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(54) Title: COMPOSITIONS AND METHODS FOR USE IN IMMUNOTHERAPY

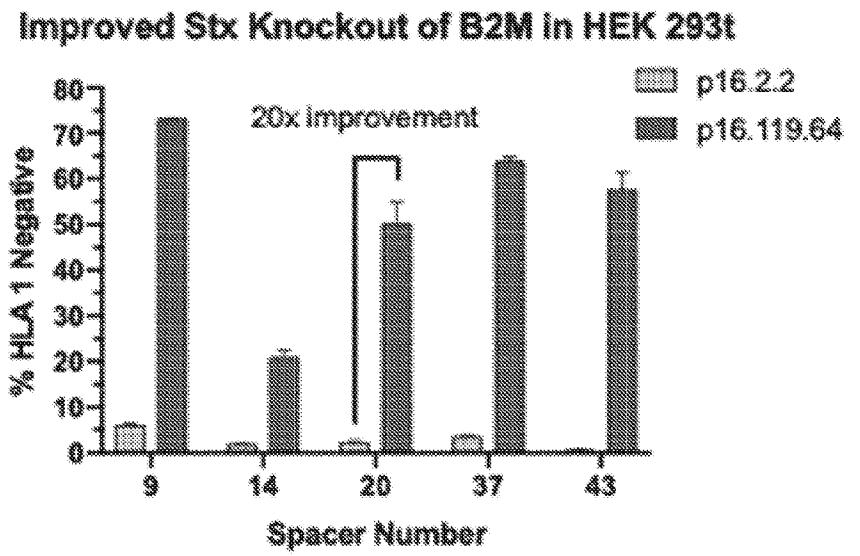


FIG. 26

(57) Abrégé/Abstract:
Provided herein are CasX:gNA systems, and compositions and methods relating thereto, the systems comprising CasX proteins, guide nucleic acids (gNAs), and optionally donor template nucleic acids useful for the modification cell genes encoding proteins involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response, as well as methods of producing and using populations of cells comprising these modified genes. In some embodiments, the modified cells further express chimeric antigen receptors (CAR) or engineered T cell receptors (TCR). Such systems are useful for preparing cells for immunotherapy.

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(54) Title: COMPOSITIONS AND METHODS FOR USE IN IMMUNOTHERAPY

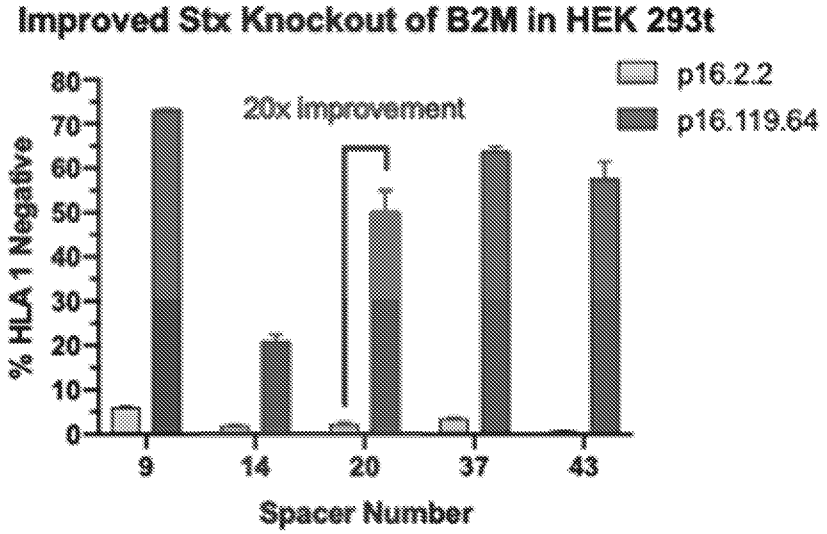


FIG. 26

(57) Abstract: Provided herein are CasX:gNA systems, and compositions and methods relating thereto, the systems comprising CasX proteins, guide nucleic acids (gNAs), and optionally donor template nucleic acids useful for the modification cell genes encoding proteins involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response, as well as methods of producing and using populations of cells comprising these modified genes. In some embodiments, the modified cells further express chimeric antigen receptors (CAR) or engineered T cell receptors (TCR). Such systems are useful for preparing cells for immunotherapy.

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[Continued on next page]

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CECI EST LE TOME 1 DE 2
CONTENANT LES PAGES 1 À 241

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JUMBO APPLICATIONS/PATENTS

THIS SECTION OF THE APPLICATION/PATENT CONTAINS MORE THAN ONE VOLUME

THIS IS VOLUME 1 OF 2
CONTAINING PAGES 1 TO 241

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COMPOSITIONS AND METHODS FOR USE IN IMMUNOTHERAPY

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to U.S. provisional patent application numbers 62/897,947, filed on September 9, 2019, and 63/075,041 filed on September 4, 2020, the contents of each of which are incorporated herein by reference in their entireties.

DESCRIPTION OF THE TEXT FILE SUBMITTED ELECTRONICALLY

[0002] The contents of the text file submitted electronically herewith are incorporated herein by reference in their entirety: A computer readable format copy of the Sequence Listing (filename: SCRB_016_02WO_SeqList_ST25.txt, date recorded: September 9, 2020, file size 12.0 megabytes).

BACKGROUND

[0003] Many approved therapeutics, for example cancer therapeutics, are cytotoxic drugs that kill normal cells as well as diseased cells. The therapeutic benefit of these cytotoxic drugs depends on diseased cells being more sensitive than normal cells, thereby allowing clinical responses to be achieved using doses that do not result in unacceptable side effects. However, essentially all of these non-specific drugs result in some if not severe damage to normal tissues, which often limits treatment suitability.

[0004] Genome engineering can offer a different approach to cytotoxic drugs in that it permits the creation of immune cells programmed to specifically bind and kill diseased cells, for example cancer cells. The advent of the chimeric antigen receptor T cell (CAR-T) technology has led to new modalities of therapeutic benefit in certain types of cancers. By engineering cells comprising CAR to reduce a mismatch in the HLA protein, reduce or eliminate the wild-type T cell receptor or other component of the modified cell, in comparison to those of the recipient subject, it reduces or eliminates the potential for host vs. graft disease (GVHD) by eliminating host T cell receptor recognition of and response to mismatched (e.g., allogeneic) graft tissue (see, e.g., Takahiro Kamiya, T. et al. A novel method to generate T-cell receptor–deficient chimeric antigen receptor T cells. Blood Advances 2:517 (2018)). This approach, therefore, could be used to generate immune cells with an improved therapeutic index for immuno-oncologic applications in a subject with a disease such as cancer, autoimmune disease and transplant rejection.

[0005] As CRISPR/Cas systems have been adapted for genome editing in eukaryotic cells, the two technologies have the potential to permit the engineering of immune cells that have potent cytotoxicity versus the targeted cells, yet permit the reduction or elimination of cell markers that contribute to triggering unwanted recipient immune responses to transplants of such cells, especially in the case of allogeneic transplants of these cells. Accordingly, there exists a need for modified cells and methods to modify such cells into engineered CAR-T cells that exhibit these properties for use in immunotherapy treatment, for example allogeneic-based immunotherapy treatments.

SUMMARY

[0006] In some aspects, the present disclosure provides compositions of CasX:guide nucleic acid systems (CasX:gNA system) and methods used to modify target nucleic acid sequences of cell genes encoding one or more proteins involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response. In the foregoing, the proteins are selected from the group consisting of beta-2-microglobulin (B2M), T cell receptor alpha chain constant region (TRAC, or TCRA), class II major histocompatibility complex transactivator (CIITA), T cell receptor beta constant 1 (TRBC1, or TCRB), T cell receptor beta constant 2 (TRBC2), programmed cell death 1 (PD-1), cytokine inducible SH2 (CISH), T cell immunoreceptor with Ig and ITIM domains (TIGIT), adenosine A2a receptor (ADORA2A), killer cell lectin like receptor C1 (NKG2A), cytotoxic T-lymphocyte-associated protein 4 (CTLA-4), lymphocyte activating 3 (LAG-3), T-cell immunoglobulin and mucin domain 3 (TIM-3), 2B4 (CD244), human leukocyte antigen A (HLA-A), human leukocyte antigen B (HLA-B), TGFβ Receptor 2 (TGFβRII), cluster of differentiation 247 (CD247), CD3d molecule (CD3D), CD3e molecule (CD3E), CD3g molecule (CD3G), CD52 molecule (CD52), human leukocyte antigen C (HLA-C), deoxycytidine kinase (dCK), or FKBP prolyl isomerase 1A (FKBP1A). The CasX:gNA systems can comprise a reference CasX protein, a CasX variant protein with improved properties relative to the reference CasX, a guide nucleic acid (gNA) that is a reference sequence or a gNA variant with improved properties relative to the reference sequence, as well as donor template nucleic acids that can be inserted into the break sites of the target nucleic acid sequences in cells introduced by the CasX nucleases to modify the target nucleic acid sequences. Embodiments of these components are described herein, below. In some aspects, the present disclosure provides gene editing pairs of CasX and gNA as of any of the embodiments described herein

complexed as a ribonuclear protein complex (RNP). In some embodiments, the present disclosure provides methods to modify the genes of cells encoding the proteins involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response in which the gene are knocked-down or knocked out from expression of such proteins.

[0007] The cells modified by the CasX:gNA systems are useful for, among other things, immunotherapy applications; e.g. preparation and use of immune cells with reduced potential for graft-versus-host disease (GVHD), and that are also modified to express one or more chimeric antigen receptor (CAR) for use in the treatment of cancer or an autoimmune disease in a subject. Such cells also are also engineered to reduce host vs. graft complications. In other embodiments, the CasX-gNA systems are used to knock-in nucleic acids into the cells that encode CAR and/or an engineered T cell receptor (TCR), the CAR and/or the TCR comprising binding domains specific for tumor cell antigens, including those listed herein, below. Such binding domains can be in the form of a linear antibody, a single domain antibody (sdAb) such as a VHH, or a single-chain variable fragment (scFv). The cells that can be used for the preparation of the modified cells include progenitor cells, hematopoietic stem cells, pluripotent stem cells, or immune cells selected from the group consisting of T cells, TREG cells, NK cells, B cells, macrophages, or dendritic cells.

[0008] In some aspects, the present disclosure provides polynucleotides and vectors encoding or comprising the CasX proteins, gNAs, the gene editing pairs, or comprising the donor template nucleic acids described herein. In some embodiments, the vectors are viral vectors such as an Adeno-Associated Viral (AAV) vector or a lentiviral vector. In other embodiments, the vectors are non-viral particles such as virus-like particles (VLP) or nanoparticles.

[0009] In some aspects, the disclosure provides methods of modifying a target nucleic acid sequence of in a population of cells, comprising introducing into each cell of the population: a) the CasX:gNA system of any of the embodiments disclosed herein; or b) the nucleic acid of any of the embodiments disclosed herein; or c) the vector of any of the embodiments disclosed herein; d) the VLP of any of the embodiments disclosed herein; or e) combinations of two or more of (a)-(d)), above, wherein the target nucleic acid sequence of the cells is modified by the CasX protein (e.g., a single- or double-stranded break, or an insertion, deletion, substitution, duplication, or inversion of one or more nucleotides in the target nucleic acid sequence).

[0010] In some aspects, the present disclosure provides populations of cells modified by the ex vivo methods of modification of the target nucleic acid by the CasX:gNA systems, vectors, or VLPs (or combinations thereof) of any of the embodiments described herein, wherein the expression of MHC Class I molecules or T cell receptors or the proteins involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response have been reduced or eliminated in the modified cells. In some embodiments, the present disclosure provides populations of cells modified by the ex vivo methods of modification of the target nucleic acid by the CasX:gNA systems, vectors, or VLPs (or combinations thereof) of any of the embodiments described herein, wherein the modified cells express a detectable level of the CAR and/or TCR of any of the embodiments described herein.

[0011] In some aspects, the present disclosure provides methods of providing an anti-tumor immunity in a subject, the method comprising administering to the subject a therapeutically effective amount of the modified cells of any of the embodiments described herein.

[0012] In some aspects, the present disclosure provides methods of treating a subject having a disease associated with expression of a tumor antigen, the method comprising administering to the subject a therapeutically effective amount of the modified cells of any one of embodiments described herein.

[0013] In another aspect, provided herein are compositions of immune cells modified by CasX and gNA gene editing pairs and, optionally, donor templates and/or polynucleotides encoding CAR and/or TCR for use as a medicament for the treatment of a subject having a disease associated with expression of a tumor antigen. In the foregoing, the CasX can be a CasX variant of any of the embodiments described herein (e.g., the sequences of Table 4) and the gNA can be a gNA variant of any of the embodiments described herein (e.g., the sequences of Table 2). In other embodiments, the disclosure provides compositions cells modified by vectors comprising or encoding the gene editing pairs of CasX and gNA, donor templates and/or polynucleotides encoding CAR for use as a medicament for the treatment of a subject having a disease associated with expression of a tumor antigen.

[0014] In some aspects, the present disclosure provides kits comprising the CasX:gNA systems, the vectors, or the VLP described herein, and further comprising an excipient and a container.

[0015] In another aspect, provided herein are CasX:gNA systems, compositions comprising CasX:gNA systems, vectors comprising or encoding CasX:gNA systems, VLP comprising

CasX:gNA systems, or populations of cells edited using the CasX:gNA systems, for use as a medicament for the treatment of a disease or disorder.

[0016] In another aspect, provided herein are CasX:gNA systems, composition comprising g CasX:gNA systems, or vectors comprising or encoding CasX:gNA systems, VLP comprising CasX:gNA systems, populations of cells edited using the CasX:gNA systems, for use in a method of treatment of a disease or disorder.

INCORPORATION BY REFERENCE

[0017] All publications, patents, and patent applications mentioned in this specification are herein incorporated by reference to the same extent as if each individual publication, patent, or patent application was specifically and individually indicated to be incorporated by reference. The contents of PCT/US2020/036505, filed on June 5, 2020, which discloses CasX variants and gNA variants, are hereby incorporated by reference in their entirety.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The novel features of the invention are set forth with particularity in the appended claims. A better understanding of the features and advantages of the present invention will be obtained by reference to the following detailed description that sets forth illustrative embodiments, in which the principles of the invention are utilized, and the accompanying drawings of which:

[0019] FIG. 1 shows an SDS-PAGE gel of StX2 purification fractions visualized by colloidal Coomassie staining, as described in Example 1.

[0020] FIG. 2 shows the chromatogram from a size exclusion chromatography assay of the StX2, using of Superdex 200 16/600 pg Gel Filtration, as described in Example 1.

[0021] FIG. 3 shows an SDS-PAGE gel of StX2 purification fractions visualized by colloidal Coomassie staining, as described in Example 1.

[0022] FIG. 4 is a schematic showing the organization of the components in the pSTX34 plasmid used to assemble the CasX constructs, as described in Example 2.

[0023] FIG. 5 is a schematic showing the steps of generating the CasX 119 variant, as described in Example 2.

[0024] FIG. 6 shows an SDS-PAGE gel of purification samples, visualized on a Bio-Rad Stain-Free™ gel, as described in Example 2.

[0025] FIG. 7 shows the chromatogram of Superdex 200 16/600 pg Gel Filtration, as described in Example 2.

[0026] FIG. 8 shows an SDS-PAGE gel of gel filtration samples, stained with colloidal Coomassie, as described in Example 2.

[0027] FIG. 9 shows the results of an editing assay of 6 target genes in HEK293T cells, as described in Example 10. Each dot represents results using an individual spacer.

[0028] FIG. 10 shows the results of an editing assay of 6 target genes in HEK293T cells, with individual bars representing the results obtained with individual spacers, as described in Example 10.

[0029] FIG. 11 shows the results of an editing assay of 4 target genes in HEK293T cells, as described in Example 10. Each dot represents results using an individual spacer utilizing a CTC PAM.

[0030] FIG. 12 is a graph of the results of an assay for the quantification of active fractions of RNP formed by sgRNA174 and the CasX variants, as described in Example 14. Equimolar amounts of RNP and target were co-incubated and the amount of cleaved target was determined at the indicated timepoints. Mean and standard deviation of three independent replicates are shown for each timepoint. The biphasic fit of the combined replicates is shown. "2" refers to the reference CasX protein of SEQ ID NO:2.

[0031] FIG. 13 shows the quantification of active fractions of RNP formed by CasX2 and the modified sgRNAs, as described in Example 14. Equimolar amounts of RNP and target were co-incubated and the amount of cleaved target was determined at the indicated timepoints. Mean and standard deviation of three independent replicates are shown for each timepoint. The biphasic fit of the combined replicates is shown.

[0032] FIG. 14 shows the quantification of active fractions of RNP formed by CasX 491 and the modified sgRNAs under guide-limiting conditions, as described in Example 14. Equimolar amounts of RNP and target were co-incubated and the amount of cleaved target was determined at the indicated timepoints. The biphasic fit of the data is shown.

[0033] FIG. 15 shows the quantification of cleavage rates of RNP formed by sgRNA174 and the CasX variants, as described in Example 14. Target DNA was incubated with a 20-fold excess of the indicated RNP and the amount of cleaved target was determined at the indicated time points. Mean and standard deviation of three independent replicates are shown for each timepoint, except for 488 and 491 where a single replicate is shown. The monophasic fit of the combined replicates is shown.

[0034] FIG. 16 shows the quantification of cleavage rates of RNP formed by CasX2 and the sgRNA variants, as described in Example 14. Target DNA was incubated with a 20-fold excess of the indicated RNP and the amount of cleaved target was determined at the indicated time points. Mean and standard deviation of three independent replicates are shown for each timepoint. The monophasic fit of the combined replicates is shown.

[0035] FIG. 17 shows the quantification of initial velocities of RNP formed by CasX2 and the sgRNA variants, as described in Example 14. The first two time-points of the previous cleavage experiment were fit with a linear model to determine the initial cleavage velocity.

[0036] FIG. 18 shows the quantification of cleavage rates of RNP formed by CasX491 and the sgRNA variants, as described in Example 14. Target DNA was incubated with a 20-fold excess of the indicated RNP at 10°C and the amount of cleaved target was determined at the indicated time points. The monophasic fit of the timepoints is shown.

[0037] FIG. 19 is a diagram and an example fluorescence activated cell sorting (FACS) plot illustrating an exemplary method for assaying the effectiveness of a reference CasX protein or single guide RNA (sgRNA), or variants thereof, as described in Example 17. A reporter (e.g., GFP reporter) coupled to a gRNA target sequence, complementary to the gRNA spacer, is integrated into a reporter cell line. Cells are transformed or transfected with a CasX protein and/or sgRNA variant, with the spacer motif of the sgRNA complementary to and targeting the gRNA target sequence of the reporter. Ability of the CasX:sgRNA ribonucleoprotein complex to cleave the target sequence is assayed by FACS. Cells that lose reporter expression indicate occurrence of CasX:sgRNA ribonucleoprotein complex-mediated cleavage and indel formation.

[0038] FIG. 20 shows results of gene editing in an EGFP disruption assay, as described in Example 19. Editing was measured by indel formation and GFP disruption in HEK293 cells carrying a GFP reporter. FIG. 2 shows the improvement in editing efficiency of a CasX sgRNA variant of SEQ ID NO:5 versus the reference of SEQ ID NO:4 across 10 targets. When averaged across 10 targets, the editing efficiency of sgRNA SEQ ID NO:5 improved 176% compared to SEQ ID NO:4.

[0039] FIG. 21 shows results of gene editing in an EGFP disruption assay where further editing improvements were obtained in the sgRNA scaffold of SEQ ID NO:5 by swapping the extended stem loop sequence (indicated in the X-axis) for additional sequences to generate the scaffolds whose sequences are shown in Table 2, as described in Example 20.

[0040] FIG. 22 is a graph showing the fold improvement of sgRNA variants generated by DME mutations normalized to SEQ ID NO:5 as the CasX reference sgRNA, as described in Example 20.

[0041] FIG. 23 is a graph showing the fold improvement normalized to the SEQ ID NO:5 reference CasX sgRNA of variants created by both combining (stacking) scaffold stem mutations showing improved cleavage, DME mutations showing improved cleavage, and using ribozyme appendages showing improved cleavage (the appendages and their sequences are listed in Table 15 in Example 20). The resulting sgRNA variants yield 2-fold or greater improvement in cleavage compared to SEQ ID NO:5 in this assay. EGFP editing assays were performed with spacer target sequences of E6 (TGTGGTCGGGGTAGCGGCTG (SEQ ID NO: 17)) and E7 (TCAAGTCCGCCATGCCCGAA (SEQ ID NO: 18)) described in Example 19.

[0042] FIG. 24 is a graph showing the expression levels of HLA1 in Jurkat and HEK 293T, as described in Example 21. Cells were analyzed via flow cytometry using a fluorescent antibody targeting HLA1.

[0043] FIG. 25 is an agarose gel showing T7E1 of HEK 293T genomic DNA treated with Stx 2.2, as described in Example 21. Editing is occurring at the B2M locus with a targeting spacer (p6.2.2.7.37), but not with a nontargeting spacer (p6.2.2.0.1).

[0044] FIG. 26 is a graph showing the relative improvement in edited (knock-out) of B2M in HEK 293T cells using Stx molecule 119.64 (numbers refer to CasX and guide, respectively), compared to Stx 2.2, as described in Example 21.

[0045] FIG. 27 is a graph showing the comparison in edited (knock-out) of B2M in HEK 293T cells using Stx 119.64 in comparison with the five high-performing SaCas9 spacers, showing comparable levels of editing, as described in Example 21.

[0046] FIG. 28 is a graph showing the relative improvement in edited (knock-out) of B2M in HEK 293T cells using Stx molecule 119.64.7 (numbers refer to CasX, guide, and spacer, respectively) compared to Stx 2.2, with results comparable to SaCas9, as described in Example 21.

[0047] FIG. 29 is a graph showing NGS analysis of percentage editing of the HEK 293T B2M locus, with up to 80% modification with Stx 119.64, as described in Example 21.

[0048] FIG. 30 shows the results of RNP-mediated editing at the B2M locus, as described in Example 24. Jurkat cells were electroporated with the indicated dose and variant of CasX

with a guide with either spacer 7.9 or 7.37. HLA knockdown was determined with antibody staining and flow cytometry.

[0049] FIG. 31 shows the results of cell viability assays following electroporation of CasX RNPs, as described in Example 24, with spacer 7.9 (top) and 7.37 (bottom). Live cells were counted via DAPI staining and flow cytometry at the time of HLA knockdown analysis.

[0050] FIG. 32 shows the results of NGS analysis of RNP-mediated editing at the B2M locus, as described in Example 24. Jurkat cells were electroporated with the indicated dose of RNP and analyzed for indel formation via NGS.

[0051] FIG. 33 shows the results of indel and HDR rates by editing at the TRAC locus analyzed for loss of surface expression of TCR α/β, which indicates indel formation, expression of GFP, which indicates HDR, and number of viable cells, as described in Example 25. "T" and "B" indicate whether the ssDNA is the top or bottom strand relative to the direction of the TRAC gene.

[0052] FIG. 34 shows the results of co-editing of B2M and TRAC loci, as described in Example 26. Jurkat cells were electroporated with the indicated dose of RNP, and editing of B2M and TRAC was identified by staining for HLA-1 and TCR α/β and detected by flow cytometry.

[0053] FIG. 35 shows Table 3A, a table of gNA targeting sequences (spacers) targeting the *B2M* gene (SEQ ID NOs: 725-2100 and 2281-7085).

[0054] FIG. 36 shows Table 3B, a table of gNA targeting sequences (spacers) targeting the *TRAC* gene (SEQ ID NOs: 7086-27454).

[0055] FIG. 37 shows Table 3C, a table of gNA targeting sequences (spacers) targeting the *CIITA* gene (SEQ ID NOs: 27455-55572).

DETAILED DESCRIPTION

[0056] While exemplary embodiments have been shown and described herein, it will be obvious to those skilled in the art that such embodiments are provided by way of example only. Numerous variations, changes, and substitutions will now occur to those skilled in the art without departing from the invention. It should be understood that various alternatives to the embodiments of the invention described herein may be employed in practicing the invention. It is intended that the following claims define the scope of the invention and that methods and structures within the scope of these claims and their equivalents be covered thereby.

[0057] Unless otherwise defined, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. Although methods and materials similar or equivalent to those described herein can be used in the practice or testing of the present invention, suitable methods and materials are described below. In case of conflict, the patent specification, including definitions, will control. In addition, the materials, methods, and examples are illustrative only and not intended to be limiting. Numerous variations, changes, and substitutions will now occur to those skilled in the art without departing from the invention.

DEFINITIONS

[0058] The terms "polynucleotide" and "nucleic acid," used interchangeably herein, refer to a polymeric form of nucleotides of any length, either ribonucleotides or deoxyribonucleotides. Thus, terms "polynucleotide" and "nucleic acid" encompass single-stranded DNA; double-stranded DNA; multi-stranded DNA; single-stranded RNA; double-stranded RNA; multi-stranded RNA; genomic DNA; cDNA; DNA-RNA hybrids; and a polymer comprising purine and pyrimidine bases or other natural, chemically or biochemically modified, non-natural, or derivatized nucleotide bases.

[0059] "Hybridizable" or "complementary" are used interchangeably to mean that a nucleic acid (e.g., RNA, DNA) comprises a sequence of nucleotides that enables it to non-covalently bind, i.e., form Watson-Crick base pairs and/or G/U base pairs, "anneal", or "hybridize," to another nucleic acid in a sequence-specific, antiparallel, manner (i.e., a nucleic acid specifically binds to a complementary nucleic acid) under the appropriate in vitro and/or in vivo conditions of temperature and solution ionic strength. It is understood that the sequence of a polynucleotide need not be 100% complementary to that of its target nucleic acid sequence to be specifically hybridizable; it can have at least about 70%, at least about 80%, or at least about 90%, or at least about 95% sequence identity and still hybridize to the target nucleic acid sequence. Moreover, a polynucleotide may hybridize over one or more segments such that intervening or adjacent segments are not involved in the hybridization event (e.g., a loop structure or hairpin structure, a 'bulge', and the like).

[0060] A “gene,” for the purposes of the present disclosure, includes a DNA region encoding a gene product (e.g., a protein, RNA), as well as all DNA regions which regulate the production of the gene product, whether or not such regulatory sequences are adjacent to coding and/or transcribed sequences. Accordingly, a gene may include regulatory element sequences including, but not necessarily limited to, promoter sequences, terminators,

translational regulatory sequences such as ribosome binding sites and internal ribosome entry sites, enhancers, silencers, insulators, boundary elements, replication origins, matrix attachment sites and locus control regions. Coding sequences encode a gene product upon transcription or transcription and translation; the coding sequences of the disclosure may comprise fragments and need not contain a full-length open reading frame. A gene can include both the strand that is transcribed, e.g. the strand containing the coding sequence, as well as the complementary strand.

[0061] The term "downstream" refers to a nucleotide sequence that is located 3' to a reference nucleotide sequence. In certain embodiments, downstream nucleotide sequences relate to sequences that follow the starting point of transcription. For example, the translation initiation codon of a gene is located downstream of the start site of transcription.

[0062] The term "upstream" refers to a nucleotide sequence that is located 5' to a reference nucleotide sequence. In certain embodiments, upstream nucleotide sequences relate to sequences that are located on the 5' side of a coding region or starting point of transcription. For example, most promoters are located upstream of the start site of transcription.

[0063] The term “regulatory element” is used interchangeably herein with the term “regulatory sequence,” and is intended to include promoters, enhancers, and other expression regulatory elements (e.g. transcription termination signals, such as polyadenylation signals and poly-U sequences). Exemplary regulatory elements include a transcription promoter such as, but not limited to, CMV, CMV+intron A, SV40, RSV, HIV-Ltr, elongation factor 1 alpha (EF1α), MMLV-ltr, internal ribosome entry site (IRES) or P2A peptide to permit translation of multiple genes from a single transcript, metallothionein, a transcription enhancer element, a transcription termination signal, polyadenylation sequences, sequences for optimization of initiation of translation, and translation termination sequences. It will be understood that the choice of the appropriate regulatory element will depend on the encoded component to be expressed (e.g., protein or RNA) or whether the nucleic acid comprises multiple components that require different polymerases or are not intended to be expressed as a fusion protein.

[0064] The term "promoter" refers to a DNA sequence that contains an RNA polymerase binding site, transcription start site, TATA box, and/or B recognition element and assists or promotes the transcription and expression of an associated transcribable polynucleotide sequence and/or gene (or transgene). A promoter can be synthetically produced or can be derived from a known or naturally occurring promoter sequence or another promoter

sequence. A promoter can be proximal or distal to the gene to be transcribed. A promoter can also include a chimeric promoter comprising a combination of two or more heterologous sequences to confer certain properties. A promoter of the present disclosure can include variants of promoter sequences that are similar in composition, but not identical to, other promoter sequence(s) known or provided herein. A promoter can be classified according to criteria relating to the pattern of expression of an associated coding or transcribable sequence or gene operably linked to the promoter, such as constitutive, developmental, tissue-specific, inducible, etc.

[0065] The term “enhancer” refers to regulatory DNA sequences that, when bound by specific proteins called transcription factors, regulate the expression of an associated gene. Enhancers may be located in the intron of the gene, or 5’ or 3’ of the coding sequence of the gene. Enhancers may be proximal to the gene (*i.e.*, within a few tens or hundreds of base pairs (bp) of the promoter), or may be located distal to the gene (*i.e.*, thousands of bp, hundreds of thousands of bp, or even millions of bp away from the promoter). A single gene may be regulated by more than one enhancer, all of which are envisaged as within the scope of the instant disclosure.

[0066] "Recombinant," as used herein, means that a particular nucleic acid (DNA or RNA) is the product of various combinations of cloning, restriction, and/or ligation steps resulting in a construct having a structural coding or non-coding sequence distinguishable from endogenous nucleic acids found in natural systems. Generally, DNA sequences encoding the structural coding sequence can be assembled from cDNA fragments and short oligonucleotide linkers, or from a series of synthetic oligonucleotides, to provide a synthetic nucleic acid which is capable of being expressed from a recombinant transcriptional unit contained in a cell or in a cell-free transcription and translation system. Such sequences can be provided in the form of an open reading frame uninterrupted by internal non-translated sequences, or introns, which are typically present in eukaryotic genes. Genomic DNA comprising the relevant sequences can also be used in the formation of a recombinant gene or transcriptional unit. Sequences of non-translated DNA may be present 5’ or 3’ from the open reading frame, where such sequences do not interfere with manipulation or expression of the coding regions, and may indeed act to modulate production of a desired product by various mechanisms (see "enhancers” and “promoters", above).

[0067] The term "recombinant polynucleotide" or "recombinant nucleic acid" refers to one which is not naturally occurring, e.g., is made by the artificial combination of two otherwise

separated segments of sequence through human intervention. This artificial combination is often accomplished by either chemical synthesis means, or by the artificial manipulation of isolated segments of nucleic acids, e.g., by genetic engineering techniques. Such is usually done to replace a codon with a redundant codon encoding the same or a conservative amino acid, while typically introducing or removing a sequence recognition site. Alternatively, it is performed to join together nucleic acid segments of desired functions to generate a desired combination of functions. This artificial combination is often accomplished by either chemical synthesis means, or by the artificial manipulation of isolated segments of nucleic acids, e.g., by genetic engineering techniques.

[0068] Similarly, the term "recombinant" polypeptide refers to a polypeptide which is not naturally occurring, e.g., is made by the artificial combination of two otherwise separated segments of amino sequence through human intervention. Thus, e.g., a polypeptide that comprises a heterologous amino acid sequence is recombinant.

[0069] As used herein, the term "contacting" means establishing a physical connection between two or more entities. For example, contacting a target nucleic acid sequence with a guide nucleic acid means that the target nucleic acid sequence and the guide nucleic acid are made to share a physical connection; e.g., can hybridize if the sequences share sequence similarity.

[0070] “Dissociation constant”, or “K_d”, are used interchangeably and mean the affinity between a ligand “L” and a protein “P”; i.e., how tightly a ligand binds to a particular protein. It can be calculated using the formula $K_d=[L][P]/[LP]$, where [P], [L] and [LP] represent molar concentrations of the protein, ligand and complex, respectively.

[0071] The term "knock-out" refers to the elimination of a gene or the expression of a gene. For example, a gene can be knocked out by either a deletion or an addition of a nucleotide sequence that leads to a disruption of the reading frame. As another example, a gene may be knocked out by replacing a part of the gene with an irrelevant sequence. The term "knock-down" as used herein refers to reduction in the expression of a gene or its gene product(s). As a result of a gene knock-down, the protein activity or function may be attenuated or the protein levels may be reduced or eliminated.

[0072] As used herein, "homology-directed repair" (HDR) refers to the form of DNA repair that takes place during repair of double-strand breaks in cells. This process requires nucleotide sequence homology, and uses a donor template to repair or knock-out a target DNA, and leads to the transfer of genetic information from the donor to the target.

Homology-directed repair can result in an alteration of the sequence of the target sequence by insertion, deletion, or mutation if the donor template differs from the target DNA sequence and part or all of the sequence of the donor template is incorporated into the target DNA.

[0073] As used herein, "non-homologous end joining" (NHEJ) refers to the repair of double-strand breaks in DNA by direct ligation of the break ends to one another without the need for a homologous template (in contrast to homology-directed repair, which requires a homologous sequence to guide repair). NHEJ often results in the loss (deletion) of nucleotide sequence near the site of the double- strand break.

[0074] As used herein "micro-homology mediated end joining" (MMEJ) refers to a mutagenic DSB repair mechanism, which always associates with deletions flanking the break sites without the need for a homologous template (in contrast to homology-directed repair, which requires a homologous sequence to guide repair). MMEJ often results in the loss (deletion) of nucleotide sequence near the site of the double- strand break.

[0075] A polynucleotide or polypeptide has a certain percent "sequence similarity" or "sequence identity" to another polynucleotide or polypeptide, meaning that, when aligned, that percentage of bases or amino acids are the same, and in the same relative position, when comparing the two sequences. Sequence similarity (sometimes referred to as percent similarity, percent identity, or homology) can be determined in a number of different manners. To determine sequence similarity, sequences can be aligned using the methods and computer programs that are known in the art, including BLAST, available over the world wide web at ncbi.nlm.nih.gov/BLAST. Percent complementarity between particular stretches of nucleic acid sequences within nucleic acids can be determined using any convenient method. Example methods include BLAST programs (basic local alignment search tools) and PowerBLAST programs (Altschul et al., J. Mol. Biol., 1990, 215, 403-410; Zhang and Madden, Genome Res., 1997, 7, 649-656) or by using the Gap program (Wisconsin Sequence Analysis Package, Version 8 for Unix, Genetics Computer Group, University Research Park, Madison Wis.), e.g., using default settings, which uses the algorithm of Smith and Waterman (Adv. Appl. Math., 1981, 2, 482-489).

[0076] The terms "polypeptide," and "protein" are used interchangeably herein, and refer to a polymeric form of amino acids of any length, which can include coded and non-coded amino acids, chemically or biochemically modified or derivatized amino acids, and polypeptides having modified peptide backbones. The term includes fusion proteins, including, but not limited to, fusion proteins with a heterologous amino acid sequence.

[0077] A "vector" or "expression vector" is a replicon, such as plasmid, phage, virus, or cosmid, to which another DNA segment, i.e., an "insert", may be attached so as to bring about the replication or expression of the attached segment in a cell.

[0078] The term "naturally-occurring" or "unmodified" or "wild type" as used herein as applied to a nucleic acid, a polypeptide, a cell, or an organism, refers to a nucleic acid, polypeptide, cell, or organism that is found in nature.

[0079] As used herein, a "mutation" refers to an insertion, deletion, substitution, duplication, or inversion of one or more amino acids or nucleotides as compared to a reference amino acid sequence or to a reference nucleotide sequence.

[0080] As used herein the term "isolated" is meant to describe a polynucleotide, a polypeptide, or a cell that is in an environment different from that in which the polynucleotide, the polypeptide, or the cell naturally occurs. An isolated genetically modified host cell may be present in a mixed population of genetically modified host cells.

[0081] A "host cell," as used herein, denotes a eukaryotic cell, a prokaryotic cell, or a cell from a multicellular organism (e.g., in a cell line), which eukaryotic or prokaryotic cells are used as recipients for a nucleic acid (e.g., an expression vector), and include the progeny of the original cell which has been genetically modified by the nucleic acid. It is understood that the progeny of a single cell may not necessarily be completely identical in morphology or in genomic or total DNA complement as the original parent, due to natural, accidental, or deliberate mutation. A "recombinant host cell" (also referred to as a "genetically modified host cell") is a host cell into which has been introduced a heterologous nucleic acid, e.g., an expression vector.

[0082] The term "conservative amino acid substitution" refers to the interchangeability in proteins of amino acid residues having similar side chains. For example, a group of amino acids having aliphatic side chains consists of glycine, alanine, valine, leucine, and isoleucine; a group of amino acids having aliphatic-hydroxyl side chains consists of serine and threonine; a group of amino acids having amide-containing side chains consists of asparagine and glutamine; a group of amino acids having aromatic side chains consists of phenylalanine, tyrosine, and tryptophan; a group of amino acids having basic side chains consists of lysine, arginine, and histidine; and a group of amino acids having sulfur-containing side chains consists of cysteine and methionine. Exemplary conservative amino acid substitution groups are: valine-leucine-isoleucine, phenylalanine-tyrosine, lysine-arginine, alanine-valine, and asparagine-glutamine.

[0083] The term "Chimeric Antigen Receptor" or a "CAR" comprises at least two domains, which when expressed in a cell, provides the cell with specificity for a target antigen, or a target cell bearing a target antigen, typically a diseased cell bearing a specific disease-related antigen. In some embodiments, a CAR comprises at least an extracellular antigen binding domain (e.g., a scFv with binding specificity to the protein involved in a disease (e.g. cancer), a transmembrane domain and a cytoplasmic signaling domain (also referred to herein as "an intracellular signaling domain") comprising a functional signaling domain derived from one or more stimulatory and/or costimulatory molecules as provided below. In some aspects, the set of polypeptides are contiguous with each other. The portion of the CAR of the disclosure comprising antigen binding domain thereof may exist in a variety of forms where the antigen binding domain is expressed as part of a contiguous polypeptide chain including, for example, a single domain antibody fragment (sdAb), a single chain antibody (scFv), a humanized antibody or bispecific antibody (Harlow et al., 1999, In: Using Antibodies: A Laboratory Manual, Cold Spring Harbor Laboratory Press, NY; Harlow et al., 1989, In: Antibodies: A Laboratory Manual, Cold Spring Harbor, N.Y.; Houston et al., 1988, Proc. Natl. Acad. Sci. USA 85:5879-5883; Bird et al., 1988, Science 242:423-426), and may further comprise hinge regions, for example of an immunoglobulin molecule, and spacers, that provide flexibility to the receptor. The hinge, spacer, and transmembrane domains connect the scFv to the activation domains and anchor the CAR in the T-cell membrane. In some embodiments, the CAR composition of the disclosure comprises an antigen binding domain. In a further embodiments, the CAR comprises an antibody fragment that comprises a scFv. The precise amino acid sequence boundaries of a given CDR can be determined using any of a number of well-known schemes, including those described by Kabat et al. (1991), "Sequences of Proteins of Immunological Interest," 5th Ed. Public Health Service, National Institutes of Health, Bethesda, Md. ("Kabat" numbering scheme), Al-Lazikani et al., (1997) JMB 273,927-948 ("Chothia" numbering scheme), or a combination thereof.

[0084] The term "T cell receptor (TCR)" refers to a protein complex found on the surface of T cells that is responsible for recognizing peptide antigens bound to major histocompatibility complex (MHC) molecules. The TCR is composed of multiple subunits, including a TCR alpha and TCR beta chain (encoded by TRAC, or TCRA, and TBRC1, or TCRB, respectively) and within these chains are complementary determining regions (CDRs) which determine the antigen to which the TCR will bind. Additional subunits include CD-epsilon (CD3E), CD3-delta (CD3D), CD3-gamma (CD3G) and CD3-zeta

(CD3Z). The extracellular domains of the TCR alpha and TCR beta subunits form the antigen binding site of the native TCR. The CDRs of the extracellular domains of the TCR are the antigen binding sections and a diverse recognition capability leads to efficient protection against foreign antigens or disease cells and the generation of optimal immune responses. Once the TCR is properly engaged with the antigen, conformational changes in the associated CD3 chains are induced that initiates, with other factors, the signaling process and T cell activation.

[0085] As used herein, an "engineered TCR" refers to a TCR which has been engineered to include an antigen binding domain with specificity for a target antigen, or a target cell bearing a target antigen, typically a diseased cell bearing a specific disease-related antigen. For example, an engineered TCR may include an antigen binding domain fused to either the TCR alpha or TCR beta subunits of the TCR, or a combination of thereof. Any antigen binding domain, including, for example, a single domain antibody fragment (sdAb), a single chain antibody (scFv), a humanized antibody or bispecific antibody may be used with the engineered TCRs described herein. In addition to the subunit or subunits fused to the antigen binding domain, engineered TCRs may also include wild type subunits that are encoded by the genome of the cell. For example, an engineered TCR may include an antigen binding domain fused to either the TCR alpha or TCR beta subunits of the TCR, as well as wild type CD3-delta, CD3-gamma, CD3-epsilon and CD3-zeta subunits.

[0086] "Signaling domain" refers to the functional portion of a protein that acts by transmitting information within the cell to regulate cellular activity via defined signaling pathways by generating second messengers or functioning as effectors by responding to such messengers.

[0087] An "intracellular signaling domain" refers to an intracellular portion of a molecule and, as used herein, is a component of the CAR. Examples of T cell-derived signaling domains are derived from polypeptides selected from the group consisting of CD247 molecule (CD3-zeta, or CD3Z), CD27 molecule (CD27), CD28 molecule (CD28), TNF receptor superfamily member 9 (4-1BB, or41BB), inducible T cell costimulator (ICOS), TNF receptor superfamily member 4 (OX40), or a combination thereof. The intracellular signaling domain generates a signal that promotes an immune effector function of the CAR containing cell, e.g., a CAR-T cell. Examples of immune effector function, e.g., in a CAR-T cell, include cytolytic activity and helper activity, including the secretion of cytokines. An intracellular signaling domain can comprise a signaling motif which is known as an immunoreceptor

tyrosine-based activation motif or ITAM. Examples of ITAM containing primary cytoplasmic signaling sequences include, but are not limited to, those derived from CD3zeta, Fc fragment of IgE receptor Ig (common FcR gamma, orFCER1G), Fc fragment of IgG receptor IIa (Fc gamma RIIa, or FCGR2A), Fc receptor gamma RIIB, CD3g molecule (CD3 gamma, or CD3G), CD3d molecule (CD3 delta, or CD3D), CD3e molecule (CD3 epsilon, or CD3E), CD79a, CD79b, DAP10, and DAP12.

[0088] The term "zeta" or alternatively "zeta chain", "CD3-zeta" or "TCR-zeta" is defined as the protein provided as GenBan Acc. No. BAG36664.1, or the equivalent residues from a non-human species, e.g., mouse, rodent, or non-human primate, and a "zeta stimulatory domain" or alternatively a "CD3-zeta stimulatory domain" or a "TCR-zeta stimulatory domain" is defined as the amino acid residues from the cytoplasmic domain of the zeta chain, or functional derivatives thereof, that are sufficient to functionally transmit an initial signal necessary for T cell activation. In some embodiments, the cytoplasmic domain of zeta comprises residues 52 through 164 of GenBank Acc. No. BAG36664.1 or the equivalent residues from a non-human species that are functional orthologs thereof.

[0089] "Protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response" as used herein, refers to extracellular, transmembrane and intracellular proteins or glycoproteins involved in antigen processing, presentation, recognition, and/or response. In some cases, the protein or glycoprotein is expressed on the surface of cells and can conveniently serve as a marker of a specific cell type. For example, T cell and B cell surface proteins identify their lineage and stage in the differentiation process. In some cases, protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response is a receptor that has binding affinity for a ligand.

[0090] A "tumor antigen" is expressed on the surface of a cancer cell, either entirely or as a fragment (e.g., an MHC peptide), and which is useful for the preferential targeting of an immune cell to the cancer cell. In some embodiments, a tumor antigen is a marker expressed by both normal cells and cancer cells, e.g., CD19 on B cells. In some embodiments, a tumor antigen is a cell surface molecule that is overexpressed in a cancer cell in comparison to a normal cell.

[0091] The term "antibody," as used herein, encompasses various antibody structures, including but not limited to monoclonal antibodies, polyclonal antibodies, multispecific antibodies (e.g., bispecific antibodies), nanobodies, single domain antibodies such as VHH antibodies, and antibody fragments so long as they exhibit the desired antigen-binding

activity or immunological activity. Antibodies represent a large family of molecules that include several types of molecules, such as IgD, IgG, IgA, IgM and IgE.

[0092] A "humanized" antibody refers to a antibody comprising amino acid residues from non-human complementarity-determining regions (CDRs) and amino acid residues from human framework regions (FRs). Typically, a humanized antibody will comprise substantially all of the variable domains in which all or substantially all of the CDRs correspond to those of a non-human antibody (which may include amino acid substitutions), and all or substantially all of the FRs correspond to those of a human antibody.

[0093] The term "monoclonal antibody" as used herein refers to an antibody obtained from a population of substantially homogeneous antibodies wherein the population are identical and/or bind the same epitope. Thus, the modifier "monoclonal" indicates the character of the antibody as being obtained from a substantially homogeneous population of antibodies, and is not to be construed as requiring production of the antibody by any particular method.

[0094] An "antigen binding domain" as used herein refers to immunologically active portions of a molecule that contains an antigen-binding site which specifically binds ("immunoreacts with") an antigen. An antigen binding domain "specifically binds to" or is "specific for" an antigen if it binds with greater affinity or avidity than it binds to other reference antigens including polypeptides or other substances. Examples of proteins that comprise antigen binding domains include but are not limited to Fv, Fab, Fab′, Fab′-SH, F(ab′)2, diabodies, linear antibodies (see, US 5,641,870), a single domain antibody, a single domain camelid antibody, single-chain fragment variable (scFv) antibody molecules, or any polypeptide chain-containing molecular structure that has a specific shape which fits to and recognizes and binds to an epitope.

[0095] "scFv" or "single chain fragment variable" are used interchangeably herein to refer to an antibody fragment format comprising variable regions of heavy ("VH") and light ("VL") chains or two copies of a VH or VL chain of an antibody, which are joined together by a short flexible peptide linker which enables the scFv to form the desired structure for antigen binding. The scFv is a fusion protein of the variable regions of the heavy (VH) and light chains (VL) of immunoglobulins each comprising complementarity-determining regions (CDRs), which can be in either order; VH-VL or VL-VH and are usually joined by linkers.

[0096] The term "4-1BB" refers to a member of the TNF-R superfamily having an amino acid sequence provided as GenBank Acc. No. AAA62478.2, or the equivalent residues from a non-human species; and a "4-1BB costimulatory domain" is defined as amino acid residues

214-255 of GenBank Acc. No. AAA62478.2, or the equivalent residues from a non-human species.

[0097] "Immune effector cell" refers to a cell that is involved in an immune response, e.g., in the promotion of an immune effector response. Examples of immune effector cells include T cells, such as helper T cells and cytotoxic T cells, gamma-delta T cells, tumor infiltrating lymphocytes, NK cells, B cells, monocytes, macrophages, or dendritic cells.

[0098] "Immune effector function" or "immune effector response," refers to function or response, e.g., of an immune effector cell, that enhances or promotes an immune attack of a target cell. In the context of the present disclosure, an immune effector function or response refers a property of a T or NK cell that promotes killing or the inhibition of growth or proliferation of a target cell.

[0099] As used herein, "treatment" or "treating," are used interchangeably herein and refer to an approach for obtaining beneficial or desired results, including but not limited to a therapeutic benefit and/or a prophylactic benefit. By therapeutic benefit is meant eradication or amelioration of the underlying disorder or disease being treated. A therapeutic benefit can also be achieved with the eradication or amelioration of one or more of the symptoms or an improvement in one or more clinical parameters associated with the underlying disease such that an improvement is observed in the subject, notwithstanding that the subject may still be afflicted with the underlying disorder.

[00100] The terms "therapeutically effective amount" and "therapeutically effective dose", as used herein, refer to an amount of a drug or a biologic, alone or as a part of a composition, that is capable of having any detectable, beneficial effect on any symptom, aspect, measured parameter or characteristics of a disease state or condition when administered in one or repeated doses to a subject such as a human or an experimental animal. Such effect need not be absolute to be beneficial.

[00101] As used herein, "administering" is meant a method of giving a dosage of a compound (e.g., a composition of the disclosure) or a composition (e.g., a pharmaceutical composition) to a subject.

[00102] A "subject" is a mammal. Mammals include, but are not limited to, domesticated animals, non-human primates, humans, rabbits, mice, rats and other rodents.

I. General Methods

[00103] The practice of the present disclosure employs, unless otherwise indicated, conventional techniques of immunology, biochemistry, chemistry, molecular biology, microbiology, cell biology, genomics and recombinant DNA, which can be found in such standard textbooks as Molecular Cloning: A Laboratory Manual, 3rd Ed. (Sambrook et al., HaRBor Laboratory Press 2001); Short Protocols in Molecular Biology, 4th Ed. (Ausubel et al. eds., John Wiley & Sons 1999); Protein Methods (Bollag et al., John Wiley & Sons 1996); Nonviral Vectors for Gene Therapy (Wagner et al. eds., Academic Press 1999); Viral Vectors (Kaplift & Loewy eds., Academic Press 1995); Immunology Methods Manual (I. Lefkovits ed., Academic Press 1997); and Cell and Tissue Culture: Laboratory Procedures in Biotechnology (Doyle & Griffiths, John Wiley & Sons 1998), the disclosures of which are incorporated herein by reference.

[00104] Where a range of values is provided, it is understood that endpoints are included, and that each intervening value, to the tenth of the unit of the lower limit unless the context clearly dictates otherwise, between the upper and lower limit of that range and any other stated or intervening value in that stated range, is encompassed. The upper and lower limits of these smaller ranges may independently be included in the smaller ranges, and are also encompassed, subject to any specifically excluded limit in the stated range. Where the stated range includes one or both of the limits, ranges excluding either or both of those included limits are also included.

[00105] Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. All publications mentioned herein are incorporated herein by reference to disclose and describe the methods and/or materials in connection with which the publications are cited.

[00106] It must be noted that as used herein and in the appended claims, the singular forms "a," "an," and "the" include plural referents unless the context clearly dictates otherwise.

[00107] It will be appreciated that certain features of the invention, which are, for clarity, described in the context of separate embodiments, may also be provided in combination in a single embodiment. In other cases, various features of the invention, which are, for brevity, described in the context of a single embodiment, may also be provided separately or in any suitable sub-combination. It is intended that all combinations of the embodiments pertaining to the invention are specifically embraced by the present invention and are disclosed herein just as if each and every combination was individually and explicitly disclosed. In addition,

all sub-combinations of the various embodiments and elements thereof are also specifically embraced by the present invention and are disclosed herein just as if each and every such sub-combination was individually and explicitly disclosed herein.

II. Systems for Genetic Editing of Proteins involved in Antigen Processing, Presentation, Recognition, and/or Response

[00108] In a first aspect, the present disclosure provides systems comprising a CRISPR nuclease and one or more guide nucleic acids (gNA) that have utility in genome editing of eukaryotic cells. In some embodiments, the CRISPR nuclease is selected from the group consisting of Cas9, Cas12a, Cas12b, Cas12c, Cas12d (CasY), CasX, Cas13a, Cas13b, Cas13c, Cas13d, CasX, CasY, Cas14, Cpfl, C2cl, Csn2, and Cas Phi. In some embodiments, the CRISPR nuclease is a is a Type V CRISPR nuclease. In some embodiments, the present disclosure provides CasX:gNA systems comprising a CasX protein and one or more guide nucleic acids (gNA) that are specifically designed to modify a target nucleic acid sequence of one or more cell genes encoding proteins involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response. A gNA and a CasX protein of the disclosure can form a complex and bind via non-covalent interactions, referred to herein as a ribonucleoprotein (RNP) complex. The use of a pre-complexed CasX:gNA confers advantages in the delivery of the system components to a cell or target nucleic acid sequence for editing of the target nucleic acid sequence. In the RNP, the gNA can provide target specificity to the complex by including a targeting sequence (or "spacer") having a nucleotide sequence that is complementary to a sequence of the target nucleic acid sequence while the CasX protein of the pre-complexed CasX:gNA provides the site-specific activity that is guided to a target site (e.g., stabilized at a target site) within a target nucleic acid sequence (e.g., a B2M or TRAC gene to be modified) by virtue of its association with the guide NA. The CasX protein of the complex provides the site-specific activities of the complex such as cleavage or nicking of the target sequence by the CasX protein and/or an activity provided by the fusion partner in the case of a chimeric CasX protein. Additionally, the present disclosure provides methods useful for modifying the target nucleic acid sequence of a populations of cells to introduce or regulate the expression of the one or more proteins involved in antigen processing, presentation, recognition and/or response using the CasX:gNA systems. Such modified populations of cells in which a protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response have been down-regulated or eliminated are useful for immunotherapies. The CasX:gNA systems of the disclosure

comprise one or more of a CasX protein, one or more guide nucleic acids (gNA) and, optionally, one or more donor template nucleic acids comprising a nucleic acid encoding a modification of a protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response wherein the nucleic acid comprises a deletion, insertion, or mutation of one or more nucleotides in comparison to a genomic nucleic acid sequence encoding the protein or its regulatory element to knock-down/knock-out gene function. In some embodiments, the donor polynucleotide comprises at least about 10, at least about 50, at least about 100, or at least about 200, or at least about 300, or at least about 400, or at least about 500, or at least about 600, or at least about 700, or at least about 800, or at least about 900, or at least about 1000, or at least about 10,000, or at least about 15,000 nucleotides of all or a portion of a target nucleic acid sequence of a cell gene to be modified. In other embodiments, the donor polynucleotide comprises at least about 10 to about 10,000 nucleotides, or at least about 100 to about 8000 nucleotides, or at least about 400 to about 6000 nucleotides, or at least about 600 to about 4000 nucleotides, or at least about 1000 to about 2000 nucleotides of a cell gene to be modified. In some embodiments, the donor template is a single stranded DNA template or a single stranded RNA template. In other embodiments, the donor template is a double stranded DNA template.

[00109] In other embodiments, the present disclosure provides polynucleic acids encoding a chimeric antigen receptor (CAR) with binding specificity for a disease antigen, optionally a tumor cell antigen, which can be introduced into the cells to be modified, such that the modified cell is able to express the CAR in the modified cell. In other embodiments, the present disclosure provides polynucleic acids encoding an engineered T cell receptor (TCR) with binding specificity for a disease antigen, optionally a tumor cell antigen, which can be introduced into the cells to be modified, such that the modified cell is able to express the TCR in the modified cell.

[00110] The CasX:gNA systems have utility in the treatment of a subject having certain diseases or conditions, including, cancer, autoimmune diseases, and transplant rejection. Each of the components of the CasX:gNA systems and their use in the editing of the target nucleic acids in cells to modify one or more proteins involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response, as well as the use of polynucleic acids encoding CAR and engineered TCR subunit or subunits, is described herein. The CasX:gNA systems and polynucleic acids described herein have utility in the creation of modified populations of cells that efficiently kill target cells associated with diseases such

cancer, autoimmune diseases, and transplant rejection. Further, the modified populations of cells can be used to confer immunity in a subject having such diseases.

III. Guide Nucleic Acids of the Systems for Genetic Editing

[00111] In another aspect, the disclosure relates to a guide nucleic acid (gNA) comprising a targeting sequence complementary to a target nucleic acid sequence in the target strand of a gene encoding a protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response, wherein the gNA is capable of forming a complex with a CRISPR protein that is specific to a protospacer adjacent motif (PAM) sequence comprising a TC motif in the complementary non-target strand, and wherein the PAM sequence is located 1 nucleotide 5' of the sequence in the non-target strand that is complementary to the target nucleic acid sequence in the target strand.

[00112] In some embodiments, present disclosure relates to guide nucleic acids (gNA) utilized in the CasX:gNA systems that have utility in genome editing of eukaryotic cells. The present disclosure provides specifically-designed guide nucleic acids ("gNAs") wherein the targeting sequence (or spacer, described more fully, below) of the gNA is complementary to (and are therefore able to hybridize with) target nucleic acid sequences when used as a component of the gene editing CasX:gNA systems. It is envisioned that in some embodiments, multiple gNAs are delivered in the CasX:gNA system for the modification of a target nucleic acid sequence. For example, when a knock-down/knock-out of a protein-encoding gene is desired, a pair of gNAs can be used in order to bind and cleave at two different sites within the gene.

[00113] The present disclosure provides specifically-designed guide nucleic acids ("gNAs") with targeting sequences that are complementary to (and are therefore able to hybridize with) the target nucleic acid as a component of the gene editing CasX:gNA systems. As described more fully, below, representative, but non-limiting examples of targeting sequences to the target nucleic acid sequence of a cell gene encoding a protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response are presented in Tables 3A, 3B, and 3C (Tables 3A, 3B, and 3C are provided as FIGS. 35-37). It is envisioned that in some embodiments, multiple gNAs are delivered in the CasX:gNA system for the modification of the target nucleic acid sequence(s). For example, when a knock-down/knock-out of a protein-encoding gene is desired, a pair of gNAs with targeting sequences to different or overlapping regions of the target nucleic acid sequence can be used in order to bind and

the CasX to cleave at two different or overlapping sites within or proximal to the gene, which is then edited by non-homologous end joining (NHEJ), homology-directed repair (HDR, which can include, for example, insertion of a donor template to replace all or a portion of the intron), homology-independent targeted integration (HITI), micro-homology mediated end joining (MMEJ), single strand annealing (SSA) or base excision repair (BER).

a. **Reference gNA and gNA variants**

[00114] In some embodiments, a gNA of the present disclosure comprises a sequence of a naturally-occurring gNA (a "reference gNA"). In other cases, a reference gNA of the disclosure may be subjected to one or more mutagenesis methods, such as the mutagenesis methods described herein, which may include Deep Mutational Evolution (DME), deep mutational scanning (DMS), error prone PCR, cassette mutagenesis, random mutagenesis, staggered extension PCR, gene shuffling, or domain swapping, in order to generate one or more gNA variants with enhanced or varied properties relative to the reference gNA. gNA variants also include variants comprising one or more exogenous sequences, for example fused to either the 5' or 3' end, or inserted internally. The activity of reference gNAs may be used as a benchmark against which the activity of gNA variants are compared, thereby measuring improvements in function or other characteristics of the gNA variants. In other embodiments, a reference gNA may be subjected to one or more deliberate, targeted mutations in order to produce a gNA variant, for example a rationally designed variant. As used herein, the terms gNA, gRNA, and gDNA cover naturally-occurring molecules, as well as sequence variants. Thus, in some embodiments, the gNA is a deoxyribonucleic acid molecule ("gDNA"); in some embodiments, the gNA is a ribonucleic acid molecule ("gRNA"), and in other embodiments, the gNA is a chimera, and comprises both DNA and RNA.

[00115] The targeting sequence of a gNA is capable of binding to a target nucleic acid sequence, including a coding sequence, a complement of a coding sequence, a non-coding sequence, and to regulatory elements. The gNA scaffold (or "protein-binding sequence") interacts with (e.g., binds to) a CasX protein, forming an RNP (described more fully, below). In some embodiments, the targeting sequence and scaffold each include complementary stretches of nucleotides that hybridize to one another to form a double stranded duplex (dsRNA duplex for a dgRNA). Site-specific binding and/or cleavage of a target nucleic acid sequence (e.g., genomic DNA) by the CasX protein can occur at one or more locations (e.g., a sequence of a target nucleic acid) determined by base-pairing complementarity between the

targeting sequence of the gNA and the target nucleic acid sequence. Thus, for example, the gNA of the disclosure have sequences complementarity to and therefore can hybridize to a protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response gene and/or its regulatory sequence in a nucleic acid in a eukaryotic cell, e.g., a eukaryotic nucleic acid (e.g., a eukaryotic chromosome, chromosomal sequence, a eukaryotic RNA, etc.) that is adjacent to a sequence complementary to a TC PAM motif or a PAM sequence, such as ATC, CTC, GTC, or TTC.

[00116] In the context of nucleic acids, cleavage refers to the breakage of the covalent backbone of a nucleic acid molecule; either DNA or RNA. Cleavage can be initiated by a variety of methods including, but not limited to, enzymatic or chemical hydrolysis of a phosphodiester bond. Both single-stranded cleavage and double-stranded cleavage are possible, and double-stranded cleavage can occur as a result of two distinct single-stranded cleavage events. DNA cleavage can result in the production of either blunt ends or staggered ends.

[00117] In some embodiments, the disclosure provides gene editing pairs of a CasX and a gNA of any of the embodiments described herein that are capable of being bound together prior to their use for gene editing and, thus, are “pre-complexed” as a ribonuclear protein complex (RNP). The use of a pre-complexed RNP confers advantages in the delivery of the system components to a cell or target nucleic acid sequence for editing of the target nucleic acid sequence. The CasX protein of the RNP provides the site-specific activity that is guided to a target site (e.g., stabilized at a target site) within a target nucleic acid sequence by virtue of its association with the guide RNA comprising a targeting sequence capable of hybridizing to the target nucleic acid sequence.

[00118] In some embodiments, wherein the gNA is a gRNA, the term “targeter” or “targeter RNA” is used herein to refer to a crRNA-like molecule (crRNA: "CRISPR RNA") of a CasX dual guide RNA (and therefore of a CasX single guide RNA when the “activator" and the "targeter” are linked together, e.g., by intervening nucleotides). Thus, for example, a CasX guide RNA (dgRNA or sgRNA) comprises a guide sequence and a duplex-forming segment of a crRNA, which can also be referred to as a crRNA repeat. Because the sequence of a guide sequence hybridizes with a sequence of a target nucleic acid sequence, a targeter can be modified by a user to hybridize with a specific target nucleic acid sequence, so long as the location of the PAM sequence is considered. Thus, in some cases, the sequence of a targeter may be a non-naturally occurring sequence. In other cases, the sequence of a targeter may be

a naturally-occurring sequence, derived from the gene to be edited. In the case of a dual guide RNA, the targeter and the activator each have a duplex-forming segment, where the duplex forming segment of the targeter and the duplex-forming segment of the activator have complementarity with one another and hybridize to one another to form a double stranded duplex (dsRNA duplex for a gRNA). In some embodiments, a targeter comprises both the guide sequence of the guide RNA and a stretch of nucleotides that forms one half of the dsRNA duplex of the protein-binding segment of the gRNA. A corresponding tracrRNA-like molecule (activator) also comprises a duplex-forming stretch of nucleotides that forms the other half of the dsRNA duplex of the protein-binding segment of the CasX guide RNA. Thus, a targeter and an activator, as a corresponding pair, hybridize to form a CasX dual guide NA, referred to herein as a "dual guide NA", a "dual-molecule gNA", a "dgNA", a "double-molecule guide NA", or a "two-molecule guide NA".

[00119] In some embodiments, the activator and targeter of the reference gNA are covalently linked to one another and comprise a single molecule, referred to herein as a "single-molecule gNA," "one-molecule guide NA," "single guide NA", "single guide RNA", a "single-molecule guide RNA," a "one-molecule guide RNA", a "single guide DNA", a "single-molecule DNA", or a "one-molecule guide DNA", ("sgNA", "sgRNA", or a "sgDNA"). In some embodiments, the sgNA includes an "activator" or a "targeter" and thus can be an "activator-RNA" and a "targeter-RNA," respectively.

[00120] Collectively, the gNAs of the disclosure comprise four distinct regions, or domains: the RNA triplex, the scaffold stem, the extended stem, and the targeting sequence that, in the embodiments of the disclosure are specific for a target nucleic acid. The RNA triplex, the scaffold stem, and the extended stem, together, are referred to as the "scaffold" of the gNA. In some embodiments, the targeting sequence is on the 3' end of the gNA.

b. **RNA triplex**

[00121] In some embodiments of the guide NAs provided herein (including reference sgNAs), there is a RNA-triplex, and the RNA triplex comprises the sequence of a UUU--nX(~4-15)--UUU stem loop (SEQ ID NO: 19) that ends with an AAAG after 2 intervening stem loops (the scaffold stem loop and the extended stem loop), forming a pseudoknot that may also extend past the triplex into a duplex pseudoknot. The UU-UUU-AAA sequence of the triplex forms as a nexus between the spacer, scaffold stem, and extended stem. In exemplary reference CasX sgNAs, the UUU-loop-UUU region is coded for first, then the

scaffold stem loop, and then the extended stem loop, which is linked by the tetraloop, and then an AAAG closes off the triplex before becoming the spacer.

c. **Scaffold Stem Loop**

[00122] In some embodiments of sgNAs of the disclosure, the triplex region is followed by the scaffold stem loop. The scaffold stem loop is a region of the gNA that is bound by CasX protein (such as a reference or CasX variant protein). In some embodiments, the scaffold stem loop is a fairly short and stable stem loop. In some cases, the scaffold stem loop does not tolerate many changes, and requires some form of an RNA bubble. In some embodiments, the scaffold stem is necessary for CasX sgNA function. While it is perhaps analogous to the nexus stem of Cas9 as being a critical stem loop, the scaffold stem of a CasX sgNA, in some embodiments, has a necessary bulge (RNA bubble) that is different from many other stem loops found in CRISPR/Cas systems. In some embodiments, the presence of this bulge is conserved across sgNA that interact with different CasX proteins. An exemplary sequence of a scaffold stem loop sequence of a gNA comprises the sequence CCAGCGACUAUGUCGUAUGG (SEQ ID NO: 20. In other embodiments, the disclosure provides gNA variants wherein the scaffold stem loop is replaced with an RNA stem loop sequence from a heterologous RNA source with proximal 5' and 3' ends, such as, but not limited to stem loop sequences selected from MS2, Q β, U1 hairpin II, Uvsx, or PP7 stem loops. In some cases, the heterologous RNA stem loop of the gNA is capable of binding a protein, an RNA structure, a DNA sequence, or a small molecule.

d. **Extended Stem Loop**

[00123] In some embodiments of the CasX sgNAs of the disclosure, the scaffold stem loop is followed by the extended stem loop. In some embodiments, the extended stem comprises a synthetic tracr and crRNA fusion that is largely unbound by the CasX protein. In some embodiments, the extended stem loop can be highly malleable. In some embodiments, a single guide gRNA is made with a GAAA tetraloop linker or a GAGAAA linker between the tracr and crRNA in the extended stem loop. In some cases, the targeter and activator of a CasX sgNA are linked to one another by intervening nucleotides and the linker can have a length of from 3 to 20 nucleotides. In some embodiments of the CasX sgNAs of the disclosure, the extended stem is a large 32-bp loop that sits outside of the CasX protein in the ribonucleoprotein complex. An exemplary sequence of an extended stem loop sequence of a sgNA comprises the sequence GCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAUAAGAAGC (SEQ ID NO: 21). In

some embodiments, the extended stem loop comprises a GAGAAA spacer sequence. In some embodiments, the disclosure provides gNA variants wherein the extended stem loop is replaced with an RNA stem loop sequence from a heterologous RNA source with proximal 5' and 3' ends, such as, but not limited to stem loop sequences selected from MS2, Qβ, U1 hairpin II, Uvsx, or PP7 stem loops. In such cases, the heterologous RNA stem loop increases the stability of the gNA. In other embodiments, the disclosure provides gNA variants having an extended stem loop region comprising at least 10, at least 100, at least 500, at least 1000, or at least 10,000 nucleotides.

e. **Targeting Sequence**

[00124] In some embodiments of the gNAs of the disclosure, the extended stem loop is followed by a region that forms part of the triplex, and then the targeting sequence (or "spacer"). The targeting sequence targets the CasX ribonucleoprotein holo complex to a specific region of the target nucleic acid sequence of the gene to be modified. Thus, for example, gNA targeting sequences of the disclosure have sequences complementarity to, and therefore can hybridize to, a portion of the B2M gene in a nucleic acid in a eukaryotic cell (e.g., a eukaryotic chromosome, chromosomal sequence, a eukaryotic RNA, etc.) as a component of the RNP when any one of the PAM sequences TTC, ATC, GTC, or CTC is located 1 nucleotide 5' to the non-target strand sequence complementary to the target sequence. The targeting sequence of a gNA can be modified so that the gNA can target a desired sequence of any desired target nucleic acid sequence, so long as the PAM sequence location is taken into consideration. In some embodiments, the gNA scaffold is 5' of the targeting sequence, with the targeting sequence on the 3' end of the gNA. In some embodiments, the PAM sequence recognized by the RNP is TC. In other embodiments, the PAM sequence recognized by the RNP is NTC.

[00125] In some embodiments, the targeting sequence of the gNA is specific for, and is capable of hybridizing with, a portion of a gene encoding a protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response, including, but not limited to beta-2-microglobulin (B2M), T cell receptor alpha chain constant region (TRAC), class II major histocompatibility complex transactivator (CIITA), T cell receptor beta constant 1 (TRBC1), T cell receptor beta constant 2 (TRBC2), human leukocyte antigen A (HLA-A), human leukocyte antigen B (HLA-B),TGFβ Receptor 2 (TGFβRII), programmed cell death 1 (PD-1), cytokine inducible SH2 (CISH), lymphocyte activating 3 (LAG-3), T cell immunoreceptor with Ig and ITIM domains (TIGIT), adenosine A2a

receptor (ADORA2A), killer cell lectin like receptor C1 (NKG2A), cytotoxic T-lymphocyte-associated protein 4 (CTLA-4), T-cell immunoglobulin and mucin domain 3 (TIM-3), and 2B4 (CD244). In one particular embodiment, the gene is B2M. The B2M gene encodes a serum protein found in association with the major histocompatibility complex (MHC) class I heavy chain on the surface of nearly all nucleated cells. In another particular embodiment, the gene is TRAC. The TRAC gene encodes the C-terminal constant region, linked to one of 70 variable regions of the T cell alpha receptor. Following similar synthesis of the beta chain, the alpha and beta chains pair to yield the alpha-beta T-cell receptor heterodimer. In another particular embodiment, the gene is CITTA. The CIITA gene provides instructions for making a protein that primarily helps control the activity (transcription) of genes of the major histocompatibility complex (MHC) class II. In the foregoing, the genomic targets are those in which the encoding gene of the target is intended to be knocked out or knocked down such that the protein (e.g., a cell marker or intracellular protein) is not expressed or is expressed at a lower level in a cell. In some embodiments, the targeting sequence of a gNA is specific for an exon of the gene. In other embodiments, the targeting sequence of a gNA is specific for an intron of the gene. In other embodiments, the targeting sequence of a gNA is specific for a regulatory element of the gene. In other embodiments, the targeting sequence of a gNA is specific for a junction of the exon, intron, and/or regulatory element of the gene. In other embodiments, the targeting sequence of a gNA is specific for an intergenic region. In those cases where the targeting sequence is specific for a regulatory element, such regulatory elements include, but are not limited to promoter regions, enhancer regions, intergenic regions, 5' untranslated regions (5' UTR), 3' untranslated regions (3' UTR), conserved elements, and regions comprising cis-regulatory elements. The promoter region is intended to encompass nucleotides within 5 kb of the initiation point of the encoding sequence or, in the case of gene enhancer elements or conserved elements, can be thousands of bp, hundreds of thousands of bp, or even millions of bp away from the encoding sequence of the gene of the target nucleic acid. In the foregoing, the targets are those in which the encoding gene of the target is intended to be knocked out or knocked down such that the targeted protein is not expressed or is expressed at a lower level in a cell.

[00126] In some embodiments, the targeting sequence of the gNA has between 14 and 35 consecutive nucleotides. In some embodiments, the targeting sequence has 14, 15, 16, 18, 18, 19, 20, 21, 22, 23 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34 or 35 consecutive nucleotides. In some embodiments, the targeting sequence consists of 20 consecutive nucleotides. In some

embodiments, the targeting sequence consists of 19 consecutive nucleotides. In some embodiments, the targeting sequence consists of 18 consecutive nucleotides. In some embodiments, the targeting sequence consists of 17 consecutive nucleotides. In some embodiments, the targeting sequence consists of 16 consecutive nucleotides. In some embodiments, the targeting sequence consists of 15 consecutive nucleotides. In some embodiments, the targeting sequence has 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34 or 35 consecutive nucleotides and the targeting sequence can comprise 0 to 5, 0 to 4, 0 to 3, or 0 to 2 mismatches relative to the target nucleic acid sequence and retain sufficient binding specificity such that the RNP comprising the gNA comprising the targeting sequence can form a complementary bond with respect to the target nucleic acid.

[00127] Representative, but non-limiting examples of targeting sequences for inclusion in the gNA of the disclosure are presented in Tables 3A, 3B, and 3C (included as FIGS. 35-37), representing targeting sequences for B2M, TRAC, and CIITA, respectively.

[00128] Exemplary targeting sequences (spacer sequences) of the gNA embodiments utilized with the CasX:gNA system for editing of the B2M gene are provided in Table 3A (SEQ ID NOs: 725-2100 and 2281-7085). In one embodiment, the targeting sequence of the B2M gNA comprises a sequence having at least about 65%, at least about 75%, at least about 85%, or at least about 95% identity to a sequence selected from the group consisting of sequences set forth in Table 3A. In another embodiment, the targeting sequence of the gNA consists of a sequence selected from the group consisting of sequences set forth in Table 3A. In the foregoing embodiments, thymine (T) nucleotides can be substituted for one or more or all of the uracil (U) nucleotides in any of the targeting sequences such that the gNA can be a gDNA or a gRNA, or a chimera of RNA and DNA. In some embodiments, a targeting sequence of Table 3A has at least 1, 2, 3, 4, 5, or 6 or more thymine nucleotides substituted for thymine nucleotides. In other embodiments, a gNA, gRNA, or gDNA of the disclosure comprises 1, 2, 3 or more targeting sequences of Table 3A, or targeting sequences that are at least 50% identical, at least 55% identical, at least 60% identical, at least 65% identical, at least 70% identical, at least 75% identical, at least 80% identical, at least 85% identical, at least 90% identical, at least 95% identical to one or more sequences of Table 3A.

[00129] Exemplary targeting sequences (spacer sequences) of the gNA embodiments utilized with the CasX:gNA system for editing of the TRAC gene are provided in Table 3B. In one embodiment, the targeting sequence of the TRAC gNA comprises a sequence having

at least about 65%, at least about 75%, at least about 85%, or at least about 95% identity to a sequence selected from the group consisting of sequences set forth in Table 3B. In another embodiment, the targeting sequence of the gNA consists of a sequence selected from the group consisting of sequences set forth in Table 3B. In the foregoing embodiments, thymine (T) nucleotides can be substituted for one or more or all of the uracil (U) nucleotides in any of the targeting sequences such that the gNA can be a gDNA or a gRNA, or a chimera of RNA and DNA. In some embodiments, a targeting sequence of Table 3B has at least 1, 2, 3, 4, 5, or 6 or more thymine nucleotides substituted for uracil nucleotides. In other embodiments, a gNA, gRNA, or gDNA of the disclosure comprises 1, 2, 3 or more targeting sequences of Table 3B, or targeting sequences that are at least 50% identical, at least 55% identical, at least 60% identical, at least 65% identical, at least 70% identical, at least 75% identical, at least 80% identical, at least 85% identical, at least 90% identical, at least 95% identical to one or more sequences of Table 3B.

[00130] Exemplary targeting sequences (spacer sequences) of the gNA embodiments utilized with the CasX:gNA system for editing of the CIITA gene are provided in Table 3C. In one embodiment, the targeting sequence of the TRAC gNA comprises a sequence having at least about 65%, at least about 75%, at least about 85%, or at least about 95% identity to a sequence selected from the group consisting of sequences set forth in Table 3C. In another embodiment, the targeting sequence of the gNA consists of a sequence selected from the group consisting of sequences set forth in Table 3C. In the foregoing embodiments, thymine (T) nucleotides can be substituted for one or more or all of the uracil (U) nucleotides in any of the targeting sequences such that the gNA can be a gDNA or a gRNA, or a chimera of RNA and DNA. In some embodiments, a targeting sequence of Table 3C has at least 1, 2, 3, 4, 5, or 6 or more thymine nucleotides substituted for uracil nucleotides. In other embodiments, a gNA, gRNA, or gDNA of the disclosure comprises 1, 2, 3 or more targeting sequences of Table 3C, or targeting sequences that are at least 50% identical, at least 55% identical, at least 60% identical, at least 65% identical, at least 70% identical, at least 75% identical, at least 80% identical, at least 85% identical, at least 90% identical, at least 95% identical to one or more sequences of Table 3C.

[00131] In some embodiments, the CasX:gNA system comprises a first gNA and further comprises a second (and optionally a third, fourth, fifth, or more) gNA, wherein the second gNA or additional gNA has a targeting sequence complementary to a different or overlapping portion of the target nucleic acid sequence compared to the targeting sequence of the first

gNA such that multiple points in the target nucleic acid are targeted, and, for example, multiple breaks are introduced in the target nucleic acid by the CasX. It will be understood that in such cases, the second or additional gNA is complexed with an additional copy of the CasX protein. By selection of the targeting sequences of the gNA, defined regions of the target nucleic acid sequence bracketing a particular location within the target nucleic acid can be modified or edited using the CasX:gNA systems described herein, including facilitating the insertion of a donor template.

f. **gNA scaffolds**

[00132] In some embodiments, a CasX reference gRNA comprises a sequence isolated or derived from *Deltaproteobacter*. In some embodiments, the sequence is a CasX tracrRNA sequence. Exemplary CasX reference tracrRNA sequences isolated or derived from *Deltaproteobacter* may include: ACAUCUGGCGCGUUUAUUCCAUUACUUUGGAGCCAGUCCCAGCGACUAUGUCG UAUGGACGAAGCGCUUAUUUAUCGGAGA (SEQ ID NO: 22) and ACAUCUGGCGCGUUUAUUCCAUUACUUUGGAGCCAGUCCCAGCGACUAUGUCG UAUGGACGAAGCGCUUAUUUAUCGG (SEQ ID NO: 23). Exemplary crRNA sequences isolated or derived from Deltaproteobacter may comprise a sequence of CCGAUAAGUAAAACGCAUCAAAG (SEQ ID NO: 24). In some embodiments, a CasX reference gNA comprises a sequence at least 60% identical, at least 65% identical, at least 70% identical, at least 75% identical, at least 80% identical, at least 81% identical, at least 82% identical, at least 83% identical, at least 84% identical, at least 85% identical, at least 86% identical, at least 86% identical, at least 87% identical, at least 88% identical, at least 89% identical, at least 89% identical, at least 90% identical, at least 91% identical, at least 92% identical, at least 93% identical, at least 94% identical, at least 95% identical, at least 96% identical, at least 97% identical, at least 98% identical, at least 99% identical, at least 99.5% identical or 100% identical to a sequence isolated or derived from *Deltaproteobacter*.

[00133] In some embodiments, a CasX reference guide RNA comprises a sequence isolated or derived from *Planctomycetes*. In some embodiments, the sequence is a CasX tracrRNA sequence. Exemplary CasX reference tracrRNA sequences isolated or derived from *Planctomycetes* may include: UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGU AUGGGUAAAGCGCUUAUUUAUCGGAGA (SEQ ID NO: 25) and

[00134] UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGG (SEQ ID NO: 26). Exemplary crRNA sequences isolated or derived from *Planctomycetes* may comprise a sequence of UCUCCGAUAAAUAAGAAGCAUCAAAG (SEQ ID NO: 27). In some embodiments, a CasX reference gNA comprises a sequence at least 60% identical, at least 65% identical, at least 70% identical, at least 75% identical, at least 80% identical, at least 81% identical, at least 82% identical, at least 83% identical, at least 84% identical, at least 85% identical, at least 86% identical, at least 86% identical, at least 87% identical, at least 88% identical, at least 89% identical, at least 89% identical, at least 90% identical, at least 91% identical, at least 92% identical, at least 93% identical, at least 94% identical, at least 95% identical, at least 96% identical, at least 97% identical, at least 98% identical, at least 99% identical, at least 99.5% identical or 100% identical to a sequence isolated or derived from *Planctomycetes*.

[00135] In some embodiments, a CasX reference gNA comprises a sequence isolated or derived from *Candidatus Sungbacteria*. In some embodiments, the sequence is a CasX tracrRNA sequence. Exemplary CasX reference tracrRNA sequences isolated or derived from *Candidatus Sungbacteria* may comprise sequences of:
GUUUACACACUCCCUCUCAUAGGGU (SEQ ID NO: 28),
GUUUACACACUCCCUCUCAUGAGGU (SEQ ID NO: 29),
UUUUACAUACCCCCUCUCAUGGGAU (SEQ ID NO: 30) and
GUUUACACACUCCCUCUCAUGGGGG (SEQ ID NO: 31). In some embodiments, a CasX reference guide RNA comprises a sequence at least 60% identical, at least 65% identical, at least 70% identical, at least 75% identical, at least 80% identical, at least 81% identical, at least 82% identical, at least 83% identical, at least 84% identical, at least 85% identical, at least 86% identical, at least 86% identical, at least 87% identical, at least 88% identical, at least 89% identical, at least 89% identical, at least 90% identical, at least 91% identical, at least 92% identical, at least 93% identical, at least 94% identical, at least 95% identical, at least 96% identical, at least 97% identical, at least 98% identical, at least 99% identical, at least 99.5% identical or 100% identical to a sequence isolated or derived from *Candidatus sungbacteria*.

[00136] Table 1 provides the sequences of reference gRNAs tracr and scaffold sequences. In some embodiments, the disclosure provides gNA sequences wherein the gNA has a scaffold comprising a sequence having at least one nucleotide modification relative to a

reference gNA sequence having a sequence of any one of SEQ ID NOS:4-16 of Table 1. It will be understood that in those embodiments wherein a vector comprises a DNA encoding sequence for a gNA, or where a gNA is a gDNA or a chimera of RNA and DNA, that thymine (T) bases can be substituted for the uracil (U) bases of any of the gNA sequence embodiments described herein.

Table 1. Reference gRNA sequences

SEQ ID NO.	Nucleotide Sequence
4	ACAUCUGGCGCGUUUAUUCCAUUACUUUGGAGCCAGUCCCAGCG ACUAUGUCGUAUGGACGAAGCGCUUAUUUAUCGGAGAGAAACCG AUAAGUAAAACGCAUCAAAG
5	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGA CUAUGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCG AUAAAUAAGAAGCAUCAAAG
6	ACAUCUGGCGCGUUUAUUCCAUUACUUUGGAGCCAGUCCCAGCG ACUAUGUCGUAUGGACGAAGCGCUUAUUUAUCGGAGA
7	ACAUCUGGCGCGUUUAUUCCAUUACUUUGGAGCCAGUCCCAGCG ACUAUGUCGUAUGGACGAAGCGCUUAUUUAUCGG
8	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGA CUAUGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGA
9	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGA CUAUGUCGUAUGGGUAAAGCGCUUAUUUAUCGG
10	GUUUACACACUCCCUCUCAUAGGGU
11	GUUUACACACUCCCUCUCAUGAGGU
12	UUUUACAUACCCCCUCUCAUGGGAU
13	GUUUACACACUCCCUCUCAUGGGGG
14	CCAGCGACUAUGUCGUAUGG
15	GCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAUAAGAAGC
16	GGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCUUAUUUAUCGGA

g. gNA Variants

[00137] In another aspect, the disclosure relates to guide nucleic acid variants (referred to herein alternatively as "gNA variant" or "gRNA variant"), which comprise one or more modifications relative to a reference gRNA scaffold. As used herein, "scaffold" refers to all parts to the gNA necessary for gNA function with the exception of the spacer sequence.

[00138] In some embodiments, a gNA variant comprises one or more nucleotide substitutions, insertions, deletions, or swapped or replaced regions relative to a reference gRNA sequence of the disclosure. In some embodiments, a mutation can occur in any region of a reference gRNA to produce a gNA variant. In some embodiments, the scaffold of the

gNA variant sequence has at least 20%, at least 30%, at least 40%, at least 50%, at least 60%, or at least 70%, at least 80%, at least 85%, at least about 90%, at least about 95%, at least about 96%, at least about 97%, at least about 98%, or at least about 99% identity to the sequence of SEQ ID NO:4 or SEQ ID NO:5.

[00139] In some embodiments, a gNA variant comprises one or more nucleotide changes within one or more regions of the reference gRNA that improve a characteristic of the reference gRNA. Exemplary regions include the RNA triplex, the pseudoknot, the scaffold stem loop, and the extended stem loop. In some cases, the variant scaffold stem further comprises a bubble. In other cases, the variant scaffold further comprises a triplex loop region. In still other cases, the variant scaffold further comprises a 5' unstructured region. In one embodiment, the gNA variant scaffold comprises a scaffold stem loop having at least 60% sequence identity to SEQ ID NO:14. In another embodiment, the gNA variant comprises a scaffold stem loop having the sequence of CCAGCGACUAUGUCGUAGUGG (SEQ ID NO: 32). In another embodiment, the disclosure provides a gNA scaffold comprising, relative to SEQ ID NO:5, a C18G substitution, a G55 insertion, a U1 deletion, and a modified extended stem loop in which the original 6 nt loop and 13 most-loop-proximal base pairs (32 nucleotides total) are replaced by a Uvsx hairpin (4 nt loop and 5 loop-proximal base pairs; 14 nucleotides total) and the loop-distal base of the extended stem was converted to a fully base-paired stem contiguous with the new Uvsx hairpin by deletion of the A99 and substitution of G64U. In the foregoing embodiment, the gNA scaffold comprises the sequence ACUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAGUGGGUAAA GCUCCCUCUUCGGAGGGAGCAUCAAAG (SEQ ID NO: 33).

[00140] All gNA variants that have one or more improved functions or characteristics, or add one or more new functions when the variant gNA is compared to a reference gRNA described herein, are envisaged as within the scope of the disclosure. A representative example of such a gNA variant is guide 174 (SEQ ID NO:2238), the design of which is described in the Examples. In some embodiments, the gNA variant adds a new function to the RNP comprising the gNA variant. In some embodiments, the gNA variant has an improved characteristic selected from: improved stability; improved solubility; improved transcription of the gNA; improved resistance to nuclease activity; increased folding rate of the gNA; decreased side product formation during folding; increased productive folding; improved binding affinity to a CasX protein; improved binding affinity to a target DNA when

complexed with a CasX protein; improved gene editing when complexed with a CasX protein; improved specificity of editing when complexed with a CasX protein; and improved ability to utilize a greater spectrum of one or more PAM sequences, including ATC, CTC, GTC, or TTC, in the editing of target DNA when complexed with a CasX protein, or any combination thereof. In some cases, the one or more of the improved characteristics of the gNA variant is at least about 1.1 to about 100,000-fold improved relative to the reference gNA of SEQ ID NO:4 or SEQ ID NO:5. In other cases, the one or more improved characteristics of the gNA variant is at least about 1.1, at least about 10, at least about 100, at least about 1000, at least about 10,000, at least about 100,000-fold or more improved relative to the reference gNA of SEQ ID NO:4 or SEQ ID NO:5. In other cases, the one or more of the improved characteristics of the gNA variant is about 1.1 to 100,00-fold, about 1.1 to 10,00-fold, about 1.1 to 1,000-fold, about 1.1 to 500-fold, about 1.1 to 100-fold, about 1.1 to 50-fold, about 1.1 to 20-fold, about 10 to 100,00-fold, about 10 to 10,00-fold, about 10 to 1,000-fold, about 10 to 500-fold, about 10 to 100-fold, about 10 to 50-fold, about 10 to 20-fold, about 2 to 70-fold, about 2 to 50-fold, about 2 to 30-fold, about 2 to 20-fold, about 2 to 10-fold, about 5 to 50-fold, about 5 to 30-fold, about 5 to 10-fold, about 100 to 100,00-fold, about 100 to 10,00-fold, about 100 to 1,000-fold, about 100 to 500-fold, about 500 to 100,00-fold, about 500 to 10,00-fold, about 500 to 1,000-fold, about 500 to 750-fold, about 1,000 to 100,00-fold, about 10,000 to 100,00-fold, about 20 to 500-fold, about 20 to 250-fold, about 20 to 200-fold, about 20 to 100-fold, about 20 to 50-fold, about 50 to 10,000-fold, about 50 to 1,000-fold, about 50 to 500-fold, about 50 to 200-fold, or about 50 to 100-fold, improved relative to the reference gNA of SEQ ID NO:4 or SEQ ID NO:5. In other cases, the one or more improved characteristics of the gNA variant is about 1.1-fold, 1.2-fold, 1.3-fold, 1.4-fold, 1.5-fold, 1.6-fold, 1.7-fold, 1.8-fold, 1.9-fold, 2-fold, 3-fold, 4-fold, 5-fold, 6-fold, 7-fold, 8-fold, 9-fold, 10-fold, 11-fold, 12-fold, 13-fold, 14-fold, 15-fold, 16-fold, 17-fold, 18-fold, 19-fold, 20-fold, 25-fold, 30-fold, 40-fold, 45-fold, 50-fold, 55-fold, 60-fold, 70-fold, 80-fold, 90-fold, 100-fold, 110-fold, 120-fold, 130-fold, 140-fold, 150-fold, 160-fold, 170-fold, 180-fold, 190-fold, 200-fold, 210-fold, 220-fold, 230-fold, 240-fold, 250-fold, 260-fold, 270-fold, 280-fold, 290-fold, 300-fold, 310-fold, 320-fold, 330-fold, 340-fold, 350-fold, 360-fold, 370-fold, 380-fold, 390-fold, 400-fold, 425-fold, 450-fold, 475-fold, or 500-fold improved relative to the reference gNA of SEQ ID NO:4 or SEQ ID NO:5.

[00141] In some embodiments, a gNA variant can be created by subjecting a reference gRNA to a one or more mutagenesis methods, such as the mutagenesis methods described

herein, below, which may include Deep Mutational Evolution (DME), deep mutational scanning (DMS), error prone PCR, cassette mutagenesis, random mutagenesis, staggered extension PCR, gene shuffling, or domain swapping, in order to generate the gNA variants of the disclosure. The activity of reference gRNAs may be used as a benchmark against which the activity of gNA variants are compared, thereby measuring improvements in function of gNA variants. In other embodiments, a reference gRNA may be subjected to one or more deliberate, targeted mutations, substitutions, or domain swaps in order to produce a gNA variant, for example a rationally designed variant. Exemplary gRNA variants produced by such methods are described in the Examples and representative sequences of gNA scaffolds are presented in Table 2.

[00142] In some embodiments, the gNA variant comprises one or more modifications compared to a reference guide nucleic acid scaffold sequence, wherein the one or more modification is selected from: at least one nucleotide substitution in a region of the gNA variant; at least one nucleotide deletion in a region of the gNA variant; at least one nucleotide insertion in a region of the gNA variant; a substitution of all or a portion of a region of the gNA variant; a deletion of all or a portion of a region of the gNA variant; or any combination of the foregoing. In some cases, the modification is a substitution of 1 to 15 consecutive or non-consecutive nucleotides in the gNA variant in one or more regions. In other cases, the modification is a deletion of 1 to 10 consecutive or non-consecutive nucleotides in the gNA variant in one or more regions. In other cases, the modification is an insertion of 1 to 10 consecutive or non-consecutive nucleotides in the gNA variant in one or more regions. In other cases, the modification is a substitution of the scaffold stem loop or the extended stem loop with an RNA stem loop sequence from a heterologous RNA source with proximal 5' and 3' ends. In some cases, a gNA variant of the disclosure comprises two or more modifications in one region. In other cases, a gNA variant of the disclosure comprises modifications in two or more regions. In other cases, a gNA variant comprises any combination of the foregoing modifications described in this paragraph.

[00143] In some embodiments, a 5' G is added to a gNA variant sequence for expression *in vivo*, as transcription from a U6 promoter is more efficient and more consistent with regard to the start site when the +1 nucleotide is a G. In other embodiments, two 5' Gs are added to a gNA variant sequence for in vitro transcription to increase production efficiency, as T7 polymerase strongly prefers a G in the +1 position and a purine in the +2 position. In some

cases, the 5' G bases are added to the reference scaffolds of Table 1. In other cases, the 5' G bases are added to the variant scaffolds of Table 2.

[00144] Table 2 provides exemplary gNA variant scaffold sequences. In Table 2, (-) indicates a deletion at the specified position(s) relative to the reference sequence of SEQ ID NO:5, (+) indicates an insertion of the specified base(s) at the position indicated relative to SEQ ID NO:5, (:) indicates the range of bases at the specified start:stop coordinates of a deletion or substitution relative to SEQ ID NO:5, and multiple insertions, deletions or substitutions are separated by commas; e.g., A14C, U17G. In some embodiments, the gNA variant scaffold comprises any one of the sequences listed in Table 2, SEQ ID NOS:2101-2280, or a sequence having at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, at least about 95%, at least about 95%, at least about 96%, at least about 97%, at least about 98%, at least about 99% sequence identity thereto. It will be understood that in those embodiments wherein a vector comprises a DNA encoding sequence for a gNA, or where a gNA is a gDNA or a chimera of RNA and DNA, that thymine (T) bases can be substituted for the uracil (U) bases of any of the gNA sequence embodiments described herein.

Table 2. Exemplary gNA Scaffold Sequences

SEQ ID NO:	NAME or Modification	NUCLEOTIDE SEQUENCE
2101	phage replication stable	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCAGGUGGGACGACCUCUCGGUCGUCCUAU CUGAAGCAUCAAAG
2102	Kissing loop_b1	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUGCUCGACGCGUCCUCGAGCAGAAGCAU CAAAG
2103	Kissing loop_a	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUGCUCGCUCCGUUCGAGCAGAAGCAUCA AAG
2104	32: uvsX hairpin	GUACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACU AUGUCGUAUGGGUAAAGCGCCCUCUUCGGAGGGAAGCAUCAAAG
2105	PP7	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCAGGAGUUUCUAUGGAAACCCUGAAGCAU CAAAG
2106	64: trip mut, extended stem truncation	GUACUGGCGCCUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACU AUGUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAU CAAAG

SEQ ID NO:	NAME or Modification	NUCLEOTIDE SEQUENCE
2107	hyperstable tetraloop	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUGCGCUUGCGCAGAAGCAUCAAAG
2108	C18G	UACUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAU AAGAAGCAUCAAAG
2109	U17G	UACUGGCGCUUUUAUCGCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAU AAGAAGCAUCAAAG
2110	CUUCGG loop	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGACUUCGGUCCGAUAA AUAAGAAGCAUCAAAG
2111	MS2	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCACAUGAGGAUUACCCAUGUGAAGCAUCA AAG
2112	-1, A2G, -78, G77U	GCUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCUUAUUUAUCGUGAGAAAUCCGAUAAAUAA GAAGCAUCAAAG
2113	QB	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUGCAUGUCUAAGACAGCAGAAGCAUCAA AG
2114	45,44 hairpin	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCAGGGCUUCGGCCGAAGCAUCAAAG
2115	U1A	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCAAUCCAUUGCACUCCGGAUUGAAGCAUC AAAG
2116	A14C, U17G	UACUGGCGCUUUUCUCGCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAU AAGAAGCAUCAAAG
2117	CUUCGG loop modified	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGACUUCGGUCCGAUAAAU AAGAAGCAUCAAAG
2118	Kissing loop_b2	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUGCUCGUUUGCGGCUACGAGCAGAAGCA UCAAAG
2119	-76:78, -83:87	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGAGAGAUAAAUAAGAAGCA UCAAAG
2120	-4	UACGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAUA AGAAGCAUCAAAG
2121	extended stem truncation	UACUGGCGCCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACU AUGUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAU CAAAG
2122	C55	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUCGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAU AAGAAGCAUCAAAG

SEQ ID NO:	NAME or Modification	NUCLEOTIDE SEQUENCE
2123	trip mut	UACUGGCGCCUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGACUUCGGUCCGAUAAAU AAGAAGCAUCAAAG
2124	-76:78	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGAGAAAUCCGAUAAAUAAG AAGCAUCAAAG
2125	-1:5	GCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCG UAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAUAAGAA GCAUCAAAG
2126	-83:87	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAGAUAAAUAAGAA GCAUCAAAG
2127	=+G28, A82U, -84,	UACUGGCGCUUUUAUCUCAUUACUUUGGAGAGCCAUCACCAGCGACU AUGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGUAUCCGAUAAAU AAGAAGCAUCAAAG
2128	=+51U	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAA UAAGAAGCAUCAAAG
2129	-1:4, +G5A, +G86,	AGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUC GUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUGCCGAUAAAUAAG AAGCAUCAAAG
2130	=+A94	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAA UAAGAAGCAUCAAAG
2131	=+G72	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUGUAUCGGAGAGAAAUCCGAUAAA UAAGAAGCAUCAAAG
2132	shorten front, CUUCGG loop modified. extend extended	GCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCG UAUGGGUAAAGCGCUUAUUUAUCGGACUUCGGUCCGAUAAAUAAGCG CAUCAAAG
2133	A14C	UACUGGCGCUUUUCUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAU AAGAAGCAUCAAAG
2134	-1:3, +G3	GUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAUG UCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAUAA GAAGCAUCAAAG
2135	=+C45, +U46	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACCU UAUGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAA AUAAGAAGCAUCAAAG
2136	CUUCGG loop modified, fun start	GAUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCUUAUUUAUCGGACUUCGGUCCGAUAAAUA AGAAGCAUCAAAG

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2137	-93:94	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAA GAAGCAUCAAAG
2138	=+U45	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGAUCU AUGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAA UAAGAAGCAUCAAAG
2139	-69, -94	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGGCUUAUUUAUCGGAGAGAAAUCCGAUAAAAA GAAGCAUCAAAG
2140	-94	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAA AGAAGCAUCAAAG
2141	modified CUUCGG, minus U in 1st triplex	UACUGGCGCUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCUUAUUUAUCGGACUUCGGUCCGAUAAAUA AGAAGCAUCAAAG
2142	-1:4, +C4, A14C, U17G, +G72, -76:78, -83:87	CGGCGCUUUUCUCGCAUUACUUUGAGAGCCAUCACCAGCGACUAUGU CGUAUGGGUAAAGCGCUUAUUGUAUCGAGAGAUAAAUAAGAAGCAUC AAAG
2143	U1C, -73	CACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUUCGGAGAGAAAUCCGAUAAAUA AGAAGCAUCAAAG
2144	Scaffold uuCG, stem uuCG. Stem swap, t shorten	UACUGGCGCUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUUC GGUCGUAUGGGUAAAGCGCUUAUGUAUCGGCUUCGGCCGAUACAUAA GAAGCAUCAAAG
2145	Scaffold uuCG, stem uuCG. Stem swap	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUU CGGUCGUAUGGGUAAAGCGCUUAUGUAUCGGCUUCGGCCGAUACAUA AGAAGCAUCAAAG
2146	=+G60	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUGAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAA UAAGAAGCAUCAAAG
2147	no stem Scaffold uuCG	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUU CGGUCGUAUGGGUAAAG
2148	no stem Scaffold uuCG, fun start	GAUGGGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUUCG GUCGUAUGGGUAAAG
2149	Scaffold uuCG, stem	GAUGGGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUUCG GUCGUAUGGGUAAAGCGCUUAUUUAUCGGCUUCGGCCGAUAAAUAAG AAGCAUCAAAG

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	uuCG, fun start	
2150	Pseudoknots	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUACACUGGGAUCGCUGAAUUAGAGAUCG GCGUCCUUUCAUUCUAUAUACUUUGGAGUUUUAAAAUGUCUCUAAGU ACAGAAGCAUCAAAG
2151	Scaffold uuCG, stem uuCG	GGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUUCGGU CGUAUGGGUAAAGCGCUUAUUUAUCGGCUUCGGCCGAUAAAUAAGAA GCAUCAAAG
2152	Scaffold uuCG, stem uuCG, no start	GCUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUUC GGUCGUAUGGGUAAAGCGCUUAUUUAUCGGCUUCGGCCGAUAAAUAA GAAGCAUCAAAG
2153	Scaffold uuCG	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUU CGGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAA UAAGAAGCAUCAAAG
2154	=+GCUC36	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUGCUCCACCAGCG ACUAUGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAU AAAUAAGAAGCAUCAAAG
2155	G quadriplex telomere basket+ ends	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGGGGUUAGGGUUAGGGUUAGGGAAGCAUCA AAG
2156	G quadriplex M3q	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGGAGGGAGGGAGGGAGAGGGAAAGCAUCAA AG
2157	G quadriplex telomere basket no ends	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGUUGGGUUAGGGUUAGGGUUAGGGAAAAGC AUCAAAG
2158	45,44 hairpin (old version)	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGC--------AGGGCUUCGGCCG-------- --GAAGCAUCAAAG
2159	Sarcin-ricin loop	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCCUGCUCAGUACGAGAGGAACCGCAGGAA GCAUCAAAG
2160	uvsX, C18G	UACUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCCCUCUUCGGAGGGAAGCAUCAAAG
2161	truncated stem loop, C18G, trip mut (U10C)	UACUGGCGCCUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUC AAAG
2162	short phage rep, C18G	UACUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCGGACGACCUCUCGGUCGUCCGAAGCAUC AAAG
2163	phage rep loop, C18G	UACUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCAGGUGGGACGACCUCUCGGUCGUCCUAU CUGAAGCAUCAAAG

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2164	=+G18, stacked onto 64	UACUGGCGCCUUUAUCUGCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUCAAAG
2165	truncated stem loop, C18G, -1 A2G	GCUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUCAAAG
2166	phage rep loop, C18G, trip mut (U10C)	UACUGGCGCCUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCAGGUGGGACGACCUCUCGGUCGUCCUAUCUGAAGCAUCAAAG
2167	short phage rep, C18G, trip mut (U10C)	UACUGGCGCCUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCGGACGACCUCUCGGUCGUCCGAAGCAUCAAAG
2168	uvsX, trip mut (U10C)	UACUGGCGCCUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCCCUCUUCGGAGGGAAGCAUCAAAG
2169	truncated stem loop	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUCAAAG
2170	=+A17, stacked onto 64	UACUGGCGCCUUUAUCAUCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUCAAAG
2171	3' HDV genomic ribozyme	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAUAAGAAGCAUCAAAGGGCCGGCAUGGUCCCAGCCUCCUCGCUGGCGCCGGCUGGGCAACAUUCCGAGGGGACCGUCCCCUCGGUAAUGGCGAAUGGGACCC
2172	phage rep loop, trip mut (U10C)	UACUGGCGCCUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCAGGUGGGACGACCUCUCGGUCGUCCUAUCUGAAGCAUCAAAG
2173	-79:80	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAAAUCCGAUAAAUAAGAAGCAUCAAAG
2174	short phage rep, trip mut (U10C)	UACUGGCGCCUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCGGACGACCUCUCGGUCGUCCGAAGCAUCAAAG
2175	extra truncated stem loop	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCCGGACUUCGGUCCGGAAGCAUCAAAG
2176	U17G, C18G	UACUGGCGCUUUUAUCGGAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAUAAGAAGCAUCAAAG
2177	short phage rep	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCGGACGACCUCUCGGUCGUCCGAAGCAUCAAAG

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2178	uvsX, C18G, -1 A2G	GCUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCCCUCUUCGGAGGGAAGCAUCAAAG
2179	uvsX, C18G, trip mut (U10C), -1 A2G, HDV -99 G65U	GCUGGCGCCUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2180	3' HDV antigenomic ribozyme	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAU AAGAAGCAUCAAAGGGGUCGGCAUGGCAUCUCCACCUCCUCGCGGUC CGACCUGGGCAUCCGAAGGAGGACGCACGUCCACUCGGAUGGCUAAG GGAGAGCCA
2181	uvsX, C18G, trip mut (U10C), -1 A2G, HDV AA(98:99)C	GCUGGCGCCUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCCCUCUUCGGAGGGCGCAUCAAAG
2182	3' HDV ribozyme (Lior Nissim, Timothy Lu)	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAU AAGAAGCAUCAAAGUUUUGGCCGGCAUGGUCCCAGCCUCCUCGCUGG CGCCGGCUGGGCAACAUGCUUCGGCAUGGCGAAUGGGACCCCGGG
2183	TAC(1:3)GA, stacked onto 64	GAUGGCGCCUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUCA AAG
2184	uvsX, -1 A2G	GCUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCCCUCUUCGGAGGGAAGCAUCAAAG
2185	truncated stem loop, C18G, trip mut (U10C), -1 A2G, HDV -99 G65U	GCUGGCGCCUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCUCUUACGGACUUCGGUCCGUAAGAGCAUCAA AG
2186	short phage rep, C18G, trip mut (U10C), -1 A2G, HDV -99 G65U	GCUGGCGCCUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCUCGGACGACCUCUCGGUCGUCCGAGCAUCAA AG
2187	3' sTRSV WT viral Hammerhead ribozyme	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAU AAGAAGCAUCAAAGCCUGUCACCGGAUGUGCUUUCCGGUCUGAUGAG UCCGUGAGGACGAAACAGG
2188	short phage rep, C18G, -1 A2G	GCUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCGGACGACCUCUCGGUCGUCCGAAGCAUCA AAG

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2189	short phage rep, C18G, trip mut (U10C), -1 A2G, 3' genomic HDV	GCUGGCGCCUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCGGACGACCUCUCGGUCGUCCGAAGCAUCA AAG
2190	phage rep loop, C18G, trip mut (U10C), -1 A2G, HDV -99 G65U	GCUGGCGCCUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCUCAGGUGGGACGACCUCUCGGUCGUCCUAUC UGAGCAUCAAAG
2191	3' HDV ribozyme (Owen Ryan, Jamie Cate)	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAU AAGAAGCAUCAAAGGAUGGCCGGCAUGGUCCCAGCCUCCUCGCUGGC GCCGGCUGGGCAACACCUUCGGGUGGCGAAUGGGAC
2192	phage rep loop, C18G, -1 A2G	GCUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCAGGUGGGACGACCUCUCGGUCGUCCUAUC UGAAGCAUCAAAG
2193	0.14	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUACUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAA UAAGAAGCAUCAAAG
2194	-78, G77U	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGUGAGAAAUCCGAUAAAUA AGAAGCAUCAAAG
2195		GUACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACU AUGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAA UAAGAAGCAUCAAAG
2196	short phage rep, -1 A2G	GCUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCGGACGACCUCUCGGUCGUCCGAAGCAUCA AAG
2197	truncated stem loop, C18G, trip mut (U10C), -1 A2G	GCUGGCGCCUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUCA AAG
2198	-1, A2G	GCUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAUA AGAAGCAUCAAAG
2199	truncated stem loop, trip mut (U10C), -1 A2G	GCUGGCGCCUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUCA AAG
2200	uvsX, C18G, trip mut	GCUGGCGCCUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCCCUCUUCGGAGGGAAGCAUCAAAG

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	(U10C), -1 A2G	
2201	phage rep loop, -1 A2G	GCUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCAGGUGGGACGACCUCUCGGUCGUCCUAUC UGAAGCAUCAAAG
2202	phage rep loop, trip mut (U10C), -1 A2G	GCUGGCGCCUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCAGGUGGGACGACCUCUCGGUCGUCCUAUC UGAAGCAUCAAAG
2203	phage rep loop, C18G, trip mut (U10C), -1 A2G	GCUGGCGCCUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCAGGUGGGACGACCUCUCGGUCGUCCUAUC UGAAGCAUCAAAG
2204	truncated stem loop, C18G	UACUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUC AAAG
2205	uvsX, trip mut (U10C), -1 A2G	GCUGGCGCCUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCCCUCUUCGGAGGGAAGCAUCAAAG
2206	truncated stem loop, -1 A2G	GCUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUCA AAG
2207	short phage rep, trip mut (U10C), -1 A2G	GCUGGCGCCUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCGGACGACCUCUCGGUCGUCCGAAGCAUCA AAG
2208	5'HDV ribozyme (Owen Ryan, Jamie Cate)	GAUGGCCGGCAUGGUCCCAGCCUCCUCGCUGGCGCCGGCUGGGCAAC ACCUUCGGGUGGCGAAUGGGACUACUGGCGCUUUUAUCUCAUUACUU UGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCUUAUUU AUCGGAGAGAAAUCCGAUAAAUAAGAAGCAUCAAAG
2209	5'HDV genomic ribozyme	GGCCGGCAUGGUCCCAGCCUCCUCGCUGGCGCCGGCUGGGCAACAUU CCGAGGGGACCGUCCCCUCGGUAAUGGCGAAUGGGACCCUACUGGCG CUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAU GGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAUAAGAAGCA UCAAAG
2210	truncated stem loop, C18G, trip mut (U10C), -1 A2G, HDV AA(98:99)C	GCUGGCGCCUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGCGCAUCAA AG
2211	5'env25 pistol ribozyme (with an added	CGUGGUUAGGGCCACGUUAAAUAGUUGCUUAAGCCCUAAGCGUUGAU CUUCGGAUCAGGUGCAAUACUGGCGCUUUUAUCUCAUUACUUUGAGA

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	CUUCGG loop)	GCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCUUAUUUAUCGG AGAGAAAUCCGAUAAAUAAGAAGCAUCAAAG
2212	5'HDV antigenomic ribozyme	GGGUCGGCAUGGCAUCUCCACCUCCUCGCGGUCCGACCUGGGCAUCC GAAGGAGGACGCACGUCCACUCGGAUGGCUAAGGGAGAGCCAUACUG GCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCG UAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAUAAGAA GCAUCAAAG
2213	3' Hammerhead ribozyme (Lior Nissim, Timothy Lu) guide scaffold scar	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAU AAGAAGCAUCAAAGCCAGUACUGAUGAGUCCGUGAGGACGAAACGAG UAAGCUCGUCUACUGGCGCUUUUAUCUCAU
2214	=+A27, stacked onto 64	UACUGGCGCCUUUAUCUCAUUACUUUAGAGAGCCAUCACCAGCGACU AUGUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAU CAAAG
2215	5'Hammerhead ribozyme (Lior Nissim, Timothy Lu) smaller scar	CGACUACUGAUGAGUCCGUGAGGACGAAACGAGUAAGCUCGUCUAGU CGUACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGAC UAUGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAA AUAAGAAGCAUCAAAG
2216	phage rep loop, C18G, trip mut (U10C), -1 A2G, HDV AA(98:99)C	GCUGGCGCCUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCAGGUGGGACGACCUCUCGGUCGUCCUAUC UGCGCAUCAAAG
2217	-27, stacked onto 64	UACUGGCGCCUUUAUCUCAUUACUUUAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUCA AAG
2218	3' Hatchet	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAU AAGAAGCAUCAAAGCAUUCCUCAGAAAAUGACAAACCUGUGGGGCGU AAGUAGAUCUUCGGAUCUAUGAUCGUGCAGACGUUAAAAUCAGGU
2219	3' Hammerhead ribozyme (Lior Nissim, Timothy Lu)	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAU AAGAAGCAUCAAAGCGACUACUGAUGAGUCCGUGAGGACGAAACGAG UAAGCUCGUCUAGUCGCGUGUAGCGAAGCA
2220	5' Hatchet	CAUUCCUCAGAAAAUGACAAACCUGUGGGGCGUAAGUAGAUCUUCGG AUCUAUGAUCGUGCAGACGUUAAAAUCAGGUUACUGGCGCUUUUAUC UCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAG CGCUUAUUUAUCGGAGAGAAAUCCGAUAAAUAAGAAGCAUCAAAG

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2221	5' HDV ribozyme (Lior Nissim, Timothy Lu)	UUUUGGCCGGCAUGGUCCCAGCCUCCUCGCUGGCGCCGGCUGGGCAA CAUGCUUCGGCAUGGCGAAUGGGACCCCGGGUACUGGCGCUUUUAUC UCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAG CGCUUAUUUAUCGGAGAGAAAUCCGAUAAAUAAGAAGCAUCAAAG
2222	5' Hammerhead ribozyme (Lior Nissim, Timothy Lu)	CGACUACUGAUGAGUCCGUGAGGACGAAACGAGUAAGCUCGUCUAGU CGCGUGUAGCGAAGCAUACUGGCGCUUUUAUCUCAUUACUUUGAGAG CCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCUUAUUUAUCGGA GAGAAAUCCGAUAAAUAAGAAGCAUCAAAG
2223	3' HH15 Minimal Hammerhead ribozyme	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAU AAGAAGCAUCAAAGGGGAGCCCCGCUGAUGAGGUCGGGGAGACCGAA AGGGACUUCGGUCCCUACGGGGCUCCC
2224	5' RBMX recruiting motif	CCACCCCCACCACCACCCCCACCCCCACCACCACCCUACUGGCGCUU UUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGG UAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAUAAGAAGCAUCA AAG
2225	3' Hammerhead ribozyme (Lior Nissim, Timothy Lu) smaller scar	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAU AAGAAGCAUCAAAGCGACUACUGAUGAGUCCGUGAGGACGAAACGAG UAAGCUCGUCUAGUCG
2226	3' env25 pistol ribozyme (with an added CUUCGG loop)	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAU AAGAAGCAUCAAAGCGUGGUUAGGGCCACGUUAAAUAGUUGCUUAAG CCCUAAGCGUUGAUCUUCGGAUCAGGUGCAA
2227	3' Env-9 Twister	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAU AAGAAGCAUCAAAGGGCAAUAAAGCGGUUACAAGCCCGCAAAAAUAG CAGAGUAAUGUCGCGAUAGCGCGGCAUUAAUGCAGCUUUAUUG
2228	=+AUUAUC UCAUUACU 25	UACUGGCGCUUUUAUCUCAUUACUAUUAUCUCAUUACUUUGAGAGCC AUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGA GAAAUCCGAUAAAUAAGAAGCAUCAAAG
2229	5' Env-9 Twister	GGCAAUAAAGCGGUUACAAGCCCGCAAAAAUAGCAGAGUAAUGUCGC GAUAGCGCGGCAUUAAUGCAGCUUUAUUGUACUGGCGCUUUUAUCUC AUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCG CUUAUUUAUCGGAGAGAAAUCCGAUAAAUAAGAAGCAUCAAAG
2230	3' Twisted Sister 1	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGAUAAAU AAGAAGCAUCAAAGACCCGCAAGGCCGACGGCAUCCGCCGCCGCUGG UGCAAGUCCAGCCGCCCCUUCGGGGGCGGGCGCUCAUGGGUAAC
2231	no stem	UACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAUGGGUAAAG

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2232	5' HH15 Minimal Hammerhead ribozyme	GGGAGCCCCGCUGAUGAGGUCGGGGAGACCGAAAGGGACUUCGGUCC CUACGGGGCUCCCUACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCA UCACCAGCGACUAUGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAG AAAUCCGAUAAAUAAGAAGCAUCAAAG
2233	5' Hammerhead ribozyme (Lior Nissim, Timothy Lu) guide scaffold scar	CCAGUACUGAUGAGUCCGUGAGGACGAAACGAGUAAGCUCGUCUACU GGCGCUUUUAUCUCAUUACUGGCGCUUUUAUCUCAUUACUUUGAGAG CCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCUUAUUUAUCGGA GAGAAAUCCGAUAAAUAAGAAGCAUCAAAG
2234	5' Twisted Sister 1	ACCCGCAAGGCCGACGGCAUCCGCCGCCGCUGGUGCAAGUCCAGCCG CCCCUUCGGGGGCGGGCGCUCAUGGGUAACUACUGGCGCUUUUAUCU CAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGC GCUUAUUUAUCGGAGAGAAAUCCGAUAAAUAAGAAGCAUCAAAG
2235	5' sTRSV WT viral Hammerhead ribozyme	CCUGUCACCGGAUGUGCUUUCCGGUCUGAUGAGUCCGUGAGGACGAA ACAGGUACUGGCGCUUUUAUCUCAUUACUUUGAGAGCCAUCACCAGC GACUAUGUCGUAUGGGUAAAGCGCUUAUUUAUCGGAGAGAAAUCCGA UAAAUAAGAAGCAUCAAAG
2236	148: =+G55, stacked onto 64	GUACUGGCGCCUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACU AUGUCGUAGUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCA UCAAAG
2237	158: 103+148(+G5 5) -99, G65U	GUACUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACU AUGUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2238	174: Uvsx Extended stem with [A99] G65U), C18G,^G55, [GU-1]	ACUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2239	175: extended stem truncation, U10C, [GU-1]	ACUGGCGCCUUUAUCUCAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUCA AAG
2240	176: 174 with A1G substitution for T7 transcription	GCUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2241	177: 174 with bubble (+G55) removed	ACUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG

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2242	181: stem 42 (truncated stem loop); U10C,C18G,[GU-1] (95+[GU-1])	ACUGGCGCCUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUCAAAG
2243	182: stem 42 (truncated stem loop); C18G,[GU-1]	ACUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUCAAAG
2244	183: stem 42 (truncated stem loop); C18G,^G55,[GU-1]	ACUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAGUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUCAAAG
2245	184: stem 48 (uvsx, -99 g65t); C18G,^T55,[GU-1]	ACUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2246	185: stem 42 (truncated stem loop); C18G,^U55,[GU-1]	ACUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUCAAAG
2247	186: stem 42 (truncated stem loop); U10C,^A17,[GU-1]	ACUGGCGCCUUUAUCAUCAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUCAAAG
2248	187: stem 46 (uvsx); C18G,^G55,[GU-1]	ACUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAGUGGGUAAAGCGCCCUCUUCGGAGGGAAGCAUCAAAG
2249	188: stem 50 (ms2 U15C, -99, g65t); C18G,^G55,[GU-1]	ACUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAGUGGGUAAAGCUCACAUGAGGAUCACCCAUGUGAGCAUCAAAG
2250	189: 174 + G8A;U15C;U35A	ACUGGCACUUUUACCUGAUUACUUUGAGAGCCAACACCAGCGACUAUGUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2251	190: 174 + G8A	ACUGGCACUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAUGUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG

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2252	191: 174 + G8C	ACUGGCCCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2253	192: 174 + U15C	ACUGGCGCUUUUACCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2254	193, 174 + U35A	ACUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAACACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2255	195: 175 + C18G + G8A;U15C;U 35A	ACUGGCACCUUUACCUGAUUACUUUGAGAGCCAACACCAGCGACUAU GUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUCA AAG
2256	196: 175 + C18G + G8A	ACUGGCACCUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUCA AAG
2257	197: 175 + C18G + G8C	ACUGGCCCCUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUCA AAG
2258	198: 175 + C18G + U35A	ACUGGCGCCUUUAUCUGAUUACUUUGAGAGCCAACACCAGCGACUAU GUCGUAUGGGUAAAGCGCUUACGGACUUCGGUCCGUAAGAAGCAUCA AAG
2259	199: 174 + A2G (test G transcription at start; ccGCT...)	GCUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2260	200: 174 + ^G1 (ccGACU...)	GACUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2261	201: 174 + U10C;^G28	ACUGGCGCCUUUAUCUGAUUACUUUGGAGAGCCAUCACCAGCGACUA UGUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2262	202: 174 + U10A;A28U	ACUGGCGCAUUUAUCUGAUUACUUUGUGAGCCAUCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2263	203: 174 + U10C	ACUGGCGCCUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2264	204: 174 + ^G28	ACUGGCGCUUUUAUCUGAUUACUUUGGAGAGCCAUCACCAGCGACUA UGUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2265	205: 174 + U10A	ACUGGCGCAUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2266	206, 174 + A28U	ACUGGCGCUUUUAUCUGAUUACUUUGUGAGCCAUCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2267	207: 174 + ^U15	ACUGGCGCUUUUAUUCUGAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2268	208: 174 + [U4]	ACGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAUG UCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2269	209: 174 + C16A	ACUGGCGCUUUUAUAUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG

SEQ ID NO:	NAME or Modification	NUCLEOTIDE SEQUENCE
2270	210: 174 + ^U17	ACUGGCGCUUUUAUCUUGAUUACUUUGAGAGCCAUCACCAGCGACUA UGUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2271	211: 174 + U35G (compare with 174 + U35A above)	ACUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAGCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2272	212: 174 +U11G, A105G (A86G), U26C	ACUGGCGCUGUUAUCUGAUUACUUCGAGAGCCAUCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCGAAG
2273	213: 174 +U11C, A105G (A86G), U26C	ACUGGCGCUCUUAUCUGAUUACUUCGAGAGCCAUCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCGAAG
2274	214: 174+U12G; A106G (A87G), U25C	ACUGGCGCUUGUAUCUGAUUACUCUGAGAGCCAUCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAGAG
2275	215: 174+U12C; A106G (A87G), U25C	ACUGGCGCUUCUAUCUGAUUACUCUGAGAGCCAUCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAGAG
2276	216: 174_tx_11.G, 87.G,22.C	ACUGGCGCUUUGAUCUGAUUACCUUGAGAGCCAUCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAGG
2277	217: 174_tx_11.C,87.G,22.C	ACUGGCGCUUUCAUCUGAUUACCUUGAGAGCCAUCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAGG
2278	218: 174 +U11G	ACUGGCGCUGUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG
2279	219: 174 +A105G (A86G)	ACUGGCGCUUUUAUCUGAUUACUUUGAGAGCCAUCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCGAAG
2280	220: 174 +U26C	ACUGGCGCUUUUAUCUGAUUACUUCGAGAGCCAUCACCAGCGACUAU GUCGUAGUGGGUAAAGCUCCCUCUUCGGAGGGAGCAUCAAAG

[00145] In some embodiments, the gNA variant comprises a tracrRNA stem loop comprising the sequence –UUU-N4-25-UUU– (SEQ ID NO: 34). For example, the gNA variant comprises a scaffold stem loop or a replacement thereof, flanked by two triplet U

motifs that contribute to the triplex region. In some embodiments, the scaffold stem loop or replacement thereof comprises at least 4 nucleotides, at least 5 nucleotides, at least 6 nucleotides, at least 7 nucleotides, at least 7 nucleotides, at least 8 nucleotides, at least 9 nucleotides, at least 10 nucleotides, at least 11 nucleotides, at least 12 nucleotides, at least 13 nucleotides, at least 14 nucleotides, at least 15 nucleotides, at least 16 nucleotides, at least 17 nucleotides, at least 18 nucleotides, at least 19 nucleotides, at least 20 nucleotides, at least 21 nucleotides, at least 22 nucleotides, at least 23 nucleotides, at least 24 nucleotides, or at least 25 nucleotides.

[00146] In some embodiments, the gNA variant comprises a crRNA sequence with –AAAG– in a location 5' to the spacer region. In some embodiments, the –AAAG– sequence is immediately 5' to the spacer region.

[00147] In some embodiments, the at least one nucleotide modification to a reference gNA to produce a gNA variant comprises at least one nucleotide deletion in the CasX variant gNA relative to the reference gRNA. In some embodiments, a gNA variant comprises a deletion of 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 or 20 consecutive or non-consecutive nucleotides relative to a reference gNA. In some embodiments, the at least one deletion comprises a deletion of 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 or 20 or more consecutive nucleotides relative to a reference gNA. In some embodiments, the gNA variant comprises 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 or 20 or more nucleotide deletions relative to the reference gNA, and the deletions are not in consecutive nucleotides. In those embodiments where there are two or more non-consecutive deletions in the gNA variant relative to the reference gRNA, any length of deletions, and any combination of lengths of deletions, as described herein, are contemplated as within the scope of the disclosure. For example, in some embodiments, a gNA variant may comprise a first deletion of one nucleotide, and a second deletion of two nucleotides and the two deletions are not consecutive. In some embodiments, a gNA variant comprises at least two deletions in different regions of the reference gRNA. In some embodiments, a gNA variant comprises at least two deletions in the same region of the reference gRNA. For example, the regions may be the extended stem loop, scaffold stem loop, scaffold stem bubble, triplex loop, pseudoknot, triplex, or a 5' end of the gNA variant. The deletion of any nucleotide in a reference gRNA is contemplated as within the scope of the disclosure.

[00148] In some embodiments, the at least one nucleotide modification of a reference gRNA to generate a gNA variant comprises at least one nucleotide insertion. In some embodiments,

a gNA variant comprises an insertion of 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10 consecutive or non-consecutive nucleotides relative to a reference gRNA. In some embodiments, the at least one nucleotide insertion comprises an insertion of 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 or 20 or more consecutive nucleotides relative to a reference gRNA. In some embodiments, the gNA variant comprises 2 or more insertions relative to the reference gRNA, and the insertions are not consecutive. In those embodiments where there are two or more non-consecutive insertions in the gNA variant relative to the reference gRNA, any length of insertions, and any combination of lengths of insertions, as described herein, are contemplated as within the scope of the disclosure. For example, in some embodiments, a gNA variant may comprise a first insertion of one nucleotide, and a second insertion of two nucleotides and the two insertions are not consecutive. In some embodiments, a gNA variant comprises at least two insertions in different regions of the reference gRNA. In some embodiments, a gNA variant comprises at least two insertions in the same region of the reference gRNA. For example, the regions may be the extended stem loop, scaffold stem loop, scaffold stem bubble, triplex loop, pseudoknot, triplex, or a 5' end of the gNA variant. Any insertion of A, G, C, U (or T, in the corresponding DNA) or combinations thereof at any location in the reference gRNA is contemplated as within the scope of the disclosure.

[00149] In some embodiments, the at least one nucleotide modification of a reference gRNA to generate a gNA variant comprises at least one nucleic acid substitution. In some embodiments, a gNA variant comprises 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 or 20 or more consecutive or non-consecutive substituted nucleotides relative to a reference gRNA. In some embodiments, a gNA variant comprises 1-4 nucleotide substitutions relative to a reference gRNA. In some embodiments, the at least one substitution comprises a substitution of 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 or 20 or more consecutive nucleotides relative to a reference gRNA. In some embodiments, the gNA variant comprises 2 or more substitutions relative to the reference gRNA, and the substitutions are not consecutive. In those embodiments where there are two or more non-consecutive substitutions in the gNA variant relative to the reference gRNA, any length of substituted nucleotides, and any combination of lengths of substituted nucleotides, as described herein, are contemplated as within the scope of the disclosure. For example, in some embodiments, a gNA variant may comprise a first substitution of one nucleotide, and a second substitution of two nucleotides and the two substitutions are not consecutive. In some embodiments, a gNA variant comprises at least two substitutions in different regions of the

reference gRNA. In some embodiments, a gNA variant comprises at least two substitutions in the same region of the reference gRNA. For example, the regions may be the triplex, the extended stem loop, scaffold stem loop, scaffold stem bubble, triplex loop, pseudoknot, triplex, or a 5' end of the gNA variant. Any substitution of A, G, C, U (or T, in the corresponding DNA) or combinations thereof at any location in the reference gRNA is contemplated as within the scope of the disclosure.

[00150] Any of the substitutions, insertions and deletions described herein can be combined to generate a gNA variant of the disclosure. For example, a gNA variant can comprise at least one substitution and at least one deletion relative to a reference gRNA, at least one substitution and at least one insertion relative to a reference gRNA, at least one insertion and at least one deletion relative to a reference gRNA, or at least one substitution, one insertion and one deletion relative to a reference gRNA.

[00151] In some embodiments, the gNA variant comprises a scaffold region at least 20% identical, at least 30% identical, at least 40% identical, at least 50% identical, at least 60% identical, at least 65% identical, at least 70% identical, at least 75% identical, at least 80% identical, at least 85% identical, at least 90% identical, at least 91% identical, at least 92% identical, at least 93% identical, at least 94% identical, at least 95% identical, at least 96% identical, at least 97% identical, at least 98% identical, or at least 99% identical to any one of SEQ ID NOS:4-16. In some embodiments, the gNA variant comprises a scaffold region at least 60% homologous (or identical) to any one of SEQ ID NOS:4-16.

[00152] In some embodiments, the gNA variant comprises a tracr stem loop at least 60% identical, at least 65% identical, at least 70% identical, at least 75% identical, at least 80% identical, at least 85% identical, at least 90% identical, at least 91% identical, at least 92% identical, at least 93% identical, at least 94% identical, at least 95% identical, at least 96% identical, at least 97% identical, at least 98% identical, or at least 99% identical to SEQ ID NO:14. In some embodiments, the gNA variant comprises a tracr stem loop at least 60% homologous (or identical) to SEQ ID NO:14.

[00153] In some embodiments, the gNA variant comprises an extended stem loop at least 60% identical, at least 65% identical, at least 70% identical, at least 75% identical, at least 80% identical, at least 85% identical, at least 90% identical, at least 91% identical, at least 92% identical, at least 93% identical, at least 94% identical, at least 95% identical, at least 96% identical, at least 97% identical, at least 98% identical, or at least 99% identical to SEQ

ID NO:15. In some embodiments, the gNA variant comprises an extended stem loop at least 60% homologous (or identical) to SEQ ID NO:15.

[00154] In some embodiments, the gNA variant comprises an exogenous extended stem loop, with such differences from a reference gNA described as follows. In some embodiments, an exogenous extended stem loop has little or no identity to the reference stem loop regions disclosed herein (e.g., SEQ ID NO:15). In some embodiments, an exogenous stem loop is at least 10 bp, at least 20 bp, at least 30 bp, at least 40 bp, at least 50 bp, at least 60 bp, at least 70 bp, at least 80 bp, at least 90 bp, at least 100 bp, at least 200 bp, at least 300 bp, at least 400 bp, at least 500 bp, at least 600 bp, at least 700 bp, at least 800 bp, at least 900 bp, at least 1,000 bp, at least 2,000 bp, at least 3,000 bp, at least 4,000 bp, at least 5,000 bp, at least 6,000 bp, at least 7,000 bp, at least 8,000 bp, at least 9,000 bp, at least 10,000 bp, at least 12,000 bp, at least 15,000 bp or at least 20,000 bp. In some embodiments, the gNA variant comprises an extended stem loop region comprising at least 10, at least 100, at least 500, at least 1000, or at least 10,000 nucleotides. In some embodiments, the heterologous stem loop increases the stability of the gNA. In some embodiments, the heterologous RNA stem loop is capable of binding a protein, an RNA structure, a DNA sequence, or a small molecule. In some embodiments, an exogenous stem loop region comprises an RNA stem loop or hairpin, for example a thermostable RNA such as MS2 (ACAUGAGGAUUACCCAUGU (SEQ ID NO: 35)), Qβ (UGCAUGUCUAAGACAGCA (SEQ ID NO: 36)), U1 hairpin II (AAUCCAUUGCACUCCGGAUU (SEQ ID NO: 37)), Uvsx (CCUCUUCGGAGG (SEQ ID NO: 38)), PP7 (AGGAGUUUCUAUGGAAACCCU (SEQ ID NO: 39)), Phage replication loop (AGGUGGGACGACCUCUCGGUCGUCCUAUCU (SEQ ID NO: 40)), Kissing loop_a (UGCUCGCUCCGUUCGAGCA (SEQ ID NO: 41)), Kissing loop_b1 (UGCUCGACGCGUCCUCGAGCA (SEQ ID NO: 42)), Kissing loop_b2 (UGCUCGUUUGCGGCUACGAGCA (SEQ ID NO: 43)), G quadriplex M3q (AGGGAGGGAGGGAGAGG (SEQ ID NO: 44)), G quadriplex telomere basket (GGUUAGGGUUAGGGUUAGG (SEQ ID NO: 45)), Sarcin-ricin loop (CUGCUCAGUACGAGAGGAACCGCAG (SEQ ID NO: 46)) or Pseudoknots (UACACUGGGAUCGCUGAAUUAGAGAUCGGCGUCCUUUCAUUCUAUAUACUUU GGAGUUUUAAAAUGUCUCUAAGUACA (SEQ ID NO: 47)). In some embodiments, an exogenous stem loop comprises an RNA scaffold. As used herein, an "RNA scaffold" refers to a multi-dimensional RNA structure capable of interacting with and organizing or localizing one or more proteins. In some embodiments, the RNA scaffold is synthetic or non-naturally

occurring. In some embodiments, an exogenous stem loop comprises a long non-coding RNA (lncRNA). As used herein, a lncRNA refers to a non-coding RNA that is longer than approximately 200 bp in length. In some embodiments, the 5' and 3' ends of the exogenous stem loop are base paired, i.e., interact to form a region of duplex RNA. In some embodiments, the 5' and 3' ends of the exogenous stem loop are base paired, and one or more regions between the 5' and 3' ends of the exogenous stem loop are not base paired. In some embodiments, the at least one nucleotide modification comprises: (a) substitution of 1 to 15 consecutive or non-consecutive nucleotides in the gNA variant in one or more regions; (b) a deletion of 1 to 10 consecutive or non-consecutive nucleotides in the gNA variant in one or more regions; (c) an insertion of 1 to 10 consecutive or non-consecutive nucleotides in the gNA variant in one or more regions; (d) a substitution of the scaffold stem loop or the extended stem loop with an RNA stem loop sequence from a heterologous RNA source with proximal 5' and 3' ends; or any combination of (a)-(d).

[00155] In some embodiments, the gNA variant comprises a scaffold stem loop having at least 60% identity to SEQ ID NO:14. In some embodiments, the gNA variant comprises a scaffold stem loop having at least 60% identity, at least 70% identity, at least 80% identity, at least 90% identity, at least 95% identity, at least 98% identity or at least 99% identity to SEQ ID NO:14. In some embodiments, the gNA variant comprises a scaffold stem loop comprising SEQ ID NO:14.

[00156] In some embodiments, the gNA variant comprises a scaffold stem loop sequence of CCAGCGACUAUGUCGUAGUGG (SEQ ID NO: 32). In some embodiments, the gNA variant comprises a scaffold stem loop sequence of CCAGCGACUAUGUCGUAGUGG (SEQ ID NO: 32) with at least 1, 2, 3, 4, or 5 mismatches thereto.

[00157] In some embodiments, the gNA variant comprises an extended stem loop region comprising less than 32 nucleotides, less than 31 nucleotides, less than 30 nucleotides, less than 29 nucleotides, less than 28 nucleotides, less than 27 nucleotides, less than 26 nucleotides, less than 25 nucleotides, less than 24 nucleotides, less than 23 nucleotides, less than 22 nucleotides, less than 21 nucleotides, or less than 20 nucleotides. In some embodiments, the gNA variant comprises an extended stem loop region comprising less than 32 nucleotides. In some embodiments, the gNA variant further comprises a thermostable stem loop.

[00158] In some embodiments, a sgRNA variant comprises a sequence of SEQ ID NO:2104, SEQ ID NO:2106, SEQ ID NO:2163, SEQ ID NO:2107, SEQ ID NO:2164, SEQ ID

NO:2165, SEQ ID NO:2166, SEQ ID NO:2103, SEQ ID NO:2167, SEQ ID NO:2105, SEQ ID NO:2108, SEQ ID NO:2112, SEQ ID NO:2160, SEQ ID NO:2170, SEQ ID NO:2114, SEQ ID NO:2171, SEQ ID NO:2112, SEQ ID NO:2173, SEQ ID NO:2102, SEQ ID NO:2174, SEQ ID NO:2175, SEQ ID NO:2109, SEQ ID NO:2176, SEQ ID NO:2238, SEQ ID NO:2239, SEQ ID NO:2240, SEQ ID NO:2241, SEQ ID NO:2274, or SEQ ID NO:2275.

[00159] In some embodiments, the gNA variant comprises the sequence of any one of SEQ ID NOS:2236, 2237, 2238, 2241, 2244, 2248, 2249, or 2259-2280, or having at least about 80%, at least about 90%, at least about 95%, at least about 96%, at least about 97%, at least about 98%, at least about 99% identity thereto. In some embodiments, the gNA variant comprises one or more additional changes to a sequence of any one of SEQ ID NOs: 2201-2280. In some embodiments, the gNA variant comprises the sequence of any one of SEQ ID NOS:2236, 2237, 2238, 2241, 2244, 2248, 2249, or 2259-2280.

[00160] In some embodiments, a sgRNA variant comprises one or more additional changes to a sequence of SEQ ID NO:2104, SEQ ID NO:2163, SEQ ID NO:2107, SEQ ID NO:2164, SEQ ID NO:2165, SEQ ID NO:2166, SEQ ID NO:2103, SEQ ID NO:2167, SEQ ID NO:2105, SEQ ID NO:2108, SEQ ID NO:2112, SEQ ID NO:2160, SEQ ID NO:2170, SEQ ID NO:2114, SEQ ID NO:2171, SEQ ID NO:2112, SEQ ID NO:2173, SEQ ID NO:2102, SEQ ID NO:2174, SEQ ID NO:2175, SEQ ID NO:2109, SEQ ID NO:2176, SEQ ID NO:2238, SEQ ID NO:2239, SEQ ID NO:2240, SEQ ID NO:2241, SEQ ID NO:2274, or SEQ ID NO:2275.

[00161] In some embodiments of the gNA variants of the disclosure, the gNA variant comprises at least one modification, wherein the at least one modification compared to the reference guide scaffold of SEQ ID NO:5 is selected from one or more of: (a) a C18G substitution in the triplex loop; (b) a G55 insertion in the stem bubble; (c) a U1 deletion; (d) a modification of the extended stem loop wherein (i) a 6 nt loop and 13 loop-proximal base pairs are replaced by a Uvsx hairpin; and (ii) a deletion of A99 and a substitution of G65U that results in a loop-distal base that is fully base-paired. In such embodiments, the gNA variant comprises the sequence of any one of SEQ ID NOS:2236, 2237, 2238, 2241, 2244, 2248, 2249, or 2259-2280.

[00162] In some embodiments, the scaffold of the gNA variant comprises the sequence of any one of SEQ ID NOS:2201-2280 of Table 2. In some embodiments, the scaffold of the gNA consists or consists essentially of the sequence of any one of SEQ ID NOS:2201-2280. In some embodiments, the scaffold of the gNA variant sequence is at least about 60%

identical, at least about 65% identical, at least about 70% identical, at least about 75% identical, at least about 80% identical, at least about 85% identical, at least about 90% identical, at least about 91% identical, at least about 92% identical, at least about 93% identical, at least about 94% identical, at least about 95% identical, at least about 96% identical, at least about 97% identical, at least about 98% identical or at least about 99% identical to any one of SEQ ID NOS:2201 to 2280.

[00163] In the embodiments of the gNA variants, the gNA further comprises a spacer (or targeting sequence) region, described more fully, supra, which comprises at least 14 to about 35 nucleotides wherein the spacer is designed with a sequence that is complementary to a target DNA. In some embodiments, the gNA variant comprises a targeting sequence of at least 10 to 30 nucleotides complementary to a target DNA. In some embodiments, the targeting sequence has 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34 or 35 nucleotides. In some embodiments, the gNA variant comprises a targeting sequence having 20 nucleotides. In some embodiments, the targeting sequence has 25 nucleotides. In some embodiments, the targeting sequence has 24 nucleotides. In some embodiments, the targeting sequence has 23 nucleotides. In some embodiments, the targeting sequence has 22 nucleotides. In some embodiments, the targeting sequence has 21 nucleotides. In some embodiments, the targeting sequence has 20 nucleotides. In some embodiments, the targeting sequence has 19 nucleotides. In some embodiments, the targeting sequence has 18 nucleotides. In some embodiments, the targeting sequence has 17 nucleotides. In some embodiments, the targeting sequence has 16 nucleotides. In some embodiments, the targeting sequence has 15 nucleotides. In some embodiments, the targeting sequence has 14 nucleotides. In some embodiments, the disclosure provides targeting sequences for inclusion in the gNA variants of the disclosure comprising a sequence that is at least 50% identical, at least 55% identical, at least 60% identical, at least 65% identical, at least 70% identical, at least 75% identical, at least 80% identical, at least 85% identical, at least 90% identical, at least 95% identical, or 100% identical to a sequence in Tables 3A, 3B, or 3C. In some embodiments, the targeting sequence of the gNA variant comprises a sequence a sequence of Tables 3A, 3B, or 3C with a single nucleotide removed from the 3' end of the sequence. In other embodiments, the targeting sequence of the gNA variant comprises a sequence a sequence of Tables 3A, 3B, or 3C with two nucleotides removed from the 3' end of the sequence. In other embodiments, the targeting sequence of the gNA variant comprises a sequence a sequence of Tables 3A, 3B, or 3C with three nucleotides

removed from the 3' end of the sequence. In other embodiments, the targeting sequence of the gNA variant comprises a sequence a sequence of Tables 3A, 3B, or 3C with four nucleotides removed from the 3' end of the sequence. In other embodiments, the targeting sequence of the gNA variant comprises a sequence a sequence of Table 3 with five nucleotides removed from the 3' end of the sequence.

Table 3A. gNA Targeting Sequences for B2M
Table 3A is provided in FIG. 35, and is referred to as Table 3A throughout.

Table 3B. gNA Targeting Sequences for TRAC
Table 3B is provided in FIG. 36, and is referred to as Table 3B throughout.

Table 3C: gNA Targeting Sequences for CIITA
Table 3C is provided in FIG. 37, and is referred to as Table 3C throughout.

[00164] In Tables 3A, 3B and 3C the left column indicates the PAM sequence, the right column indicates the SEQ ID NO of the corresponding spacer sequence (sometimes referred to herein as a targeting sequence).

[00165] In some embodiments, the scaffold of the gNA variant is part of an RNP with a reference CasX protein comprising SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3. In other embodiments, the scaffold of the gNA variant is part of an RNP with a CasX variant protein comprising any one of the sequences of Tables 4, 7, 8, 9, or 11 or a sequence having at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 85%, at least about 90%, at least about 91%, at least about 92%, at least about 93%, at least about 94%, at least about 95%, at least about 96%, at least about 97%, at least about 98%, or at least about 99% identity thereto. In the foregoing embodiments, the gNA further comprises a spacer sequence.

[00166] In some embodiments, the scaffold of the gNA variant is a variant comprising one or more additional changes to a sequence of a reference gRNA that comprises SEQ ID NO:4 or SEQ ID NO:5. In those embodiments where the scaffold of the reference gRNA is derived from SEQ ID NO:4 or SEQ ID NO:5, the one or more improved or added characteristics of the gNA variant are improved compared to the same characteristic in SEQ ID NO:4 or SEQ ID NO:5.

h. Complex Formation with CasX Protein

[00167] In some embodiments, a gNA variant has an improved ability to form a complex with a CasX protein (such as a reference CasX or a CasX variant protein) when compared to a reference gRNA. In some embodiments, a gNA variant has an improved affinity for a CasX protein (such as a reference or variant protein) when compared to a reference gRNA, thereby improving its ability to form a ribonucleoprotein (RNP) complex with the CasX protein, as described in the Examples. Improving ribonucleoprotein complex formation may, in some embodiments, improve the efficiency with which functional RNPs are assembled. In some embodiments, greater than 90%, greater than 93%, greater than 95%, greater than 96%, greater than 97%, greater than 98% or greater than 99% of RNPs comprising a gNA variant and its spacer are competent for gene editing of a target nucleic acid.

[00168] Exemplary nucleotide changes that can improve the ability of gNA variants to form a complex with CasX protein may, in some embodiments, include replacing the scaffold stem with a thermostable stem loop. Without wishing to be bound by any theory, replacing the scaffold stem with a thermostable stem loop could increase the overall binding stability of the gNA variant with the CasX protein. Alternatively, or in addition, removing a large section of the stem loop could change the gNA variant folding kinetics and make a functional folded gNA easier and quicker to structurally-assemble, for example by lessening the degree to which the gNA variant can get "tangled" in itself. In some embodiments, choice of scaffold stem loop sequence could change with different spacers that are utilized for the gNA. In some embodiments, scaffold sequence can be tailored to the spacer and therefore the target sequence. Biochemical assays can be used to evaluate the binding affinity of CasX protein for the gNA variant to form the RNP, including the assays of the Examples. For example, a person of ordinary skill can measure changes in the amount of a fluorescently tagged gNA that is bound to an immobilized CasX protein, as a response to increasing concentrations of an additional unlabeled "cold competitor" gNA. Alternatively, or in addition, fluorescence signal can be monitored to or seeing how it changes as different amounts of fluorescently labeled gNA are flowed over immobilized CasX protein. Alternatively, the ability to form an RNP can be assessed using *in vitro* cleavage assays against a defined target nucleic acid sequence.

i. gNA Stability

[00169] In some embodiments, a gNA variant has improved stability when compared to a reference gRNA. Increased stability and efficient folding may, in some embodiments,

increase the extent to which a gNA variant persists inside a target cell, which may thereby increase the chance of forming a functional RNP capable of carrying out CasX functions such as gene editing. Increased stability of gNA variants may also, in some embodiments, allow for a similar outcome with a lower amount of gNA delivered to a cell, which may in turn reduce the chance of off-target effects during gene editing.

[00170] In another aspect, the disclosure provides gNA in which the scaffold stem loop and/or the extended stem loop is replaced with a hairpin loop or a thermostable RNA stem loop in which the resulting gNA has increased stability and, depending on the choice of loop, can interact with certain cellular proteins or RNA. In some embodiments, the replacement RNA loop is selected from MS2, Qβ, U1 hairpin II, Uvsx, PP7, Phage replication loop, Kissing loop_a, Kissing loop_b1, Kissing loop_b2, G quadriplex M3q, G quadriplex telomere basket, Sarcin-ricin loop and Pseudoknots. Sequences of gNA variants including such components are provided in Table 2B.

[00171] Guide RNA stability can be assessed in a variety of ways, including for example in vitro by assembling the guide, incubating for varying periods of time in a solution that mimics the intracellular environment, and then measuring functional activity via the *in vitro* cleavage assays described herein. Alternatively, or in addition, gNAs can be harvested from cells at varying time points after initial transfection/transduction of the gNA to determine how long gNA variants persist relative to reference gRNAs.

j. **Solubility**

[00172] In some embodiments, a gNA variant has improved solubility when compared to a reference gRNA. In some embodiments, a gNA variant has improved solubility of the CasX protein:gNA RNP when compared to a reference gRNA. In some embodiments, solubility of the CasX protein:gNA RNP is improved by the addition of a ribozyme sequence to a 5' or 3' end of the gNA variant, for example the 5' or 3' of a reference sgRNA. Some ribozymes, such as the M1 ribozyme, can increase solubility of proteins through RNA mediated protein folding.

[00173] Increased solubility of CasX RNPs comprising a gNA variant as described herein can be evaluated through a variety of means known to one of skill in the art, such as by taking densitometry readings on a gel of the soluble fraction of lysed *E. coli* in which the CasX and gNA variants are expressed.

k. **Resistance to Nuclease Activity**

[00174] In some embodiments, a gNA variant has improved resistance to nuclease activity compared to a reference gRNA. Without wishing to be bound by any theory, increased resistance to nucleases, such as nucleases found in cells, may for example increase the persistence of a variant gNA in an intracellular environment, thereby improving gene editing.

[00175] Many nucleases are processive, and degrade RNA in a 3' to 5' fashion. Therefore, in some embodiments the addition of a nuclease resistant secondary structure to one or both termini of the gNA, or nucleotide changes that change the secondary structure of a sgNA, can produce gNA variants with increased resistance to nuclease activity. Resistance to nuclease activity may be evaluated through a variety of methods known to one of skill in the art. For example, *in vitro* methods of measuring resistance to nuclease activity may include for example contacting reference gNA and variants with one or more exemplary RNA nucleases and measuring degradation. Alternatively, or in addition, measuring persistence of a gNA variant in a cellular environment using the methods described herein can indicate the degree to which the gNA variant is nuclease resistant.

l. **Binding Affinity to a Target DNA**

[00176] In some embodiments, a gNA variant has improved affinity for the target DNA relative to a reference gRNA. In certain embodiments, a ribonucleoprotein complex comprising a gNA variant has improved affinity for the target DNA, relative to the affinity of an RNP comprising a reference gRNA. In some embodiments, the improved affinity of the RNP for the target DNA comprises improved affinity for the target sequence, improved affinity for the PAM sequence, improved ability of the RNP to search DNA for the target sequence, or any combinations thereof. In some embodiments, the improved affinity for the target DNA is the result of increased overall DNA binding affinity.

[00177] Without wishing to be bound by theory, it is possible that nucleotide changes in the gNA variant that affect the function of the OBD in the CasX protein may increase the affinity of CasX variant protein binding to the protospacer adjacent motif (PAM), as well as the ability to bind or utilize an increased spectrum of PAM sequences other than the canonical TTC PAM recognized by the reference CasX protein of SEQ ID NO:2, including PAM sequences selected from the group consisting of TTC, ATC, GTC, and CTC, thereby increasing the affinity and diversity of the CasX variant protein for target DNA sequences resulting in a substantial increase in the target nucleic acid sequences that can be edited and/or bound, compared to a reference CasX. As described more fully, below, increasing the sequences of the target nucleic acid that can be edited, compared to a reference CasX, refers

to both the PAM and the protospacer sequence and their directionality according to the orientation of the non-target strand. This does not imply that the PAM sequence of the non-target strand, rather than the target strand, is determinative of cleavage or mechanistically involved in target recognition. For example, when reference is to a TTC PAM, it may in fact be the complementary GAA sequence that is required for target cleavage, or it may be some combination of nucleotides from both strands. In the case of the CasX proteins disclosed herein, the PAM is located 5' of the protospacer with at least a single nucleotide separating the PAM from the first nucleotide of the protospacer. Alternatively, or in addition, changes in the gNA that affect function of the helical I and/or helical II domains that increase the affinity of the CasX variant protein for the target DNA strand can increase the affinity of the CasX RNP comprising the variant gNA for target DNA.

m. **Adding or Changing gNA Function**

[00178] In some embodiments, gNA variants can comprise larger structural changes that change the topology of the gNA variant with respect to the reference gRNA, thereby allowing for different gNA functionality. For example, in some embodiments a gNA variant has swapped an endogenous stem loop of the reference gRNA scaffold with a previously identified stable RNA structure or a stem loop that can interact with a protein or RNA binding partner to recruit additional moieties to the CasX or to recruit CasX to a specific location, such as the inside of a viral capsid, that has the binding partner to the said RNA structure. In other scenarios the RNAs may be recruited to each other, as in Kissing loops, such that two CasX proteins can be co-localized for more effective gene editing at the target DNA sequence. Such RNA structures may include MS2, Qβ, U1 hairpin II, Uvsx, PP7, Phage replication loop, Kissing loop_a, Kissing loop_b1, Kissing loop_b2, G quadriplex M3q, G quadriplex telomere basket, Sarcin-ricin loop, or a Pseudoknot.

