ccggatcgtc	60
ttccaggagt	tccgccaacg	ctacgagatc	ctggcggcga	atgccatccc	caaaggcttc	120
atggacggga	agcaggcctg	cattctcatg	atcaaagccc	tggaacttga	ccccactta	180
tacaggatag	ggcagagcaa	aatcttcttc	cgaactggcg	tcctggcca	cctagaggag	240
gagcgagatt	tgaagatcac	cgatgtcatc	atggccttcc	aggcgatgtg	tcgtggctac	300
ttggccagaa	aggcttttgc	caagaggcag	cagcagctga	ccgccatgaa	ggtgattcag	360
aggaactgcg	ctgcctacct	caagctgcgg	aactggcagt	ggtggaggct	ttcaccaaa	420
gtgaagccac	tgctgcaggt	gacacggcag	gaggaggaga	tgcaaggcaa	ggaggatgaa	480
ctgcagaaga	ccaaggagcg	gcagcagaag	gcagagaatg	agcttaagga	gctggaacag	540
aagcactcgc	agctgaccga	ggagaagaac	ctgctacagg	aacagctgca	ggcag	595

&lt;210&gt; 91

&lt;211&gt; 498

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 91

tgacagagca	agacttgggt	tcaaaaaaga	gaaacacagt	tggccctcca	tatctgagtt	60
tcacagacga	aaaatattca	gaagaaaaaa	aatcaatgg	ctgtatttgt	actaaacatg	120
cccaggcttt	ttttcttatt	gttatcccct	aaacaataca	acaactattt	ttatagcatt	180
tacattgtat	tagatgttat	aactactcta	aagaggattt	aaagtatatg	gaatgatgtg	240
cataggttat	atgcaaatac	tatactatth	atatcagggg	cttgagcatc	cttggatttt	300
ggtatgtgtg	ggaggctcctg	aaaccaatgt	cctgtggata	ctgaaggata	actgtactaa	360
tttgagatt	tctctctact	atgatcaaga	ttttcaaaca	ttacattgct	gattacatta	420
catcgttaca	ttgtgattct	ttccaagact	tgagataaag	tttgggaaga	agtaccactt	480
gtttcagttt	atgaaata					498

&lt;210&gt; 92

&lt;211&gt; 510

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 92

aaacacagtt	ggccctccat	atctgagttt	cacagacgaa	aatattcag	aagaaaaaaa	60
aatcaatggc	tgtatttgta	ctaaacatgc	ccaggctttt	tttcttattg	ttatccccta	120
aacaatacaa	caactattht	tatagcattt	acattgtatt	agatgttata	actactctaa	180
agaggattta	aagtatatgg	aatgatgtgc	ataggttata	tgcaaatact	atactattta	240
tatcagggac	ttgagcatcc	ttggattttg	gtatgtgtgg	gaggtcctga	aaccaatgtc	300
ctgtggatac	tgaaggataa	ctgtactaat	ttggagattt	ctctctacta	tgatcaagat	360
tttcaaacat	tacattgctg	attacattac	atcgttacat	tgtgattctt	tccaagactt	420
gagataaagt	ttgggaagaa	gttaccactt	gtttcagttt	atgaaataga	aaaaaaaaaa	480
aggggtaaag	catgaaataa	aaacctaaac				510

&lt;210&gt; 93

&lt;211&gt; 299

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 93

tggatcccc	gggctgcagg	aattcggcac	gagcagaagt	gcctgagacg	cggagacatg	60
gctggtgtta	aatggagcta	ttcaatagca	gtgacgcgct	ctcctcagcc	accaaagtc	120
cctgacacc	tccccagccc	ccacagataa	catcagctga	ggtttttttc	agtatgaacc	180
tgtcctaata	caattcctca	aagtgtgcac	aaaactaaag	aatataaata	aacaaaagaa	240
aggtgaaaa	aaaaaaaaaa	aaaaaaactc	gggggggggc	ccgggcccc	attccccct	299

WO 03/057926

PCT/US03/00657

<210> 94  
 <211> 234  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 163, 189, 219, 222, 225, 226, 228, 233  
 <223> n = A,T,C or G

<400> 94  
 cagaagtgcc tgagacgcgg agacatggct ggtgttaaat ggagctattc aatagcagtg 60  
 acgcgctctc ctcagccacc aaatgtccct gacaccctcc ccagcccca cagataacat 120  
 cagctgaggt ttttttcagt atgaacctgt cctaaatcaa ttnctcaaag tgtgcacaaa 180  
 actaaagant ataaataaac aaaagaaagg tgaaaaaana anaannanaa aana 234

<210> 95  
 <211> 534  
 <212> DNA  
 <213> Homo sapiens

<400> 95  
 tgaagcagaa gtacctggac tatgccagag tccccaatag caatccccct gaatatgagt 60  
 tcttctgggg cctgcgctct tactatgaga ccagcaagat gaaagtcctc aagtttgctt 120  
 gcaaggtaca aaagaaggat cccaaggaat gggcagctca gtaccgagag gcgatggaag 180  
 cagatttgag ggctgcagct gaggctgcag ctgaagccaa ggctagggcc gagattagag 240  
 ctgcaatggg cattgggctc ggctcggaga atgctgccgg gccctgcaac tgggacgaag 300  
 ctgatatcgg accctgggcc aaagcccgga tccaggcggg agcagaagct aaagccaaag 360  
 cccaagagag tggcagtgcc agcactgggt ccagtaaccag taccaataac agtgccagtg 420  
 ccagtgccag caccagtggg ggcttcagtg ctggtgccag cctgaccgcc actctcacat 480  
 ttgggctctt cgctggcctt ggtggagctg gtgccagcac cagtggcagc tctg 534

<210> 96  
 <211> 351  
 <212> DNA  
 <213> Homo sapiens

<400> 96  
 tttttttttt tttttttttt tttctgaaat ggcaaataga tttaatgcag agtgtcaact 60  
 tcaattgatt gatagtggct gcctagagtg ctgtgttgag taggtttctg aggatgcacc 120  
 ctggcttgaa gagaaagact ggcaggatta acaatatcta aaatctcact tgtaggagaa 180  
 accacaggca ccagagctgc cactgggtgct ggcaccagct ccaccaaggc cagcgaagag 240  
 cccaaatgtg agagtggcgg tcaggctggc accagcactg aagccaccac tggtgctggc 300  
 actggcactg gcactgttat tgggtactggg actggcacca gtgctggcac t 351

<210> 97  
 <211> 610  
 <212> DNA  
 <213> Homo sapiens

<400> 97  
 tttatgaatg ataaagatgt ttccggaaag atgaacaggt cacaatttga agaactctgt 60  
 gctgaacttc tgcaaaagat agaagtaccc ctttattcac tgttggaaca aactcatctc 120  
 aaagtagaag atgtgagtg c agttgagatt gttggaggca ctacacgaat tccagctgtg 180  
 aaggaaagaa ttgccaaatt ctttggaaaa gatattagca caaactcaa tgcagatgaa 240  
 gcagtagcca gaggatgtgc attacagtgt gcaatacttt ccccggcatt taaagttaga 300  
 gaattttccg tcacagatgc agttcctttt ccaatatctc tgatctggaa ccatgattca 360  
 gaagatactg aagggtgttca tgaagtcttt agtcgaaacc atgctgctcc tttctccaaa 420  
 gttctcacct ttctgagaag ggggcctttt gagctagaag ctttctattc tgatcccaaa 480  
 ggagttccat atccagaagc aaaaataggc cgctttgtag ttcagaatgt ttctgcacag 540  
 aaagatggag aaaaatctag agtaaaagtc aaagtgcgag tcaacacca tggcattttc 600

WO 03/057926

PCT/US03/00657

accatctcta 610

<210> 98  
 <211> 551  
 <212> DNA  
 <213> Homo sapiens

<400> 98  
 tttttttttt tttttttttt tagcattatc atcttaccct ctgtctcaat atacatgtta 60  
 agaaggtctt tccctaactg ccagaccaag ttggcttcaa taggcagctc aacattcacc 120  
 acctttatth tgggcttttt agcttctgga ggctgggtcaa cttttttttc atttgctttg 180  
 tcagcatctg ggattttggt ttcttctgag gtaagttcag gtgaaggggg agactgtgag 240  
 gtttggtgag catcagtttg tacctggggc tgtgttccag cttcactgtt gtcttgctgg 300  
 acatttttat cagtgtctgg gttttctggt ggtctctgat tcagacactc catgtcagct 360  
 tcagaagaca tttcattctc ctcagttggg actttctcca ccatagatgc cgtagagatg 420  
 gtgaaaatgc catgggtggt gactcgcact ttgactttta ctctagattt ttctccatct 480  
 ttctgtgcag aacattctg aactacaaag cggcctatth ttgcttctgg atatggaact 540  
 ccttggggat c 551

<210> 99  
 <211> 550  
 <212> DNA  
 <213> Homo sapiens

<400> 99  
 tgtggggctc tttttttgct ttggctttct ggtgagagag tgaggaagca ttctttcctt 60  
 cactaagttt gtctttcttg tcttctggat agattgattt taagagacta agggaattta 120  
 caaactaaag attttagtca tctgggtgaa aaggagactt taagattggt tagggctggg 180  
 cggggtgact cacatctgta atcccagcac tttgggaggg caaggcaggc agaacacttg 240  
 aaggagtctg agaccagcgt ggccaacgtg gtgaaacctt gtctctacta aaaatacaaa 300  
 aattgttttag ctctgttttt cataatagaa atagaaaagg taaaattgct tttcttctga 360  
 aaagaacaag tattgttcat ccaagaaggg tttttgtgac tgaatcagca gtgcctgccc 420  
 tagtcatagc tgtgcttcaa aaacctcagc atgattagtg ttggagcaaa acaaggaagc 480  
 aaagcaaata ctgtttttga aattctatct gttgcttgaa ctatthttgta ataattaaac 540  
 tttgatggtg 550

<210> 100  
 <211> 300  
 <212> DNA  
 <213> Homo sapiens

<400> 100  
 ctaagcttta agatttaaaa aatgttcaat gttgaaatth ctgtggggct ctatthtttg 60  
 tttggctttc tgggtgagaga gtgaggaagc attctttcct tcaactaagt tgtctttctt 120  
 gtcttctgga tagattgatt ttaagagact aagggaatth acaactaaa gatttttagtc 180  
 atctgggtgga aaaggagact ttaagattgt ttagggtctg ggggggtgac tcacatctgt 240  
 aatcccagca ctttggggagg ccaaggcagg cagaacactt gaaggagtct aagaccagcg 300

<210> 101  
 <211> 583  
 <212> DNA  
 <213> Homo sapiens

<400> 101  
 gtttgagtca tgagcatgct gttgtctaga gtgggcgggg atgacgtggt tggagtgggt 60  
 gcgctgctct gtacttgatt tttttgagtc tgaaattagc tttccaggct ggggcaggga 120  
 ggggagcaca ggtggatcag tactgcccc aagcgggtgga gctttggtgg tggatcaaat 180  
 actgctgccg cctgtctgca caaacatatt tctctcttcc agccctcag aagtgtattg 240  
 gaatatgtcg ataacaataa tgatgggtgt gaagatgatg atgatgtgg taattctggc 300  
 taccttattg ggtccaagct cccacaatt cgttgcaaaa agcactctac atacattctc 360  
 tttagtcctg atcaaaccac ctttcagagt aggatttagt gtcctatth aaagatgaag 420

WO 03/057926

PCT/US03/00657

gagctcgggc tcagagagag atcgtttaga cacacacaca actttggaat gaaacattta 480  
 cagccgggcg cgggtggcgcg tgccctgtagt cccagctact tgggaggctg aggctggagg 540  
 atcgcttgag tccaggagtt ctgggctgta gtgcgctatg ccg 583

&lt;210&gt; 102

&lt;211&gt; 517

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 102

cccggaaggc gacgggaagg agccgagctt gggatcatggc ggcgcccggc gcgctgctgg 60  
 tgatgggctg gagcggctcg gggaaatcca ccgtgggccc cctgctggca tctgagctgg 120  
 gatggaaatt ctatgatgct gatgattatc acccggagga aaatcgaagg aagatgggaa 180  
 aaggcatacc gctcaatgac caggaccgga ttccatggct ctgtaacttg catgacattt 240  
 tactaagaga tgtagcctcg ggacagcgtg tggttctagc ctgttcagcc ctgaagaaaa 300  
 cgtacagaga catattaaca caaggaaaag atgggtgtagc tctgaagtgt gaggagtcgg 360  
 gaaaggaagc aaagcaggct gagatgcagc tcctgggtgg ccatctgagc gggtcgtttg 420  
 aggtcatctc tggacgctta ctcaaaaagag agggacattt tatgccccct gaattattgc 480  
 agtcccagtt tgagactctg gagccccag cagctcc 517

&lt;210&gt; 103

&lt;211&gt; 590

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 103

tttttttttt tttttttttt ttttttacta gcgaagtttc atttatttgt gcaaatacag 60  
 gcatgagcaa gaatgttcta aacaatgtaa cgatttccag cattgattac agaatttctt 120  
 ctgatcattt gatttgggta tagatgaatt taaacttcaa ttaagcttg acttttaaaa 180  
 ctccccctct gcttcctgat gaaccagcat aattcctaaa attacaccta aacaagtctg 240  
 tcttgacaca ttgggggtttg cttttagaaa catttagaat ctattatggg caaggcggct 300  
 ggaacgaggt ttgggatggc acaatgattt atgcttagtt ctgtttggac cactgataca 360  
 aaatcattgt catttcattt ttagggtttc cataattgta gcaattatct ctgaaacatt 420  
 tttgtccaca cttatttggg taaagttttc tggagctgct gggggctcca gagtctcaaa 480  
 ctgggactgc aataattcag ggggcataaa atgtccctct cttttgagta agcgtccaga 540  
 gatgacctca aacgaccgac tcagatggac caccaggagc tgcattctcag 590

&lt;210&gt; 104

&lt;211&gt; 116

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 104

gacacttaca aattgctgct tgtccaaatc aggatccact gcaaggaaca acaggcctta 60  
 ttccactgct ggggattggt gtgtgggagc acgcttacta ccttcagtat aaaaat 116

&lt;210&gt; 105

&lt;211&gt; 574

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 105

ttcttttttt tttttttttt tttgcacaaa gcatttacta ttttcaatca cttgcccaat 60  
 aacaaaatgt ttagtaagaa attattcaga acattaagtt gtttatgaaa taagtgacta 120  
 agcaacatca agaaatgcta caatagagca gcttactgta ttctgcagta ctctatacca 180  
 ctacaaaaac agtcataaag agcttaacat actcagcata acgatcgtgg tctacttttt 240  
 gcaagccatg tatctttcag ttacattctc ccagttgatt acattccaaa tagcttttag 300  
 ataatcaggc ctgacatttt tatactgaag gtagtaagcg tgctcccaca caccaatccc 360  
 cagcagtgga ataaggcctg ttgttccttg cagtggatcc tgatttggac aagcagcaat 420  
 ttgtaagtgt ccccgttcct tattgaaacc aagccaacc caacctgagc cttggacacc 480  
 aacagatgca gccgtcagct tctccttaa cttgtcaaag gaaccaaagt cacgtttgat 540  
 ggcttccagc aactcccctt tgggttctcc acca 574

WO 03/057926

PCT/US03/00657

<210> 106  
 <211> 474  
 <212> DNA  
 <213> Homo sapiens

<400> 106  
 tttttttttt tttttttttt ttgggggggt gacagattct tttattaaca gtcaaaaact 60  
 tcacacaatt ggaaaataaa tgtttcttca atgaataatc aaacaaaaat tatccaggac 120  
 cttatagggt tttcagtatg taccaggctt gatgcacatc ttagaagaca ggacattatc 180  
 ttgctgggat cattagggta tgatcagcat aacgatcgtg gtttactttt tgcaagccat 240  
 gtatctttca gttacattct cccagttgat tacattccaa atagctttta gataatcagg 300  
 cctgacattt ttatactgaa ggtagtaagc gtgctcccac acatcaatcc ccagcagtgg 360  
 aataaggcct gttgttcctt gcagtggatc ctgatttggg caagcagcaa tttgtaagtg 420  
 tccccgttcc ttattgaaac caagccaacc ccaacctgag ccttggacac caac 474

<210> 107  
 <211> 526  
 <212> DNA  
 <213> Homo sapiens

<400> 107  
 gggaaaccgg ggcgcggcgc actgvcgagc cggccggact ccgctcagtt tccggtgcgg 60  
 cgaacaccaa agtccgggaa ctttaagcatt ttcggtttct agggttgtta cgaagctgca 120  
 ggagcgagat ggaggtggac gcaccgggtg ttgatggtcg agatggcttc cgggagcggc 180  
 gaggctttag cgagggaggg aggcagaact tcgatgtgag gcctcagctc ggggcaaatg 240  
 ggcttcccaa aactcctac tgggtggacc tctggctttt catccttttc gatgtgggtg 300  
 tgtttctctt tgtgtatttt ttgccatgac ttgttcgctg atatctaat taagaagttg 360  
 gttcttgagt gaattctgaa aatggctaca aacttcttga ataaagaaga caggactctc 420  
 aatagaagaa tttcacatct ccaagggacc ctccctttca ttttacactt tgttactaat 480  
 ttgcagaact ctattaattg ggtaggattt caccatttcc tagcta 526

<210> 108  
 <211> 344  
 <212> DNA  
 <213> Homo sapiens

<400> 108  
 gaaccgggg cgcggcgcac tgcgcatgcg gccggactcc gctcagtttc cgggtgcggcg 60  
 aacaccaaag tccgggaact taagcatttt cggtttctag gggtgttacg aagctgcagg 120  
 agcgagatgg aggtggacgc accgggtggt gatggtcgag atggtctccg ggagcggcga 180  
 ggcttttagcg agggagggag gcagaacttc gatgtgagge ctcagtctgg ggcaaattgg 240  
 cttcccaaac actcctactg gttggacctc tggcttttca tccttttcga tgggggggag 300  
 cttctctctg tgtatttctc gccatgacct gttcagtgac accc 344

<210> 109  
 <211> 332  
 <212> DNA  
 <213> Homo sapiens

<400> 109  
 gaaccgggg cgcggcgcac tgcgagggcg gccggactcc gctcagtttc cgggtgcggcg 60  
 aacaccaaag tccgggaact taagcatttt cggtttctag gggtgttacg aagctgcagg 120  
 agcgagatgg aggtggacgc accgggtggt gatggtcgag atggtctccg ggagcggcga 180  
 ggcttttagcg agggagggag gcagaacttc gatgtgagge ctcagtctgg ggcaaattgg 240  
 cttcccaaac actcctactg gttggacctc tggcttttca tccttttcga tgtggaggag 300  
 attctctttg tgtatttttt gccatgacct gt 332

<210> 110  
 <211> 545  
 <212> DNA  
 <213> Homo sapiens

&lt;400&gt; 110

```

cggctgcgag aagacgacag aaggggagtt tccggtgcg cgaacaccaa agtccgggaa 60
cttaagcatt ttcggtttct agggttgtta cgaagctgca ggagcgagat ggaggtggac 120
gcaccgggtg ttgatggtcg agatggtctc cgggagcggc gaggctttag cgagggaggg 180
aggcagaact tcgatgtgag gcctcagtct ggggcaaata ggcttcccaa acactcctac 240
tggttggacc tctggctttt catccttttc gatgtggtgg tgtttctctt tgtgtatttt 300
ttgcatgac ttgttcgctg atatctaaat taagaagttg gttcttgagt gaattctgaa 360
aatggctaca aacttcttga ataaagaaga caggactctc aatagaagaa tttcacatct 420
ccaagggacc cttcctttca ttttacactt tgttactaat ttgcagaact ctattaattg 480
ggtaggattt cacccattcc tagctaagtt cttaaaatta aaccctttgg ttcgtgttta 540
aaaac

```

&lt;210&gt; 111

&lt;211&gt; 329

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 111

```

gagtttccgg tgcggcgaac accaaagtcc gggaaacttaa gcattttcgg tttctagggt 60
tgttacgaag ctgcaggagc gagatggagg tggacgcacc ggggtgtgat ggtcgagatg 120
gtctccggga gcggcgaggc tttagcgagg gagggaggca gaacttcgat gtgaggcctc 180
agtctggggc aatgggctt cccaaacact cctactgggt ggacctctgg cttttcatcc 240
ttttcgatga ggaggtgtt ctctttgtgt attttttgcc atgacttgtt cgctgatatc 300
taaatttaca agttggatct tgagtgaaa

```

&lt;210&gt; 112

&lt;211&gt; 284

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 112

```

gcgcggcgcc tcgcctcggc cggcgcctat cagccgactt agaactgggt cggaccaggg 60
gaatccgact gtttaattaa aacaaagcat cgcgaaggcc cgcggcgggt gttgacgcga 120
tgtgatttct gccagtgct ctgaatgcca tattaataat aaactttaa atttaaaagg 180
gggcccgttt tctctgatc ccacccggtt aaaaaccctt ttgggggggg ggcccccccc 240
ccctcatggg gcgggggaaa aaggcctttt ttgggaaatt tggg

```

&lt;210&gt; 113

&lt;211&gt; 522

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 113

```

gttgcaggtc actgtagcgg gacttctttt ggttttcttt ctctttgggg cacctctgga 60
ctcactcccc agcatgaagg cgctgagccc ggtgcgcggc tgctacgagg cgggtgtgctg 120
cctgtcggaa cgcagtctgg ccatcgcccg gggccgaggg aagggcccg cagctgagga 180
gccgctgagc ttgctggacg acatgaacca ctgctactcc cgcctgcggg aactggtacc 240
cggagtcccg agaggcactc agcttagcca ggtggaaatc ctacagcgcg tcatcgacta 300
cattctcgac ctgcaggtag tcttgcccga gccagcccct ggaccccctg atggccccca 360
ccttcccac cagacagccg agcccgtctc ggaacttgtc atctccaacg acaaaaggag 420
cttttgccac tgactccggc cgtgtcctga cacctccaga acgcagggtc tggcggcccgt 480
tctgcctggg accccgggaa cctctcctgc cgggaagccgg ac

```

&lt;210&gt; 114

&lt;211&gt; 510

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 114

```

gttgcaggtc actgtagcgg gacttctttt ggttttcttt ctctttgggg cacctctgga 60
ctcactcccc agcatgaagg cgctgagccc ggtgcgcggc tgctacgagg cgggtgtgctg 120

```



WO 03/057926

PCT/US03/00657

cctgtcggaa	cgcagtctgg	ccatcgcccg	gggccgaggg	aagggcccg	cagctgagga	180
gccgctgagc	ttgctggacg	acatgaacca	ctgctactcc	cgcctgcggg	aactggtacc	240
cggagtcccg	agaggcactc	agcttagcca	ggtggaaatc	ctacagcgcg	tcatcgacta	300
cattctcgac	ctgcaggtag	tccctggccg	gccagcccct	ggaccccctg	atggccccc	360
ccttcccac	cagacagccg	agcccgctcc	ggaacttgtc	atctccaacg	acaaaaggag	420
cttttgccac	tgactcggcc	gtgtcctgac	acctccagaa	cgcaggtgct	ggcgcccgtt	480
ctgcctggga	ccccgggaac	ctctcctgcc				510

&lt;210&gt; 115

&lt;211&gt; 385

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 115

aatagtctgt	gtccaagaaa	ataagaatca	cgtcactctag	ctgtggacac	tgagcaaaaa	60
ggagcagcat	gctattaaga	tggttgagac	acacgagtga	acaaagatgg	gacaaactgt	120
gcttcgttca	agaagtttca	tcaagacccc	taccgcccc	cgctcctcag	ctctgtacag	180
taacttttagc	tttacaataga	gctgagataa	aaataaagct	ttcttataaaa	ttacattttt	240
ttccagtga	ttacttttgc	agtaaaaata	gctgctacat	aaatccctcc	tgatctctga	300
aaaggagttg	catatttcca	aaaataatat	tcttatttta	atcacacaga	agaacgtgga	360
gcacaggaag	gaaatggctg	gctgg				385

&lt;210&gt; 116

&lt;211&gt; 645

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 116

tacggccggg	tcttttaaaag	aggccgggaa	tacacatgac	tcaggtgctc	ttttgaaacg	60
actacaaaag	tctccatttt	gatcaaaaag	ttttctccga	atgaatggct	ccgatgcttt	120
ctctttccca	tcttaagtcc	ccgctctgtg	cctcagaata	gtctgtgtcc	aagaaaataa	180
gaatcacgtc	atctagctgt	ggacactgag	caaaaaggag	cagcatgcta	ttaagatggt	240
tgagacacac	gagtgaacaa	agatgggaca	aactgtgctt	cgttcaagag	gtttcatcaa	300
gacccctacc	gcccccgctc	cttcagctct	gtacagtaac	tttagcttta	catagagctg	360
agataaaaat	aaagctttct	tacaaattac	atTTTTTTTcc	agtgaattac	ttttgcagta	420
aaaatagctg	ctacataaat	ccctcctgat	ctctgaaaag	gagttgcata	tttccaaaaa	480
taatattctt	atTTTaatca	cacagaagaa	cgtggagcac	aggaaggaaa	tggttggtctg	540
gtcagggaga	ggtgagctgt	cggagaaaca	cagtaaaact	aaaaaataaa	atccattttg	600
tgtataaact	gacttaaacg	catgcaaaga	agtggaaaac	atatg		645

&lt;210&gt; 117

&lt;211&gt; 500

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 117

atgtcgaggg	aatgcagaaa	gagttaagga	aggcaggttg	tccttctatt	caggccactc	60
ttcgTTTTcc	atgtactgca	tgctgtttgt	ggcactttat	cttcaagcca	ggatgaaggg	120
agactgggca	agactcttac	gccccacact	gcaatttggg	cttggtgccc	tatccattta	180
tgtgggcctt	tctcgagttt	ctgattataa	acaccactgg	agcgatgtgt	tgactggact	240
cattcagggg	gctctgggtg	caatattagt	tgctgtatat	gtatcggatt	tcttcaaaaga	300
aagaacttct	tttaaagaaa	gaaaagagga	ggactctcat	acaactctgc	atgaaacacc	360
aacaactggg	aatcactatc	cgagcaatca	ccagccttga	aaggcagcag	ggtgcccagg	420
tgaggctggc	ctgTTTTcta	aaggaagatg	attgccacaa	ggcaagaaga	tgcatctttc	480
ttctggtgtg	acaagccttt					500

&lt;210&gt; 118

&lt;211&gt; 592

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 118

WO 03/057926

PCT/US03/00657

```

taaggaaggc aggttgtcct tctattcagg ccactcttcg ttttccatgt actgcatgct 60
gtttgtggca ctttatcttc aagccaggat gaagggagac tgggcaagac tcttacgccc 120
cacactgcaa tttggtcttg ttgcoqtatc catttatgtg ggcctttctc gagtttctga 180
ttataaacac cactggagcg atgtgttgac tggactcatt cagggagctc tggttgcaat 240
attagttgct gtatatgtat cggatttctt caaagaaaga acttctttta aagaaagaaa 300
agaggaggac tctcatacaa ctctgcatga aacaccaaca actgggaatc actatccgag 360
caatcaccag ccttgaaagg cagcagggtg cccagggtgag gctggcctgt tttctaaagg 420
aagatgattg ccacaaggca agaggatgca tctttcttcc tgggtgtacaa gcctttaaag 480
acttctgctg ctgctatgcc tcttgatgc acactttgtg tgtacatagt tacctttaac 540
tcagtggtta tctaatagct ctaaactcat taaaaaaact ccaagccttc ca 592

```

&lt;210&gt; 119

&lt;211&gt; 197

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 119

```

ggccgccctt tttttttttt tttttttttt ttttttttgg ggaaaagggg gtcttttttg 60
ggtccccccc ccccttttaa aaaaccccc taaaaaatgc ccccaaaaa aaaaattttt 120
ttttttgggg ggggggaaaa aaagggggaa aaaaccccc cccccgggg ggggaaaaaa 180
acccccccaa aaccccc 197

```

&lt;210&gt; 120

&lt;211&gt; 493

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 120

```

tttttttttt ttaatggtaa aaactttatt tactatttat aaatacattg caagacaaac 60
ttctcaaaaa tacttttccc cccaaaaagt taaaaaata aagaaaagct aataggtagg 120
cagaatgtct tgagaccct ctgttttcaa ggagagctct atgcagcgtg tgtccacacc 180
gaggtctgca gcagggcaga gtctccctga gcctgacttt gccagacct cttgggtttg 240
gcctccggga gagcagccca gtctctgggt cgacgtcctt tcctcagtca tggccacagt 300
tgtatcatat agcatctcta acatttcac taggattatc tagtatagat cttactatat 360
ttggggctat gttgtataca atgttaacaa gaacatatct tctctgcata tatgtgtgaa 420
ttataaagaa aagcatgaga atgactctaa gttcaacaaa catgggtgaa tctctatgtg 480
ctcccagtgt cct 493

```

&lt;210&gt; 121

&lt;211&gt; 265

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 121

```

tggtagcct gcagtaccgg tccggaattc ccgggtcgac ccacgcgtcc gcttctgtt 60
ttctgttgct aatgatgat aatgtgccat gatgttttat atatattcatt cagaaaaagt 120
tttatttttt aataacattc tattaacatt attttgcttg ccgctggcat gcctgaggaa 180
tgtatttggc tttgattaca cactaagttt ttgtaataaa tttgactcat taaaaacctt 240
tttttttaaa aaaaaaaaaa aaaaa 265

```

&lt;210&gt; 122

&lt;211&gt; 186

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 122

```

tttctgtttt ctgttgcaaa atgatgataa tgtgccatga tgttttatat atatcattca 60
gaaaaagttt tattttttta taacattcta ttaacattat tttgcttgcc gctggcatgc 120
ctgaggaatg tatttggcct tgattacaca ctaagttttt gtaataaatt tgactcatta 180
aaaacc 186

```

&lt;210&gt; 123

WO 03/057926

PCT/US03/00657

<211> 475  
 <212> DNA  
 <213> Homo sapiens

<400> 123  
 cagcccgtcc gcggcctctc cagccccggg ttcgcgctct cgactcccc gacccagtcc 60  
 gcggtgcccc ggcggtgat gccaaataca gccatgaaga aaaaggtgct gctgatgggg 120  
 aagagcgggt cggggaagac cagcatgagg tcgataatct tcgccaatta cattgctcgc 180  
 gacacccggc gcctgggggc caccattgac gtggaacact cccacgtccg attcctaggg 240  
 aacctggtgc tgaacctgtg ggactgtggc ggtcaggaca ccttcatgga aaattacttc 300  
 accagccagc gagacaatat cttccgtaac gtggaagttt tgatttacgt gtttgacgtg 360  
 gagagccgcg aactggaaaa ggacatgcat tattaccagt cgtgtctgga ggccatcctc 420  
 cagaactctc ctgacgcca aatcttctgc ctggtgcaca aaatggatct ggttc 475

<210> 124  
 <211> 122  
 <212> DNA  
 <213> Homo sapiens

<400> 124  
 agaagggttg ctggagccta ggacgtcgag gctgcagtga gatatgatca caccactgca 60  
 ctccagcatg actgagtgag accctgtctc aaaaaaaaaa aaaaaaaagt tttttttttt 120  
 tc 122

<210> 125  
 <211> 147  
 <212> DNA  
 <213> Homo sapiens

<400> 125  
 ggaggggaag gttggtaggt aagctgtaac agattgctcc agttgcctta aactacgcac 60  
 atagctaagt gaccaaactt cttgttttga tttgaaaaag tgcattgttt tcttgtccct 120  
 ccctttgatg aaacgttacc ctttgac 147

<210> 126  
 <211> 607  
 <212> DNA  
 <213> Homo sapiens

<400> 126  
 cagtgaagac ttgcatggtg ttttcactac tgtacacttg acctgcacat gcgagaaaaa 60  
 ggtggaatgt ttaaaacacc ataatcagct cagggatatt gccaatctga aataaaagtg 120  
 ggatgggaga gtgtgtcctt cagatcaagg gtactaaagt ccctttcgct gcagtgagtg 180  
 agaggtatgt tgtgtgtgaa tgtacggatg tgtgtttgcg tgcattgttt tgcattgtgtg 240  
 actgtgcatg ttatgtttct ccatgtgggc aaagatttga aatgtaagct tttatttatt 300  
 attttagaat gtgacataat gagcagccac actcggggga ggggaagggt ggtaggtaag 360  
 ctgtaacaga ttgctccagt tgccttaaac tacgcacata gctaagtgac caaacttctt 420  
 gttttgattt gaaaaaagtg cattgttttc ttgtccctcc ctttgatgaa acgttaccct 480  
 ttgacgggcc ttttgatgtg aacagatgtt ttctaggaca aactataagg actaatttta 540  
 aacttcaaac attccacttt tgtaatttgt tttaaattgt tttatgtata gtaagcacia 600  
 ctgtaat 607

<210> 127  
 <211> 463  
 <212> DNA  
 <213> Homo sapiens

<400> 127  
 attccaatta gccaggaatg gaaggatgag aagcgggatt tgctgactga aggacaaagt 60  
 tttagcagcc ttgatgaaga agccctggga tcccagacaca ggccagacct ggtccctagc 120  
 actccatcac tgtttgaagc tgcttccttg gcaaccacaa tttcatcttc ttccttatac 180  
 gtcaatgagc actatccaca cgacaggcct aactctatt caaacagcaa agggttacct 240

WO 03/057926

PCT/US03/00657

tccagttcaa	catttacctt	ggaagagggg	accatctact	tgaccgctga	gcccacact	300
ctggaagtgc	aggatgacaa	tgcttctgtg	cttgacgtct	atttataagt	gaaaatgggtg	360
atcacctaag	cacatggatg	agacgtgagc	acagttatgg	cagagaagtt	tctccgcacc	420
agaattatcc	acagcaactt	ggctgagccc	cactacacac	aga		463

<210> 128  
 <211> 592  
 <212> DNA  
 <213> Homo sapiens

<400> 128						
ccaattagcc	aggaatggaa	ggatgagaag	cgggatttgc	tgactgaagg	acaaagtttt	60
agcagccttg	atgaagaagc	cctgggatcc	cgacacaggc	cagacctggt	ccctagcact	120
ccatcactgt	ttgaagctgc	ttccttggca	accacaattt	catcttcttc	cttatacgtc	180
aatgagcact	atccacacga	caggcctaca	ctctattcaa	acagcaaagg	gttaccttcc	240
agttcaacat	ttaccttggg	agaggggacc	atctacttga	ccgctgagcc	caacactctg	300
gaagtgcagg	atgacaatgc	ttctgtgctt	gacgtctatt	tataagtga	aatgggtgatc	360
acctaagcac	atggatgaga	cgtgagcaca	gttatggcag	agaagtttct	ccgcaccaga	420
attatccaca	gcaacttggc	tgagccccac	tacacacaga	gaaatcatca	acctgactta	480
agagttttca	agatgtcaac	ttcaggctga	tcagcagatg	ggatgtgaaa	aatactaccc	540
tattctatca	tttgctggtg	cttgctgaac	tgtgaagaac	tgcatgaact	at	592

<210> 129  
 <211> 251  
 <212> DNA  
 <213> Homo sapiens

<400> 129						
caattagcca	ggaatggaag	gatgagaagc	gggatttgct	gactgaagga	caaagtttta	60
gcagccttga	tgaagaagcc	ctgggatccc	gacacaggcc	agacctggtc	cctagcactc	120
catcactggt	tgaagctgct	tccttggcaa	ccacaatttc	atcttcttcc	ttatacgtca	180
atgagcacta	tccacacgac	aggcctacac	tctattcaaa	cagcaaaggg	ttaccttcca	240
gttcaacatt	t					251

<210> 130  
 <211> 229  
 <212> DNA  
 <213> Homo sapiens

<400> 130						
gtagcagaag	cctcattcca	gaacccatct	ggccagagaa	gcagcagcat	cctgggggat	60
ggccgtgcat	ggggtgtaca	ctcgctatag	gcataggccc	ggcatggctg	tcgctggacg	120
ccagctgtgc	acaccagcc	acacctgctg	cacgccgctg	tagtgtgcgg	ctccgggcct	180
gagcattcgc	aaagctcgct	tctccagga	gcctcctctt	ggctttgga		229

<210> 131  
 <211> 316  
 <212> DNA  
 <213> Homo sapiens

<400> 131						
cgccataacc	tggtcagaag	tgtgcctgtc	ggcggggaga	gaggcaatat	caaggtttta	60
aatctcggag	aaatggcttt	cgtttgcttg	gctatcggat	gcttatatac	ctttctgata	120
agcacaacat	ttggctgtac	ttcatcttca	gacaccgaga	taaaagttaa	ccctcctcag	180
gattttgaga	tagtggatcc	cggatactta	ggttatctct	atgtgcaatg	gcaaccccca	240
ctgtctctgg	atcattttaa	ggaatgcaca	gtggaatatg	aactaaaata	ccgaaacatt	300
ggtagtga	catgga					316

<210> 132  
 <211> 270  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 37  
 <223> n = A,T,C or G

<400> 132  
 agtcgccata acctggtcag aagtgtgcct gtcggcnggg agagaggcaa tatcaaggtt 60  
 ttaaattctcg gagaaatggc tttcgtttgc ttggctatcg gatgcttata tacctttctg 120  
 ataagcacia catttggtg tacttcatct tcagacaccg agataaaagt taaccctcct 180  
 caggattttg agatagtgga tcccggatac ttaggttatc tctatttgca atggcaacc 240  
 ccactgtctc tggatcattt taaggaatgc 270

<210> 133  
 <211> 341  
 <212> DNA  
 <213> Homo sapiens

<400> 133  
 ttacatacgt ttttattact cggggggggac ctgtacgtca ccaatgccca gcttcacggg 60  
 ggcatgtagt gtgactcacg gctgaacaca aaatcactgt gaagcctgtg ctacagaagg 120  
 atgtccagtc gctgaggcca ggagagaggt gggcaggcct gggctctggca gtggagacgg 180  
 tcctccaggg agccgttggg caggaagccg tacaccaggc agtagaagcc gttctgagca 240  
 cagtagccag caaagtccac aatgtttggg tgacgaaacc tggacagctg ctccacctcg 300  
 gtcaggaagc tctgcttcac tgcagtccac tccaggtcag c 341

<210> 134  
 <211> 466  
 <212> DNA  
 <213> Homo sapiens

<400> 134  
 attatgtgat taatgatttg acagccgttc caatctccac gtctccagaa gagattccac 60  
 atgggagttt ctcagactga ttcttgacct ctcaatgaaa gtgttgaaac aggatgggaa 120  
 atattttaca caggggaact gtgtcaatct gacagaagca ctgtcgctct atgaagaaca 180  
 gctggggcgc ctgtattgtc ctgtggaatt ttcaaaggag atcgtctgtg tcccttcata 240  
 cttggaattg tgggtatttt acactgtttg gaagaaagct aaaccctgaa gatcagtagc 300  
 ccctaatcac atgtgctgca aatagccttc ctgacctcca tatgctgtac atgacatcaa 360  
 aatgagtcag gcaattgatt gtgaattcct taaagttttc ctttttttaa taattatttt 420  
 taatttaaaa aagcaaatgg aaaatgtata ttttgatgag cttagg 466

<210> 135  
 <211> 70  
 <212> DNA  
 <213> Homo sapiens

<400> 135  
 agttttcctt tttttaataa ttatttttaa tttaaaaaag caaatggaaa atgtatattt 60  
 tgatgagctt 70

<210> 136  
 <211> 442  
 <212> DNA  
 <213> Homo sapiens

<400> 136  
 tttttttttt tttttttcgg ctcagtataa agcttccttt tcttagggac catgcaaaga 60  
 ttctttgatt ctagaagtgc catttcatta tttctgtgac tcctgtctga atcatctgcc 120  
 aggtaactat cttgattttg tcttagcaat cgacttagca gaccattctt ggagaaagaa 180  
 aatcctgag gtgaaacagg ctccgattta aagtcttcgg aactggtaa ggcaggtgag 240  
 cttctctgca cagcaggagc catacccaag aatggggcac tcttagcatc atggctcaag 300  
 tgcacatttg tgtaggaat ttgtaagtca tcacaaggct cagattttat tttcaccatc 360

WO 03/057926

PCT/US03/00657

agtatttggt cacttaaagc tctctctgag tgttcctgag tactttcatc tcttaaggga 420  
 gttttctctt ttttttcact ct 442

<210> 137  
 <211> 275  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 244  
 <223> n = A,T,C or G

<400> 137  
 agaaaaatac aaaaaatctg cattaanaaat attaatcctg catgctggac atgtatggta 60  
 ataatttcta ttttgtacca ttttctgttt aacttttagca tggtgttgat catggatcat 120  
 actcccctgt ttcttgggtg agaagggatc gccagtttg aaactccggc ggctgcgtgc 180  
 ggggtttcag tcccactgta ggcttgtaaa taccgccccg ccaaaccgca tagagacgtg 240  
 gcancactga gggctttggt gggttatata cgtat 275

<210> 138  
 <211> 353  
 <212> DNA  
 <213> Homo sapiens

<400> 138  
 taagctcgga attcgggtcg aggaaaaata caaaaaatct gcattaanaaa tattaatcct 60  
 gcatgctgga catgtatggt aataatttct attttgtacc attttcttgt ttaacttttag 120  
 catggtgttg atcatggatc atactcccct tgtttctttg ggtgagaagg gatcgcagtt 180  
 tggaaactcc ggcggctgcg tgcgggggtt cagtcccagc tgtaggcttg taaatacccg 240  
 ccccgccaaa ccgcatagag aacgtggcag caagctgagg gtctttgttt gggtttatta 300  
 ttacggtatt tttgtttgta agttaaaaaa aaaaaaaaaa gggggggccc cca 353

<210> 139  
 <211> 559  
 <212> DNA  
 <213> Homo sapiens

<400> 139  
 gaatttggcc ctcgaggcca agaattcggc actagggcgc agaaggacca gcagaaagat 60  
 gccgaggcgg aagggtgag cggcacgacc ctgctgccga agctgattcc ctccggtgca 120  
 ggccgggagt ggctggagcg gcgcccgcgc accatccggc cctggagcac ctctgtggac 180  
 cagcagcgt tctcacggcc ccgcaacctg ggagagctgt gccagcgcct cgtacgcaac 240  
 gtggagtact accagagcaa ctatgtgttc gtgttctctg gcctcctcct gtactgtgtg 300  
 gtgacgtccc ctatgttget ggtggctctg gctgtctttt tcggcgctg ttacattctc 360  
 tatctgcgca ccttggagtc caagcttget ctctttggcc gagaggtgag cccagcgcac 420  
 cagtatgctc tggctggagg catctccttc cccttcttct ggctggctgg tgcgggctcg 480  
 gccgtcttct ggggtgctgg agccaccctg gtggctcatcg gctcccacgc tgccttccac 540  
 cagattgagg ctgtggacg 559

<210> 140  
 <211> 711  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 444  
 <223> n = A,T,C or G

<400> 140  
 tttttttttt tttttttttg acaccataa cagctttatt ttcaaaggcg ggatccctcc 60

WO 03/057926

PCT/US03/00657

```

ccgggcttgt gatgggacgg cgctgtgggc ccgagcagca aagccgtgca ggacaggcat 120
gggcaggggt ggggcagctg gcccgggagg ccggcaggtc ccaaaagaca cctcacacgg 180
gttccatctg cagctcctcc ccgtccacag cctcaatctg gtggaaggca gcgtgggagc 240
cgatgaccac caggggtggct cccagcacc agaaagacggc cgagcccgca ccagccagcc 300
agaagaaggg gaaggagatg cctccagcca gagcatactg atgctgctggg ctcacctctc 360
ggccaaagag cacaagcttg gactccaagg tgcgcagata gagaatgtaa caggcgccga 420
aaaagaccag ccagagccac cagncacata ggggacgtca ccacacagta caggatgagg 480
cccaggaaca cgaacacata gttgctctgg tagtactcca cgttgcgtac gaggcgctgg 540
cacagctctc ccaggttgcg gggccgtgag aagcgtgct ggtccacgaa ggtgctccag 600
gggccggatg gtcgcgcggc gccgctccag cactcccgg cctgcacccg gaggaatcag 660
cttcggcagc aaggtcgtgc cggtcagccc ttcgcctcgc gcattctttc t 711

```

<210> 141  
<211> 468  
<212> DNA  
<213> Homo sapiens

```

<400> 141
actcgcagtc cttcttctct ggcctctttg gaggctcatc caaaatagag gaagcatgcg 60
aatctacgc cagagcagca aacatgttca aatggccaa aaactggagt gctgctggaa 120
acgcgttctg ccaggctgca cagctgcacc tgcagctcca gagcaagcac gacgcagcca 180
cctgctttgt ggacgctggc aacgcattca agaaagccga cccccaagag gccattaact 240
gtttgatgcg agcaatcgag atctacacag acatgggccg attcacgatt gcggccaagc 300
accacatctc cattgctgag atctatgaga cagagttggt ggacatcgag aaggccattg 360
cccactacga gcagtctgca gactactaca aaggcgagga gtccaacagc tcagccaaca 420
agtgtctgct gaaggtggct ggttacgctg cgctgctgga gcagtatc 468

```

<210> 142  
<211> 203  
<212> DNA  
<213> Homo sapiens

```

<400> 142
cgcaaagtga agaactcgca gtccttcttc tctggcctct ttggaggctc atccaaaata 60
gaggaagcat gcgaaatcta cgccagagca gcaaactatg tcaaaatggc caaaaactgg 120
agtgtctgctg gaaacgcggt ctgccaggct gcacagctgc acctgcagct ccagagcaag 180
cacgacgcag ccacctgctt tgt 203

```

<210> 143  
<211> 212  
<212> DNA  
<213> Homo sapiens

```

<400> 143
tctgcgggga acagaacatg atcggcatga cgcccacggc catcgctgag cattacctgg 60
ctgaaacgga gcagcgggag aagttcgggc taaagaagcg ggagggggcc tgggagctca 120
tgaagaaggg gtacaccag caactggcct tcatacaacc cagctctgcc tttgcggcct 180
tcgtgaaacg ggcaccagc acctggctga cc 212

```

<210> 144  
<211> 226  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> 109, 128, 153, 161, 167, 174, 175, 178, 196, 202, 206, 211,  
213  
<223> n = A,T,C or G

```

<400> 144
gaagcacctc attgtgacct cctcgggctg cggggaacag aacatgatcg gcatgacgcc 60

```

WO 03/057926

PCT/US03/00657

cacgggtcatc gctgtgcatt acctggatga aacggagcag tgggagaant tcggcctaga 120  
 gaagcgggnag ggggccttgg agctcatcaa ganggggtac ncccagnagc tggnttnag 180  
 acaaccacgc tctgcntttg cnggcnttcg nanaaagggc cccac 226

