

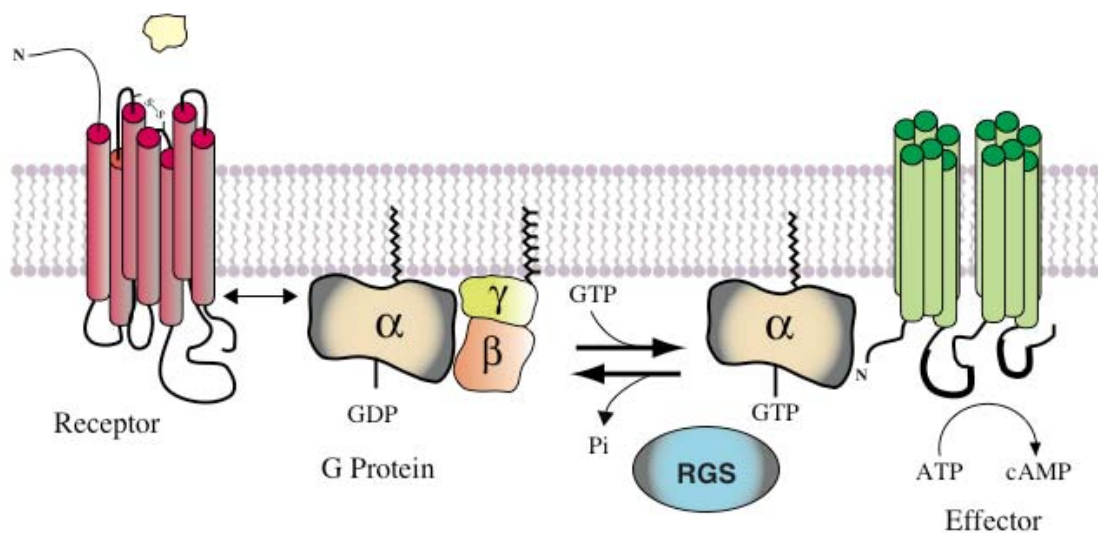
cDNA Resource Center

Catalog

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Visit our web site for product updates

The cDNA Resource Center

The cDNA Resource Center is a service provided by the faculty of the Department of Biological Sciences of Missouri University of Science and Technology.

The **purpose** of the cDNA Resource Center is to further scientific investigation by providing cDNA clones of human proteins involved in signal transduction processes. This is achieved by providing high quality clones for important signaling proteins in a timely manner.

By high quality, we mean that the clones are

- Sequence verified
- Propagated in a versatile vector useful in bacterial and mammalian systems
- Free of extraneous 3' and 5' untranslated regions
- Expression verified (in most cases) by coupled in vitro transcription/translation assays
- Available in wild-type, epitope-tagged and common mutant forms (e.g., constitutively-active or dominant negative)

By timely, we mean that the clones are

- Usually shipped within a day from when you place your order.

Clones can be ordered from our web pages, by FAX or by phone. Within the United States, clones are shipped by overnight courier (FedEx); international orders are shipped International Priority (FedEx).

The clones are supplied for research purposes only. Details on use of the material are included on the **Material Transfer Agreement** (page 3).

Clones are distributed by agreement in Invitrogen's **pcDNA3.1+** vector. The clones are provided as dried DNA (approximately 1.0 μ g) on a circle of Whatman #1 filter paper. Instructions for reconstituting the DNA are provided in the [FAQ section](#).

Questions can be directed toward any Resource Center staff member at (573) 341-7610, Monday through Friday between 8:30 AM-4:30 PM CT. You may also contact us by FAX at (573) 341-7609, or email at cdna@mst.edu.

For more information, refer to the FAQ section beginning on page 4.

MATERIAL TRANSFER AGREEMENT FOR cDNA CLONES

Acceptance of any of the clones or associated products (hereinafter “Material”) provided by the cDNA Resource Center is contingent upon your good faith agreement to the following terms.

1. You will use the Material only for research purposes to advance the public interest. This Material is provided for use only in laboratory animals or in vitro experiments; the provided Material will not be used in human beings.

2. You agree that the clones are being provided without warranty, express or implied, including any implied warranty of merchantability or fitness for a particular purpose or freedom from infringement of any patent or other proprietary right of a third party.

3. You agree that these terms apply to purchases of Material:
 - A fee of \$120 is made for each clone purchased.
 - Credit cards (MasterCard or Visa) or purchase orders are to be used exclusively for purchases with payment terms of net 30 for purchase orders.
 - FOB shipping point. A charge to purchaser of \$15.50 is added to the cost of each shipment for overnight delivery in the US and \$40.00 for international priority delivery.

4. You understand that third parties may claim proprietary rights to the commercial use of the Material provided. This agreement does not constitute a waiver of any patent rights.

5. You agree to hold harmless and indemnify the Curators of the Missouri University of Science and Technology, the provider(s) of the Material and persons acting on their behalf, for any claim asserted by a third party related to your possession, use, storage, or disposal of the Material.

6. You will not redistribute the Material except by special agreement with the cDNA Resource Center. In addition, you will not use the provided Material in a manner that duplicates or undermines the efforts of the cDNA Resource Center.

7. In scientific communications describing work utilizing the provided Material, you will acknowledge the source of the Material as being the cDNA Resource Center, referencing our Web Site (www.cdna.org).

Frequently Asked Questions

1. What is the cDNA Resource Center?

The cDNA Resource Center is a service provided by the faculty of the Department of Biological Sciences of the Missouri University of Science and Technology.

The purpose of the cDNA Resource Center is to further scientific investigation by providing cDNA clones of human proteins involved in signal transduction processes. The goal of the Center is to accelerate scientific discovery in human biology and pathology. This is achieved by providing high quality clones for important signaling proteins in a timely manner.

By high quality, we mean that the clones are

- Sequence verified
- Propagated in a versatile vector

(pcDNA3.1+)

• Free of extraneous 3' and 5' untranslated regions

- Available in wild-type, epitope-tagged and common mutant forms (e.g., constitutively-active or dominant negative)

• Expression-verified in most cases by coupled in vitro transcription/translation assays

By timely, we mean that the clones are

• Usually shipped within a day of order by courier delivery (Federal Express).

We expect this service to allow scientists to focus on basic biological questions without spending excessive amounts of time in procuring, preparing or verifying their own (or their colleagues) cDNA clones. We expect these clones to be particularly useful to scientists probing and reconstructing signal transduction pathways in model systems.

2. How are the clones obtained?

At present, the clones are obtained in one of two ways: Most frequently, the polymerase chain reaction (PCR) is used to amplify the ORF from commercially prepared cDNA. Alternatively, a computer search of GenBank human reference sequences and other web-tools are used to identify potential genomic (intron-free) sequences as a source for complete open reading frame (ORF) of

the gene of interest. The sequence is then amplified through PCR as above. Regardless of the source the ORF is amplified using a high fidelity polymerase (e.g., Pfu).

In both cases, the PCR product is then subcloned into a plasmid vector (see below) and then sequence verified against published sequences.

Discrepancies, if any, from the published sequence(s) are noted in the clone documentation.

All wildtype sequences are then submitted to GenBank to catalog the coding sequences (CDS) resolved through clone production.

We have also obtained clones from investigators who wish to deposit their clones in the Resource Center (e.g., WOX1, AGS1). The ORF of deposited clones are subcloned into the standard vector and the sequence of the insert is verified. We thus maintain standard "contexts" for each clone in the collection.

3. Which vector are the clones in?

Clones are distributed by agreement in Invitrogen's pcDNA3.1+ vector.

pcDNA3.1+

This vector can be used for mammalian expression (CMV promoter, bovine growth hormone polyadenylation signal), production of sense strand RNA by in vitro transcription (T7), production of single stranded DNA (f1 origin), and production of stably transfected cell lines (neomycin resistance). The vector contains the ampicillin resistance gene and can be propagated in common *E. coli* strains. (www.invitrogen.com)

4. How do I order the clones?

Clones can be ordered via our web page (www.cdna.org), by FAX (573 341-7609) or by telephone (573-341-7610). Purchase order (P.O.) numbers from research organizations based in the United States are accepted. Credit card (MasterCard or Visa) orders are accepted from all research organizations (US and international).

5. How are the clones shipped?

All orders are generally shipped within a day of being placed and are sent via courier delivery (Federal Express).

The clones are provided in one of two ways; as dried DNA (approximately 1.0 µg) on a circle of Whatman #1 filter paper, or, with increasing frequency, as dried DNA (approximately 2.0 µg) within a 0.5 ml skirted tube. Instructions for reconstituting the DNA are provided below.

6. Documentation

For each clone, up to four forms of documentation can be downloaded from our web site: 1) an information sheet that contains details on the insert, including how the clone was obtained, any sequence discrepancies, and experimental mutagenesis details, if applicable; 2) a sequence sheet that contains the nucleotide sequence of the insert and the predicted translation product; 3) a text file in FASTA format containing the insert nucleotide sequence can be downloaded for use with your molecular biology software (this usually contains small regions of the flanking plasmid sequence as well); 4) for the relevant clones a PDF file documenting expression in a coupled transcription/translation assay system. PDF files can be downloaded and viewed with Adobe Acrobat Reader (www.adobe.com).

7. How do I "reconstitute" the cDNA after it arrives?

Store clones at 4°C until you are ready to use them. Clones are guaranteed for up to 6 months from the date purchased. Clones are supplied as DNA (approximately 1.0 µg) spotted onto either a Whatman #1 filter disks, or dried within a 0.5ml screw-cap skirted tube.

Whatman Disk: Add 100 µl of TE buffer (10 mM TRIS base, 1 mM EDTA, pH 8.0) to the micro-centrifuge tube w/ filter paper, vortex briefly, incubate at room temperature for 5 minutes, and repeat the vortex. Centrifuge the tube for a few seconds and then remove the filter paper from the tube.

0.5ml Tube: Centrifuge the tube BEFORE

OPENING to ensure pellet is at the bottom of the tube. Add 50ul of ddH₂O or TE buffer (as above) and vortex or flick the tube to ensure that the pellet dissolves.

For Both: Use 1-2 µl of supernatant for use in transfecting E. coli by electroporation or chemical means. Please do not try to use the DNA directly for any application other than to transform bacteria and prepare a large stock.

8. What are the restrictions on the use of the clones?

The clones are supplied solely for research purposes. The clones are distributed with the understanding that you will not redistribute them to others. Details on use of the material are included on the Material Transfer Agreement that is available on this web site.

9. How should I acknowledge the source of the clones in manuscripts?

Scientific communications describing work utilizing clones or associated material provided by the cDNA Resource Center Material should acknowledge this source, referencing our Web Site. For example: "The cDNA clone for human Go-alpha was obtained from the cDNA Resource Center (www.cdna.org)."

10. Who do I contact regarding shipping and/or technical issues?

Questions can be directed toward any Resource Center staff member at (573) 341-7610 on Monday through Friday between 8:30 AM-4:30 PM, CT. We may also be contacted by FAX at (573) 341-7609, or email at cdna@mst.edu.

11. Who can I contact with suggestions for improving the Resource Center?

Suggestions and/or comments regarding the cDNA Resource Center including suggestions for improvement and future directions can be directed toward any Center staff member: (TEL) 573 341-7610; (FAX) 573 341-7609; email (cdna@mst.edu).

Clone Collection

GPCRs	7	Neuropeptide Y	17	FLAG tagged	33
Acetylcholine (Muscarinic)	7	Neurotensin	18	PDNR-1r	33
Adenosine	7	Nucleotides/P2Y	18	© subunits	35
Adrenergic	8	Opioid	19	Wild-Type	35
Adrenomedullin	8	Opsin	19	HA tagged	35
Angiotensin	8	Orphan	19	PDNR-1r	36
Arginine Vasopressin	9	Oxytocin	20	G Proteins Regulators	38
Bombesin	9	Parathyroid Hormone	20	AGS (activators of G protein	
Bradykinin	9	Platelet-Activating Factor	20	signaling)	38
Calcitonin	9	Prokineticin	20	RCC1	38
Cannabinoid	9	Prolactin Releasing		RGS (regulators of G protein	
Chemokine	10	Hormone	20	signaling)	38
Cholecystokinin	12	Prostaglandins and		Rho GDI (guanine nucleotide	
Coagulation		Thromboxane	20	dissociation inhibitor)	39
Factor/Thrombin	12	Relaxin/Insulin-Like Peptide	21	Small G-Proteins	40
Complement component 5a		Secretin	21	ARF family	40
(C5a)	12	Serotonin/5-HT	21	Wild-Type	40
Corticotropin Releasing		Somatostatin	22	PDNR-1r	40
Hormone	12	Succinate	23	Rab family	41
Cysteinyl Leukotriene	12	Tachykinin	23	Wild-Type	41
Dopamine	13	Thyroid Stimulating		PDNR-1r	43
Endothelin	13	Hormone	23	Ran family	44
Estrogen	13	Thyrotropin-Releasing		Wild-Type	44
Follicle Stimulating Hormone	13	Hormone	23	3xHA tagged	44
Formyl Peptide	13	Trace Amine	23	Ras family	45
Free Fatty Acid	14	Transmembrane 7		Wild-Type	45
Frizzled Homolog	14	Superfamily	23	pDNR-1r	45
Galanin	14	Urotensin II	23	GV Mutants	46
Glucagon	14	Vasoactive Intestinal Peptide	24	3xHA GV	46
Glutamate	14	GPCR Regulators	25	SN Mutants	47
Gonadotropin-Releasing		Arrestins	25	3xHA SN	47
Hormone	14	GRB Protein	25	3xHA-Tagged	47
Growth Hormone Releasing		RAMP Proteins	25	2XMYC GV	48
Hormone	15	Heterotrimeric G-Proteins		2XMYC SN	48
Growth Hormone		< subunits	26	2XMYC-tagged	48
Secretagogue	15	Wild-Type	26	Ras-like	49
Histamine	15	PDNR-1r	27	Wild-Type	49
Hypocretin	15	PTX-resistant Mutants	28	PDNR-1r	49
KISS	15	QL mutants (constitutively		Rho family	50
Leucine-Rich Repeat		active)	29	Wild-Type	50
Containing	15	XTP mutants (dominant		pDNR-1r	51
Leukotriene B4	15	negative)	29	3xHA-Tagged	52
Lysophosphatidic Acid/S1P	15	EE-tagged (internal tag)	30	GV Mutants	52
MAS –Related	16	GT mutants (dominant		3xHA GV Mutants	52
Melanin-Concentrating		negative)	31	TN Mutants	53
Hormone	16	QL/EE tagged		3xHA TN Mutants	53
Melanocortin	17	constitutively active	31	Other Rho mutants	54
Melatonin	17	© subunits	33		
Motilin	17	Wild-Type	33		
Neuromedin U	17				
Neuropeptide FF	17				

G Protein Coupled Receptors

Acetylcholine (Muscarinic)
 Adenosine
 Adrenergic
 Adrenomedullin
 Angiotensin
 Arginine Vasopressin
 Bombesin
 Bradykinin
 Calcitonin
 Cannabinoid
 Chemokine
 Cholecystokinin
 Coagulation Factor II
 Complement component 5a (C5a)
 Corticotropin Releasing Hormone
 Cysteinyl Leukotriene
 Dopamine
 Endothelin
 Estrogen
 Follicle Stimulating Hormone
 Formyl Peptide
 Free Fatty Acid
 Frizzled Homolog
 Galanin
 Glucagon
 Glutamate (Metabotropic)
 Gonadotropin-Releasing Hormone
 Growth Hormone Releasing Hormone
 Growth Hormone Secretagogue
 Histamine
 Hypocretin
 KISS Receptors
 Leucine-Rich Repeat-Containing

Leukotriene B4
 Lysophosphatidic Acid/S1P
 MAS-related
 Melanin-Concentrating Hormone
 Melanocortin
 Melatonin
 Motilin
 Neuromedin U
 Neuropeptide FF
 Neuropeptide Y
 Neurotensin
 Nucleotides/P2Y
 Opioid
 Opsin
 Orphan Receptors
 Oxytocin
 Parathyroid Hormone
 Platelet-Activating Factor
 Prokineticin
 Prolactin Releasing Hormone
 Prostaglandins and Thromboxanes
 Relaxin/Insulin-Like Peptide
 Secretin
 Serotonin/5-HT
 Somatostatin
 Succinate
 Tachykinin
 Thyroid stimulating hormone
 Thyrotropin-Releasing Hormone
 Trace Amine
 Transmembrane 7 Superfamily
 Urotensin-II
 Vasoactive Intestinal Peptide

Muscarinic Receptors

MAR0100000 Muscarinic acetylcholine receptor 1 (M1)
 (a.k.a: muscarinic acetylcholine receptor M1). GenBank Accession # AF498915: Human muscarinic acetylcholine receptor M1 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1390 bp.

MAR010TN00 Muscarinic acetylcholine receptor 1 (M1) 3xHA-tagged(N-terminus)

MAR0200000 Muscarinic acetylcholine receptor 2 (M2)
 GenBank Accession # AF498916: Human muscarinic acetylcholine receptor M2 (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoR I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1410 bp.

MAR020TN00 Muscarinic acetylcholine receptor 2 (M2) 3xHA-tagged(N-terminus)

MAR0300000 Muscarinic acetylcholine receptor 3 (M3)
 GenBank Accession # AF498917: Human muscarinic acetylcholine receptor M3 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xba I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1790 bp.

MAR030TN00 Muscarinic acetylcholine receptor 3 (M3) 3xHA-tagged(N-terminus)

MAR0400000 Muscarinic acetylcholine receptor 4 (M4)
 GenBank Accession # AF498918: Human muscarinic

acetylcholine receptor M4 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1450 bp.

MAR040TN00 Muscarinic acetylcholine receptor 4 (M4) 3xHA-tagged(N-terminus)

MAR0500000 Muscarinic acetylcholine receptor 5 (M5)
 GenBank Accession # AF498919: Human muscarinic acetylcholine receptor M5 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1610 bp.

MAR050TN00 Muscarinic acetylcholine receptor 5 (M5) 3xHA-tagged(N-terminus)

Adenosine Receptors

ADRA100000 Adenosine Receptor A1 (ADORA1)
 (Alternate Symbols: RDC7). GenBank Accession # AY136746: Human adenosine receptor ADORA1 (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 980 bp.

ADRA10TN00 Adenosine receptor A1 (ADORA1) 3xHA-tagged (N-terminus)

ADRA2A0000 Adenosine Receptor A2A (ADORA2A)
 (Alternate Symbols: RDC8, hA2aR, ADORA2); (a.k.a: adenosine A2 receptor; adenosine receptor subtype A2a).

GenBank Accession # AY136747: Human adenosine receptor ADORA2A (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from IMAGE clone (4385637). The insert was sequenced. Insert size = 1240 bp.

ADRA2ATN00 Adenosine receptor A2A (ADORA2A) 3xHA-tagged (N-terminus)

ADRA2B0000 Adenosine Receptor A2B (ADORA2B)

(Alternate Symbols: ADORA2). GenBank Accession # AY136748: Human adenosine receptor ADORA2B (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XbaI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1000 bp. Stop codon with adjacent XbaI site form DAM methylation sensitive site.

ADRA2BTN00 Adenosine receptor A2B (ADORA2B) 3xHA-tagged (N-terminus)

ADRA300000 Adenosine Receptor A3 (ADORA3)

(Alternate Symbols: A3AR). GenBank Accession # AY136749: Human adenosine receptor ADORA3 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 960 bp

ADRA30TN00 Adenosine receptor A3 (ADORA3) 3xHA-tagged (N-terminus)

Adrenergic Receptors

AR0A1A0000 Adrenergic Receptor alpha 1A (ADRA1A)

(Alternate Symbols: ADRA1C, ADRA1L1); (a.k.a: adrenergic, alpha-1C-, receptor; adrenergic, alpha -1A-, receptor). Genbank ACC# AY389505: Human adrenergic receptor ADRA1A (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human heart cDNA (Clontech). The insert was sequenced. Insert size = 1401 bp.

AR0A1ATN00 Adrenergic receptor alpha 1A (ADRA1A) 3xHA-tagged (N-terminus)

AR0A1B0000 Adrenergic receptor alpha 1B (ADRA1B)

(Alternate Symbols: ADRA1); (a.k.a: adrenergic, alpha -1B-, receptor). Identical to Genbank ACC# NM_000679 with the following exception G549->A (Silent mutation): Human adrenergic receptor alpha 1B (ADRA1B) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XbaI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1563 bp.

AR0A2A0000 Adrenergic Receptor alpha 2A (ADRA2A)

(Alternate Symbols: ADRA2, ADRAR, ZNF32, ADRA2R); (a.k.a: alpha-2AAR subtype C10). Identical to the Genbank ACC# NM_000681 with the following exception (G855A) silent mutation: Human adrenergic receptor ADRA2A (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human genomic DNA. The insert was sequenced. Insert size = 1353 bp.

AR0A2B0000 Adrenergic Receptor alpha 2B (ADRA2B)

(Alternate Symbols: ADRA2L1, ADRARL1, ADRA2RL1); (a.k.a: alpha-2-adrenergic receptor-like 1). Genbank ACC# AY548167: Human adrenergic receptor ADRA2B (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human genomic DNA. Insert size = 1353 bp.

AR0A2BTN00 Adrenergic receptor alpha 2B (ADRA2B) 3xHA-tagged (N-terminus)

AR0A2C0000 Adrenergic Receptor alpha 2C (ADRA2C)

(Alternate Symbols: ADRA2L2, ADRARL2, ADRA2RL2); (a.k.a: alpha2-AR-C4). Genbank ACC# AY455666: Human adrenergic receptor ADRA2C (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human genomic DNA. The insert was sequenced. Insert size = 1377 bp.

AR0B200000 Adrenergic Receptor beta 2 (ADRB2)

(Alternate Symbols: BAR, B2AR, ADRBR, ADRB2R); (a.k.a: beta-2 adrenoceptor; catecholamine receptor; beta-2 adrenergic receptor). Genebank ACC# NM_000024.3: Human adrenergic receptor ADRB2 (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human heart cDNA (clontech). The insert was sequenced. Insert size = 1250 bp.

AR0B20TN00 Adrenergic receptor beta 2 (ADRB2) 3xHA-tagged (N-terminus)

AR0B300000 Adrenergic receptor beta 3 (ADRB3)

Genbank ACC# AY487247: Human adrenergic receptor beta 3 (ADRB3) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human placental cDNA (Clontech). The insert was sequenced. Insert size = 1227 bp.

Adrenomedullin receptor

ADMR000000 Adrenomedullin receptor (ADMR)

GenBank ACC# AY268434: Adrenomedullin receptor (ADMR) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1215bp N.B. This gene encodes a seven transmembrane receptor that shares sequence similarity with the rat adrenomedullin receptor. This similarity suggests that potential ligands of the encoded protein will be members of the calcitonin gene-related peptide/amylin/ adrenomedullin peptide family. As noted previously (Kennedy SP, Sun D. Oleynek JJ, Hoth CF, Kong J, Hill RJ. 1998. "Expression of the rat adrenomedullin receptor or a putative human adrenomedullin receptor does not correlate with adrenomedullin binding or functional response". Biochim. Biophys. Res. Commun. 244:832-837) it is likely that this putative GPCR remains an orphan, as the ability to bind and be activated by adrenomedullin has been refuted. A complex of Calcitonin Receptor like-receptor (CRLR) and RAMP2 or RAMP3 is believed to give a functional receptor.

ADMR00TN00 Adrenomedullin receptor (ADMR) 3xHA-tagged (N-terminus)

Angiotensin Receptor

AGTL100000 Angiotensin receptor-like 1 (AGTRL1)

(Alternate Symbols: APJ, MGC45246); (a.k.a: angiotensin receptor-like 1). Identical to GenBank ACC# NM_005161 with the following exception (C135A) (Silent mutation): angiotensin receptor-like 1 (AGTRL1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1143bp

AGTL10TN00 Angiotensin receptor-like 1 (AGTRL1) 3xHA-tagged (N-terminus)

AGTR100000 angiotensin II receptor (Variant 1) AGTR1

(Alternate Symbols: AT1, AG2S, AT1B, AT2R1, HAT1R, AGTR1A, AGTR1B, AT2R1A, AT2R1B); (a.k.a: angiotensin

receptor 1; angiotensin receptor 1B; type-1B angiotensin II receptor). Identical to GenBank ACC# NM_000685: angiotensin II receptor (Variant 1) AGTR1 (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1080 bp

AGTR10TN00 Angiotensin II receptor (Variant 1) AGTR1 3xHA-tagged (N-terminus)

AGTR200000 Angiotensin II receptor, type 2 (AGTR2) (Alternate Symbols: ATR2L1); (a.k.a: angiotensin receptor-like 2; angiotensin II receptor-like). Identical to GenBank ACC# AY322550: Angiotensin II receptor, type 2 (AGTR2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1092bp

AGTR20TN00 Angiotensin II receptor, type 2 (AGTR2) 3xHA-tagged (N-terminus)

Arginine Vasopressin Receptors

AVR01A0000 Arginine vasopressin receptor 1A (AVPR1A) (Alternate Symbols: AVPR1); (a.k.a: V1a vasopressin receptor; antidiuretic hormone receptor 1A; SCCL vasopressin subtype 1A receptor; V1-vascular vasopressin receptor AVPR1A; vascular/hepatic-type arginine vasopressin receptor). GenBank ACC# AY322550: Arginine vasopressin receptor 1A (AVPR1A) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from human liver cDNA (Clontech). Insert size= 1257bp.

AVR01ATN00 Arginine vasopressin receptor 1A (AVPR1A) 3xHA-tagged (N-terminus)

AVR0200000 Arginine vasopressin receptor 2 (AVPR2) (nephrogenic diabetes insipidus) (Alternate Symbols: DI1, DIR, NDI, V2R, ADHR). GenBank ACC# AY242131: Arginine vasopressin receptor 2 (AVPR2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from kidney cDNA. Insert size= 1116 bp.

AVR020TN00 Arginine vasopressin receptor 2 (AVPR2) 3xHA-tagged (N-terminus)

Bombesin Receptors

BRS0300000 Bombesin-like receptor 3 (BRS3) GenBank ACC# AY585193: Bombesin-like receptor 3 (BRS3) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human testis cDNA . The insert was sequenced. Insert size= 1200bp.