[00179] In some embodiments, a gNA variant comprises a terminal fusion partner. Exemplary terminal fusions may include fusion of the gRNA to a self-cleaving ribozyme or protein binding motif. As used herein, a "ribozyme" refers to an RNA or segment thereof with one or more catalytic activities similar to a protein enzyme. Exemplary ribozyme catalytic activities may include, for example, cleavage and/or ligation of RNA, cleavage and/or ligation of DNA, or peptide bond formation. In some embodiments, such fusions could either improve scaffold folding or recruit DNA repair machinery. For example, a gRNA may in some embodiments be fused to a hepatitis delta virus (HDV) antigenomic ribozyme, HDV genomic ribozyme, hatchet ribozyme (from metagenomic data), env25 pistol ribozyme

(representative from Aliistipes putredinis), HH15 Minimal Hammerhead ribozyme, tobacco ringspot virus (TRSV) ribozyme, WT viral Hammerhead ribozyme (and rational variants), or Twisted Sister 1 or RBMX recruiting motif. Hammerhead ribozymes are RNA motifs that catalyze reversible cleavage and ligation reactions at a specific site within an RNA molecule. Hammerhead ribozymes include type I, type II and type III hammerhead ribozymes. The HDV, pistol, and hatchet ribozymes have self-cleaving activities. gNA variants comprising one or more ribozymes may allow for expanded gNA function as compared to a gRNA reference. For example, gNAs comprising self-cleaving ribozymes can, in some embodiments, be transcribed and processed into mature gNAs as part of polycistronic transcripts. Such fusions may occur at either the 5' or the 3' end of the gNA. In some embodiments, a gNA variant comprises a fusion at both the 5' and the 3' end, wherein each fusion is independently as described herein. In some embodiments, a gNA variant comprises a phage replication loop or a tetraloop. In some embodiments, a gNA comprises a hairpin loop that is capable of binding a protein. For example, in some embodiments the hairpin loop is an MS2, Qβ, U1 hairpin II, Uvsx, or PP7 hairpin loop.

[00180] In some embodiments, a gNA variant comprises one or more RNA aptamers. As used herein, an "RNA aptamer" refers to an RNA molecule that binds a target with high affinity and high specificity.

[00181] In some embodiments, a gNA variant comprises one or more riboswitches. As used herein, a "riboswitch" refers to an RNA molecule that changes state upon binding a small molecule.

[00182] In some embodiments, the gNA variant further comprises one or more protein binding motifs. Adding protein binding motifs to a reference gRNA or gNA variant of the disclosure may, in some embodiments, allow a CasX RNP to associate with additional proteins, which can, for example, add the functionality of those proteins to the CasX RNP.

n. Chemically Modified gNA

[00183] In some embodiments, the disclosure relates to chemically-modified gNA. In some embodiments, the present disclosure provides a chemically-modified gNA that has guide RNA functionality and has reduced susceptibility to cleavage by a nuclease. A gNA that comprises any nucleotide other than the four canonical ribonucleotides A, C, G, and U, or a deoxynucleotide, is a chemically modified gNA. In some cases, a chemically-modified gNA comprises any backbone or internucleotide linkage other than a natural phosphodiester internucleotide linkage. In certain embodiments, the retained functionality includes the ability

of the modified gNA to bind to a CasX of any of the embodiments described herein. In certain embodiments, the retained functionality includes the ability of the modified gNA to bind to a target nucleic acid sequence. In certain embodiments, the retained functionality includes targeting a CasX protein or the ability of a pre-complexed CasX protein-gNA to bind to a target nucleic acid sequence. In certain embodiments, the retained functionality includes the ability to nick a target polynucleotide by a CasX-gNA. In certain embodiments, the retained functionality includes the ability to cleave a target nucleic acid sequence by a CasX-gNA. In certain embodiments, the retained functionality is any other known function of a gNA in a CasX system with a CasX protein of the embodiments of the disclosure.

[00184] In some embodiments, the disclosure provides a chemically-modified gNA in which a nucleotide sugar modification is incorporated into the gNA selected from the group consisting of 2′-O—C_{1-4}alkyl such as 2′-O-methyl (2′-OMe), 2′-deoxy (2′-H), 2′-O—C_{1-3}alkyl-O—C_{1-3}alkyl such as 2′-methoxyethyl ("2′-MOE"), 2′-fluoro ("2′-F"), 2′-amino ("2′-NH_2"), 2′-arabinosyl ("2′-arabino") nucleotide, 2′-F-arabinosyl ("2′-F-arabino") nucleotide, 2′-locked nucleic acid ("LNA") nucleotide, 2′-unlocked nucleic acid ("ULNA") nucleotide, a sugar in L form ("L-sugar"), and 4′-thioribosyl nucleotide. In other embodiments, an internucleotide linkage modification incorporated into the guide RNA is selected from the group consisting of: phosphorothioate "P(S)" (P(S)), phosphonocarboxylate ($P(CH_2)_nCOOR$) such as phosphonoacetate "PACE" ($P(CH_2COO^-)$), thiophosphonocarboxylate ($(S)P(CH_2)_nCOOR$) such as thiophosphonoacetate "thioPACE" ($(S)P(CH_2)_nCOO^-$)), alkylphosphonate ($P(C_{1-3}alkyl)$ such as methylphosphonate —$P(CH_3)$, boranophosphonate ($P(BH_3)$), and phosphorodithioate ($P(S)_2$).

[00185] In certain embodiments, the disclosure provides a chemically-modified gNA in which a nucleobase ("base") modification is incorporated into the gNA selected from the group consisting of: 2-thiouracil ("2-thioU"), 2-thiocytosine ("2-thioC"), 4-thiouracil ("4-thioU"), 6-thioguanine ("6-thioG"), 2-aminoadenine ("2-aminoA"), 2-aminopurine, pseudouracil, hypoxanthine, 7-deazaguanine, 7-deaza-8-azaguanine, 7-deazaadenine, 7-deaza-8-azaadenine, 5-methylcytosine ("5-methylC"), 5-methyluracil ("5-methylU"), 5-hydroxymethylcytosine, 5-hydroxymethyluracil, 5,6-dehydrouracil, 5-propynylcytosine, 5-propynyluracil, 5-ethynylcytosine, 5-ethynyluracil, 5-allyluracil ("5-allylU"), 5-allylcytosine ("5-allylC"), 5-aminoallyluracil ("5-aminoallylU"), 5-aminoallyl-cytosine ("5-aminoallylC"), an abasic nucleotide, Z base, P base, Unstructured Nucleic Acid ("UNA"), isoguanine ("isoG"), isocytosine ("isoC"), 5-methyl-2-pyrimidine, x(A,G,C,T) and y(A,G,C,T).

[00186] In other embodiments, the disclosure provides a chemically-modified gNA in which one or more isotopic modifications are introduced on the nucleotide sugar, the nucleobase, the phosphodiester linkage and/or the nucleotide phosphates, including nucleotides comprising one or more ^{15}N, ^{13}C, ^{14}C, deuterium, ^{3}H, ^{32}P, ^{125}I, ^{131}I atoms or other atoms or elements used as tracers.

[00187] In some embodiments, an "end" modification incorporated into the gNA is selected from the group consisting of: PEG (polyethyleneglycol), hydrocarbon linkers (including: heteroatom (O,S,N)-substituted hydrocarbon spacers; halo-substituted hydrocarbon spacers; keto-, carboxyl-, amido-, thionyl-, carbamoyl-, thionocarbamaoyl-containing hydrocarbon spacers), spermine linkers, dyes including fluorescent dyes (for example fluoresceins, rhodamines, cyanines) attached to linkers such as for example 6-fluorescein-hexyl, quenchers (for example dabcyl, BHQ) and other labels (for example biotin, digoxigenin, acridine, streptavidin, avidin, peptides and/or proteins). In some embodiments, an "end" modification comprises a conjugation (or ligation) of the gNA to another molecule comprising an oligonucleotide of deoxynucleotides and/or ribonucleotides, a peptide, a protein, a sugar, an oligosaccharide, a steroid, a lipid, a folic acid, a vitamin and/or other molecule. In certain embodiments, the disclosure provides a chemically-modified gNA in which an "end" modification (described above) is located internally in the gNA sequence via a linker such as, for example, a 2-(4-butylamidofluorescein)propane-1,3-diol bis(phosphodiester) linker, which is incorporated as a phosphodiester linkage and can be incorporated anywhere between two nucleotides in the gNA.

[00188] In some embodiments, the disclosure provides a chemically-modified gNA having an end modification comprising a terminal functional group such as an amine, a thiol (or sulfhydryl), a hydroxyl, a carboxyl, carbonyl, thionyl, thiocarbonyl, a carbamoyl, a thiocarbamoyl, a phoshoryl, an alkene, an alkyne, an halogen or a functional group-terminated linker that can be subsequently conjugated to a desired moiety selected from the group consisting of a fluorescent dye, a non-fluorescent label, a tag (for ^{14}C, example biotin, avidin, streptavidin, or moiety containing an isotopic label such as ^{15}N, ^{13}C, deuterium, ^{3}H, ^{32}P, ^{125}I and the like), an oligonucleotide (comprising deoxynucleotides and/or ribonucleotides, including an aptamer), an amino acid, a peptide, a protein, a sugar, an oligosaccharide, a steroid, a lipid, a folic acid, and a vitamin. The conjugation employs standard chemistry well-known in the art, including but not limited to coupling via N-hydroxysuccinimide, isothiocyanate, DCC (or DCI), and/or any other standard method as

described in "Bioconjugate Techniques" by Greg T. Hermanson, Publisher Eslsevier Science, 3rd ed. (2013), the contents of which are incorporated herein by reference in its entirety.

IV. Proteins for Modifying a Target Nucleic Acid

[00189] The present disclosure provides systems comprising a CRISPR nuclease that have utility in genome editing of eukaryotic cells. In some embodiments, the CRISPR nuclease is selected from the group consisting of Cas9, Cas12a, Cas12b, Cas12c, Cas12d (CasY), CasX, Cas13a, Cas13b, Cas13c, Cas13d, CasX, CasY, Cas14, Cpfl, C2cl, Csn2, and Cas Phi. In some embodiments, the CRISPR nuclease is a is a Type V CRISPR nuclease. In some embodiments, the present disclosure provides systems comprising a CasX protein and one or more guide nucleic acids (gNA) that are specifically designed to modify a target nucleic acid sequence in eukaryotic cells.

[00190] The term "CasX protein", as used herein, refers to a family of proteins, and encompasses all naturally occurring CasX proteins, proteins that share at least 50% identity to naturally occurring CasX proteins, as well as CasX variants possessing one or more improved characteristics relative to a naturally-occurring reference CasX protein. CasX proteins belong to CRISPR-Cas Type V proteins. Exemplary improved characteristics of the CasX variant embodiments include, but are not limited to improved folding of the variant, improved binding affinity to the gNA, improved binding affinity to the target nucleic acid, improved ability to utilize a greater spectrum of PAM sequences in the editing and/or binding of target DNA, improved unwinding of the target DNA, increased editing activity, improved editing efficiency, improved editing specificity, increased percentage of a eukaryotic genome that can be efficiently edited, increased activity of the nuclease, increased target strand loading for double strand cleavage, decreased target strand loading for single strand nicking, decreased off-target cleavage, improved binding of the non-target strand of DNA, improved protein stability, improved protein:gNA (RNP) complex stability, improved protein solubility, improved protein:gNA (RNP) complex solubility, improved protein yield, improved protein expression, and improved fusion characteristics, as described more fully, below. In the foregoing embodiments, the one or more of the improved characteristics of an RNP of the CasX variant and the gNA variant is at least about 1.1 to about 100,000-fold improved relative to an RNP of the reference CasX protein of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3 and the gNA of Table 1, when assayed in a comparable fashion. In other cases, the one or more improved characteristics of an RNP of the CasX variant and the gNA variant is at

least about 1.1, at least about 10, at least about 100, at least about 1000, at least about 10,000, at least about 100,000-fold or more improved relative to an RNP of the reference CasX protein of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3 and the gNA of Table 1. In other cases, the one or more of the improved characteristics of an RNP of the CasX variant and the gNA variant is about 1.1 to 100,00-fold, about 1.1 to 10,00-fold, about 1.1 to 1,000-fold, about 1.1 to 500-fold, about 1.1 to 100-fold, about 1.1 to 50-fold, about 1.1 to 20-fold, about 10 to 100,00-fold, about 10 to 10,00-fold, about 10 to 1,000-fold, about 10 to 500-fold, about 10 to 100-fold, about 10 to 50-fold, about 10 to 20-fold, about 2 to 70-fold, about 2 to 50-fold, about 2 to 30-fold, about 2 to 20-fold, about 2 to 10-fold, about 5 to 50-fold, about 5 to 30-fold, about 5 to 10-fold, about 100 to 100,00-fold, about 100 to 10,00-fold, about 100 to 1,000-fold, about 100 to 500-fold, about 500 to 100,00-fold, about 500 to 10,00-fold, about 500 to 1,000-fold, about 500 to 750-fold, about 1,000 to 100,00-fold, about 10,000 to 100,00-fold, about 20 to 500-fold, about 20 to 250-fold, about 20 to 200-fold, about 20 to 100-fold, about 20 to 50-fold, about 50 to 10,000-fold, about 50 to 1,000-fold, about 50 to 500-fold, about 50 to 200-fold, or about 50 to 100-fold, improved relative to an RNP of the reference CasX protein of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3 and the gNA of Table 1, when assayed in a comparable fashion. In other cases, the one or more improved characteristics of an RNP of the CasX variant and the gNA variant is about 1.1-fold, 1.2-fold, 1.3-fold, 1.4-fold, 1.5-fold, 1.6-fold, 1.7-fold, 1.8-fold, 1.9-fold, 2-fold, 3-fold, 4-fold, 5-fold, 6-fold, 7-fold, 8-fold, 9-fold, 10-fold, 11-fold, 12-fold, 13-fold, 14-fold, 15-fold, 16-fold, 17-fold, 18-fold, 19-fold, 20-fold, 25-fold, 30-fold, 40-fold, 45-fold, 50-fold, 55-fold, 60-fold, 70-fold, 80-fold, 90-fold, 100-fold, 110-fold, 120-fold, 130-fold, 140-fold, 150-fold, 160-fold, 170-fold, 180-fold, 190-fold, 200-fold, 210-fold, 220-fold, 230-fold, 240-fold, 250-fold, 260-fold, 270-fold, 280-fold, 290-fold, 300-fold, 310-fold, 320-fold, 330-fold, 340-fold, 350-fold, 360-fold, 370-fold, 380-fold, 390-fold, 400-fold, 425-fold, 450-fold, 475-fold, or 500-fold improved relative to an RNP of the reference CasX protein of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3 and the gNA of Table 1, when assayed in a comparable fashion.

[00191] The term "CasX variant" is inclusive of variants that are fusion proteins; i.e., the CasX is "fused to" a heterologous sequence. This includes CasX variants comprising CasX variant sequences and N-terminal, C-terminal, or internal fusions of the CasX to a heterologous protein or domain thereof.

[00192] CasX proteins of the disclosure comprise at least one of the following domains: a non-target strand binding (NTSB) domain, a target strand loading (TSL) domain, a helical I

domain, a helical II domain, an oligonucleotide binding domain (OBD), and a RuvC DNA cleavage domain (the last of which may be modified or deleted in a catalytically dead CasX variant), described more fully, below. Additionally, the CasX variant proteins of the disclosure have an enhanced ability to efficiently edit and/or bind target DNA, when complexed with a gNA as an RNP, utilizing PAM sequences selected from TTC, ATC, GTC, or CTC, compared to an RNP of a reference CasX protein and reference gNA. In some embodiments, the PAM sequence comprises a TC motif. In the foregoing, the PAM sequence is located at least 1 nucleotide 5' to the non-target strand of the protospacer having identity with the targeting sequence of the gNA in a assay system compared to the editing efficiency and/or binding of an RNP comprising a reference CasX protein and reference gNA in a comparable assay system. In one embodiment, an RNP of a CasX variant and gNA variant exhibits greater editing efficiency and/or binding of a target sequence in the target DNA compared to an RNP comprising a reference CasX protein and a reference gNA in a comparable assay system, wherein the PAM sequence of the target DNA is TTC. In another embodiment, an RNP of a CasX variant and gNA variant exhibits greater editing efficiency and/or binding of a target sequence in the target DNA compared to an RNP comprising a reference CasX protein and a reference gNA in a comparable assay system, wherein the PAM sequence of the target DNA is ATC. In another embodiment, an RNP of a CasX variant and gNA variant exhibits greater editing efficiency and/or binding of a target sequence in the target DNA compared to an RNP comprising a reference CasX protein and a reference gNA in a comparable assay system, wherein the PAM sequence of the target DNA is CTC. In another embodiment, an RNP of a CasX variant and gNA variant exhibits greater editing efficiency and/or binding of a target sequence in the target DNA compared to an RNP comprising a reference CasX protein and a reference gNA in a comparable assay system, wherein the PAM sequence of the target DNA is GTC. In the foregoing embodiments, the increased editing efficiency and/or binding affinity for the one or more PAM sequences is at least 1.5-fold greater compared to the editing efficiency and/or binding affinity of an RNP of any one of the CasX proteins of SEQ ID NOS:1-3 and the gNA of Table 1 for the PAM sequences.

[00193] In some cases, the CasX protein is a naturally-occurring protein (e.g., naturally occurs in and is isolated from prokaryotic cells). In other embodiments, the CasX protein is not a naturally-occurring protein (e.g., the CasX protein is a CasX variant protein, a chimeric protein, and the like). A naturally-occurring CasX protein (referred to herein as a "reference

CasX protein") functions as an endonuclease that catalyzes a double strand break at a specific sequence in a targeted double-stranded DNA (dsDNA). The sequence specificity is provided by the targeting sequence of the associated gNA to which it is complexed, which hybridizes to a target sequence within the target nucleic acid.

[00194] In some embodiments, a CasX protein can bind and/or modify (e.g., cleave, nick, methylate, demethylate, etc.) a target nucleic acid and/or a polypeptide associated with target nucleic acid (e.g., methylation or acetylation of a histone tail). In some embodiments, the CasX protein is catalytically dead (dCasX) but retains the ability to bind a target nucleic acid. An exemplary catalytically dead CasX protein comprises one or more mutations in the active site of the RuvC domain of the CasX protein. In some embodiments, a catalytically dead CasX protein comprises substitutions at residues 672, 769 and/or 935 of SEQ ID NO:1. In one embodiment, a catalytically dead CasX protein comprises substitutions of D672A, E769A and/or D935A in a reference CasX protein of SEQ ID NO:1. In other embodiments, a catalytically dead CasX protein comprises substitutions at amino acids 659, 756 and/or 922 in a reference CasX protein of SEQ ID NO:2. In some embodiments, a catalytically dead CasX protein comprises D659A, E756A and/or D922A substitutions in a reference CasX protein of SEQ ID NO:2. In further embodiments, a catalytically dead CasX protein comprises deletions of all or part of the RuvC domain of the CasX protein. It will be understood that the same foregoing substitutions can similarly be introduced into the CasX variants of the disclosure, resulting in a dCasX variant. In one embodiment, all or a portion of the RuvC domain is deleted from the CasX variant, resulting in a dCasX variant. Catalytically inactive dCasX variant proteins can, in some embodiments, be used for base editing or epigenetic modifications. With a higher affinity for DNA, in some embodiments, catalytically inactive dCasX variant proteins can, relative to catalytically active CasX, find their target nucleic acid faster, remain bound to target nucleic acid for longer periods of time, bind target nucleic acid in a more stable fashion, or a combination thereof, thereby improving these functions of the catalytically dead CasX variant protein compared to a CasX variant that retains its cleavage capability.

a. Non-Target Strand Binding Domain

[00195] The reference CasX proteins of the disclosure comprise a non-target strand binding domain (NTSBD). The NTSBD is a domain not previously found in any Cas proteins; for example this domain is not present in Cas proteins such as Cas9, Cas12a/Cpf1, Cas13, Cas14,

CASCADE, CSM, or CSY. Without being bound to theory or mechanism, a NTSBD in a CasX allows for binding to the non-target DNA strand and may aid in unwinding of the non-target and target strands. The NTSBD is presumed to be responsible for the unwinding, or the capture, of a non-target DNA strand in the unwound state. The NTSBD is in direct contact with the non-target strand in CryoEM model structures derived to date and may contain a non-canonical zinc finger domain. The NTSBD may also play a role in stabilizing DNA during unwinding, guide RNA invasion and R-loop formation. In some embodiments, an exemplary NTSBD comprises amino acids 101-191 of SEQ ID NO:1 or amino acids 103-192 of SEQ ID NO:2. In some embodiments, the NTSBD of a reference CasX protein comprises a four-stranded beta sheet.

b. **Target Strand Loading Domain**

[00196] The reference CasX proteins of the disclosure comprise a Target Strand Loading (TSL) domain. The TSL domain is a domain not found in certain Cas proteins such as Cas9, CASCADE, CSM, or CSY. Without wishing to be bound by theory or mechanism, it is thought that the TSL domain is responsible for aiding the loading of the target DNA strand into the RuvC active site of a CasX protein. In some embodiments, the TSL acts to place or capture the target-strand in a folded state that places the scissile phosphate of the target strand DNA backbone in the RuvC active site. The TSL comprises a cys4 (CXXC, CXXC zinc finger/ribbon domain (SEQ ID NO: 48) that is separated by the bulk of the TSL. In some embodiments, an exemplary TSL comprises amino acids 825-934 of SEQ ID NO:1 or amino acids 813-921 of SEQ ID NO:2.

c. **Helical I Domain**

[00197] The reference CasX proteins of the disclosure comprise a helical I domain. Certain Cas proteins other than CasX have domains that may be named in a similar way. However, in some embodiments, the helical I domain of a CasX protein comprises one or more unique structural features, or comprises a unique sequence, or a combination thereof, compared to non-CasX proteins. For example, in some embodiments, the helical I domain of a CasX protein comprises one or more unique secondary structures compared to domains in other Cas proteins that may have a similar name. For example, in some embodiments the helical I domain in a CasX protein comprises one or more alpha helices of unique structure and sequence in arrangement, number and length compared to other CRISPR proteins. In certain embodiments, the helical I domain is responsible for interacting with the bound DNA and spacer of the guide RNA. Without wishing to be bound by theory, it is thought that in some

cases the helical I domain may contribute to binding of the protospacer adjacent motif (PAM). In some embodiments, an exemplary helical I domain comprises amino acids 57-100 and 192-332 of SEQ ID NO:1, or amino acids 59-102 and 193-333 of SEQ ID NO:2. In some embodiments, the helical I domain of a reference CasX protein comprises one or more alpha helices.

d. **Helical II Domain**

[00198] The reference CasX proteins of the disclosure comprise a helical II domain. Certain Cas proteins other than CasX have domains that may be named in a similar way. However, in some embodiments, the helical II domain of a CasX protein comprises one or more unique structural features, or a unique sequence, or a combination thereof, compared to domains in other Cas proteins that may have a similar name. For example, in some embodiments, the helical II domain comprises one or more unique structural alpha helical bundles that align along the target DNA:guide RNA channel. In some embodiments, in a CasX comprising a helical II domain, the target strand and guide RNA interact with helical II (and the helical I domain, in some embodiments) to allow RuvC domain access to the target DNA. The helical II domain is responsible for binding to the guide RNA scaffold stem loop as well as the bound DNA. In some embodiments, an exemplary helical II domain comprises amino acids 333-509 of SEQ ID NO:1, or amino acids 334-501 of SEQ ID NO:2.

e. **Oligonucleotide Binding Domain**

[00199] The reference CasX proteins of the disclosure comprise an Oligonucleotide Binding Domain (OBD). Certain Cas proteins other than CasX have domains that may be named in a similar way. However, in some embodiments, the OBD comprises one or more unique functional features, or comprises a sequence unique to a CasX protein, or a combination thereof. For example, in some embodiments the bridged helix (BH), helical I domain, helical II domain, and Oligonucleotide Binding Domain (OBD) together are responsible for binding of a CasX protein to the guide RNA. Thus, for example, in some embodiments the OBD is unique to a CasX protein in that it interacts functionally with a helical I domain, or a helical II domain, or both, each of which may be unique to a CasX protein as described herein. Specifically, in CasX the OBD largely binds the RNA triplex of the guide RNA scaffold. The OBD may also be responsible for binding to the protospacer adjacent motif (PAM). An exemplary OBD domain comprises amino acids 1-56 and 510-660 of SEQ ID NO:1, or amino acids 1-58 and 502-647 of SEQ ID NO:2.

f. **RuvC DNA Cleavage Domain**

[00200] The reference CasX proteins of the disclosure comprise a RuvC domain, that includes 2 partial RuvC domains (RuvC-I and RuvC-II). The RuvC domain is the ancestral domain of all type 12 CRISPR proteins. The RuvC domain originates from a TNPB (transposase B) like transposase. Similar to other RuvC domains, the CasX RuvC domain has a DED catalytic triad that is responsible for coordinating a magnesium (Mg) ion and cleaving DNA. In some embodiments, the RuvC has a DED motif active site that is responsible for cleaving both strands of DNA (one by one, most likely the non-target strand first at 11-14 nucleotides (nt) into the targeted sequence and then the target strand next at 2-4 nucleotides after the target sequence). Specifically in CasX, the RuvC domain is unique in that it is also responsible for binding the guide RNA scaffold stem loop that is critical for CasX function. An exemplary RuvC domain comprises amino acids 661-824 and 935-986 of SEQ ID NO:1, or amino acids 648-812 and 922-978 of SEQ ID NO:2.

g. **Reference CasX Proteins**

[00201] The disclosure provides reference CasX proteins. In some embodiments, a reference CasX protein is a naturally-occurring protein. For example, reference CasX proteins can be isolated from naturally occurring prokaryotes, such as *Deltaproteobacteria*, *Planctomycetes*, or *Candidatus Sungbacteria* species. A reference CasX protein (sometimes referred to herein as a reference CasX protein) is a type II CRISPR/Cas endonuclease belonging to the CasX (sometimes referred to as Cas12e) family of proteins that is capable of interacting with a guide NA to form a ribonucleoprotein (RNP) complex. In some embodiments, the RNP complex comprising the reference CasX protein can be targeted to a particular site in a target nucleic acid via base pairing between the targeting sequence (or spacer) of the gNA and a target sequence in the target nucleic acid. In some embodiments, the RNP comprising the reference CasX protein is capable of cleaving target DNA. In some embodiments, the RNP comprising the reference CasX protein is capable of nicking target DNA. In some embodiments, the RNP comprising the reference CasX protein is capable of editing target DNA, for example in those embodiments where the reference CasX protein is capable of cleaving or nicking DNA, followed by non-homologous end joining (NHEJ), homology-directed repair (HDR), homology-independent targeted integration (HITI), micro-homology mediated end joining (MMEJ), single strand annealing (SSA) or base excision repair (BER). In some embodiments, the RNP comprising the CasX protein is a catalytically dead (is catalytically inactive or has substantially no cleavage activity) CasX protein (dCasX), but retains the ability to bind the target DNA, described more fully, supra.

[00202] In some cases, a reference CasX protein is isolated or derived from *Deltaproteobacteria*. In some embodiments, a CasX protein comprises a sequence at least 50% identical, at least 60% identical, at least 65% identical, at least 70% identical, at least 75% identical, at least 80% identical, at least 81% identical, at least 82% identical, at least 83% identical, at least 84% identical, at least 85% identical, at least 86% identical, at least 86% identical, at least 87% identical, at least 88% identical, at least 89% identical, at least 89% identical, at least 90% identical, at least 91% identical, at least 92% identical, at least 93% identical, at least 94% identical, at least 95% identical, at least 96% identical, at least 97% identical, at least 98% identical, at least 99% identical, at least 99.5% identical or 100% identical to a sequence of:

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      1 MEKRINKIRK KLSADNATKP VSRSGPMKTL LVRVMTDDLK KRLEKRRKKP
EVMPQVISNN
     61 AANNLRMLLD DYTKMKEAIL QVYWQEFKDD HVGLMCKFAQ PASKKIDQNK
LKPEMDEKGN
    121 LTTAGFACSQ CGQPLFVYKL EQVSEKGKAY TNYFGRCNVA EHEKLILLAQ
LKPEKDSDEA
    181 VTYSLGKFGQ RALDFYSIHV TKESTHPVKP LAQIAGNRYA SGPVGKALSD
ACMGTIASFL
    241 SKYQDIIIEH QKVVKGNQKR LESLRELAGK ENLEYPSVTL PPQPHTKEGV
DAYNEVIARV
    301 RMWVNLNLWQ KLKLSRDDAK PLLRLKGFPS FPVVERRENE VDWWNTINEV
KKLIDAKRDM
    361 GRVFWSGVTA EKRNTILEGY NYLPNENDHK KREGSLENPK KPAKRQFGDL
LLYLEKKYAG
    421 DWGKVFDEAW ERIDKKIAGL TSHIEREEAR NAEDAQSKAV LTDWLRAKAS
FVLERLKEMD
    481 EKEFYACEIQ LQKWYGDLRG NPFAVEAENR VVDISGFSIG SDGHSIQYRN
LLAWKYLENG
    541 KREFYLLMNY GKKGRIRFTD GTDIKKSGKW QGLLYGGGKA KVIDLTFDPD
DEQLIILPLA
    601 FGTRQGREFI WNDLLSLETG LIKLANGRVI EKTIYNKKIG RDEPALFVAL
TFERREVVDP
    661 SNIKPVNLIG VDRGENIPAV IALTDPEGCP LPEFKDSSGG PTDILRIGEG
YKEKQRAIQA
    721 AKEVEQRRAG GYSRKFASKS RNLADDMVRN SARDLFYHAV THDAVLVFEN
LSRGFGRQGK
    781 RTFMTERQYT KMEDWLTAKL AYEGLTSKTY LSKTLAQYTS KTCSNCGFTI
TTADYDGMLV
    841 RLKKTSDGWA TTLNNKELKA EGQITYYNRY KRQTVEKELS AELDRLSEES
GNNDISKWTK
    901 GRRDEALFLL KKRFSHRPVQ EQFVCLDCGH EVHADEQAAL NIARSWLFLN
SNSTEFKSYK
    961 SGKQPFVGAW QAFYKRRLKE VWKPNA (SEQ ID NO:1).
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[00203] In some cases, a reference CasX protein is isolated or derived from *Planctomycetes*. In some embodiments, a CasX protein comprises a sequence at least 50% identical, at least 60% identical, at least 65% identical, at least 70% identical, at least 75% identical, at least 80% identical, at least 81% identical, at least 82% identical, at least 83% identical, at least 84% identical, at least 85% identical, at least 86% identical, at least 86% identical, at least 87% identical, at least 88% identical, at least 89% identical, at least 89% identical, at least 90% identical, at least 91% identical, at least 92% identical, at least 93% identical, at least 94% identical, at least 95% identical, at least 96% identical, at least 97% identical, at least 98% identical, at least 99% identical, at least 99.5% identical or 100% identical to a sequence of:

1 MQEIKRINKI RRRLVKDSNT KKAGKTGPMK TLLVRVMTPD LRERLENLRK
KPENIPQPIS
61 NTSRANLNKL LTDYTEMKKA ILHVYWEEFQ KDPVGLMSRV AQPAPKNIDQ
RKLIPVKDGN
121 ERLTSSGFAC SQCCQPLYVY KLEQVNDKGK PHTNYFGRCN VSEHERLILL
SPHKPEANDE
181 LVTYSLGKFG QRALDFYSIH VTRESNHPVK PLEQIGGNSC ASGPVGKALS
DACMGAVASF
241 LTKYQDIILE HQKVIKKNEK RLANLKDIAS ANGLAFPKIT LPPQPHTKEG
IEAYNNVVAQ
301 IVIWVNLNLW QKLKIGRDEA KPLQRLKGFP SFPLVERQAN EVDWWDMVCN
VKKLINEKKE
361 DGKVFWQNLA GYKRQEALLP YLSSEEDRKK GKKFARYQFG DLLLHLEKKH
GEDWGKVYDE
421 AWERIDKKVE GLSKHIKLEE ERRSEDAQSK AALTDWLRAK ASFVIEGLKE
ADKDEFCRCE
481 LKLQKWYGDL RGKPFAIEAE NSILDISGFS KQYNCAFIWQ KDGVKKLNLY
LIINYFKGGK
541 LRFKKIKPEA FEANRFYTVI NKKSGEIVPM EVNFNFDDPN LIILPLAFGK
RQGREFIWND
601 LLSLETGSLK LANGRVIEKT LYNRRTRQDE PALFVALTFE RREVLDSSNI
KPMNLIGIDR
661 GENIPAVIAL TDPEGCPLSR FKDSLGNPTH ILRIGESYKE KQRTIQAAKE
VEQRRAGGYS
721 RKYASKAKNL ADDMVRNTAR DLLYYAVTQD AMLIFENLSR GFGRQGKRTF
MAERQYTRME
781 DWLTAKLAYE GLPSKTYLSK TLAQYTSKTC SNCGFTITSA DYDRVLEKLK
KTATGWMTTI
841 NGKELKVEGQ ITYYNRYKRQ NVVKDLSVEL DRLSEESVNN DISSWTKGRS
GEALSLLKKR
901 FSHRPVQEKF VCLNCGFETH ADEQAALNIA RSWLFLRSQE YKKYQTNKTT
GNTDKRAFVE
961 TWQSFYRKKL KEVWKPAV (SEQ ID NO:2).

[00204] In some embodiments, the CasX protein comprises the sequence of SEQ ID NO:2, or at least 60% similarity thereto. In some embodiments, the CasX protein comprises the sequence of SEQ ID NO:2, or at least 80% similarity thereto. In some embodiments, the CasX protein comprises the sequence of SEQ ID NO:2, or at least 90% similarity thereto. In some embodiments, the CasX protein comprises the sequence of SEQ ID NO:2, or at least 95% similarity thereto. In some embodiments, the CasX protein consists of the sequence of SEQ ID NO:2. In some embodiments, the CasX protein comprises or consists of a sequence that has at least 1, at least 2, at least 3, at least 4, at least 5, at least 6, at least 7, at least 8, at least 9, at least 10, at least 20, at least 30, at least 40 or at least 50 mutations relative to the sequence of SEQ ID NO:2. These mutations can be insertions, deletions, amino acid substitutions, or any combinations thereof.