<210> 145  
 <211> 97  
 <212> DNA  
 <213> Homo sapiens

<400> 145  
 ctgggctgcg gctgatgcgc atccgttttc ctgccctggg catgtgtctc tgaaaccgta 60  
 tggcgggacg tgggcaacgg gcactgctaa gggagggc 97

<210> 146  
 <211> 120  
 <212> DNA  
 <213> Homo sapiens

<400> 146  
 ggcacgagct catctgtttg cggatcagaa cccgagctgt gcttgtggct gcggctgcta 60  
 actggctgcg cacagggagc tgtcaccatg cctcactcgt acccagccct ttctgctgag 120

<210> 147  
 <211> 273  
 <212> DNA  
 <213> Homo sapiens

<400> 147  
 ggccgccctt tttttttttt ttttttttcc cccctttttt ttgggtggggg ggtttttcca 60  
 aggggttgaa tgggggtttt ttttcccccc ttttacccca gaaaaagggg gaggaaaaaa 120  
 ggaacccccg gggaaaattt tccttttttt ggaaaatttg ggggaccgca aaaagggggg 180  
 ggaaccccc cccctttttt ttttctttta aaaaattttt ttgcccccaa aaaaaggggg 240  
 gcccccttc ccccccttct tgggcccccg ggg 273

<210> 148  
 <211> 90  
 <212> DNA  
 <213> Homo sapiens

<400> 148  
 cacttcatgc aaggcacatg tgctgtcctg caggtctgca ggaaccgac ccagagagcc 60  
 cagcggcagg ccctggaaca cccgcctctg 90

<210> 149  
 <211> 463  
 <212> DNA  
 <213> Homo sapiens

<400> 149  
 gacttgtccg ggaatccggt gcttcggatc tactacacct cgaggcctgc tctgttcacc 60  
 ttgtgtgctg ggaatgagct cttctactgc ctctctacc tgttccattt ctctgagggg 120  
 cctttagttg gctctgtggg actgttccgg atgggctctt gggcactgc cccatcgcc 180  
 ttgctgaagt cgctcatcag cgctcatccac ctgatcacgg cgcgccgcaa catggctgcc 240  
 ctggacgcag cagaccgcgc caagaagaag tgacgctgga gccccgggtc ctggctgccc 300  
 acctgccctg ggagtcttgc tgtgccacac agctccccac cccctgctag gaggtcccag 360  
 tctcacgctt tcctcatgtg ttgttctacc tgctgggatg ggggtcagcc tctctttggg 420  
 gacgtcacgt tctctgggat cctgaggacc cgggcctcaa atc 463

<210> 150  
 <211> 693  
 <212> DNA



WO 03/057926

PCT/US03/00657

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; 285, 455, 597, 606, 636, 667, 686

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 150

```

ggcacgagga gagagagagt cacaaatga tcgacttggt cgggaatccg gtgcttcgga 60
tctactacac ctcgaggcct gctctgttca ccttggtggtc tgggaatgag ctcttctact 120
gcctcctcta cctggttccat ttctctgagg gacctttagt tggctctgtg ggactgttcc 180
ggatgggect ctgggtcact gccccatcg ccttgctgaa gtcgctcatc agcgtcatcc 240
acctgatcac ggccgcccgc aacatggctg ccctggacgc agcanaccgc gccaagaaga 300
agtgacgctg gagccccggg tcttggtgctc cacctgccct gggagtcttg ctgtgccaca 360
cagctcccca cccctgcta ggaggtccca gtctcacgcc ttctctatgt gttgttctac 420
ctgctgggat gggggtcagc ctctctttgg tgaentcagc ttcttctggg atcctgagga 480
ccgggcctca aatcagggag gatacccggg agggcccctt catccaagcg gtgcttctgg 540
ggtgccggga ccgggcagtg tcacacctg cctgctagtc ctgggggtcca gatctangga 600
ccttantgaa ggagtgggtg gaggcagttc tgaagnggat aactcgcca caacaagttg 660
ggacatncag aggaaactca actctnacgt ctt 693

```

&lt;210&gt; 151

&lt;211&gt; 300

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 151

```

gagagagaga gtcacaagat gatcgacttg tccgggaatc cgggtgcttcg gatctactac 60
acctcgaggc ctgctctggt caccttgtgt gctgggaatg agctcttcta ctgcctcctc 120
tacctgttcc atttctctga gggaccttta gttggctctg tgggactgtt ccggatgggc 180
ctctgggtca ctgccccat cgccttgctg aagtcgctca tcagcgtcat ccacctgatc 240
acggccgccc gcaacatggc tgccctggac gcagcagacc gcgccaagaa gaagtgacgc 300

```

&lt;210&gt; 152

&lt;211&gt; 300

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; 37, 41

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 152

```

gacttgtccg ggaatccggt gcttcggatc tactacnct ngaggcctgc tctgttcacc 60
ttgtgtgctg ggaatgagct cttctactgc ctctctacc tgttccattt ctctgagggga 120
cctttagttg gctctgtggg actgttccgg atgggcctct gggtcactgc ccccatcgcc 180
ttgctgaagt cgctcatcag cgctcatccac ctgatcacgg ccgcccgcaa catggctgcc 240
ctggacgcag cagaccgctc caagaagaag tgacgctgga gccccgggtc ctggctgccc 300

```

&lt;210&gt; 153

&lt;211&gt; 239

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; 168, 190, 203, 229

&lt;223&gt; n = A,T,C or G

WO 03/057926

PCT/US03/00657

<400> 153  
 gttgccctgc ctctggctcc agaacagaaa gggagcctca cgctggctca cacaaaacag 60  
 ctgacactga ctaaggaact gcagcatttg cacaggggag ggggggtgcct ccttcctaga 120  
 ggccctgggg gccaggctga ttggggggca gattgacata ggccccantc atcagatgtc 180  
 tgaattcan cacgggggta acntgggggg ttagggacta tttttaaant aggggtggc 239

<210> 154  
 <211> 113  
 <212> DNA  
 <213> Homo sapiens

<400> 154  
 gacacatttg ttacttcgtg agcaagcccg gaggctcgga gccccctgcc gtgttcacag 60  
 gtgacacctt gtttgtggct ggctgcgggga agttctatga agggactgcg gat 113

<210> 155  
 <211> 294  
 <212> DNA  
 <213> Homo sapiens

<400> 155  
 tttttttttt tttttttttt ttttggcggg aataaatact tgttaaactt ctcttataaa 60  
 tatgcattaa aacgtccgat aacacaagcc aagggtctga aaattaaggt taaatcaaga 120  
 ctgaatttcc cgcacggacc agcaggaaag ccagttacct aaaagagcct aatccccaaa 180  
 tccgctgaag gtgcagggcg gcctcagtcc cggggcatct tgaactggtc cttctccctg 240  
 cgcacggccc gcatggtggt caccgggtcc gtctcacctg cgtgctgctg cacc 294

<210> 156  
 <211> 419  
 <212> DNA  
 <213> Homo sapiens

<400> 156  
 tagccatggc aggacagctc ctggaccagg tctcataatg catgtggcac ttaggtccaa 60  
 gctctccaga gggtgaaagc tggagtctgt caatgtccta ctgagacagc acagccaacc 120  
 tagctagcaa catttgtttt agtctgaaca atatatactt atagaattca gtcaaagata 180  
 cacaatctga aacagcttca tgggggtggac tctaacagta gttgcaatgt tttagaatga 240  
 gacttacttc tctgctatct agatctgaac tccttggctt ctttacttag ttcaagcccc 300  
 agcctaggaa agccagttac ataaaagttg gctcaggagt cttagagctt tacctaaata 360  
 gagcccagaa aacggaggat ggggggtgggg cgccttcctg gaggtgacac ttgatgggg 419

<210> 157  
 <211> 357  
 <212> DNA  
 <213> Homo sapiens

<400> 157  
 cgtattgctg tcaagccgtg agctagccat ggcaggacag ctcttgacc aggtctcata 60  
 atgcatgtgg cacttaggtc caagctctcc agagggtgaa agctggagtc tgtcaatgtc 120  
 ctactgagac agcacagcca acctagctag caacatttgt tttagtctga acaatatata 180  
 cttatagaat tcagtcaaag atacacaatc tgaacagct tcatgggggtg gactctaaca 240  
 gtagttgcaa tgttttagaa tgagacttac ttctctgcta tctagatctg aactccttgg 300  
 cttctttact tagttcaagc cccagcctag gaaagccagt tacataaaag ttggctc 357

<210> 158  
 <211> 408  
 <212> DNA  
 <213> Homo sapiens

<400> 158  
 actttgtatc actgcagcgc ttcacacctt catcctgaag atatctggaa cattcgtagt 60  
 atctgcagca ccaccaatat ccaatgcaag aacggcaaga tgaactgcca tgagggtgta 120

WO 03/057926

PCT/US03/00657

gtgaagggtca	cagattgcag	ggacacagga	agttccaggg	cacccaactg	cagatatcgg	180
gccatagcga	gcactagacg	tggtgtcatt	gcctgtgagg	gtaaccaca	ggtgcctgtg	240
cactttgacg	gtagatgcc	accatgtagg	gattatcgcg	agtgggtgac	cttacctta	300
ctccttaaat	agcagtgagt	aatgcatttg	agctgcccc	ggctctgtct	cctcagctca	360
tttcttactc	tttttctcta	tataactcat	tctattaaat	acattgca		408

&lt;210&gt; 159

&lt;211&gt; 550

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 159

acaaggacgc	caaccccacc	tagatgcaaa	gcaggattca	aaagaacatc	tttgcgtttt	60
ctaccggctc	cccatcatcg	tactagggag	gaagaagcgg	gtgagaaaca	aaacttcttt	120
ccattgtcct	gcccttttct	gcggacttgt	tctgaggccg	aggcacctct	aagatactga	180
tggctctgca	gaggacccat	tcattgcttc	tgcttttgct	gctgaccctg	ctggggctgg	240
ggctgggtcca	gccctcctat	ggccaggatg	gcatgtacca	gcgattcctg	cggcaacacg	300
tgcaccctga	ggagacaggt	ggcagtgatc	gctactgcaa	cttgatgatg	caaagacgga	360
agatgacttt	gtatcactgc	aagcgcttca	acaccttcat	ccatgaagat	atctggaaca	420
ttcgtagtat	ctgcagcacc	accaatatcc	aatgcaagaa	cggcaagatg	aactgccatg	480
agggtgtagt	gaaggtcaca	gattgcaggg	acacaggaag	ttccagggca	cccaactgca	540
gatatcgggc						550

&lt;210&gt; 160

&lt;211&gt; 554

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 160

ccaacccac	ctagatgcaa	agcaggattc	aaaagaacat	ctttgcgttt	tctaccggct	60
ccccatcatc	gtactagggg	ggaagaagcg	ggtgagaaac	aaaacttctt	tccattgtcc	120
tgcccgtttc	tgccgacttg	ttctgaggcc	gaggcacctc	taagatactg	atggctctgc	180
agaggacca	ttcattgctt	ctgcttttgc	tgctgaccct	gctggggctg	gggctggctc	240
agccctccta	tggccaggat	ggcatgtacc	agcgattcct	gcggaacac	gtgcaccctg	300
aggagacagg	tggcagtgat	cgctactgca	acttgatgat	gcaaagacgg	aagatgactt	360
tgtatcactg	caagcgcttc	aacaccttca	tccatgaaga	tatctggaac	attcgtagta	420
tctgcagcac	caccaatc	caatgcaaga	acggcaagat	gaactgccat	gagggtgtag	480
tgaaggtcac	agattgcagg	gacacaggaa	gttccagggc	acccaactgc	agatatcggg	540
ccatagcgag	cact					554

&lt;210&gt; 161

&lt;211&gt; 313

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 161

aattacatct	tctttaaagc	caaatgggag	atgccctttg	acccccaaga	tactcatcag	60
tcaagggcg	tacttgagca	ggaaaaagtg	ggtaatggtg	cccatgatga	gtttgcatca	120
cctgactata	ccttacttcc	gggacgagga	gctgtcctgc	accgtgggtg	agctgaagta	180
cacaggcaat	gccagcgcac	tcttcatcct	ccctgatcaa	gacaagatgg	aggaagtgga	240
agccatgctg	ctcccagaga	ccctgaagcg	gtggagagac	tctctggagt	tcagagagat	300
aggtgagctc	tac					313

&lt;210&gt; 162

&lt;211&gt; 519

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 162

cggccgcct	ttttttttt	tttggcccc	cggggcccc	ttatttttaa	aaccccccc	60
ccccctggg	ggggggccc	gacctttta	gtttttttt	tttcccccg	gggaaaaaa	120
ggggggaaa	aaaaaaaaa	ttccccccc	tttttcccc	ccccaaaaa	gggggggacc	180

WO 03/057926

PCT/US03/00657

```

ccccgggggg ggggggggtt cccccggggg gaaaaaaaaa acccccgggg gcccccccc 240
aattttttcc cccccccct tggggggggg gggggggggg gggggggggg gggggcccc 300
cccccccccc cccccccat tttggggggg tgggttggg gaaattttt tttaaaaaa 360
aaaaaaaaaa atttgggggt ccccccccc cttttttcc ccccccttt ttccaaaag 420
ggaccccccc ccccccccc caaaaaaac ccccccccc ccccaaaaa aaccccccc 480
cgggggggga aaaaaaagg gggggggggg ggccccccc 519

```

<210> 163  
 <211> 422  
 <212> DNA  
 <213> Homo sapiens

```

<400> 163
aactaaaaac tacagtggaa gaaaggaagt cttcagaagc ctccccact gcgcaaagaa 60
gtaaagatca cagtaaggaa tgcataaacg ctgccccaga ttctccgtcc aaacagcttc 120
cagaccagat ttcatcttc agtggaatc catcagttga aatagttcat ggtattatgc 180
acctatataa gacaaataag atgacctct taaaagaaga tgtgcgggcg agtgccatgc 240
tgtgtattct cacagtcctt gctgcaatga ccagtcatga ccttatgaag tttgttgccc 300
catttaacga agtaattgaa caaatgaaaa ttatcagaga ctctactccc aaccaatata 360
tgggtgctgat aaagtttcgt gcacaggctg atgcggatag tttttatatg acatgcaatg 420
gc 422

```

<210> 164  
 <211> 626  
 <212> DNA  
 <213> Homo sapiens

```

<400> 164
tacggccggg tgcgagctct gcgggaagcg gttcctggat agtttgccgc tgagaatgca 60
cttactggct cattcagcgg gtgccaaagc ctttgtctgt gatcagtgcg gtgcacagtt 120
ttcgaaggag gatgccctgg agacacacag gcagacctat actggcactg acatggccgt 180
cttctgtctg ctgtgtggga agcgcaccca ggcgcagagc gcactgcagc agcacatgga 240
ggtccacgcg ggcgtgcgca gctacatctg cagtgagtgc aaccgcacct tccccagcca 300
cacggctctc aaacgccacc tgcgctcaca tacaggcgac caccctacg agtgtgagtt 360
ctgtggcagc tgcttccggg atgagagcac actcaagagc cacaacgca tccacacggg 420
tgagaaacc tacgagtgca atggctgtgg caagaagttc agcctcaagc atcagctgga 480
gacgcactat aggggtgcaca caggtgagaa gccctttgag tgtaggctct gccaccagcg 540
ctcccgggac tactcggcca tgatcaagca cctgagaacg cacaacggcg cctcgcctta 600
ccagtgcacc atctgcacag agtact 626

```

<210> 165  
 <211> 515  
 <212> DNA  
 <213> Homo sapiens

```

<400> 165
gatagtttgc ggctgagaat gcacttactg gctcattcag cgggtgccaa agcctttgtc 60
tgtgatcagt gcggtgcaca gttttcgaag gaggatgcc tggagacaca caggcagacc 120
cactactggc ctgacatggc cgtcttctgt ctgctgtgtg ggaagcgcac ccaggcgcag 180
agcgcactgc agcagcacat ggaggtccac gcgggcgtgc gcagctacat ctgcagtgag 240
tgcaaccgca ccttccccag ccacacggct ctcaaagcgc acctgcgctc acatacaggc 300
gaccaccct acgagtgtga gttctgtggc agctgcttcc gggatgagag cacactcaag 360
agccacaaac gcatccacac ggggtgagaaa ccctacgagt gcaatggctg tggcaagaag 420
ttcagcctca agcatcagct ggagacgcac tatagggtgc acacaggtga gaagcccttt 480
gagtgtaggc tctgccacca gcgctcccgg gacta 515

```

<210> 166  
 <211> 615  
 <212> DNA  
 <213> Homo sapiens

<400> 166

WO 03/057926

PCT/US03/00657

```

actgttcaag gtttattggg ggtttttagtt ggtataacac ttggatagtt ggttgcaattg 60
tttgtatgta gatcttttta cattatatgg taatgtacac tactgatata gttcacaaaa 120
taagatcctt tggaagaatt atgcacaaga catgatattg gatttataca ctggatccca 180
ggatgtgact cactgggaaa aaatggttga ctaggcatgt tcagtgaagg agccaggaag 240
ttatataaca cacggtaaac atccacctgg ctcaaggggc aaatgcagta cgtacagcat 300
tggcagtggg gcgtcagagg tggcagaact atttcacact aaccagttga agactacaca 360
agattaatac catccagcat caggatatag ctgtggattt taaaaacat tcttatttct 420
aacttcagga gttgatgttt ttcccagtc atcttaaaat attactgctt taatcacaga 480
tcagataaaa aggacaacat gcacaacctc cacctagaat cctgttgtag cctagacagt 540
gaaatgatat gacatcagaa gactttaaaa ttgcagctcc ttttggatcc cccaaagtgt 600
atctgcactc ttctt                                     615

```

<210> 167  
<211> 99  
<212> DNA  
<213> Homo sapiens

```

<400> 167
tttttttttt ccactgttca aggtttattg ggggttttag ttggtataac acttggatag 60
tgggttgcac tgtttgtatg taaatctttt tacattata                                     99

```

<210> 168  
<211> 612  
<212> DNA  
<213> Homo sapiens

```

<400> 168
tacggccggg acatgaagga gctaggagtg ggaatagctt tgcgaaaaat gggcgcaatg 60
gccaagccag attgtatcat cacttgtgat ggtaaaaacc tcaccataaa aactgagagc 120
actttgaaaa caacacagtt ttcttgtacc ctgggagaga agtttgaaga aaccacagct 180
gatggcagaa aaactcagac tgtctgcaac tttacagatg gtgcattggg tcagcatcag 240
gagtgggatg ggaaggaaag cacaataaca agaaaattga aagatgggaa attagtgggtg 300
gagtgtgtca tgaacaatgt cacctgtact cggatctatg aaaaagtaga ataaaaattc 360
catcatcact ttggacagga gttaattaag agaatgtcca agctcagttc aatgagcaaa 420
tctccatact gtttctttct ttttttttca ttactgtgtt caattatctt tatcataaac 480
attttacatg cagctatttc aaagtgtgct ggattaatta ggatcatccc tttggttaat 540
aaataaatgg gtttgtgcta atatatcttg tatgcattct ttaaacctta caggaaatta 600
gtgatgagtt tt                                     612

```

<210> 169  
<211> 410  
<212> DNA  
<213> Homo sapiens

```

<400> 169
gaaaacaaca cagttttctt gtaccctggg agagaagttt gaagaaacca cagctgatgg 60
cagaaaaact cagactgtct gcaactttac agatggtgca ttggttcagc atcaggagtg 120
ggatgggaag gaaagcacia taacaagaaa attgaaagat gggaaattag tgggtggagtg 180
tgtcatgaac aatgtcacct gtactcggat ctatgaaaaa gtagaataaa aattccatca 240
tcactttgga caggagttaa ttaagagaat gtccaagctc agttcaatga gcaaatctcc 300
atactgtttc tttctttttt tttcattact gtgttcaatt atctttatca taaacatttt 360
acatgcagct atttcaaagt gtgctggatt aattaggatc atccctttgg                                     410

```

<210> 170  
<211> 310  
<212> DNA  
<213> Homo sapiens

```

<400> 170
gctcgggaat tcgctcgagt gctgctcccc acccatggac aggagatcct gggttgggccc 60
tccctctgat gaccccagcc agatgagcga gtggggctca gcgtggccca tgggtgcctgt 120
cactcagcat tcccatgcct gatgtttacc aagtgctgtg ttggacactg gctttctcca 180

```

WO 03/057926

PCT/US03/00657

```

aacaggattt gcctcctcca cgctccctac acacctgaga tgtaaactgg cagtcagtgt 240
tactcagga cctaggatta gaaaatggca gagttggtgc tggatccacc ttgcacttct 300
atcaagccct                                     310

```

```

<210> 171
<211> 257
<212> DNA
<213> Homo sapiens

```

```

<400> 171
tgctgctccc cagcccatgg acaggagatc ctgggttggg cctccctctg atgaccccag 60
ccagatgagc gagtggggct cagcgtggcc catggtgcct gtcactcagc attcccatgc 120
ctgatgttta ccaagtgctg tgttggacac tgactttctc caaacaggat ttgcctcctc 180
cacgctccct acacacctga gatgtaaact ggcagtcagt gttcactcag gacctaggat 240
tagaaaatgg cagagtt                                     257

```

```

<210> 172
<211> 593
<212> DNA
<213> Homo sapiens

```

```

<400> 172
tgaagaacgg tgccacttac gaagccaaaa tcaaggatgt ggatgagaaa gcagacatcg 60
cactcatcaa aattgaccac cagggcaagc tgcctgtcct gctgcttggc cgctcctcag 120
agctgcggcc gggagagtgc gtggtcgcca tcggaagccc gttttccctt caaaacacag 180
tcaccaccgg gatcgtgagc accaccacgc gaggcggcaa agagctgggg ctccgcaact 240
cagacatgga ctacatccag accgacgcca tcatcaacta tggaaactcg ggaggcccgt 300
tagtaaactt ggacggtgaa gtgattggaa ttaacacttt gaaagtgaca gctggaatct 360
cctttgcaat cccatctgat aagattaaaa agttcctcac ggagtcccat gaccgacagg 420
ccaaaggaaa agccatcacc aagaagaagt atattggtat ccgaatgatg tcaactcacgt 480
ccagcaaagc caaagagctg aaggaccggc accgggactt cccagacgtg atctcaggag 540
cgtatataat tgaagtaatt cctgataccc cagcagaagc tgggtggtctc aag          593

```

```

<210> 173
<211> 304
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> 106, 113, 125, 137
<223> n = A,T,C or G

```

```

<400> 173
gggtcaaagt tgagctgaag aacggtgcca cttacgaagc caaatcaag gatgtggatg 60
agaaagcaga catcgactc atcaaaattg accaccaggg caagcngcct gtncctgctgc 120
ttggnegctc ctcaganctg cggccgggag agttcgtggt cgccatcgga agcccgtttt 180
cccttcaaaa cacagtcacc accgggatcg tgagcaccac ccagcggagg ggcaaagagc 240
tggggctccg caactcagac atggactaca tccagaccga cgccatcatc aactatggaa 300
actc                                     304

```

```

<210> 174
<211> 258
<212> DNA
<213> Homo sapiens

```

```

<400> 174
ggtcagaaga gttgtgcacg cagattagca ggccaaggtc tgagccacag cagcattttt 60
atttcagatt ttgataactg tttatatgtg ttgaaaacca aatgacatc tttttaaagc 120
ttatccataa aaaaaaatag atgtctttta tagtggaaaa acacatgggg aaaaaaatca 180
tctattttga tgcagcattt gataatgata aaacacctca cacctcactc tttatagtgc 240
acaaaatgaa tgaggtct                                     258

```

WO 03/057926

PCT/US03/00657

<210> 175  
 <211> 442  
 <212> DNA  
 <213> Homo sapiens

<400> 175  
 aagtagccgc tccgagtgga ggcgactggg ggctgaagag cgcgccgcc tctcgtccca 60  
 ctttccagggt gtgtgatcct gtaaaattaa atcttccaag atgatctggt atatattaat 120  
 tataggaatt ctgcttcccc agtctttggc tcatccaggc ttttttactt caattggtca 180  
 gatgactgat ttgatccata ctgagaaaga tctggtgact tctctgaaag attatattaa 240  
 ggcagaagag gacaagttag aacaaataaa aaaatgggca gagaagttag atcggctaac 300  
 tagtacagcg acaaaagatc cagaaggatt tgttgggcat ccagtaaag cattcaaatt 360  
 aatgaaacgt ctgaatactg agtggagtga gttggagaat ctggtcctta agggtatgtc 420  
 agatggcttt atctctaacc ta 442

<210> 176  
 <211> 611  
 <212> DNA  
 <213> Homo sapiens

<400> 176  
 gggctgaggt aggaagtagc cgctccgagt ggagggcact gggggctgaa gagcgcgccg 60  
 ccctctcgtc ccactttcca ggtgtgtgat cctgtaaaat taaatcttcc aagatgatct 120  
 ggtatatatt aattatagga attctgcttc cccagtcttt ggctcatcca ggctttttta 180  
 cttcaattgg tcagatgact gatttgatcc atactgagaa agatctggtg acttctctga 240  
 aagattatat taaggcagaa gaggacaagt tagaacaat aaaaaaatgg gcagagaagt 300  
 tagatcggct aactagtaca gcgacaaaag atccagaagg atttgttggg catccagtaa 360  
 atgcattcaa attaataaaa cgtctgaata ctgagtggag tgagttggag aatctggtcc 420  
 ttaaggggat gtcagatggc tttatctcta acctaaccat tcagagacag tactttccta 480  
 atgatgaaga tcaggttggg gcagccaaag ctctgttacg tctccaggat acctacaatt 540  
 tggatacaga taccatctca aagggtaatc ttccaggagt gaaacacaaa tcttttctac 600  
 ggctgaggac t 611

<210> 177  
 <211> 416  
 <212> DNA  
 <213> Homo sapiens

<400> 177  
 ttacaaactc ctgaaccata atattctcgt ctccacagac acatactcca taatttaaaa 60  
 ccaaagctt gtgagaaagc ttgctcatca tacttgctgc ttcaaagaaa gactctgaat 120  
 agtttctgtg tgctttatcc agaactttta aaagaacttc tgtttcatgc agttgaccgt 180  
 agtctcctac ttctcttctg acgcctttta aaatctttgt aaaagtgcct tggccaaggc 240  
 tttcattaaa tatcaaatct tcatttctga ttttgtgaaa caccatttgg ttcatatgag 300  
 taggcctctg taatgttggt gaggttggta catcagaaac accattcgtt ctgaagacta 360  
 gaaggtttga tttatctttt cggctttggg ggacagcatt tagtacacgg gaaaat 416

<210> 178  
 <211> 163  
 <212> DNA  
 <213> Homo sapiens

<400> 178  
 gggctttttt tttttgcaaa gttccaaatt tatgggtcgg gaaataaatc caaatttctc 60  
 attaaaaaac tcctttggaa aaacttgggc ccaaaagttt cccatccgaa ctcagccttt 120  
 tttgccccga tccccgactt ttttactcaa ggccccggaa ggc 163

<210> 179  
 <211> 285  
 <212> DNA  
 <213> Homo sapiens

<400> 179  
aaagttacaa atttattggt ctggaaataa atacaaatat ctcatthaaga aactcctctg 60  
gaaagacttg tgcacaatag tttcccatcc gtactcagcc tctcttgccc cgatccccga 120  
cttttctact caaggccagg gaaaggcctc caaggtgatg ggcggcagg aacgagtcac 180  
tgcctctcac gccacctgga aggctggact acttcctcct cccaactgcg gggttcccaga 240  
aatcctcggg tcccagtgge tgacttacia tattcaattc actct 285

<210> 180  
<211> 458  
<212> DNA  
<213> Homo sapiens

<400> 180  
tcgagccgcc gccgccctg tacaacaaca acaacaactg cgaggaaaat gagcagtctc 60  
tgccccgcc ggccggcctc aacagttcct ggggtggagct acccatgaac agcagcaatg 120  
gcaatgataa tggcaatggg aaaaatgggg ggctggaaca cgtaccatcc tcatcctcca 180  
tccacaatgg agacatggag aagattcctt tggatgcaca acatgaatca ggacagagta 240  
gttccagagg cagttctcac tgtgacagcc cttcgccaca agaagatggg cagatcatgt 300  
ttgatgtgga aatgcacacc agcagggacc atagctctca gtcagaagaa gaagttgtag 360  
aaggagagaa ggaagtcgag gctttgaaga aaagtgcgga ctgggtatca gactgggtcca 420  
gtagaccgca aacattcca cccaaggagt tccacttc 458

<210> 181  
<211> 329  
<212> DNA  
<213> Homo sapiens

<400> 181  
tttttttttt tttttttttt tttcttttta ataactatca actcaaactt agggaaactt 60  
gcctttgtct tgggggaaaa aaacaactag acaataaagc ttcttttaca tcatttgcta 120  
acctgatctc gttttaagag agagatggta gttatgttgc aagagtaaaa tttataccat 180  
gaatgataca ggtctagtct ggtggcacta attagagata atagcattgc tgacaaaatt 240  
ataatctgct ggtggcattt gcggaaaaga ggcccttgca aatttctaaa caacagtaaa 300  
ctctgttagg aaattctaaa atgtcttca 329

<210> 182  
<211> 527  
<212> DNA  
<213> Homo sapiens

<400> 182  
atacatgtaa cttcattatt ttaaaaatat ttttagaact ccaatactca ccctgttatg 60  
tcttgctagt ttaaattttg ctaattaact gaaacatgct taccagattc acactgttcc 120  
agtgtctata aaagaaacac tttgaagtct ataaaaata aaataattat aaatgtcatt 180  
gtacatagca tgtttatata tgcaaaaaac ctaatagcta attaactctgg aatgatgcaac 240  
attgtcctta attgatgcaa ataacacaaa tgctgcaaag aatctacta tatcccttaa 300  
tgaaatacat cattcttcat atatttctcc ttcagtccat tcccttaggc aatttttaat 360  
ttttaaaaat tattatcagg ggagaaaaat tggcaacgct attatatgta agggaaatat 420  
atacaaaaag aaaattaatc atagtcacct gactaagaaa ttctgactgc tagttgcat 480  
aaataactca atggaaatat tcctatggga taatgtattt taagtga 527

<210> 183  
<211> 530  
<212> DNA  
<213> Homo sapiens

<400> 183  
atacatatcat gtaacttcat tatttttaaaa atatttttag aactccaata ctcaccctgt 60  
tatgtcttgc taattttaat tttgctaatt aactgaaaca tgcttaccag attcacactg 120  
ttccagtgtc tataaaagaa acactttgaa gtctataaaa aataaaataa ttataaatat 180  
cattgtacat agcatgttta tatctgcaaa aaacctaata gctaattaat ctggaatatg 240



WO 03/057926

PCT/US03/00657

```

caacattgtc ctttaattgat gcaaataaca caaatgctca aagaaatcta ctatatccct 300
taatgaaata catcattctt catatatattc tccttcagtc cattccctta ggcaattttt 360
aatttttaaa aattattatc aggggagaaa aattggcaaa actattatat gtaagggaaa 420
tatatacaaa aagaaaatta atcatagtca cctgactaag aaattctgac tgctagttgc 480
cataaataac tcaatggaaa tattcctatg ggataatgta ttttaagtga 530

```

```

<210> 184
<211> 253
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> 98, 141, 162, 213
<223> n = A,T,C or G

```

```

<400> 184
tatacataca tgtaacttca ttattttaaa aatattttta gaactccaat actcaccctg 60
ttatgtcttg ctaattttaa ttttgctaata taactganac atgcttacca gattcacact 120
gttccagtgt ctataaaaga nacactttga agtctataaa anataaaata attataaata 180
tcattgtaca tagcatgttt atatctgcaa aanacctaata agctaattaa tctggaatat 240
gcaacattgt cct 253

```

```

<210> 185
<211> 421
<212> DNA
<213> Homo sapiens

```

```

<400> 185
ccgttgctgt cgatcccagc tccttgggag gctgaggcgg gagaattgcg ggaaggcggg 60
gacggaggtt gcagtgagcc gagatcgcac tgctgtaccc agcctgggcc acagtgcaag 120
actccatctc aaaaaaaaaa gaaaagaaaa agcctgttta atgcacaggt gtgagtggat 180
tgcttatggc tatgagatag gttgatctcg cccttaccce ggggtctggt gtatgctgtg 240
ctttcctcag cagtatggct ctgacatctc ttaaagtcc caacttcagc tgttgggaga 300
tggtgatatt ttcaacccta cttcctaaac atctgtctgg ggttccttta gtcttgaatg 360
tcttatgctc aattatttgg tgttgagcct ctcttccaca agagctcctc catgtttgga 420
t 421

```

```

<210> 186
<211> 377
<212> DNA
<213> Homo sapiens

```

```

<400> 186
cagctccttg ggaggctgag gcgggagaaat tgcttgaacc cggggacgga ggttgcagtg 60
agccgagatc gcaactgctgt acccagcctg ggccacagtg caagactcca tctcaaaaaa 120
aaaagaaaag aaaaagcctg tttaatgcac aggtgtgagt ggattgctta tggctatgag 180
ataggttgat ctgcacctta cccgggggtc tgggtgatgc tgtgctttcc tcagcagtat 240
ggctctgaca tctcttagat gtcccaactt cagctggttg gagatggtga tattttcaac 300
cctacttcct aaacatctgt ctgggggttc tttagtcttg aatgtcttat gctcaattat 360
ttggtggtga gcctctc 377

```

```

<210> 187
<211> 243
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> 228
<223> n = A,T,C or G

```

WO 03/057926

PCT/US03/00657

<400> 187  
gaggtattcc acctcctacc ggaatataat taaagggaga aatacactgt atgaagtata 60  
tgttgatact atgacatggt gccaacacct tgagaagcat tatttgtttc taataaaagt 120  
aatggctttg tcaatatatt ggtgggttta aaactttgct gcttttttac ataaagcctg 180  
tgcctttcct agaaagttaa gatgtaaagtg tattctcaca tgtaaantg aaagttcagg 240  
ggt 243

<210> 188  
<211> 544  
<212> DNA  
<213> Homo sapiens

<400> 188  
tattccacct cctaccggaa tataattaaa gggagaaata cactgtatga agtatatggt 60  
gatactatga catggtgcca acaccttgag aagcattatt tgtttctaataaaaagtaagt 120  
gctttgtcaa tatattggtg ggtttaaaac tttgctgctt ttttacataa agcctgtgcc 180  
ttcctagaa agttaagatg taaatgtatt ctacacatgta aatttgaaag ttcaggggtc 240  
tattatgaaa tgatacacat ttttaaataga accataattt ttttactaa gctgtttgcc 300  
ttccaaagtg tttacacctt aagccttaac atgtatcttc attcagaaaa cagttatatt 360  
gtcataccat agtaggaaga aaaaccttta tttggaatat acactactgt aagtttgtag 420  
agatcatata cctaccacct gtctttgctt aaagagcctt gattacataa atatgtagga 480  
aaaaacatat tgagttcaaa atttatatct aacattgttt atgttatgat ttttttttaa 540  
ttgc 544

<210> 189  
<211> 244  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> 210  
<223> n = A,T,C or G

<400> 189  
cacaaaaggt atgatcagca acttgcttgg gaaaggagcc gtggaccagc tgacacggct 60  
ggtgctggtg aatgccctct acttcaacgg ccagtggaag actcccttcc ccgactccag 120  
caccaccgc cgcctcttcc acaaatcaga cggcagcact gtctctgtgc ccatgatggc 180  
tcagaccaac aagttcaact atactgagtn caccacgccc gatggccatt atacgacatc 240  
ctgg 244

<210> 190  
<211> 209  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> 140  
<223> n = A,T,C or G

<400> 190  
gaacactggt gctcttggtg gacgggcccc gaggaattca gagttaaacc ttgagtgcct 60  
gcgctccgtga gaattcagca tggaatgtct ctactatttc ctgggatttc tgctcctggc 120  
tgcaagattg ccacttgatn ccgccaacag atttcatgat gtgctgggca atgaaagacc 180  
ttctgcttac atgagggagc acaatcaat 209

<210> 191  
<211> 254  
<212> DNA  
<213> Homo sapiens

WO 03/057926

PCT/US03/00657

<220>  
 <221> misc\_feature  
 <222> 85, 100, 143, 155, 182, 203, 229, 245, 254  
 <223> n = A,T,C or G

<400> 191  
 ctcccaacca agctctcttg aggatcttga aggaaactga attcaaaaag atcaaagtcc 60  
 tgggctccgg tgcgttcggc acgngtata agggactctn gatcccagaa ggtgagaaag 120  
 ttaaaattcc cgtcgtctatc aangaattaa gagangcaac atctccgaaa gccaacaagg 180  
 anatectcga tgaagcctac gtnatggcca gcgtggacaa cccccacgng tgccgcctgc 240  
 tgggnatctg tctn 254

<210> 192  
 <211> 484  
 <212> DNA  
 <213> Homo sapiens

<400> 192  
 tttttttttt ttttttttcc aaatatacct ctttgaaaga taaatttctg ctcaaagggga 60  
 caatattctt gctggatgcg ttctgtataa tgcttcacag tttgaagaca aaggaatgca 120  
 acttcccaaa atgtgcccga ggtggaagta cttcctggct agtcggtgta aacgttgcaa 180  
 aaccagtctg tgggtctaag agctaatacg ggcatggctg ttgggatgga ggacctgctg 240  
 tggcttggtc ctgggtatcg aaagagtctg gatttttagg gctcatacta tcctccgtgg 300  
 tcatactcca ataaattcac tgctttgtgg cgcgaccctt aggtattctg cattttcagc 360  
 tgtggagccc ttaaagatgc catttggtct ggcttccttg ggaaagaagt cctgctggta 420  
 gtcagggttg tccaggctaa tttggtggct gcctttctgg gccagtgagg cagggtgctc 480  
 gaat 484

<210> 193  
 <211> 660  
 <212> DNA  
 <213> Homo sapiens

<400> 193  
 tttaatcata tccaggagtt tgcaagaaac aggtgcttaa cactaattca cctcctgaac 60  
 aagaaaaatg ggctgtgacc ggaactgtgg gctcatcgct ggggctgtca ttggtgctgt 120  
 cctggctgtg tttggaggta ttctaatacc agttggagac ctgcttatcc agaagacaat 180  
 taaaaagcaa gttgtcctcg aagaaggtac aattgctttt aaaaattggg ttaaaacagg 240  
 cacagaagtt tacagacagt tttggatctt tgatgtgcaa aatccacagg aagtgatgat 300  
 gaacagcagc aacattcaag ttaagcaaac aggtccttat acgtacagag ttcgttttct 360  
 agccaaggaa aatgtaacc aggacgctga ggacaacaca gtctctttcc tgcagcccaa 420  
 tgggtgccatc ttcgaacctt cactatcagt tggaaacagag gctgacaact tcacagttct 480  
 caatctggct gtggcagctg catcccatat ctatcaaat caatttgctc aaatgatcct 540  
 caattcactt attaacaagt caaatcttc tatgttccaa gtcagaactt tgagagaact 600  
 gttatggggc tatagggatc catttttgag tttggttccg taccctgtta ctaccacagt 660

<210> 194  
 <211> 277  
 <212> DNA  
 <213> Homo sapiens

<400> 194  
 ctttaatcat atccaggagt ttgcaagaaa cagggtgctta aactaattc acctcctgaa 60  
 caagaaaaat gggctgtgac cggaactgtg ggctcatcgc tggggctgtc attggtgctg 120  
 tcctggctgt gtttgagggt attctaatac cagttggaga cctgcttata cagaagacaa 180  
 ttaaaaagca agttgtcctc gaagaaggta caattgcttt taaaattgg gttaaaacag 240  
 gcacagaagt ttacagacag ttttggtatc ttgatgt 277

<210> 195  
 <211> 457  
 <212> DNA

WO 03/057926

PCT/US03/00657

&lt;213&gt; Homo sapiens

&lt;400&gt; 195

```

gactggggtt ggggtgcagac gttggtgctt gggcgcttct ccgctgcgtg taggtgaagg 60
gggcttcctg accgagacat ggatttaggt gctattacaa aatactcagc attacacgcc 120
aagcccaatg gactgatcct tcaatacggg actgctggat ttcgaacgaa ggcagaacat 180
cttgatcatg tcatgtttcg catgggatta ttagctgtcc tgagggtcaaa acagacaaaa 240
tccactatag gagtcatggt aacagcgtcc cacaatcctg aggaagacaa tgggtgtaaaa 300
ttggttgatc ctttgggtga aatggtggca ccatcctggg aggaacatgc cacctgttta 360
gcaaagtctg aggaacaaga tatgcagaga gtgcttattg acatcagcga gaaagaagct 420
gtgaatctgc aacaagatgc ctttgtagtt attggta 457

```

&lt;210&gt; 196

&lt;211&gt; 361

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 196

```

tttttttttt tttttttttt tttgggcagg agaccatggt actttattca tttgtttaac 60
tttaaccatg ttcaataaac ttttcacctg tttgggtgagt tccacaaaag ccttagagag 120
tttctggtag taaccttcta tagttgcctt tccatatcgg ccaccctgtg ttcgacaata 180
caccatgtag tgcagctggg gtggtgtaa caagccataa tcatggaatt gacctcctag 240
aacagtcaca ccatctatta cagattgtga aagtttctca ctgctgggcc tggtatctct 300
accaataact acaaaggcat cttggtgcag attcacagct tctttctcgc tgatgtcaat 360
a 361

```

&lt;210&gt; 197

&lt;211&gt; 551

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 197

```

gagccgagct gatttgatcg aggagcgcgg ttaccggacg ggctgggtct atggtcgctc 60
cgcggggccgc tccgcccggct ggtgcttttt tatcagggca agctgtgttc catggcaggg 120
aacttttggc agatctccca ctatttgcaa tggattttgg ataaacaaga tctggtgaag 180
gagcgcctaaa aggatttaaa gtttctctca gaggaagaat attggaagtt acaaatattt 240
tttacaatg ttatccaagc attaggtgaa catcttaaat taagacaaca agttattgcc 300
actgctacgg tatatttcaa gagattctat gccagggtatt ctctgaaaag tatagatcct 360
gtattaatgg ctctacatg tgtgtttttg gcatccaaag tagaggaatt tggagtagtt 420
tcaaatacaa gattgattgc tgctgctact tctgtattaa aaactagatt ttcatatgcc 480
tttccaaagg aatttcctta taggatgaat catatattag aatgtgaatt ctatctgtta 540
gaactaatgg a 551

```

&lt;210&gt; 198

&lt;211&gt; 637

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 198

```

tacggccggg agtcgagccg agctgatttg atcgaggagc gcggttaccg gacgggctgg 60
gtctatggtc gctccgcggg ccgctccgcc ggctgggtgct tttttatcag ggcaagctgt 120
gttccatggc agggaaactt tggcagagct cccactattt gcaatggatt ttggataaac 180
aagatctggt gaaggagcgc caaaaggatt taaagtttct ctgagaggaa gaatattgga 240
agttacaaat attttttaca aatggtatcc aagcattagg tgaacatctt aaattaagac 300
aacaagttat tgccactgct acggtatatt tcaagagatt ctatgccagg tatttctctga 360
aaagtataga tcctgtatta atggctccta catgtgtgtt tttggcatcc aaagtagagg 420
aatttggagt agtttcaaat acaagattga ttgctgctgc tacttctgta ttaaaaacta 480
gattttcata tgcctttcca aaggaatttc cttataggat gaatcatata ttagaatgtg 540
aattctatct gttagaacta atggattggt gcttgatagt gtatcatcct tatagacctt 600
tgctccagta tgtgcaggac atgggcccaag aagacat 637

```

&lt;210&gt; 199

WO 03/057926

PCT/US03/00657

<211> 130  
 <212> DNA  
 <213> Homo sapiens

<400> 199  
 tagaaagcct ccacctggag tacaatgccc tcaaggtcct tcacaatggc accctggctg 60  
 agttgcaagg tctacccac attagggttt tcttggacaa caatccctgg gtctgcgact 120  
 gccacatggc 130

<210> 200  
 <211> 372  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 29, 100, 297, 298, 353, 357  
 <223> n = A,T,C or G

<400> 200  
 gtgctgtttg accaatggtc atgtggccna gattggggac ttcgggctgg ctagggacat 60  
 catgaatgac tccaactaca ttgtcaaggg caatgccgcn ctgcctgtga agtggatggc 120  
 cccagagagc atctttgact gtgtctacac gggttcagagc gacgtctggt cctatggcat 180  
 cctcctctgg gagatcttct cacttgggct gaatccctac cctggcatcc tggatgaacag 240  
 caagttctat aaactgggta aggatggata ccaaattggc cagcctgcat ttgcccnaa 300  
 gaatatatac agcatcatgc aggctgtctg ggcttgggag cccacccaca ganccanctt 360  
 ccagcagatc tg 372

<210> 201  
 <211> 478  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 3, 10, 11, 78, 112, 130, 150, 231, 457  
 <223> n = A,T,C or G

<400> 201  
 gancacctgn nacaaggagg atggacggcc cctggagctc cgggacctgc ttcacttctc 60  
 cagccaagta gccaggnat ggccttctc gcttccaaga attgcatcca cngggacgtg 120  
 gcagcgcgtn acgtgctggt gaccaatggn catgtggcca agattgggga cttcgggctg 180  
 gctagggaca tcatgaatga ctccaactac attgtcaagg gcaatgccgc nctgcctgtg 240  
 aagtggatgg cccagagag catctttgac tgtgtctaca cgggttcagag cgacgtctgg 300  
 tcctatggca tcctcctctg ggagatcttc tcaactgggc tgaatcccta ccctggcatc 360  
 ctggtgaaca gcaagttcta taaactgggt gaaaggatgg ataccaatg gccagcctg 420  
 cattttgccc ccaaagaata tatacaagca tccatgnagg cccttctggg ccttggag 478

<210> 202  
 <211> 218  
 <212> DNA  
 <213> Homo sapiens

<400> 202  
 gcgagcaagg ggatatgcc cagcccttgc tgcagcccaa caactatcag ttctgctgag 60  
 gagttgacga cagggagtac cactctcccc tcccacaaac ttcaactcct ccatggatgg 120  
 ggcgacacgg ggagaacata caaactctgc cttcgggtcat ttcactcaac agctcggccc 180  
 agctctgaaa cttgggaagg tgagggattc aggggagg 218