BRS030TN00 Bombesin-like receptor 3 (BRS3) 3xHA-tagged (N-terminus)

GRPR000000 Gastrin Releasing Peptide Receptor (GRPR) Identical to GenBank ACC# NM_005314 with the exception of two silent mutations (C453T) and (C663T) : Gastrin releasing peptide receptor (GRPR) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human brain cDNA (Clontech) . The insert was sequenced. Insert size= 1155bp

GRPR00TN00 Gastrin-releasing peptide receptor (GRPR) 3xHA-tagged

Bradykinin Receptors

BDKB100000 Bradykinin receptor B1 (BDKRB1)

GenBank ACC# AY275464: Bradykinin receptor B1 (BDKRB1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human genomic DNA . The insert was sequenced. Insert size= 1062 bp

BDKB10TN00 Bradykinin receptor B1 (BDKRB1) 3xHA-tagged (N-terminus)

BDKB200000 Bradykinin receptor B2 (BDKRB2)

GenBank ACC# AY275465: Bradykinin receptor B2 (BDKRB2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human lung cDNA . The insert was sequenced. Insert size= 1176 bp

BDKB20TN00 Bradykinin receptor B2 (BDKRB2) 3xHA-tagged (N-terminus)

Calcitonin Receptors

CALCR00000 Calcitonin receptor (CALCR)

(Alternate Symbols: CRT, CTR, CTR1). GenBank ACC# AY430048: Calcitonin receptor (CALCR) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI(5') and XhoI (3'). The open reading frame was amplified by the PCR from human kidney cDNA (Clontech) . The insert was sequenced. Insert size= 1425 bp.

CALCRL0000 Calcitonin receptor-like (CALCRL)

(Alternate Symbols: CRLR, CGRPR). GenBank ACC# AY389506: Calcitonin receptor-like (CALCRL) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from human heart cDNA (Clontech) . The insert was sequenced. Insert size= 1386 bp

CALCRLTN00 Calcitonin receptor-like (CALCRL) 3xHA-tagged (N-terminus)

Cannabinoid Receptors

CNR01L0000 Cannabinoid receptor 1 (long isoform) (CNR1L)

(Alternate Symbols: CB1, CNR, CB-R, CB1A, CANN6, CB1K5); (a.k.a: central cannabinoid receptor). GenBank ACC# AY225225: cannabinoid receptor 1 (long isoform) (CNR1L) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1419 bp

CNR01LTN00 Cannabinoid receptor 1 (long isoform) (CNR1L) 3xHA-tagged (N-terminus)

CNR0200000 Cannabinoid receptor 2 (CNR2)

(Alternate Symbols: CB2, CX5). GenBank ACC# AY242132: Cannabinoid receptor 2 (CNR2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from human genomic DNA. Insert size= 1083bp.

CNR020TN00 Cannabinoid receptor 2 (CNR2) 3xHA-tagged (N-terminus)

Chemokine Receptors

CCBP200000 Chemokine binding protein 2 (CCBP2)

(Alternate Symbols: D6, CCR9, CCR10, CMKBR9); (a.k.a: hD6; chemokine (C-C) receptor 9; chemokine (C-C motif) receptor 9; CC-chemokine-binding receptor JAB61). GenBank ACC# AY262687: Chemokine binding protein 2 (CCBP2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI(5') and XhoI (3'). The open reading frame was amplified by the PCR from genomic DNA. Insert size= 1155 bps.

CCBP20TN00 Chemokine binding protein 2 (CCBP2) 3xHA-tagged (N-terminus)

CCR0100000 Chemokine (C-C motif) receptor 1 (CCR1)

(Alternate Symbols: CKR-1, HM145, CMKBR1, MIP1aR); (a.k.a: RANTES receptor). Chemokine (C-C motif) receptor 1 (CCR1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI(5') and XhoI (3'). The open reading frame was amplified by the PCR from a clone obtained from the Laboratory of Genetics/National Institutes of Mental Health at the NIH. The insert was sequenced and found to be identical to GenBank ACC# NM_001295. Insert size= 1068 bp.

CCR010TN00 Chemokine (C-C motif) receptor 1 (CCR1) 3xHA-tagged (N-terminus)

CCR0200000 Chemokine (C-C motif) receptor 2 (CCR2) isoform A

(Alternate Symbols: CKR2, CCR2A, CCR2B, CKR2A, CKR2B, CMKBR2, MCP-1-R, CC-CKR-2); (a.k.a: chemokine (C-C) receptor 2; monocyte chemoattractant protein 1 receptor; monocyte chemoattractant protein 1 receptor). Chemokine (C-C motif) receptor 2 (CCR2) isoform A (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI(5') and XhoI (3'). The open reading frame was amplified by the PCR from a clone obtained from the Laboratory of Genetics/National Institutes of Mental Health at the NIH. The insert was sequenced and found to be identical to GenBank ACC# AF545480. Insert size= 1083 bp.

CCR020TN00 Chemokine (C-C motif) receptor 2 (CCR2) 3xHA-tagged (N-terminus)

CCR0300000 Chemokine (C-C motif) receptor 3 (CCR3)

(Alternate Symbols: CKR3, CMKBR3, CC-CKR-3); (a.k.a: b-chemokine receptor; eosinophil eotaxin receptor; eosinophil CC chemokine receptor 3). Identical to GenBank ACC# NM_001837: Chemokine (C-C motif) receptor 3 (CCR3) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. The insert was sequenced. Insert size= 1201bp

CCR030TN00 Chemokine (C-C motif) receptor 3 (CCR3) 3xHA-tagged (N-terminus)

CCR0400000 Chemokine (C-C motif) receptor 4 (CCR4)

(Alternate Symbols: CKR4, k5-5, CMKBR4, ChemR13, CC-CKR-4, HGCN:14099); (a.k.a: chemokine (C-C) receptor 4). Identical to GenBank ACC# AY322539: Chemokine (C-C motif) receptor 4 (CCR4) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. The insert was sequenced. Insert size= 1083bp

CCR040TN00 Chemokine (C-C motif) receptor 4 (CCR4) 3xHA-tagged (N-terminus)

CCR0500000 Chemokine (C-C motif) receptor 5 (CCR5)

(Alternate Symbols: CKR5, CKR-5, CCCKR5, CMKBR5, CC-CKR-5); (a.k.a: chemr13; chemokine (C-C) receptor 5). Identical to GenBank ACC# BC038398: Chemokine (C-C motif) receptor 5 (CCR5) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI(5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. The insert was sequenced. Insert size= 1059bp

CCR050TN00 Chemokine (C-C motif) receptor 5 (CCR5) 3xHA-tagged (N-terminus)

CCR0600000 Chemokine (C-C motif) receptor 6 (CCR6)

(Alternate Symbols: BN-1, CKR6, DCR2, CKRL3, DRY-6, GPR29, CKR-L3, CMKBR6, GPRCY4, STRL22, GPR-CY4); (a.k.a: chemokine receptor-like 3; chemokine (C-C) receptor 6; G protein-coupled receptor 29; seven-transmembrane receptor, lymphocyte, 22). GenBank ACC# AY242126: Chemokine (C-C motif) receptor 6 (CCR6) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI(5') and XhoI (3'). The open reading frame was amplified by the PCR from leukocyte cDNA. Insert size= 1125 bp.

CCR060TN00 Chemokine (C-C motif) receptor 6(CCR6) 3xHA-tagged (N-terminus)

CCR0700000 Chemokine (C-C motif) receptor 7 (CCR7)

GenBank ACC# AY587876: Chemokine (C-C motif) receptor 7 (CCR7) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Leukocyte cDNA. The insert was sequenced. Insert size= 1137bp.

CCR070TN00 Chemokine (C-C motif) receptor 7(CCR6) 3xHA-tagged (N-terminus)

CCR0800000 Chemokine (C-C motif) receptor 8 (CCR8)

(Alternate symbols: CY6, TER1, CKRL1, CKR-L1, CMKBR8, CMKBR2, GPR-CY6); (a.k.a: chemokine (C-C) receptor 8; CC-chemokine receptor chemr1; chemokine (C-C) receptor-like 2). Chemokine (C-C motif) receptor 8 (CCR8) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from a clone obtained from the Laboratory of Genetics/National Institutes of Mental Health at the NIH. The insert was sequenced and found to be identical to GenBank ACC# NM_005201. Insert size= 1068bp.

CCR080TN00 Chemokine (C-C motif) receptor 8 (CCR8) 3xHA-tagged (N-terminus)

CCR0900000 Chemokine (C-C motif) receptor 9 (CCR9)

(Alternate Symbols: GPR-9-6). GenBank ACC# AY242127: Chemokine (C-C motif) receptor 9 (CCR9) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from genomic DNA. Insert size= 1074 bp.

CCR090TN00 Chemokine (C-C motif) receptor 9 (CCR9) 3xHA-tagged (N-terminus)

CCR1000000 Chemokine (C-C motif) Receptor 10 (CCR10)

(Alternate Symbols: GPR2); (a.k.a: CC chemokine receptor 10). GenBank ACC# AY429103: Chemokine (C-C motif) receptor 10 (CCR10) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human leukocytes cDNA (Clontech). The insert was sequenced. Insert size= 1089bp

CCR100TN00 Chemokine (C-C motif) receptor 10 (CCR10) 3xHA-tagged (N-terminus)

CCRL100000 Chemokine (C-C motif) receptor-like 1 (CCRL1)

(Alternate Symbol: PPR1, CCBP2, CCR10, CCR11, VSHK1, CKR-11, CCX-CKR, CC-CKR-11); (a.k.a: C-C chemokine receptor type 11; chemocentryx chemokine receptor; chemokine, cc motif, receptor-like protein 1; orphan seven-transmembrane receptor, chemokine related). GenBank ACC# AY221094: chemokine (C-C motif) receptor-like 1 (CCRL1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. The insert was sequenced. Insert size= 1053 bp

CCRL10TN00 Chemokine (C-C motif) receptor-like1 (CCRL1) 3xHA-tagged (N-terminus)

CCRL200000 Chemokine (C-C motif) receptor-like 2 (CCRL2)
(Alternate Symbols: HCR, CKRX, CRAM-A, CRAM-B). GenBank ACC# AY337001: chemokine (C-C motif) receptor-like 2 (CCRL2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Lung cDNA (Clontech). The insert was sequenced. Insert size= 1035 bp

CCRL20TN00 Chemokine (C-C motif) receptor-like2 (CCRL2) 3xHA-tagged (N-terminus)

CMKL100000 Chemokine like receptor 1 (CMKLR1)
(Alternate Symbols: DEZ, ChemR23); (a.k.a: orphan G-protein coupled receptor, Dez). GenBank ACC# AY497547: Chemokine like receptor 1 (CMKLR1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human kidney cDNA (Clontech). The insert was sequenced. Insert size= 1116 bp.

CMKL200000 Chemokine like receptor 2 (CMKLR2/GPR30)
(Alternate Symbols: FEG-1, CMKRL2, GPCR-Br); (a.k.a: chemokine receptor-like 2). Identical to GenBank Acc# NM_001505 with the following exception: (C906T) (Silent mutation). Chemokine like receptor 2 (CMKLR2/GPR30) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XbaI (3'). The open reading frame was amplified by PCR from human kidney cDNA (Clontech). Insert size= 1128 bp.

CX3R100000 Chemokine (C-X3-C motif) receptor 1 (CX3CR1)
(Alternate Symbols: V28, CCRL1, GPR13, CMKDR1, GPRV28, CMKBRL1); (a.k.a: G protein-coupled receptor 13; chemokine (C-X3-C) receptor 1; chemokine (C-C) receptor-like 1). Chemokine (C-X3-C motif) receptor 1 (CX3CR1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from a clone obtained from the Laboratory of Genetics/National Institutes of Mental Health at the NIH. The insert was sequenced and found to be identical to GenBank ACC# NM_001337. Insert size= 1068 bp.

CX3R10TN00 Chemokine (C-X3-C motif) receptor 1 (CX3CR1) 3xHA-tagged (N-terminus)

CXCR100000 Interleukin 8 receptor alpha (IL8RA/CXCR1)
(Alternate Symbols: CXCR1, IL8R1, CMKAR1, IL8RBA, CDw128a, C-C CKR-1, C-C-CKR-1); (a.k.a: IL-8 receptor; IL-8 receptor type 1; chemokine (C-X-C) receptor 1; interleukin-8 receptor type 1; interleukin-8 receptor type A; high affinity interleukin-8 receptor A). Interleukin 8 receptor alpha (IL8RA/CXCR1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from a clone obtained from the Laboratory of Genetics/National Institutes of Mental Health at the NIH. The insert was sequenced and found to be identical to GenBank ACC# NM_000634. Insert size= 1053bp.

CXCR10TN00 Interleukin 8 receptor alpha (IL8RA/CXCR1) 3xHA-tagged (N-terminus)

CXCR200000 Interleukin 8 receptor beta (IL8RB/CXCR2)
(Alternate Symbols: CXCR2, IL8R2, IL8RA, CMKAR2, CDw128b); (a.k.a: GRO/MGSA receptor; interleukin 8 receptor B; chemokine (CXC) receptor 2; interleukin 8 receptor type 2; CXCR2 gene for IL8 receptor type B; high affinity interleukin-8 receptor B). Interleukin 8 receptor beta (IL8RB/CXCR2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from a clone obtained from the Laboratory of Genetics/National Institutes of Mental Health at the NIH. The insert was sequenced and found to be identical to GenBank ACC# M73969. Insert size= 1083 bp.

CXCR20TN00 Interleukin 8 receptor beta (IL8RB/CXCR2) 3xHA-tagged (N-terminus)

CXCR300000 Chemokine (C-X-C motif) receptor 3 (CXCR3)
(Alternate Symbols: GPR9, IP10, MigR, CD183, Mig-R, CKR-L2, CMKAR3, IP10-R); (a.k.a: Mig receptor; IP10 receptor; G protein-coupled receptor 9; chemokine (C-X-C) receptor 3). GenBank ACC# AY242128: Chemokine (C-X-C motif) receptor 3 (CXCR3) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from leukocyte cDNA. Insert size= 1107 bp.

CXCR30TN00 Chemokine (C-X-C motif) receptor 3 (CXCR3) 3xHA-tagged (N-terminus)

CXCR400000 Chemokine (C-X-C motif) receptor 4 (CXCR4)
(Alternate Symbols: HM89, LAP3, NPYR, WHIM, LESTR, NPY3R, fusin, HSY3RR, NPY3R, D2S201E); (a.k.a: Neuropeptide Y receptor Y3; chemokine (C-X-C motif) receptor 4 (CXCR4). GenBank ACC# AY242129: Chemokine (C-X-C motif) receptor 4 (CXCR4) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from lung cDNA. Insert size= 1059 bp.

CXCR40TN00 Chemokine (C-X-C motif) receptor 4 (CXCR4) 3xHA-tagged (N-terminus)

CXCR500000 Chemokine (C-X-C motif) receptor 5 (CXCR5)
(Alternate Symbols: BLR1; MDR15); (a.k.a: monocyte-derived receptor 15; C-X-C chemokine receptor type 5; Burkitt lymphoma receptor 1, GTP-binding protein). Chemokine (C-X-C motif) receptor 5 (CXCR5) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XbaI (3'). The open reading frame was amplified by the PCR from leukocyte cDNA. The insert was sequenced and found to be identical to GenBank ACC# NM_001716 with the following exception: C498->T (silent). Insert size= 1119 bp.

CXCR50TN00 Chemokine (C-X-C motif) receptor 5 (CXCR5) 3xHA-tagged (N-terminus)

CXCR600000 Chemokine (C-X-C motif) receptor 6 (CXCR6)
(Alternate Symbols: BONZO, STRL33, TYMSTR). Identical to GenBank ACC# AY322543: Chemokine (C-X-C motif) receptor 6 (CXCR6) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1029bp

CXCR60TN00 Chemokine (C-X-C motif) receptor 6 (CXCR6) 3xHA-tagged (N-terminus)

FKS800000 Putative chemokine receptor (FKSG80/GPR81)
(a.k.a: putative chemokine receptor T-cell activation G protein-coupled receptor). GenBank ACC# AY507143: Putative chemokine receptor (FKSG80/GPR81) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XbaI (3'). The open reading frame was amplified by the PCR from human kidney cDNA (Clontech). The insert was sequenced. Insert size= 1041 bp.

XCR0100000 Chemokine (C motif) receptor 1 (XCR1) (GPR5)
(Alternate Symbols: GPR5, CCXCR1); (a.k.a: lymphotactin receptor; chemokine (C motif) XC receptor 1). GenBank ACC# AY275469: Chemokine (C motif) receptor 1 (XCR1) (GPR5) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human genomic DNA . The insert was sequenced. Insert size= 1002 bp

XCR010TN00 Chemokine (C motif) receptor 1 (XCR1/GPR5) 3xHA-tagged (N-terminus)

Cholecystokinin Receptors

CCKAR00000 Cholecystokinin A receptor (CCKAR)

GenBank ACC# AY322549: Cholecystokinin A receptor (CCKAR) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from human stomach cDNA (Clontech). Insert size= 1287bp.

CCKAR0TN00 Cholecystokinin A receptor (CCKAR) 3xHA-tagged (N-terminus)

CCKBR00000 Cholecystokinin B receptor (CCKBR)

(Alternate Symbol: GASR); (a.k.a: CCK2 receptor; gastrin receptor). GenBank ACC# AY322551: Cholecystokinin B receptor (CCKBR) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). Insert size= 1344bp.

CCKBR0TN00 Cholecystokinin B receptor (CCKBR) 3xHA-tagged (N-terminus)

Coagulation Factor II Receptors

F2R0000000 Coagulation factor II (thrombin) receptor (F2R/PAR1)

(Alternate symbols: TR, CF2R, PAR1); (a.k.a: thrombin receptor; CC-chemokine receptor chemr1; protease-activated receptor 1). Identical to GenBank Acc# BC002464: Coagulation factor II (thrombin) receptor (F2R/PAR1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by PCR from IMAGE Clone # 3343051. The insert was sequenced. Insert size= 1278 bp.

F2RL100000 Coagulation factor II (thrombin) receptor-like 1 (F2RL1/PAR2)

(Alternate Symbols: PAR2, GPR11); (a.k.a: G protein-coupled receptor-11, protease-activated receptor 2). Identical to GenBank Acc# BT009856 except stop codon is TGA instead of TAG: Coagulation factor II (thrombin) receptor-like 1 (F2RL1/PAR2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by PCR from IMAGE Clone #3857382. Insert size= 1194 bp.

F2RL300000 Coagulation factor II (thrombin) receptor-like 3 (F2RL3/PAR4)

(Alternate Symbols: PAR4); (a.k.a: protease-activated receptor-4). GenBank ACC# AY431102: Coagulation factor II (thrombin) receptor-like 3 (F2RL3/PAR4) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from human lung cDNA (Clontech). The insert was sequenced. Insert size= 1158 bp.

Complement Component 5a (C5a) Receptors

C3AR100000 complement component 3a receptor 1 (C3AR1) (Alternate Symbol: AZ3B, C3AR, HNFAG09); (a.k.a: complement component 3 receptor 1). GenBank ACC# AY268431: complement component 3a receptor 1 (C3AR1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1449 bp

C3AR10TN00 Complement component 3a receptor 1 (C3AR1) 3xHA-tagged (N-terminus)

C5L2000000 G-protein-coupled receptor (C5L2)

(Alternate Symbol: GPR77); (a.k.a: G protein-coupled receptor 77). GenBank ACC# AY268430: G-protein-coupled receptor 77

(GPR77) (C5L2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1014 bp

C5L200TN00 G-protein-coupled receptor 77 (GPR77) (C5L2) 3xHA-tagged (N-terminus)

C5R0100000 Complement component 5 receptor 1 (C5a ligand) (C5R1)

(Alternate Symbols: C5A, C5AR, CD88); (a.k.a: complement component-5 receptor-2 (C5a ligand). Identical to GenBank ACC# NM_001736: Complement component 5 receptor 1 (C5a ligand) (C5R1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1053bp

C5R100TN00 Complement component 5 receptor 1 (C5a ligand) (C5R1) 3xHA-tagged (N-terminus)

Corticotropin Releasing Hormone Receptors

CRHR100000 Corticotropin releasing hormone receptor 1 (CRHR1)

(Alternate Symbols: CRF1, CRHR, CRF-R, CRFR1). GenBank ACC# AY457172: Corticotropin releasing hormone receptor 1 (CRHR1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human brain cDNA (Clontech). The insert was sequenced. Insert size= 1248bp.

CRHR100000 Corticotropin releasing hormone receptor 1 (CRHR1)

CRHR200000 Corticotropin releasing hormone receptor 2 (CRHR2)

(Alternate Symbols: CRF2). GenBank ACC# AY449734: Corticotropin releasing hormone receptor 2 (CRHR2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human brain cDNA (Clontech). The insert was sequenced. Insert size= 1236bp.

CRHR200000 Corticotropin releasing hormone receptor 2 (CRHR2)

Cysteinyl Leukotriene Receptors

CLR0100000 Cysteinyl leukotriene receptor 1 (CYSLTR1)

(Alternate Symbols: HG55, CYSLT1, CYSLTR, CYSLT1R, HMTMF81, MGC46139); (a.k.a: LTD4 receptor; CysLTR vide supra; cysteinyl leukotriene D4 receptor). GenBank ACC# AY242130: Cysteinyl leukotriene receptor 1 (CYSLTR1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from genomic DNA. Insert size= 1014 bp.

CLR010TN00 Cysteinyl leukotriene receptor 1 (CYSLTR1) 3xHA-tagged (N-terminus)

CLR0200000 Cysteinyl leukotriene receptor 2 (CYSLTR2)

(Alternate Symbols: GPCR, HG57, CYSLT2, HPN321, CYSLT2R, hGPCR21, PSEC0146); (a.k.a: cysteinyl leukotriene CysLT2 receptor). Identical to GenBank ACC# NM_020377: Cysteinyl leukotriene receptor 2 (CYSLTR2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from genomic DNA. Insert size= 1041 bp.

CLR020TN00 Cysteinyl leukotriene receptor 2 (CYSLTR2) 3xHA-tagged (N-terminus)

Dopamine Receptors

DRD0100000 Dopamine receptor D1 (DRD1)
(Alternate Symbols: DADR, DRD1A). GenBank Accession # AF498961: Human dopamine receptor D1 (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1340 bp.

DRD010TN00 Dopamine receptor D1 (DRD1) 3xHA-tagged (N-terminus)

DRD0200000 Dopamine receptor 2, transcript variant 1 (DRD2)
(Alternate Symbols: D2R, D2DR). Identical to GenBank ACC#NM_000795: Dopamine receptor 2, transcript variant 1 (DRD2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from IMAGE clone ID# 3939741. Insert size= 1332 bp.

DRD020TN00 Dopamine receptor D2 (DRD2) 3xHA-tagged (N-terminus)

DRD03A0000 Dopamine Receptor D3 (DRD3), transcript variant a
(Alternate Symbols: DRD3a, D3DR, EMT1, FET1). GenBank ACC# NM_00796: Dopamine Receptor D3a (DRD3a) (wild type) cloned into pcDNA3.1+ (Invitrogen) at HindIII(5') and XhoI(3'). The open reading frame was amplified by the PCR from whole brain cDNA. Insert size= 1203 bp.

DRD0400000 Dopamine Receptor D4 (DRD4) (Alternate Symbols: D4DR). GenBank ACC# NM_00797: Dopamine Receptor D4 (DRD4) (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI(5') and EcoRI(3'). The open reading frame was amplified by the PCR from whole brain cDNA. Insert size= 1260 bp.

DRD0500000 Dopamine receptor D5 (DRD5)
(Alternate Symbols: DBDR, DRD1B, DRD1L2, MGC10601); (a.k.a: dopamine receptor D1B; D1beta dopamine receptor). GenBank Accession # AY136750: Human dopamine receptor D5 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from IMAGE clone (3928370). The insert was sequenced. Insert size = 1430 bp.

DRD050TN00 Dopamine receptor D5 (DRD5) 3xHA-tagged (N-terminus)

Endothelin Receptors

EDNBL00000 Endothelin receptor type B-like (EDNRBL)
(Alternate symbols: PAELR; GPR37) (a.k.a: hET(B)R-LP; Parkin-associated endothelin receptor-like receptor). Identical to GenBank Acc# NM_005302: Endothelin Receptor type B-like (EDNRBL) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by PCR from IMAGE clone (ID# 5174687). Insert size= 1842 bp.

EDNRA00000 Endothelin receptor type A (EDNRA)
(Alternate Symbols: ETA, ETRA). GenBank ACC# AY275462: Endothelin receptor type A (EDNRA) (wild type) cloned into pcDNA3.1+ (Invitrogen) at HindIII (5') and XhoI (3'). The open reading frame was amplified by the PCR from human placenta cDNA . The insert was sequenced. Insert size= 1284 bp

EDNRA0TN00 Endothelin receptor type A (EDNRA) 3xHA-tagged (N-terminus)

EDNRB00000 Endothelin receptor type B (EDNRB)
(Alternate Symbols: ETB, ETRB, HSCR, ABCDS, HSCR2) (a.k.a: Hirschsprung disease 2). GenBank ACC# AY275463: Endothelin receptor type B (EDNRB) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human placenta cDNA . The insert was sequenced. Insert size= 1329 bp

EDNRB0TN00 Endothelin receptor type B (EDNRB) 3xHA-tagged (N-terminus)

Estrogen Receptor

GPER100000 Estrogen receptor 1 (GPER1)
(a.k.a: chemokine receptor-like 2, CMKLR2). Identical to GenBank Acc# NM_001505 with the following exception: (C906T) (Silent mutation). Human Estrogen receptor 1 (GPER1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XbaI (3'). The open reading frame was amplified by PCR from human kidney cDNA (Clontech). The insert was sequenced. Insert size = 1128 bp. *Note GPER1 was once sold as CMKLR2.

GPER10TN00 Estrogen receptor 1 (GPER1) 3xHA-tagged (N-terminus)

Follicle Stimulating Receptor

FSHR000000 Follicle stimulating hormone receptor (FSHR)
(Alternate Symbols: ODG1, FSHRO); (a.k.a: FSH receptor, follitropin receptor, ovarian dysgenesis 1). GenBank ACC# AY429104: Follicle stimulating hormone receptor (FSHR) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human testis cDNA (Clontech) . The insert was sequenced. Insert size= 2088bp

Formyl Peptide Receptors

FPR0100000 Formyl peptide receptor 1 (FPR1)
Identical to GenBank ACC# NM_002029: Formyl peptide receptor 1 (FPR1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1053 bp

FPR010TN00 Formyl peptide receptor 1 (FPR1) 3xHA-tagged (N-terminus)

FPRL100000 Formyl peptide receptor-like 1 (FPRL1)
GenBank ACC# AY225226: formyl peptide receptor-like 1 (FPRL1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1056 bp

FPRL10TN00 Formyl peptide receptor-like 1 (FPRL1) 3xHA-tagged (N-terminus)

FPRL200000 Formyl peptide receptor-like 2 (FPRL2)
GenBank ACC# AY262690: Formyl peptide receptor like 2 (FPRL2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1062bp

FPRL20TN00 Formyl peptide receptor-like 2 (FPRL2) 3xHA-tagged (N-terminus)

Free Fatty Acid Receptors

FFAR100000 Free Fatty Acid Receptor 1 (FFAR1)

(Alternate Names: FFA1R, GPR40). Accession number: NM_005303. Human free fatty acid receptor 1 (FFAR1), wild type, cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI(3'). Contains one non-silent mutation at nt632 (G->A) resulting in an change of Arg to His. The open reading frame was amplified by PCR from human genomic DNA. Insert size= 903 bp.