[00205] In some cases, a reference CasX protein is isolated or derived from *Candidatus Sungbacteria*. In some embodiments, a CasX protein comprises a sequence at least 50% identical, at least 60% identical, at least 65% identical, at least 70% identical, at least 75% identical, at least 80% identical, at least 81% identical, at least 82% identical, at least 83% identical, at least 84% identical, at least 85% identical, at least 86% identical, at least 86% identical, at least 87% identical, at least 88% identical, at least 89% identical, at least 89% identical, at least 90% identical, at least 91% identical, at least 92% identical, at least 93% identical, at least 94% identical, at least 95% identical, at least 96% identical, at least 97% identical, at least 98% identical, at least 99% identical, at least 99.5% identical or 100% identical to a sequence of

```
    1 MDNANKPSTK SLVNTTRISD HFGVTPGQVT RVFSFGIIPT KRQYAIIERW
FAAVEAARER
   61 LYGMLYAHFQ ENPPAYLKEK FSYETFFKGR PVLNGLRDID PTIMTSAVFT
ALRHKAEGAM
  121 AAFHTNHRRL FEEARKKMRE YAECLKANEA LLRGAADIDW DKIVNALRTR
LNTCLAPEYD
  181 AVIADFGALC AFRALIAETN ALKGAYNHAL NQMLPALVKV DEPEEAEESP
RLRFFNGRIN
  241 DLPKFPVAER ETPPDTETII RQLEDMARVI PDTAEILGYI HRIRHKAARR
KPGSAVPLPQ
  301 RVALYCAIRM ERNPEEDPST VAGHFLGEID RVCEKRRQGL VRTPFDSQIR
ARYMDIISFR
  361 ATLAHPDRWT EIQFLRSNAA SRRVRAETIS APFEGFSWTS NRTNPAPQYG
MALAKDANAP
  421 ADAPELCICL SPSSAAFSVR EKGGDLIYMR PTGGRRGKDN PGKEITWVPG
SFDEYPASGV
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481 ALKLRLYFGR SQARRMLTNK TWGLLSDNPR VFAANAELVG KKRNPQDRWK
LFFHMVISGP
541 PPVEYLDFSS DVRSRARTVI GINRGEVNPL AYAVVSVEDG QVLEEGLLGK
KEYIDQLIET
601 RRRISEYQSR EQTPPRDLRQ RVRHLQDTVL GSARAKIHSL IAFWKGILAI
ERLDDQFHGR
661 EQKIIPKKTY LANKTGFMNA LSFSGAVRVD KKGNPWGGMI EIYPGGISRT
CTQCGTVWLA
721 RRPKNPGHRD AMVVIPDIVD DAAATGFDNV DCDAGTVDYG ELFTLSREWV
RLTPRYSRVM
781 RGTLGDLERA IRQGDDRKSR QMLELALEPQ PQWGQFFCHR CGFNGQSDVL
AATNLARRAI
841 SLIRRLPDTD TPPTP (SEQ ID NO:3).

[00206] In some embodiments, the CasX protein comprises the sequence of SEQ ID NO:3, or at least 60% similarity thereto. In some embodiments, the CasX protein comprises the sequence of SEQ ID NO:3, or at least 80% similarity thereto. In some embodiments, the CasX protein comprises the sequence of SEQ ID NO:3, or at least 90% similarity thereto. In some embodiments, the CasX protein comprises the sequence of SEQ ID NO:3, or at least 95% similarity thereto. In some embodiments, the CasX protein consists of the sequence of SEQ ID NO:3. In some embodiments, the CasX protein comprises or consists of a sequence that has at least 1, at least 2, at least 3, at least 4, at least 5, at least 6, at least 7, at least 8, at least 9, at least 10, at least 20, at least 30, at least 40 or at least 50 mutations relative to the sequence of SEQ ID NO:3. These mutations can be insertions, deletions, amino acid substitutions, or any combinations thereof.

h. CasX Variant Proteins

[00207] The present disclosure provides variants of a reference CasX protein (interchangeably referred to herein as "CasX variant" or "CasX variant protein"), wherein the CasX variants comprise at least one modification in at least one domain of the reference CasX protein, including the sequences of SEQ ID NOS:1-3. In some embodiments, the CasX variant exhibits at least one improved characteristic compared to the reference CasX protein. All variants that improve one or more functions or characteristics of the CasX variant protein when compared to a reference CasX protein described herein are envisaged as being within the scope of the disclosure. In some embodiments, the modification is a mutation in one or more amino acids of the reference CasX. In other embodiments, the modification is a substitution of one or more domains of the reference CasX with one or more domains from a different CasX. In some embodiments, insertion includes the insertion of a part or all of a domain from a different CasX protein. Mutations can occur in any one or more domains of

the reference CasX protein, and may include, for example, deletion of part or all of one or more domains, or one or more amino acid substitutions, deletions, or insertions in any domain of the reference CasX protein. The domains of CasX proteins include the non-target strand binding (NTSB) domain, the target strand loading (TSL) domain, the helical I domain, the helical II domain, the oligonucleotide binding domain (OBD), and the RuvC DNA cleavage domain. Any change in amino acid sequence of a reference CasX protein that leads to an improved characteristic of the CasX protein is considered a CasX variant protein of the disclosure. For example, CasX variants can comprise one or more amino acid substitutions, insertions, deletions, or swapped domains, or any combinations thereof, relative to a reference CasX protein sequence.

[00208] In some embodiments, the CasX variant protein comprises at least one modification in at least each of two domains of the reference CasX protein, including the sequences of SEQ ID NOS:1-3. In some embodiments, the CasX variant protein comprises at least one modification in at least 2 domains, in at least 3 domains, at least 4 domains or at least 5 domains of the reference CasX protein. In some embodiments, the CasX variant protein comprises two or more modifications in at least one domain of the reference CasX protein. In some embodiments, the CasX variant protein comprises at least two modifications in at least one domain of the reference CasX protein, at least three modifications in at least one domain of the reference CasX protein or at least four modifications in at least one domain of the reference CasX protein. In some embodiments, wherein the CasX variant comprises two or more modifications compared to a reference CasX protein, each modification is made in a domain independently selected from the group consisting of a NTSBD, TSLD, Helical I domain, Helical II domain, OBD, and RuvC DNA cleavage domain.

[00209] In some embodiments, the at least one modification of the CasX variant protein comprises a deletion of at least a portion of one domain of the reference CasX protein, including the sequences of SEQ ID NOS:1-3. In some embodiments, the deletion is in the NTSBD, TSLD, Helical I domain, Helical II domain, OBD, or RuvC DNA cleavage domain.

[00210] Suitable mutagenesis methods for generating CasX variant proteins of the disclosure may include, for example, Deep Mutational Evolution (DME), deep mutational scanning (DMS), error prone PCR, cassette mutagenesis, random mutagenesis, staggered extension PCR, gene shuffling, or domain swapping. In some embodiments, the CasX variants are designed, for example by selecting one or more desired mutations in a reference CasX. In certain embodiments, the activity of a reference CasX protein is used as a benchmark against

which the activity of one or more CasX variants are compared, thereby measuring improvements in function of the CasX variants. Exemplary improvements of CasX variants include, but are not limited to, improved folding of the variant, improved binding affinity to the gNA, improved binding affinity to the target DNA, altered binding affinity to one or more PAM sequences, improved unwinding of the target DNA, increased activity, improved editing efficiency, improved editing specificity, increased activity of the nuclease, increased target strand loading for double strand cleavage, decreased target strand loading for single strand nicking, decreased off-target cleavage, improved binding of the non-target strand of DNA, improved protein stability, improved protein:gNA complex stability, improved protein solubility, improved protein:gNA complex solubility, improved protein yield, improved protein expression, and improved fusion characteristics, as described more fully, below.

[00211] In some embodiments of the CasX variants described herein, the at least one modification comprises: (a) a substitution of 1 to 100 consecutive or non-consecutive amino acids in the CasX variant compared to a reference CasX of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3; (b) a deletion of 1 to 100 consecutive or non-consecutive amino acids in the CasX variant compared to a reference CasX; (c) an insertion of 1 to 100 consecutive or non-consecutive amino acids in the CasX compared to a reference CasX; or (d) any combination of (a)-(c). In some embodiments, the at least one modification comprises: (a) a substitution of 5-10 consecutive or non-consecutive amino acids in the CasX variant compared to a reference CasX of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3; (b) a deletion of 1-5 consecutive or non-consecutive amino acids in the CasX variant compared to a reference CasX; (c) an insertion of 1-5 consecutive or non-consecutive amino acids in the CasX compared to a reference CasX; or (d) any combination of (a)-(c).

[00212] In some embodiments, the CasX variant protein comprises or consists of a sequence that has at least 1, at least 2, at least 3, at least 4, at least 5, at least 6, at least 7, at least 8, at least 9, at least 10, at least 20, at least 30, at least 40 or at least 50 mutations relative to the sequence of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3. These mutations can be insertions, deletions, amino acid substitutions, or any combinations thereof.

[00213] In some embodiments, the CasX variant protein comprises at least one amino acid substitution in at least one domain of a reference CasX protein. In some embodiments, the CasX variant protein comprises at least about 1-4 amino acid substitutions, 1-10 amino acid substitutions, 1-20 amino acid substitutions, 1-30 amino acid substitutions, 1-40 amino acid substitutions, 1-50 amino acid substitutions, 1-60 amino acid substitutions, 1-70 amino acid

substitutions, 1-80 amino acid substitutions, 1-90 amino acid substitutions, 1-100 amino acid substitutions, 2-10 amino acid substitutions, 2-20 amino acid substitutions, 2-30 amino acid substitutions, 3-10 amino acid substitutions, 3-20 amino acid substitutions, 3-30 amino acid substitutions, 4-10 amino acid substitutions, 4-20 amino acid substitutions, 3-300 amino acid substitutions, 5-10 amino acid substitutions, 5-20 amino acid substitutions, 5-30 amino acid substitutions, 10-50 amino acid substitutions, or 20-50 amino acid substitutions, relative to a reference CasX protein. In some embodiments, the CasX variant protein comprises at least about 100 amino acid substitutions relative to a reference CasX protein. In some embodiments, the CasX variant protein comprises 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10 amino acid substitutions relative to a reference CasX protein. In some embodiments, the CasX variant protein comprises 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10 amino acid substitutions in a single domain relative to the reference CasX protein. In some embodiments, the amino acid substitutions are conservative substitutions. In other embodiments, the substitutions are non-conservative; e.g., a polar amino acid is substituted for a non-polar amino acid, or vice versa.

[00214] In some embodiments, a CasX variant protein comprises 1 amino acid substitution, 2-3 consecutive amino acid substitutions, 2-4 consecutive amino acid substitutions, 2-5 consecutive amino acid substitutions, 2-6 consecutive amino acid substitutions, 2-7 consecutive amino acid substitutions, 2-8 consecutive amino acid substitutions, 2-9 consecutive amino acid substitutions, 2-10 consecutive amino acid substitutions, 2-20 consecutive amino acid substitutions, 2-30 consecutive amino acid substitutions, 2-40 consecutive amino acid substitutions, 2-50 consecutive amino acid substitutions, 2-60 consecutive amino acid substitutions, 2-70 consecutive amino acid substitutions, 2-80 consecutive amino acid substitutions, 2-90 consecutive amino acid substitutions, 2-100 consecutive amino acid substitutions, 3-10 consecutive amino acid substitutions, 3-20 consecutive amino acid substitutions, 3-30 consecutive amino acid substitutions, 4-10 consecutive amino acid substitutions, 4-20 consecutive amino acid substitutions, 3-300 consecutive amino acid substitutions, 5-10 consecutive amino acid substitutions, 5-20 consecutive amino acid substitutions, 5-30 consecutive amino acid substitutions, 10-50 consecutive amino acid substitutions or 20-50 consecutive amino acid substitutions relative to a reference CasX protein. In some embodiments, a CasX variant protein comprises 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 or 20 consecutive amino acid substitutions. In some embodiments, a CasX variant protein comprises a substitution of at least about 100

consecutive amino acids. As used herein "consecutive amino acids" refer to amino acids that are contiguous in the primary sequence of a polypeptide.

[00215] In some embodiments, a CasX variant protein comprises two or more substitutions relative to a reference CasX protein, and the two or more substitutions are not in consecutive amino acids of the reference CasX sequence. For example, a first substitution may be in a first domain of the reference CasX protein, and a second substitution may be in a second domain of the reference CasX protein. In some embodiments, a CasX variant protein comprises 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 or 20 non-consecutive substitutions relative to a reference CasX protein. In some embodiments, a CasX variant protein comprises at least 20 non-consecutive substitutions relative to a reference CasX protein. Each non-consecutive substitution may be of any length of amino acids described herein, e.g., 1-4 amino acids, 1-10 amino acids, and the like. In some embodiments, the two or more substitutions relative to the reference CasX protein are not the same length, for example one substitution is one amino acid and a second substitution is three amino acids. In some embodiments, the two or more substitutions relative to the reference CasX protein are the same length, for example both substitutions are two consecutive amino acids in length.

[00216] Any amino acid can be substituted for any other amino acid in the substitutions described herein. The substitution can be a conservative substitution (e.g., a basic amino acid is substituted for another basic amino acid). The substitution can be a non-conservative substitution (e.g., a basic amino acid is substituted for an acidic amino acid or vice versa). For example, a proline in a reference CasX protein can be substituted for any of arginine, histidine, lysine, aspartic acid, glutamic acid, serine, threonine, asparagine, glutamine, cysteine, glycine, alanine, isoleucine, leucine, methionine, phenylalanine, tryptophan, tyrosine or valine to generate a CasX variant protein of the disclosure.

[00217] In some embodiments, a CasX variant protein comprises at least one amino acid deletion relative to a reference CasX protein. In some embodiments, a CasX variant protein comprises a deletion of 1-4 amino acids, 1-10 amino acids, 1-20 amino acids, 1-30 amino acids, 1-40 amino acids, 1-50 amino acids, 1-60 amino acids, 1-70 amino acids, 1-80 amino acids, 1-90 amino acids, 1-100 amino acids, 2-10 amino acids, 2-20 amino acids, 2-30 amino acids, 3-10 amino acids, 3-20 amino acids, 3-30 amino acids, 4-10 amino acids, 4-20 amino acids, 3-300 amino acids, 5-10 amino acids, 5-20 amino acids, 5-30 amino acids, 10-50 amino acids or 20-50 amino acids relative to a reference CasX protein. In some embodiments, a CasX protein comprises a deletion of at least about 100 consecutive amino acids relative to

a reference CasX protein. In some embodiments, a CasX variant protein comprises a deletion of at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 30, 40, 50 or 100 consecutive amino acids relative to a reference CasX protein. In some embodiments, a CasX variant protein comprises a deletion of 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10 consecutive amino acids.

[00218] In some embodiments, a CasX variant protein comprises two or more deletions relative to a reference CasX protein, and the two or more deletions are not consecutive amino acids. For example, a first deletion may be in a first domain of the reference CasX protein, and a second deletion may be in a second domain of the reference CasX protein. In some embodiments, a CasX variant protein comprises 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 or 20 non-consecutive deletions relative to a reference CasX protein. In some embodiments, a CasX variant protein comprises at least 20 non-consecutive deletions relative to a reference CasX protein. Each non-consecutive deletion may be of any length of amino acids described herein, e.g., 1-4 amino acids, 1-10 amino acids, and the like.

[00219] In some embodiments, the CasX variant protein comprises at least one amino acid insertion relative to the sequence of SEQ ID NOS:1, 2, or 3. In some embodiments, a CasX variant protein comprises an insertion of 1 amino acid, an insertion of 2-3 consecutive amino acids, 2-4 consecutive amino acids, 2-5 consecutive amino acids, 2-6 consecutive amino acids, 2-7 consecutive amino acids, 2-8 consecutive amino acids, 2-9 consecutive amino acids, 2-10 consecutive amino acids, 2-20 consecutive amino acids, 2-30 consecutive amino acids, 2-40 consecutive amino acids, 2-50 consecutive amino acids, 2-60 consecutive amino acids, 2-70 consecutive amino acids, 2-80 consecutive amino acids, 2-90 consecutive amino acids, 2-100 consecutive amino acids, 3-10 consecutive amino acids, 3-20 consecutive amino acids, 3-30 consecutive amino acids, 4-10 consecutive amino acids, 4-20 consecutive amino acids, 3-300 consecutive amino acids, 5-10 consecutive amino acids, 5-20 consecutive amino acids, 5-30 consecutive amino acids, 10-50 consecutive amino acids or 20-50 consecutive amino acids relative to a reference CasX protein. In some embodiments, the CasX variant protein comprises an insertion of 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 or 20 consecutive amino acids. In some embodiments, a CasX variant protein comprises an insertion of at least about 100 consecutive amino acids.

[00220] In some embodiments, a CasX variant protein comprises two or more insertions relative to a reference CasX protein, and the two or more insertions are not consecutive amino acids of the sequence. For example, a first insertion may be in a first domain of the reference CasX protein, and a second insertion may be in a second domain of the reference

CasX protein. In some embodiments, a CasX variant protein comprises 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 or 20 non-consecutive insertions relative to a reference CasX protein. In some embodiments, a CasX variant protein comprises at least 10 to about 20 or more non-consecutive insertions relative to a reference CasX protein. Each non-consecutive insertion may be of any length of amino acids described herein, e.g., 1-4 amino acids, 1-10 amino acids, and the like.

[00221] Any amino acid, or combination of amino acids, can be inserted in the insertions described herein. For example, a proline, arginine, histidine, lysine, aspartic acid, glutamic acid, serine, threonine, asparagine, glutamine, cysteine, glycine, alanine, isoleucine, leucine, methionine, phenylalanine, tryptophan, tyrosine or valine or any combination thereof can be inserted into a reference CasX protein of the disclosure to generate a CasX variant protein.

[00222] Any permutation of the substitution, insertion and deletion embodiments described herein can be combined to generate a CasX variant protein of the disclosure. For example, a CasX variant protein can comprise at least one substitution and at least one deletion relative to a reference CasX protein sequence, at least one substitution and at least one insertion relative to a reference CasX protein sequence, at least one insertion and at least one deletion relative to a reference CasX protein sequence, or at least one substitution, one insertion and one deletion relative to a reference CasX protein sequence.

[00223] In some embodiments, the CasX variant protein has at least about 60% sequence similarity, at least 70% similarity, at least 80% similarity, at least 85% similarity, at least 86% similarity, at least 87% similarity, at least 88% similarity, at least 89% similarity, at least 90% similarity, at least 91% similarity, at least 92% similarity, at least 93% similarity, at least 94% similarity, at least 95% similarity, at least 96% similarity, at least 97% similarity, at least 98% similarity, at least 99% similarity, at least 99.5% similarity, at least 99.6% similarity, at least 99.7% similarity, at least 99.8% similarity or at least 99.9% similarity to one of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3.

[00224] In some embodiments, the CasX variant protein has at least about 60% sequence similarity to SEQ ID NO:2 or a portion thereof. In some embodiments, the CasX variant protein comprises a substitution of Y789T of SEQ ID NO:2, a deletion of P793 of SEQ ID NO:2, a substitution of Y789D of SEQ ID NO:2, a substitution of T72S of SEQ ID NO:2, a substitution of I546V of SEQ ID NO:2, a substitution of E552A of SEQ ID NO:2, a substitution of A636D of SEQ ID NO:2, a substitution of F536S of SEQ ID NO:2, a substitution of A708K of SEQ ID NO:2, a substitution of Y797L of SEQ ID NO:2, a

substitution of L792G SEQ ID NO:2, a substitution of A739V of SEQ ID NO:2, a substitution of G791M of SEQ ID NO:2, an insertion of A at position 661of SEQ ID NO:2, a substitution of A788W of SEQ ID NO:2, a substitution of K390R of SEQ ID NO:2, a substitution of A751S of SEQ ID NO:2, a substitution of E385A of SEQ ID NO:2, an insertion of P at position 696 of SEQ ID NO:2, an insertion of M at position 773 of SEQ ID NO:2, a substitution of G695H of SEQ ID NO:2, an insertion of AS at position 793 of SEQ ID NO:2, an insertion of AS at position 795 of SEQ ID NO:2, a substitution of C477R of SEQ ID NO:2, a substitution of C477K of SEQ ID NO:2, a substitution of C479A of SEQ ID NO:2, a substitution of C479L of SEQ ID NO:2, a substitution of I55F of SEQ ID NO:2, a substitution of K210R of SEQ ID NO:2, a substitution of C233S of SEQ ID NO:2, a substitution of D231N of SEQ ID NO:2, a substitution of Q338E of SEQ ID NO:2, a substitution of Q338R of SEQ ID NO:2, a substitution of L379R of SEQ ID NO:2, a substitution of K390R of SEQ ID NO:2, a substitution of L481Q of SEQ ID NO:2, a substitution of F495S of SEQ ID NO:2, a substitution of D600N of SEQ ID NO:2, a substitution of T886K of SEQ ID NO:2, a substitution of A739V of SEQ ID NO:2, a substitution of K460N of SEQ ID NO:2, a substitution of I199F of SEQ ID NO:2, a substitution of G492P of SEQ ID NO:2, a substitution of T153I of SEQ ID NO:2, a substitution of R591I of SEQ ID NO:2, an insertion of AS at position 795 of SEQ ID NO:2, an insertion of AS at position 796 of SEQ ID NO:2, an insertion of L at position 889 of SEQ ID NO:2, a substitution of E121D of SEQ ID NO:2, a substitution of S270W of SEQ ID NO:2, a substitution of E712Q of SEQ ID NO:2, a substitution of K942Q of SEQ ID NO:2, a substitution of E552K of SEQ ID NO:2, a substitution of K25Q of SEQ ID NO:2, a substitution of N47D of SEQ ID NO:2, an insertion of T at position 696 of SEQ ID NO:2, a substitution of L685I of SEQ ID NO:2, a substitution of N880D of SEQ ID NO:2, a substitution of Q102R of SEQ ID NO:2, a substitution of M734K of SEQ ID NO:2, a substitution of A724S of SEQ ID NO:2, a substitution of T704K of SEQ ID NO:2, a substitution of P224K of SEQ ID NO:2, a substitution of K25R of SEQ ID NO:2, a substitution of M29E of SEQ ID NO:2, a substitution of H152D of SEQ ID NO:2, a substitution of S219R of SEQ ID NO:2, a substitution of E475K of SEQ ID NO:2, a substitution of G226R of SEQ ID NO:2, a substitution of A377K of SEQ ID NO:2, a substitution of E480K of SEQ ID NO:2, a substitution of K416E of SEQ ID NO:2, a substitution of H164R of SEQ ID NO:2, a substitution of K767R of SEQ ID NO:2, a substitution of I7F of SEQ ID NO:2, a substitution of M29R of SEQ ID NO:2, a substitution

of H435R of SEQ ID NO:2, a substitution of E385Q of SEQ ID NO:2, a substitution of E385K of SEQ ID NO:2, a substitution of I279F of SEQ ID NO:2, a substitution of D489S of SEQ ID NO:2, a substitution of D732N of SEQ ID NO:2, a substitution of A739T of SEQ ID NO:2, a substitution of W885R of SEQ ID NO:2, a substitution of E53K of SEQ ID NO:2, a substitution of A238T of SEQ ID NO:2, a substitution of P283Q of SEQ ID NO:2, a substitution of E292K of SEQ ID NO:2, a substitution of Q628E of SEQ ID NO:2, a substitution of R388Q of SEQ ID NO:2, a substitution of G791M of SEQ ID NO:2, a substitution of L792K of SEQ ID NO:2, a substitution of L792E of SEQ ID NO:2, a substitution of M779N of SEQ ID NO:2, a substitution of G27D of SEQ ID NO:2, a substitution of K955R of SEQ ID NO:2, a substitution of S867R of SEQ ID NO:2, a substitution of R693I of SEQ ID NO:2, a substitution of F189Y of SEQ ID NO:2, a substitution of V635M of SEQ ID NO:2, a substitution of F399L of SEQ ID NO:2, a substitution of E498K of SEQ ID NO:2, a substitution of E386R of SEQ ID NO:2, a substitution of V254G of SEQ ID NO:2, a substitution of P793S of SEQ ID NO:2, a substitution of K188E of SEQ ID NO:2, a substitution of QT945KI of SEQ ID NO:2, a substitution of T620P of SEQ ID NO:2, a substitution of T946P of SEQ ID NO:2, a substitution of TT949PP of SEQ ID NO:2, a substitution of N952T of SEQ ID NO:2, a substitution of K682E of SEQ ID NO:2, a substitution of K975R of SEQ ID NO:2, a substitution of L212P of SEQ ID NO:2, a substitution of E292R of SEQ ID NO:2, a substitution of I303K of SEQ ID NO:2, a substitution of C349E of SEQ ID NO:2, a substitution of E385P of SEQ ID NO:2, a substitution of E386N of SEQ ID NO:2, a substitution of D387K of SEQ ID NO:2, a substitution of L404K of SEQ ID NO:2, a substitution of E466H of SEQ ID NO:2, a substitution of C477Q of SEQ ID NO:2, a substitution of C477H of SEQ ID NO:2, a substitution of C479A of SEQ ID NO:2, a substitution of D659H of SEQ ID NO:2, a substitution of T806V of SEQ ID NO:2, a substitution of K808S of SEQ ID NO:2, an insertion of AS at position 797 of SEQ ID NO:2, a substitution of V959M of SEQ ID NO:2, a substitution of K975Q of SEQ ID NO:2, a substitution of W974G of SEQ ID NO:2, a substitution of A708Q of SEQ ID NO:2, a substitution of V711K of SEQ ID NO:2, a substitution of D733T of SEQ ID NO:2, a substitution of L742W of SEQ ID NO:2, a substitution of V747K of SEQ ID NO:2, a substitution of F755M of SEQ ID NO:2, a substitution of M771A of SEQ ID NO:2, a substitution of M771Q of SEQ ID NO:2, a substitution of W782Q of SEQ ID NO:2, a substitution of G791F, of SEQ ID NO:2 a substitution of L792D of SEQ ID NO:2, a

substitution of L792K of SEQ ID NO:2, a substitution of P793Q of SEQ ID NO:2, a substitution of P793G of SEQ ID NO:2, a substitution of Q804A of SEQ ID NO:2, a substitution of Y966N of SEQ ID NO:2, a substitution of Y723N of SEQ ID NO:2, a substitution of Y857R of SEQ ID NO:2, a substitution of S890R of SEQ ID NO:2, a substitution of S932M of SEQ ID NO:2, a substitution of L897M of SEQ ID NO:2, a substitution of R624G of SEQ ID NO:2, a substitution of S603G of SEQ ID NO:2, a substitution of N737S of SEQ ID NO:2, a substitution of L307K of SEQ ID NO:2, a substitution of I658V of SEQ ID NO:2, an insertion of PT at position 688 of SEQ ID NO:2, an insertion of SA at position 794 of SEQ ID NO:2, a substitution of S877R of SEQ ID NO:2, a substitution of N580T of SEQ ID NO:2, a substitution of V335G of SEQ ID NO:2, a substitution of T620S of SEQ ID NO:2, a substitution of W345G of SEQ ID NO:2, a substitution of T280S of SEQ ID NO:2, a substitution of L406P of SEQ ID NO:2, a substitution of A612D of SEQ ID NO:2, a substitution of A751S of SEQ ID NO:2, a substitution of E386R of SEQ ID NO:2, a substitution of V351M of SEQ ID NO:2, a substitution of K210N of SEQ ID NO:2, a substitution of D40A of SEQ ID NO:2, a substitution of E773G of SEQ ID NO:2, a substitution of H207L of SEQ ID NO:2, a substitution of T62A SEQ ID NO:2, a substitution of T287P of SEQ ID NO:2, a substitution of T832A of SEQ ID NO:2, a substitution of A893S of SEQ ID NO:2, an insertion of V at position 14 of SEQ ID NO:2, an insertion of AG at position 13 of SEQ ID NO:2, a substitution of R11V of SEQ ID NO:2, a substitution of R12N of SEQ ID NO:2, a substitution of R13H of SEQ ID NO:2, an insertion of Y at position 13 of SEQ ID NO:2, a substitution of R12L of SEQ ID NO:2, an insertion of Q at position 13 of SEQ ID NO:2, an substitution of V15S of SEQ ID NO:2, an insertion of D at position 17 of SEQ ID NO:2 or a combination thereof.

[00225] In some embodiments, the CasX variant comprises at least one modification in the NTSB domain.

[00226] In some embodiments, the CasX variant comprises at least one modification in the TSL domain. In some embodiments, the at least one modification in the TSL domain comprises an amino acid substitution of one or more of amino acids Y857, S890, or S932 of SEQ ID NO:2.

[00227] In some embodiments, the CasX variant comprises at least one modification in the helical I domain. In some embodiments, the at least one modification in the helical I domain

comprises an amino acid substitution of one or more of amino acids S219, L249, E259, Q252, E292, L307, or D318 of SEQ ID NO:2.

[00228] In some embodiments, the CasX variant comprises at least one modification in the helical II domain. In some embodiments, the at least one modification in the helical II domain comprises an amino acid substitution of one or more of amino acids D361, L379, E385, E386, D387, F399, L404, R458, C477, or D489 of SEQ ID NO:2.

[00229] In some embodiments, the CasX variant comprises at least one modification in the OBD domain. In some embodiments, the at least one modification in the OBD comprises an amino acid substitution of one or more of amino acids F536, E552, T620, or I658 of SEQ ID NO:2.

[00230] In some embodiments, the CasX variant comprises at least one modification in the RuvC DNA cleavage domain. In some embodiments, the at least one modification in the RuvC DNA cleavage domain comprises an amino acid substitution of one or more of amino acids K682, G695, A708, V711, D732, A739, D733, L742, V747, F755, M771, M779, W782, A788, G791, L792, P793, Y797, M799, Q804, S819, or Y857 or a deletion of amino acid P793 of SEQ ID NO:2.

[00231] In some embodiments, the CasX variant comprises at least one modification compared to the reference CasX sequence of SEQ ID NO:2 is selected from one or more of: (a) an amino acid substitution of L379R; (b) an amino acid substitution of A708K; (c) an amino acid substitution of T620P; (d) an amino acid substitution of E385P; (e) an amino acid substitution of Y857R; (f) an amino acid substitution of I658V; (g) an amino acid substitution of F399L; (h) an amino acid substitution of Q252K; (i) an amino acid substitution of L404K; and (j) an amino acid deletion of P793.

[00232] In some embodiments, a CasX variant protein comprises at least two amino acid changes to a reference CasX protein amino acid sequence. The at least two amino acid changes can be substitutions, insertions, or deletions of a reference CasX protein amino acid sequence, or any combination thereof. The substitutions, insertions or deletions can be any substitution, insertion or deletion in the sequence of a reference CasX protein described herein. In some embodiments, the changes are contiguous, non-contiguous, or a combination of contiguous and non-contiguous amino acid changes to a reference CasX protein sequence. In some embodiments, the reference CasX protein is SEQ ID NO:2. In some embodiments, a CasX variant protein comprises at least 2, at least 3, at least 4, at least 5, at least 6, at least 7, at least 8, at least 9, at least 10, at least 11, at least 12, at least 13, at least 14, at least 15, at

least 16, at least 17, at least 18, at least 19, at least 20, at least 21, at least 22, at least 23, at least 24, at least 25, at least 30, at least 40, at least 45, at least 50, at least 55, at least 60, at least 65, at least 70, at least 75, at least 80, at least 85, at least 90, at least 95 or at least 100 amino acid changes to a reference CasX protein sequence. In some embodiments, a CasX variant protein comprises 1-50, 3-40, 5-30, 5-20, 5-15, 5-10, 10-50, 10-40, 10-30, 10-20, 15-50, 15-40, 15-30, 2-25, 2-24, 2-22, 2-23, 2-22, 2-21, 2-20, 2-19, 2-18, 2-17, 2-16, 2-15, 2-14, 2-12, 2-11, 2-10, 2-9, 2-8, 2-7, 2-6, 2-5, 2-4, 2-3, 3-25, 3-24, 3-22, 3-23, 3-22, 3-21, 3-20, 3-19, 3-18, 3-17, 3-16, 3-15, 3-14, 3-12, 3-11, 3-10, 3-9, 3-8, 3-7, 3-6, 3-5, 3-4, 4-25, 4-24, 4-22, 4-23, 4-22, 4-21, 4-20, 4-19, 4-18, 4-17, 4-16, 4-15, 4-14, 4-12, 4-11, 4-10, 4-9, 4-8, 4-7, 4-6, 4-5, 5-25, 5-24, 5-22, 5-23, 5-22, 5-21, 5-20, 5-19, 5-18, 5-17, 5-16, 5-15, 5-14, 5-12, 5-11, 5-10, 5-9, 5-8, 5-7 or 5-6 amino acid changes to a reference CasX protein sequence. In some embodiments, a CasX variant protein comprises 15-20 changes to a reference CasX protein sequence. In some embodiments, a CasX variant protein comprises 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29 or 30 amino acid changes to a reference CasX protein sequence. In some embodiments, the at least two amino acid changes to the sequence of a reference CasX variant protein are selected from the group consisting of: a substitution of Y789T of SEQ ID NO:2, a deletion of P793 of SEQ ID NO:2, a substitution of Y789D of SEQ ID NO:2, a substitution of T72S of SEQ ID NO:2, a substitution of I546V of SEQ ID NO:2, a substitution of E552A of SEQ ID NO:2, a substitution of A636D of SEQ ID NO:2, a substitution of F536S of SEQ ID NO:2, a substitution of A708K of SEQ ID NO:2, a substitution of Y797L of SEQ ID NO:2, a substitution of L792G SEQ ID NO:2, a substitution of A739V of SEQ ID NO:2, a substitution of G791M of SEQ ID NO:2, an insertion of A at position 661of SEQ ID NO:2, a substitution of A788W of SEQ ID NO:2, a substitution of K390R of SEQ ID NO:2, a substitution of A751S of SEQ ID NO:2, a substitution of E385A of SEQ ID NO:2, an insertion of P at position 696 of SEQ ID NO:2, an insertion of M at position 773 of SEQ ID NO:2, a substitution of G695H of SEQ ID NO:2, an insertion of AS at position 793 of SEQ ID NO:2, an insertion of AS at position 795 of SEQ ID NO:2, a substitution of C477R of SEQ ID NO:2, a substitution of C477K of SEQ ID NO:2, a substitution of C479A of SEQ ID NO:2, a substitution of C479L of SEQ ID NO:2, a substitution of I55F of SEQ ID NO:2, a substitution of K210R of SEQ ID NO:2, a substitution of C233S of SEQ ID NO:2, a substitution of D231N of SEQ ID NO:2, a substitution of Q338E of SEQ ID NO:2, a substitution of Q338R of SEQ ID NO:2, a substitution of L379R of SEQ ID NO:2, a

substitution of K390R of SEQ ID NO:2, a substitution of L481Q of SEQ ID NO:2, a substitution of F495S of SEQ ID NO:2, a substitution of D600N of SEQ ID NO:2, a substitution of T886K of SEQ ID NO:2, a substitution of A739V of SEQ ID NO:2, a substitution of K460N of SEQ ID NO:2, a substitution of I199F of SEQ ID NO:2, a substitution of G492P of SEQ ID NO:2, a substitution of T153I of SEQ ID NO:2, a substitution of R591I of SEQ ID NO:2, an insertion of AS at position 795 of SEQ ID NO:2, an insertion of AS at position 796 of SEQ ID NO:2, an insertion of L at position 889 of SEQ ID NO:2, a substitution of E121D of SEQ ID NO:2, a substitution of S270W of SEQ ID NO:2, a substitution of E712Q of SEQ ID NO:2, a substitution of K942Q of SEQ ID NO:2, a substitution of E552K of SEQ ID NO:2, a substitution of K25Q of SEQ ID NO:2, a substitution of N47D of SEQ ID NO:2, an insertion of T at position 696 of SEQ ID NO:2, a substitution of L685I of SEQ ID NO:2, a substitution of N880D of SEQ ID NO:2, a substitution of Q102R of SEQ ID NO:2, a substitution of M734K of SEQ ID NO:2, a substitution of A724S of SEQ ID NO:2, a substitution of T704K of SEQ ID NO:2, a substitution of P224K of SEQ ID NO:2, a substitution of K25R of SEQ ID NO:2, a substitution of M29E of SEQ ID NO:2, a substitution of H152D of SEQ ID NO:2, a substitution of S219R of SEQ ID NO:2, a substitution of E475K of SEQ ID NO:2, a substitution of G226R of SEQ ID NO:2, a substitution of A377K of SEQ ID NO:2, a substitution of E480K of SEQ ID NO:2, a substitution of K416E of SEQ ID NO:2, a substitution of H164R of SEQ ID NO:2, a substitution of K767R of SEQ ID NO:2, a substitution of I7F of SEQ ID NO:2, a substitution of M29R of SEQ ID NO:2, a substitution of H435R of SEQ ID NO:2, a substitution of E385Q of SEQ ID NO:2, a substitution of E385K of SEQ ID NO:2, a substitution of I279F of SEQ ID NO:2, a substitution of D489S of SEQ ID NO:2, a substitution of D732N of SEQ ID NO:2, a substitution of A739T of SEQ ID NO:2, a substitution of W885R of SEQ ID NO:2, a substitution of E53K of SEQ ID NO:2, a substitution of A238T of SEQ ID NO:2, a substitution of P283Q of SEQ ID NO:2, a substitution of E292K of SEQ ID NO:2, a substitution of Q628E of SEQ ID NO:2, a substitution of R388Q of SEQ ID NO:2, a substitution of G791M of SEQ ID NO:2, a substitution of L792K of SEQ ID NO:2, a substitution of L792E of SEQ ID NO:2, a substitution of M779N of SEQ ID NO:2, a substitution of G27D of SEQ ID NO:2, a substitution of K955R of SEQ ID NO:2, a substitution of S867R of SEQ ID NO:2, a substitution of R693I of SEQ ID NO:2, a substitution of F189Y of SEQ ID NO:2, a substitution of V635M of SEQ ID NO:2, a substitution of F399L of SEQ ID NO:2, a

substitution of E498K of SEQ ID NO:2, a substitution of E386R of SEQ ID NO:2, a substitution of V254G of SEQ ID NO:2, a substitution of P793S of SEQ ID NO:2, a substitution of K188E of SEQ ID NO:2, a substitution of QT945KI of SEQ ID NO:2, a substitution of T620P of SEQ ID NO:2, a substitution of T946P of SEQ ID NO:2, a substitution of TT949PP of SEQ ID NO:2, a substitution of N952T of SEQ ID NO:2, a substitution of K682E of SEQ ID NO:2, a substitution of K975R of SEQ ID NO:2, a substitution of L212P of SEQ ID NO:2, a substitution of E292R of SEQ ID NO:2, a substitution of I303K of SEQ ID NO:2, a substitution of C349E of SEQ ID NO:2, a substitution of E385P of SEQ ID NO:2, a substitution of E386N of SEQ ID NO:2, a substitution of D387K of SEQ ID NO:2, a substitution of L404K of SEQ ID NO:2, a substitution of E466H of SEQ ID NO:2, a substitution of C477Q of SEQ ID NO:2, a substitution of C477H of SEQ ID NO:2, a substitution of C479A of SEQ ID NO:2, a substitution of D659H of SEQ ID NO:2, a substitution of T806V of SEQ ID NO:2, a substitution of K808S of SEQ ID NO:2, an insertion of AS at position 797 of SEQ ID NO:2, a substitution of V959M of SEQ ID NO:2, a substitution of K975Q of SEQ ID NO:2, a substitution of W974G of SEQ ID NO:2, a substitution of A708Q of SEQ ID NO:2, a substitution of V711K of SEQ ID NO:2, a substitution of D733T of SEQ ID NO:2, a substitution of L742W of SEQ ID NO:2, a substitution of V747K of SEQ ID NO:2, a substitution of F755M of SEQ ID NO:2, a substitution of M771A of SEQ ID NO:2, a substitution of M771Q of SEQ ID NO:2, a substitution of W782Q of SEQ ID NO:2, a substitution of G791F, of SEQ ID NO:2 a substitution of L792D of SEQ ID NO:2, a substitution of L792K of SEQ ID NO:2, a substitution of P793Q of SEQ ID NO:2, a substitution of P793G of SEQ ID NO:2, a substitution of Q804A of SEQ ID NO:2, a substitution of Y966N of SEQ ID NO:2, a substitution of Y723N of SEQ ID NO:2, a substitution of Y857R of SEQ ID NO:2, a substitution of S890R of SEQ ID NO:2, a substitution of S932M of SEQ ID NO:2, a substitution of L897M of SEQ ID NO:2, a substitution of R624G of SEQ ID NO:2, a substitution of S603G of SEQ ID NO:2, a substitution of N737S of SEQ ID NO:2, a substitution of L307K of SEQ ID NO:2, a substitution of I658V of SEQ ID NO:2, an insertion of PT at position 688 of SEQ ID NO:2, an insertion of SA at position 794 of SEQ ID NO:2, a substitution of S877R of SEQ ID NO:2, a substitution of N580T of SEQ ID NO:2, a substitution of V335G of SEQ ID NO:2, a substitution of T620S of SEQ ID NO:2, a substitution of W345G of SEQ ID NO:2, a substitution of T280S of SEQ ID NO:2, a substitution of L406P of SEQ ID NO:2, a

substitution of A612D of SEQ ID NO:2, a substitution of A751S of SEQ ID NO:2, a substitution of E386R of SEQ ID NO:2, a substitution of V351M of SEQ ID NO:2, a substitution of K210N of SEQ ID NO:2, a substitution of D40A of SEQ ID NO:2, a substitution of E773G of SEQ ID NO:2, a substitution of H207L of SEQ ID NO:2, a substitution of T62A SEQ ID NO:2, a substitution of T287P of SEQ ID NO:2, a substitution of T832A of SEQ ID NO:2, a substitution of A893S of SEQ ID NO:2, an insertion of V at position 14 of SEQ ID NO:2, an insertion of AG at position 13 of SEQ ID NO:2, a substitution of R11V of SEQ ID NO:2, a substitution of R12N of SEQ ID NO:2, a substitution of R13H of SEQ ID NO:2, an insertion of Y at position 13 of SEQ ID NO:2, a substitution of R12L of SEQ ID NO:2, an insertion of Q at position 13 of SEQ ID NO:2, an substitution of V15S of SEQ ID NO:2 and an insertion of D at position 17 of SEQ ID NO:2. In some embodiments, the at least two amino acid changes to a reference CasX protein are selected from the amino acid changes disclosed in the sequences of Table 4. In some embodiments, a CasX variant comprises any combination of the foregoing embodiments of this paragraph.

[00233] In some embodiments, a CasX variant protein comprises more than one substitution, insertion and/or deletion of a reference CasX protein amino acid sequence. In some embodiments, the reference CasX protein comprises or consists essentially of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of S794R and a substitution of Y797L of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of K416E and a substitution of A708K of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of A708K and a deletion of P793 of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a deletion of P793 and an insertion of AS at position 795 SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of Q367K and a substitution of I425S of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of A708K, a deletion of P position 793 and a substitution A793V of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of Q338R and a substitution of A339E of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of Q338R and a substitution of A339K of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of S507G and a substitution of G508R of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of A708K and a deletion of P at position 793 of SEQ ID NO:2. In some embodiments, a

CasX variant protein comprises a substitution of C477K, a substitution of A708K and a deletion of P at position 793 of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of C477K, a substitution of A708K and a deletion of P at position of 793 of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of A708K, a deletion of P at position 793 and a substitution A739V of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of A739V of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of A739V of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of A708K, a deletion of P at position 793 and a substitution of M779N of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of A708K, a deletion of P at position 793 and a substitution of M771N of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of 708K, a deletion of P at position 793 and a substitution of D489S of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of A708K, a deletion of P at position 793 and a substitution of A739T of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of A708K, a deletion of P at position 793 and a substitution of D732N of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of A708K, a deletion of P at position 793 and a substitution of G791M of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of 708K, a deletion of P at position 793 and a substitution of Y797L of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of M779N of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of M771N of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of D489S of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of A739T

of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of D732N of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of G791M of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of Y797L of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of T620P of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of A708K, a deletion of P at position 793 and a substitution of E386S of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of E386R, a substitution of F399L and a deletion of P at position 793 of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of R581I and A739V of SEQ ID NO:2. In some embodiments, a CasX variant comprises any combination of the foregoing embodiments of this paragraph.

[00234] In some embodiments, a CasX variant protein comprises more than one substitution, insertion and/or deletion of a reference CasX protein amino acid sequence. In some embodiments, a CasX variant protein comprises a substitution of A708K, a deletion of P at position 793 and a substitution of A739V of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of A708K and a deletion of P at position 793 of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of C477K, a substitution of A708K and a deletion of P at position 793 of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of C477K, a substitution of A708K and a deletion of P at position 793 of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of A708K, a deletion of P at position 793 and a substitution of A739V of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of A739 of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of A739V of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of C477K, a substitution of A708K, a

deletion of P at position 793 and a substitution of T620P of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of M771A of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of A708K, a deletion of P at position 793 and a substitution of D732N of SEQ ID NO:2. In some embodiments, a CasX variant comprises any combination of the foregoing embodiments of this paragraph.

[00235] In some embodiments, a CasX variant protein comprises a substitution of W782Q of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of M771Q of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of R458I and a substitution of A739V of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of A708K, a deletion of P at position 793 and a substitution of M771N of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of A708K, a deletion of P at position 793 and a substitution of A739T of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of D489S of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of D732N of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of V711K of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of Y797L of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of A708K and a deletion of P at position 793 of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of M771N of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of A708K, a substitution of P at position 793 and a substitution of E386S of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of C477K, a substitution of A708K and a deletion of P at position 793 of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L792D of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of G791F of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of A708K, a

deletion of P at position 793 and a substitution of A739V of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of A708K, a deletion of P at position 793 and a substitution of A739V of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of C477K, a substitution of A708K and a substitution of P at position 793 of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L249I and a substitution of M771N of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of V747K of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of L379R, a substitution of C477, a substitution of A708K, a deletion of P at position 793 and a substitution of M779N of SEQ ID NO:2. In some embodiments, a CasX variant protein comprises a substitution of F755M. In some embodiments, a CasX variant comprises any combination of the foregoing embodiments of this paragraph.

[00236] In some embodiments, a CasX variant protein comprises at least one modification compared to the reference CasX sequence of SEQ ID NO:2, wherein the at least one modification is selected from one or more of: an amino acid substitution of L379R; an amino acid substitution of A708K; an amino acid substitution of T620P; an amino acid substitution of E385P; an amino acid substitution of Y857R; an amino acid substitution of I658V; an amino acid substitution of F399L; an amino acid substitution of Q252K; and an amino acid deletion of [P793]. In some embodiments, a CasX variant protein comprises at least one modification compared to the reference CasX sequence of SEQ ID NO:2, wherein the at least one modification is selected from one or more of: an amino acid substitution of L379R; an amino acid substitution of A708K; an amino acid substitution of T620P; an amino acid substitution of E385P; an amino acid substitution of Y857R; an amino acid substitution of I658V; an amino acid substitution of F399L; an amino acid substitution of Q252K; an amino acid substitution of L404K; and an amino acid deletion of [P793]. In other embodiments, a CasX variant protein comprises any combination of the foregoing substitutions or deletions compared to the reference CasX sequence of SEQ ID NO:2. In other embodiments, the CasX variant protein can, in addition to the foregoing substitutions or deletions, further comprise a substitution of an NTSB and/or a helical 1b domain from the reference CasX of SEQ ID NO:1.

[00237] In some embodiments, the CasX variant protein comprises between 400 and 2000 amino acids, between 500 and 1500 amino acids, between 700 and 1200 amino acids, between 800 and 1100 amino acids, or between 900 and 1000 amino acids.

[00238] In some embodiments, the CasX variant protein comprises one or more modifications in a region of non-contiguous residues that form a channel in which gNA:target DNA complexing occurs. In some embodiments, the CasX variant protein comprises one or more modifications comprising a region of non-contiguous residues that form an interface which binds with the gNA. For example, in some embodiments of a reference CasX protein, the helical I, helical II and OBD domains all contact or are in proximity to the gNA:target DNA complex, and one or more modifications to non-contiguous residues within any of these domains may improve function of the CasX variant protein.

[00239] In some embodiments, the CasX variant protein comprises one or more modifications in a region of non-contiguous residues that form a channel which binds with the non-target strand DNA. For example, a CasX variant protein can comprise one or more modifications to non-contiguous residues of the NTSBD. In some embodiments, the CasX variant protein comprises one or more modifications in a region of non-contiguous residues that form an interface which binds with the PAM. For example, a CasX variant protein can comprise one or more modifications to non-contiguous residues of the helical I domain or OBD. In some embodiments, the CasX variant protein comprises one or more modifications comprising a region of non-contiguous surface-exposed residues. As used herein, "surface-exposed residues" refers to amino acids on the surface of the CasX protein, or amino acids in which at least a portion of the amino acid, such as the backbone or a part of the side chain is on the surface of the protein. Surface exposed residues of cellular proteins such as CasX, which are exposed to an aqueous intracellular environment, are frequently selected from positively charged hydrophilic amino acids, for example arginine, asparagine, aspartate, glutamine, glutamate, histidine, lysine, serine, and threonine. Thus, for example, in some embodiments of the variants provided herein, a region of surface exposed residues comprises one or more insertions, deletions, or substitutions compared to a reference CasX protein. In some embodiments, one or more positively charged residues are substituted for one or more other positively charged residues, or negatively charged residues, or uncharged residues, or any combinations thereof. In some embodiments, one or more amino acids residues for substitution are near bound nucleic acid, for example residues in the RuvC domain or helical I domain that contact target DNA, or residues in the OBD or helical II domain that bind the gNA, can be substituted for one or more positively charged or polar amino acids.

[00240] In some embodiments, the CasX variant protein comprises one or more modifications in a region of non-contiguous residues that form a core through hydrophobic

packing in a domain of the reference CasX protein. Without wishing to be bound by any theory, regions that form cores through hydrophobic packing are rich in hydrophobic amino acids such as valine, isoleucine, leucine, methionine, phenylalanine, tryptophan, and cysteine. For example, in some reference CasX proteins, RuvC domains comprise a hydrophobic pocket adjacent to the active site. In some embodiments, between 2 to 15 residues of the region are charged, polar, or base-stacking. Charged amino acids (sometimes referred to herein as residues) may include, for example, arginine, lysine, aspartic acid, and glutamic acid, and the side chains of these amino acids may form salt bridges provided a bridge partner is also present. Polar amino acids may include, for example, glutamine, asparagine, histidine, serine, threonine, tyrosine, and cysteine. Polar amino acids can, in some embodiments, form hydrogen bonds as proton donors or acceptors, depending on the identity of their side chains. As used herein, "base-stacking" includes the interaction of aromatic side chains of an amino acid residue (such as tryptophan, tyrosine, phenylalanine, or histidine) with stacked nucleotide bases in a nucleic acid. Any modification to a region of non-contiguous amino acids that are in close spatial proximity to form a functional part of the CasX variant protein is envisaged as within the scope of the disclosure.

i. **CasX Variant Proteins with Domains from Multiple Source Proteins**

[00241] In certain embodiments, the disclosure provides a chimeric CasX protein comprising protein domains from two or more different CasX proteins, such as two or more reference CasX proteins, or two or more CasX variant protein sequences as described herein. As used herein, a "chimeric CasX protein" refers to a CasX containing at least two domains isolated or derived from different sources, such as two naturally occurring proteins, which may, in some embodiments, be isolated from different species. For example, in some embodiments, a chimeric CasX protein comprises a first domain from a first CasX protein and a second domain from a second, different CasX protein. In some embodiments, the first domain can be selected from the group consisting of the NTSB, TSL, Helical I, Helical II, OBD and RuvC domains. In some embodiments, the second domain is selected from the group consisting of the NTSB, TSL, Helical I, Helical II, OBD and RuvC domains with the second domain being different from the foregoing first domain. For example, a chimeric CasX protein may comprise an NTSB, TSL, Helical I, Helical II, OBD domains from a CasX protein of SEQ ID NO:2, and a RuvC domain from a CasX protein of SEQ ID NO:1, or vice versa. As a further example, a chimeric CasX protein may comprise an NTSB, TSL, Helical II, OBD and RuvC domain from CasX protein of SEQ ID NO:2, and a Helical I domain from

a CasX protein of SEQ ID NO:1, or vice versa. Thus, in certain embodiments, a chimeric CasX protein may comprise an NTSB, TSL, Helical II, OBD and RuvC domain from a first CasX protein, and a Helical I domain from a second CasX protein. In some embodiments of the chimeric CasX proteins, the domains of the first CasX protein are derived from the sequences of SEQ ID NO:1, SEQ ID NO:2 or SEQ ID NO:3, and the domains of the second CasX protein are derived from the sequences of SEQ ID NO:1, SEQ ID NO:2 or SEQ ID NO:3, and the first and second CasX proteins are not the same. In some embodiments, domains of the first CasX protein comprise sequences derived from SEQ ID NO:1 and domains of the second CasX protein comprise sequences derived from SEQ ID NO:2. In some embodiments, domains of the first CasX protein comprise sequences derived from SEQ ID NO:1 and domains of the second CasX protein comprise sequences derived from SEQ ID NO:3. In some embodiments, domains of the first CasX protein comprise sequences derived from SEQ ID NO:2 and domains of the second CasX protein comprise sequences derived from SEQ ID NO:3. In some embodiments, the CasX variant is selected of group consisting of CasX variants 387, 388, 389, 390, 395, 485, 486, 487, 488, 489, 490, and 491, the sequences of which are set forth in Table 4.

[00242] In some embodiments, a CasX variant protein comprises at least one chimeric domain comprising a first part from a first CasX protein and a second part from a second, different CasX protein. As used herein, a “chimeric domain” refers to a domain containing at least two parts isolated or derived from different sources, such as two naturally occurring proteins or portions of domains from two reference CasX proteins. The at least one chimeric domain can be any of the NTSB, TSL, helical I, helical II, OBD or RuvC domains as described herein. In some embodiments, the first portion of a CasX domain comprises a sequence of SEQ ID NO:1 and the second portion of a CasX domain comprises a sequence of SEQ ID NO:2. In some embodiments, the first portion of the CasX domain comprises a sequence of SEQ ID NO:1 and the second portion of the CasX domain comprises a sequence of SEQ ID NO:3. In some embodiments, the first portion of the CasX domain comprises a sequence of SEQ ID NO:2 and the second portion of the CasX domain comprises a sequence of SEQ ID NO:3. In some embodiments, the at least one chimeric domain comprises a chimeric RuvC domain. As an example of the foregoing, the chimeric RuvC domain comprises amino acids 661 to 824 of SEQ ID NO:1 and amino acids 922 to 978 of SEQ ID NO:2. As an alternative example of the foregoing, a chimeric RuvC domain comprises amino acids 648 to 812 of SEQ ID NO:2 and amino acids 935 to 986 of SEQ ID NO:1. In some

embodiments, a CasX protein comprises a first domain from a first CasX protein and a second domain from a second CasX protein, and at least one chimeric domain comprising at least two parts isolated from different CasX proteins using the approach of the embodiments described in this paragraph. In the foregoing embodiments, the chimeric CasX proteins having domains or portions of domains derived from SEQ ID NOS:1, 2 and 3, can further comprise amino acid insertions, deletions, or substitutions of any of the embodiments disclosed herein.

[00243] In some embodiments, a CasX variant protein comprises a sequence set forth in Tables 4, 7, 8, 9, or 11. In some embodiments, a CasX variant protein consists of a sequence set forth in Table 4. In other embodiments, a CasX variant protein comprises a sequence at least 60% identical, at least 65% identical, at least 70% identical, at least 75% identical, at least 80% identical, at least 81% identical, at least 82% identical, at least 83% identical, at least 84% identical, at least 85% identical, at least 86% identical, at least 86% identical, at least 87% identical, at least 88% identical, at least 89% identical, at least 89% identical, at least 90% identical, at least 91% identical, at least 92% identical, at least 93% identical, at least 94% identical, at least 95% identical, at least 96% identical, at least 97% identical, at least 98% identical, at least 99% identical, at least 99.5% identical to a sequence set forth in Tables 4, 7, 8, 9, or 11. In other embodiments, a CasX variant protein comprises a sequence set forth in Table 4, and further comprises one or more NLS disclosed herein at or near either the N-terminus, the C-terminus, or both. It will be understood that in some cases, the N-terminal methionine of the CasX variants of the Tables is removed from the expressed CasX variant during post-translational modification.

Table 4: CasX Variant Sequences

Description*	Amino Acid Sequence
TSL, Helical I, Helical II, OBD and RuvC domains from SEQ ID NO:2 and an NTSB domain from SEQ ID NO:1	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPASKKIDQNKLKPEMDEKGNLTTAGFACSQCGQPLFVYKLEQVSEK GKAYTNYFGRCNVAEHEKLILLAQLKPEKDSDEAVTYSLGKFGQRALDF YSIHVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQ DIILEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNV VAQIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWW DMVCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKK FARYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEER RSEDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDL RGKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKL RFKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQ

Description*	Amino Acid Sequence
	GREFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERR EVLDSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRI GESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDL LYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYE GLSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTIN GKELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRS GEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQ EYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 49)
NTSB, Helical I, Helical II, OBD and RuvC domains from SEQ ID NO:2 and a TSL domain from SEQ ID NO:1.	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITTADYDGMLVRLKKTSDGWATTLNNK ELKAEGQITYYNRYKRQTVEKELSAELDRLSEESGNNDISKWTKGRRDE ALFLLKKRFSHRPVQEQFVCLDCGHEVHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 50)
TSL, Helical I, Helical II, OBD and RuvC domains from SEQ ID NO:1 and an NTSB domain from SEQ ID NO:2	MEKRINKIRKKLSADNATKPVSRSGPMKTLLVRVMTDDLKKRLEKRRKK PEVMPQVISNNAANNLRMLLDDYTKMKEAILQVYWQEFKDDHVGLMCK FAQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDK GKPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFY SIHVTKESTHPVKPLAQIAGNRYASGPVGKALSDACMGTIASFLSKYQDII IEHQKVVKGNQKRLESLRELAGKENLEYPSVTLPPQPHTKEGVDAYNEV IARVRMWVNLNLWQKLKLSRDDAKPLLRLKGFPSFPVVERRENEVDWW NTINEVKKLIDAKRDMGRVFWSGVTAEKRNTILEGYNYLPNENDHKKRE GSLENPKKPAKRQFGDLLLYLEKKYAGDWGKVFDEAWERIDKKIAGLTS HIEREEARNAEDAQSKAVLTDWLRAKASFVLERLKEMDEKEFYACEIQL QKWYGDLRGNPFAVEAENRVVDISGFSIGSDGHSIQYRNLLAWKYLEN GKREFYLLMNYGKKGRIRFTDGTDIKKSGKWQGLLYGGGKAKVIDLTFD PDDEQLIILPLAFGTRQGREFIWNDLLSLETGLIKLANGRVIEKTIYNKKIG RDEPALFVALTFERREVVDPSNIKPVNLIGVDRGENIPAVIALTDPEGCPL PEFKDSSGGPTDILRIGEGYKEKQRAIQAAKEVEQRRAGGYSRKFASKS

Description*	Amino Acid Sequence
	RNLADDMVRNSARDLFYHAVTHDAVLVFENLSRGFGRQGKRTFMTER QYTKMEDWLTAKLAYEGLTSKTYLSKTLAQYTSKTCSNCGFTITTADYD GMLVRLKKTSDGWATTLNNKELKAEGQITYYNRYKRQTVEKELSAELDR LSEESGNNDISKWTKGRRDEALFLLKKRFSHRPVQEQFVCLDCGHEVH ADEQAALNIARSWLFLNSNSTEFKSYKSGKQPFVGAWQAFYKRRLKEV WKPNA (SEQ ID NO: 51)
NTSB, Helical I, Helical II, OBD and RuvC domains from SEQ ID NO:1 and an TSL domain from SEQ ID NO:2.	MEKRINKIRKKLSADNATKPVSRSGPMKTLLVRVMTDDLKKRLEKRRKK PEVMPQVISNNAANNLRMLLDDYTKMKEAILQVYWQEFKDDHVGLMCK FAQPASKKIDQNKLKPEMDEKGNLTTAGFACSQCGQPLFVYKLEQVSE KGKAYTNYFGRCNVAEHEKLILLAQLKPEKDSDEAVTYSLGKFGQRALD FYSIHVTKESTHPVKPLAQIAGNRYASGPVGKALSDACMGTIASFLSKYQ DIIIEHQKVVKGNQKRLESLRELAGKENLEYPSVTLPPQPHTKEGVDAYN EVIARVRMWVNLNLWQKLKLSRDDAKPLLRLKGFPSFPVVERRENEVD WWNTINEVKKLIDAKRDMGRVFWSGVTAEKRNTILEGYNYLPNENDHK KREGSLENPKKPAKRQFGDLLLYLEKKYAGDWGKVFDEAWERIDKKIAG LTSHIEREEARNAEDAQSKAVLTDWLRAKASFVLERLKEMDEKEFYACEI QLQKWYGDLRGNPFAVEAENRVVDISGFSIGSDGHSIQYRNLLAWKYLE NGKREFYLLMNYGKKGRIRFTDGTDIKKSGKWQGLLYGGGKAKVIDLTF DPDDEQLIILPLAFGTRQGREFIWNDLLSLETGLIKLANGRVIEKTIYNKKI GRDEPALFVALTFERREVVDPSNIKPVNLIGVDRGENIPAVIALTDPEGCP LPEFKDSSGGPTDILRIGEGYKEKQRAIQAAKEVEQRRAGGYSRKFASK SRNLADDMVRNSARDLFYHAVTHDAVLVFENLSRGFGRQGKRTFMTER QYTKMEDWLTAKLAYEGLTSKTYLSKTLAQYTSKTCSNCGFTITSADYD RVLEKLKKTATGWMTTINGKELKVEGQITYYNRYKRQNVVKDLSVELDR LSEESVNNDISSWTKGRSGEALSLLKKRFSHRPVQEKFVCLNCGFETHA DEQAALNIARSWLFLNSNSTEFKSYKSGKQPFVGAWQAFYKRRLKEVW KPNA (SEQ ID NO: 52)
NTSB, TSL, Helical I, Helical II and OBD domains SEQ ID NO:2 and an exogenous RuvC domain or a portion thereof from a second CasX protein.	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPVNLIGVDRGENIPAVIALTDPEGCPLPEFKDSSGGPTDILRIGE GYKEKQRAIQAAKEVEQRRAGGYSRKFASKSRNLADDMVRNSARDLFY HAVTHDAVLVFENLSRGFGRQGKRTFMTERQYTKMEDWLTAKLAYEGL TSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTING

Description*	Amino Acid Sequence
	KELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSG EALSLLKKRFSHRPVQEKFVCLNCGFETHA (SEQ ID NO: 53)
	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHA (SEQ ID NO: 54)
NTSB, TSL, Helical II, OBD and RuvC domains from SEQ ID NO:2 and a Helical I domain from SEQ ID NO:1	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNNAANNLRMLLDDYTKMKEAILQVYWQEFKDDHVGLMCK FAQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDK GKPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFY SIHVTKESTHPVKPLAQIAGNRYASGPVGKALSDACMGTIASFLSKYQDII IEHQKVVKGNQKRLESLRELAGKENLEYPSVTLPPQPHTKEGVDAYNEV IARVRMWVNLNLWQKLKLSRDDAKPLLRLKGFPSFPLVERQANEVDWW DMVCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKK FARYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEER RSEDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDL RGKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKL RFKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQ GREFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERR EVLDSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRI GESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDL LYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYE GLSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTIN GKELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRS GEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQ EYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 55)
NTSB, TSL, Helical I, OBD and	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG

Description*	Amino Acid Sequence
RuvC domains from SEQ ID NO:2 and a Helical II domain from SEQ ID NO:1	KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPVVERRENEVDWWNTI NEVKKLIDAKRDMGRVFWSGVTAEKRNTILEGYNYLPNENDHKKREGSL ENPKKPAKRQFGDLLLYLEKKYAGDWGKVFDEAWERIDKKIAGLTSHIE REEARNAEDAQSKAVLTDWLRAKASFVLERLKEMDEKEFYACEIQLQK WYGDLRGNPFAVEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINY FKGGKLRFKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLA FGKRQGREFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVAL TFERREVLDSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNP THILRIGESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRN TARDLLYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTA KLAYEGLSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGW MTTINGKELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSW TKGRSGEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWL FLRSQEYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 56)
NTSB, TSL, Helical I, Helical II and RuvC domains from a first CasX protein and an exogenous OBD or a part thereof from a second CasX protein	MISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRVAQPAPK NIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKGKPHTNY FGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSIHVTRES NHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDIILEHQKVI KKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVAQIVIWVN LNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDMVCNVKKL INEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFARYQFGDL LLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRSEDAQSKA ALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRGKPFAIEAE NRVVDISGFSIGSDGHSIQYRNLLAWKYLENGKREFYLLMNYGKKGRIR FTDGTDIKKSGKWQGLLYGGGKAKVIDLTFDPDDEQLIILPLAFGTRQGR EFIWNDLLSLETGLIKLANGRVIEKTIYNKKIGRDEPALFVALTFERREVVD PSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGESY KEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYYA VTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLSK TYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKEL KVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEAL SLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYKK YQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 57)
	MEKRINKIRKKLSADNATKPVSRSGPMKTLLVRVMTDDLKKRLEKRRKK PEVMPQVISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA

Description*	Amino Acid Sequence
	RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 58)
	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENRVVDISGFSIGSDGHSIQYRNLLAWKYLENGKREFYLLMNY GKKGRIRFTDGTDIKKSGKWQGLLYGGGKAKVIDLTFDPDDEQLIILPLAF GTRQGREFIWNDLLSLETGLIKLANGRVIEKTIYNKKIGRDEPALFVALTF ERREVVDPSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTH ILRIGESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTA RDLLYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKL AYEGLSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWM TTINGKELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTK GRSGEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFL RSQEYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 59)
substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of T620P of	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFKRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE

Description*	Amino Acid Sequence
SEQ ID NO:2	FIWNDLLSLETGSLKLANGRVIEKPLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 60)
substitution of M771A of SEQ ID NO:2.	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALLPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAAKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFAAERQYTRMEDWLTAKLAYEGLP SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPA (SEQ ID NO: 61)
substitution of L379R, a substitution of A708K, a deletion of P at position 793 and a substitution of D732N of SEQ ID NO:2.	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLANDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE

Description*	Amino Acid Sequence
	LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 62)
substitution of W782Q of SEQ ID NO:2.	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALLPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAAKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDQLTAKLAYEGLP SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 63)
substitution of M771Q of SEQ ID NO:2	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALLPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAAKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFQAERQYTRMEDWLTAKLAYEGLP SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 64)

Description*	Amino Acid Sequence
substitution of R458I and a substitution of A739V of SEQ ID NO:2.	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALLPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLIAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRGK PFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFKK IKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGREFI WNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVLDS SNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGESYK EKQRTIQAAKEVEQRRAGGYSRKYASKAKNLADDMVRNTVRDLLYYAV TQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLPSK TYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKEL KVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEAL SLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYKK YQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 65)
L379R, a substitution of A708K, a deletion of P at position 793 and a substitution of M771N of SEQ ID NO:2	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFNAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 66)
substitution of L379R, a substitution of A708K, a deletion of P	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII

Description*	Amino Acid Sequence
at position 793 and a substitution of A739T of SEQ ID NO:2	LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTTRDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 67)
substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of D489S of SEQ ID NO:2.	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFKRCELKLQKWYGSLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 68)
substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFKRCELKLQKWYGDLRG

Description*	Amino Acid Sequence
of D732N of SEQ ID NO:2.	KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLANDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 69)
substitution of V711K of SEQ ID NO:2.	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALLPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAAKEKEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLP SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 70)
substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of Y797L of SEQ ID NO:2.	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFKRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES

Description*	Amino Acid Sequence
	YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTLLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 71)
119: substitution of L379R, a substitution of A708K and a deletion of P at position 793 of SEQ ID NO:2.	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 72)
substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of M771N of SEQ ID NO:2.	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFKRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFNAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA

Description*	Amino Acid Sequence
	LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 73)
substitution of A708K, a deletion of P at position 793 and a substitution of E386S of SEQ ID NO:2.	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALLPYLSSESDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 74)
substitution of L379R, a substitution of C477K, a substitution of A708K and a deletion of P at position 793 of SEQ ID NO:2.	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFKRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 75)
substitution of L792D of	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG

Description*	Amino Acid Sequence
SEQ ID NO:2.	KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALLPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAAKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGDP SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 76)
substitution of G791F of SEQ ID NO:2.	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALLPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAAKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEFLP SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 77)
substitution of A708K, a deletion of P at position 793 and a substitution	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA

Description*	Amino Acid Sequence
of A739V of SEQ ID NO:2.	QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALLPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTVRDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 78)
substitution of L379R, a substitution of A708K, a deletion of P at position 793 and a substitution of A739V of SEQ ID NO:2.	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTVRDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 79)
substitution of C477K, a substitution of A708K and a deletion of P at position 793 of SEQ ID NO:2.	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALLPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFKRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK

Description*	Amino Acid Sequence
	KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 80)
substitution of L249I and a substitution of M771N of SEQ ID NO:2.	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDIII EHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVAQ IVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDMV CNVKKLINEKKEDGKVFWQNLAGYKRQEALLPYLSSEEDRKKGKKFAR YQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRSE DAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRGK PFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFKK IKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGREFI WNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVLDS SNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGESYK EKQRTIQAAKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYYAV TQDAMLIFENLSRGFGRQGKRTFNAERQYTRMEDWLTAKLAYEGLPSK TYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKEL KVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEAL SLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYKK YQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 81)
substitution of V747K of SEQ ID NO:2.	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALLPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAAKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AKTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLP

Description*	Amino Acid Sequence
	SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 82)
substitution of L379R, a substitution of C477K, a substitution of A708K, a deletion of P at position 793 and a substitution of M779N of SEQ ID NO:2.	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFKRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRNEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 83)
L379R, F755M	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALLPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAAKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIMENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLP SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY

Description*	Amino Acid Sequence
	KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 84)
429: L379R, A708K, P793_, Y857R	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 85)
430: L379R, A708K, P793_, Y857R, I658V	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGE SYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLY YAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGL SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 86)
431: L379R,	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV

Description*	Amino Acid Sequence
A708K, P793_, Y857R, I658V, E386N	AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSENDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGE SYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLY YAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGL SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 87)
432: L379R, A708K, P793_, Y857R, I658V, L404K	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLKHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERR SEDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLR GKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLR FKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQG REFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERRE VLDSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRI GESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDL LYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYE GLSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTIN GKELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRS GEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQ EYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 88)
433: L379R, A708K, P793_, Y857R,	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQVRALDFY SIHVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQD

Description*	Amino Acid Sequence
I658V, ^V192	IILEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVV AQIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWD MVCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKF ARYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERR SEDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLR GKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLR FKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQG REFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERRE VLDSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRI GESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDL LYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYE GLSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTIN GKELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRS GEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQ EYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 89)
434: L379R, A708K, P793_, Y857R, I658V, L404K, E386N	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSENDRKKGKKFA RYQFGDLLKHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERR SEDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLR GKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLR FKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQG REFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERRE VLDSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRI GESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDL LYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYE GLSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTIN GKELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRS GEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQ EYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 90)
435: L379R, A708K, P793_, Y857R, I658V, F399L	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA

Description*	Amino Acid Sequence
	RYQLGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGE SYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLY YAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGL SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 91)
436: L379R, A708K, P793_, Y857R, I658V, F399L, E386N	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSENDRKKGKKFA RYQLGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGE SYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLY YAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGL SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 92)
437: L379R, A708K, P793_, Y857R, I658V, F399L, C477S	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQLGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFSRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK

Description*	Amino Acid Sequence
	KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGE SYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLY YAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGL SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 93)
438: L379R, A708K, P793_, Y857R, I658V, F399L, L404K	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQLGDLLKHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERR SEDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLR GKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLR FKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQG REFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERRE VLDSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRI GESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDL LYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYE GLSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTIN GKELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRS GEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQ EYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 94)
439: L379R, A708K, P793_, Y857R, I658V, F399L, E386N, C477S, L404K	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSENDRKKGKKFA RYQLGDLLKHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERR SEDAQSKAALTDWLRAKASFVIEGLKEADKDEFSRCELKLQKWYGDLR GKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLR FKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQG REFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERRE VLDSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRI

Description*	Amino Acid Sequence
	GESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDL LYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYE GLSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTIN GKELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRS GEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQ EYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 95)
440: L379R, A708K, P793_, Y857R, I658V, F399L, Y797L	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQLGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGE SYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLY YAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGL SKTLLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 96)
441: L379R, A708K, P793_, Y857R, I658V, F399L, Y797L, E386N	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSENDRKKGKKFA RYQLGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGE SYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLY YAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGL SKTLLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK

Description*	Amino Acid Sequence
	ELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 97)
442: L379R, A708K, P793_, Y857R, I658V, F399L, Y797L, E386N, C477S, L404K	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSENDRKKGKKFA RYQLGDLLKHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERR SEDAQSKAALTDWLRAKASFVIEGLKEADKDEFSRCELKLQKWYGDLR GKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLR FKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQG REFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERRE VLDSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRI GESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDL LYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYE GLSKTLLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTIN GKELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRS GEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQ EYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 98)
443: L379R, A708K, P793_, Y857R, I658V, Y797L	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGE SYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLY YAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGL SKTLLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY

Description*	Amino Acid Sequence
	KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 99)
444: L379R, A708K, P793_, Y857R, I658V, Y797L, L404K	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLKHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERR SEDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLR GKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLR FKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQG REFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERRE VLDSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRI GESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDL LYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYE GLSKTLLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTIN GKELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRS GEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQ EYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 100)
445: L379R, A708K, P793_, Y857R, I658V, Y797L, E386N	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSENDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGE SYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLY YAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGL SKTLLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 101)

Description*	Amino Acid Sequence
446: L379R, A708K, P793_, Y857R, I658V, Y797L, E386N, C477S, L404K	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSENDRKKGKKFA RYQFGDLLKHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERR SEDAQSKAALTDWLRAKASFVIEGLKEADKDEFSRCELKLQKWYGDLR GKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLR FKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQG REFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERRE VLDSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRI GESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDL LYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYE GLSKTLLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTIN GKELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRS GEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQ EYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 102)
447: L379R, A708K, P793_, Y857R, E386N	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSENDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 103)
448: L379R, A708K,	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG

Description*	Amino Acid Sequence
P793_, Y857R, E386N, L404K	KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSENDRKKGKKFA RYQFGDLLKHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERR SEDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLR GKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLR FKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQG REFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERRE VLDSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIG ESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLL YYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEG LSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTING KELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSG EALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQE YKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 104)
449: L379R, A708K, P793_, D732N, E385P, Y857R	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSPEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLANDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 105)
450: L379R, A708K, P793_, D732N, E385P,	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA

Description*	Amino Acid Sequence
Y857R, I658V	QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSPEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGE SYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLANDMVRNTARDLLY YAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGL SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 106)
451: L379R, A708K, P793_, D732N, E385P, Y857R, I658V, F399L	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSPEDRKKGKKFA RYQLGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGE SYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLANDMVRNTARDLLY YAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGL SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 107)
452: L379R, A708K, P793_, D732N, E385P, Y857R, I658V, E386N	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSPNDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS

Description*	Amino Acid Sequence
	EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGE SYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLANDMVRNTARDLLY YAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGL SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 108)
453: L379R, A708K, P793_, D732N, E385P, Y857R, I658V, L404K	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSPEDRKKGKKFA RYQFGDLLKHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERR SEDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLR GKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLR FKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQG REFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERRE VLDSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRI GESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLANDMVRNTARDL LYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYE GLSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTIN GKELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRS GEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQ EYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 109)
454: L379R, A708K, P793_, T620P, E385P, Y857R, Q252K	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHKKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSPEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE

Description*	Amino Acid Sequence
	FIWNDLLSLETGSLKLANGRVIEKPLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 110)
455: L379R, A708K, P793_, T620P, E385P, Y857R, I658V, Q252K	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHKKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSPEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKPLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGE SYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLY YAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGL SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 111)
456: L379R, A708K, P793_, T620P, E385P, Y857R, I658V, E386N, Q252K	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHKKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSPNDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKPLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGE SYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLY

Description*	Amino Acid Sequence
	YAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGL SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 112)
457: L379R, A708K, P793_, T620P, E385P, Y857R, I658V, F399L, Q252K	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHKKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSPEDRKKGKKFA RYQLGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKPLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGE SYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLY YAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGL SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 113)
458: L379R, A708K, P793_, T620P, E385P, Y857R, I658V, L404K, Q252K	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHKKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSPEDRKKGKKFA RYQFGDLLKHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERR SEDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLR GKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLR FKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQG REFIWNDLLSLETGSLKLANGRVIEKPLYNRRTRQDEPALFVALTFERRE VLDSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRI GESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDL LYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYE GLSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTIN GKELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRS

Description*	Amino Acid Sequence
	GEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQ EYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 114)
459: L379R, A708K, P793_, T620P, Y857R, I658V, E386N	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSENDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKPLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGE SYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLY YAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGL SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 115)
460: L379R, A708K, P793_, T620P, E385P, Q252K	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHKKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSPEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKPLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 116)

Description*	Amino Acid Sequence
278	QEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRKK PENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRVA QPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKGK PHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSIH VTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDIIL EHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVAQ IVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDMV CNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFAR YQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRSE DAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRGK PFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFKK IKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGREFI WNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVLDS SNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGESYK EKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYYAV TQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLSKT YLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKELK VEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEALS LLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYKKY QTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 117)
279	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 118)
280	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI

Description*	Amino Acid Sequence
	HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 119)
285	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 120)
286	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM

Description*	Amino Acid Sequence
	VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 121)
287	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 122)
288	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTMSSGFACSQCCQPLYVYKLEQVNDK GKPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFY SIHVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQD IILEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVV AQIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWD MVCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKF ARYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERR SEDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLR

Description*	Amino Acid Sequence
	GKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLR FKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQG REFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERRE VLDSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIG ESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLL YYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEG LSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTING KELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSG EALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQE YKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 123)
290	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 124)
291	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL

Description*	Amino Acid Sequence
	DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 125)
293	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 126)
300	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS

Description*	Amino Acid Sequence
	KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 127)
492	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 128)
493	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK

Description*	Amino Acid Sequence
	KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 129)
387: NTSB swap from SEQ ID NO:1	QEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRKK PENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRVA QPASKKIDQNKLKPEMDEKGNLTTAGFACSQCGQPLFVYKLEQVSEKG KAYTNYFGRCNVAEHEKLILLAQLKPEKDSDEAVTYSLGKFGQRALDFY SIHVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQD IILEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVV AQIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWD MVCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKF ARYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERR SEDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLR GKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLR FKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQG REFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERRE VLDSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIG ESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLL YYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEG LSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTING KELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSG EALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQE YKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 130)
395: Helical 1B swap from SEQ ID NO:1	QEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRKK PENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRVA QPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKGK PHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSIH VTKESTHPVKPLAQIAGNRYASGPVGKALSDACMGTIASFLSKYQDIIIEH QKVVKGNQKRLESLRELAGKENLEYPSVTLPPQPHTKEGVDAYNEVIAR VRMWVNLNLWQKLKLSRDDAKPLLRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEYK KYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 131)

Description*	Amino Acid Sequence
485: Helical 1B swap from SEQ ID NO:1	QEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRKK PENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRVA QPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKGK PHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSIH VTKESTHPVKPLAQIAGNRYASGPVGKALSDACMGTIASFLSKYQDIIIEH QKVVKGNQKRLESLRELAGKENLEYPSVTLPPQPHTKEGVDAYNEVIAR VRMWVNLNLWQKLKLSRDDAKPLLRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQLGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGE SYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLY YAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGL SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 132)
486: Helical 1B swap from SEQ ID NO:1	QEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRKK PENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRVA QPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKGK PHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSIH VTKESTHPVKPLAQIAGNRYASGPVGKALSDACMGTIASFLSKYQDIIIEH QKVVKGNQKRLESLRELAGKENLEYPSVTLPPQPHTKEGVDAYNEVIAR VRMWVNLNLWQKLKLSRDDAKPLLRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQLGDLLKHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERR SEDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLR GKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLR FKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQG REFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERRE VLDSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRI GESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDL LYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYE GLSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTIN GKELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRS GEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQ EYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 133)
487:	QEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRKK PENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRVA QPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKGK

Description*	Amino Acid Sequence
Helical 1B swap from SEQ ID NO:1	PHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSIH VTKESTHPVKPLAQIAGNRYASGPVGKALSDACMGTIASFLSKYQDIIIEH QKVVKGNQKRLESLRELAGKENLEYPSVTLPPQPHTKEGVDAYNEVIAR VRMWVNLNLWQKLKLSRDDAKPLLRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQLGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGE SYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLY YAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGL SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 134)
488: NTSB and Helical 1B swap from SEQ ID NO:1	QEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRKK PENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRVA QPASKKIDQNKLKPEMDEKGNLTTAGFACSQCGQPLFVYKLEQVSEKG KAYTNYFGRCNVAEHEKLILLAQLKPEKDSDEAVTYSLGKFGQRALDFY SIHVTKESTHPVKPLAQIAGNRYASGPVGKALSDACMGTIASFLSKYQDII IEHQKVVKGNQKRLESLRELAGKENLEYPSVTLPPQPHTKEGVDAYNEV IARVRMWVNLNLWQKLKLSRDDAKPLLRLKGFPSFPLVERQANEVDWW DMVCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKK FARYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEER RSEDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDL RGKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKL RFKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQ GREFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERR EVLDSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRI GESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDL LYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYE GLSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTIN GKELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRS GEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQ EYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 135)
489: NTSB and Helical 1B swap from	QEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRKK PENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRVA QPASKKIDQNKLKPEMDEKGNLTTAGFACSQCGQPLFVYKLEQVSEKG KAYTNYFGRCNVAEHEKLILLAQLKPEKDSDEAVTYSLGKFGQRALDFY SIHVTKESTHPVKPLAQIAGNRYASGPVGKALSDACMGTIASFLSKYQDII IEHQKVVKGNQKRLESLRELAGKENLEYPSVTLPPQPHTKEGVDAYNEV

Description*	Amino Acid Sequence
SEQ ID NO:1	IARVRMWVNLNLWQKLKLSRDDAKPLLRLKGFPSFPLVERQANEVDWW DMVCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKK FARYQLGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEER RSEDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDL RGKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKL RFKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQ GREFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERR EVLDSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRI GESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDL LYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYE GLSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTIN GKELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRS GEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQ EYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 136)
490: NTSB and Helical 1B swap from SEQ ID NO:1	QEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRKK PENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRVA QPASKKIDQNKLKPEMDEKGNLTTAGFACSQCGQPLFVYKLEQVSEKG KAYTNYFGRCNVAEHEKLILLAQLKPEKDSDEAVTYSLGKFGQRALDFY SIHVTKESTHPVKPLAQIAGNRYASGPVGKALSDACMGTIASFLSKYQDII IEHQKVVKGNQKRLESLRELAGKENLEYPSVTLPPQPHTKEGVDAYNEV IARVRMWVNLNLWQKLKLSRDDAKPLLRLKGFPSFPLVERQANEVDWW DMVCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKK FARYQLGDLLKHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEER RSEDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDL RGKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKL RFKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQ GREFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERR EVLDSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRI GESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDL LYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYE GLSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTIN GKELKVEGQITYYNRRKRQNVVKDLSVELDRLSEESVNNDISSWTKGRS GEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQ EYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 137)
491: NTSB and Helical 1B swap from SEQ ID NO:1	QEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRKK PENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRVA QPASKKIDQNKLKPEMDEKGNLTTAGFACSQCGQPLFVYKLEQVSEKG KAYTNYFGRCNVAEHEKLILLAQLKPEKDSDEAVTYSLGKFGQRALDFY SIHVTKESTHPVKPLAQIAGNRYASGPVGKALSDACMGTIASFLSKYQDII IEHQKVVKGNQKRLESLRELAGKENLEYPSVTLPPQPHTKEGVDAYNEV IARVRMWVNLNLWQKLKLSRDDAKPLLRLKGFPSFPLVERQANEVDWW DMVCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKK FARYQLGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEER

Description*	Amino Acid Sequence
	RSEDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDL RGKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKL RFKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQ GREFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERR EVLDSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRI GESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDL LYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYE GLSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTIN GKELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRS GEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQ EYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 138)
494: NTSB swap from SEQ ID NO:1	QEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRKK PENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRVA QPASKKIDQNKLKPEMDEKGNLTTAGFACSQCGQPLFVYKLEQVSEKG KAYTNYFGRCNVAEHEKLILLAQLKPEKDSDEAVTYSLGKFGQRALDFY SIHVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQD IILEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVV AQIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWD MVCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKF ARYQLGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERR SEDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLR GKPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLR FKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQG REFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERRE VLDSSNIKPMNLIGVDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRI GESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDL LYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYE GLSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTIN GKELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRS GEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQ EYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 139)
328: S867G	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALLPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE

Description*	Amino Acid Sequence
	FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAAKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLP SKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGK ELKVEGQITYYNRYKRQNVVKDLGVELDRLSEESVNNDISSWTKGRSGE ALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQEY KKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 140)
388: L379R+A708K+ [P793] + X1 Helical2 swap	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPVVERRENEVDWWNTI NEVKKLIDAKRDMGRVFWSGVTAEKRNTILEGYNYLPNENDHKKREGSL ENPKKPAKRQFGDLLLYLEKKYAGDWGKVFDEAWERIDKKIAGLTSHIE REEARNAEDAQSKAVLTDWLRAKASFVLERLKEMDEKEFYACEIQLQK WYGDLRGNPFAVEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINY FKGGKLRFKKIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLA FGKRQGREFIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVAL TFERREVLDSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNP THILRIGESYKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRN TARDLLYYAVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTA KLAYEGLSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGW MTTINGKELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSW TKGRSGEALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWL FLRSQEYKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 141)
389: L379R+A708K+ [P793] + X1 RuvC1 swap	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPVNLIGVDRGENIPAVIALTDPEGCPLPEFKDSSGGPTDILRIGE GYKEKQRAIQAAKEVEQRRAGGYSRKFASKSRNLADDMVRNSARDLFY HAVTHDAVLVFENLSRGFGRQGKRTFMTERQYTKMEDWLTAKLAYEGL

Description*	Amino Acid Sequence
	TSKTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTING KELKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSG EALSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLRSQE YKKYQTNKTTGNTDKRAFVETWQSFYRKKLKEVWKPAV (SEQ ID NO: 142)
390: L379R+A708K+ [P793] + X1 RuvC2 swap	MQEIKRINKIRRRLVKDSNTKKAGKTGPMKTLLVRVMTPDLRERLENLRK KPENIPQPISNTSRANLNKLLTDYTEMKKAILHVYWEEFQKDPVGLMSRV AQPAPKNIDQRKLIPVKDGNERLTSSGFACSQCCQPLYVYKLEQVNDKG KPHTNYFGRCNVSEHERLILLSPHKPEANDELVTYSLGKFGQRALDFYSI HVTRESNHPVKPLEQIGGNSCASGPVGKALSDACMGAVASFLTKYQDII LEHQKVIKKNEKRLANLKDIASANGLAFPKITLPPQPHTKEGIEAYNNVVA QIVIWVNLNLWQKLKIGRDEAKPLQRLKGFPSFPLVERQANEVDWWDM VCNVKKLINEKKEDGKVFWQNLAGYKRQEALRPYLSSEEDRKKGKKFA RYQFGDLLLHLEKKHGEDWGKVYDEAWERIDKKVEGLSKHIKLEEERRS EDAQSKAALTDWLRAKASFVIEGLKEADKDEFCRCELKLQKWYGDLRG KPFAIEAENSILDISGFSKQYNCAFIWQKDGVKKLNLYLIINYFKGGKLRFK KIKPEAFEANRFYTVINKKSGEIVPMEVNFNFDDPNLIILPLAFGKRQGRE FIWNDLLSLETGSLKLANGRVIEKTLYNRRTRQDEPALFVALTFERREVL DSSNIKPMNLIGIDRGENIPAVIALTDPEGCPLSRFKDSLGNPTHILRIGES YKEKQRTIQAKKEVEQRRAGGYSRKYASKAKNLADDMVRNTARDLLYY AVTQDAMLIFENLSRGFGRQGKRTFMAERQYTRMEDWLTAKLAYEGLS KTYLSKTLAQYTSKTCSNCGFTITSADYDRVLEKLKKTATGWMTTINGKE LKVEGQITYYNRYKRQNVVKDLSVELDRLSEESVNNDISSWTKGRSGEA LSLLKKRFSHRPVQEKFVCLNCGFETHADEQAALNIARSWLFLNSNSTE FKSYKSGKQPFVGAWQAFYKRRLKEVWKPNA (SEQ ID NO: 143)

[00244] In some embodiments, the CasX variant protein comprises a sequence selected from the group consisting of SEQ ID NOs: 49-143, 438, 440, 442, 444, 446, 448-460, 472, 474, 478, 480, 482, 484, 486, 488, 490, 612 and 613. In some embodiments, the CasX variant protein comprises a sequence selected from the group consisting of SEQ ID NOs: 49-143, 438, 440, 442, 444, 446, 448-460, 472, 474, 478, 480, 482, 484, 486, 488, 490, 612 and 613, or a sequence having at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, or at least about 95%, or at least about 95%, or at least about 96%, or at least about 97%, or at least about 98%, or at least about 99% sequence identity thereto. In some embodiments, the CasX variant protein comprises a sequence selected from the group consisting of SEQ ID NOs: 49-143, or a sequence having at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, or at least about 95%, or at least about 95%, or at least about 96%, or at least about 97%, or at least about 98%, or at least about 99% sequence identity thereto. In some embodiments, the CasX variant protein comprises a sequence selected from the group consisting of SEQ ID NOs: 49-143.

[00245] In some embodiments, the CasX variant protein has one or more improved characteristic of the CasX protein when compared to a reference CasX protein, for example a reference protein of SEQ ID NO:1, SEQ ID NO:2 or SEQ ID NO:3. In some embodiments, the at least one improved characteristic of the CasX variant is at least about 1.1 to about 100,000-fold improved relative to the reference protein. In some embodiments, the at least one improved characteristic of the CasX variant is at least about 1.1 to about 10,000-fold improved, at least about 1.1 to about 1,000-fold improved, at least about 1.1 to about 500-fold improved, at least about 1.1 to about 400-fold improved, at least about 1.1 to about 300-fold improved, at least about 1.1 to about 200-fold improved, at least about 1.1 to about 100-fold improved, at least about 1.1 to about 50-fold improved, at least about 1.1 to about 40-fold improved, at least about 1.1 to about 30-fold improved, at least about 1.1 to about 20-fold improved, at least about 1.1 to about 10-fold improved, at least about 1.1 to about 9-fold improved, at least about 1.1 to about 8-fold improved, at least about 1.1 to about 7-fold improved, at least about 1.1 to about 6-fold improved, at least about 1.1 to about 5-fold improved, at least about 1.1 to about 4-fold improved, at least about 1.1 to about 3-fold improved, at least about 1.1 to about 2-fold improved, at least about 1.1 to about 1.5-fold improved, at least about 1.5 to about 3-fold improved, at least about 1.5 to about 4-fold improved, at least about 1.5 to about 5-fold improved, at least about 1.5 to about 10-fold improved, at least about 5 to about 10-fold improved, at least about 10 to about 20-fold improved, at least 10 to about 30-fold improved, at least 10 to about 50-fold improved or at least 10 to about 100-fold improved than the reference CasX protein. In some embodiments, the at least one improved characteristic of the CasX variant is at least about 10 to about 1000-fold improved relative to the reference CasX protein.

[00246] In some embodiments, the one or more improved characteristics of the CasX variant protein is at least about 5, at least about 10, at least about 20, at least about 30, at least about 40, at least about 50, at least about 60, at least about 70, at least about 80, at least about 90, at least about 100, at least about 250, at least about 500, or at least about 1000, at least about 5,000, at least about 10,000, or at least about 100,000-fold improved relative to a reference CasX protein. In some embodiments, an improved characteristics of the CasX variant protein is at least about 1.1, at least about 1.2, at least about 1.3, at least about 1.4, at least about 1.5, at least about 1.6, at least about 1.7, at least about 1.8, at least about 1.9, at least about 2, at least about 2.1, at least about 2.2, at least about 2.3, at least about 2.4, at least about 2.5, at least about 2.6, at least about 2.7, at least about 2.8, at least about 2.9, at least about 3, at least

about 3.5, at least about 4, at least about 4.5, at least about 5, at least about 5.5, at least about 6, at least about 6.5, at least about 7.0, at least about 7.5, at least about 8, at least about 8.5, at least about 9, at least about 9.5, at least about 10, at least about 11, at least about 12, at least about 13, at least about 14, at least about 15, at least about 20, at least about 30, at least about 40, at least about 50, at least about 60, at least about 70, at least about 80, at least about 90 at least about 100, at least about 500, at least about 1,000, at least about 10,000, or at least about 100,000-fold improved relative to a reference CasX protein. In other cases, the one or more improved characteristics of the CasX variant is about 1.1 to 100,00-fold, about 1.1 to 10,00-fold, about 1.1 to 1,000-fold, about 1.1 to 500-fold, about 1.1 to 100-fold, about 1.1 to 50-fold, about 1.1 to 20-fold, about 10 to 100,00-fold, about 10 to 10,00-fold, about 10 to 1,000-fold, about 10 to 500-fold, about 10 to 100-fold, about 10 to 50-fold, about 10 to 20-fold, about 2 to 70-fold, about 2 to 50-fold, about 2 to 30-fold, about 2 to 20-fold, about 2 to 10-fold, about 5 to 50-fold, about 5 to 30-fold, about 5 to 10-fold, about 100 to 100,00-fold, about 100 to 10,00-fold, about 100 to 1,000-fold, about 100 to 500-fold, about 500 to 100,00-fold, about 500 to 10,00-fold, about 500 to 1,000-fold, about 500 to 750-fold, about 1,000 to 100,00-fold, about 10,000 to 100,00-fold, about 20 to 500-fold, about 20 to 250-fold, about 20 to 200-fold, about 20 to 100-fold, about 20 to 50-fold, about 50 to 10,000-fold, about 50 to 1,000-fold, about 50 to 500-fold, about 50 to 200-fold, or about 50 to 100-fold, improved relative to the reference CasX of SEQ ID NO:1, SEQ ID NO:2 or SEQ ID NO:3. In other cases, the one or more improved characteristics of the CasX variant is about 1.1-fold, 1.2-fold, 1.3-fold, 1.4-fold, 1.5-fold, 1.6-fold, 1.7-fold, 1.8-fold, 1.9-fold, 2-fold, 3-fold, 4-fold, 5-fold, 6-fold, 7-fold, 8-fold, 9-fold, 10-fold, 11-fold, 12-fold, 13-fold, 14-fold, 15-fold, 16-fold, 17-fold, 18-fold, 19-fold, 20-fold, 25-fold, 30-fold, 40-fold, 45-fold, 50-fold, 55-fold, 60-fold, 70-fold, 80-fold, 90-fold, 100-fold, 110-fold, 120-fold, 130-fold, 140-fold, 150-fold, 160-fold, 170-fold, 180-fold, 190-fold, 200-fold, 210-fold, 220-fold, 230-fold, 240-fold, 250-fold, 260-fold, 270-fold, 280-fold, 290-fold, 300-fold, 310-fold, 320-fold, 330-fold, 340-fold, 350-fold, 360-fold, 370-fold, 380-fold, 390-fold, 400-fold, 425-fold, 450-fold, 475-fold, or 500-fold or more improved relative to the reference CasX of SEQ ID NO:1, SEQ ID NO:2 or SEQ ID NO:3. Exemplary characteristics that can be improved in CasX variant proteins relative to the same characteristics in reference CasX proteins include, but are not limited to, improved folding of the variant, improved binding affinity to the gNA, improved binding affinity to the target DNA, improved ability to utilize a greater spectrum of PAM sequences in the editing and/or binding of target DNA, improved unwinding of the target DNA,

increased editing activity, improved editing efficiency, improved editing specificity, increased activity of the nuclease, increased target strand loading for double strand cleavage, decreased target strand loading for single strand nicking, decreased off-target cleavage, improved binding of the non-target strand of DNA, improved protein stability, improved CasX:gNA RNA complex stability, improved protein solubility, improved CasX:gNA RNP complex solubility, improved ability to form cleavage-competent RNP with a gNA, improved protein yield, improved protein expression, and improved fusion characteristics. In some embodiments, the variant comprises at least one improved characteristic. In other embodiments, the variant comprises at least two improved characteristics. In further embodiments, the variant comprises at least three improved characteristics. In some embodiments, the variant comprises at least four improved characteristics. In still further embodiments, the variant comprises at least five, at least six, at least seven, at least eight, at least nine, at least ten, at least eleven, at least twelve, at least thirteen, or more improved characteristics.

[00247] Exemplary improved characteristic include, as one example, improved editing efficiency. In some embodiments, an RNP comprising the CasX protein and a gNA of the disclosure, at a concentration of 20 pM or less, is capable of cleaving a double stranded DNA target with an efficiency of at least 80%. In some embodiments, the RNP at a concentration of 20 pM or less, is capable of cleaving a double stranded DNA target with an efficiency of at least 40%, at least 50%, at least 60%, at least 70%, at least 80%, at least 85%, at least 90% or at least 95%. In some embodiments, the RNP at a concentration of 50 pM or less, 40 pM or less, 30 pM or less, 20 pM or less, 10 pM or less, or 5 pM or less, is capable of cleaving a double stranded DNA target with an efficiency of at least 40%, at least 50%, at least 60%, at least 70%, at least 80%, at least 85%, at least 90% or at least 95%.