<210> 203  
 <211> 556  
 <212> DNA

WO 03/057926

PCT/US03/00657

&lt;213&gt; Homo sapiens

&lt;400&gt; 203

```

taagctcgga attcggctcg aggcgagcaa ggggatatcg cccagccctt gctgcagccc 60
aacaactatc agttctgctg aggagttgac gacagggagt accactctcc cctcccacaa 120
acttcaactc ctccatggat ggggcgacac ggggagaaca tacaaactct gccttcggtc 180
atctcactca acagctcggc ccagctctga aacttgggaa ggtgagggat tcaggggagg 240
tcagaggatc ccacttctg agcatgggcc atcactgcca gtcaggggct gggggctgag 300
ccctcacccc cccctcccct actgttctca tgggtgtggc ctctgtttg ctatgccaac 360
tagtagaacc ttctttccta atccccctat ctccatggaa atggactgac tttatgccta 420
tgaagtcccc aggagctaca ctgatactga gaaaaccagg ctctttgggg ctagacagac 480
tggcagagag tgagatctcc ctctctgaga ggagcagcag atgctcacag accacactca 540
gctcaggccc cttgga 556

```

&lt;210&gt; 204

&lt;211&gt; 319

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 204

```

tccttattta ttttaacttca cccgagttcc tctgggtttc taagcagtta tggatgatgac 60
ttagcgtcaa gacatttgct gaactcagca cattcgggac caatatatag tgggtacatc 120
aagtccatct gacaaaatgg ggcagaagag aaaggactca gtgtgtgatc cggtttcttt 180
ttgctcgccc ctgttttttg tagaatctct tcatgcttga catacctacc agtattattc 240
ccgacgacac atatacatat gagaatatac cttatttatt tttgtgtagg tgtctgcctt 300
cacaatgtc atgtctact 319

```

&lt;210&gt; 205

&lt;211&gt; 456

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 205

```

attccgttgc tgtcagagggt cactaccagt acaagagcat ccctgtggag gacaaccaca 60
aggcagacat cagctcctgg ttcaacgagg ccattgactt catagactcc atcaagaatg 120
ctggaggaag ggtgtttgtc cactgccagg caggcatttc ccggtcagcc accatctgcc 180
tggcttacct tatgaggact aatcgagtca agctggacga ggcctttgag tttgtgaagc 240
agaggcgaag catcatctct cccaacttca gcttcatggg ccagctgctg cagtttgagt 300
cccaggtgct ggctccgcac tgttcggcag aggctgggag ccccgccatg gctgtgctcg 360
accgaggcac ctccaccacc accgtgttca acttccccgt ctccatccct gtccactcca 420
cgaacagtgc gctgagctac cttcagagcc ccatta 456

```

&lt;210&gt; 206

&lt;211&gt; 533

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 206

```

agtttttaaa taatgaatat tatttaatac cacaacagaa ttatcccaa tttccaataa 60
gtcctatcat tgaaaattca aatataagtg aagaaaaaat tagtagatca acaatctaaa 120
caaatccctc ggttctaaga tacaatggat tccccatact ggaaggactc tgaggcttta 180
ttccccact atgcatatct tatcatttta ttattataca cacatccatc ctaaactata 240
ctaaagccct tttcccatgc atggatggaa atggaagatt tttttttaac ttgttctaaa 300
agtcttaata tgggctgttg ccatgaaggc ttgcagaatt gagtccattt tctagctgcc 360
tttattcaca tagtggacgg ggtacctaaa agtactgggg ttgactcaga gagtcgctgt 420
cattctgtca ttgctgctac tctaactctg agcaacactc tcccagtggc agatcccctg 480
tatcattcca agaggagcat tcatcccttt gctctaataga tcaggaatga tgc 533

```

&lt;210&gt; 207

&lt;211&gt; 246

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

WO 03/057926

PCT/US03/00657

<400> 207  
aatgcactaa ctcaatacca agatgagttt ttaaataatg aatattattt aataccacaa 60  
cagaattatc cccaatttcc aataagtcct atcattgaaa attcaaatat aagtgaagaa 120  
aaaattagta gatcaacaat ctaaacaat ccctcgggtc taagatacaa tggattcccc 180  
atactggaag gactctgagg ctttattccc ccactatgca tatcttatca ttttattatt 240  
atacac 246

<210> 208  
<211> 407  
<212> DNA  
<213> Homo sapiens

<400> 208  
ggccgcctt tttttttttt tttttttttt ttttttttgg gcaaaaaggg gctttttttt 60  
ttttccccc cccttttttt aacccttccc ctaatatctt ccccaaaaaa aaaaattttt 120  
tttttttggg ggggggaaaa aaaagggaaa aaaaaccccc cccccgggg ggggaaaaaa 180  
accccccaa aacccccctt ttgggggggt cccccccat ggggggtccc cccccaattt 240  
ttttccccc ccaaaaaaa tttttaacc ccccccaagg ggggtgaaaa ccttaaaaaa 300  
aaccccccg aaaaaccaa accccttttt taaaaaaaa aaaaaaattt ttgggggggca 360  
aaaccccccc ccccaaaaa accccccccc cccccttaa aaaaaaa 407

<210> 209  
<211> 359  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> 1, 53, 121, 123, 128, 133, 142, 150, 174, 179, 183, 186,  
196, 200, 201, 204, 207, 212, 215, 218, 224, 229, 230, 231,  
243, 244, 249, 260, 261, 267, 268, 270, 273, 279, 289, 291,  
295, 301, 303, 305, 312, 315, 337, 345, 357  
<223> n = A,T,C or G

<400> 209  
ncggggactg cgcgggcgtg cagagccggg cgtgggagag aacgaacggg ctnoctgagg 60  
ctgagagcgt cgagtgtcac catgggtatc acgcttggag cttcctaaag gacttcctgg 120  
ncngggcctc gcnctgccc tntccaagan cccgggtcggc cccaatcgag aggncaaanc 180  
tgntgntgaa ggtgcnagan nccnagnaac angtnaantc ttangaagnn ntacaaaggg 240  
gtnnattant tttttggtan nattecnan gancaaggnt ttcctttent nttgnagggt 300  
nanctggca angtnattcc ttaatttccc aaccaangtt ttaantttgg ctttaangg 359

<210> 210  
<211> 394  
<212> DNA  
<213> Homo sapiens

<400> 210  
ttttttttt gcattaagtg gtctttattg atgtttcaca ttcagttatt atcaattctt 60  
cagttaattg tacaagtatg ataaattatt ttctatttgc tgtgggaatt taaatgtaa 120  
ataaatacaa aatacatgtg tggtttaatg aacactcaat gaagcatctc ttctgaggta 180  
ttcctttcag tctggtttta tcccaggatc tttttacttc ccctaggaat agtctattaa 240  
accacacaat ggatctgtga acttgtagat caagttcact gtaaactctgt gaacttgtgt 300  
tttaattaca ttagacatat tttttgatct catcatacaa caccaataca aaaggcaccg 360  
cccatgcctc tcaggcacat tgggaccggg cacc 394

<210> 211  
<211> 292  
<212> DNA  
<213> Homo sapiens

WO 03/057926

PCT/US03/00657

&lt;400&gt; 211

```

gggagcccac cagcaagaat gagttggagc aatcttttca tgtgacctcc ttaacagata 60
tttactgaag gaatctaggt tgtattttca gtggacaatg ggaataaagc atttctaaag 120
caccgactgg agaggaaggc aacagagaca aggagagaag ccgagagaca tgtctgctg 180
ctgccacgca tttgagcgat tgctctgtga agagttgtac actgaacact ttcaggggag 240
gctgtttacc caggcaatgt cctcaaacia gcctgtgccg ggggtgtcctg ga 292

```

&lt;210&gt; 212

&lt;211&gt; 495

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 212

```

aattccgttg ctgtcgctgc gcccaggtaa tttgagcaaa ggccacagtg aactccggcg 60
tggctgagga aggaggaggc acccacaggc tgctgggagg agagcataag gctcaaaatg 120
gaaaatcata aatccaataa taaggaaaac ataacaattg ttgatataatc cagaaaaatt 180
aaccagcttc cagaagcaga aaggaatcta cttgaaaatg gatcgggtta tgtttgatta 240
aatgctgctc tttgtggcct catagcaaac agtcttttcc gacgcatctt gaatgtgaca 300
aaggctcgca tagctgctgg cttaccaatg gcaggggatac cttttcttac aacagactta 360
acttacagat gttttgtaag ttttctttg aatacagggtg atttggattg tgaaacctgt 420
accataacac ggagtggact gactggtctt gttattggtg gtctataccc tgttttcttg 480
gctatacctg taaat 495

```

&lt;210&gt; 213

&lt;211&gt; 358

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 213

```

tgcgaccgcg atctcctgca gctggtgcac cacctcggcg atggacagcc gtcctcccg 60
gttcacctgc agcatggcga ggatgaggct gtggaagacc gtgtactgcg tgcctgctcg 120
ggggatcgag tacttcccat tgactattcg aagtttccgt ccactcctcaa aaggggtgctg 180
ccggaagcac agcaggtaca agatgcagcc cagggcccag atatcctgct tctcgccgat 240
cgggaagttg gaatacaagt ctatgatttc tgggtgttcta tacattggtg ttgtattcct 300
cgtgatctga aaaaatacaa acatttcaaa ggaaaagttg catcccacaa acagtatt 358

```

&lt;210&gt; 214

&lt;211&gt; 406

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 214

```

tggtagcct gcaggtaccg gtccggaatt cccgggtcga cccacgcgct cgaggacatc 60
tggaatgtca ctggtgcca ggtgtacttg agctgtgagg tcatcggaat cccgacacct 120
gtcctcatct ggaacaaggt aaaaaggggt cactatggag ttcaaaggac agaactcctg 180
cctggtgacc gggacaacct ggccattcag acccgggggtg gccagaaaa gcatgaagta 240
actggctggg tgctggtatc tctctaaagt aaggaagatg ctggagaata tgagtgccat 300
gcatccaatt cccaaggaca ggcttcagca tcagcaaaaa ttacagtggg tgatgcctta 360
catgaaatac cagtgaaaaa aggtgaaggt gccgagctat aaacct 406

```

&lt;210&gt; 215

&lt;211&gt; 300

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; 66, 71, 259

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 215

```

aggacatctg gaatgtcact ggtgcccagg tgtacttgag ctgtgaggtc atcggaatcc 60

```



WO 03/057926

PCT/US03/00657

cgacanctgt nctcatctgg aacaaggtaa aaaggggtca ctatggagtt caaaggacag 120  
aacttctgcc tggtgaccgg gacaacctgg ccattcagac ccgggggtggc ccagaaaagc 180  
atgaagtaac tggctgggtg ctggatatctc ctctaagtaa ggaagatgct ggagaatatg 240  
agtgccatgc atccaattnc caaggacagg cttcagcatc agcaaaaatt acagtgggtg 300

&lt;210&gt; 216

&lt;211&gt; 232

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 216

ttcaaaagct tagagagaat aagcttcttg gtggtgaaat acaactctca cgtgtgctcc 60  
agttctaaaa ttaacctgtg cctgggtctct gaagcccttt cttgctctgt gcctttcagc 120  
cacatcctta ggtgctaacg gccatgagct ccgactctcc aaagtgagct ccactttggg 180  
tctgaggagc ccctggcaga gtccacgctg cctcaggat catgggcgta at 232

&lt;210&gt; 217

&lt;211&gt; 453

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 217

ataagcttct tggtggtgaa actacaactc tcacgtgtgc tccagttcta aaattaacct 60  
gtgcctggtc tctgaagccc tttcttgctc tgtgcctttc agccacatcc ttaggtgcta 120  
acggccatga gctccgactc tccaaagtga gctccacttt gggctctgagg agcccctggc 180  
agagtccacg ctgcctcagg tatcatgggc gtaatgatca cccaggctcc gggagatctc 240  
atggatgatt actgtatgag acagagggga cttcagtctt tccagggcct tggtggaatt 300  
tttggctctg gtgttttcgc cagacaataa acttacactg gaagctttga ttcaccctcc 360  
acagtactcc agaaaggact gtccataaag ttgtacactt taaaagggtca tgtagaggtt 420  
gtagtagaat ggcttttcac cctgggtgact ttg 453

&lt;210&gt; 218

&lt;211&gt; 520

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 218

agatgtgtga gaagtgcccc acctgcccgg atgcatgcag caccaagaga gattgcgctc 60  
agtgcttctg gctccactct gggaaacctg acaaccagac ctgccacagc ctatgcaggg 120  
atgaggtgat cacatgggtg gacaccatcg tgaaagatga ccaggaggct gtgctatggt 180  
tctacaaaac cgccaaggac tgcgtcatga tgttcaccta tgtggagctc cccagtggga 240  
agtccaacct gaccgtcctc agggagccag agtgtggaaa caccaccaac gccatgacca 300  
tcctcctggc tgtggtcggg agcctcctcc ttgttgggct tgcactcctg gctatctgga 360  
agctgcttgt caccatccac gaccggaggg agtttgcaaa gtttcagagc gagcgatcca 420  
gggcccgcta tgaaatggct tcaaatctat tatacagaaa gcctatctcc acgcacactg 480  
tggaactcac cttcaacaag ttcaacaat cctacaatgg 520

&lt;210&gt; 219

&lt;211&gt; 404

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 219

agatgtgtga gaagtgcccc acctgcccgg atgcatgcag caccaagaga gattgcgctc 60  
agtgcttctg gctccactct gggaaacctg acaaccagac ctgccacagc ctatgcaggg 120  
atgaggtgat cacatgggtg gacaccatcg tgaaagatga ccaggaggct gtgctatggt 180  
tctacaaaac cgccaaggac tgcgtcatga tgttcaccta tgtggagctc cccagtggga 240  
agtccaacct gaccgtcctc agggagccag agtgtggaaa caccaccaac gccatgacca 300  
tcctcctggc tgtggtcggg agcctcctcc ttgttgggct tgcactcctg gctatctgga 360  
agctgcttgt caccatccac gaccggaggg agtttgcaaa gttt 404

WO 03/057926

PCT/US03/00657

<210> 220  
 <211> 80  
 <212> DNA  
 <213> Homo sapiens

<400> 220  
 atggcttcaa atccattata cagaaagcct atctccacgc aactgtgga cttcaccttc 60  
 aacaagttca acaaatccta 80

<210> 221  
 <211> 607  
 <212> DNA  
 <213> Homo sapiens

<400> 221  
 tgccccacct gcccgatgc atgcagcacc aagagagatt gctgcgagtg cctgctgctc 60  
 cactctggga aacctgacaa ccagacctgc cacagcctat gcagggatga ggtgatcaca 120  
 tgggtggaca ccatcgtgaa agatgaccag gaggctgtgc tatgtttcta caaaaccgcc 180  
 aaggactgcg tcatgatggt cacctatgtg gagctcccca gtgggaagtc caacctgacc 240  
 gtcctcaggg agccagagtg tggaaacacc cccaacgcca tgaccatcct cctggctgtg 300  
 gtcggtagca tcctccttgt tgggcttgca ctctggcta tctggaagct gcttgtcacc 360  
 atccacgacc ggagggagtt tgcaaagttt cagagcgcgc gatccagggc ccgctatgaa 420  
 atggcttcaa atccattata cagaaagcct atctccacgc aactgtgga cttcaccttc 480  
 aacaagttca acaaatccta caatggcact gtggactgat gtttccttct ccgaggggct 540  
 ggagcgggga tctgatgaaa aggtcagact gaaacgcctt gcacggctgc tcggcttgat 600  
 cacaact 607

<210> 222  
 <211> 583  
 <212> DNA  
 <213> Homo sapiens

<400> 222  
 ggtatgtgcc atcacaagca gatgtggcag tatttgaagc cgtgtccagc ccaccgcctg 60  
 ccgacttgtg tcatgcccta cgttggtata atcacatcaa gtcttacgaa aaggaaaagg 120  
 ccagcctgcc aggagtgaag aaagctttgg gcaaatatgg tcctgccgat gtggaagaca 180  
 ctacaggaag tggagctaca gatagtaaag atgatgatga cattgacctc tttggatctg 240  
 atgatgagga ggaaagtga gaagcaaaga ggctaaggga agaacgtctt gcacaatatg 300  
 aatcaaagaa agccaaaaaa cctgcacttg ttgccaagtc ttccatctta ctagatgtga 360  
 aaccttggga tgatgagaca gatatggcga aattagagga gtgcgtcaga agcattcaag 420  
 cagacggctt agtctggggc tcatctaaac tagttccagt gggatacgga attaagaaac 480  
 ttcaaataca gtgtgtagtt gaagatgata aagttggaac agatatgctg gaggagcaga 540  
 tcaactgctt tgaggactat gtgcagtcga tggatgtggc tgc 583

<210> 223  
 <211> 296  
 <212> DNA  
 <213> Homo sapiens

<400> 223  
 tacatcgagg ggtatgtgcc atcacaagca gatgtggcag tatttgaagc cgtgtccagc 60  
 ccaccgcctg ccgacttgtg tcatgcccta cgttggtata atcacatcaa gtcttacgaa 120  
 aaggaaaagg ccagcctgcc aggagtgaag aaagctttgg gcaaatatgg tcctgccgat 180  
 gtggaagaca ctacaggaag tggagctaca gatagtaaag atgatgatga cattgacctc 240  
 tttggatctg atgatgagga ggaaagtga aaagcaaaga ggctaaggga agaacg 296

<210> 224  
 <211> 208  
 <212> DNA  
 <213> Homo sapiens

<220>

WO 03/057926

PCT/US03/00657

<221> misc\_feature  
 <222> 97  
 <223> n = A,T,C or G

<400> 224  
 gactacatct tggacctgca gatcgccctg gactcgcac ccactattgt cagcctgcat 60  
 caccagagac ccgggcagaa ccaggcgtcc aggacgncgc tgaccaccct caacacggat 120  
 atcagcatcc tgccttgca ggcttctgaa ttcccttctg agttaatgtc aaatgacagc 180  
 aaagcactgt gtggctgaat aagcggtg 208

<210> 225  
 <211> 274  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 133  
 <223> n = A,T,C or G

<400> 225  
 gcagcggctg gagcggcaga tcagccagga tgtcaagctg gagccagaca tcctgcttcg 60  
 ggccaagcaa gatttctga agacggacag tgactcggac ctacagctct acaaggaaca 120  
 gggtgagggg canggtgacc ggagcctgcg ggagcgtgat gtgctggaac gggagtttca 180  
 gcgggtcacc atctctggg aggagaagtg tggggtgccg ttcacagacc tgctggatgc 240  
 agccaagatg tgggtcgggc gtcttcatcc ggga 274

<210> 226  
 <211> 330  
 <212> DNA  
 <213> Homo sapiens

<400> 226  
 ggccgccctt tttttttttt tttttttttg ggcccagggg gggccccctt gggaaaaaca 60  
 cccgggaaac ttcccaaagg ggccttgggg gaattttttt taaaaaaaaa ctttttttta 120  
 aaaaaaactt tgggatttaa attttttttc cggccccctt tttgggcccg gtacccaat 180  
 ttaaaaaagg ggggcttttt aaagggtggg aaaaaaaaaa aattgggggg gcccaaaaaa 240  
 ttggggggcc cccaaaaaaa aagcgggggt tggaaaaatt ttgggggggt ttggaaattt 300  
 gggccccaaa acgggggacc cttttcccc 330

<210> 227  
 <211> 525  
 <212> DNA  
 <213> Homo sapiens

<400> 227  
 gaatttggcc ctcgaggcca agaattcggc acgaggggtc acatagcaat ttaatcaagt 60  
 aatggttaat tagttacccc ctatatataa atatatgtaa tcaatttctt caaatagctt 120  
 gcttacatga taatcaatta gccaacatg agtcatttag aatagtgata aatagaatac 180  
 acagaatagt gatgaaatc aatttaaaaa atcacgttag cctccaaacc atttaattca 240  
 aatgaacca tcaactggat gccaaactct gcgaaatgtag gacctctgag tggctgtata 300  
 attgttaatt caaatgaaat tcatttaaac agttgacaaa ctgtcattca acaattagct 360  
 ccaggaaata acagttatct catcataaaa cagtcccttc aaacacacaa ttgttctgct 420  
 gaagagttgt catcaacaat ccaatgctca cctattcagt tgctctgtgg tcagtgtggc 480  
 tgcataacag tggattccat gaaaggagtc attttagtga tgagc 525

<210> 228  
 <211> 788  
 <212> DNA  
 <213> Homo sapiens

<220>

WO 03/057926

PCT/US03/00657

<221> misc\_feature  
 <222> 42, 44, 48, 49, 51, 52, 53, 54, 55, 57, 59, 61, 62, 63, 64,  
 68, 69, 70, 71, 73, 74, 75, 76, 77, 79, 80, 83, 87, 89,  
 92, 93, 94, 95, 97, 98, 107, 112, 113, 117, 122, 125, 127,  
 130, 131, 133, 671, 677, 685, 706, 713, 718, 725, 757, 771  
 <223> n = A,T,C or G

<221> misc\_feature  
 <222> 783  
 <223> n = A,T,C or G

<400> 228  
 gttcacatag caatttaatc aagtaatcat taattagggg gngngggng nnnnngngnt 60  
 nnnngtgnnn ngnnnnngnn ggngtgngng tnnnngnngg gaggtgngga anngttnttt 120  
 tntgngngan nantagaata cacagaatag tgatgaaatt caatttaaaa aatcacgtta 180  
 gcctccaaac catttaattc aaatgaacc atcaactgga tgccaactct ggogaatgta 240  
 ggacctctga gtggctgtat aattgttaat tcaaatgaaa ttcatttaaa cagttgacaa 300  
 actgtcattc aacaattagc tccaggaaat aacagttatt tcatcataaa acagtcctt 360  
 caaacacaca attgttctgc tgaagagttg tcatcaaaa tccaatgctc acctattcag 420  
 ttgctctgtg gtcagtggtg ctgcataaca gtggattcca tgaaaggagt catttttagtg 480  
 atgagctgcc agtccattcc caggccaggc tgctgctggc catccattca gtcgattcag 540  
 tcataggcga atctgttctg cccgaagctt gtggtaaacg aaaaattcag ccctgaaaat 600  
 cagcacatct gttcgggtgga ctaaaccaca gttagttcgt caagcagcaa ccctgtggc 660  
 atgaccgcca ntgggtncat gcgntgcac tgggagttgg ccaaantcct ggnggtcncg 720  
 gggntttttt tgtgggtttt ttttttttag tcttgnnttt gggttaagtgg nttttttttt 780  
 tcnttggg 788

<210> 229  
 <211> 156  
 <212> DNA  
 <213> Homo sapiens

<400> 229  
 gccgagggaa gggcccggca gctgaggagc cgctgagctt gctggacgac atgaaccact 60  
 gctactcccg cctgcccggaa ctggtaccgc gagtcccag aggcactcag cttagccagg 120  
 tggaaatcct acagcgcgtc atcgactaca ttctcg 156

<210> 230  
 <211> 538  
 <212> DNA  
 <213> Homo sapiens

<400> 230  
 tacgactcct ataggggaatt tggccctcga ggccaagaat tcggcacgag ggtgactttg 60  
 gctttgctcg catcatcggc gagaagtcgt tccgccgctc agtgggtggc acgccggcct 120  
 acctggcacc cgaggtgctg ctcaaccagg gctacaaccg ctgctggac atgtggtcag 180  
 tgggctgat catgtacgtc agcctcagcg gcaccttccc tttcaacgag gatgaggaca 240  
 tcaatgacca gatccagaac gccgccttca tgtaccgagc cagcccctgg agccacatct 300  
 cagctggagc cattgacctc atcaacaacc tgctgcaggt gaagatgctc aaacgctaca 360  
 gcgtggacaa atctctcagc caccctggt tacaggagta ccagacgtgg ctggacctcc 420  
 gagagctgga ggggaagatg ggagagcgat acatcacgca tgagagtgc gacgcgcgct 480  
 gggagcagtt tgcagcagag catccgctgc ctgggtctgg gctgcccacg gacagggg 538

<210> 231  
 <211> 232  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 18, 56, 94, 103, 117, 128, 145, 184, 204, 219  
 <223> n = A,T,C or G

WO 03/057926

PCT/US03/00657

<400> 231  
 tggctttgct cgcatacncg gcgagaagtc gtcccgcgcg tcagtgggtg gcacgncggc 60  
 ctacctggca cccgaggtct tgctcaacca gggntacaac cgntcgctcg acatgtngtc 120  
 agtgggcntg atcatgtacg tcagnctcag cggcaccttc cctttcaacg aggatgagga 180  
 catnaatgac cagatccaga acgncgactt catgtaccng gccagaccct gg 232

<210> 232  
 <211> 420  
 <212> DNA  
 <213> Homo sapiens

<400> 232  
 taccggtccg gaattcccgg gtcgacccac gcggtccggcg tctctgctcc accaaggtgc 60  
 cctggacatg ctgaccaagg tgatggccct agagctcggg cccacaaga tccgagtgaa 120  
 tgcagtaaac cccacagtgg tgatgacgtc catggggccag gccacctgga gtgaccccca 180  
 caaggccaag actatgctga accgaatccc acttggcaag tttgctgagg tagagcacgt 240  
 ggtgaacgcc atcctctttc tgctgagtga ccgaagtggc atgaccacgg gttccacttt 300  
 gccggtggaa gggggcttct gggcctgctg agctccctcc acacacctca agcccatgc 360  
 cgtgctcatc ctacccccaa tccctccaat aaacctgatt ctgctgcca aaaaaaaaaa 420

<210> 233  
 <211> 294  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 2, 170  
 <223> n = A,T,C or G

<400> 233  
 gngtctactg ctccaccaag ggtgccctgg acatgctgac caaggtgatg gccctagagc 60  
 tcgggccccca caagatccga gtgaatgcag taaacccac agtgggtgatg acgtccatgg 120  
 gccaggccac ctggagtgac cccacaagg ccaagactat gctgaaccgn atcccacttg 180  
 gcaagtttgc tgaggtagag cacgtggtga acgccatcct ctttctgctg agtgaccgaa 240  
 gtggcatgac cacgggttcc actttgccgg tggaaggggg ttctggggct gctg 294

<210> 234  
 <211> 55  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 42  
 <223> n = A,T,C or G

<400> 234  
 gtctcgggcc atgactctgg agatccgaga aggaagagggc tntggcctga gaaag 55

<210> 235  
 <211> 394  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 22, 335, 365, 377, 383, 391  
 <223> n = A,T,C or G

WO 03/057926

PCT/US03/00657

<400> 235  
 ttttttggtc atttatatatt tntttaagag ctgtgccag ttttatcatc tcacaagaat 60  
 gaagcaaggg acaaaggtaa gtgccacgct ccctggccac tgggttcctg gcaagctccc 120  
 agccactagg tgccaatctc ccttcaatgt actccttctt ccccagagtg cagaagcgta 180  
 tgaagacagt tatgacatgg acacatgcat gagctattat acataattac aaaagctgat 240  
 tctgtcatca ccacatcttg tctcatcagt aggagcgaat ggctggcggg acgggtggcac 300  
 agtcagcctt gttcaaagtt ttgtcgatca cgggncctat attccagagt gacctttccc 360  
 agtgnccaac gttccanata ggncagggtc ntgc 394

<210> 236  
 <211> 468  
 <212> DNA  
 <213> Homo sapiens

<400> 236  
 agctcgggat tcggctcgag gacctggaaa ttccagggtg tgagctgcat cgaaggggag 60  
 cctgggcccg tcaggagcgt cctcttcaac ccagacggct gctgcctgta cagcggctgc 120  
 caggactcac tgcgtgtcta cggctgggaa cctgagcggg gctttgatgt ggtcctcgtc 180  
 aactggggca aggtggcga cctggccatc tgcaatgacc agttgatagg tgtggccttc 240  
 tcccagagca acgtctctc ctacgtggtg gatctgacgc gtgtcaccag gactggcacg 300  
 gtggcccggg accctgtgca ggaccaccgg ccctggcac agccactgcc caaccccagc 360  
 gccccctcc ggcgcatcta tgagcggccc agcacaacct gcagcaagcc tcagaggggtg 420  
 aagcagaact cagagagcga gcgccgcacc cccagcagcg aggatgac 468

<210> 237  
 <211> 254  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 48, 85, 97  
 <223> n = A,T,C or G

<400> 237  
 gacctggaga agttccagggt ggtgagctgc atcgaagggg agcctggnc cgtcaggagc 60  
 gtctcttca acccagacgg ctgcnccctg tacagcngct gccaggactc actgcgtgct 120  
 tacggctggg aacctgagcg gtgctttgat gtggctctcg tcaactgggg caaggtggcc 180  
 gacctggcca tctgcaatga ccagttgata ggtgtggcct tctcccagag caacgtctcc 240  
 tcctacgtgg tgga 254

<210> 238  
 <211> 419  
 <212> DNA  
 <213> Homo sapiens

<400> 238  
 gaccacgcg tccgtcttca acttcttttag tctcctgag attcctatga ttgggaagct 60  
 ggaaccacga gaagatgcta tcttgatga ggactttgaa attgggcaga ttttacatga 120  
 taatgtcatc ctgaaatcaa tctattacta tactggagaa gtcaatggta cctactatca 180  
 atttggcaaa cattatggaa acaagaaata cagaaaataa gtcaatctga aagatttttc 240  
 aagaatctta aatctcaag aagtgaagca gattcataca gccttgaaaa aagtaaaacc 300  
 ctgacctgta acctgaacac tattattcct tatagtcaag tttttgtggt ttcttggtag 360  
 tctatatattt aaaaatagtc ctaaaaagtg tctaagtgcc agtttattct atctaggct 419

<210> 239  
 <211> 228  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature

WO 03/057926

PCT/US03/00657

&lt;222&gt; 190

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 239

```

gaaccccgcc cgcggccaca gcgtctgctc cacctccagc ttgtacctgc aggatctgag 60
cgccgcccgc tcagagtgca tcgaccctc ggtggtcttc ccctaccctc tcaacgacag 120
cagctcgccc aagtcctgcg cctcgcaaga ctccagcgc ttctctccgt cctcggattc 180
tctgactcn tcgacggagt cctccccgca gggcagcccc gagccct 228

```

&lt;210&gt; 240

&lt;211&gt; 525

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 240

```

aaccccgccc gcggccacag cgtctgctcc acctccagct tgtacctgca ggatctgagc 60
gccgcccgcct cagagtgcac cgaccctcg gtggtcttcc cctaccctct caacgacagc 120
agctcgccca agtcctgctc ctcgcaagac tccagcgcct tctctccgtc ctccgattct 180
ctgctctctt cgacggagtc ctccccgag ggcagccccg agcccctggt gctccatgag 240
gagacaccgc ccaccaccag cagcgactct gaggaggaac aagaagatga ggaagaaatc 300
gatgttgttt ctgtggaaaa gaggcaggct cctggcaaaa ggtcagagtc tggatcacct 360
tctgctggag gccacagcaa acctcctcac agcccactgg tcctcaagag gtgccacgtc 420
tccacacatc agcacaacta cgcagcgcct ccctccactc ggaaggacta tcctgctgcc 480
aagagggtca agttggacag tgtcagagtc ctgagacaga tcagc 525

```

&lt;210&gt; 241

&lt;211&gt; 552

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 241

```

tggaaggaac tggctctgctc aacttgctg gcttgccgat caggactggc tttatctcct 60
gactcacggt gcaaagggtgc actctgcgaa cgtaagtcc gtcccagcgc ttggaatcct 120
acggccccca cagccggatc ccctcagcct tccaggctct caactcccgc ggacgctgaa 180
caatggcctc catggggcta caggtaatgg gcatcgcgct ggccgtcctg ggctggctgg 240
ccgtcatgct gtgctgcgcg ctgcccattg ggcgcgtgac ggccttcatc ggcagcaaca 300
ttgtcacctc gcagaccatc tgggagggcc tatggatgaa ctgctggtg cagagcaccg 360
gccagatgca gtgcaagggtg tacgacttgc tgctggcact gccgcaggac ctgcaggcgg 420
cccgcgccct cgtcatcatc agcatcatcg tggctgctct gggcgtgctg ctgtccgtgg 480
tggggggcaa gtgtaccaac tgccctggagg atgaaagcgc caaggccaag accatgatcg 540
tggcgggctg gg 552

```

&lt;210&gt; 242

&lt;211&gt; 519

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 242

```

tggaaggaac tggctctgctc aacttgctg gcttgccgat caggactggc tttatctcct 60
gactcacggt gcaaagggtgc actctgcgaa cgtaagtcc gtcccagcgc ttggaatcct 120
acggccccca cagccggatc ccctcagcct tccaggctct caactcccgc ggacgctgaa 180
caatggcctc catggggcta caggtaatgg gcatcgcgct ggccgtcctg ggctggctgg 240
ccgtcatgct gtgctgcgcg ctgcccattg ggcgcgtgac ggccttcatc ggcagcaaca 300
ttgtcacctc gcagaccatc tgggagggcc tatggatgaa ctgctggtg cagagcaccg 360
gccagatgca gtgcaagggtg tacgacttgc tgctggcact gccgcaggac ctgcaggcgg 420
cccgcgccct cgtcatcatc agcatcatcg tggctgctct gggcgtgctg ctgtccgtgg 480
tggggggcaa gtgtaccaac tgccctggagg atgaaagcgc 519

```

&lt;210&gt; 243

&lt;211&gt; 296

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; 64, 187, 195

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 243

```

aggttcctca tctgctcgcg aggatgcctt ttctcttctg ccttgcgaaa taacagcagc 60
ctanctggtg cccgtgacca gtgagaaagg cagcgtcacg ggctgattag gtttcacca 120
aagggtgccg ggcgccgaatt ggtttctaac gagaactttt aaaatgatcc gttccaaaaa 180
agggtangag cgcgnagacc ctccaactgc ccagagaaaa caagtctcgt ctggcaaaaat 240
tctcggccca cgcggtccgc ggccaagggg caaaggctct cgccccacgt tgccga 296

```

&lt;210&gt; 244

&lt;211&gt; 273

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 244

```

cttgcccatg gcgaattgtg gatgactgtg gtggggcctt tacgatgggt accattgggtg 60
gtggtatctt tcaagcaatc aaaggttttc gcaattctcc agtgggagta aaccacagac 120
tacgagggag tttgacagct attaaaacca gggctccaca gttaggagggt agctttgcag 180
tttggggagg gctgttttcc atgattgact gtagtatggt tcaagtcaga ggaaaggaag 240
atccctggaa ctccatcaca agtgggtgct taa 273

```

&lt;210&gt; 245

&lt;211&gt; 386

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 245

```

ttcgaattcg gcacgaggct cgatgtacgt cccggaggac ctcttcccg tctacaaaga 60
aaaagtgggt cgccttgcag acattatcac gcccaaccag tttgaggccg agttactgag 120
tggccggaag atccacagcc aggaggaagc cttgcgggtg atggacatgc tgcactctat 180
gggccccgac accgtgggtc tcaccagctc cgacctgcc tccccgcagg gcagcaacta 240
cctgattgtg ctggggagtc agaggaggag gaatcccgtt ggctccgtgg tgatggaacg 300
catccgatg gacattcgca aagtggacgc cgtctttgtg ggcaactgggg acctgtttgc 360
tggcatgctc ctggcgtgga cacaca 386

```

&lt;210&gt; 246

&lt;211&gt; 239

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 246

```

ttttttttt caaaaaagtc atggaggcca tgggggttggc ttgaaaccag ctttgggggg 60
ttcgattcct tccttttttg cctaaatttt atgtatacgg gttcttcaa tgtgtggtag 120
ggtggggggc atccatatag tcaactcagg tttatggagg gttcttctac tattaggact 180
tttcgcttca aagcgaaggc ttctcaaadc atgaaaatta ttaatattac tgctgttaa 239

```

&lt;210&gt; 247

&lt;211&gt; 623

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 247

```

aaaaagtcac ggaggccatg gggttggctt gaaaccagct ttgggggggt cgattccttc 60
cttttttgtc tagattttat gtatacgggt tcttcgaatg tgtggtaggg tggggggcat 120
ccatatagtc actccagggt tatggagggt tcttctacta ttaggacttt tcgcttcgaa 180
gcgaaggctt ctcaaatcat gaaaattatt aatattactg ctgttagaga aatgaatgag 240
cctacagatg ataggatggt tcatgtgggt tatgcatcgg ggtagtccga gtaacgtcgg 300
ggcattccgg ataggccgag aaagtgttgt gggagaaaag ttagatttac gccgatgaat 360

```



WO 03/057926

PCT/US03/00657

atgatagtga	aatggatttt	ggcgtagggt	tggcttaggg	tgtagcctga	gaatagggga	420
aatcagtga	tgaagcctcc	tatgatggca	aatacagctc	ctattgatag	gacatagtgg	480
aagtgagcta	caacgtagta	cgtgtcgtgt	agtacgatgt	ctagtgatga	gtttgcta	540
acaatgccag	tcaggccacc	tacggtgaaa	agaaagatga	atcctagggc	tcagagcact	600
gcagcagatc	atttcatatt	gct				623

&lt;210&gt; 248

&lt;211&gt; 265

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 248

ggcttagcgg	ataacaattt	cacacaggag	ttgcaccata	atcatcgcta	tccccaccgg	60
cgtcaaagta	tttagctgac	tcgccacact	ccacggaagc	aatatgaaat	gatctgctgc	120
agtgctctga	gccctaggat	tcatctttct	tttcaccgta	ggtggcctga	ctggcattgt	180
attagcaaac	tcatcactag	acatcgtact	acacgacacg	tactacgttg	tagctcactt	240
ccactatgtc	ctatcaatag	gagct				265

&lt;210&gt; 249

&lt;211&gt; 625

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 249

aatcatcgct	atccccaccg	gcgtcaaagt	athtagctga	ctcgccacac	tccacggaag	60
caatatgaaa	tgatctgctg	cagtgctctg	agccctagga	ttcatctttc	ttttcaccgt	120
agggtggcctg	actggcattg	tattagcaaa	ctcatcacta	gacatcgta	tacacgacac	180
gtactacgct	gtagctcact	tccactatgt	cctatcaata	ggagctgtat	ttgccatcat	240
aggaggcttc	attcactgat	ttcccctatt	ctcaggctac	accctagacc	aaacctacgc	300
caaaatccat	ttcactatca	tattcatcgg	cgtaaatact	actttcttcc	cacaacactt	360
tctcggccta	tccggaatgc	cccagcgtta	ctcggactac	cccgatgcat	acaccacatg	420
aaacatccta	tcatctgtag	gctcattcat	ttctctaaca	gcagtaatat	taataatttt	480
catgatttga	gaagccttcg	cttcgaagcg	aaaagtccca	atagtagaag	aacctccat	540
aaacctggag	tgactatatg	gatgcccccc	accctaccac	acattcgaag	aacctgtata	600
cataaaatct	agacaaaaaa	ggaag				625

&lt;210&gt; 250

&lt;211&gt; 253

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 250

ggcttgtaat	acgactcact	atagggcttt	ttttttttca	aaaaagtc	ggaggccatg	60
gggttggtt	gaaaccagct	ttgggggggt	cgattccttc	cttttttgtc	taaattttat	120
gtatacgggt	tcttcaaagt	tgtggtaggg	tggggggcat	ccatatagtc	actccagggt	180
tatggagggt	tcttctacta	ttaggacttt	tcgcttcaaa	gcgaaggctt	ctcaaatact	240
gaaaattatt	aat					253

&lt;210&gt; 251

&lt;211&gt; 290

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 251

caaaactcatc	actagacatc	gtactacacg	acacgtacta	cgttgtagct	cacttccact	60
atgtcctatc	aataggagct	gtatttgcca	tcataggagg	cgtcattcac	tgatttcccc	120
tattctcagg	ctacacccta	gaccaaacct	acgccaaaat	ccatttccact	atcatattca	180
tcggcgtaaa	tctaactttc	ttcccacaac	actttctcgg	cctatccgga	atgccccgac	240
gttattcggg	ctacccccgat	gcatacacca	catgaaacat	cctatcatct		290

&lt;210&gt; 252

&lt;211&gt; 638

WO 03/057926

PCT/US03/00657

<212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 522, 634, 636  
 <223> n = A,T,C or G

<400> 252  
 atatttacag taggaataga cgtagacaca cgagcatatt tcacctccgc taccataatc 60  
 atcgctatcc ccaccggcgt caaagtattt agctgactcg ccacactcca cggaagcaat 120  
 atgaaatgat ctgctgcagt gctctgagcc ctaggattca tctttctttt caccgtaggt 180  
 ggctgactg gcattgtatt agcaaactca tcactagaca tcgtactaca cgacacgtac 240  
 tacgttgtag ctcacttcca ctatgtccta tcaataggag ctgtatttgc catcatagga 300  
 ggcttcattc actgatttcc cctatttctca ggctacaccc tagaccaaac ctacgccaaa 360  
 atccatttca ctatcatatt catcggcgta aatctaactt tcttcccaca acactttctc 420  
 ggccatccg gaatgccccg acgttattcg gactaccccg atgcatacac cacatgaaac 480  
 atcctatcat ctgtaggctc attcatttct ctaacagcag tnatattaat aattttcatg 540  
 atttgagaag ccttcgcttc gaagcgaaaa gtcctaatag tagaagaacc cttcataaac 600  
 ctggagtgac tatatggatg cccccaccc tacnanca 638

<210> 253  
 <211> 531  
 <212> DNA  
 <213> Homo sapiens

<400> 253  
 ggcttagcgg ataacaattt cacacaggag ttgcaccata tatttacagt aggaatagac 60  
 gtagacacac gagcatattt cacctccgct accataatca tcgctatccc caccggcgtc 120  
 aaagtattta gctgactcgc cacactccac ggaagcaata tgaaatgatc tgctgcagtg 180  
 ctctgagccc taggattcat ctttcttttc accgtaggtg gcctgactgg cattgtatta 240  
 gcaaactcat cactagacat cgtactacac gacacgtact acgttgtagc tcacttccac 300  
 tatgtcctat caataggagc tgtatttggc atcataggag gcttcattca ctgatttccc 360  
 ctatttctcag gctacaccct agaccaaac tacgcaaaa tccatttcac tatcatattc 420  
 atcggcgtaa atctaacttt cttcccacaa cactttctcg gcctatccgg aatgccccga 480  
 cgttactcgg actaccccga tgcatacacc acatgaaaca tcctatcatc t 531

<210> 254  
 <211> 625  
 <212> DNA  
 <213> Homo sapiens

<400> 254  
 atatttacag taggaataga cgtagacaca cgagcatatt tcacctccgc taccataatc 60  
 atcgctatcc ccaccggcgt caaagtattt agctgactcg ccacactcca cggaagcaat 120  
 atgaaatgat ctgctgcagt gctctgagcc ctaggattca tctttctttt caccgtaggt 180  
 ggctgactg gcattgtatt agcaaactca tcactagaca tcgtactaca cgacacgtac 240  
 tacgttgtag ctcacttcca ctatgtccta tcaataggag ctgtatttgc catcatagga 300  
 ggcttcattc actgatttcc cctatttctca ggctacaccc tagaccaaac ctacgccaaa 360  
 atccatttca ctatcatatt catcggcgta aatctaactt tcttcccaca acactttctc 420  
 ggccatccg gaatgccccg acgttactcg gactaccccg atgcatacac cacatgaaac 480  
 atcctatcat ctgtaggctc attcatttct ctaacagcag taatattaat aattttcatg 540  
 atttgagaag tcttcgcttc gaagcgaaaa gtcctaatag tagaagaacc cttcataaac 600  
 ctggagtgac tatatggatg ccccc 625

<210> 255  
 <211> 217  
 <212> DNA  
 <213> Homo sapiens

<400> 255  
 tttttttttt taaaaagtca tggaggccat ggggttggtc tgaaccacc tttggggggt 60

WO 03/057926

PCT/US03/00657

```
tcaatccctt ccttctttgt ctaaatttta tgtatacggg ttcttcaaat gtgtggtagg 120
ggggggggca tccatatagc ccctccaggt ttatggaggg ttcttctact attagaactt 180
ttcccttcaa agcaaaggct tctcaaataca tgaaaat 217
```

```
<210> 256
<211> 636
<212> DNA
<213> Homo sapiens
```

```
<220>
<221> misc_feature
<222> 496, 562, 564, 605, 635
<223> n = A,T,C or G
```

```
<400> 256
aaagtcacatgg aggccatggg gttggcttga aaccagcttt gggggggttcg attccttct 60
tctttgtcta gattttatgt atacgggttc ttcgaatgtg tggtaggggtg gggggcatcc 120
atatagtcac tccaggttta tggagggttc ttctactatt aggacttttc gcttcgaagc 180
gaaggcttct caaatcatga aaattattaa tattactgct gttagagaaa tgaatgagcc 240
tacagatgat aggatgtttc atgtgggtga tgcacgggg tagtccgagt aacgtcgggg 300
cattccggat aggccgagaa agtgttgtgg gaagaaagt agatttacgc cgatgaatat 360
gatagtgaatg tggattttgg cgtagggttg gtctagggtg tagcctgaga ataggggaaa 420
tcagtgaatg aagcctccta tgatggcaaa tacagctcct attgatagga catagtggaa 480
gtgagctaca acgtantacg tgctcgtgtag tacgatgtct agtgatgagt ttgctaatac 540
aatgccagtc aggccaccta cngngaaaaa gaaagatgaa tcctagggtc caaacacct 600
gcacnagatc atttcatatt ggcttccgtg gagtnc 636
```

```
<210> 257
<211> 279
<212> DNA
<213> Homo sapiens
```

```
<400> 257
ggcttagcgg ataacaattt cacacaggag ttgcaccata atcatcgcta tccccaccgg 60
cgtcaaagta tttagctgac tcgccacact ccacggaagc aatatgaaat gatctgctgc 120
agtgctctga gccctaggat tcatctttct tttcacctga ggtggcctga ctggcattgt 180
attagcaaac tcatcactag acatcgtact acacgacacg tactacgttg tagctcactt 240
ccactatgtc ctatcaatag gagctgtatt tgccatcat 279
```

```
<210> 258
<211> 623
<212> DNA
<213> Homo sapiens
```

```
<220>
<221> misc_feature
<222> 537
<223> n = A,T,C or G
```

```
<400> 258
aatcatcgct atccccaccg gcgtcaaagt atttagctga ctgcgccacac tccacggaag 60
caatatgaaa tgatctgctg cagtgtctctg agccctagga ttcatctttc ttttcaccgt 120
aggtggcctg actggcattg tattagcaaa ctcatcacta gacatcgtag tacacgacac 180
gtactacgtt gtagctcact tccactatgt cctatcaata ggagctgtat ttgccatcat 240
aggaggcttc attcactgat ttcccctatt cttaggctac accctagacc aaacctacgc 300
caaaatccat ttcactatca tattcatcgg cgtaaatacta actttcttcc cacaacactt 360
tctcggccta tccggaatgc cccgacgtta ctccggactac cccgatgcat acaccacatg 420
aaacatccta tcatctgtag gctcattcat ttctctaaca gcagtaatat taataatttt 480
catgatttga gaagccttcg cttcgaagcg aaaagtcccta atagtagaag aacctnecat 540
aaacctggag tgactatatg gatgcccccc accctaccac acattcgaag aacctgtata 600
cataaaatct agacaaaaaa gga 623
```