FFAR200000 Free Fatty Acid Receptor 2 (FFAR2)

(Alternate Names: FFA2R, GPR43). Accession number: NM_005306. Human free fatty acid receptor 2 (FFAR2), wild type, cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI(3'). The open reading frame was amplified by PCR from human genomic DNA. Insert size= 993 bp.

FFAR300000 Free Fatty Acid Receptor 3 (FFAR3)

(Alternate Names: FFA3R, GPR41). Accession number: NM_005304. Human free fatty acid receptor 3 (FFAR3), wild type, cloned into pcDNA3.1+ (Invitrogen) at HindIII(5') and XhoI(3'). There is one non-silent mutation at nt91 C->G resulting in a Leu to Val substitution. The open reading frame was amplified by PCR from pituitary cDNA. Insert size= 1041 bp.

Frizzled Homolog Receptor

FZD4000000 Frizzled homolog 4 (Drosophila) (FZD4)

(Alternate Symbols: EVR1, Fz-4, FzE4, GPCR, FZD4S, MGC34390); (a.k.a: frizzled 4, WNT receptor frizzled-4). GenBank ACC# AY462097: Frizzled homolog 4 (Drosophila) (FZD4) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human heart cDNA (Clontech) . The insert was sequenced. Insert size= 1614bp

Galanin Receptors

GALR100000 Galanin Receptor 1 (GALR1)

(Alternate Symbols: GALNR, GALNR1); (a.k.a: Galanin receptor). GenBank ACC# AY541036: Galanin receptor 1 (GALR1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human brain cDNA (Clontech). The insert was sequenced. Insert size= 1050 bp.

GALR200000 Galanin receptor 2 (GALR2)

(Alternate Symbols: GALNR2); Identical to GenBank ACC# NM_003857. Galanin Receptor 2 (GALR2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and EcoRI (3'). The open reading frame was amplified by the PCR from Human cDNA (hippocampus). The insert was sequenced. Insert size= 1164bp.

GALR300000 Galanin Receptor 3 (GALR3)

GenBank ACC# AY587582: Galanin receptor 3 (GALR3) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human brain cDNA (Clontech). The insert was sequenced. Insert size= 1107bp.

Glucagon Receptors

GCGR000000 Glucagon receptor (GCGR)

(Alternate Symbols: GGR). Identical to GenBank Acc# NM_000160 with the following exception: (T1095C) (Silent

mutation). Glucagon receptor (GCGR) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by PCR from human liver cDNA (Clontech). Insert size= 1434 bp.

GLP2R000000 Glucagon-like peptide 2 receptor (GLP2R)

Identical to GenBank Acc# NM_004246 with the following exceptions: (C510T, A1326G) (both silent mutations). Glucagon-like peptide 2 receptor (GLP2R) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by PCR from human stomach cDNA (Clontech). Insert size= 1662 bp.

Glutamate Metabotropic Receptors

GRM2000000 Human Glutamate Receptor, Metabotropic 2 (GRM2)

(Alternate Symbols: GLUR2, mGlu2, GPRC1B, MGLUR2). GenBank ACC# NM_000839: Human Glutamate Receptor, Metabotropic 2 (GRM2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI(5') and XhoI(3'). The open reading frame was amplified by PCR from whole-brain cDNA. Insert size= 2619 bp.

GRM3000000 Human Glutamate Receptor, Metabotropic 3 (GRM3)

(Alternate Symbols: GLUR3, mGlu3, GPRC1C, MGLUR3). GenBank ACC# NM_000840: Human Glutamate Receptor, Metabotropic 3 (GRM3) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI(3'). The open reading frame was amplified by PCR from whole-brain cDNA. Insert size= 2640 bp.

GRM8000000 Human Glutamate Receptor, Metabotropic 8 (GRM8), wild-type

(Alternate Names: GLUR8, mGlu8, GPRC1H). Accession number: NM_000845. Human glutamate receptor, Metabotropic 8 (GRM8), wild type, cloned into pcDNA3.1+ (Invitrogen) at HindIII(5') and XhoI(3'). This version of GRM8 has been mutated from catalog# GRM800000M to match the consensus sequence. Insert size= 2727 bp.

GRM800000M Human Glutamate Receptor, Metabotropic 8 (GRM8), mutant

(Alternate Symbols: GLUR3, mGlu3, GPRC1C, MGLUR3). GenBank ACC# NM_000845: Human Glutamate Receptor, Metabotropic 8 (GRM8) (wild type) cloned into pcDNA3.1+ (Invitrogen) at HindIII(5') and XhoI(3'). Matches above accession number with the following non-silent mutations; nt1772 C->T (aa V->A), and nt2303 A->T (aa I->N). The open reading frame was amplified by PCR from whole-brain cDNA. Insert size= 2727 bp.

Gonadotropin-Releasing Hormone Receptor

GNRHR000000 Gonadotropin-releasing hormone receptor (GNRHR)

(Alternate Symbol: GRHR, LHRHR); (a.k.a: gonadotropin-releasing hormone receptor (leutinizing-releasing hormone receptor). GenBank ACC#AY39201: Gonadotropin-releasing hormone receptor (GNRHR) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from human pituitary cDNA (Clontech). Insert size= 987

GNRHR20000 Gonadotropin-releasing hormone receptor variant 2, (GNRHR2)

(Alternate Symbol: GRHR, LHRHR); (a.k.a: gonadotropin-releasing hormone receptor (leutinizing-releasing hormone

receptor). GenBank ACC# NM_00102763: Gonadotropin-releasing hormone receptor (GNRHR2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from GNRHR00000. Insert size= 750nt.

Growth Hormone Releasing Receptor

GHRHR00000 Growth hormone releasing hormone receptor (GHRHR)

(Alternate Symbols: GHRFR). GenBank ACC# AY557192: Growth hormone releasing hormone receptor (GHRHR) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human pituitary cDNA (Clontech). The insert was sequenced. Insert size= 1272 bp.

Growth Hormone Secretagogue Receptors

GHSR0A0000 Growth hormone secretagogue receptor type 1a (GHSR1a)

GenBank ACC# AY429112: Growth hormone secretagogue receptor type 1a (GHSR1a) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human brain cDNA (Clontech) . The insert was sequenced. Insert size= 1101bp

GHSR0B0000 Growth Hormone Secretagogue Receptor (GHSR1b)

GenBank ACC# AY322544: Growth Hormone secretagogue receptor (GHSR1b) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 870 bp

Histamine Receptors

HRH0100000 Histamine receptor HRH1

GenBank Accession # AY136743: Human histamine receptor HRH1 (wild type) cloned into pcDNA3.1+ (Invitrogen) at HindIII (5') and XhoI (3'). The open reading frame was amplified by the PCR from human lung cDNA (Clontech). The insert was sequenced. Insert size = 1460 bp.

HRH0200000 Histamine receptor HRH2

GenBank Accession # AY136744: Human histamine receptor HRH2 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human stomach cDNA (Clontech). The insert was sequenced. Insert size = 1080 bp.

HRH020TN00 Histamine receptor HRH2 3xHA-tagged (N-terminus)

HRH0300000 Histamine receptor 3 (HRH3)

(Alternate Names: HH3R, GPCR97). Accession number: NM_007232. Human histamine receptor 3 (HRH3), wild type, cloned into pcDNA3.1+ (Invitrogen) at BamHI(5') and XhoI(3'). This construct was donated to the collection from an external lab and mutated to match consensus. Insert size= 1340 bp.

HRH0400000 Histamine receptor HRH4

GenBank Accession # AY136745: Human histamine receptor HRH4 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human leukocyte cDNA (Clontech). The insert was sequenced. Insert size = 1180 bp.

Hypocretin Receptor

HCR0100000 Hypocretin (orexin) (Alternate Symbols: OX1R).

Identical to GenBank ACC# AY062030: Hypocretin (orexin) receptor 1 (HCRTR1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human brain cDNA (Clontech) . The insert was sequenced. Insert size= 1278bp

KISS Receptor

KISS1R0000 KISS receptor 1 (KISS1/GPR54)

(a.k.a: GPR54). GenBank Acc# NM_032551. Human KISS receptor 1 (KISS1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by PCR from human kidney cDNA (Clontech). The insert was sequenced. Insert size = 1197 bp.

Leucine-Rich Repeat-Containing Receptor

LGR4000000 Leucine-rich repeat-containing GPCR 4 (LGR4)

(Alternate Symbols: GPR48). GenBank ACC# NM_018490: Human Leucine-rich repeat-containing GPCR 4 (LGR4) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI(3'). Matches the above accession# with 6 nt exceptions all of which match an alternative ACC# AB_209743. Complete information regarding location and residue of each point mutation is in the *Sequence PDF* file. The open reading frame was amplified by PCR from whole-brain cDNA. Insert size= 2856 bp.

Leukotriene B4 Receptors

LTB4R00000 Leukotriene B4 receptor (LTB4R)

(Alternate Symbols: BLTR, P2Y7, GPR16, LTBR1, P2RY7, CMKRL1, LTB4R1); (a.k.a: chemokine receptor-like 1 ; G protein-coupled receptor 16 ; purinergic receptor P2Y, G-protein coupled, 7). GenBank ACC# AY322535: leukotriene B4 receptor (LTB4R) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1059 bp

LTB4R20000 Leukotriene B4 receptor 2 (LTB4R2)

(Alternate Symbols: BLT2, BLTR2, JULF2); (a.k.a: leukotriene B4 receptor BLT2; seven transmembrane receptor BLTR2). GenBank ACC# AY268433: leukotriene B4 receptor 2 (LTB4R2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1170 bp

Lysophosphatidic Acid/S1P Receptors

EDG0100000 Sphingosine 1-phosphate receptor 1 (S1P1/EDG1)

(Alternate Symbols: ECGF1, CHEDG1, D1S3362); (a.k.a: edg-1; sphingosine 1- phosphate receptor EDG1; G protein- coupled sphingolipid receptor). Identical to GenBank ACC# NM_001400: with the following exception (T558C) (Silent mutation) Endothelial differentiation G- protein coupled receptor 1 (EDG1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1149 bp

EDG010TN00 Sphingosine 1-phosphate receptor 1 (S1P1/EDG1) 3xHA-tagged (N-terminus)

EDG0200000 Lysophosphatidic acid receptor 1 (LPA1/EDG2)
(Alternate Symbols: LPA1, edg-2, vzg-1, Gpcr26, Mrec1.3, rec.1.3); (a.k.a: ventricular zone gene 1). GenBank ACC# AY322546: Endothelial differentiation G-protein coupled receptor 2 (EDG2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from whole brain cDNA (Clontech) . The insert was sequenced. Insert size= 1095 bp

EDG020TN00 Lysophosphatidic acid receptor 1 (LPA1/EDG2) 3xHA-tagged (N-terminus)

EDG0300000 Sphingosine 1-phosphate receptor 3 (S1P3/EDG3)
(Alternate Symbols: LPB3, S1P3, EDG- 3); (a.k.a: S1P receptor EDG3; sphingosine 1-phosphate receptor 3; G protein-coupled receptor endothelial differentiation gene-3). Human Endothelial differentiation, sphingolipid G-protein-coupled receptor, 3 (EDG3) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from genomic DNA. The insert was sequenced and found to be identical with GB ACC# NM_005226 with the following exception: G962->A (R321->Q). Insert size = 1137 bp.

EDG030TN00 Sphingosine 1-phosphate receptor 3 (S1P3/EDG3) 3xHA-tagged (N-terminus)

EDG0400000 Lysophosphatidic acid receptor 2 (LPA2/EDG4)
(Alternate Symbols: LPA2, EDG-4); (a.k.a: LPA receptor EDG4; G protein-coupled receptor Lysophosphatidic acid receptor EDG4). GenBank ACC# AY322548: Endothelial differentiation G- protein coupled receptor 4 (EDG4) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human MCF-7 breast cancer cell line cDNA (in house) . The insert was sequenced. Insert size= 1056 bp

EDG040TN00 Lysophosphatidic acid receptor 2 (LPA2/EDG4) (Alternate Symbols: LPA2, EDG-4); 3xHA-tagged (N-terminus)

EDG0500000 Sphingosine 1-phosphate receptor 2 (S1P2/EDG5)
(Alternate Symbols: H218, LPB2, S1P2, AGR16, EDG-5, Gpcr13); (a.k.a: S1P receptor EDG5; sphingosine 1- phosphate receptor 2). GenBank ACC# AY262688: Endothelial differentiation, sphingolipid G-protein-coupled receptor, 5 (EDG5) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XbaI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1062 bp

EDG050TN00 Sphingosine 1-phosphate receptor 2 (S1P2/EDG5) 3xHA-tagged (N-terminus)

EDG0600000 Sphingosine 1-phosphate receptor 4 (S1P4/EDG6)
(Alternative Symbols: LPC1, SLP4); GenBank ACC# AY322537: Endothelial differentiation G-protein-coupled receptor, 6 (EDG6) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1155 bp

EDG060TN00 Sphingosine 1-phosphate receptor 4 (S1P4/EDG6) 3xHA-tagged (N-terminus)

EDG0700000 Lysophosphatidic acid receptor 3 (LPA3/EDG7)
(Alternative Symbols: GPCR, Edg-7, LP- A3, HOFNH30, RP4-67813); (a.k.a: LPA receptor EDG7 ; endothelial cell differentiation gene 7; calcium-mobilizing lysophosphatidic acid receptor LP-A3). GenBank ACC# AY322547: Endothelial differentiation G-protein coupled receptor 7 (EDG7) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human

testis cDNA (Clontech) . The insert was sequenced. Insert size= 1062 bp

EDG070TN00 Lysophosphatidic acid receptor 3 (LPA3/EDG7) 3xHA-tagged (N-terminus)

EDG0800000 Sphingosine 1-phosphate receptor 5 (S1P5/EDG8)
(Alternate Symbols: S1P5, Edg-8, SPPR- 1, SPPR-2); (a.k.a: sphingosine 1- phosphate receptor 5; sphingosine 1- phosphate receptor Edg-8). GenBank ACC# AY262689: Endothelial differentiation, sphingolipid G-protein- coupled receptor, 8 (EDG8) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1197 bp

EDG080TN00 Sphingosine 1-phosphate receptor 5 (S1P5/EDG8) 3xHA-tagged (N-terminus)

MAS-Related Receptors

MRGX100000 MAS-related GPR, member X1 (MRGPRX1)
(Alternate Names: MRGX1). Accession number: NM_147199. Human MAS-related GPR, member X1 (MRGPRX1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI(3'). The open reading frame was amplified by PCR from human genomic DNA. Construct contains two mutations; A138G (silent) and G963C resulting in residue E321D amino acid substitution. The insert was sequenced. Insert size = 969 bp.

MRGX200000 MAS-related GPR, member X2 (MRGPRX2)
(Alternate Names: MRGX2). Accession number: NM_054030. Human MAS-related GPR, member X2 (MRGPRX2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI(3'). The open reading frame was amplified by PCR from human genomic DNA. Construct contains one mutation: A185G resulting in residue N62S amino acid substitution. The insert was sequenced. Insert size = 993 bp.

MRGX300000 MAS-related GPR, member X3 (MRGPRX3)
(Alternate Names: MRGX3). Accession number: AY042215. Human MAS-related GPR, member X3 (MRGPRX3) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI(3'). Matches above accession number perfectly but contains 3nt differences resulting in 2aa residue changes from acc#NM_054031. The open reading frame was amplified by PCR from whole-brain cDNA. Insert size= 969 bp.

Melanin-Concentrating Hormone Receptors

MCHR100000 Melanin-concentrating hormone receptor 1 (MCHR1/GPR24)
(Alternate Symbols: SLC1, GPR24, MGC32129); (a.k.a: G protein-coupled receptor 24). GenBank ACC# AY562945: Melanin-concentrating hormone receptor 1 (MCHR1/GPR24) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human brain cDNA (Clontech). The insert was sequenced. Insert size= 1269 bp.

MCHR200000 Melanin-concentrating hormone receptor 2 (MCHR2/GPR145)
(Alternate Symbols: SLT, MCH2, GPR145, MCHR2); (a.k.a: G protein-coupled receptor slt, G protein-coupled receptor 145). GenBank ACC# AY562946: Melanin-concentrating hormone receptor 2 (MCHR2/GPR145) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human brain cDNA (Clontech). The insert was sequenced. Insert size= 1023 bp.

Melanocortin Receptors

MCR0100000 Melanocortin 1 receptor (MC1R) alpha melanocyte stimulating hormone receptor

Identical to GenBank ACC# NM_002386: Melanocortin 1 receptor (MC1R) alpha melanocyte stimulating hormone receptor (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 954bp

MCR010TN00 Melanocortin 1 receptor (MC1R) 3xHA-tagged (N-terminus)

MCR0200000 Melanocortin 2 receptor (adrenocorticotrophic hormone receptor): MC2R/ACTHR

Identical to GenBank ACC# NM_000529: Melanocortin 2 receptor hormone receptor (adrenocorticotrophic hormone receptor): MC2R/ACTHR (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 894bp

MCR020TN00 Melanocortin 2 receptor (MC2R) 3xHA-tagged (N-terminus)

MCR0300000 melanocortin 3 receptor (MC3R)

GenBank ACC# AY227893: melanocortin 3 receptor MC3R (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1083 bp

MCR030TN00 Melanocortin 3 receptor (MC3R) 3xHA-tagged (N-terminus)

MCR0400000 melanocortin 4 receptor (MC4R)

GenBank ACC# AY236539: melanocortin 4 receptor MC4R (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 999 bp

MCR040TN00 Melanocortin 4 receptor (MC4R) 3xHA-tagged (N-terminus)

MCR0500000 melanocortin 5 receptor (MC5R)

Identical to GenBank ACC# NM_005913: melanocortin 5 receptor MC5R (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 978 bp

MCR050TN00 Melanocortin 5 receptor (MC5R) 3xHA-tagged (N-terminus)

Melatonin Receptor

MTNR1B0000 Melatonin receptor 1B (MTNR1B)

(Alternate Symbols: MEL-1B-R); (a.k.a: melatonin receptor type 1B). GenBank ACC# AY521019: Melatonin receptor 1B (MTNR1B) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XbaI (3'). The open reading frame was amplified by the PCR from human retina cDNA (Clontech). The insert was sequenced. Insert size= 1089 bp.

MTNR1B0000 Melatonin receptor 1B

Melatonin receptor 1B (MTNR1B) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XbaI (3'). The open reading frame was amplified by the PCR from human retina cDNA (Clontech). The insert was sequenced. Insert size= 1089 bp.

MTNR1L0000 Melatonin-related receptor (MTR1L)

(Alternate Names: MTNR1L, GPR50). Accession number: NM_004224. Human melatonin-related receptor (MTR1L), wild type, cloned into pcDNA3.1+ (Invitrogen) at BamHI(5') and XhoI(3'). This sequence differs from consensus above due to the following (non-silent) mutations: nt958 C->T, nt1238 G->C, and nt1804 G->A. The open reading frame was amplified by PCR from pituitary cDNA. Insert size= 1842 bp.

Motilin Receptor

MTLR100000 Motilin receptor

Motilin receptor (MTLR1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human stomach cDNA (Clontech). The insert was sequenced. Insert size= 1239 bp

Neuromedin U Receptors

NMU1R00000 Neuromedin U receptor 1R (NMU1R)

(Alternate Symbols: GPR66, FM-3). Identical to GenBank Acc# NM_006056: Neuromedin U receptor 1R (NMU1R) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by PCR from IMAGE Clone #6194542. Insert size= 1281 bp.

NMU1ROTNO0 Neuromedin U receptor 1 (NMU1R) 3xHA-tagged (N-terminus)

NMU2R00000 Neuromedin U receptor 2R (NMU2R)

(Alternate Symbol: FM4). Identical to GenBank Acc# NM_020167: Neuromedin U receptor 2R (NMU2R) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by PCR from IMAGE Clone #3852151. Insert size= 1248 bp.

NMU2ROTNO0 Neuromedin U receptor 2 (NMU2R) 3xHA-tagged (N-terminus)

Neuropeptide FF Receptor

NPFFR10000 Neuropeptide FF receptor 1 (NPFFR1)

(Alternate Names: NPFF1, GPR147). Accession number: NM_022146. Human neuropeptide FF receptor 1 (NPFFR1), wild type, cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI(3'). The open reading frame was amplified by PCR from spinal cord cDNA. Insert size= 1293 bp.

Neuropeptide Y Receptors

NPYR100000 Neuropeptide Y receptor Y1 (NPY1R)

(Alternate Symbol: NPYR); (a.k.a: Neuropeptide Y receptor). GenBank ACC# AY548168: neuropeptide Y receptor Y1 (NPY1R) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XbaI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (clontech). The insert was sequenced. Insert size= 1155 bp

NPYR10TN00 Neuropeptide Y1 Receptor (NPY1R) 3xHA tagged (N-terminus)

NPYR200000 neuropeptide Y receptor Y2 (NPY2R)

GenBank ACC# AY236540: neuropeptide Y receptor Y2 (NPY2R) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA . The insert was sequenced. Insert size= 1146 bp

NPYR20TN00 Neuropeptide Y2 Receptor (NPY2R) 3xHA tagged (N-terminus)

NPYR400000 neuropeptide Y receptor Y4 (NPY4R)
(Alternate Symbols: Y4, PP1, PYPYR1); (a.k.a: pancreatic polypeptide receptor 1). GenBank ACC# AY268432: neuropeptide Y receptor Y4 (NPY4R) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. The insert was sequenced. Insert size= 1128 bp
NPYR40TN00 Neuropeptide Y4 Receptor (NPY4R) 3xHA tagged (N-terminus)

NPYR500000 neuropeptide Y receptor Y5 (NPY5R)
(Alternate Symbols: NPYR5). GenBank ACC# AY322538: neuropeptide Y receptor Y5 (NPY5R) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. The insert was sequenced. Insert size= 1338 bp
NPYR50TN00 Neuropeptide Y5 Receptor (NPY5R) 3xHA tagged (N-terminus)

Neurotensin Receptors

NTSR100000 Neurotensin receptor 1 (NTSR1)
(Alternate Symbols: NTR). GenBank ACC# AY429106: Neurotensin receptor 1 (NTSR1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XbaI (3'). The open reading frame was amplified by the PCR from Human brain cDNA (Clontech). The insert was sequenced. Insert size= 1257bp
NTSR10TN00 Neurotensin Receptor 1 (NTSR1) 3xHA-tagged (N-terminus)

NTSR200000 Neurotensin receptor 2 (NTSR2)
(Alternate Symbols: NTR2); (a.k.a: neurotensin receptor, type 2; levocabastine-sensitive neurotensin receptor). GenBank ACC# AY429107: Neurotensin receptor 2 (NTSR2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XbaI (3'). The open reading frame was amplified by the PCR from Human brain cDNA (Clontech). The insert was sequenced. Insert size= 1233bp

NTSR20TN00 Neurotensin Receptor 2 (NTSR2) 3xHA-tagged (N-terminus)

Nucleotide Receptor/P2Y

FKSG7900000 Putative purinergic receptor FKSG79
Putative purinergic receptor FKSG79 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI(5') and XhoI (3'). The open reading frame was amplified by the PCR from genomic DNA. Insert size= 1002 bp.

FKSG790TN00 Putative purinergic receptor FKSG79 3xHA-tagged (N-terminus)

GPR3500000 G protein coupled receptor 35 (GPR35)
G protein coupled receptor 35 (GPR35) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human genomic DNA. The insert was sequenced. Insert size= 930 bp
GPR350TN00 G protein coupled receptor 35 (GPR35) 3xHA-tagged (N-terminus)

P2RY1300000 Purinergic receptor P2Y, G-protein coupled, 13 (P2RY13)
(Alternate Symbols: P2Y13, GPR86, GPR94, GPCR1). Identical to GenBank ACC# NM_023914 with the following exception: nt473T (silent). Purinergic receptor 13 (P2RY13) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human

cDNA (whole brain). The insert was sequenced. Insert size= 1002 bp.

P2RY1400000 Purinergic Receptor 14 (P2RY14), transcript variant 2

(Alternate Symbols: P2Y14, GPR105). GenBank ACC# NM_014879: Purinergic receptor 14 (P2RY14) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI(5') and XhoI(3'). Sequence matches above acc# with one exception: nt160 G->A resulting in a Gly to Lys AA residue change. The open reading frame was amplified by the PCR from heart cDNA. Insert size= 1017 bp.

P2RY400000 Purinergic receptor 4 (P2RY4)

(a.k.a: P2Y purinoceptor 4; uridine nucleotide receptor). Identical to GenBank ACC# NM_002565: Purinergic receptor P2RY (P2Y4) (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. The insert was sequenced. Insert size= 1098 bp

P2RY40TN00 Purinergic receptor 4 (P2RY4) 3xHA-tagged (N-terminus)

P2Y0100000 Purinergic receptor 1 (P2RY1)

(a.k.a: ATP receptor; P2Y purinoceptor 1; platelet ADP receptor; P2 purinoceptor subtype Y1). GenBank Accession # AY136752: Human Purinergic receptor P2RY1 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human lung cDNA (Clontech). The insert was sequenced. Insert size = 1125 bp.

P2Y0200000 Purinergic receptor 2 (P2RY2)

(a.k.a: ATP receptor; purinoceptor P2Y2; P2U purinoceptor 1; P2Y purinoceptor 2; P2U nucleotide receptor). GenBank Accession # AY136753: Human Purinergic receptor P2RY2 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human placenta cDNA (Clontech). The insert was sequenced. Insert size = 1135 bp.

P2Y0600000 Pyrimidinergic receptor 6 (P2RY6)

(a.k.a: P2Y6 receptor; P2 purinoceptor; P2Y purinoceptor 6; G-coupled nucleotide receptor). GenBank Accession # AF498920: Human Pyrimidinergic receptor P2RY6 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Image clone (3162734). The insert was sequenced. Insert size = 995 bp.

P2Y060TN00 Pyrimidinergic receptor 6 (P2RY6) 3xHA-tagged (N-terminus)

P2Y1000000 Putative purinergic receptor 10 (P2RY10)

(a.k.a: putative purinergic receptor; purinergic receptor P2Y, G-protein coupled 10). GenBank ACC# AY275461: Purinergic receptor 10 (P2Y10) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. The insert was sequenced. Insert size= 1020 bp

P2Y100TN00 Putative purinergic receptor 10 (P2RY10) 3xHA-tagged (N-terminus)

P2Y1100000 Purinergic receptor 11 (P2RY11)

Purinergic receptor P2Y, G protein coupled, 11 (P2RY11) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human placenta cDNA (Clontech). The insert was sequenced. Insert size= 1125 bp.

P2Y1200000 Purinergic receptor 12 (P2RY12)

(a.k.a: P2Y purinoceptor 12; ADP-glucose receptor; platelet ADP receptor; purinergic receptor P2RY12; Gi-coupled ADP receptor

HORK3; G-protein coupled receptor SP1999; putative G-protein coupled receptor purinergic receptor P2Y, G-protein coupled 12). GenBank Accession # AY136754: Human Purinergic receptor P2RY12 (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1030 bp.