[00248] These improved characteristics are described in more detail below.

j. **Protein Stability**

[00249] In some embodiments, the disclosure provides a CasX variant protein with improved stability relative to a reference CasX protein. In some embodiments, improved stability of the CasX variant protein results in expression of a higher steady state of protein, which improves editing efficiency. In some embodiments, improved stability of the CasX variant protein results in a larger fraction of CasX protein that remains folded in a functional conformation and improves editing efficiency or improves purifiability for manufacturing purposes. As used herein, a “functional conformation” refers to a CasX protein that is in a

conformation where the protein is capable of binding a gNA and target DNA. In embodiments wherein the CasX variant does not carry one or more mutations rendering it catalytically dead, the CasX variant is capable of cleaving, nicking, or otherwise modifying the target DNA. For example, a functional CasX variant can, in some embodiments, be used for gene-editing, and a functional conformation refers to an "editing-competent" conformation. In some exemplary embodiments, including those embodiments where the CasX variant protein results in a larger fraction of CasX protein that remains folded in a functional conformation, a lower concentration of CasX variant is needed for applications such as gene editing compared to a reference CasX protein. Thus, in some embodiments, the CasX variant with improved stability has improved efficiency compared to a reference CasX in one or more gene editing contexts.

[00250] In some embodiments, the disclosure provides a CasX variant protein having improved thermostability relative to a reference CasX protein. In some embodiments, the CasX variant protein has improved thermostability of the CasX variant protein at a particular temperature range. Without wishing to be bound by any theory, some reference CasX proteins natively function in organisms with niches in groundwater and sediment; thus, some reference CasX proteins may have evolved to exhibit optimal function at lower or higher temperatures that may be desirable for certain applications. For example, one application of CasX variant proteins is gene editing of mammalian cells, which is typically carried out at about 37°C. In some embodiments, a CasX variant protein as described herein has improved thermostability compared to a reference CasX protein at a temperature of at least 16°C, at least 18°C, at least 20°C, at least 22°C, at least 24°C, at least 26°C, at least 28°C, at least 30°C, at least 32°C, at least 34°C, at least 35°C, at least 36°C, at least 37°C, at least 38°C, at least 39°C, at least 40°C, at least 41°C, at least 42°C, at least 44°C, at least 46°C, at least 48°C, at least 50°C, at least 52°C, or greater. In some embodiments, a CasX variant protein has improved thermostability and functionality compared to a reference CasX protein that results in improved gene editing functionality, such as mammalian gene editing applications, which may include human gene editing applications.

[00251] In some embodiments, the disclosure provides a CasX variant protein having improved stability of the CasX variant protein:gNA complex relative to the reference CasX protein:gNA complex such that the RNP remains in a functional form. Stability improvements can include increased thermostability, resistance to proteolytic degradation, enhanced pharmacokinetic properties, stability across a range of pH conditions, salt

conditions, and tonicity. Improved stability of the complex may, in some embodiments, lead to improved editing efficiency. In some embodiments, the RNP of the CasX variant and gNA variant has at least a 5%, at least a 10%, at least a 15%, or at least a 20%, or at least a 5-20% higher percentage of cleavage-competent RNP compared to an RNP of the reference CasX of SEQ ID NOS: 1-3 and the gNA of any one of SEQ ID NOS:4-16 of Table 1.

[00252] In some embodiments, the disclosure provides a CasX variant protein having improved thermostability of the CasX variant protein:gNA complex relative to the reference CasX protein:gNA complex. In some embodiments, a CasX variant protein has improved thermostability relative to a reference CasX protein. In some embodiments, the CasX variant protein:gNA complex has improved thermostability relative to a complex comprising a reference CasX protein at temperatures of at least 16°C, at least 18°C, at least 20°C, at least 22°C, at least 24°C, at least 26°C, at least 28°C, at least 30°C, at least 32°C, at least 34°C, at least 35°C, at least 36°C, at least 37°C, at least 38°C, at least 39°C, at least 40°C, at least 41°C, at least 42°C, at least 44°C, at least 46°C, at least 48°C, at least 50°C, at least 52°C, or greater. In some embodiments, a CasX variant protein has improved thermostability of the CasX variant protein:gNA complex compared to a reference CasX protein:gNA complex, which results in improved function for gene editing applications, such as mammalian gene editing applications, which may include human gene editing applications.

[00253] In some embodiments, the improved stability and/or thermostability of the CasX variant protein comprises faster folding kinetics of the CasX variant protein relative to a reference CasX protein, slower unfolding kinetics of the CasX variant protein relative to a reference CasX protein, a larger free energy release upon folding of the CasX variant protein relative to a reference CasX protein, a higher temperature at which 50% of the CasX variant protein is unfolded (Tm) relative to a reference CasX protein, or any combination thereof. These characteristics may be improved by a wide range of values; for example, at least 1.1, at least 1.5, at least 10, at least 50, at least 100, at least 500, at least 1,000, at least 5,000, or at least a 10,000-fold improved, as compared to a reference CasX protein. In some embodiments, improved thermostability of the CasX variant protein comprises a higher Tm of the CasX variant protein relative to a reference CasX protein. In some embodiments, the Tm of the CasX variant protein is between about 20°C to about 30°C, between about 30°C to about 40°C, between about 40°C to about 50°C, between about 50°C to about 60°C, between about 60°C to about 70°C, between about 70°C to about 80°C, between about 80°C to about 90°C or between about 90°C to about 100°C. Thermal stability is determined by measuring

the "melting temperature" (T_m), which is defined as the temperature at which half of the molecules are denatured. Methods of measuring characteristics of protein stability such as Tm and the free energy of unfolding are known to persons of ordinary skill in the art, and can be measured using standard biochemical techniques *in vitro*. For example, Tm may be measured using Differential Scanning Calorimetry, a thermo-analytical technique in which the difference in the amount of heat required to increase the temperature of a sample and a reference is measured as a function of temperature (Chen et al (2003) Pharm Res 20:1952-60; Ghirlando et al (1999) Immunol Lett 68:47-52). Alternatively, or in addition, CasX variant protein Tm may be measured using commercially available methods such as the ThermoFisher Protein Thermal Shift system. Alternatively, or in addition, circular dichroism may be used to measure the kinetics of folding and unfolding, as well as the Tm (Murray et al. (2002) J. Chromatogr Sci 40:343-9). Circular dichroism (CD) relies on the unequal absorption of left-handed and right-handed circularly polarized light by asymmetric molecules such as proteins. Certain structures of proteins, for example alpha-helices and beta-sheets, have characteristic CD spectra. Accordingly, in some embodiments, CD may be used to determine the secondary structure of a CasX variant protein.

[00254] In some embodiments, improved stability and/or thermostability of the CasX variant protein comprises improved folding kinetics of the CasX variant protein relative to a reference CasX protein. In some embodiments, folding kinetics of the CasX variant protein are improved relative to a reference CasX protein by at least about 5, at least about 10, at least about 50, at least about 100, at least about 500, at least about 1,000, at least about 2,000, at least about 3,000, at least about 4,000, at least about 5,000, or at least about a 10,000-fold improvement. In some embodiments, folding kinetics of the CasX variant protein are improved relative to a reference CasX protein by at least about 1 kJ/mol, at least about 5 kJ/mol, at least about 10 kJ/mol, at least about 20 kJ/mol, at least about 30 kJ/mol, at least about 40 kJ/mol, at least about 50 kJ/mol, at least about 60 kJ/mol, at least about 70 kJ/mol, at least about 80 kJ/mol, at least about 90 kJ/mol, at least about 100 kJ/mol, at least about 150 kJ/mol, at least about 200 kJ/mol, at least about 250 kJ/mol, at least about 300 kJ/mol, at least about 350 kJ/mol, at least about 400 kJ/mol, at least about 450 kJ/mol, or at least about 500 kJ/mol.

[00255] Exemplary amino acid changes that can increase the stability of a CasX variant protein relative to a reference CasX protein may include, but are not limited to, amino acid changes that increase the number of hydrogen bonds within the CasX variant protein,

increase the number of disulfide bridges within the CasX variant protein, increase the number of salt bridges within the CasX variant protein, strengthen interactions between parts of the CasX variant protein, increase the buried hydrophobic surface area of the CasX variant protein, or any combinations thereof.

k. **Protein Yield**

[00256] In some embodiments, the disclosure provides a CasX variant protein having improved yield during expression and purification relative to a reference CasX protein. In some embodiments, the yield of CasX variant proteins purified from bacterial or eukaryotic host cells is improved relative to a reference CasX protein. In some embodiments, the bacterial host cells are *Escherichia coli* cells. In some embodiments, the eukaryotic cells are yeast, plant (e.g. tobacco), insect (e.g. *Spodoptera frugiperda* sf9 cells), mouse, rat, hamster, guinea pig, monkey, or human cells. In some embodiments, the eukaryotic host cells are mammalian cells, including, but not limited to human embryonic kidney 293 (HEK293) cells, baby hamster kidney (BHK) cells, NS0 cells, SP2/0 cells, YO myeloma cells, P3X63 mouse myeloma cells, PER cells, PER.C6 cells, hybridoma cells, NIH3T3 cells, COS, HeLa, or chinese hamster ovary (CHO) cells.

[00257] In some embodiments, improved yield of the CasX variant protein is achieved through codon optimization. Cells use 64 different codons, 61 of which encode the 20 standard amino acids, while another 3 function as stop codons. In some cases, a single amino acid is encoded by more than one codon. Different organisms exhibit bias towards use of different codons for the same naturally occurring amino acid. Therefore, the choice of codons in a protein, and matching codon choice to the organism in which the protein will be expressed, can, in some cases, significantly affect protein translation and therefore protein expression levels. In some embodiments, the CasX variant protein is encoded by a nucleic acid that has been codon optimized. In some embodiments, the nucleic acid encoding the CasX variant protein has been codon optimized for expression in a bacterial cell, a yeast cell, an insect cell, a plant cell, or a mammalian cell. In some embodiments, the mammal cell is a mouse, a rat, a hamster, a guinea pig, a monkey, or a human. In some embodiments, the CasX variant protein is encoded by a nucleic acid that has been codon optimized for expression in a human cell. In some embodiments, the CasX variant protein is encoded by a nucleic acid from which nucleotide sequences that reduce translation rates in prokaryotes and eukaryotes have been removed. For example, runs of greater than three thymine residues in a row can

reduce translation rates in certain organisms or internal polyadenylation signals can reduce translation.

[00258] In some embodiments, improvements in solubility and stability, as described herein, result in improved yield of the CasX variant protein relative to a reference CasX protein.

[00259] Improved protein yield during expression and purification can be evaluated by methods known in the art. For example, the amount of CasX variant protein can be determined by running the protein on an SDS-page gel, and comparing the CasX variant protein to a either a control whose amount or concentration is known in advance to determine an absolute level of protein. Alternatively, or in addition, a purified CasX variant protein can be run on an SDS-page gel next to a reference CasX protein undergoing the same purification process to determine relative improvements in CasX variant protein yield. Alternatively, or in addition, levels of protein can be measured using immunohistochemical methods such as Western blot or ELISA with an antibody to CasX, or by HPLC. For proteins in solution, concentration can be determined by measuring of the protein's intrinsic UV absorbance, or by methods which use protein-dependent color changes such as the Lowry assay, the Smith copper/bicinchoninic assay or the Bradford dye assay. Such methods can be used to calculate the total protein (such as, for example, total soluble protein) yield obtained by expression under certain conditions. This can be compared, for example, to the protein yield of a reference CasX protein under similar expression conditions.

l. **Protein Solubility**

[00260] In some embodiments, a CasX variant protein has improved solubility relative to a reference CasX protein. In some embodiments, a CasX variant protein has improved solubility of the CasX:gNA ribonucleoprotein complex variant relative to a ribonucleoprotein complex comprising a reference CasX protein.

[00261] In some embodiments, an improvement in protein solubility leads to higher yield of protein from protein purification techniques such as purification from *E. coli*. Improved solubility of CasX variant proteins may, in some embodiments, enable more efficient activity in cells, as a more soluble protein may be less likely to aggregate in cells. Protein aggregates can in certain embodiments be toxic or burdensome on cells, and, without wishing to be bound by any theory, increased solubility of a CasX variant protein may ameliorate this result of protein aggregation. Further, improved solubility of CasX variant proteins may allow for enhanced formulations permitting the delivery of a higher effective dose of functional protein, for example in a desired gene editing application. In some embodiments, improved

solubility of a CasX variant protein relative to a reference CasX protein results in improved yield of the CasX variant protein during purification of at least about 5, at least about 10, at least about 20, at least about 30, at least about 40, at least about 50, at least about 60, at least about 70, at least about 80, at least about 90, at least about 100, at least about 250, at least about 500, or at least about 1000-fold greater yield. In some embodiments, improved solubility of a CasX variant protein relative to a reference CasX protein improves activity of the CasX variant protein in cells by at least about 1.1, at least about 1.2, at least about 1.3, at least about 1.4, at least about 1.5, at least about 1.6, at least about 1.7, at least about 1.8, at least about 1.9, at least about 2, at least about 2.1, at least about 2.2, at least about 2.3, at least about 2.4, at least about 2.5, at least about 2.6, at least about 2.7, at least about 2.8, at least about 2.9, at least about 3, at least about 3.5, at least about 4, at least about 4.5, at least about 5, at least about 5.5, at least about 6, at least about 6.5, at least about 7.0, at least about 7.5, at least about 8, at least about 8.5, at least about 9, at least about 9.5, at least about 10, at least about 11, at least about 12, at least about 13, at least about 14, or at least about 15-fold greater activity.

[00262] Methods of measuring CasX protein solubility, and improvements thereof in CasX variant proteins, will be readily apparent to the person of ordinary skill in the art. For example, CasX variant protein solubility can in some embodiments be measured by taking densitometry readings on a gel of the soluble fraction of lysed *E.coli*. Alternatively, or addition, improvements in CasX variant protein solubility can be measured by measuring the maintenance of soluble protein product through the course of a full protein purification. For example, soluble protein product can be measured at one or more steps of gel affinity purification, tag cleavage, cation exchange purification, running the protein on a sizing column. In some embodiments, the densitometry of every band of protein on a gel is read after each step in the purification process. CasX variant proteins with improved solubility may, in some embodiments, maintain a higher concentration at one or more steps in the protein purification process when compared to the reference CasX protein, while an insoluble protein variant may be lost at one or more steps due to buffer exchanges, filtration steps, interactions with a purification column, and the like.

[00263] In some embodiments, improving the solubility of CasX variant proteins results in a higher yield in terms of mg/L of protein during protein purification when compared to a reference CasX protein.

[00264] In some embodiments, improving the solubility of CasX variant proteins enables a greater amount of editing events compared to a less soluble protein when assessed in editing assays such as the EGFP disruption assays described herein.

m. **Protein Affinity for the gNA**

[00265] In some embodiments, a CasX variant protein has improved affinity for the gNA relative to a reference CasX protein, leading to the formation of the ribonucleoprotein complex. Increased affinity of the CasX variant protein for the gNA may, for example, result in a lower K_d for the generation of a RNP complex, which can, in some cases, result in a more stable ribonucleoprotein complex formation. In some embodiments, increased affinity of the CasX variant protein for the gNA results in increased stability of the ribonucleoprotein complex when delivered to human cells. This increased stability can affect the function and utility of the complex in the cells of a subject, as well as result in improved pharmacokinetic properties in blood, when delivered to a subject. In some embodiments, increased affinity of the CasX variant protein, and the resulting increased stability of the ribonucleoprotein complex, allows for a lower dose of the CasX variant protein to be delivered to the subject or cells while still having the desired activity, for example *in vivo* or *in vitro* gene editing.

[00266] In some embodiments, a higher affinity (tighter binding) of a CasX variant protein to a gNA allows for a greater amount of editing events when both the CasX variant protein and the gNA remain in an RNP complex. Increased editing events can be assessed using editing assays such as the EGFP disruption assay described herein.

[00267] In some embodiments, the K_d of a CasX variant protein for a gNA is increased relative to a reference CasX protein by a factor of at least about 1.1, at least about 1.2, at least about 1.3, at least about 1.4, at least about 1.5, at least about 1.6, at least about 1.7, at least about 1.8, at least about 1.9, at least about 2, at least about 3, at least about 4, at least about 5, at least about 6, at least about 7, at least about 8, at least about 9, at least about 10, at least about 15, at least about 20, at least about 25, at least about 30, at least about 35, at least about 40, at least about 45, at least about 50, at least about 60, at least about 70, at least about 80, at least about 90, or at least about 100. In some embodiments, the CasX variant has about 1.1 to about 10-fold increased binding affinity to the gNA compared to the reference CasX protein of SEQ ID NO:2.

[00268] Without wishing to be bound by theory, in some embodiments amino acid changes in the Helical I domain can increase the binding affinity of the CasX variant protein with the gNA targeting sequence, while changes in the Helical II domain can increase the binding

affinity of the CasX variant protein with the gNA scaffold stem loop, and changes in the oligonucleotide binding domain (OBD) increase the binding affinity of the CasX variant protein with the gRNA triplex.

[00269] Methods of measuring CasX protein binding affinity for a gNA include *in vitro* methods using purified CasX protein and gNA. The binding affinity for reference CasX and variant proteins can be measured by fluorescence polarization if the gNA or CasX protein is tagged with a fluorophore. Alternatively, or in addition, binding affinity can be measured by biolayer interferometry, electrophoretic mobility shift assays (EMSAs), or filter binding. Additional standard techniques to quantify absolute affinities of RNA binding proteins such as the reference CasX and variant proteins of the disclosure for specific gNAs such as reference gNAs and variants thereof include, but are not limited to, isothermal calorimetry (ITC), and surface plasmon resonance (SPR), as well as the methods of the Examples.

n. **Affinity for Target DNA**

[00270] In some embodiments, a CasX variant protein has improved binding affinity for a target nucleic acid relative to the affinity of a reference CasX protein for a target nucleic acid. In some embodiments, the improved affinity for the target nucleic acid comprises improved affinity for the target nucleic acid sequence, improved affinity for the PAM sequence, an improved ability to search DNA for the target nucleic acid sequence, or any combinations thereof. Without wishing to be bound by theory, it is thought that CRISPR/Cas system proteins such as CasX may find their target nucleic acid sequences by one-dimension diffusion along a DNA molecule. The process is thought to include (1) binding of the ribonucleoprotein to the DNA molecule followed by (2) stalling at the target nucleic acid sequence, either of which may be, in some embodiments, affected by improved affinity of CasX proteins for a target nucleic acid sequence, thereby improving function of the CasX variant protein compared to a reference CasX protein.

[00271] In some embodiments, a CasX variant protein with improved target nucleic acid affinity has increased overall affinity for DNA. In some embodiments, a CasX variant protein with improved target nucleic acid affinity has increased affinity for specific PAM sequences other than the canonical TTC PAM recognized by the reference CasX protein of SEQ ID NO:2, including binding affinity for PAM sequences selected from the group consisting of TTC, ATC, GTC, and CTC. Without wishing to be bound by theory, it is possible that these protein variants will interact more strongly with DNA overall and will have an increased ability to access and edit sequences within the target DNA due to the ability to bind

additional PAM sequences beyond those of wild-type Cas X, thereby allowing for a more efficient search process of the CasX protein for the target sequence. A higher overall affinity for DNA also, in some embodiments, can increase the frequency at which a CasX protein can effectively start and finish a binding and unwinding step, thereby facilitating target strand invasion and R-loop formation, and ultimately the cleavage of a target nucleic acid sequence.

[00272] Without wishing to be bound by theory, it is possible that amino acid changes in the NTSBD that increase the efficiency of unwinding, or capture, of a non-target DNA strand in the unwound state, can increase the affinity of CasX variant proteins for target DNA. Alternatively, or in addition, amino acid changes in the NTSBD that increase the ability of the NTSBD to stabilize DNA during unwinding can increase the affinity of CasX variant proteins for target DNA. Alternatively, or in addition, amino acid changes in the OBD may increase the affinity of CasX variant protein binding to the protospacer adjacent motif (PAM), thereby increasing affinity of the CasX variant protein for target nucleic acid. Alternatively, or in addition, amino acid changes in the Helical I and/or II, RuvC and TSL domains that increase the affinity of the CasX variant protein for the target nucleic acid strand can increase the affinity of the CasX variant protein for target nucleic acid.

[00273] In some embodiments, the CasX variant protein has increased binding affinity to the target nucleic acid sequence compared to the reference protein of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3. In some embodiments, affinity of a CasX variant protein of the disclosure for a target nucleic acid molecule is increased relative to a reference CasX protein by a factor of at least about 1.1, at least about 1.2, at least about 1.3, at least about 1.4, at least about 1.5, at least about 1.6, at least about 1.7, at least about 1.8, at least about 1.9, at least about 2, at least about 3, at least about 4, at least about 5, at least about 6, at least about 7, at least about 8, at least about 9, at least about 10, at least about 15, at least about 20, at least about 25, at least about 30, at least about 35, at least about 40, at least about 45, at least about 50, at least about 60, at least about 70, at least about 80, at least about 90, or at least about 100.

[00274] In some embodiments, a CasX variant protein has improved binding affinity for the non-target strand of the target nucleic acid. As used herein, the term “non-target strand” refers to the strand of the DNA target nucleic acid sequence that does not form Watson and Crick base pairs with the targeting sequence in the gNA, and is complementary to the target strand.

[00275] Methods of measuring CasX protein (such as reference or variant) affinity for a target nucleic acid molecule may include electrophoretic mobility shift assays (EMSAs), filter binding, isothermal calorimetry (ITC), and surface plasmon resonance (SPR), fluorescence polarization and biolayer interferometry (BLI). Further methods of measuring CasX protein affinity for a target include in vitro biochemical assays that measure DNA cleavage events over time.

[00276] CasX variant proteins with higher affinity for their target nucleic acid may, in some embodiments, cleave the target nucleic acid sequence more rapidly than a reference CasX protein that does not have increased affinity for the target nucleic acid.

[00277] In some embodiments, the CasX variant protein is catalytically dead (dCasX). In some embodiments, the disclosure provides RNP comprising a catalytically-dead CasX protein that retains the ability to bind target DNA. An exemplary catalytically-dead CasX variant protein comprises one or more mutations in the active site of the RuvC domain of the CasX protein. In some embodiments, a catalytically-dead CasX variant protein comprises substitutions at residues 672, 769 and/or 935 of SEQ ID NO:1. In some embodiments, a catalytically-dead CasX variant protein comprises substitutions of D672A, E769A and/or D935A in the reference CasX protein of SEQ ID NO:1. In some embodiments, a catalytically-dead CasX protein comprises substitutions at amino acids 659, 765 and/or 922 of SEQ ID NO:2. In some embodiments, a catalytically-dead CasX protein comprises D659A, E756A and/or D922A substitutions in a reference CasX protein of SEQ ID NO:2. In further embodiments, a catalytically-dead CasX variant protein comprises deletions of all or part of the RuvC domain of the reference CasX protein.

[00278] In some embodiments, improved affinity for DNA of a CasX variant protein also improves the function of catalytically inactive versions of the CasX variant protein. In some embodiments, the catalytically inactive version of the CasX variant protein comprises one or mutations in the DED motif in the RuvC. Catalytically dead CasX variant proteins can, in some embodiments, be used for base editing or epigenetic modifications. With a higher affinity for DNA, in some embodiments, catalytically dead CasX variant proteins can, relative to catalytically active CasX, find their target DNA faster, remain bound to target DNA for longer periods of time, bind target DNA in a more stable fashion, or a combination thereof, thereby improving the function of the catalytically dead CasX variant protein.

o. **Improved Specificity for a Target Site**

[00279] In some embodiments, a CasX variant protein has improved specificity for a target DNA sequence relative to a reference CasX protein. As used herein, "specificity," sometimes referred to as "target specificity," refers to the degree to which a CRISPR/Cas system ribonucleoprotein complex cleaves off-target sequences that are similar, but not identical to the target DNA sequence; e.g., a CasX variant RNP with a higher degree of specificity would exhibit reduced off-target cleavage of sequences relative to a reference CasX protein. The specificity, and the reduction of potentially deleterious off-target effects, of CRISPR/Cas system proteins can be vitally important in order to achieve an acceptable therapeutic index for use in mammalian subjects.

[00280] In some embodiments, a CasX variant protein has improved specificity for a target site within the target sequence that is complementary to the targeting sequence of the gNA.

[00281] Without wishing to be bound by theory, it is possible that amino acid changes in the Helical I and II domains that increase the specificity of the CasX variant protein for the target DNA strand can increase the specificity of the CasX variant protein for the target DNA overall. In some embodiments, amino acid changes that increase specificity of CasX variant proteins for target DNA may also result in decreased affinity of CasX variant proteins for DNA.

[00282] Methods of testing CasX protein (such as variant or reference) target specificity may include guide and Circularization for In vitro Reporting of Cleavage Effects by Sequencing (CIRCLE-seq), or similar methods. In brief, in CIRCLE-seq techniques, genomic DNA is sheared and circularized by ligation of stem-loop adapters, which are nicked in the stem-loop regions to expose 4 nucleotide palindromic overhangs. This is followed by intramolecular ligation and degradation of remaining linear DNA. Circular DNA molecules containing a CasX cleavage site are subsequently linearized with CasX, and adapter adapters are ligated to the exposed ends followed by high-throughput sequencing to generate paired end reads that contain information about the off-target site. Additional assays that can be used to detect off-target events, and therefore CasX protein specificity include assays used to detect and quantify indels (insertions and deletions) formed at those selected off-target sites such as mismatch-detection nuclease assays and next generation sequencing (NGS). Exemplary mismatch-detection assays include nuclease assays, in which genomic DNA from cells treated with CasX and sgNA is PCR amplified, denatured and rehybridized to form hetero-duplex DNA, containing one wild type strand and one strand with an indel.

Mismatches are recognized and cleaved by mismatch detection nucleases, such as Surveyor nuclease or T7 endonuclease I.

p. **Unwinding of DNA**

[00283] In some embodiments, a CasX variant protein has improved ability of unwinding DNA relative to a reference CasX protein. In some embodiments, a CasX variant protein has enhanced DNA unwinding characteristics. Poor dsDNA unwinding has been shown previously to impair or prevent the ability of CRISPR/Cas system proteins anaCas9 or Cas14s to cleave DNA. Therefore, without wishing to be bound by any theory, it is likely that increased DNA cleavage activity by some CasX variant proteins is due at least in part to an increased ability to find and unwind the dsDNA at a target site.

[00284] Without wishing to be bound by theory, it is thought that amino acid changes in the NTSB domain may produce CasX variant proteins with increased DNA unwinding characteristics. Alternatively, or in addition, amino acid changes in the OBD or the helical domain regions that interact with the PAM may also produce CasX variant proteins with increased DNA unwinding characteristics.

[00285] Methods of measuring the ability of CasX proteins (such as variant or reference) to unwind DNA include, but are not limited to, *in vitro* assays that observe increased on rates of dsDNA targets in fluorescence polarization or biolayer interferometry.

q. **Catalytic Activity**

[00286] The ribonucleoprotein complex of the CasX:gNA systems disclosed herein comprise a reference CasX protein or variant thereof that bind to a target nucleic acid sequence and cleaves the target nucleic acid sequence. In some embodiments, a CasX variant protein has improved catalytic activity relative to a reference CasX protein. Without wishing to be bound by theory, it is thought that in some cases cleavage of the target strand can be a limiting factor for Cas12-like molecules in creating a dsDNA break. In some embodiments, CasX variant proteins improve bending of the target strand of DNA and cleavage of this strand, resulting in an improvement in the overall efficiency of dsDNA cleavage by the CasX ribonucleoprotein complex.

[00287] In some embodiments, a CasX variant protein has increased nuclease activity compared to a reference CasX protein. Variants with increased nuclease activity can be generated, for example, through amino acid changes in the RuvC nuclease domain. In one embodiment, the CasX variant comprises a nuclease domain having nickase activity. In the foregoing embodiment, the CasX nickase of a CasX:gNA system generates a single-stranded

break within 10-18 nucleotides 3' of a PAM site in the non-target strand. In another embodiment, the CasX variant comprises a nuclease domain having double-stranded cleavage activity. In the foregoing embodiment, the CasX of the CasX:gNA system generates a double-stranded break within 18-26 nucleotides 5' of a PAM site on the target strand and 10-18 nucleotides 3' on the non-target strand. Nuclease activity can be assayed by a variety of methods, including those of the Examples. In one embodiment, a CasX variant has a Kcleave constant that is at least 2-fold, or at least 3-fold, or at least 4-fold, or at least 5-fold, or at least 6-fold, or at least 7-fold, or at least 8-fold, or at least 9-fold, or at least 10-fold greater compared to a reference wild-type CasX.

[00288] In some embodiments, a CasX variant protein has increased target strand loading for double strand cleavage. Variants with increased target strand loading activity can be generated, for example, through amino acid changes in the TLS domain.

[00289] Without wishing to be bound by theory, amino acid changes in the TSL domain may result in CasX variant proteins with improved catalytic activity. Alternatively, or in addition, amino acid changes around the binding channel for the RNA:DNA duplex may also improve catalytic activity of the CasX variant protein.

[00290] In some embodiments, a CasX variant protein has increased collateral cleavage activity compared to a reference CasX protein. As used herein, "collateral cleavage activity" refers to additional, non-targeted cleavage of nucleic acids following recognition and cleavage of a target nucleic acid sequence. In some embodiments, a CasX variant protein has decreased collateral cleavage activity compared to a reference CasX protein.

[00291] In some embodiments, for example those embodiments encompassing applications where target DNA cleavage is not a desired outcome, improving the catalytic activity of a CasX variant protein comprises altering, reducing, or abolishing the catalytic activity of the CasX variant protein. In some embodiments, a ribonucleoprotein complex comprising a CasX variant protein binds to a target DNA and does not cleave the target DNA.

[00292] In some embodiments, the CasX ribonucleoprotein complex comprising a CasX variant protein binds a target DNA but generates a single stranded nick in the target DNA. In some embodiments, particularly those embodiments wherein the CasX protein is a nickase, a CasX variant protein has decreased target strand loading for single strand nicking. Variants with decreased target strand loading may be generated, for example, through amino acid changes in the TSL domain.

[00293] Exemplary methods for characterizing the catalytic activity of CasX proteins may include, but are not limited to, *in vitro* cleavage assays. In some embodiments, electrophoresis of DNA products on agarose gels can interrogate the kinetics of strand cleavage.

r. Affinity for Target DNA and RNA

[00294] In some embodiments, a ribonucleoprotein complex comprising a reference CasX protein or variant thereof binds to a target DNA and cleaves the target DNA. In some embodiments, variants of a reference CasX protein increase the specificity of the CasX variant protein for a target RNA, and increase the activity of the CasX variant protein with respect to a target RNA when compared to the reference CasX protein. For example, CasX variant proteins can display increased binding affinity for target RNAs, or increased cleavage of target RNAs, when compared to reference CasX proteins. In some embodiments, a ribonucleoprotein complex comprising a CasX variant protein binds to a target RNA and/or cleaves the target RNA. In one embodiment, a CasX variant has at least about two-fold to about 10-fold increased binding affinity to the target nucleic acid sequence compared to the reference protein of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3.

s. Combinations of Mutations

[00295] In some embodiments, the present disclosure provides variants that are a combination of mutations from separate CasX variant proteins. In some embodiments, any variant to any domain described herein can be combined with other variants described herein. In some embodiments, any variant within any domain described herein can be combined with other variants described herein, in the same domain. Combinations of different amino acid changes may in some embodiments produce new optimized variants whose function is further improved by the combination of amino acid changes. In some embodiments, the effect of combining amino acid changes on CasX protein function is linear. As used herein, a combination that is linear refers to a combination whose effect on function is equal to the sum of the effects of each individual amino acid change when assayed in isolation. In some embodiments, the effect of combining amino acid changes on CasX protein function is synergistic. As used herein, a combination of variants that is synergistic refers to a combination whose effect on function is greater than the sum of the effects of each individual amino acid change when assayed in isolation. In some embodiments, combining amino acid changes produces CasX variant proteins in which more than one function of the CasX protein has been improved relative to the reference CasX protein.

t. CasX Fusion Proteins

[00296] In some embodiments, the disclosure provides CasX proteins comprising a heterologous protein fused to the CasX. In some cases, the CasX is a reference CasX protein. In other cases, the CasX is a CasX variant of any of the embodiments described herein.

[00297] In some embodiments, the CasX variant protein is fused to one or more proteins or domains thereof that has a different activity of interest (i.e., is part of a fusion protein). For example, in some embodiments, the CasX variant protein is fused to a protein (or domain thereof) that inhibits transcription, modifies a target nucleic acid sequence, or modifies a polypeptide associated with a nucleic acid (e.g., histone modification).

[00298] In some embodiments, a heterologous polypeptide (or heterologous amino acid such as a cysteine residue or a non-natural amino acid) can be inserted at one or more positions within a CasX protein to generate a CasX fusion protein. In other embodiments, a cysteine residue can be inserted at one or more positions within a CasX protein followed by conjugation of a heterologous polypeptide described below. In some alternative embodiments, a heterologous polypeptide or heterologous amino acid can be added at the N- or C-terminus of the reference or CasX variant protein. In other embodiments, a heterologous polypeptide or heterologous amino acid can be inserted internally within the sequence of the CasX protein.

[00299] In some embodiments, the reference CasX or variant fusion protein retains RNA-guided sequence specific target nucleic acid binding and cleavage activity. In some cases, the reference CasX or variant fusion protein has (retains) 50% or more of the activity (e.g., cleavage and/or binding activity) of the corresponding reference CasX or variant protein that does not have the insertion of the heterologous protein. In some cases, the reference CasX or variant fusion protein retains at least about 60%, or at least about 70% or more, at least about 80%, or at least about 90%, or at least about 92%, or at least about 95%, or at least about 98%, or at least about 100% of the activity (e.g., cleavage and/or binding activity) of the corresponding CasX protein that does not have the insertion of the heterologous protein.

[00300] In some cases, the reference CasX or variant fusion polypeptide retains (has) target nucleic acid binding activity relative to the activity of the CasX protein without the inserted heterologous amino acid or heterologous polypeptide. For example, in some cases, the reference CasX or variant fusion polypeptide has (retains) 50% or more of the binding activity of the corresponding CasX protein (the CasX protein that does not have the insertion). For example, in some cases, the reference CasX or variant fusion polypeptide has

(retains) 60% or more (70% or more, 80% or more, 90% or more, 92% or more, 95% or more, 98% or more, or 100%) of the binding activity of the corresponding parent CasX protein (the CasX protein that does not have the insertion).

[00301] In some cases, the reference CasX or variant fusion polypeptide retains (has) target nucleic acid binding and/or cleavage activity relative to the activity of the parent CasX protein without the inserted heterologous amino acid or heterologous polypeptide. For example, in some cases, the reference CasX or variant fusion polypeptide has (retains) 50% or more of the binding and/or cleavage activity of the corresponding parent CasX protein (the CasX protein that does not have the insertion). For example, in some cases, the reference CasX or variant fusion polypeptide has (retains) 60% or more (70% or more, 80% or more, 90% or more, 92% or more, 95% or more, 98% or more, or 100%) of the binding and/or cleavage activity of the corresponding CasX parent polypeptide (the CasX protein that does not have the insertion). Methods of measuring cleaving and/or binding activity of a CasX protein and/or a CasX fusion polypeptide will be known to one of ordinary skill in the art and any convenient method can be used.

[00302] A variety of heterologous polypeptides are suitable for inclusion in a reference CasX or CasX variant fusion protein of the disclosure. In some cases, the fusion partner can modulate transcription (e.g., inhibit transcription, increase transcription) of a target DNA. For example, in some cases the fusion partner is a protein (or a domain from a protein) that inhibits transcription (e.g., a transcriptional repressor, a protein that functions via recruitment of transcription inhibitor proteins, modification of target DNA such as methylation, recruitment of a DNA modifier, modulation of histones associated with target DNA, recruitment of a histone modifier such as those that modify acetylation and/or methylation of histones, and the like). In some cases the fusion partner is a protein (or a domain from a protein) that increases transcription (e.g., a transcription activator, a protein that acts via recruitment of transcription activator proteins, modification of target DNA such as demethylation, recruitment of a DNA modifier, modulation of histones associated with target DNA, recruitment of a histone modifier such as those that modify acetylation and/or methylation of histones, and the like).

[00303] In some cases, a fusion partner has enzymatic activity that modifies a target nucleic acid sequence (e.g., nuclease activity, methyltransferase activity, demethylase activity, DNA repair activity, DNA damage activity, deamination activity, dismutase activity, alkylation activity, depurination activity, oxidation activity, pyrimidine dimer forming activity,

integrase activity, transposase activity, recombinase activity, polymerase activity, ligase activity, helicase activity, photolyase activity or glycosylase activity).

[00304] In some cases, a fusion partner has enzymatic activity that modifies a polypeptide (e.g., a histone) associated with a target nucleic acid (e.g., methyltransferase activity, demethylase activity, acetyltransferase activity, deacetylase activity, kinase activity, phosphatase activity, ubiquitin ligase activity, deubiquitinating activity, adenylation activity, deadenylation activity, SUMOylating activity, deSUMOylating activity, ribosylation activity, deribosylation activity, myristoylation activity or demyristoylation activity).

[00305] Examples of proteins (or fragments thereof) that can be used as a fusion partner to increase transcription include but are not limited to: transcriptional activators such as VP16, VP64, VP48, VP160, p65 subdomain (e.g., from NFkB), and activation domain of EDLL and/or TAL activation domain (e.g., for activity in plants); histone lysine methyltransferases such as SET domain containing 1A, histone lysine methyltransferase (SET1A), SET domain containing 1B, histone lysine methyltransferase (SET1B), lysine methyltransferase 2A (MLL1 to 5, ASCL1 (ASH1) achaete-scute family bHLH transcription factor 1 (ASH1), SET and MYND domain containing 2 (SYMD2), nuclear receptor binding SET domain protein 1 (NSD1), and the like; histone lysine demethylases such as lysine demethylase 3A (JHDM2a)/ Lysine-specific demethylase 3B (JHDM2b), lysine demethylase 6A (UTX), lysine demethylase 6B (JMJD3), and the like; histone acetyltransferases such as lysine acetyltransferase 2A (GCN5), lysine acetyltransferase 2B (PCAF), CREB binding protein (CBP), E1A binding protein p300 (p300), TATA-box binding protein associated factor 1 (TAF1), lysine acetyltransferase 5 (TIP60/PLIP), lysine acetyltransferase 6A (MOZ/MYST3), lysine acetyltransferase 6B (MORF/MYST4), SRC proto-oncogene, non-receptor tyrosine kinase (SRC1), nuclear receptor coactivator 3 (ACTR), MYB binding protein 1a (P160), clock circadian regulator (CLOCK), and the like; and DNA demethylases such as Ten-Eleven Translocation (TET) dioxygenase 1 (TET1CD), tet methylcytosine dioxygenase 1 (TET1), demeter (DME), demeter-like 1 (DML1), demeter-like 2 (DML2), protein ROS1 (ROS1), and the like.

[00306] Examples of proteins (or fragments thereof) that can be used as a fusion partner to decrease transcription include but are not limited to: transcriptional repressors such as the Kruppel associated box (KRAB or SKD); KOX1 repression domain; the Mad mSIN3 interaction domain (SID); the ERF repressor domain (ERD), the SRDX repression domain (e.g., for repression in plants), and the like; histone lysine methyltransferases such as PR/SET

domain containing protein (Pr-SET7/8), lysine methyltransferase 5B (SUV4- 20H1), PR/SET domain 2 (RIZ1), and the like; histone lysine demethylases such as lysine demethylase 4A (JMJD2A/JHDM3A), lysine demethylase 4B (JMJD2B), lysine demethylase 4C (JMJD2C/GASC1), lysine demethylase 4D (JMJD2D), lysine demethylase 5A (JARID1A/RBP2), lysine demethylase 5B (JARID1B/PLU-1), lysine demethylase 5C (JARID 1C/SMCX), lysine demethylase 5D (JARID1D/SMCY), and the like; histone lysine deacetylases such as histone deacetylase 1 (HDAC1), HDAC2, HDAC3, HDAC8, HDAC4, HDAC5, HDAC7, HDAC9, sirtuin 1 (SIRT1), SIRT2, HDAC11, and the like; DNA methylases such as HhaI DNA m5c-methyltransferase (M.HhaI), DNA methyltransferase 1 (DNMT1), DNA methyltransferase 3a (DNMT3a), DNA methyltransferase 3b (DNMT3b), methyltransferase 1 (MET1), S-adenosyl-L-methionine-dependent methyltransferases superfamily protein (DRM3) (plants), DNA cytosine methyltransferase MET2a (ZMET2), chromomethylase 1 (CMT1), chromomethylase 2 (CMT2) (plants), and the like; and periphery recruitment elements such as Lamin A, Lamin B, and the like.

[00307] In some cases the fusion partner has enzymatic activity that modifies the target nucleic acid sequence (e.g., ssRNA, dsRNA, ssDNA, dsDNA). Examples of enzymatic activity that can be provided by the fusion partner include but are not limited to: nuclease activity such as that provided by a restriction enzyme (e.g., FokI nuclease), methyltransferase activity such as that provided by a methyltransferase (e.g., Hhal DNA m5c-methyltransferase (M.Hhal), DNA methyltransferase 1 (DNMT1), DNA methyltransferase 3a (DNMT3a), DNA methyltransferase 3b (DNMT3b), METI, DRM3 (plants), ZMET2, CMT1, CMT2 (plants), and the like); demethylase activity such as that provided by a demethylase (e.g., Ten-Eleven Translocation (TET) dioxygenase 1 (TET 1 CD), TET1, DME, DML1, DML2, ROS1, and the like), DNA repair activity, DNA damage activity, deamination activity such as that provided by a deaminase (e.g., a cytosine deaminase enzyme, e.g., an APOBEC protein such as rat APOBEC1), dismutase activity, alkylation activity, depurination activity, oxidation activity, pyrimidine dimer forming activity, integrase activity such as that provided by an integrase and/or resolvase (e.g., Gin invertase such as the hyperactive mutant of the Gin invertase, GinH106Y; human immunodeficiency virus type 1 integrase (IN); Tn3 resolvase; and the like), transposase activity, recombinase activity such as that provided by a recombinase (e.g., catalytic domain of Gin recombinase), polymerase activity, ligase activity, helicase activity, photolyase activity, and glycosylase activity).

[00308] In some cases, a reference CasX or Cas X variant protein of the present disclosure is fused to a polypeptide selected from: a domain for increasing transcription (e.g., a VP16 domain, a VP64 domain), a domain for decreasing transcription (e.g., a KRAB domain, e.g., from the Kox1 protein), a core catalytic domain of a histone acetyltransferase (e.g., histone acetyltransferase p300), a protein/domain that provides a detectable signal (e.g., a fluorescent protein such as GFP), a nuclease domain (e.g., a FokI nuclease), and a base editor (e.g., cytidine deaminase such as APOBEC1).

[00309] In some cases, the fusion partner has enzymatic activity that modifies a protein associated with the target nucleic acid sequence (e.g., ssRNA, dsRNA, ssDNA, dsDNA) (e.g., a histone, an RNA binding protein, a DNA binding protein, and the like). Examples of enzymatic activity (that modifies a protein associated with a target nucleic acid) that can be provided by the fusion partner include but are not limited to: methyltransferase activity such as that provided by a histone methyltransferase (HMT) (e.g., suppressor of variegation 3-9 homolog 1 (SUV39H1, also known as KMT1A), euchromatic histone lysine methyltransferase 2 (G9A, also known as KMT1C and EHMT2), SUV39H2, ESET/SETDB 1, and the like, SET1A, SET1B, MLL1 to 5, ASH1, SYMD2, NSD1, DOT1L, Pr-SET7/8, SUV4-20H1, EZH2, RIZ1), demethylase activity such as that provided by a histone demethylase (e.g., Lysine Demethylase 1A (KDM1A also known as LSD1), JHDM2a/b, JMJD2A/JHDM3A, JMJD2B, JMJD2C/GASC1, JMJD2D, JARID1A/RBP2, JARID1B/PLU-1, JARID1C/SMCX, JARID1D/SMCY, UTX, JMJD3, and the like), acetyltransferase activity such as that provided by a histone acetylase transferase (e.g., catalytic core/fragment of the human acetyltransferase p300, GCN5, PCAF, CBP, TAF1, TIP60/PLIP, MOZ/MYST3, MORF/MYST4, HB01/MYST2, HMOF/MYST1, SRC1, ACTR, P160, CLOCK, and the like), deacetylase activity such as that provided by a histone deacetylase (e.g., HDAC1, HDAC2, HDAC3, HDAC8, HDAC4, HDAC5, HDAC7, HDAC9, SIRT1, SIRT2, HDAC11, and the like), kinase activity, phosphatase activity, ubiquitin ligase activity, deubiquitinating activity, adenylation activity, deadenylation activity, SUMOylating activity, deSUMOylating activity, ribosylation activity, deribosylation activity, myristoylation activity, and demyristoylation activity.

[00310] Additional examples of suitable fusion partners are (i) a dihydrofolate reductase (DHFR) destabilization domain to generate a chemically controllable subject RNA-guided polypeptide or a conditionally active RNA-guided polypeptide, and (ii) a chloroplast transit peptide.

[00311] Suitable chloroplast transit peptides include, but are not limited to: MASMISSSAVTTVSRASRGQSAAMAPFGGLKSMTGFPVRKVNTDITSITSNGGR VKCMQVWPPIGKKKFETLSYLPPLTRDSRA (SEQ ID NO: 144); MASMISSSAVTTVSRASRGQSAAMAPFGGLKSMTGFPVRKVNTDITSITSNGGRVKS (SEQ ID NO: 145); MASSMLSSATMVASPAQATMVAPFNGLKSSAAFPATRKANNDITSITSNGGRVNCM QV WPPIEKKKFETLSYLPDLTDSGGRVNC (SEQ ID NO: 146); MAQVSRICNGVQNPSLISNLSKSSQRKSPLSVSLKTQQHPRAYPISSSWGLKKSGMTL IG SELRPLKVMSSVSTAC (SEQ ID NO: 147); MAQVSRICNGVWNPSLISNLSKSSQRKSPLSVSLKTQQHPRAYPISSSWGLKKSGMTL IG SELRPLKVMSSVSTAC (SEQ ID NO: 148); MAQINNMAQGIQTLNPNSNFHKPQVPKSSSFLVFGSKKLKNSANSMLVLKKDSIFMQ LF CSFRISASVATAC (SEQ ID NO: 149); MAALVTSQLATSGTVLSVTDRFRRPGFQGLRPRNPADAALGMRTVGASAAPKQSRK PH RFDRRCLSMVV (SEQ ID NO: 150); MAALTTSQLATSATGFGIADRSAPSSLLRHGFQGLKPRSPAGGDATSLSVTTSARATP KQ QRSVQRGSRRFPSVVVC (SEQ ID NO: 151); MASSVLSSAAVATRSNVAQANMVAPFTGLKSAASFPVSRKQNLDITSIASNGGRVQC (SEQ ID NO: 152); MESLAATSVFAPSRVAVPAARALVRAGTVVPTRRTSSTSGTSGVKCSAAVTPQASPV IS RSAAAA (SEQ ID NO: 153); and MGAAATSMQSLKFSNRLVPPSRRLSPVPNNVTCNNLPKSAAPVRTVKCCASSWNSTI NGAAATTNGASAASS (SEQ ID NO: 154).

[00312] In some cases, a reference CasX or variant polypeptide of the present disclosure can include an endosomal escape peptide. In some cases, an endosomal escape polypeptide comprises the amino acid sequence GLFXALLXLLXSLWXLLLXA (SEQ ID NO: 155), wherein each X is independently selected from lysine, histidine, and arginine. In some cases, an endosomal escape polypeptide comprises the amino acid sequence GLFHALLHLLHSLWHLLLHA (SEQ ID NO: 156), or HHHHHHHHH (SEQ ID NO: 157).

[00313] Non-limiting examples of fusion partners for use when targeting ssRNA target nucleic acid sequences include (but are not limited to): splicing factors (e.g., RS domains); protein translation components (e.g., translation initiation, elongation, and/or release factors; e.g., eIF4G); RNA methylases; RNA editing enzymes (e.g., RNA deaminases, e.g., adenosine

deaminase acting on RNA (ADAR), including A to I and/or C to U editing enzymes); helicases; RNA-binding proteins; and the like. It is understood that a heterologous polypeptide can include the entire protein or in some cases can include a fragment of the protein (e.g., a functional domain).

[00314] A fusion partner can be any domain capable of interacting with ssRNA (which, for the purposes of this disclosure, includes intramolecular and/or intermolecular secondary structures, e.g., double-stranded RNA duplexes such as hairpins, stem-loops, etc.), whether transiently or irreversibly, directly or indirectly, including but not limited to an effector domain selected from the group comprising; Endonucleases (for example RNase III, the CRR22 DYW domain, Dicer, and PIN (PilT N-terminus) domains from proteins such as SMG5 and SMG6); proteins and protein domains responsible for stimulating RNA cleavage (for example CPSF, CstF, CFIm and CFIIm); Exonucleases (for example XRN-1 or Exonuclease T); Deadenylases (for example HNT3); proteins and protein domains responsible for nonsense mediated RNA decay (for example UPF1, UPF2, UPF3, UPF3b, RNP SI, Y14, DEK, REF2, and SRm160); proteins and protein domains responsible for stabilizing RNA (for example PABP); proteins and protein domains responsible for repressing translation (for example Ago2 and Ago4); proteins and protein domains responsible for stimulating translation (for example Staufen); proteins and protein domains responsible for (e.g., capable of) modulating translation (e.g., translation factors such as initiation factors, elongation factors, release factors, etc., e.g., eIF4G); proteins and protein domains responsible for polyadenylation of RNA (for example PAP1, GLD-2, and Star-PAP) ; proteins and protein domains responsible for polyuridinylation of RNA (for example CI Dl and terminal uridylate transferase) ; proteins and protein domains responsible for RNA localization (for example from IMP1, ZBP1, She2p, She3p, and Bicaudal-D); proteins and protein domains responsible for nuclear retention of RNA (for example Rrp6); proteins and protein domains responsible for nuclear export of RNA (for example TAP, NXF1, THO, TREX, REF, and Aly); proteins and protein domains responsible for repression of RNA splicing (for example PTB, Sam68, and hnRNP Al) ; proteins and protein domains responsible for stimulation of RNA splicing (for example Serine/ Arginine-rich (SR) domains) ; proteins and protein domains responsible for reducing the efficiency of transcription (for example FUS (TLS)); and proteins and protein domains responsible for stimulating transcription (for example CDK7 and HIV Tat). Alternatively, the effector domain may be selected from the group comprising Endonucleases; proteins and protein

domains capable of stimulating RNA cleavage; Exonucleases; Deadenylases; proteins and protein domains having nonsense mediated RNA decay activity; proteins and protein domains capable of stabilizing RNA; proteins and protein domains capable of repressing translation; proteins and protein domains capable of stimulating translation; proteins and protein domains capable of modulating translation (e.g., translation factors such as initiation factors, elongation factors, release factors, etc., e.g., eIF4G); proteins and protein domains capable of polyadenylation of RNA; proteins and protein domains capable of polyuridinylation of RNA; proteins and protein domains having RNA localization activity; proteins and protein domains capable of nuclear retention of RNA; proteins and protein domains having RNA nuclear export activity; proteins and protein domains capable of repression of RNA splicing; proteins and protein domains capable of stimulation of RNA splicing; proteins and protein domains capable of reducing the efficiency of transcription ; and proteins and protein domains capable of stimulating transcription. Another suitable heterologous polypeptide is a PUF RNA-binding domain, which is described in more detail in WO2012068627, which is hereby incorporated by reference in its entirety.

[00315] Some RNA splicing factors that can be used (in whole or as fragments thereof) as a fusion partner have modular organization, with separate sequence-specific RNA binding modules and splicing effector domains. For example, members of the Serine/ Arginine-rich (SR) protein family contain N-terminal RNA recognition motifs (RRMs) that bind to exonic splicing enhancers (ESEs) in pre-mRNAs and C-terminal RS domains that promote exon inclusion. As another example, the hnRNP protein hnRNP Al binds to exonic splicing silencers (ESSs) through its RRM domains and inhibits exon inclusion through a C-terminal Glycine -rich domain. Some splicing factors can regulate alternative use of splice site (ss) by binding to regulatory sequences between the two alternative sites. For example, ASF/SF2 can recognize ESEs and promote the use of intron proximal sites, whereas hnRNP Al can bind to ESSs and shift splicing towards the use of intron distal sites. One application for such factors is to generate ESFs that modulate alternative splicing of endogenous genes, particularly disease associated genes. For example, Bcl-x pre-mRNA produces two splicing isoforms with two alternative 5' splice sites to encode proteins of opposite functions. The long splicing isoform Bcl-xL is a potent apoptosis inhibitor expressed in long-lived post mitotic cells and is up-regulated in many cancer cells, protecting cells against apoptotic signals. The short isoform Bcl-xS is a pro-apoptotic isoform and expressed at high levels in cells with a high turnover rate (e.g., developing lymphocytes). The ratio of the two Bcl-x splicing isoforms is

regulated by multiple cc -elements that are located in either the core exon region or the exon extension region (i.e., between the two alternative 5' splice sites). For more examples, see WO2010075303, which is hereby incorporated by reference in its entirety.

[00316] Further suitable fusion partners include, but are not limited to proteins (or fragments thereof) that are boundary elements (e.g., CTCF), proteins and fragments thereof that provide periphery recruitment (e.g., Lamin A, Lamin B, etc.), protein docking elements (e.g., FKBP/FRB, Pill/Abyl, etc.).

[00317] In some cases, a heterologous polypeptide (a fusion partner) provides for subcellular localization, i.e., the heterologous polypeptide contains a subcellular localization sequence (e.g., a nuclear localization signal (NLS) for targeting to the nucleus, a sequence to keep the fusion protein out of the nucleus, e.g., a nuclear export sequence (NES), a sequence to keep the fusion protein retained in the cytoplasm, a mitochondrial localization signal for targeting to the mitochondria, a chloroplast localization signal for targeting to a chloroplast, an ER retention signal, and the like). In some embodiments, a subject RNA-guided polypeptide or a conditionally active RNA-guided polypeptide and/or subject CasX fusion polypeptide does not include a NLS so that the protein is not targeted to the nucleus (which can be advantageous, e.g., when the target nucleic acid sequence is an RNA that is present in the cytosol). In some embodiments, a fusion partner can provide a tag (i.e., the heterologous polypeptide is a detectable label) for ease of tracking and/or purification (e.g., a fluorescent protein, e.g., green fluorescent protein (GFP), yellow fluorescent protein (YFP), red fluorescent protein (RFP), cyan fluorescent protein (CFP), mCherry, tdTomato, and the like; a histidine tag, e.g., a 6XHis tag; a hemagglutinin (HA) tag; a FLAG tag; a Myc tag; and the like).

[00318] In some cases a reference or CasX variant polypeptide includes (is fused to) a nuclear localization signal (NLS) (e.g., in some cases 2 or more, 3 or more, 4 or more, or 5 or more 6 or more, 7 or more, 8 or more NLSs). Thus, in some cases, a reference or CasX variant polypeptide includes one or more NLSs (e.g., 2 or more, 3 or more, 4 or more, or 5 or more NLSs). In some cases, one or more NLSs (2 or more, 3 or more, 4 or more, or 5 or more NLSs) are positioned at or near (e.g., within 50 amino acids of) the N-terminus and/or the C-terminus. In some cases, one or more NLSs (2 or more, 3 or more, 4 or more, or 5 or more NLSs) are positioned at or near (e.g., within 50 amino acids of) the N-terminus. In some cases, one or more NLSs (2 or more, 3 or more, 4 or more, or 5 or more NLSs) are positioned at or near (e.g., within 50 amino acids of) the C-terminus. In some cases, one or more NLSs

(3 or more, 4 or more, or 5 or more NLSs) are positioned at or near (e.g., within 50 amino acids of) both the N-terminus and the C-terminus. In some cases, an NLS is positioned at the N-terminus and an NLS is positioned at the C-terminus. In some cases a reference or CasX variant polypeptide includes (is fused to) between 1 and 10 NLSs (e.g., 1-9, 1-8, 1-7, 1-6, 1-5, 2-10, 2-9, 2-8, 2-7, 2- 6, or 2-5 NLSs). In some cases a reference or CasX variant polypeptide includes (is fused to) between 2 and 5 NLSs (e.g., 2-4, or 2-3 NLSs).

[00319] Non-limiting examples of NLSs include sequences derived from: the NLS of the SV40 virus large T-antigen, having the amino acid sequence PKKKRKV (SEQ ID NO: 158); the NLS from nucleoplasmin (e.g., the nucleoplasmin bipartite NLS with the sequence KRPAATKKAGQAKKKK (SEQ ID NO: 159); the c-myc NLS having the amino acid sequence PAAKRVKLD (SEQ ID NO: 160) or RQRRNELKRSP (SEQ ID NO: 161); the hRNPAl M9 NLS having the sequence NQSSNFGPMKGGNFGGRSSGPYGGGGQYFAKPRNQGGY (SEQ ID NO: 162); the sequence RMRIZFKNKGKDTAELRRRRVEVSVELRKAKKDEQILKRRNV (SEQ ID NO: 163) of the IBB domain from importin-alpha; the sequences VSRKRPRP (SEQ ID NO: 164) and PPKKARED (SEQ ID NO: 165) of the myoma T protein; the sequence PQPKKKPL (SEQ ID NO: 166) of human p53; the sequence SALIKKKKKMAP (SEQ ID NO: 167) of mouse c-abl IV; the sequences DRLRR (SEQ ID NO: 168) and PKQKKRK (SEQ ID NO: 169) of the influenza virus NS1; the sequence RKLKKKIKKL (SEQ ID NO: 170) of the Hepatitis virus delta antigen; the sequence REKKKFLKRR (SEQ ID NO: 171) of the mouse Mxl protein; the sequence KRKGDEVDGVDEVAKKKSKK (SEQ ID NO: 172) of the human poly(ADP-ribose) polymerase; the sequence RKCLQAGMNLEARKTKK (SEQ ID NO: 173) of the steroid hormone receptors (human) glucocorticoid; the sequence PRPRKIPR (SEQ ID NO: 174) of Borna disease virus P protein (BDV-P1); the sequence PPRKKRTVV (SEQ ID NO: 175) of hepatitis C virus nonstructural protein (HCV-NS5A); the sequence NLSKKKKRKREK (SEQ ID NO: 176) of LEF1; the sequence RRPSRPFRKP (SEQ ID NO: 177) of ORF57 simirae; the sequence KRPRSPSS (SEQ ID NO: 178) of EBV LANA; the sequence KRGINDRNFWRGENERKTR (SEQ ID NO: 179) of Influenza A protein; the sequence PRPPKMARYDN (SEQ ID NO: 180) of human RNA helicase A (RHA); the sequence KRSFSKAF (SEQ ID NO: 181) of nucleolar RNA helicase II; the sequence KLKIKRPVK (SEQ ID NO: 182) of TUS-protein; the sequence PKKKRKVPPPPAAKRVKLD (SEQ ID NO: 183) associated with importin-alpha; the sequence PKTRRRPRRSQRKRPPT (SEQ ID NO: 184) from the Rex protein in HTLV-1;

the sequence MSRRRKANPTKLSENAKKLAKEVEN (SEQ ID NO: 185) from the EGL-13 protein of Caenorhabditis elegans; and the sequences KTRRRPRRSQRKRPPT (SEQ ID NO: 186), RRKKRRPRRKKRR (SEQ ID NO: 187), PKKKSRKPKKKSRK (SEQ ID NO: 188), HKKKHPDASVNFSEFSK (SEQ ID NO: 189), QRPGPYDRPQRPGPYDRP (SEQ ID NO: 190), LSPSLSPLLSPSLSPL (SEQ ID NO: 191), RGKGGKGLGKGGAKRHRK (SEQ ID NO: 192), PKRGRGRPKRGRGR (SEQ ID NO: 193), PKKKRKVPPPPAAKRVKLD (SEQ ID NO: 183) and PKKKRKVPPPPKKKRKV (SEQ ID NO: 194). In general, NLS (or multiple NLSs) are of sufficient strength to drive accumulation of a reference or CasX variant fusion protein in the nucleus of a eukaryotic cell. Detection of accumulation in the nucleus may be performed by any suitable technique. For example, a detectable marker may be fused to a reference or CasX variant fusion protein such that location within a cell may be visualized. Cell nuclei may also be isolated from cells, the contents of which may then be analyzed by any suitable process for detecting protein, such as immunohistochemistry, Western blot, or enzyme activity assay. Accumulation in the nucleus may also be determined.

[00320] In some cases, a reference or CasX variant fusion protein includes a "Protein Transduction Domain" or PTD (also known as a CPP - cell penetrating peptide), which refers to a protein, polynucleotide, carbohydrate, or organic or inorganic compound that facilitates traversing a lipid bilayer, micelle, cell membrane, organelle membrane, or vesicle membrane. A PTD attached to another molecule, which can range from a small polar molecule to a large macromolecule and/or a nanoparticle, facilitates the molecule traversing a membrane, for example going from an extracellular space to an intracellular space, or from the cytosol to within an organelle. In some embodiments, a PTD is covalently linked to the amino terminus of a reference or CasX variant fusion protein. In some embodiments, a PTD is covalently linked to the carboxyl terminus of a reference or CasX variant fusion protein. In some cases, the PTD is inserted internally in the sequence of a reference or CasX variant fusion protein at a suitable insertion site. In some cases, a reference or CasX variant fusion protein includes (is conjugated to, is fused to) one or more PTDs (e.g., two or more, three or more, four or more PTDs). In some cases, a PTD includes one or more nuclear localization signals (NLS). Examples of PTDs include but are not limited to peptide transduction domain of HIV TAT comprising YGRKKRRQRRR (SEQ ID NO: 195), RKKRRQRR (SEQ ID NO: 196); YARAAARQARA (SEQ ID NO: 197); THRLPRRRRRR (SEQ ID NO: 198); and GGRRARRRRRR (SEQ ID NO: 199); a polyarginine sequence comprising a number of arginines sufficient to direct entry into a cell (e.g., 3, 4, 5, 6, 7, 8, 9, 10, or 10-50 arginines

(SEQ ID NO: 200)); a VP22 domain (Zender et al. (2002) Cancer Gene Ther. 9(6):489-96); an Drosophila Antennapedia protein transduction domain (Noguchi et al. (2003) Diabetes 52(7): 1732-1737); a truncated human calcitonin peptide (Trehin et al. (2004) Pharm. Research 21 :1248-1256); polylysine (Wender et al. (2000) Proc. Natl. Acad. Sci. USA 97: 13003-13008); RRQRRTSKLMKR (SEQ ID NO: 201); Transportan GWTLNSAGYLLGKINLKALAALAKKIL (SEQ ID NO: 202); KALAWEAKLAKALAKALAKHLAKALAKALKCEA (SEQ ID NO: 203); and RQIKIWFQNRRMKWKK (SEQ ID NO: 204). In some embodiments, the PTD is an activatable CPP (ACPP) (Aguilera et al. (2009) Integr Biol (Camb) June; 1(5-6): 371-381). ACPPs comprise a polycationic CPP (e.g., Arg9 or "R9") connected via a cleavable linker to a matching polyanion (e.g., Glu9 or "E9"), which reduces the net charge to nearly zero and thereby inhibits adhesion and uptake into cells. Upon cleavage of the linker, the polyanion is released, locally unmasking the polyarginine and its inherent adhesiveness, thus "activating" the ACPP to traverse the membrane.

[00321] In some embodiments, a reference or CasX variant fusion protein can include a CasX protein that is linked to an internally inserted heterologous amino acid or heterologous polypeptide (a heterologous amino acid sequence) via a linker polypeptide (e.g., one or more linker polypeptides). In some embodiments, a reference or CasX variant fusion protein can be linked at the C-terminal and/or N-terminal end to a heterologous polypeptide (fusion partner) via a linker polypeptide (e.g., one or more linker polypeptides) The linker polypeptide may have any of a variety of amino acid sequences. Proteins can be joined by a spacer peptide, generally of a flexible nature, although other chemical linkages are not excluded. Suitable linkers include polypeptides of between 4 amino acids and 40 amino acids in length, or between 4 amino acids and 25 amino acids in length. These linkers are generally produced by using synthetic, linker-encoding oligonucleotides to couple the proteins. Peptide linkers with a degree of flexibility can be used. The linking peptides may have virtually any amino acid sequence, bearing in mind that the preferred linkers will have a sequence that results in a generally flexible peptide. The use of small amino acids, such as glycine and alanine, are of use in creating a flexible peptide. The creation of such sequences is routine to those of skill in the art. A variety of different linkers are commercially available and are considered suitable for use. Example linker polypeptides include glycine polymers (G)n, glycine-serine polymer (including, for example, (GS)n, GSGGSn (SEQ ID NO: 205), GGSGGSn (SEQ ID NO: 206), and GGGSn (SEQ ID NO: 207), where n is an integer of at least one), glycine-alanine

polymers, alanine-serine polymers, glycine-proline polymers, proline polymers and proline-alanine polymers. Example linkers can comprise amino acid sequences including, but not limited to, GGSG (SEQ ID NO: 208), GGSGG (SEQ ID NO: 209), GSGSG (SEQ ID NO: 210), GSGGG (SEQ ID NO: 211), GGGSG (SEQ ID NO: 212), GSSSG (SEQ ID NO: 213), GPGP (SEQ ID NO: 214), GGP, PPP, PPAPPA (SEQ ID NO: 215), PPPGPPP (SEQ ID NO: 216) and the like. The ordinarily skilled artisan will recognize that design of a peptide conjugated to any elements described above can include linkers that are all or partially flexible, such that the linker can include a flexible linker as well as one or more portions that confer less flexible structure.

V. CasX:gNA Systems and Methods for Modification of Nucleic Acids Encoding for Proteins Involved in Antigen Processing, Presentation, Recognition and/or Response and their Regulatory Regions

[00322] The CasX proteins, guide nucleic acids, and variants thereof provided herein are useful for various applications, including as therapeutics, diagnostics, and for research. To effect the methods of the disclosure for gene editing, provided herein are programmable CasX:gNA systems. The programmable nature of the CasX:gNA system provided herein allows for the precise targeting to achieve the desired effect (nicking, cleaving, repairing, etc.) at one or more regions of predetermined interest in the target nucleic acid sequence of the gene encoding the protein of interest. In some embodiments, the CasX:gNA systems provided herein comprise a CasX variant of Table 4, 7, 8, 9, or 11 or a variant having at least 50%, at least 60%, at least 70%, at least 80%, or at least 90%, or at least 95%, or at least 99% sequence identity to a sequence of Table 4, and a gNA (e.g., a gNA comprising a scaffold variant of Table 2, or a variant having at least 50%, at least 60%, at least 70%, at least 80%, or at least 90%, or at least 95%, or at least 99% sequence identity to a sequence of Table 2) or one or more polynucleotides encoding a CasX variant protein and a gNA, wherein the targeting sequence of the gNA is complementary to, and therefore is capable of hybridizing with a target nucleic acid sequence encoding the target protein, its regulatory element, or both, or a sequence complementary thereto. In other cases, the CasX:gNA system can comprise a reference CasX or a reference gNA. In some cases, the CasX:gNA system further comprises a donor template nucleic acid.

[00323] A variety of strategies and methods can be employed to modify a target nucleic acid sequence encoding a cell surface marker protein, a transmembrane protein, or intracellular or

extracellular protein and/or to introduce a protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response into a cell using the CasX:gNA systems provided herein. As used herein "modifying" includes but is not limited to cleaving, nicking, editing, deleting, knocking in, knocking out, repairing/correcting, and the like. The term "knock-out" refers to the elimination of a gene or the expression of a gene. For example, a gene can be knocked out by either a deletion or an addition of a nucleotide sequence that leads to a disruption of the reading frame. As another example, a gene may be knocked-out by replacing a part of the gene with an irrelevant sequence or one or more substituted bases. The term "knock-down" as used herein refers to reduction in the expression of a gene or its gene product(s). As a result of a gene knock-down, the protein activity or function may be attenuated or the protein levels may be reduced or eliminated. In such embodiments, gNAs having targeting sequences specific for a portion of the gene encoding the protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response or its regulatory element, or the complement of the sequence, may be utilized. Depending on the CasX protein and gNA utilized, the event may be a cleavage event, allowing for knock-down/knock-out of expression. In some embodiments gene expression for the protein may be disrupted or eliminated by introducing random insertions or deletions (indels), for example by utilizing the imprecise non-homologous DNA end joining (NHEJ) repair pathway. In such embodiments, the targeted region of the protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response includes coding sequences (exons) of the gene, wherein inserting or deleting nucleotides can generate a frame shift mutation. This approach can also be used in other non-coding regions such as introns, or regulatory elements to disturb expression of the target gene.

[00324] In some embodiments, the method of the disclosure provides CasX protein and one or more gNA that generate site-specific double strand breaks (DSBs) or single strand breaks (SSBs) (e.g., when the CasX protein is a nickase that can cleave only one strand of a target nucleic acid) within double-stranded DNA (dsDNA) target nucleic acids, which can then be repaired either by non-homologous end joining (NHEJ), homology-directed repair (HDR), homology-independent targeted integration (HITI), micro-homology mediated end joining (MMEJ), single strand annealing (SSA) or base excision repair (BER), resulting in modification of the target nucleic acid sequence. In some embodiments, it may be desirable to utilize one or a pair (or 3 or 4) of gNAs, each having a targeting sequence specific for a different region of the protein involved in antigen processing, antigen presentation, antigen

recognition, and/or antigen response allele, followed by introduction of a donor template comprising a polynucleotide sequence that will be inserted at the break site.

[00325] In one embodiment, the disclosure provides for a method of modifying a target nucleic acid sequence of a gene in a population of cells, wherein the gene encodes a protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response, comprising introducing into each cell of the population: a) the CasX:gNA system of any one of the embodiments described herein; b) a nucleic acid that encodes the CasX:gNA system of any one of the embodiments described herein; c) a vector comprising the nucleic acid of (b), above; d) a VLP comprising the CasX:gNA system of any one of the embodiments described herein; or e) combinations of two or more of (a) to (d), wherein the target nucleic acid sequence of the cells is modified by the CasX protein. In one embodiment, the CasX:gNA system is introduced into the cells as an RNP. In some embodiments of the method, the cells are selected from the group consisting of rodent cells, mouse cells, rat cells, and non-human primate cells. In other embodiments of the method, the cells are human cells. In other embodiments of the method, the cells are selected from the group consisting of progenitor cells, hematopoietic stem cells, and pluripotent stem cells. In other embodiments of the method, the cells are induced pluripotent stem cells. In other embodiments of the method, the cells are immune cells selected from the group consisting of T cells, tumor infiltrating lymphocytes, NK cells, B cells, monocytes, macrophages, or dendritic cells. In a particular embodiment, the T cells are selected from the group consisting of CD4+ T cells, CD8+ T cells, gamma-delta T cells, or a combination thereof. Where a T cell is the cell to be modified, mixtures of CD4+ and CD8+ T cells are often selected in the engineering of CAR-T cells, likely because the CD4 T cells provide growth factors and other signals to maintain function and survival of the infused CTLs (Barrett, DM, et al. Chimeric antigen receptor (CAR) and T cell receptor (TCR) Modified T cells Enter Main Street and Wall Street. J Immunol. 195(3): 755–761(2015)). In some embodiments, the cell is autologous with respect to a subject to be administered said cell. In other embodiments of the method, the cell is allogeneic with respect to a subject to be administered said cell.

[00326] In some embodiments of the method of modifying a target nucleic acid sequence of a gene in a population of cells, the modifying comprises introducing one or more single-stranded breaks in the target nucleic acid sequence of the cells of the population. In other embodiments of the method, the modifying comprises introducing one or more double-stranded breaks in the target nucleic acid sequence of the cells of the population. In other

embodiments of the method, the modifying comprises introducing an insertion, deletion, substitution, duplication, or inversion of one or more nucleotides in the target nucleic acid sequence of the cells of the population, resulting in a knock-down or knock-out of the gene in the cells of the population encoding one or more of the proteins involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response. In some embodiments, the targeted protein is selected from beta-2-microglobulin (B2M), T cell receptor alpha chain constant region (TRAC), ICP47 polypeptide, class II major histocompatibility complex transactivator (CIITA), T cell receptor beta constant 1 (TRBC1), T cell receptor beta constant 2 (TRBC2), human leukocyte antigen A (HLA-A), human leukocyte antigen B (HLA-B),TGFβ Receptor 2 (TGFβRII), programmed cell death 1 (PD-1), cytokine inducible SH2 (CISH), lymphocyte activating 3 (LAG-3), T cell immunoreceptor with Ig and ITIM domains (TIGIT), adenosine A2a receptor (ADORA2A), killer cell lectin like receptor C1 (NKG2A), cytotoxic T-lymphocyte-associated protein 4 (CTLA-4), T-cell immunoglobulin and mucin domain 3 (TIM-3), and 2B4 (CD244). In one exemplary embodiment, the cell surface marker protein is B2M and the targeting sequence of the gNA comprises a sequence selected from the sequences of Table 3A. In another exemplary embodiment, the cell surface marker protein is TRAC and the targeting sequence of the gNA comprises a sequence selected from the sequences of Table 3B. In another exemplary embodiment, the intracellular protein is CIITA and the targeting sequence of the gNA comprises a sequence selected from the sequences of Table 3C. In another embodiment of the method, the genes to be modified are at least two of the proteins selected from the group consisting of B2M, TRAC, and CIITA. In one embodiment of the foregoing, the cells of the population have been modified such that expression of the one or more proteins is reduced by at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, or at least about 95% in comparison to a cell that has not been modified. In another embodiment of the foregoing, the cells of the population have been modified such that at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, or at least about 95% of the cells do not express a detectable level of the one or more proteins in comparison to a cell that has not been modified. In another embodiment of the method, the cells have been modified such that at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, or at least 95% of the modified cells do not express a detectable level of MHC Class I molecules. In another embodiment of the method, the cells have been

modified such that at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, or at least 95% of the modified cells do not express a detectable level of wild-type T cell receptor.

[00327] In some embodiments, the method comprises insertion of the donor template into the break site(s) of the target nucleic acid sequence of the cells of the population. Depending on whether the system is used to knock-down/knock-out or to knock-in a protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response, the donor template can be a short single-stranded or double-stranded oligonucleotide, or a long single-stranded or double-stranded oligonucleotide encoding the gene for the protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response. For knock-down/knock-outs, the donor template sequence is typically not identical to the genomic sequence that it replaces and may contain one or more single base changes, insertions, deletions, inversions or rearrangements with respect to the genomic sequence, provided that there is sufficient homology with the target sequence to support homology-directed repair, which can result in a frame-shift or other mutation such that the target protein is not expressed or is expressed at a lower level. In certain embodiments, for knock-down/knock-out modifications, the donor template sequence will have at least about 60%, 70%, 80%, 90%, 95%, 98%, 99%, or 99.9% sequence identity to the target genomic sequence with which recombination is desired. In some embodiments, the donor template sequence comprises a non-homologous sequence flanked by two regions of homology ("homologous arms"), such that homology-directed repair between the target DNA region and the two flanking sequences results in insertion of the non-homologous sequence at the target region. The upstream and downstream sequences share sequence similarity with either side of the site of integration in the target DNA, facilitating insertion of the sequence. In some embodiments, the homologous region of a donor template sequence will have at least 50% sequence identity to the target genomic sequence with which recombination is desired. The donor template sequence may comprise certain sequence differences as compared to the genomic sequence, e.g., restriction sites, nucleotide polymorphisms, selectable markers (e.g., drug resistance genes, fluorescent proteins, enzymes etc.), etc., which may be used to assess for successful insertion of the donor nucleic acid at the cleavage site or in some cases may be used for other purposes (e.g., to signify expression at the targeted genomic locus). Alternatively, these sequence differences may include flanking recombination sequences such as FLPs, loxP sequences, or the like, that can be activated at a later time for removal of the marker sequence. In some embodiments, the donor template comprises at least about 10, at

least about 50, at least about 100, or at least about 200, or at least about 300, or at least about 400, or at least about 500, or at least about 600, or at least about 700, or at least about 800, or at least about 900, or at least about 1000, or at least about 10,000, or at least 15,000 nucleotides of a target gene. In other embodiments the donor template comprises at least about 20 to about 10,000 nucleotides, or at least about 200 to about 8000 nucleotides, or at least about 400 to about 6000 nucleotides, or at least about 600 to about 4000 nucleotides, or at least about 1000 to about 2000 nucleotides of a target gene. In other embodiments, the disclosure provides a method to alter a target sequence of a cell using a CasX:gNA system and a donor template comprising a deletion, insertion, or mutation of 20 or fewer nucleotides, 10 or fewer nucleotides, 5 or fewer nucleotides, 4 or fewer nucleotides, 3 or fewer nucleotides, 2 nucleotides, or a single nucleotide in an encoding nucleic acid of the gene wherein the insertion of the donor template results in a cell wherein the expression of the target protein is reduced by at least about 50%, at least about 60%, at least about 70%, at least about 80%, or at least about 90%, or at least about 95% in comparison to a cell that has not been modified. In some embodiments, the donor template comprises a single stranded DNA sequence. In other embodiments, the donor template comprises a single stranded RNA template. In other embodiments, the donor template comprises a double stranded DNA sequence.

[00328] In other cases, an exogenous donor template is inserted between the ends generated by CasX cleavage by homology-independent targeted integration (HITI) mechanisms. The exogenous sequence inserted by HITI can be any length, for example, a relatively short sequence of between 1 and 50 nucleotides in length, or a longer sequence of about 50-1000 nucleotides in length. The lack of homology can be, for example, having no more than 20-50% sequence identity and/or lacking in specific hybridization at low stringency. In other cases, the lack of homology can further include a criterion of having no more than 5, 6, 7, 8, or 9 bp identity. The donor template insertion can be mediated by homology-directed repair (HDR) or homology-independent targeted integration (HITI). In some cases, the insertion of the donor template results in a knock-down or knock-out of the gene in the cells of the population encoding the one or more proteins involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response. In some cases, the cells of the population have been modified such that expression of the one or more proteins is reduced by at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, or at least about 95% in comparison to a cell that has not been modified. In other cases,

the cells of the population have been modified such that the cells do not express a detectable level of the one or more proteins. In a particular embodiment, the one or more proteins are selected from the group consisting of B2M, TRAC, and CIITA. In one embodiment, the method is conducted ex vivo on the population of cells. In another embodiment, the method is conducted in vivo in a subject.

[00329] In some embodiments of the method of modifying a target nucleic acid sequence of a gene in a population of cells, the modifying further comprises insertion of a polynucleotide encoding a chimeric antigen receptor (CAR), described more fully below, resulting in expression of a detectable level of the CAR in the modified cells of the population. Exemplary CARs, and methods for engineering and introducing such receptors into cells, include those described, for example, in international patent application publication numbers WO2013126726, WO2012129514, WO2014031687, WO2013166321, WO2013071154, WO2013123061 U.S. patent application publication numbers US2002131960, US2013287748, US20130149337, US 20190136230, U.S. Pat. Nos. 6,451,995, 7,446,190, 8,252,592, 8,339,645, 8,398,282, 7,446,179, 6,410,319, 7,070,995, 7,265,209, 7,354,762, 7,446,191, 8,324,353, and 8,479,118, incorporated by reference herein. The polynucleotide can be introduced into the cells to be modified by a vector as described herein, or as a plasmid using conventional methods known in the art; e.g. electroporation or microinjection.

[00330] In some embodiments of the method of modifying a target nucleic acid sequence of a gene in a population of cells, the modifying further comprises insertion of a polynucleotide encoding a fusion protein comprising a subunit of a TCR linked to an antigen binding domain capable of re-targeting the TCR (referred to here as an engineered T cell receptor, or engineered TCR) to a desired protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response. The engineering of the T cell results in expression of a detectable level of the engineered TCR in the modified cells of the population, resulting in cells with a TCR for a second defined specificity that have utility in the treatment of a disease, like cancer or autoimmune diseases. The one or more subunits of the TCR may comprise any of TCR alpha, TCR beta, CD3-delta, CD3-epsilon, CD-gamma or CD3-zeta. Thus, the engineered TCR comprises a fusion protein comprising at least a portion of a TCR extracellular domain or transmembrane domain, and an antigen binding domain wherein the TCR subunit and the antigen binding domain are operatively linked. In some embodiments, the engineered TCR comprises a fusion protein comprising at least a portion of a TCR extracellular domain or transmembrane domain, a TCR intracellular domain

comprising a stimulatory domain, and an antigen binding domain wherein the TCR subunit and the antigen domain are operatively linked. Besides the ability of the modified population of T cells expressing a CAR or a second TCR to recognize and destroy respective target cells in vitro/ex vivo, the modified population of cells have utility in the treatment of subjects having a disease such as cancer or an autoimmune disease.

[00331] In some embodiments, the CAR or engineered TCR has an antigen binding domain having specific binding affinity for a disease antigen, optionally a tumor cell antigen. In the foregoing, the tumor cell antigen can be selected from the group consisting of cluster of differentiation 19 (CD19), cluster of differentiation 3 (CD3), CD3d molecule (CD3D), CD3g molecule (CD3G), CD3e molecule (CD3E), CD247 molecule (CD247, or CD3Z), CD8a molecule (CD8), CD7 molecule (CD7), membrane metalloendopeptidase (CD10), membrane spanning 4-domains A1 (CD20), CD22 molecule (CD22), TNF receptor superfamily member 8 (CD30), C-type lectin domain family 12 member A (CLL1), CD33 molecule (CD33), CD34 molecule (CD34), CD38 molecule (CD38), integrin subunit alpha 2b (CD41), CD44 molecule (Indian blood group) (CD44), CD47 molecule (CD47), integrin alpha 6 (CD49f), neural cell adhesion molecule 1 (CD56), CD70 molecule (CD70), CD74 molecule (CD74), CD99 molecule (Xg blood group) (CD99), interleukin 3 receptor subunit alpha (CD123), prominin 1 (CD133), syndecan 1 (CD138), carbonix anhydrase IX (CAIX), CC chemokine receptor 4 (CCR4), ADAM metallopeptidase domain 12 (ADAM12), adhesion G protein-coupled receptor E2 (ADGRE2), alkaline phosphatase placental-like 2 (ALPPL2), alpha 4 Integrin, angiopoietin-2 (ANG2), B-cell maturation antigen (BCMA), CD44V6, carcinoembryonic antigen (CEA), CEAC, CEA cell adhesion molecule 5 (CEACAM5), Claudin 6 (CLDN6), CLDN18, C-type lectin domain family 12 member A (CLEC12A), mesenchymal-epithelial transition factor (cMET), cytotoxic T-lymphocyte-associated protein 4 (CTLA4), epidermal growth factor receptor 1 (EGF1R), epidermal growth factor receptor variant III (EGFRvIII), epithelial glycoprotein 2 (EGP-2), epithelial cell adhesion molecule (EGP-40 or EpCAM), EPH receptor A2 (EphA2), ectonucleotide pyrophosphatase/phosphodiesterase 3 (ENPP3), erb-b2 receptor tyrosine kinase 2 (ERBB2), erb-b2 receptor tyrosine kinase 3 (ERBB3), erb-b2 receptor tyrosine kinase 4 (ERBB4), folate binding protein (FBP), fetal nicotinic acetylcholine receptor (AChR), folate receptor alpha (Fralpha or FOLR1), G protein-coupled receptor 143 (GPR143), glutamate metabotropic receptor 8 (GRM8), glypican-3 (GPC3), ganglioside GD2, ganglioside GD3, human epidermal growth factor receptor 1 (HER1), human epidermal growth factor receptor

2 (HER2), human epidermal growth factor receptor 3 (HER3), , Integrin B7, intercellular cell-adhesion molecule-1 (ICAM-l), human telomerase reverse transcriptase (hTERT), Interleukin-13 receptor α2 (IL-l3R-a2), K-light chain, Kinase insert domain receptor (KDR), Lewis-Y (LeY), chondromodulin-1 (LECT1), Ll cell adhesion molecule (L1CAM), Lysophosphatidic acid receptor 3 (LPAR3), melanoma-associated antigen 1 (MAGE-A1), mesothelin (MSLN), mucin 1 (MUC1), mucin 16, cell surface associated (MUC16), melanoma-associated antigen 3 (MAGEA3), tumor protein p53 (p53), Melanoma Antigen Recognized by T cells 1 (MART1), glycoprotein 100 (GPl00), Proteinase3 (PR1), ephrin-A receptor 2 (EphA2), Natural killer group 2D ligand (NKG2D ligand), New York esophageal squamous cell carcinoma 1 (NY-ESO-1), oncofetal antigen (h5T4), prostate-specific membrane antigen (PSMA), programmed death ligand 1 (PDL-1), receptor tyrosine kinase-like orphan receptor 1 (ROR1), trophoblast glycoprotein (TPBG), tumor-associated glycoprotein 72 (TAG-72), tumor-associated calcium signal transducer 2 (TROP-2), tyrosinase, survivin, vascular endothelial growth factor receptor 2 (VEGF- R2), Wilms tumor-1 (WT-1), leukocyte immunoglobulin-like receptor B2 (LILRB2), Preferentially Expressed Antigen In Melanoma (PRAME), T cell receptor beta constant 1(TRBC1), TRBC2, and (T-cell immunoglobulin mucin-3) TIM-3. In one embodiment, the CAR or engineered TCR comprises an antigen binding domain selected from the group consisting of linear antibody, single domain antibody (sdAb), and single-chain variable fragment (scFv). In another embodiment, the CAR further comprises at least one intracellular signaling domain, wherein the at least one intracellular signaling domain comprises one or more intracellular signaling domains isolated or derived from CD247 molecule (CD3-zeta), CD27 molecule (CD27), CD28 molecule (CD28), TNF receptor superfamily member 9 (4-1BB), inducible T cell costimulator (ICOS), or TNF receptor superfamily member 4 (OX40). In another embodiment, the CAR further comprises an extracellular hinge domain or spacer. In one embodiment, the extracellular hinge domain is an immunoglobulin like domain, wherein the hinge domain is isolated or derived from IgG1, IgG2, or IgG4. In another embodiment, the hinge domain is isolated or derived from CD8a molecule (CD8) or CD28. In another embodiment, the CAR further comprises a transmembrane domain. The transmembrane domain can be isolated or derived from the group consisting of CD3-zeta, CD4, CD8, and CD28.

[00332] In some embodiments, the antigen binding domain of the CAR or engineered TCR is selected from the group consisting of linear antibody, single domain antibody (sdAb), and

single-chain variable fragment (scFv). In a particular embodiment, the antigen binding domain is an scFv. In some embodiments, the scFv comprises a heavy chain variable domain (VH) and a light chain variable domain (VL) with specific binding affinity to the tumor cell antigen or target cell marker. Typically, the VH comprises a CDR-H1 region, a CDR-H2 region, a CDR-H3 region with interspersed framework regions (FR) connecting each CDR, and the VL comprises a CDR-L1 region, a CDR-L2 region, and a CDR-L3 region with its interspersed FR. In some embodiments, antigen binding domain exhibits an affinity with an equilibrium binding constant for a tumor cell antigen of between or between about 10^{-5} and 10^{-12} M and all individual values and ranges therein; such binding affinity being "specific". In other embodiments, the scFv comprises heavy chain complementarity determining regions (CDRs) and light chain CDRs identical to a reference antibody. In some cases, the reference antibody is a humanized antibody. Humanized antibodies refer to forms of non-human (e.g., murine) antibodies that are specific chimeric immunoglobulins, immunoglobulin chains, or antigen-binding fragments thereof that contain minimal sequence derived from non-human immunoglobulin. For the most part, humanized antibodies are human immunoglobulins in which residues from a CDR of the recipient antibody are replaced by residues from a CDR of a non-human species, such as mouse, rat, or rabbit having the desired specificity, affinity, and capacity. In some instances, Fv framework region (FR) residues are replaced by corresponding non-human residues. In general, the humanized antibody will comprise substantially all of at least one, and typically two, variable domains, in which all or substantially all of the CDR regions correspond to those of a non-human immunoglobulin and all or substantially all of the FR regions are those of a human immunoglobulin consensus sequence. In some embodiments of the method, the reference antibody utilized to provide the antigen binding domain of the CAR comprises VH and VL and/or heavy chain and light chain CDRs selected from the group consisting of the sequences set forth in Table 5. It will be understood that the VH and VL sequences of Table 5 comprise a CDR-H1 region, a CDR-H2 region, a CDR-H3 region, a CDR-L1 region, a CDR-L2 region, and a CDR-H3 region (indicated by the underlined sequences of Table 5), and that the antigen binding domains of the CAR and/or engineered TCR embodiments can be constructed with these CDRs utilizing alternative framework regions than those of the corresponding VH and VL, yet still retain specific binding affinity to the target cell marker. In some cases, the CDRs or the VL and VH can have one or more amino acid substitutions, deletions, or insertions so long as specific binding affinity to the target cell marker is retained. In the foregoing embodiments, a nucleic

acid encoding the CDRs or the VH and VL of the scFv as a component of the encoded CAR or TCR is utilized to modify the population of cells.

Table 5: Reference Antibody Sequences

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
	huOKT3	CD3	QVQLVQSGGGVVQPGRSLRLSCKAS**GYTFTRYTMH**WVRQAPGKGLEWIG**YINPSRGYTNYNQKVKD**RFTISRDNSKNTAFLQMDSLRPEDTGVYFCAR**YYDDHYCLDY**WGQGTPVTVSS (SEQ ID NO: 217)	DIQMTQSPSSLSASVGDRVTITC**SASSSVSYMN**WYQQTPGKAPKRWIY**DTSKLAS**GVPSRFSGSGSGTDYTFTISSLQPEDIATYYC**QQWSSNPFT**FGQGTKLQITR (SEQ ID NO: 218)
	huUCHT1	CD3	EVQLVESGGGLVQPGGSLRLSCAAS**GYSFTGYTMN**WVRQAPGKGLEWVA**LINPYKGVST**YNQKFKDRFTISVDKSKNTAYLQMNSLRAEDTAVYYCAR**SGYYGDSDWYFDV**WGQGTLVTVSS (SEQ ID NO: 219)	DIQMTQSPSSLSASVGDRVTITC**RASQDIRNYLN**WYQQKPGKAPKLLIY**YTSRLES**GVPSRFSGSGSGTDYTLTISSLQPEDFATYYC**QQGNTLPWT**FGQGTKVEIK (SEQ ID NO: 220)
	hu12F6	CD3	QVQLVQSGGGVVQPGRSLRLSCKAS**GYTFTSYTMH**WVRQAPGKGLEWIG**YINPSSGYTKYNQKFKD**RFTISADKSKSTAFLQMDSLRPEDTGVYFCAR**WQDYDVYFDY**WGQGTPVTVSS (SEQ ID NO: 221)	DIQMTQSPSSLSASVGDRVTMTC**RASSSVSYMH**WYQQTPGKAPKPWIY**ATSNLAS**GVPSRFSGSGSGTDYTLTISSLQPEDIATYYC**QQWSSNPPT**FGQGTKLQITR (SEQ ID NO: 222)
	mOKT3	CD3	QVQLQQSGAELARPGASVKMSCKAS**GYTFTRYTMH**WVKQRPGQGLEWIG**YINPSRGYTNYNQKFKD**KATLTTDKSSSTAYMQLSSLTSEDSAVYYCAR**YYDDHYCLDY**WGQGTTLTVSS (SEQ ID NO: 223)	QIVLTQSPAIMSASPGEKVTMTC**SASSSVSYMN**WYQQKSGTSPKRWIY**DTSKLAS**GVPAHFRGSGSGTSYSLTISGMEAEDAATYYC**QQWSSNPFT**FGSGTKLEINR (SEQ ID NO: 224)
	blinatumomab	CD3	DIKLQQSGAELARPGASVKMSCKTS**GYTFTRYTMH**WVKQRPGQGLEWIG**YINPSRGYTNYNQKFKD**KATLTTDKSSSTAYMQLSSLTSEDSAVYYCAR**YYDDH**	DIQLTQSPAIMSASPGEKVTMTC**RASSSVSYMN**WYQQKSGTSPKRWIY**DTSKVAS**GVPYRFSGSGSGTSYSLTISSMEAEDAATYYC**QQWSSNPL**

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
			YCLDYWGQGTTLTVSS (SEQ ID NO: 225)	**T**FGAGTKLELK (SEQ ID NO: 226)
	Solitomab	CD3	DVQLVQSGAEVKKPGASVKVSCKAS**GYTFTRYTMH**WVRQAPGQGLEWIG**YINPSRGYTNYADSVKG**RFTITTDKSTSTAYMELSSLRSEDTATYYCAR**YYDDHYCLDY**WGQGTTVTVSS (SEQ ID NO: 227)	DIVLTQSPATLSLSPGERATLSC**RASQSVSYMN**WYQQKPGKAPKRWIY**DTSKVAS**GVPARFSGSGSGTDYSLTINSLEAEDAATYYC**QQWSSNPLT**FGGGTKVEIK (SEQ ID NO: 228)
		CD3	EVQLVESGGGLVQPGGSLKLSCAASGFTFNKYAMNWVRQAPGKGLEWVARIRSKYNNYATYYADSVKDRFTISRDDSKNTAYLQMNNLKTEDTAVYYCVRHGNFGNSYISYWAYWGQGTLVTVSS (SEQ ID NO: 229)	QTVVTQEPSLTVSPGGTVTLTCGSSTGAVTSGYYPNWVQQKPGQAPRGLIGGTKFLAPGTPARFSGSLLGGKAALTLSGVQPEDEAEYYCALWYSNRWVFGGGTKLTVL (SEQ ID NO: 230)
		CD3	EVQLVESGGGLVQPGGSLRLSCAASGFTFNTYAMNWVRQAPGKGLEWVGRIRSKYNNYATYYADSVKGRFTISRDDSKNTLYLQMNSLRAEDTAVYYCVRHGNFGNSYVSWFAYWGQGTLVTVSS (SEQ ID NO: 231)	QAVVTQEPSLTVSPGGTVTLTCGSSTGAVTTSNYANWVQQKPGQAPRGLIGGTNKRAPGVPARFSGSLLGGKAALTLSGAQPEDEAEYYCALWYSNLWVFGGGTKLTVL (SEQ ID NO: 232)
		CD3	EVQLLESGGGLVQPGGSLKLSCAASGFTFNTYAMNWVRQAPGKGLEWVARIRSKYNNYATYYADSVKDRFTISRDDSKNTAYLQMNNLKTEDTAVYYCVRHGNFGNSYVSWFAYWGQGTLVTVSS (SEQ ID NO: 233)	ELVVTQEPSLTVSPGGTVTLTCRSSTGAVTTSNYANWVQQKPGQAPRGLIGGTNKRAPGTPARFSGSLLGGKAALTLSGVQPEDEAEYYCALWYSNLWVFGGGTKLTVL (SEQ ID NO: 234)
		CD3	EVKLLESGGGLVQPKGSLKLSCAASGFTFNTYAMNWVRQAPGKGLEWVARIRSKYNNYATYYADSVKDRFTISRDDSQSILYLQMNNLKTEDTAMYYCVRHGNFGNSYVSWFAYWGQGT	QAVVTQESALTTSPGETVTLTCRSSTGAVTTSNYANWVQEKPDHLFTGLIGGTNKRAPGVPARFSGSLIGDKAALTITGAQTEDEAIYFCALWYSN

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
			LVTVSS (SEQ ID NO: 235)	LWVFGGGTKLTVL (SEQ ID NO: 236)
Tysabri™	natalizumab	Alpha 4 Integrin	QVQLVQSGAEVKKPGASVKVSCKASGFNIK**DTYIH**WVRQAPGQRLEWMG**RIDPANGYTKYDPKFQG**RVTITADTSASTAYMELSSLRSEDTAVYYCAR**EGYYGNYGVYAMDY**WGQGTLVTVSS (SEQ ID NO: 237)	DIQMTQSPSSLSASVGDRVTITC**KTSQDINKYMA**WYQQTPGKAPRLLIH**YTSALQ**PGIPSRFSGSGSGRDYTFTISSLQPEDIATYYC**LQYDNLWT**FGQGTKVEIK (SEQ ID NO: 238)
REGN910	nesvacumab	Ang2	EVQLVESGGGLVQPGGSLRLSCAAS**GFTFSSYDI**HWVRQATGKGLEWVSAI**GPAGDTYYPGSV**KGRFTISRENAKNSLYLQMNSLRAGDTAVYYCAR**GLITFGGLIAPFD**YWGQGTLVTVSS (SEQ ID NO: 239)	EIVLTQSPGTLSLSPGERATLSCRA**SQSVSSTYLA**WYQQKPGQAPRLLIY**GASSRAT**GIPDRFSGSGSGTDFTLTISRLEPEDFAVYYC**QHYDNSQ**TFGQGTKVEIK (SEQ ID NO: 240)
hMFE23		CEA	QVKLEQSGAEVVKPGASVKLSCKAS**GFNIKDS**YMHWLRQGPGQRLEWIGWI**DPENGD**TEYAPKFQGKATFTTDTSANTAYLGLSSLRPEDTAVYYCNEG**TPTGPYYFD**YWGQGTLVTVSS (SEQ ID NO: 241)	ENVLTQSPSSMSASVGDRVNIACSA**SSSVS**YMHWFQQKPGKSPKLWIYSTSN**LAS**GVPSRFSGSGSGTDYSLTISSMQPEDAATYYCQQ**RSSYPL**TFGGGTKLEIK (SEQ ID NO: 242)
M5A (humanized T84.66)		CEA	EVQLVESGGGLVQPGGSLRLSCAASGFNIK**DTYMH**WVRQAPGKGLEWVA**RIDPANGNSKYADSVKG**RFTISADTSKNTAYLQMNSLRAEDTAVYYCAP**FGYYVSDYAMAY**WGQGTLVTVSS (SEQ ID NO: 243)	DIQLTQSPSSLSASVGDRVTITC**RAGESVDIFGVGFLH**WYQQKPGKAPKLLIY**RASNLES**GVPSRFSGSGSRTDFTLTISSLQPEDFATYYC**QQTNEDPYT**FGQGTKVEIK (SEQ ID NO: 244)
M5B (humanized T84.66)		CEA	EVQLVESGGGLVQPGGSLRLSCAASGFNIK**DTYMH**WVRQAPGKGLEWVA**RIDPANGNSKYVPKFQG**RATISADTSKNTAYLQMNSLRAEDTAVYYCAP**FGYYVSDYAMAY**WGQGTLVTVSS (SEQ ID NO: 245)	DIQLTQSPSSLSASVGDRVTITC**RAGESVDIFGVGFLH**WYQQKPGKAPKLLIY**RASNLES**GVPSRFSGSGSRTDFTLTISSLQPEDFATYYC**QQTNEDPYT**FGQGTKVEIK (SEQ ID NO: 246)

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
CEA-Cide	Labetuzumab (MN-14)	CEACAM5	EVQLVESGGGVVQPGRSLRLSCSASGFDFT**TYWMS**WVRQAPGKGLEWIG**EIHPDSSTINYAPSLKD**RFTISRDNAKNTLFLQMDSLRPEDTGVYFCAS**LYFGFPWFAY**WGQGTPVTVSS (SEQ ID NO: 247)	DIQLTQSPSSLSASVGDRVTITC**KASQDVGTSVA**WYQQKPGKAPKLLIY**WTSTRHT**GVPSRFSGSGSGTDFTFTISSLQPEDIATYYC**QQYSLYRS**FGQGTKVEIK (SEQ ID NO: 248)
CEA-Scan	arcitumomab	CEACAM5	EVKLVESGGGLVQPGGSLRLSCATS**GFTFTDYYMN**WVRQPPGKALEWLG**FIGNKANGYTTEYSAS**VKGRFTISRDKSQSILYLQMNTLRAEDSA**TYYCTRDR**GLRFYFDYWGQGTTLTVSS (SEQ ID NO: 249)	QTVLSQSPAILSASPGEKVTMTC**RASSSVTYIHW**YQQKPGSSPKSWIYA**TSNLASG**VPARFSGSGSGTSYSLTISRVEAEDAATYYC**QHWSSKPPT**FGGGTKLEIKR (SEQ ID NO: 250)
MT110		CEACAM5	EVQLVESGGGLVQPGRSLRLSCAASGFTVS**SYWMH**WVRQAPGKGLEWVG**FIRNKANGGTTEYAASVKG**RFTISRDDSKNTLYLQMNSLRAEDTAVYYCAR**DRGLRFYFDY**WGQGTTVTVSS (SEQ ID NO: 251)	QAVLTQPASLSASPGASASLTC**TLRRGINVGAYSIY**WYQQKPGSPPQYLLR**YKSDSDKQQGS**GVSSRFSASKDASANAGILLISGLQSEDEADYYC**MIWHSGASAV**FGGGTKLTVL (SEQ ID NO: 252)
MT103	blinatumomab	CD19	QVQLQQSGAELVRPGSSVKISCKASGYAFS**SYWMN**WVKQRPGQGLEWIG**QIWPGDGDTNYNGKFKG**KATLTADESSSTAYMQLSSLASEDSAVYFCAR**RETTTVGRYYYAMDY**WGQGTTVTVSS (SEQ ID NO: 253)	DIQLTQSPASLAVSLGQRATISC**KASQSVDYDGDSY**LNWYQQIPGQPPKLLI**YDASNLVS**GIPPRFSGSGSGTDFTLNIHPVEKVDAATYHC**QQSTEDPWT**FGGGTKLEIK (SEQ ID NO: 254)
Arzerra	ofatumumab	CD20	EVQLVESGGGLVQPGRSLRLSCAASGFTFN**DYAMH**WVRQAPGKGLEWVS**TISWNSGSIGYADSVKG**RFTISRDNAKKSLYLQMNSLRAEDTALYYCAK**DIQYGNYYYGMDV**WGQGTTVTVSS (SEQ ID NO: 255)	EIVLTQSPATLSLSPGERATLSC**RASQSVSSYLA**WYQQKPGQAPRLLIY**DASNRAT**GIPARFSGSGSGTDFTLTISSLEPEDFAVYYC**QQRSNWPIT**FGQGTRLEIK (SEQ ID NO: 256)
Bexxar™	tositumomab	CD20	QAYLQQSGAELVRPGASVKMSCKASGYTFT**SYNM**	QIVLSQSPAILSASPGEKVTMTC**RASSSVSYMH**

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
			HWVKQTPRQGLEWIG**AI YPGNGDTSYNQKFKG**K ATLTVDKSSSTAYMQLS SLTSEDSAVYFCAR**VVY YSNSYWYFDV**WGTGTT VTVSG (SEQ ID NO: 257)	W**APSNLAS**GVPARFSGS GSGTSYSLTISRVEAED AATYYC**QQWSFNPPT**F GAGTKLELK (SEQ ID NO: 258)
GAZYVA	Obinutuzumab	CD20	QVQLVQSGAEVKKPGSS VKVSCKASGYAFS**YSWI N**WVRQAPGQGLEWMG **RIFPGDGDTDYNGKFKG** RVTITADKSTSTAYMELS SLRSEDTAVYYCAR**NVF DGYWLVY**WGQGTLVTV SS (SEQ ID NO: 259)	DIVMTQTPLSLPVTPGE PASISC**RSSKSLLHSN GITYLY**WYLQKPGQSP QLLIY**QMSNLVS**GVPD RFSGSGSGTDFTLKISR VEAEDVGVYYC**AQNLE LPYT**FGGGTKVEIK (SEQ ID NO: 260)
	Ocrelizumab/ 2H7 v16	CD20	EVQLVESGGGLVQPGG SLRLSCAAS**GYTFTSYN** MHWVRQAPGKGLEWVG A**IYPGNGDT**SYNQKFKG RFTISVDKSKNTLYLQMN SLRAEDTAVYYCAR**VVY YSNSYWYFDV**WGQGTL VTVSS (SEQ ID NO: 261)	DIQMTQSPSSLSASVG DRVTITC**RASSSVSYM H**WYQQKPGKAPKPLIY **APSNLAS**GVPSRFSGS GSGTDFTLTISSLQPED FATYYC**QQWSFNPPT**F GQGTKVEIK (SEQ ID NO: 262)
Rituxan™	rituximab	CD20	QVQLQQPGAELVKPGAS VKMSCKAS**GYTFTSYN**M HWVKQTPGRGLEWIGA**I YPGNGDT**SYNQKFKGKA TLTADKSSSTAYMQLSSL TSEDSAVYYC**ARSTYYG GDWYFNV**WGAGTTVTV SA (SEQ ID NO: 263)	QIVLSQSPAILSASPGE KVTMTCRAS**SSVSY**IH WFQQKPGSSPKPWIY **ATS**NLASGVPVRFSGS GSGTSYSLTISRVEAED AATYYC**QQWTSNPPT**F GGGTKLEIK (SEQ ID NO: 264)
Zevalin™	ibritumomab tieuxetan	CD20	QAYLQQSGAELVRPGAS VKMSCKAS**GYTFTSYN**M HWVKQTPRQGLEWIG**AI YPGNGDTSYNQKF**KGK ATLTVDKSSSTAYMQLS SLTSEDSAVYFCAR**VVY YSNSYWYFDV**WGTGTT VTVSA (SEQ ID NO: 265)	QIVLSQSPAILSASPGE KVTMTC**RASSSVSYMH** WYQQKPGSSPKPWIY **APSNLAS**GVPARFSGS GSGTSYSLTISRVEAED AATYYC**QQWSFNPPT**F GAGTKLELK (SEQ ID NO: 266)
Mylotarg	Gemtuzumab (hP67.6)	CD33	QLVQSGAEVKKPGSSVK VSCKAS**GYTITDSNIH**WV RQAPGQSLEWIG**YIYPY NGGTDYNQKFKN**RATLT	DIQLTQSPSTLSASVGD RVTITC**RASESLDNYGI RFLT**WFQQKPGKAPKL LMY**AASNQGS**GVPSR

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
			VDNPTNTAYMELSSLRSEDTDFYYCVN**GNPWLAY**WGQGTLVTVSS (SEQ ID NO: 267)	FSGSGSGTEFTLTISSLQPDDFATYYC**QQTKEVPWS**FGQGTKVEVK (SEQ ID NO: 268)
Daratumumab		CD38	EVQLLESGGGLVQPGGSLRLSCAVS**GFTFNSFA**MSWVRQAPGKGLEWVSA**ISGSGGGT**YYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYFC**AKDKILWFGEPVFDY**WGQGTLVTVSS (SEQ ID NO: 269)	EIVLTQSPATLSLSPGERATLSCRAS**QSVSSY**LAWYQQKPGQAPRLLIY**DAS**NRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYC**QQRSNWPPT**FGQGTKVEIK (SEQ ID NO: 270)
	1F6	CD70	QIQLVQSGPEVKKPGETVKISCKAS**GYTFTNYGMN**WVKQAPGKGLKWMG**WINTYTGEPTYADAFKG**RFAFSLETSASTAYLQINNLKNEDTATYFCAR**DYGDYGMDY**WGQGTSVTVSS (SEQ ID NO: 271)	DIVLTQSPASLAVSLGQRATISC**RASKSVSTSGYSFMH**WYQQKPGQPPKLLIY**LASNLES**GVPARFSGSGSGTDFTLNIHPVEEEDAATYYC**QHSREVPWT**FGGGTKLEIK (SEQ ID NO: 272)
	2F2	CD70	QVQLQQSGTELMTPGASVTMSCKTS**GYTFSTYWIE**WVKQRPGHGLEWIG**EILGPSGYTDYNEKFKA**KATFTADTSSNTAYMQLSSLASEDSAVYYCAR**WDRLYAMDY**WGGGTSVTVSS (SEQ ID NO: 273)	DIVLTQSPASLTVSLGQKTTISC**RASKSVSTSGYSFMH**WYQLKPGQSPKLLIY**LASDLPS**GVPARFSGSGSGTDFTLKIHPVEEEDAATYYC**QHSREIPYT**FGGGTKLEIT (SEQ ID NO: 274)
	2H5	CD70	QVQLVESGGGVVQPGRSLRLSCAASGFTFS**SYIMH**WVRQAPGKGLEWVA**VISYDGRNKYYADSVKG**RFTISRDNSKNTLYLQMNSLRAED TAVYYCAR**DTDGYDFDY**WGQGTLVTVSS (SEQ ID NO: 275)	EIVLTQSPATLSLSPGERATLSC**RASQSVSSYLA**WYQQKPGQAPRLLI**YDASNRA**TGIPARFSGSGSGTDFTLTISSLEPEDFAVYYC**QQRTNWPLT**FGGGTKVEIK (SEQ ID NO: 276)
	10B4	CD70	QIQLVESGGGVVQPGRSLRLSCAASGFTFG**YYAMH**WVRQAPGKGLEWVA**VISYDGSIKYYADSVKG**RFTISRDNSKNTLYLQMNSLRAED	AIQLTQSPSSLSASVGDRVTITC**RASQGISSALA**WYQQKPGKAPKFLIY**DASSLES**GVPSRFSGSGSGTDFTLTISSLQPEDFATYYC**QQ**

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
			TAVYYCAR**EGPYSNYLDY**WGQGTLVTVSS (SEQ ID NO: 277)	**FNSYPFT**FGPGTKVDIK (SEQ ID NO: 278)
	8B5	CD70	QVQLVESGGGVVQPGRSLRLSCATSGFTFS**DYGMH**WVRQAPGKGLEWVA**VIWYDGSNKYYADSVKG**RFTISRDNSKKTLSLQMNSLRAED TAVYYCAR**DSIMVRGDY**WGQGTLVTVSS (SEQ ID NO: 279)	DIQMTQSPSSLSASVGDRVTITC**RASQGISSWLA**WYQQKPEKAPKSLIY**AASSLQS**GVPSRFSGSGSGTDFTLTISSLQPEDFATYYC**QQYNSYPLT**FGGGTKVEIK (SEQ ID NO: 280)
	18E7	CD70	QVQLVESGGGVVQPGRSLRLSCAASGFTFS**DHGMH**WVRQAPGKGLEWVA**VIWYDGSNKYYADSVKG**RFTISRDNSKNTLYLQMNSLRAED TAVYYCAR**DSIMVRGDY**WGQGTLVTVSS (SEQ ID NO: 281)	DIQMTQSPSSLSASVGDRVTITC**RASQGISSWLA**WYQQKPEKAPKSLIY**AASSLQS**GVPSRFSGSGSGTDFTLTISSLQPEDFATYYC**QQYNSYPLT**FGGGTKVEIK (SEQ ID NO: 282)
	69A7	CD70	QVQLQESGPGLVKPSETLSLTCTVSGGSVS**SDYYYWS**WIRQPPGKGLEWLG**YIYYSGSTNYNPSLKS**RVTISVDTSKNQFSLKLRSVTTA DTAVYYCAR**GDGDYGGNCF**DYWGQGTLVTVSS (SEQ ID NO: 283)	EIVLTQSPATLSLSPGERATLSC**RASQSVSSYLA**WYQQKPGQAPRLLIF**DASNRAT**GIPARFSGSGSGTDFTLTISSLEPEDFAVYYC**QQRSNWPLT**FGGGTKVEIK (SEQ ID NO: 284)
CE-355621		cMET	QVQLVQSGAEVKKPGASVKVSCKASGYTFT**SYGFS**WVRQAPGQGLEWMG**WISASNGNTYYAQKLQG**RVTMTTDTSTSTAYMELRSLRSDDTAVYYCAR**VYADYADY**WGQGTLVTVSS (SEQ ID NO: 285)	DIQMTQSPSSVSASVGDRVTITC**RASQGINTWLA**WYQQKPGKAPKLLIY**AASSLKS**GVPSRFSGSGSGTDFTLTISSLQPEDFATYYC**QQANSFPLT**FGGGTKVEIK (SEQ ID NO: 286)
LY2875358	emibetuzumab	cMET	QVQLVQSGAEVKKPGASVKVSCKAS**GYTFTDYY**MHWVRQAPGQGLEWMG**RVNPNRRGTT**YNQKFEGRVTMTTDTSTSTAYMELRSLRSDDTAVYYC**ARAN**	DIQMTQSPSSLSASVGDRVTITCSVS**SSVSSIY**LHWYQQKPGKAPKLLIY**STS**NLASGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC**QVYSGYPLT**

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
			WLDYWGQGTTVTVSS (SEQ ID NO: 287)	FGGGTKVEIK (SEQ ID NO: 288)
MetMAb	onartuzumab	cMET	EVQLVESGGGLVQPGGSLRLSCAASGYTFT**SYWLH**WVRQAPGKGLEWVG**MIDPSNSDTRFNPNFKD**RFTISADTSKNTAYLQMNSLRAEDTAVYYC**ATYRSYVTPLDY**WGQGTLVTVSS (SEQ ID NO: 289)	DIQMTQSPSSLSASVGDRVTITC**KSSQSLLYTSSQKNYLA**WYQQKPGKAPKLLIY**WASTRES**GVPSRFSGSGSGTDFTLTISSLQPEDFATYYC**QQYYAYPWT**FGQGTKVEIK (SEQ ID NO: 290)
	tremelimumab (CP-675206, or 11.2.1)	CTLA4	QVQLVESGGGVVQPGRSLRLSCAAS**GFTFSSYGMH**WVRQAPGKGLEWVA**VIWYDGSNKYYADSV**KGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR**DPRGATLYYYYYGMDV**WGQGTTVTVSS (SEQ ID NO: 291)	DIQMTQSPSSLSASVGDRVTITC**RASQSINSYLD**WYQQKPGKAPKLLIY**AASSLQS**GVPSRFSGSGSGTDFTLTISSLQPEDFATYYC**QQYYSTPFT**FGPGTKVEIK (SEQ ID NO: 292)
Yervoy	Ipilimumab 10D1	CTLA4	QVQLVESGGGVVQPGRSLRLSCAASGFTFS**SYTMH**WVRQAPGKGLEWVT**FISYDGNNKYYADSVKG**RFTISRDNSKNTLYLQMNSLRAEDTAIYYCAR**TGWLGPFDY**WGQGTLVTVSS (SEQ ID NO: 293)	EIVLTQSPGTLSLSPGERATLSC**RASQSVGSSYLA**WYQQKPGQAPRLLIY**GAFSRAT**GIPDRFSGSGSGTDFTLTISRLEPEDFAVYYC**QQYGSSPWT**FGQGTKVEIK (SEQ ID NO: 294)
AGS16F	H16-7.8	ENPP3	QVQLQESGPGLVKPSQTLSLTCTVSGGSIS**SGGYY**WSWIRQHPGKGLEWIG**IIYYSGSTYYNPSLKS**RVTISVDTSKNQFSLKLNSVTAADTAVFYCAR**VAIVTTIPGGMDV**WGQGTTVTVSS (SEQ ID NO: 295)	EIVLTQSPDFQSVTPKEKVTITC**RASQSIGISLH**WYQQKPDQSPKLLIK**YASQSFS**GVPSRFSGSGSGTDFTLTINSLEAEDAATYYC**HQSRSFPWT**FGQGTKVEIK (SEQ ID NO: 296)
MT110	solitomab	EpCAM	EVQLLEQSGAELVRPGTSVKISCKASGYAFT**NYWLG**WVKQRPGHGLEWIG**DIFPGSGNIHYNEKFKG**KATLTADKSSSTAYMQLSSLTFEDSAVYFCAR**LRNWDEPMDY**WGQGTTVTVSS (SEQ ID NO: 297)	ELVMTQSPSSLTVTAGEKVTMSC**KSSQSLLNSGNQKNYLT**WYQQKPGQPPKLLIY**WASTRES**GVPDRFTGSGSGTDFTLTISSVQAEDLAVYYC**QNDYSYPLT**FGAGTKLEIK (SEQ ID NO: 298)

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
MT201	Adecatumumab	EpCAM	EVQLLESGGGVVQPGRSLRLSCAASGFTFS**SYGMH**WVRQAPGKGLEWVA**VISYDGSNKYYADSVKG**RFTISRDNSKNTLYLQMNSLRAEDTAVYYCAK**DMGWGSGWRPYYYYGMDV**WGQGTTVTVSS (SEQ ID NO: 299)	ELQMTQSPSSLSASVGDRVTITC**RTSQSISSYLN**WYQQKPGQPPKLLIY**WASTRES**GVPDRFSGSGSGTDFTLTISSLQPEDSATYYC**QQSYDIPYT**FGQGTKLEIK (SEQ ID NO: 300)
Panorex	Edrecolomab Mab CO17-1A	EpCAM	QVQLQQSGAELVRPGTSVKVSCKAS**GYAFTNYL**IEWVKQRPGQGLEWIGV**INPGSGGT**NYNEKFKGKATLTADKSSSTAYMQLSSLTSDDSAVYFC**ARDGPWFAY**WGQGTLVTVSA (SEQ ID NO: 301)	NIVMTQSPKSMSMSVGERVTLTCKAS**ENVVTY**VSWYQQKPEQSPKLLIY**GAS**NRYTGVPDRFTGSGSATDFTLTISSVQAEDLADYHC**GQGYSYPYT**FGGGTKLEIK (SEQ ID NO: 302)
	tucotuzumab	EpCAM	QIQLVQSGPELKKPGETVKISCKAS**GYTFTNYGMN**WVRQAPGKGLKWMG**WINTYTGEPTYAD**DFKGRFVFSLETSASTAFLQLNNLRSEDTATYFCVRFI**SKGDY**WGQGTSVTVSS (SEQ ID NO: 303)	QILLTQSPAIMSASPGEKVTMTC**SASSSVS**YMLWYQQKPGSSPKPWIF**DTSNLAS**GFPARFSGSGSGTSYSLIISSMEAEDAATYYC**HQRSGYPYT**FGGGTKLEIK (SEQ ID NO: 304)
UBS-54		EpCAM	VQLQQSDAELVKPGASVKISCKAS**GYTFTDHAIH**WVKQNPEQGLEWIG**YFSPGNDDFKYNE**RFKGKATLTADKSSSTAYVQLNSLTSEDSAVYFCTR**SLNMAY**WGQGTSVTVSS (SEQ ID NO: 305)	DIVMTQSPDSLAVSLGERATINC**KSSQSVLYSSNNKNYLA**WYQQKPGQPPKLLIY**WASTRES**GVPDRFSGSGSGTDFTLTISSLQAEDVAVYYC**QQYYSYPLT**FGGGTKVKES (SEQ ID NO: 306)
3622W94	323/A3	EpCAM	EVQLVQSGPEVKKPGASVKVSCKAS**GYTFTNYGMN**WVRQAPGQGLEWMG**WINTYTGEPTYGE**DFKGRFAFSLDTSASTAYMELSSLRSEDTAVYFCARFG**NYVDY**WGQGSLVTVSS (SEQ ID NO: 307)	DIVMTQSPLSLPVTPGEPASISC**RSSINKKGSNGITY**LYWYLQKPGQSPQLLIYQMSNLASGVPDRF**SGSGS**GTDFTLKISRVEAEDVGVYYC**AQNLEIPRT**FGQGTKVEIK (SEQ ID NO: 308)
4D5MOCBv2		EpCAM	EVQLVQSGPGLVQPGGSVRISCAASGYTFT**NYGMN**WVKQAPGKGLEWM	DIQMTQSPSSLSASVGDRVTITC**RSTKSLLHSNGITYLY**WYQQKPGKAP

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
			GWINTYTGESTYADSFKGRFTFSLDTSASAAYLQINSLRAEDTAVYYCARFAIKGDYWGQGTLLTVSS (SEQ ID NO: 309)	KLLIYQMSNLASGVPSRFSSSGSGTDFTLTISSLQPEDFATYYCAQNLEIPRTFGQGTKVEIK (SEQ ID NO: 310)
4D5MOCB		EpCAM	EVQLVQSGPGLVQPGGSVRISCAASGYTFTNYGMNWVKQAPGKGLEWMGWINTYTGESTYADSFKGRFTFSLDTSASAAYLQINSLRAEDTAVYYCARFAIKGDYWGQGTLLTVSS (SEQ ID NO: 311)	DIQMTQSPSSLSASVGDRVTITCRSTKSLLHSNGITYLYWYQQKPGKAPKLLIYQMSNLASGVPSRFSSSGSGTDFTLTISSLQPEDFATYYCAQNLEIPRTFGQGTKVELK (SEQ ID NO: 312)
MEDI-547	1C1	EphA2	EVQLLESGGGLVQPGGSLRLSCAASGFTFSHYMMAWVRQAPGKGLEWVSRIGPSGGPTHYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAGYDSGYDYVAVAGPAEYFQHWGQGTLVTVSS (SEQ ID NO: 313)	DIQMTQSPSSLSASVGDRVTITCRASQSISTWLAWYQQKPGKAPKLLIYKASNLHTGVPSRFSGSGSGTEFSLTISGLQPDDFATYYCQQYNSYSRTFGQGTKVEIK (SEQ ID NO: 314)
MORAb-003	farletuzumab	FOLR1	EVQLVESGGGVVQPGRSLRLSCSASGFTFSGYGLSWVRQAPGKGLEWVAMISSGGSYTYYADSVKGRFAISRDNAKNTLFLQMDSLRPEDTGVYFCARHGDDPAWFAYWGQGTPVTVSS (SEQ ID NO: 315)	DIQLTQSPSSLSASVGDRVTITCSVSSSISSNNLHWYQQKPGKAPKPWIYGTSNLASGVPSRFSGSGSGTDYTFTISSLQPEDIATYYCQQWSSYPYMYTFGQGTKVEIK (SEQ ID NO: 316)
M9346A	huMOV19 (vLCv1.00)	FOLR1	QVQLVQSGAEVVKPGASVKISCKASGYTFTGYFMNWVKQSPGQSLEWIGRIHPYDGDTFYNQKFQGKATLTVDKSSNTAHMELLSLTSEDFAVYYCTRYDGSRAMDYWGQGTTVTVSS (SEQ ID NO: 317)	DIVLTQSPLSLAVSLGQPAIISCKASQSVSFAGTSLMHWYHQKPGQQPRLLIYRASNLEAGVPDRFSGSGSKTDFTLNISPVEAEDAATYYCQQSREYPYTFGGGTKLEIK (SEQ ID NO: 318)
M9346A	huMOV19 (vLCv1.60)	FOLR1	QVQLVQSGAEVVKPGASVKISCKASGYTFTGYFMNWVKQSPGQSLEWIGRIHPYDGDTFYNQKFQGKATLTVDKSSNTAHMELLSLTSEDFAVYYCTRYDGS	DIVLTQSPLSLAVSLGQPAIISCKASQSVSFAGTSLMHWYHQKPGQQPRLLIYRASNLEAGVPDRFSGSGSKTDFTLTISPVEAEDAATYYCQQSREYP

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
			RAMDYWGQGTTVTVSS (SEQ ID NO: 319)	**YT**FGGGTKLEIK (SEQ ID NO: 320)
26B3.F2		FOLR1	GPELVKPGASVKISCKAS DYSFT**GYFMN**WVMQSH GKSLEWIG**RIFPYNGDTF YNQKFKG**RATLTVDKSS STAHMELRSLASEDSAV YFCAR**GTHYFDY**WGQG TTLTVSS (SEQ ID NO: 321)	PASLSASVGETVTITC**R TSENIFSYLA**WYQQKQ GISPQLLVY**NAKTLAE** GVPSRFSGSGSGTQFS LKINSLQPEDFGSYYC **QHHYAFPWT**FGGGSK LEIK (SEQ ID NO: 322)
RG7686	GC33	GPC3	QVQLVQSGAEVKKPGAS VKVSCKASGYTFT**DYEM H**WVRQAPGQGLEWMG **ALDPKTGDTAYSQKFKG** RVTLTADKSTSTAYMELS SLTSED TAVYYCTR**FYSYTY**WGQ GTLVTVSS (SEQ ID NO: 323)	DVVMTQSPLSLPVTPG EPASISC**RSSQSLVHS NGNTYLH**WYLQKPGQ SPQLLIY**KVSNRFS**GVP DRFSGSGSGTDFTLKIS RVEAEDVGV YYC**SQNTHVPPT**FGQG TKLEIK (SEQ ID NO: 324)
	4A6	GPC3	EVQLVQSGAEVKKPGES LKISCKGSGYSFT**SYWIA** WVRQMPGKGLEWMG**IIF PGDSDTRYSPSFQG**QVT ISADRSIRTAYLQWSSLK ASD TALYYCAR**TREGYFDY**W GQGTLVTVSS (SEQ ID NO: 325)	EIVLTQSPGTLSLSPGE RATLSC**RAVQSVSSSY LA**WYQQKPGQAPRLLI Y**GASSRAT**GIPDRFSG SGSGTDFTLTISRLEPE DFAVYYC**Q QYGSSPT**FGGGTKVEI K (SEQ ID NO: 326)
	11E7	GPC3	EVQLVQSGAEVKKPGES LKISCKGSGYSFT**NYWIA** WVRQMPGKGLEWMG**IIY PGDSDTRYSPSFQG**QVT ISADKSIRTAYLQWSSLK ASD TAMYYCAR**TREGYFDY** WGQGTLVTVSS (SEQ ID NO: 327)	EIVLTQSPGTLSLSPGE RATLSC**RASQSVSSSY LA**WYQQKPGQAPRLLI Y**GASSRAT**GIPDRFSG SGSGTDFTLTISRLEPE DFAVYYC**Q QYGSSPT**FGGGTKVEI K (SEQ ID NO: 328)
	16D10	GPC3	EVQLVQSGADVTKPGES LKISCKVSGYRFT**NYWIG** WMRQMSGKGLEWMG**II YPGDSDTRYSPSFQG**HV TISADKSINTAYLRWSSL KASD TAIYYCAR**TREGFFDY**W	EILLTQSPGTLSLSPGE RATLSC**RASQSVSSSY LA**WYQQKPGQAPRLLI Y**GASSRAT**GIPDRFSG SGSGTDFTLTISRLEPE DFAVYYC**Q**

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
			GQGTPVTVSS (SEQ ID NO: 329)	**QYGSSPT**FGQGTKVEIK (SEQ ID NO: 330)
AMG-595		EGFR	QVQLVESGGGVVQSGRSLRLSCAAS**GFTFRNYGMH**WVRQAPGKGLEW**VAVIWYDGSDKYYADSVRG**RFTISRDNSKNTLYLQMNSLRAEDTAVYYCARDGY**DILTGNPRDFDY**WGQGTLVTVSS (SEQ ID NO: 331)	DTVMTQTPLSSHVTLGQPASISC**RSSQSLVHSDGNTYLS**WLQQRPGQPPRLLIY**RISRRFS**GVPDRFSGSGAGTDFTLEISRVEAEDVGVYYC**MQSTHVPRT**FGQGTKVEIK (SEQ ID NO: 332)
Erbitux™	cetutximab	EGFR	QVQLKQSGPGLVQPSQSLSITCTVS**GFSLTNYG**VHWVRQSPGKGLEWLGV**IWSGGNT**DYNTPFTSRLSINKDNSKSQVFFKMNSLQSNDTAIYYC**ARALTYYDYEFAY**WGQGTLVTVSA (SEQ ID NO: 333)	DILLTQSPVILSVSPGERVSFSCRAS**QSIGTN**IHWYQQRTNGSPRLLIK**YAS**ESISGIPSRFSGSGSGTDFTLSINSVESEDIADYYC**QQNNNWPTT**FGAGTKLELK (SEQ ID NO: 334)
GA201	Imgatuzumab	EGFR	QVQLVQSGAEVKKPGSSVKVSCKASGFTFT**DYKIH**WVRQAPGQGLEWMG**YFNPNSGYSTYAQKFQG**RVTITADKSTSTAYMELSSLRSEDTAVYYCAR**LSPGGYYVMDA**WGQGTTVTVSS (SEQ ID NO: 335)	DIQMTQSPSSLSASVGDRVTITC**RASQGINNYLN**WYQQKPGKAPKRLIY**NTNNLQT**GVPSRFSGSGSGTEFTLTISSLQPEDFATYYC**LQHNSFPT**FGQGTKLEIK (SEQ ID NO: 336)
Humax	zalutumumab	EGFR	QVQLVESGGGVVQPGRSLRLSCAASGFTFS**TYGMH**WVRQAPGKGLEWVA**VIWDDGSYKYYGDSVKG**RFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR**DGITMVRGVMKDYFDY**WGQGTLVTVSS (SEQ ID NO: 337)	AIQLTQSPSSLSASVGDRVTITC**RASQDISSALV**WYQQKPGKAPKLLIY**DASSLES**GVPSRFSGSESGTDFTLTISSLQPEDFATYYC**QQFNSYPLT**FGGGTKVEIK (SEQ ID NO: 338)
IMC-11F8	necitumumab	EGFR	QVQLQESGPGLVKPSQTLSLTCTVSGGSIS**SGDYYWS**WIRQPPGKGLEWIG**YIYYSGSTDYNPSLKS**RVTMSVDTSKNQFSLKVNSVTAADTAVYYCAR**VSIFGVGTFDY**WGQGTLVTVSS (SEQ ID NO: 339)	EIVMTQSPATLSLSPGERATLSC**RASQSVSSYLA**WYQQKPGQAPRLLIY**DASNRAT**GIPARFSGSGSGTDFTLTISSLEPEDFAVYYC**HQYGSTPLT**FGGGTKAEIK (SEQ ID NO: 340)

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
MM-151	P1X	EGFR	QVQLVQSGAEVKKPGSSVKVSCKASGGTFS**SYAIS**WVRQAPGQGLEWMG**SII PIFGTVNYAQKFQG**RVTITADESTSTAYMELSSLRSEDTAVYYCAR**DPSVNL YWYFDL**WGRGTLVTVSS (SEQ ID NO: 341)	DIQMTQSPSTLSASVGDRVTITC**RASQSISSW WA**WYQQKPGKAPKLLIY**DASSLES**GVPSRFSGSGSGTEFTLTISSLQPDDFATYYC**QQYHAHPTT**FGGGTKVEIK (SEQ ID NO: 342)
MM-151	P2X	EGFR	QVQLVQSGAEVKKPGSSVKVSCKASGGTFG**SYAI S**WVRQAPGQGLEWMG**SIIPIFGAANPAQKSQG**RVTITADESTSTAYMELSSLRSEDTAVYYCAK**MGRG KVAFDI**WGQGTMVTVSS (SEQ ID NO: 343)	DIVMTQSPDSLAVSLGERATINC**KSSQSVLYS PNNKNYLA**WYQQKPGQPPKLLIY**WASTRES**GVPDRFSGSGSGTDFTLTISSLQAEDVAVYYC**Q QYYGSPIT**FGGGTKVEIK (SEQ ID NO: 344)
MM-151	P3X	EGFR	QVQLVQSGAEVKKPGASVKVSCKASGYAFT**SYGIN**WVRQAPGQGLEWMG**WI SAYNGNTYYAQKLRG**RVTMTTDTSTSTAYMELRSLRSDDTAVYYCAR**DLG GYGSGSVPFDP**WGQGTLVTVSS (SEQ ID NO: 345)	EIVMTQSPATLSVSPGERATLSC**RASQSVSSNL A**WYQQKPGQAPRLLIY**GASTRAT**GIPARFSGSGSGTEFTLTISSLQSEDFAVYYC**QDYRTWPRR V**FGGGTKVEIK (SEQ ID NO: 346)
TheraCIM	nimotuzumab	EGFR	QVQLQQSGAEVKKPGSSVKVSCKASGYTFT**NYYI Y**WVRQAPGQGLEWIG**GI NPTSGGSNFNEKFKT**RVTITADESSTTAYMELSSLRSEDTAFYFCTR**QGLWF DSDGRGFDF**WGQGTTVTVSS (SEQ ID NO: 347)	DIQMTQSPSSLSASVGDRVTITC**RSSQNIVHSN GNTYLD**WYQQTPGKAPKLLIY**KVSNRFS**GVPSRFSGSGSGTDFTFTISSLQPEDIATYYC**FQYSHV PWT**FGQGTKLQIT (SEQ ID NO: 348)
Vectibix™	panitumumab	EGFR	QVQLQESGPGLVKPSETLSLTCTVS**GGSVSSGDY Y**WTWIRQSPGKGLEWIG**HIYYSGNT**NYNPSLKSRLTISIDTSKTQFSLKLSSVTAADTAIYYC**VRDRVTGA FDI**WGQGTMVTVSS (SEQ ID NO: 349)	DIQMTQSPSSLSASVGDRVTITCQAS**QDISNY**LNWYQQKPGKAPKLLIY**DAS**NLETGVPSRFSGSGSGTDFTFTISSLQPEDIATYFC**QHFDHLPLA**FGGGTKVEIK (SEQ ID NO: 350)