WO 03/057926

PCT/US03/00657

<210> 259  
 <211> 189  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 170; 173  
 <223> n = A,T,C or G

<400> 259  
 tggcctttcc cccttcatgg gagacaacga taacgaaacc ttggccaacg ttacctcagc 60  
 cacctgggac ttcgacgacg aggcattcga tgagatctcc gacgatgcca aggatttcat 120  
 cagcaatctg ctgaagaaag atatgaaaaa ccgcctggac tgcacgcagn cnttcagcat 180  
 ccatggcta 189

<210> 260  
 <211> 507  
 <212> DNA  
 <213> Homo sapiens

<400> 260  
 cctttccccc ttcattgggag acaacgataa cgaaaccttg gccaacgtta cctcagccac 60  
 ctgggacttc gacgacgagg cattcgatga gatctccgac gatgccaagg atttcatcag 120  
 caatctgctg aagaaagata tgaaaaaccg cctggactgc acgcagtgcc ttcagcatcc 180  
 atggctaata aaagatacca agaacatgga ggccaagaaa ctctccaagg accggatgaa 240  
 gaagtacatg gcaagaagga aatggcagaa aacgggcaat gctgtgagag ccattggaag 300  
 actgtcctct atggcaatga tctcagggtc cagtggcagg aaatcctcaa cagggtcacc 360  
 aaccagcccg ctcaatgcag aaaaactaga atctgaagaa gatgtgtccc aagctttcct 420  
 tgaggctggt gctgaggaaa agcctcatgt aaaaccctat ttctctaaga ccattcgcga 480  
 tttagaagtt gtggagggaa gtgctgc 507

<210> 261  
 <211> 193  
 <212> DNA  
 <213> Homo sapiens

<400> 261  
 tttttttttt tttttttttt ttttttggcc gagactccaa gactattatt tttatttccg 60  
 gacaaaaaca tctgcttcac acagtgcacg gcatcaaata aagaggaaag aacttgtatc 120  
 ccaaagcctg gctttctgta tcatccacaa attaagacag catctgctga gcccatgctg 180  
 agcctgtcac agt 193

<210> 262  
 <211> 235  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 183, 184, 185, 193  
 <223> n = A,T,C or G

<400> 262  
 cccacttccc caggagcagg ccacagaccc ccttgtggac agcctgggca gtggcattgt 60  
 ctactcagcc cttacctgcc acctgtgcgg ccacctgaaa cagtgtcatg gccaggagga 120  
 tgggtggccag acccctgtca tggccagtcc ttgctgtggc tgctgctgtg gagacaggtc 180  
 ctnnnccct acnaccctcc tgagggcccc agaccctct ccaggtgggg ttcca 235

<210> 263  
 <211> 493  
 <212> DNA

WO 03/057926

PCT/US03/00657

&lt;213&gt; Homo sapiens

&lt;400&gt; 263

```

agaatttcag cagttctctg atttttatat tttattcctc ttcctatcca atccctgcct 60
tttgagtcca ggtggtaagt acattttctt taacgttttt cctgcttttc ttcccaaag 120
tgtctttttc tttgggctac tgtaccctgc ttccagtgcg gtccccggca taggtccatc 180
tctgcagaag ccatttcagg agtacctgga ggctcaacgg cagaagcttc accacaaaag 240
cgaaatgggc acaccacagg gagaaaactg cttgtcctgg atgtttgaaa agtcggtcga 300
tgtcatggtg tgttacttca tcctatctat cattaactcc atggcacaaa gttatgccaa 360
acgaatccag cagcgggtga actcagagga gaaaactaaa taagtagaga aagttttaa 420
ctgcagaaat tggagtggat gggttctgcc ttatattggg aggactccaa gccgggaagg 480
aaaattccct ttt                                     493

```

&lt;210&gt; 264

&lt;211&gt; 345

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 264

```

agaatttcag cagttctctg atttttatat tttattcctc ttcctatcca atccctgcct 60
tttgagtcca ggtggtaagt acattttctt taacgttttt cctgcttttc ttcccaaag 120
tgtctttttc tttgggctac tgtaccctgc ttccagtgcg gtccccggca taggtccatc 180
tctgcagaag ccatttcagg agtacctgga ggctcaacgg cagaagcttc accacaaaag 240
cgaaatgggc acaccacagg gagaaaactg gttgtcctgg atgtttgaaa agtcggtcgt 300
tgtcatggtg tgttacttca tcctatctat cattaactcc atgggt                                     345

```

&lt;210&gt; 265

&lt;211&gt; 374

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 265

```

tagaagagct aacctcacac tcatcccact ctaaactatg tgattcaaca ctgattttac 60
atccaacaaa gtgaaatcct gatagttggg tgtaaaaagg agagtaatgg agatttcaga 120
gtagttgggg ttgcttactt ttcattttta attctttagg ttttgtaagt tacacacttc 180
aagcattata gatgatcctc tttttactac tgaactaatg aagccttttt cattgcattg 240
ttctgcattt atttctacag ggagaaaact ggttgctcctg gatgtttgaa aagttggtcg 300
ttgtcatggg gtgttacttc atcctatcta tcattaactc catggcacaa agttatgcca 360
aacgaatcca gcag                                     374

```

&lt;210&gt; 266

&lt;211&gt; 360

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 266

```

tttttttttt tttttttttg tgcgggtggga attctctaata tgtatcatgt gggccttttg 60
aaagtaacaa acagaaggcc agtctgctgc aagtttgctg ctgaacatca cattccacc 120
taagaaaaca caaggtggat tgcacgagg gtggatacct taccttagca cggaaggaaa 180
aagtatgtca gtgcaaagta tggactaaac tgctttcagg aaaaaagttg taaaaattga 240
tacaggttg aaaggggaat tttccttccc ggcttgagat cctccaatt taaggcagaa 300
cccattccact ccaatttctg cagtttaaaa ctttctctac ttatttagtt ttctcctctg 360

```

&lt;210&gt; 267

&lt;211&gt; 247

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 267

```

ctggaattgt catctttgga acagtgattg caacagcact tatgggattg acagagaaac 60
tgattttttc cctgagagat cctgcataca gtacattccc gccagaagg gttttcgtaa 120

```

WO 03/057926

PCT/US03/00657

atacgcttgg ccttctgac ctggtgttcg gggccctcat tttttggata gtcaccagac 180  
 cgcaatggaa acgtcctaag gagccaaatt ctaccattct tcatccaaat ggaggcatga 240  
 acaggga 247

<210> 268  
 <211> 350  
 <212> DNA  
 <213> Homo sapiens

<400> 268  
 taatggattt gtttggagat ggcattgttg tagacgactg aatatggaaa ggatatcaag 60  
 ttatctatct tgtaatttt atttttgttt tttatcatct agatttttat catggattag 120  
 tctgaaattt aaagtctctg ccagtcgggt ttctttcatc ttgtagtatt tacagtattt 180  
 ccactgtgca tatgcaaaat gggattaca taactgtatc atatttggta ttgataattt 240  
 tttttttttt ttggaaacgg gttttgttt tggcccagcc caaaaacatc ccttggttac 300  
 cccttccggg gaaaaaaaaac caaacccctt tttcggggaa aaaaaaagg 350

<210> 269  
 <211> 455  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 81, 195, 231, 247, 298, 307, 317, 395, 427, 446, 451  
 <223> n = A,T,C or G

<400> 269  
 ttttttttaa atcaaagagt agtttattaa aaaaggaatc aaacaggaaa ctctaagtac 60  
 cagtgtgtac attgtacaat nttaaatgac tcacgagaat gaagtttttt tcaaatatat 120  
 taagatcaca ccacctgtt gtttatcgaa agatattcaa ggagaaagat ctgactctcc 180  
 aaactgcac tgagnattgc cactttaaac aggacctcat ttcaaacatg ncaacaacgc 240  
 cactggntaa taaaggcttt gggaaatggg tgctcattct attattcac taaaaacngc 300  
 atagganagg caggagnagt tggggaattt attctaaaat aggaatggga gggttgtcca 360  
 tctacagcag gcactccttc acttctctctg tttgnccttt ttaggcagta ctcttggtc 420  
 ggtcttngaa cggttttcca acctnttca ntggg 455

<210> 270  
 <211> 444  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 17, 20, 391, 430  
 <223> n = A,T,C or G

<400> 270  
 ttttctgacg tctgttnctn aggctggaag aatgagcag aaaacaagg atgagtactt 60  
 ttttagagtat gtgcatgtta cgtaatacct gtttctgggc aatgctgctt cttctgactc 120  
 aacaaatggg gagagcaaat tgaaaatgcg taaattggaa ggcaagttct gaaattaaac 180  
 gttgtacttt ggctgatgt tctgacctt aaggaagcaa gagtttgtaa acttccaaat 240  
 atttactatt ctgaactgcc gtgtaaacct gacgtattcc caagtcaaca taccagtata 300  
 ccaataggat gtgaataatg tttgtgttga gtttaaaacc atagcagttt tgctctggca 360  
 agtaatggaa agcgttctcg cttctctgag ntgagctcca gcagactgca gaggggccag 420  
 tgccacagtn gtagcctgac tttc 444

<210> 271  
 <211> 502  
 <212> DNA  
 <213> Homo sapiens

WO 03/057926

PCT/US03/00657

<400> 271  
 gggtctgcgc tggtcggcgg agtagcaagt ggccatgggg agcctcagcg gtctgcgccct 60  
 ggcagcagga agctgtttta gggtatgtga aagagatggt tcctcatctc taaggcttac 120  
 cagaagctct gatttgaaga gaataaatgg attttgaca aaaccacagg aaagtcccgg 180  
 agctccatcc cgcacttaca acagagtgcc ttacacaaa cctacggatt ggcagaaaaa 240  
 gatcctcata tggtcaggtc gcttcaaaaa ggaaggtgaa atcccagaga ctgtctcggt 300  
 ggagatgctt gatgctgcaa agaacaagat gcgagtgaag atcagctatc taatgattgc 360  
 cctgacggtg gtaggatgca tcttcatggt tattgagggc aagaaggctg cccaagaca 420  
 cgagacttta acaagcttga acttagaaaa gaaagctcgt ctgaaagagg aagcagctat 480  
 gaaggccaaa acagagtagc ag 502

<210> 272  
 <211> 377  
 <212> DNA  
 <213> Homo sapiens

<400> 272  
 gggtctgcgc tggtcggcgg agtagcaagt ggccatgggg agcctcagcg gtctgcgccct 60  
 ggcagcagga agctgtttta gggtatgtga aagagatggt tcctcatctc taaggcttac 120  
 cagaagctct gatttgaaga gaataaatgg attttgaca aaaccacagg aaagtcccgg 180  
 agctccatcc cgcacttaca acagagtgcc ttacacaaa cctacggatt ggcagaaaaa 240  
 gatcctcata tggtcaggtc gcttcaaaaa ggaaggtgaa atcccagaga ctgtctcggt 300  
 ggagatgctt gatgctgcaa agaacaagat gcgagtgaag atcagctatc taatgattgc 360  
 cctgacggtg gtaggaa 377

<210> 273  
 <211> 552  
 <212> DNA  
 <213> Homo sapiens

<400> 273  
 agctcggaat tcggctcgag tctgctcagc ctgggtgaacc cacaggcccg agtttcacc 60  
 agtccccact ccacggtgca gctgcggtt atctctcagc ccagcagat gccagcctc 120  
 ctgtcccggg ccagcgtct gacatgcaga aggtgacct gggcctgctt gtgttcctgg 180  
 caggctttcc tgtcctggac gccaatgacc tagaagataa aacagtcct ttctactatg 240  
 actggcacag cctccagggt ggcgggctca tctgctgctg ggttctgtgc gccatgggca 300  
 tcatcatcgt catgagtgca aaatgcaaat gcaagtttg ccagaagtcc ggtcaccatc 360  
 caggggagac tccacctctc atcacccag gctcagccca aagctgatga ggacagacca 420  
 gctgaaattg ggtggaggac cgttctctgt cccaggctc tgtctctgca cagaaacttg 480  
 aactccagga tggattctt cctcctctgc tgggactcct ttgcatggca ggcctcatc 540  
 tcacctctcg ca 552

<210> 274  
 <211> 186  
 <212> DNA  
 <213> Homo sapiens

<400> 274  
 ctgctcagcc tgggtgaacac acagcccgat ttaccagtc cccactccag gtgcagctgc 60  
 ggcttatctc tcagcccagc gagatgccag ccttctgtc ccgggccagc gctctgacat 120  
 gcagaagggtg accctgggcc tgcttgtgtt cctggcaggc tttcctgtcc tggacgcaa 180  
 tgacct 186

<210> 275  
 <211> 121  
 <212> DNA  
 <213> Homo sapiens

<400> 275  
 tctgctcagc ctgggtgaacc acacaggccc gagtttcacc cagtccccac tccacgggtgc 60  
 agctgcggtt tatctctcag cccagcagaga tgccagcctt cctgtcccgg gccagcgtc 120  
 t 121

WO 03/057926

PCT/US03/00657

<210> 276  
 <211> 336  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 336  
 <223> n = A,T,C or G

<400> 276  
 agggacccgc agctcagcta cagcacagat cagcaccatg aagcttctca cgggcctggt 60  
 tttctgctcc ttggtcctga gtgtcagcag ccgaagcttc ttttcgttcc ttggcgaggc 120  
 ttttgatggg gctcgggaca tgtggagagc ctactctgac atgagagaag ccaattacat 180  
 cggctcagac aaatacttcc atgctcgggg gaactatgat gctgccaaaa ggggacctgg 240  
 ggggtgcctgg gccgcagaag tgatcagcaa tgccagagag aatatccaga gactcacagg 300  
 ccatggtgcg gaggactcgc tggccgatca ggctgn 336

<210> 277  
 <211> 460  
 <212> DNA  
 <213> Homo sapiens

<400> 277  
 tgcagacgga ggtcaggctt tcctctttcc tgagactgga tctgttcaaa cagcaaacgc 60  
 ccacagatgg cccagaggtg gtggtagtca ggggtgtgtg gtgttttttag ggttcttttag 120  
 tgttggttct ttcacccagg ggtggtggtc ccagccagtt tgggtgctgac ggtgagagga 180  
 aattagaatc tgtttgcaaa ttgtccaacc caccctctca acatgagggg cttccatttt 240  
 ctgtgttttg taagggaact gtttccttca tgccgccatg ttcctgatat tagttctgat 300  
 ttctttttta caaatgttat catgattaag aaaatttcca gcactttaat ggccaattaa 360  
 ctgagaatgt aagaaaattg atgctgtaca aggcaaataa agctgtttat taaccttgaa 420  
 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa ttttttgggg 460

<210> 278  
 <211> 432  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 46, 151, 350, 362, 383, 403, 417  
 <223> n = A,T,C or G

<400> 278  
 ggggttgacg acggagggtca ggtcttcctc tttcctgaga ctgganctgt tcaaacagca 60  
 aacgccca ca gatggcccag aggtggtggt agtcaggggtg tgtgggtggt tttaggggtc 120  
 tttagtgttg tttctttcac ccaggggtgg ntgggtcccag ccagtttggg gctgacgggtg 180  
 agaggaaatt agaatctggt tgcaaattgt ccaaccacc cctcaacat gaggggcttc 240  
 cttttctgt gttttgtaag ggaactgttt cttcatgcc gccatgttcc tgatattagt 300  
 tctgatttct ttttaacaaa tgttatcatg attaagaaa tttccagcan ttaatgggcc 360  
 anttaactga gaatgtaaga aantgatgct gttacaaggc aantaaagcc gttttantta 420  
 accctgaaaa aa 432

<210> 279  
 <211> 467  
 <212> DNA  
 <213> Homo sapiens

<400> 279  
 acgtgacgcg gggccaggcg gccgtacagc agctgcaggc ggagggcctg agcccgcgct 60  
 tccaccagct ggacatcgac gatctgcaga gcatccgcgc cctgocgcgac ttctgocgca 120



WO 03/057926

PCT/US03/00657

```

aggagtacgg gggcctggac gtgctgggtca acaacacggg catcgccttc aaggttgctg 180
atcccacacc ctttcatatt caagctgaag tgacgatgaa aacaaatttc tctggtacc 240
gagatgtgtg cacagaatta ctccctctaa taaaacccca agggagagtg gtgaacgtac 300
ctagcatcat gagcgtcaga gcccttaaaa gctgcagccc agagctgcag cagaagttcc 360
gcagtgagac catcactgag gaggagctgg tggggctcat gaacaagttt gtggaggata 420
caaagaaggg agtgcaccag aaggagggct ggcccagcag cgcatac 467

```

&lt;210&gt; 280

&lt;211&gt; 626

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 280

```

tacggccggg acgtgacgcg gggccaggcg gccgtacagc agctgcaggc ggagggcctg 60
agcccgcgct tccaccagct ggacatcgac gatctgcaga gcatccgcgc cctgcgcgac 120
ttcctgcgca aggagtacgg gggcctggac gtgctgggtca acaacacggg catcgccttc 180
aaggttgctg atcccacacc ctttcatatt caagctgaag tgacgatgaa aacaaatttc 240
tctggtacc gagatgtgtg cacagaatta ctccctctaa taaaacccca agggagagtg 300
gtgaacgtac ctagcatcat gagcgtcaga gcccttaaaa gctgcagccc agagctgcag 360
cagaagttcc gcagtgagac catcactgag gaggagctgg tggggctcat gaacaagttt 420
gtggaggata caaagaaggg agtgcaccag aaggagggct ggcccagcag cgcatacggg 480
gtgacgaaga ttggcgtcac cgttctgtcc aggatccacg ccaggaaact gactgagcag 540
aggaaagggg acaagatcct cctgaatgcc tgctgccag ggtgggtgag aactgacatg 600
gcgggaccca aggccaccaa gagccc 626

```

&lt;210&gt; 281

&lt;211&gt; 487

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 281

```

tggcctgttc ctcagcgagg gcctgaagct agtggataag tttttggagg atgttaaaaa 60
gttgtaccac tcagaagcct tcaactgtcaa cttcggggac accgaagagg ccaagaaaca 120
gatcaacgat tacgtggaga agggactca agggaaaatt gtggatttgg tcaaggagct 180
tgacagagac acagtttttg ccctgggtgaa ttacatcttc tttaaaggca aatgggagag 240
accctttgaa gtcaaggaca ccgaggaaga ggacttccac gtggaccagg cgaccaccgt 300
gaaggtgcct atgatgaagc gtttaggcat gtttaacatc cagcactgta agaagctgtc 360
cagctgggtg ctgctgatga aatacctggg caatgccacc gccatcttct tcctgcctga 420
tgaggggaaa ctacagcacc tggaaaatga actcaccacc gatatcatca ccaagttcct 480
ggaaaat 487

```

&lt;210&gt; 282

&lt;211&gt; 345

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 282

```

tggcctgttc ctcagcgagg gcctgaagct agtggataag tttttggagg atgttaaaaa 60
gttgtaccac tcagaagcct tcaactgtcaa cttcggggac accgaagagg ccaagaaaca 120
gatcaacgat tacgtggaga agggactca agggaaaatt gtggatttgg tcaaggagct 180
tgacagagac acagtttttg ccctgggtgaa ttacatcttc tttaaaggca aatgggagag 240
accctttgaa gtcaaggaca ccgaggaaga ggacttccac gtggaccagg cgaccaccgt 300
gaaggtgcct atgatgaagc gtttaggcat gtttaacatc cagca 345

```

&lt;210&gt; 283

&lt;211&gt; 495

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 283

```

cggccgccct tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt 60
tttttttttc aaaaaaaaaa ttttttgggt tttttttttt aaaacttttt tttttttttt 120

```

WO 03/057926

PCT/US03/00657

```

ttttgggggg ggccaaattc ccccccaaaa aaaaaaaaaa aggggggggt ttccccccc 180
cccctttttt tttttggggg ggtttttttt tttggggggg gcccccccc cttttttttt 240
tttttgaaa aaaatcccc ccttgggggg ggtttctttt tcccaaagg agtttttttt 300
cccccccc cggggggggg ggggggtttt ttttttttta aaaaaaaaaac ccccgaaaa 360
aaaaaaaaacc ccccccccc ccccccccc aaaaaaaaaa aaggggggaa aaatgggggc 420
ccccctttt tttttttttt tttttttggg gggggggaaa aaaaaccccc cccccctttt 480
tgggggggtt ttttt 495

```

&lt;210&gt; 284

&lt;211&gt; 503

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 284

```

attccgttgc tgtcagcat gaccaagcag ctgggtgact tctggacacg gatggaggag 60
ctccgccacc aagcccggca gcagggggca gaggcagtcc aggccagca gcttgcgaa 120
ggtgccagcg agcaggcatt gagtgcccaa gagggatttg agagaataaa aaaaagtat 180
gctgagttga aggaccggtt gggtcagagt tccatgctgg gtgagcaggg tgcccggatc 240
cagagtgtga agacagaggc agaggagctg tttggggaga ccatggagat gatggacagg 300
atgaaagaca tggagttgga gctgctgagg ggcagccagg ccatcatgct gcgctcagcg 360
gacctgacag gactggagaa gcgtgtggag cagatccgtg accacatcaa tgggcgcgtg 420
ctctactatg ccacctgcaa gtgatgctac agcttcacgc cegtggccc actcatctgc 480
cgctttgct tttggttggg ggc 503

```

&lt;210&gt; 285

&lt;211&gt; 581

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 285

```

agtggcactg caggaagctc aggacaccat gcaaggcacc agccgctccc ttcggcttat 60
ccaggacagg gttgctgagg ttcagcagg actgcggcca gcagaaaagc tggtgacaag 120
catgaccaag cagctgggtg acttctggac acggatggag gagctccgcc accaagcccg 180
gcagcagggg gcagaggcag tccaggccca gcagcttgcg gaaggtgcca gcgagcaggc 240
attgagtgcc caagagggat ttgagagaa aaaacaaaag tatgctgagt tgaaggaccg 300
gttgggtcag agttccatgc tgggtgagca ggggtgcccg atccagagtg tgaagacaga 360
ggcagaggag ctgtttgggg agaccatgga gatgatggac aggatgaaag acatggagtt 420
ggagctgctg cggggcagcc aggccatcat gctgcgctca gcggacctga caggactgga 480
gaagcgtgtg gagcagatcc gtgaccacat caatgggcgc gtgctctact atgccacctg 540
caagtgatgc tacagcttcc agcccgttgc cccactcatc t 581

```

&lt;210&gt; 286

&lt;211&gt; 598

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 286

```

agtggcactg caggaagctc aggacaccat gcaaggcacc agccgctccc ttcggcttat 60
ccaggacagg gttgctgagg ttcagcagg actgcggcca gcagaaaagc tggtgacaag 120
catgaccaag cagctgggtg acttctggac acggatggag gagctccgcc accaagcccg 180
gcagcagggg gcagaggcag tccaggccca gcagcttgcg gaaggtgcca gcgagcaggc 240
attgagtgcc caagagggat ttgagagaa aaaacaaaag tatgctgagt tgaaggaccg 300
gttgggtcag agttccatgc tgggtgagca ggggtgcccg atccagagtg tgaagacaga 360
ggcagaggag ctgtttgggg agaccatgga gatgatggac aggatgaaag acatggagtt 420
ggagctgctg cggggcagcc aggccatcat gctgcgctca gcggacctga caggactgga 480
gaagcgtgtg gagcagatcc gtgaccacat caatgggcgc gtgctctact atgccacctg 540
caagtgatgc tacagcttcc agcccgttgc cccactcatc tgccgccttt gcttttgg 598

```

&lt;210&gt; 287

&lt;211&gt; 316

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

<400> 287  
 ctgcccttca cctcgcagtg gacctgcaaa atcctgacct ggtgtcactc ctggtgaagt 60  
 gtggggctga tgtcaacaga gttacctacc agggctattc tccctaccag ctcacctggg 120  
 gccgcccaag caccocgata cagcagcagc tgggccagct gacactagaa aaccttcaga 180  
 tgctgccaga gagtgaggat gaggagagct atgacacaga gtcagagttc acggagttca 240  
 cagaggacga gctgccctat gatgactgtg tgtttgagg ccagcgtctg acggttatgag 300  
 cgcaaagggg ctgaaa 316

<210> 288  
 <211> 275  
 <212> DNA  
 <213> Homo sapiens

<400> 288  
 atgattagga gaagtgggtg ccacagtcga aaaatcccaa ggcccaaacc tgcaccactg 60  
 actgctgaaa tacagcaaaa gattttgcat ttgccaacat cttgggactg gagaaatggt 120  
 catggtatca attttgctcag tctgttctga aaccaagcat cctgtggcag ctgctactca 180  
 tttgcttcta tgggtatgct agaagcgaga atccgtatac taaccaacaa ttctcagacc 240  
 ccaatcctaa gccctcagga ggttgtgtct tgtag 275

<210> 289  
 <211> 522  
 <212> DNA  
 <213> Homo sapiens

<400> 289  
 cagaagggaa caccagagct ttgctaataa ttagtgtggt caagagccgt ctgagcctaa 60  
 tgagtcccag ctgcattagg ttaagagact cttccagagc catcgccagg tcgggaatgg 120  
 cacctctccc taggatacac agcctgcagg tccccaggac ctggatgaca cccgcctcac 180  
 tgtggcagtg tattgctgt taattgctgc taatttctaat tctgatgatg actcctactc 240  
 cattgtttac cccaaagcat cagctaggct ggagtgattt gttacaaatg agcaaaagat 300  
 gagtccctgc ttccctcaga aataaaaagga gctcagctgc agcgttgcag tgggcttctt 360  
 ggcctcccaa ctcttcccac tcccagaatc cagaagtaag ctctgcatgt tccccttctt 420  
 gggaggaaac cagttgtcag aaggatgtat gatgaccccc tcccctccca tccttcacct 480  
 cctaagcagt cctggctttt cctcatcact cccctctaca gt 522

<210> 290  
 <211> 331  
 <212> DNA  
 <213> Homo sapiens

<400> 290  
 aacaccagag ctttgctaata aattagtgtg gtcaagagcc gtctgagcct aatgagctcc 60  
 agctgcatta ggttaagaga ctcttccaga gccatcgcca ggtcttgaat ggcacctctc 120  
 cctaggatac acagcctgca ggtccccagg acctggatga caccocgctc actgtggcag 180  
 tgtattgcct gttaattgct gctaattcta attctgatga tgactcctac tccattgttt 240  
 accccaaagc atcagctagg ctggagtgat ttgttataaa tgagcaaaaag atgagtcctt 300  
 gcttccctca gaaataaaaag gagctcagct g 331

<210> 291  
 <211> 228  
 <212> DNA  
 <213> Homo sapiens

<400> 291  
 gagatgcaaa gcaggattca aaagaacatc tttgcgtttt ctaccggctc cccatcatcg 60  
 tactagggag gaagaagcgg gtgagaaaca aaacttcttt ccattgtcct gcccgtttct 120  
 gcggacttgt tctgaggccg aggcacctct aagatactga tggctctgca gaggacccat 180  
 tcattgcttc tgcttttgct gctgaccctg ctggggctgg ggctggctc 228

<210> 292

WO 03/057926

PCT/US03/00657

<211> 342  
 <212> DNA  
 <213> Homo sapiens

<400> 292  
 ggagctgtcc tgcaccgtgg tggagctgaa gtacacagge aatgccagcg cactcttcat 60  
 cctccctgat caagacaaga tggaggaagt ggaagccatg ctgctcccag agaccctgaa 120  
 gcggtggaga gactctctgg agttcagaga gataggtgag ctctacctgc caaagttttc 180  
 catctcgagg gactataacc tgaacgacat acttctccag ctgggcattg aggaagcctt 240  
 caccagcaag gctgacctgt cagggatcac aggggccagg aaccctacag tctcccaggt 300  
 ggtccataag gctgtgcttg atgtatttga ggagggcaca ga 342

<210> 293  
 <211> 311  
 <212> DNA  
 <213> Homo sapiens

<400> 293  
 ggagctgtcc tgcaccgtgg tggagctgaa gtacacagge aatgccagcg cactcttcat 60  
 cctccctgat caagacaaga tggaggaagt ggaagccatg ctgctcccag agaccctgaa 120  
 gcggtggaga gactctctgg agttcacaga gataggtgag ctctacctgc caaagttttc 180  
 catctcgagg gactataacc tgaacgacat acttctccag ctgggcattg aggaagcctt 240  
 caccagcaag gctgacctgt cagggatcac aggggccagg aacctagcag tctcccaggt 300  
 ggtccataag g 311

<210> 294  
 <211> 402  
 <212> DNA  
 <213> Homo sapiens

<400> 294  
 cggctgagag aagacgacag aaggaagat ggaggaagtg gaagccatgc tgctcccaga 60  
 gaccctgaag cggaggagag actctctgga gttcagagag ataggtgagc tctacctgcc 120  
 aaagttttcc atctcgaggg actataacct gaacgacgac ttctccagct gggcattgag 180  
 gaagccttca ccagcaaggc tgacctgtca gggatcacag gggccaggaa cctagcagtc 240  
 tcccaggtgg tccataaggc tgtgcttgat gtatttgagg agggcacaga agcatctgct 300  
 gccacagcag tcaaaatcac cctcctttct gcattagtgg agacaaggac cattgtgcgt 360  
 ttcaacaggc ccttcctgat gatcattgtg cctacagaca cc 402

<210> 295  
 <211> 232  
 <212> DNA  
 <213> Homo sapiens

<400> 295  
 ttccatctcg agggactata acctgaacga cgacttctcc agctgggcat tgaggaagcc 60  
 ttcaccagca aggctgacct gtcagggatc acaggggcca ggaacctagc agtctcccag 120  
 gtggtccata aggctgtgct tgatgtattt gaggagggca cagaagcatc tgctgccaca 180  
 gcagtcaaaa tcaccctcct ttctgcatta gtggagacaa ggaccattgt gc 232

<210> 296  
 <211> 435  
 <212> DNA  
 <213> Homo sapiens

<400> 296  
 tgactctgac ttctgaggaa gaggcccgtt tgaagaagag tgcacatcac tttgggggat 60  
 ccaaaaggag ctgcaathtt aaagtcttct gatgtcatat catttactg tctaggctac 120  
 aacaggattc taggtggagg ttgtgcatgt tgtccttttt atctgatctg cgattaaagc 180  
 agtaatatht taagatggac tgggaaaaac atcaactcct gaagttagaa ataagaatgg 240  
 tttgtaaaat ccacagctat atcctgatgc tggatggat taatcttgtg tagtcttcaa 300  
 ctggttagtg tgaaatagtt ctgccacctc tgacgcacca ctgccaatgc tgtacgtact 360

WO 03/057926

PCT/US03/00657

gcatttgccc cttgagccag gtggatgttt accgtgtggt atataactta ctggctcctt 420  
 cactgaacat gccta 435

<210> 297  
 <211> 309  
 <212> DNA  
 <213> Homo sapiens

<400> 297  
 atcatttcac tgtctaggct acaacaggat tctaagggga cgttgtgcat gttggccttt 60  
 gtatctgac tgtgattaaa gcagtaatat tttaagatgg actgggaaaa acatcaactc 120  
 ctgaagttag aaataagaat ggtttgtaaa atccacagct gtatgctgaa gctggatggt 180  
 attaactctg cgtagtcttc aactggtttag gtgaaatagt tctgccacct ctgacgcacc 240  
 actgccaatg ctgtacgtac tggatttggc ccttgagcca ggtggatggt caccgggcgt 300  
 gatataact 309

<210> 298  
 <211> 342  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 342  
 <223> n = A,T,C or G

<400> 298  
 atcatttgac tgtctaggct acaacaggat tctagggtgga ggttgtgcat gttgtccttt 60  
 ttatctgac tgtgattaaa gcagtaatat tttaacatgg actgggaaaa acatcaactc 120  
 ctgaagttag aaataagaat ggtttgtaaa atccacagct atatcctgat gctggatggt 180  
 attaactctg tgtagtcttc aactggtttag ttgaaatagt tctgccacct ctgacgcacc 240  
 actgccaatg ctgtacgtac tgcatttgcc ccttgagcca ggtggatggt taccgtgtgt 300  
 tatataactt cctggctcct tcaactgaaca tgccctagtcc an 342

<210> 299  
 <211> 266  
 <212> DNA  
 <213> Homo sapiens

<400> 299  
 gggacagaat ggctatctcg gaccttgtga aggtgactct gacttctgag gaagacgccc 60  
 gcttgaagaa gagagcccat acactttggg ggatccaaaa cgagctgoga ttttcaagtc 120  
 ttctgatgtc atatcattcc actgtctagg ctacaacagg attctagggg gacggtgtgc 180  
 atggtggcct ttttatctga tctgtgacta aagcactaat attttaagat ggactgggaa 240  
 aaacatcaac tcctgaagtt agaaat 266

<210> 300  
 <211> 383  
 <212> DNA  
 <213> Homo sapiens

<400> 300  
 ggacagaatg gaatctcaga ccttgtgaag gtgactctga cttctgagga agaggcccgt 60  
 ttgaagaaga gtgcagatac actttggggg atccaaaagg agctgcaatt ttaaagtctt 120  
 ctgatgtcat atcatttcac tgtctaggct acaacaggat tctagggtgga ggttgtgcat 180  
 gttgaccttt ttatctgac tgtgattaaa gcagtaatat tttaagatgg actgggaaaa 240  
 acatcaactc ctgaagttag aaataagaat ggtttgtaaa atccacagct atatcctgat 300  
 gctggatggt attaactctg tgtagtcttc aactggtttag tgtgaaatag ttctgccacc 360  
 tctgacgcac cactgccaat gct 383

<210> 301  
 <211> 453

WO 03/057926

PCT/US03/00657

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 301

```

aaccgcttct ccgttgaaca acatactaga tggggacaga atggaatctc agaccttgtg 60
aaggtgactc tgacttctga ggaagaggcc cgtttgaaga agagtgcaga tacactttgg 120
gggatccaaa aggagctgca attttaaagt cttctgatgt catatcattt cactgtctag 180
gctacaacag gattctaggt ggaggttgtg catggtgtcc tttttatctg atctgtgatt 240
aaagcagtaa tattttaaga tggactggga aaaacatcaa ctctgaagt tagaaataag 300
aatggtttgt aaaatccaca gctatatacct gatgctggat ggtattaatc ttgtgtagtc 360
ttcaactggg tagtgtgaaa tagttctgcc acctctgacg caccactgcc aatgctgtac 420
gtactgcatt tgccccttga gccagggtga tgt 453

```

&lt;210&gt; 302

&lt;211&gt; 383

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 302

```

ggacagaatg gaatctcaga ctttgtgaag gtgactctga cttctgagga agaggcccgt 60
ttgaagaaga gtgcagatac actttggggg atccaaaagg agctgcaatt ttaaagtctt 120
ctgatgtcat atcatttcac tgtctaggct acaacaggat tctagggtga ggttgtgcat 180
gttgaccttt ttatctgatc tgtgattaaa gcagtaatat ttttaagatgg actgggaaaa 240
acatcaactc ctgaagttag aaataagaat ggtttgtaaa atccacagct atatcctgat 300
gctggatggg attaactctt tgtagtcttc aactggttag tgtgaaatag ttctgccacc 360
tctgacgcac cactgccaat gct 383

```

&lt;210&gt; 303

&lt;211&gt; 97

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 303

```

gttgccttgg agatgatcaa agtaactggg ggctatccat ttgaagctta caaaaattgt 60
tttcttaact tagccattcc aattgtagta tttacag 97

```

&lt;210&gt; 304

&lt;211&gt; 442

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 304

```

gccctagtta ttataccata ttacatcatt actctatgta attatctatg aagctatgta 60
gttatttacc cctgtattaa gtgatttttag actggtgtta ttttttgagt tacagcatgt 120
gctttcaaaa tagggagact gtatggttga attaataatt ttttaaataa ctgttaacat 180
gtatagagta gggtgaaagt ttgaaagat aaaatatact aaaagtatac agacctgtaa 240
taagaaattt atattactat agtcccatag ctgcttttac tatccacaga gaaatgcttg 300
aaaacgtgaa agttgaatag atgcaattaa aatcacggat agtttttaggc tgtttatatt 360
atcagatcac cttcttttat ctaggttgcc ttggagatga tcaaagtaac tgggtggctat 420
ccatttgaag cttacaaaaa tt 442

```

&lt;210&gt; 305

&lt;211&gt; 380

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 305

```

gagacgttgc cacacctggg tgccagcgcc ccagaggtcc cgggacagcc cgaggcgccg 60
cgcccggcgc cccgagctcc ccaagccttc gagagcggcg cacactcccg gtctccactc 120
gctcttccaa caccgctcg ttttgggcgc agctcgtgtc ccagagaccg agttgcccc 180
gagaccgaga cgccgcccgt gcgaaggacc aatgagagcc ccgctgctac cgccggcgcc 240
gggtggtgctg tcgctcttga tactcggctc aggccattat gctgctggat tggacctcaa 300

```

WO 03/057926

PCT/US03/00657

tgacacctac tctgggaagc gtgaaccatt ttctggggac cacagggctg atggatttga 360  
 ggttacctcc agaaggagg 380

<210> 306  
 <211> 133  
 <212> DNA  
 <213> Homo sapiens

<400> 306  
 ccagtactgc ctctgtgct cgtgccaaaga cacagtgaat ataaccccca gctcagcctc 60  
 ctggccaagt tccgcagcgc ctccctgcac agtgagccac tcatgccaca caacgccacc 120  
 tctctgact ctt 133

<210> 307  
 <211> 428  
 <212> DNA  
 <213> Homo sapiens

<400> 307  
 tccagtactg cctcctgtgc tcgtgccaaag acacagtga tataaccccc agctcagcct 60  
 cctggccaag ttccgcagcg cctccctgca cagtgagcca tcatgccac acaacgccac 120  
 ctatcctgac tctttccagc agcctccgtg ctctgcactc cctccctcac ccagccacgc 180  
 gttctcccag tccccgtgca cggccagcta ccctcactcc ccaggaagtc cttctgagcc 240  
 agagagtccc tatcaacact cagactttcg accagtttgt tacgaggagc cccactggg 300  
 gctcggtcgc ctactatgaa ctgaacaacc gagttgggga gacattccag gcttctccc 360  
 gaagtgtgct catagatggg ttcaccgacc cttcaaataa caggaacaga ttctgtcttg 420  
 gacttctt 428

<210> 308  
 <211> 497  
 <212> DNA  
 <213> Homo sapiens

<400> 308  
 cggctgcgag aagacgacag aaggggggaa tgtgtctggc ccttcagcag tttctcttgg 60  
 cagcatcagc tgggctgctt tctttgtgtg tggccccagg tgtcaaatg acaccagctg 120  
 tctgtactag acaaggttac caagtgcgga attggttaat actaacagag agatttgctc 180  
 cattctcttt ggaataacag gacatgctgt atagatacag gcagtaggtt tgctctgtac 240  
 ccatgtgtac agcctacca tgcagggact gggattcgag gacttccagg cgcataagggt 300  
 agaaccaaat gatagggtag gagcatgtgt tctttagggc cttgtaaggc tgtttccttt 360  
 tgcactctgga actgactata taattgtctt caatgaagac taattcaatt ttgcatatag 420  
 aggagccaaa gagagatttc agctctgtat ttgtggatc agtttgaaa aaaaaaatct 480  
 gatactccat ttgatta 497

<210> 309  
 <211> 356  
 <212> DNA  
 <213> Homo sapiens

<400> 309  
 gggaatgtgt ctggcccttc agcagtttct cttggcagca tcagctgggc tgctttcttt 60  
 gtgtgtggcc ccagggtgtca aatgacacc agctgtctgt actagacaag gttaccaagt 120  
 gcggaattgg ttaatactaa cagagagatt tgctccattc tctttggaat aacaggacat 180  
 gctgtataga tacaggcagt aggtttgctc tgtacccatg tgtacagcct acccatgcag 240  
 ggactgggat tgcaggactt ccaggcgcac agggtagaac caaatgatag ggtaggagca 300  
 tgtgttcttt aaggccttgt aaggctgttt ctttttgcac ctggaactga ctatat 356

<210> 310  
 <211> 348  
 <212> DNA  
 <213> Homo sapiens

WO 03/057926

PCT/US03/00657

<400> 310  
 gggaatgtgt ctggcccttc agcagtttct cttggcagca tcagctgggc tgctttcttt 60  
 gtgtgtggcc ccaggtgtca aaatgacacc agctgtctgt actagacaag gttaccaagt 120  
 gcggaattgg ttaatactaa cagagagatt tgctccattc tctttggaat aacaggacat 180  
 gctgtataga tacaggcagt aggtttgctc tgtacccatg tgtacagcct acccatgcag 240  
 ggactgggat tgcaggactt ccaggcgcac agggtagaac caaatgatag ggtaggagca 300  
 tgtgttcttt agggccttgt aaggctgttt ccttttgcat ctggaact 348

<210> 311  
 <211> 337  
 <212> DNA  
 <213> Homo sapiens

<400> 311  
 aagttgtggt ctgacacaca ctgctgtggt tcccctggat ttagtgaat gccgtatgca 60  
 ggtggacccc caaaagtaca agggcatatt taacggattc tcagttacac ttaaagagga 120  
 tgggtgttcgt ggtttggcta aaggatgggc tccgacttcc cttggctact ccatgcaggg 180  
 actctgcaag tttggctttt atgaagtctt taaagtcttg tatagcaata tgcttggaga 240  
 ggagaatact tatctctggc gcacatcact atatttggct gcctctgcca gtgctgaatt 300  
 ctttgctgac attgccctgg ctccctatgga agctgct 337

<210> 312  
 <211> 252  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 144  
 <223> n = A,T,C or G

<400> 312  
 agcccaagcc ctcaagtggaa cctgtcaaga gcatcagcag catggagctg aagaccgagc 60  
 cctttgatga cttcctgttc ccagtgacac ttcagagagc tggtagttag tagcatgttg 120  
 agccaggcct gggctctgtg ctcttttctc tttctcctta gtcttctcat agcattaact 180  
 aatctattgg gttcattatt ggaattaacc tgggtgctgga tattttcaaa ttgtatctag 240  
 tgcagctgat tt 252

<210> 313  
 <211> 51  
 <212> DNA  
 <213> Homo sapiens

<400> 313  
 actcccagct gcactgggta cacgtcttcc ttcgtcttca cctaccccga g 51

<210> 314  
 <211> 348  
 <212> DNA  
 <213> Homo sapiens

<400> 314  
 atggccacag agctggagcc cctgtgcaact ccgggtggca cctgtactcc cagctgcact 60  
 gcttacacgt cttccttctg cttcacctac cccgaggctg actccttccc cagctgtgca 120  
 gctgcccacc gcaagggcag cagcagcaat gagccttccct ctgactcget cagctcacc 180  
 acgctgctgg ccctgtgagg gggcagggaa ggggaggcag ccggcaccga caagtgccac 240  
 tgcccagct ggtgcattac agagaggaga aacacatctt ccctagaggg ttctgtaga 300  
 cctagggagg accttatctg tgcgtgaaac acaccaggct gtgggccc 348

<210> 315  
 <211> 507  
 <212> DNA



WO 03/057926

PCT/US03/00657

&lt;213&gt; Homo sapiens

&lt;400&gt; 315

```

ccggtggtca cctgtactcc cagctgcact gcttacacgt cttccttctg cttcacctac 60
cccgaggctg actccttccc cagctgtgca gctgcccacc gcaagggcag cagcagcaat 120
gagccttctt ctgactcgtt cagctcacc acgctgctgg ccctgtgagg gggcagggaa 180
ggggaggcag ccggcaccca caagtgccac tgcccagact ggtgcattac agagaggaga 240
aacacatctt ccctagaggg ttctgtaga cctagggagg accttatctg tgcgtgaaac 300
acaccaggct gtgggcctca aggacttgaa agcatccatg tgtggactca agtccttacc 360
tcttccggag atgtagcaaa acgcatggag tgtgtattgt tcccagtgac acttcagaga 420
gctggtagtt agtagcatgt tgagccaggc ctgggtctgt gtctcttttc tctttctcct 480
tagtcttctc atagcattaa ctaatct                                     507

```

&lt;210&gt; 316

&lt;211&gt; 239

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; 223

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 316

```

agactccaag ccctactggg aggcacggag ggtggcgagg caggctcagc tggaagctca 60
gaaagccacg caggacttcc agagggccac agaggtgctc cgccgcccca aggagaccat 120
ctccctggcc gagcagcggc tgctggagga tgacaagcgg cagttcgact ccgcctggca 180
ggagatgctg aatcacgcca ctgagagggg catggaggcg ganagaccaa gaccaggag 239

```

&lt;210&gt; 317

&lt;211&gt; 313

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 317

```

catcagtgat agggatgatt cacaaacaca aagctggtct tttcaaatg ggaagaaaaa 60
agatgcaatt gatcccttac tattcaagta taaagtgcaa cccactaaaa agaattaca 120
tgagtctgct attgttaaag caacacaaat cagccggaga aacacctat tttctcgtga 180
taaaactaaag ctttttctga agcaacactg ggaaccacaa gatggagtca ttaaaataaa 240
ggcatcatct ctttcaacgg ataaaatagc cgaacaagat tttttcttat ttcttccctg 300
atgattccac ccc                                     313

```

&lt;210&gt; 318

&lt;211&gt; 574

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 318

```

aaataacatc aacagaacag cttcactttg ggccaaacat ttgaaaaact ttttataaaa 60
aattgtttga tatttcttaa tgtctgctct gagccttaa acacagattg aagaagaaaa 120
gaaagaaaaa acttaaatat ttatttctat gctttgttgc ctctgagaat aatgacaatt 180
tatgaatttg tgtttcaaat tgataaaata tttaggtaca aataacaaga ctaataatat 240
tttcttattt aaaaaaagca tgggaagatt tttatttatc aaaatataga ggaaatgtag 300
acaaaatgga tataaatgaa aattaccatg ttgtaaaacc ttgaaaatca gatttctaact 360
ggatttgtat gcaactaagt atttttctga acacctatgc aggtcttatt tacagtagtt 420
actaagggaa cacacaaaga attacacac gttttcctca agaaaatggg acaaaacaca 480
accgaggagc gtatacagtt gaaaacattt ttgttttgat tggaaggcag attattttat 540
attagtatta aaaatcaaac cctatgtttc tttc                                     574