Opioid Receptors

OPR0K00000 opioid receptor, kappa 1 (OPRK1)

(Alternate Symbols: KOR, OPRK); (a.k.a: Opiate receptor, kappa-1). GenBank Accession # AF498922: Human opioid receptor kappa (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1150 bp.

OPR0K0TN00 Opioid Receptor Kappa (OPRK) 3xHA tagged (N-terminus)

OPR0M10000 opioid receptor, Mu1 (OPRM1)

(Alternate Symbols: OPRM, MOR-1). Genbank ACC# AY521028: Human opioid receptor mu1 (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1203 bp.

OPRD100000 Opioid receptor, delta 1 (OPRD1)

(Alternate Names: OPRD, DOR-1). Accession number: NM_000911. Human opioid receptor, delta 1 (OPRD1), wild type, cloned into pcDNA3.1+ (Invitrogen) at BamHI(5') and EcoRI(3'). One silent mutation exists: nt921 C->T. The open reading frame was amplified by PCR from kidney cDNA. Insert size= 1119 bp.

OPRL100000 Opiate receptor-like 1 (OPRL1)

(Alternate Symbols: OOR, ORL1, KOR-3, NOCIR); (a.k.a: nociceptin receptor; orphanin FQ receptor; rat LC132 receptor-like; kappa3-related opioid receptor). GenBank ACC# AY268428: Opiate receptor-like 1 (OPRL1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. The insert was sequenced. Insert size= 1113bp

OPRL10TN00 Opioid Receptor-Like 1 (OPRL1) 3xHA tagged (N-terminus)

Opsin Receptor

OPN1S00000 Opsin 1, short-wave-sensitive (OPN1SW)

(Alternative names: BCP, BOP, CBT). Protein identical to mRNA GenBank Acc# NM_001708. Human Opsin 1, short-wave-sensitive (color-blindness, tritan) (OPN1SW) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from cDNA. The insert was sequenced and contains a SILENT mutation (nt366 A-C). Insert size = 1047bp.

Orphan Receptors

ACP1R10000 Adenylate cyclase activating polypeptide 1

(pituitary) receptor type 1 (ADCYAP1R1) (Alternate symbols: PACAPR, PACAPRI). GenBank ACC# AY366498: Adenyl cycl activating polypep 1 (pituitary) rect type 1 (ADCYAP1R1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by PCR from human brain cDNA (Clontech). Insert size= 1407 bp.

GPR0010000 Orphan G Protein-Couple Receptor 1 (GPR1)

(Alternate Symbols: n/a). GenBank ACC# NM_005279: Orphan G protein-coupled receptor 1 (GPR1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI(5') and XhoI(3'). The open reading frame was amplified by PCR from hippocampus cDNA. Insert size= 1068 bp.

GPR0040000 Orphan G Protein-Couple Receptor 4 (GPR4)

(Alternate Symbols: n/a). GenBank ACC# NM_005282: Orphan G protein-coupled receptor 4 (GPR4) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI(3'). The open reading frame was amplified by PCR from whole-brain cDNA. Insert size= 1089 bp

GPR0310000 G protein coupled receptor 31 (GPR31)

(Alternate Names:). Accession number: NM_005299. Human orphan g protein coupled receptor 31 (GPR31), wild type, cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI(3'). There is one non-silent mutation at nt271 A->G resulting in a His to Arg substitution. The open reading frame was amplified by PCR from genomic DNA. Insert size= 960 bp.

GPR0450000 Orphan G Protein-coupled Receptor 45 (GPR45)

(Alternate Symbols: PSP24, GPR45) Accession number: NM_007227. Human orphan g protein coupled receptor 45 (GPR45), wild-type, cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by PCR from hippocampus cDNA. Insert was sequenced. Insert = 1119.

GPR1320000 Orphan G Protein-Couple Receptor 132 (GPR132)

(Alternate Symbols: G2A). GenBank ACC# NM_013345: Orphan G protein-coupled receptor 132 (GPR132) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI(3'). One silent mutation at nt138 C->A but otherwise a match to the above accession number. The open reading frame was amplified by PCR from lung cDNA. Insert size= 1143 bp.

GPR5600000 G protein coupled receptor 56 (GPR56), variant 1

(Alternate Names: GPR56 isoform a, TM7LN4). Accession number: NM_005682. Human orphan g protein coupled receptor 56 (GPR56) variant 1, wild type, cloned into pcDNA3.1+ (Invitrogen) at HindIII(5') and XbaI(3'). *** Please note, the stop codon is INSIDE the XbaI(3') RE site limiting options for subsequent sub-cloning. The open reading frame was amplified by PCR from whole brain cDNA. Insert size= 2082 bp.

GPR5700000 G protein coupled orphan receptor 57 (GPR57)

(Alternate Symbols: n/a). G protein coupled orphan receptor 57 (GPR57) was cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and EcoRI (3'). The open reading frame was amplified by the PCR from human genomic DNA. The insert was sequenced is identical to GenBank Acc# AF_112461. Insert size = 1032bp.

GPR570TN00 G protein coupled orphan receptor 57 (GPR57) 3xHA-tagged (N-terminus)

GPR6500000 Orphan G Protein-Couple Receptor 65 (GPR65)

(Alternate Symbols: n/a). GenBank ACC# NM_003608: Orphan G protein-coupled receptor 65 (GPR65) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI(3'). The open reading frame was amplified by PCR from thymus cDNA. Insert size= 1014 bp.

GPR6800000 Orphan G Protein-Couple Receptor 68 (GPR68)

(Alternate Symbols: OGR1). GenBank ACC# NM_003485: Orphan G protein-coupled receptor 68 (GPR68) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI(3'). The open reading frame was amplified by PCR from thymus cDNA. Insert size= 1128 bp. Please note: this was formerly found under catalog number OGR1000000.

GPR8300000 G protein coupled receptor 83 (GPR83)

(Alternate Names:). Accession number: NM_016540. Human orphan g protein coupled receptor 83 (GPR83), wild type, cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI(3'). The open reading frame was amplified by PCR from whole brain cDNA. Insert size= 1272 bp.

GPR8700000 Orphan G Protein-Couple Receptor 87 (GPR87)

(Alternate Symbols: GPR95, FKSG78, KPG_002). GenBank ACC# NM_023915: Orphan G protein-coupled receptor 87 (GPR87) (wild type) cloned into pcDNA3.1+ (Invitrogen) at HindIII(5') and XhoI(3'). One positive mutation at nt461 A->G (Serine to Asparagine) but otherwise a match to the above accession number. The open reading frame was amplified by PCR from testis cDNA. Insert size= 1077 bp.

GPRE200000 G-protein coupled receptor (RE2)

GenBank ACC# AY275468: G-protein coupled receptor RE2 (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human brain cDNA . The insert was sequenced. Insert size= 1590 bp

STRG000000 G-protein coupled receptor 88 (STRG)

(Alternate Symbols: GPR88). GenBank ACC# AY336999: G-protein coupled receptor 88 (STRG/GPR88) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. The insert was sequenced. Insert size= 1155 bp

Oxytocin Receptor**OXTR000000 Oxytocin receptor (OXTR)**

(Alternate Symbols: OT-R). Identical to GenBank ACC#AY389507: Oxytocin receptor (OXTR) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from human ovary cDNA (Clontech). Insert size= 1170 bp.

Parathyroid Hormone Receptors**PTHR100000 Parathyroid hormone receptor 1 (PTHR1)**

(Alternate Symbols: PTHR). GenBank ACC# AY449732: Parathyroid hormone receptor 1 (PTHR1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XbaI (3'). The open reading frame was amplified by the PCR from human lung cDNA (Clontech). The insert was sequenced. Insert size= 1782 bp.

PTHR200000 Parathyroid hormone receptor 2 (PTHR2)

(a.k.a: PTH2 receptor). GenBank ACC# AY497546: Parathyroid hormone receptor 2 (PTHR2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human retina cDNA (Clontech). The insert was sequenced. Insert size= 1653 bp.

Platelet Activating Factor Receptors**HUMNP00000 Leukocyte Platelet-Activating Factor Receptor (HUMNP1Y20)**

(Alternate symbols: PAFR, GPR135I); (a.k.a: G protein-coupled receptor 135; platelet activating factor receptor). Identical to GenBank Acc# NM_022571: Leukocyte Platelet-Activating Factor Recept (HUMNP1Y20) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by PCR from IMAGE clone (ID# 4825908). Insert size= 1485 bp.

PTAFR00000 Platelet-activating factor receptor (PTAFR)

GenBank ACC# AY275466: Platelet-activating factor receptor (PTAFR) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human placenta cDNA . The insert was sequenced. Insert size= 1029 bp

Prokineticin Receptors**PROKR10000 Prokineticin Receptor (PROKR1)**

(Alternate Symbols: GPR73, GPR73a, PKR1, ZAQ); Identical to GenBank ACC# NM_138964. Prokineticin receptor (PROKR1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human cDNA (testis). The insert was sequenced. Insert size= 1182bp.

PROKR20000 Prokineticin Receptor (PROKR2)

(Alternate Symbols: GPR73b, GPR73L1, PKR2, KAL3); Identical to GenBank ACC# NM_144773 with the following exceptions: 4 SILENT mutations (nt475T, nt595C, nt1131A, nt1119T) and 1 positive amino acid substitution at V330M. Prokineticin receptor (PROKR2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and EcoRI (3'). The open reading frame was amplified by the PCR from Human cDNA (testis). The insert was sequenced. Insert size= 1155bp

Prolactin Releasing Hormone Receptor**PRLHR00000 Prolactin Releasing Hormone Receptor (PRLHR)**

(Alternate Symbols: GR3, GPR10). GenBank ACC# NM_004248: human prolactin releasing hormone receptor (PRLHR) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI(3'). The open reading frame was amplified by the PCR from whole-brain cDNA. Insert size= 1113 bp.

Prostaglandin and Thromboxane Receptors**CRTH200000 Prostaglandin D2 receptor, chemoattractant receptor-homologous molecule expressed on TH2 cells (CRTH2/GPR44)**

(Alternate Symbol: GPR44); (a.k.a: G protein-coupled receptor 44). GenBank ACC# AY507142: Prostaglandin D2 receptor, chemoattractant receptor-homologous molecule expressed on TH2 cells (CRTH2/GPR44) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XbaI (3'). The open reading frame was amplified by the PCR from human placenta cDNA (Clontech). The insert was sequenced. Insert size= 1188 bp.

PER0100000 Prostaglandin E receptor 1, (subtype EP1), 42kDa (PTGER1)

(Alternate Symbol: EP1); (a.k.a: Prostaglandin E receptor 1, EP1 subtype, 42kDa). GenBank ACC# AY275470: Prostaglandin E receptor 1, subtype EP1 (PTGER1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human kidney cDNA. The insert was sequenced. Insert size= 1209 bp

PER0200000 Prostaglandin E receptor 2, (subtype EP2), 53kDa (PTGER2)

(Alternate Symbol: EP2); (a.k.a: Prostaglandin E receptor 2, EP2 subtype, 53kD). GenBank ACC# AY275471: Prostaglandin E receptor 2, subtype EP2 (PTGER2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human placenta cDNA. The insert was sequenced. Insert size= 1077 bp

PER020TN00 Prostaglandin E receptor 2 (subtype EP2) (PTGER2) 3xHA-tagged (N-terminus)

PER0400000 Prostaglandin E receptor 4 subtype EP4 (PTGER4)
(Alternate Symbols: EP4, EP4R). GenBank ACC# AY429109: Prostaglandin E receptor 4 subtype EP4 (PTGER4) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Lung cDNA (Clontech). The insert was sequenced. Insert size= 1467bp

PER3VI0000 Prostaglandin E receptor 3 subtype EP3 (Isoform VI) (PTGER3)
(Alternate Symbols: EP3); (a.k.a: Prostaglandin E receptor 3, EP3 subtype). GenBank ACC# AY429108: Prostaglandin E receptor 3 subtype EP3 (Isoform VI) (PTGER3) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human placental cDNA (Clontech). The insert was sequenced. Insert size= 1182bp

PER3VITN00 Prostaglandin E receptor 3 (subtype EP3) (Isoform VI) (PTGER3) 3xHA-tagged (N-terminus)

PTGDR00000 Prostaglandin D2 Receptor (PTGDR)
(Alternate Symbols: DP, AS1, ASRT1); Identical to GenBank ACC# NM_000953 with the following exceptions: nt576T mutation (silent). Prostaglandin D2 Receptor (PTGDR) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and EcoRI (3'). The open reading frame was amplified by the PCR from Human cDNA (small intestine). The insert was sequenced. Insert size= 1080bp.

PTGFR00000 Prostaglandin F receptor (FP) (PTGFR)
(Alternate Symbols: FP). Identical to GenBank ACC#AY337000: Prostaglandin F receptor (FP) (PTGFR) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from human placental cDNA (Clontech). Insert size= 1080 bp.

PTGFR0TN00 Prostaglandin F receptor (FP) (PTGFR) 3xHA-tagged (N-terminus)

PTGIR00000 Prostaglandin I2 (prostacyclin) receptor (IP) (PTGIR)
(Alternate Symbols: IP, PRIPR). GenBank ACC# AY242134: Prostaglandin I2 (prostacyclin) receptor (PTGIR) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from placental cDNA. Insert size= 1161 bp.

PTGIROT000 Prostaglandin I2 (prostacyclin) receptor (PTGIR) 3xHA-tagged (N-terminus)

TXA2R00000 Thromboxane A2 receptor (TBXA2R)
GenBank ACC# AY429110: Thromboxane A2 receptor (TBXA2R) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Placental cDNA (Clontech). The insert was sequenced. Insert size= 1032bp

TXA2ROT000 Thromboxane A2 Receptor (TBXA2R) 3xHA-tagged (N-terminus)

Relaxin/Insulin-Like Peptide Receptors

RXFP300000 Relaxin/Insulin-like Family Peptide Receptor 3 (RXFP3)
(Alternate Symbols: SALPR). GenBank ACC# NM_016568. Human Relaxin/Insulin-like Family Peptide Receptor 3 (RXFP3) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and

XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. The insert was sequenced and contains one SILENT mutation nt820 T->C. This was formerly sold as catalog number SALPR00000. Insert size= 1410 bp.

RXFP30TN00 Relaxin/Insulin-like Family Peptide Receptor 3 (RXFP3) 3xHA-tagged (N-terminus)

RXFP400000 Relaxin/Insulin-like Family Peptide Receptor 4 (RXFP4)
(Alternate Symbols: GPR100, RLN3R2, GPCR142). GenBank ACC# NM_181885: Human Relaxin/Insulin-like Family Peptide Receptor 4 (RXFP4) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI(5') and EcoRI(3'). Matches above accession number with the following non-silent mutation; nt986 T->C (aa L->S). The open reading frame was amplified by PCR from testis cDNA. Insert size= 1125 bp.

Secretin Receptor

SCTR000000 Secretin receptor (SCTR)
(Alternate Symbols: SR); (a.k.a: pancreatic secretin receptor). GenBank ACC# AY462218: Secretin receptor (SCTR) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human kidney cDNA (Clontech). The insert was sequenced. Insert size= 1323bp.

Serotonin/5-HT Receptors

HTR01A0000 5-hydroxytryptamine (serotonin) receptor 1A (HTR1A)
(Alternate Symbols: ADRBRL1, ADRB2RL1). GenBank Accession # AF498978: Human 5-hydroxytryptamine (serotonin) receptor HTR1A (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1270 bp.

HTR01ATN00 5-hydroxytryptamine (serotonin) receptor 1A (HTR1A) 3xHA-tagged (N-terminus)

HTR01B0000 5-hydroxytryptamine (serotonin) receptor 1B (HTR1B)
Alternate Symbols: S12, HTR1D2, HTR1DB); (a.k.a: 5-HT1B; 5-HT1DB). GenBank ACC# AY225227: 5-hydroxytryptamine (serotonin) receptor (HTR1B) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. The insert was sequenced. Insert size= 1173 bp

HTR01BTN00 5-hydroxytryptamine (serotonin) receptor 1B (HTR1B) 3xHA-tagged (N-terminus)

HTR01D0000 5-hydroxytryptamine (serotonin) receptor 1D (HTR1D)
(Alternate Symbols: HTRL; RDC4; HT1DA; HTR1DA). GenBank Accession # AF498979: Human 5-hydroxytryptamine (serotonin) receptor HTR1D (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XbaI (3'). The open reading frame was amplified by the PCR from Image clone (4299633). The insert was sequenced. Insert size = 1140 bp.

HTR01E0000 5-hydroxytryptamine (serotonin) receptor 1E (HTR1E)
GenBank Accession # AF498980: Human 5-hydroxytryptamine (serotonin) receptor HTR1E (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1100 bp.

HTR01F0000 5-hydroxytryptamine (serotonin) receptor 1F (HTR1F)

(Alternate Symbols: MR77; HTR1EL); (a.k.a: 5-hydroxytryptamine receptor 1F). GenBank Accession # AF498981: Human 5-hydroxytryptamine (serotonin) receptor HTR1F (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1110 bp.

HTR02A0000 5-hydroxytryptamine (serotonin) receptor 2A (HTR2A)

(Alternate Symbol: HTR2). GenBank Accession # AF498982: Human 5-hydroxytryptamine (serotonin) receptor HTR2A (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1420 bp.

HTR02B0000 5-hydroxytryptamine (serotonin) receptor 2B (HTR2B)

GenBank Accession # AY136751: Human 5-hydroxytryptamine (serotonin) receptor HTR2B (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human colon cDNA (Clontech). The insert was sequenced. Insert size = 1445 bp.

HTR02BTN00 5-hydroxytryptamine (serotonin) receptor 2B (HTR2B) 3xHA-tagged (N-terminus)**HTR02C0000 5-hydroxytryptamine (serotonin) receptor 2C (HTR2C)**

(Alternate Symbol: HTR1C). GenBank Accession # AF498983: Human 5-hydroxytryptamine (serotonin) receptor HTR2C (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1380 bp.

HTR02CTN00 5-hydroxytryptamine (serotonin) receptor 2C (HTR2C) 3xHA-tagged (N-terminus)**HTR03A0000 5-Hydroxytryptamine (serotonin) receptor 3A (HTR3A)**

(a.k.a: 5-HT3R; 5-hydroxytryptamine (serotonin) receptor-3). GenBank Accession # AF498984: Human 5-hydroxytryptamine (serotonin) receptor HTR3A (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Image clone (2821710). The insert was sequenced. Insert size = 1440 bp.

HTR0400000 5-hydroxytryptamine (serotonin) receptor 4 (HTR4)

Identical to GenBank ACC# NM_000870 with the following exception (C112T) silent mutation: 5-hydroxytryptamine (serotonin) receptor 4 (HTR4) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human brain cDNA (Clontech). The insert was sequenced. Insert size= 1167bp

HTR040TN00 5-hydroxytryptamine (serotonin) receptor 4 (HTR4) 3xHA-tagged (N-terminus)**HTR05A0000 5-hydroxytryptamine (serotonin) receptor 5A (HTR5A)**

GenBank Accession # AF498985: Human 5-hydroxytryptamine (serotonin) receptor HTR5A (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1070 bp.

HTR05ATN00 5-hydroxytryptamine (serotonin) receptor 5A (HTR5A) 3xHA-tagged (N-terminus)**HTR0600000 5-hydroxytryptamine (serotonin) receptor 6 (HTR6)**

GenBank ACC# AY429105: 5-hydroxytryptamine (serotonin) receptor 6 (HTR6) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human brain cDNA (Clontech). The insert was sequenced. Insert size= 1323bp

HTR060TN00 5-hydroxytryptamine (serotonin) receptor 6 (HTR6) 3xHA-tagged (N-terminus)**HTR07A0000 5-hydroxytryptamine (serotonin) receptor 7A (HTR7A)**

Identical to GenBank Acc# NM_000872: 5-hydroxytryptamine (serotonin) receptor 7A (HTR7A) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and Xba1 (3'). The open reading frame was amplified by PCR from IMAGE Clone # 5297325. The insert was sequenced. Insert size= 1338bp.

HTR07ATN00 5-hydroxytryptamine (serotonin) receptor 7A (HTR7A) 3xHA-tagged (N-terminus)**HTR07B0000 5-hydroxytryptamine (serotonin) receptor 7B (HTR7B)**

GenBank ACC# AY493988: 5-hydroxytryptamine (serotonin) receptor 7B (HTR7B) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XbaI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size= 1299bp.

HTR07BTN00 5-hydroxytryptamine (serotonin) receptor 7B (HTR7B) 3xHA-tagged (N-terminus)**Somatostatin Receptors****SSTR100000 Somatostatin receptor 1 (SSTR1)**

(Alternate Symbols: SRIF-2); (a.k.a: G-protein coupled receptor somatostatin receptor isoform 1). GenBank ACC# AY322536: Somatostatin receptor 1 (SSTR1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. The insert was sequenced. Insert size= 1176 bp

SSTR10TN00 Somatostatin receptor 1(SSTR1) 3xHA tagged (N-terminus)**SSTR200000 Somatostatin receptor 2 (SSTR2)**

GenBank ACC# AY236542: somatostatin receptor 2 (SSTR2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. The insert was sequenced. Insert size= 1110 bp

SSTR20TN00 Somatostatin receptor 2(SSTR2) 3xHA tagged (N-terminus)**SSTR300000 Somatostatin receptor 3 (SSTR3)**

GenBank ACC# AY322541: Somatostatin receptor 3 (SSTR3) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. The insert was sequenced. Insert size= 1257 bp

SSTR30TN00 Somatostatin receptor 3(SSTR3) 3xHA tagged (N-terminus)**SSTR400000 Somatostatin receptor 4 (SSTR4)**

GenBank ACC# AY548169: Somatostatin receptor 4 (SSTR4) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. The insert was sequenced. Insert size= 1167bp

SSTR40TN00 Somatostatin receptor 5(SSTR4) 3xHA tagged (N-terminus)**SSTR500000 Somatostatin receptor 5 (SSTR5)**

Identical to GenBank ACC# NM_001053: with the following

exception (G1044A) (Silent mutation) Somatostatin receptor 5 (SSTR5) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. The insert was sequenced. Insert size= 1095 bp

SSTR50TN00 Somatostatin receptor 5(SSTR5) 3xHA tagged (N-terminus)

Succinate Receptor

SUCNR10000 Succinate receptor 1 (SUCNR1)

(Alternate Names: GPR91). Accession number: NM_033050. Human succinate receptor 1 (SUCNR1), wild type, cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI(3'). The open reading frame was amplified by PCR from kidney cDNA. Insert size= 1160 bp.

Tachykinin Receptors

TACR100000 Tachykinin receptor 1 (TACR1)

(Alternate Symbols: SPR, NK1R, TAC1R); (a.k.a: NK-1 receptor; neurokinin 1 receptor; Tachykinin receptor 1 (substance P receptor; neurokinin-1 receptor); tachykinin 1 receptor (substance P receptor,neurokinin 1 receptor). GenBank ACC# AY462098: Tachykinin receptor 1 (TACR1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech) . The insert was sequenced. Insert size= 1224 bp

TACR10TN00 Tachykinin receptor 1 (TACR1) 3xHA tagged (N-terminus)

TACR200000 Tachykinin receptor 2 (TACR2)

(Alternate Symbols: SKR, NK2R, NK2R, TAC2R); (a.k.a: NK-2 receptor; neurokinin 2 receptor; Tachykinin receptor 2 (substance K receptor, neurokinin 2 receptor); tachykinin 2 receptor (substance K receptor, neurokinin 2 receptor). GenBank ACC# AY322545: Tachykinin receptor 2 (TACR2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XbaI (3'). The open reading frame was amplified by the PCR from human stomach cDNA (Clontech). The insert was sequenced. Insert size= 1197 bp

TACR20TN00 Tachykinin receptor 2 (TACR2) 3xHA tagged (N-terminus)

TACR300000 Tachykinin receptor 3 (TACR3)

(Alternate Symbols: NK3R, TAC3RL); (a.k.a: NK-3 receptor; neurokinin B receptor). GenBank ACC# AY462099: Tachykinin receptor 3 (TACR3) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech) The insert was sequenced. Insert size= 1398 bp

TACR30TN00 Tachykinin receptor 3 (TACR3) 3xHA tagged (N-terminus)

Thyroid Stimulating Hormone Receptor

TSHR000000 Thyroid stimulating hormone receptor (TSHR)

(A.k.a: thyrotropin receptor). GenBank ACC# AY429111: Thyroid stimulating hormone receptor (TSHR) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human thyroid cDNA (Clontech). The insert was sequenced. Insert size= 2295bp

Thyrotropin-releasing Hormone Receptor

TRHR000000 Thyrotropin-releasing hormone receptor (TRHR)

GenBank ACC# AY493373 : Thyrotropin-releasing hormone receptor (TRHR) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human pituitary cDNA (Clontech) . The insert was sequenced. Insert size= 1197bp

Trace Amine Receptors

TAR0100000 Trace Amine Receptor (TAR) 1

GenBank ACC# AY180374: Human Trace Amine Receptor (TAR) 1 (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. The insert was sequenced.

Insert size= 1020 bp

TAR010TN00 Trace Amine Receptor 1 (TAR1) 3xHA tagged (N-terminus)

TAR0300000 Trace Amine Receptor (TAR) 3

GenBank ACC# AY183469: Human Trace Amine Receptor (TAR) 3 (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. Insert size= 1047 bp

TAR030TN00 Trace Amine Receptor (TAR3) 3xHA tagged (N-terminus)

TAR0400000 Trace Amine Receptor (TAR) 4

GenBank ACC# AY183470: Human Trace Amine Receptor (TAR) 4 (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. Insert size= 1038 bp

TAR040TN00 Trace Amine Receptor 4 (TAR4) 3xHA tagged (N-terminus)

TAR0500000 Trace Amine Receptor (TAR) 5

GenBank ACC# AY183468: Human Trace Amine Receptor (TAR) 5 (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Human Genomic DNA. Insert size=1038 bp

TAR050TN00 Trace Amine Receptor 5 (TAR5) 3xHA tagged (N-terminus)

Transmembrane 7 Superfamily receptor

TM7S100000 Similar to transmembrane 7 superfamily member 1 (TM7SF1)

GenBank ACC# AY242135: Similar to transmembrane 7 superfamily member 1 (TM7SF1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by the PCR from kidney cDNA. Insert size= 1200 bp

Urotensin Receptor

UTR0200000 Urotensin-II receptor (UTR2/GPR14)

(Alternate Symbols: UTR, GPR14); (a.k.a: G protein-coupled receptor 14). Identical to GenBank Acc# NM_018949 with the following exception: (C51T) (Silent mutation). Urotensin-II receptor (UTR2/GPR14) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by PCR from human heart cDNA (Clontech). Insert size= 1170 bp.