07D06		EGFR	QIQLVQSGPELKKPGETVKISCKAS**GYTFTEYP**IHWVKQAPGKGFKWMGM**I**	DVVMTQTPLSLPVSLGDQASISCRSS**QSLVHS NGNTY**LHWYLQKPGQ

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
			YTDIGKPTYAEEFKGRFA FSLETSASTAYLQINNLK NEDTATYFC**VRDRYDSL FDY**WGQGTTLTVSS (SEQ ID NO: 351)	SPKLLIY**KVSNR**FSGVP DRFSGSGSGTDFTLKIS RVEAEDLGVYFC**SQST HVPWT**FGGGTKLEIK (SEQ ID NO: 352)
12D03		EGFR	EMQLVESGGGFVKPGG SLKLSCAASGFAFS**HYD MS**WVRQTPKQRLEWVA **YIASGGDITYYADTVKG**R FTISRDNAQNTLYLQMSS LKSEDTAMFYCSR**SSYG NNGDALDF**WGQGTSVT VSS (SEQ ID NO: 353)	DVVMTQTPLSLPVSLG DQASISC**RSSQSLVHS NGNTYLH**WYLQKPGQ SPKLLIY**KVSNRFS**GVP DRFSGSGSGTDFTLKIS RVEAEDLGVYFC**SQST HVLT**FGSGTKLEIK (SEQ ID NO: 354)
	C1	HER2	QVQLVESGGGLVQPGG SLRLSCAASGFTFS**SYA MG**WVRQAPGKGLEWVS **SISGSSRYIYYADSVKG**R FTISRDNSKNTLYLQMNS LRAEDTAV YYCAK**MDASGSYFNF**W GQGTLVTVSS (SEQ ID NO: 355)	QSPSFLSAFVGDRITIT C**RASPGIRNYLA**WYQ QKPGKAPKLLIY**AASTL QS**GVPSRFSGSGSGT DFTLTISSLQPEDFATY YC**QQYNSYPLS**FGGG TKVEIK (SEQ ID NO: 356)
Erbicin		HER2	QVQLLQSAAEVKKPGES LKISCKGSGYSFT**SYWIG** WVRQMPGKGLEWMG**IIY PGDSDTRYSPSFQG**QVT ISADKSISTAYLQWSSLK ASDTAVYYCAR**WRDSPL** WGQGTLVTVSS (SEQ ID NO: 357)	QAVVTQEPSFSVSPGG TVTLTC**GLSSGSVSTS YYPS**WYQQTPGQAPR TLIY**STNTRSS**GVPDRF SGSILGNKAALTITGAQ ADDESDYYC**VLYMGS GQYV**FGGGTKLTVL (SEQ ID NO: 358)
Herceptin	trastuzumab	HER2	EVQLVESGGGLVQPGG SLRLSCAAS**GFNIKDTY**I HWVRQAPGKGLEWVAR **IYPTNGYT**RYADSVKGR FTISADTSKNTAYLQMNS LRAEDTAVYYC**SRWGG DGFYAMDY**WGQGTLVT VSS (SEQ ID NO: 359)	DIQMTQSPSSLSASVG DRVTITCRAS**QDVNTA** VAWYQQKPGKAPKLLI Y**SAS**FLYSGVPSRFSG SRSGTDFTLTISSLQPE DFATYYC**QQHYTTPPT** FGQGTKVEIK (SEQ ID NO: 360)
MAGH22	margetuximab	HER2	QVQLQQSGPELVKPGAS LKLSCTAS**GFNIKDTY**IH WVKQRPEQGLEWIGR**IY PTNGYT**RYDPKFQDKATI TADTSSNTAYLQVSRLTS EDTAVYYC**SRWGGDGF**	DIVMTQSHKFMSTSVG DRVSITCKAS**QDVNTA** VAWYQQKPGHSPKLLI Y**SAS**FRYTGVPDRFTG SRSGTDFTFTISSVQAE DLAVYYC**QQHYTTPPT**

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
			YAMDYWGQGASVTVSS (SEQ ID NO: 361)	FGGGTKVEIK (SEQ ID NO: 362)
MM-302	F5	HER2	QVQLVESGGGLVQPGGSLRLSCAASGFTFR**SYAMS**WVRQAPGKGLEWVS**AISGRGDNTYYADSVKG**RFTISRDNSKNTLYLQMNSLRAEDTAVYYC**AKMTSNAFAFDY**WGQGTLVTVSS (SEQ ID NO: 363)	QSVLTQPPSVSGAPGQRVTISC**TGSSSNIGAGYGVH**WYQQLPGTAPKLLIY**GNTNRPS**GVPDRFSGFKSGTSASLAITGLQAEDEADYYC**QFYDSSLSGWV**FGGGTKLTVL (SEQ ID NO: 364)
Perjeta	pertuzumab	HER2	EVQLVESGGGLVQPGGSLRLSCAAS**GFTFTDYT**MDWVRQAPGKGLEWVAD**VNPNSGGS**IYNQRFKGRFTLSVDRSKNTLYLQMNSLRAEDTAVYYC**ARNLGPSFYFDY**WGQGTLVTVSS (SEQ ID NO: 365)	DIQMTQSPSSLSASVGDRVTITCKASQ**DVSIG**VAWYQQKPGKAPKLLIY**SAS**YRYTGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC**QQYYIYPYT**FGQGTKVEIK (SEQ ID NO: 366)
MM-121/SAR256212		HER3	EVQLLESGGGLVQPGGSLRLSCAASGFTFS**HYVMA**WVRQAPGKGLEWVS**SISSSGGWTLYADSVKG**RFTISRDNSKNTLYLQMNSLRAEDTAVYYCTR**GLKMATIFDY**WGQGTLVTVSS (SEQ ID NO: 367)	QSALTQPASVSGSPGQSITISC**TGTSSDVGSYNVVS**WYQQHPGKAPKLIIY**EVSQRPS**GVSNRFSGSKSGNTASLTISGLQTEDEADYYC**CSYAGSSIFVI**FGGGTKVTVL (SEQ ID NO: 368)
MEHD7945A	Duligotumab	EGFR/HER3	EVQLVESGGGLVQPGGSLRLSCAASGFTLS**GDWIH**WVRQAPGKGLEWVG**EISAAGGYTDYADSVKG**RFTISADTSKNTAYLQMNSLRAEDTAVYYCAR**ESRVSFEAAMDY**WGQGTLVTVSS (SEQ ID NO: 369)	DIQMTQSPSSLSASVGDRVTITC**RASQNIATDVA**WYQQKPGKAPKLLIY**SASFLYS**GVPSRFSGSGSGTDFTLTISSLQPEDFATYYC**QQSEPEPYT**FGQGTKVEIK (SEQ ID NO: 370)
MM-111		HER2/3	QVQLQESGGGLVKPGGSLRLSCAASGFTFS**SYWMS**WVRQAPGKGLEWVA**NINRDGSASYYVDSVKG**RFTISRDDAKNSLYLQMNSLRAEDTAVYYCAR**DRGVGYFDL**WGRGTLVTVSS (SEQ ID NO: 371)	QSALTQPASVSGSPGQSITISC**TGTSSDVGGYNFVS**WYQQHPGKAPKLMIY**DVSDRPS**GVSDRFSGSKSGNTASLIISGLQADDEADYYC**SSYGSSSTHVI**FGGGTKVTVL (SEQ ID NO: 372)

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
MM-111		HER2/3	QVQLVQSGAEVKKPGESLKISCKGSGYSFT**SYWIA**WVRQMPGKGLEYMG**LIYPGDSDTKYSPSFQG**QVTISVDKSVSTAYLQWSSLKPSDSAVYFCAR**HDVGYCTDRTCAKWPEWLGV**WGQGTLVTVSS (SEQ ID NO: 373)	QSVLTQPPSVSAAPGQKVTISC**SGSSSNIGNNYVS**WYQQLPGTAPKLLIY**DHTNRPA**GVPDRFSGSKSGTSASLAISGFRSEDEADYYC**ASWDYTLSGWV**FGGGTKLTVL (SEQ ID NO: 374)
	Hu3S193	Lewis-Y	EVQLVESGGGVVQPGRSLRLSCSTSGFTFS**DYYMY**WVRQAPGKGLEWVA**YMSNVGAITDYPDTVKG**RFTISRDNSKNTLFLQMDSLRPEDTGVYFCAR**GTRDGSWFAY**WGQGTPVTVSS (SEQ ID NO: 375)	DIQMTQSPSSLSASVGDRVTITC**RSSQRIVHSNGNTYLE**WYQQTPGKAPKLLIY**KVSNRFS**GVPSRFSGSGSGTDFTFTISSLQPEDIATYYC**FQGSHVPFT**FGQGTKLQIT (SEQ ID NO: 376)
BAY 94-9343	anetumab ravtansine	Mesothelin	QVELVQSGAEVKKPGESLKISCKGS**GYSFTSYW**IGWVRQAPGKGLEWMGI**IDPGDSRT**RYSPSFQGQVTISADKSISTAYLQWSSLKASDTAMYYC**ARGQLYGGTYMDG**WGQGTLVTVSS (SEQ ID NO: 377)	DIALTQPASVSGSPGQSITISCTGT**SSDIGGYNS**VSWYQQHPGKAPKLMIY**GVN**NRPSGVSNRFSGSKSGNTASLTISGLQAEDEADYYC**SSYDIESATPV**FGGGTKLTVL (SEQ ID NO: 378)
	SS1	Mesothelin	QVQLQQSGPELEKPGASVKISCKASGYSFTGYTMNWVKQSHGKSLEWIGLITPYNGASSYNQKFRGKATLTVDKSSSTAYMDLLSLTSEDSAVYFCARGGYDGRGFDYWGQGTTVTVSS (SEQ ID NO: 379)	DIELTQSPAIMSASPGEKVTMTCSASSSVSYMHWYQQKSGTSPKRWIYDTSKLASGVPGRFSGSGSGNSYSLTISSVEAEDDATYYCQQWSGYPLTFGAGTKLEIK (SEQ ID NO: 380)
		Mesothelin	QVYLVESGGGVVQPGRSLRLSCAASGITFS**IYGMH**WVRQAPGKGLEWVA**VIWYDGSHEYYADSVKG**RFTISRDNSKNTLYLLMNSLRAED TAVYYCAR**DGDYYDSGSPLDY**WGQGTLVTVSS (SEQ ID NO: 381)	EIVLTQSPATLSLSPGERATLSC**RASQSVSSYLA**WYQQKPGQAPRLLIY**DASNRAT**GIPARFSGSGSGTDFTLTISSLEPEDFAVYYC**QQRSNWPLT**FGGGTKVEIK (SEQ ID NO: 382)
		Mesothelin	QVHLVESGGGVVQPGRSLRLSCVASGITF**RIYGM**HWVRQAPGKGLEWVA**V**	EIVLTQSPATLSLSPGERATLSC**RASQSVSSYLA**WYQQKPGQAPRLLIY

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
			LWYDGSHEYYADSVKG RFTISRDNSKNTLYLQMN SLRAED TAIYYCAR**DGDYYDSGS PLDY**WGQGTLVTVSS (SEQ ID NO: 383)	**DASNRAT**GIPARFSGS GSGTDFTLTISSLEPED FAVYYC**QQ RSNWPLT**FGGGTKVEI K (SEQ ID NO: 384)
		Mesothelin	EVHLVESGGGLVQPGGS LRLSCAASGFTFS**RYWM S**WVRQAQGKGLEWVA**S IKQAGSEKTYVDSVKG**R FTISRDNAKNSLSLQMNS LRAED TAVYYCAR**EGAYYYDSA SYYPYYYYYSMDV**WGQ GTTVTVSS (SEQ ID NO: 385)	EIVLTQSPGTLSLSPGE RATLSC**RASQSVSSSY LA**WYQQKPGQAPRLLI Y**GASSRAT**GIPDRFSG SGSGTDFTLTISRLEPE DFAVYYC**Q QYGSSQYT**FGQGTKLE IK (SEQ ID NO: 386)
MORAb-009	amatuximab	Mesothelin	QVQLQQSGPELEKPGAS VKISCKASGYSFT**GYTM N**WVKQSHGKSLEWIG**LI TPYNGASSYNQKFRG**KA TLTVDKSSSTAYMDLLSL TSEDSAVYFCAR**GGYDG RGFDY**WGSGTPVTVSS (SEQ ID NO: 387)	DIELTQSPAIMSASPGE KVTMTC**SASSSVSYMH** WYQQKSGTSPKRWIY **DTSKLAS**GVPGRFSGS GSGNSYSLTISSVEAED DATYYC**QQWSKHPLT** FGSGTKVEIK (SEQ ID NO: 388)
hPAM4		MUC-1	EVQLQESGPELVKPGAS VKMSCKASGYTFP**SYVL H**WVKQKPGQGLEWIG**YI NPYNDGTQYNEKFKG**K ATLTSDKSSSTAYMELS RLTSED SAVYYCAR**GFGGSYGFA Y**WGQGTLITVSA (SEQ ID NO: 389)	DIVMTQSPAIMSASPGE KVTMTC**SASSSVSSSY LY**WYQQKPGSSPKLWI Y**STSNLAS**GVPARFSG SGSGTSYSLTISSMEAE DAASYFC**H QWNRYPYT**FGGGTKL EIK (SEQ ID NO: 390)
hPAM4-Cide	clivatuzumab	MUC1	QVQLQQSGAEVKKFGAS VKVSCEASGYTFP**SYVL H**WVKQAPGQGLEWIG**YI NPYNDGTQTNKKFKG**K ATLTRDTSINTAYMELSR LRSDDTAVYYCAR**GFGG SYGFAY**NGQGTLVTVSS (SEQ ID NO: 391)	DIQLTQSPSSLSASVGD RVTMTC**SASSSVSSSY LY**WYQQKPGKAPKLWI Y**STSNLAS**GVPARFSG SGSGTDFTLTISSLQPE DSASYFC**HQWNRYPY T**FGGGTRLEIK (SEQ ID NO: 392)
SAR566658	huDS6v1.01	MUC1	QAQLQVSGAEVVKPGAS VKMSCKASGYTFT**SYNM H**WVKQTPGQGLEWIG**YI**	EIVLTQSPATMSASPGE RVTITC**SAHSSVSFMH** WFQQKPGTSPKLWIY**S**

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
			YPGNGATNYNQKFQGK ATLTADTSSSTAYMQISS LTSEDSAVYFCAR**GDSV PFAY**WGQGTLVTVSA (SEQ ID NO: 393)	**TSSLAS**GVPARFGGSG SGTSYSLTISSMEAEDA ATYYC**QQRSSFPLT**FG AGTKLELK (SEQ ID NO: 394)
Theragyn	Pemtumomab muHMFG1	MUC1	QVQLQQSGAELMKPGA SVKISCKATGYTFS**AYWI EWVKQRPGHGLEWIG EI LPGSNNSRYNEKFKG**KA TFTADTSSNTAYMQLSS LTSEDSAVYYCSR**SYDF AWFAY**WGQGTPVTVSA (SEQ ID NO: 395)	DIVMSQSPSSLAVSVG EKVTMSC**KSSQSLLYS SNQKIYLA**WYQQKPG QSPKLLIYW**ASTRES**G VPDRFTGGGSGTDFTL TISSVKAEDLAVYYC**QQ YYRYPRT**FGGGTKLEIK (SEQ ID NO: 396)
Therex	Sontuzumab huHMFG1 AS1402 R1150	MUC1	QVQLVQSGAEVKKPGAS VKVSCKASGYTFS**AYWI EWVRQAPGKGLEWVG E ILPGSNNSRYNEKFKG**R VTVTRDTSTNTAYMELS SLRSEDTAVYYCAR**SYD FAWFAY**WGQGTLVTVS S (SEQ ID NO: 397)	DIQMTQSPSSLSASVG DRVTITC**KSSQSLLYSS NQKIYLA**WYQQKPGKA PKLLIYW**ASTRES**GVP SRFSGSGSGTDFTFTIS SLQPEDIATYYC**QQYY RYPRT**FGQGTKVEIK (SEQ ID NO: 398)
MDX-1105 or BMS-936559		PD-L1	QVQLVQSGAEVKKPGSS VKVSCKTSGDTFS**TYAIS** WVRQAPGQGLEWMG**GI IPIFGKAHYAQKFQG**RVT ITADESTSTAYMELSSLR SEDTAVY FCAR**KFHFVSGSPFGMD V**WGQGTTVTVSS (SEQ ID NO: 399)	EIVLTQSPATLSLSPGE RATLSC**RASQSVSSYL A**WYQQKPGQAPRLLIY **DASNRAT**GIPARFSGS GSGTDFTLTISSLEPED FAVYYC**QQRSNWPT**F GQGTKVEIK (SEQ ID NO: 400)
MEDI-4736	durvalumab	PD-L1	EVQLVESGGGLVQPGG SLRLSCAAS**GFTFSRYW** MSWVRQAPGKGLEWVA N**IKQDGSEK**YYVDSVKG RFTISRDNAKNSLYLQM NSLRAEDTAVYYC**AREG GWFGELAFDY**WGQGTL VTVSS (SEQ ID NO: 401)	EIVLTQSPGTLSLSPGE RATLSCRAS**QRVSSSY** LAWYQQKPGQAPRLLI Y**DAS**SRATGIPDRFSG SGSGTDFTLTISRLEPE DFAVYYC**QQYGSLPW T**FGQGTKVEIK (SEQ ID NO: 402)
MPDL3280A	atezolizumab	PD-L1	EVQLVESGGGLVQPGG SLRLSCAAS**GFTFSDSW**I HWVRQAPGKGLEWVAW **ISPYGGST**YYADSVKGR FTISADTSKNTAYLQMNS	DIQMTQSPSSLSASVG DRVTITCRAS**QDVSTA** VAWYQQKPGKAPKLLI Y**SAS**FLYSGVPSRFSG SGSGTDFTLTISSLQPE

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
			LRAEDTAVYYC**ARRHWPGGFDY**WGQGTLVTVSS (SEQ ID NO: 403)	DFATYYC**QQYLYHPAT**FGQGTKVEIK (SEQ ID NO: 404)
MSB0010718C	avelumab	PD-L1	EVQLLESGGGLVQPGGSLRLSCAAS**GFTFSSYI**MMWVRQAPGKGLEWVSS**IYPSGGIT**FYADTVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYC**ARIKLGTVTTVDY**WGQGTLVTVSS (SEQ ID NO: 405)	QSALTQPASVSGSPGQSITISCTGT**SSDVGGYNY**VSWYQQHPGKAPKLMIY**DVS**NRPSGVSNRFSGSKSGNTASLTISGLQAEDEADYYC**SSYTSSSTRV**FGTGTKVTVL (SEQ ID NO: 406)
MLN591		PSMA	EVQLVQSGPEVKKPGATVKISCKTS**GYTFTEYTIH**WVKQAPGKGLEWIG**NINPNNGGTTYNQKFED**KATLTVDKSTDTAYMELSSLRSEDTAVYYCAA**GWNFDY**WGQGTLLTVSS (SEQ ID NO: 407)	DIQMTQSPSSLSTSVGDRVTLTC**KASQDVGTAVD**WYQQKPGPSPKLLIY**WASTRHT**GIPSRFSGSGSGTDFTLTISSLQPEDFADYYC**QQYNSYPLT**FGPGTKVDIK (SEQ ID NO: 408)
MT112	pasotuximab	PSMA	QVQLVESGGGLVKPGESLRLSCAAS**GFTFSDYY**MYWVRQAPGKGLEWVA**II SDGGYYT**YYSDIIKGRFTISRDNAKNSLYLQMNSLKAEDTAVYYC**ARGFPLLRHGAMDY**WGQGTLVTVSS (SEQ ID NO: 409)	DIQMTQSPSSLSASVGDRVTITCKAS**QNVDTN**VAWYQQKPGQAPKSLIY**SAS**YRYSDVPSRFSGSASGTDFTLTISSVQSEDFATYYC**QQYDSYPYT**FGGGTKLEIK (SEQ ID NO: 410)
		ROR1	QEQLVESGGRLVTPGGSLTLSCKASGFDFS**AYYMS**WVRQAPGKGLEWIA**TIYPSSGKTYYATWVNG**RFTISSDNAQNTVDLQMNSLTAAD RATYFCAR**DSYADDGALFNI**WGPGTLVTISS (SEQ ID NO: 411)	ELVLTQSPSVSAALGSPAKITC**TLSSAHKTDTIDW**YQQLQGEAPRYLMQVQSD**GSYTKRP**GVPDRFSGSSSGADRYLIIPSVQADDEADY YC**GADYIGGYV**FGGGTQLTVTG (SEQ ID NO: 412)
		ROR1	EVKLVESGGGLVKPGGSLKLSCAASGFTFS**SYAMS**WVRQIPEKRLEWVA**SISRGGTTYYPDSVKG**RFTISRDNVRNILYLQMSSLRSEDT AMYYCGR**YDYDGYYAM**	DIKMTQSPSSMYASLGERVTITC**KASPDINSYLS**WFQQKPGKSPKTLIY**RANRLVD**GVPSRFSGGGSGQDYSLTINSLEYEDMGIYYC**LQ**

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
			DYWGQGTSVTVSS (SEQ ID NO: 413)	**YDEFPYT**FGGGTKLEMK (SEQ ID NO: 414)
		ROR1	QSLEESGGRLVTPGTPLTLTCTVSGIDLN**SHWMS**WVRQAPGKGLEWIG**IIA ASGSTYYANWAKG**RFTISKTSTTVDLRIASPTTEDTATY FCAR**DYGDYRLVTFNI**WGPGTLVTVSS (SEQ ID NO: 415)	ELVMTQTPSSVSAAVGGTVTINC**QASQSIGSYLA**WYQQKPGQPPKLLIY**YASNLAS**GVPSRFSGSGSGTEYTLTISGVQREDAATYYC**LG SLSNSDNV**FGGGTELEIL (SEQ ID NO: 416)
		ROR1	QSVKESEGDLVTPAGNLTLTCTASGSDIN**DYPIS**WVRQAPGKGLEWIG**FINS GGSTWYASWVKG**RFTISRTSTTVDLKMTSLTTDDTATY FCAR**GYSTYYCDFNI**WGPGTLVTISS (SEQ ID NO: 417)	ELVMTQTPSSTSGAVGGTVTINC**QASQSIDSNLA**WFQQKPGQPPTLLIY**RASNLAS**GVPSRFSGSRSGTEYTLTISGVQREDAATYYC**LG GVGNVSYRTS**FGGGTEVVVK (SEQ ID NO: 418)
CC49 (Humanized)		TAG-72	QVQLVQSGAEVVKPGASVKISCKASGYTFT**DHAIH**WVKQNPGQRLEWIG**YF SPGNDDFKYNERFKG**KATLTADTSASTAYVELSSLRSEDTAVYFCTR**SLNMA Y**WGQGTLVTVSS (SEQ ID NO: 419)	DIVMSQSPDSLAVSLGERVTLNCKSS**QSLLYS GNQKNYLA**WYQQKPGQSPKLLIY**WASARES**GVPDRFSGSGSGTDFTLTISSVQAEDVAVYYC**Q QYYSYPLT**FGAGTKLELK (SEQ ID NO: 420)
	Murine A1	TPBG/5T4	QIQLVQSGPELKKPGETVKISCKAS**GYTFTNFGMN**WVKQGPGEGLKWMG**WINTNTGE PRYAEEFKG**RXAFSLETTASTAYLQINNLKNEDTATYFCAR**DWDGAYFFDY**WGQGTTLTVSS (SEQ ID NO: 421)	SIVMTQTPKFLLVSAGDRVTITC**KASQSVSNDVA**WYQQKPGQSPKLLIN**FATNRYT**GVPNRFTGSGYGTDFTFTISTVQAEDLALYFC**QQ DYSSPWT**FGGGTKLEIK (SEQ ID NO: 422)
	Murine A2	TPBG/5T4	QVQLQQSRPELVKPGASVKMSCKAS**GYTFTDYVIS**WVKQRTGQGLEWIG**EIYPGSNS IYYNEKFKG**RATLTADKSSSTAYMQLSSLTSEDSAVYFCAM**GGNYGFDY**WGQGTTLTVSS (SEQ ID NO: 423)	SVIMSRGQIVLTQSPAIMSASLGERVTLTC**TASSSV NSNYLH**WYQQKPGSSPKLWIY**STSNLAS**GVPARFSGSGSGTSYSLTISSMEAEDAATYYC**HQYHRSPLT**FGAGTKLELK (SEQ ID NO: 424)

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
	Murine A3	TPBG/5T4	EVQLVESGGGLVQPKGSLKLSCAAS**GFTFNTYAMN**WVRQAPGKGLEWVA**RIRSKSNNYATYYADSVKD**RFTISRDDSQSMLYLQMNNLKTEDTAMYXCVR**QWDYDVRAMNY**WGQGTSVTVSS (SEQ ID NO: 425)	DIVMTQSHIFMSTSVGDRVSITC**KASQDVDTAVA**WYQQKPGQSPKLLIY**WASTRLT**GVPDRFTGSGSGTDFTLTISNVQSEDLADYFC**QQYSSYPYT**FGGGTKLEIK (SEQ ID NO: 426)
IMMU-132	hRS-7	TROP-2	QVQLQQSGSELKKPGASVKVSCKASGYTFT**NYGMN**WVKQAPGQGLKWMG**WINTYTGEPTYTDDFKG**RFAFSLDTSVSTAYLQISSLKADDTAVYFCAR**GGFGSSYWYFDV**WGQGSLVTVSS (SEQ ID NO: 427)	DIQLTQSPSSLSASVGDRVSITC**KASQDVSIAVA**WYQQKPGKAPKLLIY**SASYRYT**GVPDRFSGSGSGTDFTLTISSLQPEDFAVYYC**QQHYITPLT**FGAGTKVEIK (SEQ ID NO: 428)
IMC-18F1	icrucumab	VEGFR1	QAQVVESGGGVVQSGRSLRLSCAAS**GFAFSSYGMHW**VRQAPGKGLEWVA**VIWYDGSNKYYADSVRG**RFTISRDNSENTLYLQMNSLRAEDTAVYYCAR**DHYGSGVHHYFYYGLDV**WGQGTTVTVSS (SEQ ID NO: 429)	EIVLTQSPGTLSLSPGERATLSC**RASQSVSSSYLA**WYQQKPGQAPRLLIY**GASSRAT**GIPDRFSGSGSGTDFTLTISRLEPEDFAVYYC**QQYGSSPLT**FGGGTKVEIK (SEQ ID NO: 430)
Cyramza	ramucirumab	VEGFR2	EVQLVQSGGGLVKPGGSLRLSCAAS**GFTFSSYSMN**WVRQAPGKGLEWVS**SISSSSSYIYYADSVKG**RFTISRDNAKNSLYLQMNSLRAEDTAVYYCAR**VTDAFDI**WGQGTMVTVSSA (SEQ ID NO: 431)	DIQMTQSPSSVSASIGDRVTITC**RASQGIDN**WLGWYQQKPGKAPKLLIY**DASNLDT**GVPSRFSGSGSGTYFTLTISSLQAEDFAVYFC**QQAKAFPPT**FGGGTKVDIK (SEQ ID NO: 432)
g165D FM-PEG	alacizumabpegol	VEGFR2	EVQLVESGGGLVQPGGSLRLSCAAS**GFTFSSYG**MSWVRQAPGKGLEWVA**TITSGGSYT**YYVDSVKGRFTISRDNAKNTLYLQMNSLRAEDTAVYYC**VRIGEDALDY**WGQGTLVTVSS (SEQ ID NO: 433)	DIQMTQSPSSLSASVGDRVTITCRAS**QDIAGS**LNWLQQKPGKAIKRLIY**ATS**SLDSGVPKRFSGSRSGSDYTLTISSLQPEDFATYYC**LQYGSFPPT**FGQGTKVEIK (SEQ ID NO: 434)
Imclone6.64		VEGFR2	KVQLQQSGTELVKPGASVKVSCKASGYIFTEYIIH	DIVLTQSPASLAVSLGQRATISCRASESVDSYG

Trade Name	Antibody Name	Target Cell Marker	VH Sequence	VL Sequence
			WVKQRSGQGLEWIGWL YPESNIIKYNEKFKDKATL TADKSSSTVYMELSRLT SEDSAVYFCTRHDGTNF DYWGQGTTLTVSSA (SEQ ID NO: 435)	NSFMHWYQQKPGQPP KLLIYRASNLESGIPARF SGSGSRTDFTLTINPVE ADDVATYYCQQSNEDP LTFGAGTKLELK (SEQ ID NO: 436)

* underlined sequences, if present, are CDRs within the VL and VH

[00333] In some embodiments, the CAR and/or engineered TCR of the disclosure comprises an antigen binding domain comprising a VH and a VL, and the VH and VL are selected from the group consisting of SEQ ID NO: 217 and SEQ ID NO: 218, SEQ ID NO: 219 and SEQ ID NO: 220, SEQ ID NO: 221 and SEQ ID NO: 222, SEQ ID NO: 223 and SEQ ID NO: 224, SEQ ID NO: 225 and SEQ ID NO: 226, SEQ ID NO: 227 and SEQ ID NO: 228, SEQ ID NO: 229 and SEQ ID NO: 230, SEQ ID NO: 231 and SEQ ID NO: 232, SEQ ID NO: 233 and SEQ ID NO: 234, SEQ ID NO: 235 and SEQ ID NO: 236, SEQ ID NO: 237 and SEQ ID NO: 238, SEQ ID NO: 239 and SEQ ID NO: 240, SEQ ID NO: 241 and SEQ ID NO: 242, SEQ ID NO: 243 and SEQ ID NO: 244, SEQ ID NO: 245 and SEQ ID NO: 246, SEQ ID NO: 247 and SEQ ID NO: 248, SEQ ID NO: 249 and SEQ ID NO: 250, SEQ ID NO: 251 and SEQ ID NO: 252, SEQ ID NO: 253 and SEQ ID NO: 254, SEQ ID NO: 255 and SEQ ID NO: 256, SEQ ID NO: 257 and SEQ ID NO: 258, SEQ ID NO: 259 and SEQ ID NO: 260, SEQ ID NO: 261 and SEQ ID NO: 262, SEQ ID NO: 263 and SEQ ID NO: 264, SEQ ID NO: 265 and SEQ ID NO: 266, SEQ ID NO: 267 and SEQ ID NO: 268, SEQ ID NO: 269 and SEQ ID NO: 270, SEQ ID NO: 271 and SEQ ID NO: 272, SEQ ID NO: 273 and SEQ ID NO: 274, SEQ ID NO: 275 and SEQ ID NO: 276, SEQ ID NO: 277 and SEQ ID NO: 278, SEQ ID NO: 279 and SEQ ID NO: 280, SEQ ID NO: 281 and SEQ ID NO: 282, SEQ ID NO: 283 and SEQ ID NO: 284, SEQ ID NO: 285 and SEQ ID NO: 286, SEQ ID NO: 287 and SEQ ID NO: 288, SEQ ID NO: 289 and SEQ ID NO: 290, SEQ ID NO: 291 and SEQ ID NO: 292, SEQ ID NO: 293 and SEQ ID NO: 294, SEQ ID NO: 295 and SEQ ID NO: 296, SEQ ID NO: 297 and SEQ ID NO: 298, SEQ ID NO: 299 and SEQ ID NO: 300, SEQ ID NO: 301 and SEQ ID NO: 302, SEQ ID NO: 303 and SEQ ID NO: 304, SEQ ID NO: 305 and SEQ ID NO: 306, SEQ ID NO: 307 and SEQ ID NO: 308, SEQ ID NO: 309 and SEQ ID NO: 310, SEQ ID NO: 311 and SEQ ID NO: 312, SEQ ID NO: 313 and SEQ ID NO: 314, SEQ ID NO: 315 and SEQ ID NO: 316, SEQ ID NO: 317 and SEQ ID NO: 318, SEQ ID

NO: 319 and SEQ ID NO: 320, SEQ ID NO: 321 and SEQ ID NO: 322, SEQ ID NO: 323 and SEQ ID NO: 324, SEQ ID NO: 325 and SEQ ID NO: 326, SEQ ID NO: 327 and SEQ ID NO: 328, SEQ ID NO: 329 and SEQ ID NO: 330, SEQ ID NO: 331 and SEQ ID NO: 332, SEQ ID NO: 333 and SEQ ID NO: 334, SEQ ID NO: 335 and SEQ ID NO: 336, SEQ ID NO: 337 and SEQ ID NO: 338, SEQ ID NO: 339 and SEQ ID NO: 340, SEQ ID NO: 341 and SEQ ID NO: 342, SEQ ID NO: 343 and SEQ ID NO: 344, SEQ ID NO: 345 and SEQ ID NO: 346, SEQ ID NO: 347 and SEQ ID NO: 348, SEQ ID NO: 349 and SEQ ID NO: 350, SEQ ID NO: 351 and SEQ ID NO: 352, SEQ ID NO: 353 and SEQ ID NO: 354, SEQ ID NO: 355 and SEQ ID NO: 356, SEQ ID NO: 357 and SEQ ID NO: 358, SEQ ID NO: 359 and SEQ ID NO: 360, SEQ ID NO: 361 and SEQ ID NO: 362, SEQ ID NO: 363 and SEQ ID NO: 364, SEQ ID NO: 365 and SEQ ID NO: 366, SEQ ID NO: 367 and SEQ ID NO: 368, SEQ ID NO: 369 and SEQ ID NO: 370, SEQ ID NO: 371 and SEQ ID NO: 372, SEQ ID NO: 373 and SEQ ID NO: 374, SEQ ID NO: 375 and SEQ ID NO: 376, SEQ ID NO: 377 and SEQ ID NO: 378, SEQ ID NO: 379 and SEQ ID NO: 380, SEQ ID NO: 381 and SEQ ID NO: 382, SEQ ID NO: 383 and SEQ ID NO: 384, SEQ ID NO: 385 and SEQ ID NO: 386, SEQ ID NO: 387 and SEQ ID NO: 388, SEQ ID NO: 389 and SEQ ID NO: 390, SEQ ID NO: 391 and SEQ ID NO: 392, SEQ ID NO: 393 and SEQ ID NO: 394, SEQ ID NO: 395 and SEQ ID NO: 396, SEQ ID NO: 397 and SEQ ID NO: 398, SEQ ID NO: 399 and SEQ ID NO: 400, SEQ ID NO: 401 and SEQ ID NO: 402, SEQ ID NO: 403 and SEQ ID NO: 404, SEQ ID NO: 405 and SEQ ID NO: 406, SEQ ID NO: 407 and SEQ ID NO: 408, SEQ ID NO: 409 and SEQ ID NO: 410, SEQ ID NO: 411 and SEQ ID NO: 412, SEQ ID NO: 413 and SEQ ID NO: 414, SEQ ID NO: 415 and SEQ ID NO: 416, SEQ ID NO: 417 and SEQ ID NO: 418, SEQ ID NO: 419 and SEQ ID NO: 420, SEQ ID NO: 421 and SEQ ID NO:422, SEQ ID NO: 423 and SEQ ID NO: 424, SEQ ID NO: 425 and SEQ ID NO: 426, SEQ ID NO: 427 and SEQ ID NO: 418, SEQ ID NO: 419 and SEQ ID NO: 430, SEQ ID NO: 431 and SEQ ID NO: 432. SEQ ID NO: 433 and SEQ ID NO: 434, SEQ ID NO: 435 and SEQ ID NO: 436, or sequences having at least 90%, at least 95% or at least 99% identity thereto.

[00334] In some embodiments, the cells of the population have been modified such that at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, or at least 95% of the modified cells express a detectable level of the chimeric antigen receptor (CAR) or engineered TCR. In one embodiment, the method of modifying a target nucleic acid sequence of a gene in a population of cells is conducted ex vivo on the population of cells. In another

embodiment, the method is conducted in vivo in a subject, wherein the subject is selected from the group consisting of a rodent, a mouse, a rat, a non-human primate, and a human.

[00335] Thus, the CasX:gNA systems and methods described herein can be used, in combination with conventional molecular biology methods, to modify populations of cells (examples of which are described more fully, below) to produce a cell having an allogeneic CAR- or TCR -engineered T cell function that, for example, reduces or eliminates undesirable immunogenicity (such as a host versus graft response or a graft versus host response), and enhances survival, proliferation and/or efficacy by altering the gene of a component of the major histocompatibility complex, e.g., an HLA protein, e.g., HLA-A, HLA-B, HLA-C or B2M (encoded by the B2M gene), or a protein that regulates expression of one or more components of the major histocompatibility complex, eliminates proteins that are a part of the T-cell receptor, such as TRAC, represses expression of transcriptional coactivators that regulates γ-interferon-activated transcription of Major Histocompatibility Complex (MHC) class I and II genes, such as CIITA, or allows the modified cells to escape the immunosuppressive effects of a factor, such as TGFβ. By reducing a mismatch in the HLA protein, reducing or eliminating the wild-type T cell receptor or other component of the modified cell in comparison to those of the recipient subject, it reduces or eliminates the potential for host vs. graft disease (GVHD) by eliminating host T cell receptor recognition of and response to mismatched (e.g., allogeneic) graft tissue (see, e.g., Takahiro Kamiya, T. et al. A novel method to generate T-cell receptor–deficient chimeric antigen receptor T cells. Blood Advances 2:517 (2018)). This approach, therefore, could be used to generate immune cells with an improved therapeutic index for immuno-oncologic applications in a subject with a disease such as cancer, autoimmune diseases and transplant rejection.

VI. Polynucleotides and Vectors

[00336] In another aspect, the present disclosure relates to polynucleotides of the CasX:gNA systems encoding the CasX proteins and the polynucleotides of the gNAs (e.g., the gDNAs and gRNAs) of any of the embodiments described herein. In a further aspect, the disclosure provides donor template polynucleotides for use in modifying the target proteins in the modified cells. In yet a further aspect, the disclosure relates to vectors comprising polynucleotides encoding the CasX proteins and the gNAs described herein, as well as the donor templates and polynucleotides encoding the CAR of the embodiments. In yet a further

aspect, the disclosure relates to vectors comprising polynucleotides encoding fusion proteins of the engineered TCR of the embodiments.

[00337] In some embodiments, the disclosure provides polynucleotide sequences encoding the reference CasX of SEQ ID NOS:1-3. In other embodiments, the disclosure provides polynucleotide sequences encoding the CasX variants of any of the embodiments described herein. In some embodiments, the disclosure provides an isolated polynucleotide sequence encoding a CasX variant polypeptide sequence set forth in Table 4, or a sequence having at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, at least about 95%, at least about 96%, at least about 97%, at least about 98%, or at least about 99% sequence identity thereto. In some embodiments, the disclosure provides an isolated polynucleotide sequence encoding a gNA sequence of any of the embodiments described herein. In some embodiments, the polynucleotide encodes a gNA scaffold sequence set forth in Table 1 or Table 2, or a sequence having at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, at least about 95%, at least about 96%, at least about 97%, at least about 98%, at least about 99% sequence identity thereto. In some embodiments, the polynucleotide encodes a gNA scaffold sequence selected from the group consisting of SEQ ID NOS:2101-2280, or a sequence having at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, at least about 95%, at least about 96%, at least about 97%, at least about 98%, at least about 99% sequence identity thereto. In other embodiments, the disclosure provides targeting sequence polynucleotides of Tables 3A 3B, or 3C, or a sequences having at least about 65%, at least about 75%, at least about 85%, or at least about 95% identity thereto, as well as DNA encoding the targeting sequences. In some embodiments, the polynucleotide encoding the scaffold sequence further comprises the sequence encoding the targeting sequence such that a gNA capable of binding the CasX and the target sequence can be expressed as a sgNA or dgNA. In other embodiments, the disclosure provides an isolated polynucleotide sequence encoding a gNA sequence that hybridizes with the target gene encoding a protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response. In some cases, the polynucleotide sequence encodes a gNA sequence that hybridizes with a target gene exon. In other cases, the polynucleotide sequence encodes a gNA sequence that hybridizes with a target gene intron. In other cases, the polynucleotide sequence encodes a gNA sequence that hybridizes with a target gene intron-exon junction. In other cases, the polynucleotide sequence encodes a gNA sequence that hybridizes with an intergenic region

of the target gene. In other cases, the polynucleotide sequence encodes a gNA sequence that hybridizes with a regulatory element of the target gene. In some cases, the cell surface marker regulatory element is 5' of the gene. In other cases, the regulatory element is 3' of the cell surface marker gene. In other cases, the regulatory element comprises the 5' UTR of the target gene. In still other cases, the regulatory element comprises the 3'UTR of the target gene.

[00338] In other embodiments, the disclosure provides donor template nucleic acids wherein the donor template comprises a nucleotide sequence having homology but not complete identity to a target sequence of the target nucleic acid for which gene editing is intended. For knock-down/knock-outs, the donor template sequence is typically not identical to the genomic sequence that it replaces and may contain one or more single base changes, insertions, deletions, inversions or rearrangements with respect to the genomic sequence, provided that there is sufficient homology with the target sequence to support homology-directed repair, or the donor template has homologous arms, whereupon insertion can result in a frame-shift or other mutation such that the target protein is not expressed or is expressed at a lower level. In certain embodiments, for knock-down/knock-out modifications, the donor template sequence will have at least about 60%, 70%, 80%, 90%, 95%, 98%, 99%, or 99.9% sequence identity to the target genomic sequence with which recombination is desired. In some embodiments, the target sequence has a sequence that hybridizes with the protein target gene and is inserted at the break sites introduced by the CasX, effecting a modification of the gene sequence. In some cases, the target sequence has a sequence that hybridizes with a target gene exon. In other cases, the target sequence has a sequence that hybridizes with a target gene intron. In other cases, the target sequence has a sequence that hybridizes with a target gene intron-exon junction. In other cases, the target sequence has a sequence that hybridizes with an intergenic region of the target gene. In still other cases, the target sequence has a sequence that hybridizes with a regulatory element of the target gene. In the foregoing embodiments, the donor template can range in size from 10-15,000 nucleotides, 50-10,000 nucleotides, or 100-1000 nucleotides. In some embodiments, the donor template is a single-stranded DNA template. In other embodiments, the donor template is a single stranded RNA template. In other embodiments, the donor template is a double-stranded DNA template.

[00339] In other embodiments, the disclosure provides polynucleotides encoding a chimeric antigen receptor (CAR), engineered TCR, or one or more subunits of an engineered TCR with a binding domain specific for a disease antigen, optionally a tumor cell antigen, that is to

be introduced into the target cells of the population for expression of the CAR or engineered TCR. In the foregoing, the tumor cell antigen is selected from the group consisting of Cluster of Differentiation 19 (CD19), CD3, CD8, CD7, CD10, CD20, CD22, CD30, CLL1, CD33, CD34, CD38, CD41, CD44, CD47, CD49f, CD56, CD70, CD74, CD99, CD123, CD133, CD138, carbonix anhydrase IX (CAIX), CC chemokine receptor 4 (CCR4), ADAM metallopeptidase domain 12 (ADAM12), adhesion G protein-coupled receptor E2 (ADGRE2), alkaline phosphatase placental-like 2 (ALPPL2), alpha 4 Integrin, angiopoietin-2 (ANG2), B-cell maturation antigen (BCMA), CD44V6, carcinoembryonic antigen (CEA), CEAC, CEACAM5, Claudin 6 (CLDN6), CLDN18, C-type lectin domain family 12 member A (CLEC12A), mesenchymal-epithelial transition factor (cMET), cytotoxic T-lymphocyte-associated protein 4 (CTLA4), epidermal growth factor receptor 1 (EGF1R), EGFR-VIII, epithelial glycoprotein 2 (EGP-2), EGP-40, EphA2, ENPP3, epithelial cell adhesion molecule (EpCAM), erb-B2,3,4, folate binding protein (FBP), fetal acetylcholine receptor, folate receptor-a, folate receptor 1 (FOLR1), G protein-coupled receptor 143 (GPR143), glutamate metabotropic receptor 8 (GRM8), glypican-3 (GPC3), ganglioside GD2, ganglioside GD3, human epidermal growth factor receptor 1 (HER1), human epidermal growth factor receptor 2 (HER2), HER3, Integrin B7, intercellular cell-adhesion molecule-1 (ICAM-l), human telomerase reverse transcriptase (hTERT), Interleukin-13 receptor α2 (IL-l3R-a2), K-light chain, Kinase insert domain receptor (KDR), Lewis-Y (LeY), chondromodulin-1 (LECT1), Ll cell adhesion molecule, Lysophosphatidic acid receptor 3 (LPAR3), melanoma-associated antigen 1 (MAGE-A1), mesothelin, mucin 1 (MUC1), MUC16, melanoma-associated antigen 3 (MAGEA3), tumor protein p53 (p53), Melanoma Antigen Recognized by T cells 1 (MART1), glycoprotein 100 (GPl00), Proteinase3 (PR1), ephrin-A receptor 2 (EphA2), Natural killer group 2D ligand (NKG2D ligand), New York esophageal squamous cell carcinoma 1 (NY-ESO-1), oncofetal antigen (h5T4), prostate-specific membrane antigen (PSMA), programmed death ligand 1 (PDL-1), receptor tyrosine kinase-like orphan receptor 1 (ROR1), trophoblast glycoprotein (TPBG), tumor-associated glycoprotein 72 (TAG-72), tumor-associated calcium signal transducer 2 (TROP-2), tyrosinase, survivin, vascular endothelial growth factor receptor 2 (VEGF- R2), Wilms tumor-1 (WT-1), leukocyte immunoglobulin-like receptor B2 (LILRB2), Preferentially Expressed Antigen In Melanoma (PRAME), T cell receptor beta constant 1(TRBC1), TRBC2, and (T-cell immunoglobulin mucin-3) TIM-3. In some embodiments, the CAR or engineered TCR comprises an antigen binding domain selected from the group consisting of linear antibody, single domain antibody

(sdAb), and single-chain variable fragment (scFv). In a particular embodiment, the antigen binding domain is a scFv. Exemplary CDR and VL and VH sequences suitable for use in the scFv of the embodiments are described herein, including the sequences of Table 5. In one embodiment, the VH, VL, and/or the CDRs of the scFv have one or more amino acid modifications relative to the sequences of Table 5, wherein the scFv retains binding affinity to the tumor antigen, and wherein the modification is selected from the group consisting of a substitution, deletion, and insertion.

[00340] In those embodiments comprising a CAR, the CAR can further comprise one or more intracellular signaling domains, wherein the at least one intracellular signaling domain comprises at least one intracellular signaling domain isolated or derived from CD247 molecule (CD3-zeta), CD27 molecule (CD27), CD28 molecule (CD28), TNF receptor superfamily member 9 (4-1BB), inducible T cell costimulator (ICOS), or TNF receptor superfamily member 4 (OX40). In another embodiment, the at least one intracellular signaling domain comprises: a) a CD3-zeta intracellular signaling domain; b) a CD3-zeta intracellular signaling domain and a 4-1BB or CD28 intracellular signaling domain; c) a CD-zeta intracellular signaling domain, a 4-1BB intracellular signaling domain, and a CD28 intracellular signaling domain; or d) a CD-zeta intracellular signaling domain, a CD28 intracellular signaling domain, a 4-1BB intracellular signaling domain, and a CD27 or OX40 intracellular signaling domain. In another embodiment, the CAR further comprises an extracellular hinge domain, wherein the hinge domain is an immunoglobulin like domain or wherein the hinge domain is isolated or derived from IgG1, IgG2, or IgG4, or wherein the hinge domain is isolated or derived from CD8a molecule (CD8) or CD28. In another embodiment, the CAR further comprises a transmembrane domain, wherein the transmembrane domain is isolated or derived from the group consisting of CD3-zeta, CD4, CD8, and CD28.

[00341] In those embodiments comprising an engineered T cell receptor (TCR), the TCR can further comprise one or more subunits selected from the group consisting of TCR alpha, TCR beta, CD3-delta, CD3-epsilon, CD-gamma or CD3-zeta. In some embodiments, the TCR further comprises an intracellular domain comprising a stimulatory domain from an intracellular signaling domain, wherein the antigen binding domain of the TCR is operably linked to the one or more subunits.

[00342] In some embodiments, the disclosure further provides polynucleotides encoding inducible expression cassettes coding for immune stimulatory cytokines selected from the

group consisting of IL-7, IL-12, IL-15, and IL-18, wherein the polynucleotides are to be introduced into the modified target cells of the population expressing CAR, wherein expression of the cytokines render the modified cells resistant to the immunosuppressive tumor environment when administered to a subject. The polynucleotides encoding the CAR with the foregoing components can be introduced into the cells by several conventional methods, described below.

[00343] In some embodiments, the disclosure relates to methods to produce polynucleotide sequences encoding the reference CasX, the CasX variants, or the gNA of any of the embodiments described herein, including variants thereof, or sequences complementary to the target sequences, as well as methods to express the proteins expressed or RNA transcribed by the polynucleotide sequences. In general, the methods include producing a polynucleotide sequence coding for the reference CasX, the CasX variants, or the gNA of any of the embodiments described herein and incorporating the encoding gene into an expression vector appropriate for a host cell. For production of the encoded reference CasX, the CasX variants, or the gNA of any of the embodiments described herein, the method includes transforming an appropriate host cell with an expression vector comprising the encoding polynucleotide, and culturing the host cell under conditions causing or permitting the resulting reference CasX, the CasX variants, or the gNA of any of the embodiments described herein to be expressed or transcribed in the transformed host cell, thereby producing the reference CasX, the CasX variants, or the gNA, which is recovered by methods described herein or by standard purification methods known in the art. Standard recombinant techniques in molecular biology are used to make the polynucleotides and expression vectors of the present disclosure.

[00344] In accordance with the disclosure, polynucleotide sequences that encode the reference CasX, the CasX variants, the gNA, the CAR or the expression cassettes for the immune stimulatory cytokines of any of the embodiments described herein are used to generate recombinant DNA molecules that direct the expression in appropriate host cells. Several cloning strategies are suitable for performing the present disclosure, many of which are used to generate a construct that comprises a gene coding for a composition of the present disclosure, or its complement. In some embodiments, the cloning strategy is used to create a gene that encodes a construct that comprises nucleotides encoding the reference CasX, the CasX variants, or the gNA that is used to transform a host cell for expression of the composition.

[00345] In one approach, a construct is first prepared containing the DNA sequence encoding a reference CasX, a CasX variant, or a gNA. Exemplary methods for the preparation of such constructs are described in the Examples. The construct is then used to create an expression vector suitable for transforming a host cell, such as a prokaryotic or eukaryotic host cell for the expression and recovery of the polypeptide construct. Where desired, the host cell is an *E. coli*. In other embodiments, the host cell is selected from BHK cells, HEK293 cells, HEK293T cells, NS0 cells, SP2/0 cells, YO myeloma cells, P3X63 mouse myeloma cells, PER cells, PER.C6 cells, hybridoma cells, NIH3T3 cells, COS, HeLa, CHO, or yeast cells. Exemplary methods for the creation of expression vectors, the transformation of host cells and the expression and recovery of reference CasX, the CasX variants, or the gNA are described in the Examples.

[00346] The gene or genes encoding for the reference CasX, the CasX variants, the gNA constructs, the CAR, the one or more fusion polypeptides comprising a TCR subunit, or the immune stimulatory cytokines can be made in one or more steps, either fully synthetically or by synthesis combined with enzymatic processes, such as restriction enzyme-mediated cloning, PCR and overlap extension, including methods more fully described in the Examples. The methods disclosed herein can be used, for example, to ligate sequences of polynucleotides encoding the various components (e.g., CasX and gNA) genes of a desired sequence. Genes encoding polypeptide compositions are assembled from oligonucleotides using standard techniques of gene synthesis.

[00347] In some embodiments, the nucleotide sequence encoding a CasX protein, CAR, engineered TCR, or one or more subunits of the engineered TCR is codon optimized. This type of optimization can entail a mutation of an encoding nucleotide sequence to mimic the codon preferences of the intended host organism or cell while encoding the same CasX protein, CAR or TCR. Thus, the codons can be changed, but the encoded protein remains unchanged. For example, if the intended target cell of the CasX protein was a human cell, a human codon-optimized CasX-encoding nucleotide sequence could be used. As another non-limiting example, if the intended host cell were a mouse cell, then a mouse codon-optimized CasX-encoding nucleotide sequence could be generated. As another non-limiting example, if the intended host cell were a plant cell, then a plant codon-optimized CasX protein variant-encoding nucleotide sequence could be generated. As another non-limiting example, if the intended host cell were an insect cell, then an insect codon-optimized CasX protein-encoding nucleotide sequence could be generated. The gene design can be performed using algorithms

that optimize codon usage and amino acid composition appropriate for the host cell utilized in the production of the reference CasX, the CasX variants, or the gNA. In one method of the disclosure, a library of polynucleotides encoding the components of the constructs is created and then assembled, as described above. The resulting genes are then assembled and the resulting genes used to transform a host cell and produce and recover the reference CasX, the CasX variants, or the gNA compositions for evaluation of its properties, as described herein.

[00348] In some embodiments, a nucleotide sequence encoding a gNA is operably linked to a control element, e.g., a transcriptional control element, such as a promoter. In some embodiments, a nucleotide sequence encoding a CasX protein is operably linked to a control element, e.g., a transcriptional control element, such as a promoter. In some embodiments, a nucleotide sequence encoding a CAR is operably linked to a control element, e.g., a transcriptional control element, such as a promoter.

[00349] The transcriptional control element can be a promoter. In some cases, the promoter is a constitutively active promoter. In some cases, the promoter is a regulatable promoter. In some cases, the promoter is an inducible promoter. In some cases, the promoter is a tissue-specific promoter. In some cases, the promoter is a cell type-specific promoter. In some cases, the transcriptional control element (e.g., the promoter) is functional in a targeted cell type or targeted cell population. For example, in some cases, the transcriptional control element can be functional in eukaryotic cells, e.g., neurons, spinal motor neurons, oligodendrocytes, or glial cells.

[00350] Non-limiting examples of eukaryotic promoters (promoters functional in a eukaryotic cell) include EF1alpha, EF1alpha core promoter, those from cytomegalovirus (CMV) immediate early, herpes simplex virus (HSV) thymidine kinase, early and late SV40, long terminal repeats (LTRs) from retrovirus, and mouse metallothionein-I. Further non-limiting examples of eukaryotic promoters include the CMV promoter full-length promoter, the minimal CMV promoter, the chicken β-actin promoter, the hPGK promoter, the HSV TK promoter, the Mini-TK promoter, the human synapsin I promoter which confers neuron-specific expression, the Mecp2 promoter for selective expression in neurons, the minimal IL-2 promoter, the Rous sarcoma virus enhancer/promoter (single), the spleen focus-forming virus long terminal repeat (LTR) promoter, the SV40 promoter, the SV40 enhancer and early promoter, the TBG promoter: promoter from the human thyroxine-binding globulin gene (Liver specific), the PGK promoter, the human ubiquitin C promoter, the UCOE promoter (Promoter of HNRPA2B1-CBX3), the Histone H2 promoter, the Histone H3 promoter, the

U1a1 small nuclear RNA promoter (226 nt), the U1b2 small nuclear RNA promoter (246 nt) 26, the TTR minimal enhancer/promoter, the b-kinesin promoter, the human eIF4A1 promoter, the ROSA26 promoter and the glyceraldehyde 3-phosphate dehydrogenase (GAPDH) promoter.

[00351] Selection of the appropriate vector and promoter is well within the level of ordinary skill in the art, as it related to controlling expression, e.g., for modifying a protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response and/or its regulatory element. The expression vector may also contain a ribosome binding site for translation initiation and a transcription terminator. The expression vector may also include appropriate sequences for amplifying expression. The expression vector may also include nucleotide sequences encoding protein tags (e.g., 6xHis tag, hemagglutinin tag, fluorescent protein, etc.) that can be fused to the CasX protein, thus resulting in a chimeric CasX protein that are used for purification or detection.

[00352] In some embodiments, a nucleotide sequence encoding each of a gNA variant or a CasX protein, a CAR, or an expression cassette for the immune stimulatory cytokines is operably linked to an inducible promoter, a constitutively active promoter, a spatially restricted promoter (i.e., transcriptional control element, enhancer, tissue specific promoter, cell type specific promoter, etc.), or a temporally restricted promoter. In other embodiments, individual nucleotide sequences encoding the gNA, the CasX, the CAR, or an expression cassette for the immune stimulatory cytokines are linked to one of the foregoing categories of promoters, which are then introduced into the cells to be modified by conventional methods, described below.

[00353] In certain embodiments, suitable promoters can be derived from viruses and can therefore be referred to as viral promoters, or they can be derived from any organism, including prokaryotic or eukaryotic organisms. Suitable promoters can be used to drive expression by any RNA polymerase (e.g., pol I, pol II, pol III). Exemplary promoters include, but are not limited to the SV40 early promoter, mouse mammary tumor virus long terminal repeat (LTR) promoter; adenovirus major late promoter (Ad MLP); a herpes simplex virus (HSV) promoter, a cytomegalovirus (CMV) promoter such as the CMV immediate early promoter region (CMVIE), a rous sarcoma virus (RSV) promoter, a human U6 small nuclear promoter (U6), an enhanced U6 promoter, a human HI promoter (HI), a POL1 promoter, a 7SK promoter, tRNA promoters and the like.

[00354] In some embodiments, one or more nucleotide sequences encoding a CasX and gNA and, optionally, comprising a donor template or a polynucleic acid encoding a CAR, are each operably linked to (under the control of) a promoter operable in a eukaryotic cell. Examples of inducible promoters may include, but are not limited to, T7 RNA polymerase promoter, T3 RNA polymerase promoter, isopropyl-beta-D-thiogalactopyranoside (IPTG) -regulated promoter, lactose induced promoter, heat shock promoter, tetracycline-regulated promoter, steroid-regulated promoter, metal-regulated promoter, estrogen receptor-regulated promoter, etc. Inducible promoters can therefore, in some embodiments, be regulated by molecules including, but not limited to, doxycycline; estrogen and/or an estrogen analog; IPTG; etc.

[00355] In certain embodiments, inducible promoters suitable for use may include any inducible promoter described herein or known to one of ordinary skill in the art. Examples of inducible promoters include, without limitation, chemically/biochemically-regulated and physically-regulated promoters such as alcohol-regulated promoters, tetracycline-regulated promoters (e.g., anhydrotetracycline (aTc)-responsive promoters and other tetracycline -responsive promoter systems, which include a tetracycline repressor protein (tetR), a tetracycline operator sequence (tetO) and a tetracycline transactivator fusion protein (tTA), steroid-regulated promoters (e.g., promoters based on the rat glucocorticoid receptor, human estrogen receptor, moth ecdysone receptors, and promoters from the steroid/retinoid/thyroid receptor superfamily), metal-regulated promoters (e.g., promoters derived from metallothionein (proteins that bind and sequester metal ions) genes from yeast, mouse and human), pathogenesis-regulated promoters (e.g., induced by salicylic acid, ethylene or benzothiadiazole (BTH)), temperature/heat-inducible promoters (e.g., heat shock promoters), and light-regulated promoters (e.g., light responsive promoters from plant cells).

[00356] In some cases, the promoter is a spatially restricted promoter (i.e., cell type specific promoter, tissue specific promoter, etc.) such that in a multi-cellular organism, the promoter is active (i.e., "ON") in a subset of specific cells. Spatially restricted promoters may also be referred to as enhancers, transcriptional control elements, control sequences, etc. Any convenient spatially restricted promoter may be used as long as the promoter is functional in the targeted host cell (e.g., eukaryotic cell; prokaryotic cell).

[00357] In some cases, the promoter is a reversible promoter. Suitable reversible promoters, including reversible inducible promoters are known in the art. Such reversible promoters may be isolated and derived from many organisms, e.g., eukaryotes and prokaryotes. Modification

of reversible promoters derived from a first organism for use in a second organism, e.g., a first prokaryote and a second a eukaryote, a first eukaryote and a second a prokaryote, etc., is well known in the art. Such reversible promoters, and systems based on such reversible promoters but also comprising additional control proteins, include, but are not limited to, alcohol regulated promoters (e.g., alcohol dehydrogenase I (alcA) gene promoter, promoters responsive to alcohol transactivator proteins (AlcR, etc.), tetracycline regulated promoters, (e.g., promoter systems including Tet Activators, TetON, TetOFF, etc.), steroid regulated promoters (e.g., rat glucocorticoid receptor promoter systems, human estrogen receptor promoter systems, retinoid promoter systems, thyroid promoter systems, ecdysone promoter systems, mifepristone promoter systems, etc.), metal regulated promoters (e.g., metallothionein promoter systems, etc.), pathogenesis-related regulated promoters (e.g., salicylic acid regulated promoters, ethylene regulated promoters, benzothiadiazole regulated promoters, etc.), temperature regulated promoters (e.g., heat shock inducible promoters (e.g., HSP-70, HSP-90, soybean heat shock promoter, etc.), light regulated promoters, synthetic inducible promoters, and the like.

[00358] Recombinant expression vectors of the disclosure can also comprise elements that facilitate robust expression of CasX proteins, the gNAs, and the CAR of the disclosure. For example, recombinant expression vectors can include one or more of a polyadenylation signal (PolyA), an intronic sequence or a post-transcriptional regulatory element such as a woodchuck hepatitis post-transcriptional regulatory element (WPRE). Exemplary polyA sequences include hGH poly(A) signal (short), HSV TK poly(A) signal, synthetic polyadenylation signals, SV40 poly(A) signal, β-globin poly(A) signal and the like. A person of ordinary skill in the art will be able to select suitable elements to include in the recombinant expression vectors described herein.

[00359] The polynucleotides encoding the reference CasX, the CasX variants, the gNA sequences, and the CAR, engineered TCR, or one or more subunits of the engineered TCR can then be individually cloned into one or more expression vectors. In some embodiments, the present disclosure provides vectors comprising the polynucleotides selected from the group consisting of a retroviral vector, a lentiviral vector, an adenoviral vector, an adeno-associated viral (AAV) vector, a virus-like particle (VLP), a herpes simplex virus (HSV) vector, a plasmid, a minicircle, a nanoplasmid, a DNA vector, and an RNA vector. In some embodiments, the vector is a recombinant expression vector that comprises a nucleotide sequence encoding a CasX protein. In other embodiments, the disclosure provides a

recombinant expression vector comprising a nucleotide sequence encoding a CasX protein and a nucleotide sequence encoding a gNA. In some cases, the nucleotide sequence encoding the CasX protein variant and/or the nucleotide sequence encoding the gNA are operably linked to a promoter that is operable in a cell type of choice. In other embodiments, the nucleotide sequence encoding the CasX protein variant and the nucleotide sequence encoding the gNA are provided in separate vectors operably linked to a promoter. In other embodiments, the vector can comprise a donor template or a polynucleotide encoding one or more CAR, engineered TCR, one or more engineered TCR subunits, or a separate vector can be utilized to introduce the donor template or the one or more CAR or engineered TCR subunits into the target cell to be modified.

[00360] In some embodiments, provided herein are one or more recombinant expression vectors comprising one or more of: (i) a nucleotide sequence of a donor template nucleic acid where the donor template comprises a nucleotide sequence having homology to a target sequence of a target nucleic acid (e.g., a target genome); (ii) a nucleotide sequence that encodes a gNA that hybridizes to a target sequence of the locus of the targeted genome (e.g., configured as a single or dual guide RNA) operably linked to a promoter that is operable in a target cell such as a eukaryotic cell; (iii) a nucleotide sequence encoding a CasX protein operably linked to a promoter that is operable in a target cell such as a eukaryotic cell; (iv) a nucleotide sequence encoding a CAR operably linked to a promoter that is operable in a target cell such as a eukaryotic cell; and (v) a nucleotide sequence encoding an expression cassette for the immune stimulatory cytokines operably linked to a promoter that is operable in a target cell such as a eukaryotic cell. In some embodiments, the sequences encoding the donor template, the gNA, the CasX protein, the CAR, the engineered TCR or one or more subunits thereof, and the expression cassette are in different recombinant expression vectors, and in other embodiments one or more polynucleotide sequences (for the donor template, CasX, gNA, the CAR, the engineered TCR or one or more subunits thereof, and the expression cassette) are in the same recombinant expression vector. In other cases, the CasX and gNA are delivered to the target cell as an RNP (e.g., by electroporation or chemical means) and the donor template and/or the polynucleotide encoding the CAR, or engineered TCR or one or more subunits thereof, and the expression cassette are delivered by a vector.

[00361] The polynucleotide sequence(s) are inserted into the vector by a variety of procedures. In general, DNA is inserted into an appropriate restriction endonuclease site(s) using techniques known in the art. Vector components generally include, but are not limited

to, one or more of a signal sequence, an origin of replication, one or more marker genes, an enhancer element, a promoter, and a transcription termination sequence. Construction of suitable vectors containing one or more of these components employs standard ligation techniques which are known to the skilled artisan. Such techniques are well known in the art and well described in the scientific and patent literature. Various vectors are publicly available. The vector may, for example, be in the form of a plasmid, cosmid, viral particle, or phage that may conveniently be subjected to recombinant DNA procedures, and the choice of vector will often depend on the host cell into which it is to be introduced. Thus, the vector may be an autonomously replicating vector, i.e., a vector, which exists as an extrachromosomal entity, the replication of which is independent of chromosomal replication, e.g., a plasmid. Alternatively, the vector may be one which, when introduced into a host cell, is integrated into the host cell genome and replicated together with the chromosome(s) into which it has been integrated. Once introduced into a suitable host cell, expression of the protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response can be determined using any nucleic acid or protein assay known in the art. For example, the presence of transcribed mRNA of reference CasX or the CasX variants can be detected and/or quantified by conventional hybridization assays (e.g., Northern blot analysis), amplification procedures (e.g. RT-PCR), SAGE (U.S. Pat. No. 5,695,937), and array-based technologies (see e.g., U.S. Pat. Nos. 5,405,783, 5,412,087 and 5,445,934), using probes complementary to any region of the polynucleotide.

[00362] The disclosure provides for the use of plasmid expression vectors containing replication and control sequences that are compatible with and recognized by the host cell and are operably linked to the gene encoding the polypeptide for controlled expression of the polypeptide or transcription of the RNA. Such vector sequences are well known for a variety of bacteria, yeast, and viruses. Useful expression vectors that can be used include, for example, segments of chromosomal, non-chromosomal and synthetic DNA sequences. "Expression vector" refers to a DNA construct containing a DNA sequence that is operably linked to a suitable control sequence capable of effecting the expression of the DNA encoding the polypeptide in a suitable host. The requirements are that the vectors are replicable and viable in the host cell of choice. Low- or high-copy number vectors may be used as desired. The control sequences of the vector include a promoter to effect transcription, an optional operator sequence to control such transcription, a sequence encoding suitable mRNA ribosome binding sites, and sequences that control termination of

transcription and translation. The promoter may be any DNA sequence, which shows transcriptional activity in the host cell of choice and may be derived from genes encoding proteins either homologous or heterologous to the host cell.

[00363] The polynucleotides and recombinant expression vectors can be delivered to the target host cells by a variety of methods. Such methods include, but are not limited to, viral infection, transfection, lipofection, electroporation, calcium phosphate precipitation, polyethyleneimine (PEI)-mediated transfection, DEAE-dextran mediated transfection, microinjection, liposome-mediated transfection, particle gun technology, nucleofection, direct addition by cell penetrating CasX proteins that are fused to or recruit donor DNA, cell squeezing, calcium phosphate precipitation, direct microinjection, nanoparticle-mediated nucleic acid delivery, and using the commercially available TransMessenger® reagents from Qiagen, StemfectTM RNA Transfection Kit from Stemgent, and TransIT®-mRNA Transfection Kit from Mirus Bio LLC, Lonza nucleofection, Maxagen electroporation and the like.

[00364] A recombinant expression vector sequence can be packaged into a virus or virus-like particle (also referred to herein as a "VLP" or "virion") for subsequent infection and transformation of a cell, ex vivo, in vitro or in vivo. Such VLP or virions will typically include proteins that encapsidate or package the vector genome. Suitable expression vectors may include viral expression vectors based on vaccinia virus; poliovirus; adenovirus; a retroviral vector (e.g., Murine Leukemia Virus), spleen necrosis virus, and vectors derived from retroviruses such as Rous Sarcoma Virus, Harvey Sarcoma Virus, avian leukosis virus, retrovirus, a lentivirus, human immunodeficiency virus, myeloproliferative sarcoma virus, and mammary tumor virus; and the like. In some embodiments, a recombinant expression vector of the present disclosure is a recombinant adeno-associated virus (AAV) vector. In a particular embodiment, a recombinant expression vector of the present disclosure is a recombinant retrovirus vector. In another particular embodiment, a recombinant expression vector of the present disclosure is a recombinant lentivirus vector.

[00365] AAV is a small (20 nm), nonpathogenic virus that is useful in treating human diseases in situations that employ a viral vector for delivery to a cell such as a eukaryotic cell, either *in vivo* or *ex vivo* for cells to be prepared for administration to a subject. A construct is generated, for example, encoding any of the CasX proteins and gNA embodiments as described herein, and optionally a donor template or a polynucleotide encoding a CAR, and

can be flanked with AAV inverted terminal repeat (ITR) sequences, thereby enabling packaging of the AAV vector into an AAV viral particle.

[00366] An "AAV" vector may refer to the naturally occurring wild-type virus itself or derivatives thereof. The term covers all subtypes, serotypes and pseudotypes, and both naturally occurring and recombinant forms, except where required otherwise. As used herein, the term "serotype" refers to an AAV which is identified by and distinguished from other AAVs based on capsid protein reactivity with defined antisera, e.g., there are many known serotypes of primate AAVs. In some embodiments, the AAV vector is selected from AAV1, AAV2, AAV3, AAV4, AAV5, AAV6, AAV7, AAV8, AAV9, AAV 10, AAV-Rh74 (Rhesus macaque-derived AAV), and AAVRh10, and modified capsids of these serotypes. For example, serotype AAV-2 is used to refer to an AAV which contains capsid proteins encoded from the cap gene of AAV-2 and a genome containing 5′ and 3′ ITR sequences from the same AAV-2 serotype. Pseudotyped AAV refers to an AAV that contains capsid proteins from one serotype and a viral genome including 5′-3′ ITRs of a second serotype. Pseudotyped rAAV would be expected to have cell surface binding properties of the capsid serotype and genetic properties consistent with the ITR serotype. Pseudotyped recombinant AAV (rAAV) are produced using standard techniques described in the art. As used herein, for example, rAAV1 may be used to refer an AAV having both capsid proteins and 5′-3′ ITRs from the same serotype or it may refer to an AAV having capsid proteins from serotype 1 and 5′-3′ ITRs from a different AAV serotype, e.g., AAV serotype 2. For each example illustrated herein the description of the vector design and production describes the serotype of the capsid and 5′-3′ ITR sequences.

[00367] An "AAV virus" or "AAV viral particle" refers to a viral particle composed of at least one AAV capsid protein (preferably by all of the capsid proteins of a wild-type AAV) and an encapsidated polynucleotide. If the particle additionally comprises a heterologous polynucleotide (i.e., a polynucleotide other than a wild-type AAV genome to be delivered to a mammalian cell), it is typically referred to as "rAAV". An exemplary heterologous polynucleotide is a polynucleotide comprising a CasX protein and/or sgNA and, optionally, a donor template of any of the embodiments described herein.

[00368] By "adeno-associated virus inverted terminal repeats" or "AAV ITRs" is meant the art recognized regions found at each end of the AAV genome which function together in cis as origins of DNA replication and as packaging signals for the virus. AAV ITRs, together with the AAV rep coding region, provide for the efficient excision and rescue from, and

integration of a nucleotide sequence interposed between two flanking ITRs into a mammalian cell genome.

[00369] The nucleotide sequences of AAV ITR regions are known. See, for example Kotin, R. M. (1994) Human Gene Therapy 5:793-801; Berns, K. I. "Parvoviridae and their Replication" in Fundamental Virology, 2nd Edition, (B. N. Fields and D. M. Knipe, eds.). As used herein, an AAV ITR need not have the wild-type nucleotide sequence depicted, but may be altered, e.g., by the insertion, deletion or substitution of nucleotides. Additionally, the AAV ITR may be derived from any of several AAV serotypes, including without limitation, AAV1, AAV2, AAV3, AAV4, AAV5, AAV6, AAV7, AAV8, AAV9, AAV10, AAV-Rh74, and AAVRh10, and modified capsids of these serotypes. Furthermore, 5′ and 3′ ITRs which flank a selected nucleotide sequence in an AAV vector need not necessarily be identical or derived from the same AAV serotype or isolate, so long as they function as intended, i.e., to allow for excision and rescue of the sequence of interest from a host cell genome or vector, and to allow integration of the heterologous sequence into the recipient cell genome when AAV Rep gene products are present in the cell. Use of AAV serotypes for integration of heterologous sequences into a host cell is known in the art (*see*, e.g., WO2018195555A1 and US20180258424A1, incorporated by reference herein.)

[00370] By "AAV rep coding region" is meant the region of the AAV genome which encodes the replication proteins Rep 78, Rep 68, Rep 52 and Rep 40. These Rep expression products have been shown to possess many functions, including recognition, binding and nicking of the AAV origin of DNA replication, DNA helicase activity and modulation of transcription from AAV (or other heterologous) promoters. The Rep expression products are collectively required for replicating the AAV genome.

[00371] By "AAV cap coding region" is meant the region of the AAV genome which encodes the capsid proteins VP1, VP2, and VP3, or functional homologues thereof. These Cap expression products supply the packaging functions which are collectively required for packaging the viral genome.

[00372] In some embodiments, AAV capsids utilized for delivery of the CasX, gNA, and, optionally, donor template nucleotides or polynucleotides encoding the CAR and/or the expression cassette for the cytokines, to a host cell can be derived from any of several AAV serotypes, including without limitation, AAV1, AAV2, AAV3, AAV4, AAV5, AAV6, AAV7, AAV8, AAV9, AAV10, AAV-Rh74 (Rhesus macaque-derived AAV), and AAVRh10, and the AAV ITRs are derived from AAV serotype 2.

[00373] In order to produce rAAV viral particles, an AAV expression vector is introduced into a suitable host cell using known techniques, such as by transfection. Packaging cells are typically used to form virus particles; such cells include HEK293 or HEK293T cells (and other cells known in the art), which package adenovirus. A number of transfection techniques are generally known in the art; see, e.g., Sambrook et al. (1989) Molecular Cloning, a laboratory manual, Cold Spring Harbor Laboratories, New York. Particularly suitable transfection methods include calcium phosphate co-precipitation, direct microinjection into cultured cells, electroporation, liposome mediated gene transfer, lipid-mediated transduction, and nucleic acid delivery using high-velocity microprojectiles.

[00374] In some embodiments, host cells transfected with the above-described AAV expression vectors are rendered capable of providing AAV helper functions in order to replicate and encapsidate the nucleotide sequences flanked by the AAV ITRs to produce rAAV viral particles. AAV helper functions are generally AAV-derived coding sequences which can be expressed to provide AAV gene products that, in turn, function in trans for productive AAV replication. AAV helper functions are used herein to complement necessary AAV functions that are missing from the AAV expression vectors. Thus, AAV helper functions include one, or both of the major AAV ORFs (open reading frames), encoding the rep and cap coding regions, or functional homologues thereof. Accessory functions can be introduced into and then expressed in host cells using methods known to those of skill in the art. Commonly, accessory functions are provided by infection of the host cells with an unrelated helper virus. In some embodiments, accessory functions are provided using an accessory function vector. Depending on the host/vector system utilized, any of a number of suitable transcription and translation control elements, including constitutive and inducible promoters, transcription enhancer elements, transcription terminators, etc., may be used in the expression vector.

[00375] In other embodiments, suitable vectors may include virus-like particles (VLP). Virus-like particles (VLPs) are particles that closely resemble viruses, but do not contain viral genetic material and are therefore non-infectious. In some embodiments, VLPs comprise a polynucleotide encoding a transgene of interest, for example any of the CasX protein and/or a gNA embodiments, and, optionally, donor template polynucleotides or polynucleotides encoding CAR, described herein, packaged with one or more viral structural proteins.

[00376] In other embodiments, the disclosure provides VLPs produced *in vitro* that comprise a CasX:gNA RNP complex and, optionally, a donor template or polynucleotides encoding

CAR, engineered TCR, or fusion polypeptides comprising subunits of the engineered TCR. Combinations of structural proteins from different viruses can be used to create VLPs, including components from virus families including Parvoviridae (e.g., adeno-associated virus), Retroviridae (e.g., HIV), Flaviviridae (e.g., Hepatitis C virus), Paramyxoviridae (e.g., Nipah) and bacteriophages (e.g., Qβ, AP205). In some embodiments, the disclosure provides VLP systems designed using components of retrovirus, including lentiviruses such as HIV, in which individual plasmids comprising polynucleotides encoding the various components are introduced into a packaging cell that, in turn, produce the VLP. In some embodiments, the disclosure provides VLP comprising one or more components of a gag polyprotein selected from the group of matrix protein (MA), nucleocapsid protein (NC), capsid protein (CA), p1-p6 protein, and a protease cleavage site wherein the resulting VLP particle encapsidates a CasX:gNA RNP, and wherein the VLP particle further comprises targeting glycoproteins on the surface that provides tropism to the target cell, wherein upon administration and entry into the target cell, the RNP molecule is free to be transported into the nucleus of the cell. In other embodiments, the disclosure provides VLP comprising one or more components of a gag polyprotein selected from the group of matrix protein (MA), nucleocapsid protein (NC), capsid protein (CA), p1-p6 protein, one or more components of a pol polyprotein, a protease cleavage site, wherein the resulting VLP particle encapsidates a CasX:gNA RNP, , and wherein the VLP particle further comprises targeting glycoproteins on the surface that provides tropism to the target cell, wherein upon administration and entry into the target cell, the RNP molecule is free to be transported into the nucleus of the cell. The foregoing offers advantages over other vectors in the art in that viral transduction to dividing and non-dividing cells is efficient and that the VLP delivers potent and short-lived RNP that escape a subject's immune surveillance mechanisms that would otherwise detect a foreign protein. In some embodiments, a system to make VLP in a host cell comprises polynucleotides encoding one or more components selected from i) a gag polyprotein or portions thereof; ii) a CasX protein of any of the embodiments described herein; iii) a protease cleavage site; iv) a protease; v) a guide RNA of any of the embodiments described herein; vi) a pol polyprotein or portions thereof; vii) a pseudotyping glycoprotein or antibody fragment that provides for binding and fusion of the VLP to a target cell; and viii) a CAR or engineered TCR. The envelope protein or glycoprotein can be derived from any enveloped viruses known in the art to confer tropism to VLP, including but not limited to the group consisting of Argentine hemorrhagic fever virus, Australian bat virus, Autographa californica multiple nucleopolyhedrovirus, Avian

leukosis virus, baboon endogenous virus, Bolivian hemorrhagic fever virus, Borna disease virus, Breda virus, Bunyamwera virus, Chandipura virus, Chikungunya virus, Crimean-Congo hemorrhagic fever virus, Dengue fever virus, Duvenhage virus, Eastern equine encephalitis virus, Ebola hemorrhagic fever virus, Ebola Zaire virus, enteric adenovirus, Ephemerovirus, Epstein-Bar virus (EBV), European bat virus 1, European bat virus 2, Fug Synthetic gP Fusion, Gibbon ape leukemia virus, Hantavirus, Hendra virus, hepatitis A virus, hepatitis B virus, hepatitis C virus, hepatitis D virus, hepatitis E virus, hepatitis G Virus (GB virus C), herpes simplex virus type 1, herpes simplex virus type 2, human cytomegalovirus (HHV5), human foamy virus, human herpesvirus (HHV), human Herpesvirus 7, human herpesvirus type 6, human herpesvirus type 8, human immunodeficiency virus 1 (HIV-1), human metapneumovirus, human T-lymphotro pic virus 1, influenza A, influenza B, influenza C virus, Japanese encephalitis virus, Kaposi's sarcoma-associated herpesvirus (HHV8), Kaysanur Forest disease virus, La Crosse virus, Lagos bat virus, Lassa fever virus, lymphocytic choriomeningitis virus (LCMV), Machupo virus, Marburg hemorrhagic fever virus, measles virus, Middle eastern respiratory syndrome-related coronavirus, Mokola virus, Moloney murine leukemia virus, monkey pox, mouse mammary tumor virus, mumps virus, murine gammaherpesvirus, Newcastle disease virus, Nipah virus, Nipah virus, Norwalk virus, Omsk hemorrhagic fever virus, papilloma virus, parvovirus, pseudorabies virus, Quaranfil virus, rabies virus, RD114 Endogenous Feline Retrovirus, respiratory syncytial virus (RSV), Rift Valley fever virus, Ross River virus, rRotavirus, Rous sarcoma virus, rubella virus, Sabia-associated hemorrhagic fever virus, SARS-associated coronavirus (SARS-CoV), Sendai virus, Tacaribe virus, Thogotovirus, tick-borne encephalitis causing virus, varicella zoster virus (HHV3), varicella zoster virus (HHV3), variola major virus, variola minor virus, Venezuelan equine encephalitis virus, Venezuelan hemorrhagic fever virus, vesicular stomatitis virus (VSV), VSV-G, Vesiculovirus, West Nile virus, western equine encephalitis virus, and Zika Virus. In some embodiments, the packaging cell used for the production of VLP is selected from the group consisting of HEK293 cells, Lenti-X 293T cells, BHK cells, HepG2 cells, Saos-2 cells, HuH7 cells, NS0 cells, SP2/0 cells, YO myeloma cells, A549 cells, P3X63 mouse myeloma cells, PER cells, PER.C6 cells, hybridoma cells, VERO cells, NIH3T3 cells, COS cells, WI38 cells, MRC5 cells, A549 cells, HeLa cells, CHO cells, or HT1080 cells.

VII. Cells

[00377] In some embodiments, the present disclosure provides a population of cells that has been modified to knock-down or knock out one or more proteins of the cell involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response. In other embodiments, the present disclosure provides a population of cells that has been modified to knock in one or more chimeric antigen receptor (CAR) or fusion polypeptides comprising subunits of an engineered TCR with binding affinity for a disease antigen. In still other embodiments, the present disclosure provides a population of cells that has been modified to knock in one or more T cell-derived signaling chain polypeptides. In some embodiments, the population of cells comprises all of the foregoing modifications; e.g., the knock-down/knock-out of the one or more proteins of the cell involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response, the knock in of the one or more chimeric antigen receptor (CAR) or fusion polypeptides of an engineered TCR specific for a disease antigen. Such modified cells altered in this manner are useful for immunotherapy applications, for example for ex vivo preparation of cells bearing a CAR, for use in a subject in need thereof.

[00378] In some embodiments, the disclosure provides a population of cells comprising a CasX:gNA system comprising a CasX protein and one or more gNA, wherein the gNA comprises a targeting sequence complementary to a target nucleic acid sequence of a gene encoding a protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response, wherein the CasX and gNA are designed to modify the gene encoding the protein. In one embodiment of the foregoing, the CasX:gNA system is designed to knock-down/knock-out genes encoding the one or more proteins involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response, resulting in the modified population of cells. In another embodiment of the foregoing, the CasX:gNA system is designed to knock-down/knock-out genes encoding the MHC Class I molecules, resulting in the modified population of cells. In some embodiments, the protein is an immune cell surface marker. In other embodiments, the protein is an intracellular protein. In some embodiments, the CasX and one or more gNA are introduced into the population of cells complexed as an RNP, such that the RNP can then modify the target gene. In other cases, the CasX and the one or more gNA are introduced into the population of cells as encoding polynucleotides using a vector.

[00379] In other embodiments, the populations of cells have been modified by either contacting the cell with a CasX protein, one or more gNA comprising a targeting sequence,

and a donor template wherein the donor template is inserted into or replaces all or a portion of the target nucleic acid sequence of a cell gene encoding a protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response. In the foregoing embodiment, the donor template comprises at least a portion of a target gene, wherein the target gene portion is selected from an exon, an intron, an intron-exon junction, or a regulatory element and the modification of the cell results in a mutation of the wild-type sequence and the knocking-down or knocking-out of the target gene. In some cases, the donor template is a single-stranded DNA template or a single stranded RNA template. In other cases, the donor template is a double-stranded DNA template. In some cases, the cell is contacted with a CasX and a gNA wherein the gNA is a guide RNA (gRNA). In other cases, the cell is contacted with a CasX and a gNA wherein the gNA is a guide DNA (gDNA). In other cases, the cell is contacted with a CasX and a gNA wherein the gNA is a chimera comprising DNA and RNA. As described herein, in embodiments of any of the combinations, each of said gNA molecules (a combination of the scaffold and targeting sequence, which can be configured as a sgRNA or a dgRNA) can be provided as an RNP complexed with a CasX molecule described herein. An RNP can be introduced into a cell to be modified via any suitable method, including via electroporation, injection, nucleofection, delivery via liposomes, delivery by nanoparticles, or using a protein transduction domain (PTD) conjugated to one or more components of the CasX:gNA. Additional methods of modification of the cells using the CasX:gNA system components include viral infection, transfection, conjugation, protoplast fusion, particle gun technology, calcium phosphate precipitation, direct microinjection, and the like. The choice of method is generally dependent on the type of cell being transformed and the circumstances under which the transformation is taking place; e.g., in vitro, ex vivo, or in vivo. A general discussion of these methods can be found in Ausubel, et al, Short Protocols in Molecular Biology, 3rd ed., Wiley & Sons, 1995.

[00380] In exemplary embodiments, the protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response is selected from beta-2-microglobulin (B2M), T cell receptor alpha chain constant region (TRAC), class II major histocompatibility complex transactivator (CIITA), ICP47, T cell receptor beta constant 1 (TRBC1), T cell receptor beta constant 2 (TRBC2), human leukocyte antigen A (HLA-A), human leukocyte antigen B (HLA-B), PD-1, CTLA-4, LAG-3, TIM-3, 2B4, TIGIT, CISH, ADORA2A, NKG2A, or TGFβ Receptor 2 (TGFβRII). In other embodiments, the protein is selected from cluster of differentiation 247 (CD247), CD3D, CD3E, CD3G, CD52, human

leukocyte antigen C (HLA-C), deoxycytidine kinase (dCK), or FKBP1A. In still other embodiments, the protein to be modified in the cell is selected from one of i) beta-2-microglobulin (B2M), T cell receptor alpha chain constant region (TRAC), class II major histocompatibility complex transactivator (CIITA), ICP47, T cell receptor beta constant 1 (TRBC1), T cell receptor beta constant 2 (TRBC2), TIGIT, CISH ADORA2A, NKG2A, PD-1, CTLA-4, LAG-3, TIM-3, 2B4, human leukocyte antigen A (HLA-A), human leukocyte antigen B (HLA-B), or TGFβ Receptor 2 (TGFβRII) and another selected from one of ii) cluster of differentiation 247 (CD247), CD3D, CD3E, CD3G, CD52, human leukocyte antigen C (HLA-C), deoxycytidine kinase (dCK), or FKBP1A.

[00381] In some embodiments, the population of cells includes one or more cells that have reduced or eliminated expression of a component of the T-cell receptor (TCR). In some embodiments, the T-cell receptor is a native T-cell receptor. In some embodiments, the reduced or eliminated expression of a component of the T-cell receptor (TCR) includes reduced or eliminated expression of TRAC. In other embodiments, the reduced or eliminated expression of a component of the T-cell receptor (TCR) includes reduced or eliminated expression of TRBC1. In still other embodiments, the reduced or eliminated expression of a component of the T-cell receptor (TCR) includes reduced or eliminated expression of TRBC2. In still other embodiments, the reduced or eliminated expression of a component of the T-cell receptor (TCR) includes reduced or eliminated expression of CD3G. In yet other embodiments, the reduced or eliminated expression of a component of the T-cell receptor (TCR) includes reduced or eliminated expression of CD3D. In other embodiments, the reduced or eliminated expression of a component of the T-cell receptor (TCR) includes reduced or eliminated expression of CD3E. In some cases, the reduced or eliminated expression of said component of the TCR is the result of introduction of one or more, e.g., one or two, e.g., one gNA molecules described herein specific to the component of the TCR into the cell. For example, the method employing the CasX:gNA system can introduce into the cell an indel, e.g., a frameshift mutation, e.g., as described herein, at or near the target sequence of a targeting domain of a gNA molecule to the TCR. In other cases, the reduced or eliminated expression of said component of the TCR is the result of introduction of the CasX, one or more gNA, and a donor template comprising one or more mutations in comparison to the TCR to be knock-down or knocked-out. In some embodiments, the population of cells includes at least about 50%, e.g., at least about 60%, e.g., at least about 70%, e.g., at least about 80%, e.g., at least about 90% or more cells (as described herein) which exhibit reduced

or eliminated expression of a component of the TCR; e.g., TRAC. In embodiments, said reduced or eliminated expression of a component of the TCR is as measured by flow cytometry or other methods know in the art. In other embodiments, at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, or at least 95% of the modified cells do not express a detectable level of wild-type T cell receptor.

[00382] In some embodiments, (including either alternatively, or in addition to, the reduced or eliminated expression of a component of the TCR) the cell or the population of cells includes one or more cells that have reduced or eliminated expression of beta-2 microglobulin (B2M). In embodiments, said reduced or eliminated expression of said B2M is the result of introduction of one or more, e.g., one or two, e.g., one gNA molecule described herein targeted to the gene encoding B2M into said cell. In the foregoing embodiment, the targeting sequence of the gNA comprises a sequence selected from the group consisting of sequences set forth in Table 3A, Table 13, and Table 16, or a sequence having at least about 65%, at least about 75%, at least about 85%, or at least about 95% identity thereto. In some embodiments, the modified cell includes an indel, e.g., a frameshift mutation, as described herein, at or near the target sequence of a targeting domain of a gNA molecule to said B2M. In some embodiments, the population of cells includes at least about 50%, e.g., at least about 60%, e.g., at least about 70%, e.g., at least about 80%, e.g., at least about 90% or more cells (as described herein) which exhibit reduced or eliminated expression of B2M. In embodiments, said reduced or eliminated expression of B2M is as measured by flow cytometry or other methods know in the art.

[00383] In certain embodiments, (including either alternatively, or in addition to, the reduced or eliminated expression of a component of the TCR and/or B2M) the cell or population of cells includes one or more cells that have reduced or eliminated expression of CIITA. In the foregoing embodiment, the targeting sequence of the gNA comprises a sequence selected from the group consisting of sequences set forth in Table 3C, or a sequence having at least about 65%, at least about 75%, at least about 85%, or at least about 95% identity thereto. In some embodiments, said reduced or eliminated expression of said CIITA is the result of introduction of one or more, e.g., one or two, e.g., one gNA molecule targeted to the gene encoding said CIITA described herein into said cell. In the foregoing, the targeting sequence of the gNA comprises a sequence selected from the group consisting of sequences set forth in Table 3C, or a sequence having at least about 65%, at least about 75%, at least about 85%, or at least about 95% identity thereto. In embodiments, the cell includes

an indel, e.g., a frameshift mutation, e.g., as described herein, at or near the target sequence of a targeting domain of a gNA molecule to said CIITA. In embodiments, the population of cells includes at least about 50%, e.g., at least about 60%, e.g., at least about 70%, e.g., at least about 80%, e.g., at least about 90% or more cells (as described herein) which exhibit reduced or eliminated expression of CIITA. In embodiments, said reduced or eliminated expression of CIITA is as measured by flow cytometry or other methods know in the art.

[00384] In other embodiments, the disclosure provides populations of cells wherein the cells have been modified such that at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, or at least about 95% of the cells do not express a detectable level of at least two of the proteins selected from the group consisting of B2M, TRAC, and CIITA. In still other embodiments, the disclosure provides populations of cells wherein the cells have been modified such that at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, or at least about 95% of the cells do not express a detectable level of the proteins B2M, TRAC, and CIITA. In other embodiments, the disclosure provides a population of cells, wherein the cells have been modified such that at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, or at least 95% of the modified cells do not express a detectable level of MHC Class I molecules or a wild-type T-cell receptor. In other embodiments, the disclosure provides populations of cells modified to produce CAR and are further modified such that at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, or at least about 95% of the cells comprise an inducible expression cassette coding for one or more immune stimulatory cytokines selected from the group consisting of IL-7, IL-12, IL-15, and IL-18.

[00385] In some embodiments, the present disclosure provides populations of cells modified to: i) have reduced or eliminated expression of MHC Class I molecules and/or a wild-type T-cell receptor, and ii) express CAR or engineered TCR. Such cells are capable of specifically binding a tumor antigen of a cell that is a ligand of the CAR or engineered TCR, whereupon such binding, the modified cells are capable of a response selected from: i) becoming activated; ii) inducing proliferation of the modified cell; iii) cytokine secretion by the modified cell; or iv) inducing cytotoxicity of the cell bearing said tumor antigen. For example, a population of cells may have reduced or eliminated expression of wild type TRAC and TRBC1, and express fusion polypeptides comprising the TRAC and/or TRBC1 transmembrane and intracellular domain fused to an antigen binding domain. Activation includes a clonal expansion and differentiation, expression of cytokines, including IFN-γ,

TNF-α, or IL-2. The production of cytokines and assessment of cytotoxicity can be determined by standard assays such as ELISA, ^{51}CR release, flow-cytometry, and other such assays known in the art.

[00386] In exemplary embodiments in which it is intended to reduce or eliminate expression in the cell or population of cells of both a component of the T cell receptor, e.g., TRAC, (including embodiments when expression or function of an additional target, e.g., more than one additional target, is also reduced or eliminated), the gNA targeting sequence molecule which targets TRAC is selected from a sequence of Table 3B. For example, the cell exhibits reduced or eliminated expression of a component of the TCR (e.g., TRAC, TRBC1, TRBC2, CD3E, CD3G, and/or CD3D), and reduced or eliminated expression of a target of an immunosuppressant or immune checkpoint protein, e.g., FKBP1A, or proteins selected from the group consisting of PD-1, CISH, CTLA-4, LAG-3, TIM-3, 2B4, TIGIT, ADORA2A, NKG2A, cluster of differentiation 247 (CD247), CD3D, CD3E, CD3G, CD52, human leukocyte antigen C (HLA-C), and deoxycytidine kinase (dCK). As described herein, in embodiments of any of the combinations, each of said gNA molecules (a combination of the scaffold and targeting sequence, which can be configured as, for example, a sgRNA or a dgRNA) can be provided as an RNP with a CasX molecule described herein for the modification of the population of the cells. In other embodiments of any of the combinations, each of said gNA molecules (a combination of the scaffold and targeting sequence, which can be configured as, for example, a sgRNA or a dgRNA) and the CasX can be provided as encoded polynucleotides within a vector for the modification of the population of the cells.

[00387] In some embodiments, the population of cells are animal cells, for example, derived from a rodent, rat, mouse, rabbit or dog cell. In some embodiments, the cell is a human cell. In some embodiments, the cell is a non-human primate cell; e.g., a cynomolgus monkey cell. In some embodiments, the cell is a progenitor cell, a hematopoietic stem cell, or a pluripotent stem cell. In one embodiment, the cell is an induced pluripotent stem cell. In some embodiments, the cell is an immune cell. In some embodiments, the cell is an immune effector cell (e.g., a population of cells including one or more immune effector cells), for example, a T cell, NK cell, B cell, a macrophage, or a dendritic cells. T cells include, but are not limited to, regulatory T cells (TREG), gamma-delta T cells, helper T cells and cytotoxic T cells. In some embodiments, the cell is a T cell selected from the group consisting of CD4+ T cells, CD8+ T cells, or a combination thereof. In some embodiments, the population of cells

are autologous or allogeneic (genetically mismatched) with respect to a subject to be administered said population of cells.

[00388] In some embodiments, the disclosure provides a cell or population of cells that are a CAR or engineered TCR-expressing, and that have been modified to reduce or eliminate one or more proteins involved with antigen processing, presentation, recognition, or response, as described above. In some embodiments, a CAR or engineered TCR cell, as described herein, is modified and/or altered by the methods described herein, ex vivo, by the introduction of a polynucleotide encoding the CAR or engineered TCR, or a vector comprising the polynucleotide. In other embodiments, CAR or engineered TCR cell, as described herein, is modified and/or altered by the methods described herein, in vivo utilizing the CasX:gNA molecules and/or compositions (e.g., compositions comprising CasX, more than one gNA molecule and, optionally, a donor template, as well as a polynucleotide encoding the CAR) that are introduced into a cell as described herein. In the embodiments, the cell has been, is, or will be, modified to express a chimeric antigen receptor (CAR) or engineered TCR, as described herein (for example, the cell includes, or will include, a polynucleotide sequence encoding a CAR, or a fusion protein comprising a subunit of the engineered TCR). In embodiments, the CAR or engineered TCR has specific binding affinity for antigen selected from Cluster of Differentiation 19 (CD19), CD3, CD8, CD7, CD10, CD20, CD22, CD30, CLL1, CD33, CD34, CD38, CD41, CD44, CD47, CD49f, CD56, CD70, CD74, CD99, CD123, CD133, CD138, carbonix anhydrase IX (CAIX), CC chemokine receptor 4 (CCR4), ADAM metallopeptidase domain 12 (ADAM12), adhesion G protein-coupled receptor E2 (ADGRE2), alkaline phosphatase placental-like 2 (ALPPL2), alpha 4 Integrin, angiopoietin-2 (ANG2), B-cell maturation antigen (BCMA), CD44V6, carcinoembryonic antigen (CEA), CEAC, CEACAM5, Claudin 6 (CLDN6), CLDN18, C-type lectin domain family 12 member A (CLEC12A), mesenchymal-epithelial transition factor (cMET), cytotoxic T-lymphocyte-associated protein 4 (CTLA4), epidermal growth factor receptor 1 (EGF1R), EGFR-VIII, epithelial glycoprotein 2 (EGP-2), EGP-40, EphA2, ENPP3, epithelial cell adhesion molecule (EpCAM), erb-B2,3,4, folate binding protein (FBP), fetal acetylcholine receptor, folate receptor-a, folate receptor 1 (FOLR1), G protein-coupled receptor 143 (GPR143), glutamate metabotropic receptor 8 (GRM8), glypican-3 (GPC3), ganglioside GD2, ganglioside GD3, human epidermal growth factor receptor 1 (HER1), human epidermal growth factor receptor 2 (HER2), HER3, Integrin B7, intercellular cell-adhesion molecule-1 (ICAM-l), human telomerase reverse transcriptase (hTERT), Interleukin-13 receptor α2 (IL-l3R-a2), K-light

chain, Kinase insert domain receptor (KDR), Lewis-Y (LeY), chondromodulin-1 (LECT1), Ll cell adhesion molecule, Lysophosphatidic acid receptor 3 (LPAR3), melanoma-associated antigen 1 (MAGE-A1), mesothelin, mucin 1 (MUC1), MUC16, melanoma-associated antigen 3 (MAGEA3), tumor protein p53 (p53), Melanoma Antigen Recognized by T cells 1 (MARTl), glycoprotein 100 (GPl00), Proteinase3 (PR1), ephrin-A receptor 2 (EphA2), Natural killer group 2D ligand (NKG2D ligand), New York esophageal squamous cell carcinoma 1 (NY-ESO-1), oncofetal antigen (h5T4), prostate-specific membrane antigen (PSMA), programmed death ligand 1 (PDL-1), receptor tyrosine kinase-like orphan receptor 1 (ROR1), trophoblast glycoprotein (TPBG), tumor-associated glycoprotein 72 (TAG-72), tumor-associated calcium signal transducer 2 (TROP-2), tyrosinase, survivin, vascular endothelial growth factor receptor 2 (VEGF- R2), Wilms tumor-1 (WT-1), leukocyte immunoglobulin-like receptor B2 (LILRB2), Preferentially Expressed Antigen In Melanoma (PRAME), T cell receptor beta constant 1(TRBC1), TRBC2, and (T-cell immunoglobulin mucin-3) TIM-3. In the foregoing, the CAR or engineered TCR comprises an antigen binding domain selected from single domain antibody, linear antibody, or single-chain variable fragment (scFv), which can be derived from a reference antibody; e.g., an antibody of Table 5 (having the VL, VH, and/or the CDR sequences of Table 5). In some embodiments, the antigen binding domain exhibits an affinity with an equilibrium binding constant for the target antigen of between or between about 10^{-5} and 10^{-12} M and all individual values and ranges therein (e.g., 10^{-5} M, 10^{-6} M, 10^{-7} M, 10^{-8} M, 10^{-9} M, 10^{-10} M, 10^{-11} M, or 10^{-12} M); such binding affinity being "specific". In some embodiments, the CAR or engineered TCR includes an antigen binding domain, a transmembrane domain derived from a polypeptide selected from the group consisting of CD3-zeta, CD4, CD8, and CD28, and an intracellular signaling domain, which can be linked by spacer sequences. In some embodiments, the encoded CAR further comprises one or more T cell-derived signaling chain polypeptides, including, but not limited to of CD3-zeta, CD27, CD28, 4-1BB (41BB), ICOS, or OX40, linked to the CAR antigen binding domain either directly, or by domain hinge and/or a spacer. The hinge domain can be an immunoglobulin-like hinge, or a hinge domain isolated or derived from CD8a molecule (CD8) or CD28. The hinge, spacer, and transmembrane domains connect the antigen binding domain to the activation domains and anchor the CAR in the T-cell membrane. In other embodiments, the CAR or engineered TCR-expressing cell described herein can further comprise a second CAR or engineered TCR, e.g., a second CAR that includes a different antigen binding domain, e.g., to the same target or a different target

(e.g., a target other than a cancer associated antigen described herein or a different cancer associated antigen described herein, supra). In some embodiments, the second CAR or engineered includes an antigen binding domain to a target expressed on the same cancer cell type as the cancer associated antigen. In some embodiments, the CAR-expressing cell comprises a first CAR that targets a first antigen and includes an intracellular signaling domain having a costimulatory signaling domain but not a primary signaling domain, and a second CAR that targets a second, different, antigen and includes an intracellular signaling domain having a primary signaling domain but not a costimulatory signaling domain. While not wishing to be bound by theory, placement of a costimulatory T cell-derived signaling domain, e.g., CD27, CD28, 4-1BB (41BB), ICOS, or OX40, onto the first CAR, and the primary signaling domain, e.g., CD3 zeta, on the second CAR can limit the CAR activity to cells where both targets are expressed. In some embodiments, the CAR expressing cell comprises a first disease (e.g. cancer) associated antigen CAR that includes an antigen binding domain that binds a target antigen described herein, a transmembrane domain and a costimulatory domain and a second CAR that targets a different target antigen (e.g., an antigen expressed on that same cell type as the first target antigen) and includes an antigen binding domain, a transmembrane domain and a primary signaling domain. In other embodiments, the CAR expressing cell comprises a first CAR that includes an antigen binding domain that binds a target antigen described herein, a transmembrane domain and a primary signaling domain and a second CAR that targets an antigen other than the first target antigen (e.g., an antigen expressed on the same cancer cell type as the first target antigen) and includes an antigen binding domain to the antigen, a transmembrane domain and a costimulatory signaling domain.

[00389] In another embodiment, the present disclosure provides populations of CAR or engineered TCR-expressing cells modified with inducible expression cassettes coding for expression of immune stimulatory cytokines such as IL-7, IL-12, IL-15, and/or IL-18, wherein the cytokines improve CAR or engineered TCR cell expansion and persistence while rendering them resistant to the immunosuppressive tumor environment when administered to a subject. In some embodiments, the disclosure provides a population of cells, wherein at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, or at least 95% of the modified cells of the population express a detectable level of the CAR or engineered TCR.

[00390] In embodiments, a population of CAR or engineered TCR-expressing cells of the invention in which expression or function of one or more proteins has been reduced or

eliminated by the methods described herein, maintains the ability to become activated and to proliferate in response to stimulation, for example, binding of the CAR or engineered TCR to its target antigen. In embodiments, the proliferation occurs ex vivo such that the population of cells can be expanded. In one embodiment, the population of CAR or engineered TCR-expressing cells is expanded by in vitro culture in an appropriate medium under appropriate growth conditions. In other embodiments, the proliferation occurs in vivo. In embodiments, the proliferation occurs both ex vivo and in vivo. In the embodiments, the level of proliferation is substantially the same as the level of proliferation exhibited by the same cell type (e.g., a CAR-expressing cell of the same type) but which has not had expression or function of one or more proteins reduced or eliminated.

[00391] The method provides that immune cells; e.g., T cells, TREG cells, gamma-delta T cells, NK cells, B cells, macrophages, or dendritic cells, can be obtained from a unit of blood collected from a subject using any number of techniques known to the skilled artisan. In one exemplary aspect, cells from the circulating blood of an individual are obtained by apheresis. The apheresis product typically contains lymphocytes, including T cells, monocytes, granulocytes, B cells, other nucleated white blood cells, red blood cells, and platelets. In some embodiments, the T cells are CD4+ T cells, CD8+ T cells, or a combination thereof. The cells collected by apheresis may be washed to remove the plasma fraction and, optionally, to place the cells in an appropriate buffer or media for subsequent processing steps. In some embodiments, T cells are isolated from peripheral blood lymphocytes by lysing the red blood cells and depleting the monocytes, for example, by centrifugation through a PERCOLL™ gradient or by counterflow centrifugal elutriation. The method may include the steps of i) introducing the CasX:gNA system components for the editing of the target nucleic acids; ii) introducing a nucleic acid encoding a CAR and/or one or more fusion polypeptides of an engineered TCR of the embodiments to the cells; iii) i) expansion of the cells, and iv) cryopreservation of the cells for subsequent administration to the subject. The procedure for ex vivo expansion of hematopoietic stem and progenitor cells is described in U.S. Pat. No. 5,199,942, incorporated herein by reference, can be applied to the cells of the present invention.

[00392] Among the sub-types and subpopulations of T cells and/or of CD4+ and/or of CD8+ T cells are naïve T cells, effector T cells, memory T cells and sub-types thereof, such as stem cell memory T, central memory T, effector memory T, or terminally differentiated effector memory T cells, tumor-infiltrating lymphocytes, immature T cells, mature T cells, helper T

cells, cytotoxic T cells, mucosa-associated invariant T cells, naturally occurring and adaptive regulatory T (Treg) cells, helper T cells, such as TH1 cells, TH2 cells, TH3 cells, TH17 cells, TH9 cells, TH22 cells, follicular helper T cells, alpha/beta T cells, and delta/gamma T cells.

[00393] The methods described herein can include selection of a specific subpopulation of immune effector cells, e.g., T cells, that are a T regulatory cell-depleted population, CD25+ depleted cells, using, e.g., a negative selection technique, e.g., described herein. Preferably, the population of T regulatory depleted cells contains less than 30%, 25%, 20%, 15%, 10%, 5%, 4%, 3%, 2%, 1% of CD25+ cells. In some embodiments, the method provides that T regulatory cells, e.g., CD25+ T cells, are removed from the population using an anti-CD25 antibody, or fragment thereof, or a CD25-binding ligand, IL-2. In other embodiments, the anti-CD25 antibody is conjugated to a substrate, e.g., a bead, or is otherwise coated on a substrate over which the population of cells is added and washed to effect the separation.

[00394] In other embodiments, T cells are isolated from peripheral blood lymphocytes by lysing the red blood cells and depleting the monocytes, for example, by centrifugation through a PERCOLL™ gradient or by counterflow centrifugal elutriation. The cells typically are primary cells, such as those isolated directly from a subject and/or isolated from a subject and frozen.

[00395] The methods described herein can further include removing cells from the population which express a disease antigen, e.g., a tumor antigen that does not comprise CD25, e.g., CD19, CD30, CD38, CD123, CD20, CD14 or CD11b, to thereby provide a population of T regulatory depleted, e.g., CD25+ depleted, and tumor antigen depleted cells that are suitable for expression of a CAR described herein. In some embodiments, tumor antigen expressing cells are removed simultaneously with the T regulatory, e.g., CD25+ cells. For example, an anti-CD25 antibody, or fragment thereof, and an anti-tumor antigen antibody, or fragment thereof, can be attached to the same substrate, e.g., a bead, which can be used to remove the cells or an anti-CD25 antibody, or fragment thereof, or the anti-tumor antigen antibody, or fragment thereof, can be attached to separate beads, a mixture of which can be used to remove the cells. In other embodiments, the removal of T regulatory cells, e.g., CD25+ cells, and the removal of the tumor antigen expressing cells is sequential, and can occur, e.g., in either order.

[00396] T cells for stimulation can also be frozen after a washing step, and the freeze and subsequent thaw step provides a more uniform product by removing granulocytes and to some extent monocytes in the cell population. After the washing step that removes plasma

and platelets, the cells may be suspended in a suitable freezing solution. In certain cases, cryopreserved cells are thawed and washed and allowed to rest for one hour at room temperature prior to activation using the methods of the present disclosure.

[00397] In other embodiments, the cells of the disclosure (e.g., the immune cells of the disclosure and/or the CAR-expressing cells of the invention) are induced pluripotent stem cells ("iPSCs") or embryonic stem cells (ESCs), or are T cells generated from (e.g., differentiated from) said iPSC and/or ESC. iPSCs can be generated, for example, by methods known in the art, from peripheral blood T lymphocytes, e.g., peripheral blood T lymphocytes isolated from a healthy volunteer. As well, such cells may be differentiated into T cells by methods known in the art (*see* e.g., Themeli M. et al., Nat. Biotechnol. 31:928 (2013); doi:10.1038/nbt.2678; and WO2014/165707, the contents of each of which are incorporated herein by reference in their entirety).

[00398] In some embodiments, the disclosure provides a population of modified cells for use in methods to provide anti-tumor immunity in a subject (immunotherapy) having a disease associated with cancer or a tumor. In some embodiments, the method comprising administering to the subject a therapeutically effective amount of a population of any of the modified cell embodiments described herein.

[00399] In some embodiments, the dose of total cells and/or dose of individual sub-populations of cells is within a range of between at or about 10^4 and at or about 10^9 cells/kilograms (kg) body weight, such as between 10^5 and 10^6 cells/kg body weight, for example, at or about 1×10^5 cells/kg, 1.5×10^5 cells/kg, 2×10^5 cells/kg, or 1×10^6 cells/kg body weight. For example, in some embodiments, the cells are administered at, or within a certain range of error of, between at or about 10^4 and at or about 10^9 cells/kilograms (kg) body weight, such as between 10^5 and 10^6 cells/kg body weight, for example, at or about 1×10^5 cells/kg, 1.5×10^5 cells/kg, 2×10^5 cells/kg, or 1×10^6 cells/kg body weight.

[00400] In some embodiments, the administration of the effective amount of the modified cells results in an improvement in a clinical parameter or endpoint associated with the disease in the subject, wherein the clinical parameter or endpoint is selected from one or any combination of the group consisting of tumor shrinkage as a complete, partial or incomplete response; time-to-progression, time to treatment failure, biomarker response; progression-free survival; disease free-survival; time to recurrence; time to metastasis; time of overall survival; improvement of quality of life; and improvement of symptoms.

[00401] In some embodiments, the disclosure provides a method of preparing cells for immunotherapy in a subject comprising modifying immune effector cells by reducing or eliminating expression of one or more proteins involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response. In some embodiments, the one or more proteins involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response are selected from beta-2-microglobulin (B2M), T cell receptor alpha chain constant region (TRAC), ICP47 polypeptide, class II major histocompatibility complex transactivator (CIITA), T cell receptor beta constant 1 (TRBC1), T cell receptor beta constant 2 (TRBC2), PD-1, CTLA-4, LAG-3, TIM-3, 2B4, CISH, ADORA2A, TIGIT, NKG2A, human leukocyte antigen A (HLA-A), human leukocyte antigen B (HLA-B), TGFβ Receptor 2 (TGFβRII), cluster of differentiation 247 (CD247), CD3D, CD3E, CD3G, CD52, human leukocyte antigen C (HLA-C), deoxycytidine kinase (dCK), or FKBP1A. In some embodiments, the method comprises contacting the target nucleic acid sequence of the immune effector cell with a CasX:gNA system comprising a CasX protein and a guide nucleic acid (gNA), wherein the gNA comprises a targeting sequence (a) complementary to a target nucleic acid sequence for a gene or a portion of a gene encoding the protein, a regulatory element for the gene, or both, or (b) is complementary to a complement of a target nucleic acid sequence of genes encoding the one or more proteins. In some embodiments, the cell has been modified such that expression of the one or more proteins is reduced by at least about 50%, at least about 60%, at least about 70%, at least about 80%, or at least about 90%, or at least about 95% in comparison to a cell that has not been modified. In other embodiments of the method, the cell has been modified such that the cell does not express a detectable level of the one or more proteins. In an exemplary embodiment of the method, the proteins to be knocked-down or knocked-out are selected from B2M, TRAC, or CIITA. In other embodiments of the method, the cell has been modified such that at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, or at least 95% of the modified cells do not express a detectable level of MHC Class I molecules. In other embodiments of the method, the cell has been modified such that at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, or at least 95% of the modified cells do not express a detectable level of wild-type T cell receptor.

[00402] In some embodiments, the disclosure provides a method of preparing cells for immunotherapy in a subject that, in addition to modifying immune effector cells by reducing or eliminating expression of a protein involved in antigen processing, antigen presentation,

antigen recognition, and/or antigen response, further comprises modifying the cells by introducing a nucleic acid that encodes a chimeric antigen receptor (CAR) specific for a tumor cell antigen. In some embodiments, the tumor cell antigen ligand of the CAR is selected from Cluster of Differentiation 19 (CD19), CD3, CD8, CD7, CD10, CD20, CD22, CD30, CLL1, CD33, CD34, CD38, CD41, CD44, CD47, CD49f, CD56, CD70, CD74, CD99, CD123, CD133, CD138, carbonix anhydrase IX (CAIX), CC chemokine receptor 4 (CCR4), ADAM metallopeptidase domain 12 (ADAM12), adhesion G protein-coupled receptor E2 (ADGRE2), alkaline phosphatase placental-like 2 (ALPPL2), alpha 4 Integrin, angiopoietin-2 (ANG2), B-cell maturation antigen (BCMA), CD44V6, carcinoembryonic antigen (CEA), CEAC, CEACAM5, Claudin 6 (CLDN6), CLDN18, C-type lectin domain family 12 member A (CLEC12A), mesenchymal-epithelial transition factor (cMET), cytotoxic T-lymphocyte-associated protein 4 (CTLA4), epidermal growth factor receptor 1 (EGF1R), EGFR-VIII, epithelial glycoprotein 2 (EGP-2), EGP-40, EphA2, ENPP3, epithelial cell adhesion molecule (EpCAM), erb-B2,3,4, folate binding protein (FBP), fetal acetylcholine receptor, folate receptor-a, folate receptor 1 (FOLR1), G protein-coupled receptor 143 (GPR143), glutamate metabotropic receptor 8 (GRM8), glypican-3 (GPC3), ganglioside GD2, ganglioside GD3, human epidermal growth factor receptor 1 (HER1), human epidermal growth factor receptor 2 (HER2), HER3, Integrin B7, intercellular cell-adhesion molecule-1 (ICAM-l), human telomerase reverse transcriptase (hTERT), Interleukin-13 receptor α2 (IL-l3R-a2), K-light chain, Kinase insert domain receptor (KDR), Lewis-Y (LeY), chondromodulin-1 (LECT1), Ll cell adhesion molecule, Lysophosphatidic acid receptor 3 (LPAR3), melanoma-associated antigen 1 (MAGE-A1), mesothelin, mucin 1 (MUC1), MUC16, melanoma-associated antigen 3 (MAGE-A3), tumor protein p53 (p53), Melanoma Antigen Recognized by T cells 1 (MART1), glycoprotein 100 (GPl00), Proteinase3 (PR1), ephrin-A receptor 2 (EphA2), Natural killer group 2D ligand (NKG2D ligand), New York esophageal squamous cell carcinoma 1 (NY-ES0-1), oncofetal antigen (h5T4), prostate-specific membrane antigen (PSMA), programmed death ligand 1 (PDL-1), receptor tyrosine kinase-like orphan receptor 1 (ROR1), trophoblast glycoprotein (TPBG), tumor-associated glycoprotein 72 (TAG-72), tumor-associated calcium signal transducer 2 (TROP-2), tyrosinase, survivin, vascular endothelial growth factor receptor 2 (VEGF- R2), Wilms tumor-1 (WT-1), leukocyte immunoglobulin-like receptor B2 (LILRB2), Preferentially Expressed Antigen In Melanoma (PRAME), T cell receptor beta constant 1(TRBC1), TRBC2, and (T-cell immunoglobulin mucin-3) TIM-3. In some embodiments,

the CAR comprises an antigen binding domain selected from linear antibody, single domain antibody (sdAb), or single-chain variable fragment (scFv). In some embodiments, the antigen binding domain is an scFv derived from a reference antibody with specific binding affinity to a tumor cell antigen. In some embodiments, the scFv comprises VH and VL and/or heavy chain and light chain CDRs selected from the group consisting of the sequences set forth in Table 5. In the foregoing embodiment, the VH, VL, and/or the CDRs can have one or more amino acid substitutions wherein the scFv retains specific binding affinity to the tumor antigen.

[00403] In other embodiments of the method of preparing cells for immunotherapy in a subject, the nucleic acid encoding the CAR further comprises a nucleic acid encoding at least one intracellular signaling domain, wherein the at least one intracellular signaling domain comprises at least one intracellular signaling domain isolated or derived from CD247 molecule (CD3-zeta), CD27 molecule (CD27), CD28 molecule (CD28), TNF receptor superfamily member 9 (4-1BB), inducible T cell costimulator (ICOS), or TNF receptor superfamily member 4 (OX40). In one embodiment, the at least one intracellular signaling domain comprises: a) a CD3-zeta intracellular signaling domain; b) a CD3-zeta intracellular signaling domain and a 4-1BB or CD28 intracellular signaling domain; c) a CD-zeta intracellular signaling domain, a 4-1BB intracellular signaling domain, and a CD28 intracellular signaling domain; or d) a CD-zeta intracellular signaling domain, a CD28 intracellular signaling domain, a 4-1BB intracellular signaling domain, and a CD27 or OX40 intracellular signaling domain. In other embodiments, the CAR further comprises an extracellular hinge domain, wherein the hinge domain is an immunoglobulin like domain, or wherein the hinge domain is isolated or derived from IgG1, IgG2, or IgG4, or wherein the hinge domain is isolated or derived from CD8a molecule (CD8) or CD28. In some embodiments, the CAR further comprises a transmembrane domain, wherein the transmembrane domain is isolated or derived from the group consisting of CD3-zeta, CD4, CD8, and CD28. In the foregoing, the components of the CAR are operably linked with appropriate linkers to form a single chimeric fusion polypeptide.

[00404] In some embodiments, the TCR comprises one or more subunits selected from the group consisting of TCR alpha, TCR beta, CD3-delta, CD3-epsilon, CD-gamma or CD3-zeta, operably linked to the antigen binding domain arranged such that the extracellular antigen binding domain and the subunit form a single chimeric fusion polypeptide. In some

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CLAIMS

What is claimed is:

1. A CasX:gNA system comprising a CasX protein and a first guide nucleic acid (gNA), wherein the gNA comprises a targeting sequence complementary to a target nucleic acid sequence of a gene encoding a first protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response.

2. The CasX:gNA system of claim 1, wherein the first protein is an immune cell surface marker or an immune checkpoint protein.

3. The CasX:gNA system of claim 1, wherein the first protein is an intracellular protein.

4. The CasX:gNA system of any one of claims 1-3, wherein the protein is selected from the group consisting of beta-2-microglobulin (B2M), T cell receptor alpha chain constant region (TRAC), class II major histocompatibility complex transactivator (CIITA), T cell receptor beta constant 1 (TRBC1), T cell receptor beta constant 2 (TRBC2), human leukocyte antigen A (HLA-A), human leukocyte antigen B (HLA-B), TGFβ Receptor 2 (TGFβRII), programmed cell death 1 (PD-1), cytokine inducible SH2 (CISH), lymphocyte activating 3 (LAG-3), T cell immunoreceptor with Ig and ITIM domains (TIGIT), adenosine A2a receptor (ADORA2A), killer cell lectin like receptor C1 (NKG2A), cytotoxic T-lymphocyte-associated protein 4 (CTLA-4), T-cell immunoglobulin and mucin domain 3 (TIM-3), and 2B4 (CD244).

5. The CasX:gNA system of claim 4, wherein the first protein is B2M.

6. The CasX:gNA system of claim 5, wherein the targeting sequence of the first gNA comprises a sequence selected from the group consisting of SEQ ID NOs: 725-2100, 2281-7085, 547-551, 591-595 and 614-681- or a sequence having at least about 65%, at least about 75%, at least about 85%, or at least about 95% identity thereto.

7. The CasX:gNA system of claim 5, wherein the targeting sequence of the first gNA comprises a sequence selected from the group consisting of SEQ ID NOs: 725-2100, 2281-7085, 547-551, 591-595, and 614-681.

8. The CasX:gNA system of claim 4, wherein the first protein is TRAC.

9. The CasX:gNA system of claim 8, wherein the targeting sequence of the first gNA comprises a sequence selected from the group consisting of SEQ ID NOs: 7086-27454, 522-529 and 566-573, or a sequence having at least about 65%, at least about 75%, at least about 85%, or at least about 95% identity thereto.

10. The CasX:gNA system of claim 8, wherein the targeting sequence of the first gNA comprises a sequence selected from the group consisting of SEQ ID NOs: 7086-27454, 522-529 and 566-573.

11. The CasX:gNA system of claim 4, wherein the first protein is CIITA.

12. The CasX:gNA system of claim 11, wherein the targeting sequence of the first gNA comprises a sequence selected from the group consisting of SEQ ID NOs: 27455-55572, or a sequence having at least about 65%, at least about 75%, at least about 85%, or at least about 95% identity thereto.

13. The CasX:gNA system of claim 11, wherein the targeting sequence of the first gNA comprises a sequence selected from the group consisting of SEQ ID NOs: 27455-55572.

14. The CasX:gNA system of any one of claims 1-13, further comprising a second gNA comprising a targeting sequence complementary to a target nucleic acid sequence of an immune cell gene encoding a second protein selected from the group consisting of beta-2-microglobulin (B2M), T cell receptor alpha chain constant region (TRAC), class II major histocompatibility complex transactivator (CIITA), T cell receptor beta constant 1 (TRBC1), T cell receptor beta constant 2 (TRBC2), human leukocyte antigen A (HLA-A), human leukocyte antigen B (HLA-B), TGFβRII, PD-1, CISH, LAG-3, TIGIT, ADORA2A, NKG2A, CTLA-4, TIM-3, and CD244, wherein the second protein is different from the first protein.

15. The CasX:gNA system of claim 14, wherein the first gNA targeting sequence is complementary to a B2M gene target nucleic acid sequence and the second gNA targeting sequence is complementary to a TRAC gene target nucleic acid sequence.

16. The CasX:gNA system of claim 14, wherein the first gNA targeting sequence is complementary to a B2M gene target nucleic acid sequence and the second gNA targeting sequence is complementary to a CIITA gene target nucleic acid sequence.

17. The CasX:gNA system of claim 14, wherein the first gNA targeting sequence is complementary to a TRAC gene target nucleic acid sequence and the second gNA targeting sequence is complementary to a CIITA gene target nucleic acid sequence.

18. The CasX:gNA system of any one of claims 14-17, further comprising a third gNA comprising a targeting sequence complementary to a target nucleic acid sequence of an immune cell gene encoding a third protein selected from the group consisting of beta-2-microglobulin (B2M), T cell receptor alpha chain constant region (TRAC), class II major histocompatibility complex transactivator (CIITA), T cell receptor beta constant 1 (TRBC1), T cell receptor beta constant 2 (TRBC2), human leukocyte antigen A (HLA-A), human leukocyte antigen B (HLA-B), TGFβRII, PD-1, CISH, LAG-3, TIGIT, ADORA2A, NKG2A,

CTLA-4, TIM-3, and CD244, wherein the third protein is different from the first and second proteins.

19. The CasX:gNA system of claim 18, wherein the first gNA targeting sequence is complementary to a target nucleic acid sequence of a gene encoding B2M, the second gNA targeting sequence is complementary to a target nucleic acid sequence of a gene encoding TRAC, and the third gNA targeting sequence is complementary to a target nucleic acid sequence of a gene encoding CIITA.

20. The CasX:gNA system of any one of claims 1-19, further comprising an additional gNA with a targeting sequence complementary to a target nucleic acid sequence of an immune cell gene encoding a protein selected from the group consisting of cluster of differentiation 247 (CD247), CD3d molecule (CD3D), CD3e molecule (CD3E), CD3g molecule (CD3G), CD52 molecule (CD52), human leukocyte antigen C (HLA-C), deoxycytidine kinase (dCK), and FKBP prolyl isomerase 1A (FKBP1A).

21. The CasX:gNA system of any one of claims 1-20, wherein the first, second, third, and/or additional gNA is a guide RNA (gRNA).

22. The CasX:gNA system of any one of claims 1-20, wherein the gNA is a guide DNA (gDNA).

23. The CasX:gNA system of any one of claims 1-20, wherein the gNA is a chimera comprising DNA and RNA.

24. The CasX:gNA system of any one of claims 1-23, wherein the gNA is a single-molecule gNA (sgNA).

25. The CasX:gNA system of any one of claims 1-23, wherein the gNA is a dual-molecule gNA (dgNA).

26. The CasX:gNA system of any one of claims 1-25, wherein the targeting sequence of the gNA comprises 15, 16, 17, 18, 19, or 20 nucleotides.

27. The CasX:gNA system of any one of claims 1-26, wherein the gNA has a scaffold comprising a sequence selected from the group consisting of reference gNA sequences of SEQ ID NOS: 4-16 or gNA variant sequences of SEQ ID NOS:2101-2280, or a sequence having at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, at least about 95%, at least about 96%, at least about 97%, at least about 98%, or at least about 99% sequence identity thereto.

28. The CasX:gNA system of claim 27, wherein the gNA variant scaffold comprises a sequence having at least one modification relative to a reference gNA sequence selected from the group consisting of SEQ ID NOS:4-16.

29. The CasX:gNA system of claim 28, wherein the at least one modification of the reference gNA comprises at least one substitution, deletion, or substitution of a nucleotide of the gNA sequence.

30. The CasX:gNA system of any one of the preceding claims, wherein the gNA is chemically modified.

31. The CasX:gNA system of any one of the preceding claims, wherein the CasX protein comprises a reference CasX protein having a sequence of any one of SEQ ID NOS:1-3, a CasX variant protein having a sequence of SEQ ID NOs: 49-143, 438, 440, 442, 444, 446, 448-460, 472, 474, 478, 480, 482, 484, 486, 488, 490, 612 or 613, or a sequence having at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, or at least about 95%, or at least about 95%, or at least about 96%, or at least about 97%, or at least about 98%, or at least about 99% sequence identity thereto.