```

&lt;210&gt; 319

&lt;211&gt; 518

&lt;212&gt; DNA

WO 03/057926

PCT/US03/00657

&lt;213&gt; Homo sapiens

&lt;400&gt; 319

```

gaagggaaat aacatcaaca gaacaacttc actttgggcc aaacatttga aaaacttttt 60
ataaaaaatt gtttgatatt tcttaatgtc tgctctgagc cttaaaacac agattgaaga 120
agaaaagaaa gaaaaaactt aaatatttat ttctatgctt tgttgcctct gagaataatg 180
acaatttatg aatttgtggt tcaaattgat aaaatattta ggtacaaata acaagactaa 240
taatattttc ttatttaaaa aaagcatggg aagattttta tttatcaaaa tatagaggaa 300
atgtagacaa aatggatata aatgaaaatt accatgttgt aaaaccttga aaatcagatt 360
ctaactggat ttgtatgcaa ctaagtattt ttctgaacac ctatgcaggt cttatttaca 420
gtagttacta agggaacaca caaagaatta cacaacgttt tcctcaagaa aatggtacaa 480
aacacaaccg aggagcgtat acagttgaaa acattttt 518

```

&lt;210&gt; 320

&lt;211&gt; 353

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 320

```

aaataacatc aacagaacaa cttcactttg ggccaaacat ttaaaaaact ttttataaaa 60
aatgtttga tatttcttaa tgtctgctct gagccttaca acacagattg aagaagaaaa 120
gaaagaacaa acttagatat ttatttctat gctttggtgc ctctgagaat aatgacaatt 180
tatgaatttg agtttcaaat tgataaaata tttaggtact aataacaaga ctaataatat 240
tttcttattt ataaaaagca tgggaagatt tttatttatc aaaatataca ggaagtgtag 300
acaaaatgga tataaatgaa aattaccatg ttgtaaaacc ttgaaaatca gag 353

```

&lt;210&gt; 321

&lt;211&gt; 401

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 321

```

gacctgcaca cagagactcc ctctctgggct cctggcacca tggccccctg aagagctggc 60
cctggtcacc ctctcctgg gggcttctct gcagcacatc cacgcagctc gagggaccaa 120
tgtgggccgg gagtgctgcc tggagtactt caagggagcc attcccctta gaaagctgaa 180
gacgtggtac cagacatctg aggactgctc cagggatgcc atcgtttttg taactgtgca 240
gggcagggcc atctgttcgg accccaacaa caagagagtg aagaatgcag ttaaataacct 300
gcaaagcctt gagaggtctt gaagcctcct caccacagac tcctgactgt ctcccgggac 360
tacctgggac ctccaccggt ggtgttcacc gccccacc t 401

```

&lt;210&gt; 322

&lt;211&gt; 547

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 322

```

gacctgcaca cagagactcc ctctctgggct cctggcacca tggccccact gaagatgctg 60
gccctggtca ccctcctcct gggggcttct ctgcagcaca tccacgcagc tcgagggacc 120
aatgtgggcc gggagtgctg cctggagtac ttcaagggag ccattcccct tagaaagctg 180
aagacgtggt accagacatc tgaggactgc tccagggatg ccatcgtttt tgtaactgtg 240
cagggcaggg ccatctgttc ggacccaac aacaagagag tgaagaatgc agttaaatac 300
ctgcaaagcc ttgagaggtc ttgaagcctc ctaccccag actcctgact gtctcccggg 360
actacctggg acctccaccg ttggtgttca ccgccccac cctgagcgcc tgggtccagg 420
ggaggccttc cagggacgaa gaagagccac agtgagggag atcccatccc cttgtctgaa 480
ctggagccat gggcacaag gggccagatt aaagtcttta tcctcaaaaa aaaaaaaaaa 540
aaaaaaaa 547

```

&lt;210&gt; 323

&lt;211&gt; 283

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

WO 03/057926

PCT/US03/00657

&lt;400&gt; 323

```

ctgagcagag ggacctgcac acagagactc cctcctgggc tcctggcacc atggccccac 60
tgaagatgct ggccctggtc accctcctcc tgggggcttc tctgcagcac atccacgcag 120
ctcgagggac caatgtgggc cgggagtgtc gcctggagta cttcaaggga gccattcccc 180
ttagaaagct gaagacgtgg taccagacat ctgaggactg ctccagggat gccatcgttt 240
ttgtaactgt gcagggcagg gccatctgtt cggaccccaa caa 283

```

&lt;210&gt; 324

&lt;211&gt; 160

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 324

```

gcggtgacga cggggacatc tttaccatca ccacccaccc tgagagcaac cagggcatcc 60
tgacaaccag gaagggtttg gattttgagg ccaaaaacca gcacaccctg tacgttgaag 120
tgaccaacga ggcccctttt gtgctgaagc tcccaacctc 160

```

&lt;210&gt; 325

&lt;211&gt; 300

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 325

```

tttttttttg gggccaatc ttttaatttaa ctaaattagg aacgcagctt ttacagaaca 60
ataaacacaa gggacggggc caccccagga tctaacagct tttcaggac ctatgttgca 120
agctcaaaag taatccacta acgaaccaag tcaaactcca gtttttaata aaaaggggct 180
gggggaggtt gtcaaaccct ttccaatata aatccccaat ccgagggcca ccaaatgaaa 240
aagcaccaaa aatggaagga aaactttcaa aaattctgca aaaaatatgc cccctttttt 300

```

&lt;210&gt; 326

&lt;211&gt; 394

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 326

```

gtctattctt ttattttact aaattaggaa cgcagcattt acagaacaat aaacacaagt 60
gacgtggcca ccccaggatc taacagctct tcagtgagct atggttgcaag ctcagaagta 120
atccactaac gaaccaagtc agactccagt tcttcatcaa aagggtgctg tggaggttgt 180
cagacgcctt ccaatataga tcccacatcc gatggccagc aatgagaga gcagcagaga 240
tgaagggaaa acttccagaa attctgcaga gaatatgcc cctttcttca tgacgctcgt 300
gttcccccat gctgaagggt gccgtgcgct tccggtgttt aaagaagaac ccttgggggg 360
aatatttccc ggccatttga ccaatcccat tcca 394

```

&lt;210&gt; 327

&lt;211&gt; 524

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 327

```

gtctattctt ttattttact aaattaggaa cgcagcattt acagaacaaa taaacacaag 60
tgacgtggcc accccaggat ctaacagctc ttcagtgagc tatggttgca gctcagaagt 120
aatccactaa cgaaccaagt cagactccag ttcttcatca aaagggtgctg gtggaggttg 180
tcagacgcct tccaatatag atcccacatc cgatggccag caaatgagag agcagcagag 240
atggaaggaa aactttcaga aattctgcag agaatatgcc ccctttcttc atgacgctcg 300
tgttcctcat gctgaggttg ccgtgcgctt ccggtgttta aagaagaacc cttggggggg 360
atatttccgg ccgacttgac caatcccata tccatctgat ttttcttcca gaagctttca 420
cttccttctt ccttcaatat cactccctca actgtgactg ttttcccccc aatgctatgg 480
tttctgttca aaaccccgtt ggttctgttg ggtcgtctact ccgt 524

```

&lt;210&gt; 328

&lt;211&gt; 55

WO 03/057926

PCT/US03/00657

<212> DNA  
 <213> Homo sapiens

<400> 328  
 ggccgccctt tttttttttt ttttttcggg ggcggttttt gatttttaaa attgg 55

<210> 329  
 <211> 463  
 <212> DNA  
 <213> Homo sapiens

<400> 329  
 tcaactatagg gaaagctggt acgcctgcag gtaccgggtcc ggaattcccg ggtcgacca 60  
 cgcggtccgcc gcccccgaga cctgtgaaga aaaccatctt gtgaggggct gcctggactg 120  
 gtctggcagg ttgggcctgg atggggaggc tctagcatct ctcatagggt caacctgaga 180  
 gtgggggagc taagccatga ggtaggggca ggcaagagag aggattcaga cgctctggga 240  
 gccagttcct agtcctcaac tccagccacc tgccccagct cgacggcact gggccagttc 300  
 cccctctgct ctgcagctcg gtttcctttt ctagaatgga aatagtgagg gccaatgccc 360  
 agggttggag ggaggagggc gttcatagaa gaacacacat gcgggcacct tcatcgtgtg 420  
 tggcccactg tcagaactta ataaaagtca actcatttgc tgg 463

<210> 330  
 <211> 274  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 144, 218, 268  
 <223> n = A, T, C or G

<400> 330  
 ccgccccga gaccatgtga agaaaacat cttgtgaggg gctgcctgga ctggtctggc 60  
 aggttgggcc tggatgggga ggctctagca tctctcatag gtgcaacctg agagtggggg 120  
 agctaagcca tgaggtaggg gcangcaaga gagaggattc agacgctctg ggagccagtt 180  
 cctagtcctc aactccagcc acctgccccca gctcgacngc actgggcccag tccccctct 240  
 gctctgcagt cggtttcctt ttctagantg gaaa 274

<210> 331  
 <211> 232  
 <212> DNA  
 <213> Homo sapiens

<400> 331  
 cggctgtgag aatacgacag aagggtccgg ctgcgagaag acgacagaag ggggatctca 60  
 gcggggagcc acgtctcttg cactgtggtc tctgcatgga ccccagggct gtggggactt 120  
 gggggacagt aatcaagtaa tccccttttc cagaatgcat taaccactc ccctgacctc 180  
 acgctggggc aggtccccaa gtgtgcaagc tcagtattca tgatggtggg gg 232

<210> 332  
 <211> 321  
 <212> DNA  
 <213> Homo sapiens

<400> 332  
 gttgtgttga gatccagtgc agttgtgatt tctgtggatc ccagcttggg tccaggaatt 60  
 ttgtgtgatt ggttttaaat cagttttcaa tcttcgacag ctgggctgga acgtgaactc 120  
 agtagctgaa cctgtctgac ccggtcacgt tcttggatcc tcagaactct ttgctcttgt 180  
 cgggggtggg gtgggaactc tcgtgaggag cgccagctgt gtaaatacca cgactccgta 240  
 attcttattc ggtgggacct tgcttccctc tgggagctgg ctcgttttgt tgggtgtctaa 300  
 ctttccgccc aatcgtaaa g 321

WO 03/057926

PCT/US03/00657

<210> 333  
 <211> 344  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 265, 267, 272, 337  
 <223> n = A, T, C or G

<400> 333  
 gtcctatttc tcattttggt gataatttct gcatttaatg gtctgtgctt taaatggtaa 60  
 cgctacggcc ccaggtcact gcgaggcact taccatgtag atacgggctc aaaagtcacc 120  
 tctcagagac ctacgtcatc cactcaggaa ttcgcgcctc tcatacttgc ctgtctcatt 180  
 ttatcttctt tctagcagct gtctgaaatt ggttcgtctg ttttcttggt tatgggtattc 240  
 tcaagccctt gacagaccgg ctagnngngt tntcccgtgc atcttcagcc tggcacatta 300  
 tggacactta aatactacgt attgatctaa tattganggg ttaa 344

<210> 334  
 <211> 405  
 <212> DNA  
 <213> Homo sapiens

<400> 334  
 ggcacgaggg atgaagggtg ctgctcattt tcattagatg tatgtgaagg cacagtgaaa 60  
 atggaaatgt tcttggagct acttccctcaa aatgtatcct tagtcacctc agtgcaacag 120  
 ctgggagggg gccgtgttaa gatttttttt gctacaaaga ggaggtggca atggtagatc 180  
 cacccttatg cttctcagtt tagcataacc tcttatggat tttcatcaaa ttcagcgtgt 240  
 tggtcactgg aaagagcctt ttccttctcc ttttcttact ctcccctcat ggggttcccc 300  
 tcttaaagga gaggagcttt taatttacac ttaccacctc atttgctttt ttggaggcca 360  
 tgccatataa gcgggactac cgagttaatc tcctttttac aaaag 405

<210> 335  
 <211> 227  
 <212> DNA  
 <213> Homo sapiens

<400> 335  
 ggatgaacta ttcagatgct atcgtttggc taaaagaaca tgatgtaaag aaagaagatg 60  
 gaactttcta tgaatttggg gaagatatcc cagaagctcc tgagagactg atgacagaca 120  
 ccattaatga accaatcttg ctgtgtcgat ttctgtgga gatcaagtcc ttctacatgc 180  
 agcgatgtcc tgaggattcc cgtcttactg aatctgtcga cgtgtttg 227

<210> 336  
 <211> 521  
 <212> DNA  
 <213> Homo sapiens

<400> 336  
 tcgaattcgg atgaactatt cagatgctat cgtttggcta aaagaacatg atgtaaagaa 60  
 agaagatgga actttctatg aatttggaga agatatccca gaagctcctg agagactgat 120  
 gacagacacc attaataaac caatcttgct gtgtcgattt cctgtggaga tcaagtcctt 180  
 ctacatgcag cgatgtcctg aggattcccg tcttactgaa tctgtcgacg tgttgatgcc 240  
 caatgttggg gagattgtgg gaggctcaat gcgtatcttt gatagtgaag aaatactggc 300  
 aggttataaa agggaaggga ttgaccccac tccctattac tggatatacg atcagagaaa 360  
 atacggtaca tgtccccatg gaggatatgg cttgggcttg gaacgattct taacgtggat 420  
 tctgaatagg tatcacatcc gagacgtgtg cttataccct cgatttgtcc agcgttgcac 480  
 gccataacca ttttctccag aagcgtggag gaaagattat g 521

<210> 337  
 <211> 325  
 <212> DNA

WO 03/057926

PCT/US03/00657

&lt;213&gt; Homo sapiens

&lt;400&gt; 337

```

ggactttccc gatcgccagg caggagtttc tctcggtgac tactatcgct gtcattgtctg 60
gtcgtggcaa gcaaggaggc aaggcccgcg ccaaggccaa gtcgcgctcg tcccgcgcgg 120
gccttcagtt cccggtaggg cgagtgcac gcttgctgcg caaaggcaac tacgcggagc 180
gagtgggggc cggcgcgccc gtctacatgg ctgcgttcct cgagtatctg accgctgaga 240
tcctggagct ggcgggcaac gcggctcggg acaacaagaa gacgcgcac atccctcgtc 300
acctccagct ggccatccgc aacga                                     325

```

&lt;210&gt; 338

&lt;211&gt; 401

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; 264

&lt;223&gt; n = A, T, C or G

&lt;400&gt; 338

```

cgttgctgtc ggtttttagga aacctggcat ggtgctttca ggtctggggc ttttagagcc 60
ccccgtgtgg cttacaaatt ctacagcata cagagcaggc cacgctcagg cccggcatgc 120
gggccaccaa gttctggaaa ccacgtgggtg tccctgcgaa tggggcgatc aagtccagag 180
ccggggcact ttcagagttt gaaggtaact gagagcagat ggtcctccat ttcaactcca 240
gaagtggggc tctgggaggg atgntctaac cctccctggc atgtcacaac caggctctgg 300
ctggaggatc cctccatccg gctcctgtca tcccctacac tttggcctag caagaggtgg 360
aataaccact tgtgtgctca ttactgttgg gaggaacaaa g                                     401

```

&lt;210&gt; 339

&lt;211&gt; 460

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 339

```

catgcggggc accaagttct ggaaaccacg tgggtgcccct gogaatgggg cgatcaagtc 60
cagagccggg gcactttcag agtttgaagg taactgagag cagatgggtcc tccatttcaa 120
ctccagaagt ggggctctgg gagggatggt ctagccctcc ctggcatgtc agaaccaggc 180
tctgcctgga ggatccctcc atccggctcc tgatcatccc tacactttgg ccaagcaaga 240
agtggtagaa ccacttggct gctccttct tctggaggac acacagtctc agtccagatg 300
ccttcctgtc tttctggccc tttctggacc agatcctact cttcctttct aaatctgaga 360
tctccctcca gggaatccgc ctgcagagga cagagctggc tgtcttcccc caccctaac 420
ctggcttatt cccaactgct ctgcccactg tgaaccact                                     460

```

&lt;210&gt; 340

&lt;211&gt; 496

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 340

```

tttttttttt tttttttttt tttttgggat tcttaaatat agatgtattt ttttcatctc 60
atctccggac aactccaat cacaccctc ctgccctccc ctctcaactg caaaccaagc 120
ggtgcagaca cagcacagca cacatgaggg gccctccctt tcaccaaagc tgaaggcagg 180
gcacagtttg gggatggaag agcctcgagg taaatgtggg ggttctagaa cccagtgacc 240
tcagttctgg atcatgggaa agggatcagt atgcagtaac gtggtaagg tccagatcta 300
gaagccagga ctagaacct agtggtttca cagtgggcag agcagttggg aataagccag 360
gtaggggtg ggggaagaca gccagctctg tcctctgcag gcggattccc tggagggaga 420
tctcagattt agaaaggaag agtaggatct ggtccagaaa gggccagaaa gacaggaagg 480
catctggact gagact                                     496

```

&lt;210&gt; 341

&lt;211&gt; 283

WO 03/057926

PCT/US03/00657

<212> DNA  
 <213> Homo sapiens

<400> 341  
 tttttttttt tttttttttt ttttttttag gatttgaata catttattgt gacaagaatg 60  
 ctgttataaa tattcataag caaaggccat ctttttatct aggaattgtc aaagagaaga 120  
 ttccaaattg gaaggataca tcttttgtaa aatctgccac caattcctgc tttgagaata 180  
 agcacctatt gtaaaatttc tactaacatt ataaatggtc acagcacatg ccacttgata 240  
 caatccaaac tttgaaatgt ttgacttctc agtgggctgt ccc 283

<210> 342  
 <211> 335  
 <212> DNA  
 <213> Homo sapiens

<400> 342  
 tgtcgggcag caggcgcagc ccagcctcga aatgcagaac gacgccggcg agttcgtgga 60  
 cctgtacgtg ccgcggaaat gctccgctag caatcgcac atcgggtgcca aggaccacgc 120  
 atccatccag atgaacgtgg ccgagggtga caaggtcaca ggcaggttta atggccagtt 180  
 taaaacttat gctatctgcg gggccattcg taggatgggt gagtcagatg attccattct 240  
 ccgattggcc aaggccgatg gcatcgtctc aaagaacttt tgactggaga gaatcacaga 300  
 tgtggaatat ttgtcataaa taaataatga aaacc 335

<210> 343  
 <211> 75  
 <212> DNA  
 <213> Homo sapiens

<400> 343  
 gggtagagtt cttaaactga gatctggagg tagatggacg ctttgtaacc ctccagatct 60  
 gggacactgc agggc 75

<210> 344  
 <211> 611  
 <212> DNA  
 <213> Homo sapiens

<400> 344  
 gccggggggc agcggcgggc gcgagcggca gctgtcaggc caccgaggtc caagccgcac 60  
 ttgctgcccc attgaggacg aggaggcagc aggagcagtg acggtgactc taaggagccg 120  
 gattcccggc acgcagagct gacctgcctg gcacccgcgg ccctctcctg tttccttccc 180  
 attgtgttgg caccctaaaa agaaagaata aaacaacaac aggaaaaaaaa ggaaaatatt 240  
 taaattgtga caaaaaccca ctgggttctc ttggttacaa actccttccc ttctggtgct 300  
 acaaaaatga gtgggaaatc cctgctctta aaggtcattc tcttgggtga tgggtggagt 360  
 gggaaaagtt cgcttatgaa ccgttacgta accaacaat ttgactccca ggcttttcac 420  
 accatagggg tagagttctt aaatcgagat ctggaggtag atggacgctt tgtaaccctc 480  
 cagatctggg aactgcagc gcaggaacgt ttcaagagcc ttaggacacc cttctacagg 540  
 ggagcagact gctgcctctt gaccttcagc gtggatgatc ggcagagctt cgagaatctt 600  
 ggtaactggc a 611

<210> 345  
 <211> 441  
 <212> DNA  
 <213> Homo sapiens

<400> 345  
 ggcctttgca agcctcaccg gcgatgcaag gatagtcac aacagggccc ggggtggagtg 60  
 ccagagccac cggtgactg tggaggaccc ggtcactgtg gagtacatca cccgctacat 120  
 cgccagtctg aagcagcgtt atacgcatag cactgggcgc aggcgtttgg catctctgcc 180  
 ctcatcgtgg gtttctactt tgatggcact cctaggctct atcagactga cccctctgtc 240  
 acataccatg cctggaaggc caatgccata cgccggggtg ccaactcagt gcgtgagttc 300  
 ctggagaaga actatactga cgaagccatt gtaacatag atctgacat taagctggtg 360

WO 03/057926

PCT/US03/00657

atcaacgcac tcctggaagt ggttcactca ggtggcaaaa acattgaact tgctgtcatg 420  
 aggcgagatc aatccctcaa g 441

<210> 346  
 <211> 323  
 <212> DNA  
 <213> Homo sapiens

<400> 346  
 ggcctttgca ggcctcaccg ccgatgcaag gatagtcac aacagggccc ggggtggagtg 60  
 ccagagccac cggctgactg tggaggaccc ggtcactgtg gagtacatca cccgctacat 120  
 cgccagtctg aagcagcgtt atacgcacag caatgggccc aggcgtttgg catctctgcc 180  
 ctcatcgtgg gtttcgactt tgatggcact cctaggctct atcagactga ccctcggggc 240  
 acataccatg cctggaaggc caatgccata tgccgggggtg ccaagtcagt gcgtgagttc 300  
 ctggagaaga actatactga cga 323

<210> 347  
 <211> 567  
 <212> DNA  
 <213> Homo sapiens

<400> 347  
 ccagcggcct cttccccttc ctggtgctgc ttgccctggg aactctggca ccttgggctg 60  
 tggaaaggctc tggaaagtcc ttcaaagctg gagtctgtcc tcctaagaaa tctgcccagt 120  
 gccttagata caagaaacct gagtgccaga gtgactggca gtgtccaggg aagaagaaat 180  
 gttgtcctga cacttgtggc atcaaagtcc tggatcctgt tgacacccca aacccaacaa 240  
 ggaggaagcc tgggaagtgc ccagtgactt atggccaatg tttgatgctt aaccccccca 300  
 atttctgtga gatggatggc cagtgcaagc gtgacttgaa gtggttgcag ggcatgtgtg 360  
 ggaaatcctg cgtttcccct gtgaaagctt gattcctgcc atatggagga ggctctggag 420  
 tcctgctctg tgtgggtccag gtcctttcca ccctgagact tggctccacc actgatatcc 480  
 tcctttgggg aaaggcttgg cacacagcag gctttcaaga agtgccagtt gatcaatgaa 540  
 taaataaacg agcctatttc tctttg 567

<210> 348  
 <211> 314  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 48  
 <223> n = A,T,C or G

<400> 348  
 atgaagtcca gcggcctctt cccttctctg gtgctgcttg ccctgggnac tctggcacct 60  
 tgggctgtgg aaggctctgg aaagtccttc aaagctggag tctgtcctcc taagaaatct 120  
 gccagtgcc ttagatacaa gaaacctgag tgccagagtg actggcagtg tccagggag 180  
 aagagatgtt gtcctgacac ttgtggcatc aaatgcctgg atcctgttga cccccaaac 240  
 ccaacaagga ggaagcctgg gaagtgccca gtgacttatg gccaatgttt gatgcttaac 300  
 ccccccaatt tctg 314

<210> 349  
 <211> 611  
 <212> DNA  
 <213> Homo sapiens

<400> 349  
 ggctctgctc tgcagcacac ccgtgggtga cccctcacc cagaagcagc agtggcagct 60  
 tgggaaatgt gaggaaggga aggagggaga gacgggaggg aggagagaga ggagaaggga 120  
 ggcaggggag gggcagcaga accaaggcaa atatttcagc tgggctatac ccctctcccc 180  
 atccctgtta tagaagctta gagagccagc cagcaatgga accttctggt tcctgcgcca 240  
 atcgccacca gtatcaattg tgtgagcttg ggtgagagtg cacgcgtgag tgagtacgga 300



WO 03/057926

PCT/US03/00657

```

gagtatatat agatctctat ctcttagcaa aggtgaatgc cagatgtaaa tggcgcctct 360
gggcaaagga ggcttgtatt ttgcacattt tataaaaact tgagagaatg agatttctgc 420
ttgtatatatt ctaaaaagag gaaggagccc aaaccatcct ctcttacca ctcccatccc 480
tgtgagccct accttaccct tctgccccta gccaaaggag gtgaatttat agatctaact 540
ttcataggca aaacaaaagc ttcgagctgt tgcgtgtgtg agtctgttgt gtggatgtgc 600
gtgtgtggtc c 611

```

&lt;210&gt; 350

&lt;211&gt; 370

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 350

```

tggctggatg ggcttggact gtggctcctga aagcagcaag aagtatgctg aggctgtcac 60
tcgggctaag cagattgtgt ggaatggctc tgtgggggta tttgaatggg aagcttttgc 120
ccggggaacc aaagctctca tggatgaggt ggtgaaagcc acttctaggg gctgcatcac 180
catcataggt ggtggagaca ctgccacttg ctgtgccaaa tggaacacgg aggataaagt 240
cagccatgtg agcactgggg gtgggtgccag tttggagctc ctggaaggta aagtccttcc 300
tgggggtgat gctctcagca atatttagta ctttcctgcc ttttagttcc tgtgcacagc 360
ccctaagtca 370

```

&lt;210&gt; 351

&lt;211&gt; 177

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 351

```

gggctgcatc accatcatag gtgggtggaga cactgccact tgctgtgcca aatggaacac 60
ggaggataaa gtcagccatg tgagcactgg ggggtgggtgcc agtttggagc tcctggaagg 120
gaaagtcctt cctgggggtg atgctctcag caatatttag tactttcctg cctttta 177

```

&lt;210&gt; 352

&lt;211&gt; 204

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; misc\_feature

&lt;222&gt; 53, 55, 76, 86, 137

&lt;223&gt; n = A,T,C or G

&lt;400&gt; 352

```

atggctttta ccttccttaa ggtgctcaac aacatggaga ttgggcactt tcnngggtg 60
atgaagaagg aagccnagat ttgtcnaaga cctaattgtc aaaagctgag aagaatgggtg 120
tgaagattac cttgccttgt tgacttgtca ctgctgacaa gtttgatgag aatgcccaag 180
actggcccag ccactgggtg cttc 204

```

&lt;210&gt; 353

&lt;211&gt; 489

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 353

```

cttttacctt ccttaagggtg ctccaggacat ggagattggc acttctctgt ttgatgaaga 60
gggagccaag attgtcaaag acctaattgtc caaagctgag aagaatgggtg tgaagattac 120
cttgctgtgt gactttgtca ctgctgacaa gtttgatgag aatgcccaaga ctggccaagc 180
cactgtggct tctggcatac ctgctggctg gatgggcttg gactgtggctc ctgaaagcag 240
caagaagtat gctgaggctg tcaactcgggc taagcagatt gtgtggaatg gtcctgtggg 300
ggtatttgaa tgggaagctt ttgcccgggg aaccaaagct tcatggatg aggtgggtgaa 360
agccacttct aggggctgca tcaccatcat aggtgggtgga gacactgcca cttgctgtgc 420
caaatggaac acggaggata aagtcagcca tgtgagcact ggggggtgggtg ccagtttggg 480
gctcctgga 489

```

WO 03/057926

PCT/US03/00657

<210> 354  
 <211> 885  
 <212> DNA  
 <213> Homo sapiens

<400> 354  
 tttttttttt tcacggtttc aatggacact tttattgttt acttaatgga tcatcaattt 60  
 tgtctcacta cctacaaatg gaatttcac tttgtttccat gctgagtagt gaaacagtga 120  
 caaagctaata cataataacc tacatcaaaa gagaactaag ctaacactgc tcacttttctt 180  
 ttttaacaggc aaaatataaa tatatgcact ctaaaatgca caatggttta gtcactaaaa 240  
 aattcaaagc ggatcttgaa gaatgtatgc aaatccaggg tgcagtgaaa atgagctgag 300  
 atgctgtgca actgtttaag ggttcctggc actgcatctc ttggccacta gctgaatctt 360  
 gacatggaag gtttttagct atgcccaggg gaaatgcaaa aaatgctaata ttgacttagg 420  
 gcctgtgcac aggaactaaa aggcaggaaa gtactaaata ttgctgagag catccacccc 480  
 aggaaggact ttaccttcca ggagctccaa actggcacca cccccagtgc tcacatggct 540  
 gactttatcc tccgtgttcc atttggcaca gcaagtggca gtgtctccac cacctatgat 600  
 ggtgatgcag ccccctaaaa gtggctttca ccacctcacc catgagagct ttgggtcccc 660  
 gggcaaaagc ttcccattca aataccccca caggaccatt ccacacaatc tgcttaacct 720  
 gagtgacagc ctcagcatac ttcttgctgg tttcaggacc acagtccaag ccccatccca 780  
 ccagcaggta tgcaagaagg cccagtgggc ttgccagtct tggcatttct catcaacttg 840  
 tcagcagtga caaagtcaac cgggaaggaa tcttcacacc atctt 885

<210> 355  
 <211> 434  
 <212> DNA  
 <213> Homo sapiens

<400> 355  
 cggctgcgag aagacgacag aaggggggag tggttgctat accttgactt catttatatg 60  
 aatttccact ttattaaata atagaaaaga aaatcccggg gcttgacagta gagtgatagg 120  
 acattctatg cttacagaaa atatagccat gattgaaatc aaatagtaaa ggctgttctg 180  
 gctttttatc ttcttagctc atcttaaata agcagtacac ttggatgcag tgcgtctgaa 240  
 gtgctaataca gttgtaacaa tagcacaat cgaacttagg atttgtttct tctcttctgt 300  
 gtttcgattt ttgatcaatt ctttaatttt ggaagcctat aatacagttt tctattcttg 360  
 gagataaaaa ttaaatggat cactgatatt ttagtcatte tgcttctcat ctaaataatt 420  
 ccatattctg tatt 434

<210> 356  
 <211> 318  
 <212> DNA  
 <213> Homo sapiens

<400> 356  
 gggagtgggt gctatacctt gacttcattt atatgaattt ccactttatt aaataataga 60  
 aaagaaaatc ccgggtgctt cagtagagt ataggacatt ctatgcttac agaaaatata 120  
 gccatgattg aatcaaata gtaaaggctg ttctggcttt ttatcttctt agctcatctt 180  
 aaataagcag tacacttgga tgcagtgcgt ctgaagtgt aatcagttgt aacaatagca 240  
 caaatcgaac ttaggatttg cttcttctct tctgtgttgc gatttttgat caattcttta 300  
 attttggaag cctataat 318

<210> 357  
 <211> 231  
 <212> DNA  
 <213> Homo sapiens

<400> 357  
 cggctgcgag aagacaacag aagggggctc ccgctcggga tctcgtccg gatctcgtc 60  
 cgggtcccgc agtgggtccc ggagaggaag ctttgacgcc acaaggaatt cttcctactc 120  
 ttattcctac tcatttagca gtagttctat tgggcactat tagtcagttg ggagtgggtg 180  
 ctataccttg acttcattta tatgaatttc cactttatta aataatagaa a 231

WO 03/057926

PCT/US03/00657

<210> 358  
 <211> 446  
 <212> DNA  
 <213> Homo sapiens

<400> 358  
 atttgctgta tgccgagaat ggaaaaattg gaccacctaa actggatatac agaaaggagg 60  
 agaagcaaat catgattgac atatttcacc cttcagtttt tgtaaattgga gacgagcagg 120  
 aagtcgatta tgatcccga actacctgtt acattagggt gtacaatgtg tatgtgagaa 180  
 tgaacggaag tgagatccag tataaaatac tcacgcagaa ggaagatgat tgtgacgaga 240  
 ttcagtgccca gttagcgatt ccagtatcct cactgaattc tcagtactgt gtttcagcag 300  
 aaggagtctt acatgtgtgg ggtgttacaa ctgaaaagtc aaaagaagtt tgtattacca 360  
 ttttcaatag cagtataaaa ggttctcttt ggattccagt tgttgctgct ttactactct 420  
 ttctagtgtc tagcctggta ttcatac 446

<210> 359  
 <211> 209  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 19, 185, 193  
 <223> n = A,T,C or G

<400> 359  
 gagaatttgc tgtatgccng agatggaaaa attggaccac ctaaactgga tatcagaaaag 60  
 gaggagaagc aatcatgat tgacatattt cacccttcaa gtttttgtaa atggagacga 120  
 gcaggaagtc gattatgatc ccgaaactac ctgttacatt aggggtgtaca atgtgtatgt 180  
 gagantgaac ggnagtgaga tccagtata 209

<210> 360  
 <211> 521  
 <212> DNA  
 <213> Homo sapiens

<400> 360  
 tgctgtcggg gactactgaa gaaatattcc tgacgtggtc ccgggcagcc atctgactcc 60  
 aatagagaga gagagttcct cacctttaag tagtaaccag tctgaacctg gcagcatcgc 120  
 tttaaactcg taccactcca gaaattgttc tgagagtgat cactccagaa atggttttga 180  
 tactgattcc agctgtctgg aatcacatag ctcttatct gactcagaat ttcccccaaa 240  
 taataaagggt gaaataaaaa cagaaggaca agagctcata accgtaataa aagccccac 300  
 ctcttttggg tatgataaac cacatgtgct agtggatcta cttgtggatg atagcggtaa 360  
 agagtccttg attggttata gaccaacaga agattccaaa gaattttcat gagatcagct 420  
 aagttgcacc aactttgaag tctgattttc ctggacagtt ttctgcttta atttcatgaa 480  
 aagattatga tctcagaaat tgtatcttag ttggtatcaa c 521

<210> 361  
 <211> 522  
 <212> DNA  
 <213> Homo sapiens

<400> 361  
 tggccctcga ggccaagaat tcggcactag gggagaggag cttgaatttc tgacacacat 60  
 aacatgtaaa aagtatttgg catttcataa ggatttgggg tggggtaaac gcaaggtag 120  
 tctgttttaa aaaatgtttt cattaacgag cacataactg gtggttccta atgggaatac 180  
 ttgaccagcag cagaaactag aaaagtagca agtaggaaac ttccatttct ctcccctaaa 240  
 caaccctta aggcactgtg agctggagac aggagaggtg ttgccaacc tttgttcata 300  
 tactcggtga cgatgtagat gggctcctca gacaccactg catagagctg gaccagcttg 360  
 tcgtgcttca gcttcttcat gatctgcgct tctcaagga atgattcggg ggacattgtg 420  
 cctggtttaa gagtctttat ggctactttt gtgtttccat tccaggtacc tacaacatc 480  
 ccagaatatg aagtcaaacc aaagatcttc ttttgatgga aa 522

WO 03/057926

PCT/US03/00657

<210> 362  
 <211> 421  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 12, 331, 372  
 <223> n = A,T,C or G

<400> 362  
 ttaatgagtt anaaatctta atatagccat cttagccata accacaaata aactcatttt 60  
 ttctgttaaa atacttgaca gagtccttgc aattgaatgt ctttgttcaa caaaaactgt 120  
 attaagtgtt ttaaatttaa aatctaactt tatgcaaata gctgggtggtc aaaacctttt 180  
 tccatcaaaa gaagatcttt ggtttgactt catattctgg gatgtttgta ggtacctgga 240  
 atggaaacac aaaagtagcc ataaagactc ttaaaccagg cacaatgtcc cccgaatcat 300  
 tccttgagga agcgcagatc atgaagaagc ngaagcacga caagctgggtc cagctctatg 360  
 gcagtgggtg cngaggagcc catctacatc gtcaccgagt atatgaacaa aggttgggca 420  
 a 421

<210> 363  
 <211> 503  
 <212> DNA  
 <213> Homo sapiens

<400> 363  
 cagaaggggt ttccgaatgt tttagttagc cttttgggtg agccgccagc tgacaggaca 60  
 tcttacaaga gaatttgac atctctggaa gcttagcaat cttattgcac actgttcgct 120  
 ggaagctttt tgaagagcac attctcctca gtgagctcat gaggttttca tttttattct 180  
 tccttccaac gtgggtgctat ctctgaaacg agcgttagag tgccgcctta gacggaggca 240  
 ggagtttcgt tagaaagcgg acgctgttct aaaaaaggct tcctgcagat ctgtctgggc 300  
 tgtgatgacg aatattatga aatgtgcctt ttctgaagag attgtgtag ctccaaagct 360  
 tttcctgtcg cagtgtttca gttctttatt ttcccttggt gatatgctgt gtgaaccgtc 420  
 gtgtgagtg ggtatgcctg atcacagatg gattttgtta taagcatcaa tgtgacactt 480  
 gcaggacact acaacgtggg aca 503

<210> 364  
 <211> 365  
 <212> DNA  
 <213> Homo sapiens

<400> 364  
 ggccgccctt tttttttttt ttggggggga aaaaattttt ttttaaaaaa aaaaaaactt 60  
 cccccctggg gaaaaaaaaa ggttttttaa aaaaaaaccc aaacaaaatt ttcccgggcc 120  
 ctttaggggt tttaaatttt cccccgggtt gaacccttt taaaaaaaaa ggaatttttt 180  
 tggggggaaa taatggggga aaaacccaaa aaaaaggggg gttttttttt taaaaccctt 240  
 ttttttttaa aaaaccttcc cccaggggaa aaattcccaa aaccttttaa aaaaaagggt 300  
 ccgaaatttt taatccaaag gggaaaaacc ccccccccaa caaaaaacc ccaaagggga 360  
 aaaag 365

<210> 365  
 <211> 680  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 172, 173, 176, 186, 199, 200, 591, 625, 659, 670  
 <223> n = A,T,C or G

<400> 365

WO 03/057926

PCT/US03/00657

```

aggacacaga caaggaactt gctgaaaggc caaccatttc aggatcagtc aaaggcagca 60
agcagataga ctcaaggtgt gtgaaagatg ttatacacca ggagctgcca cttcatgtcc 120
caaccagact gtgtctgtct gtgtctgcat gtaagagtga gggagggag gnnngnacta 180
caaganagtc ggagatgann cagcacacac acaattcccc agcccacgtg atgcttgtgt 240
tgaccagatg ttcttgagtc tggagcaagc acccaggcca gaataacaga gctttcttag 300
ttgggtgaaga cttaaacatc tgcctgaggt caggaggcaa tttgcctgcc ttgtacaaaa 360
gctcaggtga aagactgaga tgaatgtctt tcctctccct gcctcccacc agacttcctc 420
ctggaaaacg ctttggtaga tttggccagg agctttcttt tatgtaattg gataaatata 480
cacaccatac actatccaca gatatagcca agtagatttg ggtagaggat actatttcca 540
gaatagtgtt tagctcacct agggggatat gttgtatcac atttgcatat nccacatggg 600
gacataagct aattttttac agacncgatt ctgtcatgct gttaatagcc atgggttaanc 660
ccccattggn ggggccggtg                                     680

```

&lt;210&gt; 366

&lt;211&gt; 570

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 366

```

taagctcggg attcggctcg agcggctcga gtcaagagaa aacacaagaa ggacatcagc 60
cagaacaagc gagccgtgag gcggctgcgc accgcctgcg agagggccaa gaggaccctg 120
tcgtccagca cccaggccag cctggagatc gactccctgt ttgagggcat cgacttctac 180
acgtccatca ccagggcgag gttcgaggag ctgtgctccg acctgttccg aagcaccctg 240
gagcccgtgg agaaggctct gcgcgacgcc aagctggaca aggccagat tcacgacctg 300
gtcctggtcg ggggctccac ccgcatcccc aaggtgcaga agctgctgca ggacttcttc 360
aacgggcgcg acctgaacaa gagcatcaac cccgacgagg ctgtggccta cggggcggcg 420
gtgcaggcgg ccatcctgat gggggacaag tccgagaacg tgcaggacct gctgctgctg 480
gacgtggctc ccctgtcgtc ggggctggag acggccggag gcgtgatgac tgccctgatc 540
aagcgcaact ccaccatccc caccaagcag                                     570

```

&lt;210&gt; 367

&lt;211&gt; 454

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 367

```

gccgcccttt tttttttttt tttttttttt tttttttttg tttttttttt tttttcaaaa 60
aaaaaaaaatc ttttttagaaa aaaaaacccc cccccaacaa aaaatggggg ggggggggga 120
ttttccctcc cgggggaagg agaaaaagcc gcagtaataa aaaggggggg aaccaaaaaa 180
tttttttttt tttttaaaaa aggttttttt gggggccccc cccccaacaa aaaaaaagg 240
tccccccctt ttttttcccc cttttttggg ggggaaaaaa aaaaaagggg ggggaaaaaa 300
acagaaaatt ttccccaaaa atttaaaaaa aaaagggggg ggggggggaa aaaaaagggt 360
tttttacccc cctggggggg aaaaaaaaaa aatttggggc caccaaaaag gggggggggc 420
cccccaaaaa aggggggttt ttttaaaaaa aaaa                                     454

```

&lt;210&gt; 368

&lt;211&gt; 651

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 368

```

taagctcggg attcggctcg agtggctctc gtctactccg ggtctttcag gaggccaaaa 60
ggcagctcca gaagattgac aaatctgagg gccgcttcca tgtccagaac cttagccagg 120
tggagcagga tgggcggacg gggcatggac tccgcagatc ttccaagttc tgcttgaagg 180
agcaciaaagc cctcaagacg ttaggcatca tcatgggcac tttcaccctc tgctggctgc 240
ccttcttcat cgttaacatt gtgcatgtga tccaggataa cctcatccgt aaggaagttt 300
acatcctcct aaattggata ggctatgtca attctggttt caatcccctt atctactgcc 360
ggagcccaga tttcaggatt gccttccagg agcttctgtg cctgocgagg tcttctttga 420
aggcctatgg gaatggctac tccagcaacg gcaacacagg ggagcagagt ggatatcacg 480
tggaacagga gaaagaaaat aaactgctgt gtgaagacct cccaggcacg gaagactttg 540
tgggccatca aggtactgtg cctagcgata acattgattc acaagggagg aattgtagta 600
caaatgactc actgctgtaa agcagttttt ctacttttaa agaccccccc c                                     651

```

WO 03/057926

PCT/US03/00657

<210> 369  
 <211> 280  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 112  
 <223> n = A,T,C or G

<400> 369  
 tggctcttcgt ctactccagg gtctttcagg aggccaaaag gcagctccag aagattgaca 60  
 aatctgaggg cgccttccat gtccagaacc ttagccagggt ggagcaggat gngcggacgg 120  
 ggcatggact cgcagatct tccaagttct gcttgaagga gcacaaagcc ctcaagacgt 180  
 taggcatcat catgggcact ttcaccctct gctggctgcc cttcttcatc gttaacattg 240  
 tgcattgtgat ccaggataac ctcatccgta agaagtttac 280

<210> 370  
 <211> 418  
 <212> DNA  
 <213> Homo sapiens

<400> 370  
 ggccgccctt tttttttttt ttttttcccg ggcttttttg ggaaaaacc ccctttccca 60  
 taaaaaaatt tttttggggg tttcccaatt tttttttcca atttcaaata atttttttcc 120  
 aaaaaaaacc caaaccttg gggccttttt tttttttttt aaagggcctt tttacttttc 180  
 cccaaggagg ccttggggaa ataaaaaaaa cccggttggg gggcccaaaa aaaggggttg 240  
 gcccccttga atccccatt ggtttggggg taaaaaaggc cccccatgg gcccccttcc 300  
 cccggggggg ggaaccccc ccgaagacc cccgggggga aaccgggccc aaaaaaaaa 360  
 ccctttaaaa ttttaaaaaa cgggcccccc cctaaaaaaaa ctttttttta aaaagggg 418

<210> 371  
 <211> 292  
 <212> DNA  
 <213> Homo sapiens

<400> 371  
 ttaggggtata agttgctgta aaatttgtgt aaatttgtat ccacacaaat tcagtctctg 60  
 aatacacagt attcagagtc tctgatacac agtaattgtg acaatagggc taaatgttta 120  
 aagaaatcaa aagaatctat tagattttag aaaaacattt aaacttttta aaatacttat 180  
 taaaaaattt gtataagcca cttgtcttga aaactgtgca acttttttaa gtaaattatt 240  
 aagcagactg gaaaagtgat gtattttcat agtgacctgt gtttcactta at 292

<210> 372  
 <211> 415  
 <212> DNA  
 <213> Homo sapiens

<400> 372  
 tccttattta ttttaacttca cccgagttcc tctgggtttc taagcagtta tgggtgatgac 60  
 ttagcgtcaa gacatttgct gaactcagca cattcgggac caatatatag tgggtacatc 120  
 aagtccatct gacaaaatgg ggcagaagag aaaggactca gtgtgtgatc cggtttcttt 180  
 ttgctcgccc ctgttttttg tagaatctct tcatgcttga catacctacc agtattattc 240  
 ccgacgacac atatacatat gagaatatac cttatttatt tttgtgtagg tgtctgcctt 300  
 cacaaatgtc attgtctact cctagaagaa ccaaatacct caatttttgt ttttgagtac 360  
 tgtactatcc tgtaaatata tcttaagcag gtttgttttc agcactgatg gaaaa 415

<210> 373  
 <211> 326  
 <212> DNA  
 <213> Homo sapiens

WO 03/057926

PCT/US03/00657

&lt;400&gt; 373

tccttattta	tttaacttca	cccagagttcc	tctggggtttc	taagcagtta	tggatgatgac	60
ttagcgtcaa	gacatttgct	gaactcagca	cattcggggac	caatatatag	tgggtacatc	120
aagtccatct	gacaaaatgg	ggcagaagag	aaaggactca	gtgtgtgatc	cggtttcttt	180
ttgctcgccc	ctgttttttg	tagaatctct	tcatgcttga	catacctacc	agtattattc	240
ccgacgacac	atatacatat	gagaatatac	cttatttatt	tttgtagtagg	ggtctgcctt	300
cacaaatgtc	attgtctact	cctaca				326

&lt;210&gt; 374

&lt;211&gt; 324

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 374

tccttattta	tttaacttca	cccagagttcc	tctggggtttc	taagcagtta	tggatgatgac	60
ttagcgtcaa	gacatttgct	gaactcagca	cattcggggac	caatatatag	tgggtacatc	120
aagttcatct	gacaaaatgg	ggcagaagag	aaaggactca	gtgtgtgatc	cggtttcttt	180
ttgctcgccc	ctgttttttg	tagaatcttt	tcatgcttga	catacctacc	agtattattc	240
ccgacgacac	atatacatat	gagaatatac	cttatttatt	tttgagtagg	tgtctgcctt	300
cacaaatggc	attggctact	ccag				324

&lt;210&gt; 375

&lt;211&gt; 466

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 375

taactctggg	aggggctcga	gagggctggt	ccttatttat	ttaacttcac	ccgagttcct	60
ctgggtttct	aagcagttat	ggtgatgact	tagcgtcaag	acatttgctg	aactcagcac	120
attcgggacc	aatatatagt	gggtacatca	agtccatctg	acaaaatggg	gcagaagaga	180
aaggactcag	tgtgtgatcc	ggtttctttt	tgctcgcccc	tgttttttgt	agaatctctt	240
catgcttgac	atacctacca	gtattattcc	cgacgacaca	tatacatatg	agaatatacc	300
ttatttattt	ttgtgtaggt	gtctgccttc	acaaatgtca	ttgtctactc	ctagaagaac	360
caaatacctc	aatttttggt	tttgagtact	gtactatcct	gtaaataat	cttaagcagg	420
tttgttttca	gcactgatgg	aaaataccag	tgttgggttt	tttttt		466