Vasoactive Intestinal Peptide Receptor

VIPR100000 Vasoactive intestinal peptide receptor 1 (VIPR1)

(Alternate Symbols: n/a) Identical to GenBank ACC# NM_004624 with the following exception: (T444C-Silent mutation). Vasoactive Intestinal Pep Rec 1 (VIPR1) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by PCR from human lung cDNA (BioChain). Insert size= 1374 bp.

VIPR200000 Vasoactive intestinal peptide receptor 2 (VIPR2)

Identical to GenBank ACC# NM_003382 with the following exception: (C825T) (Silent mutation). Vasoactive Intestinal Pep Rec 2 (VIPR2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI(5') and XhoI (3'). The open reading frame was amplified by PCR from human placenta cDNA (Clontech). Insert size= 1317 bp.

GPCR Regulators

Arrestins

GRB Protein

RAMP Proteins

Arrestins

ARR3000000 Arrestin 3, retinal (X-arrestin) (ARR3)

(Alternate Symbols:) Accession number: NM_004312. Human arrestin 3, retinal (X-arrestin) (ARR3), wild-type, cloned into pcDNA3.1+ (Invitrogen) at HindIII (5') and XhoI (3'). The open reading frame was amplified by PCR from whole-eye cDNA. Insert was sequenced. Insert size = 1

ARRB200000 Arrestin, beta 2 (ARRB2), transcript variant 1

(Alternate Symbols:) Accession number: NM_004313. Human arrestin, beta 2 (ARRB2), transcript variant 1, wild-type, cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and EcoRI (3'). The open reading frame was amplified by PCR from lung cDNA. Insert was sequenced. Insert size = 1230.

GRB Protein

GRB0200000 GRB2

Human growth factor receptor-bound protein 2 (GRB2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 660 bp.

RAMP Proteins

RAMP1000000 Receptor (calcitonin) activity modifying protein 1 (RAMP1)

(a.k.a: Calcitonin receptor-like receptor activity modifying protein 1). GeneBank Accession # AY265457. RAMPs are required to transport calcitonin-receptor-like receptor (CRLR) to the plasma membrane. CRLR, a receptor with seven transmembrane domains, can function as either a calcitonin-gene-related peptide (CGRP) receptor or an adrenomedullin receptor, depending on which members of the RAMP family are expressed. In the presence of this (RAMP1) protein, CRLR functions as a CGRP receptor. The RAMP1 protein is involved in the terminal glycosylation, maturation, and presentation of the CGRP receptor to the cell surface. Receptor (calcitonin) activity modifying protein 1 (RAMP1) (wild type) cloned into pcDNA3.1 (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human Lung cDNA (Clontech). The insert was sequenced. Insert size= 447.

RAMP10TN00 Receptor (calcitonin) activity modifying protein 1 (RAMP1) 3xHA tagged (N-terminus)

RAMP2000000 Receptor (calcitonin) activity modifying protein 2 (RAMP2)

(a.k.a: receptor-activity-modifying protein 2 calcitonin receptor-like receptor activity modifying protein 2). GeneBank Accession # AY265458. RAMPs are type I transmembrane proteins with an extracellular N terminus and a cytoplasmic C terminus. RAMPs are required to transport calcitonin-receptor-like receptor (CRLR) to the plasma membrane. CRLR, a receptor with seven transmembrane domains, can function as either a calcitonin-gene-related peptide (CGRP) receptor or an adrenomedullin receptor, depending on which members of the RAMP family are expressed. In the presence of this (RAMP2) protein, CRLR functions as an adrenomedullin receptor. The RAMP2 protein is involved in core glycosylation and transportation of adrenomedullin receptor to the cell surface. Receptor (calcitonin) activity modifying protein 2 (RAMP2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human Heart cDNA (Clontech). The insert was sequenced. Insert size= 528

RAMP20TN00 Receptor (calcitonin) activity modifying protein 2 (RAMP2) 3xHA tagged (N-terminus)

RAMP3000000 Receptor (calcitonin) activity modifying protein 3 (RAMP3)

(a.k.a: receptor-activity-modifying protein 3 calcitonin receptor-like receptor activity modifying protein 3). GeneBank Accession # AY265459. RAMPs are type I transmembrane proteins with an extracellular N terminus and a cytoplasmic C terminus. RAMPs are required to transport calcitonin-receptor-like receptor (CRLR) to the plasma membrane. CRLR, a receptor with seven transmembrane domains, can function as either a calcitonin-gene-related peptide (CGRP) receptor or an adrenomedullin receptor, depending on which members of the RAMP family are expressed. In the presence of this (RAMP3) protein, CRLR functions as an adrenomedullin receptor. Receptor (calcitonin) activity modifying protein 3 (RAMP3) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human Fetus cDNA (Clontech). The insert was sequenced. Insert size= 447

RAMP30TN00 Receptor (calcitonin) activity modifying protein 3 (RAMP3) 3xHA tagged (N-terminus)

Heterotrimeric G-proteins**Alpha subunits**

Wild-Type	Native G-protein alpha subunits
pDNR-1r	Native G-protein alpha subunits in pDNR-1r vector
PTX-R Mutants	G-protein alpha subunits resistant to Pertussis toxin due to mutation of a cysteine (C) to either isoleucine (I), glycine (G) or a serine (S), as indicated.
QL Mutants	G-protein alpha subunits with constitutively active phenotype due to a glutamine (Q) to leucine (L) mutation, which eliminates GTPase activity.
XTP Mutants	G-protein alpha subunits with dominant negative phenotype due to double glutamine (Q) to leucine (L) and aspartate (D) to asparagine (N) mutations.
EE-Tagged	G-protein alpha subunits epitope-tagged with an internal glutamate-glutamate epitope
GT Mutants	G-protein alpha subunits with dominant negative phenotype due to a glycine (G) to threonine (T) mutation
QL/EE-Tagged	G-protein alpha subunits with constitutively active

Alpha Subunits Wild-Type. Native G-protein alpha subunits**GNA0L00000 G-protein alpha olf**

GenBank Accession # AF493893: Human G-protein alpha olf subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1150 bp.

GNA00A0000 G-protein alpha oA

GenBank Accession # AF493894: Human G-protein alpha oA subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and Xba I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1070 bp.

GNA00B0000 G-protein alpha oB

GenBank Accession # AF493895: Human G-protein alpha oB subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and Xba I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1070 bp.

GNA0Q00000 G-protein alpha q

GenBank Accession # AF493896: Human G-protein alpha q subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (46381). The insert was sequenced. Insert size = 1085 bp.

GNA0SL0000 G-protein alpha S long

GenBank Accession # AF493897: Human G-protein alpha s long subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (2448174). The insert was sequenced. Insert size = 1195 bp.

GNA0SS0000 G-protein alpha S short

GenBank Accession # AF493898: Human G-protein alpha s short subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (2178802). The insert was sequenced. Insert size = 1150 bp.

GNA0Z00000 G-protein alpha z

GenBank Accession # AF493899: Human G-protein alpha z subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA. The insert was sequenced. Insert size = 1075 bp.

GNA1100000 G-protein alpha 11

GenBank Accession # AF493900: Human G-protein alpha 11

subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (669438). The insert was sequenced. Insert size = 1085 bp.

GNA1200000 G-protein alpha 12

GenBank Accession # AF493901: Human G-protein alpha 12 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1150 bp.

GNA1300000 G-protein alpha 13

GenBank Accession # AF493902: Human G-protein alpha 13 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and Xba I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA. The insert was sequenced. Insert size = 1140 bp.

GNA1400000 G-protein alpha 14

GenBank Accession # AF493903: Human G-protein alpha 14 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (299064). The insert was sequenced. Insert size = 1075 bp.

GNA1500000 G-protein alpha 15 (16)

GenBank Accession # AF493904: Human G-protein alpha 15 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (2204272). The insert was sequenced. Insert size = 1130 bp.

GNA1100000 G-protein alpha i1

GenBank Accession # AF493905: Human G-protein alpha i1 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (1903020). The insert was sequenced. Insert size = 1080 bp.

GNA1200000 G-protein alpha i2

GenBank Accession # AF493906: Human G-protein alpha i2 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (2208983). The insert was sequenced. Insert size = 1075 bp.

GNA1300000 G-protein alpha i3

GenBank Accession # AF493907: Human G-protein alpha i3 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (1687117). The insert was sequenced. Insert size = 1075 bp.

GNA100000 G-protein alpha transducin rod

GenBank Accession # AF493908: Human G-protein alpha transducin rod subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and Xba I (3'). The open reading frame was amplified by the PCR from IMAGE clone (222533). The insert was sequenced. Insert size = 1060 bp.

GNA200000 G-protein alpha transducin cone

GenBank Accession # AF493909: Human G-protein alpha transducin cone subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (2109792). The insert was sequenced. Insert size = 1070 bp.

Alpha Subunits Wild Type in pDNR-1r. Native G-protein alpha subunits in pDNR-1r vector**GNA00A0001 G-protein alpha oA (pDNR-1r)**

Human G-protein alpha oA subunit (wild type) GNA00A0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493894. Insert size = 1070 bp.

GNA00B0001 G-protein alpha oB (pDNR-1r)

Human G-protein alpha oB subunit (wild type) GNA00B0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493895. Insert size = 1070 bp.

GNA00Q0001 G-protein alpha q (pDNR-1r)

Human G-protein alpha q subunit (wild type) GNA00Q0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493896. Insert size = 1085 bp.

GNA00SL0001 G-protein alpha s long (pDNR-1r)

Human G-protein alpha s long subunit (wild type) GNA00SL0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493897. Insert size = 1195 bp.

GNA00SS0001 G-protein alpha s short (pDNR-1r)

Human G-protein alpha s short subunit (wild type) GNA00SS0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493898. Insert size = 1150 bp.

GNA00Z0001 G-protein alpha z (pDNR-1r)

Human G-protein alpha z subunit (wild type) GNA00Z00000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493899. Insert size = 1075 bp.

GNA1100001 G-protein alpha 11 (pDNR-1r)

Human G-protein alpha 11 subunit (wild type) GNA1100000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall

and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493900. Insert size = 1085 bp.

GNA1200001 G-protein alpha 12 (pDNR-1r)

Human G-protein alpha 12 subunit (wild type) GNA1200000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493901. Insert size = 1150 bp.

GNA1300001 G-protein alpha 13 (pDNR-1r)

Human G-protein alpha 13 subunit (wild type) GNA1300000 cloned into pDNR-1r (Clontech) at SmaI (5') and XbaI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493902. Insert size = 1140 bp.

GNA1400001 G-protein alpha 14 (pDNR-1r)

Human G-protein alpha 14 subunit (wild type) GNA1400000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493903. Insert size = 1075 bp.

GNA1500001 G-protein alpha 15 (16) (pDNR-1r)

Human G-protein alpha 15 subunit (wild type) GNA1500000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493904. Insert size = 1130 bp.

GNAI100001 Human G-protein alpha i1 subunit (pDNR-1r)

Human G-protein alpha i1 subunit (wild type) GNAI100000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493905. Insert size = 1080 bp.

GNAI200001 G-protein alpha i2 (pDNR-1r)

Human G-protein alpha i2 subunit (wild type) GNAI200000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493906. Insert size = 1075 bp.

GNAI300001 G-protein alpha i3 (pDNR-1r)

Human G-protein alpha i3 subunit (wild type) GNAI300000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493907. Insert size = 1075 bp.

GNA100001 G-protein alpha transducin rod (pDNR-1r)

Human G-protein alpha transducin rod subunit (wild type) GNA100000 cloned into pDNR-1r (Clontech) at SmaI (5') and XbaI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493908. Insert size = 1060 bp.

GNA200001 G-protein alpha transducin cone (pDNR-1r)

Human G-protein alpha transducin cone subunit (wild type)

GNAT200001 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493909. Insert size = 1070 bp.

Alpha Subunit PTX-Resistant Mutants. G-protein alpha subunits resistant to Pertussis toxin due to mutation of a cysteine (C) to either isoleucine (I), glycine (G) or a serine (S), as indicated.

GNA00A00P0 G-protein alpha oA C351I

The C351I mutation was introduced into the human G-protein alpha oA subunit (GNA00A0000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1070 bp.

GNA00A00Q0 G-protein alpha oA C351G

The C351G mutation was introduced into the human G-protein alpha oA subunit (GNA00A0000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1070 bp.

GNA00A00R0 G-protein alpha oA C351S

The C351S mutation was introduced into the human G-protein alpha oA subunit (GNA00A0000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1070 bp.

GNA00B00P0 G-protein alpha oB C351I

The C351I mutation was introduced into the human G-protein alpha oB subunit (GNA00B00000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1070 bp.

GNA00B00Q0 G-protein alpha oB C351G

The C351G mutation was introduced into the human G-protein alpha oB subunit (GNA00B00000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1070 bp.

GNA00B00R0 G-protein alpha oB C351S

The C351S mutation was introduced into the human G-protein alpha oB subunit (GNA00B00000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1070 bp.

GNAI1000P0 G-protein alpha i1 C351I

The C351I mutation was introduced into the human G-protein alpha i1 subunit (GNAI100000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1080 bp.

GNAI1000Q0 G-protein alpha i1 C351G

The C351G mutation was introduced into the human G-protein alpha i1 subunit (GNAI100000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1080 bp.

GNAI1000R0 G-protein alpha i1 C351S

The C351S mutation was introduced into the human G-protein alpha i1 subunit (GNAI100000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1080 bp.

GNAI2000P0 G-protein alpha i2 C352I

The C352I mutation was introduced into the human G-protein alpha i2 subunit (GNAI200000) via the Quickchange

mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1075 bp.

GNAI2000Q0 G-protein alpha i2 C352G

The C352G mutation was introduced into the human G-protein alpha i2 subunit (GNAI200000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1075 bp.

GNAI2000R0 G-protein alpha i2 C352S

The C352S mutation was introduced into the human G-protein alpha i2 subunit (GNAI200000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1075 bp.

GNAI3000P0 G-protein alpha i3 C351I

The C351I mutation was introduced into the human G-protein alpha i3 subunit (GNAI300000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1080 bp.

GNAI3000Q0 G-protein alpha i3 C351G

The C351G mutation was introduced into the human G-protein alpha i3 subunit (GNAI300000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1080 bp.

GNAI3000R0 G-protein alpha i3 C351S

The C351S mutation was introduced into the human G-protein alpha i3 subunit (GNAI300000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1080 bp.

GNAT1000P0 G-protein alpha transducin rod C347I

The C347I mutation was introduced into the human G-protein alpha transducin rod subunit (GNAT100000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1060 bp.

GNAT1000Q0 G-protein alpha transducin rod C347G

The C347G mutation was introduced into the human G-protein alpha transducin rod subunit (GNAT100000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1060 bp.

GNAT1000R0 G-protein alpha transducin rod C347S

The C347S mutation was introduced into the human G-protein alpha transducin rod subunit (GNAT100000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1060 bp.

GNAT2000P0 G-protein alpha transducin cone C351I

The C351I mutation was introduced into the human G-protein alpha transducin cone (GNAT200000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1070 bp.

GNAT2000Q0 G-protein alpha transducin cone C351G

The C351G mutation was introduced into the human G-protein alpha transducin cone (GNAT200000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1070 bp.

GNAT2000R0 G-protein alpha transducin cone C351S

The C351S mutation was introduced into the human G-protein alpha transducin cone (GNAT200000) via the Quickchange mutagenesis kit (Stratagene). The mutation eliminates sensitivity to pertussis toxin. Insert size = 1070 bp.

Alpha Subunits QL Mutants. G-protein alpha subunits with constitutively active phenotype due to a glutamine (Q) to leucine (L) mutation, which eliminates GTPase activity.

GNA0L000C0 G-protein alpha olf Q214L

The Q214L mutation was introduced into the human G-protein alpha olf (GNA0L00000) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1150 bp.

GNA00A00C0 G-protein alpha oA Q205L

The Q205L mutation was introduced into the human G-protein alpha oA (GNA00A00000) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1070 bp.

GNA00B00C0 G-protein alpha oB Q205L

The Q205L mutation was introduced into the human G-protein alpha oB (GNA00B00000) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1070 bp.

GNA0Q000C0 G-protein alpha q Q209L

The Q209L mutation was introduced into the human G-protein alpha q subunit (GNA0Q00000) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1085 bp.

GNA0SL00C0 G-protein alpha s long Q227L

The Q227L mutation was introduced into the human G-protein alpha s long subunit (GNA0SL00000) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1195 bp.

GNA0SS00C0 G-protein alpha s short Q213L

The Q213L mutation was introduced into the human G-protein alpha s short subunit (GNA0SS00000) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1070 bp.

GNA0Z000C0 G-protein alpha z Q205L

The Q205L mutation was introduced into the human G-protein alpha z (GNA0Z00000) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1075 bp.

GNA11000C0 G-protein alpha 11 Q209L

The Q209L mutation was introduced into the human G-protein alpha 11 subunit (GNA1100000) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1085 bp.

GNA12000C0 G-protein alpha 12 Q231L

The Q231L mutation was introduced into the human G-protein alpha 12 (GNA1200000) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1150 bp.

GNA13000C0 G-protein alpha 13 Q226L

The Q226L mutation was introduced into the human G-protein alpha 13 subunit (GNA1300000) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1140 bp.

GNA14000C0 G-protein alpha 14 Q205L

The Q205L mutation was introduced into the human G-protein alpha 14 (GNA1400000) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1075 bp.

GNA15000C0 G-protein alpha 15 Q212L

The Q212L mutation was introduced into the human G-protein alpha 15 (GNA1500000) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1130 bp.

GNAI1000C0 G-protein alpha i1 Q204L

The Q204L mutation was introduced into the human G-protein alpha i1 subunit (GNAI1000000) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1080 bp.

GNAI2000C0 G-protein alpha i2 Q205L

The Q205L mutation was introduced into the human G-protein alpha i2 subunit (GNAI2000000) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1075 bp.

GNAI3000C0 G-protein alpha i3 Q204L

The Q204L mutation was introduced into the human G-protein alpha i3 subunit (GNAI3000000) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1075 bp.

GNAT1000C0 G-protein alpha transducin rod Q200L

The Q200L mutation was introduced into the human G-protein alpha transducin rod (GNAT1000000) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1060 bp.

GNAT2000C0 G-protein alpha transducin cone Q204L

The Q204L mutation was introduced into the human G-protein alpha transducin cone subunit (GNAT2000000) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1070 bp.

Alpha Subunit XTP Mutants. G-protein alpha subunits with dominant negative phenotype due to double glutamine (Q) to leucine (L) and aspartate (D) to asparagine (N) mutations.

GNA0L000X0 G-protein alpha olf Q214L/D282N

The Q214L and D282N mutations were introduced into the human G-protein alpha olf subunit (GNA0L00000) via the Quickchange mutagenesis kit (Stratagene). The mutations confer a preference for xanthine nucleotide binding. Insert size = 1150 bp.

GNA00A00X0 G-protein alpha oA Q205L/D273N

The Q205L and D273N mutations were introduced into the human G-protein alpha oA subunit (GNA00A00000) via the Quickchange mutagenesis kit (Stratagene). The mutations confer a preference for xanthine nucleotide binding. Insert size = 1070 bp.

GNA00B00X0 G-protein alpha oB Q205L/D273N

The Q205L and D273N mutations were introduced into the human G-protein alpha oB subunit (GNA00B00000) via the Quickchange mutagenesis kit (Stratagene). The mutations

confer a preference for xanthine nucleotide binding. Insert size = 1070 bp.

GNA0Q000X0 G-protein alpha q Q209L/D277N

The Q209L and D277N mutations were introduced into the human G-protein alpha q subunit (GNA0Q00000) via the Quickchange mutagenesis kit (Stratagene). The mutations confer a preference for xanthine nucleotide binding. Insert size = 1085 bp.

GNA0SL00X0 G-protein alpha S long Q227L/D295N

The Q213L and D281N mutations were introduced into the human G-protein alpha s short subunit (GNA0SS0000) via the Quickchange mutagenesis kit (Stratagene). The mutations confer a preference for xanthine nucleotide binding. Insert size = 1150 bp.

GNA0SS00X0 G-protein alpha S short Q213L/D281N

The Q213L and D281N mutations were introduced into the human G-protein alpha s short subunit (GNA0SS0000) via the Quickchange mutagenesis kit (Stratagene). The mutations confer a preference for xanthine nucleotide binding. Insert size = 1150 bp.

GNA0Z000X0 G-protein alpha z Q205L/D273N

The Q205L and D273N mutations were introduced into the human G-protein alpha z subunit (GNA0Z00000) via the Quickchange mutagenesis kit (Stratagene). The mutations confer a preference for xanthine nucleotide binding. Insert size = 1075 bp.

GNA11000X0 G-protein alpha 11 Q209L/D277N

The Q209L and D277N mutations were introduced into the human G-protein alpha 11 subunit (GNA11000000) via the Quickchange mutagenesis kit (Stratagene). The mutations confer a preference for xanthine nucleotide binding. Insert size = 1085 bp.

GNA12000X0 G-protein alpha 12 Q231L/D299N

The Q231L and D299N mutations were introduced into the human G-protein alpha 12 (GNA12000000) via the Quickchange mutagenesis kit (Stratagene). The mutations confer a preference for xanthine nucleotide binding. Insert size = 1150 bp.

GNA13000X0 G-protein alpha 13 Q226L/D294N

The Q226L and D294N mutations were introduced into the human G-protein alpha 13 subunit (GNA13000000) via the Quickchange mutagenesis kit (Stratagene). The mutations confer a preference for xanthine nucleotide binding. Insert size = 1140 bp.

GNA14000X0 G-protein alpha 14 Q205L/D273N

The Q205L and D273N mutations were introduced into the human G-protein alpha 14 (GNA14000000) via the Quickchange mutagenesis kit (Stratagene). The mutations confer a preference for xanthine nucleotide binding. Insert size = 1075 bp.

GNA15000X0 G-protein alpha 15(16) Q212L/D280N

The Q212L and D280N mutations were introduced into the human G-protein alpha 15 subunit (GNA15000000) via the Quickchange mutagenesis kit (Stratagene). The mutations confer a preference for xanthine nucleotide binding. Insert size = 1130 bp.

GNA11000X0 G-protein alpha i1 Q204L/D272N

The Q204L and D272N mutations were introduced into the human G-protein alpha i1 subunit (GNA11000000) via the Quickchange mutagenesis kit (Stratagene). The mutations confer a preference for xanthine nucleotide binding. Insert size = 1080 bp.

GNAI2000X0 G-protein alpha i2 Q205L/D273N

The Q205L and D273N mutations were introduced into the human G-protein alpha i2 subunit (GNAI2000000) via the Quickchange mutagenesis kit (Stratagene). The mutations confer a preference for xanthine nucleotide binding. Insert size = 1075 bp.

GNAI3000X0 G-protein alpha i3 Q204L/D272N

The Q204L and D272N mutations were introduced into the human G-protein alpha i3 subunit (GNAI3000000) via the Quickchange mutagenesis kit (Stratagene). The mutations confer a preference for xanthine nucleotide binding. Insert size = 1075 bp.

GNAT1000X0 G-protein alpha transducin rod Q200L/D268N

The Q200L and D268N mutations were introduced into the human G-protein alpha transducin rod subunit (GNAT1000000) via the Quickchange mutagenesis kit (Stratagene). The mutations confer a preference for xanthine nucleotide binding. Insert size = 1060 bp.

GNAT2000X0 G-protein alpha transducin cone Q204L/D272N

The Q204L and D272N mutations were introduced into the human G-protein alpha transducin cone subunit (GNAT2000000) via the Quickchange mutagenesis kit (Stratagene). The mutations confer a preference for xanthine nucleotide binding. Insert size = 1070 bp.

Alpha Subunits EE-Tagged. G-protein alpha subunits epitope-tagged with an internal glutamate-glutamate epitope.

GNA0L0EI00 G-protein alpha olf EE tagged (internal)

An internal Glu-Glu epitope tag (see reference above) was introduced into the human G-protein alpha olf subunit (wild type;GNA0L000000) via the Quickchange mutagenesis kit (Stratagene). Residues DYTPTD (176-181) were mutated to EYMPTE.

GNA0OAEI00 G-protein alpha oA EE tagged (internal)

An internal Glu-Glu epitope tag (see reference above) was introduced into the human G-protein alpha oA subunit (wild type;GNA0OA0000) via the Quickchange mutagenesis kit (Stratagene). Residues DYQPTE (167-172) were mutated to EYMPTE.

GNA0OBEI00 G-protein alpha oB EE-tagged (internal)

An internal Glu-Glu epitope tag was introduced into the human G-protein alpha oB subunit (wild type;GNA0OB00000) via the Quickchange mutagenesis kit (Stratagene). Residues DYQPTE (167-172) were mutated to EYMPTE.

GNA0Q0EI00 G-protein alpha q EE tagged (internal)

An internal Glu-Glu epitope tag (see reference above) was introduced into the human G-protein alpha q subunit (wild type;GNA0Q00000) via the Quickchange mutagenesis kit (Stratagene). Residues AYLPTQ (171-176) were mutated to EYMPTE.

GNA0SLEI00 G-protein alpha S long EE tagged (internal)

An internal Glu-Glu epitope tag (see reference above) was introduced into the human G-protein alpha s long subunit (wild type;GNA0SL00000) via the Quickchange mutagenesis kit (Stratagene). Residues DYVPSD (189-194) were mutated to EYMPTE.

GNA0SSEI00 G-protein alpha S short EE tagged (internal)

An internal Glu-Glu epitope tag (see reference above) was introduced into the human G-protein alpha olf subunit (wild

type;GNA0SS0000) via the Quickchange mutagenesis kit (Stratagene). Residues DYVPSD (175-180) were mutated to EYMPTE.

GNA0Z0EI00 G-protein alpha z EE tagged (internal)

An internal Glu-Glu epitope tag (see reference above) was introduced into the human G-protein alpha transducin rod subunit (wild type;GNA0Z00000) via the Quickchange mutagenesis kit (Stratagene). Residues DYIPTV (167-172) were mutated to EYMPTE.

GNA110EI00 G-protein alpha 11 EE tagged (internal)

An internal Glu-Glu epitope tag (see reference above) was introduced into the human G-protein alpha 11 subunit (wild type;GNA110000) via the Quickchange mutagenesis kit (Stratagene). Residues GYLPTQ (171-176) were mutated to EYMPTE.

GNA120EI00 G-protein alpha 12 EE tagged (internal)

An internal Glu-Glu epitope tag was introduced into the human G-protein alpha 12 subunit (wild type;GNA1200000) via the Quickchange mutagenesis kit (Stratagene). Residues NYFPSK (193-198) were mutated to EYMPTE.

GNA130EI00 G-protein alpha 13 EE tagged (internal)

An internal Glu-Glu epitope tag (see reference above) was introduced into the human G-protein alpha 13 subunit (wild type;GNA130000) via the Quickchange mutagenesis kit (Stratagene). Residues DYIPSQ (188-193) were mutated to EYMPTE.