32. The CasX:gNA system of claim 31, wherein the CasX variant protein comprises at least one modification relative to a reference CasX protein having a sequence selected from SEQ ID NOS:1-3.

33. The CasX:gNA system of claim 32, wherein the at least one modification comprises at least one amino acid substitution, deletion, or substitution in a domain of the CasX variant protein relative to the reference CasX protein.

34. The CasX:gNA system of claim 33, wherein the domain is selected from the group consisting of a non-target strand binding (NTSB) domain, a target strand loading (TSL) domain, a helical I domain, a helical II domain, an oligonucleotide binding domain (OBD), and a RuvC DNA cleavage domain.

35. The CasX:gNA system of any one of claims 31-34, wherein the CasX protein further comprises one or more nuclear localization signals (NLS).

36. The CasX:gNA system of claim 35, wherein the one or more NLS are selected from the group of sequences consisting of PKKKRKV (SEQ ID NO: 158), KRPAATKKAGQAKKKK (SEQ ID NO: 159), PAAKRVKLD (SEQ ID NO: 160), RQRRNELKRSP (SEQ ID NO: 161), NQSSNFGPMKGGNFGGRSSGPYGGGGQYFAKPRNQGGY (SEQ ID NO: 162), RMRIZFKNKGKDTAELRRRRVEVSVELRKAKKDEQILKRRNV (SEQ ID NO: 163), VSRKRPRP (SEQ ID NO: 164), PPKKARED (SEQ ID NO: 165), PQPKKKPL (SEQ ID NO: 166), SALIKKKKKMAP (SEQ ID NO: 167), DRLRR (SEQ ID NO: 168), PKQKKRK (SEQ ID NO: 169), RKLKKKIKKL (SEQ ID NO: 170), REKKKFLKRR (SEQ ID NO: 171), KRKGDEVDGVDEVAKKKSKK (SEQ ID NO: 172), RKCLQAGMNLEARKTKK

(SEQ ID NO: 173), PRPRKIPR (SEQ ID NO: 174), PPRKKRTVV (SEQ ID NO: 175), NLSKKKKRKREK (SEQ ID NO: 176), RRPSRPFRKP (SEQ ID NO: 177), KRPRSPSS (SEQ ID NO: 178), KRGINDRNFWRGENERKTR (SEQ ID NO: 179), PRPPKMARYDN (SEQ ID NO: 180), KRSFSKAF (SEQ ID NO: 181), KLKIKRPVK (SEQ ID NO: 182), PKTRRRPRRSQRKRPPT (SEQ ID NO:184), RRKKRRPRRKKRR (SEQ ID NO: 187), PKKKSRKPKKKSRK (SEQ ID NO: 188), HKKKHPDASVNFSEFSK (SEQ ID NO: 189), QRPGPYDRPQRPGPYDRP (SEQ ID NO: 190), LSPSLSPLLSPSLSPL (SEQ ID NO: 191), RGKGGKGLGKGGAKRHRK (SEQ ID NO: 192), PKRGRGRPKRGRGR (SEQ ID NO: 193), MSRRRKANPTKLSENAKKLAKEVEN (SEQ ID NO: 185), PKKKRKVPPPPAAKRVKLD (SEQ ID NO: 183), and PKKKRKVPPPPKKKRKV (SEQ ID NO: 194).

37. The CasX:gNA system of claim 35 or claim 36, wherein the one or more NLS are expressed at or near the C-terminus of the CasX protein.

38. The CasX:gNA system of claim 35 or claim 36, wherein the one or more NLS are expressed at or near the N-terminus of the CasX protein.

39. The CasX:gNA system of claim 35 or claim 36, comprising one or more NLS located at or near the N-terminus and at or near the C-terminus of the CasX protein.

40. The CasX:gNA system of any one of claims 31-39, wherein the CasX variant is capable of forming a ribonuclear protein complex (RNP) with the variant gNA.

41. The CasX:gNA system of claim 40, wherein an RNP of the CasX variant protein and the gNA variant exhibit at least one or more improved characteristics as compared to an RNP of a reference CasX protein of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3 and a gNA comprising a sequence of any one of SEQ ID NOS: 4-16.

42. The CasX:gNA system of claim 41, wherein the improved characteristic is selected from one or more of the group consisting of improved folding of the CasX variant; improved binding affinity to a guide nucleic acid (gNA); improved binding affinity to a target DNA; improved ability to utilize a greater spectrum of one or more PAM sequences, including ATC, CTC, GTC, or TTC, in the editing of target DNA; improved unwinding of the target DNA; increased editing activity; improved editing efficiency; improved editing specificity; increased nuclease activity; increased target strand loading for double strand cleavage; decreased target strand loading for single strand nicking; decreased off-target cleavage; improved binding of non-target DNA strand; improved protein stability; improved protein solubility; improved protein:gNA complex (RNP) stability; improved protein:gNA complex

solubility; improved protein yield; improved protein expression; and improved fusion characteristics.

43. The CasX:gNA system of claim 41 or claim 42, wherein the improved characteristic of the RNP of the CasX variant protein and the gNA variant is at least about 1.1 to about 100-fold or more improved relative to the RNP of the reference CasX protein of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3 and the gNA of any one of SEQ ID NOS: 4-16.

44. The CasX:gNA system of claim 41 or claim 42, wherein the improved characteristic of the CasX variant protein is at least about 1.1, at least about 2, at least about 10, at least about 100-fold or more improved relative to the reference CasX protein of SEQ ID NO:1, SEQ ID NO:2, or SEQ ID NO:3 and the gNA comprising the sequence of any one of SEQ ID NOS: 4-16.

45. The CasX:gNA system of any one of claims 41-43, wherein the improved characteristic comprises editing efficiency, and the RNP of the CasX variant protein and the gNA variant comprises a 1.1 to 100-fold improvement in editing efficiency compared to the RNP of the reference CasX protein of SEQ ID NO:2 and the gNA comprising the sequence of any one of SEQ ID NOS: 4-16.

46. The CasX:gNA system of any one of claims 40-45, wherein the RNP comprising the CasX variant and the gNA variant exhibits greater editing efficiency and/or binding of a target sequence in the target DNA when any one of the PAM sequences TTC, ATC, GTC, or CTC is located 1 nucleotide 5' to the non-target strand of the protospacer having identity with the targeting sequence of the gNA in a cellular assay system compared to the editing efficiency and/or binding of an RNP comprising a reference CasX protein of SEQ ID NO:2 and the gNA comprising the sequence of any one of SEQ ID NOS: 4-16 in a comparable assay system.

47. The CasX:gNA system of claim 46, wherein the PAM sequence is TTC.

48. The CasX:gNA system of claim 46, wherein the PAM sequence is ATC.

49. The CasX:gNA system of claim 46, wherein the PAM sequence is CTC.

50. The CasX:gNA system of claim 46, wherein the PAM sequence is GTC.

51. The CasX:gNA system of any one of claims 46-50, wherein the increased binding affinity for the one or more PAM sequences is at least 1.5-fold to at least 10-fold greater compared to the binding affinity of any one of the reference CasX proteins of SEQ ID NOS: 1-3 for the PAM sequences.

52. The CasX:gNA system of any one of claims 40-51, wherein the RNP has at least a 5%, at least a 10%, at least a 15%, or at least a 20% higher percentage of cleavage-competent

RNP compared to an RNP of the reference CasX of SEQ ID NOS: 1-3 and the gNA comprising a sequence of any one of SEQ ID NOS: 4-16.

53. The CasX:gNA system of any one of claims 31-52, wherein the CasX variant protein comprises a RuvC DNA cleavage domain having nickase activity.

54. The CasX:gNA system of any one of claims 31-52, wherein the CasX variant protein comprises a RuvC DNA cleavage domain having double-stranded cleavage activity.

55. The CasX:gNA system of any one of claims 1-40, wherein the CasX protein is a catalytically inactive CasX (dCasX) protein, and wherein the dCasX and the gNA retain the ability to bind to the SOD1 target nucleic acid.

56. The CasX:gNA system of claim 55, wherein the dCasX comprises a mutation at residues:

a. D672, E769, and/or D935 corresponding to the CasX protein of SEQ ID NO:1; or

b. D659, E756 and/or D922 corresponding to the CasX protein of SEQ ID NO:2.

57. The CasX:gNA system of claim 56, wherein the mutation is a substitution of alanine for the residue.

58. The CasX:gNA system of any one of claims 1-54, further comprising a donor template nucleic acid.

59. The CasX:gNA system of claim 58, wherein the donor template comprises a polynucleotide comprising all or a portion of a gene encoding a protein selected from the group consisting of B2M, TRAC, CIITA, TRBC1, TRBC2, HLA-A, HLA-B, TGFβRII, PD-1, CISH, LAG-3, TIGIT, ADORA2A, NKG2A, CTLA-4, TIM-3, and CD244, , wherein the polynucleotide comprises a deletion, insertion, or mutation of one or more nucleotides in comparison to a genomic polynucleotide sequence encoding the protein.

60. A polynucleotide comprising a sequence that encodes the CasX of any one of claims 31-57.

61. A polynucleotide comprising a sequence that encodes the gNA of any one of claims 1-30.

62. A polynucleotide comprising the donor template of claim 58 or claim 59.

63. A vector comprising one or more of the polynucleotides of claims 60-62.

64. A vector comprising the polynucleotide of any one of claims 60-62.

65. The vector of claim 63 or claim 64, wherein the vector further comprises a promoter.

66. The vector of any one of claims 63-65, wherein the vector is selected from the group consisting of a retroviral vector, a lentiviral vector, an adenoviral vector, an adeno-associated

viral (AAV) vector, a virus-like particle (VLP), a herpes simplex virus (HSV) vector, a plasmid, a minicircle, a nanoplasmid, a DNA vector, and an RNA vector.

67. The vector of claim 66, wherein the vector is an AAV vector.

68. The vector of claim 67, wherein the AAV vector is selected from AAV1, AAV2, AAV3, AAV4, AAV5, AAV6, AAV7, AAV8, AAV9, AAV10, AAV-Rh74, or AAVRh10.

69. The vector of claim 66, wherein the vector is a retroviral vector.

70. A virus-like particle (VLP) comprising one or more components of a gag polyprotein selected from the group of matrix protein (MA), nucleocapsid protein (NC), capsid protein (CA), p1-p6 protein, and a protease cleavage site, and further comprising a targeting glycoprotein that provides for binding and fusion of the VLP to a target cell.

71. The VLP of claim 70 comprising the CasX protein of any one of claims 31-57, and the gNA of any one of claims 1-30, and optionally comprising the polynucleotide of claim 62.

72. The VLP of claim 71, wherein the CasX protein and the gNA are associated together in an RNP.

73. A method of modifying a target nucleic acid sequence of a gene in a population of cells, wherein the gene encodes a protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response, comprising introducing into each cell of the population:

a. the CasX:gNA system of any one of claims 1-59;
b. the polynucleotide of any one of claims 60-62;
c. the vector as in any one of claims 63;
d. the VLP of any one of claims 70-72; or
e. combinations of two or more of (a) to (d),

wherein the target nucleic acid sequence of the cells is modified by the CasX protein.

74. The method of claim 73, wherein the CasX:gNA system is introduced into the cells as an RNP.

75. The method of claim 73 or claim 74, wherein the cells are modified by introduction of a polynucleotide encoding a chimeric antigen receptor (CAR) with binding affinity for a disease antigen, optionally a tumor cell antigen.

76. The method of claim 73 or claim 74, wherein the cells are modified by introduction of a polynucleotide encoding an engineered T cell receptor (TCR) comprising a binding domain with binding affinity for a disease antigen, optionally a tumor cell antigen.

77. The method of claim 74 or claim 75, wherein the tumor cell antigen is selected from the group consisting of Cluster of Differentiation 19 (CD19), cluster of differention 3 (CD3), CD3d molecule (CD3D), CD3g molecule (CD3G), CD3e molecule (CD3E), CD247 molecule (CD247, or CD3Z), CD8a molecule (CD8), CD7 molecule (CD7), membrane metalloendopeptidase (CD10), membrane spanning 4-domains A1 (CD20), CD22 molecule (CD22), TNF receptor superfamily member 8 (CD30), C-type lectin domain family 12 member A (CLL1), CD33 molecule (CD33), CD34 molecule (CD34), CD38 molecule (CD38), integrin subunit alpha 2b (CD41), CD44 molecule (Indian blood group) (CD44), CD47 molecule (CD47), integrin alpha 6 (CD49f), neural cell adhesion molecule 1 (CD56), CD70 molecule (CD70), CD74 molecule (CD74), CD99 molecule (Xg blood group) (CD99), interleukin 3 receptor subunit alpha (CD123), prominin 1 (CD133), syndecan 1 (CD138), carbonix anhydrase IX (CAIX), CC chemokine receptor 4 (CCR4), ADAM metallopeptidase domain 12 (ADAM12), adhesion G protein-coupled receptor E2 (ADGRE2), alkaline phosphatase placental-like 2 (ALPPL2), alpha 4 Integrin, angiopoietin-2 (ANG2), B-cell maturation antigen (BCMA), CD44V6, carcinoembryonic antigen (CEA), CEAC, CEA cell adhesion molecule 5 (CEACAM5), Claudin 6 (CLDN6), claudin 18 (CLDN18), C-type lectin domain family 12 member A (CLEC12A), mesenchymal-epithelial transition factor (cMET), cytotoxic T-lymphocyte-associated protein 4 (CTLA4), epidermal growth factor receptor 1 (EGF1R), epidermal growth factor receptor variant III (EGFRvIII), epithelial glycoprotein 2 (EGP-2), epithelial cell adhesion molecule (EGP-40 or EpCAM), EPH receptor A2 (EphA2), ectonucleotide pyrophosphatase/phosphodiesterase 3 (ENPP3), erb-b2 receptor tyrosine kinase 2 (ERBB2), erb-b2 receptor tyrosine kinase 3 (ERBB3), erb-b2 receptor tyrosine kinase 4 (ERBB4), folate binding protein (FBP), fetal nicotinic acetylcholine receptor (AChR), folate receptor alpha (FRalpha or FOLR1), G protein-coupled receptor 143 (GPR143), glutamate metabotropic receptor 8 (GRM8), glypican-3 (GPC3), ganglioside GD2, ganglioside GD3, human epidermal growth factor receptor 1 (HER1), human epidermal growth factor receptor 2 (HER2), human epidermal growth factor receptor 3 (HER3), Integrin B7, intercellular cell-adhesion molecule-1 (ICAM-l), human telomerase reverse transcriptase (hTERT), Interleukin-13 receptor α2 (IL-l3R-a2), K-light chain, Kinase insert domain receptor (KDR), Lewis-Y (LeY), chondromodulin-1 (LECT1), Ll cell adhesion molecule (L1CAM), Lysophosphatidic acid receptor 3 (LPAR3), melanoma-associated antigen 1 (MAGE-A1), mesothelin (MSLN), mucin 1 (MUC1), mucin 16, cell surface associated (MUC16), melanoma-associated antigen 3 (MAGE-A3), tumor protein p53 (p53), Melanoma Antigen Recognized by T cells 1 (MART1), glycoprotein 100 (GPl00), Proteinase3 (PR1),

ephrin-A receptor 2 (EphA2), Natural killer group 2D ligand (NKG2D ligand), New York esophageal squamous cell carcinoma 1 (NY-ESO-1), oncofetal antigen (h5T4), prostate-specific membrane antigen (PSMA), programmed death ligand 1 (PDL-1), receptor tyrosine kinase-like orphan receptor 1 (ROR1), trophoblast glycoprotein (TPBG), tumor-associated glycoprotein 72 (TAG-72), tumor-associated calcium signal transducer 2 (TROP-2), tyrosinase (TYR), survivin, vascular endothelial growth factor receptor 2 (VEGF- R2), Wilms tumor-1 (WT-1), leukocyte immunoglobulin-like receptor B2 (LILRB2), Preferentially Expressed Antigen In Melanoma (PRAME), T cell receptor beta constant 1 (TRBC1), TRBC2, and (T-cell immunoglobulin mucin-3) TIM-3.

78. The method of any one of claims 75-77, wherein the CAR and/or the TCR comprises an antigen binding domain selected from the group consisting of a linear antibody, single domain antibody (sdAb), and single-chain variable fragment (scFv).

79. The method of claim 78, wherein the antigen binding domain is an scFv with binding affinity to the tumor cell antigen.

80. The method of claim 79, wherein the antigen binding domain is an scFv comprising variable heavy (VH) and variable light (VL) and/or heavy chain and light chain CDRs selected from the group consisting of the sequences set forth in Table 5.

81. The method of claim 80, wherein the VH, VL, and/or the CDRs of the scFv have one or more amino acid modifications wherein the scFv retains binding affinity to the tumor antigen, and wherein the modification is selected from the group consisting of a substitution, deletion, and insertion.

82. The method of any one of claims 75-81, wherein the CAR further comprises at least one intracellular signaling domain.

83. The method of claim 82, wherein the at least one intracellular signaling domain comprises at least one intracellular signaling domain isolated or derived from CD247 molecule (CD3-zeta), CD27 molecule (CD27), CD28 molecule (CD28), TNF receptor superfamily member 9 (4-1BB), inducible T cell costimulator (ICOS), or TNF receptor superfamily member 4 (OX40).

84. The method of claim 83, wherein the at least one intracellular signaling domain comprises:

a. a CD3-zeta intracellular signaling domain;

b. a CD3-zeta intracellular signaling domain and a 4-1BB or CD28 intracellular signaling domain;

c. a CD-zeta intracellular signaling domain, a 4-1BB intracellular signaling domain, and a CD28 intracellular signaling domain; or

d. a CD-zeta intracellular signaling domain, a CD28 intracellular signaling domain, a 4-1BB intracellular signaling domain, and a CD27 or OX40 intracellular signaling domain.

85. The method of any one of claims 75-84, wherein the CAR further comprises an extracellular hinge domain.

86. The method of claim 85, wherein the hinge domain is an immunoglobulin like domain.

87. The method of claim 86, wherein the hinge domain is isolated or derived from IgG1, IgG2, or IgG4.

88. The method of claim 86, wherein the hinge domain is isolated or derived from CD8a molecule (CD8) or CD28.

89. The method of any one of claims 75-88, wherein the CAR further comprises a transmembrane domain.

90. The method of claim 89, wherein the transmembrane domain is isolated or derived from the group consisting of CD3-zeta, CD4, CD8, and CD28.

91. The method of any one of claims 76-81, wherein the TCR comprises one or more subunits selected from the group consisting of TCR alpha, TCR beta, CD3-delta, CD3-epsilon, CD-gamma or CD3-zeta.

92. The method of claim 91, wherein the TCR further comprises one or more intracellular signaling domains selected from the group consisting of CD247 molecule (CD3-zeta), CD27 molecule (CD27), CD28 molecule (CD28), TNF receptor superfamily member 9 (4-1BB), inducible T cell costimulator (ICOS), or TNF receptor superfamily member 4 (OX40).

93. The method of claim 90 or claim 91, wherein the antigen binding domain of the TCR is operably linked to one or more TCR subunits selected from the group consisting of of TCR alpha, TCR beta, CD3-delta, CD3-epsilon, CD-gamma or CD3-zeta.

94. The method of claim 93, wherein the antigen binding domain of the TCR is an scFv comprising variable heavy (VH) and variable light (VL) and/or heavy chain and light chain CDRs selected from the group consisting of the sequences set forth in Table 5.

95. The method of claim 94, wherein the VH, VL, and/or the CDRs of the scFv have one or more amino acid modifications wherein the scFv retains binding affinity to the tumor antigen, and wherein the modification is selected from the group consisting of a substitution, deletion, and insertion.

96. The method of any one of claims 73-95, wherein the cells are selected from the group consisting of rodent cells, mouse cells, rat cells, and non-human primate cells.

97. The method of any one of claims 73-95, wherein the cells are human cells.

98. The method of any one of claims 73-97, wherein the cells are selected from the group consisting of progenitor cells, hematopoietic stem cells, and pluripotent stem cells.

99. The method of claim 98, wherein the cells are induced pluripotent stem cells.

100. The method of any one of claims 73-97, wherein the cells are immune cells.

101. The method of claim 100, wherein the immune cells are selected from the group consisting of T cells, tumor infiltrating lymphocytes, NK cells, B cells, monocytes, macrophages, or dendritic cells.

102. The method of claim 101, wherein the T cells are selected from the group consisting of CD4+ T cells, CD8+ T cells, cytotoxic T cells, terminal effector T cells, memory T cells, naïve T cells, regulatory T cells, natural killer T cells, gamma-delta T cells, cytokine-induced killer (CIK) T cells, and tumor infiltrating lymphocytes, or a combination thereof.

103. The method of any one of claims 73-102, wherein the modifying comprises introducing one or more single-stranded breaks in the target nucleic acid sequence of the cells of the population.

104. The method of any one of claims 73-102, wherein the modifying comprises introducing one or more double-stranded breaks in the target nucleic acid sequence of the cells of the population.

105. The method of any one of claims 73-104, wherein the modifying comprises introducing an insertion, deletion, substitution, duplication, or inversion of one or more nucleotides in the target nucleic acid sequence of the cells of the population, resulting in a knock-down or knock-out of a gene in the cells of the population encoding one or more proteins selected from the group consisting of B2M, TRAC, CIITA, TRBC1, TRBC2, HLA-A, HLA-B, TGFβRII, PD-1, CISH, LAG3, TIGIT, ADORA2A, NKG2A, CTLA-4, TIM-3, and CD244.

106. The method of any one of claims 73-104, wherein the method comprises insertion of the donor template of claim 58 or claim 59 into the break site(s) of the target nucleic acid sequence of the cells of the population.

107. The method of claim 106, wherein the insertion of the donor template is mediated by homology-directed repair (HDR) or homology-independent targeted integration (HITI).

108. The method of claim 106 or claim 107, wherein insertion of the donor template results in a knock-down or knock-out of the gene in the cells of the population encoding one or more

proteins selected from the group consisting of B2M, TRAC, CIITA, TRBC1, TRBC2, HLA-A, HLA-B, TGFβRII, PD-1, CISH, LAG-3, TIGIT, ADORA2A, NKG2A, CTLA-4, TIM-3, and CD244.

109. The method of any one of claims 105-108, wherein the cells of the population have been modified such that expression of the one or more proteins is reduced by at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, or at least about 95% in comparison to a cell that has not been modified.

110. The method of any one of claims 105-109, wherein the cells of the population have been modified such that at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, or at least about 95% of the cells do not express a detectable level of the one or more proteins in comparison to a cell that has not been modified.

111. The method of any one of claims 105-110, wherein the one or more proteins are selected from the group consisting of B2M, TRAC, and CIITA.

112. The method of claim 111, wherein the cells of the population have been modified such that at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, or at least about 95% of the cells do not express a detectable level of at least two of the proteins selected from the group consisting of B2M, TRAC, and CIITA.

113. The method of any one of claims 105-112, wherein the cells have been modified such that at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, or at least about 95% of the population of cells do not express a detectable level of MHC Class I molecules.

114. The method of any one of claims 105-113, wherein the cells have been modified such that at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, or at least about 95% of the population of cells do not express a detectable level of wild-type T cell receptor.

115. The method of any one of claims 105-114, wherein the population of cells expresses a detectable level of the CAR.

116. The method of any one of claims 105-115, wherein the population of cells expresses a detectable level of the TCR.

117. The method of any one of claims 73-115, wherein the method is conducted ex vivo on the population of cells.

118. The method of any one of claims 73-115, wherein the method is conducted in vivo in a subject.

119. The method of claim 118, wherein the subject is selected from the group consisting of a rodent, a mouse, a rat, and a non-human primate.

120. The method of claim 118, wherein the subject is human.

121. A population of cells modified *ex vivo* by the method of any one of claims 73-117.

122. The population of cells of claim 121, wherein the cells have been modified such that at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, or at least 95% of the population of cells do not express a detectable level of MHC Class I molecules.

123. The population of cells of claim 121 or claim 122, wherein the cells have been modified such that at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, or at least 95% of the population of cells do not express a detectable level of wild-type T cell receptor.

124. The population of cells of any one of claims 121-123, wherein the cell has been modified such that at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, or at least 95% of the population of cells express a detectable level of the chimeric antigen receptor (CAR).

125. The population of cells of claim 121-124, wherein the cell has been modified such that at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, or at least 95% of the population of cells express a detectable level of an immune stimulatory cytokine selected from the group consisting of interleukin 7 (IL-7), IL-12, IL-15, and IL-18.

126. The population of cells of any one of claims 121-125, wherein the cell has been modified such that at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, or at least 95% of the population of cells express a detectable level of the TCR.

127. The population of cells of any one of claims 124-126, wherein upon binding of the CAR to the tumor antigen of a cell bearing said tumor antigen, the population of cells are capable of a response selected from: i) becoming activated; ii) inducing proliferation of the population of cells; iii) cytokine secretion by the population of cells;iv) inducing cytotoxicity of the cell bearing said tumor antigen, or v) a combination of any one of (i)-(iv).

128. A method of providing anti-tumor immunity in a subject, the method comprising administering to the subject a therapeutically effective amount of the population of cells of any one of claims 121-127.

129. A method of treating a subject in need thereof, comprising administering to the subject a therapeutically effective amount of the population of cells of any one of claims 121-127.

130. The method of claim 129, wherein the subject has cancer or an autoimmune disease.

131. The method of claim 130, wherein the cancer selected from the group consisting of colon cancer, rectal cancer, renal-cell carcinoma, liver cancer, non-small cell carcinoma of the lung, cancer of the small intestine, cancer of the esophagus, melanoma, bone cancer, pancreatic cancer, skin cancer, cancer of the head or neck, cutaneous or intraocular malignant melanoma, uterine cancer, ovarian cancer, rectal cancer, cancer of the anal region, stomach cancer, testicular cancer, carcinoma of the fallopian tubes, carcinoma of the endometrium, carcinoma of the cervix, carcinoma of the vagina, carcinoma of the vulva, Hodgkin's Disease, non-Hodgkin's lymphoma, cancer of the endocrine system, cancer of the thyroid gland, cancer of the parathyroid gland, cancer of the adrenal gland, sarcoma of soft tissue, cancer of the urethra, cancer of the penis, solid tumors of childhood, cancer of the bladder, cancer of the kidney or ureter, carcinoma of the renal pelvis, neoplasm of the central nervous system (CNS), primary CNS lymphoma, tumor angiogenesis, spinal axis tumor, brain stem glioma, pituitary adenoma, Kaposi's sarcoma, epidermoid cancer, squamous cell cancer, T-cell lymphoma, environmentally induced cancers, chronic lymphocytic leukemia (CLL), acute leukemias, acute lymphoid leukemia (ALL), B-cell acute lymphoid leukemia (B-ALL), T-cell acute lymphoid leukemia (T-ALL), chronic myelogenous leukemia (CML), acute myeloid leukemia (AML), B cell prolymphocytic leukemia, blastic plasmacytoid dendritic cell neoplasm, Burkitt's lymphoma, diffuse large B cell lymphoma, follicular lymphoma, hairy cell leukemia, small cell- or a large cell-follicular lymphoma, malignant lymphoproliferative conditions, MALT lymphoma, mantle cell lymphoma, marginal zone lymphoma, multiple myeloma, myelodysplasia and myelodysplastic syndrome, Hodgkin's lymphoma, plasmablastic lymphoma, plasmacytoid dendritic cell neoplasm, Waldenstrom macroglobulinemia, pre-leukemia, combinations of said cancers, and metastatic lesions of said cancers.

132. The method of claim 130 or 131, wherein the cancer expresses a tumor cell antigen.

133. The method of claim 132, wherein the CAR has a specific binding affinity to the tumor cell antigen.

134. The method of claim 133, wherein upon binding of the CAR to the tumor antigen , the population of cells are capable of: i) becoming activated; ii) inducing proliferation of the population of cells; iii) cytokine secretion by the population of cells; iv) inducing cytotoxicity of the cell bearing said tumor antigen, or v) a combination of any one of (i)-(iv). .

135. The method of any one of claims 128-134, wherein the population of cells is administered to the subject by a route of administration selected from intraparenchymal, intravenous, intra-arterial, intracerebroventricular, intracisternal, intrathecal, intracranial,

lumbar, intraperitoneal, subcutaneous, intraocular, periocular, subretinal, intravitreal, intrapulmonary, intranasal, and combinations thereof.

136. The method of any one of claims 128-135, wherein the administration of the therapeutically effective amount of the population of cells results in an improvement in a clinical parameter or endpoint associated with the disease in the subject selected from one or more of tumor shrinkage as a complete, partial or incomplete response; time-to-progression, time to treatment failure, biomarker response; progression-free survival; disease free-survival; time to recurrence; time to metastasis; time of overall survival; improvement of quality of life; and improvement of symptoms.

137. The method of any one of claims 128-136, wherein the method further comprises administering a chemotherapeutic agent.

138. A method of preparing cells for immunotherapy in a subject, comprising modifying immune cells by reducing or eliminating expression of one or more proteins involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response.

139. The method of claim 138, comprising contacting a target nucleic acid sequence of the immune cell with a CasX:gNA system comprising a CasX protein and one or more gNA, wherein each gNA comprises a targeting sequence complementary to a target nucleic acid sequence of one or more genes encoding the one or more proteins involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response.

140. The method of claim 138 or claim 139, wherein the one or more proteins are selected from the group consisting of B2M, TTRAC, CIITA, TRBC1, TRBC2, HLA-A, HLA-B, TGFβRII, PD-1, CISH, LAG-3, TIGIT, ADORA2A, NKG2A, CTLA-4, TIM-3, and CD244.

141. The method of claim 140, wherein the one or more proteins are selected from the group consisting of B2M, TRAC, and CIITA.

142. The method of claim 140 or claim 141, further comprising a gNA comprising a targeting sequence complementary to a nucleic acid sequence of a gene encoding a protein selected from the group consisting of CD247, CD3D, CD3E, CD3G, CD52, human leukocyte antigen C (HLA-C), deoxycytidine kinase (dCK), and FKBP1A.

143. The method of any one of claims 138-142, wherein the cells have been modified such that expression of the one or more proteins is reduced by at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, or at least about 95% in comparison to a cell that has not been modified.

144. The method of any one of claims 138-143, wherein the cells have been modified such that the cells do not express a detectable level of the one or more proteins.

145. The method of any one of claims 138-144, wherein the cells have been modified such that at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, or at least 95% of the modified cells do not express a detectable level of MHC Class I molecules.

146. The method of claim 138-145, wherein the cells have been modified such that at least 70%, at least 75%, at least 80%, at least 85%, at least 90%, or at least 95% of the modified cells do not express a detectable level of wild-type T cell receptor.

147. The method of any one of claims 138-146, further comprising introducing into the immune cell a polynucleic acid encoding a chimeric antigen receptor (CAR) with specific binding affinity for a tumor cell antigen.

148. The method of any one of claims 138-147, further comprising introducing into the immune cell a polynucleic acid encoding an engineered T cell receptor (TCR) comprising a binding domain with binding affinity for a disease antigen, optionally a tumor cell antigen.

149. The method of claim 147, wherein the tumor cell antigen is selected from the group consisting ofCD19, CD3, CD3D, CD3G, CD3E, CD247, CD8, CD7, CD10, CD20, CD22, CD30, CLL1, CD33, CD34, CD38, CD41, CD44, CD47, CD49f, CD56, CD70, CD74, CD99, CD123, CD133, CD138, CAIX, CCR4, ADAM12, ADGRE2, ALPPL2, ANG2, BCMA, CD44V6, CEA, CEAC, CEACAM5, CLDN6, CLDN18, CLEC12A, cMET, CTLA-4, EGF1R, EGFR-vIII, EGP-2, EGP-40, EphA2, ENPP3, EpCAM, ERBB2, ERBB3, ERBB4, FBP, AChR, FRalpha, GPR143, GRM8, gGPC3, ganglioside GD2, ganglioside GD3, HER1, HER2, HER3, Integrin B7, ICAM-l, hTERT, IL-l3R-a2, K-light chain, KDR, Lewis-Y, LECT1, L1CAM, LPAR3, MAGE-A1, MSLN, MUC1, MUC16, MAGE-A3, p53, MART1, GPl00, PR1, EphA2, NKG2D ligand, NY-ESO-1, h5T4, PSMA, PDL-1, ROR1, TPBG, TAG-72, TROP-2, TYR, survivin, VEGF-R2, WT-1, LILRB2, PRAME, TRBC1, TRBC2, and TIM-3. .

150. The method of claim 147 or claim 148, wherein the CAR comprises an antigen binding domain selected from the group consisting of linear antibody, single domain antibody (sdAb), and single-chain variable fragment (scFv).

151. The method of claim 150, wherein the antigen binding domain is a scFv comprising variable heavy (VH) and variable light (VL) and/or heavy chain and light chain CDRs selected from the group consisting of the sequences set forth in Table 5.

152. The method of claim 151, wherein the VH, VL, and/or the CDRs of the scFv have one or more amino acid modifications wherein the scFv retains binding affinity to the tumor antigen, and wherein the modification is selected from the group consisting of a substitution, deletion, and insertion.

153. The method of any one of claims 147-152, wherein the CAR further comprises at least one intracellular signaling domain.

154. The method of claim 153, wherein the at least one intracellular signaling domain comprises at least one intracellular signaling domain isolated or derived from CD247 molecule (CD3-zeta), CD27 molecule (CD27), CD28 molecule (CD28), TNF receptor superfamily member 9 (4-1BB), inducible T cell costimulator (ICOS), or TNF receptor superfamily member 4 (OX40).

155. The method of claim 154, wherein the at least one intracellular signaling domain comprises:

a. a CD3-zeta intracellular signaling domain;

b. a CD3-zeta intracellular signaling domain and a 4-1BB or CD28 intracellular signaling domain;

c. a CD-zeta intracellular signaling domain, a 4-1BB intracellular signaling domain, and a CD28 intracellular signaling domain;

d. a CD-zeta intracellular signaling domain, a CD28 intracellular signaling domain, a 4-1BB intracellular signaling domain, and a CD27 or OX40 intracellular signaling domain.

156. The method of any one of claims 147-155, wherein the CAR further comprises an extracellular hinge domain.

157. The method of claim 156, wherein the hinge domain is an immunoglobulin like domain.

158. The method of claim 157, wherein the hinge domain is isolated or derived from IgG1, IgG2, or IgG4.

159. The method of claim 157, wherein the hinge domain is isolated or derived from CD8a molecule (CD8) or CD28.

160. The method of any one of claims 147-159, wherein the CAR further comprises a transmembrane domain.

161. The method of claim 160, wherein the transmembrane domain is isolated or derived from from the group consisting of CD3-zeta, CD4, CD8, and CD28.

162. The method of any one of claims 148-161, wherein the TCR comprises one or more subunits selected from the group consisting of TCR alpha, TCR beta, CD3-delta, CD3-epsilon, CD-gamma or CD3-zeta.

163. The method of claim 162, wherein the TCR further comprises an intracellular domain comprising a stimulatory domain from an intracellular signaling domain.

164. The method of claim 162 or claim 163, wherein the antigen binding domain of the TCR is operably linked to the TCR alpha or the TCR beta subunits.

165. The method of claim 164, wherein the antigen binding domain of the TCR is an scFv comprising variable heavy (VH) and variable light (VL) and/or heavy chain and light chain CDRs selected from the group consisting of the sequences set forth in Table 5.

166. The method of claim 165, wherein the VH, VL, and/or the CDRs of the scFv have one or more amino acid modifications wherein the scFv retains binding affinity to the tumor antigen, and wherein the modification is selected from the group consisting of a substitution, deletion, and insertion.

167. The method of any one of claims 147-166, further comprising introducing into the immune cell a polynucleotide encoding an immune stimulatory cytokine selected from the group consisting of IL-7, IL-12, IL-15, and IL-18.

168. The method of any one of claims 138-167, further comprising expanding a population of said cells by in vitro culture in an appropriate medium under appropriate growth conditions.

169. The method of any one of claims 138-168, wherein the cells are autologous to the subject to receive the cells.

170. The method of any one of claims 138-168, wherein the cells are allogeneic to the subject to receive the cells.

171. The method of any one of claims 138-170, wherein the subject has cancer or an autoimmune disease.

172. The method of claim 171, wherein the cancer selected from the group consisting of colon cancer, rectal cancer, renal-cell carcinoma, liver cancer, non-small cell carcinoma of the lung, cancer of the small intestine, cancer of the esophagus, melanoma, bone cancer, pancreatic cancer, skin cancer, cancer of the head or neck, cutaneous or intraocular malignant melanoma, uterine cancer, ovarian cancer, rectal cancer, cancer of the anal region, stomach cancer, testicular cancer, carcinoma of the fallopian tubes, carcinoma of the endometrium, carcinoma of the cervix, carcinoma of the vagina, carcinoma of the vulva, Hodgkin's Disease, non-Hodgkin's lymphoma, cancer of the endocrine system, cancer of the thyroid gland, cancer of the parathyroid gland, cancer of the adrenal gland, sarcoma of soft tissue, cancer of the urethra, cancer of the penis, solid tumors of childhood, cancer of the bladder, cancer of the kidney or ureter, carcinoma of the renal pelvis, neoplasm of the central nervous system (CNS), primary CNS lymphoma, tumor angiogenesis, spinal axis tumor, brain stem glioma, pituitary adenoma, Kaposi's sarcoma, epidermoid cancer, squamous cell cancer, T-cell

lymphoma, environmentally induced cancers, chronic lymphocytic leukemia (CLL), acute leukemias, acute lymphoid leukemia (ALL), B-cell acute lymphoid leukemia (B-ALL), T-cell acute lymphoid leukemia (T-ALL), chronic myelogenous leukemia (CML), acute myeloid leukemia (AML), B cell prolymphocytic leukemia, blastic plasmacytoid dendritic cell neoplasm, Burkitt's lymphoma, diffuse large B cell lymphoma, follicular lymphoma, hairy cell leukemia, small cell- or a large cell-follicular lymphoma, malignant lymphoproliferative conditions, MALT lymphoma, mantle cell lymphoma, marginal zone lymphoma, multiple myeloma, myelodysplasia and myelodysplastic syndrome, Hodgkin's lymphoma, plasmablastic lymphoma, plasmacytoid dendritic cell neoplasm, Waldenstrom macroglobulinemia, pre-leukemia, combinations of said cancers, and metastatic lesions of said cancers.

173. The method of claim 171 or claim 172, wherein the cancer expresses a tumor cell antigen.

174. The method of claim 173, wherein the CAR has a specific binding affinity to the tumor cell antigen.

175. The method of claim 174, wherein upon binding of the CAR to the tumor antigen, the cells are capable of: i) becoming activated; ii) inducing proliferation of the cells; iii) inducing cytokine secretion by the cells; iv) inducing cytotoxicity of the cell bearing said tumor antigen, or v) a combination of any one of (i)-(iv).

176. The method of any one of claims 138-175, wherein the cells are administered to the subject by a route of administration selected from intraparenchymal, intravenous, intra-arterial, intracerebroventricular, intracisternal, intrathecal, intracranial, lumbar, intraperitoneal, subcutaneous, intraocular, periocular, subretinal, intravitreal, intrapulmonary, intranasal, and combinations thereof.

177. The method of any one of claims 138-176, wherein the administration of a therapeutically effective amount of the cells results in an improvement in a clinical parameter or endpoint associated with the disease in the subject selected from one or more of tumor shrinkage as a complete, partial or incomplete response; time-to-progression, time to treatment failure, biomarker response; progression-free survival; disease free-survival; time to recurrence; time to metastasis; time of overall survival; improvement of quality of life; and improvement of symptoms.

178. The method of any one of claims 138-177, wherein the method further comprises administering a chemotherapeutic agent.

179. A kit, comprising

a. the CasX system of any one of claims 1-59;

b. the vector of any one of claims 63-69 or

c. the VLP of any one of claims 70-72;

and further comprising an excipient and a container.

180. The kit of claim 179, further comprising a buffer, a nuclease inhibitor, a protease inhibitor, a liposome, a therapeutic agent, a label, a label visualization reagent, or any combination of the foregoing.

181. The CasX:gNA system of any one of claims 1-54, the polynucleotide of any one of claims 60-62, the vector of any one of claims 63-69, the VLP of any one of claims 70-72, or the population of cells of any one of claims 121-127 for use as a medicament for the treatment of a disease or disorder.

182. The CasX:gNA system of any one of claims 1-54, the polynucleotide of any one of claims 60-62, the vector of any one of claims 63-69, the VLP of any one of claims 70-72, or the population of cells of any one of claims 121-127 for use in a method of treatment of a disease or disorder in a subject in need thereof.

183. The CasX:gNA system, polynucleotide, vector, VLP or population of cells of claim 181 or 182, wherein the disease or disorder is cancer or an autoimmune disease.

184. A guide nucleic acid (gNA) comprising a targeting sequence complementary to a target nucleic acid sequence in the target strand of a gene encoding a protein involved in antigen processing, antigen presentation, antigen recognition, and/or antigen response, wherein the gNA is capable of forming a complex with a CRISPR protein that is specific to a protospacer adjacent motif (PAM) sequence comprising a TC motif in the complementary non-target strand, and wherein the PAM sequence is located 1 nucleotide 5' of the sequence in the non-target strand that is complementary to the target nucleic acid sequence in the target strand.

185. The gNA of claim 184, wherein the CRISPR protein is specific for a TC PAM sequence.

186. The gNA of claim 184, wherein the CRISPR protein is specific for a TTC PAM sequence.

187. The gNA of claim 184, wherein the CRISPR protein is specific for an ATC PAM sequence.

188. The gNA of claim 184, wherein the CRISPR protein is specific for a CTC PAM sequence.

189. The gNA of claim 184, wherein the CRISPR protein is specific for a GTC PAM sequence.

190. The gNA any one of claims 184-189, wherein the targeting sequence is located at the 3' end of the gNA.

191. The gNA of any one of claims 184-190, wherein the CRISPR protein is a Type V CRISPR protein.

192. The gNA sequence of claim 184-191, wherein the protein is an immune cell surface marker.

193. The gNA sequence of claim 184-191, wherein the protein is an immune checkpoint protein.

194. The gNA sequence of claim 184-191, wherein the protein is an intracellular protein.

195. The gNA sequence of claim 184-191, wherein the protein is selected from the group consisting of beta-2-microglobulin (B2M), T cell receptor alpha chain constant region (TRAC), class II major histocompatibility complex transactivator (CIITA), T cell receptor beta constant 1 (TRBC1), T cell receptor beta constant 2 (TRBC2), human leukocyte antigen A (HLA-A), human leukocyte antigen B (HLA-B), TGFβ Receptor 2 (TGFβRII), programmed cell death 1 (PD-1), cytokine inducible SH2 (CISH), lymphocyte activating 3 (LAG-3), T cell immunoreceptor with Ig and ITIM domains (TIGIT), adenosine A2a receptor (ADORA2A), killer cell lectin like receptor C1 (NKG2A), cytotoxic T-lymphocyte-associated protein 4 (CTLA-4), T-cell immunoglobulin and mucin domain 3 (TIM-3), and 2B4 (CD244).

196. The gNA of claim 195, wherein the protein is B2M.

197. The gNA of claim 196, wherein the targeting sequence of the gNA comprises a sequence selected from the group consisting of SEQ ID NOs: 725-2100, 2281-7085, 547-551, 591-595, and 614-681 or a sequence having at least about 65%, at least about 75%, at least about 85%, or at least about 95% identity thereto.

198. The gNA of claim 196, wherein the targeting sequence of the gNA comprises a sequence selected from the group consisting of SEQ ID NOs: 725-2100, 2281-7085, 547-551, 591-595 and 614-681.

199. The gNA of claim 195, wherein the protein is TRAC.

200. The gNA of claim 199, wherein the targeting sequence of the gNA comprises a sequence selected from the group consisting of SEQ ID NOs: 7086-27454, 522-529 and 566-573, or a sequence having at least about 65%, at least about 75%, at least about 85%, or at least about 95% identity thereto.

201. The gNA of claim 199, wherein the targeting sequence of the gNA comprises a sequence selected from the group consisting of SEQ ID NOs: 7086-27454, 522-529 and 566-573.

202. The gNA of claim 195, wherein the protein is CIITA.

203. The gNA of claim 202, wherein the targeting sequence of the gNA comprises a sequence selected from the group consisting of SEQ ID NOs: 27455-55572, or a sequence having at least about 65%, at least about 75%, at least about 85%, or at least about 95% identity thereto.

204. The gNA of claim 202, wherein the targeting sequence of the gNA comprises a sequence selected from the group consisting of SEQ ID NOs: 27455-55572.

205. The gNA of any one of claims 184-204, wherein the gNA is a guide RNA (gRNA).

206. The gNA of any one of claims 184-204, wherein the gNA is a guide DNA (gDNA).

207. The gNA of any one of claims 184-204, wherein the gNA is a chimera comprising DNA and RNA.

208. The gNA of any one of claims 184-204, wherein the gNA is a single-molecule gNA (sgNA).

209. The gNA of any one of claims 184-208, wherein the gNA is a dual-molecule gNA (dgNA).

210. The gNA of any one of claims 184-209, wherein the targeting sequence of the gNA comprises 15, 16, 17, 18, 19, or 20 nucleotides.

211. The gNA of any one of claims 184-210, wherein the gNA has a scaffold comprising a sequence selected from the group consisting of reference gNA sequences of SEQ ID NOS: 4-16 or gNA variant sequences of SEQ ID NOS:2101-2280, or a sequence having at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, at least about 95%, at least about 96%, at least about 97%, at least about 98%, or at least about 99% sequence identity thereto.

212. The gNA of claim 211, wherein the gNA variant scaffold comprises a sequence having at least one modification relative to a reference gNA sequence selected from the group consisting of SEQ ID NOS:4-16.

213. The gNA of claim 212, wherein the at least one modification of the reference gNA comprises at least one substitution, deletion, or substitution of a nucleotide of the gNA sequence.

214. The gNA of any one of claims 184-213, wherein the gNA is chemically modified.

215. The gNA of any one of claims 184-214, wherein the gNA can from a ribonuclear protein complex (RNP) with a Class II Type V CRISPR-Cas protein.

216. The gNA of claim 215, wherein the Class II Type V CRISPR-Cas protein is selected from a protein comprising any one of the SEQ ID NOS:1-3, a protein comprising a sequence of SEQ ID NOs: 49-143, 438, 440, 442, 444, 446, 448-460, 472, 474, 478, 480, 482, 484, 486, 488, 490, 612 or 613, or a sequence having at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, or at least about 95%, or at least about 95%, or at least about 96%, or at least about 97%, or at least about 98%, or at least about 99% sequence identity thereto.

217. A Class II Type V CRISPR protein, wherein an RNP comprising the CRISPR protein and a gNA at a concentration of 20 pM or less is capable of cleaving a double stranded DNA target with an efficiency of at least 80%.

DEMANDE OU BREVET VOLUMINEUX

LA PRÉSENTE PARTIE DE CETTE DEMANDE OU CE BREVET COMPREND PLUS D'UN TOME.

CECI EST LE TOME 1 DE 2
CONTENANT LES PAGES 1 À 237

NOTE : Pour les tomes additionels, veuillez contacter le Bureau canadien des brevets

JUMBO APPLICATIONS/PATENTS

THIS SECTION OF THE APPLICATION/PATENT CONTAINS MORE THAN ONE VOLUME

THIS IS VOLUME 1 OF 2
CONTAINING PAGES 1 TO 237

NOTE: For additional volumes, please contact the Canadian Patent Office

NOM DU FICHIER / FILE NAME :

NOTE POUR LE TOME / VOLUME NOTE:

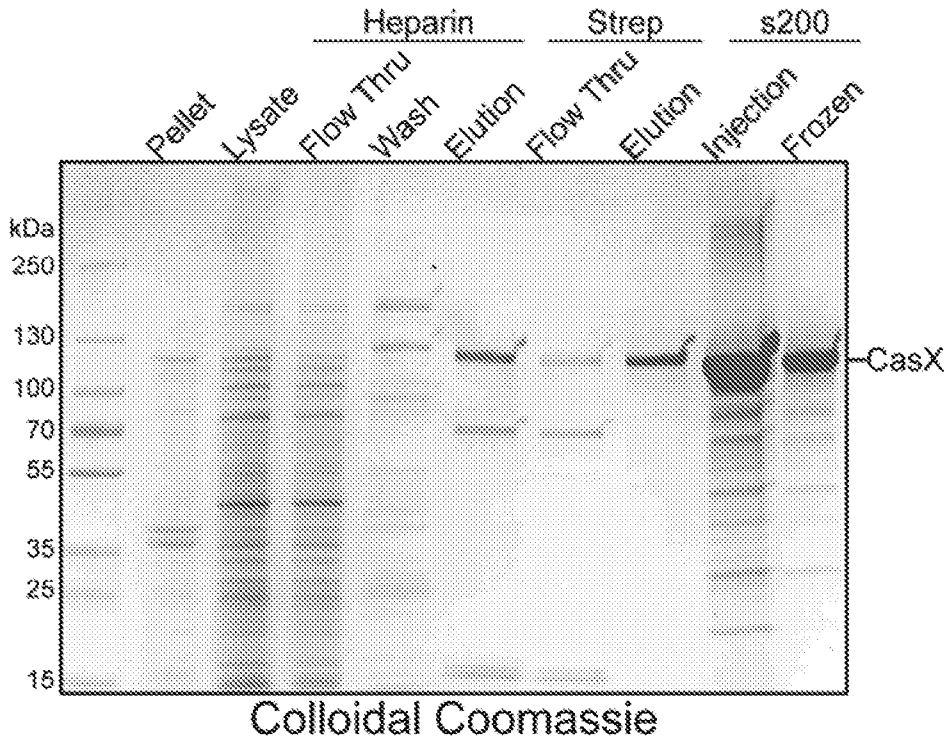

Heparin
Strep
s200
Pellet
Lysate
Flow Thru
Wash
Elution
Flow Thru
Elution
Injection
Frozen
kDa
250
130
100
70
55
35
25
15
CasX
Colloidal Coomassie

FIG. 1

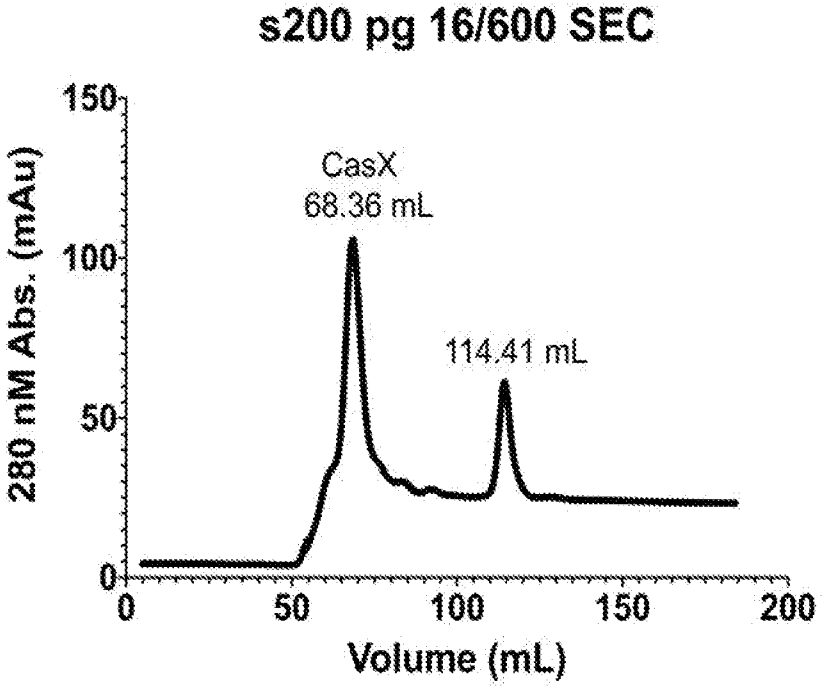

s200 pg 16/600 SEC
280 nM Abs. (mAu)
150
100
50
0
CasX
68.36 mL
114.41 mL
0
50
100
150
200
Volume (mL)

FIG. 2

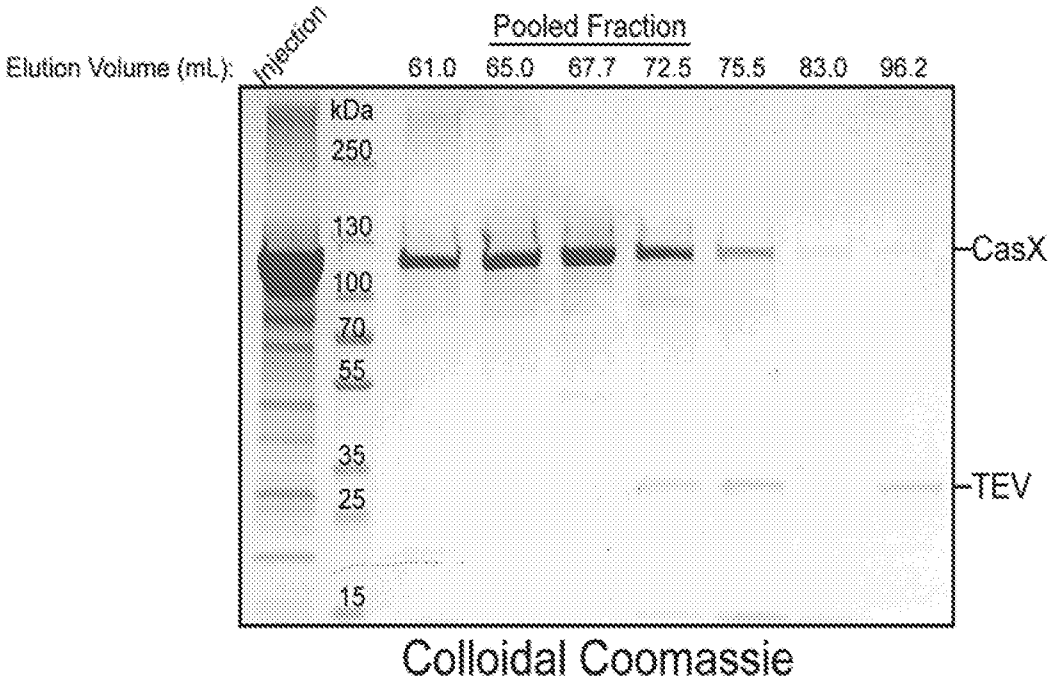

Pooled Fraction
Elution Volume (mL):
Injection
61.0
65.0
67.7
72.5
75.5
83.0
96.2
kDa
250
130
100
70
55
35
25
15
CasX
TEV
Colloidal Coomassie

FIG. 3

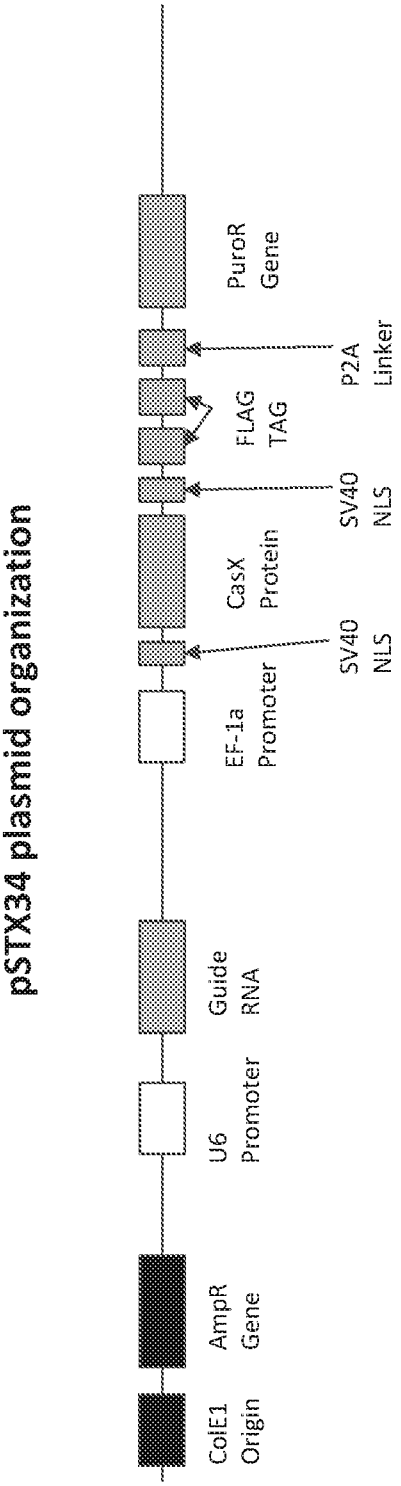

pSTX34 plasmid organization
ColE1 Origin
AmpR Gene
U6 Promoter
Guide RNA
EF-1a Promoter
SV40 NLS
CasX Protein
SV40 NLS
FLAG TAG
P2A Linker
PuroR Gene

FIG. 4

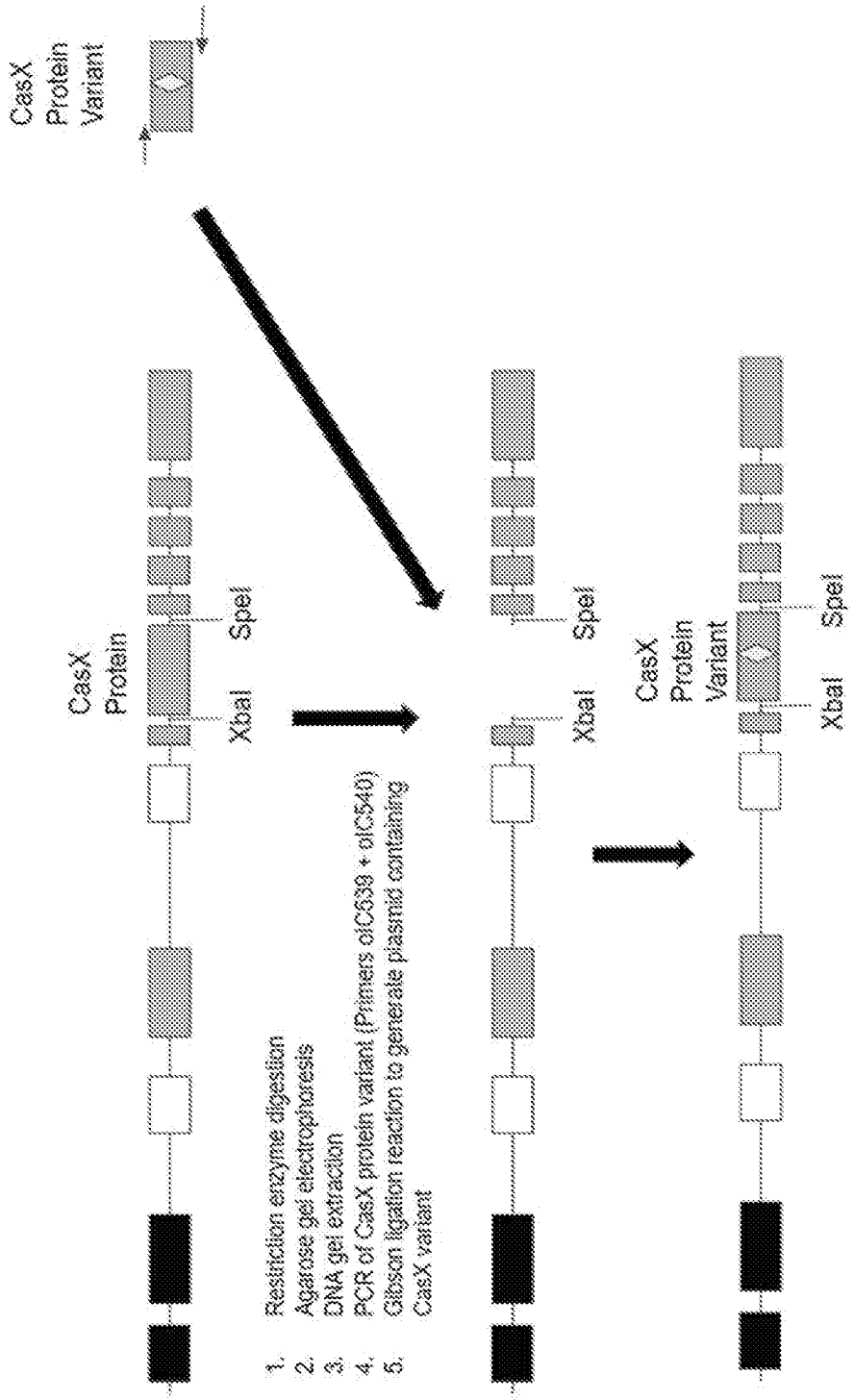

CasX Protein Variant
CasX Protein
XbaI
SpeI
1. Restriction enzyme digestion
2. Agarose gel electrophoresis
3. DNA gel extraction
4. PCR of CasX protein variant (Primers oIC539 + oIC540)
5. Gibson ligation reaction to generate plasmid containing CasX variant
CasX Protein Variant

FIG. 5

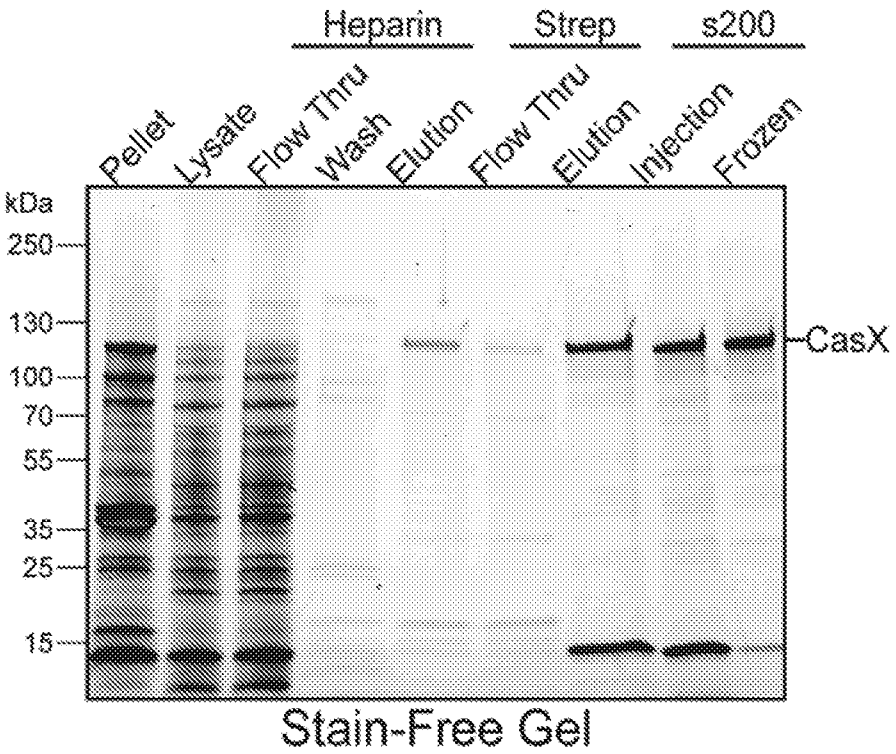

Heparin
Strep
s200
Pellet
Lysate
Flow Thru
Wash
Elution
Flow Thru
Elution
Injection
Frozen
kDa
250
130
100
70
55
35
25
15
CasX
Stain-Free Gel

FIG. 6

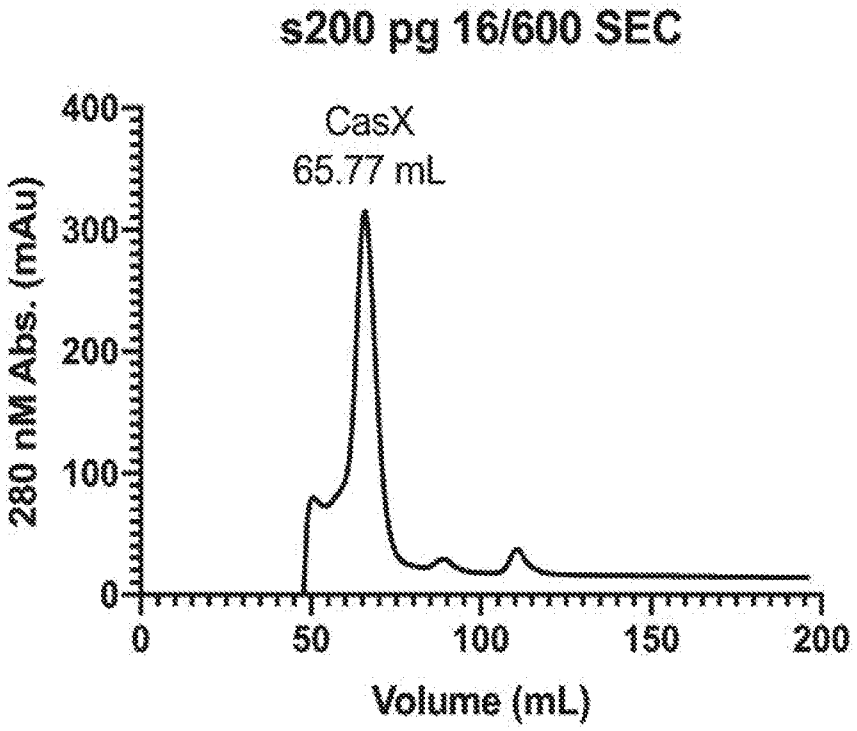

s200 pg 16/600 SEC
CasX
65.77 mL
280 nM Abs. (mAu)
400
300
200
100
0
0
50
100
150
200
Volume (mL)

FIG. 7

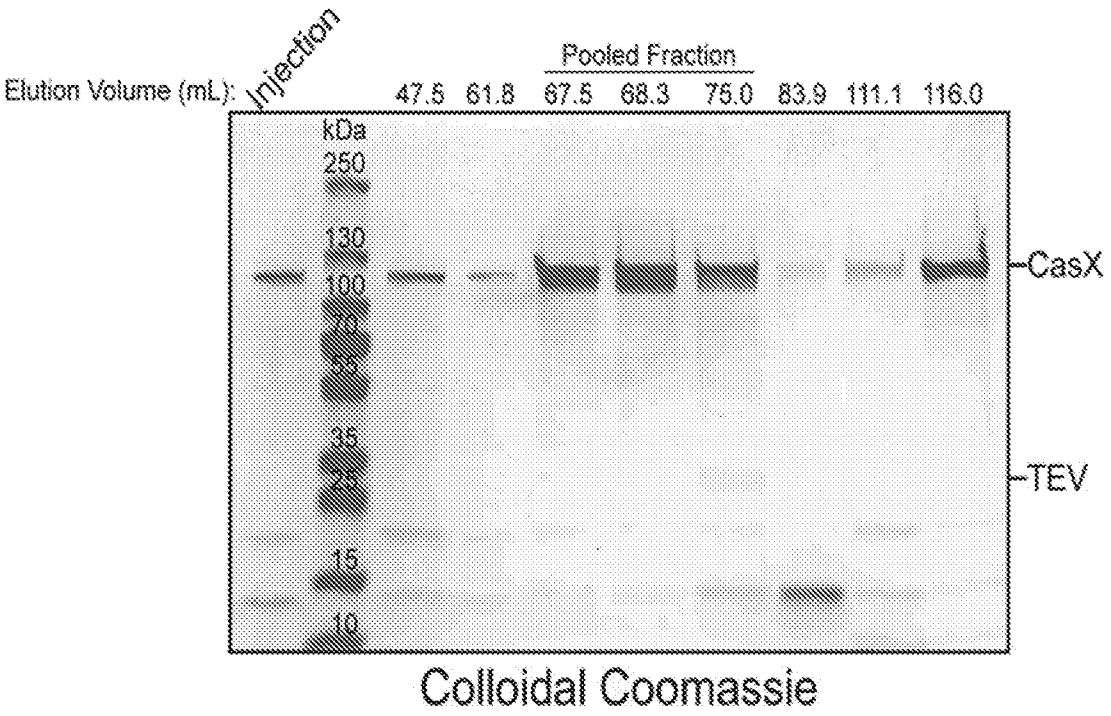

Elution Volume (mL):
Injection
Pooled Fraction
47.5
61.8
67.5
68.3
75.0
83.9
111.1
116.0
kDa
250
130
100
35
15
10
CasX
TEV
Colloidal Coomassie

FIG. 8

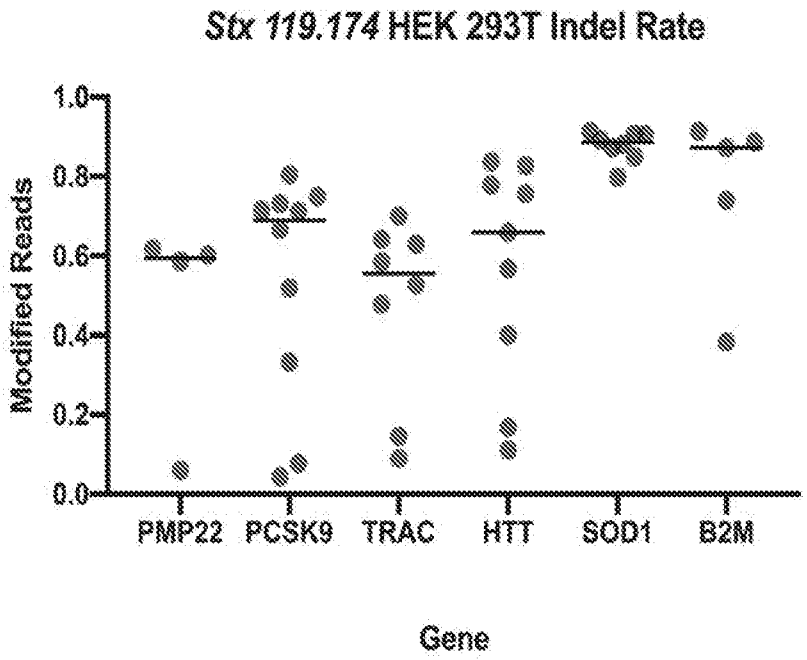

Stx 119.174 HEK 293T Indel Rate
Modified Reads
1.0
0.8
0.6
0.4
0.2
0.0
PMP22
PCSK9
TRAC
HTT
SOD1
B2M
Gene

FIG. 9

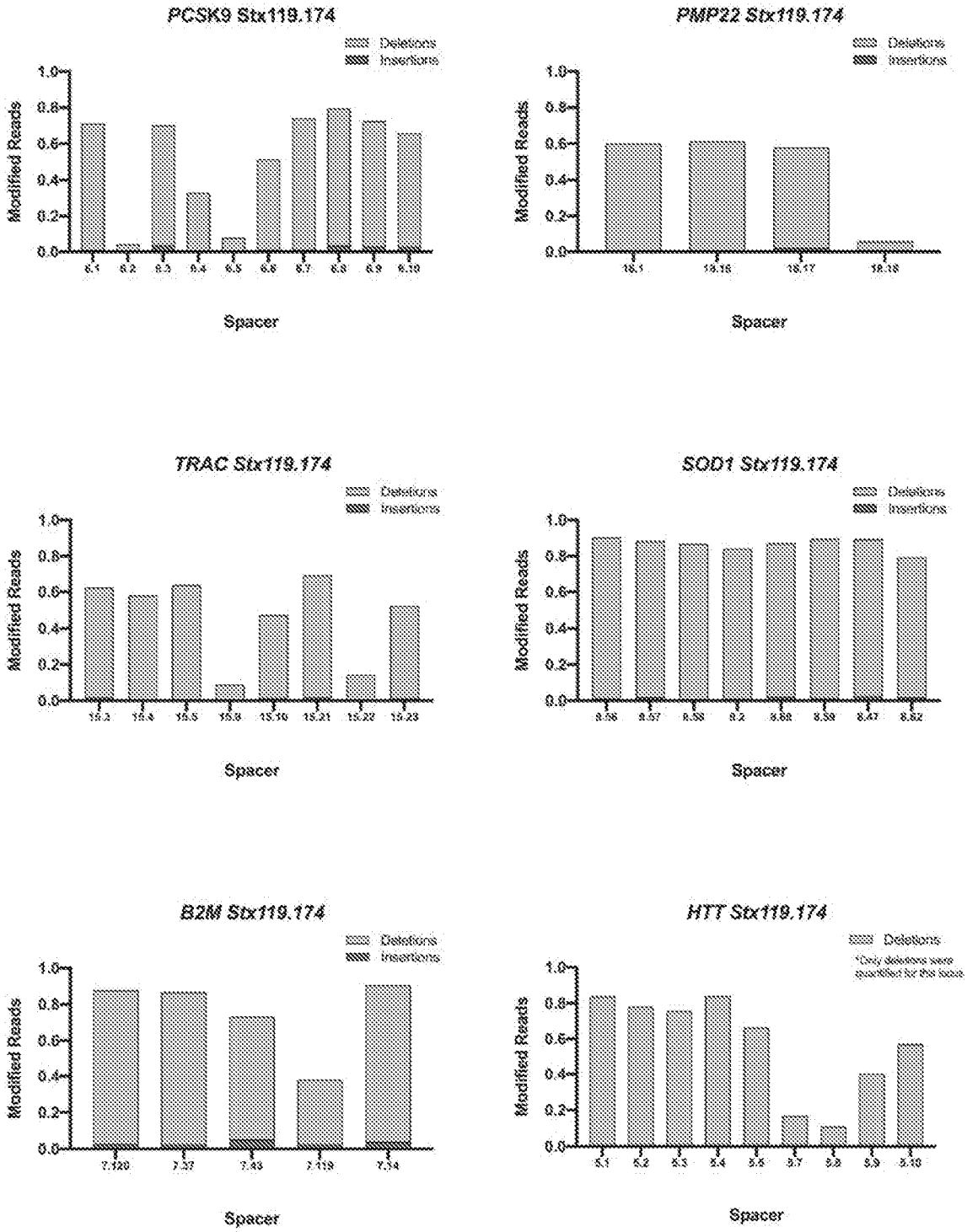

PCSK9 Stx119.174
PMP22 Stx119.174
TRAC Stx119.174
SOD1 Stx119.174
B2M Stx119.174
HTT Stx119.174
Deletions
Insertions
Modified Reads
Spacer
*Only deletions were quantified for this locus

FIG. 10

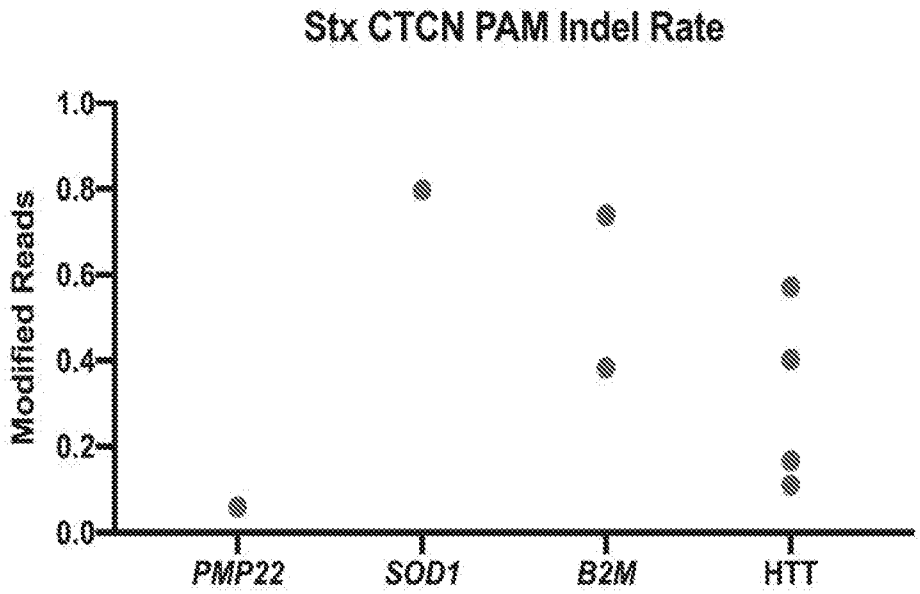

Stx CTCN PAM Indel Rate
Modified Reads
1.0
0.8
0.6
0.4
0.2
0.0
PMP22
SOD1
B2M
HTT

FIG. 11

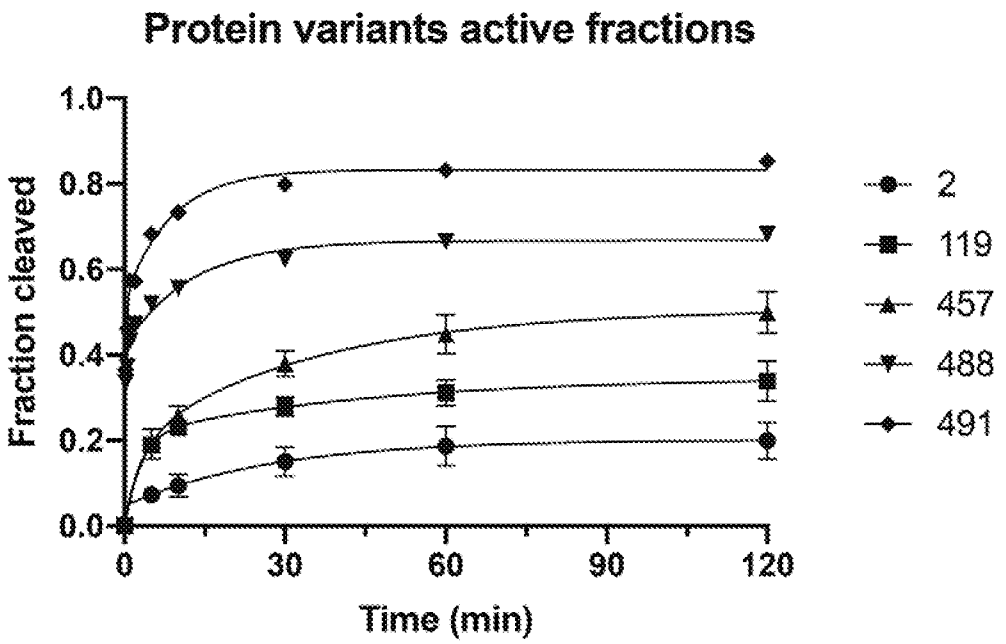

Protein variants active fractions
Fraction cleaved
1.0
0.8
0.6
0.4
0.2
0.0
0
30
60
90
120
Time (min)
2
119
457
488
491

FIG. 12

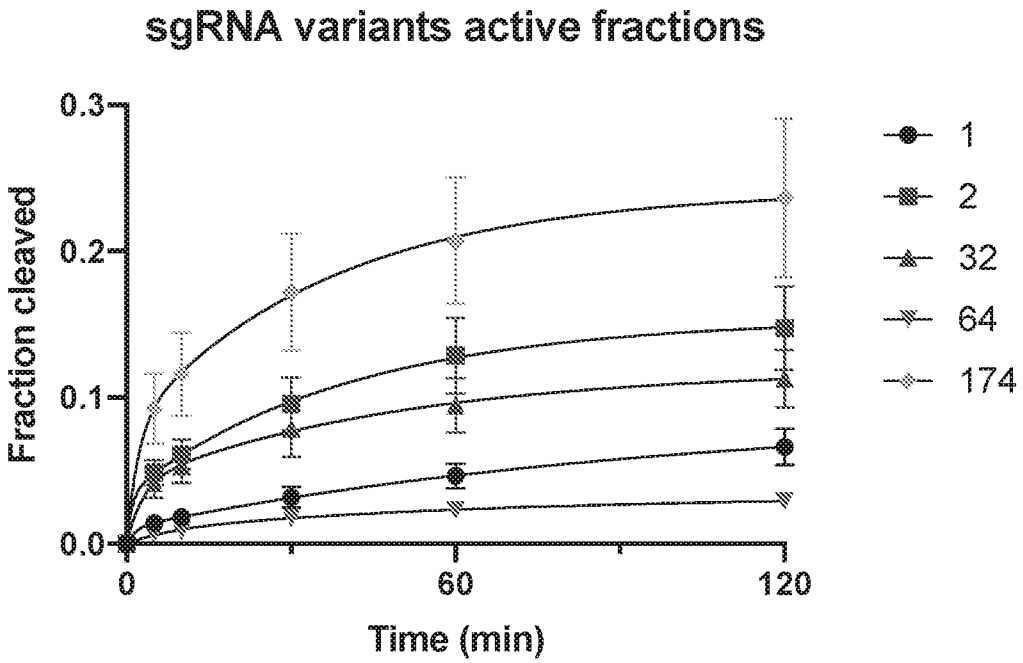

sgRNA variants active fractions
Fraction cleaved
0.3
0.2
0.1
0.0
0
60
120
Time (min)
1
2
32
64
174

FIG. 13

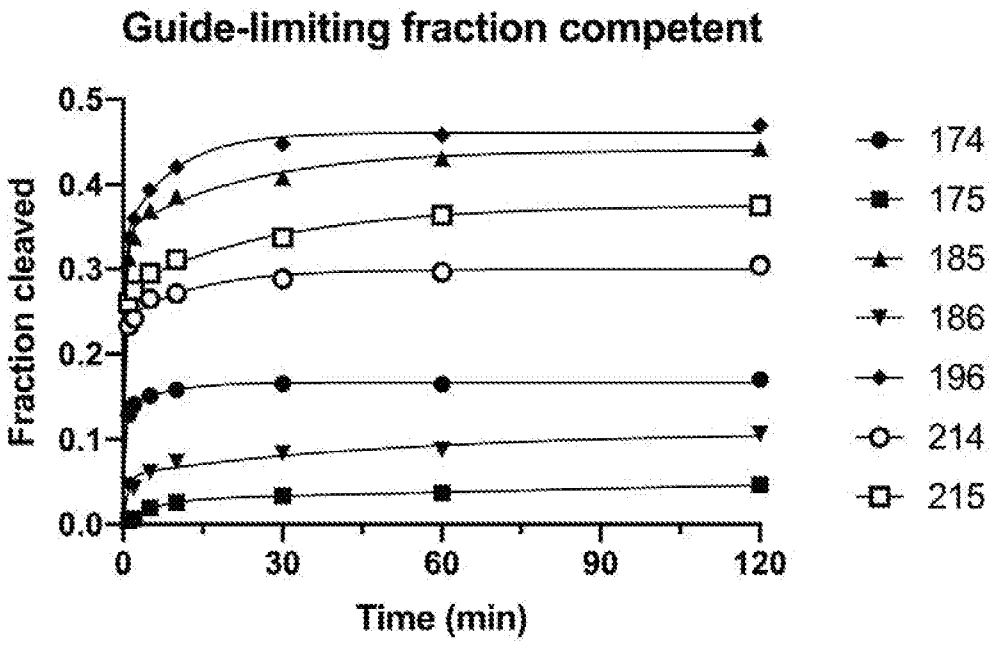

Guide-limiting fraction competent
Fraction cleaved
0.5
0.4
0.3
0.2
0.1
0.0
0
30
60
90
120
Time (min)
174
175
185
186
196
214
215

FIG. 14

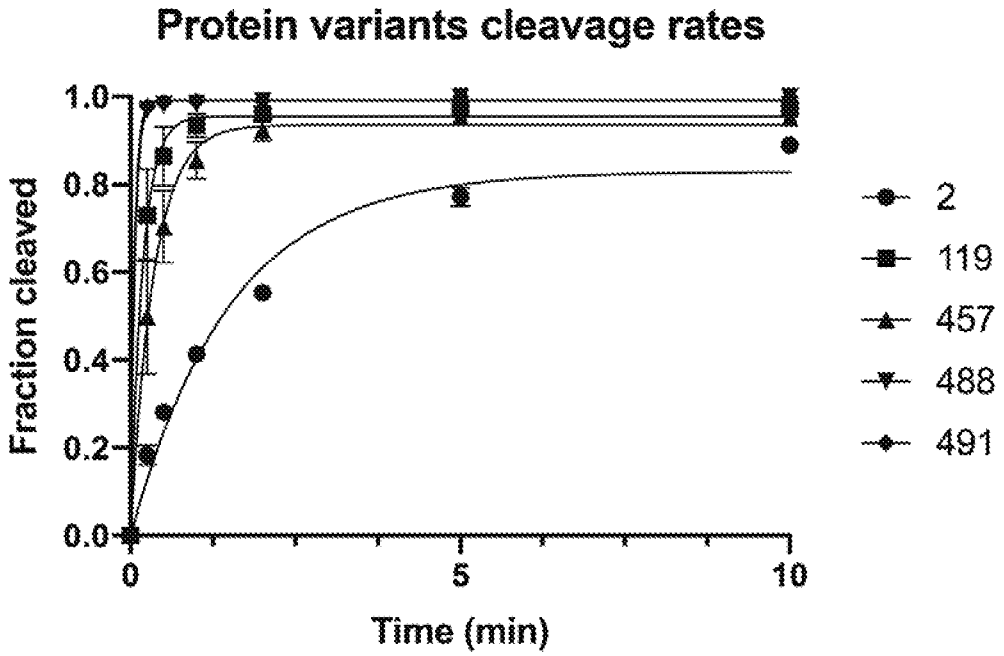

Protein variants cleavage rates
Fraction cleaved
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
Time (min)
2
119
457
488
491

FIG. 15

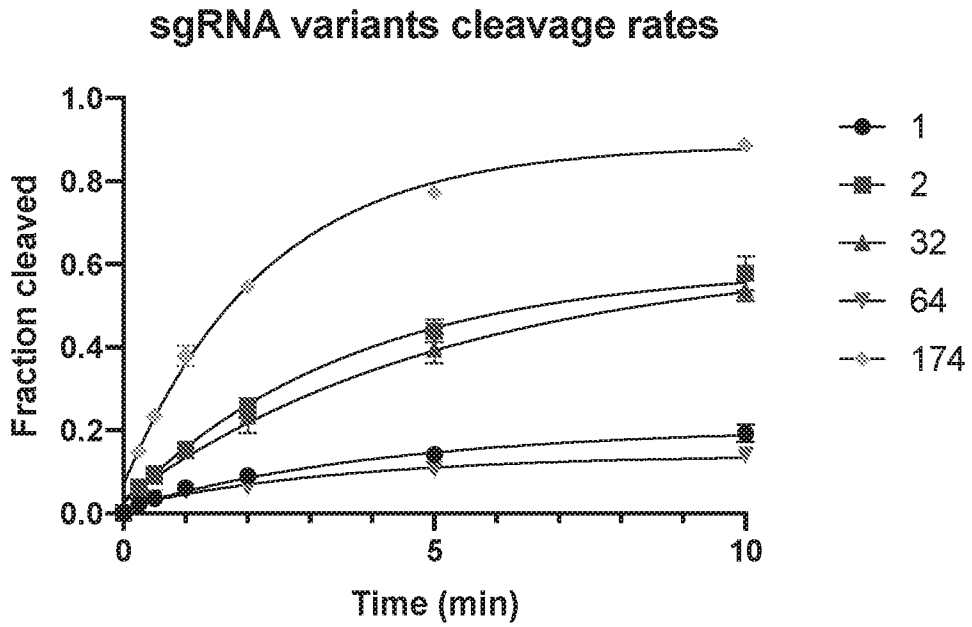

sgRNA variants cleavage rates
Fraction cleaved
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
Time (min)
1
2
32
64
174

FIG. 16

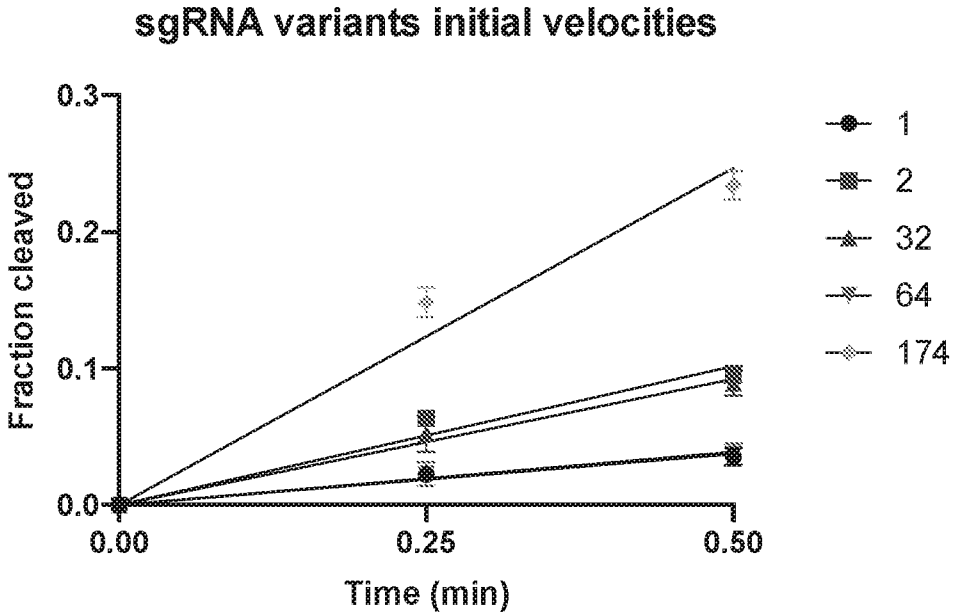

sgRNA variants initial velocities
Fraction cleaved
0.3
0.2
0.1
0.0
0.00
0.25
0.50
Time (min)
1
2
32
64
174

FIG. 17

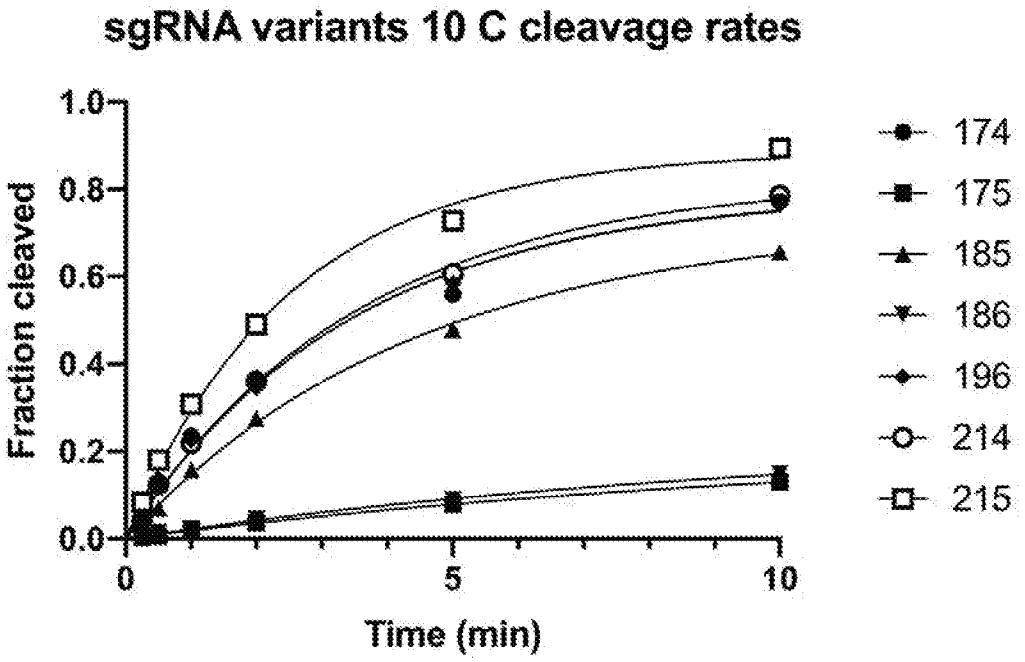

sgRNA variants 10 C cleavage rates
Fraction cleaved
1.0
0.8
0.6
0.4
0.2
0.0
0
5
10
Time (min)
174
175
185
186
196
214
215

FIG. 18

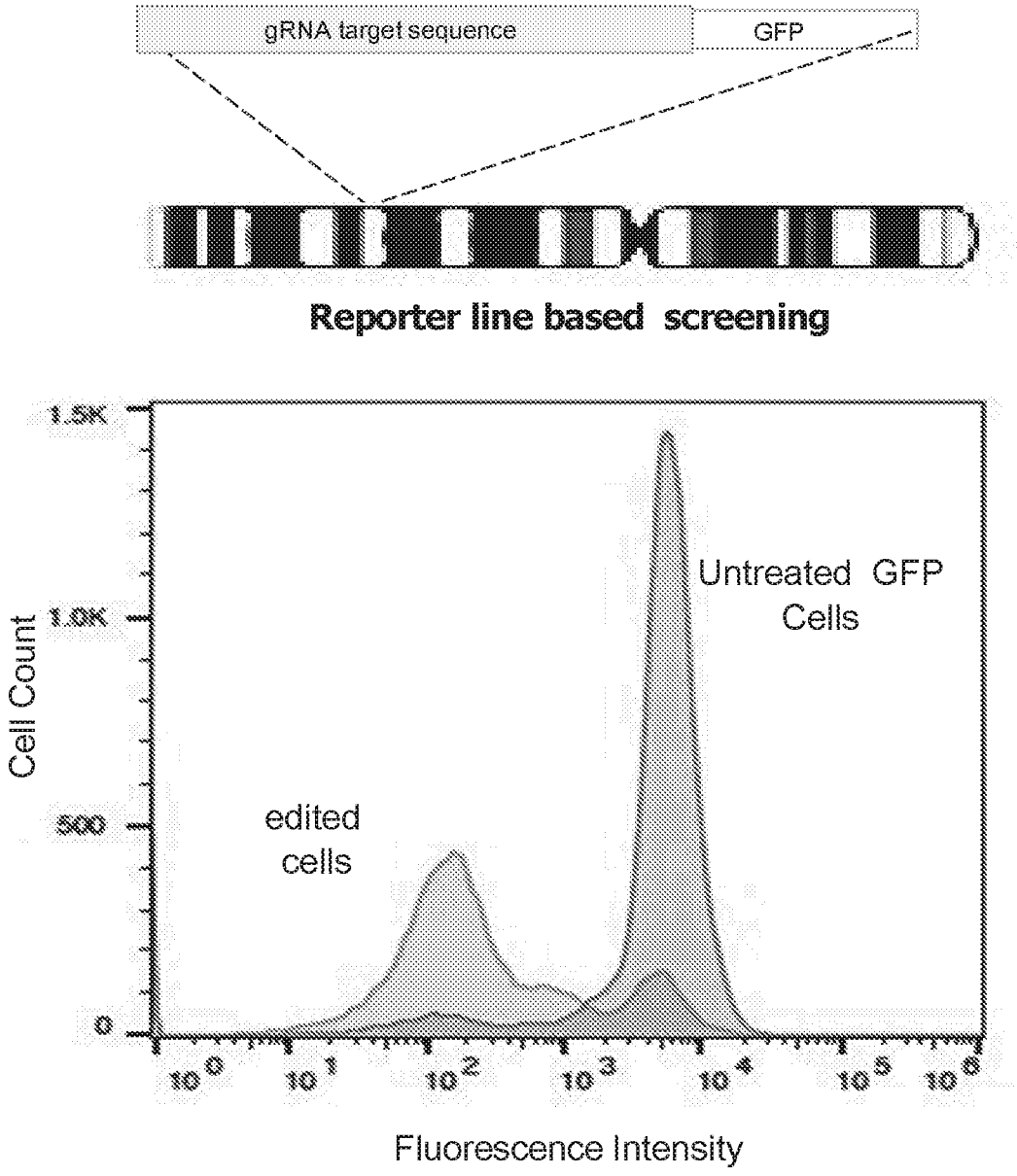

gRNA target sequence
GFP
Reporter line based screening
1.5K
1.0K
500
0
Cell Count
edited cells
Untreated GFP Cells
10 0
10 1
10 2
10 3
10 4
10 5
10 6
Fluorescence Intensity

FIG. 19

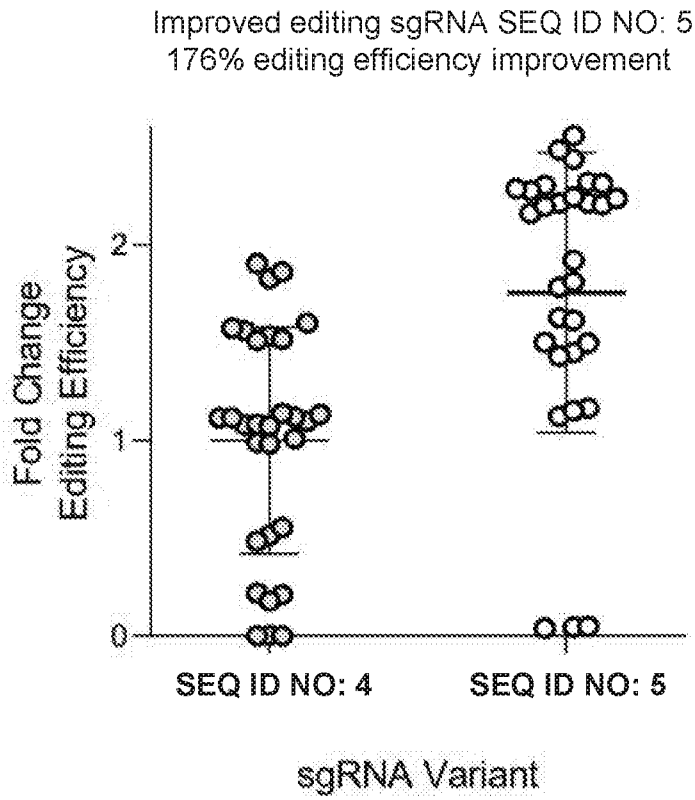

Improved editing sgRNA SEQ ID NO: 5
176% editing efficiency improvement
Fold Change
Editing Efficiency
2
1
0
SEQ ID NO: 4
SEQ ID NO: 5
sgRNA Variant

FIG. 20

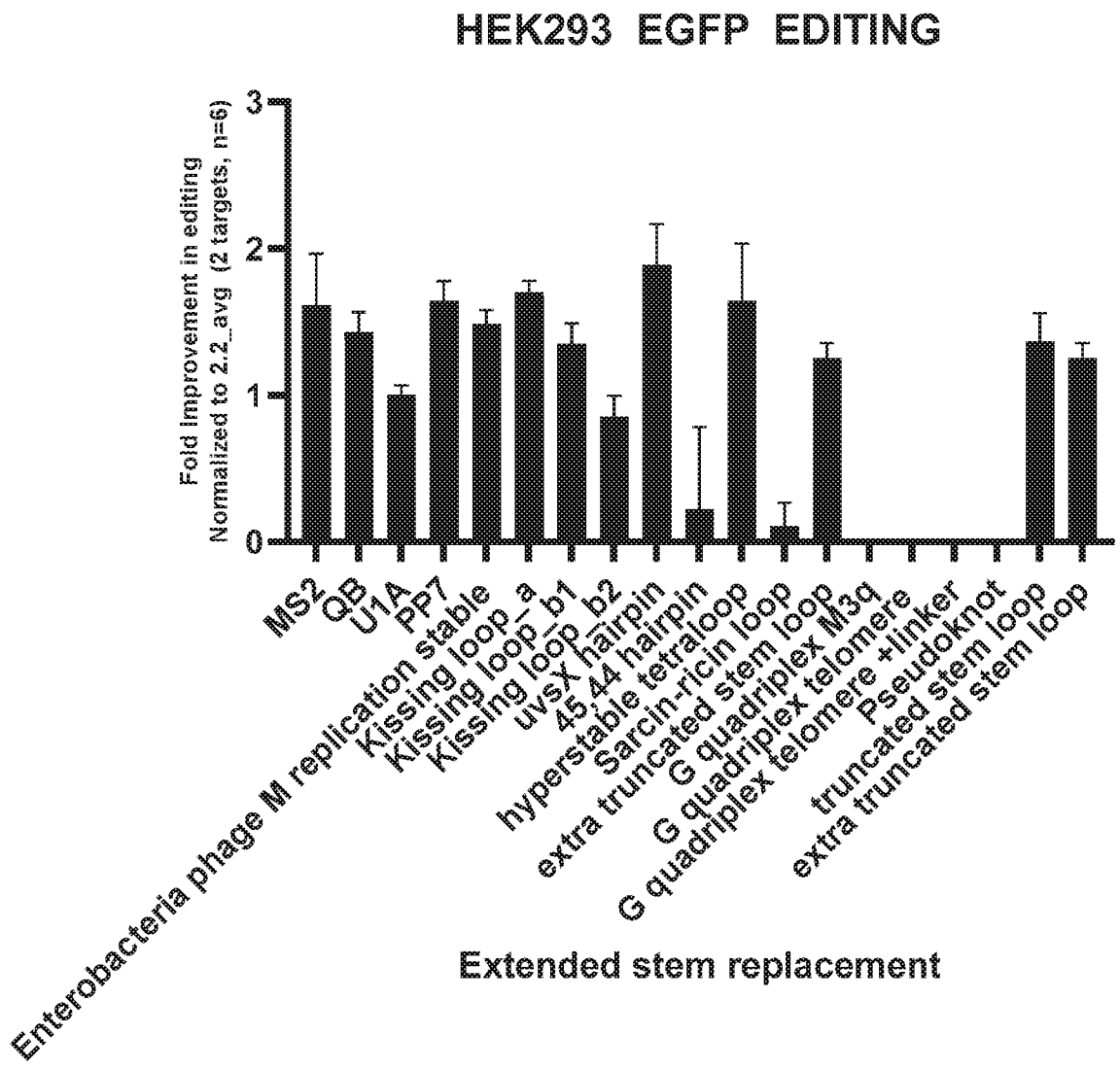

HEK293 EGFP EDITING
Fold Improvement in editing
Normalized to 2.2_avg (2 targets, n=6)
0
1
2
3
MS2
QB
U1A
PP7
Enterobacteria phage M replication stable
Kissing loop_a
Kissing loop_b1
Kissing loop_b2
uvsX hairpin
45.44 hairpin
hyperstable tetraloop
extra truncated stem loop
Sarcin-ricin loop
G quadriplex stem loop
G quadriplex M3q
G quadriplex telomere
G quadriplex telomere +linker
Pseudoknot
truncated stem loop
extra truncated stem loop
Extended stem replacement

FIG. 21

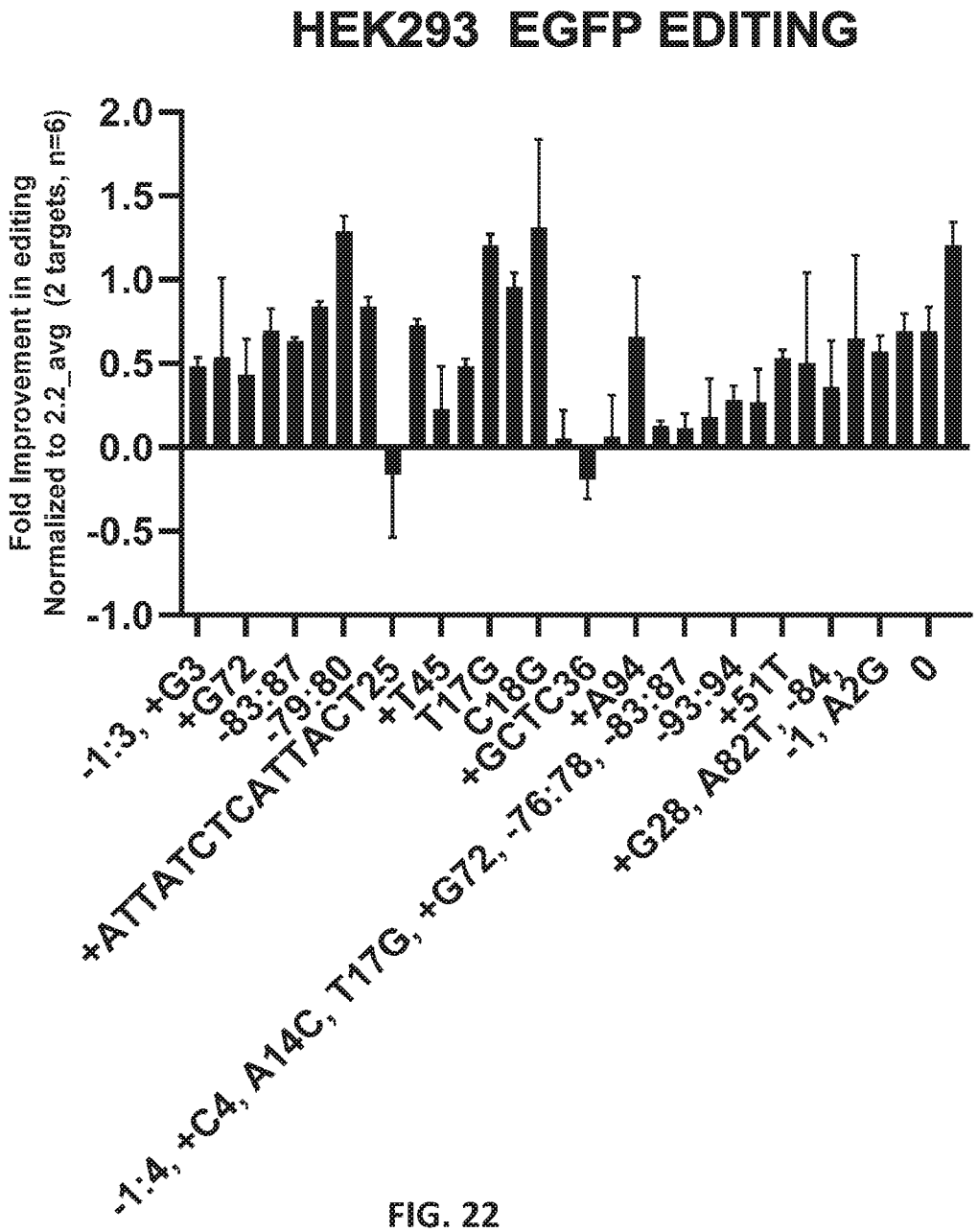

HEK293 EGFP EDITING
Fold Improvement in editing
Normalized to 2.2_avg (2 targets, n=6)
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
-1:3, +G3
+G72
-83:87
-79:80
+ATTATCTCATTACT25
+T45
T17G
C18G
+GCTC36
+A94
-83:87
-93:94
+51T
-84,
-1, A2G
0
-1:4, +C4, A14C, T17G, +G72, -76:78,
+G28, A82T,

FIG. 22

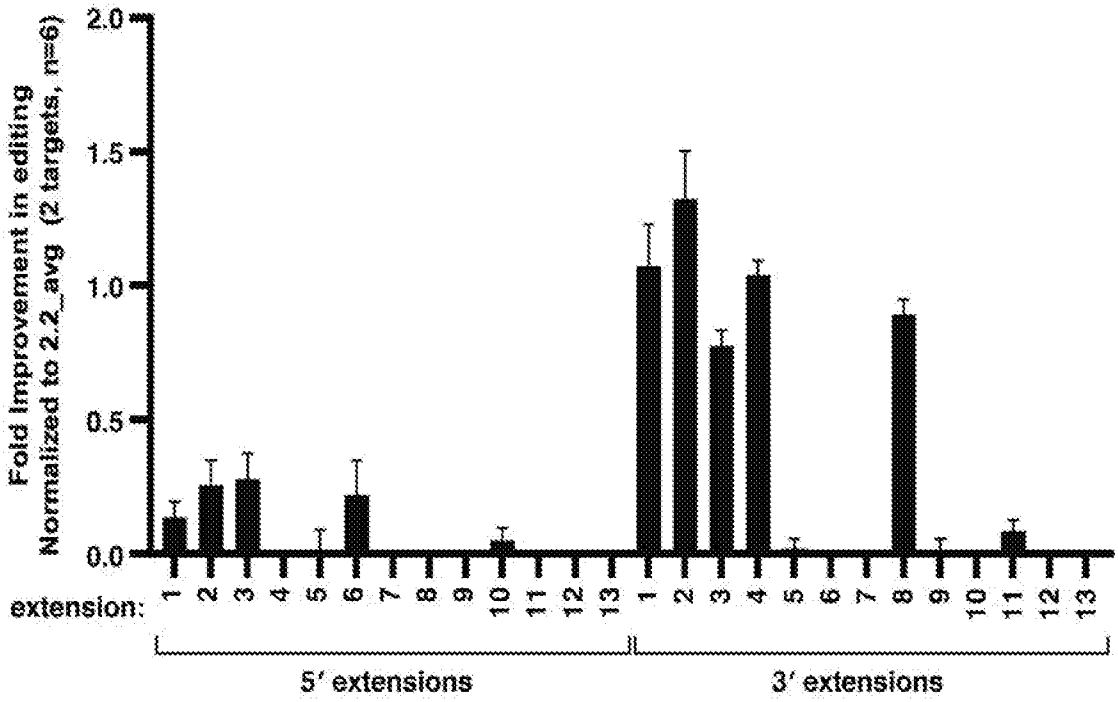

Fold Improvement in editing
Normalized to 2.2_avg (2 targets, n=6)
2.0
1.5
1.0
0.5
0.0
extension:
1 2 3 4 5 6 7 8 9 10 11 12 13
1 2 3 4 5 6 7 8 9 10 11 12 13
5′ extensions
3′ extensions

FIG. 23

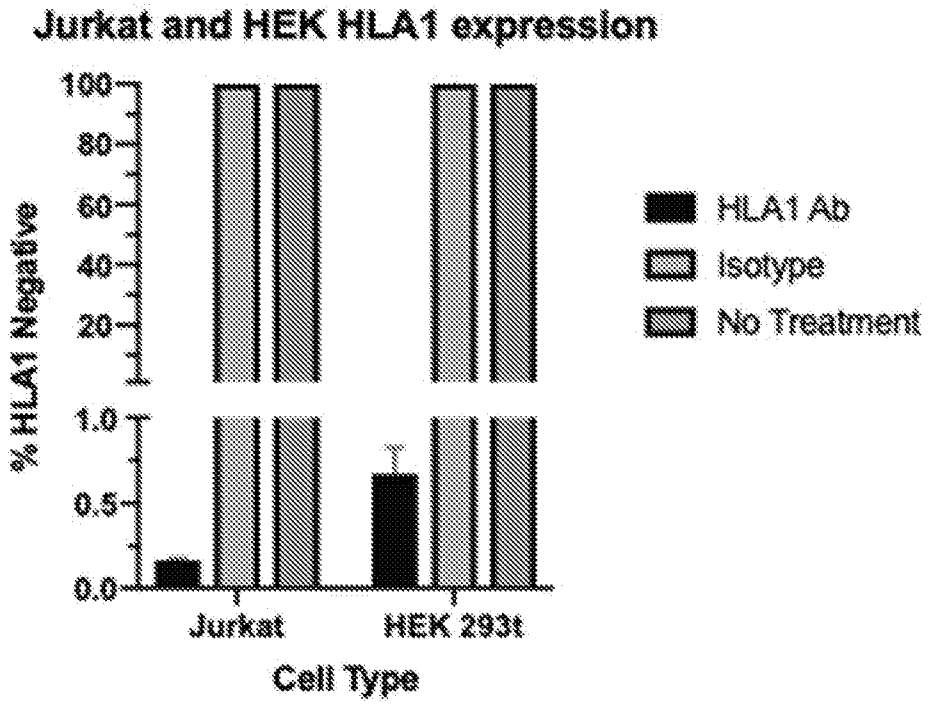

Jurkat and HEK HLA1 expression
% HLA1 Negative
100
80
60
40
20
1.0
0.5
0.0
Jurkat
HEK 293t
Cell Type
HLA1 Ab
Isotype
No Treatment

FIG. 24

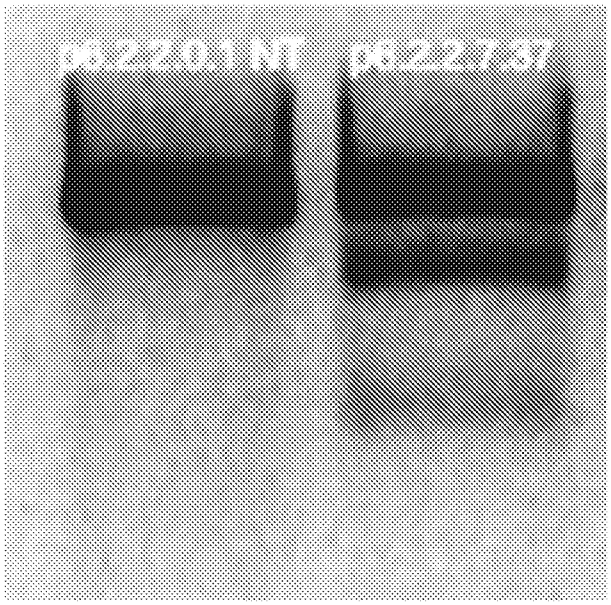


FIG. 25

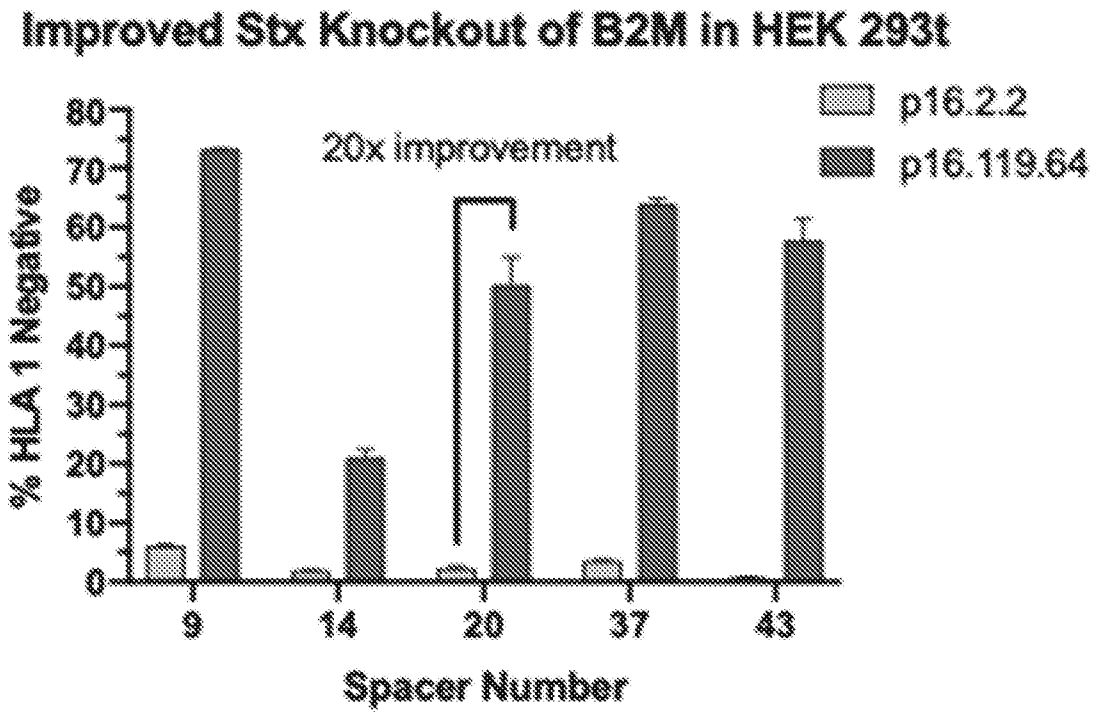

Improved Stx Knockout of B2M in HEK 293t
p16.2.2
p16.119.64
20x improvement
% HLA 1 Negative
0
10
20
30
40
50
60
70
80
9
14
20
37
43
Spacer Number

FIG. 26

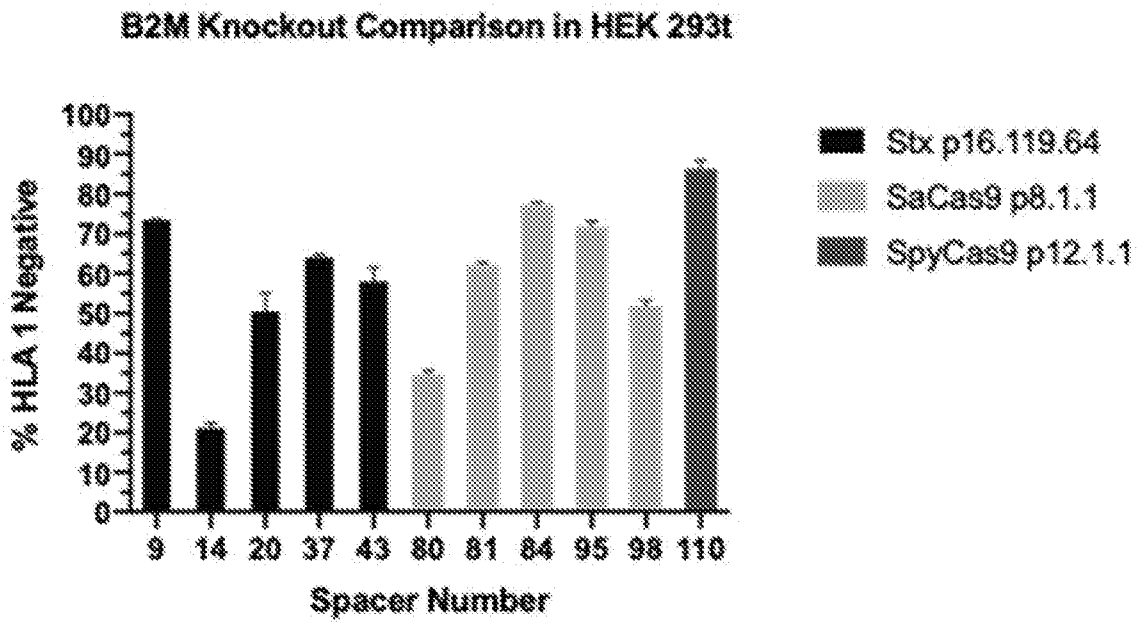

B2M Knockout Comparison in HEK 293t
% HLA 1 Negative
100
90
80
70
60
50
40
30
20
10
0
9
14
20
37
43
80
81
84
95
98
110
Spacer Number
Stx p16.119.64
SaCas9 p8.1.1
SpyCas9 p12.1.1

FIG. 27

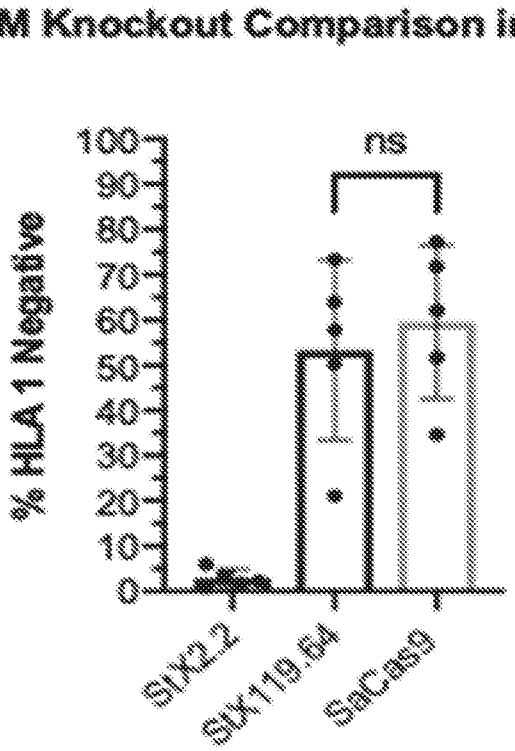

B2M Knockout Comparison in HEK 293t
% HLA 1 Negative
100
90
80
70
60
50
40
30
20
10
0
ns
SiX2.2
SiX119.64
SaCas9

FIG. 28

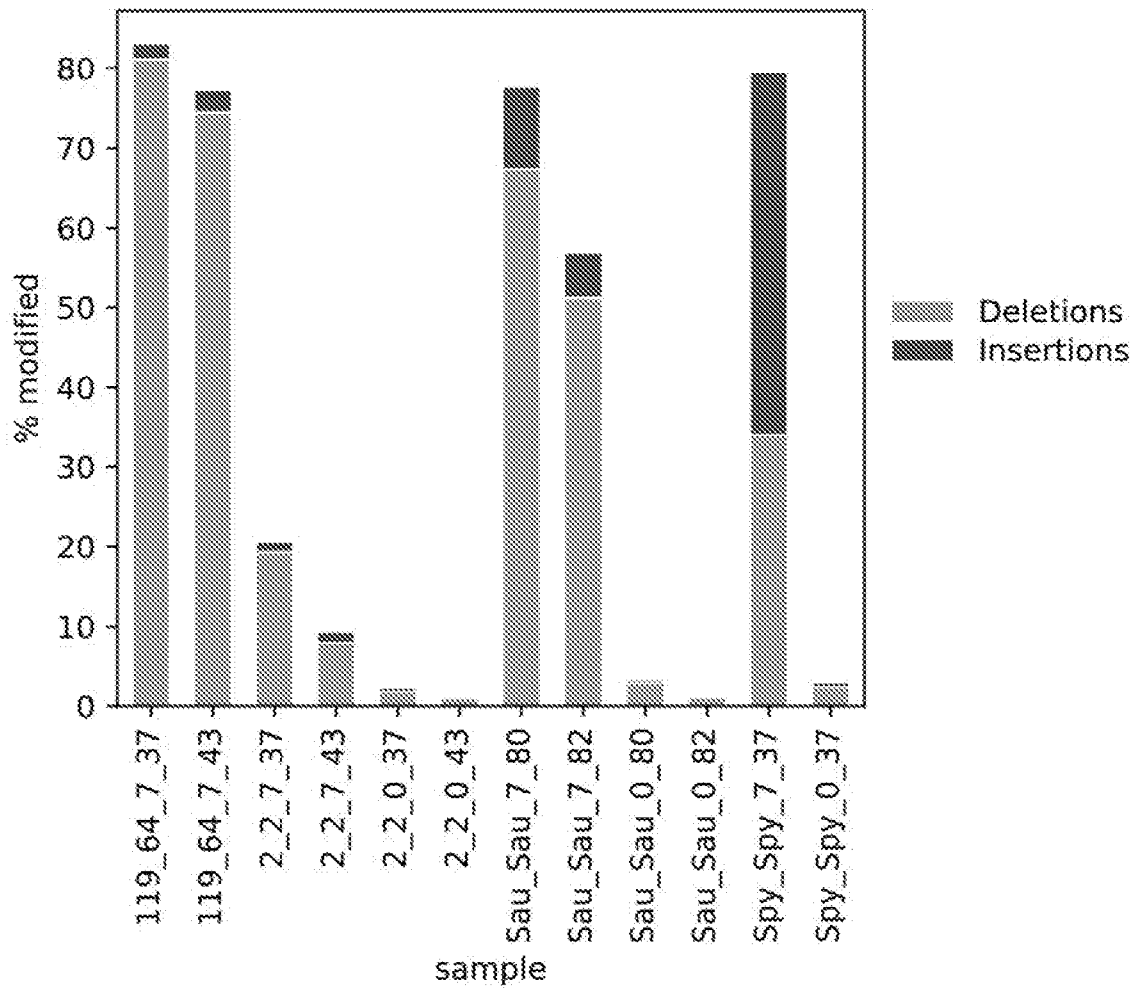

% modified
0
10
20
30
40
50
60
70
80
119_64_7_37
119_64_7_43
2_2_7_37
2_2_7_43
2_2_0_37
2_2_0_43
Sau_Sau_7_80
Sau_Sau_7_82
Sau_Sau_0_80
Sau_Sau_0_82
Spy_Spy_7_37
Spy_Spy_0_37
sample
Deletions
Insertions

FIG. 29

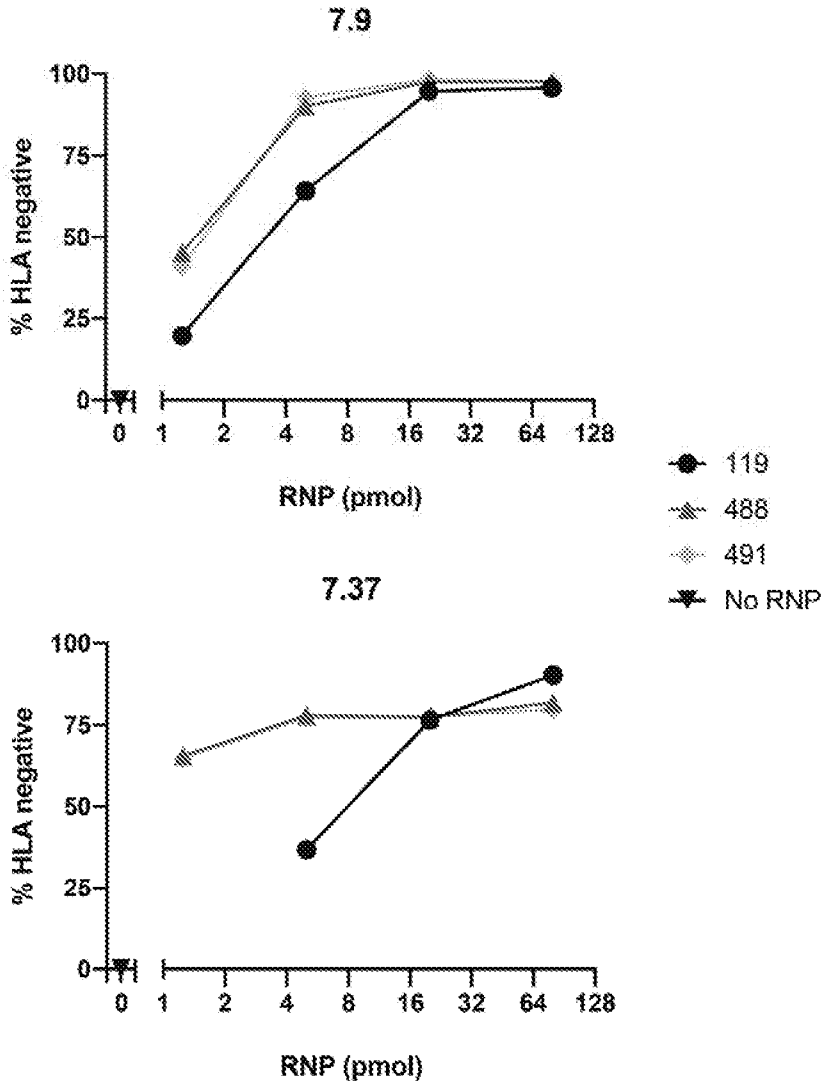

7.9
100
75
50
25
0
% HLA negative
0 1 2 4 8 16 32 64 128
RNP (pmol)
119
488
491
No RNP
7.37
100
75
50
25
0
% HLA negative
0 1 2 4 8 16 32 64 128
RNP (pmol)

FIG. 30

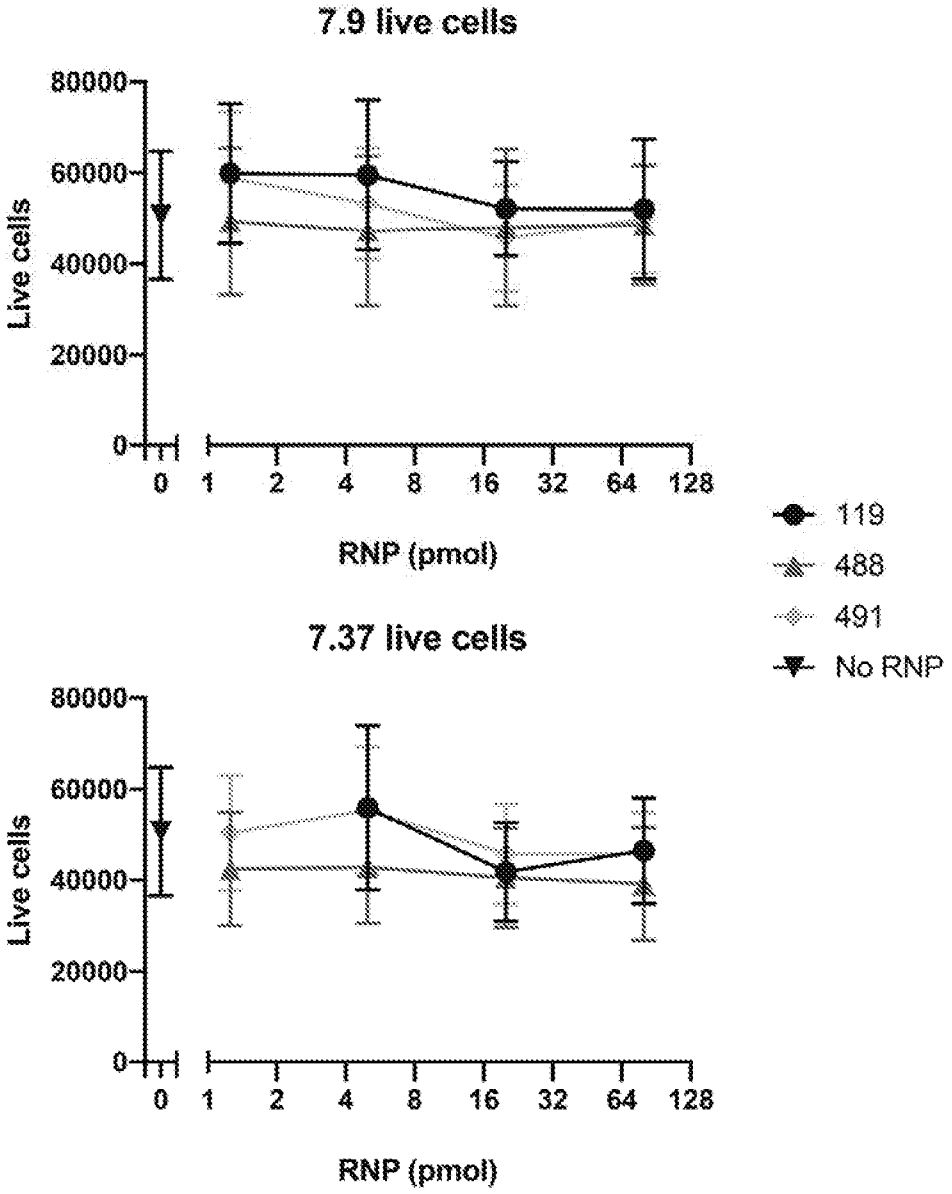

7.9 live cells
Live cells
80000
60000
40000
20000
0
0 1 2 4 8 16 32 64 128
RNP (pmol)
7.37 live cells
Live cells
80000
60000
40000
20000
0
0 1 2 4 8 16 32 64 128
RNP (pmol)
119
488
491
No RNP

FIG. 31

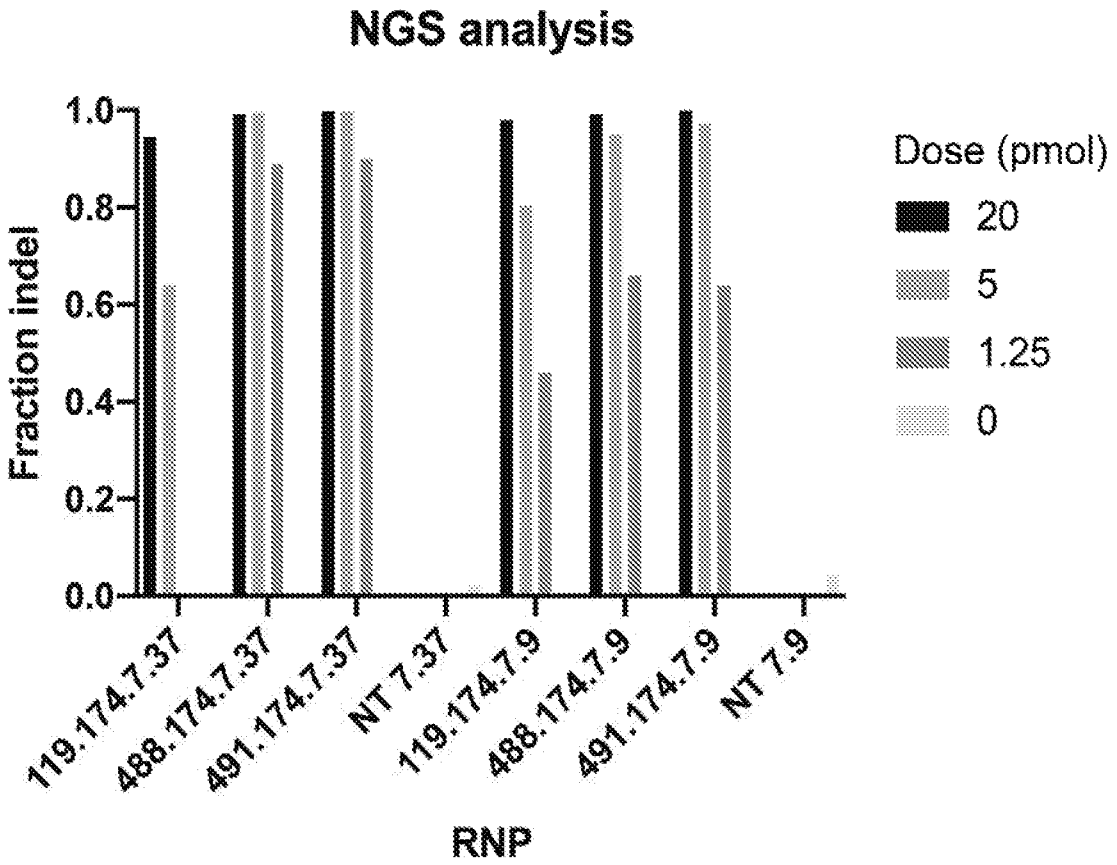

NGS analysis
Fraction indel
1.0
0.8
0.6
0.4
0.2
0.0
119.174.7.37
488.174.7.37
491.174.7.37
NT 7.37
119.174.7.9
488.174.7.9
491.174.7.9
NT 7.9
RNP
Dose (pmol)
20
5
1.25
0

FIG. 32

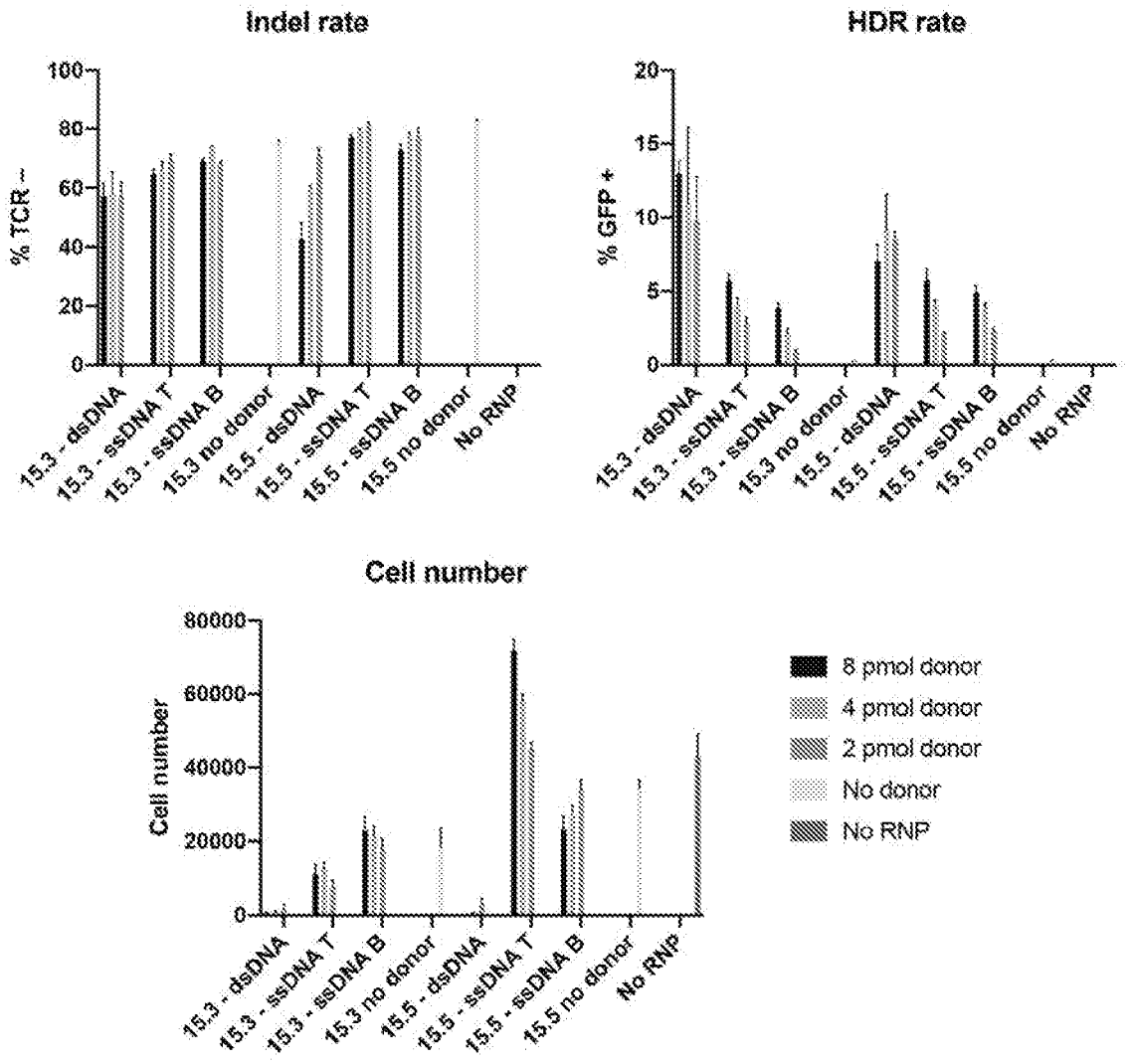

Indel rate
% TCR -
100
80
60
40
20
0
15.3 - dsDNA
15.3 - ssDNA T
15.3 - ssDNA B
15.3 no donor
15.5 - dsDNA
15.5 - ssDNA T
15.5 - ssDNA B
15.5 no donor
No RNP
HDR rate
% GFP +
20
15
10
5
0
Cell number
Cell number
80000
60000
40000
20000
0
8 pmol donor
4 pmol donor
2 pmol donor
No donor
No RNP

FIG. 33

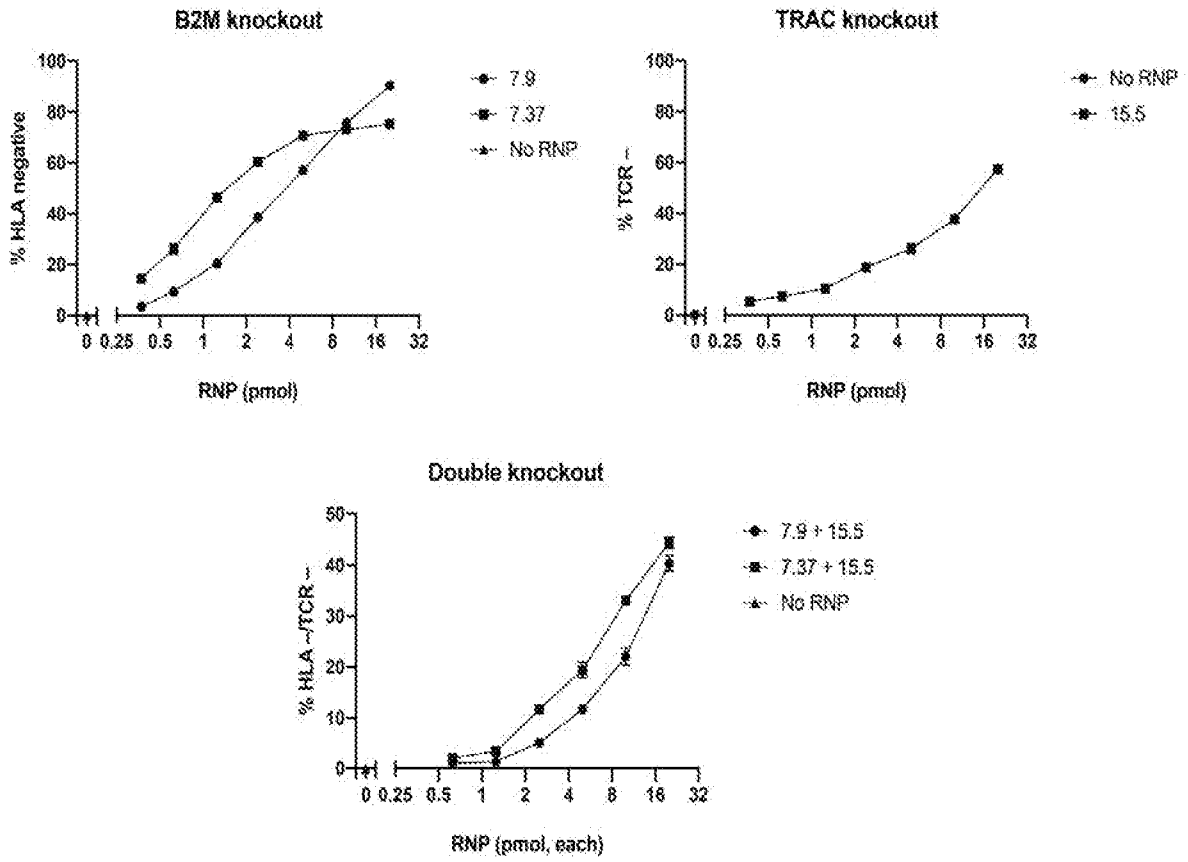

B2M knockout
% HLA negative
RNP (pmol)
7.9
7.37
No RNP
TRAC knockout
% TCR –
RNP (pmol)
No RNP
15.5
Double knockout
% HLA –/TCR –
RNP (pmol, each)
7.9 + 15.5
7.37 + 15.5
No RNP

FIG. 34

FIG. 35: Table 3A: Targeting Sequences for B2M

Name	SEQ ID NO.	Name	SEQ ID NO.
GTCN_0	725	CTCN_844	3996
GTCN_1	726	TTCN_855	3997
TTCN_0	727	GTCN_456	3998
GTCN_2	728	TTCN_856	3999
TTCN_1	729	CTCN_845	4000
ATCN_0	730	GTCN_457	4001
TTCN_2	731	ATCN_517	4002
GTCN_3	732	ATCN_518	4003
ATCN_1	733	CTCN_846	4004
CTCN_0	734	ATCN_519	4005
ATCN_2	735	GTCN_458	4006
GTCN_4	736	CTCN_847	4007
TTCN_3	737	GTCN_459	4008
GTCN_5	738	TTCN_857	4009
TTCN_4	739	ATCN_520	4010
TTCN_5	740	CTCN_848	4011
ATCN_3	741	GTCN_460	4012
ATCN_4	742	CTCN_849	4013
TTCN_6	743	TTCN_858	4014
GTCN_6	744	TTCN_859	4015
TTCN_7	745	TTCN_860	4016
TTCN_8	746	TTCN_861	4017
CTCN_1	747	GTCN_461	4018
TTCN_9	748	CTCN_850	4019
TTCN_10	749	CTCN_851	4020
TTCN_11	750	CTCN_852	4021
TTCN_12	751	GTCN_462	4022
GTCN_7	752	CTCN_853	4023
TTCN_13	753	GTCN_463	4024
GTCN_8	754	GTCN_464	4025
TTCN_18	755	GTCN_465	4026
TTCN_19	756	GTCN_466	4027
CTCN_6	757	ATCN_521	4028
ATCN_6	758	CTCN_854	4029
TTCN_20	759	GTCN_467	4030
TTCN_21	760	TTCN_862	4031
TTCN_22	761	TTCN_863	4032
CTCN_7	762	GTCN_468	4033
CTCN_8	763	TTCN_864	4034
CTCN_9	764	CTCN_855	4035
TTCN_23	765	ATCN_522	4036
ATCN_7	766	GTCN_469	4037
TTCN_24	767	CTCN_856	4038
CTCN_10	768	CTCN_857	4039
ATCN_8	769	CTCN_858	4040
TTCN_25	770	CTCN_859	4041
CTCN_11	771	CTCN_860	4042
TTCN_26	772	CTCN_861	4043
CTCN_12	773	TTCN_865	4044
GTCN_10	774	CTCN_862	4045
ATCN_9	775	ATCN_523	4046
CTCN_13	776	CTCN_863	4047
TTCN_27	777	GTCN_470	4048
GTCN_11	778	CTCN_864	4049
TTCN_28	779	CTCN_865	4050
CTCN_14	780	CTCN_866	4051
TTCN_29	781	CTCN_867	4052
ATCN_10	782	GTCN_471	4053
ATCN_11	783	TTCN_866	4054
TTCN_30	784	CTCN_868	4055
ATCN_12	785	CTCN_869	4056
CTCN_15	786	CTCN_870	4057
GTCN_12	787	CTCN_871	4058
CTCN_16	788	CTCN_872	4059
CTCN_17	789	CTCN_873	4060
CTCN_18	790	CTCN_874	4061
CTCN_19	791	CTCN_875	4062
ATCN_13	792	CTCN_876	4063
TTCN_31	793	GTCN_472	4064
ATCN_14	794	TTCN_867	4065
GTCN_13	795	TTCN_868	4066
CTCN_20	796	CTCN_877	4067
ATCN_15	797	TTCN_869	4068
TTCN_32	798	CTCN_878	4069
CTCN_21	799	GTCN_473	4070
TTCN_33	800	ATCN_524	4071
TTCN_34	801	ATCN_525	4072
GTCN_14	802	CTCN_879	4073
CTCN_22	803	TTCN_870	4074
CTCN_23	804	CTCN_880	4075
ATCN_16	805	TTCN_871	4076
CTCN_24	806	GTCN_474	4077
CTCN_25	807	TTCN_872	4078
ATCN_17	808	CTCN_881	4079
ATCN_18	809	CTCN_882	4080
CTCN_26	810	GTCN_475	4081
CTCN_27	811	GTCN_476	4082
CTCN_28	812	CTCN_883	4083
GTCN_15	813	GTCN_477	4084
CTCN_29	814	GTCN_478	4085
GTCN_16	815	GTCN_479	4086
CTCN_30	816	ATCN_526	4087
ATCN_19	817	GTCN_480	4088
CTCN_31	818	CTCN_884	4089
TTCN_35	819	CTCN_885	4090
GTCN_17	820	CTCN_886	4091
CTCN_32	821	TTCN_873	4092
CTCN_33	822	CTCN_887	4093
CTCN_34	823	TTCN_874	4094
GTCN_18	824	CTCN_888	4095
TTCN_36	825	TTCN_875	4096
GTCN_19	826	CTCN_889	4097
CTCN_35	827	CTCN_890	4098
CTCN_36	828	CTCN_891	4099

FIG. 35 (continued)

GTCN_20	829	GTCN_481	4100
GTCN_21	830	CTCN_892	4101
ATCN_20	831	GTCN_482	4102
CTCN_37	832	CTCN_893	4103
CTCN_38	833	TTCN_876	4104
TTCN_37	834	CTCN_894	4105
ATCN_21	835	GTCN_483	4106
CTCN_39	836	CTCN_895	4107
TTCN_38	837	GTCN_484	4108
CTCN_40	838	GTCN_485	4109
TTCN_39	839	CTCN_896	4110
ATCN_22	840	TTCN_877	4111
GTCN_22	841	GTCN_486	4112
TTCN_40	842	CTCN_897	4113
CTCN_41	843	CTCN_898	4114
TTCN_41	844	GTCN_487	4115
TTCN_42	845	TTCN_878	4116
GTCN_23	846	GTCN_488	4117
CTCN_42	847	TTCN_879	4118
CTCN_43	848	GTCN_489	4119
TTCN_43	849	CTCN_899	4120
TTCN_44	850	GTCN_490	4121
GTCN_24	851	CTCN_900	4122
GTCN_25	852	TTCN_880	4123
CTCN_44	853	GTCN_491	4124
GTCN_26	854	TTCN_881	4125
TTCN_45	855	ATCN_527	4126
TTCN_46	856	TTCN_882	4127
CTCN_45	857	TTCN_883	4128
GTCN_27	858	TTCN_884	4129
TTCN_47	859	ATCN_528	4130
TTCN_48	860	GTCN_492	4131
TTCN_49	861	TTCN_885	4132
TTCN_50	862	GTCN_493	4133
GTCN_28	863	ATCN_529	4134
TTCN_51	864	TTCN_886	4135
ATCN_23	865	GTCN_494	4136
ATCN_24	866	GTCN_495	4137
ATCN_25	867	TTCN_887	4138
TTCN_52	868	ATCN_530	4139
CTCN_46	869	TTCN_888	4140
ATCN_26	870	ATCN_531	4141
ATCN_27	871	ATCN_532	4142
ATCN_28	872	TTCN_889	4143
CTCN_47	873	CTCN_901	4144
ATCN_29	874	CTCN_902	4145
TTCN_53	875	ATCN_533	4146
TTCN_54	876	TTCN_890	4147
GTCN_29	877	TTCN_891	4148
CTCN_48	878	CTCN_903	4149
GTCN_30	879	ATCN_534	4150
GTCN_31	880	TTCN_892	4151
ATCN_30	881	ATCN_535	4152

TTCN_55	882	ATCN_536	4153
TTCN_56	883	CTCN_904	4154
TTCN_57	884	ATCN_537	4155
ATCN_31	885	TTCN_893	4156
CTCN_49	886	GTCN_496	4157
CTCN_50	887	CTCN_905	4158
GTCN_32	888	TTCN_894	4159
TTCN_58	889	TTCN_895	4160
TTCN_59	890	TTCN_896	4161
CTCN_51	891	CTCN_906	4162
GTCN_33	892	ATCN_538	4163
CTCN_52	893	TTCN_897	4164
TTCN_60	894	CTCN_907	4165
CTCN_53	895	CTCN_908	4166
CTCN_54	896	GTCN_497	4167
TTCN_61	897	TTCN_898	4168
CTCN_55	898	CTCN_909	4169
CTCN_56	899	TTCN_899	4170
TTCN_62	900	CTCN_910	4171
GTCN_34	901	CTCN_911	4172
TTCN_63	902	TTCN_900	4173
TTCN_64	903	ATCN_539	4174
CTCN_57	904	CTCN_912	4175
TTCN_65	905	TTCN_901	4176
CTCN_58	906	TTCN_902	4177
CTCN_59	907	CTCN_913	4178
TTCN_66	908	ATCN_540	4179
TTCN_67	909	CTCN_914	4180
CTCN_60	910	CTCN_915	4181
CTCN_61	911	CTCN_916	4182
CTCN_62	912	ATCN_541	4183
CTCN_63	913	CTCN_917	4184
CTCN_64	914	GTCN_498	4185
CTCN_65	915	CTCN_918	4186
GTCN_35	916	GTCN_499	4187
CTCN_66	917	TTCN_903	4188
CTCN_67	918	GTCN_500	4189
GTCN_36	919	CTCN_919	4190
CTCN_68	920	CTCN_920	4191
CTCN_69	921	GTCN_501	4192
CTCN_70	922	CTCN_921	4193
CTCN_71	923	CTCN_922	4194
TTCN_68	924	CTCN_923	4195
CTCN_72	925	ATCN_542	4196
GTCN_37	926	ATCN_543	4197
GTCN_38	927	CTCN_924	4198
TTCN_69	928	CTCN_925	4199
CTCN_73	929	CTCN_926	4200
GTCN_39	930	ATCN_544	4201
CTCN_74	931	CTCN_927	4202
CTCN_75	932	CTCN_928	4203
CTCN_76	933	CTCN_929	4204
CTCN_77	934	GTCN_502	4205

FIG. 35 (continued)

CTCN_78	935	GTCN_503	4206
ATCN_32	936	CTCN_930	4207
CTCN_79	937	CTCN_931	4208
GTCN_40	938	TTCN_904	4209
ATCN_33	939	TTCN_905	4210
TTCN_70	940	CTCN_932	4211
TTCN_71	941	TTCN_906	4212
CTCN_80	942	TTCN_907	4213
GTCN_41	943	TTCN_908	4214
TTCN_72	944	TTCN_909	4215
CTCN_81	945	TTCN_910	4216
ATCN_34	946	TTCN_911	4217
TTCN_73	947	GTCN_504	4218
GTCN_42	948	GTCN_505	4219
TTCN_74	949	CTCN_933	4220
TTCN_75	950	ATCN_545	4221
GTCN_43	951	ATCN_546	4222
GTCN_44	952	ATCN_547	4223
CTCN_82	953	GTCN_506	4224
CTCN_83	954	CTCN_934	4225
CTCN_84	955	GTCN_507	4226
GTCN_45	956	CTCN_935	4227
CTCN_85	957	ATCN_548	4228
CTCN_86	958	ATCN_549	4229
GTCN_46	959	CTCN_936	4230
CTCN_87	960	TTCN_912	4231
CTCN_88	961	CTCN_937	4232
GTCN_47	962	TTCN_913	4233
CTCN_89	963	CTCN_938	4234
GTCN_48	964	ATCN_550	4235
ATCN_35	965	ATCN_551	4236
TTCN_76	966	TTCN_914	4237
TTCN_77	967	TTCN_915	4238
TTCN_78	968	ATCN_552	4239
CTCN_90	969	ATCN_553	4240
CTCN_91	970	CTCN_939	4241
ATCN_36	971	TTCN_916	4242
GTCN_49	972	TTCN_917	4243
GTCN_50	973	ATCN_554	4244
CTCN_92	974	ATCN_555	4245
CTCN_93	975	ATCN_556	4246
TTCN_79	976	GTCN_508	4247
TTCN_80	977	ATCN_557	4248
CTCN_94	978	ATCN_558	4249
CTCN_95	979	ATCN_559	4250
CTCN_96	980	TTCN_918	4251
TTCN_81	981	TTCN_919	4252
GTCN_51	982	GTCN_509	4253
CTCN_97	983	TTCN_920	4254
CTCN_98	984	TTCN_921	4255
TTCN_82	985	ATCN_560	4256
TTCN_83	986	TTCN_922	4257
CTCN_99	987	ATCN_561	4258

TTCN_84	988	ATCN_562	4259
TTCN_85	989	CTCN_940	4260
TTCN_86	990	TTCN_923	4261
TTCN_87	991	GTCN_510	4262
CTCN_100	992	TTCN_924	4263
TTCN_88	993	CTCN_941	4264
GTCN_52	994	CTCN_942	4265
GTCN_53	995	GTCN_511	4266
ATCN_37	996	TTCN_925	4267
ATCN_38	997	TTCN_926	4268
GTCN_54	998	CTCN_943	4269
TTCN_89	999	CTCN_944	4270
TTCN_90	1000	GTCN_512	4271
GTCN_55	1001	CTCN_945	4272
ATCN_39	1002	TTCN_927	4273
GTCN_56	1003	GTCN_513	4274
CTCN_101	1004	ATCN_563	4275
CTCN_102	1005	GTCN_514	4276
GTCN_57	1006	CTCN_946	4277
CTCN_103	1007	TTCN_928	4278
ATCN_40	1008	TTCN_929	4279
CTCN_104	1009	ATCN_564	4280
CTCN_105	1010	ATCN_565	4281
CTCN_106	1011	CTCN_947	4282
GTCN_58	1012	CTCN_948	4283
TTCN_91	1013	ATCN_566	4284
CTCN_107	1014	TTCN_930	4285
TTCN_92	1015	CTCN_949	4286
ATCN_41	1016	CTCN_950	4287
ATCN_42	1017	CTCN_951	4288
ATCN_43	1018	TTCN_931	4289
ATCN_44	1019	ATCN_567	4290
CTCN_108	1020	TTCN_932	4291
TTCN_93	1021	ATCN_568	4292
CTCN_109	1022	CTCN_952	4293
CTCN_110	1023	ATCN_569	4294
CTCN_111	1024	ATCN_570	4295
CTCN_112	1025	CTCN_953	4296
CTCN_113	1026	TTCN_933	4297
CTCN_114	1027	TTCN_934	4298
TTCN_94	1028	CTCN_954	4299
CTCN_115	1029	ATCN_571	4300
TTCN_95	1030	CTCN_955	4301
GTCN_59	1031	CTCN_956	4302
CTCN_116	1032	CTCN_957	4303
GTCN_60	1033	TTCN_935	4304
TTCN_96	1034	ATCN_572	4305
ATCN_45	1035	GTCN_515	4306
TTCN_97	1036	TTCN_936	4307
TTCN_98	1037	ATCN_573	4308
TTCN_99	1038	TTCN_937	4309
TTCN_100	1039	ATCN_574	4310
CTCN_117	1040	CTCN_958	4311

FIG. 35 (continued)

GTCN_61	1041	ATCN_575	4312
CTCN_118	1042	TTCN_938	4313
TTCN_101	1043	ATCN_576	4314
GTCN_62	1044	TTCN_939	4315
TTCN_102	1045	CTCN_959	4316
GTCN_63	1046	CTCN_960	4317
CTCN_119	1047	ATCN_577	4318
CTCN_120	1048	ATCN_578	4319
ATCN_46	1049	GTCN_516	4320
ATCN_47	1050	CTCN_961	4321
ATCN_48	1051	CTCN_962	4322
TTCN_103	1052	TTCN_940	4323
TTCN_104	1053	CTCN_963	4324
GTCN_64	1054	CTCN_964	4325
TTCN_105	1055	GTCN_517	4326
TTCN_106	1056	CTCN_965	4327
CTCN_121	1057	CTCN_966	4328
GTCN_65	1058	ATCN_579	4329
CTCN_122	1059	ATCN_580	4330
GTCN_66	1060	TTCN_941	4331
TTCN_107	1061	TTCN_942	4332
TTCN_108	1062	GTCN_518	4333
CTCN_123	1063	ATCN_581	4334
ATCN_49	1064	TTCN_943	4335
ATCN_50	1065	CTCN_967	4336
GTCN_67	1066	TTCN_944	4337
GTCN_68	1067	TTCN_945	4338
TTCN_109	1068	TTCN_946	4339
CTCN_124	1069	CTCN_968	4340
ATCN_51	1070	TTCN_947	4341
CTCN_125	1071	TTCN_948	4342
GTCN_69	1072	TTCN_949	4343
CTCN_126	1073	ATCN_582	4344
GTCN_70	1074	GTCN_519	4345
CTCN_127	1075	GTCN_520	4346
CTCN_128	1076	CTCN_969	4347
ATCN_52	1077	CTCN_970	4348
ATCN_53	1078	TTCN_950	4349
CTCN_129	1079	TTCN_951	4350
CTCN_130	1080	TTCN_952	4351
CTCN_131	1081	TTCN_953	4352
CTCN_132	1082	ATCN_583	4353
CTCN_133	1083	ATCN_584	4354
TTCN_110	1084	ATCN_585	4355
CTCN_134	1085	GTCN_521	4356
TTCN_111	1086	CTCN_971	4357
ATCN_54	1087	ATCN_586	4358
CTCN_135	1088	ATCN_587	4359
GTCN_71	1089	TTCN_954	4360
TTCN_112	1090	TTCN_955	4361
TTCN_113	1091	GTCN_522	4362
TTCN_114	1092	GTCN_523	4363
TTCN_115	1093	CTCN_972	4364

GTCN_72	1094	ATCN_588	4365
CTCN_136	1095	ATCN_589	4366
ATCN_55	1096	GTCN_524	4367
GTCN_73	1097	CTCN_973	4368
TTCN_116	1098	CTCN_974	4369
ATCN_56	1099	TTCN_956	4370
GTCN_74	1100	CTCN_975	4371
CTCN_137	1101	TTCN_957	4372
TTCN_117	1102	GTCN_525	4373
TTCN_118	1103	CTCN_976	4374
ATCN_57	1104	CTCN_977	4375
CTCN_138	1105	GTCN_526	4376
ATCN_58	1106	CTCN_978	4377
TTCN_119	1107	TTCN_958	4378
TTCN_120	1108	CTCN_979	4379
TTCN_121	1109	TTCN_959	4380
TTCN_122	1110	CTCN_980	4381
TTCN_123	1111	ATCN_590	4382
GTCN_75	1112	CTCN_981	4383
ATCN_59	1113	ATCN_591	4384
GTCN_76	1114	ATCN_592	4385
GTCN_77	1115	TTCN_960	4386
TTCN_124	1116	CTCN_982	4387
CTCN_139	1117	TTCN_961	4388
ATCN_60	1118	GTCN_527	4389
CTCN_140	1119	TTCN_962	4390
CTCN_141	1120	ATCN_593	4391
ATCN_61	1121	GTCN_528	4392
ATCN_62	1122	CTCN_983	4393
CTCN_142	1123	TTCN_963	4394
CTCN_143	1124	GTCN_529	4395
GTCN_78	1125	TTCN_964	4396
GTCN_79	1126	ATCN_594	4397
CTCN_144	1127	TTCN_965	4398
ATCN_63	1128	CTCN_984	4399
CTCN_145	1129	CTCN_985	4400
CTCN_146	1130	CTCN_986	4401
CTCN_147	1131	CTCN_987	4402
GTCN_80	1132	ATCN_595	4403
CTCN_148	1133	ATCN_596	4404
GTCN_81	1134	CTCN_988	4405
CTCN_149	1135	CTCN_989	4406
CTCN_150	1136	TTCN_966	4407
CTCN_151	1137	CTCN_990	4408
CTCN_152	1138	ATCN_597	4409
TTCN_125	1139	TTCN_967	4410
ATCN_64	1140	ATCN_598	4411
TTCN_126	1141	TTCN_968	4412
CTCN_153	1142	ATCN_599	4413
CTCN_154	1143	ATCN_600	4414
CTCN_155	1144	TTCN_969	4415
ATCN_65	1145	CTCN_991	4416
ATCN_66	1146	ATCN_601	4417

FIG. 35 (continued)

CTCN_156	1147	ATCN_602	4418
GTCN_82	1148	CTCN_992	4419
TTCN_127	1149	GTCN_530	4420
TTCN_128	1150	CTCN_993	4421
GTCN_83	1151	GTCN_531	4422
TTCN_129	1152	TTCN_970	4423
CTCN_157	1153	TTCN_971	4424
CTCN_158	1154	ATCN_603	4425
GTCN_84	1155	ATCN_604	4426
CTCN_159	1156	ATCN_605	4427
ATCN_67	1157	ATCN_606	4428
ATCN_68	1158	CTCN_994	4429
CTCN_160	1159	TTCN_972	4430
CTCN_161	1160	TTCN_973	4431
CTCN_162	1161	TTCN_974	4432
ATCN_69	1162	TTCN_975	4433
CTCN_163	1163	TTCN_976	4434
GTCN_85	1164	CTCN_995	4435
ATCN_70	1165	CTCN_996	4436
CTCN_164	1166	ATCN_607	4437
TTCN_130	1167	TTCN_977	4438
GTCN_86	1168	CTCN_997	4439
CTCN_165	1169	TTCN_978	4440
CTCN_166	1170	TTCN_979	4441
ATCN_71	1171	TTCN_980	4442
ATCN_72	1172	ATCN_608	4443
CTCN_167	1173	ATCN_609	4444
CTCN_168	1174	GTCN_532	4445
GTCN_87	1175	CTCN_998	4446
ATCN_73	1176	CTCN_999	4447
CTCN_169	1177	ATCN_610	4448
GTCN_88	1178	TTCN_981	4449
CTCN_170	1179	CTCN_1000	4450
GTCN_89	1180	CTCN_1001	4451
GTCN_90	1181	CTCN_1002	4452
CTCN_171	1182	ATCN_611	4453
TTCN_131	1183	TTCN_982	4454
GTCN_91	1184	GTCN_533	4455
TTCN_132	1185	CTCN_1003	4456
CTCN_172	1186	CTCN_1004	4457
CTCN_173	1187	CTCN_1005	4458
ATCN_74	1188	CTCN_1006	4459
TTCN_133	1189	TTCN_983	4460
TTCN_134	1190	CTCN_1007	4461
ATCN_75	1191	ATCN_612	4462
TTCN_135	1192	CTCN_1008	4463
ATCN_76	1193	GTCN_534	4464
CTCN_174	1194	TTCN_984	4465
GTCN_92	1195	ATCN_613	4466
ATCN_77	1196	TTCN_985	4467
ATCN_78	1197	ATCN_614	4468
TTCN_136	1198	TTCN_986	4469
TTCN_137	1199	CTCN_1009	4470

ATCN_79	1200	TTCN_987	4471
TTCN_138	1201	CTCN_1010	4472
TTCN_139	1202	TTCN_988	4473
TTCN_140	1203	ATCN_615	4474
CTCN_175	1204	GTCN_535	4475
TTCN_141	1205	TTCN_989	4476
GTCN_93	1206	TTCN_990	4477
TTCN_142	1207	CTCN_1011	4478
GTCN_94	1208	TTCN_991	4479
CTCN_176	1209	TTCN_992	4480
CTCN_177	1210	CTCN_1012	4481
ATCN_80	1211	CTCN_1013	4482
ATCN_81	1212	TTCN_993	4483
GTCN_95	1213	TTCN_994	4484
GTCN_96	1214	CTCN_1014	4485
ATCN_82	1215	TTCN_995	4486
ATCN_83	1216	ATCN_616	4487
TTCN_143	1217	ATCN_617	4488
TTCN_144	1218	GTCN_536	4489
TTCN_145	1219	ATCN_618	4490
TTCN_146	1220	GTCN_537	4491
ATCN_84	1221	TTCN_996	4492
ATCN_85	1222	GTCN_538	4493
ATCN_86	1223	TTCN_997	4494
CTCN_178	1224	ATCN_619	4495
TTCN_147	1225	TTCN_998	4496
ATCN_87	1226	CTCN_1015	4497
TTCN_148	1227	CTCN_1016	4498
ATCN_88	1228	ATCN_620	4499
ATCN_89	1229	TTCN_999	4500
GTCN_97	1230	CTCN_1017	4501
CTCN_179	1231	GTCN_539	4502
TTCN_149	1232	ATCN_621	4503
TTCN_150	1233	CTCN_1018	4504
CTCN_180	1234	TTCN_1000	4505
GTCN_98	1235	TTCN_1001	4506
CTCN_181	1236	GTCN_540	4507
ATCN_90	1237	TTCN_1002	4508
GTCN_99	1238	TTCN_1003	4509
TTCN_151	1239	GTCN_541	4510
ATCN_91	1240	TTCN_1004	4511
TTCN_152	1241	ATCN_622	4512
GTCN_100	1242	ATCN_623	4513
CTCN_182	1243	GTCN_542	4514
TTCN_153	1244	TTCN_1005	4515
TTCN_154	1245	GTCN_543	4516
TTCN_155	1246	TTCN_1006	4517
TTCN_156	1247	TTCN_1007	4518
TTCN_157	1248	CTCN_1019	4519
TTCN_158	1249	CTCN_1020	4520
CTCN_183	1250	CTCN_1021	4521
GTCN_101	1251	TTCN_1008	4522
TTCN_159	1252	TTCN_1009	4523

FIG. 35 (continued)

TTCN_160	1253	CTCN_1022	4524
GTCN_102	1254	TTCN_1010	4525
GTCN_103	1255	GTCN_544	4526
TTCN_161	1256	GTCN_545	4527
CTCN_184	1257	TTCN_1011	4528
GTCN_104	1258	GTCN_546	4529
TTCN_162	1259	GTCN_547	4530
TTCN_163	1260	TTCN_1012	4531
ATCN_92	1261	ATCN_624	4532
ATCN_93	1262	CTCN_1023	4533
TTCN_164	1263	TTCN_1013	4534
CTCN_185	1264	TTCN_1014	4535
TTCN_165	1265	TTCN_1015	4536
TTCN_166	1266	ATCN_625	4537
TTCN_167	1267	CTCN_1024	4538
TTCN_168	1268	TTCN_1016	4539
TTCN_169	1269	GTCN_548	4540
ATCN_94	1270	GTCN_549	4541
TTCN_170	1271	ATCN_626	4542
GTCN_105	1272	GTCN_550	4543
TTCN_171	1273	TTCN_1017	4544
CTCN_186	1274	TTCN_1018	4545
ATCN_95	1275	CTCN_1025	4546
CTCN_187	1276	GTCN_551	4547
TTCN_172	1277	ATCN_627	4548
GTCN_106	1278	ATCN_628	4549
GTCN_107	1279	GTCN_552	4550
TTCN_173	1280	TTCN_1019	4551
TTCN_174	1281	CTCN_1026	4552
TTCN_175	1282	GTCN_553	4553
TTCN_176	1283	ATCN_629	4554
CTCN_188	1284	ATCN_630	4555
CTCN_189	1285	ATCN_631	4556
ATCN_96	1286	ATCN_632	4557
CTCN_190	1287	ATCN_633	4558
ATCN_97	1288	GTCN_554	4559
TTCN_177	1289	TTCN_1020	4560
GTCN_108	1290	TTCN_1021	4561
GTCN_109	1291	ATCN_634	4562
CTCN_191	1292	ATCN_635	4563
CTCN_192	1293	ATCN_636	4564
ATCN_98	1294	CTCN_1027	4565
TTCN_178	1295	ATCN_637	4566
GTCN_110	1296	ATCN_638	4567
CTCN_193	1297	TTCN_1022	4568
TTCN_179	1298	TTCN_1023	4569
ATCN_99	1299	TTCN_1024	4570
TTCN_180	1300	CTCN_1028	4571
GTCN_111	1301	CTCN_1029	4572
TTCN_181	1302	CTCN_1030	4573
CTCN_194	1303	TTCN_1025	4574
TTCN_182	1304	TTCN_1026	4575
TTCN_183	1305	CTCN_1031	4576

ATCN_100	1306	TTCN_1027	4577
TTCN_184	1307	TTCN_1028	4578
CTCN_195	1308	TTCN_1029	4579
ATCN_101	1309	ATCN_639	4580
ATCN_102	1310	CTCN_1032	4581
ATCN_103	1311	TTCN_1030	4582
TTCN_185	1312	GTCN_555	4583
CTCN_196	1313	GTCN_556	4584
TTCN_186	1314	ATCN_640	4585
CTCN_197	1315	ATCN_641	4586
TTCN_187	1316	GTCN_557	4587
TTCN_188	1317	TTCN_1031	4588
TTCN_189	1318	CTCN_1033	4589
ATCN_104	1319	TTCN_1032	4590
TTCN_190	1320	ATCN_642	4591
TTCN_191	1321	ATCN_643	4592
GTCN_112	1322	CTCN_1034	4593
ATCN_105	1323	TTCN_1033	4594
GTCN_113	1324	TTCN_1034	4595
CTCN_198	1325	CTCN_1035	4596
TTCN_192	1326	TTCN_1035	4597
TTCN_193	1327	TTCN_1036	4598
TTCN_194	1328	TTCN_1037	4599
CTCN_199	1329	TTCN_1038	4600
TTCN_195	1330	GTCN_558	4601
TTCN_196	1331	GTCN_559	4602
TTCN_197	1332	TTCN_1039	4603
CTCN_200	1333	TTCN_1040	4604
ATCN_106	1334	CTCN_1036	4605
CTCN_201	1335	GTCN_560	4606
TTCN_198	1336	TTCN_1041	4607
CTCN_202	1337	ATCN_644	4608
TTCN_199	1338	ATCN_645	4609
CTCN_203	1339	CTCN_1037	4610
TTCN_200	1340	GTCN_561	4611
TTCN_201	1341	ATCN_646	4612
CTCN_204	1342	CTCN_1038	4613
GTCN_114	1343	GTCN_562	4614
ATCN_107	1344	CTCN_1039	4615
CTCN_205	1345	TTCN_1042	4616
ATCN_108	1346	TTCN_1043	4617
ATCN_109	1347	GTCN_563	4618
ATCN_110	1348	CTCN_1040	4619
GTCN_115	1349	GTCN_564	4620
TTCN_202	1350	GTCN_565	4621
CTCN_206	1351	CTCN_1041	4622
TTCN_203	1352	ATCN_647	4623
TTCN_204	1353	CTCN_1042	4624
ATCN_111	1354	CTCN_1043	4625
CTCN_207	1355	TTCN_1044	4626
CTCN_208	1356	GTCN_566	4627
CTCN_209	1357	CTCN_1044	4628
ATCN_112	1358	TTCN_1045	4629

FIG. 35 (continued)

TTCN_205	1359	TTCN_1046	4630
GTCN_116	1360	TTCN_1047	4631
TTCN_206	1361	ATCN_648	4632
CTCN_210	1362	GTCN_567	4633
CTCN_211	1363	TTCN_1048	4634
TTCN_207	1364	TTCN_1049	4635
CTCN_212	1365	CTCN_1045	4636
TTCN_208	1366	CTCN_1046	4637
GTCN_117	1367	TTCN_1050	4638
CTCN_213	1368	TTCN_1051	4639
ATCN_113	1369	GTCN_568	4640
TTCN_209	1370	CTCN_1047	4641
GTCN_118	1371	CTCN_1048	4642
TTCN_210	1372	CTCN_1049	4643
CTCN_214	1373	TTCN_1052	4644
ATCN_114	1374	ATCN_649	4645
CTCN_215	1375	ATCN_650	4646
CTCN_216	1376	ATCN_651	4647
ATCN_115	1377	TTCN_1053	4648
GTCN_119	1378	TTCN_1054	4649
CTCN_217	1379	TTCN_1055	4650
TTCN_211	1380	GTCN_569	4651
CTCN_218	1381	ATCN_652	4652
CTCN_219	1382	CTCN_1050	4653
TTCN_212	1383	CTCN_1051	4654
TTCN_213	1384	CTCN_1052	4655
ATCN_116	1385	CTCN_1053	4656
CTCN_220	1386	TTCN_1056	4657
TTCN_214	1387	TTCN_1057	4658
TTCN_215	1388	CTCN_1054	4659
GTCN_120	1389	TTCN_1058	4660
CTCN_221	1390	TTCN_1059	4661
CTCN_222	1391	TTCN_1060	4662
CTCN_223	1392	GTCN_570	4663
ATCN_117	1393	TTCN_1061	4664
TTCN_216	1394	CTCN_1055	4665
CTCN_224	1395	CTCN_1056	4666
CTCN_225	1396	CTCN_1057	4667
CTCN_226	1397	CTCN_1058	4668
ATCN_118	1398	GTCN_571	4669
ATCN_119	1399	ATCN_653	4670
TTCN_217	1400	TTCN_1062	4671
ATCN_120	1401	GTCN_572	4672
TTCN_218	1402	CTCN_1059	4673
ATCN_121	1403	CTCN_1060	4674
CTCN_227	1404	TTCN_1063	4675
GTCN_121	1405	CTCN_1061	4676
GTCN_122	1406	CTCN_1062	4677
CTCN_228	1407	ATCN_654	4678
TTCN_219	1408	TTCN_1064	4679
GTCN_123	1409	ATCN_655	4680
TTCN_220	1410	ATCN_656	4681
CTCN_229	1411	ATCN_657	4682

ATCN_122	1412	ATCN_658	4683
ATCN_123	1413	CTCN_1063	4684
TTCN_221	1414	CTCN_1064	4685
CTCN_230	1415	TTCN_1065	4686
CTCN_231	1416	CTCN_1065	4687
ATCN_124	1417	CTCN_1066	4688
TTCN_222	1418	CTCN_1067	4689
ATCN_125	1419	CTCN_1068	4690
CTCN_232	1420	TTCN_1066	4691
GTCN_124	1421	GTCN_573	4692
CTCN_233	1422	TTCN_1067	4693
TTCN_223	1423	CTCN_1069	4694
TTCN_224	1424	ATCN_659	4695
GTCN_125	1425	CTCN_1070	4696
TTCN_225	1426	GTCN_574	4697
CTCN_234	1427	TTCN_1068	4698
GTCN_126	1428	TTCN_1069	4699
TTCN_226	1429	TTCN_1070	4700
GTCN_127	1430	ATCN_660	4701
CTCN_235	1431	TTCN_1071	4702
CTCN_236	1432	TTCN_1072	4703
CTCN_237	1433	ATCN_661	4704
CTCN_238	1434	CTCN_1071	4705
CTCN_239	1435	TTCN_1073	4706
TTCN_227	1436	TTCN_1074	4707
CTCN_240	1437	TTCN_1075	4708
CTCN_241	1438	ATCN_662	4709
TTCN_228	1439	CTCN_1072	4710
CTCN_242	1440	CTCN_1073	4711
GTCN_128	1441	ATCN_663	4712
TTCN_229	1442	TTCN_1076	4713
TTCN_230	1443	ATCN_664	4714
CTCN_243	1444	ATCN_665	4715
CTCN_244	1445	ATCN_666	4716
TTCN_231	1446	GTCN_575	4717
GTCN_129	1447	CTCN_1074	4718
TTCN_232	1448	GTCN_576	4719
ATCN_126	1449	TTCN_1077	4720
CTCN_245	1450	CTCN_1075	4721
CTCN_246	1451	GTCN_577	4722
ATCN_127	1452	GTCN_578	4723
TTCN_233	1453	GTCN_579	4724
GTCN_130	1454	TTCN_1078	4725
ATCN_128	1455	CTCN_1076	4726
ATCN_129	1456	TTCN_1079	4727
CTCN_247	1457	CTCN_1077	4728
CTCN_248	1458	GTCN_580	4729
CTCN_249	1459	TTCN_1080	4730
CTCN_250	1460	ATCN_667	4731
CTCN_251	1461	TTCN_1081	4732
TTCN_234	1462	ATCN_668	4733
GTCN_131	1463	CTCN_1078	4734
GTCN_132	1464	GTCN_581	4735

FIG. 35 (continued)

CTCN_252	1465	GTCN_582	4736
TTCN_235	1466	GTCN_583	4737
CTCN_253	1467	ATCN_669	4738
GTCN_133	1468	GTCN_584	4739
TTCN_236	1469	ATCN_670	4740
CTCN_254	1470	ATCN_671	4741
GTCN_134	1471	TTCN_1082	4742
ATCN_130	1472	TTCN_1083	4743
TTCN_237	1473	ATCN_672	4744
ATCN_131	1474	CTCN_1079	4745
TTCN_238	1475	ATCN_673	4746
ATCN_132	1476	ATCN_674	4747
CTCN_255	1477	CTCN_1080	4748
GTCN_135	1478	CTCN_1081	4749
GTCN_136	1479	TTCN_1084	4750
CTCN_256	1480	GTCN_585	4751
GTCN_137	1481	TTCN_1085	4752
CTCN_257	1482	ATCN_675	4753
ATCN_133	1483	ATCN_676	4754
CTCN_258	1484	TTCN_1086	4755
CTCN_259	1485	GTCN_586	4756
CTCN_260	1486	CTCN_1082	4757
CTCN_261	1487	ATCN_677	4758
CTCN_262	1488	ATCN_678	4759
ATCN_134	1489	ATCN_679	4760
CTCN_263	1490	TTCN_1087	4761
CTCN_264	1491	TTCN_1088	4762
GTCN_138	1492	TTCN_1089	4763
TTCN_239	1493	TTCN_1090	4764
CTCN_265	1494	TTCN_1091	4765
GTCN_139	1495	ATCN_680	4766
ATCN_135	1496	ATCN_681	4767
TTCN_240	1497	ATCN_682	4768
TTCN_241	1498	TTCN_1092	4769
GTCN_140	1499	TTCN_1093	4770
GTCN_141	1500	TTCN_1094	4771
TTCN_242	1501	ATCN_683	4772
GTCN_142	1502	GTCN_587	4773
CTCN_266	1503	ATCN_684	4774
CTCN_267	1504	ATCN_685	4775
ATCN_136	1505	TTCN_1095	4776
GTCN_143	1506	TTCN_1096	4777
TTCN_243	1507	CTCN_1083	4778
GTCN_144	1508	GTCN_588	4779
TTCN_244	1509	CTCN_1084	4780
TTCN_245	1510	ATCN_686	4781
TTCN_246	1511	ATCN_687	4782
TTCN_247	1512	CTCN_1085	4783
GTCN_145	1513	CTCN_1086	4784
CTCN_268	1514	CTCN_1087	4785
CTCN_269	1515	CTCN_1088	4786
TTCN_248	1516	CTCN_1089	4787
GTCN_146	1517	CTCN_1090	4788

GTCN_147	1518	CTCN_1091	4789
TTCN_249	1519	TTCN_1097	4790
TTCN_250	1520	TTCN_1098	4791
TTCN_251	1521	CTCN_1092	4792
GTCN_148	1522	ATCN_688	4793
TTCN_252	1523	ATCN_689	4794
TTCN_253	1524	ATCN_690	4795
TTCN_254	1525	GTCN_589	4796
TTCN_255	1526	ATCN_691	4797
ATCN_137	1527	TTCN_1099	4798
CTCN_270	1528	CTCN_1093	4799
ATCN_138	1529	TTCN_1100	4800
CTCN_271	1530	ATCN_692	4801
GTCN_149	1531	CTCN_1094	4802
GTCN_150	1532	CTCN_1095	4803
TTCN_256	1533	ATCN_693	4804
CTCN_272	1534	TTCN_1101	4805
ATCN_139	1535	CTCN_1096	4806
ATCN_140	1536	TTCN_1102	4807
TTCN_257	1537	TTCN_1103	4808
TTCN_258	1538	TTCN_1104	4809
GTCN_151	1539	GTCN_590	4810
CTCN_273	1540	ATCN_694	4811
GTCN_152	1541	TTCN_1105	4812
CTCN_274	1542	TTCN_1106	4813
ATCN_141	1543	TTCN_1107	4814
ATCN_142	1544	GTCN_591	4815
GTCN_153	1545	ATCN_695	4816
CTCN_275	1546	TTCN_1108	4817
ATCN_143	1547	TTCN_1109	4818
CTCN_276	1548	ATCN_696	4819
GTCN_154	1549	ATCN_697	4820
CTCN_277	1550	TTCN_1110	4821
TTCN_259	1551	ATCN_698	4822
ATCN_144	1552	ATCN_699	4823
TTCN_260	1553	ATCN_700	4824
TTCN_261	1554	CTCN_1097	4825
CTCN_278	1555	ATCN_701	4826
GTCN_155	1556	CTCN_1098	4827
CTCN_279	1557	CTCN_1099	4828
TTCN_262	1558	TTCN_1111	4829
CTCN_280	1559	TTCN_1112	4830
TTCN_263	1560	GTCN_592	4831
CTCN_281	1561	TTCN_1113	4832
CTCN_282	1562	TTCN_1114	4833
CTCN_283	1563	TTCN_1115	4834
GTCN_156	1564	CTCN_1100	4835
CTCN_284	1565	CTCN_1101	4836
TTCN_264	1566	CTCN_1102	4837
TTCN_265	1567	ATCN_702	4838
ATCN_145	1568	TTCN_1116	4839
TTCN_266	1569	TTCN_1117	4840
GTCN_157	1570	ATCN_703	4841

FIG. 35 (continued)

TTCN_267	1571	TTCN_1118	4842
TTCN_268	1572	ATCN_704	4843
CTCN_285	1573	ATCN_705	4844
TTCN_269	1574	CTCN_1103	4845
CTCN_286	1575	TTCN_1119	4846
TTCN_270	1576	GTCN_593	4847
GTCN_158	1577	GTCN_594	4848
CTCN_287	1578	CTCN_1104	4849
GTCN_159	1579	TTCN_1120	4850
TTCN_271	1580	TTCN_1121	4851
GTCN_160	1581	TTCN_1122	4852
CTCN_288	1582	GTCN_595	4853
CTCN_289	1583	CTCN_1105	4854
TTCN_272	1584	CTCN_1106	4855
TTCN_273	1585	GTCN_596	4856
GTCN_161	1586	CTCN_1107	4857
ATCN_146	1587	CTCN_1108	4858
ATCN_147	1588	CTCN_1109	4859
ATCN_148	1589	ATCN_706	4860
ATCN_149	1590	TTCN_1123	4861
TTCN_274	1591	ATCN_707	4862
CTCN_290	1592	TTCN_1124	4863
TTCN_275	1593	ATCN_708	4864
CTCN_291	1594	ATCN_709	4865
CTCN_292	1595	ATCN_710	4866
GTCN_162	1596	GTCN_597	4867
GTCN_163	1597	CTCN_1110	4868
ATCN_150	1598	ATCN_711	4869
ATCN_151	1599	TTCN_1125	4870
GTCN_164	1600	GTCN_598	4871
ATCN_152	1601	TTCN_1126	4872
ATCN_153	1602	GTCN_599	4873
CTCN_293	1603	ATCN_712	4874
CTCN_294	1604	ATCN_713	4875
GTCN_165	1605	GTCN_600	4876
CTCN_295	1606	TTCN_1127	4877
CTCN_296	1607	ATCN_714	4878
CTCN_297	1608	ATCN_715	4879
TTCN_276	1609	CTCN_1111	4880
CTCN_298	1610	ATCN_716	4881
CTCN_299	1611	TTCN_1128	4882
CTCN_300	1612	ATCN_717	4883
TTCN_277	1613	TTCN_1129	4884
TTCN_278	1614	GTCN_601	4885
CTCN_301	1615	TTCN_1130	4886
TTCN_279	1616	GTCN_602	4887
TTCN_280	1617	CTCN_1112	4888
TTCN_281	1618	GTCN_603	4889
GTCN_166	1619	ATCN_718	4890
CTCN_302	1620	TTCN_1131	4891
CTCN_303	1621	ATCN_719	4892
CTCN_304	1622	ATCN_720	4893
TTCN_282	1623	TTCN_1132	4894

GTCN_167	1624	ATCN_721	4895
CTCN_305	1625	ATCN_722	4896
CTCN_306	1626	CTCN_1113	4897
TTCN_283	1627	ATCN_723	4898
ATCN_154	1628	TTCN_1133	4899
CTCN_307	1629	TTCN_1134	4900
CTCN_308	1630	GTCN_604	4901
GTCN_168	1631	ATCN_724	4902
GTCN_169	1632	TTCN_1135	4903
CTCN_309	1633	ATCN_725	4904
CTCN_310	1634	GTCN_605	4905
CTCN_311	1635	TTCN_1136	4906
TTCN_284	1636	ATCN_726	4907
TTCN_285	1637	CTCN_1114	4908
ATCN_155	1638	TTCN_1137	4909
CTCN_312	1639	GTCN_606	4910
TTCN_286	1640	ATCN_727	4911
CTCN_313	1641	CTCN_1115	4912
TTCN_287	1642	ATCN_728	4913
CTCN_314	1643	ATCN_729	4914
CTCN_315	1644	TTCN_1138	4915
TTCN_288	1645	CTCN_1116	4916
CTCN_316	1646	CTCN_1117	4917
TTCN_289	1647	GTCN_607	4918
ATCN_156	1648	ATCN_730	4919
GTCN_170	1649	CTCN_1118	4920
TTCN_290	1650	ATCN_731	4921
CTCN_317	1651	ATCN_732	4922
CTCN_318	1652	TTCN_1139	4923
GTCN_171	1653	TTCN_1140	4924
CTCN_319	1654	TTCN_1141	4925
TTCN_291	1655	ATCN_733	4926
ATCN_157	1656	TTCN_1142	4927
ATCN_158	1657	TTCN_1143	4928
CTCN_320	1658	CTCN_1119	4929
CTCN_321	1659	GTCN_608	4930
ATCN_159	1660	CTCN_1120	4931
ATCN_160	1661	GTCN_609	4932
CTCN_322	1662	ATCN_734	4933
GTCN_172	1663	CTCN_1121	4934
GTCN_173	1664	ATCN_735	4935
CTCN_323	1665	ATCN_736	4936
TTCN_292	1666	ATCN_737	4937
ATCN_161	1667	CTCN_1122	4938
TTCN_293	1668	CTCN_1123	4939
TTCN_294	1669	GTCN_610	4940
ATCN_162	1670	CTCN_1124	4941
CTCN_324	1671	GTCN_611	4942
TTCN_295	1672	GTCN_612	4943
TTCN_296	1673	GTCN_613	4944
TTCN_297	1674	CTCN_1125	4945
TTCN_298	1675	TTCN_1144	4946
TTCN_299	1676	TTCN_1145	4947

FIG. 35 (continued)

ATCN_163	1677	TTCN_1146	4948
CTCN_325	1678	TTCN_1147	4949
TTCN_300	1679	TTCN_1148	4950
CTCN_326	1680	TTCN_1149	4951
TTCN_301	1681	ATCN_738	4952
TTCN_302	1682	CTCN_1126	4953
GTCN_174	1683	CTCN_1127	4954
CTCN_327	1684	TTCN_1150	4955
TTCN_303	1685	CTCN_1128	4956
CTCN_328	1686	CTCN_1129	4957
GTCN_175	1687	CTCN_1130	4958
ATCN_164	1688	TTCN_1151	4959
CTCN_329	1689	CTCN_1131	4960
TTCN_304	1690	ATCN_739	4961
TTCN_305	1691	TTCN_1152	4962
CTCN_330	1692	TTCN_1153	4963
GTCN_176	1693	GTCN_614	4964
TTCN_306	1694	TTCN_1154	4965
GTCN_177	1695	CTCN_1132	4966
ATCN_165	1696	TTCN_1155	4967
TTCN_307	1697	GTCN_615	4968
TTCN_308	1698	TTCN_1156	4969
TTCN_309	1699	GTCN_616	4970
TTCN_310	1700	TTCN_1157	4971
GTCN_178	1701	CTCN_1133	4972
CTCN_331	1702	TTCN_1158	4973
GTCN_179	1703	ATCN_740	4974
ATCN_166	1704	ATCN_741	4975
ATCN_167	1705	CTCN_1134	4976
TTCN_311	1706	TTCN_1159	4977
GTCN_180	1707	TTCN_1160	4978
CTCN_332	1708	TTCN_1161	4979
ATCN_168	1709	CTCN_1135	4980
ATCN_169	1710	TTCN_1162	4981
TTCN_312	1711	GTCN_617	4982
TTCN_313	1712	ATCN_742	4983
ATCN_170	1713	TTCN_1163	4984
GTCN_181	1714	CTCN_1136	4985
TTCN_314	1715	CTCN_1137	4986
TTCN_315	1716	TTCN_1164	4987
GTCN_182	1717	GTCN_618	4988
CTCN_333	1718	ATCN_743	4989
TTCN_316	1719	CTCN_1138	4990
CTCN_334	1720	CTCN_1139	4991
TTCN_317	1721	ATCN_744	4992
CTCN_335	1722	TTCN_1165	4993
GTCN_183	1723	CTCN_1140	4994
TTCN_318	1724	TTCN_1166	4995
CTCN_336	1725	CTCN_1141	4996
CTCN_337	1726	TTCN_1167	4997
ATCN_171	1727	TTCN_1168	4998
CTCN_338	1728	GTCN_619	4999
GTCN_184	1729	CTCN_1142	5000

ATCN_172	1730	ATCN_745	5001
GTCN_185	1731	GTCN_620	5002
TTCN_319	1732	GTCN_621	5003
ATCN_173	1733	TTCN_1169	5004
CTCN_339	1734	TTCN_1170	5005
ATCN_174	1735	ATCN_746	5006
CTCN_340	1736	TTCN_1171	5007
TTCN_320	1737	TTCN_1172	5008
TTCN_321	1738	GTCN_622	5009
GTCN_186	1739	TTCN_1173	5010
CTCN_341	1740	ATCN_747	5011
CTCN_342	1741	TTCN_1174	5012
CTCN_343	1742	CTCN_1143	5013
CTCN_344	1743	TTCN_1175	5014
GTCN_187	1744	CTCN_1144	5015
GTCN_188	1745	ATCN_748	5016
CTCN_345	1746	CTCN_1145	5017
GTCN_189	1747	GTCN_623	5018
CTCN_346	1748	CTCN_1146	5019
CTCN_347	1749	CTCN_1147	5020
CTCN_348	1750	GTCN_624	5021
CTCN_349	1751	ATCN_749	5022
GTCN_190	1752	TTCN_1176	5023
GTCN_191	1753	CTCN_1148	5024
TTCN_322	1754	CTCN_1149	5025
CTCN_350	1755	TTCN_1177	5026
TTCN_323	1756	ATCN_750	5027
TTCN_324	1757	TTCN_1178	5028
CTCN_351	1758	CTCN_1150	5029
TTCN_325	1759	CTCN_1151	5030
TTCN_326	1760	GTCN_625	5031
GTCN_192	1761	GTCN_626	5032
ATCN_175	1762	CTCN_1152	5033
GTCN_193	1763	CTCN_1153	5034
GTCN_194	1764	GTCN_627	5035
CTCN_352	1765	CTCN_1154	5036
ATCN_176	1766	TTCN_1179	5037
GTCN_195	1767	ATCN_751	5038
GTCN_196	1768	ATCN_752	5039
GTCN_197	1769	CTCN_1155	5040
TTCN_327	1770	GTCN_628	5041
TTCN_328	1771	TTCN_1180	5042
GTCN_198	1772	CTCN_1156	5043
CTCN_353	1773	ATCN_753	5044
GTCN_199	1774	TTCN_1181	5045
CTCN_354	1775	CTCN_1157	5046
CTCN_355	1776	CTCN_1158	5047
CTCN_356	1777	CTCN_1159	5048
ATCN_177	1778	GTCN_629	5049
CTCN_357	1779	GTCN_630	5050
ATCN_178	1780	CTCN_1160	5051
ATCN_179	1781	ATCN_754	5052
TTCN_329	1782	TTCN_1182	5053

FIG. 35 (continued)

CTCN_358	1783	CTCN_1161	5054
TTCN_330	1784	TTCN_1183	5055
ATCN_180	1785	TTCN_1184	5056
TTCN_331	1786	CTCN_1162	5057
CTCN_359	1787	CTCN_1163	5058
TTCN_332	1788	TTCN_1185	5059
GTCN_200	1789	ATCN_755	5060
ATCN_181	1790	CTCN_1164	5061
ATCN_182	1791	CTCN_1165	5062
ATCN_183	1792	GTCN_631	5063
ATCN_184	1793	CTCN_1166	5064
CTCN_360	1794	TTCN_1186	5065
ATCN_185	1795	CTCN_1167	5066
ATCN_186	1796	CTCN_1168	5067
TTCN_333	1797	GTCN_632	5068
TTCN_334	1798	CTCN_1169	5069
CTCN_361	1799	ATCN_756	5070
ATCN_187	1800	CTCN_1170	5071
TTCN_335	1801	CTCN_1171	5072
ATCN_188	1802	CTCN_1172	5073
TTCN_336	1803	TTCN_1187	5074
GTCN_201	1804	ATCN_757	5075
ATCN_189	1805	TTCN_1188	5076
ATCN_190	1806	CTCN_1173	5077
CTCN_362	1807	TTCN_1189	5078
ATCN_191	1808	CTCN_1174	5079
TTCN_337	1809	CTCN_1175	5080
TTCN_338	1810	CTCN_1176	5081
TTCN_339	1811	ATCN_758	5082
CTCN_363	1812	CTCN_1177	5083
GTCN_202	1813	ATCN_759	5084
ATCN_192	1814	TTCN_1190	5085
ATCN_193	1815	GTCN_633	5086
TTCN_340	1816	GTCN_634	5087
GTCN_203	1817	CTCN_1178	5088
CTCN_364	1818	CTCN_1179	5089
GTCN_204	1819	CTCN_1180	5090
CTCN_365	1820	ATCN_760	5091
CTCN_366	1821	ATCN_761	5092
GTCN_205	1822	CTCN_1181	5093
ATCN_194	1823	CTCN_1182	5094
CTCN_367	1824	TTCN_1191	5095
CTCN_368	1825	CTCN_1183	5096
GTCN_206	1826	CTCN_1184	5097
TTCN_341	1827	ATCN_762	5098
TTCN_342	1828	CTCN_1185	5099
GTCN_207	1829	ATCN_763	5100
ATCN_195	1830	CTCN_1186	5101
ATCN_196	1831	GTCN_635	5102
TTCN_343	1832	ATCN_764	5103
CTCN_369	1833	TTCN_1192	5104
ATCN_197	1834	TTCN_1193	5105
GTCN_208	1835	ATCN_765	5106

ATCN_198	1836	ATCN_766	5107
TTCN_344	1837	ATCN_767	5108
CTCN_370	1838	ATCN_768	5109
GTCN_209	1839	CTCN_1187	5110
TTCN_345	1840	ATCN_769	5111
CTCN_371	1841	GTCN_636	5112
CTCN_372	1842	ATCN_770	5113
ATCN_199	1843	ATCN_771	5114
CTCN_373	1844	CTCN_1188	5115
CTCN_374	1845	TTCN_1194	5116
GTCN_210	1846	GTCN_637	5117
CTCN_375	1847	GTCN_638	5118
ATCN_200	1848	CTCN_1189	5119
CTCN_376	1849	TTCN_1195	5120
TTCN_346	1850	ATCN_772	5121
ATCN_201	1851	ATCN_773	5122
TTCN_347	1852	CTCN_1190	5123
TTCN_348	1853	TTCN_1196	5124
GTCN_211	1854	GTCN_639	5125
TTCN_349	1855	GTCN_640	5126
TTCN_350	1856	TTCN_1197	5127
TTCN_351	1857	TTCN_1198	5128
TTCN_352	1858	CTCN_1191	5129
TTCN_353	1859	GTCN_641	5130
ATCN_202	1860	CTCN_1192	5131
TTCN_354	1861	GTCN_642	5132
GTCN_212	1862	GTCN_643	5133
CTCN_377	1863	TTCN_1199	5134
GTCN_213	1864	ATCN_774	5135
ATCN_203	1865	ATCN_775	5136
GTCN_214	1866	GTCN_644	5137
ATCN_204	1867	TTCN_1200	5138
TTCN_355	1868	ATCN_776	5139
TTCN_356	1869	TTCN_1201	5140
TTCN_357	1870	ATCN_777	5141
TTCN_358	1871	TTCN_1202	5142
GTCN_215	1872	GTCN_645	5143
TTCN_359	1873	GTCN_646	5144
TTCN_360	1874	CTCN_1193	5145
TTCN_361	1875	CTCN_1194	5146
TTCN_362	1876	CTCN_1195	5147
CTCN_378	1877	CTCN_1196	5148
ATCN_205	1878	TTCN_1203	5149
CTCN_379	1879	TTCN_1204	5150
ATCN_206	1880	CTCN_1197	5151
ATCN_207	1881	ATCN_778	5152
CTCN_380	1882	TTCN_1205	5153
GTCN_216	1883	CTCN_1198	5154
CTCN_381	1884	CTCN_1199	5155
ATCN_208	1885	ATCN_779	5156
ATCN_209	1886	ATCN_780	5157
CTCN_382	1887	CTCN_1200	5158
CTCN_383	1888	CTCN_1201	5159

FIG. 35 (continued)

TTCN_363	1889	TTCN_1206	5160
ATCN_210	1890	TTCN_1207	5161
TTCN_364	1891	CTCN_1202	5162
CTCN_384	1892	ATCN_781	5163
CTCN_385	1893	TTCN_1208	5164
CTCN_386	1894	TTCN_1209	5165
CTCN_387	1895	ATCN_782	5166
ATCN_211	1896	TTCN_1210	5167
TTCN_365	1897	CTCN_1203	5168
TTCN_366	1898	ATCN_783	5169
TTCN_367	1899	GTCN_647	5170
GTCN_217	1900	TTCN_1211	5171
CTCN_388	1901	GTCN_648	5172
CTCN_389	1902	ATCN_784	5173
GTCN_218	1903	CTCN_1204	5174
CTCN_390	1904	ATCN_785	5175
ATCN_212	1905	CTCN_1205	5176
CTCN_391	1906	CTCN_1206	5177
ATCN_213	1907	CTCN_1207	5178
TTCN_368	1908	CTCN_1208	5179
TTCN_369	1909	GTCN_649	5180
TTCN_370	1910	CTCN_1209	5181
CTCN_392	1911	ATCN_786	5182
CTCN_393	1912	CTCN_1210	5183
TTCN_371	1913	TTCN_1212	5184
TTCN_372	1914	ATCN_787	5185
GTCN_219	1915	TTCN_1213	5186
TTCN_373	1916	TTCN_1214	5187
TTCN_374	1917	GTCN_650	5188
TTCN_375	1918	TTCN_1215	5189
CTCN_394	1919	GTCN_651	5190
ATCN_214	1920	GTCN_652	5191
TTCN_376	1921	TTCN_1216	5192
CTCN_395	1922	TTCN_1217	5193
GTCN_220	1923	CTCN_1211	5194
ATCN_215	1924	TTCN_1218	5195
ATCN_216	1925	CTCN_1212	5196
CTCN_396	1926	TTCN_1219	5197
TTCN_377	1927	GTCN_653	5198
TTCN_378	1928	CTCN_1213	5199
ATCN_217	1929	TTCN_1220	5200
TTCN_379	1930	GTCN_654	5201
TTCN_380	1931	CTCN_1214	5202
TTCN_381	1932	ATCN_788	5203
GTCN_221	1933	CTCN_1215	5204
TTCN_382	1934	CTCN_1216	5205
GTCN_222	1935	TTCN_1221	5206
GTCN_223	1936	GTCN_655	5207
CTCN_397	1937	TTCN_1222	5208
GTCN_224	1938	GTCN_656	5209
ATCN_218	1939	CTCN_1217	5210
ATCN_219	1940	TTCN_1223	5211
CTCN_398	1941	ATCN_789	5212

TTCN_383	1942	CTCN_1218	5213
GTCN_225	1943	CTCN_1219	5214
TTCN_384	1944	CTCN_1220	5215
GTCN_226	1945	CTCN_1221	5216
ATCN_220	1946	TTCN_1224	5217
TTCN_385	1947	ATCN_790	5218
GTCN_227	1948	TTCN_1225	5219
CTCN_399	1949	CTCN_1222	5220
GTCN_228	1950	CTCN_1223	5221
ATCN_221	1951	CTCN_1224	5222
ATCN_222	1952	CTCN_1225	5223
ATCN_223	1953	CTCN_1226	5224
TTCN_386	1954	ATCN_791	5225
TTCN_387	1955	ATCN_792	5226
ATCN_224	1956	CTCN_1227	5227
TTCN_388	1957	CTCN_1228	5228
TTCN_389	1958	GTCN_657	5229
TTCN_390	1959	CTCN_1229	5230
ATCN_225	1960	CTCN_1230	5231
TTCN_391	1961	GTCN_658	5232
CTCN_400	1962	CTCN_1231	5233
TTCN_392	1963	ATCN_793	5234
TTCN_393	1964	CTCN_1232	5235
TTCN_394	1965	CTCN_1233	5236
TTCN_395	1966	TTCN_1226	5237
ATCN_226	1967	GTCN_659	5238
GTCN_229	1968	CTCN_1234	5239
ATCN_227	1969	ATCN_794	5240
GTCN_230	1970	ATCN_795	5241
CTCN_401	1971	CTCN_1235	5242
CTCN_402	1972	CTCN_1236	5243
ATCN_228	1973	CTCN_1237	5244
TTCN_396	1974	CTCN_1238	5245
CTCN_403	1975	ATCN_796	5246
CTCN_404	1976	ATCN_797	5247
ATCN_229	1977	ATCN_798	5248
CTCN_405	1978	GTCN_660	5249
CTCN_406	1979	GTCN_661	5250
TTCN_397	1980	CTCN_1239	5251
GTCN_231	1981	TTCN_1227	5252
GTCN_232	1982	GTCN_662	5253
CTCN_407	1983	TTCN_1228	5254
GTCN_233	1984	CTCN_1240	5255
ATCN_230	1985	CTCN_1241	5256
CTCN_408	1986	CTCN_1242	5257
TTCN_398	1987	CTCN_1243	5258
TTCN_399	1988	TTCN_1229	5259
GTCN_234	1989	ATCN_799	5260
TTCN_400	1990	TTCN_1230	5261
CTCN_409	1991	CTCN_1244	5262
CTCN_410	1992	CTCN_1245	5263
ATCN_231	1993	CTCN_1246	5264
ATCN_232	1994	ATCN_800	5265

FIG. 35 (continued)

TTCN_401	1995	GTCN_663	5266
TTCN_402	1996	GTCN_664	5267
ATCN_233	1997	TTCN_1231	5268
ATCN_234	1998	CTCN_1247	5269
GTCN_235	1999	TTCN_1232	5270
TTCN_403	2000	ATCN_801	5271
TTCN_404	2001	CTCN_1248	5272
TTCN_405	2002	TTCN_1233	5273
CTCN_411	2003	CTCN_1249	5274
ATCN_235	2004	TTCN_1234	5275
TTCN_406	2005	TTCN_1235	5276
TTCN_407	2006	CTCN_1250	5277
GTCN_236	2007	GTCN_665	5278
TTCN_408	2008	GTCN_666	5279
TTCN_409	2009	GTCN_667	5280
ATCN_236	2010	TTCN_1236	5281
GTCN_237	2011	TTCN_1237	5282
CTCN_412	2012	ATCN_802	5283
CTCN_413	2013	CTCN_1251	5284
TTCN_410	2014	CTCN_1252	5285
CTCN_414	2015	TTCN_1238	5286
GTCN_238	2016	TTCN_1239	5287
CTCN_415	2017	CTCN_1253	5288
GTCN_239	2018	CTCN_1254	5289
GTCN_240	2019	ATCN_803	5290
CTCN_416	2020	ATCN_804	5291
CTCN_417	2021	GTCN_668	5292
ATCN_237	2022	TTCN_1240	5293
ATCN_238	2023	GTCN_669	5294
CTCN_418	2024	CTCN_1255	5295
CTCN_419	2025	CTCN_1256	5296
CTCN_420	2026	GTCN_670	5297
CTCN_421	2027	TTCN_1241	5298
TTCN_411	2028	TTCN_1242	5299
TTCN_412	2029	ATCN_805	5300
CTCN_422	2030	ATCN_806	5301
CTCN_423	2031	TTCN_1243	5302
CTCN_424	2032	TTCN_1244	5303
CTCN_425	2033	TTCN_1245	5304
CTCN_426	2034	ATCN_807	5305
TTCN_413	2035	TTCN_1246	5306
CTCN_427	2036	CTCN_1257	5307
GTCN_241	2037	TTCN_1247	5308
CTCN_428	2038	CTCN_1258	5309
GTCN_242	2039	TTCN_1248	5310
CTCN_429	2040	GTCN_671	5311
GTCN_243	2041	CTCN_1259	5312
CTCN_430	2042	CTCN_1260	5313
ATCN_239	2043	GTCN_672	5314
CTCN_431	2044	GTCN_673	5315
CTCN_432	2045	ATCN_808	5316
CTCN_433	2046	GTCN_674	5317
CTCN_434	2047	TTCN_1249	5318

ATCN_240	2048	TTCN_1250	5319
ATCN_241	2049	CTCN_1261	5320
GTCN_244	2050	TTCN_1251	5321
CTCN_435	2051	CTCN_1262	5322
CTCN_436	2052	TTCN_1252	5323
TTCN_414	2053	CTCN_1263	5324
ATCN_242	2054	CTCN_1264	5325
TTCN_415	2055	CTCN_1265	5326
TTCN_416	2056	CTCN_1266	5327
GTCN_245	2057	TTCN_1253	5328
GTCN_246	2058	TTCN_1254	5329
TTCN_417	2059	TTCN_1255	5330
CTCN_437	2060	GTCN_675	5331
GTCN_247	2061	ATCN_809	5332
CTCN_438	2062	CTCN_1267	5333
ATCN_243	2063	TTCN_1256	5334
CTCN_439	2064	ATCN_810	5335
CTCN_440	2065	ATCN_811	5336
ATCN_244	2066	GTCN_676	5337
CTCN_441	2067	TTCN_1257	5338
TTCN_418	2068	TTCN_1258	5339
TTCN_419	2069	TTCN_1259	5340
TTCN_420	2070	TTCN_1260	5341
CTCN_442	2071	CTCN_1268	5342
ATCN_245	2072	ATCN_812	5343
GTCN_248	2073	CTCN_1269	5344
CTCN_443	2074	CTCN_1270	5345
CTCN_444	2075	GTCN_677	5346
TTCN_421	2076	CTCN_1271	5347
ATCN_246	2077	TTCN_1261	5348
ATCN_247	2078	CTCN_1272	5349
CTCN_445	2079	GTCN_678	5350
CTCN_446	2080	CTCN_1273	5351
CTCN_447	2081	GTCN_679	5352
ATCN_248	2082	GTCN_680	5353
CTCN_448	2083	CTCN_1274	5354
GTCN_249	2084	CTCN_1275	5355
GTCN_250	2085	CTCN_1276	5356
CTCN_449	2086	CTCN_1277	5357
TTCN_422	2087	ATCN_813	5358
TTCN_423	2088	CTCN_1278	5359
ATCN_249	2089	GTCN_681	5360
CTCN_450	2090	CTCN_1279	5361
CTCN_451	2091	GTCN_682	5362
TTCN_424	2092	GTCN_683	5363
TTCN_425	2093	CTCN_1280	5364
TTCN_426	2094	GTCN_684	5365
CTCN_452	2095	ATCN_814	5366
GTCN_251	2096	ATCN_815	5367
GTCN_252	2097	CTCN_1281	5368
TTCN_427	2098	CTCN_1282	5369
GTCN_253	2099	CTCN_1283	5370
TTCN_428	2100	CTCN_1284	5371

FIG. 35 (continued)

TTCN_429	2281	TTCN_1262	5372
TTCN_430	2282	ATCN_816	5373
ATCN_250	2283	TTCN_1263	5374
TTCN_431	2284	CTCN_1285	5375
ATCN_251	2285	CTCN_1286	5376
ATCN_252	2286	CTCN_1287	5377
TTCN_432	2287	CTCN_1288	5378
CTCN_453	2288	TTCN_1264	5379
TTCN_433	2289	CTCN_1289	5380
TTCN_434	2290	GTCN_685	5381
ATCN_253	2291	ATCN_817	5382
GTCN_254	2292	TTCN_1265	5383
GTCN_255	2293	ATCN_818	5384
CTCN_454	2294	GTCN_686	5385
ATCN_254	2295	GTCN_687	5386
CTCN_455	2296	CTCN_1290	5387
GTCN_256	2297	CTCN_1291	5388
TTCN_435	2298	GTCN_688	5389
CTCN_456	2299	CTCN_1292	5390
GTCN_257	2300	ATCN_819	5391
CTCN_457	2301	ATCN_820	5392
CTCN_458	2302	CTCN_1293	5393
TTCN_436	2303	CTCN_1294	5394
ATCN_255	2304	ATCN_821	5395
GTCN_258	2305	CTCN_1295	5396
ATCN_256	2306	CTCN_1296	5397
CTCN_459	2307	GTCN_689	5398
TTCN_437	2308	GTCN_690	5399
CTCN_460	2309	CTCN_1297	5400
CTCN_461	2310	TTCN_1266	5401
TTCN_438	2311	ATCN_822	5402
CTCN_462	2312	CTCN_1298	5403
ATCN_257	2313	ATCN_823	5404
ATCN_258	2314	CTCN_1299	5405
ATCN_259	2315	CTCN_1300	5406
ATCN_260	2316	CTCN_1301	5407
CTCN_463	2317	TTCN_1267	5408
CTCN_464	2318	ATCN_824	5409
CTCN_465	2319	TTCN_1268	5410
CTCN_466	2320	CTCN_1302	5411
GTCN_259	2321	CTCN_1303	5412
TTCN_439	2322	CTCN_1304	5413
CTCN_467	2323	CTCN_1305	5414
CTCN_468	2324	ATCN_825	5415
TTCN_440	2325	ATCN_826	5416
TTCN_441	2326	GTCN_691	5417
CTCN_469	2327	CTCN_1306	5418
TTCN_442	2328	GTCN_692	5419
TTCN_443	2329	GTCN_693	5420
TTCN_444	2330	GTCN_694	5421
TTCN_445	2331	ATCN_827	5422
TTCN_446	2332	CTCN_1307	5423
CTCN_470	2333	CTCN_1308	5424

TTCN_447	2334	CTCN_1309	5425
GTCN_260	2335	CTCN_1310	5426
CTCN_471	2336	CTCN_1311	5427
CTCN_472	2337	ATCN_828	5428
TTCN_448	2338	ATCN_829	5429
ATCN_261	2339	GTCN_695	5430
TTCN_449	2340	CTCN_1312	5431
GTCN_261	2341	ATCN_830	5432
GTCN_262	2342	TTCN_1269	5433
GTCN_263	2343	GTCN_696	5434
GTCN_264	2344	CTCN_1313	5435
CTCN_473	2345	TTCN_1270	5436
ATCN_262	2346	GTCN_697	5437
CTCN_474	2347	ATCN_831	5438
TTCN_450	2348	TTCN_1271	5439
GTCN_265	2349	ATCN_832	5440
TTCN_451	2350	CTCN_1314	5441
ATCN_263	2351	ATCN_833	5442
CTCN_475	2352	TTCN_1272	5443
ATCN_264	2353	ATCN_834	5444
ATCN_265	2354	ATCN_835	5445
TTCN_452	2355	TTCN_1273	5446
GTCN_266	2356	GTCN_698	5447
CTCN_476	2357	ATCN_836	5448
CTCN_477	2358	GTCN_699	5449
GTCN_267	2359	TTCN_1274	5450
TTCN_453	2360	GTCN_700	5451
CTCN_478	2361	TTCN_1275	5452
ATCN_266	2362	GTCN_701	5453
CTCN_479	2363	TTCN_1276	5454
CTCN_480	2364	CTCN_1315	5455
CTCN_481	2365	GTCN_702	5456
GTCN_268	2366	TTCN_1277	5457
CTCN_482	2367	TTCN_1278	5458
CTCN_483	2368	TTCN_1279	5459
TTCN_454	2369	TTCN_1280	5460
CTCN_484	2370	TTCN_1281	5461
ATCN_267	2371	CTCN_1316	5462
ATCN_268	2372	GTCN_703	5463
TTCN_455	2373	GTCN_704	5464
TTCN_456	2374	CTCN_1317	5465
CTCN_485	2375	ATCN_837	5466
TTCN_457	2376	CTCN_1318	5467
TTCN_458	2377	CTCN_1319	5468
CTCN_486	2378	CTCN_1320	5469
CTCN_487	2379	GTCN_705	5470
CTCN_488	2380	CTCN_1321	5471
CTCN_489	2381	ATCN_838	5472
TTCN_459	2382	CTCN_1322	5473
GTCN_269	2383	ATCN_839	5474
GTCN_270	2384	CTCN_1323	5475
CTCN_490	2385	CTCN_1324	5476
CTCN_491	2386	CTCN_1325	5477

FIG. 35 (continued)

TTCN_460	2387	GTCN_706	5478
ATCN_269	2388	TTCN_1282	5479
TTCN_461	2389	CTCN_1326	5480
TTCN_462	2390	ATCN_840	5481
CTCN_492	2391	GTCN_707	5482
GTCN_271	2392	CTCN_1327	5483
CTCN_493	2393	TTCN_1283	5484
CTCN_494	2394	GTCN_708	5485
CTCN_495	2395	TTCN_1284	5486
TTCN_463	2396	CTCN_1328	5487
TTCN_464	2397	TTCN_1285	5488
TTCN_465	2398	ATCN_841	5489
ATCN_270	2399	ATCN_842	5490
TTCN_466	2400	CTCN_1329	5491
ATCN_271	2401	GTCN_709	5492
ATCN_272	2402	CTCN_1330	5493
GTCN_272	2403	CTCN_1331	5494
TTCN_467	2404	CTCN_1332	5495
CTCN_496	2405	ATCN_843	5496
GTCN_273	2406	CTCN_1333	5497
ATCN_273	2407	CTCN_1334	5498
GTCN_274	2408	TTCN_1286	5499
TTCN_468	2409	GTCN_710	5500
TTCN_469	2410	ATCN_844	5501
GTCN_275	2411	ATCN_845	5502
CTCN_497	2412	TTCN_1287	5503
CTCN_498	2413	GTCN_711	5504
TTCN_470	2414	TTCN_1288	5505
CTCN_499	2415	CTCN_1335	5506
TTCN_471	2416	GTCN_712	5507
CTCN_500	2417	GTCN_713	5508
CTCN_501	2418	TTCN_1289	5509
GTCN_276	2419	TTCN_1290	5510
TTCN_472	2420	TTCN_1291	5511
ATCN_274	2421	ATCN_846	5512
CTCN_502	2422	ATCN_847	5513
TTCN_473	2423	ATCN_848	5514
TTCN_474	2424	ATCN_849	5515
TTCN_475	2425	TTCN_1292	5516
CTCN_503	2426	TTCN_1293	5517
TTCN_476	2427	TTCN_1294	5518
CTCN_504	2428	CTCN_1336	5519
CTCN_505	2429	CTCN_1337	5520
TTCN_477	2430	TTCN_1295	5521
TTCN_478	2431	TTCN_1296	5522
CTCN_506	2432	ATCN_850	5523
CTCN_507	2433	GTCN_714	5524
CTCN_508	2434	CTCN_1338	5525
ATCN_275	2435	CTCN_1339	5526
CTCN_509	2436	ATCN_851	5527
GTCN_277	2437	CTCN_1340	5528
CTCN_510	2438	GTCN_715	5529
CTCN_511	2439	ATCN_852	5530

GTCN_278	2440	GTCN_716	5531
GTCN_279	2441	ATCN_853	5532
CTCN_512	2442	GTCN_717	5533
CTCN_513	2443	CTCN_1341	5534
TTCN_479	2444	ATCN_854	5535
CTCN_514	2445	TTCN_1297	5536
GTCN_280	2446	TTCN_1298	5537
TTCN_480	2447	ATCN_855	5538
TTCN_481	2448	GTCN_718	5539
CTCN_515	2449	GTCN_719	5540
TTCN_482	2450	TTCN_1299	5541
ATCN_276	2451	ATCN_856	5542
CTCN_516	2452	TTCN_1300	5543
CTCN_517	2453	CTCN_1342	5544
GTCN_281	2454	GTCN_720	5545
CTCN_518	2455	GTCN_721	5546
CTCN_519	2456	TTCN_1301	5547
CTCN_520	2457	CTCN_1343	5548
ATCN_277	2458	TTCN_1302	5549
TTCN_483	2459	GTCN_722	5550
TTCN_484	2460	CTCN_1344	5551
ATCN_278	2461	GTCN_723	5552
CTCN_521	2462	CTCN_1345	5553
CTCN_522	2463	ATCN_857	5554
CTCN_523	2464	CTCN_1346	5555
GTCN_282	2465	ATCN_858	5556
ATCN_279	2466	CTCN_1347	5557
ATCN_280	2467	CTCN_1348	5558
CTCN_524	2468	CTCN_1349	5559
CTCN_525	2469	TTCN_1303	5560
TTCN_485	2470	TTCN_1304	5561
CTCN_526	2471	ATCN_859	5562
CTCN_527	2472	TTCN_1305	5563
GTCN_283	2473	CTCN_1350	5564
CTCN_528	2474	CTCN_1351	5565
ATCN_281	2475	CTCN_1352	5566
ATCN_282	2476	CTCN_1353	5567
ATCN_283	2477	TTCN_1306	5568
ATCN_284	2478	GTCN_724	5569
ATCN_285	2479	CTCN_1354	5570
CTCN_529	2480	ATCN_860	5571
ATCN_286	2481	TTCN_1307	5572
TTCN_486	2482	GTCN_725	5573
CTCN_530	2483	CTCN_1355	5574
ATCN_287	2484	CTCN_1356	5575
GTCN_284	2485	GTCN_726	5576
TTCN_487	2486	CTCN_1357	5577
ATCN_288	2487	ATCN_861	5578
TTCN_488	2488	ATCN_862	5579
TTCN_489	2489	CTCN_1358	5580
TTCN_490	2490	CTCN_1359	5581
TTCN_491	2491	ATCN_863	5582
GTCN_285	2492	TTCN_1308	5583

FIG. 35 (continued)

CTCN_531	2493	CTCN_1360	5584
GTCN_286	2494	TTCN_1309	5585
TTCN_492	2495	TTCN_1310	5586
GTCN_287	2496	CTCN_1361	5587
TTCN_493	2497	CTCN_1362	5588
ATCN_289	2498	GTCN_727	5589
TTCN_494	2499	TTCN_1311	5590
TTCN_495	2500	GTCN_728	5591
TTCN_496	2501	TTCN_1312	5592
ATCN_290	2502	TTCN_1313	5593
ATCN_291	2503	CTCN_1363	5594
GTCN_288	2504	GTCN_729	5595
TTCN_497	2505	CTCN_1364	5596
ATCN_292	2506	TTCN_1314	5597
TTCN_498	2507	GTCN_730	5598
TTCN_499	2508	TTCN_1315	5599
TTCN_500	2509	TTCN_1316	5600
CTCN_532	2510	TTCN_1317	5601
CTCN_533	2511	TTCN_1318	5602
ATCN_293	2512	ATCN_864	5603
ATCN_294	2513	CTCN_1365	5604
TTCN_501	2514	TTCN_1319	5605
TTCN_502	2515	ATCN_865	5606
ATCN_295	2516	CTCN_1366	5607
TTCN_503	2517	CTCN_1367	5608
TTCN_504	2518	GTCN_731	5609
ATCN_296	2519	CTCN_1368	5610
CTCN_534	2520	ATCN_866	5611
ATCN_297	2521	ATCN_867	5612
CTCN_535	2522	CTCN_1369	5613
GTCN_289	2523	CTCN_1370	5614
TTCN_505	2524	CTCN_1371	5615
CTCN_536	2525	GTCN_732	5616
CTCN_537	2526	CTCN_1372	5617
TTCN_506	2527	GTCN_733	5618
CTCN_538	2528	CTCN_1373	5619
GTCN_290	2529	CTCN_1374	5620
TTCN_507	2530	CTCN_1375	5621
ATCN_298	2531	ATCN_868	5622
GTCN_291	2532	GTCN_734	5623
TTCN_508	2533	TTCN_1320	5624
ATCN_299	2534	CTCN_1376	5625
ATCN_300	2535	CTCN_1377	5626
TTCN_509	2536	ATCN_869	5627
TTCN_510	2537	TTCN_1321	5628
TTCN_511	2538	CTCN_1378	5629
TTCN_512	2539	CTCN_1379	5630
TTCN_513	2540	CTCN_1380	5631
CTCN_539	2541	GTCN_735	5632
CTCN_540	2542	CTCN_1381	5633
ATCN_301	2543	GTCN_736	5634
TTCN_514	2544	CTCN_1382	5635
TTCN_515	2545	ATCN_870	5636

TTCN_516	2546	GTCN_737	5637
CTCN_541	2547	ATCN_871	5638
TTCN_517	2548	ATCN_872	5639
TTCN_518	2549	ATCN_873	5640
TTCN_519	2550	ATCN_874	5641
ATCN_302	2551	ATCN_875	5642
TTCN_520	2552	ATCN_876	5643
TTCN_521	2553	ATCN_877	5644
TTCN_522	2554	ATCN_878	5645
TTCN_523	2555	ATCN_879	5646
TTCN_524	2556	ATCN_880	5647
TTCN_525	2557	CTCN_1383	5648
CTCN_542	2558	TTCN_1322	5649
ATCN_303	2559	TTCN_1323	5650
TTCN_526	2560	ATCN_881	5651
ATCN_304	2561	CTCN_1384	5652
TTCN_527	2562	TTCN_1324	5653
TTCN_528	2563	CTCN_1385	5654
TTCN_529	2564	GTCN_738	5655
TTCN_530	2565	GTCN_739	5656
TTCN_531	2566	CTCN_1386	5657
GTCN_292	2567	CTCN_1387	5658
GTCN_293	2568	TTCN_1325	5659
CTCN_543	2569	TTCN_1326	5660
TTCN_532	2570	ATCN_882	5661
TTCN_533	2571	ATCN_883	5662
TTCN_534	2572	ATCN_884	5663
CTCN_544	2573	CTCN_1388	5664
ATCN_305	2574	TTCN_1327	5665
TTCN_535	2575	GTCN_740	5666
TTCN_536	2576	TTCN_1328	5667
GTCN_294	2577	CTCN_1389	5668
CTCN_545	2578	TTCN_1329	5669
TTCN_537	2579	CTCN_1390	5670
ATCN_306	2580	CTCN_1391	5671
ATCN_307	2581	ATCN_885	5672
TTCN_538	2582	ATCN_886	5673
GTCN_295	2583	ATCN_887	5674
GTCN_296	2584	CTCN_1392	5675
GTCN_297	2585	CTCN_1393	5676
ATCN_308	2586	ATCN_888	5677
CTCN_546	2587	ATCN_889	5678
TTCN_539	2588	ATCN_890	5679
ATCN_309	2589	TTCN_1330	5680
ATCN_310	2590	CTCN_1394	5681
CTCN_547	2591	ATCN_891	5682
CTCN_548	2592	CTCN_1395	5683
TTCN_540	2593	TTCN_1331	5684
TTCN_541	2594	TTCN_1332	5685
TTCN_542	2595	CTCN_1396	5686
ATCN_311	2596	CTCN_1397	5687
TTCN_543	2597	TTCN_1333	5688
ATCN_312	2598	TTCN_1334	5689

FIG. 35 (continued)

ATCN_313	2599	TTCN_1335	5690
ATCN_314	2600	TTCN_1336	5691
CTCN_549	2601	CTCN_1398	5692
CTCN_550	2602	ATCN_892	5693
CTCN_551	2603	ATCN_893	5694
ATCN_315	2604	ATCN_894	5695
ATCN_316	2605	CTCN_1399	5696
GTCN_298	2606	CTCN_1400	5697
CTCN_552	2607	CTCN_1401	5698
ATCN_317	2608	CTCN_1402	5699
ATCN_318	2609	ATCN_895	5700
GTCN_299	2610	ATCN_896	5701
ATCN_319	2611	TTCN_1337	5702
GTCN_300	2612	ATCN_897	5703
CTCN_553	2613	CTCN_1403	5704
TTCN_544	2614	ATCN_898	5705
ATCN_320	2615	ATCN_899	5706
CTCN_554	2616	CTCN_1404	5707
GTCN_301	2617	ATCN_900	5708
CTCN_555	2618	CTCN_1405	5709
CTCN_556	2619	GTCN_741	5710
CTCN_557	2620	GTCN_742	5711
CTCN_558	2621	CTCN_1406	5712
TTCN_545	2622	ATCN_901	5713
TTCN_546	2623	ATCN_902	5714
CTCN_559	2624	CTCN_1407	5715
CTCN_560	2625	CTCN_1408	5716
CTCN_561	2626	CTCN_1409	5717
ATCN_321	2627	CTCN_1410	5718
ATCN_322	2628	TTCN_1338	5719
CTCN_562	2629	TTCN_1339	5720
CTCN_563	2630	CTCN_1411	5721
GTCN_302	2631	CTCN_1412	5722
ATCN_323	2632	CTCN_1413	5723
CTCN_564	2633	GTCN_743	5724
TTCN_547	2634	CTCN_1414	5725
ATCN_324	2635	GTCN_744	5726
CTCN_565	2636	TTCN_1340	5727
ATCN_325	2637	ATCN_903	5728
ATCN_326	2638	GTCN_745	5729
ATCN_327	2639	CTCN_1415	5730
GTCN_303	2640	ATCN_904	5731
ATCN_328	2641	ATCN_905	5732
TTCN_548	2642	CTCN_1416	5733
ATCN_329	2643	GTCN_746	5734
TTCN_549	2644	CTCN_1417	5735
GTCN_304	2645	ATCN_906	5736
ATCN_330	2646	ATCN_907	5737
ATCN_331	2647	ATCN_908	5738
ATCN_332	2648	CTCN_1418	5739
GTCN_305	2649	ATCN_909	5740
TTCN_550	2650	TTCN_1341	5741
TTCN_551	2651	ATCN_910	5742

GTCN_306	2652	CTCN_1419	5743
CTCN_566	2653	GTCN_747	5744
GTCN_307	2654	ATCN_911	5745
ATCN_333	2655	TTCN_1342	5746
CTCN_567	2656	GTCN_748	5747
CTCN_568	2657	CTCN_1420	5748
CTCN_569	2658	CTCN_1421	5749
CTCN_570	2659	CTCN_1422	5750
CTCN_571	2660	CTCN_1423	5751
TTCN_552	2661	ATCN_912	5752
CTCN_572	2662	ATCN_913	5753
TTCN_553	2663	CTCN_1424	5754
CTCN_573	2664	GTCN_749	5755
TTCN_554	2665	TTCN_1343	5756
GTCN_308	2666	CTCN_1425	5757
TTCN_555	2667	ATCN_914	5758
GTCN_309	2668	ATCN_915	5759
CTCN_574	2669	CTCN_1426	5760
GTCN_310	2670	CTCN_1427	5761
TTCN_556	2671	CTCN_1428	5762
ATCN_334	2672	ATCN_916	5763
GTCN_311	2673	ATCN_917	5764
ATCN_335	2674	CTCN_1429	5765
TTCN_557	2675	TTCN_1344	5766
ATCN_336	2676	TTCN_1345	5767
ATCN_337	2677	GTCN_750	5768
TTCN_558	2678	TTCN_1346	5769
TTCN_559	2679	GTCN_751	5770
TTCN_560	2680	TTCN_1347	5771
TTCN_561	2681	ATCN_918	5772
ATCN_338	2682	GTCN_752	5773
GTCN_312	2683	TTCN_1348	5774
GTCN_313	2684	ATCN_919	5775
TTCN_562	2685	ATCN_920	5776
CTCN_575	2686	TTCN_1349	5777
ATCN_339	2687	CTCN_1430	5778
GTCN_314	2688	GTCN_753	5779
ATCN_340	2689	CTCN_1431	5780
TTCN_563	2690	GTCN_754	5781
CTCN_576	2691	CTCN_1432	5782
GTCN_315	2692	GTCN_755	5783
TTCN_564	2693	CTCN_1433	5784
CTCN_577	2694	ATCN_921	5785
CTCN_578	2695	ATCN_922	5786
GTCN_316	2696	GTCN_756	5787
ATCN_341	2697	TTCN_1350	5788
TTCN_565	2698	CTCN_1434	5789
ATCN_342	2699	TTCN_1351	5790
GTCN_317	2700	CTCN_1435	5791
CTCN_579	2701	GTCN_757	5792
TTCN_566	2702	CTCN_1436	5793
GTCN_318	2703	TTCN_1352	5794
CTCN_580	2704	CTCN_1437	5795

FIG. 35 (continued)

TTCN_567	2705	TTCN_1353	5796
TTCN_568	2706	CTCN_1438	5797
TTCN_569	2707	TTCN_1354	5798
TTCN_570	2708	CTCN_1439	5799
GTCN_319	2709	TTCN_1355	5800
TTCN_571	2710	TTCN_1356	5801
TTCN_572	2711	CTCN_1440	5802
TTCN_573	2712	ATCN_923	5803
ATCN_343	2713	TTCN_1357	5804
TTCN_574	2714	GTCN_758	5805
CTCN_581	2715	TTCN_1358	5806
TTCN_575	2716	TTCN_1359	5807
ATCN_344	2717	TTCN_1360	5808
GTCN_320	2718	CTCN_1441	5809
CTCN_582	2719	CTCN_1442	5810
ATCN_345	2720	ATCN_924	5811
ATCN_346	2721	TTCN_1361	5812
ATCN_347	2722	TTCN_1362	5813
CTCN_583	2723	GTCN_759	5814
GTCN_321	2724	CTCN_1443	5815
CTCN_584	2725	ATCN_925	5816
ATCN_348	2726	ATCN_926	5817
ATCN_349	2727	TTCN_1363	5818
CTCN_585	2728	TTCN_1364	5819
CTCN_586	2729	TTCN_1365	5820
TTCN_576	2730	CTCN_1444	5821
CTCN_587	2731	CTCN_1445	5822
ATCN_350	2732	TTCN_1366	5823
ATCN_351	2733	CTCN_1446	5824
ATCN_352	2734	CTCN_1447	5825
CTCN_588	2735	CTCN_1448	5826
CTCN_589	2736	TTCN_1367	5827
GTCN_322	2737	ATCN_927	5828
CTCN_590	2738	GTCN_760	5829
GTCN_323	2739	ATCN_928	5830
CTCN_591	2740	TTCN_1368	5831
GTCN_324	2741	CTCN_1449	5832
CTCN_592	2742	TTCN_1369	5833
GTCN_325	2743	CTCN_1450	5834
TTCN_577	2744	CTCN_1451	5835
TTCN_578	2745	TTCN_1370	5836
TTCN_579	2746	CTCN_1452	5837
CTCN_593	2747	CTCN_1453	5838
CTCN_594	2748	GTCN_761	5839
CTCN_595	2749	CTCN_1454	5840
CTCN_596	2750	ATCN_929	5841
ATCN_353	2751	GTCN_762	5842
CTCN_597	2752	CTCN_1455	5843
CTCN_598	2753	ATCN_930	5844
TTCN_580	2754	CTCN_1456	5845
TTCN_581	2755	GTCN_763	5846
TTCN_582	2756	ATCN_931	5847
ATCN_354	2757	ATCN_932	5848

TTCN_583	2758	CTCN_1457	5849
TTCN_584	2759	GTCN_764	5850
CTCN_599	2760	TTCN_1371	5851
GTCN_326	2761	GTCN_765	5852
CTCN_600	2762	ATCN_933	5853
TTCN_585	2763	CTCN_1458	5854
GTCN_327	2764	TTCN_1372	5855
GTCN_328	2765	TTCN_1373	5856
GTCN_329	2766	TTCN_1374	5857
TTCN_586	2767	ATCN_934	5858
GTCN_330	2768	ATCN_935	5859
TTCN_587	2769	GTCN_766	5860
GTCN_331	2770	CTCN_1459	5861
TTCN_588	2771	GTCN_767	5862
CTCN_601	2772	CTCN_1460	5863
ATCN_355	2773	TTCN_1375	5864
CTCN_602	2774	ATCN_936	5865
ATCN_356	2775	TTCN_1376	5866
TTCN_589	2776	TTCN_1377	5867
TTCN_590	2777	TTCN_1378	5868
TTCN_591	2778	CTCN_1461	5869
CTCN_603	2779	GTCN_768	5870
TTCN_592	2780	GTCN_769	5871
TTCN_593	2781	GTCN_770	5872
CTCN_604	2782	GTCN_771	5873
GTCN_332	2783	ATCN_937	5874
TTCN_594	2784	ATCN_938	5875
TTCN_595	2785	TTCN_1379	5876
ATCN_357	2786	ATCN_939	5877
TTCN_596	2787	TTCN_1380	5878
CTCN_605	2788	GTCN_772	5879
TTCN_597	2789	CTCN_1462	5880
TTCN_598	2790	GTCN_773	5881
GTCN_333	2791	CTCN_1463	5882
GTCN_334	2792	TTCN_1381	5883
ATCN_358	2793	CTCN_1464	5884
TTCN_599	2794	TTCN_1382	5885
ATCN_359	2795	ATCN_940	5886
CTCN_606	2796	CTCN_1465	5887
GTCN_335	2797	TTCN_1383	5888
TTCN_600	2798	CTCN_1466	5889
GTCN_336	2799	CTCN_1467	5890
TTCN_601	2800	ATCN_941	5891
CTCN_607	2801	GTCN_774	5892
TTCN_602	2802	CTCN_1468	5893
TTCN_603	2803	TTCN_1384	5894
ATCN_360	2804	TTCN_1385	5895
TTCN_604	2805	TTCN_1386	5896
CTCN_608	2806	CTCN_1469	5897
TTCN_605	2807	CTCN_1470	5898
TTCN_606	2808	CTCN_1471	5899
ATCN_361	2809	ATCN_942	5900
TTCN_607	2810	CTCN_1472	5901

FIG. 35 (continued)

TTCN_608	2811	ATCN_943	5902
GTCN_337	2812	ATCN_944	5903
GTCN_338	2813	TTCN_1387	5904
ATCN_362	2814	TTCN_1388	5905
CTCN_609	2815	ATCN_945	5906
CTCN_610	2816	ATCN_946	5907
TTCN_609	2817	TTCN_1389	5908
ATCN_363	2818	ATCN_947	5909
ATCN_364	2819	CTCN_1473	5910
TTCN_610	2820	ATCN_948	5911
TTCN_611	2821	CTCN_1474	5912
GTCN_339	2822	TTCN_1390	5913
CTCN_611	2823	ATCN_949	5914
CTCN_612	2824	ATCN_950	5915
GTCN_340	2825	GTCN_775	5916
ATCN_365	2826	TTCN_1391	5917
TTCN_612	2827	CTCN_1475	5918
TTCN_613	2828	ATCN_951	5919
TTCN_614	2829	CTCN_1476	5920
TTCN_615	2830	CTCN_1477	5921
TTCN_616	2831	ATCN_952	5922
ATCN_366	2832	CTCN_1478	5923
ATCN_367	2833	ATCN_953	5924
TTCN_617	2834	TTCN_1392	5925
TTCN_618	2835	ATCN_954	5926
GTCN_341	2836	ATCN_955	5927
ATCN_368	2837	ATCN_956	5928
TTCN_619	2838	CTCN_1479	5929
TTCN_620	2839	TTCN_1393	5930
ATCN_369	2840	TTCN_1394	5931
CTCN_613	2841	ATCN_957	5932
CTCN_614	2842	ATCN_958	5933
CTCN_615	2843	TTCN_1395	5934
CTCN_616	2844	TTCN_1396	5935
CTCN_617	2845	TTCN_1397	5936
CTCN_618	2846	CTCN_1480	5937
CTCN_619	2847	TTCN_1398	5938
TTCN_621	2848	ATCN_959	5939
CTCN_620	2849	TTCN_1399	5940
GTCN_342	2850	TTCN_1400	5941
CTCN_621	2851	ATCN_960	5942
GTCN_343	2852	GTCN_776	5943
CTCN_622	2853	CTCN_1481	5944
GTCN_344	2854	TTCN_1401	5945
CTCN_623	2855	GTCN_777	5946
ATCN_370	2856	TTCN_1402	5947
ATCN_371	2857	CTCN_1482	5948
TTCN_622	2858	TTCN_1403	5949
CTCN_624	2859	CTCN_1483	5950
TTCN_623	2860	TTCN_1404	5951
TTCN_624	2861	TTCN_1405	5952
TTCN_625	2862	TTCN_1406	5953
CTCN_625	2863	TTCN_1407	5954

CTCN_626	2864	CTCN_1484	5955
CTCN_627	2865	TTCN_1408	5956
CTCN_628	2866	TTCN_1409	5957
ATCN_372	2867	CTCN_1485	5958
GTCN_345	2868	TTCN_1410	5959
CTCN_629	2869	TTCN_1411	5960
GTCN_346	2870	TTCN_1412	5961
TTCN_626	2871	GTCN_778	5962
ATCN_373	2872	ATCN_961	5963
CTCN_630	2873	GTCN_779	5964
CTCN_631	2874	CTCN_1486	5965
CTCN_632	2875	ATCN_962	5966
TTCN_627	2876	GTCN_780	5967
CTCN_633	2877	ATCN_963	5968
GTCN_347	2878	TTCN_1413	5969
CTCN_634	2879	ATCN_964	5970
ATCN_374	2880	TTCN_1414	5971
ATCN_375	2881	CTCN_1487	5972
CTCN_635	2882	ATCN_965	5973
ATCN_376	2883	CTCN_1488	5974
CTCN_636	2884	GTCN_781	5975
CTCN_637	2885	CTCN_1489	5976
CTCN_638	2886	GTCN_782	5977
CTCN_639	2887	ATCN_966	5978
TTCN_628	2888	ATCN_967	5979
ATCN_377	2889	CTCN_1490	5980
ATCN_378	2890	TTCN_1415	5981
TTCN_629	2891	ATCN_968	5982
TTCN_630	2892	TTCN_1416	5983
TTCN_631	2893	CTCN_1491	5984
TTCN_632	2894	TTCN_1417	5985
ATCN_279	2895	ATCN_969	5986
ATCN_280	2896	TTCN_1418	5987
CTCN_524	2897	ATCN_970	5988
CTCN_525	2898	ATCN_971	5989
TTCN_485	2899	TTCN_1419	5990
CTCN_526	2900	TTCN_1420	5991
CTCN_527	2901	CTCN_1492	5992
GTCN_283	2902	TTCN_1421	5993
CTCN_528	2903	GTCN_783	5994
ATCN_281	2904	ATCN_972	5995
ATCN_282	2905	ATCN_973	5996
ATCN_283	2906	CTCN_1493	5997
ATCN_284	2907	TTCN_1422	5998
ATCN_285	2908	TTCN_1423	5999
CTCN_529	2909	GTCN_784	6000
ATCN_286	2910	CTCN_1494	6001
TTCN_486	2911	CTCN_1495	6002
CTCN_530	2912	ATCN_974	6003
ATCN_287	2913	ATCN_975	6004
GTCN_284	2914	CTCN_1496	6005
TTCN_487	2915	ATCN_976	6006
ATCN_288	2916	TTCN_1424	6007

FIG. 35 (continued)

TTCN_488	2917	TTCN_1425	6008
TTCN_489	2918	TTCN_1426	6009
TTCN_490	2919	TTCN_1427	6010
TTCN_491	2920	ATCN_977	6011
GTCN_285	2921	CTCN_1497	6012
CTCN_531	2922	CTCN_1498	6013
GTCN_286	2923	ATCN_978	6014
TTCN_492	2924	TTCN_1428	6015
GTCN_287	2925	CTCN_1499	6016
TTCN_493	2926	TTCN_1429	6017
ATCN_289	2927	TTCN_1430	6018
TTCN_494	2928	TTCN_1431	6019
TTCN_495	2929	CTCN_1500	6020
TTCN_496	2930	CTCN_1501	6021
ATCN_290	2931	ATCN_979	6022
ATCN_291	2932	GTCN_785	6023
GTCN_288	2933	CTCN_1502	6024
TTCN_497	2934	TTCN_1432	6025
ATCN_292	2935	TTCN_1433	6026
TTCN_498	2936	GTCN_786	6027
TTCN_499	2937	ATCN_980	6028
TTCN_500	2938	GTCN_787	6029
CTCN_532	2939	CTCN_1503	6030
CTCN_533	2940	GTCN_788	6031
ATCN_293	2941	CTCN_1504	6032
ATCN_294	2942	CTCN_1505	6033
TTCN_501	2943	TTCN_1434	6034
TTCN_502	2944	CTCN_1506	6035
ATCN_295	2945	ATCN_981	6036
TTCN_503	2946	ATCN_982	6037
TTCN_504	2947	CTCN_1507	6038
ATCN_296	2948	CTCN_1508	6039
CTCN_534	2949	CTCN_1509	6040
ATCN_297	2950	TTCN_1435	6041
CTCN_535	2951	ATCN_983	6042
GTCN_289	2952	ATCN_984	6043
TTCN_505	2953	CTCN_1510	6044
CTCN_536	2954	CTCN_1511	6045
CTCN_537	2955	CTCN_1512	6046
TTCN_506	2956	CTCN_1513	6047
CTCN_538	2957	ATCN_985	6048
GTCN_290	2958	CTCN_1514	6049
TTCN_507	2959	ATCN_986	6050
ATCN_298	2960	ATCN_987	6051
GTCN_291	2961	CTCN_1515	6052
TTCN_508	2962	TTCN_1436	6053
ATCN_299	2963	TTCN_1437	6054
ATCN_300	2964	ATCN_988	6055
TTCN_509	2965	TTCN_1438	6056
TTCN_510	2966	CTCN_1516	6057
TTCN_511	2967	GTCN_789	6058
TTCN_512	2968	CTCN_1517	6059
TTCN_513	2969	ATCN_989	6060

CTCN_539	2970	ATCN_990	6061
CTCN_540	2971	CTCN_1518	6062
ATCN_301	2972	CTCN_1519	6063
TTCN_514	2973	ATCN_991	6064
TTCN_515	2974	CTCN_1520	6065
TTCN_516	2975	GTCN_790	6066
CTCN_541	2976	CTCN_1521	6067
TTCN_517	2977	GTCN_791	6068
TTCN_518	2978	GTCN_792	6069
TTCN_519	2979	CTCN_1522	6070
ATCN_302	2980	CTCN_1523	6071
TTCN_520	2981	CTCN_1524	6072
TTCN_521	2982	CTCN_1525	6073
TTCN_522	2983	GTCN_793	6074
TTCN_523	2984	TTCN_1439	6075
TTCN_524	2985	TTCN_1440	6076
TTCN_525	2986	CTCN_1526	6077
CTCN_542	2987	TTCN_1441	6078
ATCN_303	2988	ATCN_992	6079
TTCN_526	2989	ATCN_993	6080
ATCN_304	2990	CTCN_1527	6081
TTCN_527	2991	CTCN_1528	6082
TTCN_528	2992	TTCN_1442	6083
TTCN_529	2993	ATCN_994	6084
TTCN_530	2994	ATCN_995	6085
TTCN_531	2995	CTCN_1529	6086
GTCN_292	2996	ATCN_996	6087
GTCN_293	2997	CTCN_1530	6088
CTCN_543	2998	TTCN_1443	6089
TTCN_532	2999	TTCN_1444	6090
TTCN_533	3000	TTCN_1445	6091
TTCN_534	3001	CTCN_1531	6092
CTCN_544	3002	TTCN_1446	6093
ATCN_305	3003	TTCN_1447	6094
TTCN_535	3004	TTCN_1448	6095
TTCN_536	3005	CTCN_1532	6096
GTCN_294	3006	TTCN_1449	6097
CTCN_545	3007	GTCN_794	6098
TTCN_537	3008	TTCN_1450	6099
ATCN_306	3009	GTCN_795	6100
ATCN_307	3010	ATCN_997	6101
TTCN_538	3011	TTCN_1451	6102
GTCN_295	3012	ATCN_998	6103
GTCN_296	3013	TTCN_1452	6104
GTCN_297	3014	GTCN_796	6105
ATCN_308	3015	CTCN_1533	6106
CTCN_546	3016	GTCN_797	6107
TTCN_539	3017	GTCN_798	6108
ATCN_309	3018	CTCN_1534	6109
ATCN_310	3019	GTCN_799	6110
CTCN_547	3020	CTCN_1535	6111
CTCN_548	3021	ATCN_999	6112
TTCN_540	3022	TTCN_1453	6113

FIG. 35 (continued)

TTCN_541	3023	TTCN_1454	6114
TTCN_542	3024	TTCN_1455	6115
ATCN_311	3025	GTCN_800	6116
TTCN_543	3026	ATCN_1000	6117
ATCN_312	3027	TTCN_1456	6118
ATCN_313	3028	CTCN_1536	6119
ATCN_314	3029	GTCN_801	6120
CTCN_549	3030	CTCN_1537	6121
CTCN_550	3031	TTCN_1457	6122
CTCN_551	3032	GTCN_802	6123
ATCN_315	3033	CTCN_1538	6124
ATCN_316	3034	CTCN_1539	6125
GTCN_298	3035	GTCN_803	6126
CTCN_552	3036	ATCN_1001	6127
ATCN_317	3037	GTCN_804	6128
ATCN_318	3038	CTCN_1540	6129
GTCN_299	3039	TTCN_1458	6130
ATCN_319	3040	CTCN_1541	6131
GTCN_300	3041	CTCN_1542	6132
CTCN_553	3042	CTCN_1543	6133
TTCN_544	3043	CTCN_1544	6134
ATCN_320	3044	CTCN_1545	6135
CTCN_554	3045	TTCN_1459	6136
GTCN_301	3046	ATCN_1002	6137
CTCN_555	3047	CTCN_1546	6138
CTCN_556	3048	CTCN_1547	6139
CTCN_557	3049	CTCN_1548	6140
CTCN_558	3050	CTCN_1549	6141
TTCN_545	3051	GTCN_805	6142
TTCN_546	3052	CTCN_1550	6143
CTCN_559	3053	TTCN_1460	6144
CTCN_560	3054	TTCN_1461	6145
CTCN_561	3055	CTCN_1551	6146
ATCN_321	3056	GTCN_806	6147
ATCN_322	3057	CTCN_1552	6148
CTCN_562	3058	GTCN_807	6149
CTCN_563	3059	GTCN_808	6150
GTCN_302	3060	TTCN_1462	6151
ATCN_323	3061	CTCN_1553	6152
CTCN_564	3062	TTCN_1463	6153
TTCN_547	3063	CTCN_1554	6154
ATCN_324	3064	CTCN_1555	6155
CTCN_565	3065	CTCN_1556	6156
ATCN_325	3066	TTCN_1464	6157
ATCN_326	3067	CTCN_1557	6158
ATCN_327	3068	CTCN_1558	6159
GTCN_303	3069	CTCN_1559	6160
ATCN_328	3070	ATCN_1003	6161
TTCN_548	3071	TTCN_1465	6162
ATCN_329	3072	GTCN_809	6163
TTCN_549	3073	TTCN_1466	6164
GTCN_304	3074	GTCN_810	6165
ATCN_330	3075	GTCN_811	6166

ATCN_331	3076	ATCN_1004	6167
ATCN_332	3077	ATCN_1005	6168
GTCN_305	3078	CTCN_1560	6169
TTCN_550	3079	TTCN_1467	6170
TTCN_551	3080	ATCN_1006	6171
GTCN_306	3081	TTCN_1468	6172
CTCN_566	3082	TTCN_1469	6173
GTCN_307	3083	TTCN_1470	6174
ATCN_333	3084	CTCN_1561	6175
CTCN_567	3085	CTCN_1562	6176
CTCN_568	3086	TTCN_1471	6177
CTCN_569	3087	CTCN_1563	6178
CTCN_570	3088	TTCN_1472	6179
CTCN_571	3089	CTCN_1564	6180
TTCN_552	3090	CTCN_1565	6181
CTCN_572	3091	GTCN_812	6182
TTCN_553	3092	TTCN_1473	6183
CTCN_573	3093	GTCN_813	6184
TTCN_554	3094	CTCN_1566	6185
GTCN_308	3095	TTCN_1474	6186
TTCN_555	3096	ATCN_1007	6187
GTCN_309	3097	ATCN_1008	6188
CTCN_574	3098	CTCN_1567	6189
GTCN_310	3099	TTCN_1475	6190
TTCN_556	3100	GTCN_814	6191
ATCN_334	3101	CTCN_1568	6192
GTCN_311	3102	TTCN_1476	6193
ATCN_335	3103	ATCN_1009	6194
TTCN_557	3104	CTCN_1569	6195
ATCN_336	3105	CTCN_1570	6196
ATCN_337	3106	CTCN_1571	6197
TTCN_558	3107	TTCN_1477	6198
TTCN_559	3108	CTCN_1572	6199
TTCN_560	3109	GTCN_815	6200
TTCN_561	3110	TTCN_1478	6201
ATCN_338	3111	TTCN_1479	6202
GTCN_312	3112	CTCN_1573	6203
GTCN_313	3113	TTCN_1480	6204
TTCN_562	3114	CTCN_1574	6205
CTCN_575	3115	TTCN_1481	6206
ATCN_339	3116	ATCN_1010	6207
GTCN_314	3117	ATCN_1011	6208
ATCN_340	3118	ATCN_1012	6209
TTCN_563	3119	TTCN_1482	6210
CTCN_576	3120	GTCN_816	6211
GTCN_315	3121	ATCN_1013	6212
TTCN_564	3122	CTCN_1575	6213
CTCN_577	3123	ATCN_1014	6214
CTCN_578	3124	TTCN_1483	6215
GTCN_316	3125	TTCN_1484	6216
ATCN_341	3126	TTCN_1485	6217
TTCN_565	3127	CTCN_1576	6218
ATCN_342	3128	GTCN_817	6219

FIG. 35 (continued)

GTCN_317	3129	TTCN_1486	6220
CTCN_579	3130	GTCN_818	6221
TTCN_566	3131	CTCN_1577	6222
GTCN_318	3132	TTCN_1487	6223
CTCN_580	3133	TTCN_1488	6224
TTCN_567	3134	GTCN_819	6225
TTCN_568	3135	CTCN_1578	6226
TTCN_569	3136	TTCN_1489	6227
TTCN_570	3137	CTCN_1579	6228
GTCN_319	3138	GTCN_820	6229
TTCN_571	3139	TTCN_1490	6230
TTCN_572	3140	ATCN_1015	6231
TTCN_573	3141	TTCN_1491	6232
ATCN_343	3142	GTCN_821	6233
TTCN_574	3143	CTCN_1580	6234
CTCN_581	3144	TTCN_1492	6235
TTCN_575	3145	TTCN_1493	6236
ATCN_344	3146	TTCN_1494	6237
GTCN_320	3147	GTCN_822	6238
CTCN_582	3148	TTCN_1495	6239
ATCN_345	3149	TTCN_1496	6240
ATCN_346	3150	GTCN_823	6241
ATCN_347	3151	GTCN_824	6242
CTCN_583	3152	ATCN_1016	6243
GTCN_321	3153	ATCN_1017	6244
CTCN_584	3154	TTCN_1497	6245
ATCN_348	3155	TTCN_1498	6246
ATCN_349	3156	TTCN_1499	6247
CTCN_585	3157	ATCN_1018	6248
CTCN_586	3158	TTCN_1500	6249
TTCN_576	3159	CTCN_1581	6250
CTCN_587	3160	ATCN_1019	6251
ATCN_350	3161	ATCN_1020	6252
ATCN_351	3162	ATCN_1021	6253
ATCN_352	3163	ATCN_1022	6254
CTCN_588	3164	TTCN_1501	6255
CTCN_589	3165	CTCN_1582	6256
GTCN_322	3166	TTCN_1502	6257
CTCN_590	3167	CTCN_1583	6258
GTCN_323	3168	TTCN_1503	6259
CTCN_591	3169	ATCN_1023	6260
GTCN_324	3170	TTCN_1504	6261
CTCN_592	3171	GTCN_825	6262
GTCN_325	3172	ATCN_1024	6263
TTCN_577	3173	TTCN_1505	6264
TTCN_578	3174	TTCN_1506	6265
TTCN_579	3175	CTCN_1584	6266
CTCN_593	3176	CTCN_1585	6267
CTCN_594	3177	CTCN_1586	6268
CTCN_595	3178	TTCN_1507	6269
CTCN_596	3179	ATCN_1025	6270
ATCN_353	3180	CTCN_1587	6271
CTCN_597	3181	ATCN_1026	6272

CTCN_598	3182	TTCN_1508	6273
TTCN_580	3183	TTCN_1509	6274
TTCN_581	3184	CTCN_1588	6275
TTCN_582	3185	TTCN_1510	6276
ATCN_354	3186	CTCN_1589	6277
TTCN_583	3187	CTCN_1590	6278
TTCN_584	3188	TTCN_1511	6279
CTCN_599	3189	TTCN_1512	6280
GTCN_326	3190	ATCN_1027	6281
CTCN_600	3191	CTCN_1591	6282
TTCN_585	3192	ATCN_1028	6283
GTCN_327	3193	TTCN_1513	6284
GTCN_328	3194	ATCN_1029	6285
GTCN_329	3195	TTCN_1514	6286
TTCN_586	3196	ATCN_1030	6287
GTCN_330	3197	CTCN_1592	6288
TTCN_587	3198	ATCN_1031	6289
GTCN_331	3199	TTCN_1515	6290
TTCN_588	3200	GTCN_826	6291