&lt;210&gt; 376

&lt;211&gt; 324

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 376

tccttattta	tttaacttca	cccagagttcc	tctggggtttc	taagcagtta	tggatgatgac	60
ttagcgtcaa	gacatttgct	gaactcagca	cattcggggac	caatatatag	tgggtacatc	120
aagttcatct	gacaaaatgg	ggcagaagag	aaaggactca	gtgtgtgatc	cggtttcttt	180
ttgctcgccc	ctgttttttg	tagaatcttt	tcatgcttga	catacctacc	agtattattc	240
ccgacgacac	atatacatat	gagaatatac	cttatttatt	tttgagtagg	tgtctgcctt	300
cacaaatggc	attggctact	ccag				324

&lt;210&gt; 377

&lt;211&gt; 326

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 377

tccttattta	tttaacttca	cccagagttcc	tctggggtttc	taagcagtta	tggatgatgac	60
ttagcgtcaa	gacatttgct	gaactcagca	cattcggggac	caatatatag	tgggtacatc	120
aagtccatct	gacaaaatgg	ggcagaagag	aaaggactca	gtgtgtgatc	cggtttcttt	180
ttgctcgccc	ctgttttttg	tagaatctct	tcatgcttga	catacctacc	agtattattc	240
ccgacgacac	atatacatat	gagaatatac	cttatttatt	tttgtagtagg	ggtctgcctt	300
cacaaatgtc	attgtctact	cctaca				326

WO 03/057926

PCT/US03/00657

<210> 378  
 <211> 494  
 <212> DNA  
 <213> Homo sapiens

<400> 378  
 atgccccgca tagatgcgga cctcaagctc gacttcaagg atgtcctgct ccgacctaaag 60  
 cggagcagcc tcaagagccg agccgaggtg gatccttgaac gcaccttcac gtttcgaaat 120  
 tcaaagcaga cctactcagg gattcccac atcgtggcca acatggacac tgtgggcacg 180  
 tttgagatgg cagccgtgat gtcacagcac tccatgttta cagcaattca taagcattac 240  
 tccctggatg actggaagct ctttgccaca aatcacccag aatgcctgca gaatgtagcc 300  
 gtgagttcag gcagtgggca gaatgatctg gaaaagatga ccagcatcct ggaagctgtg 360  
 ccacaggtta agtttatttg cctggatgtg gccaatgggt attcaaaaca ttttgtggaa 420  
 ttcgtgaaac ttgtccgtgc caaatttctt gaacacacca ttatggcagg gaacgtgggtg 480  
 acaggagaaa tggt 494

<210> 379  
 <211> 243  
 <212> DNA  
 <213> Homo sapiens

<400> 379  
 gccgctgcac catgccccgc atagatgcgg acctcaagct cgacttcaag gatgtcctgc 60  
 tccgacctaa gcggacagcc tcaagagccg agccgaggtg gatccttgaac gcaccttcac 120  
 gtttcgaaat tcaaagcaga cctactcagg gattcccac atcgtggcca acatggacac 180  
 tgtgggcacg tttgagatgg cagccgtgat gtcacagcac tccatgttta cagcaattca 240  
 taa 243

<210> 380  
 <211> 804  
 <212> DNA  
 <213> Homo sapiens

<400> 380  
 gcaaatgttt gattaattct gctcatatgc acatctgaaa gcatgagaca cactccacag 60  
 acagcacgca ctggagctgg tggggcagat gggcactcgc cgattaggta ttaatgtcaa 120  
 taatacgtgc ataaagtgct gataaaataa cttaagtgtt acaaaaacag acagtccacg 180  
 gtggctgcag gcacatgcag gcgggactgg gtcagacact ccagggtgct acatgttcca 240  
 gctggcctga gtccgacacg tcatagctgg ccttgtactt ggccaggatt ttcagaggg 300  
 gccgtagctt gagccaccac tgttctttgg gaatcctgtg ctcaaaatcc gtttgcttct 360  
 tcagctctgc cacaggtttg aaaaataacg tttcttttgc ttattcccag cacacaaatg 420  
 gaatcatcgg tggtaaattt ttttctctg ccccgggcct ccttgagttt tgcagtgatc 480  
 cactccatag ctctggcaga gattttgggt ccaaagtttc tatcaaatgg agagggtgcc 540  
 ccaccctgct gcatgtgacc cagcacgttc ttctgacagt caaacacgcc tttgccctct 600  
 tctgaataca gctggtaaat gaagtgggtg gtgtagtttt cactgcagct ctcatctctg 660  
 agcacaaggc ctctctggat ggtggtcttc attttctccg tcagggtgct cacgttggac 720  
 tgcagatcct gatgtcgaag ggctcttcga aatgtatgcg gcatcagtcg ggccgcagcc 780  
 ccccatgttg gcaggtagca cagt 804

<210> 381  
 <211> 624  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 514  
 <223> n = A, T, C or G

<400> 381  
 tggagttgta ggcaaatgtt taattaattc tgctcatatg cacatctgaa agcatgagac 60



WO 03/057926

PCT/US03/00657

```

acactccaca gacagcacgc actggggctg gtggggcaga tgggcactcg ccgattaggt 120
attaatgtca ataatacgtg cataaagtgc tgataaaata acttaagtgt tacaaaaaca 180
gacagtccac ggtggctgca ggcacatgca ggcgggactg ggtcagacac tccagggctg 240
cacatgttcc agctggcctg agtccgacac gtcatagctg gccttgact tggccaggat 300
tttcatgagg ggccgtagct tgagccacca ctgttctttg ggaatcctgt gctcaaaatc 360
cgtttgcttc ttcagctctg ccacaggttg aaaaataacg tttcttttgc ttattcccag 420
cacacaaatg gaatcatcgg tggtaaattt ttttcctctg ccccgggcct ccttgagttt 480
tgcagtgatc cactccatag ctctggcaga gatnttgggt ccaaagtttc tatcaaatgg 540
agaggtgccc caccctgctg atgtgacccc acacgttctt cctgagtcaa acacgccttt 600
gccctcttct gaatacaagc tgggt                                     624

```

<210> 382  
<211> 507  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> 301, 460, 498  
<223> n = A,T,C or G

```

<400> 382
ttttttggag ttgtaggaaa tgtttaattc tgctcatatg cacatctgaa agcatgagac 60
acactccaca agacagcacg cactggggct ggtggggcag atgggcactc gcgattaggt 120
attaatgtta ataatacgtg cataaagtgc tgataaaata acttaagtgt tacaaaaaca 180
gacagtccac ggtggctgca ggcacatgca ggcgggactg ggtcagacac tccagggctg 240
cacatgttcc agctggcctg agtcccgaca cgtcatagct ggccttgtagc ttggccaggg 300
nttttcatga ggggccctag ctttgagcca ccacttgctt tttggggaat cctgtgcttc 360
aaaatcccgt tttgcttctt tcagctcttc ccacaggttt gaaaaataac gttttctttt 420
tgcttatttc ccagcacaca aatgggattc atcggtggnn aatttttttc ctctgccccg 480
gggcttcttg agtttttnca gtgatc                                     507

```

<210> 383  
<211> 224  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> 198, 219  
<223> n = A,T,C or G

```

<400> 383
atcagatccc aaagaccaat tgcaacgtag ctgtcatcaa cgtgggggca cccgcggctg 60
ggatgaacgc ggccgtacgc tcagctgtgc gcgtgggcat tgccgacggc acaggatgct 120
cgccatctat gatggtttga cggcttcgca agggccagat caaagaaatc ggctggacag 180
atgtcggggg ctggaccngc caaggaggct ccattcttng gaca                                     224

```

<210> 384  
<211> 507  
<212> DNA  
<213> Homo sapiens

<220>  
<221> misc\_feature  
<222> 301, 460, 498  
<223> n = A,T,C or G

```

<400> 384
ttttttggag ttgtaggaaa tgtttaattc tgctcatatg cacatctgaa agcatgagac 60
acactccaca agacagcacg cactggggct ggtggggcag atgggcactc gcgattaggt 120
attaatgtta ataatacgtg cataaagtgc tgataaaata acttaagtgt tacaaaaaca 180

```

WO 03/057926

PCT/US03/00657

```

gacagtccac ggtggctgca ggcacatgca ggcgggactg ggtcagacac tccagggctg 240
cacatgttcc agctggcctg agtcccgaca cgtcatagct ggccttgtac ttggccaggg 300
nttttcatga ggggccctag ctttgagcca ccacttgctt tttggggaat cctgtgcttc 360
aaaatcccgt tttgcttctt tcagctcttc ccacaggttt gaaaaataac gttttctttt 420
tgcttatttc ccagcacaca aatgggattc atcggtggnn aatttttttc ctctgccccg 480
gggcttcttg agtttttnca gtgattc 507

```

```

<210> 385
<211> 224
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> 198, 219
<223> n = A,T,C or G

```

```

<400> 385
atcagatccc aaagaccaat tgcaacgtag ctgtcatcaa cgtgggggca cccgcggtg 60
ggatgaacgc ggccgtacgc tcagctgtgc gcggtggcat tgccgacggc acaggatgct 120
cgccatctat gatggtttga cggcttcgca agggccagat caaagaaatc ggctggacag 180
atgtcggggg ctggaccngc caaggaggct ccattcttng gaca 224

```

```

<210> 386
<211> 232
<212> DNA
<213> Homo sapiens

```

```

<400> 386
acgacagaag ggtacggctg cgagaagacg acagatgggt acggctgtga gaagacgact 60
gatgggaaca gctaaggact gctaaacccc actctgcatc aactgaacgc aaatcagcca 120
ctttaattaa gctaagccct tactagacca atgggactta aaccacaaa cacttagtta 180
acagctaagc accctaatac actggcttca atgtacttct cccgccgtcg gg 232

```

```

<210> 387
<211> 339
<212> DNA
<213> Homo sapiens

```

```

<400> 387
tactggtttt ggagaacttg tctacaacca gggattgatt ttaaagatgt ctttttttat 60
tttacttttt ttttaagcacc aaattttggt gttttttttt ttttctccct tccccacaaa 120
tcccttttaa aatatttttg ttaaccccct ttccaacggg ccgaggaaac ttaaaacccc 180
tttttctctg gcctggttcc tctttaattt ttaatttttc cccatcagtt taaaggtttt 240
ggcatacttg gcatcttttt tcaaagggaa aacttttttt gccattcttt ggacttcccc 300
ttttttaaag gaaatggggg ggccaaaagg ggatttcaa 339

```

```

<210> 388
<211> 456
<212> DNA
<213> Homo sapiens

```

```

<400> 388
tttttttttt tttttttttt ttttaaccatc aaattcacag ctatttttctg ctttttagtgt 60
gctcacagaa aattagaaca ccttaagcag gagtttaata gcattttttg taagcaaagt 120
tacattccat ctctaagtca aattgggtcaa agcttctcca gtatttacia aacatgatag 180
acaagatgct acacaaaacc attgcatctg aagattttgt tttcctttat tctcaaagac 240
gactggaaaa gaaagcatta tctgctgtaa tcaaaaacat accacagtat aaacagttac 300
cattccactt atcacagctt gggtgagttt agaattagtg ttttaaaaag tccaagatga 360
ctgcagtttt acaaaaatgg gcagggtgga aagttgcaaa cttcatgtgc ttctggatat 420
caagatttgt ttttatacaa tagtcacagt taaaaa 456

```

WO 03/057926

PCT/US03/00657

<210> 389  
 <211> 490  
 <212> DNA  
 <213> Homo sapiens

<400> 389  
 ttacattgaa tactacatat gtcgagggaa tgcagaaaga gttaaggaag gcaggttgtc 60  
 ctgctatgga ggccactcct cgttttccat gtactgcatg ctgtttgtgg cactttatct 120  
 tcaagccagg atgaaggag actgggcaag actcttacc cccacactgc aatttgggtct 180  
 tgttgccgta tccatttatg tgggcctttc tcgagttgct gattataaac accactggag 240  
 cgatgtgttg actggactca ttcagggagc tctggttgca atattagttg ctgtatatgt 300  
 atcggatttc ttcaaagaaa gaacttcttt taaagaaaga aaagaggagg actctcatac 360  
 aactctgcat gaaacaccaa caactgggaa tcactatccg agcaatcacc agccttgaaa 420  
 ggcagcaggg tgcccagggtg aagctggcct gttttctaaa ggaaaatgat tgccacaagg 480  
 caagaggatg 490

<210> 390  
 <211> 334  
 <212> DNA  
 <213> Homo sapiens

<400> 390  
 gaactcgggtg gtggccactg cgcagaccag acttcgctcg tactcgtgcg cctcgtcttcg 60  
 cttttcctcc gcaaccatgt ctgacaaacc cgatatggct gagatcgaga aattcgataa 120  
 gtcgaaactg aagaagacag agacgcaaga gaaaaatcca ctgccttcca aagaaacgat 180  
 tgaacaggag aagcaagcag gcgaatcgta atgaggcgtg cgccgccaat atgactgta 240  
 cattccacaa gcattgcctt cttattttac ttcttttagc tgtttaactt tgtaagatgc 300  
 aaagagggtg gatcaagatt aaatgactgt gctg 334

<210> 391  
 <211> 377  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 349  
 <223> n = A,T,C or G

<400> 391  
 gaactcgggtg gtggccactg cgcagaccag acttcgctcg tactcgtgcg cctcgtcttcg 60  
 cttttcctcc gcaaccatgt ctgacaaacc cgatatggct gaggtcgaga aattcgataa 120  
 gtcgaaactg aagaagacag agacgcaaga gaaaaatcca ctgccttcca aagaaacgat 180  
 tgaacaggag aagcaagcag gcgaatcgta atgaggcgtg cgccgccaat atgactgta 240  
 cattccacaa gcattgcctt cttattttac ttcttttagc tgtttaactt tgtaagacgc 300  
 atagagggtg gatcaagttt aaatgactgt gctgcccctt tcacatcana gaactactga 360  
 caacgaaggc cgcgct 377

<210> 392  
 <211> 555  
 <212> DNA  
 <213> Homo sapiens

<400> 392  
 ctcggtggtg gccactgcgc agaccagact tcgctcgtac tcgtgcgcct cgctttgctt 60  
 ttctccgca accatgtctg acaaaccgga tatggctgag atcgagaaat tcgataagtc 120  
 gaaactgaag aagacagaga cgcaagagaa aatccactg ccttccaaag aaacgattga 180  
 acaggagaag caagcaggcg aatcgtaatg aggcgtgcgc cgccaatatg cactgtacat 240  
 tccacaagca ttgccttctt attttacttc ttttagctgt ttaactttgt aagatgcaaa 300  
 gaggttggtg caagtttaaa tgactgtgct gccctttca catcaaagaa ctactgacaa 360  
 cgaaggccgc gcctgccttt cccatctgtc tatctatctg gctggcaggg aaggaaagaa 420  
 cttgcatggt ggtgaaggaa gaagtggggt ggaagaagtg ggggtgggacg acagtgaat 480

WO 03/057926

PCT/US03/00657

ctagagtaaa accaagctgg cccaaggtgt cctgcaggct gtaatgcagt ttaatcagag 540  
 tgccattttt ttttt 555

<210> 393  
 <211> 300  
 <212> DNA  
 <213> Homo sapiens

<400> 393  
 gctcaattgg actatgttga cctctatctt attcattctc caatgtctct aaagccaggt 60  
 gaggaacttt caccaacaga tgaaaatgga aaagtaatat ttgacatagt ggatctctgt 120  
 accacctggg aggccatgga gaagtgtgag gatgcatgat tggccaagtc cattgggggtg 180  
 tcaaacttca accgcaggca gctggagatg atcctcaaca agccaggact caagtacaag 240  
 cctggctgca accaggtaga aagtcattcg tatttcaacc ggagtaaatt gctagaatcg 300

<210> 394  
 <211> 344  
 <212> DNA  
 <213> Homo sapiens

<400> 394  
 acagaagggt acggctgcca gaagacgaca gaagggtacg gctgcgagaa gacgacagaa 60  
 gggtagggct gcgagaagac gacagaaggg taaaacactg aactgacaat taacagccca 120  
 atatctacaa tcaaccgaca agtcattatt accctcactg tcaacccaac acaggcatgc 180  
 tcataaggaa aggttaaaaa aagtaaaagg aactcggcaa atcttaccac gcctgtttac 240  
 caaaaacatc acctgtagca tcaccagtat tagaggcacc gcctgcccag tgacacatgt 300  
 ttaacggccg cggtagccta accgtgcaaa ggtagcataa tcac 344

<210> 395  
 <211> 507  
 <212> DNA  
 <213> Homo sapiens

<400> 395  
 tgctcgggcc ttccgaggaa gctaaggctg cgttgggggtg aggccctcac ttcattccggc 60  
 gactagcacc gcgtccggca gcgccagccc tacactcgcc cgcgccatgg cctctgtctc 120  
 cgagctcgcc tgcatctact cggccctcat tctgcaacgac gatgaggtga cagtcacgga 180  
 ggataagatc aatgccctca ttaaagcagc cgggtgaaat gttgagcctt tttggcctgg 240  
 cttgtttgca aaggccctgg ccaacgtcaa cattggggagc ctcatctgca atgtaggggc 300  
 cgggtggacct gctccagcag ctggtgctgc accagcagga ggtcctgccc cctccactgc 360  
 tgctgctcca gttgaggaga agaaagtgga agcaaagaaa gaagaatccg aggagtctga 420  
 tgatgacatg ggctttggtc tttttgacta aacctctttt ataacatggt caataaaaag 480  
 ctgaacttta aaaaaaaaaa aaaaaaa 507

<210> 396  
 <211> 488  
 <212> DNA  
 <213> Homo sapiens

<400> 396  
 gaggccctca cttcatccgg cgactagcac cgcgtccggc agcggccagcc ctacactcgc 60  
 ccgcgccatg gcctctgtct ccgagctcgc ctgcatctac tcggccctca ttctgcacga 120  
 cgatgaggtg acagtcacgg aggataagat caatgcctc attaaagcag ccggtgtaaa 180  
 tgttgagcct ttttggcctg gcttgtttgc aaaggccctg gccaacgtca acattggggag 240  
 cctcatctgc aatgtagggg ccggaggacc tgctccagca gctgggtgctg caccagcagg 300  
 aggtcctgcc ccctgcactg ctgctgctcc agttgaggag aagaaagtgg aagcatagaa 360  
 agaagaatcc gacgagtctg atgatgacat gggctatggt ctttttgact aaacctcttt 420  
 tataacatgt tcaataaaaa gctgaacttt aaaaagaaaa aaaaaaaact cgagcctcta 480  
 gaactata 488

<210> 397

WO 03/057926

PCT/US03/00657

<211> 180  
 <212> DNA  
 <213> Homo sapiens

<400> 397  
 ctgCGttggg gTgaggccct cacttcatcc ggcgactagc accgCGtccg gcagcgcCag 60  
 ccctacactc gccCGcgcca tggcctctgt ctccgagctc gcctgcatct actcggccct 120  
 cattctgcac gacgatgagg tgacagtcac ggaggataag atcaatgccc tcattaaagc 180

<210> 398  
 <211> 491  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 12, 154, 255, 348, 368, 402, 409, 450, 471  
 <223> n = A,T,C or G

<400> 398  
 tttttttttt tntttcactg ttcaaggttt attggggggtt ttagttggta taacacttgg 60  
 atagttgggt gcattgtttg tatgtagatc tttttacatt atatggtaat gtacactact 120  
 gatatagttc acaaataag atcctttgga aganttatac acaagacatg atattggatt 180  
 tatacactgg atcccaggga tgtgactcac tgggaaaaaa tgttggacta ggcatgttca 240  
 gtgaaggagc cagnagttta tataacacac ggtaaacatc cacctggctc aaggggcaaa 300  
 tgcagtacgt acagcattgg cagtgggtgcg tcagaggtgg cagaactntt tcacactaac 360  
 cagttganga ctacacaaga ttaataccat ccagcatcag gntatagcnt gtggatttta 420  
 caaaccattt cttatttcta actttcaggn gttgatgttt ttcccagtcc ntcttaaaat 480  
 ttttactgct t 491

<210> 399  
 <211> 235  
 <212> DNA  
 <213> Homo sapiens

<400> 399  
 tgatttctgt ggatcccagc ttggttccag gaattttgtg tgattggctt aaatccagtt 60  
 ttcaatcttc gacagctggg ctggaacgtg aactcagtag ctgaacctgt ctgaccCGgt 120  
 cacgttcttg gatcctcaga actctttgct cttgtcgggg tgggggtggg aactcacgtg 180  
 gggagcggtg gctgagaaaa tgtaaggatt ctggaataca tattccatgg gactt 235

<210> 400  
 <211> 465  
 <212> DNA  
 <213> Homo sapiens

<400> 400  
 tacggctgCG agaagacgac agaagggtac ggctgCGaga agacgacaga agggTaccggc 60  
 Tgcgagaaga cgacagaagg gtacggctgc gagaagacga cagaagggtg atttctgtgg 120  
 atcccagctt ggTtccagga attttgtgtg attggcttaa atccagtttt caatcttcga 180  
 cagctgggct ggaacgtgaa ctCagtagct gaacctgtct gaccCGgtca cgttcttggA 240  
 tcctcagaac tctttgctct tgtcgggggtg ggggtgggaa ctCacgtggg gagcggTggc 300  
 tgagaaaatg taaggattct ggaatacata ttccatggga ctttccttcc ctctcctgct 360  
 tcctcttttc ctgctcccta acctttcGCC gaatggggca gcaccactga cgtttctggg 420  
 cggccagTgc ggctgCCagG ttCctgtact actgccttgt acttt 465

<210> 401  
 <211> 243  
 <212> DNA  
 <213> Homo sapiens

WO 03/057926

PCT/US03/00657

&lt;400&gt; 401

```

tgatttctgt ggatcccagc ttggttccag gaattttgtg tgattggctt aatccagtt 60
ttcaatcttc gacagctggg ctggaacgtg aactcagtag ctgaacctgt ctgaccgggt 120
cacgttcttg gatcctcaca actccttgct cttgtcgggg tgggggtggg aactcacgtg 180
gggagcggtg gctgagaaaa tgtaaggatt ctggaataca tattccatgg gactttcctt 240
ccc                                                                                   243

```

&lt;210&gt; 402

&lt;211&gt; 506

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 402

```

ttctagcatc ctcttaacgt gcagcaaaag caggcgacaa aatctcctgg ctttacagac 60
aaaaatattt cagcaaacgt tgggcatcat ggtttttgaa ggcttttagt ctgctttctg 120
cctctcctcc acagcccaaa cctcccaccc ctgatacatg agccagtgat tattcttggt 180
cagggagaag atcatttaga tttgttttgc attccttaga atggagggca acattccaca 240
gctgccctgg ctgtgatgag tgtccttgca ggggccggag taggagcact ggggtggggg 300
cggaattggg gttactcgat gtaagggatt ccttgttggt gtggtgagat ccagtgcagt 360
tgtgatttct gtggatccca gcttggttcc aggaattttg tgtgattggc ttaaatccag 420
ttttcaatct tcgacagctg ggctggaacg tgaactcagt agctgaacct gtctgacctg 480
gtcacgttct tggatcctca gaactc                                                                                   506

```

&lt;210&gt; 403

&lt;211&gt; 390

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 403

```

gtagtgcct ctctttcagc agttaccagc ggtttttgga gtctctggat gatttttaca 60
ttcttagcag tggattgata ttgctgcaga ccacaaacag tgtgtttaat aaaaccctgc 120
taaagcaggt aatacccgag actctcctgt cctggcaaaag agtccgtgtg gccaatatga 180
tggcagatag tggcaagagg tgggcagaca tcttttcaaa atacaactct ggcacctata 240
acaatcaata catggttctg gacctgaaga aagtaaagct gaaccacagt cttgacaaag 300
gcactctgta cattgtggag caaattccta catatgtaga atattctgaa caaactgatg 360
ttctacggaa aggatattgg ccctcctaca                                                                                   390

```

&lt;210&gt; 404

&lt;211&gt; 372

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 404

```

aggagattca gaagcacaac cacagcaaga gcacctggct gatcctgcac cacaaggtgt 60
acgatttgac caaatttctg gaagagcatc ctgggtggga agaagtтта agggaacaag 120
ctggagggtg cgctactgag aactttgagg atgtcgggca ctctacaaat gccagggaaa 180
tgtccaaaac attcatcatt ggggagctcc atccagatga cagaccaaag ttaacaagc 240
ctccggaaac tcttatcact actattgatt ctagttccag ttgggtggacc aactgggtga 300
tcctgccat ctctgcagtg gccgtcgctc tgatgtatcg cctatacatg gcagaggact 360
gaacacctcc tc                                                                                   372

```

&lt;210&gt; 405

&lt;211&gt; 619

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 405

```

tcccgggtgg agctggctga gtcgcgcgct ctgctccacc cgacggggct gtgtgtgctg 60
ggcctggctc gcggcgaacc gagatggcag agcagtcgga cgaggccgtg aagtactaca 120
ccctagagga gattcagaag cacaaccaca gcaagagcac ctggctgatc ctgcaccaca 180
aggtgtacga tttgaccaa tttctggaag agcatcctgg tggggaagaa gttttaaggg 240
aacaagctgg aggtgacgct actgagaact ttgaggatgt cgggcactct acaaatgcca 300

```

WO 03/057926

PCT/US03/00657

gggaaatgtc	caaaacattc	atcattgggg	agctccatcc	agatgacaga	ccaaagttaa	360
acaagcctcc	ggaaactctt	atcactacta	ttgattctag	ttccagttgg	tggaccaact	420
gggtgatccc	tgccatctct	gcagtggccg	tcgccttgat	gtatcgcta	tacatggcag	480
aggactgaac	acctcctcag	aagtcagcgc	aggaagagcc	tgctttggac	acgggagaaa	540
agaagccatt	gctaactact	tcaactgaca	gaaaccttca	cttgaaaaca	atgattttaa	600
tatatctctt	tctttttct					619

&lt;210&gt; 406

&lt;211&gt; 499

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 406

taagctcgga	attcggctcg	agggctccag	ctgagctcct	gcttctactg	aggacatacc	60
tcccagatga	ggtggggccc	ccaaccccat	tcctgagcc	tggagcagag	ccccctctca	120
ctgtgggctt	gctcaaagcc	ctgctggagc	agactggggc	tcaaggatgg	ctgtcgggccc	180
cagttctaag	cccatatgag	gacatcctat	gggaccccag	cactccaccc	ccgactccac	240
ctcgggacct	atgactaccc	ttcaggcatc	agaacactca	gggcctggag	gcttgcttgg	300
gactggaggc	ttgcttggac	agttcctctg	tgtcactgac	acaggaaatc	atttctagga	360
cacagtgatc	aggggaagggt	gcctgggact	tggaggggtcc	catgtatgga	cctgtgtatg	420
caatactggt	ctgtcatctg	gagctatttt	taagatgtgt	gtgttaaata	tatacatagt	480
ttaatatata	aaaaaaaaa					499

&lt;210&gt; 407

&lt;211&gt; 229

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 407

ggctccagct	gagctcctgc	ttctactgag	gacatacctc	ccagatgagg	tggggccccc	60
aaccccatc	cctgagcctg	gagcagagcc	ccctctcact	gtgggcttgc	tcaaagccct	120
gctggagcag	actggggctc	aaggatggct	gtcggggcca	gttctaagcc	catatgagga	180
catcctatgg	gaccccagca	ctccaccccc	gactccacct	cgggaccta		229

&lt;210&gt; 408

&lt;211&gt; 467

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 408

ggaagttctg	cgctggtcgg	cggagtatca	agtggccatg	gggagcctca	gcggtctgcg	60
cctggcagca	ggaagctggt	ttaggttatg	tgaaagagat	gttggcctca	tctctaaggc	120
ttaccagaag	ctctgatttg	aagagaataa	atggattttg	cacaaaacca	caggaaagtc	180
ccggagctcc	atcccgcact	tacaacagag	tgcttttaca	caaacctacg	gattggcaga	240
aaaagatcct	catatgggtca	ggtcgcttca	aaaaggaaga	tgaaatccca	gagactgtct	300
cgttggagat	gcttgatgct	gcaaagaaca	agatgctgag	gaagatcagc	tatctaataa	360
ttgccctgac	ggtggttaga	tgcacttca	tggttattga	gggcaagaag	gctgcccaca	420
gacacgagac	tttaacaagc	ttgaacttat	aaaagaaagc	tcgtctg		467

&lt;210&gt; 409

&lt;211&gt; 338

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 409

ggaagttctg	cgctggtcgg	cggagtagca	agtggccatg	gggagcctca	gcggtctgcg	60
cctggcagca	ggaagctggt	ttaggttatg	tgaaagagat	gtttcctcat	ctctaaggct	120
taccagaagc	tctgatttga	agagaataaa	tggattttgc	acaaaaccac	aggaaagtcc	180
cggagctcca	tcccgcactt	acaacagagt	gcctttacac	aaacctacgg	attggcagaa	240
aaagatcctc	atatggtcag	gtcgcttcaa	aaaggaagat	gaaatcccag	agactgtctc	300
gttggagatg	cttgatgctg	cagagatcaa	gatgctgag			338

WO 03/057926

PCT/US03/00657

<210> 410  
 <211> 601  
 <212> DNA  
 <213> Homo sapiens

<400> 410  
 tttgcacgat gccttccaca tcccacggcg ctgctgctgg gggcagattg gcctggggag 60  
 gcagcacttg ctctccagct catctgggtt gcttttcccc gcagtggata tcacaggcta 120  
 aagggggggg cagtccccac catatctgag tctttctcca agttgcgccg gacaaccaag 180  
 accaaaggac acagttaccc acctggcccc tctgaagtca gccggctcag acgatgcagg 240  
 aagcgctgct ccgagggccg agggcccaca actccatttt ctccacctcc acctgctgat 300  
 gtcacctgct ttctgtgga agaggcctca gcacctgcca ctttgccggc ctccccagct 360  
 gggaggctgg agcctggcct tagcagcccc ttttcagacc tactgggccc cttgggtgcc 420  
 caggcagatg aagcaggctg cagcgcccag ccttcaccag agcggcagcc ctcccctctc 480  
 gaaccacggc cagtctcccc ctacgcgtat atgctgcgcc tgccccacc cgccggagcc 540  
 tacatccaga atgaacacag ctaccagggtg ggcagcgct tactctggaa gcggcgagcc 600  
 g 601

<210> 411  
 <211> 52  
 <212> DNA  
 <213> Homo sapiens

<400> 411  
 gcccttggg tgcccaggca gatgaagcag gctgcagcgc ccagccttca cc 52

<210> 412  
 <211> 525  
 <212> DNA  
 <213> Homo sapiens

<400> 412  
 cgtttcgggt tctaggggtg ttacgaagct gcaggagcga gatggagggtg gacgcaccgg 60  
 gtggtgatgg tcgagatggt ctccgggagc ggcgaggctt tagcgaggga gggaggcaga 120  
 acttcgatgt gaggcctcag tctggggcaa atgggcttcc caaacactcc tactgggttg 180  
 acctctggct tttcctcctt ttcgatgtgg tgggtgttct ctttgtgtat tttttgcat 240  
 gacttggtcg ctgatatcta aattaagaag ttgggtcctg agtgaattct gaaaatggct 300  
 acaaacttct tgaataaaga agacaggact ctcaatagaa gaatttcaca tctccaagg 360  
 acccttcctt tcattttaca ctttggtact aatttgcaga actctattaa ttgggtagga 420  
 tttcacccat tcctagctaa gttcttaaaa ttaaaccctt tgggtcgtgt ttaaaaactt 480  
 tcaaacatct gatggcttta caggggctga atataaaagc atttg 525

<210> 413  
 <211> 604  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 12, 14, 18, 20, 24, 27, 29, 31, 33, 35, 54, 594, 595  
 <223> n = A,T,C or G

<400> 413  
 ttcgaaccca tncntttncn atcnganana ngntnctagt tcttctgaag accncatcga 60  
 ttcgtttcgg tttctagggt tgttacgaag ctgcaggagc gagatggagg tggacgcacc 120  
 ggggtgttgat ggtcgagatg gtctccggga gcggcgaggc tttagcgagg gagggaggca 180  
 gaacttcgat gtgaggcctc agtctggggc aaatgggctt cccaaacact cctactgggt 240  
 ggacctctgg cttttcatcc ttttcgatgt ggtgggtggt ctctttgtgt attttttgcc 300  
 atgacttggt cgctgatatc taaattaaga agttgggttct tgagtgaatt ctgaaaatgg 360  
 ctacaaactt cttgaataaa gaagacagga ctctcaatag aagaatttca catctccaag 420  
 ggacccttcc tttcatttta cactttgtta ctaatttgca gaactctatt aattgggtag 480  
 gatttcaccc attcctagct aagttcttaa aattaaacc tttgggtcgt gtttaaaaac 540



WO 03/057926

PCT/US03/00657

tttcaaacat ctgatggctt tacaggggct gaatataaaa gcatttgtac ttannaaaaa 600  
 aaaa 604

<210> 414  
 <211> 285  
 <212> DNA  
 <213> Homo sapiens

<400> 414  
 ctctaacgtg ggcaacagag accctgtctc aaaaagaaaa tattcctggt agccctaaag 60  
 gctttacatg aggaatggta gaagtggctt tttgttttaa ttagttgcat tcagcatata 120  
 tgaattgtct taaatatttt ggggatactc ccccgcttt taaacagggc ataagatctg 180  
 gtaaactctc tgtatatctt cctacctttc aaaatcgttc ttaggggttag tcaagtctgg 240  
 aatataattg ctgactataa agttagcaat tatgctttaa ggtga 285

<210> 415  
 <211> 241  
 <212> DNA  
 <213> Homo sapiens

<400> 415  
 atttacactt gatggctaataa aaagatggac agctaatagac agaattattt aatcgattag 60  
 aaagtcagca tcatttccag atagaaaagg ctctagttga gaaacttcag caggattttg 120  
 tagctgactg gtgctctgag ggagagtgcc tagcagctat taactccacc tataatactt 180  
 cagggtatat tttggatcca cacactgctg ttgcaaaagt ggttgcagat aggggtgcaag 240  
 a 241

<210> 416  
 <211> 315  
 <212> DNA  
 <213> Homo sapiens

<400> 416  
 cggcttctgg aagaggggggt gttgcggcag atccctgtag tgggcttcgt gctgaattgg 60  
 ttttctccgg tccaggcttc acagtaggga agaactttta acttgacagc aggctctctg 120  
 gagtccacag aacctatata tgtctacaaa gcacaagggtg caggagtcac gctgcctcca 180  
 acgccctcgg gcagtcgcac caagcagagg cttccaggcc agaagccttt taaaagggtcc 240  
 ctgcgagggt cagatgcttt gagtgagacc agctcagtcg gtcataattga agacttagaa 300  
 aaggtggagc gccta 315

<210> 417  
 <211> 164  
 <212> DNA  
 <213> Homo sapiens

<400> 417  
 tggatcccc gggctgcagg aattcgaatt ctgtgtgtgt gtgtgtgtat gaatgggtata 60  
 tttattacat tatttagaaa gagaatgagt gtgttatgag gataatgtta tatacagtct 120  
 aagtggatgt ttctgtttgg cacagaatgt aggatttctg aaac 164

<210> 418  
 <211> 206  
 <212> DNA  
 <213> Homo sapiens

<400> 418  
 tatatttatt acattatttt gaaagagaat tagtgtgtta tgtggataat gttatataca 60  
 gccaaagtgg atgtttctgt ttggcaagga aggtaggatt tctgaaactc aggccttaac 120  
 caatagggtg gaagacaaga ccaattgaag agttaggaaa tgtgagtttt tgttacttct 180  
 gttattccag tcttggtttc attgtc 206

<210> 419

WO 03/057926

PCT/US03/00657

<211> 238  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 159, 227  
 <223> n = A,T,C or G

<400> 419  
 agcagtgtac ataatattcc agtaggaaac tgcttccaag ttaagcatg agctcccaa 60  
 actggagaaa acatattttg ctattctgag acaacaatca gaatacagac tttggattcc 120  
 aggtcacagt ttgcttttta gacaaggtaa agcaaagana gccacattgt gccatcttca 180  
 gctccagtgg ctttagcagt gactgtttga cataaaacat gtaaganttg cttggttg 238

<210> 420  
 <211> 504  
 <212> DNA  
 <213> Homo sapiens

<400> 420  
 cggcgtgctt gctgctggag ggtgatggcc ctgcaaggct gtgggctccg acctcaccgg 60  
 gagtcgacag cgagagggtc gccgaagagc gaggttctgg gcgagcgtg aacgccggcc 120  
 ccaagcacc cgggtcttta cacagtccgc gtccacagac tctgacgaag acgtggatct 180  
 gctctcgtt tagctgctcg cggctctcca gatcatgtcc gcgactcctg cgactccgcg 240  
 cggaaaaaaa agtttgccag gcgtggactc aatgacctt ccaagctgtg cgctcgtg 300  
 cctggaccgg gtctgagcgc ggctgccag gttgacctt ctgcccagg gctttctcta 360  
 cgtgctgtt tctcactggg tttttgtcgg agccccacgc cctccggcct ctgattcctg 420  
 gaagaaaggg ttgggtcccct cagcaccccc agcatcccgg aaaatgggga gcaaggctct 480  
 gccagcggcc atcccgtcc accc 504

<210> 421  
 <211> 814  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 38, 93, 94, 95, 422, 440, 467, 474, 508, 519, 529, 535, 554,  
 557, 561, 565, 584, 594, 604, 619, 641, 655, 674, 679, 690,  
 695, 702, 704, 706, 712, 716, 724, 734, 737, 740, 743, 780,  
 781, 808, 813  
 <223> n = A,T,C or G

<400> 421  
 cggggacgga gctcggcgtg cttgctgctg gagggttntg gccctgcaag gctgtgggct 60  
 ccgacctcac cgggagtcga cagcgagagg ttnnncgaag agcgagggtc tgggcgagcg 120  
 ctgaacgccg gccccaagca ccccggtct ttacacagtc cgcgtccaca gactctgacg 180  
 aagacgtgga tctgctctcg ctttagctgc tgcggctcct ccagatcatg tccgcgactc 240  
 ctgcgactcc gcgcgaaaaa aaaagtttgc caggcgtgga ctcaatgacc tttccaagct 300  
 gtgcgctcct ctgcctggac cgggtctgag cgcggctgcc caggttgacc ttttctgctg 360  
 aagggctttc tctacgtgct gttgctcatg ggtttttgtc ggagcccaa cgcccttccg 420  
 gncttttgat tcctggaaan aaaaggggtt ggttcccctt caagcanccc caancattcc 480  
 ccgggaaaaa atgggggagc caaagggntt ttggccaang gccccaatnc ccgnttcaa 540  
 cccgttgggt tggnaanttt naccnaaatt aacttcttt cctncaaggc ccnggaaaa 600  
 aacnttttcc cgggccacng ggggggaacc aaccttgcaa nggggccttg taccnggtct 660  
 tcaaacggcg ggtnccaana acccttgccn ccatngaaac cnantnggaa cncctngggg 720  
 gttnttcccc aatnggngcn ccnaaaaaac aaccccggtt ccaaccattt aagggaaaa 780  
 nggcgggggg gccccaaggg cccttttngg acnt 814

<210> 422  
 <211> 375

WO 03/057926

PCT/US03/00657

<212> DNA  
 <213> Homo sapiens

<400> 422  
 ctgacgaaga cgtggatctg ctctcgcttt agctgctcgc ggtcctccag atcatgtccg 60  
 cgactcctgc gactccgcgc ggaaaaaaaaa gtttgccagg cgtggactca atgacctttc 120  
 caagctgtgc gcctcgctgc ctggaccggg tctgagcgcg gctgcccagg ttgacctttc 180  
 tgcgggaggg ctttctctac gtgctgttgt ctactgggt ttttgtcggg gccccacgcc 240  
 ctccggcctc tgattcctgg aagaaagggt tggccccctc agcaccccca gcatcccgga 300  
 aatggggag caaggctctg cagcgcccat cccgctccac cgtcgctgca gctcccatt 360  
 actcttctgc aggcg 375

<210> 423  
 <211> 405  
 <212> DNA  
 <213> Homo sapiens

<400> 423  
 ggggacggag ctccggcgtgc ttgctgctgg agggatgatgg ccctgcaagg ctgtgggctc 60  
 cgacctcacc gggagtcgac agcgagaggt tccccaaga gcgaggttct gggcgagcgc 120  
 tgaacgccgg cccaagcac cccgggtctt tacacagtcc gcgtccacag actctgacga 180  
 agacgtggat ctgctctcgc tttagctgct cgcggctcctc cagatcatgt ccgagactcc 240  
 tgcgactccg cgcggaaaaa aaagtgtgac aggcgtggac tcaatgacct ttccaagctg 300  
 tgcgctcgc tgcttgacc gggctctgagc gcggctgccc aggttgacct ttctgcggga 360  
 gggctttctc tacgtgctgt tgtctcactg ggtttttgtc ggacc 405

<210> 424  
 <211> 139  
 <212> DNA  
 <213> Homo sapiens

<400> 424  
 ctctgtgttca gctgtcagaa taacagccaa taaaaactac aggagcaaaa cctctcagga 60  
 aggtgcttta aaaaagatgc atgaggaaga acaccatcaa caaatgtcca tcttacaact 120  
 gcaactgata caaatgaat 139

<210> 425  
 <211> 273  
 <212> DNA  
 <213> Homo sapiens

<400> 425  
 ttctggctgg gaagcgcgat tgtggcttta aaccaccatc atggtctagc aaagaggcaa 60  
 agaccaagac caccaagaag cgcctcagc gtgcaacatc caatgtggtt gccatgtttg 120  
 accagtcaca gattcaggag ttcaaagagg ccttcaacat gattgatcag aacagagatg 180  
 gcttcatcga caaggaagat ttgcatgata tgcttgcttc tctaggaag aatcccactg 240  
 atgcatacct tgatgccatg atgaatgagg ccc 273

<210> 426  
 <211> 56  
 <212> DNA  
 <213> Homo sapiens

<400> 426  
 gggaaaccgcc attctgcctg ggaaccgcca ttctggccgg gaaccgcat tatgac 56

<210> 427  
 <211> 365  
 <212> DNA  
 <213> Homo sapiens

<400> 427

WO 03/057926

PCT/US03/00657

```

ggcgcattct tacctgtcgg ggtgcggcga gtgtctcacc tctctgcact tccaaggact 60
cttgtcatct gccttaggcg ggaaatgctg ttgctggatt gcaaccccga ggtggatggt 120
ctgaagcatt tgctggagac aggggcctcg gtcaacgcac ccccggatcc ctgcaagcag 180
tcgcctgtcc acttagccgc aggaagcggc cttgcttgct ttcttctctg gcagctgcaa 240
acgggcgctg acctcaacca gcaggatggt ttaggagaag ctccactaca caaggcagca 300
aaagttggaa gcctggagtg cctaagcctg cttgtagcca gtgatgccca aattgattta 360
tgtag                                     365

```

<210> 428  
 <211> 119  
 <212> DNA  
 <213> Homo sapiens

```

<400> 428
gagcgggtggc tgagaaatgt aaggattctg gaatacatat tccatgggac tttccttccc 60
tctcctgctt cctcttttcc tgctccctaa cctttcgccg aatggggcag caccactga 119

```

<210> 429  
 <211> 421  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 130, 185, 246, 256, 336, 361, 385, 412  
 <223> n = A,T,C or G

```

<400> 429
tttttttttt tttttttgga aataagtcaa agcattgttt atttatgaca tatttacata 60
tttacaacac tgattttact caatacatca tcttgcgtaa taccataaaa tgaacacccat 120
atcctgngan taaaaatcca tttttcttaa taatttatgt atagcccaac ttttagaaca 180
tagantatta tcaatttggc ttcccaaact acaaagtcct gtttataatt ttttctagcc 240
aaggancaga gtaggntcaa caggcatatt aaagtaattt agttaaccct gaggtaatta 300
ctaacttggc ataattttgg aatgggggat atatancaca ctttccatct ggcacttagg 360
ntacttatta ctattcacac tacnttttg gtatttatcc acctcaattt tncaacttcc 420
t                                     421

```

<210> 430  
 <211> 481  
 <212> DNA  
 <213> Homo sapiens

```

<400> 430
gggtagccgc ttttcgctga ctcttaccgg ttggctgggc cagctgcgcc gcggctcaca 60
gctgacgatg ggggaccca gcaagcagga catcttgacc atcttcaagc gcctccgctc 120
ggtgccact aacaagggtg gttttgattg tgggtgccaaa aatcccagc tgggcaagca 180
taacctatgg agtgttcctt tgcattgatt gctcagggtc ccaccgggtca cttggtgttc 240
acttgagttt tattcgatct acagagttgg attccagctg gtcattggtt cagttgcat 300
gcatgcaagt cggaggaaac gctagtgcac cttccttttt tcatcaacat ggggtgtcca 360
ccaatgacac caatgccaag tacaacagtc gtgctgctca gctctatagg gagaaaatca 420
aatcgctcgc ctctcaagca acacggaagc atggcactga tctgtggctt gatagttgtg 480
t                                     481

```

<210> 431  
 <211> 136  
 <212> DNA  
 <213> Homo sapiens

```

<400> 431
ggggtaagtt tagaaatagc gctgggcatg tccagccctg accacggcca gctctggagg 60
gctgtccttt ggctgtaccc acttgggaaga gaaagaaaaa gaaaaaaaaa aaaaaaaaaa 120
aaaatttttt tttttt                                     136

```

WO 03/057926

PCT/US03/00657

<210> 432  
 <211> 578  
 <212> DNA  
 <213> Homo sapiens

<400> 432  
 aaacaacaaa caccagaaaa attacctata ccaatgatag caaaaaacct tatgtgtgaa 60  
 ctcgatgaag actgtgaaaa gaatagtaag agggactact taagttctag ttttctatgt 120  
 tctgatgatg atagagcttc taaaaatatt tctatgaact ctgattcatc ttttcctgga 180  
 atttctataa tggaaagtcc attagaaagt cagcccttag attcagatag aagcattaaa 240  
 gaatcctctt ttgaagaatc aaatattgaa gatccactta ttgtaacacc agattgccaa 300  
 gaaaagacct caccaaaagg tgctcgagaac cctgctgtac aagagagtaa ccaaaaaaatg 360  
 ttaggtcctc ctttggaggt gctgaaaacg ttagcctcta aaagaaatgc tgttgctttt 420  
 cgaagtttta acagtcatat taatgcatcc aataactcag aaccatccag aatgaacatg 480  
 acttcttttag atgccaatgg atatttcgtg tgcctacagt ggttcatatc ccatggctat 540  
 aaccctact caaaaaagaa gatcctgtat gccacatc 578