GNA140EI00 G-protein alpha 14 EE tagged (internal)

An internal Glu-Glu epitope tag (see reference above) was introduced into the human G-protein alpha 14 subunit (wild type;GNA1400000) via the Quickchange mutagenesis kit (Stratagene). Residues sfvptq (167-172) were mutated to EYMPTE.

GNA150EI00 G-protein alpha 15 EE tagged (internal)

An internal Glu-Glu epitope tag (see reference above) was introduced into the human G-protein alpha 15 subunit (wild type;GNA1500000) via the Quickchange mutagenesis kit (Stratagene). Residues GYVPTA (174-179) were mutated to EYMPTE.

GNAI10EI00 G-protein alpha i1 EE tagged (internal)

An internal Glu-Glu epitope tag (see reference above) was introduced into the human G-protein alpha olf subunit (wild type;GNAI100000) via the Quickchange mutagenesis kit (Stratagene). Residues NYIPTQ (166-171) were mutated to EYMPTE.

GNAI20EI00 G-protein alpha i2 EE tagged (internal)

An internal Glu-Glu epitope tag (see reference above) was introduced into the human G-protein alpha i2 subunit (wild type;GNAI200000) via the Quickchange mutagenesis kit (Stratagene). Residues DYIPTQ (167-172) were mutated to EYMPTE.

GNAI30EI00 G-protein alpha i3 EE tagged (internal)

An internal Glu-Glu epitope tag (see reference above) was introduced into the human G-protein alpha i3 subunit (wild type;GNAI300000) via the Quickchange mutagenesis kit (Stratagene). Residues nYIPTQ (166-171) were mutated to EYMPTE.

GNAT10EI00 G-protein alpha transducin rod EE tagged (internal)

An internal Glu-Glu epitope tag (see reference above) was introduced into the human G-protein alpha transducin rod

subunit (wild type;GNAT100000) via the Quickchange mutagenesis kit (Stratagene). Residues GYVPTE (162-167) were mutated to EYMPTE.

GNAT20EI00 G-protein alpha transducin cone EE tagged (internal)

An internal Glu-Glu epitope tag (see reference above) was introduced into the human G-protein alpha transducin cone subunit (wild type;GNAT200000) via the Quickchange mutagenesis kit (Stratagene). Residues EYLPSE (166-171) were mutated to EYMPTE.

Alpha Subunits GT Mutants. G-protein alpha subunits with dominant negative phenotype due to a glycine (G) to threonine (T) mutation

GNA00A00T0 G-protein alpha oA G203T

The G203T mutation was introduced into the human G-protein alpha oA subunit (GNA00A0000) via the Quickchange mutagenesis kit (Stratagene). The mutation produces a putatively dominant-negative phenotype. Insert size = 1070 bp.

GNA00B00T0 G-protein alpha oB G203T

The G203T mutation was introduced into the human G-protein alpha oB subunit (GNA00B0000) via the Quickchange mutagenesis kit (Stratagene). The mutation produces a putatively dominant-negative phenotype. Insert size = 1070 bp.

GNAI1000T0 G-protein alpha i1 G202T

The G202T mutation was introduced into the human G-protein alpha i1 subunit (GNAI100000) via the Quickchange mutagenesis kit (Stratagene). The mutation produces a putatively dominant-negative phenotype. Insert size = 1075 bp.

GNAI2000T0 G-protein alpha i2 G203T

The G203T mutation was introduced into the human G-protein alpha i2 subunit (GNAI200000) via the Quickchange mutagenesis kit (Stratagene). The mutation produces a putatively dominant-negative phenotype. Insert size = 1075 bp.

GNAI3000T0 G-protein alpha i3 G202T

The G202T mutation was introduced into the human G-protein alpha i3 subunit (GNAI300000) via the Quickchange mutagenesis kit (Stratagene). The mutation produces a putatively dominant-negative phenotype. Insert size = 1075 bp.

Alpha Subunits QL/EE-Tagged. G-protein alpha subunits with constitutively active phenotype and an internal glutamate-glutamate epitope

GNA0L0EIC0 G-protein alpha olf Q214L EE-tagged (internal)

The Q214L mutation was introduced into the internally Glu-Glu epitope tagged human G-protein alpha olf (GNA0L0EI00) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1150 bp.

GNA00AEIC0 G-protein alpha oA Q205L EE-tagged (internal)

The Q205L mutation was introduced into the internally Glu-Glu epitope tagged human G-protein alpha oA (GNA00AEI00) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1070 bp.

GNA00BEIC0 G-protein alpha oB Q205L EE-tagged (internal)

The Q205L mutation was introduced into the internally Glu-Glu epitope tagged human G-protein alpha oB (GNA00BEI00) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1070 bp.

GNA0Q0EIC0 G-protein alpha q Q209L EE-tagged (internal)

The Q209L mutation was introduced into the internally Glu-Glu epitope tagged human G-protein alpha q (GNA0Q0EI00) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1085 bp.

GNA0SLEIC0 G-protein alpha S long Q227L EE-tagged (internal)

The Q227L mutation was introduced into the internally Glu-Glu epitope tagged human G-protein alpha S long (GNA0SLEI00) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1195 bp.

GNA0SSEIC0 G-protein alpha S short Q213L EE-tagged (internal)

The Q213L mutation was introduced into the internally Glu-Glu epitope tagged human G-protein alpha S short (GNA0SSEI00) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1150 bp.

GNA0Z0EIC0 G-protein alpha z Q205L EE-tagged (internal)

The Q205L mutation was introduced into the internally Glu-Glu epitope tagged human G-protein alpha z (GNA0Z0EI00) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1075 bp.

GNA110EIC0 G-protein alpha 11 Q209L EE-tagged (internal)

The Q209L mutation was introduced into the internally Glu-Glu epitope tagged human G-protein alpha 11 (GNA110EI00) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1085 bp.

GNA120EIC0 G-protein alpha 12 Q231L EE-tagged (internal)

The Q231L mutation was introduced into the internally Glu-Glu epitope tagged human G-protein alpha 12 (GNA120EI00) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1150 bp.

GNA130EIC0 G-protein alpha 13 Q226L EE-tagged (internal)

The Q226L mutation was introduced into the internally Glu-Glu epitope tagged human G-protein alpha 13 (GNA130EI00) via the

Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1140 bp.

GNA140EIC0 G-protein alpha 14 Q205L EE-tagged (internal)

The Q205L mutation was introduced into the internally Glu-Glu epitope tagged human G-protein alpha 14 (GNA140EI00) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1075 bp.

GNA150EIC0 G-protein alpha 15 Q212L EE-tagged (internal)

The Q212L mutation was introduced into the internally Glu-Glu epitope tagged human G-protein alpha 15 (GNA150EI00) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1130 bp.

GNA110EIC0 G-protein alpha i1 Q204L EE-tagged (internal)

The Q204L mutation was introduced into the internally Glu-Glu epitope tagged human G-protein alpha i1 (GNA110EI00) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1080 bp.

GNAI20EIC0 G-protein alpha i2 Q205L EE-tagged (internal)

The Q205L mutation was introduced into the internally Glu-Glu epitope tagged human G-protein alpha i2 (GNAI20EI00) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1075 bp.

GNAI30EIC0 G-protein alpha i3 Q204L EE-tagged (internal)

The Q204L mutation was introduced into the internally Glu-Glu epitope tagged human G-protein alpha i3 (GNAI30EI00) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1075 bp.

GNAT10EIC0 G-protein alpha transducin rod Q200L EE-tagged (internal)

The Q200L mutation was introduced into the internally Glu-Glu epitope tagged human G-protein alpha transducin rod (GNAT10EI00) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1060 bp.

GNAT20EIC0 G-protein alpha transducin cone Q204L EE-tagged (internal)

The Q204L mutation was introduced into the internally Glu-Glu epitope tagged human G-protein alpha transducin cone (GNAT20EI00) via the Quickchange mutagenesis kit (Stratagene). The mutation reduces GTPase activity resulting in a constitutively active phenotype. Insert size = 1070 bp.

Heterotrimeric G-proteins**Beta subunits**

Wild-Type	Native G-protein beta subunits
FLAG-Tagged	Native G-protein beta subunits with an N-terminal FLAG epitope tag
pDNR-1r	Native G-protein beta subunits in pDNR-1r vector

Beta Wild-Type. Native G-protein beta subunits**GNB0100000 G-protein beta 1**

GenBank Accession # AF501882: Human G-protein beta 1 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (2001658). The insert was sequenced. Insert size = 1025 bp.

GNB0200000 G-protein beta 2

GenBank Accession # AF501883: Human G-protein beta 2 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (1962114). The insert was sequenced. Insert size = 1025 bp.

GNB0300000 G-protein beta 3

GenBank Accession # AF501884: Human G-protein beta 3 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1025 bp.

GNB03S0000 G-protein beta 3S

Human G-protein beta 3s subunit (splice variant) cloned into pcDNA3.1+ (Invitrogen) at EcoR I (5') and Not I (3'). The open reading frame was constructed by the PCR from G-protein beta 3 wt. The insert was sequenced. Insert size = 900 bp.

GNB0400000 G-protein beta 4

GenBank Accession # AF300648: Human G-protein beta 4 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced and the translated protein found to be similar to mouse beta 4. Insert size = 1025 bp.

GNB040000M G-protein beta 4 (mouse)

GenBank Accession # AF501886: Mouse G-protein beta 4 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (457406). The insert was sequenced. Insert size = 1040 bp.

GNB0500000 G-protein beta 5

GenBank Accession # AF501885: Human G-protein beta 5 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (37537). The insert was sequenced. Insert size = 1070 bp.

GNB05L0000 G-protein beta 5L

GenBank Accession # AF300650: Human G-protein beta 5L subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human retinal cDNA (Clontech). N-terminal primer sequence derived from EST clone AA317427. The insert was sequenced. 41 out of the 42 additional predicted N-terminal amino acids are identical to mouse G-beta 5L (M87286). Insert size = 1200 bp.

Beta FLAG-Tagged. Native G-protein beta subunits with an N-terminal FLAG epitope tag**GNB010FN00 G-protein beta 1 FLAG-tagged (N-terminus)**

N-terminal FLAG-tagged human G-protein beta 1 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was derived from GNB0100000 by the PCR. Insert size = 1050 bp.

GNB020FN00 G-protein beta 2 FLAG-tagged (N-terminus)

N-terminal FLAG-tagged human G-protein beta 2 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was derived from GNB0200000 by the PCR. Insert size = 1050 bp.

GNB030FN00 G-protein beta 3 FLAG-tagged (N-terminus)

N-terminal FLAG-tagged human G-protein beta 3 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was derived from GNB0300000 by the PCR. Insert size = 1050 bp.

GNB03SFN00 G-protein beta 3S FLAG-tagged (N-terminus)

N-terminal FLAG-tagged human G-protein beta 3s subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was derived from GNB03S0000 by the PCR. Insert size = 930 bp.

GNB040FN00 G-protein beta 4 FLAG-tagged (N-terminus)

N-terminal FLAG-tagged human G-protein beta 4 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was derived from GNB0400000 by the PCR. Insert size = 1050 bp.

GNB050FN00 G-protein beta 5 FLAG-tagged (N-terminus)

N-terminal FLAG-tagged human G-protein beta 5 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was derived from GNB0500000 by the PCR. Insert size = 1100 bp.

GNB05LFN00 G-protein beta 5L FLAG-tagged (N-terminus)

N-terminal FLAG-tagged human G-protein beta 5L subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was derived from GNB05L0000 by the PCR. Insert size = 1225 bp.

Beta Wild-Type in pDNR-1r. Native G-protein beta subunits in pDNR-1r vector**GNB0100001 G-protein beta 1 (pDNR-1r)**

Human G-protein beta 1 subunit (wild type) GNB0100000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF501882. Insert size = 1025 bp.

GNB0200001 G-protein beta 2 (pDNR-1r)

Human G-protein beta 2 subunit (wild type) GNB0200000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The

Smal site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC#AF501883. Insert size = 1025 bp.

GNB0300001 G-protein beta 3 (pDNR-1r)

Human G-protein beta 3 subunit (wild type) GNB0300000 cloned into pDNR-1r (Clontech) at Smal (5') and XhoI (3'). The Smal site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF501884. Insert size = 1025 bp.

GNB03S0001 G-protein beta 3S (pDNR-1r)

Human G-protein beta 3s subunit (splice variant) GNB03S0000 cloned into pDNR-1r (Clontech) at Smal (5') and HindIII (3'). The Smal site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical to human beta 3 wt with a 41 amino acid deletion as described by Siffert et al. Nature Genetics 18: 45-48 (1998). Insert size = 900 bp.

GNB0400001 G-protein beta 4 (pDNR-1r)

Human G-protein beta 4 subunit (wild type) GNB0400000 cloned into pDNR-1r (Clontech) at Smal (5') and XhoI (3'). The Smal site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and the translated protein found to be similar to mouse beta 4. Insert size = 1025 bp.

GNB0400002 mouse G-protein beta 4 (pDNR-1r)

Mouse G-protein beta 4 subunit (wild type) GNB040000M cloned into pDNR-1r (Clontech) at Smal (5') and XhoI (3'). The Smal site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and compared to GB ACC# AF300648. Insert size = 1040 bp.

GNB05L0001 G-protein beta 5L (pDNR-1r)

Human G-protein beta 5L subunit (wild type) GNB05L0000 cloned into pDNR-1r (Clontech) at Smal (5') and XhoI (3'). The Smal site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and bases 127- 1188 were identical with GB ACC# AF300650. 41 out of the 42 additional predicted N-terminal amino acids are identical to mouse Gbeta 5L (M87286). Insert size = 1200 bp.

The insert was sequenced and found to be identical with GB ACC# M31328 with the following exceptions: A339->G, T657->A and C825->T (all mutations are silent). Insert size = 1025 bp.

Heterotrimeric G-proteins**Gamma subunits**

Wild-Type
HA-Tagged
pDNR-1r

Native G-protein gamma subunits
 Native G-protein gamma subunits with an N-terminal hemagglutinin epitope tag
 Native G-protein gamma subunits in pDNR-1r vector

Gamma Wild-Type. Native G-protein gamma subunits**GNG0100000 G-protein gamma 1**

GenBank Accession # AF493869: Human G-protein gamma subunit 1 (wild type) cloned into pcDNA3.1+ (Invitrogen) at Kpn I (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (381155). The insert was sequenced. Insert size = 225 bp.

GNG0200000 G-protein gamma 2

GenBank Accession # AF493870: Human G-protein gamma 2 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at Kpn I (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (1408502). Predicted amino acid sequence is identical to bovine G-protein gamma 2 (M37183). The insert was sequenced. Insert size = 220 bp.

GNG0300000 G-protein gamma 3

GenBank Accession # AF493871: Human G-protein gamma 3 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at Kpn I (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (632992). The insert was sequenced. Insert size = 232 bp.

GNG0400000 G-protein gamma 4

GenBank Accession # AF493872: Human G-protein gamma 4 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at Kpn I (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (2340744). The insert was sequenced. Insert size = 232 bp.

GNG0500000 G-protein gamma 5

GenBank Accession # AF493873: Human G-protein gamma 5 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at Kpn I (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (2453124). The insert was sequenced. Insert size = 210 bp.

GNG0700000 G-protein gamma 7

GenBank Accession # AF493874: Human G-protein gamma 7 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at Kpn I (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (190059). The insert was sequenced. Insert size = 210 bp.

GNG0800000 G-protein gamma 8

GenBank Accession # AF493875: Human G-protein gamma 8 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at Kpn I (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (2207401). The insert was sequenced. Insert size = 223 bp.

GNG0900000 G-protein gamma 9

GenBank Accession # AF493876: Human G-protein gamma 9 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at Kpn I (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (1535311). The insert was sequenced. Insert size = 219 bp. Predicted amino acid sequence is 86% identical to bovine G-protein gamma 9 (U20085).

GNG1000000 G-protein gamma 10

GenBank Accession # AF493877: Human G-protein gamma 10 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at Hind III (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (290588). The insert was sequenced. Insert size = 220 bp.

GNG1100000 G-protein gamma 11

GenBank Accession # AF493878: Human G-protein gamma 11 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at Hind III (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (550119). The insert was sequenced. Insert size = 235 bp.

GNG1200000 G-protein gamma 12

GenBank Accession # AF493879: Human G-protein gamma 12 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at Kpn I (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (306388). The insert was sequenced. Insert size = 227 bp.

GNG1300000 G-protein gamma 13

GenBank Accession # AF493880: Human G-protein gamma 13 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at Kpn I (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (178213). The predicted amino acid sequence is identical to that reported by Huang et al. (1999). Insert size = 213 bp.

Gamma HA-Tagged. Native G-protein gamma subunits with an N-terminal hemagglutinin epitope tag**GNG010HN00 G-protein gamma 1 HA-tagged (N-terminus)**

N-terminal hemagglutinin tagged human G-protein gamma 1 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was derived from GNG0100000 by the PCR. Insert size = 250 bp.

GNG020HN00 G-protein gamma 2 HA-tagged (N-terminus)

N-terminal hemagglutinin tagged human G-protein gamma 2 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was derived from GNG0200000 by the PCR. Insert size = 250 bp.

GNG030HN00 G-protein gamma 3 HA-tagged (N-terminus)

N-terminal hemagglutinin tagged human G-protein gamma 3 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at Kpn I (5') and Xho I (3'). The open reading frame was derived from GNG0300000 by the PCR. Insert size = 255 bp.

GNG040HN00 G-protein gamma 4 HA tagged (N-terminus)

N-terminal hemagglutinin tagged human G-protein gamma 4 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was derived from GNG0400000 by the PCR. Insert size = 250 bp.

GNG050HN00 G-protein gamma 5 HA tagged (N-terminus)

N-terminal hemagglutinin tagged human G-protein gamma 5 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI

(5') and Xho I (3'). The open reading frame was derived from GNG0500000 by the PCR. Insert size = 250 bp.

GNG070HN00 G-protein gamma 7 HA-tagged (N-terminus)

N-terminal hemagglutinin tagged human G-protein gamma 7 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was derived from GNG0700000 by the PCR. Insert size = 240 bp.

GNG080HN00 G-protein gamma 8 HA tagged (N-terminus)

N-terminal hemagglutinin tagged human G-protein gamma 8 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was derived from GNG0800000 by the PCR. Insert size = 260 bp.

GNG090HN00 G-protein gamma 9 HA tagged (N-terminus)

N-terminal hemagglutinin tagged human G-protein gamma 9 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was derived from GNG0900000 by the PCR. Insert size = 250 bp.

GNG100HN00 G-protein gamma 10 HA tagged (N-terminus)

N-terminal hemagglutinin tagged human G-protein gamma 10 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was derived from GNG1000000 by the PCR. Insert size = 250 bp.

GNG110HN00 G-protein gamma 11 HA tagged (N-terminus)

N-terminal hemagglutinin tagged human G-protein gamma 11 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was derived from GNG1100000 by the PCR. Insert size = 250 bp.

GNG120HN00 G-protein gamma 12 HA-tagged (N-terminus)

N-terminal hemagglutinin tagged human G-protein gamma 12 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was derived from GNG1200000 by the PCR. Insert size = 250 bp.

GNG130HN00 G-protein gamma 13 HA tagged (N-terminus)

N-terminal hemagglutinin tagged human G-protein gamma 13 subunit (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was derived from GNG1300000 by the PCR. Insert size = 230 bp.

Gamma Wild-Type in pDNR-1r. Native G-protein gamma subunits in pDNR-1r vector

GNG0100001 G-protein gamma 1 (pDNR-1r)

Human G-protein gamma subunit 1 (wild type) GNG0100000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493869. Insert size = 225 bp.

GNG0200001 G-protein gamma 2 (pDNR-1r)

Human G-protein gamma subunit 2 (wild type) GNG0200000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493870. Insert size = 220 bp.

GNG0300001 G-protein gamma 3 (pDNR-1r)

Human G-protein gamma 3 subunit (wild type) cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was

sequenced and found to be identical with GB ACC#AF493871. Insert size = 232 bp.

GNG0400001 G-protein gamma 4 (pDNR-1r)

Human G-protein gamma 4 subunit (wild type) GNG0100000 cloned into pDNR-1R (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC#AF493872. Insert size = 232 bp.

GNG0500001 G-protein gamma 5 (pDNR-1r)

Human G-protein gamma 5 subunit (wild type) GNG0100000 cloned into pDNR-1r (Clontech) at SmaI(5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. The insert was sequenced and found to be identical with GB ACC# AF493873. Insert size = 210 bp.

GNG0700001 G-protein gamma 7 (pDNR-1r)

Human G-protein gamma 7 subunit (wild type) GNG0700000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC#AF493874. Insert size = 210 bp.

GNG0800001 G-protein gamma 8 (pDNR-1r)

Human G-protein gamma 8 subunit (wild type) GNG0800001 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC#AF493875. Insert size = 223 bp.

GNG0900001 G-protein gamma 9 (pDNR-1r)

Human G-protein gamma 9 subunit (wild type) GNG0900000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC#AF493876. Insert size = 219 bp. Predicted amino acid sequence is 86% identical to bovine G- protein gamma 9 (U20085).

GNG1000001 G-protein gamma 10 (pDNR-1r)

Human G-protein gamma 10 subunit (wild type) GNG1000000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493877. Insert size = 220 bp.

GNG1100001 G-protein gamma 11 (pDNR-1r)

Human G-protein gamma 11 subunit (wild type) GNG1100000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493878. Insert size = 235 bp.

GNG1200001 G-protein gamma 12 (pDNR-1r)

Human G-protein gamma 12 subunit (wild type) GNG1200000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC# AF493879. Insert size = 227 bp.

GNG1300001 G-protein gamma 13 (pDNR-1r)

Human G-protein gamma 13 subunit (wild type) GNG1300000

cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical to GB ACC# AF493880. The predicted amino acid sequence is identical to that reported by Huang et al. (1999). Insert size = 213 bp.

G Protein Regulators

AGS proteins

Activators of G protein signaling

RCC1 Proteins

Regulator of chromosome condensation 1 (RCC1) and guanine nucleotide exchange factor (GEF) for Ran proteins

RGS Proteins

Heterotrimeric G- protein GAPs; regulators of G- protein signaling (RGS) proteins

RHO GDI Proteins

Rho family guanine nucleotide dissociation inhibitor (GDI) proteins

AGS Proteins

AGS0100000 Human activator of G-protein signaling AGS1

Human activator of G-protein signaling AGS1 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 850 bp.

AGS030000R Rat activator of G-protein signaling AGS3

Rat activator of G-protein signaling AGS3 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from rat whole brain cDNA. The insert was sequenced. Insert size = 1960 bp.

AGS03L0000 Human Activator of G-protein Signaling AGS3-like

(Alternate Symbols: AGS3, GPSM1) GenBank Accession # AY173053: Human activator of G-protein signaling AGS3 (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human cDNA (Clontech). The insert was sequenced. Insert size = 1959 bp.

AGS03S000R Rat activator of G-protein signaling AGS3 short

Rat activator of G-protein signaling AGS3 short isoform (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from rat whole brain cDNA. The insert was sequenced. Insert size = 510 bp.

LGN0000000 AGS3-like (LGN)

Human LGN protein (wild type) G-protein signalling modulator 2 (AGS3-like, *C. elegans*) (GPSM2) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA. The insert was sequenced. Insert size = 2055 bp.

RCC1 Protein

RCC0100000 RCC1

Human regulator of chromosome condensation 1 RCC1 (wild type) and guanine nucleotide exchange factor (GEF) for Ran proteins. Cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (clontech). The insert was sequenced. Insert size = 1280 bp.

RGS Proteins

RGS0100000 RGS 1

Human RGS1 (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and NotI (3'). The open reading frame was amplified by the PCR from Image clone (1519345). The insert was sequenced. Insert size = 600 bp.
RGS010TN00 RGS 1 3xHA-tagged (N-terminus)

RGS0200000 RGS 2

(a.k.a: G0 to G1 switch regulatory 8, 24kD). GenBank Accession # AF493926: Human RGS2 (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Image clone (43727). The insert was sequenced. Insert size = 640 bp.

RGS020TN00 RGS 2 3xHA-tagged (N-terminus)

RGS030TN00 RGS 3 3xHA-tagged (N-terminus)

N-terminal 3X-hemagglutinin tagged human RGS3 (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was derived from RGS0300000 by the PCR. Insert size = 1670 bp.

RGS03T0000 RGS 3T

Human RGS3T (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 630 bp.

RGS03TTN00 RGS 3T 3xHA-tagged (N-terminus)

RGS0400000 RGS 4

Human RGS4 (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 620 bp.

RGS040TN00 RGS 4 3xHA-tagged (N-terminus)

RGS0500000 RGS 5

Human RGS5 (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Image clone (550112). The insert was sequenced. Insert size = 550 bp.

RGS050TN00 RGS 5 3xHA-tagged (N-terminus)

RGS0700000 RGS 7

Human RGS7 (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 1410 bp.

RGS0710000 RGS 7 (S1)

Human RGS7(S1) (wild type, splice variant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced and found to be a splice variant of GB ACC# AF090116. When compared to AF090116 the following differences were noted: 1) deletion of bp 225-385 (residues 76-128); 2) A701->G (Q234R); 3) 78 bp insertion between 1362-1363 (new 23 residue C-terminus). Insert size = 1330 bp.

RGS071TN00 RGS 7 (S1) 3xHA-tagged (N-terminus)

RGS0720000 RGS 7 (S2)

Human RGS7(S2) (wild type, splice variant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole

brain cDNA (Clontech). The insert was sequenced and found to be a splice variant of GB ACC# AF090116. When compared to AF090116 the following differences were noted: 1) A77->G (K26R); 2) 78 bp insertion between 1362-1363 (new 23 residue C-terminus). Insert size = 1490 bp.

RGS072TN00 RGS 7 (S2) 3xHA-tagged (N-terminus)

RGS0800000 RGS 8

Human RGS8 (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA. The insert was sequenced and the predicted amino acid sequence found to be 99% identical to rat RGS8. Insert size = 550 bp.

RGS080TN00 RGS 8 3xHA-tagged (N-terminus)

RGS1000000 RGS 10

Human RGS14 short (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Image clone (2275604). The insert was sequenced. Insert size = 610 bp.

RGS100TN00 RGS 10 3xHA-tagged (N-terminus)

RGS1300000 RGS 13

Human RGS13 (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Image clone (239446). The insert was sequenced. Insert size = 485 bp.

RGS130TN00 RGS 13 3xHA-tagged (N-terminus)

RGS14S0000 RGS 14 short

Human RGS14 short (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Image clone (2275604). The insert was sequenced. Insert size = 610 bp.

RGS14STN00 RGS 14 short 3xHA-tagged(N-terminus)

RGS1600000 RGS 16

Human RGS16 (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Image clone (2030792). The insert was sequenced. Insert size = 615 bp.

RGS160TN00 RGS 16 3xHA-tagged (N-terminus)

RGS1700000 RGS 17

Human RGS17 (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XbaI (3'). The open reading frame was amplified by the PCR from Human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 470 bp.