CTCN_601	3201	ATCN_1032	6292
ATCN_355	3202	ATCN_1033	6293
CTCN_602	3203	GTCN_827	6294
ATCN_356	3204	TTCN_1516	6295
TTCN_589	3205	GTCN_828	6296
TTCN_590	3206	CTCN_1593	6297
TTCN_591	3207	GTCN_829	6298
CTCN_603	3208	CTCN_1594	6299
TTCN_592	3209	GTCN_830	6300
TTCN_593	3210	TTCN_1517	6301
CTCN_604	3211	CTCN_1595	6302
GTCN_332	3212	TTCN_1518	6303
TTCN_594	3213	CTCN_1596	6304
TTCN_595	3214	ATCN_1034	6305
ATCN_357	3215	CTCN_1597	6306
TTCN_596	3216	CTCN_1598	6307
CTCN_605	3217	TTCN_1519	6308
TTCN_597	3218	TTCN_1520	6309
TTCN_598	3219	ATCN_1035	6310
GTCN_333	3220	ATCN_1036	6311
GTCN_334	3221	TTCN_1521	6312
ATCN_358	3222	TTCN_1522	6313
TTCN_599	3223	CTCN_1599	6314
ATCN_359	3224	CTCN_1600	6315
CTCN_606	3225	TTCN_1523	6316
GTCN_335	3226	TTCN_1524	6317
TTCN_600	3227	ATCN_1037	6318
GTCN_336	3228	TTCN_1525	6319
TTCN_601	3229	CTCN_1601	6320
CTCN_607	3230	TTCN_1526	6321
TTCN_602	3231	CTCN_1602	6322
TTCN_603	3232	CTCN_1603	6323
ATCN_360	3233	ATCN_1038	6324
TTCN_604	3234	GTCN_831	6325

FIG. 35 (continued)

CTCN_608	3235	CTCN_1604	6326
TTCN_605	3236	CTCN_1605	6327
TTCN_606	3237	CTCN_1606	6328
ATCN_361	3238	CTCN_1607	6329
TTCN_607	3239	ATCN_1039	6330
TTCN_608	3240	ATCN_1040	6331
GTCN_337	3241	CTCN_1608	6332
GTCN_338	3242	GTCN_832	6333
ATCN_362	3243	CTCN_1609	6334
CTCN_609	3244	ATCN_1041	6335
CTCN_610	3245	ATCN_1042	6336
TTCN_609	3246	CTCN_1610	6337
ATCN_363	3247	GTCN_833	6338
ATCN_364	3248	CTCN_1611	6339
TTCN_610	3249	ATCN_1043	6340
TTCN_611	3250	ATCN_1044	6341
GTCN_339	3251	GTCN_834	6342
CTCN_611	3252	ATCN_1045	6343
CTCN_612	3253	CTCN_1612	6344
GTCN_340	3254	TTCN_1527	6345
ATCN_365	3255	CTCN_1613	6346
TTCN_612	3256	CTCN_1614	6347
TTCN_613	3257	TTCN_1528	6348
TTCN_614	3258	TTCN_1529	6349
TTCN_615	3259	CTCN_1615	6350
TTCN_616	3260	GTCN_835	6351
ATCN_366	3261	CTCN_1616	6352
ATCN_367	3262	CTCN_1617	6353
TTCN_617	3263	ATCN_1046	6354
TTCN_618	3264	CTCN_1618	6355
GTCN_341	3265	GTCN_836	6356
ATCN_368	3266	CTCN_1619	6357
TTCN_619	3267	CTCN_1620	6358
TTCN_620	3268	CTCN_1621	6359
ATCN_369	3269	TTCN_1530	6360
CTCN_613	3270	CTCN_1622	6361
CTCN_614	3271	TTCN_1531	6362
CTCN_615	3272	CTCN_1623	6363
CTCN_616	3273	TTCN_1532	6364
CTCN_617	3274	CTCN_1624	6365
CTCN_618	3275	TTCN_1533	6366
CTCN_619	3276	TTCN_1534	6367
TTCN_621	3277	TTCN_1535	6368
CTCN_620	3278	ATCN_1047	6369
GTCN_342	3279	TTCN_1536	6370
CTCN_621	3280	CTCN_1625	6371
GTCN_343	3281	TTCN_1537	6372
CTCN_622	3282	ATCN_1048	6373
GTCN_344	3283	TTCN_1538	6374
CTCN_623	3284	CTCN_1626	6375
ATCN_370	3285	CTCN_1627	6376
ATCN_371	3286	CTCN_1628	6377
TTCN_622	3287	ATCN_1049	6378

CTCN_624	3288	GTCN_837	6379
TTCN_623	3289	TTCN_1539	6380
TTCN_624	3290	CTCN_1629	6381
TTCN_625	3291	CTCN_1630	6382
CTCN_625	3292	TTCN_1540	6383
CTCN_626	3293	CTCN_1631	6384
CTCN_627	3294	TTCN_1541	6385
CTCN_628	3295	TTCN_1542	6386
ATCN_372	3296	CTCN_1632	6387
GTCN_345	3297	ATCN_1050	6388
CTCN_629	3298	GTCN_838	6389
GTCN_346	3299	ATCN_1051	6390
TTCN_626	3300	GTCN_839	6391
ATCN_373	3301	TTCN_1543	6392
CTCN_630	3302	CTCN_1633	6393
CTCN_631	3303	CTCN_1634	6394
CTCN_632	3304	TTCN_1544	6395
TTCN_627	3305	TTCN_1545	6396
CTCN_633	3306	ATCN_1052	6397
GTCN_347	3307	TTCN_1546	6398
CTCN_634	3308	ATCN_1053	6399
ATCN_374	3309	CTCN_1635	6400
ATCN_375	3310	TTCN_1547	6401
CTCN_635	3311	ATCN_1054	6402
ATCN_376	3312	ATCN_1055	6403
CTCN_636	3313	CTCN_1636	6404
CTCN_637	3314	TTCN_1548	6405
CTCN_638	3315	TTCN_1549	6406
CTCN_639	3316	TTCN_1550	6407
TTCN_628	3317	GTCN_840	6408
ATCN_377	3318	GTCN_841	6409
ATCN_378	3319	GTCN_842	6410
TTCN_629	3320	TTCN_1551	6411
TTCN_630	3321	TTCN_1552	6412
TTCN_631	3322	TTCN_1553	6413
TTCN_632	3323	ATCN_1056	6414
GTCN_348	3324	GTCN_843	6415
CTCN_640	3325	CTCN_1637	6416
TTCN_633	3326	TTCN_1554	6417
ATCN_379	3327	GTCN_844	6418
TTCN_634	3328	CTCN_1638	6419
GTCN_349	3329	CTCN_1639	6420
TTCN_635	3330	GTCN_845	6421
CTCN_641	3331	TTCN_1555	6422
TTCN_636	3332	CTCN_1640	6423
TTCN_637	3333	GTCN_846	6424
TTCN_638	3334	ATCN_1057	6425
ATCN_380	3335	TTCN_1556	6426
ATCN_381	3336	CTCN_1641	6427
TTCN_639	3337	ATCN_1058	6428
ATCN_382	3338	ATCN_1059	6429
CTCN_642	3339	ATCN_1060	6430
CTCN_643	3340	TTCN_1557	6431

FIG. 35 (continued)

GTCN_350	3341	CTCN_1642	6432
ATCN_383	3342	GTCN_847	6433
GTCN_351	3343	TTCN_1558	6434
ATCN_384	3344	ATCN_1061	6435
TTCN_640	3345	TTCN_1559	6436
CTCN_644	3346	CTCN_1643	6437
ATCN_385	3347	GTCN_848	6438
TTCN_641	3348	TTCN_1560	6439
ATCN_386	3349	TTCN_1561	6440
CTCN_645	3350	GTCN_849	6441
ATCN_387	3351	CTCN_1644	6442
ATCN_388	3352	TTCN_1562	6443
TTCN_642	3353	CTCN_1645	6444
TTCN_643	3354	TTCN_1563	6445
TTCN_644	3355	CTCN_1646	6446
TTCN_645	3356	ATCN_1062	6447
CTCN_646	3357	TTCN_1564	6448
TTCN_646	3358	ATCN_1063	6449
CTCN_647	3359	TTCN_1565	6450
TTCN_647	3360	TTCN_1566	6451
CTCN_648	3361	ATCN_1064	6452
GTCN_352	3362	TTCN_1567	6453
CTCN_649	3363	GTCN_850	6454
GTCN_353	3364	CTCN_1647	6455
CTCN_650	3365	TTCN_1568	6456
CTCN_651	3366	ATCN_1065	6457
ATCN_389	3367	CTCN_1648	6458
ATCN_390	3368	ATCN_1066	6459
CTCN_652	3369	GTCN_851	6460
TTCN_648	3370	CTCN_1649	6461
ATCN_391	3371	GTCN_852	6462
CTCN_653	3372	CTCN_1650	6463
CTCN_654	3373	ATCN_1067	6464
TTCN_649	3374	TTCN_1569	6465
CTCN_655	3375	CTCN_1651	6466
CTCN_656	3376	CTCN_1652	6467
CTCN_657	3377	CTCN_1653	6468
CTCN_658	3378	CTCN_1654	6469
ATCN_392	3379	GTCN_853	6470
CTCN_659	3380	TTCN_1570	6471
ATCN_393	3381	ATCN_1068	6472
TTCN_650	3382	CTCN_1655	6473
GTCN_354	3383	CTCN_1656	6474
TTCN_651	3384	CTCN_1657	6475
CTCN_660	3385	TTCN_1571	6476
CTCN_661	3386	GTCN_854	6477
CTCN_662	3387	CTCN_1658	6478
ATCN_394	3388	ATCN_1069	6479
ATCN_395	3389	TTCN_1572	6480
CTCN_663	3390	GTCN_855	6481
TTCN_652	3391	TTCN_1573	6482
ATCN_396	3392	GTCN_856	6483
CTCN_664	3393	ATCN_1070	6484

GTCN_355	3394	ATCN_1071	6485
TTCN_653	3395	CTCN_1659	6486
TTCN_654	3396	CTCN_1660	6487
TTCN_655	3397	ATCN_1072	6488
GTCN_356	3398	TTCN_1574	6489
ATCN_397	3399	ATCN_1073	6490
CTCN_665	3400	CTCN_1661	6491
TTCN_656	3401	TTCN_1575	6492
CTCN_666	3402	ATCN_1074	6493
ATCN_398	3403	GTCN_857	6494
CTCN_667	3404	TTCN_1576	6495
TTCN_657	3405	TTCN_1577	6496
ATCN_399	3406	TTCN_1578	6497
CTCN_668	3407	ATCN_1075	6498
GTCN_357	3408	CTCN_1662	6499
TTCN_658	3409	ATCN_1076	6500
GTCN_358	3410	ATCN_1077	6501
ATCN_400	3411	ATCN_1078	6502
ATCN_401	3412	CTCN_1663	6503
TTCN_659	3413	GTCN_858	6504
ATCN_402	3414	ATCN_1079	6505
GTCN_359	3415	ATCN_1080	6506
CTCN_669	3416	ATCN_1081	6507
GTCN_360	3417	TTCN_1579	6508
GTCN_361	3418	GTCN_859	6509
ATCN_403	3419	TTCN_1580	6510
GTCN_362	3420	ATCN_1082	6511
TTCN_660	3421	CTCN_1664	6512
TTCN_661	3422	CTCN_1665	6513
TTCN_662	3423	ATCN_1083	6514
TTCN_663	3424	ATCN_1084	6515
TTCN_664	3425	TTCN_1581	6516
TTCN_665	3426	CTCN_1666	6517
ATCN_404	3427	ATCN_1085	6518
ATCN_405	3428	TTCN_1582	6519
GTCN_363	3429	CTCN_1667	6520
ATCN_406	3430	CTCN_1668	6521
CTCN_670	3431	CTCN_1669	6522
TTCN_666	3432	GTCN_860	6523
CTCN_671	3433	TTCN_1583	6524
TTCN_667	3434	TTCN_1584	6525
GTCN_364	3435	CTCN_1670	6526
ATCN_407	3436	GTCN_861	6527
ATCN_408	3437	TTCN_1585	6528
CTCN_672	3438	CTCN_1671	6529
CTCN_673	3439	ATCN_1086	6530
ATCN_409	3440	GTCN_862	6531
ATCN_410	3441	GTCN_863	6532
CTCN_674	3442	TTCN_1586	6533
GTCN_365	3443	TTCN_1587	6534
ATCN_411	3444	GTCN_864	6535
CTCN_675	3445	ATCN_1087	6536
CTCN_676	3446	GTCN_865	6537

FIG. 35 (continued)

GTCN_366	3447	TTCN_1588	6538
ATCN_412	3448	GTCN_866	6539
ATCN_413	3449	GTCN_867	6540
ATCN_414	3450	CTCN_1672	6541
TTCN_668	3451	ATCN_1088	6542
TTCN_669	3452	TTCN_1589	6543
TTCN_670	3453	ATCN_1089	6544
CTCN_677	3454	GTCN_868	6545
ATCN_415	3455	TTCN_1590	6546
CTCN_678	3456	TTCN_1591	6547
GTCN_367	3457	CTCN_1673	6548
CTCN_679	3458	GTCN_869	6549
GTCN_368	3459	GTCN_870	6550
TTCN_671	3460	TTCN_1592	6551
TTCN_672	3461	CTCN_1674	6552
GTCN_369	3462	TTCN_1593	6553
GTCN_370	3463	GTCN_871	6554
TTCN_673	3464	ATCN_1090	6555
ATCN_416	3465	CTCN_1675	6556
ATCN_417	3466	GTCN_872	6557
CTCN_680	3467	GTCN_873	6558
CTCN_681	3468	TTCN_1594	6559
TTCN_674	3469	ATCN_1091	6560
GTCN_371	3470	CTCN_1676	6561
GTCN_372	3471	GTCN_874	6562
GTCN_373	3472	CTCN_1677	6563
GTCN_374	3473	GTCN_875	6564
GTCN_375	3474	GTCN_876	6565
TTCN_675	3475	GTCN_877	6566
GTCN_376	3476	ATCN_1092	6567
TTCN_676	3477	ATCN_1093	6568
CTCN_682	3478	GTCN_878	6569
CTCN_683	3479	TTCN_1595	6570
ATCN_418	3480	GTCN_879	6571
GTCN_377	3481	CTCN_1678	6572
CTCN_684	3482	TTCN_1596	6573
CTCN_685	3483	TTCN_1597	6574
TTCN_677	3484	TTCN_1598	6575
TTCN_678	3485	TTCN_1599	6576
ATCN_419	3486	TTCN_1600	6577
CTCN_686	3487	GTCN_880	6578
ATCN_420	3488	ATCN_1094	6579
TTCN_679	3489	TTCN_1601	6580
TTCN_680	3490	ATCN_1095	6581
GTCN_378	3491	ATCN_1096	6582
TTCN_681	3492	GTCN_881	6583
TTCN_682	3493	ATCN_1097	6584
ATCN_421	3494	ATCN_1098	6585
CTCN_687	3495	CTCN_1679	6586
CTCN_688	3496	TTCN_1602	6587
TTCN_683	3497	CTCN_1680	6588
GTCN_379	3498	CTCN_1681	6589
GTCN_380	3499	CTCN_1682	6590

TTCN_684	3500	TTCN_1603	6591
TTCN_685	3501	GTCN_882	6592
CTCN_689	3502	TTCN_1604	6593
TTCN_686	3503	TTCN_1605	6594
CTCN_690	3504	ATCN_1099	6595
CTCN_691	3505	TTCN_1606	6596
GTCN_381	3506	GTCN_883	6597
CTCN_692	3507	TTCN_1607	6598
TTCN_687	3508	CTCN_1683	6599
GTCN_382	3509	TTCN_1608	6600
ATCN_422	3510	ATCN_1100	6601
CTCN_693	3511	ATCN_1101	6602
CTCN_694	3512	TTCN_1609	6603
TTCN_688	3513	CTCN_1684	6604
GTCN_383	3514	CTCN_1685	6605
CTCN_695	3515	TTCN_1610	6606
TTCN_689	3516	GTCN_884	6607
TTCN_690	3517	ATCN_1102	6608
CTCN_696	3518	ATCN_1103	6609
CTCN_697	3519	GTCN_885	6610
CTCN_698	3520	CTCN_1686	6611
GTCN_384	3521	CTCN_1687	6612
TTCN_691	3522	CTCN_1688	6613
ATCN_423	3523	GTCN_886	6614
CTCN_699	3524	CTCN_1689	6615
TTCN_692	3525	CTCN_1690	6616
ATCN_424	3526	CTCN_1691	6617
GTCN_385	3527	GTCN_887	6618
CTCN_700	3528	GTCN_888	6619
TTCN_693	3529	GTCN_889	6620
GTCN_386	3530	TTCN_1611	6621
CTCN_701	3531	CTCN_1692	6622
TTCN_694	3532	CTCN_1693	6623
TTCN_695	3533	CTCN_1694	6624
TTCN_696	3534	CTCN_1695	6625
CTCN_702	3535	CTCN_1696	6626
TTCN_697	3536	ATCN_1104	6627
TTCN_698	3537	ATCN_1105	6628
TTCN_699	3538	TTCN_1612	6629
CTCN_703	3539	GTCN_890	6630
GTCN_387	3540	GTCN_891	6631
GTCN_388	3541	CTCN_1697	6632
CTCN_704	3542	TTCN_1613	6633
CTCN_705	3543	TTCN_1614	6634
GTCN_389	3544	GTCN_892	6635
CTCN_706	3545	GTCN_893	6636
ATCN_425	3546	GTCN_894	6637
CTCN_707	3547	CTCN_1698	6638
TTCN_700	3548	GTCN_895	6639
ATCN_426	3549	GTCN_896	6640
TTCN_701	3550	TTCN_1615	6641
CTCN_708	3551	CTCN_1699	6642
GTCN_390	3552	ATCN_1106	6643

FIG. 35 (continued)

CTCN_709	3553	CTCN_1700	6644
TTCN_702	3554	CTCN_1701	6645
ATCN_427	3555	GTCN_897	6646
GTCN_391	3556	ATCN_1107	6647
GTCN_392	3557	CTCN_1702	6648
TTCN_703	3558	ATCN_1108	6649
TTCN_704	3559	ATCN_1109	6650
TTCN_705	3560	GTCN_898	6651
TTCN_706	3561	CTCN_1703	6652
TTCN_707	3562	GTCN_899	6653
GTCN_393	3563	GTCN_900	6654
CTCN_710	3564	GTCN_901	6655
TTCN_708	3565	TTCN_1616	6656
CTCN_711	3566	CTCN_1704	6657
GTCN_394	3567	CTCN_1705	6658
ATCN_428	3568	CTCN_1706	6659
CTCN_712	3569	CTCN_1707	6660
ATCN_429	3570	CTCN_1708	6661
GTCN_395	3571	TTCN_1617	6662
CTCN_713	3572	GTCN_902	6663
ATCN_430	3573	TTCN_1618	6664
TTCN_709	3574	TTCN_1619	6665
TTCN_710	3575	CTCN_1709	6666
CTCN_714	3576	TTCN_1620	6667
CTCN_715	3577	TTCN_1621	6668
CTCN_716	3578	ATCN_1110	6669
TTCN_711	3579	ATCN_1111	6670
CTCN_717	3580	GTCN_903	6671
CTCN_718	3581	TTCN_1622	6672
TTCN_712	3582	ATCN_1112	6673
TTCN_713	3583	ATCN_1113	6674
GTCN_396	3584	CTCN_1710	6675
CTCN_719	3585	CTCN_1711	6676
CTCN_720	3586	CTCN_1712	6677
CTCN_721	3587	TTCN_1623	6678
CTCN_722	3588	TTCN_1624	6679
CTCN_723	3589	TTCN_1625	6680
CTCN_724	3590	CTCN_1713	6681
CTCN_725	3591	CTCN_1714	6682
ATCN_431	3592	GTCN_904	6683
ATCN_432	3593	TTCN_1626	6684
GTCN_397	3594	ATCN_1114	6685
CTCN_726	3595	CTCN_1715	6686
TTCN_714	3596	GTCN_905	6687
CTCN_727	3597	CTCN_1716	6688
CTCN_728	3598	ATCN_1115	6689
GTCN_398	3599	GTCN_906	6690
TTCN_715	3600	CTCN_1717	6691
ATCN_433	3601	CTCN_1718	6692
GTCN_399	3602	CTCN_1719	6693
TTCN_716	3603	CTCN_1720	6694
TTCN_717	3604	GTCN_907	6695
CTCN_729	3605	TTCN_1627	6696

CTCN_730	3606	CTCN_1721	6697
TTCN_718	3607	CTCN_1722	6698
CTCN_731	3608	TTCN_1628	6699
TTCN_719	3609	CTCN_1723	6700
CTCN_732	3610	GTCN_908	6701
TTCN_720	3611	CTCN_1724	6702
ATCN_434	3612	TTCN_1629	6703
ATCN_435	3613	GTCN_909	6704
CTCN_733	3614	TTCN_1630	6705
GTCN_400	3615	GTCN_910	6706
ATCN_436	3616	GTCN_911	6707
ATCN_437	3617	GTCN_912	6708
CTCN_734	3618	GTCN_913	6709
GTCN_401	3619	TTCN_1631	6710
CTCN_735	3620	GTCN_914	6711
TTCN_721	3621	CTCN_1725	6712
TTCN_722	3622	CTCN_1726	6713
GTCN_402	3623	GTCN_915	6714
CTCN_736	3624	TTCN_1632	6715
TTCN_723	3625	CTCN_1727	6716
GTCN_403	3626	GTCN_916	6717
TTCN_724	3627	TTCN_1633	6718
ATCN_438	3628	GTCN_917	6719
CTCN_737	3629	TTCN_1634	6720
TTCN_725	3630	CTCN_1728	6721
CTCN_738	3631	GTCN_918	6722
CTCN_739	3632	TTCN_1635	6723
TTCN_726	3633	CTCN_1729	6724
TTCN_727	3634	ATCN_1116	6725
CTCN_740	3635	CTCN_1730	6726
CTCN_741	3636	TTCN_1636	6727
CTCN_742	3637	ATCN_1117	6728
TTCN_728	3638	CTCN_1731	6729
CTCN_743	3639	TTCN_1637	6730
CTCN_744	3640	ATCN_1118	6731
ATCN_439	3641	TTCN_1638	6732
TTCN_729	3642	CTCN_1732	6733
GTCN_404	3643	ATCN_1119	6734
GTCN_405	3644	ATCN_1120	6735
CTCN_745	3645	TTCN_1639	6736
TTCN_730	3646	ATCN_1121	6737
CTCN_746	3647	ATCN_1122	6738
TTCN_731	3648	ATCN_1123	6739
ATCN_440	3649	ATCN_1124	6740
TTCN_732	3650	ATCN_1125	6741
ATCN_441	3651	TTCN_1640	6742
ATCN_442	3652	TTCN_1641	6743
CTCN_747	3653	TTCN_1642	6744
ATCN_443	3654	CTCN_1733	6745
TTCN_733	3655	GTCN_919	6746
TTCN_734	3656	CTCN_1734	6747
ATCN_444	3657	CTCN_1735	6748
ATCN_445	3658	CTCN_1736	6749

FIG. 35 (continued)

TTCN_735	3659	CTCN_1737	6750
TTCN_736	3660	GTCN_920	6751
CTCN_748	3661	TTCN_1643	6752
ATCN_446	3662	TTCN_1644	6753
CTCN_749	3663	CTCN_1738	6754
GTCN_406	3664	CTCN_1739	6755
TTCN_737	3665	CTCN_1740	6756
ATCN_447	3666	TTCN_1645	6757
CTCN_750	3667	GTCN_921	6758
CTCN_751	3668	CTCN_1741	6759
GTCN_407	3669	ATCN_1126	6760
ATCN_448	3670	CTCN_1742	6761
GTCN_408	3671	GTCN_922	6762
TTCN_738	3672	GTCN_923	6763
TTCN_739	3673	CTCN_1743	6764
ATCN_449	3674	TTCN_1646	6765
ATCN_450	3675	GTCN_924	6766
ATCN_451	3676	GTCN_925	6767
TTCN_740	3677	ATCN_1127	6768
CTCN_752	3678	GTCN_926	6769
ATCN_452	3679	TTCN_1647	6770
ATCN_453	3680	CTCN_1744	6771
ATCN_454	3681	ATCN_1128	6772
TTCN_741	3682	ATCN_1129	6773
CTCN_753	3683	GTCN_927	6774
ATCN_455	3684	TTCN_1648	6775
ATCN_456	3685	ATCN_1130	6776
ATCN_457	3686	ATCN_1131	6777
CTCN_754	3687	CTCN_1745	6778
TTCN_742	3688	TTCN_1649	6779
CTCN_755	3689	GTCN_928	6780
TTCN_743	3690	CTCN_1746	6781
CTCN_756	3691	TTCN_1650	6782
ATCN_458	3692	CTCN_1747	6783
TTCN_744	3693	GTCN_929	6784
GTCN_409	3694	CTCN_1748	6785
ATCN_459	3695	CTCN_1749	6786
TTCN_745	3696	TTCN_1651	6787
CTCN_757	3697	CTCN_1750	6788
TTCN_746	3698	TTCN_1652	6789
ATCN_460	3699	CTCN_1751	6790
TTCN_747	3700	GTCN_930	6791
TTCN_748	3701	ATCN_1132	6792
GTCN_410	3702	ATCN_1133	6793
GTCN_411	3703	GTCN_931	6794
TTCN_749	3704	TTCN_1653	6795
ATCN_461	3705	TTCN_1654	6796
TTCN_750	3706	CTCN_1752	6797
ATCN_462	3707	ATCN_1134	6798
ATCN_463	3708	GTCN_932	6799
TTCN_751	3709	TTCN_1655	6800
ATCN_464	3710	CTCN_1753	6801
ATCN_465	3711	TTCN_1656	6802

TTCN_752	3712	CTCN_1754	6803
ATCN_466	3713	TTCN_1657	6804
CTCN_758	3714	GTCN_933	6805
TTCN_753	3715	CTCN_1755	6806
ATCN_467	3716	TTCN_1658	6807
ATCN_468	3717	TTCN_1659	6808
ATCN_469	3718	CTCN_1756	6809
TTCN_754	3719	ATCN_1135	6810
TTCN_755	3720	TTCN_1660	6811
ATCN_470	3721	TTCN_1661	6812
GTCN_412	3722	CTCN_1757	6813
GTCN_413	3723	CTCN_1758	6814
GTCN_414	3724	GTCN_934	6815
TTCN_756	3725	CTCN_1759	6816
TTCN_757	3726	GTCN_935	6817
CTCN_759	3727	TTCN_1662	6818
CTCN_760	3728	GTCN_936	6819
ATCN_471	3729	CTCN_1760	6820
CTCN_761	3730	ATCN_1136	6821
GTCN_415	3731	TTCN_1663	6822
TTCN_758	3732	GTCN_937	6823
TTCN_759	3733	CTCN_1761	6824
TTCN_760	3734	ATCN_1137	6825
TTCN_761	3735	TTCN_1664	6826
CTCN_762	3736	GTCN_938	6827
ATCN_472	3737	CTCN_1762	6828
TTCN_762	3738	ATCN_1138	6829
GTCN_416	3739	ATCN_1139	6830
CTCN_763	3740	ATCN_1140	6831
CTCN_764	3741	ATCN_1141	6832
ATCN_473	3742	ATCN_1142	6833
CTCN_765	3743	TTCN_1665	6834
CTCN_766	3744	TTCN_1666	6835
CTCN_767	3745	CTCN_1763	6836
CTCN_768	3746	GTCN_939	6837
TTCN_763	3747	CTCN_1764	6838
TTCN_764	3748	TTCN_1667	6839
CTCN_769	3749	ATCN_1143	6840
CTCN_770	3750	TTCN_1668	6841
CTCN_771	3751	ATCN_1144	6842
CTCN_772	3752	TTCN_1669	6843
ATCN_474	3753	ATCN_1145	6844
CTCN_773	3754	ATCN_1146	6845
GTCN_417	3755	CTCN_1765	6846
TTCN_765	3756	ATCN_1147	6847
GTCN_418	3757	GTCN_940	6848
CTCN_774	3758	CTCN_1766	6849
CTCN_775	3759	TTCN_1670	6850
ATCN_475	3760	GTCN_941	6851
ATCN_476	3761	CTCN_1767	6852
CTCN_776	3762	TTCN_1671	6853
ATCN_477	3763	TTCN_1672	6854
ATCN_478	3764	GTCN_942	6855

FIG. 35 (continued)

GTCN_419	3765	GTCN_943	6856
CTCN_777	3766	TTCN_1673	6857
CTCN_778	3767	TTCN_1674	6858
ATCN_479	3768	TTCN_1675	6859
CTCN_779	3769	ATCN_1148	6860
ATCN_480	3770	GTCN_944	6861
TTCN_766	3771	GTCN_945	6862
ATCN_481	3772	TTCN_1676	6863
CTCN_780	3773	ATCN_1149	6864
CTCN_781	3774	TTCN_1677	6865
TTCN_767	3775	GTCN_946	6866
TTCN_768	3776	GTCN_947	6867
TTCN_769	3777	TTCN_1678	6868
TTCN_770	3778	CTCN_1768	6869
TTCN_771	3779	TTCN_1679	6870
TTCN_772	3780	GTCN_948	6871
CTCN_782	3781	GTCN_949	6872
TTCN_773	3782	ATCN_1150	6873
ATCN_482	3783	CTCN_1769	6874
CTCN_783	3784	TTCN_1680	6875
ATCN_483	3785	ATCN_1151	6876
GTCN_420	3786	ATCN_1152	6877
ATCN_484	3787	CTCN_1770	6878
ATCN_485	3788	CTCN_1771	6879
CTCN_784	3789	GTCN_950	6880
TTCN_774	3790	TTCN_1681	6881
CTCN_785	3791	CTCN_1772	6882
ATCN_486	3792	ATCN_1153	6883
ATCN_487	3793	GTCN_951	6884
CTCN_786	3794	ATCN_1154	6885
GTCN_421	3795	CTCN_1773	6886
CTCN_787	3796	CTCN_1774	6887
TTCN_775	3797	ATCN_1155	6888
CTCN_788	3798	CTCN_1775	6889
GTCN_422	3799	CTCN_1776	6890
GTCN_423	3800	GTCN_952	6891
CTCN_789	3801	ATCN_1156	6892
GTCN_424	3802	CTCN_1777	6893
CTCN_790	3803	GTCN_953	6894
TTCN_776	3804	ATCN_1157	6895
GTCN_425	3805	TTCN_1682	6896
GTCN_426	3806	GTCN_954	6897
TTCN_777	3807	CTCN_1778	6898
ATCN_488	3808	ATCN_1158	6899
CTCN_791	3809	GTCN_955	6900
TTCN_778	3810	GTCN_956	6901
CTCN_792	3811	GTCN_957	6902
TTCN_779	3812	GTCN_958	6903
GTCN_427	3813	ATCN_1159	6904
GTCN_428	3814	CTCN_1779	6905
TTCN_780	3815	GTCN_959	6906
TTCN_781	3816	ATCN_1160	6907
TTCN_782	3817	CTCN_1780	6908

ATCN_489	3818	TTCN_1683	6909
GTCN_429	3819	GTCN_960	6910
TTCN_783	3820	CTCN_1781	6911
ATCN_490	3821	GTCN_961	6912
TTCN_784	3822	TTCN_1684	6913
CTCN_793	3823	CTCN_1782	6914
ATCN_491	3824	GTCN_962	6915
TTCN_785	3825	CTCN_1783	6916
ATCN_492	3826	CTCN_1784	6917
ATCN_493	3827	TTCN_1685	6918
ATCN_494	3828	TTCN_1686	6919
TTCN_786	3829	TTCN_1687	6920
CTCN_794	3830	TTCN_1688	6921
ATCN_495	3831	TTCN_1689	6922
TTCN_787	3832	CTCN_1785	6923
CTCN_795	3833	CTCN_1786	6924
GTCN_430	3834	CTCN_1787	6925
TTCN_788	3835	CTCN_1788	6926
TTCN_789	3836	CTCN_1789	6927
CTCN_796	3837	TTCN_1690	6928
TTCN_790	3838	TTCN_1691	6929
CTCN_797	3839	TTCN_1692	6930
TTCN_791	3840	TTCN_1693	6931
CTCN_798	3841	ATCN_1161	6932
CTCN_799	3842	TTCN_1694	6933
CTCN_800	3843	ATCN_1162	6934
GTCN_431	3844	TTCN_1695	6935
CTCN_801	3845	ATCN_1163	6936
TTCN_792	3846	CTCN_1790	6937
CTCN_802	3847	GTCN_963	6938
CTCN_803	3848	TTCN_1696	6939
CTCN_804	3849	CTCN_1791	6940
TTCN_793	3850	TTCN_1697	6941
TTCN_794	3851	CTCN_1792	6942
CTCN_805	3852	CTCN_1793	6943
CTCN_806	3853	TTCN_1698	6944
CTCN_807	3854	CTCN_1794	6945
CTCN_808	3855	TTCN_1699	6946
ATCN_496	3856	CTCN_1795	6947
CTCN_809	3857	TTCN_1700	6948
TTCN_795	3858	TTCN_1701	6949
GTCN_432	3859	CTCN_1796	6950
CTCN_810	3860	ATCN_1164	6951
CTCN_811	3861	TTCN_1702	6952
TTCN_796	3862	TTCN_1703	6953
CTCN_812	3863	CTCN_1797	6954
ATCN_497	3864	TTCN_1704	6955
ATCN_498	3865	TTCN_1705	6956
TTCN_797	3866	ATCN_1165	6957
TTCN_798	3867	ATCN_1166	6958
CTCN_813	3868	TTCN_1706	6959
TTCN_799	3869	CTCN_1798	6960
ATCN_499	3870	TTCN_1707	6961

FIG. 35 (continued)

TTCN_800	3871	TTCN_1708	6962
TTCN_801	3872	GTCN_964	6963
GTCN_433	3873	TTCN_1709	6964
TTCN_802	3874	TTCN_1710	6965
ATCN_500	3875	CTCN_1799	6966
ATCN_501	3876	TTCN_1711	6967
CTCN_814	3877	CTCN_1800	6968
CTCN_815	3878	ATCN_1167	6969
ATCN_502	3879	CTCN_1801	6970
GTCN_434	3880	CTCN_1802	6971
TTCN_803	3881	CTCN_1803	6972
CTCN_816	3882	CTCN_1804	6973
TTCN_804	3883	GTCN_965	6974
CTCN_817	3884	CTCN_1805	6975
TTCN_805	3885	CTCN_1806	6976
CTCN_818	3886	ATCN_1168	6977
TTCN_806	3887	ATCN_1169	6978
ATCN_503	3888	CTCN_1807	6979
ATCN_504	3889	CTCN_1808	6980
GTCN_435	3890	TTCN_1712	6981
CTCN_819	3891	CTCN_1809	6982
TTCN_807	3892	GTCN_966	6983
GTCN_436	3893	TTCN_1713	6984
CTCN_820	3894	TTCN_1714	6985
TTCN_808	3895	ATCN_1170	6986
GTCN_437	3896	GTCN_967	6987
GTCN_438	3897	CTCN_1810	6988
GTCN_439	3898	TTCN_1715	6989
GTCN_440	3899	TTCN_1716	6990
ATCN_505	3900	GTCN_968	6991
GTCN_441	3901	TTCN_1717	6992
CTCN_821	3902	ATCN_1171	6993
CTCN_822	3903	CTCN_1811	6994
CTCN_823	3904	ATCN_1172	6995
GTCN_442	3905	CTCN_1812	6996
TTCN_809	3906	CTCN_1813	6997
GTCN_443	3907	TTCN_1718	6998
GTCN_444	3908	TTCN_1719	6999
TTCN_810	3909	GTCN_969	7000
ATCN_506	3910	ATCN_1173	7001
CTCN_824	3911	GTCN_970	7002
TTCN_811	3912	TTCN_1720	7003
TTCN_812	3913	CTCN_1814	7004
GTCN_445	3914	ATCN_1174	7005
CTCN_825	3915	GTCN_971	7006
TTCN_813	3916	ATCN_1175	7007
GTCN_446	3917	ATCN_1176	7008
TTCN_814	3918	GTCN_972	7009
TTCN_815	3919	CTCN_1815	7010
TTCN_816	3920	GTCN_973	7011
CTCN_826	3921	TTCN_1721	7012
TTCN_817	3922	TTCN_1722	7013
TTCN_818	3923	CTCN_1816	7014

TTCN_819	3924	CTCN_1817	7015
TTCN_820	3925	TTCN_1723	7016
ATCN_507	3926	TTCN_1724	7017
ATCN_508	3927	ATCN_1177	7018
TTCN_821	3928	ATCN_1178	7019
TTCN_822	3929	ATCN_1179	7020
TTCN_823	3930	ATCN_1180	7021
CTCN_827	3931	CTCN_1818	7022
TTCN_824	3932	TTCN_1725	7023
TTCN_825	3933	ATCN_1181	7024
CTCN_828	3934	ATCN_1182	7025
TTCN_826	3935	ATCN_1183	7026
ATCN_509	3936	ATCN_1184	7027
CTCN_829	3937	ATCN_1185	7028
TTCN_827	3938	CTCN_1819	7029
CTCN_830	3939	TTCN_1726	7030
GTCN_447	3940	TTCN_1727	7031
TTCN_828	3941	CTCN_1820	7032
CTCN_831	3942	CTCN_1821	7033
GTCN_448	3943	ATCN_1186	7034
ATCN_510	3944	ATCN_1187	7035
TTCN_829	3945	ATCN_1188	7036
TTCN_830	3946	TTCN_1728	7037
GTCN_449	3947	TTCN_1729	7038
CTCN_832	3948	GTCN_974	7039
TTCN_831	3949	CTCN_1822	7040
TTCN_832	3950	ATCN_1189	7041
TTCN_833	3951	TTCN_1730	7042
TTCN_834	3952	GTCN_975	7043
TTCN_835	3953	ATCN_1190	7044
TTCN_836	3954	TTCN_1731	7045
ATCN_511	3955	TTCN_1732	7046
TTCN_837	3956	CTCN_1823	7047
TTCN_838	3957	GTCN_976	7048
CTCN_833	3958	CTCN_1824	7049
TTCN_839	3959	GTCN_977	7050
GTCN_450	3960	ATCN_1191	7051
TTCN_840	3961	GTCN_978	7052
CTCN_834	3962	CTCN_1825	7053
CTCN_835	3963	GTCN_979	7054
GTCN_451	3964	ATCN_1192	7055
CTCN_836	3965	TTCN_1733	7056
ATCN_512	3966	TTCN_1734	7057
GTCN_452	3967	ATCN_1193	7058
TTCN_841	3968	TTCN_1735	7059
CTCN_837	3969	CTCN_1826	7060
TTCN_842	3970	CTCN_1827	7061
CTCN_838	3971	TTCN_1736	7062
TTCN_843	3972	TTCN_1737	7063
TTCN_844	3973	ATCN_1194	7064
TTCN_845	3974	GTCN_980	7065
TTCN_846	3975	TTCN_1738	7066
TTCN_847	3976	CTCN_1828	7067

FIG. 35 (continued)

CTCN_839	3977	GTCN_981	7068
TTCN_848	3978	CTCN_1829	7069
TTCN_849	3979	GTCN_982	7070
ATCN_513	3980	CTCN_1830	7071
ATCN_514	3981	CTCN_1831	7072
ATCN_515	3982	CTCN_1832	7073
TTCN_850	3983	CTCN_1833	7074
TTCN_851	3984	ATCN_1195	7075
TTCN_852	3985	CTCN_1834	7076
CTCN_840	3986	CTCN_1835	7077
TTCN_853	3987	CTCN_1836	7078
TTCN_854	3988	TTCN_1739	7079
GTCN_453	3989	TTCN_1740	7080
CTCN_841	3990	CTCN_1837	7081
GTCN_454	3991	CTCN_1838	7082
ATCN_516	3992	CTCN_1839	7083
CTCN_842	3993	CTCN_1840	7084
GTCN_455	3994	GTCN_983	7085
CTCN_843	3995		

FIG. 36: Table 3B: Targeting Sequences for TRAC

Name	SEQ ID NO.	Name	SEQ ID NO.
GTCN_0	7086	TTCN_3239	17273
TTCN_0	7087	CTCN_2822	17274
CTCN_0	7088	TTCN_3240	17275
ATCN_0	7089	ATCN_2005	17276
ATCN_1	7090	TTCN_3241	17277
GTCN_1	7091	ATCN_2006	17278
GTCN_2	7092	TTCN_3242	17279
CTCN_1	7093	ATCN_2007	17280
CTCN_2	7094	ATCN_2008	17281
CTCN_3	7095	CTCN_2823	17282
ATCN_2	7096	ATCN_2009	17283
TTCN_1	7097	TTCN_3243	17284
TTCN_2	7098	ATCN_2010	17285
TTCN_3	7099	GTCN_1701	17286
ATCN_3	7100	CTCN_2824	17287
TTCN_4	7101	TTCN_3244	17288
TTCN_5	7102	TTCN_3245	17289
ATCN_4	7103	GTCN_1702	17290
TTCN_6	7104	CTCN_2825	17291
CTCN_4	7105	TTCN_3246	17292
CTCN_5	7106	CTCN_2826	17293
GTCN_3	7107	CTCN_2827	17294
CTCN_6	7108	TTCN_3247	17295
GTCN_4	7109	TTCN_3248	17296
TTCN_7	7110	CTCN_2828	17297
CTCN_7	7111	TTCN_3249	17298
ATCN_5	7112	CTCN_2829	17299
TTCN_8	7113	CTCN_2830	17300
TTCN_9	7114	CTCN_2831	17301
GTCN_5	7115	TTCN_3250	17302
CTCN_8	7116	CTCN_2832	17303
TTCN_10	7117	GTCN_1703	17304
GTCN_6	7118	TTCN_3251	17305
TTCN_11	7119	TTCN_3252	17306
CTCN_9	7120	TTCN_3252	17307
TTCN_12	7121	TTCN_3253	17308
CTCN_10	7122	GTCN_1704	17309
GTCN_7	7123	TTCN_3254	17310
TTCN_13	7124	CTCN_2833	17311
ATCN_6	7125	CTCN_2834	17312
TTCN_14	7126	GTCN_1705	17313
ATCN_7	7127	CTCN_2835	17314
ATCN_8	7128	TTCN_3255	17315
TTCN_15	7129	TTCN_3256	17316
GTCN_8	7130	CTCN_2836	17317
TTCN_16	7131	ATCN_2011	17318
GTCN_9	7132	GTCN_1706	17319
TTCN_17	7133	CTCN_2837	17320
CTCN_11	7134	CTCN_2838	17321
GTCN_10	7135	GTCN_1707	17322
GTCN_11	7136	CTCN_2839	17323
GTCN_12	7137	TTCN_3257	17324
ATCN_9	7138	GTCN_1708	17325
ATCN_10	7139	CTCN_2840	17326
CTCN_12	7140	CTCN_2841	17327
GTCN_13	7141	GTCN_1709	17328
CTCN_13	7142	CTCN_2842	17329
TTCN_18	7143	TTCN_3258	17330
ATCN_11	7144	CTCN_2843	17331
TTCN_19	7145	ATCN_2012	17332
ATCN_12	7146	TTCN_3259	17333
TTCN_20	7147	TTCN_3260	17334
CTCN_14	7148	CTCN_2844	17335
TTCN_21	7149	CTCN_2845	17336
CTCN_15	7150	CTCN_2846	17337
TTCN_22	7151	GTCN_1710	17338
CTCN_16	7152	CTCN_2847	17339
GTCN_14	7153	CTCN_2848	17340
ATCN_13	7154	CTCN_2849	17341
CTCN_17	7155	CTCN_2850	17342
GTCN_15	7156	GTCN_1711	17343
TTCN_23	7157	CTCN_2851	17344
ATCN_14	7158	GTCN_1712	17345
ATCN_15	7159	TTCN_3261	17346
CTCN_18	7160	CTCN_2852	17347
CTCN_19	7161	CTCN_2853	17348
CTCN_20	7162	CTCN_2854	17349
CTCN_21	7163	TTCN_3262	17350
CTCN_22	7164	CTCN_2855	17351
TTCN_24	7165	TTCN_3263	17352
TTCN_25	7166	ATCN_2013	17353
TTCN_26	7167	CTCN_2856	17354
CTCN_23	7168	CTCN_2857	17355
CTCN_24	7169	GTCN_1713	17356
CTCN_25	7170	TTCN_3264	17357
ATCN_16	7171	ATCN_2014	17358
CTCN_26	7172	GTCN_1714	17359
TTCN_27	7173	CTCN_2858	17360
CTCN_27	7174	ATCN_2015	17361
ATCN_17	7175	CTCN_2859	17362
TTCN_28	7176	TTCN_3265	17363
GTCN_16	7177	TTCN_3266	17364
TTCN_29	7178	CTCN_2860	17365
GTCN_17	7179	TTCN_3267	17366
CTCN_28	7180	TTCN_3268	17367
CTCN_29	7181	ATCN_2016	17368
GTCN_18	7182	TTCN_3269	17369
TTCN_30	7183	ATCN_2017	17370
TTCN_31	7184	ATCN_2018	17371
CTCN_30	7185	TTCN_3270	17372
CTCN_31	7186	GTCN_1715	17373
TTCN_32	7187	ATCN_2019	17374
GTCN_19	7188	TTCN_3271	17375
CTCN_32	7189	ATCN_2020	17376
GTCN_20	7190	CTCN_2861	17377
ATCN_18	7191	CTCN_2862	17378

FIG. 36 (continued)

CTCN_33	7192	ATCN_2021	17379
ATCN_19	7193	ATCN_2022	17380
TTCN_33	7194	TTCN_3272	17381
TTCN_34	7195	ATCN_2023	17382
GTCN_21	7196	CTCN_2863	17383
TTCN_35	7197	GTCN_1716	17384
CTCN_34	7198	CTCN_2864	17385
ATCN_20	7199	ATCN_2024	17386
TTCN_36	7200	GTCN_1717	17387
TTCN_37	7201	GTCN_1718	17388
CTCN_35	7202	ATCN_2025	17389
GTCN_22	7203	CTCN_2865	17390
CTCN_36	7204	ATCN_2026	17391
TTCN_38	7205	ATCN_2027	17392
CTCN_37	7206	CTCN_2866	17393
TTCN_39	7207	GTCN_1719	17394
ATCN_21	7208	ATCN_2028	17395
TTCN_40	7209	TTCN_3273	17396
CTCN_38	7210	CTCN_2867	17397
CTCN_39	7211	GTCN_1720	17398
CTCN_40	7212	ATCN_2029	17399
TTCN_41	7213	TTCN_3274	17400
GTCN_23	7214	GTCN_1721	17401
CTCN_41	7215	TTCN_3275	17402
TTCN_42	7216	CTCN_2868	17403
GTCN_24	7217	TTCN_3276	17404
TTCN_43	7218	TTCN_3277	17405
CTCN_42	7219	TTCN_3278	17406
GTCN_25	7220	TTCN_3279	17407
ATCN_22	7221	GTCN_1722	17408
TTCN_44	7222	CTCN_2869	17409
CTCN_43	7223	CTCN_2870	17410
TTCN_45	7224	CTCN_2871	17411
TTCN_46	7225	GTCN_1723	17412
TTCN_47	7226	CTCN_2872	17413
GTCN_26	7227	TTCN_3280	17414
TTCN_48	7228	CTCN_2873	17415
CTCN_44	7229	GTCN_1724	17416
TTCN_49	7230	CTCN_2874	17417
CTCN_45	7231	GTCN_1725	17418
TTCN_50	7232	CTCN_2875	17419
GTCN_27	7233	TTCN_3281	17420
TTCN_51	7234	ATCN_2030	17421
TTCN_52	7235	CTCN_2876	17422
CTCN_46	7236	ATCN_2031	17423
GTCN_28	7237	TTCN_3282	17424
ATCN_23	7238	TTCN_3283	17425
TTCN_53	7239	CTCN_2877	17426
GTCN_29	7240	CTCN_2878	17427
TTCN_54	7241	CTCN_2879	17428
TTCN_55	7242	TTCN_3284	17429
TTCN_56	7243	ATCN_2032	17430
TTCN_57	7244	ATCN_2033	17431
GTCN_30	7245	TTCN_3285	17432
CTCN_47	7246	TTCN_3286	17433

GTCN_31	7247	TTCN_3287	17434
CTCN_48	7248	CTCN_2880	17435
CTCN_49	7249	ATCN_2034	17436
TTCN_58	7250	TTCN_3288	17437
ATCN_24	7251	TTCN_3289	17438
GTCN_32	7252	ATCN_2035	17439
TTCN_59	7253	ATCN_2036	17440
GTCN_33	7254	CTCN_2881	17441
TTCN_60	7255	TTCN_3290	17442
TTCN_61	7256	GTCN_1726	17443
GTCN_34	7257	TTCN_3291	17444
GTCN_35	7258	CTCN_2882	17445
ATCN_25	7259	GTCN_1727	17446
ATCN_26	7260	ATCN_2037	17447
ATCN_27	7261	CTCN_2883	17448
ATCN_28	7262	TTCN_3292	17449
TTCN_62	7263	ATCN_2038	17450
ATCN_29	7264	ATCN_2039	17451
ATCN_30	7265	ATCN_2040	17452
TTCN_63	7266	CTCN_2884	17453
TTCN_64	7267	TTCN_3293	17454
TTCN_65	7268	CTCN_2885	17455
GTCN_36	7269	ATCN_2041	17456
ATCN_31	7270	ATCN_2042	17457
GTCN_37	7271	ATCN_2043	17458
GTCN_38	7272	TTCN_3294	17459
CTCN_50	7273	GTCN_1728	17460
ATCN_32	7274	CTCN_2886	17461
TTCN_66	7275	CTCN_2887	17462
TTCN_67	7276	CTCN_2888	17463
TTCN_68	7277	ATCN_2044	17464
TTCN_69	7278	GTCN_1729	17465
TTCN_70	7279	CTCN_2889	17466
ATCN_33	7280	CTCN_2890	17467
TTCN_71	7281	TTCN_3295	17468
TTCN_72	7282	TTCN_3296	17469
ATCN_34	7283	TTCN_3297	17470
CTCN_51	7284	GTCN_1730	17471
TTCN_73	7285	TTCN_3298	17472
ATCN_35	7286	CTCN_2891	17473
TTCN_74	7287	ATCN_2045	17474
TTCN_75	7288	ATCN_2046	17475
ATCN_36	7289	CTCN_2892	17476
CTCN_52	7290	TTCN_3299	17477
GTCN_39	7291	GTCN_1731	17478
ATCN_37	7292	GTCN_1732	17479
TTCN_76	7293	CTCN_2893	17480
CTCN_53	7294	TTCN_3300	17481
TTCN_77	7295	TTCN_3301	17482
ATCN_38	7296	CTCN_2894	17483
TTCN_78	7297	ATCN_2047	17484
CTCN_54	7298	ATCN_2048	17485
TTCN_79	7299	CTCN_2895	17486
TTCN_80	7300	GTCN_1733	17487
TTCN_81	7301	TTCN_3302	17488

FIG. 36 (continued)

CTCN_55	7302	CTCN_2896	17489
CTCN_56	7303	TTCN_3303	17490
GTCN_40	7304	CTCN_2897	17491
CTCN_57	7305	TTCN_3304	17492
ATCN_39	7306	GTCN_1734	17493
CTCN_58	7307	CTCN_2898	17494
CTCN_59	7308	CTCN_2899	17495
GTCN_41	7309	TTCN_3305	17496
TTCN_82	7310	TTCN_3306	17497
TTCN_83	7311	ATCN_2049	17498
CTCN_60	7312	TTCN_3307	17499
TTCN_84	7313	TTCN_3308	17500
GTCN_42	7314	CTCN_2900	17501
TTCN_85	7315	TTCN_3309	17502
CTCN_61	7316	CTCN_2901	17503
GTCN_43	7317	CTCN_2902	17504
ATCN_40	7318	GTCN_1735	17505
ATCN_41	7319	CTCN_2903	17506
TTCN_86	7320	ATCN_2050	17507
TTCN_87	7321	ATCN_2051	17508
ATCN_42	7322	GTCN_1736	17509
TTCN_88	7323	CTCN_2904	17510
CTCN_62	7324	CTCN_2905	17511
ATCN_43	7325	CTCN_2906	17512
ATCN_44	7326	TTCN_3310	17513
CTCN_63	7327	GTCN_1737	17514
TTCN_89	7328	CTCN_2907	17515
CTCN_64	7329	CTCN_2908	17516
GTCN_44	7330	GTCN_1738	17517
CTCN_65	7331	TTCN_3311	17518
TTCN_90	7332	CTCN_2909	17519
CTCN_66	7333	TTCN_3312	17520
CTCN_67	7334	ATCN_2052	17521
CTCN_68	7335	ATCN_2053	17522
CTCN_69	7336	TTCN_3313	17523
GTCN_45	7337	ATCN_2054	17524
CTCN_70	7338	TTCN_3314	17525
CTCN_71	7339	TTCN_3315	17526
GTCN_46	7340	TTCN_3316	17527
TTCN_91	7341	TTCN_3317	17528
TTCN_92	7342	CTCN_2910	17529
ATCN_45	7343	TTCN_3318	17530
TTCN_93	7344	ATCN_2055	17531
ATCN_46	7345	TTCN_3319	17532
CTCN_72	7346	TTCN_3320	17533
TTCN_94	7347	GTCN_1739	17534
GTCN_47	7348	TTCN_3321	17535
TTCN_95	7349	TTCN_3322	17536
TTCN_96	7350	TTCN_3323	17537
TTCN_97	7351	ATCN_2056	17538
TTCN_98	7352	CTCN_2911	17539
CTCN_73	7353	GTCN_1740	17540
TTCN_99	7354	ATCN_2057	17541
TTCN_100	7355	TTCN_3324	17542
ATCN_47	7356	CTCN_2912	17543

GTCN_48	7357	GTCN_1741	17544
TTCN_101	7358	ATCN_2058	17545
TTCN_102	7359	ATCN_2059	17546
TTCN_103	7360	ATCN_2060	17547
CTCN_74	7361	TTCN_3325	17548
TTCN_104	7362	TTCN_3326	17549
GTCN_49	7363	GTCN_1742	17550
ATCN_48	7364	ATCN_2061	17551
CTCN_75	7365	ATCN_2062	17552
GTCN_50	7366	TTCN_3327	17553
CTCN_76	7367	TTCN_3328	17554
GTCN_51	7368	TTCN_3329	17555
TTCN_105	7369	ATCN_2063	17556
CTCN_77	7370	TTCN_3330	17557
GTCN_52	7371	TTCN_3331	17558
TTCN_106	7372	GTCN_1743	17559
GTCN_53	7373	CTCN_2913	17560
CTCN_78	7374	GTCN_1744	17561
TTCN_107	7375	TTCN_3332	17562
GTCN_54	7376	CTCN_2914	17563
CTCN_79	7377	ATCN_2064	17564
CTCN_80	7378	CTCN_2915	17565
GTCN_55	7379	CTCN_2916	17566
CTCN_81	7380	ATCN_2065	17567
CTCN_82	7381	TTCN_3333	17568
CTCN_83	7382	TTCN_3334	17569
TTCN_108	7383	CTCN_2917	17570
ATCN_49	7384	TTCN_3335	17571
CTCN_84	7385	TTCN_3336	17572
GTCN_56	7386	TTCN_3337	17573
CTCN_85	7387	TTCN_3338	17574
CTCN_86	7388	TTCN_3339	17575
TTCN_109	7389	GTCN_1745	17576
ATCN_50	7390	TTCN_3340	17577
ATCN_51	7391	TTCN_3341	17578
ATCN_52	7392	ATCN_2066	17579
TTCN_110	7393	TTCN_3342	17580
ATCN_53	7394	TTCN_3343	17581
ATCN_54	7395	TTCN_3344	17582
CTCN_87	7396	TTCN_3345	17583
TTCN_111	7397	CTCN_2918	17584
CTCN_88	7398	TTCN_3346	17585
TTCN_112	7399	GTCN_1746	17586
ATCN_55	7400	TTCN_3347	17587
CTCN_89	7401	CTCN_2919	17588
CTCN_90	7402	TTCN_3348	17589
TTCN_113	7403	TTCN_3349	17590
TTCN_114	7404	CTCN_2920	17591
GTCN_57	7405	TTCN_3350	17592
TTCN_115	7406	TTCN_3351	17593
TTCN_116	7407	TTCN_3352	17594
ATCN_56	7408	TTCN_3353	17595
TTCN_117	7409	TTCN_3354	17596
CTCN_91	7410	TTCN_3355	17597
ATCN_57	7411	CTCN_2921	17598

FIG. 36 (continued)

ATCN_58	7412	CTCN_2922	17599
GTCN_58	7413	TTCN_3356	17600
ATCN_59	7414	CTCN_2923	17601
ATCN_60	7415	TTCN_3357	17602
ATCN_61	7416	GTCN_1747	17603
TTCN_118	7417	CTCN_2924	17604
ATCN_62	7418	CTCN_2925	17605
TTCN_119	7419	TTCN_3358	17606
CTCN_92	7420	TTCN_3359	17607
CTCN_93	7421	TTCN_3360	17608
GTCN_59	7422	TTCN_3361	17609
ATCN_63	7423	CTCN_2926	17610
CTCN_94	7424	TTCN_3362	17611
ATCN_64	7425	CTCN_2927	17612
TTCN_120	7426	TTCN_3363	17613
ATCN_65	7427	CTCN_2928	17614
TTCN_121	7428	CTCN_2929	17615
TTCN_122	7429	TTCN_3364	17616
GTCN_60	7430	CTCN_2930	17617
TTCN_123	7431	TTCN_3365	17618
CTCN_95	7432	ATCN_2067	17619
CTCN_96	7433	TTCN_3366	17620
GTCN_61	7434	CTCN_2931	17621
TTCN_124	7435	CTCN_2932	17622
ATCN_66	7436	CTCN_2933	17623
TTCN_125	7437	GTCN_1748	17624
ATCN_67	7438	CTCN_2934	17625
TTCN_126	7439	ATCN_2068	17626
TTCN_127	7440	CTCN_2935	17627
GTCN_62	7441	CTCN_2936	17628
CTCN_97	7442	CTCN_2937	17629
TTCN_128	7443	GTCN_1749	17630
CTCN_98	7444	GTCN_1750	17631
TTCN_129	7445	GTCN_1751	17632
CTCN_99	7446	CTCN_2938	17633
GTCN_63	7447	TTCN_3367	17634
TTCN_130	7448	TTCN_3368	17635
TTCN_131	7449	GTCN_1752	17636
TTCN_132	7450	GTCN_1753	17637
GTCN_64	7451	CTCN_2939	17638
ATCN_68	7452	TTCN_3369	17639
ATCN_69	7453	CTCN_2940	17640
TTCN_133	7454	ATCN_2069	17641
ATCN_70	7455	CTCN_2941	17642
CTCN_100	7456	CTCN_2942	17643
GTCN_65	7457	CTCN_2943	17644
CTCN_101	7458	GTCN_1754	17645
TTCN_134	7459	TTCN_3370	17646
ATCN_71	7460	ATCN_2070	17647
TTCN_135	7461	CTCN_2944	17648
ATCN_72	7462	CTCN_2945	17649
GTCN_66	7463	CTCN_2946	17650
GTCN_67	7464	GTCN_1755	17651
ATCN_73	7465	ATCN_2071	17652
ATCN_74	7466	TTCN_3371	17653

TTCN_136	7467	TTCN_3372	17654
ATCN_75	7468	ATCN_2072	17655
CTCN_102	7469	CTCN_2947	17656
TTCN_137	7470	ATCN_2073	17657
TTCN_138	7471	TTCN_3373	17658
GTCN_68	7472	CTCN_2948	17659
TTCN_139	7473	CTCN_2949	17660
GTCN_69	7474	CTCN_2950	17661
TTCN_140	7475	CTCN_2951	17662
ATCN_76	7476	GTCN_1756	17663
CTCN_103	7477	CTCN_2952	17664
TTCN_141	7478	CTCN_2953	17665
ATCN_77	7479	ATCN_2074	17666
GTCN_70	7480	TTCN_3374	17667
GTCN_71	7481	ATCN_2075	17668
GTCN_72	7482	ATCN_2076	17669
CTCN_104	7483	ATCN_2077	17670
GTCN_73	7484	GTCN_1757	17671
TTCN_142	7485	CTCN_2954	17672
ATCN_78	7486	TTCN_3375	17673
GTCN_74	7487	ATCN_2078	17674
TTCN_143	7488	CTCN_2955	17675
TTCN_144	7489	CTCN_2956	17676
CTCN_105	7490	TTCN_3376	17677
TTCN_145	7491	CTCN_2957	17678
TTCN_146	7492	CTCN_2958	17679
GTCN_75	7493	ATCN_2079	17680
GTCN_76	7494	TTCN_3377	17681
GTCN_77	7495	TTCN_3378	17682
CTCN_106	7496	ATCN_2080	17683
ATCN_79	7497	CTCN_2959	17684
ATCN_80	7498	TTCN_3379	17685
ATCN_81	7499	CTCN_2960	17686
ATCN_82	7500	TTCN_3380	17687
CTCN_107	7501	TTCN_3381	17688
CTCN_108	7502	TTCN_3382	17689
TTCN_147	7503	ATCN_2081	17690
CTCN_109	7504	TTCN_3383	17691
TTCN_148	7505	CTCN_2961	17692
TTCN_149	7506	TTCN_3384	17693
CTCN_110	7507	ATCN_2082	17694
TTCN_150	7508	CTCN_2962	17695
ATCN_83	7509	ATCN_2083	17696
TTCN_151	7510	ATCN_2084	17697
ATCN_84	7511	CTCN_2963	17698
ATCN_85	7512	TTCN_3385	17699
CTCN_111	7513	ATCN_2085	17700
CTCN_112	7514	CTCN_2964	17701
ATCN_86	7515	ATCN_2086	17702
CTCN_113	7516	CTCN_2965	17703
CTCN_114	7517	TTCN_3386	17704
ATCN_87	7518	TTCN_3387	17705
TTCN_152	7519	CTCN_2966	17706
ATCN_88	7520	GTCN_1758	17707
GTCN_78	7521	ATCN_2087	17708

FIG. 36 (continued)

GTCN_79	7522	TTCN_3388	17709
CTCN_115	7523	GTCN_1759	17710
TTCN_153	7524	CTCN_2967	17711
ATCN_89	7525	CTCN_2968	17712
GTCN_80	7526	CTCN_2969	17713
ATCN_90	7527	GTCN_1760	17714
CTCN_116	7528	CTCN_2970	17715
ATCN_91	7529	TTCN_3389	17716
ATCN_92	7530	ATCN_2088	17717
CTCN_117	7531	TTCN_3390	17718
TTCN_154	7532	TTCN_3391	17719
CTCN_118	7533	TTCN_3392	17720
GTCN_81	7534	CTCN_2971	17721
CTCN_119	7535	CTCN_2972	17722
TTCN_155	7536	TTCN_3393	17723
CTCN_120	7537	ATCN_2089	17724
TTCN_156	7538	ATCN_2090	17725
ATCN_93	7539	TTCN_3394	17726
TTCN_157	7540	CTCN_2973	17727
GTCN_82	7541	TTCN_3395	17728
GTCN_83	7542	TTCN_3396	17729
CTCN_121	7543	GTCN_1761	17730
TTCN_158	7544	TTCN_3397	17731
ATCN_94	7545	TTCN_3398	17732
GTCN_84	7546	TTCN_3399	17733
CTCN_122	7547	TTCN_3400	17734
TTCN_159	7548	ATCN_2091	17735
TTCN_160	7549	ATCN_2092	17736
TTCN_161	7550	ATCN_2093	17737
CTCN_123	7551	GTCN_1762	17738
ATCN_95	7552	ATCN_2094	17739
TTCN_162	7553	CTCN_2974	17740
CTCN_124	7554	TTCN_3401	17741
TTCN_163	7555	GTCN_1763	17742
CTCN_125	7556	CTCN_2975	17743
ATCN_96	7557	TTCN_3402	17744
TTCN_164	7558	TTCN_3403	17745
CTCN_126	7559	TTCN_3404	17746
TTCN_165	7560	ATCN_2095	17747
TTCN_166	7561	ATCN_2096	17748
TTCN_167	7562	TTCN_3405	17749
CTCN_127	7563	TTCN_3406	17750
TTCN_168	7564	ATCN_2097	17751
CTCN_128	7565	ATCN_2098	17752
TTCN_169	7566	CTCN_2976	17753
GTCN_85	7567	CTCN_2977	17754
CTCN_129	7568	ATCN_2099	17755
TTCN_170	7569	ATCN_2100	17756
TTCN_171	7570	TTCN_3407	17757
GTCN_86	7571	CTCN_2978	17758
GTCN_87	7572	CTCN_2979	17759
CTCN_130	7573	TTCN_3408	17760
TTCN_172	7574	TTCN_3409	17761
ATCN_97	7575	GTCN_1764	17762
TTCN_173	7576	CTCN_2980	17763

GTCN_88	7577	GTCN_1765	17764
GTCN_89	7578	TTCN_3410	17765
CTCN_131	7579	CTCN_2981	17766
TTCN_174	7580	CTCN_2982	17767
TTCN_175	7581	GTCN_1766	17768
GTCN_90	7582	CTCN_2983	17769
TTCN_176	7583	TTCN_3411	17770
GTCN_91	7584	GTCN_1767	17771
CTCN_132	7585	CTCN_2984	17772
CTCN_133	7586	TTCN_3412	17773
CTCN_134	7587	GTCN_1768	17774
ATCN_98	7588	CTCN_2985	17775
ATCN_99	7589	ATCN_2101	17776
TTCN_177	7590	CTCN_2986	17777
CTCN_135	7591	GTCN_1769	17778
TTCN_178	7592	CTCN_2987	17779
TTCN_179	7593	TTCN_3413	17780
CTCN_136	7594	ATCN_2102	17781
CTCN_137	7595	ATCN_2103	17782
TTCN_180	7596	TTCN_3414	17783
TTCN_181	7597	ATCN_2104	17784
CTCN_138	7598	CTCN_2988	17785
TTCN_182	7599	GTCN_1770	17786
ATCN_100	7600	CTCN_2989	17787
CTCN_139	7601	GTCN_1771	17788
CTCN_140	7602	GTCN_1772	17789
CTCN_141	7603	TTCN_3415	17790
CTCN_142	7604	GTCN_1773	17791
GTCN_92	7605	GTCN_1774	17792
CTCN_143	7606	CTCN_2990	17793
TTCN_183	7607	TTCN_3416	17794
CTCN_144	7608	ATCN_2105	17795
TTCN_184	7609	ATCN_2106	17796
TTCN_185	7610	ATCN_2107	17797
ATCN_101	7611	ATCN_2108	17798
GTCN_93	7612	CTCN_2991	17799
ATCN_102	7613	TTCN_3417	17800
GTCN_94	7614	CTCN_2992	17801
ATCN_103	7615	TTCN_3418	17802
ATCN_104	7616	TTCN_3419	17803
ATCN_105	7617	CTCN_2993	17804
CTCN_145	7618	CTCN_2994	17805
TTCN_186	7619	GTCN_1775	17806
TTCN_187	7620	TTCN_3420	17807
ATCN_106	7621	TTCN_3421	17808
TTCN_188	7622	CTCN_2995	17809
TTCN_189	7623	TTCN_3422	17810
TTCN_190	7624	TTCN_3423	17811
ATCN_107	7625	CTCN_2996	17812
TTCN_191	7626	TTCN_3424	17813
ATCN_108	7627	ATCN_2109	17814
ATCN_109	7628	CTCN_2997	17815
CTCN_146	7629	TTCN_3425	17816
CTCN_147	7630	TTCN_3426	17817
GTCN_95	7631	CTCN_2998	17818

FIG. 36 (continued)

TTCN_192	7632	TTCN_3427	17819
TTCN_193	7633	CTCN_2999	17820
TTCN_194	7634	TTCN_3428	17821
ATCN_110	7635	TTCN_3429	17822
TTCN_195	7636	ATCN_2110	17823
ATCN_111	7637	ATCN_2111	17824
CTCN_148	7638	ATCN_2112	17825
ATCN_112	7639	ATCN_2113	17826
GTCN_96	7640	TTCN_3430	17827
CTCN_149	7641	TTCN_3431	17828
ATCN_113	7642	TTCN_3432	17829
GTCN_97	7643	TTCN_3433	17830
CTCN_150	7644	CTCN_3000	17831
TTCN_196	7645	ATCN_2114	17832
TTCN_197	7646	CTCN_3001	17833
CTCN_151	7647	TTCN_3434	17834
TTCN_198	7648	CTCN_3002	17835
TTCN_199	7649	TTCN_3435	17836
CTCN_152	7650	ATCN_2115	17837
TTCN_200	7651	ATCN_2116	17838
ATCN_114	7652	ATCN_2117	17839
ATCN_115	7653	CTCN_3003	17840
TTCN_201	7654	TTCN_3436	17841
CTCN_153	7655	ATCN_2118	17842
ATCN_116	7656	TTCN_3437	17843
TTCN_202	7657	CTCN_3004	17844
TTCN_203	7658	CTCN_3005	17845
ATCN_117	7659	CTCN_3006	17846
GTCN_98	7660	CTCN_3007	17847
GTCN_99	7661	CTCN_3008	17848
TTCN_204	7662	TTCN_3438	17849
GTCN_100	7663	TTCN_3439	17850
TTCN_205	7664	CTCN_3009	17851
CTCN_154	7665	GTCN_1776	17852
CTCN_155	7666	TTCN_3440	17853
ATCN_118	7667	CTCN_3010	17854
ATCN_119	7668	CTCN_3011	17855
ATCN_120	7669	CTCN_3012	17856
ATCN_121	7670	GTCN_1777	17857
CTCN_156	7671	TTCN_3441	17858
CTCN_157	7672	ATCN_2119	17859
TTCN_206	7673	CTCN_3013	17860
GTCN_101	7674	CTCN_3014	17861
ATCN_122	7675	CTCN_3015	17862
GTCN_102	7676	TTCN_3442	17863
CTCN_158	7677	CTCN_3016	17864
TTCN_207	7678	TTCN_3443	17865
ATCN_123	7679	CTCN_3017	17866
ATCN_124	7680	GTCN_1778	17867
ATCN_125	7681	ATCN_2120	17868
CTCN_159	7682	CTCN_3018	17869
GTCN_103	7683	ATCN_2121	17870
CTCN_160	7684	TTCN_3444	17871
TTCN_208	7685	ATCN_2122	17872
TTCN_209	7686	ATCN_2123	17873

CTCN_161	7687	TTCN_3445	17874
GTCN_104	7688	CTCN_3019	17875
CTCN_162	7689	ATCN_2124	17876
CTCN_163	7690	TTCN_3446	17877
GTCN_105	7691	CTCN_3020	17878
TTCN_210	7692	TTCN_3447	17879
TTCN_211	7693	ATCN_2125	17880
CTCN_164	7694	TTCN_3448	17881
GTCN_106	7695	TTCN_3449	17882
TTCN_212	7696	ATCN_2126	17883
TTCN_213	7697	GTCN_1779	17884
CTCN_165	7698	CTCN_3021	17885
TTCN_214	7699	TTCN_3450	17886
TTCN_215	7700	CTCN_3022	17887
TTCN_216	7701	GTCN_1780	17888
CTCN_166	7702	TTCN_3451	17889
GTCN_107	7703	ATCN_2127	17890
CTCN_167	7704	ATCN_2128	17891
GTCN_108	7705	TTCN_3452	17892
CTCN_168	7706	ATCN_2129	17893
ATCN_126	7707	CTCN_3023	17894
TTCN_217	7708	GTCN_1781	17895
TTCN_218	7709	TTCN_3453	17896
ATCN_127	7710	ATCN_2130	17897
TTCN_219	7711	ATCN_2131	17898
GTCN_109	7712	ATCN_2132	17899
CTCN_169	7713	ATCN_2133	17900
TTCN_220	7714	GTCN_1782	17901
TTCN_221	7715	GTCN_1783	17902
CTCN_170	7716	CTCN_3024	17903
TTCN_222	7717	ATCN_2134	17904
TTCN_223	7718	TTCN_3454	17905
CTCN_171	7719	TTCN_3455	17906
TTCN_224	7720	CTCN_3025	17907
CTCN_172	7721	CTCN_3026	17908
CTCN_173	7722	CTCN_3027	17909
CTCN_174	7723	GTCN_1784	17910
CTCN_175	7724	GTCN_1785	17911
TTCN_225	7725	TTCN_3456	17912
GTCN_110	7726	TTCN_3457	17913
ATCN_128	7727	GTCN_1786	17914
ATCN_129	7728	TTCN_3458	17915
TTCN_226	7729	TTCN_3459	17916
ATCN_130	7730	CTCN_3028	17917
TTCN_227	7731	CTCN_3029	17918
GTCN_111	7732	TTCN_3460	17919
CTCN_176	7733	TTCN_3461	17920
TTCN_228	7734	ATCN_2135	17921
CTCN_177	7735	TTCN_3462	17922
CTCN_178	7736	ATCN_2136	17923
GTCN_112	7737	CTCN_3030	17924
CTCN_179	7738	ATCN_2137	17925
ATCN_131	7739	CTCN_3031	17926
ATCN_132	7740	CTCN_3032	17927
ATCN_133	7741	CTCN_3033	17928

FIG. 36 (continued)

CTCN_180	7742	GTCN_1787	17929
ATCN_134	7743	ATCN_2138	17930
CTCN_181	7744	ATCN_2139	17931
ATCN_135	7745	GTCN_1788	17932
TTCN_229	7746	TTCN_3463	17933
TTCN_230	7747	CTCN_3034	17934
TTCN_231	7748	CTCN_3035	17935
CTCN_182	7749	CTCN_3036	17936
GTCN_113	7750	CTCN_3037	17937
CTCN_183	7751	TTCN_3464	17938
CTCN_184	7752	TTCN_3465	17939
GTCN_114	7753	ATCN_2140	17940
CTCN_185	7754	ATCN_2141	17941
ATCN_136	7755	TTCN_3466	17942
CTCN_186	7756	CTCN_3038	17943
TTCN_232	7757	TTCN_3467	17944
CTCN_187	7758	TTCN_3468	17945
CTCN_188	7759	TTCN_3469	17946
GTCN_115	7760	ATCN_2142	17947
CTCN_189	7761	TTCN_3470	17948
CTCN_190	7762	GTCN_1789	17949
TTCN_233	7763	CTCN_3039	17950
CTCN_191	7764	TTCN_3471	17951
CTCN_192	7765	ATCN_2143	17952
ATCN_137	7766	TTCN_3472	17953
CTCN_193	7767	TTCN_3473	17954
CTCN_194	7768	CTCN_3040	17955
CTCN_195	7769	CTCN_3041	17956
GTCN_116	7770	TTCN_3474	17957
CTCN_196	7771	ATCN_2144	17958
GTCN_117	7772	TTCN_3475	17959
GTCN_118	7773	TTCN_3476	17960
ATCN_138	7774	TTCN_3477	17961
TTCN_234	7775	CTCN_3042	17962
TTCN_235	7776	TTCN_3478	17963
ATCN_139	7777	CTCN_3043	17964
CTCN_197	7778	ATCN_2145	17965
TTCN_236	7779	CTCN_3044	17966
CTCN_198	7780	CTCN_3045	17967
CTCN_199	7781	CTCN_3046	17968
ATCN_140	7782	ATCN_2146	17969
ATCN_141	7783	ATCN_2147	17970
TTCN_237	7784	GTCN_1790	17971
TTCN_238	7785	CTCN_3047	17972
ATCN_142	7786	ATCN_2148	17973
CTCN_200	7787	ATCN_2149	17974
GTCN_119	7788	GTCN_1791	17975
ATCN_143	7789	ATCN_2150	17976
TTCN_239	7790	TTCN_3479	17977
CTCN_201	7791	ATCN_2151	17978
GTCN_120	7792	CTCN_3048	17979
CTCN_202	7793	ATCN_2152	17980
ATCN_144	7794	GTCN_1792	17981
TTCN_240	7795	CTCN_3049	17982
GTCN_121	7796	CTCN_3050	17983

TTCN_241	7797	CTCN_3051	17984
TTCN_242	7798	GTCN_1793	17985
CTCN_203	7799	CTCN_3052	17986
GTCN_122	7800	CTCN_3053	17987
TTCN_243	7801	TTCN_3480	17988
ATCN_145	7802	TTCN_3481	17989
ATCN_146	7803	CTCN_3054	17990
GTCN_123	7804	CTCN_3055	17991
CTCN_204	7805	ATCN_2153	17992
TTCN_244	7806	CTCN_3056	17993
ATCN_147	7807	CTCN_3057	17994
GTCN_124	7808	ATCN_2154	17995
TTCN_245	7809	ATCN_2155	17996
TTCN_246	7810	ATCN_2156	17997
GTCN_125	7811	CTCN_3058	17998
TTCN_247	7812	CTCN_3059	17999
TTCN_248	7813	GTCN_1794	18000
TTCN_249	7814	CTCN_3060	18001
CTCN_205	7815	TTCN_3482	18002
TTCN_250	7816	CTCN_3061	18003
GTCN_126	7817	TTCN_3483	18004
GTCN_127	7818	GTCN_1795	18005
TTCN_251	7819	CTCN_3062	18006
TTCN_252	7820	ATCN_2157	18007
TTCN_253	7821	ATCN_2158	18008
GTCN_128	7822	TTCN_3484	18009
TTCN_254	7823	CTCN_3063	18010
GTCN_129	7824	CTCN_3064	18011
TTCN_255	7825	ATCN_2159	18012
TTCN_256	7826	ATCN_2160	18013
ATCN_148	7827	TTCN_3485	18014
ATCN_149	7828	CTCN_3065	18015
ATCN_150	7829	GTCN_1796	18016
ATCN_151	7830	CTCN_3066	18017
TTCN_257	7831	GTCN_1797	18018
GTCN_130	7832	TTCN_3486	18019
TTCN_258	7833	CTCN_3067	18020
TTCN_259	7834	TTCN_3487	18021
GTCN_131	7835	ATCN_2161	18022
TTCN_260	7836	CTCN_3068	18023
TTCN_261	7837	TTCN_3488	18024
CTCN_206	7838	GTCN_1798	18025
ATCN_152	7839	TTCN_3489	18026
TTCN_262	7840	ATCN_2162	18027
TTCN_263	7841	CTCN_3069	18028
ATCN_153	7842	GTCN_1799	18029
ATCN_154	7843	ATCN_2163	18030
CTCN_207	7844	GTCN_1800	18031
ATCN_155	7845	ATCN_2164	18032
TTCN_264	7846	TTCN_3490	18033
GTCN_132	7847	CTCN_3070	18034
CTCN_208	7848	CTCN_3071	18035
GTCN_133	7849	ATCN_2165	18036
CTCN_209	7850	ATCN_2166	18037
ATCN_156	7851	CTCN_3072	18038

FIG. 36 (continued)

GTCN_134	7852	ATCN_2167	18039
TTCN_265	7853	TTCN_3491	18040
TTCN_266	7854	CTCN_3073	18041
GTCN_135	7855	GTCN_1801	18042
ATCN_157	7856	TTCN_3492	18043
GTCN_136	7857	TTCN_3493	18044
TTCN_267	7858	ATCN_2168	18045
TTCN_268	7859	ATCN_2169	18046
CTCN_210	7860	TTCN_3494	18047
ATCN_158	7861	TTCN_3495	18048
CTCN_211	7862	TTCN_3496	18049
ATCN_159	7863	CTCN_3074	18050
ATCN_160	7864	GTCN_1802	18051
GTCN_137	7865	GTCN_1803	18052
ATCN_161	7866	ATCN_2170	18053
TTCN_269	7867	TTCN_3497	18054
TTCN_270	7868	TTCN_3498	18055
ATCN_162	7869	GTCN_1804	18056
ATCN_163	7870	ATCN_2171	18057
GTCN_138	7871	CTCN_3075	18058
ATCN_164	7872	GTCN_1805	18059
CTCN_212	7873	CTCN_3076	18060
ATCN_165	7874	TTCN_3499	18061
CTCN_213	7875	CTCN_3077	18062
CTCN_214	7876	ATCN_2172	18063
ATCN_166	7877	ATCN_2173	18064
GTCN_139	7878	TTCN_3500	18065
TTCN_271	7879	GTCN_1806	18066
CTCN_215	7880	GTCN_1807	18067
TTCN_272	7881	CTCN_3078	18068
GTCN_140	7882	GTCN_1808	18069
CTCN_216	7883	TTCN_3501	18070
GTCN_141	7884	TTCN_3502	18071
CTCN_217	7885	GTCN_1809	18072
GTCN_142	7886	ATCN_2174	18073
ATCN_167	7887	ATCN_2175	18074
CTCN_218	7888	GTCN_1810	18075
TTCN_273	7889	GTCN_1811	18076
TTCN_274	7890	CTCN_3079	18077
CTCN_219	7891	ATCN_2176	18078
CTCN_220	7892	TTCN_3503	18079
CTCN_221	7893	CTCN_3080	18080
TTCN_275	7894	ATCN_2177	18081
CTCN_222	7895	CTCN_3081	18082
ATCN_168	7896	TTCN_3504	18083
TTCN_276	7897	GTCN_1812	18084
ATCN_169	7898	CTCN_3082	18085
TTCN_277	7899	TTCN_3505	18086
TTCN_278	7900	TTCN_3506	18087
TTCN_279	7901	ATCN_2178	18088
TTCN_280	7902	TTCN_3507	18089
CTCN_223	7903	CTCN_3083	18090
TTCN_281	7904	TTCN_3508	18091
TTCN_282	7905	ATCN_2179	18092
TTCN_283	7906	ATCN_2180	18093

TTCN_284	7907	ATCN_2181	18094
GTCN_143	7908	ATCN_2182	18095
ATCN_170	7909	CTCN_3084	18096
TTCN_285	7910	TTCN_3509	18097
TTCN_286	7911	CTCN_3085	18098
TTCN_287	7912	CTCN_3086	18099
CTCN_224	7913	TTCN_3510	18100
GTCN_144	7914	TTCN_3511	18101
TTCN_288	7915	TTCN_3512	18102
TTCN_289	7916	TTCN_3513	18103
ATCN_171	7917	GTCN_1813	18104
GTCN_145	7918	TTCN_3514	18105
CTCN_225	7919	TTCN_3515	18106
TTCN_290	7920	ATCN_2183	18107
CTCN_226	7921	ATCN_2184	18108
CTCN_227	7922	TTCN_3516	18109
TTCN_291	7923	ATCN_2185	18110
CTCN_228	7924	ATCN_2186	18111
TTCN_292	7925	ATCN_2187	18112
ATCN_172	7926	TTCN_3517	18113
ATCN_173	7927	GTCN_1814	18114
ATCN_174	7928	CTCN_3087	18115
TTCN_293	7929	TTCN_3518	18116
CTCN_229	7930	ATCN_2188	18117
TTCN_294	7931	GTCN_1815	18118
ATCN_175	7932	TTCN_3519	18119
TTCN_295	7933	TTCN_3520	18120
TTCN_296	7934	CTCN_3088	18121
ATCN_176	7935	TTCN_3521	18122
ATCN_177	7936	TTCN_3522	18123
TTCN_297	7937	TTCN_3523	18124
TTCN_298	7938	TTCN_3524	18125
ATCN_178	7939	CTCN_3089	18126
TTCN_299	7940	TTCN_3525	18127
ATCN_179	7941	ATCN_2189	18128
TTCN_300	7942	ATCN_2190	18129
TTCN_301	7943	CTCN_3090	18130
TTCN_302	7944	ATCN_2191	18131
CTCN_230	7945	GTCN_1816	18132
TTCN_303	7946	TTCN_3526	18133
GTCN_146	7947	TTCN_3527	18134
GTCN_147	7948	CTCN_3091	18135
CTCN_231	7949	CTCN_3092	18136
TTCN_304	7950	GTCN_1817	18137
TTCN_305	7951	CTCN_3093	18138
TTCN_306	7952	CTCN_3094	18139
TTCN_307	7953	CTCN_3095	18140
TTCN_308	7954	TTCN_3528	18141
TTCN_309	7955	CTCN_3096	18142
ATCN_180	7956	CTCN_3097	18143
GTCN_148	7957	CTCN_3098	18144
TTCN_310	7958	CTCN_3099	18145
TTCN_311	7959	GTCN_1818	18146
TTCN_312	7960	ATCN_2192	18147
ATCN_181	7961	CTCN_3100	18148

FIG. 36 (continued)

ATCN_182	7962	CTCN_3101	18149
TTCN_313	7963	CTCN_3102	18150
CTCN_232	7964	TTCN_3529	18151
GTCN_149	7965	ATCN_2193	18152
ATCN_183	7966	TTCN_3530	18153
TTCN_314	7967	CTCN_3103	18154
ATCN_184	7968	GTCN_1819	18155
GTCN_150	7969	TTCN_3531	18156
GTCN_151	7970	CTCN_3104	18157
ATCN_185	7971	TTCN_3532	18158
TTCN_315	7972	CTCN_3105	18159
TTCN_316	7973	TTCN_3533	18160
CTCN_233	7974	TTCN_3534	18161
TTCN_317	7975	CTCN_3106	18162
TTCN_318	7976	GTCN_1820	18163
ATCN_186	7977	TTCN_3535	18164
ATCN_187	7978	ATCN_2194	18165
CTCN_234	7979	CTCN_3107	18166
CTCN_235	7980	CTCN_3108	18167
CTCN_236	7981	GTCN_1821	18168
TTCN_319	7982	CTCN_3109	18169
GTCN_152	7983	GTCN_1822	18170
GTCN_153	7984	GTCN_1823	18171
TTCN_320	7985	TTCN_3536	18172
TTCN_321	7986	ATCN_2195	18173
GTCN_154	7987	TTCN_3537	18174
TTCN_322	7988	GTCN_1824	18175
TTCN_323	7989	GTCN_1825	18176
TTCN_324	7990	ATCN_2196	18177
TTCN_325	7991	TTCN_3538	18178
GTCN_155	7992	TTCN_3539	18179
TTCN_326	7993	ATCN_2197	18180
TTCN_327	7994	GTCN_1826	18181
ATCN_188	7995	ATCN_2198	18182
ATCN_189	7996	ATCN_2199	18183
ATCN_190	7997	CTCN_3110	18184
CTCN_237	7998	TTCN_3540	18185
ATCN_191	7999	TTCN_3541	18186
GTCN_156	8000	TTCN_3542	18187
CTCN_238	8001	GTCN_1827	18188
TTCN_328	8002	ATCN_2200	18189
GTCN_157	8003	ATCN_2201	18190
GTCN_158	8004	TTCN_3543	18191
TTCN_329	8005	TTCN_3544	18192
TTCN_330	8006	TTCN_3545	18193
CTCN_239	8007	CTCN_3111	18194
ATCN_192	8008	TTCN_3546	18195
ATCN_193	8009	GTCN_1828	18196
TTCN_331	8010	TTCN_3547	18197
ATCN_194	8011	ATCN_2202	18198
ATCN_195	8012	ATCN_2203	18199
ATCN_196	8013	ATCN_2204	18200
TTCN_332	8014	ATCN_2205	18201
TTCN_333	8015	ATCN_2206	18202
GTCN_159	8016	TTCN_3548	18203

TTCN_334	8017	TTCN_3549	18204
ATCN_197	8018	ATCN_2207	18205
TTCN_335	8019	GTCN_1829	18206
ATCN_198	8020	CTCN_3112	18207
CTCN_240	8021	CTCN_3113	18208
CTCN_241	8022	GTCN_1830	18209
TTCN_336	8023	CTCN_3114	18210
GTCN_160	8024	GTCN_1831	18211
TTCN_337	8025	GTCN_1832	18212
TTCN_338	8026	CTCN_3115	18213
CTCN_242	8027	CTCN_3116	18214
GTCN_161	8028	ATCN_2208	18215
TTCN_339	8029	TTCN_3550	18216
CTCN_243	8030	GTCN_1833	18217
TTCN_340	8031	ATCN_2209	18218
ATCN_199	8032	TTCN_3551	18219
ATCN_200	8033	TTCN_3552	18220
CTCN_244	8034	ATCN_2210	18221
ATCN_201	8035	CTCN_3117	18222
TTCN_341	8036	CTCN_3118	18223
GTCN_162	8037	TTCN_3553	18224
CTCN_245	8038	CTCN_3119	18225
ATCN_202	8039	CTCN_3120	18226
GTCN_163	8040	GTCN_1834	18227
TTCN_342	8041	TTCN_3554	18228
TTCN_343	8042	TTCN_3555	18229
GTCN_164	8043	GTCN_1835	18230
GTCN_165	8044	GTCN_1836	18231
TTCN_344	8045	TTCN_3556	18232
TTCN_345	8046	TTCN_3557	18233
TTCN_346	8047	TTCN_3558	18234
ATCN_203	8048	GTCN_1837	18235
TTCN_347	8049	GTCN_1838	18236
ATCN_204	8050	ATCN_2211	18237
CTCN_246	8051	GTCN_1839	18238
GTCN_166	8052	CTCN_3121	18239
ATCN_205	8053	CTCN_3122	18240
TTCN_348	8054	TTCN_3559	18241
ATCN_206	8055	TTCN_3560	18242
CTCN_247	8056	TTCN_3561	18243
ATCN_207	8057	TTCN_3562	18244
ATCN_208	8058	TTCN_3563	18245
GTCN_167	8059	GTCN_1840	18246
ATCN_209	8060	TTCN_3564	18247
CTCN_248	8061	CTCN_3123	18248
CTCN_249	8062	GTCN_1841	18249
TTCN_349	8063	GTCN_1842	18250
GTCN_168	8064	CTCN_3124	18251
TTCN_350	8065	ATCN_2212	18252
ATCN_210	8066	ATCN_2213	18253
TTCN_351	8067	TTCN_3565	18254
TTCN_352	8068	CTCN_3125	18255
GTCN_169	8069	GTCN_1843	18256
TTCN_353	8070	GTCN_1844	18257
TTCN_354	8071	GTCN_1845	18258

FIG. 36 (continued)

GTCN_170	8072	CTCN_3126	18259
CTCN_250	8073	CTCN_3127	18260
GTCN_171	8074	GTCN_1846	18261
TTCN_355	8075	CTCN_3128	18262
TTCN_356	8076	TTCN_3566	18263
GTCN_172	8077	TTCN_3567	18264
ATCN_211	8078	CTCN_3129	18265
TTCN_357	8079	ATCN_2214	18266
TTCN_358	8080	ATCN_2215	18267
TTCN_359	8081	ATCN_2216	18268
CTCN_251	8082	CTCN_3130	18269
CTCN_252	8083	ATCN_2217	18270
ATCN_212	8084	ATCN_2218	18271
TTCN_360	8085	TTCN_3568	18272
TTCN_361	8086	GTCN_1847	18273
GTCN_173	8087	CTCN_3131	18274
TTCN_362	8088	CTCN_3132	18275
GTCN_174	8089	CTCN_3133	18276
ATCN_213	8090	CTCN_3134	18277
CTCN_253	8091	GTCN_1848	18278
GTCN_175	8092	ATCN_2219	18279
CTCN_254	8093	GTCN_1849	18280
TTCN_363	8094	ATCN_2220	18281
CTCN_255	8095	ATCN_2221	18282
GTCN_176	8096	CTCN_3135	18283
CTCN_256	8097	TTCN_3569	18284
CTCN_257	8098	GTCN_1850	18285
ATCN_214	8099	GTCN_1851	18286
CTCN_258	8100	TTCN_3570	18287
CTCN_259	8101	TTCN_3571	18288
TTCN_364	8102	TTCN_3572	18289
TTCN_365	8103	CTCN_3136	18290
GTCN_177	8104	ATCN_2222	18291
TTCN_366	8105	GTCN_1852	18292
ATCN_215	8106	CTCN_3137	18293
ATCN_216	8107	CTCN_3138	18294
TTCN_367	8108	TTCN_3573	18295
TTCN_368	8109	TTCN_3574	18296
TTCN_369	8110	ATCN_2223	18297
CTCN_260	8111	CTCN_3139	18298
TTCN_370	8112	CTCN_3140	18299
ATCN_217	8113	CTCN_3141	18300
TTCN_371	8114	ATCN_2224	18301
TTCN_372	8115	GTCN_1853	18302
ATCN_218	8116	CTCN_3142	18303
CTCN_261	8117	CTCN_3143	18304
GTCN_178	8118	CTCN_3144	18305
ATCN_219	8119	GTCN_1854	18306
ATCN_220	8120	CTCN_3145	18307
TTCN_373	8121	CTCN_3146	18308
TTCN_374	8122	CTCN_3147	18309
CTCN_262	8123	GTCN_1855	18310
TTCN_375	8124	CTCN_3148	18311
CTCN_263	8125	CTCN_3149	18312
CTCN_264	8126	ATCN_2225	18313

TTCN_376	8127	ATCN_2226	18314
CTCN_265	8128	TTCN_3575	18315
TTCN_377	8129	ATCN_2227	18316
TTCN_378	8130	ATCN_2228	18317
CTCN_266	8131	ATCN_2229	18318
TTCN_379	8132	GTCN_1856	18319
TTCN_380	8133	CTCN_3150	18320
ATCN_221	8134	CTCN_3151	18321
GTCN_179	8135	GTCN_1857	18322
CTCN_267	8136	TTCN_3576	18323
TTCN_381	8137	ATCN_2230	18324
GTCN_180	8138	GTCN_1858	18325
GTCN_181	8139	CTCN_3152	18326
TTCN_382	8140	TTCN_3577	18327
CTCN_268	8141	ATCN_2231	18328
GTCN_182	8142	CTCN_3153	18329
TTCN_383	8143	CTCN_3154	18330
TTCN_384	8144	CTCN_3155	18331
TTCN_385	8145	TTCN_3578	18332
TTCN_386	8146	TTCN_3579	18333
ATCN_222	8147	TTCN_3580	18334
CTCN_269	8148	ATCN_2232	18335
TTCN_387	8149	TTCN_3581	18336
ATCN_223	8150	CTCN_3156	18337
TTCN_388	8151	CTCN_3157	18338
TTCN_389	8152	ATCN_2233	18339
TTCN_390	8153	CTCN_3158	18340
TTCN_391	8154	CTCN_3159	18341
TTCN_392	8155	TTCN_3582	18342
CTCN_270	8156	CTCN_3160	18343
TTCN_393	8157	CTCN_3161	18344
ATCN_224	8158	CTCN_3162	18345
TTCN_394	8159	GTCN_1859	18346
CTCN_271	8160	TTCN_3583	18347
GTCN_183	8161	TTCN_3584	18348
GTCN_184	8162	CTCN_3163	18349
TTCN_395	8163	CTCN_3164	18350
CTCN_272	8164	GTCN_1860	18351
TTCN_396	8165	ATCN_2234	18352
CTCN_273	8166	TTCN_3585	18353
CTCN_274	8167	TTCN_3586	18354
TTCN_397	8168	TTCN_3587	18355
TTCN_398	8169	CTCN_3165	18356
ATCN_225	8170	GTCN_1861	18357
CTCN_275	8171	CTCN_3166	18358
TTCN_399	8172	TTCN_3588	18359
TTCN_400	8173	CTCN_3167	18360
ATCN_226	8174	CTCN_3168	18361
TTCN_401	8175	TTCN_3589	18362
TTCN_402	8176	CTCN_3169	18363
ATCN_227	8177	TTCN_3590	18364
GTCN_185	8178	ATCN_2235	18365
TTCN_403	8179	GTCN_1862	18366
GTCN_186	8180	CTCN_3170	18367
ATCN_228	8181	GTCN_1863	18368

FIG. 36 (continued)

CTCN_276	8182	CTCN_3171	18369
TTCN_404	8183	CTCN_3172	18370
TTCN_405	8184	ATCN_2236	18371
ATCN_229	8185	TTCN_3591	18372
GTCN_187	8186	GTCN_1864	18373
ATCN_230	8187	CTCN_3173	18374
CTCN_277	8188	ATCN_2237	18375
GTCN_188	8189	CTCN_3174	18376
TTCN_406	8190	TTCN_3592	18377
ATCN_231	8191	CTCN_3175	18378
ATCN_232	8192	CTCN_3176	18379
ATCN_233	8193	TTCN_3593	18380
ATCN_234	8194	TTCN_3594	18381
GTCN_189	8195	CTCN_3177	18382
TTCN_407	8196	TTCN_3595	18383
TTCN_408	8197	CTCN_3178	18384
TTCN_409	8198	TTCN_3596	18385
CTCN_278	8199	ATCN_2238	18386
ATCN_235	8200	CTCN_3179	18387
ATCN_236	8201	TTCN_3597	18388
GTCN_190	8202	TTCN_3598	18389
TTCN_410	8203	TTCN_3599	18390
GTCN_191	8204	CTCN_3180	18391
TTCN_411	8205	ATCN_2239	18392
TTCN_412	8206	CTCN_3181	18393
TTCN_413	8207	GTCN_1865	18394
GTCN_192	8208	CTCN_3182	18395
CTCN_279	8209	ATCN_2240	18396
TTCN_414	8210	CTCN_3183	18397
CTCN_280	8211	GTCN_1866	18398
TTCN_415	8212	TTCN_3600	18399
TTCN_416	8213	ATCN_2241	18400
ATCN_237	8214	TTCN_3601	18401
CTCN_281	8215	CTCN_3184	18402
TTCN_417	8216	ATCN_2242	18403
GTCN_193	8217	CTCN_3185	18404
TTCN_418	8218	CTCN_3186	18405
ATCN_238	8219	CTCN_3187	18406
TTCN_419	8220	ATCN_2243	18407
GTCN_194	8221	CTCN_3188	18408
GTCN_195	8222	ATCN_2244	18409
GTCN_196	8223	ATCN_2245	18410
CTCN_282	8224	TTCN_3602	18411
CTCN_283	8225	CTCN_3189	18412
ATCN_239	8226	TTCN_3603	18413
TTCN_420	8227	CTCN_3190	18414
ATCN_240	8228	GTCN_1867	18415
TTCN_421	8229	CTCN_3191	18416
GTCN_197	8230	ATCN_2246	18417
TTCN_422	8231	TTCN_3604	18418
TTCN_423	8232	ATCN_2247	18419
TTCN_424	8233	TTCN_3605	18420
TTCN_425	8234	CTCN_3192	18421
GTCN_198	8235	CTCN_3193	18422
TTCN_426	8236	TTCN_3606	18423

TTCN_427	8237	TTCN_3607	18424
CTCN_284	8238	ATCN_2248	18425
CTCN_285	8239	ATCN_2249	18426
CTCN_286	8240	TTCN_3608	18427
ATCN_241	8241	TTCN_3609	18428
TTCN_428	8242	TTCN_3610	18429
CTCN_287	8243	CTCN_3194	18430
CTCN_288	8244	TTCN_3611	18431
TTCN_429	8245	TTCN_3612	18432
ATCN_242	8246	TTCN_3613	18433
CTCN_289	8247	ATCN_2250	18434
ATCN_243	8248	CTCN_3195	18435
CTCN_290	8249	ATCN_2251	18436
CTCN_291	8250	ATCN_2252	18437
ATCN_244	8251	GTCN_1868	18438
ATCN_245	8252	CTCN_3196	18439
CTCN_292	8253	GTCN_1869	18440
CTCN_293	8254	GTCN_1870	18441
TTCN_430	8255	ATCN_2253	18442
TTCN_431	8256	CTCN_3197	18443
ATCN_246	8257	TTCN_3614	18444
TTCN_432	8258	ATCN_2254	18445
TTCN_433	8259	TTCN_3615	18446
TTCN_434	8260	CTCN_3198	18447
CTCN_294	8261	GTCN_1871	18448
CTCN_295	8262	GTCN_1872	18449
CTCN_296	8263	CTCN_3199	18450
CTCN_297	8264	GTCN_1873	18451
CTCN_298	8265	ATCN_2255	18452
CTCN_299	8266	ATCN_2256	18453
TTCN_435	8267	GTCN_1874	18454
GTCN_199	8268	CTCN_3200	18455
TTCN_436	8269	CTCN_3201	18456
CTCN_300	8270	TTCN_3616	18457
CTCN_301	8271	CTCN_3202	18458
CTCN_302	8272	ATCN_2257	18459
GTCN_200	8273	ATCN_2258	18460
CTCN_303	8274	GTCN_1875	18461
TTCN_437	8275	ATCN_2259	18462
CTCN_304	8276	ATCN_2260	18463
ATCN_247	8277	CTCN_3203	18464
CTCN_305	8278	GTCN_1876	18465
GTCN_201	8279	ATCN_2261	18466
CTCN_306	8280	ATCN_2262	18467
TTCN_438	8281	TTCN_3617	18468
TTCN_439	8282	GTCN_1877	18469
CTCN_307	8283	CTCN_3204	18470
CTCN_308	8284	CTCN_3205	18471
CTCN_309	8285	GTCN_1878	18472
TTCN_440	8286	CTCN_3206	18473
CTCN_310	8287	ATCN_2263	18474
CTCN_311	8288	GTCN_1879	18475
CTCN_312	8289	GTCN_1880	18476
CTCN_313	8290	GTCN_1881	18477
TTCN_441	8291	TTCN_3618	18478

FIG. 36 (continued)

TTCN_442	8292	ATCN_2264	18479
ATCN_248	8293	ATCN_2265	18480
ATCN_249	8294	TTCN_3619	18481
TTCN_443	8295	CTCN_3207	18482
CTCN_314	8296	GTCN_1882	18483
TTCN_444	8297	ATCN_2266	18484
ATCN_250	8298	TTCN_3620	18485
CTCN_315	8299	ATCN_2267	18486
CTCN_316	8300	ATCN_2268	18487
CTCN_317	8301	GTCN_1883	18488
CTCN_318	8302	GTCN_1884	18489
TTCN_445	8303	CTCN_3208	18490
CTCN_319	8304	GTCN_1885	18491
GTCN_202	8305	GTCN_1886	18492
TTCN_446	8306	TTCN_3621	18493
TTCN_447	8307	CTCN_3209	18494
TTCN_448	8308	CTCN_3210	18495
GTCN_203	8309	ATCN_2269	18496
TTCN_449	8310	GTCN_1887	18497
CTCN_320	8311	TTCN_3622	18498
CTCN_321	8312	TTCN_3623	18499
CTCN_322	8313	TTCN_3624	18500
TTCN_450	8314	GTCN_1888	18501
TTCN_451	8315	TTCN_3625	18502
GTCN_204	8316	TTCN_3626	18503
GTCN_205	8317	TTCN_3627	18504
TTCN_452	8318	TTCN_3628	18505
ATCN_251	8319	TTCN_3629	18506
GTCN_206	8320	TTCN_3630	18507
GTCN_207	8321	TTCN_3631	18508
GTCN_208	8322	CTCN_3211	18509
CTCN_323	8323	CTCN_3212	18510
ATCN_252	8324	GTCN_1889	18511
TTCN_453	8325	ATCN_2270	18512
CTCN_324	8326	GTCN_1890	18513
TTCN_454	8327	CTCN_3213	18514
GTCN_209	8328	CTCN_3214	18515
GTCN_210	8329	ATCN_2271	18516
TTCN_455	8330	GTCN_1891	18517
TTCN_456	8331	CTCN_3215	18518
CTCN_325	8332	ATCN_2272	18519
TTCN_457	8333	CTCN_3216	18520
ATCN_253	8334	TTCN_3632	18521
GTCN_211	8335	CTCN_3217	18522
GTCN_212	8336	TTCN_3633	18523
GTCN_213	8337	GTCN_1892	18524
CTCN_326	8338	CTCN_3218	18525
CTCN_327	8339	TTCN_3634	18526
CTCN_328	8340	GTCN_1893	18527
CTCN_329	8341	TTCN_3635	18528
GTCN_214	8342	ATCN_2273	18529
TTCN_458	8343	TTCN_3636	18530
ATCN_254	8344	CTCN_3219	18531
GTCN_215	8345	TTCN_3637	18532
TTCN_459	8346	CTCN_3220	18533

GTCN_216	8347	CTCN_3221	18534
CTCN_330	8348	CTCN_3222	18535
CTCN_331	8349	GTCN_1894	18536
ATCN_255	8350	CTCN_3223	18537
ATCN_256	8351	CTCN_3224	18538
TTCN_460	8352	CTCN_3225	18539
TTCN_461	8353	TTCN_3638	18540
GTCN_217	8354	CTCN_3226	18541
TTCN_462	8355	GTCN_1895	18542
TTCN_463	8356	CTCN_3227	18543
TTCN_464	8357	TTCN_3639	18544
GTCN_218	8358	CTCN_3228	18545
CTCN_332	8359	TTCN_3640	18546
ATCN_257	8360	TTCN_3641	18547
TTCN_465	8361	CTCN_3229	18548
ATCN_258	8362	CTCN_3230	18549
ATCN_259	8363	CTCN_3231	18550
ATCN_260	8364	TTCN_3642	18551
GTCN_219	8365	CTCN_3232	18552
TTCN_466	8366	GTCN_1896	18553
TTCN_467	8367	ATCN_2274	18554
ATCN_261	8368	TTCN_3643	18555
ATCN_262	8369	CTCN_3233	18556
TTCN_468	8370	GTCN_1897	18557
ATCN_263	8371	GTCN_1898	18558
ATCN_264	8372	CTCN_3234	18559
TTCN_469	8373	GTCN_1899	18560
GTCN_220	8374	CTCN_3235	18561
CTCN_333	8375	ATCN_2275	18562
CTCN_334	8376	ATCN_2276	18563
CTCN_335	8377	TTCN_3644	18564
GTCN_221	8378	TTCN_3645	18565
GTCN_222	8379	CTCN_3236	18566
TTCN_470	8380	TTCN_3646	18567
CTCN_336	8381	GTCN_1900	18568
GTCN_223	8382	ATCN_2277	18569
GTCN_224	8383	CTCN_3237	18570
TTCN_471	8384	CTCN_3238	18571
GTCN_225	8385	TTCN_3647	18572
CTCN_337	8386	TTCN_3648	18573
TTCN_472	8387	CTCN_3239	18574
TTCN_473	8388	ATCN_2278	18575
TTCN_474	8389	GTCN_1901	18576
CTCN_338	8390	TTCN_3649	18577
TTCN_475	8391	GTCN_1902	18578
TTCN_476	8392	TTCN_3650	18579
TTCN_477	8393	ATCN_2279	18580
TTCN_478	8394	TTCN_3651	18581
ATCN_265	8395	CTCN_3240	18582
ATCN_266	8396	CTCN_3241	18583
TTCN_479	8397	TTCN_3652	18584
TTCN_480	8398	TTCN_3653	18585
ATCN_267	8399	GTCN_1903	18586
CTCN_339	8400	GTCN_1904	18587
ATCN_268	8401	TTCN_3654	18588

FIG. 36 (continued)

CTCN_340	8402	CTCN_3242	18589
GTCN_226	8403	CTCN_3243	18590
ATCN_269	8404	TTCN_3655	18591
GTCN_227	8405	TTCN_3656	18592
TTCN_481	8406	TTCN_3657	18593
TTCN_482	8407	ATCN_2280	18594
TTCN_483	8408	CTCN_3244	18595
GTCN_228	8409	CTCN_3245	18596
CTCN_341	8410	GTCN_1905	18597
TTCN_484	8411	CTCN_3246	18598
CTCN_342	8412	GTCN_1906	18599
CTCN_343	8413	CTCN_3247	18600
GTCN_229	8414	CTCN_3248	18601
GTCN_230	8415	CTCN_3249	18602
GTCN_231	8416	TTCN_3658	18603
GTCN_232	8417	CTCN_3250	18604
ATCN_270	8418	TTCN_3659	18605
TTCN_485	8419	CTCN_3251	18606
GTCN_233	8420	CTCN_3252	18607
TTCN_486	8421	TTCN_3660	18608
CTCN_344	8422	TTCN_3661	18609
ATCN_271	8423	CTCN_3253	18610
CTCN_345	8424	GTCN_1907	18611
TTCN_487	8425	TTCN_3662	18612
TTCN_488	8426	CTCN_3254	18613
CTCN_346	8427	CTCN_3255	18614
ATCN_272	8428	GTCN_1908	18615
ATCN_273	8429	TTCN_3663	18616
TTCN_489	8430	GTCN_1909	18617
ATCN_274	8431	TTCN_3664	18618
ATCN_275	8432	ATCN_2281	18619
ATCN_276	8433	ATCN_2282	18620
TTCN_490	8434	TTCN_3665	18621
GTCN_234	8435	CTCN_3256	18622
CTCN_347	8436	GTCN_1910	18623
CTCN_348	8437	TTCN_3666	18624
ATCN_277	8438	CTCN_3257	18625
CTCN_349	8439	ATCN_2283	18626
CTCN_350	8440	CTCN_3258	18627
CTCN_351	8441	CTCN_3259	18628
ATCN_278	8442	TTCN_3307	18629
TTCN_491	8443	TTCN_3308	18630
CTCN_352	8444	CTCN_2900	18631
TTCN_492	8445	TTCN_3309	18632
ATCN_279	8446	CTCN_2901	18633
TTCN_493	8447	CTCN_2902	18634
GTCN_235	8448	GTCN_1735	18635
TTCN_494	8449	CTCN_2903	18636
TTCN_495	8450	ATCN_2050	18637
GTCN_236	8451	ATCN_2051	18638
TTCN_496	8452	GTCN_1736	18639
TTCN_497	8453	CTCN_2904	18640
ATCN_280	8454	CTCN_2905	18641
TTCN_498	8455	CTCN_2906	18642
TTCN_499	8456	TTCN_3310	18643

TTCN_500	8457	GTCN_1737	18644
GTCN_237	8458	CTCN_2907	18645
GTCN_238	8459	CTCN_2908	18646
CTCN_353	8460	GTCN_1738	18647
GTCN_239	8461	TTCN_3311	18648
ATCN_281	8462	CTCN_2909	18649
TTCN_501	8463	TTCN_3312	18650
CTCN_354	8464	ATCN_2052	18651
GTCN_240	8465	ATCN_2053	18652
TTCN_502	8466	TTCN_3313	18653
CTCN_355	8467	ATCN_2054	18654
GTCN_241	8468	TTCN_3314	18655
ATCN_282	8469	TTCN_3315	18656
ATCN_283	8470	TTCN_3316	18657
CTCN_356	8471	TTCN_3317	18658
TTCN_503	8472	CTCN_2910	18659
CTCN_357	8473	TTCN_3318	18660
CTCN_358	8474	ATCN_2055	18661
CTCN_359	8475	TTCN_3319	18662
ATCN_284	8476	TTCN_3320	18663
CTCN_360	8477	GTCN_1739	18664
TTCN_504	8478	TTCN_3321	18665
ATCN_285	8479	TTCN_3322	18666
CTCN_361	8480	TTCN_3323	18667
ATCN_286	8481	ATCN_2056	18668
ATCN_287	8482	CTCN_2911	18669
ATCN_288	8483	GTCN_1740	18670
ATCN_289	8484	ATCN_2057	18671
ATCN_290	8485	TTCN_3324	18672
ATCN_291	8486	CTCN_2912	18673
GTCN_242	8487	GTCN_1741	18674
GTCN_243	8488	ATCN_2058	18675
ATCN_292	8489	ATCN_2059	18676
TTCN_505	8490	ATCN_2060	18677
GTCN_244	8491	TTCN_3325	18678
CTCN_362	8492	TTCN_3326	18679
CTCN_363	8493	GTCN_1742	18680
ATCN_293	8494	ATCN_2061	18681
ATCN_294	8495	ATCN_2062	18682
CTCN_364	8496	TTCN_3327	18683
GTCN_245	8497	TTCN_3328	18684
ATCN_295	8498	TTCN_3329	18685
ATCN_296	8499	ATCN_2063	18686
CTCN_365	8500	TTCN_3330	18687
CTCN_366	8501	TTCN_3331	18688
GTCN_246	8502	GTCN_1743	18689
CTCN_367	8503	CTCN_2913	18690
CTCN_368	8504	GTCN_1744	18691
CTCN_369	8505	TTCN_3332	18692
GTCN_247	8506	CTCN_2914	18693
CTCN_370	8507	ATCN_2064	18694
CTCN_371	8508	CTCN_2915	18695
CTCN_372	8509	CTCN_2916	18696
TTCN_506	8510	ATCN_2065	18697
CTCN_373	8511	TTCN_3333	18698

FIG. 36 (continued)

TTCN_507	8512	TTCN_3334	18699
TTCN_508	8513	CTCN_2917	18700
GTCN_248	8514	TTCN_3335	18701
TTCN_509	8515	TTCN_3336	18702
TTCN_510	8516	TTCN_3337	18703
CTCN_374	8517	TTCN_3338	18704
CTCN_375	8518	TTCN_3339	18705
ATCN_297	8519	GTCN_1745	18706
ATCN_298	8520	TTCN_3340	18707
GTCN_249	8521	TTCN_3341	18708
CTCN_376	8522	ATCN_2066	18709
TTCN_511	8523	TTCN_3342	18710
CTCN_377	8524	TTCN_3343	18711
TTCN_512	8525	TTCN_3344	18712
CTCN_378	8526	TTCN_3345	18713
ATCN_299	8527	CTCN_2918	18714
TTCN_513	8528	TTCN_3346	18715
GTCN_250	8529	GTCN_1746	18716
TTCN_514	8530	TTCN_3347	18717
CTCN_379	8531	CTCN_2919	18718
ATCN_300	8532	TTCN_3348	18719
TTCN_515	8533	TTCN_3349	18720
ATCN_301	8534	CTCN_2920	18721
CTCN_380	8535	TTCN_3350	18722
GTCN_251	8536	TTCN_3351	18723
CTCN_381	8537	TTCN_3352	18724
TTCN_516	8538	TTCN_3353	18725
CTCN_382	8539	TTCN_3354	18726
GTCN_252	8540	TTCN_3355	18727
TTCN_517	8541	CTCN_2921	18728
TTCN_518	8542	CTCN_2922	18729
TTCN_519	8543	TTCN_3356	18730
CTCN_383	8544	CTCN_2923	18731
CTCN_384	8545	TTCN_3357	18732
GTCN_253	8546	GTCN_1747	18733
CTCN_385	8547	CTCN_2924	18734
GTCN_254	8548	CTCN_2925	18735
CTCN_386	8549	TTCN_3358	18736
CTCN_387	8550	TTCN_3359	18737
ATCN_302	8551	TTCN_3360	18738
TTCN_520	8552	TTCN_3361	18739
GTCN_255	8553	CTCN_2926	18740
GTCN_256	8554	TTCN_3362	18741
ATCN_303	8555	CTCN_2927	18742
ATCN_304	8556	TTCN_3363	18743
ATCN_305	8557	CTCN_2928	18744
ATCN_306	8558	CTCN_2929	18745
CTCN_388	8559	TTCN_3364	18746
ATCN_307	8560	CTCN_2930	18747
CTCN_389	8561	TTCN_3365	18748
TTCN_521	8562	ATCN_2067	18749
CTCN_390	8563	TTCN_3366	18750
GTCN_257	8564	CTCN_2931	18751
TTCN_522	8565	CTCN_2932	18752
CTCN_391	8566	CTCN_2933	18753

CTCN_392	8567	GTCN_1748	18754
TTCN_523	8568	CTCN_2934	18755
CTCN_393	8569	ATCN_2068	18756
GTCN_258	8570	CTCN_2935	18757
CTCN_394	8571	CTCN_2936	18758
ATCN_308	8572	CTCN_2937	18759
ATCN_309	8573	GTCN_1749	18760
CTCN_395	8574	GTCN_1750	18761
GTCN_259	8575	GTCN_1751	18762
CTCN_396	8576	CTCN_2938	18763
ATCN_310	8577	TTCN_3367	18764
TTCN_524	8578	TTCN_3368	18765
ATCN_311	8579	GTCN_1752	18766
ATCN_312	8580	GTCN_1753	18767
TTCN_525	8581	CTCN_2939	18768
TTCN_526	8582	TTCN_3369	18769
TTCN_527	8583	CTCN_2940	18770
TTCN_528	8584	ATCN_2069	18771
TTCN_529	8585	CTCN_2941	18772
GTCN_260	8586	CTCN_2942	18773
TTCN_530	8587	CTCN_2943	18774
GTCN_261	8588	GTCN_1754	18775
CTCN_397	8589	TTCN_3370	18776
TTCN_531	8590	ATCN_2070	18777
TTCN_532	8591	CTCN_2944	18778
CTCN_398	8592	CTCN_2945	18779
CTCN_399	8593	CTCN_2946	18780
GTCN_262	8594	GTCN_1755	18781
TTCN_533	8595	ATCN_2071	18782
CTCN_400	8596	TTCN_3371	18783
GTCN_263	8597	TTCN_3372	18784
ATCN_313	8598	ATCN_2072	18785
CTCN_401	8599	CTCN_2947	18786
GTCN_264	8600	ATCN_2073	18787
CTCN_402	8601	TTCN_3373	18788
GTCN_265	8602	CTCN_2948	18789
GTCN_266	8603	CTCN_2949	18790
ATCN_314	8604	CTCN_2950	18791
CTCN_403	8605	CTCN_2951	18792
ATCN_315	8606	GTCN_1756	18793
CTCN_404	8607	CTCN_2952	18794
ATCN_316	8608	CTCN_2953	18795
GTCN_267	8609	ATCN_2074	18796
TTCN_534	8610	TTCN_3374	18797
GTCN_268	8611	ATCN_2075	18798
CTCN_405	8612	ATCN_2076	18799
GTCN_269	8613	ATCN_2077	18800
TTCN_535	8614	GTCN_1757	18801
TTCN_536	8615	CTCN_2954	18802
ATCN_317	8616	TTCN_3375	18803
ATCN_318	8617	ATCN_2078	18804
CTCN_406	8618	CTCN_2955	18805
GTCN_270	8619	CTCN_2956	18806
ATCN_319	8620	TTCN_3376	18807
CTCN_407	8621	CTCN_2957	18808

FIG. 36 (continued)

TTCN_537	8622	CTCN_2958	18809
TTCN_538	8623	ATCN_2079	18810
TTCN_539	8624	TTCN_3377	18811
TTCN_540	8625	TTCN_3378	18812
ATCN_320	8626	ATCN_2080	18813
TTCN_541	8627	CTCN_2959	18814
TTCN_542	8628	TTCN_3379	18815
ATCN_321	8629	CTCN_2960	18816
TTCN_543	8630	TTCN_3380	18817
TTCN_544	8631	TTCN_3381	18818
CTCN_408	8632	TTCN_3382	18819
CTCN_409	8633	ATCN_2081	18820
TTCN_545	8634	TTCN_3383	18821
ATCN_322	8635	CTCN_2961	18822
TTCN_546	8636	TTCN_3384	18823
ATCN_323	8637	ATCN_2082	18824
TTCN_547	8638	CTCN_2962	18825
TTCN_548	8639	ATCN_2083	18826
TTCN_549	8640	ATCN_2084	18827
ATCN_324	8641	CTCN_2963	18828
CTCN_410	8642	TTCN_3385	18829
ATCN_325	8643	ATCN_2085	18830
ATCN_326	8644	CTCN_2964	18831
GTCN_271	8645	ATCN_2086	18832
GTCN_272	8646	CTCN_2965	18833
ATCN_327	8647	TTCN_3386	18834
TTCN_550	8648	TTCN_3387	18835
TTCN_551	8649	CTCN_2966	18836
CTCN_411	8650	GTCN_1758	18837
GTCN_273	8651	ATCN_2087	18838
GTCN_274	8652	TTCN_3388	18839
GTCN_275	8653	GTCN_1759	18840
TTCN_552	8654	CTCN_2967	18841
GTCN_276	8655	CTCN_2968	18842
GTCN_277	8656	CTCN_2969	18843
CTCN_412	8657	GTCN_1760	18844
TTCN_553	8658	CTCN_2970	18845
GTCN_278	8659	TTCN_3389	18846
CTCN_413	8660	ATCN_2088	18847
TTCN_554	8661	TTCN_3390	18848
TTCN_555	8662	TTCN_3391	18849
TTCN_556	8663	TTCN_3392	18850
CTCN_414	8664	CTCN_2971	18851
TTCN_557	8665	CTCN_2972	18852
TTCN_558	8666	TTCN_3393	18853
CTCN_415	8667	ATCN_2089	18854
TTCN_559	8668	ATCN_2090	18855
TTCN_560	8669	TTCN_3394	18856
GTCN_279	8670	CTCN_2973	18857
CTCN_416	8671	TTCN_3395	18858
CTCN_417	8672	TTCN_3396	18859
TTCN_561	8673	GTCN_1761	18860
GTCN_280	8674	TTCN_3397	18861
GTCN_281	8675	TTCN_3398	18862
GTCN_282	8676	TTCN_3399	18863

ATCN_328	8677	TTCN_3400	18864
ATCN_329	8678	ATCN_2091	18865
GTCN_283	8679	ATCN_2092	18866
GTCN_284	8680	ATCN_2093	18867
GTCN_285	8681	GTCN_1762	18868
CTCN_418	8682	ATCN_2094	18869
ATCN_330	8683	CTCN_2974	18870
TTCN_562	8684	TTCN_3401	18871
ATCN_331	8685	GTCN_1763	18872
GTCN_286	8686	CTCN_2975	18873
TTCN_563	8687	TTCN_3402	18874
CTCN_419	8688	TTCN_3403	18875
TTCN_564	8689	TTCN_3404	18876
CTCN_420	8690	ATCN_2095	18877
ATCN_332	8691	ATCN_2096	18878
ATCN_333	8692	TTCN_3405	18879
CTCN_421	8693	TTCN_3406	18880
ATCN_334	8694	ATCN_2097	18881
CTCN_422	8695	ATCN_2098	18882
CTCN_423	8696	CTCN_2976	18883
GTCN_287	8697	CTCN_2977	18884
CTCN_424	8698	ATCN_2099	18885
TTCN_565	8699	ATCN_2100	18886
ATCN_335	8700	TTCN_3407	18887
TTCN_566	8701	CTCN_2978	18888
CTCN_425	8702	CTCN_2979	18889
ATCN_336	8703	TTCN_3408	18890
CTCN_426	8704	TTCN_3409	18891
CTCN_427	8705	GTCN_1764	18892
TTCN_567	8706	CTCN_2980	18893
CTCN_428	8707	GTCN_1765	18894
CTCN_429	8708	TTCN_3410	18895
ATCN_337	8709	CTCN_2981	18896
CTCN_430	8710	CTCN_2982	18897
TTCN_568	8711	GTCN_1766	18898
CTCN_431	8712	CTCN_2983	18899
TTCN_569	8713	TTCN_3411	18900
TTCN_570	8714	GTCN_1767	18901
CTCN_432	8715	CTCN_2984	18902
CTCN_433	8716	TTCN_3412	18903
ATCN_338	8717	GTCN_1768	18904
GTCN_288	8718	CTCN_2985	18905
TTCN_571	8719	ATCN_2101	18906
TTCN_572	8720	CTCN_2986	18907
CTCN_434	8721	GTCN_1769	18908
GTCN_289	8722	CTCN_2987	18909
CTCN_435	8723	TTCN_3413	18910
TTCN_573	8724	ATCN_2102	18911
TTCN_574	8725	ATCN_2103	18912
ATCN_339	8726	TTCN_3414	18913
CTCN_436	8727	ATCN_2104	18914
TTCN_575	8728	CTCN_2988	18915
CTCN_437	8729	GTCN_1770	18916
ATCN_340	8730	CTCN_2989	18917
GTCN_290	8731	GTCN_1771	18918

FIG. 36 (continued)

TTCN_576	8732	GTCN_1772	18919
TTCN_577	8733	TTCN_3415	18920
GTCN_291	8734	GTCN_1773	18921
TTCN_578	8735	GTCN_1774	18922
GTCN_292	8736	CTCN_2990	18923
TTCN_579	8737	TTCN_3416	18924
ATCN_341	8738	ATCN_2105	18925
TTCN_580	8739	ATCN_2106	18926
CTCN_438	8740	ATCN_2107	18927
TTCN_581	8741	ATCN_2108	18928
TTCN_582	8742	CTCN_2991	18929
TTCN_583	8743	TTCN_3417	18930
CTCN_439	8744	CTCN_2992	18931
CTCN_440	8745	TTCN_3418	18932
ATCN_342	8746	TTCN_3419	18933
GTCN_293	8747	CTCN_2993	18934
TTCN_584	8748	CTCN_2994	18935
ATCN_343	8749	GTCN_1775	18936
TTCN_585	8750	TTCN_3420	18937
GTCN_294	8751	TTCN_3421	18938
CTCN_441	8752	CTCN_2995	18939
ATCN_344	8753	TTCN_3422	18940
TTCN_586	8754	TTCN_3423	18941
ATCN_345	8755	CTCN_2996	18942
CTCN_442	8756	TTCN_3424	18943
CTCN_443	8757	ATCN_2109	18944
GTCN_295	8758	CTCN_2997	18945
CTCN_444	8759	TTCN_3425	18946
GTCN_296	8760	TTCN_3426	18947
TTCN_587	8761	CTCN_2998	18948
GTCN_297	8762	TTCN_3427	18949
TTCN_588	8763	CTCN_2999	18950
CTCN_445	8764	TTCN_3428	18951
CTCN_446	8765	TTCN_3429	18952
GTCN_298	8766	ATCN_2110	18953
CTCN_447	8767	ATCN_2111	18954
GTCN_299	8768	ATCN_2112	18955
CTCN_448	8769	ATCN_2113	18956
TTCN_589	8770	TTCN_3430	18957
CTCN_449	8771	TTCN_3431	18958
GTCN_300	8772	TTCN_3432	18959
CTCN_450	8773	TTCN_3433	18960
TTCN_590	8774	CTCN_3000	18961
GTCN_301	8775	ATCN_2114	18962
CTCN_451	8776	CTCN_3001	18963
TTCN_591	8777	TTCN_3434	18964
ATCN_346	8778	CTCN_3002	18965
GTCN_302	8779	TTCN_3435	18966
CTCN_452	8780	ATCN_2115	18967
ATCN_347	8781	ATCN_2116	18968
CTCN_453	8782	ATCN_2117	18969
TTCN_592	8783	CTCN_3003	18970
TTCN_593	8784	TTCN_3436	18971
ATCN_348	8785	ATCN_2118	18972
CTCN_454	8786	TTCN_3437	18973

CTCN_455	8787	CTCN_3004	18974
TTCN_594	8788	CTCN_3005	18975
TTCN_595	8789	CTCN_3006	18976
GTCN_303	8790	CTCN_3007	18977
CTCN_456	8791	CTCN_3008	18978
TTCN_596	8792	TTCN_3438	18979
ATCN_349	8793	TTCN_3439	18980
TTCN_597	8794	CTCN_3009	18981
GTCN_304	8795	GTCN_1776	18982
CTCN_457	8796	TTCN_3440	18983
TTCN_598	8797	CTCN_3010	18984
ATCN_350	8798	CTCN_3011	18985
TTCN_599	8799	CTCN_3012	18986
CTCN_458	8800	GTCN_1777	18987
CTCN_459	8801	TTCN_3441	18988
CTCN_460	8802	ATCN_2119	18989
TTCN_600	8803	CTCN_3013	18990
TTCN_601	8804	CTCN_3014	18991
TTCN_602	8805	CTCN_3015	18992
TTCN_603	8806	TTCN_3442	18993
TTCN_604	8807	CTCN_3016	18994
GTCN_305	8808	TTCN_3443	18995
GTCN_306	8809	CTCN_3017	18996
CTCN_461	8810	GTCN_1778	18997
ATCN_351	8811	ATCN_2120	18998
CTCN_462	8812	CTCN_3018	18999
GTCN_307	8813	ATCN_2121	19000
TTCN_605	8814	TTCN_3444	19001
ATCN_352	8815	ATCN_2122	19002
ATCN_353	8816	ATCN_2123	19003
CTCN_463	8817	TTCN_3445	19004
CTCN_464	8818	CTCN_3019	19005
CTCN_465	8819	ATCN_2124	19006
TTCN_606	8820	TTCN_3446	19007
TTCN_607	8821	CTCN_3020	19008
GTCN_308	8822	TTCN_3447	19009
ATCN_354	8823	ATCN_2125	19010
ATCN_355	8824	TTCN_3448	19011
TTCN_608	8825	TTCN_3449	19012
TTCN_609	8826	ATCN_2126	19013
TTCN_610	8827	GTCN_1779	19014
TTCN_611	8828	CTCN_3021	19015
TTCN_612	8829	TTCN_3450	19016
CTCN_466	8830	CTCN_3022	19017
GTCN_309	8831	GTCN_1780	19018
ATCN_356	8832	TTCN_3451	19019
ATCN_357	8833	ATCN_2127	19020
TTCN_613	8834	ATCN_2128	19021
GTCN_310	8835	TTCN_3452	19022
TTCN_614	8836	ATCN_2129	19023
ATCN_358	8837	CTCN_3023	19024
TTCN_615	8838	GTCN_1781	19025
CTCN_467	8839	TTCN_3453	19026
CTCN_468	8840	ATCN_2130	19027
CTCN_469	8841	ATCN_2131	19028

FIG. 36 (continued)

CTCN_470	8842	ATCN_2132	19029
ATCN_359	8843	ATCN_2133	19030
CTCN_471	8844	GTCN_1782	19031
CTCN_472	8845	GTCN_1783	19032
TTCN_616	8846	CTCN_3024	19033
TTCN_617	8847	ATCN_2134	19034
CTCN_473	8848	TTCN_3454	19035
CTCN_474	8849	TTCN_3455	19036
CTCN_475	8850	CTCN_3025	19037
CTCN_476	8851	CTCN_3026	19038
TTCN_618	8852	CTCN_3027	19039
CTCN_477	8853	GTCN_1784	19040
CTCN_478	8854	GTCN_1785	19041
GTCN_311	8855	TTCN_3456	19042
ATCN_360	8856	TTCN_3457	19043
ATCN_361	8857	GTCN_1786	19044
TTCN_619	8858	TTCN_3458	19045
GTCN_312	8859	TTCN_3459	19046
CTCN_479	8860	CTCN_3028	19047
CTCN_480	8861	CTCN_3029	19048
TTCN_620	8862	TTCN_3460	19049
GTCN_313	8863	TTCN_3461	19050
CTCN_481	8864	ATCN_2135	19051
CTCN_482	8865	TTCN_3462	19052
TTCN_621	8866	ATCN_2136	19053
ATCN_362	8867	CTCN_3030	19054
TTCN_622	8868	ATCN_2137	19055
CTCN_483	8869	CTCN_3031	19056
TTCN_623	8870	CTCN_3032	19057
TTCN_624	8871	CTCN_3033	19058
ATCN_363	8872	GTCN_1787	19059
TTCN_625	8873	ATCN_2138	19060
ATCN_364	8874	ATCN_2139	19061
CTCN_484	8875	GTCN_1788	19062
CTCN_485	8876	TTCN_3463	19063
ATCN_365	8877	CTCN_3034	19064
TTCN_626	8878	CTCN_3035	19065
TTCN_627	8879	CTCN_3036	19066
ATCN_366	8880	CTCN_3037	19067
CTCN_486	8881	TTCN_3464	19068
TTCN_628	8882	TTCN_3465	19069
CTCN_487	8883	ATCN_2140	19070
TTCN_629	8884	ATCN_2141	19071
ATCN_367	8885	TTCN_3466	19072
ATCN_368	8886	CTCN_3038	19073
ATCN_369	8887	TTCN_3467	19074
CTCN_488	8888	TTCN_3468	19075
GTCN_314	8889	TTCN_3469	19076
TTCN_630	8890	ATCN_2142	19077
CTCN_489	8891	TTCN_3470	19078
TTCN_631	8892	GTCN_1789	19079
ATCN_370	8893	CTCN_3039	19080
CTCN_490	8894	TTCN_3471	19081
GTCN_315	8895	ATCN_2143	19082
CTCN_491	8896	TTCN_3472	19083

ATCN_371	8897	TTCN_3473	19084
TTCN_632	8898	CTCN_3040	19085
GTCN_316	8899	CTCN_3041	19086
ATCN_372	8900	TTCN_3474	19087
CTCN_492	8901	ATCN_2144	19088
GTCN_317	8902	TTCN_3475	19089
GTCN_318	8903	TTCN_3476	19090
TTCN_633	8904	TTCN_3477	19091
TTCN_634	8905	CTCN_3042	19092
TTCN_635	8906	TTCN_3478	19093
ATCN_373	8907	CTCN_3043	19094
TTCN_636	8908	ATCN_2145	19095
ATCN_374	8909	CTCN_3044	19096
TTCN_637	8910	CTCN_3045	19097
ATCN_375	8911	CTCN_3046	19098
CTCN_493	8912	ATCN_2146	19099
TTCN_638	8913	ATCN_2147	19100
GTCN_319	8914	GTCN_1790	19101
ATCN_376	8915	CTCN_3047	19102
TTCN_639	8916	ATCN_2148	19103
TTCN_640	8917	ATCN_2149	19104
TTCN_641	8918	GTCN_1791	19105
CTCN_494	8919	ATCN_2150	19106
GTCN_320	8920	TTCN_3479	19107
TTCN_642	8921	ATCN_2151	19108
GTCN_321	8922	CTCN_3048	19109
TTCN_643	8923	ATCN_2152	19110
ATCN_377	8924	GTCN_1792	19111
TTCN_644	8925	CTCN_3049	19112
TTCN_645	8926	CTCN_3050	19113
ATCN_378	8927	CTCN_3051	19114
GTCN_322	8928	GTCN_1793	19115
CTCN_495	8929	CTCN_3052	19116
TTCN_646	8930	CTCN_3053	19117
GTCN_323	8931	TTCN_3480	19118
TTCN_647	8932	TTCN_3481	19119
ATCN_379	8933	CTCN_3054	19120
ATCN_380	8934	CTCN_3055	19121
TTCN_648	8935	ATCN_2153	19122
ATCN_381	8936	CTCN_3056	19123
CTCN_496	8937	CTCN_3057	19124
GTCN_324	8938	ATCN_2154	19125
TTCN_649	8939	ATCN_2155	19126
TTCN_650	8940	ATCN_2156	19127
CTCN_497	8941	CTCN_3058	19128
TTCN_651	8942	CTCN_3059	19129
CTCN_498	8943	GTCN_1794	19130
TTCN_652	8944	CTCN_3060	19131
GTCN_325	8945	TTCN_3482	19132
ATCN_382	8946	CTCN_3061	19133
GTCN_326	8947	TTCN_3483	19134
GTCN_327	8948	GTCN_1795	19135
GTCN_328	8949	CTCN_3062	19136
CTCN_499	8950	ATCN_2157	19137
TTCN_653	8951	ATCN_2158	19138

FIG. 36 (continued)

ATCN_383	8952	TTCN_3484	19139
TTCN_654	8953	CTCN_3063	19140
CTCN_500	8954	CTCN_3064	19141
CTCN_501	8955	ATCN_2159	19142
TTCN_655	8956	ATCN_2160	19143
GTCN_329	8957	TTCN_3485	19144
ATCN_384	8958	CTCN_3065	19145
GTCN_330	8959	GTCN_1796	19146
TTCN_656	8960	CTCN_3066	19147
ATCN_385	8961	GTCN_1797	19148
GTCN_331	8962	TTCN_3486	19149
ATCN_386	8963	CTCN_3067	19150
ATCN_387	8964	TTCN_3487	19151
CTCN_502	8965	ATCN_2161	19152
GTCN_332	8966	CTCN_3068	19153
GTCN_333	8967	TTCN_3488	19154
GTCN_334	8968	GTCN_1798	19155
CTCN_503	8969	TTCN_3489	19156
CTCN_504	8970	ATCN_2162	19157
CTCN_505	8971	CTCN_3069	19158
TTCN_657	8972	GTCN_1799	19159
TTCN_658	8973	ATCN_2163	19160
ATCN_388	8974	GTCN_1800	19161
ATCN_389	8975	ATCN_2164	19162
ATCN_390	8976	TTCN_3490	19163
CTCN_506	8977	CTCN_3070	19164
TTCN_659	8978	CTCN_3071	19165
GTCN_335	8979	ATCN_2165	19166
CTCN_507	8980	ATCN_2166	19167
CTCN_508	8981	CTCN_3072	19168
CTCN_509	8982	ATCN_2167	19169
CTCN_510	8983	TTCN_3491	19170
CTCN_511	8984	CTCN_3073	19171
CTCN_512	8985	GTCN_1801	19172
TTCN_660	8986	TTCN_3492	19173
CTCN_513	8987	TTCN_3493	19174
ATCN_391	8988	ATCN_2168	19175
CTCN_514	8989	ATCN_2169	19176
TTCN_661	8990	TTCN_3494	19177
ATCN_392	8991	TTCN_3495	19178
TTCN_662	8992	TTCN_3496	19179
TTCN_663	8993	CTCN_3074	19180
CTCN_515	8994	GTCN_1802	19181
ATCN_393	8995	GTCN_1803	19182
TTCN_664	8996	ATCN_2170	19183
ATCN_394	8997	TTCN_3497	19184
ATCN_395	8998	TTCN_3498	19185
TTCN_665	8999	GTCN_1804	19186
CTCN_516	9000	ATCN_2171	19187
GTCN_336	9001	CTCN_3075	19188
CTCN_517	9002	GTCN_1805	19189
TTCN_666	9003	CTCN_3076	19190
TTCN_667	9004	TTCN_3499	19191
TTCN_668	9005	CTCN_3077	19192
TTCN_669	9006	ATCN_2172	19193

TTCN_670	9007	ATCN_2173	19194
GTCN_337	9008	TTCN_3500	19195
CTCN_518	9009	GTCN_1806	19196
CTCN_519	9010	GTCN_1807	19197
TTCN_671	9011	CTCN_3078	19198
ATCN_396	9012	GTCN_1808	19199
GTCN_338	9013	TTCN_3501	19200
TTCN_672	9014	TTCN_3502	19201
ATCN_397	9015	GTCN_1809	19202
TTCN_673	9016	ATCN_2174	19203
TTCN_674	9017	ATCN_2175	19204
TTCN_675	9018	GTCN_1810	19205
TTCN_676	9019	GTCN_1811	19206
TTCN_677	9020	CTCN_3079	19207
CTCN_520	9021	ATCN_2176	19208
CTCN_521	9022	TTCN_3503	19209
ATCN_398	9023	CTCN_3080	19210
ATCN_399	9024	ATCN_2177	19211
TTCN_678	9025	CTCN_3081	19212
GTCN_339	9026	TTCN_3504	19213
TTCN_679	9027	GTCN_1812	19214
TTCN_680	9028	CTCN_3082	19215
ATCN_400	9029	TTCN_3505	19216
ATCN_401	9030	TTCN_3506	19217
ATCN_402	9031	ATCN_2178	19218
ATCN_403	9032	TTCN_3507	19219
TTCN_681	9033	CTCN_3083	19220
CTCN_522	9034	TTCN_3508	19221
TTCN_682	9035	ATCN_2179	19222
CTCN_523	9036	ATCN_2180	19223
CTCN_524	9037	ATCN_2181	19224
TTCN_683	9038	ATCN_2182	19225
TTCN_684	9039	CTCN_3084	19226
ATCN_404	9040	TTCN_3509	19227
ATCN_405	9041	CTCN_3085	19228
TTCN_685	9042	CTCN_3086	19229
CTCN_525	9043	TTCN_3510	19230
ATCN_406	9044	TTCN_3511	19231
ATCN_407	9045	TTCN_3512	19232
CTCN_526	9046	TTCN_3513	19233
CTCN_527	9047	GTCN_1813	19234
GTCN_340	9048	TTCN_3514	19235
TTCN_686	9049	TTCN_3515	19236
ATCN_408	9050	ATCN_2183	19237
ATCN_409	9051	ATCN_2184	19238
ATCN_410	9052	TTCN_3516	19239
ATCN_411	9053	ATCN_2185	19240
ATCN_412	9054	ATCN_2186	19241
GTCN_341	9055	ATCN_2187	19242
CTCN_528	9056	TTCN_3517	19243
CTCN_529	9057	GTCN_1814	19244
CTCN_530	9058	CTCN_3087	19245
TTCN_687	9059	TTCN_3518	19246
ATCN_413	9060	ATCN_2188	19247
ATCN_414	9061	GTCN_1815	19248

FIG. 36 (continued)

CTCN_531	9062	TTCN_3519	19249
CTCN_532	9063	TTCN_3520	19250
CTCN_533	9064	CTCN_3088	19251
TTCN_688	9065	TTCN_3521	19252
GTCN_342	9066	TTCN_3522	19253
TTCN_689	9067	TTCN_3523	19254
CTCN_534	9068	TTCN_3524	19255
CTCN_535	9069	CTCN_3089	19256
CTCN_536	9070	TTCN_3525	19257
TTCN_690	9071	ATCN_2189	19258
CTCN_537	9072	ATCN_2190	19259
GTCN_343	9073	CTCN_3090	19260
ATCN_415	9074	ATCN_2191	19261
ATCN_416	9075	GTCN_1816	19262
ATCN_417	9076	TTCN_3526	19263
ATCN_418	9077	TTCN_3527	19264
GTCN_344	9078	CTCN_3091	19265
GTCN_345	9079	CTCN_3092	19266
CTCN_538	9080	GTCN_1817	19267
TTCN_691	9081	CTCN_3093	19268
CTCN_539	9082	CTCN_3094	19269
GTCN_346	9083	CTCN_3095	19270
CTCN_540	9084	TTCN_3528	19271
TTCN_692	9085	CTCN_3096	19272
ATCN_419	9086	CTCN_3097	19273
GTCN_347	9087	CTCN_3098	19274
ATCN_420	9088	CTCN_3099	19275
ATCN_421	9089	GTCN_1818	19276
TTCN_693	9090	ATCN_2192	19277
GTCN_348	9091	CTCN_3100	19278
TTCN_694	9092	CTCN_3101	19279
CTCN_541	9093	CTCN_3102	19280
TTCN_695	9094	TTCN_3529	19281
ATCN_422	9095	ATCN_2193	19282
CTCN_542	9096	TTCN_3530	19283
TTCN_696	9097	CTCN_3103	19284
TTCN_697	9098	GTCN_1819	19285
ATCN_423	9099	TTCN_3531	19286
TTCN_698	9100	CTCN_3104	19287
GTCN_349	9101	TTCN_3532	19288
TTCN_699	9102	CTCN_3105	19289
TTCN_700	9103	TTCN_3533	19290
TTCN_701	9104	TTCN_3534	19291
ATCN_424	9105	CTCN_3106	19292
TTCN_702	9106	GTCN_1820	19293
ATCN_425	9107	TTCN_3535	19294
GTCN_350	9108	ATCN_2194	19295
CTCN_543	9109	CTCN_3107	19296
CTCN_544	9110	CTCN_3108	19297
TTCN_703	9111	GTCN_1821	19298
TTCN_704	9112	CTCN_3109	19299
TTCN_705	9113	GTCN_1822	19300
GTCN_351	9114	GTCN_1823	19301
TTCN_706	9115	TTCN_3536	19302
GTCN_352	9116	ATCN_2195	19303

ATCN_426	9117	TTCN_3537	19304
GTCN_353	9118	GTCN_1824	19305
TTCN_707	9119	GTCN_1825	19306
TTCN_708	9120	ATCN_2196	19307
CTCN_545	9121	TTCN_3538	19308
TTCN_709	9122	TTCN_3539	19309
TTCN_710	9123	ATCN_2197	19310
ATCN_427	9124	GTCN_1826	19311
TTCN_711	9125	ATCN_2198	19312
ATCN_428	9126	ATCN_2199	19313
ATCN_429	9127	CTCN_3110	19314
ATCN_430	9128	TTCN_3540	19315
ATCN_431	9129	TTCN_3541	19316
GTCN_354	9130	TTCN_3542	19317
TTCN_712	9131	GTCN_1827	19318
TTCN_713	9132	ATCN_2200	19319
CTCN_546	9133	ATCN_2201	19320
TTCN_714	9134	TTCN_3543	19321
GTCN_355	9135	TTCN_3544	19322
TTCN_715	9136	TTCN_3545	19323
TTCN_716	9137	CTCN_3111	19324
ATCN_432	9138	TTCN_3546	19325
ATCN_433	9139	GTCN_1828	19326
CTCN_547	9140	TTCN_3547	19327
GTCN_356	9141	ATCN_2202	19328
ATCN_434	9142	ATCN_2203	19329
GTCN_357	9143	ATCN_2204	19330
TTCN_717	9144	ATCN_2205	19331
TTCN_718	9145	ATCN_2206	19332
TTCN_719	9146	TTCN_3548	19333
ATCN_435	9147	TTCN_3549	19334
GTCN_358	9148	ATCN_2207	19335
ATCN_436	9149	GTCN_1829	19336
TTCN_720	9150	CTCN_3112	19337
CTCN_548	9151	CTCN_3113	19338
TTCN_721	9152	GTCN_1830	19339
CTCN_549	9153	CTCN_3114	19340
TTCN_722	9154	GTCN_1831	19341
TTCN_723	9155	GTCN_1832	19342
TTCN_724	9156	CTCN_3115	19343
TTCN_725	9157	CTCN_3116	19344
CTCN_550	9158	ATCN_2208	19345
TTCN_726	9159	TTCN_3550	19346
ATCN_437	9160	GTCN_1833	19347
CTCN_551	9161	ATCN_2209	19348
TTCN_727	9162	TTCN_3551	19349
CTCN_552	9163	TTCN_3552	19350
GTCN_359	9164	ATCN_2210	19351
TTCN_728	9165	CTCN_3117	19352
TTCN_729	9166	CTCN_3118	19353
CTCN_553	9167	TTCN_3553	19354
TTCN_730	9168	CTCN_3119	19355
ATCN_438	9169	CTCN_3120	19356
CTCN_554	9170	GTCN_1834	19357
CTCN_555	9171	TTCN_3554	19358

FIG. 36 (continued)

TTCN_731	9172	TTCN_3555	19359
ATCN_439	9173	GTCN_1835	19360
CTCN_556	9174	GTCN_1836	19361
TTCN_732	9175	TTCN_3556	19362
ATCN_440	9176	TTCN_3557	19363
TTCN_733	9177	TTCN_3558	19364
CTCN_557	9178	GTCN_1837	19365
ATCN_441	9179	GTCN_1838	19366
TTCN_734	9180	ATCN_2211	19367
ATCN_442	9181	GTCN_1839	19368
CTCN_558	9182	CTCN_3121	19369
TTCN_735	9183	CTCN_3122	19370
GTCN_360	9184	TTCN_3559	19371
CTCN_559	9185	TTCN_3560	19372
ATCN_443	9186	TTCN_3561	19373
ATCN_444	9187	TTCN_3562	19374
TTCN_736	9188	TTCN_3563	19375
CTCN_560	9189	GTCN_1840	19376
CTCN_561	9190	TTCN_3564	19377
ATCN_445	9191	CTCN_3123	19378
TTCN_737	9192	GTCN_1841	19379
CTCN_562	9193	GTCN_1842	19380
TTCN_738	9194	CTCN_3124	19381
CTCN_563	9195	ATCN_2212	19382
TTCN_739	9196	ATCN_2213	19383
CTCN_564	9197	TTCN_3565	19384
TTCN_740	9198	CTCN_3125	19385
GTCN_361	9199	GTCN_1843	19386
TTCN_741	9200	GTCN_1844	19387
CTCN_565	9201	GTCN_1845	19388
GTCN_362	9202	CTCN_3126	19389
TTCN_742	9203	CTCN_3127	19390
CTCN_566	9204	GTCN_1846	19391
TTCN_743	9205	CTCN_3128	19392
ATCN_446	9206	TTCN_3566	19393
CTCN_567	9207	TTCN_3567	19394
TTCN_744	9208	CTCN_3129	19395
ATCN_447	9209	ATCN_2214	19396
ATCN_448	9210	ATCN_2215	19397
CTCN_568	9211	ATCN_2216	19398
TTCN_745	9212	CTCN_3130	19399
ATCN_449	9213	ATCN_2217	19400
TTCN_746	9214	ATCN_2218	19401
TTCN_747	9215	TTCN_3568	19402
CTCN_569	9216	GTCN_1847	19403
ATCN_450	9217	CTCN_3131	19404
ATCN_451	9218	CTCN_3132	19405
GTCN_363	9219	CTCN_3133	19406
CTCN_570	9220	CTCN_3134	19407
ATCN_452	9221	GTCN_1848	19408
CTCN_571	9222	ATCN_2219	19409
TTCN_748	9223	GTCN_1849	19410
CTCN_572	9224	ATCN_2220	19411
ATCN_453	9225	ATCN_2221	19412
TTCN_749	9226	CTCN_3135	19413

TTCN_750	9227	TTCN_3569	19414
CTCN_573	9228	GTCN_1850	19415
ATCN_454	9229	GTCN_1851	19416
TTCN_751	9230	TTCN_3570	19417
TTCN_752	9231	TTCN_3571	19418
ATCN_455	9232	TTCN_3572	19419
TTCN_753	9233	CTCN_3136	19420
TTCN_754	9234	ATCN_2222	19421
CTCN_574	9235	GTCN_1852	19422
TTCN_755	9236	CTCN_3137	19423
CTCN_575	9237	CTCN_3138	19424
TTCN_756	9238	TTCN_3573	19425
CTCN_576	9239	TTCN_3574	19426
ATCN_456	9240	ATCN_2223	19427
TTCN_757	9241	CTCN_3139	19428
CTCN_577	9242	CTCN_3140	19429
TTCN_758	9243	CTCN_3141	19430
CTCN_578	9244	ATCN_2224	19431
ATCN_457	9245	GTCN_1853	19432
GTCN_364	9246	CTCN_3142	19433
CTCN_579	9247	CTCN_3143	19434
TTCN_759	9248	CTCN_3144	19435
GTCN_365	9249	GTCN_1854	19436
ATCN_458	9250	CTCN_3145	19437
CTCN_580	9251	CTCN_3146	19438
GTCN_366	9252	CTCN_3147	19439
CTCN_581	9253	GTCN_1855	19440
ATCN_459	9254	CTCN_3148	19441
ATCN_460	9255	CTCN_3149	19442
TTCN_760	9256	ATCN_2225	19443
CTCN_582	9257	ATCN_2226	19444
CTCN_583	9258	TTCN_3575	19445
GTCN_367	9259	ATCN_2227	19446
GTCN_368	9260	ATCN_2228	19447
GTCN_369	9261	ATCN_2229	19448
TTCN_761	9262	GTCN_1856	19449
ATCN_461	9263	CTCN_3150	19450
ATCN_462	9264	CTCN_3151	19451
ATCN_463	9265	GTCN_1857	19452
TTCN_762	9266	TTCN_3576	19453
CTCN_584	9267	ATCN_2230	19454
TTCN_763	9268	GTCN_1858	19455
CTCN_585	9269	CTCN_3152	19456
TTCN_764	9270	TTCN_3577	19457
GTCN_370	9271	ATCN_2231	19458
CTCN_586	9272	CTCN_3153	19459
CTCN_587	9273	CTCN_3154	19460
CTCN_588	9274	CTCN_3155	19461
CTCN_589	9275	TTCN_3578	19462
GTCN_371	9276	TTCN_3579	19463
ATCN_464	9277	TTCN_3580	19464
ATCN_465	9278	ATCN_2232	19465
ATCN_466	9279	TTCN_3581	19466
ATCN_467	9280	CTCN_3156	19467
TTCN_765	9281	CTCN_3157	19468

FIG. 36 (continued)

GTCN_372	9282	ATCN_2233	19469
CTCN_590	9283	CTCN_3158	19470
TTCN_766	9284	CTCN_3159	19471
TTCN_767	9285	TTCN_3582	19472
TTCN_768	9286	CTCN_3160	19473
CTCN_591	9287	CTCN_3161	19474
CTCN_592	9288	CTCN_3162	19475
CTCN_593	9289	GTCN_1859	19476
CTCN_594	9290	TTCN_3583	19477
ATCN_468	9291	TTCN_3584	19478
TTCN_769	9292	CTCN_3163	19479
GTCN_373	9293	CTCN_3164	19480
GTCN_374	9294	GTCN_1860	19481
CTCN_595	9295	ATCN_2234	19482
ATCN_469	9296	TTCN_3585	19483
ATCN_470	9297	TTCN_3586	19484
TTCN_770	9298	TTCN_3587	19485
GTCN_375	9299	CTCN_3165	19486
TTCN_771	9300	GTCN_1861	19487
TTCN_772	9301	CTCN_3166	19488
TTCN_773	9302	TTCN_3588	19489
GTCN_376	9303	CTCN_3167	19490
GTCN_377	9304	CTCN_3168	19491
TTCN_774	9305	TTCN_3589	19492
TTCN_775	9306	CTCN_3169	19493
TTCN_776	9307	TTCN_3590	19494
CTCN_596	9308	ATCN_2235	19495
TTCN_777	9309	GTCN_1862	19496
ATCN_471	9310	CTCN_3170	19497
TTCN_778	9311	GTCN_1863	19498
TTCN_779	9312	CTCN_3171	19499
TTCN_780	9313	CTCN_3172	19500
GTCN_378	9314	ATCN_2236	19501
GTCN_379	9315	TTCN_3591	19502
ATCN_472	9316	GTCN_1864	19503
TTCN_781	9317	CTCN_3173	19504
TTCN_782	9318	ATCN_2237	19505
GTCN_380	9319	CTCN_3174	19506
CTCN_597	9320	TTCN_3592	19507
CTCN_598	9321	CTCN_3175	19508
ATCN_473	9322	CTCN_3176	19509
CTCN_599	9323	TTCN_3593	19510
TTCN_783	9324	TTCN_3594	19511
GTCN_381	9325	CTCN_3177	19512
CTCN_600	9326	TTCN_3595	19513
CTCN_601	9327	CTCN_3178	19514
CTCN_602	9328	TTCN_3596	19515
GTCN_382	9329	ATCN_2238	19516
GTCN_383	9330	CTCN_3179	19517
TTCN_784	9331	TTCN_3597	19518
TTCN_785	9332	TTCN_3598	19519
TTCN_786	9333	TTCN_3599	19520
TTCN_787	9334	CTCN_3180	19521
TTCN_788	9335	ATCN_2239	19522
CTCN_603	9336	CTCN_3181	19523

ATCN_474	9337	GTCN_1865	19524
TTCN_789	9338	CTCN_3182	19525
GTCN_384	9339	ATCN_2240	19526
CTCN_604	9340	CTCN_3183	19527
TTCN_790	9341	GTCN_1866	19528
ATCN_475	9342	TTCN_3600	19529
CTCN_605	9343	ATCN_2241	19530
CTCN_606	9344	TTCN_3601	19531
CTCN_607	9345	CTCN_3184	19532
CTCN_608	9346	ATCN_2242	19533
TTCN_791	9347	CTCN_3185	19534
CTCN_609	9348	CTCN_3186	19535
CTCN_610	9349	CTCN_3187	19536
TTCN_792	9350	ATCN_2243	19537
CTCN_611	9351	CTCN_3188	19538
TTCN_793	9352	ATCN_2244	19539
TTCN_794	9353	ATCN_2245	19540
CTCN_612	9354	TTCN_3602	19541
ATCN_476	9355	CTCN_3189	19542
TTCN_795	9356	TTCN_3603	19543
GTCN_385	9357	CTCN_3190	19544
CTCN_613	9358	GTCN_1867	19545
TTCN_796	9359	CTCN_3191	19546
CTCN_614	9360	ATCN_2246	19547
TTCN_797	9361	TTCN_3604	19548
TTCN_798	9362	ATCN_2247	19549
GTCN_386	9363	TTCN_3605	19550
CTCN_615	9364	CTCN_3192	19551
TTCN_799	9365	CTCN_3193	19552
GTCN_387	9366	TTCN_3606	19553
ATCN_477	9367	TTCN_3607	19554
ATCN_478	9368	ATCN_2248	19555
TTCN_800	9369	ATCN_2249	19556
ATCN_479	9370	TTCN_3608	19557
GTCN_388	9371	TTCN_3609	19558
ATCN_480	9372	TTCN_3610	19559
CTCN_616	9373	CTCN_3194	19560
GTCN_389	9374	TTCN_3611	19561
CTCN_617	9375	TTCN_3612	19562
ATCN_481	9376	TTCN_3613	19563
ATCN_482	9377	ATCN_2250	19564
CTCN_618	9378	CTCN_3195	19565
GTCN_390	9379	ATCN_2251	19566
CTCN_619	9380	ATCN_2252	19567
GTCN_391	9381	GTCN_1868	19568
TTCN_801	9382	CTCN_3196	19569
TTCN_802	9383	GTCN_1869	19570
CTCN_620	9384	GTCN_1870	19571
CTCN_621	9385	ATCN_2253	19572
GTCN_392	9386	CTCN_3197	19573
TTCN_803	9387	TTCN_3614	19574
TTCN_804	9388	ATCN_2254	19575
ATCN_483	9389	TTCN_3615	19576
TTCN_805	9390	CTCN_3198	19577
TTCN_806	9391	GTCN_1871	19578

FIG. 36 (continued)

TTCN_807	9392	GTCN_1872	19579
ATCN_484	9393	CTCN_3199	19580
TTCN_808	9394	GTCN_1873	19581
ATCN_485	9395	ATCN_2255	19582
CTCN_622	9396	ATCN_2256	19583
ATCN_486	9397	GTCN_1874	19584
TTCN_809	9398	CTCN_3200	19585
GTCN_393	9399	CTCN_3201	19586
TTCN_810	9400	TTCN_3616	19587
CTCN_623	9401	CTCN_3202	19588
TTCN_811	9402	ATCN_2257	19589
GTCN_394	9403	ATCN_2258	19590
GTCN_395	9404	GTCN_1875	19591
GTCN_396	9405	ATCN_2259	19592
TTCN_812	9406	ATCN_2260	19593
TTCN_813	9407	CTCN_3203	19594
TTCN_814	9408	GTCN_1876	19595
CTCN_624	9409	ATCN_2261	19596
ATCN_487	9410	ATCN_2262	19597
GTCN_397	9411	TTCN_3617	19598
GTCN_398	9412	GTCN_1877	19599
TTCN_815	9413	CTCN_3204	19600
ATCN_488	9414	CTCN_3205	19601
TTCN_816	9415	GTCN_1878	19602
TTCN_817	9416	CTCN_3206	19603
TTCN_818	9417	ATCN_2263	19604
TTCN_819	9418	GTCN_1879	19605
GTCN_399	9419	GTCN_1880	19606
TTCN_820	9420	GTCN_1881	19607
GTCN_400	9421	TTCN_3618	19608
ATCN_489	9422	ATCN_2264	19609
GTCN_401	9423	ATCN_2265	19610
CTCN_625	9424	TTCN_3619	19611
ATCN_490	9425	CTCN_3207	19612
TTCN_821	9426	GTCN_1882	19613
CTCN_626	9427	ATCN_2266	19614
ATCN_491	9428	TTCN_3620	19615
ATCN_492	9429	ATCN_2267	19616
CTCN_627	9430	ATCN_2268	19617
CTCN_628	9431	GTCN_1883	19618
GTCN_402	9432	GTCN_1884	19619
GTCN_403	9433	CTCN_3208	19620
GTCN_404	9434	GTCN_1885	19621
TTCN_822	9435	GTCN_1886	19622
TTCN_823	9436	TTCN_3621	19623
TTCN_824	9437	CTCN_3209	19624
TTCN_825	9438	CTCN_3210	19625
GTCN_405	9439	ATCN_2269	19626
ATCN_493	9440	GTCN_1887	19627
CTCN_629	9441	TTCN_3622	19628
ATCN_494	9442	TTCN_3623	19629
CTCN_630	9443	TTCN_3624	19630
ATCN_495	9444	GTCN_1888	19631
TTCN_826	9445	TTCN_3625	19632
GTCN_406	9446	TTCN_3626	19633

GTCN_407	9447	TTCN_3627	19634
ATCN_496	9448	TTCN_3628	19635
TTCN_827	9449	TTCN_3629	19636
ATCN_497	9450	TTCN_3630	19637
TTCN_828	9451	TTCN_3631	19638
TTCN_829	9452	CTCN_3211	19639
GTCN_408	9453	CTCN_3212	19640
TTCN_830	9454	GTCN_1889	19641
GTCN_409	9455	ATCN_2270	19642
TTCN_831	9456	GTCN_1890	19643
TTCN_832	9457	CTCN_3213	19644
TTCN_833	9458	CTCN_3214	19645
TTCN_834	9459	ATCN_2271	19646
GTCN_410	9460	GTCN_1891	19647
CTCN_631	9461	CTCN_3215	19648
TTCN_835	9462	ATCN_2272	19649
TTCN_836	9463	CTCN_3216	19650
ATCN_498	9464	TTCN_3632	19651
CTCN_632	9465	CTCN_3217	19652
GTCN_411	9466	TTCN_3633	19653
CTCN_633	9467	GTCN_1892	19654
TTCN_837	9468	CTCN_3218	19655
CTCN_634	9469	TTCN_3634	19656
TTCN_838	9470	GTCN_1893	19657
ATCN_499	9471	TTCN_3635	19658
CTCN_635	9472	ATCN_2273	19659
TTCN_839	9473	TTCN_3636	19660
CTCN_636	9474	CTCN_3219	19661
GTCN_412	9475	TTCN_3637	19662
CTCN_637	9476	CTCN_3220	19663
TTCN_840	9477	CTCN_3221	19664
CTCN_638	9478	CTCN_3222	19665
TTCN_841	9479	GTCN_1894	19666
ATCN_500	9480	CTCN_3223	19667
TTCN_842	9481	CTCN_3224	19668
ATCN_501	9482	CTCN_3225	19669
TTCN_843	9483	TTCN_3638	19670
CTCN_639	9484	CTCN_3226	19671
CTCN_640	9485	GTCN_1895	19672
TTCN_844	9486	CTCN_3227	19673
CTCN_641	9487	TTCN_3639	19674
TTCN_845	9488	CTCN_3228	19675
TTCN_846	9489	TTCN_3640	19676
TTCN_847	9490	TTCN_3641	19677
TTCN_848	9491	CTCN_3229	19678
CTCN_642	9492	CTCN_3230	19679
TTCN_849	9493	CTCN_3231	19680
ATCN_502	9494	TTCN_3642	19681
CTCN_643	9495	CTCN_3232	19682
TTCN_850	9496	GTCN_1896	19683
ATCN_503	9497	ATCN_2274	19684
CTCN_644	9498	TTCN_3643	19685
TTCN_851	9499	CTCN_3233	19686
ATCN_504	9500	GTCN_1897	19687
CTCN_645	9501	GTCN_1898	19688

FIG. 36 (continued)

TTCN_852	9502	CTCN_3234	19689
ATCN_505	9503	GTCN_1899	19690
TTCN_853	9504	CTCN_3235	19691
CTCN_646	9505	ATCN_2275	19692
ATCN_506	9506	ATCN_2276	19693
GTCN_413	9507	TTCN_3644	19694
ATCN_507	9508	TTCN_3645	19695
TTCN_854	9509	CTCN_3236	19696
TTCN_855	9510	TTCN_3646	19697
ATCN_508	9511	GTCN_1900	19698
TTCN_856	9512	ATCN_2277	19699
GTCN_414	9513	CTCN_3237	19700
TTCN_857	9514	CTCN_3238	19701
GTCN_415	9515	TTCN_3647	19702
TTCN_858	9516	TTCN_3648	19703
TTCN_859	9517	CTCN_3239	19704
CTCN_647	9518	ATCN_2278	19705
CTCN_648	9519	GTCN_1901	19706
TTCN_860	9520	TTCN_3649	19707
TTCN_861	9521	GTCN_1902	19708
TTCN_862	9522	TTCN_3650	19709
GTCN_416	9523	ATCN_2279	19710
CTCN_649	9524	TTCN_3651	19711
CTCN_650	9525	CTCN_3240	19712
GTCN_417	9526	CTCN_3241	19713
CTCN_651	9527	TTCN_3652	19714
TTCN_863	9528	TTCN_3653	19715
GTCN_418	9529	GTCN_1903	19716
GTCN_419	9530	GTCN_1904	19717
GTCN_420	9531	TTCN_3654	19718
ATCN_509	9532	CTCN_3242	19719
ATCN_510	9533	CTCN_3243	19720
ATCN_511	9534	TTCN_3655	19721
TTCN_864	9535	TTCN_3656	19722
TTCN_865	9536	TTCN_3657	19723
TTCN_866	9537	ATCN_2280	19724
TTCN_867	9538	CTCN_3244	19725
ATCN_512	9539	CTCN_3245	19726
TTCN_868	9540	GTCN_1905	19727
TTCN_869	9541	CTCN_3246	19728
TTCN_870	9542	GTCN_1906	19729
CTCN_652	9543	CTCN_3247	19730
CTCN_653	9544	CTCN_3248	19731
TTCN_871	9545	CTCN_3249	19732
ATCN_513	9546	TTCN_3658	19733
TTCN_872	9547	CTCN_3250	19734
CTCN_654	9548	TTCN_3659	19735
ATCN_514	9549	CTCN_3251	19736
CTCN_655	9550	CTCN_3252	19737
TTCN_873	9551	TTCN_3660	19738
CTCN_656	9552	TTCN_3661	19739
ATCN_515	9553	CTCN_3253	19740
TTCN_874	9554	GTCN_1907	19741
CTCN_657	9555	TTCN_3662	19742
ATCN_516	9556	CTCN_3254	19743

TTCN_875	9557	CTCN_3255	19744
GTCN_421	9558	GTCN_1908	19745
CTCN_658	9559	TTCN_3663	19746
CTCN_659	9560	GTCN_1909	19747
ATCN_517	9561	TTCN_3664	19748
TTCN_876	9562	ATCN_2281	19749
CTCN_660	9563	ATCN_2282	19750
ATCN_518	9564	TTCN_3665	19751
TTCN_877	9565	CTCN_3256	19752
TTCN_878	9566	GTCN_1910	19753
ATCN_519	9567	TTCN_3666	19754
TTCN_879	9568	CTCN_3257	19755
ATCN_520	9569	ATCN_2283	19756
ATCN_521	9570	CTCN_3258	19757
CTCN_661	9571	CTCN_3259	19758
CTCN_662	9572	CTCN_3260	19759
ATCN_522	9573	ATCN_2284	19760
GTCN_422	9574	CTCN_3261	19761
GTCN_423	9575	CTCN_3262	19762
CTCN_663	9576	CTCN_3263	19763
GTCN_424	9577	TTCN_3667	19764
ATCN_523	9578	ATCN_2285	19765
GTCN_425	9579	TTCN_3668	19766
TTCN_880	9580	CTCN_3264	19767
CTCN_664	9581	CTCN_3265	19768
TTCN_881	9582	CTCN_3266	19769
GTCN_426	9583	CTCN_3267	19770
CTCN_665	9584	CTCN_3268	19771
TTCN_882	9585	ATCN_2286	19772
GTCN_427	9586	CTCN_3269	19773
CTCN_666	9587	GTCN_1911	19774
GTCN_428	9588	TTCN_3669	19775
TTCN_883	9589	GTCN_1912	19776
TTCN_884	9590	CTCN_3270	19777
ATCN_524	9591	TTCN_3670	19778
TTCN_885	9592	CTCN_3271	19779
CTCN_667	9593	GTCN_1913	19780
TTCN_886	9594	CTCN_3272	19781
TTCN_887	9595	ATCN_2287	19782
CTCN_668	9596	ATCN_2288	19783
TTCN_888	9597	TTCN_3671	19784
TTCN_889	9598	CTCN_3273	19785
CTCN_669	9599	ATCN_2289	19786
TTCN_890	9600	CTCN_3274	19787
TTCN_891	9601	TTCN_3672	19788
ATCN_525	9602	ATCN_2290	19789
GTCN_429	9603	ATCN_2291	19790
ATCN_526	9604	ATCN_2292	19791
TTCN_892	9605	CTCN_3275	19792
ATCN_527	9606	CTCN_3276	19793
TTCN_893	9607	CTCN_3277	19794
CTCN_670	9608	CTCN_3278	19795
ATCN_528	9609	TTCN_3673	19796
TTCN_894	9610	TTCN_3674	19797
TTCN_895	9611	CTCN_3279	19798

FIG. 36 (continued)

CTCN_671	9612	CTCN_3280	19799
ATCN_529	9613	CTCN_3281	19800
TTCN_896	9614	ATCN_2293	19801
TTCN_897	9615	ATCN_2294	19802
GTCN_430	9616	CTCN_3282	19803
TTCN_898	9617	CTCN_3283	19804
CTCN_672	9618	TTCN_3675	19805
CTCN_673	9619	TTCN_3676	19806
TTCN_899	9620	TTCN_3677	19807
CTCN_674	9621	ATCN_2295	19808
TTCN_900	9622	CTCN_3284	19809
CTCN_675	9623	TTCN_3678	19810
ATCN_530	9624	CTCN_3285	19811
TTCN_901	9625	ATCN_2296	19812
CTCN_676	9626	ATCN_2297	19813
ATCN_531	9627	TTCN_3679	19814
TTCN_902	9628	ATCN_2298	19815
TTCN_903	9629	CTCN_3286	19816
TTCN_904	9630	CTCN_3287	19817
TTCN_905	9631	GTCN_1914	19818
CTCN_677	9632	ATCN_2299	19819
CTCN_678	9633	TTCN_3680	19820
TTCN_906	9634	TTCN_3681	19821
TTCN_907	9635	TTCN_3682	19822
GTCN_431	9636	ATCN_2300	19823
TTCN_908	9637	ATCN_2301	19824
TTCN_909	9638	TTCN_3683	19825
CTCN_679	9639	TTCN_3684	19826
GTCN_432	9640	CTCN_3288	19827
CTCN_680	9641	GTCN_1915	19828
CTCN_681	9642	CTCN_3289	19829
ATCN_532	9643	CTCN_3290	19830
CTCN_682	9644	GTCN_1916	19831
ATCN_533	9645	CTCN_3291	19832
ATCN_534	9646	TTCN_3685	19833
ATCN_535	9647	TTCN_3686	19834
GTCN_433	9648	CTCN_3292	19835
CTCN_683	9649	GTCN_1917	19836
TTCN_910	9650	ATCN_2302	19837
ATCN_536	9651	GTCN_1918	19838
CTCN_684	9652	CTCN_3293	19839
ATCN_537	9653	TTCN_3687	19840
CTCN_685	9654	GTCN_1919	19841
GTCN_434	9655	CTCN_3294	19842
TTCN_911	9656	CTCN_3295	19843
ATCN_538	9657	ATCN_2303	19844
ATCN_539	9658	GTCN_1920	19845
CTCN_686	9659	CTCN_3296	19846
ATCN_540	9660	CTCN_3297	19847
TTCN_912	9661	CTCN_3298	19848
ATCN_541	9662	TTCN_3688	19849
TTCN_913	9663	CTCN_3299	19850
TTCN_914	9664	ATCN_2304	19851
TTCN_915	9665	ATCN_2305	19852
GTCN_435	9666	CTCN_3300	19853

GTCN_436	9667	CTCN_3301	19854
GTCN_437	9668	CTCN_3302	19855
ATCN_542	9669	TTCN_3689	19856
CTCN_687	9670	TTCN_3690	19857
CTCN_688	9671	TTCN_3691	19858
TTCN_916	9672	CTCN_3303	19859
TTCN_917	9673	GTCN_1921	19860
CTCN_689	9674	CTCN_3304	19861
TTCN_918	9675	CTCN_3305	19862
ATCN_543	9676	GTCN_1922	19863
CTCN_690	9677	CTCN_3306	19864
CTCN_691	9678	ATCN_2306	19865
GTCN_438	9679	TTCN_3692	19866
GTCN_439	9680	TTCN_3693	19867
CTCN_692	9681	GTCN_1923	19868
GTCN_440	9682	TTCN_3694	19869
ATCN_544	9683	TTCN_3695	19870
TTCN_919	9684	TTCN_3696	19871
ATCN_545	9685	ATCN_2307	19872
CTCN_693	9686	GTCN_1924	19873
CTCN_694	9687	GTCN_1925	19874
CTCN_695	9688	CTCN_3307	19875
ATCN_546	9689	TTCN_3697	19876
TTCN_920	9690	TTCN_3698	19877
TTCN_921	9691	GTCN_1926	19878
TTCN_922	9692	GTCN_1927	19879
TTCN_923	9693	ATCN_2308	19880
ATCN_547	9694	TTCN_3699	19881
ATCN_548	9695	ATCN_2309	19882
TTCN_924	9696	TTCN_3700	19883
ATCN_549	9697	ATCN_2310	19884
GTCN_441	9698	CTCN_3308	19885
GTCN_442	9699	CTCN_3309	19886
CTCN_696	9700	TTCN_3701	19887
TTCN_925	9701	TTCN_3702	19888
CTCN_697	9702	ATCN_2311	19889
TTCN_926	9703	TTCN_3703	19890
CTCN_698	9704	TTCN_3704	19891
CTCN_699	9705	ATCN_2312	19892
ATCN_550	9706	CTCN_3310	19893
ATCN_551	9707	TTCN_3705	19894
GTCN_443	9708	TTCN_3706	19895
TTCN_927	9709	TTCN_3707	19896
CTCN_700	9710	GTCN_1928	19897
TTCN_928	9711	CTCN_3311	19898
TTCN_929	9712	GTCN_1929	19899
TTCN_930	9713	CTCN_3312	19900
CTCN_701	9714	CTCN_3313	19901
GTCN_444	9715	TTCN_3708	19902
CTCN_702	9716	ATCN_2313	19903
ATCN_552	9717	CTCN_3314	19904
ATCN_553	9718	CTCN_3315	19905
GTCN_445	9719	ATCN_2314	19906
TTCN_931	9720	CTCN_3316	19907
CTCN_703	9721	GTCN_1930	19908

FIG. 36 (continued)

CTCN_704	9722	TTCN_3709	19909
CTCN_705	9723	TTCN_3710	19910
CTCN_706	9724	CTCN_3317	19911
TTCN_932	9725	ATCN_2315	19912
CTCN_707	9726	CTCN_3318	19913
TTCN_933	9727	TTCN_3711	19914
CTCN_708	9728	TTCN_3712	19915
TTCN_934	9729	GTCN_1931	19916
TTCN_935	9730	GTCN_1932	19917
GTCN_446	9731	CTCN_3319	19918
ATCN_554	9732	CTCN_3320	19919
GTCN_447	9733	CTCN_3321	19920
TTCN_936	9734	CTCN_3322	19921
CTCN_709	9735	TTCN_3713	19922
GTCN_448	9736	TTCN_3714	19923
TTCN_937	9737	CTCN_3323	19924
TTCN_938	9738	GTCN_1933	19925
GTCN_449	9739	CTCN_3324	19926
GTCN_450	9740	CTCN_3325	19927
CTCN_710	9741	CTCN_3326	19928
CTCN_711	9742	CTCN_3327	19929
CTCN_712	9743	CTCN_3328	19930
GTCN_451	9744	TTCN_3715	19931
CTCN_713	9745	TTCN_3716	19932
GTCN_452	9746	TTCN_3717	19933
CTCN_714	9747	CTCN_3329	19934
TTCN_939	9748	GTCN_1934	19935
GTCN_453	9749	ATCN_2316	19936
TTCN_940	9750	TTCN_3718	19937
GTCN_454	9751	ATCN_2317	19938
TTCN_941	9752	ATCN_2318	19939
CTCN_715	9753	ATCN_2319	19940
TTCN_942	9754	CTCN_3330	19941
CTCN_716	9755	GTCN_1935	19942
GTCN_455	9756	CTCN_3331	19943
CTCN_717	9757	TTCN_3719	19944
TTCN_943	9758	TTCN_3720	19945
CTCN_718	9759	GTCN_1936	19946
TTCN_944	9760	CTCN_3332	19947
ATCN_555	9761	GTCN_1937	19948
TTCN_945	9762	GTCN_1938	19949
ATCN_556	9763	CTCN_3333	19950
TTCN_946	9764	CTCN_3334	19951
ATCN_557	9765	TTCN_3721	19952
TTCN_947	9766	ATCN_2320	19953
ATCN_558	9767	CTCN_3335	19954
TTCN_948	9768	CTCN_3336	19955
TTCN_949	9769	TTCN_3722	19956
CTCN_719	9770	TTCN_3723	19957
TTCN_950	9771	CTCN_3337	19958
TTCN_951	9772	TTCN_3724	19959
ATCN_559	9773	CTCN_3338	19960
CTCN_720	9774	GTCN_1939	19961
TTCN_952	9775	ATCN_2321	19962
ATCN_560	9776	TTCN_3725	19963

TTCN_953	9777	TTCN_3726	19964
TTCN_954	9778	CTCN_3339	19965
TTCN_955	9779	ATCN_2322	19966
TTCN_956	9780	GTCN_1940	19967
ATCN_561	9781	CTCN_3340	19968
TTCN_957	9782	ATCN_2323	19969
ATCN_562	9783	ATCN_2324	19970
GTCN_456	9784	TTCN_3727	19971
TTCN_958	9785	CTCN_3341	19972
ATCN_563	9786	ATCN_2325	19973
TTCN_959	9787	TTCN_3728	19974
ATCN_564	9788	CTCN_3342	19975
ATCN_565	9789	TTCN_3729	19976
ATCN_566	9790	CTCN_3343	19977
GTCN_457	9791	GTCN_1941	19978
CTCN_721	9792	GTCN_1942	19979
TTCN_960	9793	TTCN_3730	19980
CTCN_722	9794	GTCN_1943	19981
CTCN_723	9795	TTCN_3731	19982
TTCN_961	9796	TTCN_3732	19983
GTCN_458	9797	TTCN_3733	19984
ATCN_567	9798	TTCN_3734	19985
TTCN_962	9799	ATCN_2326	19986
CTCN_724	9800	ATCN_2327	19987
CTCN_725	9801	TTCN_3735	19988
ATCN_568	9802	GTCN_1944	19989
GTCN_459	9803	CTCN_3344	19990
GTCN_460	9804	CTCN_3345	19991
GTCN_461	9805	CTCN_3346	19992
TTCN_963	9806	CTCN_3347	19993
CTCN_726	9807	TTCN_3736	19994
TTCN_964	9808	GTCN_1945	19995
TTCN_965	9809	GTCN_1946	19996
TTCN_966	9810	CTCN_3348	19997
TTCN_967	9811	ATCN_2328	19998
CTCN_727	9812	TTCN_3737	19999
TTCN_968	9813	TTCN_3738	20000
CTCN_728	9814	GTCN_1947	20001
GTCN_462	9815	ATCN_2329	20002
TTCN_969	9816	TTCN_3739	20003
TTCN_970	9817	TTCN_3740	20004
CTCN_729	9818	ATCN_2330	20005
CTCN_730	9819	CTCN_3349	20006
TTCN_971	9820	CTCN_3350	20007
ATCN_569	9821	TTCN_3741	20008
TTCN_972	9822	ATCN_2331	20009
CTCN_731	9823	CTCN_3351	20010
TTCN_973	9824	GTCN_1948	20011
TTCN_974	9825	GTCN_1949	20012
TTCN_975	9826	CTCN_3352	20013
TTCN_976	9827	CTCN_3353	20014
ATCN_570	9828	TTCN_3742	20015
CTCN_732	9829	CTCN_3354	20016
TTCN_977	9830	GTCN_1950	20017
TTCN_978	9831	GTCN_1951	20018

FIG. 36 (continued)

ATCN_571	9832	CTCN_3355	20019
ATCN_572	9833	ATCN_2332	20020
ATCN_573	9834	CTCN_3356	20021
CTCN_733	9835	CTCN_3357	20022
ATCN_574	9836	CTCN_3358	20023
TTCN_979	9837	CTCN_3359	20024
CTCN_734	9838	GTCN_1952	20025
GTCN_463	9839	GTCN_1953	20026
TTCN_980	9840	CTCN_3360	20027
TTCN_981	9841	CTCN_3361	20028
ATCN_575	9842	CTCN_3362	20029
TTCN_982	9843	TTCN_3743	20030
ATCN_576	9844	TTCN_3744	20031
ATCN_577	9845	TTCN_3745	20032
CTCN_735	9846	CTCN_3363	20033
TTCN_983	9847	TTCN_3746	20034
TTCN_984	9848	ATCN_2333	20035
TTCN_985	9849	CTCN_3364	20036
ATCN_578	9850	TTCN_3747	20037
CTCN_736	9851	CTCN_3365	20038
ATCN_579	9852	TTCN_3748	20039
ATCN_580	9853	CTCN_3366	20040
GTCN_464	9854	CTCN_3367	20041
TTCN_986	9855	TTCN_3749	20042
TTCN_987	9856	TTCN_3750	20043
ATCN_581	9857	TTCN_3751	20044
CTCN_737	9858	TTCN_3752	20045
TTCN_988	9859	TTCN_3753	20046
ATCN_582	9860	CTCN_3368	20047
GTCN_465	9861	CTCN_3369	20048
GTCN_466	9862	CTCN_3370	20049
GTCN_467	9863	TTCN_3754	20050
GTCN_468	9864	CTCN_3371	20051
ATCN_583	9865	CTCN_3372	20052
CTCN_738	9866	GTCN_1954	20053
CTCN_739	9867	TTCN_3755	20054
ATCN_584	9868	CTCN_3373	20055
TTCN_989	9869	CTCN_3374	20056
TTCN_990	9870	CTCN_3375	20057
TTCN_991	9871	CTCN_3376	20058
TTCN_992	9872	GTCN_1955	20059
TTCN_993	9873	CTCN_3377	20060
CTCN_740	9874	CTCN_3378	20061
TTCN_994	9875	CTCN_3379	20062
TTCN_995	9876	CTCN_3380	20063
TTCN_996	9877	CTCN_3381	20064
CTCN_741	9878	CTCN_3382	20065
CTCN_742	9879	TTCN_3756	20066
TTCN_997	9880	TTCN_3757	20067
TTCN_998	9881	GTCN_1956	20068
TTCN_999	9882	CTCN_3383	20069
CTCN_743	9883	ATCN_2334	20070
ATCN_585	9884	CTCN_3384	20071
GTCN_469	9885	GTCN_1957	20072
CTCN_744	9886	CTCN_3385	20073

GTCN_470	9887	CTCN_3386	20074
GTCN_471	9888	CTCN_3387	20075
GTCN_472	9889	GTCN_1958	20076
CTCN_745	9890	GTCN_1959	20077
CTCN_746	9891	GTCN_1960	20078
TTCN_1000	9892	GTCN_1961	20079
ATCN_586	9893	ATCN_2335	20080
TTCN_1001	9894	TTCN_3758	20081
CTCN_747	9895	ATCN_2336	20082
TTCN_1002	9896	ATCN_2337	20083
CTCN_748	9897	CTCN_3388	20084
TTCN_1003	9898	CTCN_3389	20085
TTCN_1004	9899	ATCN_2338	20086
TTCN_1005	9900	CTCN_3390	20087
ATCN_587	9901	CTCN_3391	20088
GTCN_473	9902	CTCN_3392	20089
CTCN_749	9903	CTCN_3393	20090
CTCN_750	9904	CTCN_3394	20091
GTCN_474	9905	CTCN_3395	20092
CTCN_751	9906	GTCN_1962	20093
TTCN_1006	9907	CTCN_3396	20094
CTCN_752	9908	GTCN_1963	20095
TTCN_1007	9909	CTCN_3397	20096
CTCN_753	9910	TTCN_3759	20097
CTCN_754	9911	GTCN_1964	20098
TTCN_1008	9912	CTCN_3398	20099
TTCN_1009	9913	CTCN_3399	20100
CTCN_755	9914	ATCN_2339	20101
TTCN_1010	9915	CTCN_3400	20102
ATCN_588	9916	ATCN_2340	20103
TTCN_1011	9917	ATCN_2341	20104
TTCN_1012	9918	CTCN_3401	20105
ATCN_589	9919	TTCN_3760	20106
GTCN_475	9920	CTCN_3402	20107
TTCN_1013	9921	CTCN_3403	20108
TTCN_1014	9922	ATCN_2342	20109
CTCN_756	9923	GTCN_1965	20110
TTCN_1015	9924	CTCN_3404	20111
GTCN_476	9925	TTCN_3761	20112
GTCN_477	9926	GTCN_1966	20113
TTCN_1016	9927	ATCN_2343	20114
ATCN_590	9928	ATCN_2344	20115
TTCN_1017	9929	GTCN_1967	20116
TTCN_1018	9930	CTCN_3405	20117
ATCN_591	9931	TTCN_3762	20118
GTCN_478	9932	CTCN_3406	20119
CTCN_757	9933	CTCN_3407	20120
ATCN_592	9934	TTCN_3763	20121
CTCN_758	9935	CTCN_3408	20122
CTCN_759	9936	CTCN_3409	20123
ATCN_593	9937	ATCN_2345	20124
ATCN_594	9938	ATCN_2346	20125
TTCN_1019	9939	ATCN_2347	20126
ATCN_595	9940	GTCN_1968	20127
TTCN_1020	9941	GTCN_1969	20128

FIG. 36 (continued)

CTCN_760	9942	TTCN_3764	20129
ATCN_596	9943	CTCN_3410	20130
CTCN_761	9944	GTCN_1970	20131
CTCN_762	9945	GTCN_1971	20132
CTCN_763	9946	TTCN_3765	20133
TTCN_1021	9947	TTCN_3766	20134
TTCN_1022	9948	TTCN_3767	20135
GTCN_479	9949	CTCN_3411	20136
CTCN_764	9950	TTCN_3768	20137
TTCN_1023	9951	ATCN_2348	20138
GTCN_480	9952	ATCN_2349	20139
CTCN_765	9953	ATCN_2350	20140
GTCN_481	9954	GTCN_1972	20141
CTCN_766	9955	CTCN_3412	20142
CTCN_767	9956	CTCN_3413	20143
GTCN_482	9957	CTCN_3414	20144
GTCN_483	9958	TTCN_3769	20145
TTCN_1024	9959	CTCN_3415	20146
TTCN_1025	9960	CTCN_3416	20147
ATCN_597	9961	TTCN_3770	20148
TTCN_1026	9962	CTCN_3417	20149
TTCN_1027	9963	CTCN_3418	20150
ATCN_598	9964	CTCN_3419	20151
TTCN_1028	9965	CTCN_3420	20152
TTCN_1029	9966	TTCN_3771	20153
CTCN_768	9967	CTCN_3421	20154
ATCN_599	9968	CTCN_3422	20155
GTCN_484	9969	CTCN_3423	20156
TTCN_1030	9970	TTCN_3772	20157
ATCN_600	9971	CTCN_3424	20158
ATCN_601	9972	ATCN_2351	20159
TTCN_1031	9973	ATCN_2352	20160
GTCN_485	9974	TTCN_3773	20161
CTCN_769	9975	ATCN_2353	20162
CTCN_770	9976	ATCN_2354	20163
GTCN_486	9977	TTCN_3774	20164
ATCN_602	9978	CTCN_3425	20165
TTCN_1032	9979	CTCN_3426	20166
ATCN_603	9980	TTCN_3775	20167
TTCN_1033	9981	GTCN_1973	20168
TTCN_1034	9982	GTCN_1974	20169
ATCN_604	9983	TTCN_3776	20170
CTCN_771	9984	CTCN_3427	20171
GTCN_487	9985	CTCN_3428	20172
CTCN_772	9986	TTCN_3777	20173
GTCN_488	9987	CTCN_3429	20174
CTCN_773	9988	CTCN_3430	20175
GTCN_489	9989	CTCN_3431	20176
TTCN_1035	9990	GTCN_1975	20177
CTCN_774	9991	CTCN_3432	20178
GTCN_490	9992	ATCN_2355	20179
GTCN_491	9993	ATCN_2356	20180
TTCN_1036	9994	ATCN_2357	20181
TTCN_1037	9995	ATCN_2358	20182
TTCN_1038	9996	ATCN_2359	20183

CTCN_775	9997	TTCN_3778	20184
TTCN_1039	9998	TTCN_3779	20185
TTCN_1040	9999	CTCN_3433	20186
CTCN_776	10000	CTCN_3434	20187
TTCN_1041	10001	GTCN_1976	20188
CTCN_777	10002	TTCN_3780	20189
CTCN_778	10003	CTCN_3435	20190
CTCN_779	10004	TTCN_3781	20191
GTCN_492	10005	TTCN_3782	20192
CTCN_780	10006	TTCN_3783	20193
GTCN_493	10007	TTCN_3784	20194
CTCN_781	10008	TTCN_3785	20195
TTCN_1042	10009	CTCN_3436	20196
CTCN_782	10010	GTCN_1977	20197
GTCN_494	10011	TTCN_3786	20198
CTCN_783	10012	ATCN_2360	20199
GTCN_495	10013	CTCN_3437	20200
GTCN_496	10014	ATCN_2361	20201
TTCN_1043	10015	CTCN_3438	20202
ATCN_605	10016	ATCN_2362	20203
TTCN_1044	10017	GTCN_1978	20204
TTCN_1045	10018	ATCN_2363	20205
CTCN_784	10019	TTCN_3787	20206
CTCN_785	10020	ATCN_2364	20207
GTCN_497	10021	TTCN_3788	20208
ATCN_606	10022	CTCN_3439	20209
ATCN_607	10023	CTCN_3440	20210
TTCN_1046	10024	GTCN_1979	20211
ATCN_608	10025	CTCN_3441	20212
TTCN_1047	10026	GTCN_1980	20213
TTCN_1048	10027	CTCN_3442	20214
CTCN_786	10028	GTCN_1981	20215
GTCN_498	10029	TTCN_3789	20216
TTCN_1049	10030	ATCN_2365	20217
ATCN_609	10031	ATCN_2366	20218
TTCN_1050	10032	CTCN_3443	20219
TTCN_1051	10033	TTCN_3790	20220
TTCN_1052	10034	GTCN_1982	20221
CTCN_787	10035	ATCN_2367	20222
ATCN_610	10036	GTCN_1983	20223
GTCN_499	10037	TTCN_3791	20224
CTCN_788	10038	CTCN_3444	20225
GTCN_500	10039	TTCN_3792	20226
CTCN_789	10040	GTCN_1984	20227
CTCN_790	10041	CTCN_3445	20228
ATCN_611	10042	TTCN_3793	20229
GTCN_501	10043	TTCN_3794	20230
CTCN_791	10044	CTCN_3446	20231
TTCN_1053	10045	TTCN_3795	20232
CTCN_792	10046	CTCN_3447	20233
CTCN_793	10047	TTCN_3796	20234
TTCN_1054	10048	GTCN_1985	20235
GTCN_502	10049	CTCN_3448	20236
TTCN_1055	10050	CTCN_3449	20237
TTCN_1056	10051	CTCN_3450	20238

FIG. 36 (continued)

TTCN_1057	10052	CTCN_3451	20239
CTCN_794	10053	CTCN_3452	20240
ATCN_612	10054	GTCN_1986	20241
TTCN_1058	10055	CTCN_3453	20242
GTCN_503	10056	GTCN_1987	20243
TTCN_1059	10057	GTCN_1988	20244
ATCN_613	10058	GTCN_1989	20245
GTCN_504	10059	GTCN_1990	20246
GTCN_505	10060	GTCN_1991	20247
ATCN_614	10061	CTCN_3454	20248
GTCN_506	10062	CTCN_3455	20249
TTCN_1060	10063	CTCN_3456	20250
TTCN_1061	10064	TTCN_3797	20251
CTCN_795	10065	CTCN_3457	20252
CTCN_796	10066	CTCN_3458	20253
TTCN_1062	10067	CTCN_3459	20254
ATCN_615	10068	CTCN_3460	20255
TTCN_1063	10069	GTCN_1992	20256
GTCN_507	10070	TTCN_3798	20257
GTCN_508	10071	TTCN_3799	20258
TTCN_1064	10072	GTCN_1993	20259
GTCN_509	10073	CTCN_3461	20260
CTCN_797	10074	TTCN_3800	20261
TTCN_1065	10075	GTCN_1994	20262
TTCN_1066	10076	CTCN_3462	20263
CTCN_798	10077	ATCN_2368	20264
GTCN_510	10078	ATCN_2369	20265
TTCN_1067	10079	CTCN_3463	20266
GTCN_511	10080	GTCN_1995	20267
ATCN_616	10081	CTCN_3464	20268
ATCN_617	10082	CTCN_3465	20269
ATCN_618	10083	CTCN_3466	20270
ATCN_619	10084	TTCN_3801	20271
TTCN_1068	10085	GTCN_1996	20272
ATCN_620	10086	GTCN_1997	20273
CTCN_799	10087	TTCN_3802	20274
TTCN_1069	10088	ATCN_2370	20275
GTCN_512	10089	ATCN_2371	20276
ATCN_621	10090	CTCN_3467	20277
GTCN_513	10091	TTCN_3803	20278
GTCN_514	10092	CTCN_3468	20279
CTCN_800	10093	TTCN_3804	20280
ATCN_622	10094	CTCN_3469	20281
TTCN_1070	10095	ATCN_2372	20282
GTCN_515	10096	CTCN_3470	20283
TTCN_1071	10097	GTCN_1998	20284
GTCN_516	10098	CTCN_3471	20285
ATCN_623	10099	CTCN_3472	20286
TTCN_1072	10100	ATCN_2373	20287
TTCN_1073	10101	GTCN_1999	20288
CTCN_801	10102	CTCN_3473	20289
GTCN_517	10103	CTCN_3474	20290
CTCN_802	10104	CTCN_3475	20291
GTCN_518	10105	CTCN_3476	20292
CTCN_803	10106	CTCN_3477	20293

CTCN_804	10107	CTCN_3478	20294
GTCN_519	10108	CTCN_3479	20295
TTCN_1074	10109	CTCN_3480	20296
CTCN_805	10110	CTCN_3481	20297
CTCN_806	10111	TTCN_3805	20298
GTCN_520	10112	GTCN_2000	20299
CTCN_807	10113	TTCN_3806	20300
ATCN_624	10114	GTCN_2001	20301
GTCN_521	10115	CTCN_3482	20302
TTCN_1075	10116	CTCN_3483	20303
TTCN_1076	10117	CTCN_3484	20304
TTCN_1077	10118	CTCN_3485	20305
GTCN_522	10119	CTCN_3486	20306
GTCN_523	10120	GTCN_2002	20307
TTCN_1078	10121	CTCN_3487	20308
TTCN_1079	10122	CTCN_3488	20309
ATCN_625	10123	TTCN_3807	20310
ATCN_626	10124	GTCN_2003	20311
ATCN_627	10125	ATCN_2374	20312
ATCN_628	10126	CTCN_3489	20313
TTCN_1080	10127	TTCN_3808	20314
ATCN_629	10128	CTCN_3490	20315
TTCN_1081	10129	GTCN_2004	20316
CTCN_808	10130	CTCN_3491	20317
TTCN_1082	10131	ATCN_2375	20318
TTCN_1083	10132	GTCN_2005	20319
GTCN_524	10133	CTCN_3492	20320
GTCN_525	10134	CTCN_3493	20321
TTCN_1084	10135	TTCN_3809	20322
CTCN_809	10136	ATCN_2376	20323
ATCN_630	10137	TTCN_3810	20324
TTCN_1085	10138	CTCN_3494	20325
TTCN_1086	10139	TTCN_3811	20326
TTCN_1087	10140	GTCN_2006	20327
CTCN_810	10141	GTCN_2007	20328
CTCN_811	10142	ATCN_2377	20329
ATCN_631	10143	TTCN_3812	20330
ATCN_632	10144	ATCN_2378	20331
TTCN_1088	10145	ATCN_2379	20332
CTCN_812	10146	CTCN_3495	20333
GTCN_526	10147	TTCN_3813	20334
ATCN_633	10148	TTCN_3814	20335
CTCN_813	10149	TTCN_3815	20336
ATCN_634	10150	ATCN_2380	20337
TTCN_1089	10151	TTCN_3816	20338
GTCN_527	10152	CTCN_3496	20339
TTCN_1090	10153	ATCN_2381	20340
CTCN_814	10154	ATCN_2382	20341
TTCN_1091	10155	TTCN_3817	20342
CTCN_815	10156	TTCN_3818	20343
CTCN_816	10157	TTCN_3819	20344
CTCN_817	10158	ATCN_2383	20345
GTCN_528	10159	CTCN_3497	20346
CTCN_818	10160	TTCN_3820	20347
ATCN_635	10161	TTCN_3821	20348

FIG. 36 (continued)

TTCN_1092	10162	ATCN_2384	20349
GTCN_529	10163	ATCN_2385	20350
ATCN_636	10164	ATCN_2386	20351
TTCN_1093	10165	TTCN_3822	20352
GTCN_530	10166	ATCN_2387	20353
CTCN_819	10167	ATCN_2388	20354
CTCN_820	10168	CTCN_3498	20355
CTCN_821	10169	CTCN_3499	20356
CTCN_822	10170	TTCN_3823	20357
GTCN_531	10171	CTCN_3500	20358
GTCN_532	10172	ATCN_2389	20359
TTCN_1094	10173	TTCN_3824	20360
ATCN_637	10174	ATCN_2390	20361
ATCN_638	10175	CTCN_3501	20362
CTCN_823	10176	TTCN_3825	20363
TTCN_1095	10177	TTCN_3826	20364
GTCN_533	10178	ATCN_2391	20365
TTCN_1096	10179	TTCN_3827	20366
ATCN_639	10180	ATCN_2392	20367
TTCN_1097	10181	GTCN_2008	20368
CTCN_824	10182	CTCN_3502	20369
GTCN_534	10183	ATCN_2393	20370
TTCN_1098	10184	CTCN_3503	20371
CTCN_825	10185	CTCN_3504	20372
CTCN_826	10186	TTCN_3828	20373
ATCN_640	10187	GTCN_2009	20374
TTCN_1099	10188	GTCN_2010	20375
CTCN_827	10189	CTCN_3505	20376
TTCN_1100	10190	CTCN_3506	20377
ATCN_641	10191	CTCN_3507	20378
CTCN_828	10192	CTCN_3508	20379
GTCN_535	10193	ATCN_2394	20380
CTCN_829	10194	TTCN_3829	20381
TTCN_1101	10195	GTCN_2011	20382
CTCN_830	10196	TTCN_3830	20383
CTCN_831	10197	TTCN_3831	20384
CTCN_832	10198	GTCN_2012	20385
ATCN_642	10199	TTCN_3832	20386
CTCN_833	10200	CTCN_3509	20387
TTCN_1102	10201	GTCN_2013	20388
GTCN_536	10202	GTCN_2014	20389
CTCN_834	10203	CTCN_3510	20390
GTCN_537	10204	GTCN_2015	20391
GTCN_538	10205	TTCN_3833	20392
GTCN_539	10206	ATCN_2395	20393
GTCN_540	10207	TTCN_3834	20394
CTCN_835	10208	TTCN_3835	20395
TTCN_1103	10209	ATCN_2396	20396
GTCN_541	10210	CTCN_3511	20397
TTCN_1104	10211	CTCN_3512	20398
ATCN_643	10212	ATCN_2397	20399
TTCN_1105	10213	TTCN_3836	20400
CTCN_836	10214	CTCN_3513	20401
CTCN_837	10215	GTCN_2016	20402
GTCN_542	10216	CTCN_3514	20403

CTCN_838	10217	ATCN_2398	20404
TTCN_1106	10218	GTCN_2017	20405
CTCN_839	10219	CTCN_3515	20406
TTCN_1107	10220	CTCN_3516	20407
CTCN_840	10221	GTCN_2018	20408
CTCN_841	10222	TTCN_3837	20409
TTCN_1108	10223	CTCN_3517	20410
GTCN_543	10224	CTCN_3518	20411
CTCN_842	10225	CTCN_3519	20412
TTCN_1109	10226	CTCN_3520	20413
TTCN_1110	10227	CTCN_3521	20414
GTCN_544	10228	GTCN_2019	20415
TTCN_1111	10229	GTCN_2020	20416
CTCN_843	10230	CTCN_3522	20417
TTCN_1112	10231	ATCN_2399	20418
GTCN_545	10232	TTCN_3838	20419
GTCN_546	10233	TTCN_3839	20420
GTCN_547	10234	TTCN_3840	20421
ATCN_644	10235	TTCN_3841	20422
GTCN_548	10236	CTCN_3523	20423
GTCN_549	10237	TTCN_3842	20424
ATCN_645	10238	TTCN_3843	20425
GTCN_550	10239	CTCN_3524	20426
TTCN_1113	10240	CTCN_3525	20427
TTCN_1114	10241	CTCN_3526	20428
TTCN_1115	10242	ATCN_2400	20429
GTCN_551	10243	CTCN_3527	20430
GTCN_552	10244	TTCN_3844	20431
TTCN_1116	10245	CTCN_3528	20432
ATCN_646	10246	TTCN_3845	20433
GTCN_553	10247	TTCN_3846	20434
CTCN_844	10248	TTCN_3847	20435
CTCN_845	10249	TTCN_3848	20436
GTCN_554	10250	TTCN_3849	20437
TTCN_1117	10251	ATCN_2401	20438
CTCN_846	10252	TTCN_3850	20439
TTCN_1118	10253	TTCN_3851	20440
CTCN_847	10254	CTCN_3529	20441
TTCN_1119	10255	GTCN_2021	20442
ATCN_647	10256	CTCN_3530	20443
TTCN_1120	10257	CTCN_3531	20444
GTCN_555	10258	GTCN_2022	20445
CTCN_848	10259	TTCN_3852	20446
GTCN_556	10260	GTCN_2023	20447
GTCN_557	10261	CTCN_3532	20448
CTCN_849	10262	TTCN_3853	20449
GTCN_558	10263	CTCN_3533	20450
GTCN_559	10264	GTCN_2024	20451
TTCN_1121	10265	CTCN_3534	20452
GTCN_560	10266	GTCN_2025	20453
TTCN_1122	10267	TTCN_3854	20454
ATCN_648	10268	GTCN_2026	20455
TTCN_1123	10269	GTCN_2027	20456
TTCN_1124	10270	GTCN_2028	20457
GTCN_561	10271	CTCN_3535	20458

FIG. 36 (continued)

TTCN_1125	10272	TTCN_3855	20459
CTCN_850	10273	CTCN_3536	20460
CTCN_851	10274	CTCN_3537	20461
ATCN_649	10275	CTCN_3538	20462
CTCN_852	10276	GTCN_2029	20463
CTCN_853	10277	GTCN_2030	20464
GTCN_562	10278	CTCN_3539	20465
ATCN_650	10279	GTCN_2031	20466
TTCN_1126	10280	CTCN_3540	20467
GTCN_563	10281	CTCN_3541	20468
CTCN_854	10282	CTCN_3542	20469
CTCN_855	10283	CTCN_3543	20470
TTCN_1127	10284	CTCN_3544	20471
TTCN_1128	10285	CTCN_3545	20472
GTCN_564	10286	CTCN_3546	20473
TTCN_1129	10287	CTCN_3547	20474
GTCN_565	10288	CTCN_3548	20475
TTCN_1130	10289	CTCN_3549	20476
CTCN_856	10290	CTCN_3550	20477
ATCN_651	10291	GTCN_2032	20478
TTCN_1131	10292	CTCN_3551	20479
CTCN_857	10293	CTCN_3552	20480
TTCN_1132	10294	CTCN_3553	20481
ATCN_652	10295	CTCN_3554	20482
ATCN_653	10296	CTCN_3555	20483
CTCN_858	10297	CTCN_3556	20484
TTCN_1133	10298	CTCN_3557	20485
CTCN_859	10299	GTCN_2033	20486
CTCN_860	10300	CTCN_3558	20487
CTCN_861	10301	CTCN_3559	20488
TTCN_1134	10302	GTCN_2034	20489
TTCN_1135	10303	CTCN_3560	20490
TTCN_1136	10304	CTCN_3561	20491
TTCN_1137	10305	CTCN_3562	20492
CTCN_862	10306	CTCN_3563	20493
CTCN_863	10307	CTCN_3564	20494
TTCN_1138	10308	CTCN_3565	20495
TTCN_1139	10309	GTCN_2035	20496
TTCN_1140	10310	CTCN_3566	20497
TTCN_1141	10311	CTCN_3567	20498
ATCN_654	10312	CTCN_3568	20499
CTCN_864	10313	CTCN_3569	20500
GTCN_566	10314	GTCN_2036	20501
TTCN_1142	10315	CTCN_3570	20502
ATCN_655	10316	CTCN_3571	20503
CTCN_865	10317	CTCN_3572	20504
CTCN_866	10318	CTCN_3573	20505
TTCN_1143	10319	GTCN_2037	20506
GTCN_567	10320	CTCN_3574	20507
GTCN_568	10321	CTCN_3575	20508
ATCN_656	10322	CTCN_3576	20509
CTCN_867	10323	CTCN_3577	20510
TTCN_1144	10324	GTCN_2038	20511
ATCN_657	10325	GTCN_2039	20512
CTCN_868	10326	ATCN_2402	20513

CTCN_869	10327	ATCN_2403	20514
CTCN_870	10328	ATCN_2404	20515
CTCN_871	10329	GTCN_2040	20516
CTCN_872	10330	CTCN_3578	20517
CTCN_873	10331	ATCN_2405	20518
TTCN_1145	10332	GTCN_2041	20519
ATCN_658	10333	GTCN_2042	20520
GTCN_569	10334	ATCN_2406	20521
TTCN_1146	10335	TTCN_3856	20522
ATCN_659	10336	CTCN_3579	20523
GTCN_570	10337	CTCN_3580	20524
TTCN_1147	10338	CTCN_3581	20525
GTCN_571	10339	TTCN_3857	20526
TTCN_1148	10340	TTCN_3858	20527
ATCN_660	10341	GTCN_2043	20528
TTCN_1149	10342	ATCN_2407	20529
CTCN_874	10343	CTCN_3582	20530
TTCN_1150	10344	ATCN_2408	20531
ATCN_661	10345	ATCN_2409	20532
TTCN_1151	10346	ATCN_2410	20533
CTCN_875	10347	TTCN_3859	20534
GTCN_572	10348	TTCN_3860	20535
ATCN_662	10349	TTCN_3861	20536
ATCN_663	10350	CTCN_3583	20537
CTCN_876	10351	GTCN_2044	20538
ATCN_664	10352	CTCN_3584	20539
TTCN_1152	10353	CTCN_3585	20540
ATCN_665	10354	GTCN_2045	20541