<210> 433  
 <211> 229  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 35, 37  
 <223> n = A,T,C or G

<400> 433  
 gcctaggtgc ccaggctatg atgagtctgc ttttnangga ggtaggggaat gacatcttcc 60  
 ttggacccaa agcttaaaag taatgtatgc tttgctgacc actgtttgtt aggccttaaa 120  
 caacattcac tgtggtggta tcaggcacac tgctatgtgc atcaattatt tttttgcttt 180  
 ccaaacagaa tctctggggc acaagtttta cactcaagct aagtataac 229

<210> 434  
 <211> 503  
 <212> DNA  
 <213> Homo sapiens

<400> 434  
 tggtagcct gcaggtaccg gtccggaatt cccgggtcga cccacgcgtc cggcgtcatg 60  
 gagctgacct gggtcccac taccctttg gagagaatga agtgtacaag caggtgatct 120  
 tcgaggaggg ctccctggggc cgatgggtcc agaagaagt ccagaaatac attggtttcg 180  
 ccccatgcat ctccatggt cgaggcctct tctcctccga cacctggggg ctgggtgccct 240  
 actccaagcc catcaccact gttgtgggag agcccatcac catccccaag ctggagcacc 300  
 caaccagca agacatcgac ctgtaccaca ccatgtacat ggaggccctg gtgaagctct 360  
 tcgacaagca caagaccaag ttcggcctcc cgggagactga ggtcctggag gtgaactgag 420  
 ccagccttcg gggccaattc cctggaggaa ccagctgcaa atcacttttt tgctctgtaa 480  
 atttggaagt gtcatgggtg tct 503

<210> 435  
 <211> 248  
 <212> DNA  
 <213> Homo sapiens

<400> 435  
 gcgtcatgga gctgacctgg ttcccatcta ctcttttga gagaatgaag tgtacaagca 60  
 ggtgatcttc gaggagggt cctggggccg atgggtccag aagaagttcc agaaatacat 120  
 tggtttcgcc ccatgcatct tccatggctc aggcctcttc tcctccgaca cctgggggct 180  
 ggtgctact ccaagcccat caccactgtt gtgggagagc ccatcaccat cccaagctg 240  
 gagcacca 248

WO 03/057926

PCT/US03/00657

<210> 436  
 <211> 457  
 <212> DNA  
 <213> Homo sapiens

<400> 436  
 atcttgctctc ttttcatcgt gatgggtgtga tgctgacgag aatatccttat gctttcttca 60  
 gcctgttgca atctgagcca atgattttct ttgcactgat cctttctact ctggagagaa 120  
 gctcttttga cacagatcct gccccgttta atagactcca gctgctggca ctgccttctg 180  
 agttctttca cttccgaatt cttatcgtcc tgcagcccca ccacagtcaa tgactaagtt 240  
 cctctggact ttcacatgga tcgtaataga caacttcate ctgtttttct taccagaccc 300  
 taaaatgtgc ctccaagaca gtcgtgggaa cagtatggag ccagcagcag aagccactca 360  
 cgaaccaatg gaggagaaca actcagaaac agaccaagt caatctaagg tttactttt 420  
 ataagtcttt caagagagtc caactgtgta gtaagca 457

<210> 437  
 <211> 589  
 <212> DNA  
 <213> Homo sapiens

<400> 437  
 gcttccaggc ctccttccag catccacaca agtacctgct ccaactacctg gtttccctcc 60  
 agaactggct gaaccgccac agctggcagc ggaccctgt tgccgtcacc gcctgggccc 120  
 tgctgcggga cagctaccat ggggcgctgt gcctccgctt ccaggcccag cacatcgccg 180  
 tggcgggtgct ctacctggcc ctgcaggtct acggagttga ggtgcccgcc gaggtcgagg 240  
 ctgagaagcc gtgggtggcag gtgtttaatg acgaccttac caagccaatc attgataata 300  
 ttgtgtctga tctcattcag atttatacca tggacacaga gatcccctaa ggccctggcc 360  
 caggcctgcc caaagagaag cccaggatgg tcggctgcct ggggacattg tcaccacgtc 420  
 gccatgacgg ctgggtccca caggaccagc tgggaggact ggttgtgctg ctggagaagg 480  
 gctggagaag gcaatggcat gctgccgctt tgccagtccc taaaagtgcg ggtgcaggtg 540  
 atggtgggag ccgcgcctcc agcgggcagc ccgggagtgt actgtgtgc 589

<210> 438  
 <211> 241  
 <212> DNA  
 <213> Homo sapiens

<400> 438  
 cgcttccagg tctccttcca gcatccacac aagtacctgc tccaactacct ggtttccctc 60  
 cagaactggc tgaaccgccac cagctggcag cggaccctgt ttgccgtcac gcctgggccc 120  
 ctgctgcggg acagctacca tggggcgctg tgccctcgct tccaggccca gcacatcgcc 180  
 gtggcgggtgc tctacctggc cctgcaggtc tacggagttg aggtgcccgc cgaggtcgag 240  
 g 241

<210> 439  
 <211> 221  
 <212> DNA  
 <213> Homo sapiens

<400> 439  
 ttcagctctg caaacactgt cacatccttt cctggaaggg cactgaccat ccgtgcactg 60  
 ccaataacc agagagctgc tccgtttcac tttcaccca ggactttatc aacttgttca 120  
 agttctgaat cccagcacat gacaacactt cagaagggtc cccctgctga ctggagagct 180  
 gggaatatgg catttggaca cttcatttgt aatagtgtgta c 221

<210> 440  
 <211> 228  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature

WO 03/057926

PCT/US03/00657

<222> 191  
 <223> n = A,T,C or G

<400> 440  
 gagctttctt aataaccgta cttctcaaaa tcagagtttt actgtttcaa taaatgttca 60  
 ccctagattg taagtttttt gttggtgagc cctagatttt tttctactag tgtaaactctg 120  
 tattccctcc aagtatgggtg ataaggggac tgagtcttat ttacatttgt acaatcacta 180  
 ctttacctgt ngatatttgc gtaagtcttt tgagccctat taaacctg 228

<210> 441  
 <211> 531  
 <212> DNA  
 <213> Homo sapiens

<400> 441  
 tttcttaata accgtacttc tcaaaatcag agttttactg tttcaataaa tgttcacctt 60  
 agattgtaag ttttttggtg ttgagcccta gatttttttc tactagtgtg aatctgtatt 120  
 ccctccaagt atgggtgataa ggggactgag tcttatttac atttgtacaa tcactacttt 180  
 acctggtgta tttgcagtaa gtcttttgag ccctattaaa cctgtcaatt ttcttgtcct 240  
 gtcagaaaac tgagattttg gctcaaaaat ggatgttatt aacaaagggg aacaatatag 300  
 atgtcttagt acaaagaaaa tgaaatgtaa gaggagattg tctggagttc aggggataga 360  
 gtgtcaagtc ttaaattggtt acatcttttt gctaagtgtt actcagaata tagttacaaa 420  
 tatggtactt aaatatctag ctgaaatttg tttgtcccat gagcttctca catgagtcta 480  
 ctgggcaatt ttatgtgagt tttggtcaaa attggtaatc tcttttatct t 531

<210> 442  
 <211> 147  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> misc\_feature  
 <222> 112  
 <223> n = A,T,C or G

<400> 442  
 aacttggtac ccaataacaa ttaaatgtta aatttggctt tcttctgtgt cccagcctct 60  
 taaattaata gatgggcctt tccattatca ttatgaccgg acattgtaaa gnacttaagg 120  
 taacacccag ttttctatta cttgccc 147

<210> 443  
 <211> 518  
 <212> DNA  
 <213> Homo sapiens

<400> 443  
 acctgaagaa tattagaaga aattgtgcac cctccacaaa acatacaaag tttaaaagtt 60  
 tggatctttt tctcagcagg tatcagttgt aaataatgaa ttaggggcca aaatgcaaaa 120  
 cgaaaaatga atcatctaca tgtagttagt aatttctagt ttgaactgta attgaatatt 180  
 gtggcttcat atgtattatt ttatattgta cttttttcat tattgatggg ttggacttta 240  
 ataagagaaa ttccatagtt ttaatatcc cagaagtgag acaatttgaa cagtgtattc 300  
 tggaaaacaa cacactaact gaacagaagt gaatgcttat atatattatg atagccttaa 360  
 acctttttcc tctaatgcct taactgtcaa ataattataa ccttttaaag cataggacta 420  
 tagtcagcat gctagactga gaggtaaaca ctgatgcaat tagaacaggg actgatgctg 480  
 tcagtgttta acactatggt tagctgtggt tatgctat 518

<210> 444  
 <211> 76  
 <212> DNA  
 <213> Homo sapiens

<400> 444

WO 03/057926

PCT/US03/00657

gctgctcatg agcagcatgg acgacctgat acgccactgt aacgggaagc tgggcagcta 60  
 caaaatcaat ggccgg 76

<210> 445  
 <211> 308  
 <212> DNA  
 <213> Homo sapiens

<400> 445  
 gagcattatg agcattatgt cagaatagaa tagaattggg gttcgatctt aacaggccag 60  
 aatgcctgg gtttttttgg tttgtttttg tttttgtttt tttatcaaat cctgcctgac 120  
 tgtctgcttg ttttgcctac catcgtgaca tctccatggc tgtaccacct tgcgggtag 180  
 cttatcagac tgatgttgac tgttgaatct catggcaaca ccagtcgatg ggctgtctga 240  
 cattttggta tctttcatct gaccatccat atccaatggt ctcatntaaa cattaccag 300  
 catcattg 308

<210> 446  
 <211> 530  
 <212> DNA  
 <213> Homo sapiens

<400> 446  
 tgtgttaatg ttttctagca tgtactctgg tttcaacaga cacaaattta tatgttaacc 60  
 cagttttctt gccgttctgt aagtgtttta ttcttagtgt gatttttttc cattgggatg 120  
 tttttgattg aacttgttca tttgtttttg cttgggagga aaataaaca tttactttt 180  
 ttcctttagg agcattatga gcattatgtc agaatagaat agaattgggg ttcgatctta 240  
 acaggccaga aatgcctggg tttttttggg ttgtttttgt tttgtttttt ttatcaaatc 300  
 ctgcctgact gtctgcttgt tttgcctacc atcgtgacat ctccatggct gtaccacctt 360  
 gtcgggtagc ttatcagact gatgttgact gttgaatctc atggcaacac cagtcgatgg 420  
 gctgtctgac attttggat ctttcatctg accatccata tccaatgttc tcatttaaac 480  
 attaccagc atcattggtt ataatcagaa actctggtcc ttctgtctgg 530

<210> 447  
 <211> 104  
 <212> DNA  
 <213> Homo sapiens

<400> 447  
 ggacgtgcct ggaaccacct cgtccacgtc cacgtccacc tgggggcctc gggaggctag 60  
 gccctcctc aaaggccac cagcccggcg ctcatgctga gcc 104

<210> 448  
 <211> 417  
 <212> DNA  
 <213> Homo sapiens

<400> 448  
 tatctttcat ctgaccatcc atatccaatg ttctcattta aacattacc agcatcattg 60  
 ttataatca gaaactctgg tccttctgtc tgggtggcact taaagtcttt tgtgccataa 120  
 tgcagcagta tggagggagg attttatgga gaaatgggga tagtcttcat gaccacaaat 180  
 aaataaagga aaactaagct gcactgtggg ttttgaaaag gttattatac ttcttaacaa 240  
 ttcttttttt cagggacttt tctagctgta tgactgttac ttgaccttct ttgaaaagca 300  
 ttcccaaat gctctatttt agatagtta acattaacca acataattt ttttagatcg 360  
 agtcagcata aatttctaag tcagcctcta gtcgtggttc atctctttca cctgcat 417

<210> 449  
 <211> 630  
 <212> DNA  
 <213> Homo sapiens

<400> 449  
 tttttttttt tttttttttt ttggaatcgc aagaattccc aggcctctt tttattaca 60



WO 03/057926

PCT/US03/00657

```

gtgataccaa accatccact tgcaaattct ttggtctccc atcagctgga attaagtagg 120
tactgtgtat ctttgagatc atgtatattgt ctccactttg gtggatacaa gaaaggaagg 180
cacgaacagc tgaaaaagaa gggatcaca ccgctccagc tggaatccag caggaacctc 240
tgagcatgcc acagctgaac acttaaaaga ggaaagaagg acagctgctc ttcatttatt 300
ttgaaagcaa attcatttga aagtgcataa atggatcatca taagtcaaac gtatcaatta 360
gaccttcaac ctaggaaaca aaatTTTTTT ttctatttaa taatacacca cactgaaatt 420
atttgccaat gaatcccaaa gatttggtac aaatagtaca attcgtattt gctttcctct 480
ttcctttctt cagacaaaca ccaaataaaa tgcaggtgaa agagatgaac cacgactaga 540
ggctgactta gaaatttatg ctgactcgat ctaaaaaaaaa ttatgttggg taatgttaaa 600
ctatctaaaa tagagcattt tgggaatgct                                     630

```

&lt;210&gt; 450

&lt;211&gt; 596

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 450

```

TTTTTTTTTT TTTTTTTTTT TTTGGGGTAA AAGTTATATC TTATTGCCAT GCTACAAAAT 60
gtatgaagtt ggcactgata gggagaaata gagaacaaag ggtgggaagg gatagagggg 120
aaattatggt gttacatata caacaagggt ttattttaat taacagtggg tacgttttgc 180
caatattaaa aatgcaaacc aaaattttaa atgctgatct gaaacagcat taagatacaa 240
tgtatgcata gtacagtatc acttatgtct ttttattaga gaaatatgga atgtttataa 300
aagaaattaa ccatgggggt aaaattcata tttcatatac aatttggcaa tggtagtccc 360
actgttggac aattttttat aaaagaaaaa attaaaaatc taataagcta cttttataca 420
aagttgctat atttatgcct ttacgtagga aaaaaacatt tataatgcaa attaggacat 480
acaatagtct tacaatacta tacaatgtaa tgaaaataaa acataacaca aagtttgtcc 540
tttataaaat gtatattttg cactactaat gcaaatgtgg cacactgggtg actact 596

```

&lt;210&gt; 451

&lt;211&gt; 559

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 451

```

TGGCGGGTTG CTTTCCAAA TGGCGCGGGT GCTGAAGGCT GCAGCCGCGA ATGCCGTAGG 60
gcttttttcc agacttcaag ctccatttcc aacagtaaga gcttcttcca catcacagcc 120
cttggatcaa gtgacagggt ctgtgtggaa cctgggtcga ctcaacctatg tagccatagc 180
agtgccagat ttggaaaagg ctgcagcatt ttataagaat attctggggg cccaggtaag 240
tgaagcggtc cctcttctg aacatggagt atctgttgtt tttgtcaacc tgggaaatac 300
caagatggaa ctgcttcac cttgggacg tgacagtcca attgcagggt ttctgcagaa 360
aaacaaggct ggaggaatgc atcacatctg catcgagggt gataatatta atgcagctgt 420
gatggatttg aaaaaaaaaa aagatccgca gtctaagtga aggggtcaaa ataggagcac 480
atggaaaacc agtgattttt ctccatccta aagactgtgg tggagtcctt gtggaactgg 540
agcaagcttg acttatatt                                     559

```

&lt;210&gt; 452

&lt;211&gt; 638

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 452

```

TGGCGGGTTG CGTTCCAAAT GGCAGGGGTG CTGAAGGCTG CAGCCGCGAA TGCCGTAGGG 60
cttttttcca gacttcaagc tccatttcca acagtaagag cttcttccac atcacagccc 120
ttggatcaag tgacagggtc tgtgtggaac ctgggtcgac tcaacctatg agccatagca 180
gtgccagatt tggaaaaggc tgcagcattt tataagaata ttctgggggc ccaggtaagt 240
gaagcgggtc ctcttctgga acatggagta tctgttgttt ttgtcaacct gggaaatacc 300
aagatggaac tgcttcatcc attgggacgt gacagtccaa ttgcagggtt tctgcagaaa 360
aacaaggctg gaggaatgca tcacatctgc atcgagggtg ataatattaa tgcagctgtg 420
atggatttga aaaaaaaaga agatcccgag tctaagtgaa ggggtcaaaa taggagcaca 480
tggaaaacca gtgatttttc tccatcctaa agactgtggg ggagtccttg tggaaactgga 540
gcaagcttga cttatatttg caagcaacta aattaattga cctgaaaaag cctatcaaat 600
actatcaaaa tgtactatga cattgagtcc ttcactgc                                     638

```

WO 03/057926

PCT/US03/00657

<210> 453  
 <211> 57  
 <212> DNA  
 <213> Homo sapiens

<400> 453  
 gactacattt ggggatgatg cattccttta agattgaatg attctgccct tgggcag 57

<210> 454  
 <211> 538  
 <212> DNA  
 <213> Homo sapiens

<400> 454  
 gccgggctgc taattctggt taattgttcc tgggctaaaa agaattagaa ggaagctgtc 60  
 tgtttccac tgcggttatg tttcagtaaa ttagacgtac tttctgatga atactaatta 120  
 gccactgagc atttgcaccc actgtctttg ctggttgtgt gcagaacagc tgccaagttg 180  
 cccaagacc tcgctatccc atccccctct cttgctttcc acttttgggc ttcctttgcc 240  
 tagattagaa gagatttcag ttccgagaaa gtaaaagggt atccaaggaa gtaatcaccg 300  
 agtgtctcat ggtttttcct tgttgacaaa attcaaaact cacacatgtg tagtctaag 360  
 atagcgctag gatttaaaga aagtgtttta gtgctgtgct tatttaggac tacatttggg 420  
 gatgatgcat tcctttaaga ttgaatgatt ctgcccttgg gcagagctcc caattaggga 480  
 ggattaggta agctttttgt ggcgatgggt aataccattc ttttctcat tgtgctg 538

<210> 455  
 <211> 548  
 <212> DNA  
 <213> Homo sapiens

<400> 455  
 tgaatcagta ggaatgtggg gaagggagtg aggggagacc ccctccttga ctcagcagtg 60  
 gtgacggtcg gtgtgtcctg cagacctgaa gccaagatca agggggcttg agcaccagga 120  
 gccccgcag ttgctgaatg accagcggag ggcaggtgcc agcctgtggc aaaataggaa 180  
 agaaaaggac aggatgggga cttcaccatt tttttcagcc ttaaattggt ctttaaacct 240  
 tcatgtcctt ttctctaag tgtgttcttg tttggtaaaa taaaaaagtt tgtaaccctg 300  
 agttctctaa agatatacat tcttttttac tggtttgtga agtcagaagg atgagagctg 360  
 ctatttcttg gaaccgtgca ataaatatta gcatattcag tctcggttct gcctagagga 420  
 cctatttget tttctttatc tcgtaaccca taactcacag gacattaacc aggggtgtcca 480  
 agaacagtct gggaaagttt tgataattac ttcagcattg ctgtgtgatg ggagacattg 540  
 ttttaaaa 548

<210> 456  
 <211> 354  
 <212> DNA  
 <213> Homo sapiens

<400> 456  
 tcagtgggag tgaatcagta ggaatgtggg gaagggagtg aggggagacc ccctccttga 60  
 ctcagcagtg gtgacggtcg gtgtgtcctg cagacctgaa gccaagatca agggggcttg 120  
 agcaccagga gccccgcag ttgctgaatg accagcggag ggcaggtgcc agcctgtggc 180  
 aaaataggaa agaaaaggac aggatgggga cttcaccatt tttttcagcc ttaaattggt 240  
 ctttaaacct tcatgtcctt ttctctaag tgtgttcttg tttggtaaaa taaaaaagtt 300  
 tgtaaccctg agttctctaa agatatacat tcttttttac tggtttgtga agtc 354

<210> 457  
 <211> 570  
 <212> DNA  
 <213> Homo sapiens

<400> 457  
 cttttatagg attcatttaa aggtgaataa aataatgaat gtgaaactca tattagagct 60

WO 03/057926

PCT/US03/00657

taacatatag	tagtaatgat	ttataaaata	tttgcctccc	ttagaccaga	gcagctacta	120
aatttgattt	taataataag	ataaacaat	taataagatc	aaaagttgt	tatgtaataa	180
cataaacagc	tgtgttaaaa	ttagtagtga	cccatatcaa	agaaacacaa	ttacaaagag	240
attaagaagg	ataatattta	aagtgtagct	ttactcagtc	ttttgtgtga	aggtattcct	300
agggataaaa	caatgtattt	ggaagctgct	ggaagaatat	ggtgcaaaga	atatttttaa	360
atgcttgtga	atgcttctgta	accacaaaca	tagatacata	acagatcaaa	gacatatttt	420
agactgccat	gtggacttaa	atcatgggag	gcggaagagt	ggctcccaa	agaggactat	480
atcgtaatac	cagaacttgt	gaatatatta	ctttaagtgg	caaaggac	tttacagatg	540
tgattaaaat	taaggacctt	gaaatggggg				570

&lt;210&gt; 458

&lt;211&gt; 540

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 458

aactagactt	cttttatagg	atcatttaa	aggtgaataa	aataatgaat	gtgaaactca	60
tattagagct	taacatatag	tagtaatgat	ttataaaata	tttgcctccc	ttagaccaga	120
gcagctacta	aatttgattt	taataataag	ataaacaat	taataagatc	aaaagttgt	180
tatgtaataa	cataaacagc	tgtgttaaaa	ttagtagtga	cccatatcaa	agaaacacaa	240
ttacaaagag	attaagaagg	ataatattta	aagtgtagct	ttactcagtc	ttttgtgtga	300
aggtattcct	agggataaaa	caatgtattt	ggaagctgct	ggaagaatat	ggtgcaaaga	360
atatttttaa	atgcttgtga	atgcttctgta	accacaaaca	tagatacata	acagatcaaa	420
gacatatttg	agactggcat	gtggacttaa	atcatgggag	gcggaagagt	ggctcccaa	480
agaggactat	atcgtagtac	cagaacttgt	gaatatatta	ctttaagtgg	caaaggac	540

&lt;210&gt; 459

&lt;211&gt; 622

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 459

acttaagatt	ttttcaatgt	aagaaaaatg	caatgaaata	atagctgcaa	ataccacta	60
ctaacaattg	cttggccttc	ttatatagac	ctcccagggt	tctcatcttt	tacatttcag	120
gagtagaatc	agttaaaaac	taatctttat	atgtaagggg	tgagagagag	aaagaggagg	180
gtatgtgtat	gcacacatgt	gtgtgtgtgt	ggtgggtagt	aattttaatt	caatgattta	240
ctagagttcg	atgtcgtttg	ctgataaatg	aagcaggagg	aagagccagg	tttgaggagg	300
acgagagaat	gagttccatt	tgtctcatat	agaagttgaa	gtaactgagt	gatgatgggt	360
agagatgtcc	ctcaggggta	gccacagtat	tttatttact	ttttattcac	cacatgcagc	420
aaggagcttt	gttctccaaa	atgctgtcaa	ttatttttct	aaattacagg	tttgattgct	480
tcaactgtatt	ttcatgtctc	attactacct	ttacgcttaa	aaccagaaac	tgtgccacag	540
cgttaaagat	tctgctaact	tttaaaatac	agaactctgg	agatgccata	attagattgc	600
agatttatga	gtcttctgga	ta				622

&lt;210&gt; 460

&lt;211&gt; 378

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 460

acaatggggt	tgttctctgc	cttataaatt	gggggattct	agaggagtct	gcttttctcc	60
caagaaggac	ctcttctttt	cttgcttttc	atatgctctc	cttgagatat	cttgggtatt	120
ctcatggctt	taaatagcac	ttatatccag	aagactcata	aatctgcaat	ctaattatgg	180
catctccaga	gttctgtatt	ttaaagttta	gcagaatctt	taacgctgtg	gcaaagtttc	240
tggttttaag	cgtaaaggta	gtaatgagac	atgaaaatac	cgtgaagcca	tcaaacctgt	300
aatttaaaaa	aataattgac	agcatttttg	agaacaaagc	tccttgctgc	atgtggggaa	360
taaaaagtaa	ataaaata					378

&lt;210&gt; 461

&lt;211&gt; 396

&lt;212&gt; DNA

WO 03/057926

PCT/US03/00657

&lt;213&gt; Homo sapiens

&lt;400&gt; 461

```

ccttctgctc tacgagaact atgggcagtc ggaaacggga ctaatttgtg ccacctactg 60
gggaatgaag atcaagccgg gtttcatggg gaaggccact ccaccctacg acgtccaggt 120
cattgatgac aagggcagca tcctgccacc taacacagaa ggaaacattg gcatcagaat 180
caaacctgtc aggcctgtga gcctcttcat gtgctatgag ggtgacccag agaagacagc 240
taaagtggaa tgtggggact tctacaacac tggggacaga ggaaagatgg atgaagaggg 300
ctacatttgt ttcttgggga ggagtgatga catcattaat gcctctgggt atcgcatcgg 360
gcctgcagag gttgaaagtg ctttgggtgga gcaccc 396

```

&lt;210&gt; 462

&lt;211&gt; 529

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 462

```

tttttttttt tttttttttt ttttttcggt agaatgggg ttttaccatg ttgcccaggc 60
tagtctcgaa ctcttgggct taagcaatcc acacacctcg cttccaaaaa agctgggggt 120
acaggtgtga gccatcacac ccagcctaata atacaatctc aatatatttg ttttaaatca 180
ttacttactg aactataaag taaaactaat ttttagacag cattttaata catattttac 240
tttttaaagg ttataaagaa aacactaaca atatggaaaa tgcataatta aagaaaattg 300
aatcaaata taatcttatg gctcaaaatc attagtgtta atattttgat acctaccttc 360
cccatctttt gcctacgaat actggggtta gagtttttaa atagttttgt ccttgctttg 420
taattttcgt atgttctcac aaaagagaag ctgaggaagc atttggtat tgggaaaatt 480
aattaataga tgtaactta ccaagatata ctataataga ttagacagc 529

```

&lt;210&gt; 463

&lt;211&gt; 485

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 463

```

tttaaagtaa atgactcatg ttgaggaaag aggttattac ctaaactctgg actgcggcct 60
aaggaaattc ccttaacctc tattctgggt tcctatttca aatgggtgt gtaggaggct 120
aatggaagtt agttgggtgc tatgatccaa aaactctatg ggtgaaaatt taaagtacag 180
atttcttatt taatcggtta acagctttag ttgtgagttc tatgtcctgg tataatggat 240
cctgattatt aatgcattaa atatgcattc agtgaattca aatggtgcta attattcttt 300
taccaatcaa agaaaactca aagcatggga ttaagagggg ttggccaaaa gtatttggac 360
caggttgcac accaggacca tgaagaaatt gagaacagag cctacatctt ttatactatg 420
gctcaaagca agggctggtg gaatgtgctg cttctccaaa gtaggactta tgaaaaaatg 480
agggt 485

```

&lt;210&gt; 464

&lt;211&gt; 576

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 464

```

talcagcatc tgtagaggag aaagcagaat aagcactggg gtatttgata gacttgagaa 60
taagagaacc ccaaagtgt caataggtat ttgctagaaa gttcagtggg tcagggtggg 120
aatagcagct gaaattggca gggattttga ctattcaaat aatgggtgag tagaaggat 180
ctgtggaata gccattatga cctcttgaaa ccaggcaact aggggtccc ttctagaatg 240
atgctgcgta cctaagaaat tcagtaggga gtggagtcaa aatgatcaga aaagatagag 300
atagttgtgg caaaagatga tctaagagtg tgtgtgtatg tgtgtgagtg agagagagaa 360
atctcaagaa atagtggtc taaggttgaa cactacatga aagcaacct aacagctgt 420
gtgaagttag aaaaggtact ctggaccata ttgccctgta aaagctcagg aaaactaatt 480
ttgcataaac ataagcaaca ggaaattatt gctgtcaaat ctattcaga gttattgtac 540
aaaaaagag acaagaatcc ctatagacaa tgaaag 576

```

&lt;210&gt; 465

&lt;211&gt; 459

WO 03/057926

PCT/US03/00657

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 465

```

ttatctaacg tttctaacag ggggtgtaat gatattagca gcaagagcta tgagaaataa 60
ctttagacat tatttcattg aaccttccca actgaaatta ttttatgatg ttataacatg 120
gatagtaact caagtagcaa taagttacac agttgtgcca tttgtgcttc tttctataaa 180
accatcactc acgttttaca gctcctggta ttattgcctg cacattcttg gtatcttagt 240
attatcgttg ttgccagtga aaaaaactca aagaaggaag aatacacatg aaaacattca 300
gctctcacia tccaanaagt ttgatgaagg agaaaattct ttgggacaga acagtttttc 360
tacaacaaac aatgtttgca atcagaatca agaaatagcc tcgagacatt catcactaaa 420
gcagtgatcg ggaaggctct gagggctggt ttttttttt 459

```

&lt;210&gt; 466

&lt;211&gt; 250

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 466

```

tatacccagg atattatcta acgtgtctaa caggggtggt aatgatatta gcagcaagag 60
ctatgagaaa taactttaga cattatttca ttgaacctc ccaactgaaa ttattttatg 120
atgttataac atggatagta actcaagtag caataagtta cacagttgtg ccatttgtgc 180
ttctttctat aaaacatca ctcacgtttt acagctcctg gtattattgc ctgcacattc 240
ttggtatctt 250

```

&lt;210&gt; 467

&lt;211&gt; 509

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 467

```

atactttatc tattttcggg caacttgctt ccctcatgaa ccatggacat ctcaatgtgc 60
cattacacac aggagttata tgttaggtat tgttgtccca ttttacagaa gagaatccgc 120
aaggttcaca gagtgaatca taggcataaa gtccttcagg tggtaaattg caaggctggt 180
gttccaacca gtcttctctg gctccaggga ctggctcctt cagactacat ttcaccagct 240
gcctccagga acagaagacg ggaattcacc tttcatgcca catataccag aaacgtggac 300
ctcagccacc ctgggtccta ttgatcccc agggccttca tttggcctc gaataaaaac 360
cttatttttt tatctcetta ctttcccag aattcatagt aggacttggc tggtgaaagg 420
ctgggtgctg agaaggctac agtgtggcta ggctgcagtt ccctgttatt acattgcccc 480
aggtattaat attgtatatt taggcagct 509

```

&lt;210&gt; 468

&lt;211&gt; 554

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 468

```

ggatttcaaa tctgagatga tactttatct attttcgggc aacttgcttc cctcatgaac 60
catggacatc tcaatgtgcc attacacaca ggagttatat gttaggtatt gttgtcccat 120
tttacagaag agaatccgca aggttcacag agtgaatcat aggcataaag tccttcaggt 180
ggtaaattggc aaggctggtg ttccaaccag tcttctctgg ctccagggac tggctccttc 240
agactacatt tcaccagctg cctccaggaa cagaagacgg gaattcacct ttcattgcgc 300
atataccaga aacgtggacc tcagccaccc tgggtcctat ttgatcccca gggccttcat 360
ttggcctcgc aataaaaacc ttattttttt atctccttac ctttcccaga attcatagta 420
ggacttggct ggtgaaaggc tgggtgctga gaaggctaca gtgtggctag gctgcagttc 480
cctgttatta cattgcccc ggtattaata ttgtatattt aggcagctgt tctcatccgt 540
gcctggcagt gaaa 554

```

&lt;210&gt; 469

&lt;211&gt; 537

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

WO 03/057926

PCT/US03/00657

&lt;400&gt; 469

```

attctgaccc cattgtgcac cttagtcatg gcaaactttc cagttgctcc ttgccaaaac 60
tcaagaataa aagggcccaa gctagagagg ctgtcctcac aagcatcagc tgctgggggc 120
ttccactcat tttcctctga aacaacagag aaagagacca tctctcattc gcagagcagc 180
ccaaggcctt ctgaggagac tgtgagtctc ctctaagtca tttctctctg cttttagtagca 240
gtggagctac caaggggtgag atgagcaggt tgagaggcct ctgaagcctg ctgggcacaa 300
tgctctgtga taagtttcag ctccactgga gcttatcatc caccagcaat cgacttcatg 360
gctgctgctc agaggcccta ggtgctgcgc tgctcactgc cctcacgtct ctgggacttc 420
cacacataaa gccatctctt tccattgcac tatggcactt gtagggagga tcccacactt 480
agggcccaaa atgagaccat ttgagtcaaa tttctaattg tctttcaaat tttatta 537

```

&lt;210&gt; 470

&lt;211&gt; 492

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 470

```

attctgaccc cattgtgcac cttagtcatg gcaaactttc cagttgctcc ttgccaaaac 60
tcaagaataa aagggcccaa gctagagagg ctgtcctcac aagcatcagc tgctgggggc 120
ttccactcat tttcctctga aacaacagag aaagagacca tctctcattc gcagagcagc 180
ccaaggcctt ctgaggagac tgtgagtctc ctctaagtca tttctctctg cttttagtagca 240
gtggagctac caaggggtgag atgagcaggt tgagaggcct ctgaagcctg ctgggcacaa 300
tgctctgtga taagtttcag ctccactgga gcttatcatc caccagcaat cgacttcatg 360
gctgctgctc agaggcccta ggtgctgcgc tgctcactgc cctcacgtct ctgggacttc 420
cacacataaa gccatctctt tccattgcac tatggcactt gtagggagga tcccacactt 480
agggcccaaa tg

```

&lt;210&gt; 471

&lt;211&gt; 509

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 471

```

aagacattca aattagccac cactggagta gatgacctaa aagttcttac aacttctcaat 60
tatacccagt gatgtctcga ttagcactta ttataaaaat taaaatttat aattcaacat 120
ttataccatc cagaaaaagt taaaatatat taatagccta tttctcttca ataaagcgt 180
tatataactc tatttgtaa tgtttctatt ctccatgaca ttctgtttat agataagccc 240
tatgctattt ctagtcaagt gctaattctt tgaatgaagc tgaattaggt agtcaactac 300
tagatgtatc ctgaaaagca agtaattgtt atatttctt tattttatac ataagagcta 360
cagactgttg tcacaatctt ttcaagggtc attaaattca ttattttaac taacattttt 420
gaacatctgt cttatgttgt taattgagga ctttctgaa tgtataacaa cataagaata 480
atagttgta aacttcaaag agatgacag

```

&lt;210&gt; 472

&lt;211&gt; 649

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 472

```

caaattagcc accactggag tagatgacct aaaagttctt acaactctca attataccca 60
gtgatgtctc gattagcact tattataaaa attaaaattt ataattcaac atttatacca 120
tccagaaaaa gttaaaatat attaatagcc tatttctctt caataaagcg tatatataac 180
tctatttggt aatgtttcta ttctccatga cattctgttt atagataagc cctatgctat 240
ttctagtcaa gtgctaattc cttgaatgaa gctgaattag gtagtcaact actagatgta 300
tcctgaaaag caagtaatgt gtatatttca tttattttat acataagagc tacagactgt 360
tgtcacaatc ttttcaaggg ctattaaatt cattatttta actaacattt ttgaacatct 420
gtcttatggt gtttaattgag gacatttctg aatgtataac aacataagaa taatagtttt 480
taaacttcaa agagatgaca ggttaatgag taaaggagaa atatgaaata tcacagaatt 540
ccttgacact aatgatgtt ttgcaaatac tgaacagaat gatgtttgta aactttccac 600
tggttttcaa gagtcccaaa acattaggaa aatgtacatc acctaactt

```

WO 03/057926

PCT/US03/00657

<210> 473  
 <211> 494  
 <212> DNA  
 <213> Homo sapiens

<400> 473  
 atatcagaag taaaacaatt tttcttggtg actgctttgg taaaaaacag tttgatggat 60  
 agttttacat ttcactggac tagataaaaa atgggtgctaa tatttatgta gcttgatgct 120  
 atagttgctt tggatcaaaa cttaatacct aacccatata agatccttat tatataattt 180  
 tgtgatcagt aaaatgatat tttaaagagt gatcttaaaa atatgacctg gtcattgcac 240  
 aacgtttgca tttgaaatga atttttgtac tatagggtgg atatggagt attcagtgca 300  
 agtgtgtgct taatatcaaa ccctatgcaa ggagctatgt ctagattttt ggtccgaatt 360  
 tgcctccttc aagcctacta gtgtgagatg gaaaaaatc gattgctctt ttaatattat 420  
 ttccattttg aaattctcga cacttgaatg aaggcagtag aagcctcttt ttggatttct 480  
 cttctaataa caaa 494

<210> 474  
 <211> 630  
 <212> DNA  
 <213> Homo sapiens

<400> 474  
 aaaacatttt tcttggtgac tgctttggta aaaaacagtt tgatggatag ttttacattt 60  
 cactggacta gataaaaaat ggtgctaata tttatgtagc ttgatgctat agttgctttg 120  
 gtatcaaact taatacctaa cccatataag atccttatta tataattttg tgatcagtaa 180  
 aatgatattt taaagagtga tcttaaaaat atgacctggt cattgcacaa cgtttgcat 240  
 tgaatgaat ttttgtacta taggggtggat atggagtat tcagtgcaag tgtgtgctta 300  
 atatcaaacc ctatgcaagg agctatgtct agattttttg tccgaatttg cctccttcaa 360  
 gcctactagt gtgagatgga aaaaaatcga ttgctctttt aatattattt ccattttgaa 420  
 attctcgaca cttgaatgaa ggcagtagag gcctcttttt ggatttctct tctaataaca 480  
 aaactttatt tagggaaggt ttccctgtgc tatcgtaagt ttgttttgag cactgcattc 540  
 actttaaaat tctggaggaa caaaggctgg gcacataatc acaaagccca ggccacacaa 600  
 taattccggg gttgtatttt ctaagaacta 630

<210> 475  
 <211> 156  
 <212> DNA  
 <213> Homo sapiens

<400> 475  
 gggggagata aggcaaagag gcacttttgg atttctccat ctgagcagct ctgtgattca 60  
 ttatctgttc tagaaagcag cacacgcagt tccagcaaaa aaaaaaaaaa aaaaaaattt 120  
 tttttttttt cccccctttt tttttttttt ttcccc 156

<210> 476  
 <211> 579  
 <212> DNA  
 <213> Homo sapiens

<400> 476  
 attccggtgc tgtcggcggc cgggtcccga tgagcctcct gttgcctccg ctggcgctgc 60  
 tgetgcttct cgcggcgctt gtggccccag ccacagccgc cactgcctac cggccggact 120  
 ggaaccgtct gagcggccta acccgcgccc gggtagagac ctgcggggga tgacagctga 180  
 accgcctaaa ggaggtgaag gctttcgtca cgcaggacat tccattctat cacaacctgg 240  
 tgatgaaaca cctccctggg gccgacctg agctcgtgct gctgggcccgc cgctacgagg 300  
 aactagagcg catcccactc agtgaatga cccgcgaaga gatcaatgcg ctagtgcagg 360  
 agctcggctt ctaccgcaag gcggcgcccg acgcgcaggt gccccccgag tacgtgtggg 420  
 cgcccgcgaa gcccccagag gaaacttcgg accacgctga cctgtaggtc cgggggcccgc 480  
 gcggagctgg gacctacctg cctgagtcct ggagacagaa tgaagcgcctc agcatcccgg 540  
 gaatacttct cttgctgaga gccgatgccc gtccccggg 579

<210> 477

WO 03/057926

PCT/US03/00657

<211> 472  
 <212> DNA  
 <213> Homo sapiens

<400> 477  
 ggcttagcgg ataacaattt cacacaggag ctagcagaca ccacaagata ccaacagagc 60  
 ttctgaaaca gatacccata gcattggaga gaaaaacagc tcacagtctg aggaagatga 120  
 tattgaaaga aggaaagaag ttgaaagcat cttgaagaaa aactcagatt ggatatggga 180  
 ttgggtcaagt cggccggaaa atattcccc caaggagttc ctctaaacac ccgaagcgca 240  
 cggccaccct cagcatgagg aacacgagcg tcatgaagaa agggggcata ttctctgcag 300  
 aatttctgaa agatttcctt ccattctctgc tgctctctca ttgctggcc atcggattgg 360  
 ggatctatat tggaaggcgt gtgacaacct ccaccagcac cttttgatga agaactggag 420  
 tctgacttgg ttcgtttagtg gattacttct gagcttgcaa catagctcac tg 472

<210> 478  
 <211> 355  
 <212> DNA  
 <213> Homo sapiens

<400> 478  
 tctacactta aagctttgga gcaattccca tcgaccagag ttgggtccgac cagccttgga 60  
 aaggctcactg aaaaatcttc aattggacta tgggtgacctc tatcttatac attttccatt 120  
 gtctgcaaag ccagggtgagg aagtgatccc aaaagatgac aatggaaaaa tactatttga 180  
 cacagtggat ctctgtgccca catggggaggc catggagaag tgtaaagatg cacgattggc 240  
 caagtccatc ggggtgtcca acttcaacca caggctgctg gagatgatcc tcaacaagcc 300  
 agggctcaag tacaagcctg tctgcaacca ggtggaatgt catccttact tcaac 355

<210> 479  
 <211> 510  
 <212> DNA  
 <213> Homo sapiens

<400> 479  
 aagactactg aatctgctac caaaacagtg aatcagtgag tcgatgttct attttttggt 60  
 ttgtttcctc ccctatctgt attcccaaaa attacttttg ggctaattta acaagaactt 120  
 taaattgtgt tttaattgta aaaatggcag ggggtggaat tattactcta tacattcaac 180  
 agagactgaa tagatatgaa agctgatttt tttaattac catgcttcac aatgttaagt 240  
 tatatgggga gcaacagcaa acagggtgcta atttgttttg gatatagtat aagcagtgtc 300  
 tgtgttttga aagaatagaa cacagtttgt agtgccactg ttgttttggg ggggcttttt 360  
 tcttttcgga aatcttaaac cttaagatac taaggacgtt gttttggttg tactttggaa 420  
 ttcttagtca caaaatatat tttgtttaca aaaatttctg taaaacaggt tataacagtg 480  
 tttaaagtct cagtttcttg cttggggaac 510

<210> 480  
 <211> 371  
 <212> DNA  
 <213> Homo sapiens

<400> 480  
 ttccgttgct gtcggaattg aggaagagct gggggatgaa gctcgccttg ccggacataa 60  
 ctcccgtaat ccagtggtgc tgtgattcct ctgcttgccct ggagacgtgg aacctctgtc 120  
 tcactctcct ggaaccttgc tgtcctgatc tgtgatagtt caccctctga gatccctga 180  
 gcccaggggt gcccagaact tcctgattg acctgctccg ctgctccttg gcttacctga 240  
 cctcttgctg tctctgctcg ccctccttcc tgtgccctac tcattgggggt tccgcacttt 300  
 ccacttcttc ctttctcttt ctctcttccc tcaaaaacta gaaatgtgaa tgaggattat 360  
 tataaaaaggg g 371

<210> 481  
 <211> 543  
 <212> DNA  
 <213> Homo sapiens



WO 03/057926

PCT/US03/00657

<400> 481  
aattccggtg ctgtcgggtg ctggaggcca tcctccagaa ctctcctgac gccaaaatct 60  
tctgcctggg gcacaaaatg gatctgggtc aggaggatca gcgtgacctg atttttaaag 120  
agcgagagga agacctgagg cgtctgtctc gcccgctgga gtgtgcttgt tttcgaacgt 180  
ccatctggga tgagacgctc taaaaagcct ggtccagcat cgtctaccag ctgattccca 240  
acgttcagca gctggagatg aacctcagga attttgccca aatcattgag gccgatgaag 300  
ttctgctggt cgaaagagct acattcttgg ttatttccca ctaccagtgc aaagagcagc 360  
gcgacgtcca ccggtttgag aagatcagca acatcatcaa acagttcaag ctgagctgca 420  
gtaaattggc cgcttccttc cagagcatgg aagttaggaa ttccaacttc gctgctttca 480  
tcgacatctt cacctcaaat acgtacgtga tgggtggtcat gtcagatccg tcgatccctt 540  
ctg 543

<210> 482  
<211> 415  
<212> DNA  
<213> Homo sapiens

<400> 482  
ggcttactca ctatagggct tttttttttt tccgggtctat tctttaattt tactaaatta 60  
ggaacgcagc ttttacagaa caaataaccc caggggacgg ggcccccca ggatctaaca 120  
gcttttcagg gagctatggt gcaagctcaa aagtaatcca ctaacgaacc aagtcaaact 180  
ccagttttta ataaaaagg gctgggggag gttgtcaaac cccttccaat ataaatcccc 240  
aatccgatgg ccaccaaag aaaaagcacc agggatggaa ggaaaacttt caaaaattct 300  
gcaaaaaata tgccccctt tttaatgacc ctccgggttc taatgctaag gggggccgcc 360  
cccttcgggg gttaaaaaag gaactccttg gggggaatat tttccggccg acttg 415

<210> 483  
<211> 240  
<212> DNA  
<213> Homo sapiens

<400> 483  
ttttttttt taaagtcatg gaggccatgg ggttggcttg aaaccacctt tgggggggtcc 60  
aatcccttc ttttttgctt aaattttatg tatacgggtt cttcaaatgc gtggtagggg 120  
ggggggcatc catatagtcc ctccagggtt atggagggtt cttctactat taggactttt 180  
cgcttcaaaa caaaggctt tcaaatcatg aaaattttta attttctgc tgttaaaaaa 240

<210> 484  
<211> 293  
<212> DNA  
<213> Homo sapiens

<400> 484  
ttttttttt aataaatctc ctaaggggat ggctactttt tctatctaaa taataatata 60  
tagacctatt cgatcagaga tacaggggac taacaatcac aatcctgtga tcgacatccg 120  
aacataagtc actatctatc agaataaaca atgatccaac gaataataga ggagtaaggg 180  
gacatgtcca aagcatcagg tatcgtcatg atcgaaaacc actgtcaagc aagacacaaa 240  
caaacaaaac agctttacac acaagtcagc agtccaagcg ttcattgtccc aag 293

<210> 485  
<211> 221  
<212> DNA  
<213> Homo sapiens

<400> 485  
ttttttttt tcaagggaca ctttaatggt taacttaagg gatcatcaat tttgcctcac 60  
tacctacaaa ggaatttca tcttgtcccc atgctgagta gggaaacagg gacaaagtta 120  
atcataatac cctacatcaa aaaaaaacta agctaact gctaactttt tttttaacag 180  
gcaaaatata aatatatgcc ctctaaaatg cccaagggtt t 221