RGS170TN00 RGS 17 3xHA-tagged (N-terminus)

RGS1800000 RGS 18

RGS18 identical to Genbank ACC# NM_130782 with the

following exception (C690T) silent mutation: cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human lung cDNA (Clontech). Insert size = 708 bp.

RGS1900000 RGS 19

(a.k.a: G alpha interacting protein, guanine nucleotide binding protein alpha inhibiting activity polypeptide interacting protein). GenBank Accession # AF493939: Human RGS protein GAIP/RGS19 (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from IMAGE clone (33393). The insert was sequenced. Insert size = 660 bp.

RGS190TN00 RGS 19 3xHA-tagged (N-terminus)

RGSZ100000 RGS Z1

(a.k.a: Regulator of Gz-selective protein signaling). GenBank Accession # AF493940: Human RGSZ1/RGS20 (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from Image clone (1690771). The insert was sequenced. Insert size = 660 bp.

RGSZ10TN00 RGS Z1 3xHA-tagged (N-terminus)

RHO GDI Proteins

RH10A00000 Rho GDI alpha

Human Rho GDP dissociation inhibitor (Rho GDI alpha) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoR I (5') and Xho I (3'). The open reading frame was amplified by the PCR from Human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 625 bp

RH10B00000 Rho GDI beta

Human Rho GDP dissociation inhibitor (Rho GDI beta) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoR I (5') and Xho I (3'). The open reading frame was amplified by the PCR from Human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 615 bp.

RH10G00000 Rho GDI gamma

Human Rho GDP dissociation inhibitor (Rho GDI gamma) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoR I (5') and Xho I (3'). The open reading frame was amplified by the PCR from Human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 690 bp.

Small G-proteins

Arf family
Rab family
Ran family
Ras family
Ras-like
Rho family

Arf Family

Wild-Type

Native ADP ribosylating factors (ARF) and ARF-like (ARL) proteins

Wild -Type in pDNR-1r

Native ADP ribosylating factors (ARF) and ARF-like (ARL) proteins in pDNR-1r vector

Arf Wild-Type

ARF0100000 ARF1

GenBank Accession # AF493881: Human ADP-ribosylation factor protein ARF1 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 560 bp.

ARF0300000 ARF3

GenBank Accession # AF493882: Human ADP-ribosylation factor protein ARF3 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 560 bp.

ARF0400000 ARF4

GenBank Accession # AF493883: Human ADP-ribosylation factor protein ARF4 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 560 bp.

ARF0500000 ARF5

GenBank Accession # AF493884: Human ADP-ribosylation factor protein ARF5 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 560 bp.

ARF0600000 ARF6

GenBank Accession # AF493885: Human ADP-ribosylation factor protein ARF6 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 545 bp.

ARF0P00000 ARF protein

GenBank Accession # AF493886: Human ADP-ribosylation factor-like protein ARF protein (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 410 bp.

ARL0100000 ARL1

GenBank Accession # AF493887: Human ADP-ribosylation factor-like protein ARL1 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 560 bp.

ARL0200000 ARL2

GenBank Accession # AF493888: Human ADP-ribosylation factor-like protein ARL2 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading

frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 570 bp.

ARL0300000 ARL3

GenBank Accession # AF493889: Human ADP-ribosylation factor-like protein ARL3 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 560 bp.

ARL0400000 ARL4

GenBank Accession # AF493890: Human ADP-ribosylation factor-like protein ARL4 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 610 bp.

ARL0500000 ARL5

GenBank Accession # AF493891: Human ADP-ribosylation factor-like protein ARL5 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 550 bp.

ARL0700000 ARL7

GenBank Accession # AF493892: Human ADP-ribosylation factor-like protein ARL7 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 590 bp.

Arf Wild-Type in pDNR-1r

ARF0100001 ARF1 (pDNR-1r)

Human ADP-ribosylation factor protein ARF1 (wild type) ARF0100000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493881. Insert size = 560 bp.

ARF0400001 ARF4 (pDNR-1r)

Human ADP-ribosylation factor protein ARF4 (wild type) ARF0400000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493883. Insert size = 560 bp.

ARF0500001 ARF5 (pDNR-1r)

Human ADP-ribosylation factor protein ARF5 (wild type) ARF0500000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be

present. The insert was sequenced and found to be identical with GB ACC # AF493884. Insert size = 560 bp.

ARF0600001 ARF6 (pDNR-1r)

Human ADP-ribosylation factor protein ARF6 (wild type) ARF0600000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493885. Insert size = 545 bp.

ARL0100001 ARL1 (pDNR-1r)

Human ADP-ribosylation factor-like protein ARL1 (wild type) ARL0100000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493887. Insert size = 560 bp.

ARL0200001 ARL2 (pDNR-1r)

Human ADP-ribosylation factor-like protein ARL2 (wild type) ARL0200000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493888. Insert size = 570 bp.

ARL0300001 ARL3 (pDNR-1r)

Human ADP-ribosylation factor-like protein ARL3 (wild type) ARL0300000 cloned into pDNR-1r (Clontech) at SmaI (5') and

XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493889. Insert size = 560 bp.

ARL0400001 ARL4 (pDNR-1r)

Human ADP-ribosylation factor-like protein ARL4 (wild type) ARL0400000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493890 with the following exception:A105->T(silent). Insert size = 610 bp.

ARL0500001 ARL5 (pDNR-1r)

Human ADP-ribosylation factor-like protein ARL5 (wild type) ARL0500000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493891. Insert size = 550 bp.

ARL0700001 ARL7 (pDNR-1r)

Human ADP-ribosylation factor-like protein ARL7 (wild type) ARL0700000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493892. Insert size = 590 bp.

Rab family

Wild-Type

Native Rab proteins

Wild-Type in pDNR-1r

Native Rab proteins in pDNR-1r vector

Rab Wild-Type

RAB01A0000 RAB 1A

GenBank Accession # AF498929: Human RAB family small GTP binding protein RAB1A (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 625 bp.

RAB02A0000 RAB 2A

GenBank Accession # AF498930: Human RAB family small GTP binding protein RAB2A (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 650 bp.

RAB03A0000 RAB 3A

GenBank Accession # AF498931: Human RAB family small GTP binding protein RAB3A (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 675 bp.

RAB03B0000 RAB 3B

GenBank Accession # AF498932: Human RAB family small GTP binding protein RAB3B (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 675 bp.

RAB03D0000 RAB 3D

GenBank Accession # AF498933: Human RAB family small

GTP binding protein RAB3D (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 670 bp.

RAB04A0000 RAB 4A

GenBank Accession # AF498934: Human RAB family small GTP binding protein RAB4A (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 670 bp.

RAB04B0000 RAB 4B

GenBank Accession # AF498935: Human RAB family small GTP binding protein RAB4B (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 650 bp.

RAB05A0000 RAB 5A

GenBank Accession # AF498936: Human RAB family small GTP binding protein RAB5A (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 655 bp.

RAB05B0000 RAB 5B

GenBank Accession # AF498937: Human RAB family small GTP binding protein RAB5B (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 670 bp.

RAB3200000 RAB 32

GenBank Accession # AF498958: Human RAB family small GTP binding protein RAB32 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 690 bp.

RAB33A0000 RAB 33A

GenBank Accession # AF498959: Human RAB family small GTP binding protein RAB33A (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 720 bp.

RAB3500000 RAB 35

GenBank Accession # AF498960: Human RAB family small GTP binding protein RAB35 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 615 bp.

Rab Wild-Type in pDNR-1r**RAB01A0001 Rab 1A (pDNR-1r)**

Human RAB family small GTP binding protein RAB1A (wild type) RAB01A0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498929. Insert size = 625 bp.

RAB02A0001 Rab 2A (pDNR-1r)

Human RAB family small GTP binding protein RAB2A (wild type) RAB02A0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498930. Insert size = 650 bp.

RAB03A0001 Rab 3A (pDNR-1r)

Human RAB family small GTP binding protein RAB3A (wild type) RAB03A0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498931. Insert size = 675 bp.

RAB03B0001 Rab 3B (pDNR-1r)

Human RAB family small GTP binding protein RAB3B (wild type) RAB03B0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498932. Insert size = 675 bp.

RAB03D0001 Rab 3D (pDNR-1r)

Human RAB family small GTP binding protein RAB3D (wild type) RAB03D0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498933. Insert size = 670 bp.

RAB04A0001 Rab 4A (pDNR-1r)

Human RAB family small GTP binding protein RAB4A (wild type) RAB04A0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498934. Insert size = 670 bp.

RAB04B0001 Rab 4B (pDNR-1r)

Human RAB family small GTP binding protein RAB4B (wild type) RAB04B0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498935. Insert size = 650 bp.

RAB05A0001 Rab 5A (pDNR-1r)

Human RAB family small GTP binding protein RAB5A (wild type) RAB05A0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498936. Insert size = 655 bp.

RAB05B0001 Rab 5B (pDNR-1r)

Human RAB family small GTP binding protein RAB5B (wild type) RAB05B0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498937. Insert size = 670 bp.

RAB05C0001 Rab 5C (pDNR-1r)

Human RAB family small GTP binding protein RAB5C (wild type) RAB05C0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498938. Insert size = 660 bp.

RAB06A0001 Rab 6A (pDNR-1r)

Human RAB family small GTP binding protein RAB6A (wild type) RAB06A0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498939. Insert size = 635 bp.

RAB06B0001 Rab 6B (pDNR-1r)

Human RAB family small GTP binding protein RAB6B (wild type) RAB06B0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498940. Insert size = 630 bp.

RAB06C0001 Rab 6C (pDNR-1r)

Human RAB family small GTP binding protein RAB6C (wild type) RAB06C0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498941. Insert size = 630 bp.

RAB0700001 Rab 7 (pDNR-1r)

Human RAB family small GTP binding protein RAB7 (wild type) RAB0700000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498942. Insert size = 630 bp.

RAB0800001 Rab 8 (pDNR-1r)

Human RAB family small GTP binding protein RAB8 (wild type) RAB0800000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498943. Insert size = 630 bp.

RAB0900001 Rab 9 (pDNR-1r)

Human RAB family small GTP binding protein RAB9 (wild type) RAB0900000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498944. Insert size = 615 bp.

RAB1000001 Rab 10 (pDNR-1r)

Human RAB family small GTP binding protein RAB10 (wild type) RAB1000000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498945. Insert size = 610 bp.

RAB11A0001 Rab 11A (pDNR-1r)

Human RAB family small GTP binding protein RAB11A (wild type) RAB11A0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498946. Insert size = 660 bp.

RAB11B0001 Rab 11B (pDNR-1r)

Human RAB family small GTP binding protein RAB11B (wild type) RAB11B0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498947. Insert size = 675 bp.

RAB2300001 Rab 23 (pDNR-1r)

Human RAB family small GTP binding protein RAB23 (wild type) RAB2300000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498951. Insert size = 730 bp.

RAB2600001 Rab 26 (pDNR-1r)

Human RAB family small GTP binding protein RAB26 (wild type) RAB2600000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498952. Insert size = 580 bp.

RAB27A0001 Rab 27A (pDNR-1r)

Human RAB family small GTP binding protein RAB27a (wild type) RAB27A0000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498954. Insert size = 670 bp.

Ran family**Wild-Type
3xHA-Tagged**

Native RAN family proteins
Native RAN family proteins with an N-terminal hemagglutinin tag in triplicate

Ran Wild-Type**RAN0000000 RAN**

GenBank Accession # AF501887: Human RAN family small GTP binding protein RAN (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 660 bp.

Ran 3xHA-Tagged**RAN000TN00 RAN 3xHA-tagged(N-terminus)**

N-terminal 3X-hemagglutinin tagged human RAN family small GTP binding protein RAN (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was derived from RAN0000000 by the PCR. Insert size = 750 bp.

Ras Family

Wild-Type	Native Ras family proteins
pDNR-1r	Native Ras family proteins in pDNR-1r vector
GV Mutants	Ras family proteins with a constitutively active phenotype due to a glycine (G) to valine (V) mutation, which eliminates GTPase activity
3xHA GV	Ras family proteins with a constitutively active phenotype and an N-terminal hemagglutinin tag in triplicate
SN Mutants	Ras family proteins with a dominant negative phenotype due to a serine (S) to asparagine (N) mutation
3xHA SN	Ras family proteins with a dominant negative phenotype and an N-terminal hemagglutinin tag in triplicate
3xHA-Tagged	Native Ras family proteins with an N-terminal hemagglutinin tag in triplicate
2XMYC GV	Ras family proteins with a constitutively active phenotype and an N-terminal MYC tag in duplicate
2XMYC SN	Ras family proteins with a dominant negative phenotype and an N-terminal MYC tag in duplicate
2XMYC-tagged	Native Ras family proteins with an N-terminal MYC tag in duplicate

Ras Family Wild-Type

RAP1A00000 RAP1A

GenBank Accession # AF493912: Human Ras family small GTP binding protein RAP1A (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 560 bp.

RAP1B00000 RAP1B

GenBank Accession # AF493913: Human Ras family small GTP binding protein RAP1B (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 560 bp.

RAP2A00000 RAP2A

GenBank Accession # AF493914: Human Ras family small GTP binding protein RAP2A (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from Image clone (2407404). The insert was sequenced. Insert size = 560 bp.

RAP2B00000 RAP2B

GenBank Accession # AF493915: Human Ras family small GTP binding protein RAP2A (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 560 bp.

RASH000000 H-Ras

GenBank Accession # AF493916: Human Ras family small GTP binding protein H-Ras (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 570 bp.

RASK200000 K-Ras2

GenBank Accession # AF493917: Human Ras family small GTP binding protein K-Ras2 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 570 bp.

RASM000000 M-Ras

GenBank Accession # AF493918: Human Ras family small GTP binding protein M-Ras (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 630 bp.

RASN000000 N-Ras

GenBank Accession # AF493919: Human Ras family small GTP binding protein N-Ras (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading

frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 580 bp.

RASR000000 R-Ras

GenBank Accession # AF493920: Human Ras family small GTP binding protein R-Ras (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamH I (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 660 bp.

Ras Family Wild-Type in pDNR-1r

RAP1A00001 RAP 1A (pDNR-1R)

Human Ras family small GTP binding protein RAP1A (wild type) RAP1A00000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493912. Insert size = 560 bp.

RAP1B00001 RAP1B (pDNR-1r)

Human Ras family small GTP binding protein RAP1B (wild type) RAP1B00000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493913. Insert size = 560 bp.

RAP2A00001 RAP2A (pDNR-1r)

Human Ras family small GTP binding protein RAP2A (wild type) RAP2A00000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493914. Insert size = 560 bp.

RAP2B00001 RAP2B (pDNR-1r)

Human Ras family small GTP binding protein RAP2B (wild type) RAP2B00000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493915. Insert size = 560 bp.

RASH000001 H-Ras (pDNR-1r)

Human Ras family small GTP binding protein H-Ras (wild type) RASH000000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493916. Insert size = 570 bp.

RASK200001 K-Ras2 (pDNR-1r)

Human Ras family small GTP binding protein K-Ras2 (wild type) RASK200000 cloned into pDNR-1r (Clontech) at SmaI (5') and

XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493917. Insert size = 570 bp.

RASM000001 M-Ras (pDNR-1r)

Human Ras family small GTP binding protein M-Ras (wild type) RASM000000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493918. Insert size = 630 bp.

RASN000001 N-Ras (pDNR-1r)

Human Ras family small GTP binding protein N-Ras (wild type) RASN000000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493919. Insert size = 580 bp.

RASR000001 R-Ras (pDNR-1r)

Human Ras family small GTP binding protein R-Ras (wild type) RASR000000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493920. Insert size = 660 bp.

Ras GV Mutants

RAP1A000C0 RAP1A G12V

Human Ras family small GTP binding protein Rap1A G12V (constitutively active) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The G12V mutation was introduced into the Ras family small GTP binding protein Rap1A (RAP1A000000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 560 bp.

RAP1B000C0 RAP1B G12V

Human Ras family small GTP binding protein Rap1B G12V (constitutively active) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The G12V mutation was introduced into the Ras family small GTP binding protein Rap1B (RAP1B000000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 560 bp.

RASH000C0 H-Ras G12V

The G12V mutation was introduced into the Ras family small GTP binding protein H-Ras (RASH000000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 570 bp.

RASK2000C0 K-Ras2 G12V

The G12V mutation was introduced into the Ras family small GTP binding protein K-Ras2 (RASK200000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 570 bp.

RASM000C0 M-Ras G22V

The G22V mutation was introduced into the Ras family small GTP binding protein M-Ras (RASM000000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 630 bp.

RASN000C0 N-Ras G12V

The G12V mutation was introduced into the Ras family small

GTP binding protein N-Ras (RASN000000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 580 bp.

RASR000C0 R-Ras G38V

The G38V mutation was introduced into the Ras family small GTP binding protein R-Ras (RASR000000) via the Quickchange mutagenesis kit (Stratagene). The mutation putatively confers a constitutively active phenotype. Insert size = 660 bp.

Ras GV Mutants 3xHA Tagged

RAP1A0TNC0 RAP1A G12V 3XHA-tagged (N-terminus)

N-terminal 3XHemagglutinin-tagged human Ras family small GTP binding protein RAP1A G12V (constitutively active) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G12V mutation was introduced into the Ras family small GTP binding protein Rap1A (RAP1A000000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 640 bp.

RAP1B0TNC0 RAP1B G12V 3XHA-tagged (N-terminus)

N-terminal 3XHemagglutinin-tagged human Ras family small GTP binding protein RAP1B G12V (constitutively active) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G12V mutation was introduced into the Ras family small GTP binding protein Rap1B (RAP1B000000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 640 bp.

RASH00TNC0 H-Ras G12V 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Ras family small GTP binding protein H-Ras (G12V mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G12V mutation was introduced into H-Ras 3X HA tagged (N-terminus)(RASH00TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 670 bp.

RASK20TNC0 K-Ras2 G12V 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Ras family small GTP binding protein K-Ras2 (G12V mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G12V mutation was introduced into K-Ras2 3X HA tagged (N-terminus)(RASK20TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 670 bp.

RASM00TNC0 M-Ras G22V 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Ras family small GTP binding protein M-Ras (G22V mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G22V mutation was introduced into M-Ras 3X HA tagged (N-terminus)(RASM00TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 730 bp.

RASN00TNC0 N-Ras G12V 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Ras family small GTP binding protein N-Ras (G12V mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G12V mutation was introduced into N-Ras 3X HA tagged (N-terminus)(RASN00TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 680 bp.

RASR00TNC0 R-Ras G38V 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Ras family small GTP binding protein R-Ras (G38V mutant) cloned into

pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G38V mutation was introduced into R-Ras 3X HA tagged (N-terminus)(RASR00TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 760 bp.

Ras Family SN Mutants

RAP1A000D0 RAP1A S17N

Human Ras family small GTP binding protein RAP1A S17N (dominant negative) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The S17N mutation was introduced into the Ras family small GTP binding protein Rap1A (RAP1A00000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 560 bp.

RAP1B000D0 RAP1B S17N

Human Ras family small GTP binding protein RAP1B S17N (dominant negative) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The S17N mutation was introduced into the Ras family small GTP binding protein Rap1B (RAP1B00000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 560 bp.

RASH000D0 H-Ras S17N

The S17N mutation was introduced into the Ras family small GTP binding protein H-Ras (RASH000000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 570 bp.

RASK200D0 K-Ras2 S17N

The S17N mutation was introduced into the Ras family small GTP binding protein K-Ras2 (RASK200000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 570 bp.

RASM000D0 M-Ras S27N

The S27N mutation was introduced into the Ras family small GTP binding protein M-Ras (RASM000000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 630 bp.

RASN000D0 N-Ras S17N

The S17N mutation was introduced into the Ras family small GTP binding protein N-Ras (RASN000000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 580 bp.

RASR000D0 R-Ras S43N

The S43N mutation was introduced into the Ras family small GTP binding protein R-Ras (RASR000000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 660 bp.

Ras Family SN MUTANTS 3xHA Tagged

RAP1A0TN00 RAP1A S17N 3XHA-tagged (N-terminus)

N-terminal 3XHemagglutinin-tagged human Ras family small GTP binding protein RAP1A S17N (dominant negative) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The S17N mutation was introduced into the Ras family small GTP binding protein Rap1A (RAP1A00000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 640 bp.

RAP1B0TN00 RAP1B S17N 3XHA-tagged (N-terminus)

N-terminal 3XHemagglutinin-tagged human Ras family small

GTP binding protein RAP1B S17N (dominant negative) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The S17N mutation was introduced into the Ras family small GTP binding protein Rap1B (RAP1B00000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 640 bp.

RASH00TN00 H-Ras S17N 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Ras family small GTP binding protein H-Ras (S17N mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The S17N mutation was introduced into H-Ras 3X HA tagged (N-terminus)(RASH00TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 660 bp.

RASK20TN00 K-Ras2 S17N 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Ras family small GTP binding protein K-Ras2 (S17N mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The S17N mutation was introduced into K-Ras2 3X HA tagged (N-terminus)(RASK20TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 660 bp.

RASM00TN00 M-Ras S27N 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Ras family small GTP binding protein M-Ras (S27N mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The S27N mutation was introduced into M-Ras 3X HA tagged (N-terminus)(RASM00TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 720 bp.

RASN00TN00 N-Ras S17N 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Ras family small GTP binding protein N-Ras (S17N mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The S17N mutation was introduced into N-Ras 3X HA tagged (N-terminus)(RASN00TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 670 bp.

RASR00TN00 R-Ras S43N 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Ras family small GTP binding protein R-Ras (S43N mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The S43N mutation was introduced into R-Ras 3X HA tagged (N-terminus)(RASR00TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 750 bp.

Ras Family Wild-Type 3xHA Tagged

RAP1A0TN00 RAP1A 3XHA-tagged (N-terminus)

N-terminal 3XHemagglutinin-tagged human Ras family small GTP binding protein RAP1A (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced and found to be identical with GB ACC#X12533. Insert size = 640 bp.

RAP1B0TN00 RAP1B 3XHA-tagged (N-terminus)

N-terminal 3XHemagglutinin-tagged human Ras family small GTP binding protein RAP1B (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced and found to be identical with GB ACC#X08004. Insert size = 640 bp.

RASH00TN00 H-Ras 3xHA-tagged(N-terminus)

N-terminal 3X-hemagglutinin tagged human Ras family small GTP binding protein H-Ras (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was derived from RASH000000 by the PCR. Insert = 670 bp.

RASK20TN00 K-Ras2 3xHA-tagged(N-terminus)

N-terminal 3X-hemagglutinin tagged human Ras family small GTP binding protein K-Ras2 (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was derived from RASK200000 by the PCR. Insert size = 670 bp.

RASM00TN00 M-Ras 3xHA-tagged(N-terminus)

N-terminal 3X-hemagglutinin tagged human Ras family small GTP binding protein M-Ras (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was derived from RASM000000 by the PCR. Insert size = 730 bp.

RASN00TN00 N-Ras 3xHA-tagged(N-terminus)

N-terminal 3X-hemagglutinin tagged human Ras family small GTP binding protein N-Ras (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was derived from RASN000000 by the PCR. Insert size = 680 bp.

RASR00TN00 R-Ras 3xHA-tagged(N-terminus)

N-terminal 3X-hemagglutinin tagged human Ras family small GTP binding protein R-Ras (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was derived from RASR000000 by the PCR. Insert size = 760 bp.

2XMYC GV**RAP1A0MNC0 RAP1A G12V 2XMYC-tagged (N-terminus)**

N-terminal 2XMYC-tagged human Ras family small GTP binding protein RAP1A G12V (constitutively active) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G12V mutation was introduced into the Ras family small GTP binding protein Rap1A (RAP1A00000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 640 bp.

RAP1B0MNC0 RAP1B G12V 2XMYC-tagged (N-terminus)

N-terminal 2XMYC-tagged human Ras family small GTP binding protein RAP1B G12V (constitutively active) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G12V mutation was introduced into the Ras family small GTP binding protein Rap1B (RAP1B00000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 640 bp.

RASH00MNC0 H-Ras G12V 2XMYC-tagged(N-terminus)

N-terminal 2XMYC-tagged human Ras family small GTP binding protein H-Ras G12V (constitutively active) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G12V mutation was introduced into the Ras family small GTP binding protein H-Ras (RASH000000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 670 bp.

RASK20MNC0 K-Ras2 G12V 2XMYC-tagged(N-terminus)

N-terminal 2XMYC- tagged human Ras family small GTP binding protein K-Ras2 G12V (constitutively active) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G12V mutation was introduced into the Ras family small GTP binding protein K-Ras2 (RASK200000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. . Insert size = 670 bp.

2XMYC SN**RAP1A0MND0 RAP1A S17N 2XMYC-tagged (N-terminus)**

N-terminal 2XMYC-tagged human Ras family small GTP binding protein RAP1A S17N (dominant negative) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The S17N mutation was introduced into the Ras family small GTP binding protein Rap1A (RAP1A00000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 640 bp.

RAP1B0MND0 RAP1B S17N 2XMYC-tagged (N-terminus)

N-terminal 2XMYC-tagged human Ras family small GTP binding protein RAP1B S17N (dominant negative) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The S17N mutation was introduced into the Ras family small GTP binding protein Rap1B (RAP1B00000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 640 bp.

RASH00MND0 H-Ras S17N 2XMYC-tagged(N-terminus)

N-terminal 2XMYC-tagged human Ras family small GTP binding protein H-Ras S17N (dominant negative) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The S17N mutation was introduced into the Ras family small GTP binding protein H-Ras (RASH000000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 670 bp.

RASK20MND0 K-Ras2 S17N 2XMYC-tagged(N-terminus)

N-terminal 2XMYC- tagged human Ras family small GTP binding protein K-Ras2 S17N (dominant negative) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The S17N mutation was introduced into the Ras family small GTP binding protein K-Ras2 (RASK200000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. . Insert size = 670 bp.

2XMYC-tagged**RAP1A0MN00 RAP1A 2XMYC-tagged (N-terminus)**

N-terminal 2XMYC-tagged human Ras family small GTP binding protein RAP1A (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced and found to be identical with GB ACC#X12533. Insert size = 640 bp.

RAP1B0MN00 RAP1B 2XMYC-tagged (N-terminus)

N-terminal 2XMYC-tagged human Ras family small GTP binding protein RAP1B (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced and found to be identical with GB ACC#X08004. Insert size = 640 bp.

RASH00MN00 H-Ras 2XMYC-tagged(N-terminus)

N-terminal 2XMYC-tagged human Ras family small GTP binding protein H-Ras (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was derived from RASH000000 by the PCR. Insert size = 670 bp.

RASK20MN00 K-Ras2 2XMYC-tagged (N-terminus)

N-terminal 2XMYC- tagged human Ras family small GTP binding protein K-Ras2 (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was derived from RASK200000 by the PCR. Insert size = 670 bp.

Ras-like G-proteins

Wild-Type

Native Ras-like proteins

Wild-Type in DNR-1r

Native Ras-like proteins in pDNR-1r vector

Ras-like Wild-Type

AGS0100000 AGS1

GenBank Accession # AF498923: Human activator of G-protein signaling AGS1 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 850 bp.

RALA000000 RALA

GenBank Accession # AF493910: Human Ras family small GTP binding protein RALA (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human lung cDNA (Clontech). The insert was sequenced. Insert size = 635 bp.

RALB000000 RALB

GenBank Accession # AF493911: Human Ras family small GTP binding protein RALB (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 625 bp.

RHEB200000 RHEB2

GenBank Accession # AF493921: Human Ras family small GTP binding protein RHEB2 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 565 bp.

RIG0000000 Rig

GeneBank Accession # AY180973. Human Ras family small GTP binding protein Rig (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 597 bp.

RIN0000000 RIN

GenBank Accession # AF493922: Human Ras family small GTP binding protein RIN (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from IMAGE clone (45534). The insert was sequenced. Insert size = 665 bp.

RIT0000000 RIT

GenBank Accession # AF493923: Human Ras family small GTP binding protein RIT (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was amplified by the PCR from IMAGE clone (268332). The insert was sequenced. Insert size = 670 bp.

TC21000000 TC21

GenBank Accession # AF493924: Human Ras family small GTP binding protein TC21 (wild type) cloned into pcDNA3.1+ (Invitrogen) at BamHI (5') and XhoI (3'). The open reading frame was amplified by the PCR from human heart cDNA (Clontech). The insert was sequenced. Insert size = 620 bp.

Ras-like Wild-Type in DNR-1r

GS0100001 AGS1 (pDNR-1r)

Human activator of G-protein signaling AGS1 (wild type) AGS0100000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498923. Insert size = 850 bp.

RALA000001 RALA (pDNR-1r)

Human Ras family small GTP binding protein RALA (wild type) RALA000000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493910. Insert size = 635 bp.

RHEB200001 RHEB2 (pDNR-1r)

Human Ras family small GTP binding protein RHEB2 (wild type) RHEB200000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493921. Insert size = 565 bp.

RIN0000001 RIN (pDNR-1r)

Human Ras family small GTP binding protein RIN (wild type) RIN0000000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493922. Insert size = 665 bp.

RIT0000001 RIT (pDNR-1r)

Human Ras family small GTP binding protein RIT (wild type) RIT0000000 cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed(*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF493923. Insert size = 670 bp.

Small G-proteins Rho family

Wild-Type	Native Rho family proteins
pDNR-1r	Native Rho family proteins in pDNR-1r vector
3xHA-Tagged	Native Rho family proteins with an N-terminal hemagglutinin tag in triplicate
GV Mutants	Constitutively active phenotype
3xHA GV	Rho family proteins with a constitutively active phenotype and an N-terminal hemagglutinin tag in triplicate
TN Mutants	Rho family proteins with a dominant negative phenotype due to a threonine (T) to asparagine (N) mutation
3xHA TN	Rho family proteins with a constitutively active phenotype and an N-terminal hemagglutinin tag in triplicate
2XMYC GV	Rho family proteins with a constitutively active phenotype and an N-terminal MYC tag in duplicate
2XMYC TN	Rho family proteins with a dominant negative phenotype and an N-terminal MYC tag in duplicate
2XMYC-tagged	Native Rho family proteins with an N-terminal MYC tag in duplicate
GV PBRQ 2XMYC	Rho family proteins with a constitutively active phenotype, the polybasic region mutated, and an N-terminal MYC tag in duplicate
GV PBRQ 3XHA	Rho family proteins with a constitutively active phenotype, the polybasic region mutated, and an N-terminal hemagglutinin tag in triplicate
PBRQ 2XMYC	Rho family proteins with the polybasic region mutated and an N-terminal MYC tag in duplicate
PBRQ 3XHA	Rho family proteins with the polybasic region mutated and an N-terminal hemagglutinin tag in triplicate
TN PBRQ 2XMYC	Rho family proteins with a dominant negative phenotype, the polybasic region mutated, and an N-terminal MYC tag in duplicate
TN PBRQ 3XHA	Rho family proteins with a dominant negative phenotype, the polybasic region mutated, and an N-terminal hemagglutinin tag in triplicate

Rho Family Wild-Type

CDC4200000 CDC42

GenBank Accession # AF498962: Human Rho family small GTP binding protein CDC42 (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xba I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 600 bp.

CDC42P0000 CDC42 placental isoform

GenBank Accession # AF498963: Human Rho family small GTP binding protein CDC42 placental isoform (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was amplified by the PCR from human placental cDNA (Clontech). The insert was sequenced. Insert size = 600 bp.

RAC0100000 Rac1

GenBank Accession # AF498964: Human Rho family small GTP binding protein Rac1 (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (1657288). The insert was sequenced. Insert size = 630 bp.

RAC0200000 Rac2

GenBank Accession # AF498965: Human Rho family small GTP binding protein Rac2 (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (245761). The insert was sequenced. Insert size = 575bp.

RAC0300000 Rac3

GenBank Accession # AF498966: Human Rho family small GTP binding protein Rac3 (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (1739912). The insert was sequenced. Insert size = 590 bp.

RHO0600000 Rho6

GenBank Accession # AF498967: Human Rho family small GTP binding protein Rho6 (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA

(Clontech). The insert was sequenced. Insert size = 700 bp.

RHO0700000 Rho7 (Rnd2)

GenBank Accession # AF498968: Human Rho family small GTP binding protein Rho7 (Rnd2) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (1650500). The insert was sequenced. Insert size = 690 bp.

RHO0800000 Rho8 (RhoE, Rnd3)

GenBank Accession # AF498969: Human Rho family small GTP binding protein Rho8 (Rnd3, RhoE) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was amplified by the PCR from human placental cDNA (Clontech). The insert was sequenced. Insert size = 745 bp.

RHO0A00000 RhoA

GenBank Accession # AF498970: Human Rho family small GTP binding protein RhoA (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 600 bp.

RHO0B00000 RhoB

GenBank Accession # AF498971: Human Rho family small GTP binding protein RhoB (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xba I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 600 bp.

RHO0C00000 RhoC

GenBank Accession # AF498972: Human Rho family small GTP binding protein RhoC (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 600 bp.

RHO0D00000 RhoD (RhoHP1)

GenBank Accession # AF498973: Human Rho family small GTP binding protein RhoD (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xba I (3'). The open reading frame was amplified by the PCR from IMAGE clone (1565600). The insert was sequenced. Insert size = 640 bp.

RHO0G00000 RhoG

GenBank Accession # AF498974: Human Rho family small GTP binding protein RhoG (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 580 bp.

RHO0H00000 RhoH (TTF)

GenBank Accession # AF498975: Human Rho family small GTP binding protein RhoH (TTF) (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (2021711). The insert was sequenced. Insert size = 580 bp.

TC10000000 TC10

GenBank Accession # AF498976: Human Rho family small GTP binding protein TC10 (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was amplified by the PCR from human whole brain cDNA (Clontech). The insert was sequenced. Insert size = 650 bp.

TCL0000000 TCL

GenBank Accession # AF498977: Human Rho family small GTP binding protein TCL (wild type) cloned into pcDNA3.1+ (Invitrogen) at EcoRI (5') and Xho I (3'). The open reading frame was amplified by the PCR from IMAGE clone (1682327). The insert was sequenced. Insert size = 660 bp.

Rho Family Wild-Type in pDNR-1r**CDC4200001 CDC42 (pDNR-1r)**

Human Rho family small GTP binding protein CDC42 (wild type) cloned into pDNR-1r (Clontech) at SmaI (5') and XbaI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498962. Insert size = 600 bp.

CDC42P0001 CDC42 placental isoform (pDNR-1r)

Human Rho family small GTP binding protein CDC42 placental isoform (wild type) cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498963. Insert size = 600 bp.

RAC0100001 Rac1 (pDNR-1r)

Human Rho family small GTP binding protein Rac1 (wild type) cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498964. Insert size = 630 bp.

RAC0200001 Rac2 (pDNR-1r)

Human Rho family small GTP binding protein Rac2 (wild type) cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498965. Insert size = 575 bp.

RAC0300001 Rac3 (pDNR-1r)

Human Rho family small GTP binding protein Rac3 (wild type) cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. The insert was sequenced and found to be identical with GB ACC # AF498966. Insert size = 590 bp.

RHO0600001 Rho6 (pDNR-1r)

Human Rho family small GTP binding protein Rho6 (wild type) cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498967. Insert size = 700 bp.

RHO0700001 Rho7 (Rnd2) (pDNR-1r)

Human Rho family small GTP binding protein Rho7 (Rnd2) (wild type) cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498968. Insert size = 690 bp.

RHO0800001 Rho8 (RhoE, Rnd3) (pDNR-1r)

Human Rho family small GTP binding protein Rho8 (Rnd3, RhoE) (wild type) cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498969. Insert size = 745 bp.

RHO0A00001 RhoA (pDNR-1r)

Human Rho family small GTP binding protein RhoA (wild type) cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498970. Insert size = 600 bp.

RHO0B00001 RhoB (pDNR-1r)

Human Rho family small GTP binding protein RhoB (wild type) cloned into pDNR-1r (Clontech) at SmaI (5') and XbaI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498971. Insert size = 600 bp.

RHO0C00001 RhoC (pDNR-1r)

Human Rho family small GTP binding protein RhoC (wild type) cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498972. Insert size = 600 bp.

RHO0D00001 RhoD (RhoHP1) (pDNR-1r)

Human Rho family small GTP binding protein RhoD (HP1) (wild type) cloned into pDNR-1r (Clontech) at SmaI (5') and XbaI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498973. Insert size = 640 bp.

RHO0G00001 RhoG (pDNR-1r)

Human Rho family small GTP binding protein RhoG (wild type) cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498974. Insert size = 580 bp.

RHO0H00001 RhoH (TTF) (pDNR-1r)

Human Rho family small GTP binding protein RhoH (TTF) (wild type) cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3' RE. Internal Sall sites may be present. The insert

was sequenced and found to be identical with GB ACC # AF498975. Insert size = 580 bp.

TC10000001 TC10 (pDNR-1r)

Human Rho family small GTP binding protein TC10 (wild type) cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and the 3'RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498976. Insert size = 650 bp.

TCL0000001 TCL (pDNR-1r)

Human Rho family small GTP binding protein TCL (wild type) cloned into pDNR-1r (Clontech) at SmaI (5') and XhoI (3'). The SmaI site was destroyed (*). The insert can be excised with Sall and te3' RE. Internal Sall sites may be present. The insert was sequenced and found to be identical with GB ACC # AF498977. Insert size = 660 bp.

Rho Family Wild-Type 3xHA-Tagged

CDC420TN00 CDC42 3XHA-tagged(N-terminal)

N-terminal 3X-hemagglutinin tagged human Rho family small GTP binding protein CDC42 (wild type) cloned into pcDNA3.1+ (Invitrogen) at Kpn I (5') and Xba I (3'). The open reading frame was derived from CDC4200000 by the PCR. Insert size = 670 bp.

CDC42PTN00 CDC42 placental isoform 3XHA-tagged(N-terminus)

N-terminal 3X-hemagglutinin tagged human Rho family small GTP binding protein CDC42 placental isoform (wild type) cloned into pcDNA3.1+ (Invitrogen) at Kpn I (5') and Xho I (3'). The open reading frame was derived from CDC42P0000 by the PCR. Insert size = 670 bp.

RAC010TN00 Rac1 3XHA-tagged(N-terminus)

N-terminal 3X-hemagglutinin tagged human Rho family small GTP binding protein Rac1 (wild type) cloned into pcDNA3.1+ (Invitrogen) at Kpn I (5') and Xho I (3'). The open reading frame was derived from RAC0100000 by the PCR. Insert size = 730 bp.

RAC020TN00 Rac2 3XHA-tagged(N-terminus)

N-terminal 3X-hemagglutinin tagged human Rho family small GTP binding protein Rac2 (wild type) cloned into pcDNA3.1+ (Invitrogen) at Kpn I (5') and Xho I (3'). The open reading frame was derived from RAC0200000 by the PCR. Insert size = 680 bp.

RAC030TN00 Rac3 3xHA-tagged(N-terminus)

N-terminal 3X-hemagglutinin tagged human Rho family small GTP binding protein Rac3 (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was derived from RAC0300000 by the PCR. Insert size = 680 bp.

RHO0A0TN00 RhoA 3XHA-tagged(N-terminus)

N-terminal 3X-hemagglutinin tagged human Rho family small GTP binding protein RhoA (wild type) cloned into pcDNA3.1+ (Invitrogen) at Kpn I (5') and Xho I (3'). The open reading frame was derived from RHO0A00000 by the PCR. Insert size = 680 bp.

RHO0B0TN00 RhoB 3XHA-tagged(N-terminus)

N-terminal 3X-hemagglutinin tagged human Rho family small GTP binding protein RhoB (wild type) cloned into pcDNA3.1+ (Invitrogen) at Kpn I (5') and Xba I (3'). The open reading frame

was derived from RHO0B00000 by the PCR. Insert size = 680 bp.

RHO0C0TN00 RhoC 3XHA-tagged(N-terminus)

N-terminal 3X-hemagglutinin tagged human Rho family small GTP binding protein RhoC (wild type) cloned into pcDNA3.1+ (Invitrogen) at Kpn I (5') and Xho I (3'). The open reading frame was derived from RHO0C00000 by the PCR. Insert size = 680 bp.

Rho GV Mutants

CDC42000C0 CDC42 G12V

The G12V mutation was introduced into the Rho family small GTP binding protein CDC42 (CDC4200000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 600 bp.

CDC42P00C0 CDC42 placental isoform G12V

The G12V mutation was introduced into the Rho family small GTP binding protein CDC42 placental isoform (CDC42P0000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 600 bp.

RAC01000C0 Rac1 G12V

The G12V mutation was introduced into the Rho family small GTP binding protein Rac1 (RAC0100000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 630 bp.

RAC02000C0 Rac2 G12V

The G12V mutation was introduced into the Rho family small GTP binding protein Rac2 (RAC0200000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 575 bp.

RAC03000C0 Rac3 G12V

The G12V mutation was introduced into the Rho family small GTP binding protein Rac3 (RAC0300000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 590 bp.

RHO0A000C0 RhoA G14V

The G14V mutation was introduced into the Rho family small GTP binding protein RhoA (RHO0A00000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 600 bp.

RHO0B000C0 RhoB G14V

The G14V mutation was introduced into the Rho family small GTP binding protein RhoB (RHO0B00000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 600 bp.

RHO0C000C0 RhoC G14V

The G14V mutation was introduced into the Rho family small GTP binding protein RhoC (RHO0C00000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 600 bp.

Rho GV Mutants 3xHA-Tagged

CDC420TNC0 CDC42 G12V 3xHA-tagged (N-terminal)

N-terminal 3x-hemagglutinin tagged human Rho family small GTP binding protein CDC42 (G12V mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XbaI (3'). The G12V mutation was introduced into CDC42 3X HA tagged (N-

terminus)(CDC420TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 670 bp.

CDC42PTNC0 CDC42 placental isoform G12V 3xHA-tagged (N-terminus)

N-terminal 3x-hemagglutinin tagged human Rho family small GTP binding protein CDC42 placental isoform (G12V mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G12V mutation was introduced into CDC42 placental isoform 3X HA tagged (N-terminus)(CDC42PTN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 670 bp.

RAC010TNC0 Rac1 G12V 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Rho family small GTP binding protein Rac1 (G12V mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G12V mutation was introduced into Rac1 3X HA tagged (N-terminus)(RAC010TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 730 bp.

RAC020TNC0 Rac2 G12V 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Rho family small GTP binding protein Rac2 (G12V mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G12V mutation was introduced into Rac2 3X HA tagged (N-terminus)(RAC020TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 680 bp.

RAC030TNC0 Rac3 G12V 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Rho family small GTP binding protein Rac3 (G12V mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G12V mutation was introduced into Rac3 3X HA tagged (N-terminus)(RAC030TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 670 bp.

RHO0A0TNC0 RhoA G14V 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Rho family small GTP binding protein RhoA (G14V mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G14V mutation was introduced into RhoA 3X HA tagged (N-terminus)(RHO0A0TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 680 bp.

RHO0B0TNC0 RhoB G14V 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Rho family small GTP binding protein RhoB (G14V mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XbaI (3'). The G14V mutation was introduced into RhoB 3X HA tagged (N-terminus)(RHO0B0TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 680 bp.

RHO0C0TNC0 RhoC G14V 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Rho family small GTP binding protein RhoC (G14V mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G14V mutation was introduced into RhoC 3X HA tagged (N-terminus)(RHO0C0TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 680 bp.

Rho TN Mutants

CDC42000D0 CDC42 T17N

The T17N mutation was introduced into the Rho family small GTP binding protein CDC42 (CDC4200000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 600 bp.

CDC42P00D0 CDC42 placental isoform T17N

The T17N mutation was introduced into the Rho family small GTP binding protein CDC42 placental isoform (CDC42P00000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 600 bp.

RAC01000D0 Rac1 T17N

The T17N mutation was introduced into the Rho family small GTP binding protein Rac1 (RAC0100000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 630 bp.

RAC02000D0 Rac2 T17N

The T17N mutation was introduced into the Rho family small GTP binding protein Rac2 (RAC0200000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 575 bp.

RAC03000D0 Rac3 T17N

The T17N mutation was introduced into the Rho family small GTP binding protein Rac3 (RAC0300000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 590 bp.

RHO0A000D0 RhoA T19N

The T19N mutation was introduced into the Rho family small GTP binding protein RhoA (RHO0A00000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 600 bp.

RHO0B000D0 RhoB T19N

The T19N mutation was introduced into the Rho family small GTP binding protein RhoB (RHO0B00000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 600 bp.

RHO0C000D0 RhoC T19N

The T19N mutation was introduced into the Rho family small GTP binding protein RhoC (RHO0C00000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 600 bp.

Rho TN Mutants 3xHA-Tagged

CDC420TND0 CDC42 T17N 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Rho family small GTP binding protein CDC42 (T17N mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XbaI (3'). The T17N mutation was introduced into CDC42 3X HA tagged (N-terminus)(CDC420TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 690 bp.

CDC42PTND0 CDC42 placental isoform T17N 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Rho family small GTP binding protein CDC42 placental isoform (T17N mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The T17N mutation was introduced into CDC42 placental isoform 3X HA tagged (N-terminus)(CDC42PTN00) via the

Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 690 bp.

RAC010TND0 Rac1 T17N 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Rho family small GTP binding protein Rac1 (T17N mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The T17N mutation was introduced into Rac1 3X HA tagged (N-terminus)(RAC010TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 720 bp.

RAC020TND0 Rac2 T17N 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Rho family small GTP binding protein Rac2 (T17N mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The T17N mutation was introduced into Rac2 3X HA tagged (N-terminus)(RAC020TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 670 bp.

RAC030TND0 Rac3 T17N 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Rho family small GTP binding protein Rac3 (T17N mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The T17N mutation was introduced into Rac3 3X HA tagged (N-terminus)(RAC030TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 670 bp.

RHO0A0TND0 RhoA T19N 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Rho family small GTP binding protein RhoA (T19N mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The T19N mutation was introduced into RhoA 3X HA tagged (N-terminus)(RHO0A0TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 690 bp.

RHO0B0TND0 RhoB T19N 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Rho family small GTP binding protein RhoB (T19N mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XbaI (3'). The T19N mutation was introduced into RhoB 3X HA tagged (N-terminus)(RHO0B0TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 690 bp.

RHO0C0TND0 RhoC T19N 3xHA-tagged(N-terminus)

N-terminal 3x-hemagglutinin tagged human Rho family small GTP binding protein RhoC (T19N mutant) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The T19N mutation was introduced into RhoC 3X HA tagged (N-terminus)(RHO0C0TN00) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 690 bp.

2XMYC GV

RAC010MNC0 Rac1 G12V 2XMYC-tagged (N-terminus)

N-terminal 2XMYC-tagged human Rho family small GTP binding protein Rac1 G12V (constitutively active) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G12V mutation was introduced into the Rho family small GTP binding protein Rac1 (RAC0100000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 720 bp.

RHO0A0MNC0 RhoA G14V 2XMYC-tagged(N-terminus)

N-terminal 2XMYC-tagged human Rho family small GTP binding protein RhoA G14V (constitutively active) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G14V mutation was

introduced into the Rho family small GTP binding protein RhoA (RHO0A00000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a constitutively active phenotype. Insert size = 680 bp.

2XMYC TN

RAC010MND0 Rac1 T17N 2XMYC-tagged (N-terminus)

N-terminal 2XMYC-tagged human Rho family small GTP binding protein Rac1 T17N (dominant negative) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The T17N mutation was introduced into the Rho family small GTP binding protein Rac1 (RAC0100000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 720 bp.

RHO0A0MND0 RhoA T19N 2XMYC-tagged (N-terminus)

N-terminal 2XMYC-tagged human Rho family small GTP binding protein RhoA T19N (dominant negative) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The T19N mutation was introduced into the Rho family small GTP binding protein RhoA (RHO0A00000) via the Quickchange mutagenesis kit (Stratagene). The mutation confers a dominant negative phenotype. Insert size = 680 bp.

2XMYC-tagged

RAC010MN00 Rac1 2XMYC-tagged(N-terminus)

N-terminal 2XMYC-tagged human Rho family small GTP binding protein Rac1 (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was derived from RAC0100000 by the PCR. Insert size = 720 bp.

RHO0A0MN00 RhoA 2XMYC-tagged (N-terminus)

N-terminal 2XMYC-tagged human Rho family small GTP binding protein RhoA (wild type) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The open reading frame was derived from RHO0A00000 by the PCR. Insert size = 680 bp.

GV PBRQ 2XMYC

RHO0A0MNE0 RhoA G14V PBRQ 2XMYC-tagged (N-terminus)

N-terminal 2XMYC-tagged human Rho family small GTP binding protein RhoA G14V (constitutively active) PBRQ (polybasic region mutated) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The constitutively active and polybasic region mutations were introduced into the Rho family small GTP binding protein RhoA (RHO0A00000) via Quickchange mutagenesis kit (Stratagene). Phenotypes of these mutation are described in Lanning, Ruiz- Velasco and Williams, (2003) J. Biol. Chem. 278:12495-12506. Insert size = 680 bp.

GV PBRQ 3XHA

RAC010TNE0 Rac1 G12V PBRQ 3XHA-tagged (N-terminus)

N-terminal 3Xhemagglutinin-tagged human Rho family small GTP binding protein Rac1 G12V (constitutively active) PBRQ (polybasic region mutated) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G12V mutation and the PBRQ mutations were introduced into the Rho family small GTP binding protein Rac1 (RAC0100000) via the Quickchange mutagenesis kit (Stratagene). The mutations confer a constitutively active and polybasic region mutated phenotype as described in Lanning, Ruiz-Velasco and Williams, (2003) J. Biol. Chem. 278:12495-12506. Insert size = 720 bp.

RHO0A0TNE0 RhoA G14V PBRQ 3XHA-tagged (N-terminus)

N-terminal 3XHA-tagged human Rho family small GTP binding protein RhoA G14V (constitutively active) PBRQ (polybasic region mutated) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The G14V and polybasic region mutations were introduced into the Rho family small GTP binding protein RhoA (RHO0A00000) via Quickchange mutagenesis kit (Stratagene). Phenotypes of these mutation are described in Lanning, Ruiz-Velasco and Williams, (2003) J. Biol. Chem. 278:12495-12506. Insert size = 680 bp.

PBRQ 2XMYC**RHO0A0MNB0 RhoA PBRQ 2XMYC-tagged (N-terminus)**

N-terminal 2XMYC-tagged human Rho family small GTP binding protein RhoA PBRQ (polybasic region mutated) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The polybasic region mutations were introduced into the Rho family small GTP binding protein RhoA (RHO0A00000) via Quickchange mutagenesis kit (Stratagene). Phenotypes of these mutation are described in Lanning, Ruiz-Velasco and Williams, (2003) J. Biol. Chem. 278:12495-12506. Insert size = 680 bp.

PBRQ 3XHA**RAC010TNB0 Rac1 PBRQ 3xHA-tagged(N-terminus)**

N-terminal 3X-hemagglutinin tagged human Rho family small GTP binding protein Rac1 PBRQ (polybasic region mutated) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The polybasic region mutations were introduced into the Rho family small GTP binding protein Rac 1 (RAC0100000) via Quickchange mutagenesis kit (Stratagene). Phenotypes of these mutation are described in Lanning, Ruiz-Velasco and Williams, (2003) J. Biol. Chem. 278:12495-12506. Insert size = 730 bp.

RHO0A0TNB0 RhoA PBRQ 3XHA-tagged (N-terminus)

N-terminal 3XHA-tagged human Rho family small GTP binding protein RhoA PBRQ (polybasic region mutated) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The polybasic region mutations were introduced into the Rho family small GTP binding protein RhoA (RHO0A00000) via Quickchange mutagenesis kit (Stratagene). Phenotypes of these mutation are described in Lanning, Ruiz-Velasco and Williams, (2003) J. Biol. Chem. 278:12495-12506. Insert size = 680 bp.

TN PBRQ 2XMYC**RHO0A0MNF0 RhoA T19N PBRQ 2XMYC-tagged (N-terminus)**

N-terminal 2XMYC-tagged human Rho family small GTP binding protein RhoA T19N (dominant negative) PBRQ (polybasic region mutated) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The T19N and polybasic region mutations were introduced into the Rho family small GTP binding protein RhoA (RHO0A00000) via Quickchange mutagenesis kit (Stratagene). Phenotypes of these mutation are described in Lanning, Ruiz-Velasco and Williams, (2003) J. Biol. Chem. 278:12495-12506. Insert size = 680 bp.

TN PBRQ 3XHA**RAC010TNF0 Rac1 T17N PBRQ 3XHA-tagged (N-terminus)**

N-terminal 3Xhemagglutinin-tagged human Rho family small GTP binding protein Rac1 T17N (dominant negative) PBRQ (polybasic region mutated) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The T17N mutation and the PBRQ mutations were introduced into the Rho family small GTP binding protein Rac1 (RAC0100000) via the Quickchange mutagenesis kit (Stratagene). The mutations confer a dominant negative and polybasic region mutated phenotype as described in Lanning, Ruiz-Velasco and Williams, (2003) J. Biol. Chem. 278:12495-12506. Insert size = 720 bp.

RHO0A0TNF0 RhoA T19N PBRQ 3XHA-tagged (N-terminus)

N-terminal 3XHA-tagged human Rho family small GTP binding protein RhoA T19N (dominant negative) PBRQ (polybasic region mutated) cloned into pcDNA3.1+ (Invitrogen) at KpnI (5') and XhoI (3'). The T19N and polybasic region mutations were introduced into the Rho family small GTP binding protein RhoA (RHO0A00000) via Quickchange mutagenesis kit (Stratagene). Phenotypes of these mutation are described in Lanning, Ruiz-Velasco and Williams, (2003) J. Biol. Chem. 278:12495-12506. Insert size = 680 bp.