<210> 486

WO 03/057926

PCT/US03/00657

<211> 563  
 <212> DNA  
 <213> Homo sapiens

<400> 486  
 ttccgttgct gtcgcctccg ctctgctctt cgtggaacac gaccgtgggtg cccggccctt 60  
 gggagccttg gggccagctg gcctgctgct ctccagtcaa gtagcgaagc tcctaccacc 120  
 cagacaccca aacagccgtg gccccagagg tcctggccaa atatgggggc ctgcctaggt 180  
 tgggtggaaca gtgctcctta tgtaaactga gccctttgtt taaaaaaca ttccaaatgt 240  
 gaaactagaa tgagagggaa gagataacat ggcatgcagc acacacggct gctccagttc 300  
 atggcctccc aggggtgctg gggatgcac caaagtgggt gtctgagaca gagttggaaa 360  
 ccctcaccaa ctggcctctt caccttccac attatcccgc tgccaccggc tgccctgtct 420  
 cactgcagat tcaggaccag cttgggctgc gtgctgtctg ccttgccagt cagccgagga 480  
 tgtagttgtt gctgccgtcg tcccaccacc tcagggacca gagggctagg ttggcactgc 540  
 ggcctcacc aggtcctggg ctc 563

<210> 487  
 <211> 271  
 <212> DNA  
 <213> Homo sapiens

<400> 487  
 ctcatatggg caggtcgctt caaaaaggaa gatgaaatcc cagagactgt ctcggtggag 60  
 atgcttgatg ctgcaaagaa caagatgcga gtgaagatca gctatcta gattgccctg 120  
 acggtggtag gatgcatctt catggttatt gagggcaaga aggctgccca aagacacgag 180  
 actttaacaa gcttgaactt agaaaagaaa gctcgtctga aagaggaagc agctatgaag 240  
 gccaaaacag agtagcagag gtatccgtgt t 271

<210> 488  
 <211> 342  
 <212> DNA  
 <213> Homo sapiens

<400> 488  
 ggcttgtaat acgactcact atagggcttt tttttttctg aattaaaaaa attccgtag 60  
 ccttttctcc atctcctcta attctggtag catctttgga cccctaacac ttggcatctg 120  
 ctacttcaga caaacaacc ctatgtaaat gacaaagaag gggcctccca accttctccc 180  
 tgtgttacta tttcaaaagc actactcggg gcacaggggt acaaatttct tatggccact 240  
 agcatctttt ttcaattttc aaaggaatca tcaaacatct ggggtcaatta tacttaaatt 300  
 acagaagccc ggaatttttag gcaacaggcc cctcatttta cc 342

<210> 489  
 <211> 326  
 <212> DNA  
 <213> Homo sapiens

<400> 489  
 tttttttttt aaaaagtcac ggaggccatg gggttggctt gaaaccagct ttgggggggtt 60  
 cgattccttc cttttttgtc taaattttat gtatacgggt tcttcaaagc tgtggtaggg 120  
 tggggggcat ccatatagtc actccagggt tatggagggt tcttctacta ttaggacttt 180  
 tcgcttcgaa gcgaaggcct ctcaaactcat gaaaattatt aatattactg ctgttagaaa 240  
 aatgaatgag cctaccgatg ataggatgtt tcatgtgggt tatgcatcgg ggtagtccga 300  
 gtaacgtcgg ggcattccgg ataggc 326

<210> 490  
 <211> 55  
 <212> DNA  
 <213> Homo sapiens

<400> 490  
 tttttttttt tttttttttg agaaaccggg gggggttttt tttttaaaat tgggg 55

WO 03/057926

PCT/US03/00657

<210> 491  
 <211> 558  
 <212> DNA  
 <213> Homo sapiens

<400> 491  
 cgccgcgtcc ccttctcgct cctgcggggc cccagctggg accccttccg cgactggtac 60  
 ccgcatagcc gcctcttcga ccaggccttc gggctgcccc ggctgccgga ggagtggctg 120  
 cagtggttag gcggcagcag ctggccaggc tacgtgcgcc ccctgcccc cgccgccatc 180  
 gagagccccg cagtggccgc gcccgccctac agccgcgcgc tcagccggca actcagcagc 240  
 ggggtcttcg gagatccggc aactgcgga ccgctggcgc gtgtccctgg atgtcaacca 300  
 cttcgccccg gacgagctga cggtaagac caaggatggc gtgggtggaga tcaccggcaa 360  
 gcacgaggag cggcaggacg agcatggcta catctcccgg tgcttcacgc ggaaatacac 420  
 gctgcccccc ggtgtggacc ccaccaagt ttctcctcc ctgtcccctg agggcacact 480  
 gaccgtggag gccccatgc ccaagctagc cacgcagtc aacgagatca ccatcccagt 540  
 caccttcgag tcgcgggc 558

<210> 492  
 <211> 370  
 <212> DNA  
 <213> Homo sapiens

<400> 492  
 ggctagcggg taacaatttc acacaggatg gattggctcag agtgaattga atattgtaag 60  
 tcagccactg ggacccgagg atttctggga ccccgagtt gggaggagga agtagtccag 120  
 ccttccagggt ggcgtgagag gcaatgactc gttacctgcc gcccatcacc ttggaggcct 180  
 tccctggcct tgagtagaaa agtcggggat cggggcaaga gaggctgagt acggatggga 240  
 aactattgtg cacaagtctt tccagaggag tttcttaatg agatatttgt atttatttcc 300  
 agaccaataa atttgtaact ttgcaaaaa aaaaaagccc tatagtgagt cgtattacaa 360  
 gccgaattcc 370

<210> 493  
 <211> 560  
 <212> DNA  
 <213> Homo sapiens

<400> 493  
 cagccagcat gaccgagcgc cgcgtcccct tctcgctcct gcggggcccc agctgggacc 60  
 ccttccgcga ctggtacccg catagccgcc tcttcgacca ggccttcggg ctgccccggc 120  
 tgccggagga gtggtcgcag tggttaggcg gcagcagctg gccaggctac gtgcgcccc 180  
 tgccccccgc cgccatcgag agccccgcag tggccgcgcc cgcctacagc cgcgcgctca 240  
 gccggcaact cagcagcggg gtctcggaga tccggcacac tgcggaccgc tggcgcgtgt 300  
 ccctggatgt caaccacttc gccccggacg agctgacggc caagaccaag gatggcgtgg 360  
 tggagatcac cggcaagcac gaggagcggc aggacgagca tggctacatc tcccgggtgt 420  
 tcacgcggaa atacacgctg cccccgggtg tggacccac ccaagtttcc tctcctctgt 480  
 cccctgaggg cactgacc gtggaggccc ccatgcccaa gctagccacg cagtccaacg 540  
 agatcaccat cccagtcacc 560

<210> 494  
 <211> 443  
 <212> DNA  
 <213> Homo sapiens

<400> 494  
 ggcttgtaat acgactcact atagggcttt tttttttgca agtgctgtgg gaagaaagtt 60  
 agatttacgc cgatgaatat gatagtgaaa tggattttgg cgtaggtttg gtctaggggtg 120  
 tagcctgaga ataggggaaa tcagtgaatg aagcctccta tgatggcaaa tacagctcct 180  
 attgatagga catagtggaa gtgagctaca acgtagtacg tgctcgtgtag tacgatgtct 240  
 agtgatgagt ttgctaatac aatgccagtc aggccaccta cggtgaaaag aaagatgaat 300  
 cctagggctc aaagcactgc agcagatcat ttcataattgc ctccgtggag tgtggcgagt 360  
 cagctaaata ctttgacgcc ggtggggata gcgatgatta tggtagcatc atcctgtgtg 420  
 aaattgttat ccgctaagcc gaa 443

WO 03/057926

PCT/US03/00657

<210> 495  
 <211> 249  
 <212> DNA  
 <213> Homo sapiens

<400> 495  
 tttttttttt cgaaggattt ggcaaagatt tgtttttttt tccatttcca gtttttttaa 60  
 gtaaacacag atttgcttaa aataaagctg attttaaaag cccacaaaag ttgaacacaa 120  
 aggagaggat taaattcccc aatgcagagt gataaaaagg aaaagatcct gagtaggtgc 180  
 cttcagcaaa aaactgatca tccaggggtga tcacctaata atcggagact taattcctta 240  
 taatgcaaa 249

<210> 496  
 <211> 434  
 <212> DNA  
 <213> Homo sapiens

<400> 496  
 tttccgtatc tgcttcgggc ttccacctca tttttttcgc tttgcccatt ctgtttcagc 60  
 cagtcgccaa gaatcatgaa agtcgccagt ggcagcaccg ccaccgccgc cgcgggcccc 120  
 agctgcgcgc tgaaggccgg caagacagcg agcgggtgcg gcgagggtgt gcgctgtctg 180  
 tctgagcaga gcggtggccat ctgcgcctgc gccgggggcg ccggggcgcg cctgcctgcc 240  
 ctgctggacg agcagcaggt aaacgtgctg ctctacgaca tgaacggctg ttactcacgc 300  
 ctcaaggagc tggtgcccac cctgccccag aaccgcaagg tgagcaaggg ggagattctc 360  
 cagcacgtca tcgactacat cagggacctt cagttggagc tgaactcgga atccgaagtt 420  
 ggaacccccg gggg 434

<210> 497  
 <211> 368  
 <212> DNA  
 <213> Homo sapiens

<400> 497  
 tttttttttg cttatggagg gttcctctac tattaggact tttcgcttcg aagcgaaggc 60  
 ttctcaaadc atgaaaatta ttaatatcag tgctgttaga gaagtgaatg accctacaga 120  
 tgataggatg tttcatgtgg tgtatgcatc ggggtagtcc gagtaacgtc ggggcattcc 180  
 ggataggccg aaaaagtgtt gtgggaaaaa agtttagattt accccgatga atatgatagt 240  
 gaaatggatt ttggcgtagg tttgggtctag ggtgtaccct gagaataggg gaaatcagtg 300  
 aatgaagcct cctatgatgg caaatacagc tcctattgat aggacatagt ggaagtgagc 360  
 tacaacgt 368

<210> 498  
 <211> 482  
 <212> DNA  
 <213> Homo sapiens

<400> 498  
 ccagccttcc tgtcccgggc cagcgcctctg acatgcagaa ggtgaccctg ggccctgcttg 60  
 tgttcctggc aggctttcct gtccctggacg ccaatgacct agaagataaa aacagtcctt 120  
 tctactatga ctggcacagc ctccaggttg gcgggctcat ctgcgctggg gttctgtgcg 180  
 ccatgggcat catcatcgtc atgagtgcaa aatgcaaagc caagtttggc cagaagtccg 240  
 gtcaccatcc aggggagact ccacctctca tcaccccagg ctccagccca agctgatgag 300  
 gacagaccag ctgaaattgg gtggaggacc gttctctgtc cccaggtcct gtctctgcac 360  
 agaaacttga actccaggat ggaattcttc ctccctctgt gggactcctt tgcatggcag 420  
 ggccctcatct cacctctcgc aagaggggtct ctttgttcaa ttttttttta tctaaaatga 480  
 tt 482

<210> 499  
 <211> 489  
 <212> DNA  
 <213> Homo sapiens

<400> 499  
 tggcgagcag tttcccactt gccaaagatc cttttaacc aacactagcc cttgttttta 60  
 acacacgctc cagcccttca tcagcctggg cagtcttacc aaaatgttta aagtgatctc 120  
 agaggggccc atggattaac gccctcatcc caaggccgt cccatgacat aacactccac 180  
 acccgcccca gccaaacttca tgggtcactt tttctggaaa ataatgatct gtacagacag 240  
 gacagaatga aactcctgcg gctctttggc ctgaaagttg ggaatgggtg ggggagagaa 300  
 gggcagcagc ttattgggtg tcttttcacc attggcagaa acagtgagag ctgtgtggtg 360  
 cagaaatcca gaaatgaggt gtagggaatt ttgcctgcct tcctgcagac ctgagctggc 420  
 tttggaatga ggttaaagtg tcaggggacgt tgcctgagcc caaatgtgta gtgtggtctg 480  
 ggcaggcag 489

<210> 500  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Oligonucleotide primer

<400> 500  
 ggaatcaccg ctttgccatc ttcaa 25

<210> 501  
 <211> 25  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Oligonucleotide primer

<400> 501  
 aacttctacc gtttcgccac taagg 25

<210> 502  
 <211> 23  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Oligonucleotide primer

<400> 502  
 gaccgtgtac tgcgtgtcgt gcg 23

<210> 503  
 <211> 23  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Oligonucleotide primer

<400> 503  
 gcgtgctgtg cgcatgtgc cag 23

<210> 504  
 <211> 24  
 <212> DNA  
 <213> Artificial Sequence

<220>

WO 03/057926

PCT/US03/00657

<223> Oligonucleotide primer

<400> 504  
gccgtcttca ggcaacaact ccca 24

<210> 505  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Oligonucleotide primer

<400> 505  
tgctggacga ggctgtcatc ttgc 24

<210> 506  
<211> 25  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Oligonucleotide primer

<400> 506  
acaggagaa aactggttgt cctgg 25

<210> 507  
<211> 23  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Oligonucleotide primer

<400> 507  
aaggcagaac ccatccactc caa 23

<210> 508  
<211> 25  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Oligonucleotide primer

<400> 508  
gctgctggat tcgtttggca taact 25

<210> 509  
<211> 25  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Oligonucleotide primer

<400> 509  
tcaatacggt ttgcttaggt cgtcg 25

<210> 510  
<211> 24

WO 03/057926

PCT/US03/00657

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Oligonucleotide primer

&lt;400&gt; 510

tctcctctga gttcaaccgc tgct

24

&lt;210&gt; 511

&lt;211&gt; 24

&lt;212&gt; DNA

&lt;213&gt; Artificial Sequence

&lt;220&gt;

&lt;223&gt; Oligonucleotide primer

&lt;400&gt; 511

tcgctcgcaa cttgagtctc ctct

24

&lt;210&gt; 512

&lt;211&gt; 406

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 512

Met	Ala	Glu	Asn	Gly	Lys	Asn	Cys	Asp	Gln	Arg	Arg	Val	Ala	Met	Asn
1				5					10					15	
Lys	Glu	His	His	Asn	Gly	Asn	Phe	Thr	Asp	Pro	Ser	Ser	Val	Asn	Glu
			20					25					30		
Lys	Lys	Arg	Arg	Glu	Arg	Glu	Glu	Arg	Gln	Asn	Ile	Val	Leu	Trp	Arg
		35				40					45				
Gln	Pro	Leu	Ile	Thr	Leu	Gln	Tyr	Phe	Ser	Leu	Glu	Ile	Leu	Val	Ile
	50				55						60				
Leu	Lys	Glu	Trp	Thr	Ser	Lys	Leu	Trp	His	Arg	Gln	Ser	Ile	Val	Val
65					70				75						80
Ser	Phe	Leu	Leu	Leu	Leu	Ala	Val	Leu	Ile	Ala	Thr	Tyr	Tyr	Val	Glu
			85					90						95	
Gly	Val	His	Gln	Gln	Tyr	Val	Gln	Arg	Ile	Glu	Lys	Gln	Phe	Leu	Leu
			100					105					110		
Tyr	Ala	Tyr	Trp	Ile	Gly	Leu	Gly	Ile	Leu	Ser	Ser	Val	Gly	Leu	Gly
		115					120					125			
Thr	Gly	Leu	His	Thr	Phe	Leu	Leu	Tyr	Leu	Gly	Pro	His	Ile	Ala	Ser
		130				135					140				
Val	Thr	Leu	Ala	Ala	Tyr	Glu	Cys	Asn	Ser	Val	Asn	Phe	Pro	Glu	Pro
145					150					155					160
Pro	Tyr	Pro	Asp	Gln	Ile	Ile	Cys	Pro	Asp	Glu	Glu	Gly	Thr	Glu	Gly
			165						170					175	
Thr	Ile	Ser	Leu	Trp	Ser	Ile	Ile	Ser	Lys	Val	Arg	Ile	Glu	Ala	Cys
			180					185					190		
Met	Trp	Gly	Ile	Gly	Thr	Ala	Ile	Gly	Glu	Leu	Pro	Pro	Tyr	Phe	Met
		195					200					205			
Ala	Arg	Ala	Ala	Arg	Leu	Ser	Gly	Ala	Glu	Pro	Asp	Asp	Glu	Glu	Tyr
		210				215					220				
Gln	Glu	Phe	Glu	Glu	Met	Leu	Glu	His	Ala	Glu	Ser	Ala	Gln	Asp	Phe
225					230					235					240
Ala	Ser	Arg	Ala	Lys	Leu	Ala	Val	Gln	Lys	Leu	Val	Gln	Lys	Val	Gly
			245						250					255	
Phe	Phe	Gly	Ile	Leu	Ala	Cys	Ala	Ser	Ile	Pro	Asn	Pro	Leu	Phe	Asp
			260					265					270		
Leu	Ala	Gly	Ile	Thr	Cys	Gly	His	Phe	Leu	Val	Pro	Phe	Trp	Thr	Phe
		275					280						285		

WO 03/057926

PCT/US03/00657

Phe Gly Ala Thr Leu Ile Gly Lys Ala Ile Ile Lys Met His Ile Gln  
 290 295 300  
 Lys Ile Phe Val Ile Ile Thr Phe Ser Lys His Ile Val Glu Gln Met  
 305 310 315 320  
 Val Ala Phe Ile Gly Ala Val Pro Gly Ile Gly Pro Ser Leu Gln Lys  
 325 330 335  
 Pro Phe Gln Glu Tyr Leu Glu Ala Gln Arg Gln Lys Leu His His Lys  
 340 345 350  
 Ser Glu Met Gly Thr Pro Gln Gly Glu Asn Trp Leu Ser Trp Met Phe  
 355 360 365  
 Glu Lys Leu Val Val Val Met Val Cys Tyr Phe Ile Leu Ser Ile Ile  
 370 375 380  
 Asn Ser Met Ala Gln Ser Tyr Ala Lys Arg Ile Gln Gln Arg Leu Asn  
 385 390 395 400  
 Ser Glu Glu Lys Thr Lys  
 405

<210> 513  
 <211> 1221  
 <212> DNA  
 <213> Homo sapiens

<400> 513  
 atggcagaga atggaaaaa ttgtgaccag agacgtgtag caatgaacaa ggaacatcat 60  
 aatggaaatt tcacagaccc ctcttcagtg aatgaaaaga agaggaggga gcgggaagaa 120  
 aggcagaata ttgtcctgtg gagacagccg ctcttaccct tgcagtattt ttctctggaa 180  
 atccttgtaa tcttgaagga atggacctca aaattatggc atcgtcaaag cattgtgggtg 240  
 tcttttttac tgctgcttgc tgtgcttata gctacgtatt atggtgaagg agtgcacaa 300  
 cagtatgtgc aacgtataga gaaacagttt cttttgtatg cctactggat aggcttagga 360  
 attttgtctt ctggtgggct tggaaacagg ctgcacacct ttctgcttta tctgggtcca 420  
 catatagcct cagttacatt agctgcttat gaatgcaatt cagttaattt tcccgaacca 480  
 ccctatcctg atcagattat ttgtccagat gaagagggca ctgaaggaac catttctttg 540  
 tggagtatca tctcaaaagt taggattgaa gcctgcatgt ggggtatcgg tacagcaatc 600  
 ggagagctgc ctccatattt catggccaga gcagctcgcc tctcagggtgc tgaaccagat 660  
 gatgaagagt atcaggaatt tgaagagatg ctggaacatg cagagtctgc acaagacttt 720  
 gcctcccggg ccaaactggc agttcaaaaa ctagtacaga aagttggatt ttttggatt 780  
 ttggcctgtg cttcaattcc aaatccttta tttgatctgg ctggaataac gtgtggacac 840  
 tttctggtag ctttttggac cttctttggg gcaaccctaa ttggaaaagc aataataaaa 900  
 atgcatatcc agaaaatttt tgttataata acattcagca agcacatagt ggagcaaatg 960  
 gtggctttca ttgggtgctgt ccccggcata ggtccatctc tgcagaagcc atttcaggag 1020  
 tacctggagg ctcaacggca gaagcttcac cacaaaagcg aatggggcac accacaggga 1080  
 gaaaactggg tgtcctggat gtttgaaaag ttggctcgtt tcatgggtgtg ttacttcac 1140  
 ctatctatca ttaactccat ggcacaaagt tatgccaac gaatccagca gcggttgaac 1200  
 tcagaggaga aaactaaata a 1221

<210> 514  
 <211> 338  
 <212> DNA  
 <213> Homo sapiens

<400> 514  
 gtgctgtccc cggcataggt ccatctctgc agaagccatt tcaggagtac ctggaggctc 60  
 aacggcagaa gcttcaccac aaaagcgaaa tgggcacacc acaggagagaa aactgcttgt 120  
 cctggatggt tgaaaagtcg gtcgatgtca tgggtgtgta cttcatccta tctatcatta 180  
 actccatggc acaaagttat gccaaacgaa tccagcagcg gttgaactca gaggagaaaa 240  
 ctaaataagt agagaaagtt ttaaactgca gaaattggag tggatgggtt ctgccttata 300  
 ttgggaggac tccaagccgg gaaggaaaat tccctttt 338

<210> 515  
 <211> 186  
 <212> DNA



WO 03/057926

PCT/US03/00657

&lt;213&gt; Homo sapiens

&lt;400&gt; 515

```
tgtgtaatg ttttctagca tgtactctgg tttcaacaga cacaaattta tatgtaacc 60
cagttttctt gccgttctgt aagtgtttta ttcttagtgt gatttttttc cattgggatg 120
tttttgattg aacttgttca ttttgttttg cttgggagga aaataaaca ttttactttt 180
ttcctt 186
```

&lt;210&gt; 516

&lt;211&gt; 118

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 516

```
acaggagaaa aactggttgt cctggatggt tgaaaagttg gtcgttgtca tgggtgtgta 60
cttcaccta tctatcatta actccatggc acaaagttat gccaaacgaa tccagcag 118
```

## CLAIMS

That which is claimed is:

- 5 1. A method for inhibiting a cancerous phenotype of a cell, said method comprising:  
contacting a cancerous mammalian cell with an agent for inhibition of DKFZP566I133  
activity.
2. The method of claim 1, wherein said test cell is a breast cell.
- 10 3. The method of claims 1-2, wherein said cancerous phenotype is aberrant cellular  
proliferation relative to a normal cell.
4. The method of claims 1-3, wherein said cancerous phenotype is loss of contact inhibition  
15 of cell growth.
5. The method of claims 1-4, wherein said agent is selected from the group consisting of a  
small molecule, an antibody, an antisense polynucleotide, and an RNAi molecule.
- 20 6. The method of claims 1-6, wherein said inhibition is associated with a reduction in a level  
of DKFZP566I133 protein.
7. The method of claims 1-7, wherein said inhibition is associated with a reduction in a level  
of DKFZP566I133 RNA.
- 25 8. The method of claims 1-8, wherein said inhibition is associated with a reduction in a level  
of activity of DKFZP566I133 protein.
9. A method for detecting a cancerous cell, said method comprising:  
30 detecting a level of DKFZP566I133 or fragment thereof in a test sample obtained from a cell  
of a subject,  
comparing the level of DKFZP566I133 to a control level of DKFZP566I133,  
wherein the presence of a cancerous cell is indicated by detection of said level and  
comparison to a control level of DKFZP566I133.

10. The method of claim 9, wherein said cancerous cell is a cancerous breast cell.

11. The method of claims 9-10, wherein said gene product is nucleic acid.

5

12. The method of claims 9-11, wherein said gene product is a polypeptide.

13. The method of claims 9-12, wherein said detecting step uses a polymerase chain reaction.

10

14. The method of claims 9-13, wherein said detecting step uses hybridization.

15. The method of claims 9-14, wherein said sample is a sample of breast tissue.

15 16. The method of claims 9-15, wherein said level of said product is indicative of the cancerous state of the cell of the test sample.

17. A method of treating a subject with cancer, said method comprising:  
administering to a subject a pharmaceutically effective amount of an agent,  
20 wherein said agent modulates the activity of DKFZP566I133.

18. The method of claim 17, wherein said cancer is breast cancer.

19. The method of claims 17-18, wherein said agent is selected from the group consisting  
25 of a small molecule, an antibody, an antisense polynucleotide, and an RNAi molecule.

20. A method for assessing the tumor burden of a subject, said method comprising:  
detecting a level of DKFZP566I133 in a test sample from a subject,  
wherein the level of DKFZP566I133 in the test sample is indicative of the tumor  
30 burden in the subject.

21. A method for identifying an agent that modulates a biological activity of a gene product differentially expressed in a cancerous cell as compared to a normal cell, said method comprising:

contacting a candidate agent with a DKFZP566I133; and

detecting modulation of a biological activity of DKFZP566I133 relative to a level of biological activity of DKFZP566I133 in the absence of the candidate agent.

5 22. The method of claim 21, wherein said cancerous cell and said normal cell are breast cells.

23. The method of claims 21-22, wherein said detecting is by assessing expression of said gene product.

10

24. The method of claim 23, wherein expression is assessed by detecting a polynucleotide gene product.

15

25. The method of claims 23-24, wherein expression is assessed by detecting a polypeptide gene product.

26. The method of claims 21-25, wherein said candidate agent is selected from the group consisting of a small molecule, an antibody, an antisense polynucleotide, and an RNAi molecule.

20

27. The method of claims 21-26, wherein said biological activity is modulation of a cancerous phenotype.

25

28. The method of claim 27, wherein said cancerous phenotype is abnormal cellular proliferation.

29. The method of claim 27-28, wherein said cancerous phenotype is loss of contact inhibition.

30

30. An isolated polynucleotide comprising at least 15 contiguous nucleotides of a sequence selected from the group consisting of SEQ ID NO:1-499.

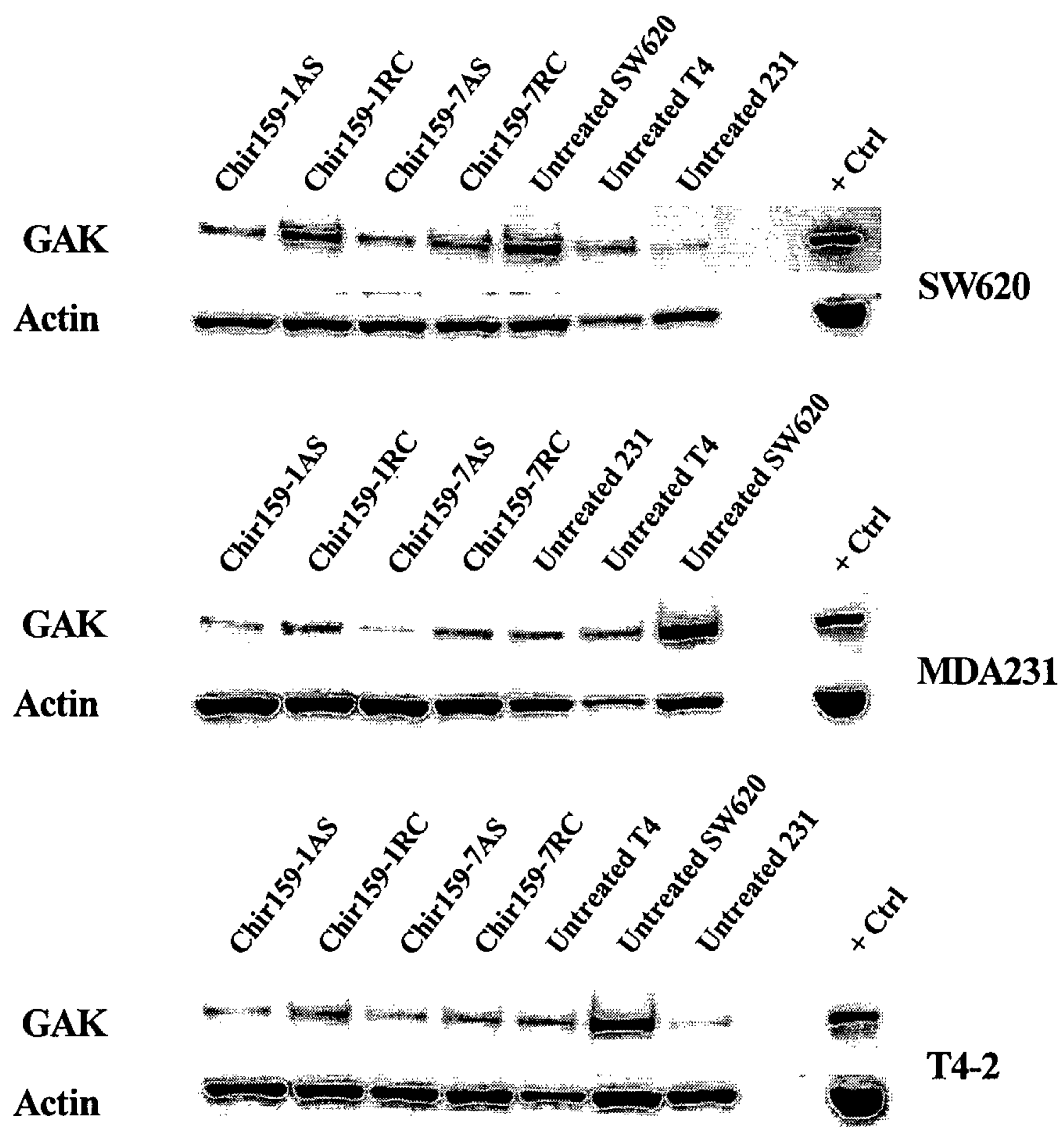
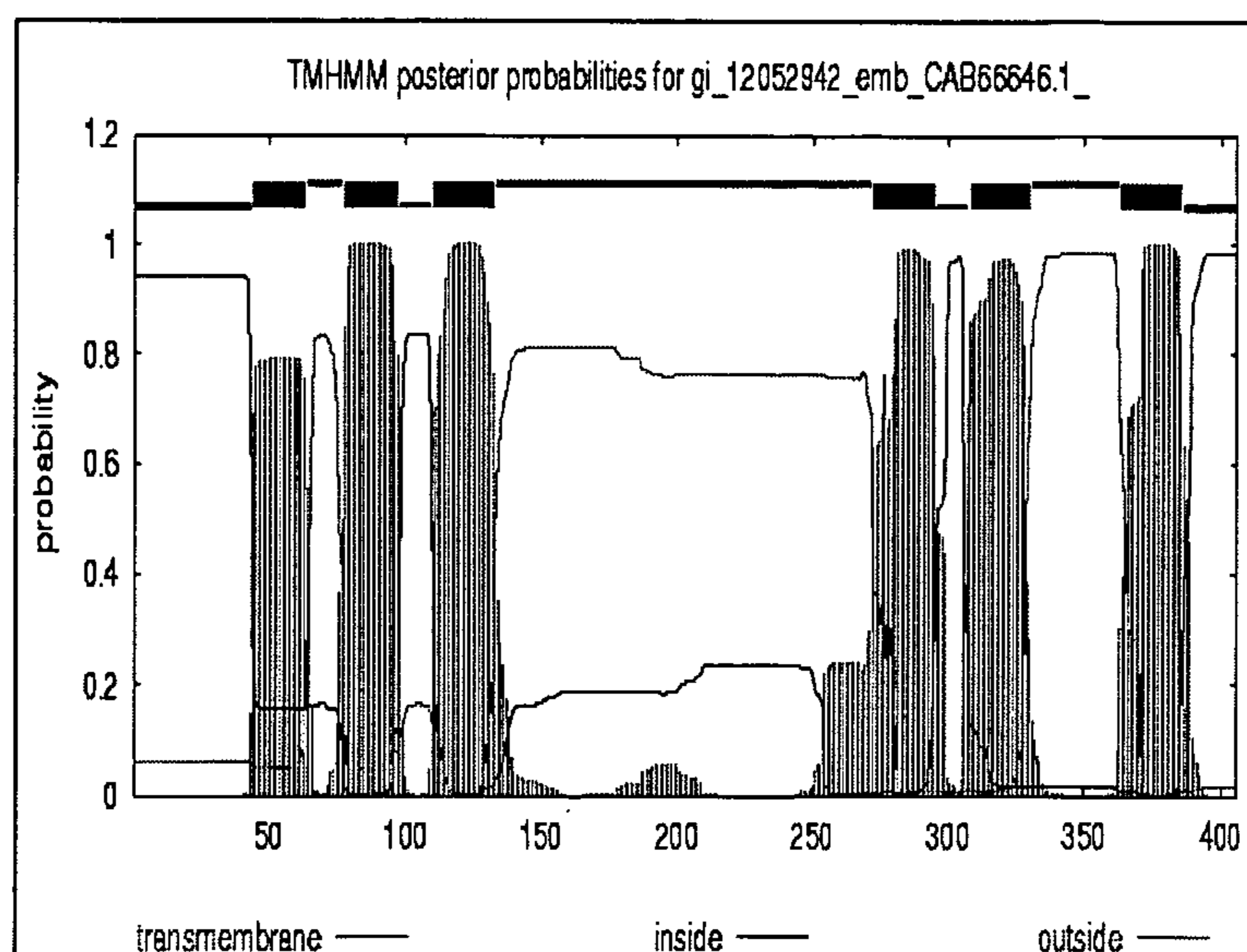


FIG. 1



CBS Prediction Server for Transmembrane Proteins

# gi\_12052942\_emb\_CAB66646.1 Length: 406  
 # gi\_12052942\_emb\_CAB66646.1 Number of predicted TMHs: 6  
 # gi\_12052942\_emb\_CAB66646.1 Exp number of AAs in TMHs: 132.21029  
 # gi\_12052942\_emb\_CAB66646.1 Exp number, first 60 AAs: 13.48568  
 # gi\_12052942\_emb\_CAB66646.1 Total prob of N-in: 0.94086  
 # gi\_12052942\_emb\_CAB66646.1 POSSIBLE N-term signal sequence

gi\_12052942\_emb\_CAB66646.1\_TMHMM2.0inside 1 43  
 gi\_12052942\_emb\_CAB66646.1\_TMHMM2.0TMhelix 44 63  
 gi\_12052942\_emb\_CAB66646.1\_TMHMM2.0outside 64 77  
 gi\_12052942\_emb\_CAB66646.1\_TMHMM2.0TMhelix 78 97  
 gi\_12052942\_emb\_CAB66646.1\_TMHMM2.0inside 98 109  
 gi\_12052942\_emb\_CAB66646.1\_TMHMM2.0TMhelix 110 132  
 gi\_12052942\_emb\_CAB66646.1\_TMHMM2.0outside 133 272  
 gi\_12052942\_emb\_CAB66646.1\_TMHMM2.0TMhelix 273 295  
 gi\_12052942\_emb\_CAB66646.1\_TMHMM2.0inside 296 307  
 gi\_12052942\_emb\_CAB66646.1\_TMHMM2.0TMhelix 308 330  
 gi\_12052942\_emb\_CAB66646.1\_TMHMM2.0outside 331 362  
 gi\_12052942\_emb\_CAB66646.1\_TMHMM2.0TMhelix 363 385  
 gi\_12052942\_emb\_CAB66646.1\_TMHMM2.0inside 386 406

FIG. 2

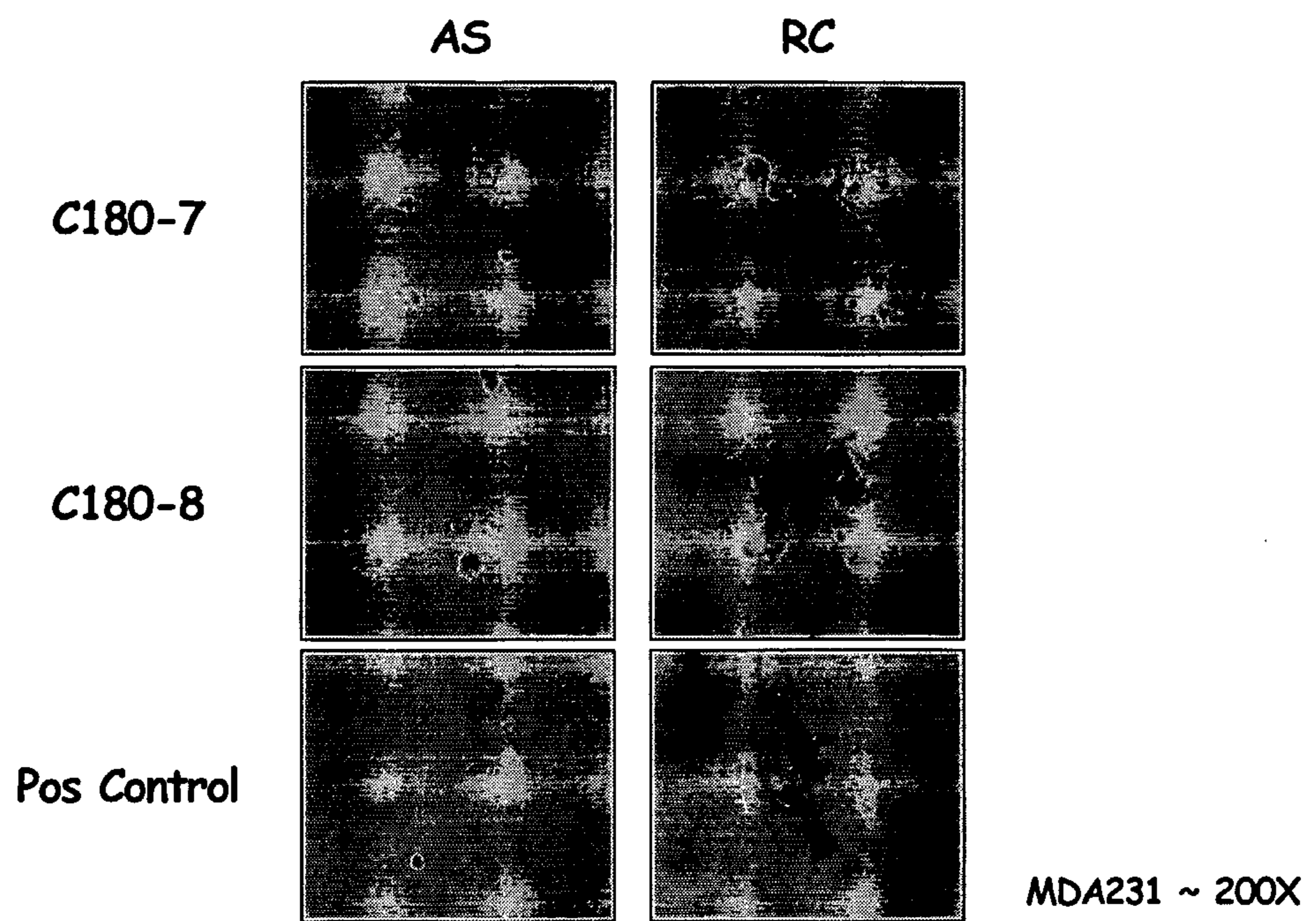


FIG. 3

		935		984
VMP1	(935)	TGGAATAACGTGTGGACA	CTTCTGGIACCTTTTGGACCTTCTTGGTG	
22793	(1)	-AGAATTT	CAGCAGTTCTCTGATTTTATATTTTATT-CCTCTTCCTATC	
26883	(1)	---TAGAAGAGCTAACCTCACACTCATCCACTCTAAAC--TATGTGAT		
Consensus	(935)	GAATAACAGCTG	CTCT ACT TACCTTTTT ACCTT T TGAT	
		985		1034
VMP1	(985)	CAA-CCCTAATTGGAAAGCAATAATAAAATGCATAATCCAGAAAATTTT		
22793	(49)	CAATCCCTGCCCTTTTGTGAGTCCAGGTGGTAAAGTACATTTCTTTAACGTTT		
26883	(46)	CAA-CACTGATTTTACATCCAACAAGTGAATCTTGATAGTTGGGTGTA		
Consensus	(985)	CAA CCCTGATTTTA A	CAA AA GTAAAT CAT TTC TTAA TTTT	
		1035		1084
VMP1	1034)	TGTTATAATAACATTCAGCAAGCACA-DAGTG----	GAGCAAAATGGTGGC	
22793	(99)	TTCTCTCTTTCTTCCCAAATGTGTC-TTTTCTTTGGGCTACTGACCC		
26883	(95)	AAAAGGAGAGTAAATGGAGATTTCAAGTAGTTGGGGTTCCTTACTTTCA		
Consensus	(1035)	T GA T TCAT CAGAATGCA A TAGTT	G GCTAATGTT CC	
		1085		1134
VMP1	(1079)	TTTCATTTGGTGGTGTCCCGGGCATAGGTCCATCTCTGCAGAAGCCATTTG		
22793	(148)	TGCTTCCAGTGGTGTCCCGGGCATAGGTCCATCTCTGCAGAAGCCATTTG		
26883	(145)	TTT--TTAAATCTTTAGGTTTTGTAAAGTTACACACTTCA--AGC-ATTAT		
Consensus	(1085)	TTT TTAGTGCTGTCCCGGGCATAGGTCCATCTCTGCAGAAGCCATTTG		
		1135		1184
VMP1	1129)	AGGAGTACCTGGAGGCTCAACGGCA-----GAAGC-TTCACCACAAAAGC		
22793	(198)	AGGAGTACCTGGAGGCTCAACGGCA-----GAAGC-TTCACCACAAAAGC		
26883	(190)	AGATGATCGTCTTTTTACTACTEAACTAATGAAGCCTTTTTTCAATTGCATT		
Consensus	(1135)	AGGAGTACCTGGAGGCTCAACGGCA	GAAGC TTCACCACAAAAGC	
		1185		1234
VMP1	1173)	GAAATGGGCACA---CCACAGGGAGAAAAGTGGTTGTCTCTGGATGTTTGA		
22793	(242)	GAAATGGGCACA---CCACAGGGAGAAAAGTGGTTGTCTCTGGATGTTTGA		
26883	(240)	GTTCTGCATTTATTTCTACAGGGAGAAAAGTGGTTGTCTCTGGATGTTTGA		
Consensus	(1185)	GAAATGGGCACA	CCACAGGGAGAAAAGTGGTTGTCTCTGGATGTTTGA	
		1235		1284
VMP1	(1220)	AAAGTTGGTCTGTGTCATGGTGTGTTACTTTCATCCTATCTATCATTAAGT		
22793	(289)	AAAGTTGGTCTGTGTCATGGTGTGTTACTTTCATCCTATCTATCATTAAGT		
26883	(290)	AAAGTTGGTCTGTGTCATGGTGTGTTACTTTCATCCTATCTATCATTAAGT		
Consensus	(1235)	AAAGTTGGTCTGTGTCATGGTGTGTTACTTTCATCCTATCTATCATTAAGT		
		1285		1334
VMP1	(1270)	CCATGGCACAAGTTATGCCAAACGAATCCAGCAGCGGTTGAACTCAGAG		
22793	(339)	CCATGGCACAAGTTATGCCAAACGAATCCAGCAGCGGTTGAACTCAGAG		
26883	(340)	CCATGGCACAAGTTATGCCAAACGAATCCAGCAG-----		
Consensus	(1285)	CCATGGCACAAGTTATGCCAAACGAATCCAGCAGCGGTTGAACTCAGAG		
		1335		1384
VMP1	(1320)	GAGAAAATAAATAAGTAGAGAAAGTTTAAACTGCAGAAATGGAGTGG		
22793	(389)	GAGAAAATAAATAAGTAGAGAAAGTTTAAACTGCAGAAATGGAGTGG		
26883	(375)	-----		
Consensus	(1335)	GAGAAAATAAATAAGTAGAGAAAGTTTAAACTGCAGAAATGGAGTGG		
		1385		1434
VMP1	1370)	ATGGGTCTGCCTTAATTTGGGAGGACTCCAAGCCGGGAAGGAAAATTCC		
22793	(439)	ATGGGTCTGCCTTAATTTGGGAGGACTCCAAGCCGGGAAGGAAAATTCC		
26883	(375)	-----		
Consensus	(1385)	ATGGGTCTGCCTTA	ATTGGGAGGACTCCAAGCCGGGAAGGAAAATTCC	
		1435		1467
VMP1	1420)	CTTTTCCAACCTGTATCAATTTTACAACCTTTT		
22793	(489)	CTTTT-----		
26883	(375)	-----		
Consensus	(1435)	CTTTT		

FIG. 4



**Spot 22793 mapped to VMP1**

VMP1: 1087 gtgctgtccccggcataggtccatctctgcagaagccatttcaggagtacctggaggctc 1146  
 |||  
 22793: 156 gtgctgtccccggcataggtccatctctgcagaagccatttcaggagtacctggaggctc 215

VMP1: 1147 aacggcagaagcttcaccacaaaagcgaaatgggcacaccacaggagaaaactggttgt 1206  
 |||  
 22793: 216 aacggcagaagcttcaccacaaaagcgaaatgggcacaccacaggagaaaactgcttgt 275

VMP1: 1207 cctggatgtttgaaaagttggtcggttgcattggtgtgttacttcatcctatctatcatta 1266  
 |||  
 22793: 276 cctggatgtttgaaaagtcggtcgcattggtgtgttacttcatcctatctatcatta 335

VMP1: 1267 actccatggcacaagttatgccaacgaatccagcagcgggtgaactcagaggagaaaa 1326  
 |||  
 22793: 336 actccatggcacaagttatgccaacgaatccagcagcgggtgaactcagaggagaaaa 395

VMP1: 1327 ctaaataagtagagaaaagttttaaactgcagaaattggagtggatgggttctgccttaa 1386  
 |||  
 22793: 396 ctaaataagtagagaaaagttttaaactgcagaaattggagtggatgggttctgccttata 455

VMP1: 1387 ttgggaggactccaagccgggaaggaaaattccctttt 1424  
 |||  
 22793: 456 ttgggaggactccaagccgggaaggaaaattccctttt 493

**Spot 27450 mapped to VMP1**

VMP1: 2330 tgtgtaaatgtttctagcatgtactctggtttcaacagacacaaatttatatgttaacc 2389  
 |||  
 27450: 1 tgtgtaaatgtttctagcatgtactctggtttcaacagacacaaatttatatgttaacc 60

VMP1: 2390 cagtttcttgccggttctgtaagtgttttattccttagtgtgattttttccattgggatg 2449  
 |||  
 27450: 61 cagtttcttgccggttctgtaagtgttttattccttagtgtgattttttccattgggatg 120

VMP1: 2450 tttttgattgaacttgttcattttgttttgcttgggaggaaaataaacaattttactttt 2509  
 |||  
 27450: 121 tttttgattgaacttgttcattttgttttgcttgggaggaaaataaacaattttactttt 180

VMP1: 2510 ttcctt 2515  
 |||  
 27450: 181 ttcctt 186

**Spot 26883 mapped to VMP1**

VMP1: 1187 acaggagaaaactggttgtcctggatgtttgaaaagttggtcggttgcattggtgtgta 1246  
 |||  
 26883: 257 acaggagaaaactggttgtcctggatgtttgaaaagttggtcggttgcattggtgtgta 316

VMP1: 1247 cttcatcctatctatcattaactccatggcacaagttatgccaacgaatccagcag 1304  
 |||  
 26883: 317 cttcatcctatctatcattaactccatggcacaagttatgccaacgaatccagcag 374

**FIG. 5**