TTCN_1153	10355	CTCN_3586	20542
CTCN_877	10356	GTCN_2046	20543
GTCN_573	10357	CTCN_3587	20544
TTCN_1154	10358	GTCN_2047	20545
GTCN_574	10359	CTCN_3588	20546
ATCN_666	10360	CTCN_3589	20547
TTCN_1155	10361	CTCN_3590	20548
TTCN_1156	10362	ATCN_2411	20549
TTCN_1157	10363	TTCN_3862	20550
GTCN_575	10364	CTCN_3591	20551
GTCN_576	10365	ATCN_2412	20552
CTCN_878	10366	ATCN_2413	20553
TTCN_1158	10367	CTCN_3592	20554
CTCN_879	10368	GTCN_2048	20555
ATCN_667	10369	CTCN_3593	20556
GTCN_577	10370	CTCN_3594	20557
CTCN_880	10371	ATCN_2414	20558
TTCN_1159	10372	CTCN_3595	20559
ATCN_668	10373	GTCN_2049	20560
TTCN_1160	10374	CTCN_3596	20561
CTCN_881	10375	TTCN_3863	20562
GTCN_578	10376	TTCN_3864	20563
GTCN_579	10377	CTCN_3597	20564
TTCN_1161	10378	CTCN_3598	20565
TTCN_1162	10379	CTCN_3599	20566
GTCN_580	10380	CTCN_3600	20567
CTCN_882	10381	TTCN_3865	20568

FIG. 36 (continued)

TTCN_1163	10382	CTCN_3601	20569
CTCN_883	10383	GTCN_2050	20570
TTCN_1164	10384	CTCN_3602	20571
TTCN_1165	10385	CTCN_3603	20572
TTCN_1166	10386	TTCN_3866	20573
ATCN_669	10387	CTCN_3604	20574
TTCN_1167	10388	TTCN_3867	20575
CTCN_884	10389	CTCN_3605	20576
CTCN_885	10390	CTCN_3606	20577
GTCN_581	10391	GTCN_2051	20578
TTCN_1168	10392	TTCN_3868	20579
ATCN_670	10393	GTCN_2052	20580
TTCN_1169	10394	TTCN_3869	20581
CTCN_886	10395	CTCN_3607	20582
CTCN_887	10396	GTCN_2053	20583
GTCN_582	10397	TTCN_3870	20584
TTCN_1170	10398	GTCN_2054	20585
CTCN_888	10399	GTCN_2055	20586
TTCN_1171	10400	CTCN_3608	20587
ATCN_671	10401	CTCN_3609	20588
TTCN_1172	10402	GTCN_2056	20589
TTCN_1173	10403	CTCN_3610	20590
CTCN_889	10404	GTCN_2057	20591
GTCN_583	10405	ATCN_2415	20592
TTCN_1174	10406	TTCN_3871	20593
TTCN_1175	10407	TTCN_3872	20594
TTCN_1176	10408	GTCN_2058	20595
TTCN_1177	10409	TTCN_3873	20596
GTCN_584	10410	CTCN_3611	20597
TTCN_1178	10411	GTCN_2059	20598
ATCN_672	10412	CTCN_3612	20599
GTCN_585	10413	CTCN_3613	20600
CTCN_890	10414	GTCN_2060	20601
ATCN_673	10415	GTCN_2061	20602
CTCN_891	10416	TTCN_3874	20603
GTCN_586	10417	TTCN_3875	20604
CTCN_892	10418	GTCN_2062	20605
TTCN_1179	10419	CTCN_3614	20606
ATCN_674	10420	CTCN_3615	20607
ATCN_675	10421	ATCN_2416	20608
CTCN_893	10422	TTCN_3876	20609
TTCN_1180	10423	CTCN_3616	20610
CTCN_894	10424	GTCN_2063	20611
TTCN_1181	10425	CTCN_3617	20612
ATCN_676	10426	CTCN_3618	20613
ATCN_677	10427	TTCN_3877	20614
CTCN_895	10428	TTCN_3878	20615
ATCN_678	10429	TTCN_3879	20616
GTCN_587	10430	GTCN_2064	20617
CTCN_896	10431	GTCN_2065	20618
ATCN_679	10432	CTCN_3619	20619
CTCN_897	10433	CTCN_3620	20620
GTCN_588	10434	CTCN_3621	20621
GTCN_589	10435	GTCN_2066	20622
TTCN_1182	10436	CTCN_3622	20623

CTCN_898	10437	CTCN_3623	20624
GTCN_590	10438	TTCN_3880	20625
GTCN_591	10439	TTCN_3881	20626
ATCN_680	10440	CTCN_3624	20627
CTCN_899	10441	ATCN_2417	20628
CTCN_900	10442	CTCN_3625	20629
CTCN_901	10443	GTCN_2067	20630
GTCN_592	10444	TTCN_3882	20631
ATCN_681	10445	CTCN_3626	20632
CTCN_902	10446	GTCN_2068	20633
TTCN_1183	10447	CTCN_3627	20634
ATCN_682	10448	CTCN_3628	20635
ATCN_683	10449	CTCN_3629	20636
TTCN_1184	10450	ATCN_2418	20637
TTCN_1185	10451	CTCN_3630	20638
CTCN_903	10452	GTCN_2069	20639
ATCN_684	10453	CTCN_3631	20640
ATCN_685	10454	GTCN_2070	20641
ATCN_686	10455	TTCN_3883	20642
TTCN_1186	10456	CTCN_3632	20643
CTCN_904	10457	ATCN_2419	20644
ATCN_687	10458	ATCN_2420	20645
CTCN_905	10459	GTCN_2071	20646
TTCN_1187	10460	ATCN_2421	20647
GTCN_593	10461	ATCN_2422	20648
TTCN_1188	10462	TTCN_3884	20649
CTCN_906	10463	GTCN_2072	20650
GTCN_594	10464	CTCN_3633	20651
TTCN_1189	10465	ATCN_2423	20652
CTCN_907	10466	TTCN_3885	20653
TTCN_1190	10467	GTCN_2073	20654
CTCN_908	10468	GTCN_2074	20655
CTCN_909	10469	ATCN_2424	20656
CTCN_910	10470	GTCN_2075	20657
CTCN_911	10471	TTCN_3886	20658
GTCN_595	10472	TTCN_3887	20659
GTCN_596	10473	ATCN_2425	20660
CTCN_912	10474	TTCN_3888	20661
ATCN_688	10475	TTCN_3889	20662
ATCN_689	10476	GTCN_2076	20663
GTCN_597	10477	CTCN_3634	20664
TTCN_1191	10478	CTCN_3635	20665
ATCN_690	10479	CTCN_3636	20666
ATCN_691	10480	CTCN_3637	20667
TTCN_1192	10481	CTCN_3638	20668
GTCN_598	10482	CTCN_3639	20669
TTCN_1193	10483	CTCN_3640	20670
CTCN_913	10484	CTCN_3641	20671
CTCN_914	10485	TTCN_3890	20672
ATCN_692	10486	TTCN_3891	20673
CTCN_915	10487	ATCN_2426	20674
CTCN_916	10488	CTCN_3642	20675
GTCN_599	10489	TTCN_3892	20676
TTCN_1194	10490	GTCN_2077	20677
ATCN_693	10491	CTCN_3643	20678

FIG. 36 (continued)

TTCN_1195	10492	GTCN_2078	20679
CTCN_917	10493	TTCN_3893	20680
CTCN_918	10494	CTCN_3644	20681
TTCN_1196	10495	GTCN_2079	20682
GTCN_600	10496	TTCN_3894	20683
CTCN_919	10497	TTCN_3895	20684
TTCN_1197	10498	TTCN_3896	20685
GTCN_601	10499	TTCN_3897	20686
CTCN_920	10500	CTCN_3645	20687
ATCN_694	10501	CTCN_3646	20688
CTCN_921	10502	ATCN_2427	20689
CTCN_922	10503	ATCN_2428	20690
ATCN_695	10504	CTCN_3647	20691
ATCN_696	10505	GTCN_2080	20692
CTCN_923	10506	GTCN_2081	20693
CTCN_924	10507	ATCN_2429	20694
CTCN_925	10508	CTCN_3648	20695
CTCN_926	10509	GTCN_2082	20696
TTCN_1198	10510	GTCN_2083	20697
TTCN_1199	10511	CTCN_3649	20698
ATCN_697	10512	GTCN_2084	20699
CTCN_927	10513	CTCN_3650	20700
CTCN_928	10514	GTCN_2085	20701
ATCN_698	10515	CTCN_3651	20702
CTCN_929	10516	GTCN_2086	20703
CTCN_930	10517	TTCN_3898	20704
TTCN_1200	10518	CTCN_3652	20705
ATCN_699	10519	TTCN_3899	20706
ATCN_700	10520	CTCN_3653	20707
CTCN_931	10521	CTCN_3654	20708
GTCN_602	10522	GTCN_2087	20709
GTCN_603	10523	CTCN_3655	20710
CTCN_932	10524	ATCN_2430	20711
GTCN_604	10525	CTCN_3656	20712
TTCN_1201	10526	CTCN_3657	20713
CTCN_933	10527	TTCN_3900	20714
ATCN_701	10528	GTCN_2088	20715
ATCN_702	10529	CTCN_3658	20716
ATCN_703	10530	TTCN_3901	20717
TTCN_1202	10531	GTCN_2089	20718
TTCN_1203	10532	ATCN_2431	20719
CTCN_934	10533	CTCN_3659	20720
TTCN_1204	10534	GTCN_2090	20721
CTCN_935	10535	CTCN_3660	20722
CTCN_936	10536	CTCN_3661	20723
CTCN_937	10537	GTCN_2091	20724
GTCN_605	10538	GTCN_2092	20725
CTCN_938	10539	TTCN_3902	20726
TTCN_1205	10540	TTCN_3903	20727
ATCN_704	10541	GTCN_2093	20728
CTCN_939	10542	GTCN_2094	20729
TTCN_1206	10543	GTCN_2095	20730
GTCN_606	10544	CTCN_3662	20731
TTCN_1207	10545	CTCN_3663	20732
TTCN_1208	10546	CTCN_3664	20733

ATCN_705	10547	TTCN_3904	20734
TTCN_1209	10548	CTCN_3665	20735
TTCN_1210	10549	GTCN_2096	20736
TTCN_1211	10550	CTCN_3666	20737
ATCN_706	10551	CTCN_3667	20738
CTCN_940	10552	CTCN_3668	20739
CTCN_941	10553	CTCN_3669	20740
CTCN_942	10554	GTCN_2097	20741
ATCN_707	10555	GTCN_2098	20742
ATCN_708	10556	CTCN_3670	20743
TTCN_1212	10557	GTCN_2099	20744
ATCN_709	10558	TTCN_3905	20745
CTCN_943	10559	TTCN_3906	20746
ATCN_710	10560	TTCN_3907	20747
TTCN_1213	10561	GTCN_2100	20748
ATCN_711	10562	CTCN_3671	20749
GTCN_607	10563	TTCN_3908	20750
CTCN_944	10564	CTCN_3672	20751
ATCN_712	10565	GTCN_2101	20752
CTCN_945	10566	CTCN_3673	20753
GTCN_608	10567	TTCN_3909	20754
GTCN_609	10568	GTCN_2102	20755
ATCN_713	10569	GTCN_2103	20756
TTCN_1214	10570	CTCN_3674	20757
CTCN_946	10571	TTCN_3910	20758
GTCN_610	10572	CTCN_3675	20759
ATCN_714	10573	CTCN_3676	20760
GTCN_611	10574	TTCN_3911	20761
ATCN_715	10575	ATCN_2432	20762
GTCN_612	10576	CTCN_3677	20763
TTCN_1215	10577	TTCN_3912	20764
GTCN_613	10578	TTCN_3913	20765
CTCN_947	10579	CTCN_3678	20766
GTCN_614	10580	CTCN_3679	20767
CTCN_948	10581	CTCN_3680	20768
GTCN_615	10582	ATCN_2433	20769
ATCN_716	10583	ATCN_2434	20770
ATCN_717	10584	CTCN_3681	20771
CTCN_949	10585	CTCN_3682	20772
GTCN_616	10586	CTCN_3683	20773
CTCN_950	10587	CTCN_3684	20774
CTCN_951	10588	GTCN_2104	20775
TTCN_1216	10589	CTCN_3685	20776
ATCN_718	10590	CTCN_3686	20777
CTCN_952	10591	CTCN_3687	20778
ATCN_719	10592	CTCN_3688	20779
GTCN_617	10593	CTCN_3689	20780
CTCN_953	10594	CTCN_3690	20781
ATCN_720	10595	ATCN_2435	20782
ATCN_721	10596	ATCN_2436	20783
TTCN_1217	10597	GTCN_2105	20784
GTCN_618	10598	ATCN_2437	20785
TTCN_1218	10599	ATCN_2438	20786
GTCN_619	10600	CTCN_3691	20787
ATCN_722	10601	ATCN_2439	20788

FIG. 36 (continued)

GTCN_620	10602	GTCN_2106	20789
TTCN_1219	10603	CTCN_3692	20790
TTCN_1220	10604	CTCN_3693	20791
GTCN_621	10605	GTCN_2107	20792
ATCN_723	10606	CTCN_3694	20793
TTCN_1221	10607	GTCN_2108	20794
CTCN_954	10608	CTCN_3695	20795
ATCN_724	10609	CTCN_3696	20796
TTCN_1222	10610	TTCN_3914	20797
GTCN_622	10611	CTCN_3697	20798
ATCN_725	10612	CTCN_3698	20799
TTCN_1223	10613	CTCN_3699	20800
CTCN_955	10614	ATCN_2440	20801
GTCN_623	10615	TTCN_3915	20802
TTCN_1224	10616	CTCN_3700	20803
TTCN_1225	10617	CTCN_3701	20804
TTCN_1226	10618	GTCN_2109	20805
ATCN_726	10619	CTCN_3702	20806
ATCN_727	10620	ATCN_2441	20807
CTCN_956	10621	GTCN_2110	20808
CTCN_957	10622	ATCN_2442	20809
CTCN_958	10623	GTCN_2111	20810
ATCN_728	10624	ATCN_2443	20811
CTCN_959	10625	GTCN_2112	20812
TTCN_1227	10626	GTCN_2113	20813
ATCN_729	10627	GTCN_2114	20814
TTCN_1228	10628	GTCN_2115	20815
TTCN_1229	10629	CTCN_3703	20816
TTCN_1230	10630	GTCN_2116	20817
TTCN_1231	10631	TTCN_3916	20818
GTCN_624	10632	ATCN_2444	20819
ATCN_730	10633	GTCN_2117	20820
TTCN_1232	10634	CTCN_3704	20821
GTCN_625	10635	CTCN_3705	20822
ATCN_731	10636	TTCN_3917	20823
ATCN_732	10637	TTCN_3918	20824
TTCN_1233	10638	ATCN_2445	20825
TTCN_1234	10639	ATCN_2446	20826
ATCN_733	10640	CTCN_3706	20827
ATCN_734	10641	TTCN_3919	20828
ATCN_735	10642	GTCN_2118	20829
ATCN_736	10643	ATCN_2447	20830
CTCN_960	10644	CTCN_3707	20831
CTCN_961	10645	GTCN_2119	20832
TTCN_1235	10646	CTCN_3708	20833
GTCN_626	10647	TTCN_3920	20834
TTCN_1236	10648	CTCN_3709	20835
TTCN_1237	10649	GTCN_2120	20836
GTCN_627	10650	TTCN_3921	20837
GTCN_628	10651	CTCN_3710	20838
GTCN_629	10652	ATCN_2448	20839
ATCN_737	10653	TTCN_3922	20840
TTCN_1238	10654	TTCN_3923	20841
ATCN_738	10655	CTCN_3711	20842
CTCN_962	10656	TTCN_3924	20843

CTCN_963	10657	CTCN_3712	20844
CTCN_964	10658	TTCN_3925	20845
TTCN_1239	10659	GTCN_2121	20846
ATCN_739	10660	ATCN_2449	20847
GTCN_630	10661	GTCN_2122	20848
CTCN_965	10662	GTCN_2123	20849
GTCN_631	10663	GTCN_2124	20850
CTCN_966	10664	ATCN_2450	20851
CTCN_967	10665	GTCN_2125	20852
CTCN_968	10666	ATCN_2451	20853
TTCN_1240	10667	CTCN_3713	20854
CTCN_969	10668	CTCN_3714	20855
TTCN_1241	10669	CTCN_3715	20856
CTCN_970	10670	TTCN_3926	20857
ATCN_740	10671	GTCN_2126	20858
GTCN_632	10672	ATCN_2452	20859
GTCN_633	10673	ATCN_2453	20860
CTCN_971	10674	GTCN_2127	20861
GTCN_634	10675	GTCN_2128	20862
CTCN_972	10676	CTCN_3716	20863
TTCN_1242	10677	CTCN_3717	20864
CTCN_973	10678	CTCN_3718	20865
TTCN_1243	10679	TTCN_3927	20866
ATCN_741	10680	CTCN_3719	20867
TTCN_1244	10681	CTCN_3720	20868
TTCN_1245	10682	CTCN_3721	20869
GTCN_635	10683	TTCN_3928	20870
GTCN_636	10684	TTCN_3929	20871
GTCN_637	10685	CTCN_3722	20872
GTCN_638	10686	GTCN_2129	20873
TTCN_1246	10687	ATCN_2454	20874
GTCN_639	10688	ATCN_2455	20875
TTCN_1247	10689	ATCN_2456	20876
TTCN_1248	10690	CTCN_3723	20877
ATCN_742	10691	GTCN_2130	20878
CTCN_974	10692	CTCN_3724	20879
TTCN_1249	10693	TTCN_3930	20880
CTCN_975	10694	GTCN_2131	20881
GTCN_640	10695	TTCN_3931	20882
GTCN_641	10696	CTCN_3725	20883
CTCN_976	10697	CTCN_3726	20884
TTCN_1250	10698	CTCN_3727	20885
CTCN_977	10699	CTCN_3728	20886
TTCN_1251	10700	TTCN_3932	20887
ATCN_743	10701	TTCN_3933	20888
GTCN_642	10702	GTCN_2132	20889
CTCN_978	10703	CTCN_3729	20890
CTCN_979	10704	ATCN_2457	20891
GTCN_643	10705	TTCN_3934	20892
CTCN_980	10706	GTCN_2133	20893
TTCN_1252	10707	CTCN_3730	20894
ATCN_744	10708	GTCN_2134	20895
GTCN_644	10709	CTCN_3731	20896
GTCN_645	10710	ATCN_2458	20897
TTCN_1253	10711	TTCN_3935	20898

FIG. 36 (continued)

TTCN_1254	10712	GTCN_2135	20899
TTCN_1255	10713	TTCN_3936	20900
ATCN_745	10714	ATCN_2459	20901
ATCN_746	10715	ATCN_2460	20902
GTCN_646	10716	TTCN_3937	20903
ATCN_747	10717	CTCN_3732	20904
ATCN_748	10718	TTCN_3938	20905
ATCN_749	10719	ATCN_2461	20906
ATCN_750	10720	ATCN_2462	20907
ATCN_751	10721	TTCN_3939	20908
ATCN_752	10722	CTCN_3733	20909
ATCN_753	10723	TTCN_3940	20910
ATCN_754	10724	TTCN_3941	20911
ATCN_755	10725	TTCN_3942	20912
ATCN_756	10726	TTCN_3943	20913
CTCN_981	10727	ATCN_2463	20914
TTCN_1256	10728	ATCN_2464	20915
ATCN_757	10729	ATCN_2465	20916
TTCN_1257	10730	ATCN_2466	20917
CTCN_982	10731	ATCN_2467	20918
GTCN_647	10732	TTCN_3944	20919
ATCN_758	10733	CTCN_3734	20920
ATCN_759	10734	TTCN_3945	20921
TTCN_1258	10735	CTCN_3735	20922
TTCN_1259	10736	CTCN_3736	20923
TTCN_1260	10737	TTCN_3946	20924
CTCN_983	10738	GTCN_2136	20925
TTCN_1261	10739	TTCN_3947	20926
TTCN_1262	10740	CTCN_3737	20927
TTCN_1263	10741	GTCN_2137	20928
TTCN_1264	10742	CTCN_3738	20929
TTCN_1265	10743	TTCN_3948	20930
ATCN_760	10744	CTCN_3739	20931
GTCN_648	10745	ATCN_2468	20932
GTCN_649	10746	GTCN_2138	20933
CTCN_984	10747	CTCN_3740	20934
CTCN_985	10748	TTCN_3949	20935
CTCN_986	10749	CTCN_3741	20936
ATCN_761	10750	CTCN_3742	20937
CTCN_987	10751	CTCN_3743	20938
TTCN_1266	10752	GTCN_2139	20939
CTCN_988	10753	CTCN_3744	20940
CTCN_989	10754	CTCN_3745	20941
CTCN_990	10755	CTCN_3746	20942
TTCN_1267	10756	TTCN_3950	20943
CTCN_991	10757	GTCN_2140	20944
GTCN_650	10758	GTCN_2141	20945
TTCN_1268	10759	CTCN_3747	20946
CTCN_992	10760	TTCN_3951	20947
CTCN_993	10761	CTCN_3748	20948
CTCN_994	10762	CTCN_3749	20949
CTCN_995	10763	TTCN_3952	20950
CTCN_996	10764	CTCN_3750	20951
GTCN_651	10765	GTCN_2142	20952
CTCN_997	10766	TTCN_3953	20953

ATCN_762	10767	CTCN_3751	20954
TTCN_1269	10768	ATCN_2469	20955
CTCN_998	10769	TTCN_3954	20956
GTCN_652	10770	CTCN_3752	20957
CTCN_999	10771	TTCN_3955	20958
TTCN_1270	10772	ATCN_2470	20959
ATCN_763	10773	TTCN_3956	20960
TTCN_1271	10774	TTCN_3957	20961
ATCN_764	10775	TTCN_3958	20962
ATCN_765	10776	ATCN_2471	20963
CTCN_1000	10777	TTCN_3959	20964
TTCN_1272	10778	TTCN_3960	20965
ATCN_766	10779	ATCN_2472	20966
GTCN_653	10780	TTCN_3961	20967
ATCN_767	10781	TTCN_3962	20968
ATCN_768	10782	GTCN_2143	20969
CTCN_1001	10783	TTCN_3963	20970
GTCN_654	10784	GTCN_2144	20971
ATCN_769	10785	TTCN_3964	20972
ATCN_770	10786	ATCN_2473	20973
ATCN_771	10787	GTCN_2145	20974
CTCN_1002	10788	ATCN_2474	20975
CTCN_1003	10789	CTCN_3753	20976
CTCN_1004	10790	TTCN_3965	20977
TTCN_1273	10791	TTCN_3966	20978
CTCN_1005	10792	CTCN_3754	20979
ATCN_772	10793	CTCN_3755	20980
TTCN_1274	10794	CTCN_3756	20981
TTCN_1275	10795	TTCN_3967	20982
CTCN_1006	10796	CTCN_3757	20983
TTCN_1276	10797	TTCN_3968	20984
TTCN_1277	10798	CTCN_3758	20985
TTCN_1278	10799	CTCN_3759	20986
ATCN_773	10800	CTCN_3760	20987
ATCN_774	10801	GTCN_2146	20988
ATCN_775	10802	TTCN_3969	20989
GTCN_655	10803	CTCN_3761	20990
CTCN_1007	10804	TTCN_3970	20991
CTCN_1008	10805	ATCN_2475	20992
TTCN_1279	10806	GTCN_2147	20993
TTCN_1280	10807	CTCN_3762	20994
TTCN_1281	10808	TTCN_3971	20995
CTCN_1009	10809	CTCN_3763	20996
CTCN_1010	10810	TTCN_3972	20997
TTCN_1282	10811	TTCN_3973	20998
TTCN_1283	10812	TTCN_3974	20999
TTCN_1284	10813	TTCN_3975	21000
GTCN_656	10814	ATCN_2476	21001
ATCN_776	10815	CTCN_3764	21002
TTCN_1285	10816	TTCN_3976	21003
TTCN_1286	10817	GTCN_2148	21004
CTCN_1011	10818	CTCN_3765	21005
ATCN_777	10819	GTCN_2149	21006
TTCN_1287	10820	CTCN_3766	21007
CTCN_1012	10821	TTCN_3977	21008

FIG. 36 (continued)

GTCN_657	10822	GTCN_2150	21009
CTCN_1013	10823	TTCN_3978	21010
CTCN_1014	10824	TTCN_3979	21011
TTCN_1288	10825	CTCN_3767	21012
ATCN_778	10826	CTCN_3768	21013
GTCN_658	10827	GTCN_2151	21014
TTCN_1289	10828	CTCN_3769	21015
ATCN_779	10829	CTCN_3770	21016
TTCN_1290	10830	ATCN_2477	21017
CTCN_1015	10831	TTCN_3980	21018
TTCN_1291	10832	CTCN_3771	21019
GTCN_659	10833	GTCN_2152	21020
TTCN_1292	10834	ATCN_2478	21021
GTCN_660	10835	CTCN_3772	21022
CTCN_1016	10836	CTCN_3773	21023
ATCN_780	10837	CTCN_3774	21024
TTCN_1293	10838	CTCN_3775	21025
TTCN_1294	10839	TTCN_3981	21026
ATCN_781	10840	CTCN_3776	21027
GTCN_661	10841	TTCN_3982	21028
TTCN_1295	10842	TTCN_3983	21029
ATCN_782	10843	CTCN_3777	21030
ATCN_783	10844	CTCN_3778	21031
TTCN_1296	10845	TTCN_3984	21032
ATCN_784	10846	ATCN_2479	21033
ATCN_785	10847	TTCN_3985	21034
CTCN_1017	10848	CTCN_3779	21035
ATCN_786	10849	GTCN_2153	21036
CTCN_1018	10850	CTCN_3780	21037
TTCN_1297	10851	CTCN_3781	21038
TTCN_1298	10852	TTCN_3986	21039
ATCN_787	10853	ATCN_2480	21040
GTCN_662	10854	CTCN_3782	21041
TTCN_1299	10855	CTCN_3783	21042
CTCN_1019	10856	TTCN_3987	21043
GTCN_663	10857	GTCN_2154	21044
ATCN_788	10858	CTCN_3784	21045
CTCN_1020	10859	GTCN_2155	21046
TTCN_1300	10860	TTCN_3988	21047
TTCN_1301	10861	CTCN_3785	21048
CTCN_1021	10862	TTCN_3989	21049
GTCN_664	10863	CTCN_3786	21050
GTCN_665	10864	CTCN_3787	21051
TTCN_1302	10865	GTCN_2156	21052
TTCN_1303	10866	CTCN_3788	21053
ATCN_789	10867	GTCN_2157	21054
TTCN_1304	10868	TTCN_3990	21055
TTCN_1305	10869	CTCN_3789	21056
GTCN_666	10870	TTCN_3991	21057
TTCN_1306	10871	TTCN_3992	21058
CTCN_1022	10872	TTCN_3993	21059
TTCN_1307	10873	ATCN_2481	21060
TTCN_1308	10874	ATCN_2482	21061
TTCN_1309	10875	ATCN_2483	21062
GTCN_667	10876	CTCN_3790	21063

ATCN_790	10877	CTCN_3791	21064
TTCN_1310	10878	ATCN_2484	21065
TTCN_1311	10879	ATCN_2485	21066
ATCN_791	10880	TTCN_3994	21067
ATCN_792	10881	TTCN_3995	21068
CTCN_1023	10882	TTCN_3996	21069
CTCN_1024	10883	ATCN_2486	21070
TTCN_1312	10884	ATCN_2487	21071
TTCN_1313	10885	CTCN_3792	21072
TTCN_1314	10886	CTCN_3793	21073
ATCN_793	10887	GTCN_2158	21074
CTCN_1025	10888	TTCN_3997	21075
GTCN_668	10889	TTCN_3998	21076
CTCN_1026	10890	TTCN_3999	21077
GTCN_669	10891	TTCN_4000	21078
CTCN_1027	10892	CTCN_3794	21079
CTCN_1028	10893	TTCN_4001	21080
GTCN_670	10894	ATCN_2488	21081
TTCN_1315	10895	ATCN_2489	21082
GTCN_671	10896	TTCN_4002	21083
TTCN_1316	10897	GTCN_2159	21084
GTCN_672	10898	GTCN_2160	21085
CTCN_1029	10899	CTCN_3795	21086
CTCN_1030	10900	CTCN_3796	21087
CTCN_1031	10901	GTCN_2161	21088
ATCN_794	10902	ATCN_2490	21089
TTCN_1317	10903	TTCN_4003	21090
CTCN_1032	10904	TTCN_4004	21091
CTCN_1033	10905	CTCN_3797	21092
ATCN_795	10906	GTCN_2162	21093
ATCN_796	10907	CTCN_3798	21094
TTCN_1318	10908	TTCN_4005	21095
ATCN_797	10909	TTCN_4006	21096
ATCN_798	10910	ATCN_2491	21097
CTCN_1034	10911	CTCN_3799	21098
TTCN_1319	10912	TTCN_4007	21099
TTCN_1320	10913	GTCN_2163	21100
ATCN_799	10914	TTCN_4008	21101
CTCN_1035	10915	TTCN_4009	21102
TTCN_1321	10916	CTCN_3800	21103
TTCN_1322	10917	ATCN_2492	21104
ATCN_800	10918	TTCN_4010	21105
ATCN_801	10919	CTCN_3801	21106
GTCN_673	10920	GTCN_2164	21107
CTCN_1036	10921	ATCN_2493	21108
TTCN_1323	10922	GTCN_2165	21109
TTCN_1324	10923	TTCN_4011	21110
ATCN_802	10924	ATCN_2494	21111
CTCN_1037	10925	TTCN_4012	21112
TTCN_1325	10926	TTCN_4013	21113
GTCN_674	10927	GTCN_2166	21114
GTCN_675	10928	ATCN_2495	21115
ATCN_803	10929	ATCN_2496	21116
TTCN_1326	10930	GTCN_2167	21117
TTCN_1327	10931	CTCN_3802	21118

FIG. 36 (continued)

ATCN_804	10932	ATCN_2497	21119
ATCN_805	10933	ATCN_2498	21120
TTCN_1328	10934	ATCN_2499	21121
CTCN_1038	10935	CTCN_3803	21122
ATCN_806	10936	ATCN_2500	21123
TTCN_1329	10937	ATCN_2501	21124
TTCN_1330	10938	ATCN_2502	21125
CTCN_1039	10939	GTCN_2168	21126
CTCN_1040	10940	CTCN_3804	21127
TTCN_1331	10941	TTCN_4014	21128
TTCN_1332	10942	CTCN_3805	21129
CTCN_1041	10943	CTCN_3806	21130
ATCN_807	10944	CTCN_3807	21131
ATCN_808	10945	ATCN_2503	21132
GTCN_676	10946	TTCN_4015	21133
TTCN_1333	10947	CTCN_3808	21134
TTCN_1334	10948	ATCN_2504	21135
ATCN_809	10949	ATCN_2505	21136
CTCN_1042	10950	TTCN_4016	21137
GTCN_677	10951	ATCN_2506	21138
CTCN_1043	10952	ATCN_2507	21139
CTCN_1044	10953	GTCN_2169	21140
ATCN_810	10954	CTCN_3809	21141
CTCN_1045	10955	ATCN_2508	21142
ATCN_811	10956	ATCN_2509	21143
GTCN_678	10957	TTCN_4017	21144
CTCN_1046	10958	CTCN_3810	21145
TTCN_1335	10959	GTCN_2170	21146
CTCN_1047	10960	CTCN_3811	21147
ATCN_812	10961	TTCN_4018	21148
ATCN_813	10962	TTCN_4019	21149
ATCN_814	10963	ATCN_2510	21150
CTCN_1048	10964	TTCN_4020	21151
CTCN_1049	10965	ATCN_2511	21152
CTCN_1050	10966	CTCN_3812	21153
CTCN_1051	10967	TTCN_4021	21154
ATCN_815	10968	CTCN_3813	21155
ATCN_816	10969	TTCN_4022	21156
GTCN_679	10970	GTCN_2171	21157
CTCN_1052	10971	TTCN_4023	21158
TTCN_1336	10972	GTCN_2172	21159
TTCN_1337	10973	GTCN_2173	21160
CTCN_1053	10974	TTCN_4024	21161
ATCN_817	10975	CTCN_3814	21162
CTCN_1054	10976	TTCN_4025	21163
CTCN_1055	10977	CTCN_3815	21164
TTCN_1338	10978	TTCN_4026	21165
CTCN_1056	10979	GTCN_2174	21166
CTCN_1057	10980	CTCN_3816	21167
CTCN_1058	10981	ATCN_2512	21168
ATCN_818	10982	ATCN_2513	21169
ATCN_819	10983	ATCN_2514	21170
TTCN_1339	10984	TTCN_4027	21171
TTCN_1340	10985	ATCN_2515	21172
CTCN_1059	10986	CTCN_3817	21173

CTCN_1060	10987	ATCN_2516	21174
TTCN_1341	10988	ATCN_2517	21175
TTCN_1342	10989	TTCN_4028	21176
TTCN_1343	10990	CTCN_3818	21177
TTCN_1344	10991	CTCN_3819	21178
TTCN_1345	10992	CTCN_3820	21179
GTCN_680	10993	CTCN_3821	21180
TTCN_1346	10994	CTCN_3822	21181
TTCN_1347	10995	ATCN_2518	21182
CTCN_1061	10996	CTCN_3823	21183
TTCN_1348	10997	ATCN_2519	21184
TTCN_1349	10998	TTCN_4029	21185
TTCN_1350	10999	ATCN_2520	21186
TTCN_1351	11000	ATCN_2521	21187
GTCN_681	11001	CTCN_3824	21188
CTCN_1062	11002	GTCN_2175	21189
TTCN_1352	11003	CTCN_3825	21190
TTCN_1353	11004	TTCN_4030	21191
ATCN_820	11005	GTCN_2176	21192
TTCN_1354	11006	TTCN_4031	21193
TTCN_1355	11007	ATCN_2522	21194
CTCN_1063	11008	CTCN_3826	21195
CTCN_1064	11009	ATCN_2523	21196
ATCN_821	11010	CTCN_3827	21197
GTCN_682	11011	CTCN_3828	21198
GTCN_683	11012	CTCN_3829	21199
GTCN_684	11013	TTCN_4032	21200
ATCN_822	11014	TTCN_4033	21201
CTCN_1065	11015	TTCN_4034	21202
ATCN_823	11016	CTCN_3830	21203
ATCN_824	11017	ATCN_2524	21204
GTCN_685	11018	CTCN_3831	21205
TTCN_1356	11019	CTCN_3832	21206
TTCN_1357	11020	ATCN_2525	21207
TTCN_1358	11021	ATCN_2526	21208
ATCN_825	11022	CTCN_3833	21209
CTCN_1066	11023	CTCN_3834	21210
ATCN_826	11024	GTCN_2177	21211
TTCN_1359	11025	CTCN_3835	21212
GTCN_686	11026	ATCN_2527	21213
CTCN_1067	11027	ATCN_2528	21214
CTCN_1068	11028	CTCN_3836	21215
CTCN_1069	11029	ATCN_2529	21216
CTCN_1070	11030	CTCN_3837	21217
ATCN_827	11031	ATCN_2530	21218
GTCN_687	11032	ATCN_2531	21219
CTCN_1071	11033	GTCN_2178	21220
CTCN_1072	11034	CTCN_3838	21221
CTCN_1073	11035	GTCN_2179	21222
TTCN_1360	11036	TTCN_4035	21223
GTCN_688	11037	GTCN_2180	21224
CTCN_1074	11038	CTCN_3839	21225
GTCN_689	11039	TTCN_4036	21226
CTCN_1075	11040	GTCN_2181	21227
CTCN_1076	11041	ATCN_2532	21228

FIG. 36 (continued)

GTCN_690	11042	ATCN_2533	21229
CTCN_1077	11043	CTCN_3840	21230
GTCN_691	11044	GTCN_2182	21231
GTCN_692	11045	GTCN_2183	21232
GTCN_693	11046	CTCN_3841	21233
CTCN_1078	11047	CTCN_3842	21234
CTCN_1079	11048	GTCN_2184	21235
TTCN_1361	11049	TTCN_4037	21236
TTCN_1362	11050	CTCN_3843	21237
GTCN_694	11051	CTCN_3844	21238
CTCN_1080	11052	GTCN_2185	21239
TTCN_1363	11053	TTCN_4038	21240
TTCN_1364	11054	TTCN_4039	21241
ATCN_828	11055	TTCN_4040	21242
CTCN_1081	11056	CTCN_3845	21243
CTCN_1082	11057	CTCN_3846	21244
TTCN_1365	11058	TTCN_4041	21245
GTCN_695	11059	CTCN_3847	21246
GTCN_696	11060	CTCN_3848	21247
CTCN_1083	11061	TTCN_4042	21248
CTCN_1084	11062	TTCN_4043	21249
CTCN_1085	11063	CTCN_3849	21250
TTCN_1366	11064	TTCN_4044	21251
TTCN_1367	11065	CTCN_3850	21252
TTCN_1368	11066	GTCN_2186	21253
TTCN_1369	11067	GTCN_2187	21254
TTCN_1370	11068	TTCN_4045	21255
TTCN_1371	11069	TTCN_4046	21256
TTCN_1372	11070	TTCN_4047	21257
CTCN_1086	11071	CTCN_3851	21258
GTCN_697	11072	TTCN_4048	21259
ATCN_829	11073	CTCN_3852	21260
CTCN_1087	11074	TTCN_4049	21261
TTCN_1373	11075	TTCN_4050	21262
ATCN_830	11076	CTCN_3853	21263
TTCN_1374	11077	CTCN_3854	21264
CTCN_1088	11078	ATCN_2534	21265
ATCN_831	11079	ATCN_2535	21266
TTCN_1375	11080	GTCN_2188	21267
TTCN_1376	11081	ATCN_2536	21268
TTCN_1377	11082	GTCN_2189	21269
TTCN_1378	11083	ATCN_2537	21270
GTCN_698	11084	TTCN_4051	21271
TTCN_1379	11085	GTCN_2190	21272
ATCN_832	11086	CTCN_3855	21273
TTCN_1380	11087	CTCN_3856	21274
TTCN_1381	11088	GTCN_2191	21275
ATCN_833	11089	CTCN_3857	21276
CTCN_1089	11090	TTCN_4052	21277
ATCN_834	11091	TTCN_4053	21278
GTCN_699	11092	ATCN_2538	21279
CTCN_1090	11093	ATCN_2539	21280
GTCN_700	11094	TTCN_4054	21281
TTCN_1382	11095	GTCN_2192	21282
TTCN_1383	11096	CTCN_3858	21283

TTCN_1384	11097	CTCN_3859	21284
ATCN_835	11098	CTCN_3860	21285
GTCN_701	11099	GTCN_2193	21286
TTCN_1385	11100	CTCN_3861	21287
TTCN_1386	11101	CTCN_3862	21288
ATCN_836	11102	TTCN_4055	21289
GTCN_702	11103	CTCN_3863	21290
TTCN_1387	11104	TTCN_4056	21291
GTCN_703	11105	CTCN_3864	21292
CTCN_1091	11106	GTCN_2194	21293
TTCN_1388	11107	CTCN_3865	21294
TTCN_1389	11108	CTCN_3866	21295
CTCN_1092	11109	GTCN_2195	21296
CTCN_1093	11110	TTCN_4057	21297
CTCN_1094	11111	ATCN_2540	21298
CTCN_1095	11112	CTCN_3867	21299
GTCN_704	11113	CTCN_3868	21300
TTCN_1390	11114	TTCN_4058	21301
TTCN_1391	11115	GTCN_2196	21302
GTCN_705	11116	TTCN_4059	21303
TTCN_1392	11117	CTCN_3869	21304
TTCN_1393	11118	CTCN_3870	21305
CTCN_1096	11119	TTCN_4060	21306
CTCN_1097	11120	CTCN_3871	21307
GTCN_706	11121	TTCN_4061	21308
GTCN_707	11122	TTCN_4062	21309
CTCN_1098	11123	ATCN_2541	21310
CTCN_1099	11124	CTCN_3872	21311
GTCN_708	11125	TTCN_4063	21312
TTCN_1394	11126	ATCN_2542	21313
TTCN_1395	11127	TTCN_4064	21314
TTCN_1396	11128	ATCN_2543	21315
ATCN_837	11129	TTCN_4065	21316
TTCN_1397	11130	ATCN_2544	21317
TTCN_1398	11131	CTCN_3873	21318
TTCN_1399	11132	GTCN_2197	21319
TTCN_1400	11133	ATCN_2545	21320
TTCN_1401	11134	CTCN_3874	21321
TTCN_1402	11135	TTCN_4066	21322
ATCN_838	11136	TTCN_4067	21323
TTCN_1403	11137	GTCN_2198	21324
TTCN_1404	11138	TTCN_4068	21325
TTCN_1405	11139	ATCN_2546	21326
TTCN_1406	11140	TTCN_4069	21327
CTCN_1100	11141	CTCN_3875	21328
CTCN_1101	11142	GTCN_2199	21329
ATCN_839	11143	CTCN_3876	21330
ATCN_840	11144	TTCN_4070	21331
TTCN_1407	11145	CTCN_3877	21332
CTCN_1102	11146	ATCN_2547	21333
GTCN_709	11147	TTCN_4071	21334
TTCN_1408	11148	ATCN_2548	21335
CTCN_1103	11149	TTCN_4072	21336
TTCN_1409	11150	CTCN_3878	21337
GTCN_710	11151	TTCN_4073	21338

FIG. 36 (continued)

ATCN_841	11152	ATCN_2549	21339
CTCN_1104	11153	TTCN_4074	21340
GTCN_711	11154	CTCN_3879	21341
GTCN_712	11155	GTCN_2200	21342
GTCN_713	11156	CTCN_3880	21343
TTCN_1410	11157	CTCN_3881	21344
TTCN_1411	11158	CTCN_3882	21345
CTCN_1105	11159	GTCN_2201	21346
ATCN_842	11160	ATCN_2550	21347
TTCN_1412	11161	GTCN_2202	21348
CTCN_1106	11162	ATCN_2551	21349
CTCN_1107	11163	TTCN_4075	21350
ATCN_843	11164	CTCN_3883	21351
ATCN_844	11165	GTCN_2203	21352
CTCN_1108	11166	GTCN_2204	21353
GTCN_714	11167	GTCN_2205	21354
CTCN_1109	11168	TTCN_4076	21355
ATCN_845	11169	GTCN_2206	21356
TTCN_1413	11170	TTCN_4077	21357
ATCN_846	11171	ATCN_2552	21358
ATCN_847	11172	TTCN_4078	21359
GTCN_715	11173	ATCN_2553	21360
TTCN_1414	11174	ATCN_2554	21361
GTCN_716	11175	TTCN_4079	21362
CTCN_1110	11176	CTCN_3884	21363
CTCN_1111	11177	CTCN_3885	21364
GTCN_717	11178	TTCN_4080	21365
GTCN_718	11179	ATCN_2555	21366
GTCN_719	11180	GTCN_2207	21367
TTCN_1415	11181	TTCN_4081	21368
GTCN_720	11182	GTCN_2208	21369
CTCN_1112	11183	ATCN_2556	21370
TTCN_1416	11184	GTCN_2209	21371
TTCN_1417	11185	TTCN_4082	21372
CTCN_1113	11186	TTCN_4083	21373
GTCN_721	11187	TTCN_4084	21374
GTCN_722	11188	CTCN_3886	21375
GTCN_723	11189	TTCN_4085	21376
GTCN_724	11190	CTCN_3887	21377
CTCN_1114	11191	CTCN_3888	21378
GTCN_725	11192	CTCN_3889	21379
CTCN_1115	11193	CTCN_3890	21380
TTCN_1418	11194	ATCN_2557	21381
ATCN_848	11195	ATCN_2558	21382
TTCN_1419	11196	TTCN_4086	21383
TTCN_1420	11197	TTCN_4087	21384
GTCN_726	11198	TTCN_4088	21385
CTCN_1116	11199	CTCN_3891	21386
GTCN_727	11200	CTCN_3892	21387
CTCN_1117	11201	TTCN_4089	21388
ATCN_849	11202	ATCN_2559	21389
TTCN_1421	11203	GTCN_2210	21390
ATCN_850	11204	TTCN_4090	21391
ATCN_851	11205	GTCN_2211	21392
GTCN_728	11206	CTCN_3893	21393

TTCN_1422	11207	CTCN_3894	21394
CTCN_1118	11208	ATCN_2560	21395
CTCN_1119	11209	CTCN_3895	21396
TTCN_1423	11210	CTCN_3896	21397
TTCN_1424	11211	CTCN_3897	21398
ATCN_852	11212	GTCN_2212	21399
GTCN_729	11213	CTCN_3898	21400
CTCN_1120	11214	CTCN_3899	21401
GTCN_730	11215	CTCN_3900	21402
GTCN_731	11216	CTCN_3901	21403
TTCN_1425	11217	CTCN_3902	21404
TTCN_1426	11218	CTCN_3903	21405
ATCN_853	11219	GTCN_2213	21406
GTCN_732	11220	CTCN_3904	21407
TTCN_1427	11221	TTCN_4091	21408
GTCN_733	11222	ATCN_2561	21409
ATCN_854	11223	TTCN_4092	21410
ATCN_855	11224	ATCN_2562	21411
CTCN_1121	11225	TTCN_4093	21412
CTCN_1122	11226	ATCN_2563	21413
TTCN_1428	11227	ATCN_2564	21414
CTCN_1123	11228	ATCN_2565	21415
CTCN_1124	11229	CTCN_3905	21416
CTCN_1125	11230	TTCN_4094	21417
CTCN_1126	11231	CTCN_3906	21418
TTCN_1429	11232	TTCN_4095	21419
GTCN_734	11233	TTCN_4096	21420
GTCN_735	11234	CTCN_3907	21421
GTCN_736	11235	CTCN_3908	21422
TTCN_1430	11236	ATCN_2566	21423
CTCN_1127	11237	TTCN_4097	21424
CTCN_1128	11238	ATCN_2567	21425
CTCN_1129	11239	TTCN_4098	21426
TTCN_1431	11240	CTCN_3909	21427
CTCN_1130	11241	CTCN_3910	21428
TTCN_1432	11242	TTCN_4099	21429
CTCN_1131	11243	TTCN_4100	21430
CTCN_1132	11244	TTCN_4101	21431
CTCN_1133	11245	GTCN_2214	21432
TTCN_1433	11246	TTCN_4102	21433
CTCN_1134	11247	TTCN_4103	21434
CTCN_1135	11248	TTCN_4104	21435
GTCN_737	11249	CTCN_3911	21436
GTCN_738	11250	TTCN_4105	21437
CTCN_1136	11251	CTCN_3912	21438
GTCN_739	11252	CTCN_3913	21439
CTCN_1137	11253	CTCN_3914	21440
ATCN_856	11254	TTCN_4106	21441
ATCN_857	11255	GTCN_2215	21442
ATCN_858	11256	CTCN_3915	21443
CTCN_1138	11257	CTCN_3916	21444
TTCN_1434	11258	CTCN_3917	21445
GTCN_740	11259	CTCN_3918	21446
CTCN_1139	11260	ATCN_2568	21447
GTCN_741	11261	CTCN_3919	21448

FIG. 36 (continued)

TTCN_1435	11262	TTCN_4107	21449
CTCN_1140	11263	TTCN_4108	21450
TTCN_1436	11264	TTCN_4109	21451
ATCN_859	11265	TTCN_4110	21452
CTCN_1141	11266	ATCN_2569	21453
CTCN_1142	11267	TTCN_4111	21454
GTCN_742	11268	GTCN_2216	21455
CTCN_1143	11269	TTCN_4112	21456
ATCN_860	11270	GTCN_2217	21457
CTCN_1144	11271	GTCN_2218	21458
GTCN_743	11272	TTCN_4113	21459
CTCN_1145	11273	GTCN_2219	21460
CTCN_1146	11274	TTCN_4114	21461
ATCN_861	11275	ATCN_2570	21462
ATCN_862	11276	GTCN_2220	21463
CTCN_1147	11277	CTCN_3920	21464
CTCN_1148	11278	CTCN_3921	21465
GTCN_744	11279	ATCN_2571	21466
CTCN_1149	11280	ATCN_2572	21467
TTCN_1437	11281	GTCN_2221	21468
ATCN_863	11282	CTCN_3922	21469
ATCN_864	11283	CTCN_3923	21470
GTCN_745	11284	CTCN_3924	21471
ATCN_865	11285	CTCN_3925	21472
CTCN_1150	11286	CTCN_3926	21473
ATCN_866	11287	GTCN_2222	21474
GTCN_746	11288	CTCN_3927	21475
CTCN_1151	11289	CTCN_3928	21476
TTCN_1438	11290	GTCN_2223	21477
TTCN_1439	11291	GTCN_2224	21478
TTCN_1440	11292	CTCN_3929	21479
TTCN_1441	11293	GTCN_2225	21480
ATCN_867	11294	TTCN_4115	21481
CTCN_1152	11295	CTCN_3930	21482
ATCN_868	11296	TTCN_4116	21483
TTCN_1442	11297	TTCN_4117	21484
CTCN_1153	11298	TTCN_4118	21485
TTCN_1443	11299	CTCN_3931	21486
GTCN_747	11300	TTCN_4119	21487
CTCN_1154	11301	ATCN_2573	21488
TTCN_1444	11302	CTCN_3932	21489
CTCN_1155	11303	TTCN_4120	21490
GTCN_748	11304	GTCN_2226	21491
GTCN_749	11305	TTCN_4121	21492
CTCN_1156	11306	ATCN_2574	21493
ATCN_869	11307	TTCN_4122	21494
ATCN_870	11308	TTCN_4123	21495
TTCN_1445	11309	TTCN_4124	21496
CTCN_1157	11310	CTCN_3933	21497
ATCN_871	11311	ATCN_2575	21498
CTCN_1158	11312	CTCN_3934	21499
ATCN_872	11313	CTCN_3935	21500
GTCN_750	11314	CTCN_3936	21501
CTCN_1159	11315	TTCN_4125	21502
ATCN_873	11316	TTCN_4126	21503

TTCN_1446	11317	CTCN_3937	21504
ATCN_874	11318	GTCN_2227	21505
TTCN_1447	11319	CTCN_3938	21506
TTCN_1448	11320	GTCN_2228	21507
GTCN_751	11321	CTCN_3939	21508
TTCN_1449	11322	CTCN_3940	21509
TTCN_1450	11323	ATCN_2576	21510
TTCN_1451	11324	CTCN_3941	21511
CTCN_1160	11325	CTCN_3942	21512
GTCN_752	11326	GTCN_2229	21513
TTCN_1452	11327	TTCN_4127	21514
CTCN_1161	11328	ATCN_2577	21515
TTCN_1453	11329	GTCN_2230	21516
GTCN_753	11330	GTCN_2231	21517
CTCN_1162	11331	CTCN_3943	21518
CTCN_1163	11332	GTCN_2232	21519
ATCN_875	11333	CTCN_3944	21520
GTCN_754	11334	ATCN_2578	21521
GTCN_755	11335	ATCN_2579	21522
CTCN_1164	11336	CTCN_3945	21523
GTCN_756	11337	CTCN_3946	21524
CTCN_1165	11338	ATCN_2580	21525
GTCN_757	11339	TTCN_4128	21526
CTCN_1166	11340	CTCN_3947	21527
ATCN_876	11341	TTCN_4129	21528
CTCN_1167	11342	GTCN_2233	21529
CTCN_1168	11343	CTCN_3948	21530
TTCN_1454	11344	CTCN_3949	21531
CTCN_1169	11345	GTCN_2234	21532
TTCN_1455	11346	TTCN_4130	21533
TTCN_1456	11347	TTCN_4131	21534
ATCN_877	11348	GTCN_2235	21535
CTCN_1170	11349	CTCN_3950	21536
CTCN_1171	11350	TTCN_4132	21537
ATCN_878	11351	ATCN_2581	21538
CTCN_1172	11352	TTCN_4133	21539
CTCN_1173	11353	CTCN_3951	21540
ATCN_879	11354	CTCN_3952	21541
ATCN_880	11355	ATCN_2582	21542
CTCN_1174	11356	ATCN_2583	21543
CTCN_1175	11357	CTCN_3953	21544
TTCN_1457	11358	GTCN_2236	21545
CTCN_1176	11359	TTCN_4134	21546
CTCN_1177	11360	TTCN_4135	21547
CTCN_1178	11361	GTCN_2237	21548
TTCN_1458	11362	TTCN_4136	21549
ATCN_881	11363	TTCN_4137	21550
TTCN_1459	11364	TTCN_4138	21551
GTCN_758	11365	ATCN_2584	21552
TTCN_1460	11366	ATCN_2585	21553
TTCN_1461	11367	CTCN_3954	21554
ATCN_882	11368	CTCN_3955	21555
CTCN_1179	11369	GTCN_2238	21556
CTCN_1180	11370	GTCN_2239	21557
GTCN_759	11371	TTCN_4139	21558

FIG. 36 (continued)

TTCN_1462	11372	GTCN_2240	21559
GTCN_760	11373	ATCN_2586	21560
TTCN_1463	11374	CTCN_3956	21561
GTCN_761	11375	ATCN_2587	21562
CTCN_1181	11376	ATCN_2588	21563
TTCN_1464	11377	TTCN_4140	21564
CTCN_1182	11378	GTCN_2241	21565
TTCN_1465	11379	GTCN_2242	21566
ATCN_883	11380	TTCN_4141	21567
CTCN_1183	11381	TTCN_4142	21568
ATCN_884	11382	TTCN_4143	21569
ATCN_885	11383	TTCN_4144	21570
ATCN_886	11384	GTCN_2243	21571
GTCN_762	11385	CTCN_3957	21572
TTCN_1466	11386	GTCN_2244	21573
TTCN_1467	11387	ATCN_2589	21574
TTCN_1468	11388	TTCN_4145	21575
CTCN_1184	11389	TTCN_4146	21576
ATCN_887	11390	TTCN_4147	21577
ATCN_888	11391	TTCN_4148	21578
CTCN_1185	11392	CTCN_3958	21579
CTCN_1186	11393	GTCN_2245	21580
GTCN_763	11394	ATCN_2590	21581
TTCN_1469	11395	TTCN_4149	21582
GTCN_764	11396	CTCN_3959	21583
TTCN_1470	11397	ATCN_2591	21584
CTCN_1187	11398	GTCN_2246	21585
TTCN_1471	11399	GTCN_2247	21586
TTCN_1472	11400	ATCN_2592	21587
TTCN_1473	11401	TTCN_4150	21588
TTCN_1474	11402	ATCN_2593	21589
CTCN_1188	11403	CTCN_3960	21590
CTCN_1189	11404	ATCN_2594	21591
CTCN_1190	11405	CTCN_3961	21592
TTCN_1475	11406	CTCN_3962	21593
TTCN_1476	11407	ATCN_2595	21594
GTCN_765	11408	ATCN_2596	21595
TTCN_1477	11409	CTCN_3963	21596
TTCN_1478	11410	GTCN_2248	21597
TTCN_1479	11411	CTCN_3964	21598
ATCN_889	11412	CTCN_3965	21599
ATCN_890	11413	GTCN_2249	21600
GTCN_766	11414	GTCN_2250	21601
GTCN_767	11415	CTCN_3966	21602
CTCN_1191	11416	TTCN_4151	21603
ATCN_891	11417	GTCN_2251	21604
ATCN_892	11418	CTCN_3967	21605
ATCN_893	11419	ATCN_2597	21606
CTCN_1192	11420	CTCN_3968	21607
TTCN_1480	11421	CTCN_3969	21608
CTCN_1193	11422	CTCN_3970	21609
CTCN_1194	11423	TTCN_4152	21610
CTCN_1195	11424	TTCN_4153	21611
TTCN_1481	11425	CTCN_3971	21612
CTCN_1196	11426	CTCN_3972	21613

CTCN_1197	11427	CTCN_3973	21614
GTCN_768	11428	CTCN_3974	21615
TTCN_1482	11429	ATCN_2598	21616
CTCN_1198	11430	ATCN_2599	21617
ATCN_894	11431	CTCN_3975	21618
TTCN_1483	11432	CTCN_3976	21619
CTCN_1199	11433	CTCN_3977	21620
ATCN_895	11434	CTCN_3978	21621
ATCN_896	11435	ATCN_2600	21622
TTCN_1484	11436	CTCN_3979	21623
TTCN_1485	11437	TTCN_4154	21624
GTCN_769	11438	ATCN_2601	21625
TTCN_1486	11439	CTCN_3980	21626
GTCN_770	11440	ATCN_2602	21627
CTCN_1200	11441	CTCN_3981	21628
GTCN_771	11442	TTCN_4155	21629
TTCN_1487	11443	ATCN_2603	21630
ATCN_897	11444	TTCN_4156	21631
ATCN_898	11445	GTCN_2252	21632
TTCN_1488	11446	ATCN_2604	21633
TTCN_1489	11447	TTCN_4157	21634
ATCN_899	11448	TTCN_4158	21635
GTCN_772	11449	GTCN_2253	21636
CTCN_1201	11450	CTCN_3982	21637
TTCN_1490	11451	GTCN_2254	21638
CTCN_1202	11452	CTCN_3983	21639
CTCN_1203	11453	CTCN_3984	21640
CTCN_1204	11454	CTCN_3985	21641
TTCN_1491	11455	TTCN_4159	21642
TTCN_1492	11456	TTCN_4160	21643
ATCN_900	11457	TTCN_4161	21644
TTCN_1493	11458	ATCN_2605	21645
ATCN_901	11459	CTCN_3986	21646
CTCN_1205	11460	GTCN_2255	21647
CTCN_1206	11461	CTCN_3987	21648
GTCN_773	11462	TTCN_4162	21649
CTCN_1207	11463	ATCN_2606	21650
ATCN_902	11464	CTCN_3988	21651
TTCN_1494	11465	CTCN_3989	21652
TTCN_1495	11466	ATCN_2607	21653
CTCN_1208	11467	TTCN_4163	21654
TTCN_1496	11468	CTCN_3990	21655
TTCN_1497	11469	ATCN_2608	21656
GTCN_774	11470	ATCN_2609	21657
TTCN_1498	11471	CTCN_3991	21658
GTCN_775	11472	GTCN_2256	21659
GTCN_776	11473	TTCN_4164	21660
TTCN_1499	11474	ATCN_2610	21661
ATCN_903	11475	TTCN_4165	21662
GTCN_777	11476	CTCN_3992	21663
GTCN_778	11477	CTCN_3993	21664
CTCN_1209	11478	ATCN_2611	21665
CTCN_1210	11479	GTCN_2257	21666
ATCN_904	11480	GTCN_2258	21667
GTCN_779	11481	CTCN_3994	21668

FIG. 36 (continued)

TTCN_1500	11482	TTCN_4166	21669
GTCN_780	11483	ATCN_2612	21670
GTCN_781	11484	CTCN_3995	21671
TTCN_1501	11485	TTCN_4167	21672
TTCN_1502	11486	CTCN_3996	21673
CTCN_1211	11487	CTCN_3997	21674
TTCN_1503	11488	TTCN_4168	21675
TTCN_1504	11489	ATCN_2613	21676
GTCN_782	11490	TTCN_4169	21677
CTCN_1212	11491	CTCN_3998	21678
GTCN_783	11492	ATCN_2614	21679
CTCN_1213	11493	GTCN_2259	21680
TTCN_1505	11494	ATCN_2615	21681
CTCN_1214	11495	TTCN_4170	21682
CTCN_1215	11496	GTCN_2260	21683
GTCN_784	11497	CTCN_3999	21684
GTCN_785	11498	TTCN_4171	21685
CTCN_1216	11499	TTCN_4172	21686
GTCN_786	11500	CTCN_4000	21687
GTCN_787	11501	ATCN_2616	21688
GTCN_788	11502	TTCN_4173	21689
TTCN_1506	11503	CTCN_4001	21690
GTCN_789	11504	TTCN_4174	21691
ATCN_905	11505	CTCN_4002	21692
GTCN_790	11506	TTCN_4175	21693
CTCN_1217	11507	ATCN_2617	21694
CTCN_1218	11508	TTCN_4176	21695
TTCN_1507	11509	TTCN_4177	21696
TTCN_1508	11510	GTCN_2261	21697
GTCN_791	11511	GTCN_2262	21698
CTCN_1219	11512	TTCN_4178	21699
CTCN_1220	11513	GTCN_2263	21700
ATCN_906	11514	TTCN_4179	21701
ATCN_907	11515	ATCN_2618	21702
TTCN_1509	11516	GTCN_2264	21703
CTCN_1221	11517	TTCN_4180	21704
GTCN_792	11518	CTCN_4003	21705
CTCN_1222	11519	ATCN_2619	21706
TTCN_1510	11520	ATCN_2620	21707
GTCN_793	11521	GTCN_2265	21708
ATCN_908	11522	ATCN_2621	21709
TTCN_1511	11523	CTCN_4004	21710
TTCN_1512	11524	TTCN_4181	21711
ATCN_909	11525	TTCN_4182	21712
ATCN_910	11526	TTCN_4183	21713
GTCN_794	11527	CTCN_4005	21714
TTCN_1513	11528	GTCN_2266	21715
TTCN_1514	11529	TTCN_4184	21716
TTCN_1515	11530	ATCN_2622	21717
TTCN_1516	11531	TTCN_4185	21718
TTCN_1517	11532	CTCN_4006	21719
TTCN_1518	11533	CTCN_4007	21720
CTCN_1223	11534	TTCN_4186	21721
ATCN_911	11535	TTCN_4187	21722
CTCN_1224	11536	TTCN_4188	21723

CTCN_1225	11537	ATCN_2623	21724
ATCN_912	11538	GTCN_2267	21725
CTCN_1226	11539	TTCN_4189	21726
CTCN_1227	11540	CTCN_4008	21727
TTCN_1519	11541	GTCN_2268	21728
ATCN_913	11542	CTCN_4009	21729
ATCN_914	11543	TTCN_4190	21730
CTCN_1228	11544	TTCN_4191	21731
GTCN_795	11545	TTCN_4192	21732
CTCN_1229	11546	ATCN_2624	21733
ATCN_915	11547	TTCN_4193	21734
GTCN_796	11548	TTCN_4194	21735
ATCN_916	11549	CTCN_4010	21736
TTCN_1520	11550	ATCN_2625	21737
ATCN_917	11551	TTCN_4195	21738
CTCN_1230	11552	TTCN_4196	21739
GTCN_797	11553	GTCN_2269	21740
CTCN_1231	11554	CTCN_4011	21741
CTCN_1232	11555	TTCN_4197	21742
CTCN_1233	11556	ATCN_2626	21743
CTCN_1234	11557	TTCN_4198	21744
TTCN_1521	11558	ATCN_2627	21745
ATCN_918	11559	ATCN_2628	21746
TTCN_1522	11560	CTCN_4012	21747
TTCN_1523	11561	TTCN_4199	21748
CTCN_1235	11562	TTCN_4200	21749
CTCN_1236	11563	GTCN_2270	21750
ATCN_919	11564	GTCN_2271	21751
ATCN_920	11565	TTCN_4201	21752
CTCN_1237	11566	GTCN_2272	21753
GTCN_798	11567	TTCN_4202	21754
CTCN_1238	11568	TTCN_4203	21755
CTCN_1239	11569	CTCN_4013	21756
GTCN_799	11570	TTCN_4204	21757
ATCN_921	11571	CTCN_4014	21758
CTCN_1240	11572	CTCN_4015	21759
TTCN_1524	11573	TTCN_4205	21760
TTCN_1525	11574	CTCN_4016	21761
TTCN_1526	11575	GTCN_2273	21762
CTCN_1241	11576	TTCN_4206	21763
TTCN_1527	11577	CTCN_4017	21764
CTCN_1242	11578	TTCN_4207	21765
GTCN_800	11579	ATCN_2629	21766
GTCN_801	11580	TTCN_4208	21767
CTCN_1243	11581	ATCN_2630	21768
GTCN_802	11582	TTCN_4209	21769
CTCN_1244	11583	CTCN_4018	21770
ATCN_922	11584	CTCN_4019	21771
TTCN_1528	11585	CTCN_4020	21772
CTCN_1245	11586	CTCN_4021	21773
TTCN_1529	11587	CTCN_4022	21774
GTCN_803	11588	TTCN_4210	21775
TTCN_1530	11589	TTCN_4211	21776
GTCN_804	11590	TTCN_4212	21777
TTCN_1531	11591	CTCN_4023	21778

FIG. 36 (continued)

ATCN_923	11592	ATCN_2631	21779
ATCN_924	11593	TTCN_4213	21780
ATCN_925	11594	TTCN_4214	21781
TTCN_1532	11595	GTCN_2274	21782
ATCN_926	11596	TTCN_4215	21783
ATCN_927	11597	CTCN_4024	21784
ATCN_928	11598	TTCN_4216	21785
CTCN_1246	11599	CTCN_4025	21786
TTCN_1533	11600	CTCN_4026	21787
GTCN_805	11601	ATCN_2632	21788
GTCN_806	11602	TTCN_4217	21789
TTCN_1534	11603	TTCN_4218	21790
TTCN_1535	11604	ATCN_2633	21791
CTCN_1247	11605	GTCN_2275	21792
CTCN_1248	11606	ATCN_2634	21793
GTCN_807	11607	CTCN_4027	21794
TTCN_1536	11608	TTCN_4219	21795
CTCN_1249	11609	CTCN_4028	21796
TTCN_1537	11610	ATCN_2635	21797
ATCN_929	11611	TTCN_4220	21798
ATCN_930	11612	TTCN_4221	21799
CTCN_1250	11613	CTCN_4029	21800
CTCN_1251	11614	TTCN_4222	21801
TTCN_1538	11615	TTCN_4223	21802
CTCN_1252	11616	TTCN_4224	21803
ATCN_931	11617	GTCN_2276	21804
TTCN_1539	11618	ATCN_2636	21805
ATCN_932	11619	CTCN_4030	21806
GTCN_808	11620	GTCN_2277	21807
TTCN_1540	11621	ATCN_2637	21808
CTCN_1253	11622	TTCN_4225	21809
TTCN_1541	11623	ATCN_2638	21810
TTCN_1542	11624	TTCN_4226	21811
ATCN_933	11625	GTCN_2278	21812
CTCN_1254	11626	TTCN_4227	21813
ATCN_934	11627	CTCN_4031	21814
TTCN_1543	11628	GTCN_2279	21815
CTCN_1255	11629	CTCN_4032	21816
CTCN_1256	11630	TTCN_4228	21817
ATCN_935	11631	TTCN_4229	21818
TTCN_1544	11632	TTCN_4230	21819
GTCN_809	11633	TTCN_4231	21820
ATCN_936	11634	TTCN_4232	21821
ATCN_937	11635	CTCN_4033	21822
ATCN_938	11636	ATCN_2639	21823
GTCN_810	11637	TTCN_4233	21824
CTCN_1257	11638	GTCN_2280	21825
TTCN_1545	11639	TTCN_4234	21826
TTCN_1546	11640	TTCN_4235	21827
CTCN_1258	11641	ATCN_2640	21828
CTCN_1259	11642	TTCN_4236	21829
CTCN_1260	11643	TTCN_4237	21830
TTCN_1547	11644	CTCN_4034	21831
CTCN_1261	11645	GTCN_2281	21832
CTCN_1262	11646	GTCN_2282	21833

GTCN_811	11647	CTCN_4035	21834
TTCN_1548	11648	CTCN_4036	21835
CTCN_1263	11649	GTCN_2283	21836
ATCN_939	11650	TTCN_4238	21837
TTCN_1549	11651	GTCN_2284	21838
CTCN_1264	11652	GTCN_2285	21839
ATCN_940	11653	TTCN_4239	21840
ATCN_941	11654	TTCN_4240	21841
TTCN_1550	11655	CTCN_4037	21842
TTCN_1551	11656	CTCN_4038	21843
GTCN_812	11657	CTCN_4039	21844
TTCN_1552	11658	CTCN_4040	21845
GTCN_813	11659	TTCN_4241	21846
CTCN_1265	11660	TTCN_4242	21847
GTCN_814	11661	ATCN_2641	21848
TTCN_1553	11662	TTCN_4243	21849
ATCN_942	11663	ATCN_2642	21850
TTCN_1554	11664	TTCN_4244	21851
TTCN_1555	11665	CTCN_4041	21852
TTCN_1556	11666	TTCN_4245	21853
CTCN_1266	11667	ATCN_2643	21854
CTCN_1267	11668	TTCN_4246	21855
CTCN_1268	11669	TTCN_4247	21856
TTCN_1557	11670	TTCN_4248	21857
CTCN_1269	11671	TTCN_4249	21858
GTCN_815	11672	TTCN_4250	21859
CTCN_1270	11673	ATCN_2644	21860
TTCN_1558	11674	CTCN_4042	21861
CTCN_1271	11675	GTCN_2286	21862
ATCN_943	11676	TTCN_4251	21863
ATCN_944	11677	TTCN_4252	21864
TTCN_1559	11678	ATCN_2645	21865
TTCN_1560	11679	TTCN_4253	21866
TTCN_1561	11680	TTCN_4254	21867
TTCN_1562	11681	TTCN_4255	21868
TTCN_1563	11682	CTCN_4043	21869
GTCN_816	11683	TTCN_4256	21870
TTCN_1564	11684	CTCN_4044	21871
GTCN_817	11685	TTCN_4257	21872
GTCN_818	11686	CTCN_4045	21873
GTCN_819	11687	ATCN_2646	21874
TTCN_1565	11688	ATCN_2647	21875
GTCN_820	11689	CTCN_4046	21876
TTCN_1566	11690	TTCN_4258	21877
CTCN_1272	11691	CTCN_4047	21878
GTCN_821	11692	ATCN_2648	21879
TTCN_1567	11693	TTCN_4259	21880
GTCN_822	11694	GTCN_2287	21881
CTCN_1273	11695	CTCN_4048	21882
CTCN_1274	11696	CTCN_4049	21883
ATCN_945	11697	GTCN_2288	21884
ATCN_946	11698	CTCN_4050	21885
ATCN_947	11699	CTCN_4051	21886
CTCN_1275	11700	TTCN_4260	21887
ATCN_948	11701	GTCN_2289	21888

FIG. 36 (continued)

ATCN_949	11702	CTCN_4052	21889
ATCN_950	11703	CTCN_4053	21890
CTCN_1276	11704	GTCN_2290	21891
GTCN_823	11705	CTCN_4054	21892
GTCN_824	11706	ATCN_2649	21893
GTCN_825	11707	TTCN_4261	21894
CTCN_1277	11708	ATCN_2650	21895
TTCN_1568	11709	CTCN_4055	21896
CTCN_1278	11710	GTCN_2291	21897
TTCN_1569	11711	CTCN_4056	21898
ATCN_951	11712	CTCN_4057	21899
ATCN_952	11713	TTCN_4262	21900
GTCN_826	11714	TTCN_4263	21901
GTCN_827	11715	TTCN_4264	21902
GTCN_828	11716	TTCN_4265	21903
ATCN_953	11717	CTCN_4058	21904
TTCN_1570	11718	TTCN_4266	21905
GTCN_829	11719	GTCN_2292	21906
TTCN_1571	11720	CTCN_4059	21907
ATCN_954	11721	ATCN_2651	21908
CTCN_1279	11722	TTCN_4267	21909
TTCN_1572	11723	ATCN_2652	21910
GTCN_830	11724	TTCN_4268	21911
CTCN_1280	11725	CTCN_4060	21912
TTCN_1573	11726	CTCN_4061	21913
TTCN_1574	11727	ATCN_2653	21914
CTCN_1281	11728	GTCN_2293	21915
TTCN_1575	11729	TTCN_4269	21916
CTCN_1282	11730	TTCN_4270	21917
TTCN_1576	11731	TTCN_4271	21918
CTCN_1283	11732	TTCN_4272	21919
GTCN_831	11733	TTCN_4273	21920
CTCN_1284	11734	TTCN_4274	21921
GTCN_832	11735	TTCN_4275	21922
CTCN_1285	11736	ATCN_2654	21923
CTCN_1286	11737	TTCN_4276	21924
TTCN_1577	11738	TTCN_4277	21925
TTCN_1578	11739	CTCN_4062	21926
ATCN_955	11740	TTCN_4278	21927
GTCN_833	11741	TTCN_4279	21928
TTCN_1579	11742	GTCN_2294	21929
TTCN_1580	11743	TTCN_4280	21930
GTCN_834	11744	CTCN_4063	21931
ATCN_956	11745	TTCN_4281	21932
CTCN_1287	11746	TTCN_4282	21933
ATCN_957	11747	ATCN_2655	21934
TTCN_1581	11748	TTCN_4283	21935
TTCN_1582	11749	CTCN_4064	21936
CTCN_1288	11750	CTCN_4065	21937
ATCN_958	11751	GTCN_2295	21938
ATCN_959	11752	ATCN_2656	21939
GTCN_835	11753	TTCN_4284	21940
CTCN_1289	11754	GTCN_2296	21941
ATCN_960	11755	CTCN_4066	21942
ATCN_961	11756	GTCN_2297	21943

TTCN_1583	11757	CTCN_4067	21944
GTCN_836	11758	ATCN_2657	21945
TTCN_1584	11759	ATCN_2658	21946
CTCN_1290	11760	CTCN_4068	21947
ATCN_962	11761	GTCN_2298	21948
TTCN_1585	11762	CTCN_4069	21949
ATCN_963	11763	CTCN_4070	21950
CTCN_1291	11764	TTCN_4285	21951
GTCN_837	11765	ATCN_2659	21952
TTCN_1586	11766	TTCN_4286	21953
TTCN_1587	11767	CTCN_4071	21954
TTCN_1588	11768	TTCN_4287	21955
TTCN_1589	11769	CTCN_4072	21956
GTCN_838	11770	ATCN_2660	21957
CTCN_1292	11771	CTCN_4073	21958
ATCN_964	11772	ATCN_2661	21959
GTCN_839	11773	TTCN_4288	21960
CTCN_1293	11774	GTCN_2299	21961
ATCN_965	11775	GTCN_2300	21962
GTCN_840	11776	CTCN_4074	21963
TTCN_1590	11777	TTCN_4289	21964
ATCN_966	11778	CTCN_4075	21965
CTCN_1294	11779	GTCN_2301	21966
CTCN_1295	11780	CTCN_4076	21967
TTCN_1591	11781	ATCN_2662	21968
ATCN_967	11782	ATCN_2663	21969
CTCN_1296	11783	CTCN_4077	21970
CTCN_1297	11784	ATCN_2664	21971
ATCN_968	11785	ATCN_2665	21972
CTCN_1298	11786	TTCN_4290	21973
GTCN_841	11787	CTCN_4078	21974
CTCN_1299	11788	CTCN_4079	21975
TTCN_1592	11789	CTCN_4080	21976
GTCN_842	11790	GTCN_2302	21977
ATCN_969	11791	ATCN_2666	21978
ATCN_970	11792	ATCN_2667	21979
TTCN_1593	11793	TTCN_4291	21980
ATCN_971	11794	TTCN_4292	21981
CTCN_1300	11795	GTCN_2303	21982
TTCN_1594	11796	TTCN_4293	21983
TTCN_1595	11797	TTCN_4294	21984
CTCN_1301	11798	ATCN_2668	21985
TTCN_1596	11799	ATCN_2669	21986
ATCN_972	11800	ATCN_2670	21987
CTCN_1302	11801	ATCN_2671	21988
TTCN_1597	11802	ATCN_2672	21989
CTCN_1303	11803	CTCN_4081	21990
CTCN_1304	11804	GTCN_2304	21991
ATCN_973	11805	TTCN_4295	21992
CTCN_1305	11806	GTCN_2305	21993
ATCN_974	11807	CTCN_4082	21994
ATCN_975	11808	CTCN_4083	21995
TTCN_1598	11809	CTCN_4084	21996
ATCN_976	11810	GTCN_2306	21997
CTCN_1306	11811	CTCN_4085	21998

FIG. 36 (continued)

CTCN_1307	11812	ATCN_2673	21999
GTCN_843	11813	TTCN_4296	22000
CTCN_1308	11814	TTCN_4297	22001
GTCN_844	11815	TTCN_4298	22002
CTCN_1309	11816	ATCN_2674	22003
TTCN_1599	11817	ATCN_2675	22004
TTCN_1600	11818	TTCN_4299	22005
TTCN_1601	11819	CTCN_4086	22006
CTCN_1310	11820	ATCN_2676	22007
GTCN_845	11821	ATCN_2677	22008
CTCN_1311	11822	GTCN_2307	22009
GTCN_846	11823	TTCN_4300	22010
CTCN_1312	11824	CTCN_4087	22011
TTCN_1602	11825	TTCN_4301	22012
CTCN_1313	11826	ATCN_2678	22013
CTCN_1314	11827	TTCN_4302	22014
TTCN_1603	11828	TTCN_4303	22015
TTCN_1604	11829	CTCN_4088	22016
TTCN_1605	11830	GTCN_2308	22017
CTCN_1315	11831	CTCN_4089	22018
CTCN_1316	11832	TTCN_4304	22019
TTCN_1606	11833	TTCN_4305	22020
TTCN_1607	11834	TTCN_4306	22021
TTCN_1608	11835	TTCN_4307	22022
CTCN_1317	11836	TTCN_4308	22023
CTCN_1318	11837	GTCN_2309	22024
CTCN_1319	11838	ATCN_2679	22025
CTCN_1320	11839	CTCN_4090	22026
TTCN_1609	11840	CTCN_4091	22027
CTCN_1321	11841	ATCN_2680	22028
ATCN_977	11842	ATCN_2681	22029
ATCN_978	11843	GTCN_2310	22030
ATCN_979	11844	TTCN_4309	22031
TTCN_1610	11845	GTCN_2311	22032
TTCN_1611	11846	CTCN_4092	22033
CTCN_1322	11847	TTCN_4310	22034
GTCN_847	11848	GTCN_2312	22035
GTCN_848	11849	TTCN_4311	22036
TTCN_1612	11850	GTCN_2313	22037
CTCN_1323	11851	TTCN_4312	22038
CTCN_1324	11852	TTCN_4313	22039
CTCN_1325	11853	GTCN_2314	22040
TTCN_1613	11854	ATCN_2682	22041
ATCN_980	11855	TTCN_4314	22042
GTCN_849	11856	ATCN_2683	22043
CTCN_1326	11857	ATCN_2684	22044
CTCN_1327	11858	TTCN_4315	22045
GTCN_850	11859	TTCN_4316	22046
ATCN_981	11860	GTCN_2315	22047
ATCN_982	11861	CTCN_4093	22048
TTCN_1614	11862	ATCN_2685	22049
ATCN_983	11863	TTCN_4317	22050
TTCN_1615	11864	ATCN_2686	22051
CTCN_1328	11865	GTCN_2316	22052
CTCN_1329	11866	TTCN_4318	22053

CTCN_1330	11867	TTCN_4319	22054
ATCN_984	11868	ATCN_2687	22055
ATCN_985	11869	TTCN_4320	22056
ATCN_986	11870	TTCN_4321	22057
TTCN_1616	11871	CTCN_4094	22058
GTCN_851	11872	ATCN_2688	22059
CTCN_1331	11873	CTCN_4095	22060
TTCN_1617	11874	TTCN_4322	22061
TTCN_1618	11875	GTCN_2317	22062
TTCN_1619	11876	ATCN_2689	22063
TTCN_1620	11877	TTCN_4323	22064
TTCN_1621	11878	ATCN_2690	22065
TTCN_1622	11879	TTCN_4324	22066
GTCN_852	11880	TTCN_4325	22067
ATCN_987	11881	TTCN_4326	22068
CTCN_1332	11882	ATCN_2691	22069
TTCN_1623	11883	CTCN_4096	22070
TTCN_1624	11884	ATCN_2692	22071
ATCN_988	11885	ATCN_2693	22072
ATCN_989	11886	TTCN_4327	22073
TTCN_1625	11887	GTCN_2318	22074
TTCN_1626	11888	TTCN_4328	22075
GTCN_853	11889	TTCN_4329	22076
ATCN_990	11890	TTCN_4330	22077
ATCN_991	11891	ATCN_2694	22078
CTCN_1333	11892	GTCN_2319	22079
TTCN_1627	11893	TTCN_4331	22080
CTCN_1334	11894	TTCN_4332	22081
GTCN_854	11895	TTCN_4333	22082
CTCN_1335	11896	CTCN_4097	22083
TTCN_1628	11897	TTCN_4334	22084
ATCN_992	11898	ATCN_2695	22085
GTCN_855	11899	TTCN_4335	22086
TTCN_1629	11900	GTCN_2320	22087
CTCN_1336	11901	TTCN_4336	22088
TTCN_1630	11902	TTCN_4337	22089
CTCN_1337	11903	CTCN_4098	22090
TTCN_1631	11904	CTCN_4099	22091
ATCN_993	11905	ATCN_2696	22092
ATCN_994	11906	ATCN_2697	22093
ATCN_995	11907	TTCN_4338	22094
ATCN_996	11908	ATCN_2698	22095
CTCN_1338	11909	TTCN_4339	22096
ATCN_997	11910	CTCN_4100	22097
ATCN_998	11911	ATCN_2699	22098
ATCN_999	11912	CTCN_4101	22099
TTCN_1632	11913	TTCN_4340	22100
TTCN_1633	11914	ATCN_2700	22101
CTCN_1339	11915	GTCN_2321	22102
CTCN_1340	11916	ATCN_2701	22103
CTCN_1341	11917	GTCN_2322	22104
TTCN_1634	11918	CTCN_4102	22105
ATCN_1000	11919	GTCN_2323	22106
GTCN_856	11920	GTCN_2324	22107
ATCN_1001	11921	GTCN_2325	22108

FIG. 36 (continued)

ATCN_1002	11922	GTCN_2326	22109
ATCN_1003	11923	TTCN_4341	22110
ATCN_1004	11924	TTCN_4342	22111
GTCN_857	11925	TTCN_4343	22112
CTCN_1342	11926	GTCN_2327	22113
CTCN_1343	11927	TTCN_4344	22114
CTCN_1344	11928	TTCN_4345	22115
TTCN_1635	11929	GTCN_2328	22116
ATCN_1005	11930	TTCN_4346	22117
ATCN_1006	11931	TTCN_4347	22118
TTCN_1636	11932	CTCN_4103	22119
TTCN_1637	11933	GTCN_2329	22120
CTCN_1345	11934	GTCN_2330	22121
TTCN_1638	11935	ATCN_2702	22122
GTCN_858	11936	ATCN_2703	22123
ATCN_1007	11937	CTCN_4104	22124
GTCN_859	11938	GTCN_2331	22125
CTCN_1346	11939	GTCN_2332	22126
TTCN_1639	11940	CTCN_4105	22127
ATCN_1008	11941	GTCN_2333	22128
GTCN_860	11942	TTCN_4348	22129
CTCN_1347	11943	CTCN_4106	22130
ATCN_1009	11944	CTCN_4107	22131
CTCN_1348	11945	TTCN_4349	22132
ATCN_1010	11946	CTCN_4108	22133
TTCN_1640	11947	GTCN_2334	22134
TTCN_1641	11948	TTCN_4350	22135
CTCN_1349	11949	CTCN_4109	22136
GTCN_861	11950	ATCN_2704	22137
TTCN_1642	11951	TTCN_4351	22138
TTCN_1643	11952	ATCN_2705	22139
GTCN_862	11953	TTCN_4352	22140
TTCN_1644	11954	ATCN_2706	22141
TTCN_1645	11955	ATCN_2707	22142
ATCN_1011	11956	CTCN_4110	22143
ATCN_1012	11957	TTCN_4353	22144
TTCN_1646	11958	TTCN_4354	22145
TTCN_1647	11959	TTCN_4355	22146
CTCN_1350	11960	ATCN_2708	22147
GTCN_863	11961	GTCN_2335	22148
TTCN_1648	11962	ATCN_2709	22149
TTCN_1649	11963	CTCN_4111	22150
TTCN_1650	11964	ATCN_2710	22151
CTCN_1351	11965	TTCN_4356	22152
CTCN_1352	11966	TTCN_4357	22153
TTCN_1651	11967	TTCN_4358	22154
CTCN_1353	11968	TTCN_4359	22155
GTCN_864	11969	CTCN_4112	22156
GTCN_865	11970	GTCN_2336	22157
CTCN_1354	11971	ATCN_2711	22158
TTCN_1652	11972	ATCN_2712	22159
ATCN_1013	11973	CTCN_4113	22160
TTCN_1653	11974	CTCN_4114	22161
TTCN_1654	11975	GTCN_2337	22162
CTCN_1355	11976	TTCN_4360	22163

GTCN_866	11977	TTCN_4361	22164
GTCN_867	11978	CTCN_4115	22165
TTCN_1655	11979	GTCN_2338	22166
CTCN_1356	11980	GTCN_2339	22167
GTCN_868	11981	ATCN_2713	22168
TTCN_1656	11982	TTCN_4362	22169
GTCN_869	11983	CTCN_4116	22170
TTCN_1657	11984	GTCN_2340	22171
ATCN_1014	11985	TTCN_4363	22172
ATCN_1015	11986	ATCN_2714	22173
TTCN_1658	11987	ATCN_2715	22174
TTCN_1659	11988	TTCN_4364	22175
GTCN_870	11989	CTCN_4117	22176
CTCN_1357	11990	TTCN_4365	22177
CTCN_1358	11991	GTCN_2341	22178
GTCN_871	11992	GTCN_2342	22179
CTCN_1359	11993	CTCN_4118	22180
TTCN_1660	11994	ATCN_2716	22181
CTCN_1360	11995	TTCN_4366	22182
CTCN_1361	11996	TTCN_4367	22183
CTCN_1362	11997	ATCN_2717	22184
CTCN_1363	11998	ATCN_2718	22185
ATCN_1016	11999	CTCN_4119	22186
GTCN_872	12000	ATCN_2719	22187
ATCN_1017	12001	TTCN_4368	22188
TTCN_1661	12002	TTCN_4369	22189
TTCN_1662	12003	ATCN_2720	22190
ATCN_1018	12004	TTCN_4370	22191
ATCN_1019	12005	TTCN_4371	22192
GTCN_873	12006	GTCN_2343	22193
TTCN_1663	12007	TTCN_4372	22194
CTCN_1364	12008	ATCN_2721	22195
TTCN_1664	12009	ATCN_2722	22196
CTCN_1365	12010	TTCN_4373	22197
CTCN_1366	12011	CTCN_4120	22198
TTCN_1665	12012	ATCN_2723	22199
TTCN_1666	12013	TTCN_4374	22200
TTCN_1667	12014	ATCN_2724	22201
TTCN_1668	12015	TTCN_4375	22202
CTCN_1367	12016	TTCN_4376	22203
TTCN_1669	12017	ATCN_2725	22204
CTCN_1368	12018	CTCN_4121	22205
TTCN_1670	12019	TTCN_4377	22206
GTCN_874	12020	TTCN_4378	22207
CTCN_1369	12021	CTCN_4122	22208
CTCN_1370	12022	ATCN_2726	22209
CTCN_1371	12023	ATCN_2727	22210
CTCN_1372	12024	ATCN_2728	22211
TTCN_1671	12025	CTCN_4123	22212
ATCN_1020	12026	CTCN_4124	22213
TTCN_1672	12027	TTCN_4379	22214
CTCN_1373	12028	ATCN_2729	22215
TTCN_1673	12029	TTCN_4380	22216
ATCN_1021	12030	ATCN_2730	22217
ATCN_1022	12031	CTCN_4125	22218

FIG. 36 (continued)

CTCN_1374	12032	CTCN_4126	22219
CTCN_1375	12033	CTCN_4127	22220
TTCN_1674	12034	GTCN_2344	22221
ATCN_1023	12035	ATCN_2731	22222
GTCN_875	12036	TTCN_4381	22223
ATCN_1024	12037	ATCN_2732	22224
ATCN_1025	12038	GTCN_2345	22225
GTCN_876	12039	ATCN_2733	22226
CTCN_1376	12040	CTCN_4128	22227
CTCN_1377	12041	CTCN_4129	22228
CTCN_1378	12042	GTCN_2346	22229
TTCN_1675	12043	CTCN_4130	22230
ATCN_1026	12044	TTCN_4382	22231
TTCN_1676	12045	CTCN_4131	22232
TTCN_1677	12046	CTCN_4132	22233
CTCN_1379	12047	CTCN_4133	22234
TTCN_1678	12048	GTCN_2347	22235
ATCN_1027	12049	TTCN_4383	22236
TTCN_1679	12050	CTCN_4134	22237
TTCN_1680	12051	GTCN_2348	22238
TTCN_1681	12052	TTCN_4384	22239
CTCN_1380	12053	ATCN_2734	22240
CTCN_1381	12054	CTCN_4135	22241
TTCN_1682	12055	GTCN_2349	22242
ATCN_1028	12056	TTCN_4385	22243
CTCN_1382	12057	CTCN_4136	22244
CTCN_1383	12058	CTCN_4137	22245
TTCN_1683	12059	GTCN_2350	22246
GTCN_877	12060	CTCN_4138	22247
ATCN_1029	12061	CTCN_4139	22248
GTCN_878	12062	ATCN_2735	22249
ATCN_1030	12063	ATCN_2736	22250
GTCN_879	12064	TTCN_4386	22251
GTCN_880	12065	GTCN_2351	22252
CTCN_1384	12066	CTCN_4140	22253
ATCN_1031	12067	CTCN_4141	22254
ATCN_1032	12068	ATCN_2737	22255
CTCN_1385	12069	TTCN_4387	22256
CTCN_1386	12070	CTCN_4142	22257
CTCN_1387	12071	TTCN_4388	22258
GTCN_881	12072	CTCN_4143	22259
ATCN_1033	12073	GTCN_2352	22260
ATCN_1034	12074	CTCN_4144	22261
TTCN_1684	12075	TTCN_4389	22262
TTCN_1685	12076	ATCN_2738	22263
CTCN_1388	12077	CTCN_4145	22264
TTCN_1686	12078	GTCN_2353	22265
ATCN_1035	12079	GTCN_2354	22266
ATCN_1036	12080	ATCN_2739	22267
CTCN_1389	12081	GTCN_2355	22268
ATCN_1037	12082	CTCN_4146	22269
ATCN_1038	12083	CTCN_4147	22270
ATCN_1039	12084	CTCN_4148	22271
GTCN_882	12085	ATCN_2740	22272
TTCN_1687	12086	ATCN_2741	22273

TTCN_1688	12087	CTCN_4149	22274
CTCN_1390	12088	CTCN_4150	22275
CTCN_1391	12089	ATCN_2742	22276
CTCN_1392	12090	CTCN_4151	22277
ATCN_1040	12091	CTCN_4152	22278
TTCN_1689	12092	GTCN_2356	22279
CTCN_1393	12093	TTCN_4390	22280
CTCN_1394	12094	GTCN_2357	22281
CTCN_1395	12095	CTCN_4153	22282
GTCN_883	12096	CTCN_4154	22283
TTCN_1690	12097	TTCN_4391	22284
ATCN_1041	12098	CTCN_4155	22285
CTCN_1396	12099	CTCN_4156	22286
ATCN_1042	12100	TTCN_4392	22287
TTCN_1691	12101	ATCN_2743	22288
TTCN_1692	12102	TTCN_4393	22289
CTCN_1397	12103	TTCN_4394	22290
CTCN_1398	12104	TTCN_4395	22291
TTCN_1693	12105	ATCN_2744	22292
GTCN_884	12106	TTCN_4396	22293
TTCN_1694	12107	CTCN_4157	22294
CTCN_1399	12108	TTCN_4397	22295
TTCN_1695	12109	CTCN_4158	22296
CTCN_1400	12110	ATCN_2745	22297
CTCN_1401	12111	ATCN_2746	22298
GTCN_885	12112	GTCN_2358	22299
CTCN_1402	12113	ATCN_2747	22300
CTCN_1403	12114	CTCN_4159	22301
TTCN_1696	12115	GTCN_2359	22302
CTCN_1404	12116	TTCN_4398	22303
GTCN_886	12117	GTCN_2360	22304
TTCN_1697	12118	CTCN_4160	22305
CTCN_1405	12119	CTCN_4161	22306
ATCN_1043	12120	CTCN_4162	22307
CTCN_1406	12121	GTCN_2361	22308
CTCN_1407	12122	CTCN_4163	22309
CTCN_1408	12123	CTCN_4164	22310
TTCN_1698	12124	CTCN_4165	22311
CTCN_1409	12125	CTCN_4166	22312
ATCN_1044	12126	TTCN_4399	22313
ATCN_1045	12127	CTCN_4167	22314
CTCN_1410	12128	CTCN_4168	22315
TTCN_1699	12129	CTCN_4169	22316
GTCN_887	12130	ATCN_2748	22317
TTCN_1700	12131	ATCN_2749	22318
GTCN_888	12132	GTCN_2362	22319
CTCN_1411	12133	CTCN_4170	22320
ATCN_1046	12134	GTCN_2363	22321
TTCN_1701	12135	CTCN_4171	22322
ATCN_1047	12136	GTCN_2364	22323
GTCN_889	12137	CTCN_4172	22324
CTCN_1412	12138	TTCN_4400	22325
GTCN_890	12139	TTCN_4401	22326
TTCN_1702	12140	CTCN_4173	22327
GTCN_891	12141	TTCN_4402	22328

FIG. 36 (continued)

CTCN_1413	12142	TTCN_4403	22329
TTCN_1703	12143	CTCN_4174	22330
GTCN_892	12144	GTCN_2365	22331
CTCN_1414	12145	CTCN_4175	22332
CTCN_1415	12146	CTCN_4176	22333
GTCN_893	12147	CTCN_4177	22334
ATCN_1048	12148	TTCN_4404	22335
TTCN_1704	12149	TTCN_4405	22336
TTCN_1705	12150	TTCN_4406	22337
GTCN_894	12151	TTCN_4407	22338
TTCN_1706	12152	TTCN_4408	22339
GTCN_895	12153	ATCN_2750	22340
ATCN_1049	12154	CTCN_4178	22341
TTCN_1707	12155	TTCN_4409	22342
ATCN_1050	12156	GTCN_2366	22343
ATCN_1051	12157	CTCN_4179	22344
CTCN_1416	12158	CTCN_4180	22345
CTCN_1417	12159	TTCN_4410	22346
GTCN_896	12160	GTCN_2367	22347
ATCN_1052	12161	TTCN_4411	22348
TTCN_1708	12162	CTCN_4181	22349
GTCN_897	12163	GTCN_2368	22350
GTCN_898	12164	ATCN_2751	22351
GTCN_899	12165	CTCN_4182	22352
CTCN_1418	12166	ATCN_2752	22353
CTCN_1419	12167	CTCN_4183	22354
TTCN_1709	12168	TTCN_4412	22355
ATCN_1053	12169	TTCN_4413	22356
TTCN_1710	12170	TTCN_4414	22357
ATCN_1054	12171	TTCN_4281	22358
TTCN_1711	12172	TTCN_4282	22359
ATCN_1055	12173	ATCN_2655	22360
TTCN_1712	12174	TTCN_4283	22361
CTCN_1420	12175	CTCN_4064	22362
GTCN_900	12176	CTCN_4065	22363
CTCN_1421	12177	GTCN_2295	22364
GTCN_901	12178	ATCN_2656	22365
CTCN_1422	12179	TTCN_4284	22366
CTCN_1423	12180	GTCN_2296	22367
TTCN_1713	12181	CTCN_4066	22368
GTCN_902	12182	GTCN_2297	22369
CTCN_1424	12183	CTCN_4067	22370
CTCN_1425	12184	ATCN_2657	22371
GTCN_903	12185	ATCN_2658	22372
TTCN_1714	12186	CTCN_4068	22373
CTCN_1426	12187	GTCN_2298	22374
ATCN_1056	12188	CTCN_4069	22375
CTCN_1427	12189	CTCN_4070	22376
CTCN_1428	12190	TTCN_4285	22377
GTCN_904	12191	ATCN_2659	22378
GTCN_905	12192	TTCN_4286	22379
CTCN_1429	12193	CTCN_4071	22380
CTCN_1430	12194	TTCN_4287	22381
ATCN_1057	12195	CTCN_4072	22382
CTCN_1431	12196	ATCN_2660	22383

GTCN_906	12197	CTCN_4073	22384
TTCN_1715	12198	ATCN_2661	22385
GTCN_907	12199	TTCN_4288	22386
CTCN_1432	12200	GTCN_2299	22387
TTCN_1716	12201	GTCN_2300	22388
TTCN_1717	12202	CTCN_4074	22389
CTCN_1433	12203	TTCN_4289	22390
TTCN_1718	12204	CTCN_4075	22391
ATCN_1058	12205	GTCN_2301	22392
ATCN_1059	12206	CTCN_4076	22393
TTCN_1719	12207	ATCN_2662	22394
TTCN_1720	12208	ATCN_2663	22395
TTCN_1721	12209	CTCN_4077	22396
CTCN_1434	12210	ATCN_2664	22397
TTCN_1722	12211	ATCN_2665	22398
TTCN_1723	12212	TTCN_4290	22399
TTCN_1724	12213	CTCN_4078	22400
GTCN_908	12214	CTCN_4079	22401
ATCN_1060	12215	CTCN_4080	22402
ATCN_1061	12216	GTCN_2302	22403
TTCN_1725	12217	ATCN_2666	22404
GTCN_909	12218	ATCN_2667	22405
TTCN_1726	12219	TTCN_4291	22406
ATCN_1062	12220	TTCN_4292	22407
ATCN_1063	12221	GTCN_2303	22408
ATCN_1064	12222	TTCN_4293	22409
ATCN_1065	12223	TTCN_4294	22410
GTCN_910	12224	ATCN_2668	22411
TTCN_1727	12225	ATCN_2669	22412
CTCN_1435	12226	ATCN_2670	22413
CTCN_1436	12227	ATCN_2671	22414
ATCN_1066	12228	ATCN_2672	22415
ATCN_1067	12229	CTCN_4081	22416
CTCN_1437	12230	GTCN_2304	22417
TTCN_1728	12231	TTCN_4295	22418
TTCN_1729	12232	GTCN_2305	22419
ATCN_1068	12233	CTCN_4082	22420
ATCN_1069	12234	CTCN_4083	22421
TTCN_1730	12235	CTCN_4084	22422
TTCN_1731	12236	GTCN_2306	22423
TTCN_1732	12237	CTCN_4085	22424
CTCN_1438	12238	ATCN_2673	22425
CTCN_1439	12239	TTCN_4296	22426
TTCN_1733	12240	TTCN_4297	22427
ATCN_1070	12241	TTCN_4298	22428
ATCN_1071	12242	ATCN_2674	22429
TTCN_1734	12243	ATCN_2675	22430
CTCN_1440	12244	TTCN_4299	22431
CTCN_1441	12245	CTCN_4086	22432
TTCN_1735	12246	ATCN_2676	22433
GTCN_911	12247	ATCN_2677	22434
CTCN_1442	12248	GTCN_2307	22435
ATCN_1072	12249	TTCN_4300	22436
CTCN_1443	12250	CTCN_4087	22437
TTCN_1736	12251	TTCN_4301	22438

FIG. 36 (continued)

ATCN_1073	12252	ATCN_2678	22439
TTCN_1737	12253	TTCN_4302	22440
CTCN_1444	12254	TTCN_4303	22441
TTCN_1738	12255	CTCN_4088	22442
TTCN_1739	12256	GTCN_2308	22443
CTCN_1445	12257	CTCN_4089	22444
CTCN_1446	12258	TTCN_4304	22445
TTCN_1740	12259	TTCN_4305	22446
TTCN_1741	12260	TTCN_4306	22447
CTCN_1447	12261	TTCN_4307	22448
ATCN_1074	12262	TTCN_4308	22449
TTCN_1742	12263	GTCN_2309	22450
ATCN_1075	12264	ATCN_2679	22451
ATCN_1076	12265	CTCN_4090	22452
TTCN_1743	12266	CTCN_4091	22453
GTCN_912	12267	ATCN_2680	22454
GTCN_913	12268	ATCN_2681	22455
TTCN_1744	12269	GTCN_2310	22456
CTCN_1448	12270	TTCN_4309	22457
TTCN_1745	12271	GTCN_2311	22458
ATCN_1077	12272	CTCN_4092	22459
TTCN_1746	12273	TTCN_4310	22460
GTCN_914	12274	GTCN_2312	22461
GTCN_915	12275	TTCN_4311	22462
GTCN_916	12276	GTCN_2313	22463
TTCN_1747	12277	TTCN_4312	22464
GTCN_917	12278	TTCN_4313	22465
GTCN_918	12279	GTCN_2314	22466
CTCN_1449	12280	ATCN_2682	22467
TTCN_1748	12281	TTCN_4314	22468
CTCN_1450	12282	ATCN_2683	22469
TTCN_1749	12283	ATCN_2684	22470
ATCN_1078	12284	TTCN_4315	22471
TTCN_1750	12285	TTCN_4316	22472
CTCN_1451	12286	GTCN_2315	22473
GTCN_919	12287	CTCN_4093	22474
TTCN_1751	12288	ATCN_2685	22475
CTCN_1452	12289	TTCN_4317	22476
GTCN_920	12290	ATCN_2686	22477
TTCN_1752	12291	GTCN_2316	22478
GTCN_921	12292	TTCN_4318	22479
CTCN_1453	12293	TTCN_4319	22480
TTCN_1753	12294	ATCN_2687	22481
ATCN_1079	12295	TTCN_4320	22482
TTCN_1754	12296	TTCN_4321	22483
CTCN_1454	12297	CTCN_4094	22484
TTCN_1755	12298	ATCN_2688	22485
CTCN_1455	12299	CTCN_4095	22486
TTCN_1756	12300	TTCN_4322	22487
CTCN_1456	12301	GTCN_2317	22488
GTCN_922	12302	ATCN_2689	22489
TTCN_1757	12303	TTCN_4323	22490
GTCN_923	12304	ATCN_2690	22491
GTCN_924	12305	TTCN_4324	22492
TTCN_1758	12306	TTCN_4325	22493

CTCN_1457	12307	TTCN_4326	22494
GTCN_925	12308	ATCN_2691	22495
CTCN_1458	12309	CTCN_4096	22496
CTCN_1459	12310	ATCN_2692	22497
ATCN_1080	12311	ATCN_2693	22498
ATCN_1081	12312	TTCN_4327	22499
TTCN_1759	12313	GTCN_2318	22500
ATCN_1082	12314	TTCN_4328	22501
TTCN_1760	12315	TTCN_4329	22502
ATCN_1083	12316	TTCN_4330	22503
GTCN_926	12317	ATCN_2694	22504
TTCN_1761	12318	GTCN_2319	22505
GTCN_927	12319	TTCN_4331	22506
ATCN_1084	12320	TTCN_4332	22507
ATCN_1085	12321	TTCN_4333	22508
TTCN_1762	12322	CTCN_4097	22509
ATCN_1086	12323	TTCN_4334	22510
CTCN_1460	12324	ATCN_2695	22511
CTCN_1461	12325	TTCN_4335	22512
GTCN_928	12326	GTCN_2320	22513
TTCN_1763	12327	TTCN_4336	22514
CTCN_1462	12328	TTCN_4337	22515
GTCN_929	12329	CTCN_4098	22516
GTCN_930	12330	CTCN_4099	22517
TTCN_1764	12331	ATCN_2696	22518
ATCN_1087	12332	ATCN_2697	22519
CTCN_1463	12333	TTCN_4338	22520
TTCN_1765	12334	ATCN_2698	22521
CTCN_1464	12335	TTCN_4339	22522
TTCN_1766	12336	CTCN_4100	22523
CTCN_1465	12337	ATCN_2699	22524
ATCN_1088	12338	CTCN_4101	22525
ATCN_1089	12339	TTCN_4340	22526
TTCN_1767	12340	ATCN_2700	22527
TTCN_1768	12341	GTCN_2321	22528
GTCN_931	12342	ATCN_2701	22529
TTCN_1769	12343	GTCN_2322	22530
CTCN_1466	12344	CTCN_4102	22531
ATCN_1090	12345	GTCN_2323	22532
ATCN_1091	12346	GTCN_2324	22533
CTCN_1467	12347	GTCN_2325	22534
ATCN_1092	12348	GTCN_2326	22535
ATCN_1093	12349	TTCN_4341	22536
CTCN_1468	12350	TTCN_4342	22537
TTCN_1770	12351	TTCN_4343	22538
CTCN_1469	12352	GTCN_2327	22539
TTCN_1771	12353	TTCN_4344	22540
TTCN_1772	12354	TTCN_4345	22541
CTCN_1470	12355	GTCN_2328	22542
CTCN_1471	12356	TTCN_4346	22543
TTCN_1773	12357	TTCN_4347	22544
TTCN_1774	12358	CTCN_4103	22545
CTCN_1472	12359	GTCN_2329	22546
TTCN_1775	12360	GTCN_2330	22547
TTCN_1776	12361	ATCN_2702	22548

FIG. 36 (continued)

CTCN_1473	12362	ATCN_2703	22549
TTCN_1777	12363	CTCN_4104	22550
GTCN_932	12364	GTCN_2331	22551
CTCN_1474	12365	GTCN_2332	22552
TTCN_1778	12366	CTCN_4105	22553
GTCN_933	12367	GTCN_2333	22554
GTCN_934	12368	TTCN_4348	22555
TTCN_1779	12369	CTCN_4106	22556
CTCN_1475	12370	CTCN_4107	22557
CTCN_1476	12371	TTCN_4349	22558
GTCN_935	12372	CTCN_4108	22559
CTCN_1477	12373	GTCN_2334	22560
GTCN_936	12374	TTCN_4350	22561
GTCN_937	12375	CTCN_4109	22562
CTCN_1478	12376	ATCN_2704	22563
ATCN_1094	12377	TTCN_4351	22564
CTCN_1479	12378	ATCN_2705	22565
ATCN_1095	12379	TTCN_4352	22566
ATCN_1096	12380	ATCN_2706	22567
TTCN_1780	12381	ATCN_2707	22568
GTCN_938	12382	CTCN_4110	22569
CTCN_1480	12383	TTCN_4353	22570
ATCN_1097	12384	TTCN_4354	22571
CTCN_1481	12385	TTCN_4355	22572
ATCN_1098	12386	ATCN_2708	22573
CTCN_1482	12387	GTCN_2335	22574
CTCN_1483	12388	ATCN_2709	22575
TTCN_1781	12389	CTCN_4111	22576
CTCN_1484	12390	ATCN_2710	22577
CTCN_1485	12391	TTCN_4356	22578
ATCN_1099	12392	TTCN_4357	22579
CTCN_1486	12393	TTCN_4358	22580
TTCN_1782	12394	TTCN_4359	22581
TTCN_1783	12395	CTCN_4112	22582
ATCN_1100	12396	GTCN_2336	22583
TTCN_1784	12397	ATCN_2711	22584
ATCN_1101	12398	ATCN_2712	22585
TTCN_1785	12399	CTCN_4113	22586
CTCN_1487	12400	CTCN_4114	22587
TTCN_1786	12401	GTCN_2337	22588
CTCN_1488	12402	TTCN_4360	22589
TTCN_1787	12403	TTCN_4361	22590
TTCN_1788	12404	CTCN_4115	22591
CTCN_1489	12405	GTCN_2338	22592
CTCN_1490	12406	GTCN_2339	22593
GTCN_939	12407	ATCN_2713	22594
TTCN_1789	12408	TTCN_4362	22595
CTCN_1491	12409	CTCN_4116	22596
ATCN_1102	12410	GTCN_2340	22597
GTCN_940	12411	TTCN_4363	22598
TTCN_1790	12412	ATCN_2714	22599
TTCN_1791	12413	ATCN_2715	22600
TTCN_1792	12414	TTCN_4364	22601
TTCN_1793	12415	CTCN_4117	22602
GTCN_941	12416	TTCN_4365	22603

CTCN_1492	12417	GTCN_2341	22604
GTCN_942	12418	GTCN_2342	22605
TTCN_1794	12419	CTCN_4118	22606
CTCN_1493	12420	ATCN_2716	22607
CTCN_1494	12421	TTCN_4366	22608
ATCN_1103	12422	TTCN_4367	22609
CTCN_1495	12423	ATCN_2717	22610
TTCN_1795	12424	ATCN_2718	22611
TTCN_1796	12425	CTCN_4119	22612
TTCN_1797	12426	ATCN_2719	22613
GTCN_943	12427	TTCN_4368	22614
ATCN_1104	12428	TTCN_4369	22615
ATCN_1105	12429	ATCN_2720	22616
GTCN_944	12430	TTCN_4370	22617
TTCN_1798	12431	TTCN_4371	22618
TTCN_1799	12432	GTCN_2343	22619
TTCN_1800	12433	TTCN_4372	22620
ATCN_1106	12434	ATCN_2721	22621
GTCN_945	12435	ATCN_2722	22622
CTCN_1496	12436	TTCN_4373	22623
CTCN_1497	12437	CTCN_4120	22624
CTCN_1498	12438	ATCN_2723	22625
TTCN_1801	12439	TTCN_4374	22626
GTCN_946	12440	ATCN_2724	22627
TTCN_1802	12441	TTCN_4375	22628
CTCN_1499	12442	TTCN_4376	22629
GTCN_947	12443	ATCN_2725	22630
TTCN_1803	12444	CTCN_4121	22631
TTCN_1804	12445	TTCN_4377	22632
TTCN_1805	12446	TTCN_4378	22633
GTCN_948	12447	CTCN_4122	22634
TTCN_1806	12448	ATCN_2726	22635
ATCN_1107	12449	ATCN_2727	22636
ATCN_1108	12450	ATCN_2728	22637
ATCN_1109	12451	CTCN_4123	22638
GTCN_949	12452	CTCN_4124	22639
TTCN_1807	12453	TTCN_4379	22640
GTCN_950	12454	ATCN_2729	22641
TTCN_1808	12455	TTCN_4380	22642
TTCN_1809	12456	ATCN_2730	22643
TTCN_1810	12457	CTCN_4125	22644
ATCN_1110	12458	CTCN_4126	22645
CTCN_1500	12459	CTCN_4127	22646
ATCN_1111	12460	GTCN_2344	22647
GTCN_951	12461	ATCN_2731	22648
TTCN_1811	12462	TTCN_4381	22649
ATCN_1112	12463	ATCN_2732	22650
GTCN_952	12464	GTCN_2345	22651
TTCN_1812	12465	ATCN_2733	22652
CTCN_1501	12466	CTCN_4128	22653
TTCN_1813	12467	CTCN_4129	22654
CTCN_1502	12468	GTCN_2346	22655
TTCN_1814	12469	CTCN_4130	22656
TTCN_1815	12470	TTCN_4382	22657
TTCN_1816	12471	CTCN_4131	22658

FIG. 36 (continued)

TTCN_1817	12472	CTCN_4132	22659
ATCN_1113	12473	CTCN_4133	22660
TTCN_1818	12474	GTCN_2347	22661
TTCN_1819	12475	TTCN_4383	22662
ATCN_1114	12476	CTCN_4134	22663
CTCN_1503	12477	GTCN_2348	22664
CTCN_1504	12478	TTCN_4384	22665
TTCN_1820	12479	ATCN_2734	22666
CTCN_1505	12480	CTCN_4135	22667
ATCN_1115	12481	GTCN_2349	22668
ATCN_1116	12482	TTCN_4385	22669
CTCN_1506	12483	CTCN_4136	22670
CTCN_1507	12484	CTCN_4137	22671
ATCN_1117	12485	GTCN_2350	22672
CTCN_1508	12486	CTCN_4138	22673
ATCN_1118	12487	CTCN_4139	22674
CTCN_1509	12488	ATCN_2735	22675
GTCN_953	12489	ATCN_2736	22676
ATCN_1119	12490	TTCN_4386	22677
TTCN_1821	12491	GTCN_2351	22678
TTCN_1822	12492	CTCN_4140	22679
GTCN_954	12493	CTCN_4141	22680
CTCN_1510	12494	ATCN_2737	22681
TTCN_1823	12495	TTCN_4387	22682
TTCN_1824	12496	CTCN_4142	22683
TTCN_1825	12497	TTCN_4388	22684
TTCN_1826	12498	CTCN_4143	22685
ATCN_1120	12499	GTCN_2352	22686
ATCN_1121	12500	CTCN_4144	22687
CTCN_1511	12501	TTCN_4389	22688
CTCN_1512	12502	ATCN_2738	22689
ATCN_1122	12503	CTCN_4145	22690
GTCN_955	12504	GTCN_2353	22691
GTCN_956	12505	GTCN_2354	22692
ATCN_1123	12506	ATCN_2739	22693
TTCN_1827	12507	GTCN_2355	22694
TTCN_1828	12508	CTCN_4146	22695
ATCN_1124	12509	CTCN_4147	22696
CTCN_1513	12510	CTCN_4148	22697
TTCN_1829	12511	ATCN_2740	22698
ATCN_1125	12512	ATCN_2741	22699
TTCN_1830	12513	CTCN_4149	22700
CTCN_1514	12514	CTCN_4150	22701
GTCN_957	12515	ATCN_2742	22702
CTCN_1515	12516	CTCN_4151	22703
TTCN_1831	12517	CTCN_4152	22704
CTCN_1516	12518	GTCN_2356	22705
CTCN_1517	12519	TTCN_4390	22706
TTCN_1832	12520	GTCN_2357	22707
TTCN_1833	12521	CTCN_4153	22708
GTCN_958	12522	CTCN_4154	22709
ATCN_1126	12523	TTCN_4391	22710
ATCN_1127	12524	CTCN_4155	22711
ATCN_1128	12525	CTCN_4156	22712
TTCN_1834	12526	TTCN_4392	22713

CTCN_1518	12527	ATCN_2743	22714
TTCN_1835	12528	TTCN_4393	22715
TTCN_1836	12529	TTCN_4394	22716
ATCN_1129	12530	TTCN_4395	22717
ATCN_1130	12531	ATCN_2744	22718
TTCN_1837	12532	TTCN_4396	22719
TTCN_1838	12533	CTCN_4157	22720
CTCN_1519	12534	TTCN_4397	22721
CTCN_1520	12535	CTCN_4158	22722
TTCN_1839	12536	ATCN_2745	22723
CTCN_1521	12537	ATCN_2746	22724
GTCN_959	12538	GTCN_2358	22725
TTCN_1840	12539	ATCN_2747	22726
TTCN_1841	12540	CTCN_4159	22727
ATCN_1131	12541	GTCN_2359	22728
TTCN_1842	12542	TTCN_4398	22729
TTCN_1843	12543	GTCN_2360	22730
ATCN_1132	12544	CTCN_4160	22731
TTCN_1844	12545	CTCN_4161	22732
TTCN_1845	12546	CTCN_4162	22733
ATCN_1133	12547	GTCN_2361	22734
GTCN_960	12548	CTCN_4163	22735
TTCN_1846	12549	CTCN_4164	22736
TTCN_1847	12550	CTCN_4165	22737
GTCN_961	12551	CTCN_4166	22738
TTCN_1848	12552	TTCN_4399	22739
GTCN_962	12553	CTCN_4167	22740
TTCN_1849	12554	CTCN_4168	22741
ATCN_1134	12555	CTCN_4169	22742
TTCN_1850	12556	ATCN_2748	22743
CTCN_1522	12557	ATCN_2749	22744
CTCN_1523	12558	GTCN_2362	22745
CTCN_1524	12559	CTCN_4170	22746
CTCN_1525	12560	GTCN_2363	22747
CTCN_1526	12561	CTCN_4171	22748
TTCN_1851	12562	GTCN_2364	22749
GTCN_963	12563	CTCN_4172	22750
GTCN_964	12564	TTCN_4400	22751
ATCN_1135	12565	TTCN_4401	22752
TTCN_1852	12566	CTCN_4173	22753
TTCN_1853	12567	TTCN_4402	22754
GTCN_965	12568	TTCN_4403	22755
TTCN_1854	12569	CTCN_4174	22756
ATCN_1136	12570	GTCN_2365	22757
TTCN_1855	12571	CTCN_4175	22758
GTCN_966	12572	CTCN_4176	22759
TTCN_1856	12573	CTCN_4177	22760
TTCN_1857	12574	TTCN_4404	22761
TTCN_1858	12575	TTCN_4405	22762
CTCN_1527	12576	TTCN_4406	22763
ATCN_1137	12577	TTCN_4407	22764
CTCN_1528	12578	TTCN_4408	22765
CTCN_1529	12579	ATCN_2750	22766
ATCN_1138	12580	CTCN_4178	22767
ATCN_1139	12581	TTCN_4409	22768

FIG. 36 (continued)

CTCN_1530	12582	GTCN_2366	22769
GTCN_967	12583	CTCN_4179	22770
CTCN_1531	12584	CTCN_4180	22771
TTCN_1859	12585	TTCN_4410	22772
CTCN_1532	12586	GTCN_2367	22773
GTCN_968	12587	TTCN_4411	22774
ATCN_1140	12588	CTCN_4181	22775
TTCN_1860	12589	GTCN_2368	22776
GTCN_969	12590	ATCN_2751	22777
CTCN_1533	12591	CTCN_4182	22778
GTCN_970	12592	ATCN_2752	22779
CTCN_1534	12593	CTCN_4183	22780
CTCN_1535	12594	TTCN_4412	22781
CTCN_1536	12595	TTCN_4413	22782
TTCN_1861	12596	TTCN_4414	22783
TTCN_1862	12597	ATCN_2753	22784
CTCN_1537	12598	TTCN_4415	22785
CTCN_1538	12599	ATCN_2754	22786
CTCN_1539	12600	TTCN_4416	22787
ATCN_1141	12601	TTCN_4417	22788
ATCN_1142	12602	CTCN_4184	22789
CTCN_1540	12603	TTCN_4418	22790
GTCN_971	12604	GTCN_2369	22791
CTCN_1541	12605	ATCN_2755	22792
CTCN_1542	12606	ATCN_2756	22793
GTCN_972	12607	TTCN_4419	22794
CTCN_1543	12608	TTCN_4420	22795
ATCN_1143	12609	TTCN_4421	22796
CTCN_1544	12610	TTCN_4422	22797
TTCN_1863	12611	ATCN_2757	22798
TTCN_1864	12612	CTCN_4185	22799
TTCN_1865	12613	CTCN_4186	22800
CTCN_1545	12614	GTCN_2370	22801
GTCN_973	12615	GTCN_2371	22802
CTCN_1546	12616	TTCN_4423	22803
CTCN_1547	12617	CTCN_4187	22804
ATCN_1144	12618	CTCN_4188	22805
CTCN_1548	12619	ATCN_2758	22806
TTCN_1866	12620	ATCN_2759	22807
CTCN_1549	12621	GTCN_2372	22808
CTCN_1550	12622	CTCN_4189	22809
ATCN_1145	12623	TTCN_4424	22810
ATCN_1146	12624	CTCN_4190	22811
CTCN_1551	12625	GTCN_2373	22812
CTCN_1552	12626	ATCN_2760	22813
TTCN_1867	12627	CTCN_4191	22814
GTCN_974	12628	TTCN_4425	22815
CTCN_1553	12629	CTCN_4192	22816
GTCN_975	12630	TTCN_4426	22817
ATCN_1147	12631	CTCN_4193	22818
CTCN_1554	12632	TTCN_4427	22819
GTCN_976	12633	ATCN_2761	22820
ATCN_1148	12634	GTCN_2374	22821
TTCN_1868	12635	CTCN_4194	22822
CTCN_1555	12636	ATCN_2762	22823

CTCN_1556	12637	TTCN_4428	22824
CTCN_1557	12638	GTCN_2375	22825
ATCN_1149	12639	TTCN_4429	22826
ATCN_1150	12640	CTCN_4195	22827
CTCN_1558	12641	CTCN_4196	22828
GTCN_977	12642	CTCN_4197	22829
CTCN_1559	12643	CTCN_4198	22830
TTCN_1869	12644	GTCN_2376	22831
CTCN_1560	12645	TTCN_4430	22832
GTCN_978	12646	TTCN_4431	22833
ATCN_1151	12647	ATCN_2763	22834
ATCN_1152	12648	CTCN_4199	22835
GTCN_979	12649	TTCN_4432	22836
CTCN_1561	12650	TTCN_4433	22837
TTCN_1870	12651	CTCN_4200	22838
CTCN_1562	12652	ATCN_2764	22839
TTCN_1871	12653	CTCN_4201	22840
CTCN_1563	12654	GTCN_2377	22841
ATCN_1153	12655	CTCN_4202	22842
TTCN_1872	12656	TTCN_4434	22843
TTCN_1873	12657	GTCN_2378	22844
TTCN_1874	12658	TTCN_4435	22845
TTCN_1875	12659	TTCN_4436	22846
GTCN_980	12660	CTCN_4203	22847
CTCN_1564	12661	CTCN_4204	22848
TTCN_1876	12662	CTCN_4205	22849
GTCN_981	12663	TTCN_4437	22850
TTCN_1877	12664	TTCN_4438	22851
CTCN_1565	12665	ATCN_2765	22852
GTCN_982	12666	TTCN_4439	22853
CTCN_1566	12667	GTCN_2379	22854
TTCN_1878	12668	GTCN_2380	22855
GTCN_983	12669	GTCN_2381	22856
CTCN_1567	12670	TTCN_4440	22857
GTCN_984	12671	ATCN_2766	22858
CTCN_1568	12672	TTCN_4441	22859
GTCN_985	12673	TTCN_4442	22860
GTCN_986	12674	CTCN_4206	22861
TTCN_1879	12675	GTCN_2382	22862
CTCN_1569	12676	TTCN_4443	22863
ATCN_1154	12677	TTCN_4444	22864
GTCN_987	12678	ATCN_2767	22865
TTCN_1880	12679	CTCN_4207	22866
TTCN_1881	12680	GTCN_2383	22867
CTCN_1570	12681	CTCN_4208	22868
TTCN_1882	12682	GTCN_2384	22869
ATCN_1155	12683	TTCN_4445	22870
CTCN_1571	12684	TTCN_4446	22871
CTCN_1572	12685	ATCN_2768	22872
CTCN_1573	12686	TTCN_4447	22873
TTCN_1883	12687	TTCN_4448	22874
GTCN_988	12688	CTCN_4209	22875
CTCN_1574	12689	CTCN_4210	22876
GTCN_989	12690	CTCN_4211	22877
TTCN_1884	12691	CTCN_4212	22878

FIG. 36 (continued)

TTCN_1885	12692	TTCN_4449	22879
TTCN_1886	12693	ATCN_2769	22880
GTCN_990	12694	TTCN_4450	22881
ATCN_1156	12695	ATCN_2770	22882
ATCN_1157	12696	TTCN_4451	22883
TTCN_1887	12697	TTCN_4452	22884
TTCN_1888	12698	CTCN_4213	22885
ATCN_1158	12699	TTCN_4453	22886
CTCN_1575	12700	ATCN_2771	22887
GTCN_991	12701	TTCN_4454	22888
GTCN_992	12702	TTCN_4455	22889
ATCN_1159	12703	TTCN_4456	22890
ATCN_1160	12704	TTCN_4457	22891
ATCN_1161	12705	GTCN_2385	22892
GTCN_993	12706	CTCN_4214	22893
TTCN_1889	12707	TTCN_4458	22894
CTCN_1576	12708	TTCN_4459	22895
TTCN_1890	12709	ATCN_2772	22896
TTCN_1891	12710	ATCN_2773	22897
CTCN_1577	12711	TTCN_4460	22898
TTCN_1892	12712	GTCN_2386	22899
TTCN_1893	12713	CTCN_4215	22900
ATCN_1162	12714	CTCN_4216	22901
TTCN_1894	12715	TTCN_4461	22902
GTCN_994	12716	GTCN_2387	22903
CTCN_1578	12717	CTCN_4217	22904
TTCN_1895	12718	ATCN_2774	22905
GTCN_995	12719	CTCN_4218	22906
GTCN_996	12720	CTCN_4219	22907
CTCN_1579	12721	CTCN_4220	22908
CTCN_1580	12722	TTCN_4462	22909
CTCN_1581	12723	GTCN_2388	22910
TTCN_1896	12724	TTCN_4463	22911
TTCN_1897	12725	TTCN_4464	22912
TTCN_1898	12726	TTCN_4465	22913
ATCN_1163	12727	GTCN_2389	22914
CTCN_1582	12728	TTCN_4466	22915
TTCN_1899	12729	ATCN_2775	22916
TTCN_1900	12730	TTCN_4467	22917
TTCN_1901	12731	TTCN_4468	22918
ATCN_1164	12732	CTCN_4221	22919
GTCN_997	12733	ATCN_2776	22920
GTCN_998	12734	ATCN_2777	22921
CTCN_1583	12735	TTCN_4469	22922
TTCN_1902	12736	GTCN_2390	22923
TTCN_1903	12737	TTCN_4470	22924
ATCN_1165	12738	TTCN_4471	22925
TTCN_1904	12739	CTCN_4222	22926
GTCN_999	12740	TTCN_4472	22927
GTCN_1000	12741	TTCN_4473	22928
ATCN_1166	12742	CTCN_4223	22929
GTCN_1001	12743	ATCN_2778	22930
TTCN_1905	12744	GTCN_2391	22931
CTCN_1584	12745	CTCN_4224	22932
CTCN_1585	12746	ATCN_2779	22933

TTCN_1906	12747	CTCN_4225	22934
ATCN_1167	12748	TTCN_4344	22935
TTCN_1907	12749	TTCN_4345	22936
CTCN_1586	12750	GTCN_2328	22937
ATCN_1168	12751	TTCN_4346	22938
TTCN_1908	12752	TTCN_4347	22939
CTCN_1587	12753	CTCN_4103	22940
TTCN_1909	12754	GTCN_2329	22941
GTCN_1002	12755	GTCN_2330	22942
ATCN_1169	12756	ATCN_2702	22943
CTCN_1588	12757	ATCN_2703	22944
CTCN_1589	12758	CTCN_4104	22945
GTCN_1003	12759	GTCN_2331	22946
TTCN_1910	12760	GTCN_2332	22947
GTCN_1004	12761	CTCN_4105	22948
GTCN_1005	12762	GTCN_2333	22949
GTCN_1006	12763	TTCN_4348	22950
CTCN_1590	12764	CTCN_4106	22951
GTCN_1007	12765	CTCN_4107	22952
GTCN_1008	12766	TTCN_4349	22953
CTCN_1591	12767	CTCN_4108	22954
CTCN_1592	12768	GTCN_2334	22955
GTCN_1009	12769	TTCN_4350	22956
CTCN_1593	12770	CTCN_4109	22957
GTCN_1010	12771	ATCN_2704	22958
GTCN_1011	12772	TTCN_4351	22959
TTCN_1911	12773	ATCN_2705	22960
TTCN_1912	12774	TTCN_4352	22961
TTCN_1913	12775	ATCN_2706	22962
TTCN_1914	12776	ATCN_2707	22963
CTCN_1594	12777	CTCN_4110	22964
GTCN_1012	12778	TTCN_4353	22965
GTCN_1013	12779	TTCN_4354	22966
ATCN_1170	12780	TTCN_4355	22967
GTCN_1014	12781	ATCN_2708	22968
TTCN_1915	12782	GTCN_2335	22969
TTCN_1916	12783	ATCN_2709	22970
GTCN_1015	12784	CTCN_4111	22971
TTCN_1917	12785	ATCN_2710	22972
CTCN_1595	12786	TTCN_4356	22973
CTCN_1596	12787	TTCN_4357	22974
ATCN_1171	12788	TTCN_4358	22975
ATCN_1172	12789	TTCN_4359	22976
TTCN_1918	12790	CTCN_4112	22977
TTCN_1919	12791	GTCN_2336	22978
ATCN_1173	12792	ATCN_2711	22979
CTCN_1597	12793	ATCN_2712	22980
CTCN_1598	12794	CTCN_4113	22981
ATCN_1174	12795	CTCN_4114	22982
CTCN_1599	12796	GTCN_2337	22983
CTCN_1600	12797	TTCN_4360	22984
CTCN_1601	12798	TTCN_4361	22985
TTCN_1920	12799	CTCN_4115	22986
TTCN_1921	12800	GTCN_2338	22987
GTCN_1016	12801	GTCN_2339	22988

FIG. 36 (continued)

CTCN_1602	12802	ATCN_2713	22989
ATCN_1175	12803	TTCN_4362	22990
TTCN_1922	12804	CTCN_4116	22991
CTCN_1603	12805	GTCN_2340	22992
GTCN_1017	12806	TTCN_4363	22993
TTCN_1923	12807	ATCN_2714	22994
CTCN_1604	12808	ATCN_2715	22995
CTCN_1605	12809	TTCN_4364	22996
ATCN_1176	12810	CTCN_4117	22997
ATCN_1177	12811	TTCN_4365	22998
CTCN_1606	12812	GTCN_2341	22999
CTCN_1607	12813	GTCN_2342	23000
CTCN_1608	12814	CTCN_4118	23001
TTCN_1924	12815	ATCN_2716	23002
ATCN_1178	12816	TTCN_4366	23003
CTCN_1609	12817	TTCN_4367	23004
CTCN_1610	12818	ATCN_2717	23005
CTCN_1611	12819	ATCN_2718	23006
CTCN_1612	12820	CTCN_4119	23007
GTCN_1018	12821	ATCN_2719	23008
GTCN_1019	12822	TTCN_4368	23009
TTCN_1925	12823	TTCN_4369	23010
CTCN_1613	12824	ATCN_2720	23011
ATCN_1179	12825	TTCN_4370	23012
CTCN_1614	12826	TTCN_4371	23013
TTCN_1926	12827	GTCN_2343	23014
CTCN_1615	12828	TTCN_4372	23015
TTCN_1927	12829	ATCN_2721	23016
CTCN_1616	12830	ATCN_2722	23017
GTCN_1020	12831	TTCN_4373	23018
TTCN_1928	12832	CTCN_4120	23019
TTCN_1929	12833	ATCN_2723	23020
TTCN_1930	12834	TTCN_4374	23021
CTCN_1617	12835	ATCN_2724	23022
ATCN_1180	12836	TTCN_4375	23023
GTCN_1021	12837	TTCN_4376	23024
TTCN_1931	12838	ATCN_2725	23025
ATCN_1181	12839	CTCN_4121	23026
CTCN_1618	12840	TTCN_4377	23027
CTCN_1619	12841	TTCN_4378	23028
CTCN_1620	12842	CTCN_4122	23029
CTCN_1621	12843	ATCN_2726	23030
TTCN_1932	12844	ATCN_2727	23031
TTCN_1933	12845	ATCN_2728	23032
CTCN_1622	12846	CTCN_4123	23033
GTCN_1022	12847	CTCN_4124	23034
GTCN_0	12848	TTCN_4379	23035
TTCN_0	12849	ATCN_2729	23036
CTCN_0	12850	TTCN_4380	23037
ATCN_0	12851	ATCN_2730	23038
ATCN_1	12852	CTCN_4125	23039
GTCN_1	12853	CTCN_4126	23040
GTCN_2	12854	CTCN_4127	23041
CTCN_1	12855	GTCN_2344	23042
CTCN_2	12856	ATCN_2731	23043

CTCN_3	12857	TTCN_4381	23044
ATCN_2	12858	ATCN_2732	23045
TTCN_1	12859	GTCN_2345	23046
TTCN_2	12860	ATCN_2733	23047
TTCN_3	12861	CTCN_4128	23048
ATCN_3	12862	CTCN_4129	23049
TTCN_4	12863	GTCN_2346	23050
TTCN_5	12864	CTCN_4130	23051
ATCN_4	12865	TTCN_4382	23052
TTCN_6	12866	CTCN_4131	23053
CTCN_4	12867	CTCN_4132	23054
CTCN_5	12868	CTCN_4133	23055
GTCN_3	12869	GTCN_2347	23056
CTCN_6	12870	TTCN_4383	23057
GTCN_4	12871	CTCN_4134	23058
TTCN_7	12872	GTCN_2348	23059
CTCN_7	12873	TTCN_4384	23060
ATCN_5	12874	ATCN_2734	23061
TTCN_8	12875	CTCN_4135	23062
TTCN_9	12876	GTCN_2349	23063
GTCN_5	12877	TTCN_4385	23064
CTCN_8	12878	CTCN_4136	23065
TTCN_10	12879	CTCN_4137	23066
GTCN_6	12880	GTCN_2350	23067
TTCN_11	12881	CTCN_4138	23068
CTCN_9	12882	CTCN_4139	23069
TTCN_12	12883	ATCN_2735	23070
CTCN_10	12884	ATCN_2736	23071
GTCN_7	12885	TTCN_4386	23072
TTCN_13	12886	GTCN_2351	23073
ATCN_6	12887	CTCN_4140	23074
TTCN_14	12888	CTCN_4141	23075
ATCN_7	12889	ATCN_2737	23076
ATCN_8	12890	TTCN_4387	23077
TTCN_15	12891	CTCN_4142	23078
GTCN_8	12892	TTCN_4388	23079
TTCN_16	12893	CTCN_4143	23080
GTCN_9	12894	GTCN_2352	23081
TTCN_17	12895	CTCN_4144	23082
CTCN_11	12896	TTCN_4389	23083
GTCN_10	12897	ATCN_2738	23084
GTCN_11	12898	CTCN_4145	23085
GTCN_12	12899	GTCN_2353	23086
ATCN_9	12900	GTCN_2354	23087
ATCN_10	12901	ATCN_2739	23088
CTCN_12	12902	GTCN_2355	23089
GTCN_13	12903	CTCN_4146	23090
CTCN_13	12904	CTCN_4147	23091
TTCN_18	12905	CTCN_4148	23092
ATCN_11	12906	ATCN_2740	23093
TTCN_19	12907	ATCN_2741	23094
ATCN_12	12908	CTCN_4149	23095
TTCN_20	12909	CTCN_4150	23096
CTCN_14	12910	ATCN_2742	23097
TTCN_21	12911	CTCN_4151	23098

FIG. 36 (continued)

CTCN_15	12912	CTCN_4152	23099
TTCN_22	12913	GTCN_2356	23100
CTCN_16	12914	TTCN_4390	23101
GTCN_14	12915	GTCN_2357	23102
ATCN_13	12916	CTCN_4153	23103
CTCN_17	12917	CTCN_4154	23104
GTCN_15	12918	TTCN_4391	23105
TTCN_23	12919	CTCN_4155	23106
ATCN_14	12920	CTCN_4156	23107
ATCN_15	12921	TTCN_4392	23108
CTCN_18	12922	ATCN_2743	23109
CTCN_19	12923	TTCN_4393	23110
CTCN_20	12924	TTCN_4394	23111
CTCN_21	12925	TTCN_4395	23112
CTCN_22	12926	ATCN_2744	23113
TTCN_24	12927	TTCN_4396	23114
TTCN_25	12928	CTCN_4157	23115
TTCN_26	12929	TTCN_4397	23116
CTCN_23	12930	CTCN_4158	23117
CTCN_24	12931	ATCN_2745	23118
CTCN_25	12932	ATCN_2746	23119
ATCN_16	12933	GTCN_2358	23120
CTCN_26	12934	ATCN_2747	23121
TTCN_27	12935	CTCN_4159	23122
CTCN_27	12936	GTCN_2359	23123
ATCN_17	12937	TTCN_4398	23124
TTCN_28	12938	GTCN_2360	23125
GTCN_16	12939	CTCN_4160	23126
TTCN_29	12940	CTCN_4161	23127
GTCN_17	12941	CTCN_4162	23128
CTCN_28	12942	GTCN_2361	23129
CTCN_29	12943	CTCN_4163	23130
GTCN_18	12944	CTCN_4164	23131
TTCN_30	12945	CTCN_4165	23132
TTCN_31	12946	CTCN_4166	23133
CTCN_30	12947	TTCN_4399	23134
CTCN_31	12948	CTCN_4167	23135
TTCN_32	12949	CTCN_4168	23136
GTCN_19	12950	CTCN_4169	23137
CTCN_32	12951	ATCN_2748	23138
GTCN_20	12952	ATCN_2749	23139
ATCN_18	12953	GTCN_2362	23140
CTCN_33	12954	CTCN_4170	23141
ATCN_19	12955	GTCN_2363	23142
TTCN_33	12956	CTCN_4171	23143
TTCN_34	12957	GTCN_2364	23144
GTCN_21	12958	CTCN_4172	23145
TTCN_35	12959	TTCN_4400	23146
CTCN_34	12960	TTCN_4401	23147
ATCN_20	12961	CTCN_4173	23148
TTCN_36	12962	TTCN_4402	23149
TTCN_37	12963	TTCN_4403	23150
CTCN_35	12964	CTCN_4174	23151
GTCN_22	12965	GTCN_2365	23152
CTCN_36	12966	CTCN_4175	23153

TTCN_38	12967	CTCN_4176	23154
CTCN_37	12968	CTCN_4177	23155
TTCN_39	12969	TTCN_4404	23156
ATCN_21	12970	TTCN_4405	23157
TTCN_40	12971	TTCN_4406	23158
CTCN_38	12972	TTCN_4407	23159
CTCN_39	12973	TTCN_4408	23160
CTCN_40	12974	ATCN_2750	23161
TTCN_41	12975	CTCN_4178	23162
GTCN_23	12976	TTCN_4409	23163
CTCN_41	12977	GTCN_2366	23164
TTCN_42	12978	CTCN_4179	23165
GTCN_24	12979	CTCN_4180	23166
TTCN_43	12980	TTCN_4410	23167
CTCN_42	12981	GTCN_2367	23168
GTCN_25	12982	TTCN_4411	23169
ATCN_22	12983	CTCN_4181	23170
TTCN_44	12984	GTCN_2368	23171
CTCN_43	12985	ATCN_2751	23172
TTCN_45	12986	CTCN_4182	23173
TTCN_46	12987	ATCN_2752	23174
TTCN_47	12988	CTCN_4183	23175
GTCN_26	12989	TTCN_4412	23176
TTCN_48	12990	TTCN_4413	23177
CTCN_44	12991	TTCN_4414	23178
TTCN_49	12992	ATCN_2753	23179
CTCN_45	12993	TTCN_4415	23180
TTCN_50	12994	ATCN_2754	23181
GTCN_27	12995	TTCN_4416	23182
TTCN_51	12996	TTCN_4417	23183
TTCN_52	12997	CTCN_4184	23184
CTCN_46	12998	TTCN_4418	23185
GTCN_28	12999	GTCN_2369	23186
ATCN_23	13000	ATCN_2755	23187
TTCN_53	13001	ATCN_2756	23188
GTCN_29	13002	TTCN_4419	23189
TTCN_54	13003	TTCN_4420	23190
TTCN_55	13004	TTCN_4421	23191
TTCN_56	13005	TTCN_4422	23192
TTCN_57	13006	ATCN_2757	23193
GTCN_30	13007	CTCN_4185	23194
CTCN_47	13008	CTCN_4186	23195
GTCN_31	13009	GTCN_2370	23196
CTCN_48	13010	GTCN_2371	23197
CTCN_49	13011	TTCN_4423	23198
TTCN_58	13012	CTCN_4187	23199
ATCN_24	13013	CTCN_4188	23200
GTCN_32	13014	ATCN_2758	23201
TTCN_59	13015	ATCN_2759	23202
GTCN_33	13016	GTCN_2372	23203
TTCN_60	13017	CTCN_4189	23204
TTCN_61	13018	TTCN_4424	23205
GTCN_34	13019	CTCN_4190	23206
GTCN_35	13020	GTCN_2373	23207
ATCN_25	13021	ATCN_2760	23208

FIG. 36 (continued)

ATCN_26	13022	CTCN_4191	23209
ATCN_27	13023	TTCN_4425	23210
ATCN_28	13024	CTCN_4192	23211
TTCN_62	13025	TTCN_4426	23212
ATCN_29	13026	CTCN_4193	23213
ATCN_30	13027	TTCN_4427	23214
TTCN_63	13028	ATCN_2761	23215
TTCN_64	13029	GTCN_2374	23216
TTCN_65	13030	CTCN_4194	23217
GTCN_36	13031	ATCN_2762	23218
ATCN_31	13032	TTCN_4428	23219
GTCN_37	13033	GTCN_2375	23220
GTCN_38	13034	TTCN_4429	23221
CTCN_50	13035	CTCN_4195	23222
ATCN_32	13036	CTCN_4196	23223
TTCN_66	13037	CTCN_4197	23224
TTCN_67	13038	CTCN_4198	23225
TTCN_68	13039	GTCN_2376	23226
TTCN_69	13040	TTCN_4430	23227
TTCN_70	13041	TTCN_4431	23228
ATCN_33	13042	ATCN_2763	23229
TTCN_71	13043	CTCN_4199	23230
TTCN_72	13044	TTCN_4432	23231
ATCN_34	13045	TTCN_4433	23232
CTCN_51	13046	CTCN_4200	23233
TTCN_73	13047	ATCN_2764	23234
ATCN_35	13048	CTCN_4201	23235
TTCN_74	13049	GTCN_2377	23236
TTCN_75	13050	CTCN_4202	23237
ATCN_36	13051	TTCN_4434	23238
CTCN_52	13052	GTCN_2378	23239
GTCN_39	13053	TTCN_4435	23240
ATCN_37	13054	TTCN_4436	23241
TTCN_76	13055	CTCN_4203	23242
CTCN_53	13056	CTCN_4204	23243
TTCN_77	13057	CTCN_4205	23244
ATCN_38	13058	TTCN_4437	23245
TTCN_78	13059	TTCN_4438	23246
CTCN_54	13060	ATCN_2765	23247
TTCN_79	13061	TTCN_4439	23248
TTCN_80	13062	GTCN_2379	23249
TTCN_81	13063	GTCN_2380	23250
CTCN_55	13064	GTCN_2381	23251
CTCN_56	13065	TTCN_4440	23252
GTCN_40	13066	ATCN_2766	23253
CTCN_57	13067	TTCN_4441	23254
ATCN_39	13068	TTCN_4442	23255
CTCN_58	13069	CTCN_4206	23256
CTCN_59	13070	GTCN_2382	23257
GTCN_41	13071	TTCN_4443	23258
TTCN_82	13072	TTCN_4444	23259
TTCN_83	13073	ATCN_2767	23260
CTCN_60	13074	CTCN_4207	23261
TTCN_84	13075	GTCN_2383	23262
GTCN_42	13076	CTCN_4208	23263

TTCN_85	13077	GTCN_2384	23264
CTCN_61	13078	TTCN_4445	23265
GTCN_43	13079	TTCN_4446	23266
ATCN_40	13080	ATCN_2768	23267
ATCN_41	13081	TTCN_4447	23268
TTCN_86	13082	TTCN_4448	23269
TTCN_87	13083	CTCN_4209	23270
ATCN_42	13084	CTCN_4210	23271
TTCN_88	13085	CTCN_4211	23272
CTCN_62	13086	CTCN_4212	23273
ATCN_43	13087	TTCN_4449	23274
ATCN_44	13088	ATCN_2769	23275
CTCN_63	13089	TTCN_4450	23276
TTCN_89	13090	ATCN_2770	23277
CTCN_64	13091	TTCN_4451	23278
GTCN_44	13092	TTCN_4452	23279
CTCN_65	13093	CTCN_4213	23280
TTCN_90	13094	TTCN_4453	23281
CTCN_66	13095	ATCN_2771	23282
CTCN_67	13096	TTCN_4454	23283
CTCN_68	13097	TTCN_4455	23284
CTCN_69	13098	TTCN_4456	23285
GTCN_45	13099	TTCN_4457	23286
CTCN_70	13100	GTCN_2385	23287
CTCN_71	13101	CTCN_4214	23288
GTCN_46	13102	TTCN_4458	23289
TTCN_91	13103	TTCN_4459	23290
TTCN_92	13104	ATCN_2772	23291
ATCN_45	13105	ATCN_2773	23292
TTCN_93	13106	TTCN_4460	23293
ATCN_46	13107	GTCN_2386	23294
CTCN_72	13108	CTCN_4215	23295
TTCN_94	13109	CTCN_4216	23296
GTCN_47	13110	TTCN_4461	23297
TTCN_95	13111	GTCN_2387	23298
TTCN_96	13112	CTCN_4217	23299
TTCN_97	13113	ATCN_2774	23300
TTCN_98	13114	CTCN_4218	23301
CTCN_73	13115	CTCN_4219	23302
TTCN_99	13116	CTCN_4220	23303
TTCN_100	13117	TTCN_4462	23304
ATCN_47	13118	GTCN_2388	23305
GTCN_48	13119	TTCN_4463	23306
TTCN_101	13120	TTCN_4464	23307
TTCN_102	13121	TTCN_4465	23308
TTCN_103	13122	GTCN_2389	23309
CTCN_74	13123	TTCN_4466	23310
TTCN_104	13124	ATCN_2775	23311
GTCN_49	13125	TTCN_4467	23312
ATCN_48	13126	TTCN_4468	23313
CTCN_75	13127	CTCN_4221	23314
GTCN_50	13128	ATCN_2776	23315
CTCN_76	13129	ATCN_2777	23316
GTCN_51	13130	TTCN_4469	23317
TTCN_105	13131	GTCN_2390	23318

FIG. 36 (continued)

CTCN_77	13132	TTCN_4470	23319
GTCN_52	13133	TTCN_4471	23320
TTCN_106	13134	CTCN_4222	23321
GTCN_53	13135	TTCN_4472	23322
CTCN_78	13136	TTCN_4473	23323
TTCN_107	13137	CTCN_4223	23324
GTCN_54	13138	ATCN_2778	23325
CTCN_79	13139	GTCN_2391	23326
CTCN_80	13140	CTCN_4224	23327
GTCN_55	13141	ATCN_2779	23328
CTCN_81	13142	CTCN_4225	23329
CTCN_82	13143	TTCN_4474	23330
CTCN_83	13144	CTCN_4226	23331
TTCN_108	13145	ATCN_2780	23332
ATCN_49	13146	CTCN_4227	23333
CTCN_84	13147	CTCN_4228	23334
GTCN_56	13148	ATCN_2781	23335
CTCN_85	13149	ATCN_2782	23336
CTCN_86	13150	CTCN_4229	23337
TTCN_109	13151	GTCN_2392	23338
ATCN_50	13152	CTCN_4230	23339
ATCN_51	13153	TTCN_4475	23340
ATCN_52	13154	CTCN_4231	23341
TTCN_110	13155	TTCN_4476	23342
ATCN_53	13156	ATCN_2783	23343
ATCN_54	13157	CTCN_4232	23344
CTCN_87	13158	GTCN_2393	23345
TTCN_111	13159	CTCN_4233	23346
CTCN_88	13160	CTCN_4234	23347
TTCN_112	13161	CTCN_4235	23348
ATCN_55	13162	TTCN_4477	23349
CTCN_89	13163	TTCN_4478	23350
CTCN_90	13164	CTCN_4236	23351
TTCN_113	13165	CTCN_4237	23352
TTCN_114	13166	GTCN_2394	23353
GTCN_57	13167	CTCN_4238	23354
TTCN_115	13168	GTCN_2395	23355
TTCN_116	13169	GTCN_2396	23356
ATCN_56	13170	CTCN_4239	23357
TTCN_117	13171	GTCN_2397	23358
CTCN_91	13172	CTCN_4240	23359
ATCN_57	13173	TTCN_4479	23360
ATCN_58	13174	TTCN_4480	23361
GTCN_58	13175	TTCN_4481	23362
ATCN_59	13176	TTCN_4482	23363
ATCN_60	13177	TTCN_4483	23364
ATCN_61	13178	TTCN_4484	23365
TTCN_118	13179	TTCN_4485	23366
ATCN_62	13180	ATCN_2784	23367
TTCN_119	13181	CTCN_4241	23368
CTCN_92	13182	TTCN_4486	23369
CTCN_93	13183	TTCN_4487	23370
GTCN_59	13184	GTCN_2398	23371
ATCN_63	13185	TTCN_4374	23372
CTCN_94	13186	ATCN_2724	23373

ATCN_64	13187	TTCN_4375	23374
TTCN_120	13188	TTCN_4376	23375
ATCN_65	13189	ATCN_2725	23376
TTCN_121	13190	CTCN_4121	23377
TTCN_122	13191	TTCN_4377	23378
GTCN_60	13192	TTCN_4378	23379
TTCN_123	13193	CTCN_4122	23380
CTCN_95	13194	ATCN_2726	23381
CTCN_96	13195	ATCN_2727	23382
GTCN_61	13196	ATCN_2728	23383
TTCN_124	13197	CTCN_4123	23384
ATCN_66	13198	CTCN_4124	23385
TTCN_125	13199	TTCN_4379	23386
ATCN_67	13200	ATCN_2729	23387
TTCN_126	13201	TTCN_4380	23388
TTCN_127	13202	ATCN_2730	23389
GTCN_62	13203	CTCN_4125	23390
CTCN_97	13204	CTCN_4126	23391
TTCN_128	13205	CTCN_4127	23392
CTCN_98	13206	GTCN_2344	23393
TTCN_129	13207	ATCN_2731	23394
CTCN_99	13208	TTCN_4381	23395
GTCN_63	13209	ATCN_2732	23396
TTCN_130	13210	GTCN_2345	23397
TTCN_131	13211	ATCN_2733	23398
TTCN_132	13212	CTCN_4128	23399
GTCN_64	13213	CTCN_4129	23400
ATCN_68	13214	GTCN_2346	23401
ATCN_69	13215	CTCN_4130	23402
TTCN_133	13216	TTCN_4382	23403
ATCN_70	13217	CTCN_4131	23404
CTCN_100	13218	CTCN_4132	23405
GTCN_65	13219	CTCN_4133	23406
CTCN_101	13220	GTCN_2347	23407
TTCN_134	13221	TTCN_4383	23408
ATCN_71	13222	CTCN_4134	23409
TTCN_135	13223	GTCN_2348	23410
ATCN_72	13224	TTCN_4384	23411
GTCN_66	13225	ATCN_2734	23412
GTCN_67	13226	CTCN_4135	23413
ATCN_73	13227	GTCN_2349	23414
ATCN_74	13228	TTCN_4385	23415
TTCN_136	13229	CTCN_4136	23416
ATCN_75	13230	CTCN_4137	23417
CTCN_102	13231	GTCN_2350	23418
TTCN_137	13232	CTCN_4138	23419
TTCN_138	13233	CTCN_4139	23420
GTCN_68	13234	ATCN_2735	23421
TTCN_139	13235	ATCN_2736	23422
GTCN_69	13236	TTCN_4386	23423
TTCN_140	13237	GTCN_2351	23424
ATCN_76	13238	CTCN_4140	23425
CTCN_103	13239	CTCN_4141	23426
TTCN_141	13240	ATCN_2737	23427
ATCN_77	13241	TTCN_4387	23428

FIG. 36 (continued)

GTCN_70	13242	CTCN_4142	23429
GTCN_71	13243	TTCN_4388	23430
GTCN_72	13244	CTCN_4143	23431
CTCN_104	13245	GTCN_2352	23432
GTCN_73	13246	CTCN_4144	23433
TTCN_142	13247	TTCN_4389	23434
ATCN_78	13248	ATCN_2738	23435
GTCN_74	13249	CTCN_4145	23436
TTCN_143	13250	GTCN_2353	23437
TTCN_144	13251	GTCN_2354	23438
CTCN_105	13252	ATCN_2739	23439
TTCN_145	13253	GTCN_2355	23440
TTCN_146	13254	CTCN_4146	23441
GTCN_75	13255	CTCN_4147	23442
GTCN_76	13256	CTCN_4148	23443
GTCN_77	13257	ATCN_2740	23444
CTCN_106	13258	ATCN_2741	23445
ATCN_79	13259	CTCN_4149	23446
ATCN_80	13260	CTCN_4150	23447
ATCN_81	13261	ATCN_2742	23448
ATCN_82	13262	CTCN_4151	23449
CTCN_107	13263	CTCN_4152	23450
CTCN_108	13264	GTCN_2356	23451
TTCN_147	13265	TTCN_4390	23452
CTCN_109	13266	GTCN_2357	23453
GTCN_1022	13267	CTCN_4153	23454
TTCN_1934	13268	CTCN_4154	23455
CTCN_1623	13269	TTCN_4391	23456
ATCN_1182	13270	CTCN_4155	23457
GTCN_1023	13271	CTCN_4156	23458
TTCN_1935	13272	TTCN_4392	23459
CTCN_1624	13273	ATCN_2743	23460
ATCN_1183	13274	TTCN_4393	23461
TTCN_1936	13275	TTCN_4394	23462
GTCN_1024	13276	TTCN_4395	23463
CTCN_1625	13277	ATCN_2744	23464
ATCN_1184	13278	TTCN_4396	23465
ATCN_1185	13279	CTCN_4157	23466
TTCN_1937	13280	TTCN_4397	23467
CTCN_1626	13281	CTCN_4158	23468
TTCN_1938	13282	ATCN_2745	23469
GTCN_1025	13283	ATCN_2746	23470
ATCN_1186	13284	GTCN_2358	23471
TTCN_1939	13285	ATCN_2747	23472
TTCN_1940	13286	CTCN_4159	23473
TTCN_1941	13287	GTCN_2359	23474
TTCN_1942	13288	TTCN_4398	23475
GTCN_1026	13289	GTCN_2360	23476
CTCN_1627	13290	CTCN_4160	23477
CTCN_1628	13291	CTCN_4161	23478
TTCN_1943	13292	CTCN_4162	23479
GTCN_1027	13293	GTCN_2361	23480
CTCN_1629	13294	CTCN_4163	23481
GTCN_1028	13295	CTCN_4164	23482
GTCN_1029	13296	CTCN_4165	23483

ATCN_1187	13297	CTCN_4166	23484
GTCN_1030	13298	TTCN_4399	23485
TTCN_1944	13299	CTCN_4167	23486
TTCN_1945	13300	CTCN_4168	23487
ATCN_1188	13301	CTCN_4169	23488
TTCN_1946	13302	ATCN_2748	23489
GTCN_1031	13303	ATCN_2749	23490
TTCN_1947	13304	GTCN_2362	23491
ATCN_1189	13305	CTCN_4170	23492
TTCN_1948	13306	GTCN_2363	23493
CTCN_1630	13307	CTCN_4171	23494
CTCN_1631	13308	GTCN_2364	23495
GTCN_1032	13309	CTCN_4172	23496
GTCN_1033	13310	TTCN_4400	23497
TTCN_1949	13311	TTCN_4401	23498
TTCN_1950	13312	CTCN_4173	23499
TTCN_1951	13313	TTCN_4402	23500
CTCN_1632	13314	TTCN_4403	23501
GTCN_1034	13315	CTCN_4174	23502
GTCN_1035	13316	GTCN_2365	23503
TTCN_1952	13317	CTCN_4175	23504
TTCN_1953	13318	CTCN_4176	23505
ATCN_1190	13319	CTCN_4177	23506
GTCN_1036	13320	TTCN_4404	23507
TTCN_1954	13321	TTCN_4405	23508
GTCN_1037	13322	TTCN_4406	23509
CTCN_1633	13323	TTCN_4407	23510
TTCN_1955	13324	TTCN_4408	23511
ATCN_1191	13325	ATCN_2750	23512
TTCN_1956	13326	CTCN_4178	23513
TTCN_1957	13327	TTCN_4409	23514
TTCN_1958	13328	GTCN_2366	23515
GTCN_1038	13329	CTCN_4179	23516
ATCN_1192	13330	CTCN_4180	23517
TTCN_1959	13331	TTCN_4410	23518
CTCN_1634	13332	GTCN_2367	23519
TTCN_1960	13333	TTCN_4411	23520
TTCN_1961	13334	CTCN_4181	23521
ATCN_1193	13335	GTCN_2368	23522
GTCN_1039	13336	ATCN_2751	23523
TTCN_1962	13337	CTCN_4182	23524
GTCN_1040	13338	ATCN_2752	23525
TTCN_1963	13339	CTCN_4183	23526
ATCN_1194	13340	TTCN_4412	23527
GTCN_1041	13341	TTCN_4413	23528
TTCN_1964	13342	TTCN_4414	23529
ATCN_1195	13343	ATCN_2753	23530
TTCN_1965	13344	TTCN_4415	23531
ATCN_1196	13345	ATCN_2754	23532
TTCN_1966	13346	TTCN_4416	23533
TTCN_1967	13347	TTCN_4417	23534
ATCN_1197	13348	CTCN_4184	23535
ATCN_1198	13349	TTCN_4418	23536
TTCN_1968	13350	GTCN_2369	23537
TTCN_1969	13351	ATCN_2755	23538

FIG. 36 (continued)

CTCN_1635	13352	ATCN_2756	23539
ATCN_1199	13353	TTCN_4419	23540
ATCN_1200	13354	TTCN_4420	23541
ATCN_1201	13355	TTCN_4421	23542
ATCN_1202	13356	TTCN_4422	23543
GTCN_1042	13357	ATCN_2757	23544
GTCN_1043	13358	CTCN_4185	23545
TTCN_1970	13359	CTCN_4186	23546
GTCN_1044	13360	GTCN_2370	23547
GTCN_1045	13361	GTCN_2371	23548
GTCN_1046	13362	TTCN_4423	23549
ATCN_1203	13363	CTCN_4187	23550
ATCN_1204	13364	CTCN_4188	23551
CTCN_1636	13365	ATCN_2758	23552
CTCN_1637	13366	ATCN_2759	23553
ATCN_1205	13367	GTCN_2372	23554
TTCN_1971	13368	CTCN_4189	23555
TTCN_1972	13369	TTCN_4424	23556
TTCN_1973	13370	CTCN_4190	23557
GTCN_1047	13371	GTCN_2373	23558
CTCN_1638	13372	ATCN_2760	23559
GTCN_1048	13373	CTCN_4191	23560
TTCN_1974	13374	TTCN_4425	23561
TTCN_1975	13375	CTCN_4192	23562
TTCN_1976	13376	TTCN_4426	23563
TTCN_1977	13377	CTCN_4193	23564
GTCN_1049	13378	TTCN_4427	23565
TTCN_1978	13379	ATCN_2761	23566
GTCN_1050	13380	GTCN_2374	23567
ATCN_1206	13381	CTCN_4194	23568
ATCN_1207	13382	ATCN_2762	23569
ATCN_1208	13383	TTCN_4428	23570
CTCN_1639	13384	GTCN_2375	23571
ATCN_1209	13385	TTCN_4429	23572
GTCN_1051	13386	CTCN_4195	23573
GTCN_1052	13387	CTCN_4196	23574
TTCN_1979	13388	CTCN_4197	23575
CTCN_1640	13389	CTCN_4198	23576
CTCN_1641	13390	GTCN_2376	23577
CTCN_1642	13391	TTCN_4430	23578
ATCN_1210	13392	TTCN_4431	23579
ATCN_1211	13393	ATCN_2763	23580
CTCN_1643	13394	CTCN_4199	23581
ATCN_1212	13395	TTCN_4432	23582
GTCN_1053	13396	TTCN_4433	23583
GTCN_1054	13397	CTCN_4200	23584
CTCN_1644	13398	ATCN_2764	23585
ATCN_1213	13399	CTCN_4201	23586
GTCN_1055	13400	GTCN_2377	23587
GTCN_1056	13401	CTCN_4202	23588
ATCN_1214	13402	TTCN_4434	23589
GTCN_1057	13403	GTCN_2378	23590
TTCN_1980	13404	TTCN_4435	23591
TTCN_1981	13405	TTCN_4436	23592
CTCN_1645	13406	CTCN_4203	23593

TTCN_1982	13407	CTCN_4204	23594
TTCN_1983	13408	CTCN_4205	23595
TTCN_1984	13409	TTCN_4437	23596
TTCN_1985	13410	TTCN_4438	23597
TTCN_1986	13411	ATCN_2765	23598
CTCN_1646	13412	TTCN_4439	23599
CTCN_1647	13413	GTCN_2379	23600
ATCN_1215	13414	GTCN_2380	23601
ATCN_1216	13415	GTCN_2381	23602
CTCN_1648	13416	TTCN_4440	23603
CTCN_1649	13417	ATCN_2766	23604
CTCN_1650	13418	TTCN_4441	23605
CTCN_1651	13419	TTCN_4442	23606
TTCN_1987	13420	CTCN_4206	23607
ATCN_1217	13421	GTCN_2382	23608
TTCN_1988	13422	TTCN_4443	23609
CTCN_1652	13423	TTCN_4444	23610
GTCN_1058	13424	ATCN_2767	23611
CTCN_1653	13425	CTCN_4207	23612
CTCN_1654	13426	GTCN_2383	23613
CTCN_1655	13427	CTCN_4208	23614
ATCN_1218	13428	GTCN_2384	23615
TTCN_1989	13429	TTCN_4445	23616
TTCN_1990	13430	TTCN_4446	23617
GTCN_1059	13431	ATCN_2768	23618
TTCN_1991	13432	TTCN_4447	23619
CTCN_1656	13433	TTCN_4448	23620
GTCN_1060	13434	CTCN_4209	23621
CTCN_1657	13435	CTCN_4210	23622
ATCN_1219	13436	CTCN_4211	23623
ATCN_1220	13437	CTCN_4212	23624
CTCN_1658	13438	TTCN_4449	23625
ATCN_1221	13439	ATCN_2769	23626
TTCN_1992	13440	TTCN_4450	23627
TTCN_1993	13441	ATCN_2770	23628
TTCN_1994	13442	TTCN_4451	23629
CTCN_1659	13443	TTCN_4452	23630
CTCN_1660	13444	CTCN_4213	23631
CTCN_1661	13445	TTCN_4453	23632
CTCN_1662	13446	ATCN_2771	23633
TTCN_1995	13447	TTCN_4454	23634
TTCN_1996	13448	TTCN_4455	23635
ATCN_1222	13449	TTCN_4456	23636
TTCN_1997	13450	TTCN_4457	23637
TTCN_1998	13451	GTCN_2385	23638
CTCN_1663	13452	CTCN_4214	23639
ATCN_1223	13453	TTCN_4458	23640
TTCN_1999	13454	TTCN_4459	23641
TTCN_2000	13455	ATCN_2772	23642
CTCN_1664	13456	ATCN_2773	23643
GTCN_1061	13457	TTCN_4460	23644
ATCN_1224	13458	GTCN_2386	23645
GTCN_1062	13459	CTCN_4215	23646
CTCN_1665	13460	CTCN_4216	23647
ATCN_1225	13461	TTCN_4461	23648

FIG. 36 (continued)

ATCN_1226	13462	GTCN_2387	23649
TTCN_2001	13463	CTCN_4217	23650
CTCN_1666	13464	ATCN_2774	23651
ATCN_1227	13465	CTCN_4218	23652
TTCN_2002	13466	CTCN_4219	23653
TTCN_2003	13467	CTCN_4220	23654
TTCN_2004	13468	TTCN_4462	23655
TTCN_2005	13469	GTCN_2388	23656
CTCN_1667	13470	TTCN_4463	23657
TTCN_2006	13471	TTCN_4464	23658
TTCN_2007	13472	TTCN_4465	23659
TTCN_2008	13473	GTCN_2389	23660
TTCN_2009	13474	TTCN_4466	23661
CTCN_1668	13475	ATCN_2775	23662
CTCN_1669	13476	TTCN_4467	23663
GTCN_1063	13477	TTCN_4468	23664
ATCN_1228	13478	CTCN_4221	23665
GTCN_1064	13479	ATCN_2776	23666
ATCN_1229	13480	ATCN_2777	23667
GTCN_1065	13481	TTCN_4469	23668
TTCN_2010	13482	GTCN_2390	23669
ATCN_1230	13483	TTCN_4470	23670
ATCN_1231	13484	TTCN_4471	23671
CTCN_1670	13485	CTCN_4222	23672
ATCN_1232	13486	TTCN_4472	23673
CTCN_1671	13487	TTCN_4473	23674
TTCN_2011	13488	CTCN_4223	23675
TTCN_2012	13489	ATCN_2778	23676
CTCN_1672	13490	GTCN_2391	23677
GTCN_1066	13491	CTCN_4224	23678
GTCN_1067	13492	ATCN_2779	23679
GTCN_1068	13493	CTCN_4225	23680
CTCN_1673	13494	TTCN_4474	23681
ATCN_1233	13495	CTCN_4226	23682
ATCN_1234	13496	ATCN_2780	23683
TTCN_2013	13497	CTCN_4227	23684
GTCN_1069	13498	CTCN_4228	23685
TTCN_2014	13499	ATCN_2781	23686
GTCN_1070	13500	ATCN_2782	23687
ATCN_1235	13501	CTCN_4229	23688
ATCN_1236	13502	GTCN_2392	23689
ATCN_1237	13503	CTCN_4230	23690
GTCN_1071	13504	TTCN_4475	23691
GTCN_1072	13505	CTCN_4231	23692
CTCN_1674	13506	TTCN_4476	23693
CTCN_1675	13507	ATCN_2783	23694
ATCN_1238	13508	CTCN_4232	23695
GTCN_1073	13509	GTCN_2393	23696
CTCN_1676	13510	CTCN_4233	23697
CTCN_1677	13511	CTCN_4234	23698
CTCN_1678	13512	CTCN_4235	23699
GTCN_1074	13513	TTCN_4477	23700
TTCN_2015	13514	TTCN_4478	23701
ATCN_1239	13515	CTCN_4236	23702
TTCN_2016	13516	CTCN_4237	23703

GTCN_1075	13517	GTCN_2394	23704
CTCN_1679	13518	CTCN_4238	23705
GTCN_1076	13519	GTCN_2395	23706
CTCN_1680	13520	GTCN_2396	23707
GTCN_1077	13521	CTCN_4239	23708
CTCN_1681	13522	GTCN_2397	23709
CTCN_1682	13523	CTCN_4240	23710
CTCN_1683	13524	TTCN_4479	23711
TTCN_2017	13525	TTCN_4480	23712
GTCN_1078	13526	TTCN_4481	23713
CTCN_1684	13527	TTCN_4482	23714
GTCN_1079	13528	TTCN_4483	23715
TTCN_2018	13529	TTCN_4484	23716
TTCN_2019	13530	TTCN_4485	23717
TTCN_2020	13531	ATCN_2784	23718
CTCN_1685	13532	CTCN_4241	23719
CTCN_1686	13533	TTCN_4486	23720
CTCN_1687	13534	TTCN_4487	23721
CTCN_1688	13535	GTCN_2398	23722
TTCN_2021	13536	ATCN_2785	23723
ATCN_1240	13537	TTCN_4488	23724
TTCN_2022	13538	TTCN_4489	23725
CTCN_1689	13539	ATCN_2786	23726
ATCN_1241	13540	ATCN_2787	23727
CTCN_1690	13541	TTCN_4490	23728
TTCN_2023	13542	ATCN_2788	23729
CTCN_1691	13543	TTCN_4491	23730
TTCN_2024	13544	GTCN_2399	23731
TTCN_2025	13545	TTCN_4492	23732
CTCN_1692	13546	CTCN_4242	23733
TTCN_2026	13547	CTCN_4243	23734
CTCN_1693	13548	TTCN_4493	23735
TTCN_2027	13549	TTCN_4494	23736
TTCN_2028	13550	GTCN_2400	23737
GTCN_1080	13551	CTCN_4244	23738
GTCN_1081	13552	GTCN_2401	23739
TTCN_2029	13553	TTCN_4495	23740
TTCN_2030	13554	ATCN_2789	23741
GTCN_1082	13555	ATCN_2790	23742
CTCN_1694	13556	ATCN_2791	23743
CTCN_1695	13557	ATCN_2792	23744
GTCN_1083	13558	ATCN_2793	23745
ATCN_1242	13559	TTCN_4496	23746
CTCN_1696	13560	CTCN_4245	23747
GTCN_1084	13561	TTCN_4497	23748
CTCN_1697	13562	CTCN_4246	23749
CTCN_1698	13563	GTCN_2402	23750
ATCN_1243	13564	CTCN_4247	23751
CTCN_1699	13565	CTCN_4248	23752
CTCN_1700	13566	TTCN_4498	23753
GTCN_1085	13567	CTCN_4249	23754
CTCN_1701	13568	CTCN_4250	23755
GTCN_1086	13569	CTCN_4251	23756
CTCN_1702	13570	TTCN_4499	23757
TTCN_2031	13571	ATCN_2794	23758

FIG. 36 (continued)

ATCN_1244	13572	TTCN_4500	23759
GTCN_1087	13573	CTCN_4252	23760
GTCN_1088	13574	CTCN_4253	23761
GTCN_1089	13575	CTCN_4254	23762
CTCN_1703	13576	ATCN_2795	23763
TTCN_2032	13577	GTCN_2403	23764
TTCN_2033	13578	CTCN_4255	23765
ATCN_1245	13579	GTCN_2404	23766
GTCN_1090	13580	CTCN_4256	23767
GTCN_1091	13581	TTCN_4501	23768
CTCN_1704	13582	GTCN_2405	23769
TTCN_2034	13583	CTCN_4257	23770
TTCN_2035	13584	CTCN_4258	23771
GTCN_1092	13585	GTCN_2406	23772
GTCN_1093	13586	CTCN_4259	23773
CTCN_1705	13587	ATCN_2796	23774
ATCN_1246	13588	ATCN_2797	23775
CTCN_1706	13589	CTCN_4260	23776
CTCN_1707	13590	CTCN_4261	23777
CTCN_1708	13591	ATCN_2798	23778
TTCN_2036	13592	ATCN_2799	23779
GTCN_1094	13593	CTCN_4262	23780
TTCN_2037	13594	ATCN_2800	23781
CTCN_1709	13595	CTCN_4263	23782
ATCN_1247	13596	CTCN_4264	23783
TTCN_2038	13597	CTCN_4265	23784
CTCN_1710	13598	TTCN_4502	23785
GTCN_1095	13599	TTCN_4503	23786
GTCN_1096	13600	CTCN_4266	23787
ATCN_1248	13601	ATCN_2801	23788
TTCN_2039	13602	CTCN_4267	23789
GTCN_1097	13603	TTCN_4504	23790
TTCN_2040	13604	ATCN_2802	23791
GTCN_1098	13605	CTCN_4268	23792
TTCN_2041	13606	TTCN_4505	23793
ATCN_1249	13607	TTCN_4506	23794
TTCN_2042	13608	TTCN_4507	23795
GTCN_1099	13609	ATCN_2803	23796
TTCN_2043	13610	TTCN_4508	23797
GTCN_1100	13611	TTCN_4509	23798
ATCN_1250	13612	CTCN_4269	23799
CTCN_1711	13613	CTCN_4270	23800
ATCN_1251	13614	ATCN_2804	23801
ATCN_1252	13615	TTCN_4510	23802
GTCN_1101	13616	TTCN_4511	23803
TTCN_2044	13617	TTCN_4512	23804
TTCN_2045	13618	TTCN_4513	23805
CTCN_1712	13619	GTCN_2407	23806
ATCN_1253	13620	CTCN_4271	23807
GTCN_1102	13621	TTCN_4514	23808
CTCN_1713	13622	CTCN_4272	23809
TTCN_2046	13623	CTCN_4273	23810
ATCN_1254	13624	GTCN_2408	23811
CTCN_1714	13625	TTCN_4515	23812
TTCN_2047	13626	ATCN_2805	23813

GTCN_1103	13627	ATCN_2806	23814
TTCN_2048	13628	TTCN_4516	23815
CTCN_1715	13629	ATCN_2807	23816
TTCN_2049	13630	CTCN_4274	23817
ATCN_1255	13631	CTCN_4275	23818
TTCN_2050	13632	TTCN_4517	23819
CTCN_1716	13633	GTCN_2409	23820
TTCN_2051	13634	TTCN_4518	23821
TTCN_2052	13635	ATCN_2808	23822
TTCN_2053	13636	TTCN_4519	23823
TTCN_2054	13637	TTCN_4520	23824
GTCN_1104	13638	CTCN_4276	23825
TTCN_2055	13639	CTCN_4277	23826
ATCN_1256	13640	TTCN_4521	23827
CTCN_1717	13641	TTCN_4522	23828
CTCN_1718	13642	CTCN_4278	23829
GTCN_1105	13643	TTCN_4523	23830
GTCN_1106	13644	CTCN_4279	23831
TTCN_2056	13645	CTCN_4280	23832
TTCN_2057	13646	CTCN_4281	23833
TTCN_2058	13647	GTCN_2410	23834
CTCN_1719	13648	TTCN_4524	23835
TTCN_2059	13649	TTCN_4525	23836
CTCN_1720	13650	ATCN_2809	23837
GTCN_1107	13651	ATCN_2810	23838
CTCN_1721	13652	CTCN_4282	23839
CTCN_1722	13653	TTCN_4526	23840
ATCN_1257	13654	ATCN_2811	23841
TTCN_2060	13655	ATCN_2812	23842
CTCN_1723	13656	CTCN_4283	23843
CTCN_1724	13657	CTCN_4284	23844
TTCN_2061	13658	TTCN_4527	23845
GTCN_1108	13659	ATCN_2813	23846
CTCN_1725	13660	ATCN_2814	23847
GTCN_1109	13661	ATCN_2815	23848
CTCN_1726	13662	CTCN_4285	23849
TTCN_2062	13663	ATCN_2816	23850
CTCN_1727	13664	TTCN_4528	23851
TTCN_2063	13665	CTCN_4286	23852
CTCN_1728	13666	GTCN_2411	23853
TTCN_2064	13667	GTCN_2412	23854
ATCN_1258	13668	TTCN_4529	23855
ATCN_1259	13669	CTCN_4287	23856
ATCN_1260	13670	GTCN_2413	23857
GTCN_1110	13671	GTCN_2414	23858
CTCN_1729	13672	GTCN_2415	23859
TTCN_2065	13673	TTCN_4530	23860
TTCN_2066	13674	CTCN_4288	23861
TTCN_2067	13675	CTCN_4289	23862
CTCN_1730	13676	CTCN_4290	23863
TTCN_2068	13677	GTCN_2416	23864
TTCN_2069	13678	TTCN_4531	23865
CTCN_1731	13679	CTCN_4291	23866
GTCN_1111	13680	ATCN_2817	23867
CTCN_1732	13681	GTCN_2417	23868

FIG. 36 (continued)

ATCN_1261	13682	TTCN_4532	23869
TTCN_2070	13683	TTCN_4533	23870
CTCN_1733	13684	ATCN_2818	23871
CTCN_1734	13685	ATCN_2819	23872
TTCN_2071	13686	CTCN_4292	23873
CTCN_1735	13687	CTCN_4293	23874
ATCN_1262	13688	TTCN_4534	23875
ATCN_1263	13689	ATCN_2820	23876
TTCN_2072	13690	TTCN_4535	23877
TTCN_2073	13691	GTCN_2418	23878
CTCN_1736	13692	TTCN_4536	23879
TTCN_2074	13693	GTCN_2419	23880
TTCN_2075	13694	CTCN_4294	23881
ATCN_1264	13695	ATCN_2821	23882
GTCN_1112	13696	TTCN_4537	23883
GTCN_1113	13697	TTCN_4538	23884
TTCN_2076	13698	TTCN_4539	23885
TTCN_2077	13699	TTCN_4540	23886
CTCN_1737	13700	ATCN_2822	23887
CTCN_1738	13701	CTCN_4295	23888
CTCN_1739	13702	ATCN_2823	23889
TTCN_2078	13703	TTCN_4541	23890
TTCN_2079	13704	GTCN_2420	23891
GTCN_1114	13705	GTCN_2421	23892
ATCN_1265	13706	TTCN_4542	23893
GTCN_1115	13707	TTCN_4543	23894
ATCN_1266	13708	CTCN_4296	23895
CTCN_1740	13709	ATCN_2824	23896
CTCN_1741	13710	TTCN_4544	23897
CTCN_1742	13711	TTCN_4545	23898
CTCN_1743	13712	CTCN_4297	23899
TTCN_2080	13713	TTCN_4546	23900
CTCN_1744	13714	CTCN_4298	23901
ATCN_1267	13715	GTCN_2422	23902
CTCN_1745	13716	TTCN_4547	23903
CTCN_1746	13717	TTCN_4548	23904
CTCN_1747	13718	TTCN_4549	23905
ATCN_1268	13719	TTCN_4550	23906
CTCN_1748	13720	CTCN_4299	23907
GTCN_1116	13721	GTCN_2423	23908
ATCN_1269	13722	ATCN_2825	23909
CTCN_1749	13723	TTCN_4551	23910
ATCN_1270	13724	TTCN_4552	23911
GTCN_1117	13725	CTCN_4300	23912
TTCN_2081	13726	ATCN_2826	23913
TTCN_2082	13727	ATCN_2827	23914
TTCN_2083	13728	GTCN_2424	23915
CTCN_1750	13729	TTCN_4553	23916
TTCN_2084	13730	CTCN_4301	23917
GTCN_1118	13731	TTCN_4554	23918
CTCN_1751	13732	TTCN_4555	23919
CTCN_1752	13733	GTCN_2425	23920
TTCN_2085	13734	TTCN_4556	23921
TTCN_2086	13735	ATCN_2828	23922
GTCN_1119	13736	ATCN_2829	23923

TTCN_2087	13737	ATCN_2830	23924
TTCN_2088	13738	GTCN_2426	23925
TTCN_2089	13739	GTCN_2427	23926
TTCN_2090	13740	ATCN_2831	23927
GTCN_1120	13741	CTCN_4302	23928
CTCN_1753	13742	ATCN_2832	23929
TTCN_2091	13743	ATCN_2833	23930
CTCN_1754	13744	ATCN_2834	23931
TTCN_2092	13745	TTCN_4557	23932
ATCN_1271	13746	ATCN_2835	23933
CTCN_1755	13747	GTCN_2428	23934
TTCN_2093	13748	CTCN_4303	23935
TTCN_2094	13749	TTCN_4558	23936
ATCN_1272	13750	ATCN_2836	23937
ATCN_1273	13751	CTCN_4304	23938
CTCN_1756	13752	CTCN_4305	23939
GTCN_1121	13753	TTCN_4559	23940
CTCN_1757	13754	CTCN_4306	23941
CTCN_1758	13755	TTCN_4560	23942
ATCN_1274	13756	TTCN_4561	23943
CTCN_1759	13757	ATCN_2837	23944
TTCN_2095	13758	TTCN_4562	23945
ATCN_1275	13759	TTCN_4563	23946
TTCN_2096	13760	TTCN_4564	23947
GTCN_1122	13761	GTCN_2429	23948
TTCN_2097	13762	GTCN_2430	23949
CTCN_1760	13763	CTCN_4307	23950
CTCN_1761	13764	ATCN_2838	23951
GTCN_1123	13765	TTCN_4565	23952
CTCN_1762	13766	ATCN_2839	23953
ATCN_1276	13767	ATCN_2840	23954
TTCN_2098	13768	GTCN_2431	23955
TTCN_2099	13769	TTCN_4566	23956
TTCN_2100	13770	TTCN_4567	23957
CTCN_1763	13771	GTCN_2432	23958
CTCN_1764	13772	CTCN_4308	23959
GTCN_1124	13773	ATCN_2841	23960
CTCN_1765	13774	ATCN_2842	23961
TTCN_2101	13775	GTCN_2433	23962
TTCN_2102	13776	ATCN_2843	23963
ATCN_1277	13777	TTCN_4568	23964
TTCN_2103	13778	CTCN_4309	23965
CTCN_1766	13779	TTCN_4569	23966
TTCN_2104	13780	ATCN_2844	23967
TTCN_2105	13781	GTCN_2434	23968
CTCN_1767	13782	GTCN_2435	23969
CTCN_1768	13783	ATCN_2845	23970
GTCN_1125	13784	ATCN_2846	23971
CTCN_1769	13785	ATCN_2847	23972
TTCN_2106	13786	TTCN_4570	23973
TTCN_2107	13787	GTCN_2436	23974
TTCN_2108	13788	CTCN_4310	23975
GTCN_1126	13789	CTCN_4311	23976
CTCN_1770	13790	CTCN_4312	23977
CTCN_1771	13791	CTCN_4313	23978

FIG. 36 (continued)

ATCN_1278	13792	TTCN_4571	23979
TTCN_2109	13793	ATCN_2848	23980
CTCN_1772	13794	TTCN_4572	23981
TTCN_2110	13795	TTCN_4573	23982
ATCN_1279	13796	GTCN_2437	23983
GTCN_1127	13797	ATCN_2849	23984
ATCN_1280	13798	CTCN_4314	23985
TTCN_2111	13799	TTCN_4574	23986
CTCN_1773	13800	ATCN_2850	23987
ATCN_1281	13801	CTCN_4315	23988
ATCN_1282	13802	CTCN_4316	23989
TTCN_2112	13803	CTCN_4317	23990
TTCN_2113	13804	ATCN_2851	23991
GTCN_1128	13805	TTCN_4575	23992
TTCN_2114	13806	ATCN_2852	23993
TTCN_2115	13807	TTCN_4576	23994
CTCN_1774	13808	ATCN_2853	23995
ATCN_1283	13809	ATCN_2854	23996
CTCN_1775	13810	TTCN_4577	23997
GTCN_1129	13811	CTCN_4318	23998
CTCN_1776	13812	TTCN_4578	23999
ATCN_1284	13813	ATCN_2855	24000
CTCN_1777	13814	TTCN_4579	24001
GTCN_1130	13815	GTCN_2438	24002
ATCN_1285	13816	CTCN_4319	24003
CTCN_1778	13817	GTCN_2439	24004
TTCN_2116	13818	TTCN_4580	24005
TTCN_2117	13819	CTCN_4320	24006
CTCN_1779	13820	TTCN_4581	24007
CTCN_1780	13821	TTCN_4582	24008
ATCN_1286	13822	ATCN_2856	24009
CTCN_1781	13823	TTCN_4583	24010
ATCN_1287	13824	ATCN_2857	24011
CTCN_1782	13825	TTCN_4584	24012
TTCN_2118	13826	ATCN_2858	24013
GTCN_1131	13827	GTCN_2440	24014
CTCN_1783	13828	TTCN_4585	24015
ATCN_1288	13829	GTCN_2441	24016
TTCN_2119	13830	TTCN_4586	24017
TTCN_2120	13831	TTCN_4587	24018
TTCN_2121	13832	ATCN_2859	24019
CTCN_1784	13833	TTCN_4588	24020
TTCN_2122	13834	TTCN_4589	24021
ATCN_1289	13835	TTCN_4590	24022
ATCN_1290	13836	CTCN_4321	24023
CTCN_1785	13837	TTCN_4591	24024
TTCN_2123	13838	ATCN_2860	24025
GTCN_1132	13839	ATCN_2861	24026
CTCN_1786	13840	TTCN_4592	24027
TTCN_2124	13841	TTCN_4593	24028
TTCN_2125	13842	ATCN_2862	24029
ATCN_1291	13843	TTCN_4594	24030
ATCN_1292	13844	TTCN_4595	24031
CTCN_1787	13845	ATCN_2863	24032
TTCN_2126	13846	ATCN_2864	24033

GTCN_1133	13847	CTCN_4322	24034
GTCN_1134	13848	GTCN_2442	24035
GTCN_1135	13849	TTCN_4596	24036
ATCN_1293	13850	GTCN_2443	24037
GTCN_1136	13851	CTCN_4323	24038
GTCN_1137	13852	ATCN_2865	24039
TTCN_2127	13853	GTCN_2444	24040
GTCN_1138	13854	GTCN_2445	24041
TTCN_2128	13855	TTCN_4597	24042
TTCN_2129	13856	GTCN_2446	24043
TTCN_2130	13857	ATCN_2866	24044
TTCN_2131	13858	CTCN_4324	24045
ATCN_1294	13859	GTCN_2447	24046
GTCN_1139	13860	CTCN_4325	24047
CTCN_1788	13861	TTCN_4598	24048
TTCN_2132	13862	TTCN_4599	24049
ATCN_1295	13863	TTCN_4600	24050
CTCN_1789	13864	ATCN_2867	24051
TTCN_2133	13865	GTCN_2448	24052
ATCN_1296	13866	GTCN_2449	24053
ATCN_1297	13867	CTCN_4326	24054
ATCN_1298	13868	CTCN_4327	24055
ATCN_1299	13869	GTCN_2450	24056
TTCN_2134	13870	CTCN_4328	24057
CTCN_1790	13871	GTCN_2451	24058
TTCN_2135	13872	CTCN_4329	24059
CTCN_1791	13873	ATCN_2868	24060
TTCN_2136	13874	TTCN_4601	24061
CTCN_1792	13875	ATCN_2869	24062
TTCN_2137	13876	ATCN_2870	24063
CTCN_1793	13877	ATCN_2871	24064
TTCN_2138	13878	ATCN_2872	24065
CTCN_1794	13879	GTCN_2452	24066
TTCN_2139	13880	ATCN_2873	24067
CTCN_1795	13881	TTCN_4602	24068
GTCN_1140	13882	CTCN_4330	24069
TTCN_2140	13883	TTCN_4603	24070
CTCN_1796	13884	TTCN_4604	24071
CTCN_1797	13885	CTCN_4331	24072
GTCN_1141	13886	CTCN_4332	24073
GTCN_1142	13887	TTCN_4605	24074
ATCN_1300	13888	CTCN_4333	24075
GTCN_1143	13889	TTCN_4606	24076
CTCN_1798	13890	CTCN_4334	24077
CTCN_1799	13891	TTCN_4607	24078
GTCN_1144	13892	CTCN_4335	24079
GTCN_1145	13893	CTCN_4336	24080
GTCN_1146	13894	ATCN_2874	24081
ATCN_1301	13895	ATCN_2875	24082
TTCN_2141	13896	TTCN_4608	24083
GTCN_1147	13897	ATCN_2876	24084
CTCN_1800	13898	ATCN_2877	24085
ATCN_1302	13899	CTCN_4337	24086
TTCN_2142	13900	GTCN_2453	24087
TTCN_2143	13901	TTCN_4609	24088

FIG. 36 (continued)

TTCN_2144	13902	ATCN_2878	24089
GTCN_1148	13903	TTCN_4610	24090
TTCN_2145	13904	TTCN_4611	24091
CTCN_1801	13905	CTCN_4338	24092
ATCN_1303	13906	TTCN_4612	24093
ATCN_1304	13907	CTCN_4339	24094
GTCN_1149	13908	ATCN_2879	24095
CTCN_1802	13909	ATCN_2880	24096
GTCN_1150	13910	ATCN_2881	24097
TTCN_2146	13911	ATCN_2882	24098
ATCN_1305	13912	CTCN_4340	24099
ATCN_1306	13913	TTCN_4613	24100
GTCN_1151	13914	TTCN_4614	24101
ATCN_1307	13915	GTCN_2454	24102
CTCN_1803	13916	CTCN_4341	24103
TTCN_2147	13917	TTCN_4615	24104
GTCN_1152	13918	GTCN_2455	24105
TTCN_2148	13919	CTCN_4342	24106
CTCN_1804	13920	CTCN_4343	24107
TTCN_2149	13921	ATCN_2883	24108
CTCN_1805	13922	CTCN_4344	24109
TTCN_2150	13923	CTCN_4345	24110
GTCN_1153	13924	TTCN_4616	24111
TTCN_2151	13925	CTCN_4346	24112
GTCN_1154	13926	CTCN_4347	24113
ATCN_1308	13927	CTCN_4348	24114
ATCN_1309	13928	ATCN_2884	24115
CTCN_1806	13929	TTCN_4617	24116
TTCN_2152	13930	ATCN_2885	24117
CTCN_1807	13931	TTCN_4618	24118
CTCN_1808	13932	GTCN_2456	24119
CTCN_1809	13933	GTCN_2457	24120
CTCN_1810	13934	TTCN_4619	24121
GTCN_1155	13935	TTCN_4620	24122
ATCN_1310	13936	CTCN_4349	24123
GTCN_1156	13937	TTCN_4621	24124
TTCN_2153	13938	TTCN_4622	24125
CTCN_1811	13939	ATCN_2886	24126
TTCN_2154	13940	ATCN_2887	24127
TTCN_2155	13941	TTCN_4623	24128
GTCN_1157	13942	CTCN_4350	24129
ATCN_1311	13943	TTCN_4624	24130
ATCN_1312	13944	ATCN_2888	24131
TTCN_2156	13945	ATCN_2889	24132
ATCN_1313	13946	ATCN_2890	24133
CTCN_1812	13947	TTCN_4625	24134
GTCN_1158	13948	ATCN_2891	24135
CTCN_1813	13949	ATCN_2892	24136
ATCN_1314	13950	TTCN_4626	24137
CTCN_1814	13951	ATCN_2893	24138
TTCN_2157	13952	GTCN_2458	24139
GTCN_1159	13953	TTCN_4627	24140
TTCN_2158	13954	CTCN_4351	24141
TTCN_2159	13955	CTCN_4352	24142
CTCN_1815	13956	GTCN_2459	24143

TTCN_2160	13957	TTCN_4628	24144
TTCN_2161	13958	TTCN_4629	24145
GTCN_1160	13959	ATCN_2894	24146
CTCN_1816	13960	ATCN_2895	24147
TTCN_2162	13961	TTCN_4630	24148
TTCN_2163	13962	ATCN_2896	24149
CTCN_1817	13963	GTCN_2460	24150
TTCN_2164	13964	GTCN_2461	24151
ATCN_1315	13965	GTCN_2462	24152
ATCN_1316	13966	TTCN_4631	24153
GTCN_1161	13967	TTCN_4632	24154
TTCN_2165	13968	ATCN_2897	24155
CTCN_1818	13969	TTCN_4633	24156
TTCN_2166	13970	TTCN_4634	24157
ATCN_1317	13971	ATCN_2898	24158
TTCN_2167	13972	CTCN_4353	24159
CTCN_1819	13973	CTCN_4354	24160
GTCN_1162	13974	ATCN_2899	24161
ATCN_1318	13975	ATCN_2900	24162
TTCN_2168	13976	GTCN_2463	24163
TTCN_2169	13977	TTCN_4635	24164
ATCN_1319	13978	ATCN_2901	24165
TTCN_2170	13979	TTCN_4636	24166
CTCN_1820	13980	GTCN_2464	24167
TTCN_2171	13981	TTCN_4637	24168
CTCN_1821	13982	TTCN_4638	24169
CTCN_1822	13983	TTCN_4639	24170
GTCN_1163	13984	GTCN_2465	24171
CTCN_1823	13985	ATCN_2902	24172
GTCN_1164	13986	ATCN_2903	24173
TTCN_2172	13987	TTCN_4640	24174
TTCN_2173	13988	ATCN_2904	24175
CTCN_1824	13989	TTCN_4641	24176
CTCN_1825	13990	TTCN_4642	24177
TTCN_2174	13991	TTCN_4643	24178
TTCN_2175	13992	CTCN_4355	24179
TTCN_2176	13993	GTCN_2466	24180
TTCN_2177	13994	ATCN_2905	24181
GTCN_1165	13995	GTCN_2467	24182
CTCN_1826	13996	CTCN_4356	24183
TTCN_2178	13997	CTCN_4357	24184
ATCN_1320	13998	TTCN_4644	24185
CTCN_1827	13999	CTCN_4358	24186
ATCN_1321	14000	TTCN_4645	24187
CTCN_1828	14001	TTCN_4646	24188
CTCN_1829	14002	ATCN_2906	24189
TTCN_2179	14003	TTCN_4647	24190
CTCN_1830	14004	ATCN_2907	24191
GTCN_1166	14005	ATCN_2908	24192
TTCN_2180	14006	CTCN_4359	24193
ATCN_1322	14007	ATCN_2909	24194
GTCN_1167	14008	TTCN_4648	24195
CTCN_1831	14009	TTCN_4649	24196
TTCN_2181	14010	CTCN_4360	24197
ATCN_1323	14011	TTCN_4650	24198

FIG. 36 (continued)

GTCN_1168	14012	ATCN_2910	24199
GTCN_1169	14013	CTCN_4361	24200
CTCN_1832	14014	TTCN_4651	24201
GTCN_1170	14015	CTCN_4362	24202
ATCN_1324	14016	ATCN_2911	24203
TTCN_2182	14017	ATCN_2912	24204
CTCN_1833	14018	TTCN_4652	24205
ATCN_1325	14019	GTCN_2468	24206
GTCN_1171	14020	CTCN_4363	24207
ATCN_1326	14021	CTCN_4364	24208
ATCN_1327	14022	TTCN_4653	24209
ATCN_1328	14023	ATCN_2913	24210
TTCN_2183	14024	TTCN_4654	24211
GTCN_1172	14025	CTCN_4365	24212
GTCN_1173	14026	TTCN_4655	24213
TTCN_2184	14027	GTCN_2469	24214
TTCN_2185	14028	TTCN_4656	24215
CTCN_1834	14029	TTCN_4657	24216
ATCN_1329	14030	ATCN_2914	24217
TTCN_2186	14031	CTCN_4366	24218
GTCN_1174	14032	ATCN_2915	24219
CTCN_1835	14033	GTCN_2470	24220
CTCN_1836	14034	TTCN_4658	24221
TTCN_2187	14035	ATCN_2916	24222
CTCN_1837	14036	GTCN_2471	24223
CTCN_1838	14037	ATCN_2917	24224
TTCN_2188	14038	TTCN_4659	24225
TTCN_2189	14039	TTCN_4660	24226
TTCN_2190	14040	TTCN_4661	24227
GTCN_1175	14041	GTCN_2472	24228
GTCN_1176	14042	CTCN_4367	24229
CTCN_1839	14043	CTCN_4368	24230
TTCN_2191	14044	TTCN_4662	24231
CTCN_1840	14045	CTCN_4369	24232
CTCN_1841	14046	CTCN_4370	24233
GTCN_1177	14047	CTCN_4371	24234
GTCN_1178	14048	TTCN_4663	24235
CTCN_1842	14049	GTCN_2473	24236
TTCN_2192	14050	TTCN_4664	24237
CTCN_1843	14051	ATCN_2918	24238
TTCN_2193	14052	TTCN_4665	24239
CTCN_1844	14053	ATCN_2919	24240
CTCN_1845	14054	CTCN_4372	24241
TTCN_2194	14055	TTCN_4666	24242
GTCN_1179	14056	GTCN_2474	24243
CTCN_1846	14057	TTCN_4667	24244
TTCN_2195	14058	CTCN_4373	24245
CTCN_1847	14059	ATCN_2920	24246
TTCN_2196	14060	CTCN_4374	24247
ATCN_1330	14061	ATCN_2921	24248
GTCN_1180	14062	GTCN_2475	24249
GTCN_1181	14063	GTCN_2476	24250
TTCN_2197	14064	GTCN_2477	24251
TTCN_2198	14065	ATCN_2922	24252
GTCN_1182	14066	ATCN_2923	24253

TTCN_2199	14067	TTCN_4668	24254
GTCN_1183	14068	GTCN_2478	24255
CTCN_1848	14069	GTCN_2479	24256
GTCN_1184	14070	TTCN_4669	24257
CTCN_1849	14071	GTCN_2480	24258
ATCN_1331	14072	CTCN_4375	24259
CTCN_1850	14073	TTCN_4670	24260
ATCN_1332	14074	GTCN_2481	24261
TTCN_2200	14075	CTCN_4376	24262
GTCN_1185	14076	ATCN_2924	24263
CTCN_1851	14077	TTCN_4671	24264
GTCN_1186	14078	ATCN_2925	24265
CTCN_1852	14079	CTCN_4377	24266
CTCN_1853	14080	ATCN_2926	24267
TTCN_2201	14081	CTCN_4378	24268
CTCN_1854	14082	TTCN_4672	24269
ATCN_1333	14083	ATCN_2927	24270
TTCN_2202	14084	GTCN_2482	24271
CTCN_1855	14085	TTCN_4673	24272
CTCN_1856	14086	TTCN_4674	24273
ATCN_1334	14087	TTCN_4675	24274
TTCN_2203	14088	CTCN_4379	24275
ATCN_1335	14089	ATCN_2928	24276
ATCN_1336	14090	CTCN_4380	24277
ATCN_1337	14091	CTCN_4381	24278
CTCN_1857	14092	CTCN_4382	24279
CTCN_1858	14093	CTCN_4383	24280
TTCN_2204	14094	TTCN_4676	24281
TTCN_2205	14095	CTCN_4384	24282
ATCN_1338	14096	ATCN_2929	24283
CTCN_1859	14097	CTCN_4385	24284
CTCN_1860	14098	GTCN_2483	24285
ATCN_1339	14099	CTCN_4386	24286
GTCN_1187	14100	CTCN_4387	24287
CTCN_1861	14101	GTCN_2484	24288
TTCN_2206	14102	GTCN_2485	24289
ATCN_1340	14103	CTCN_4388	24290
CTCN_1862	14104	GTCN_2486	24291
GTCN_1188	14105	TTCN_4677	24292
CTCN_1863	14106	TTCN_4678	24293
CTCN_1864	14107	GTCN_2487	24294
CTCN_1865	14108	TTCN_4679	24295
ATCN_1341	14109	CTCN_4389	24296
CTCN_1866	14110	ATCN_2930	24297
TTCN_2207	14111	CTCN_4390	24298
CTCN_1867	14112	CTCN_4391	24299
CTCN_1868	14113	GTCN_2488	24300
TTCN_2208	14114	CTCN_4392	24301
ATCN_1342	14115	TTCN_4680	24302
TTCN_2209	14116	TTCN_4681	24303
ATCN_1343	14117	TTCN_4682	24304
GTCN_1189	14118	CTCN_4393	24305
CTCN_1869	14119	CTCN_4394	24306
TTCN_2210	14120	GTCN_2489	24307
CTCN_1870	14121	TTCN_4683	24308

FIG. 36 (continued)

ATCN_1344	14122	CTCN_4395	24309
ATCN_1345	14123	CTCN_4396	24310
GTCN_1190	14124	TTCN_4684	24311
TTCN_2211	14125	TTCN_4685	24312
ATCN_1346	14126	TTCN_4686	24313
TTCN_2212	14127	TTCN_4687	24314
TTCN_2213	14128	TTCN_4688	24315
TTCN_2214	14129	TTCN_4689	24316
TTCN_2215	14130	CTCN_4397	24317
GTCN_1191	14131	GTCN_2490	24318
TTCN_2216	14132	GTCN_2491	24319
TTCN_2217	14133	CTCN_4398	24320
ATCN_1347	14134	TTCN_4690	24321
CTCN_1871	14135	TTCN_4691	24322
CTCN_1872	14136	TTCN_4692	24323
TTCN_2218	14137	TTCN_4693	24324
CTCN_1873	14138	TTCN_4694	24325
ATCN_1348	14139	TTCN_4695	24326
GTCN_1192	14140	ATCN_2931	24327
TTCN_2219	14141	TTCN_4696	24328
CTCN_1874	14142	TTCN_4697	24329
ATCN_1349	14143	ATCN_2932	24330
CTCN_1875	14144	TTCN_4698	24331
TTCN_2220	14145	ATCN_2933	24332
TTCN_2221	14146	ATCN_2934	24333
CTCN_1876	14147	GTCN_2492	24334
ATCN_1350	14148	ATCN_2935	24335
TTCN_2222	14149	TTCN_4699	24336
ATCN_1351	14150	ATCN_2936	24337
TTCN_2223	14151	ATCN_2937	24338
TTCN_2224	14152	CTCN_4399	24339
TTCN_2225	14153	CTCN_4400	24340
GTCN_1193	14154	TTCN_4700	24341
CTCN_1877	14155	TTCN_4701	24342
TTCN_2226	14156	GTCN_2493	24343
TTCN_2227	14157	TTCN_4702	24344
TTCN_2228	14158	CTCN_4401	24345
TTCN_2229	14159	TTCN_4703	24346
CTCN_1878	14160	TTCN_4704	24347
TTCN_2230	14161	TTCN_4705	24348
ATCN_1352	14162	ATCN_2938	24349
TTCN_2231	14163	ATCN_2939	24350
TTCN_2232	14164	TTCN_4706	24351
TTCN_2233	14165	TTCN_4707	24352
CTCN_1879	14166	CTCN_4402	24353
GTCN_1194	14167	TTCN_4708	24354
TTCN_2234	14168	CTCN_4403	24355
GTCN_1195	14169	ATCN_2940	24356
TTCN_2235	14170	TTCN_4709	24357
ATCN_1353	14171	TTCN_4710	24358
TTCN_2236	14172	TTCN_4711	24359
ATCN_1354	14173	CTCN_4404	24360
ATCN_1355	14174	TTCN_4712	24361
ATCN_1356	14175	TTCN_4713	24362
ATCN_1357	14176	TTCN_4714	24363

TTCN_2237	14177	TTCN_4715	24364
TTCN_2238	14178	CTCN_4405	24365
TTCN_2239	14179	TTCN_4716	24366
TTCN_2240	14180	ATCN_2941	24367
TTCN_2241	14181	CTCN_4406	24368
TTCN_2242	14182	TTCN_4717	24369
TTCN_2243	14183	GTCN_2494	24370
CTCN_1880	14184	GTCN_2495	24371
GTCN_1196	14185	TTCN_4718	24372
TTCN_2244	14186	GTCN_2496	24373
TTCN_2245	14187	CTCN_4407	24374
TTCN_2246	14188	CTCN_4408	24375
TTCN_2247	14189	TTCN_4719	24376
GTCN_1197	14190	CTCN_4409	24377
GTCN_1198	14191	CTCN_4410	24378
TTCN_2248	14192	TTCN_4720	24379
ATCN_1358	14193	GTCN_2497	24380
ATCN_1359	14194	GTCN_2498	24381
CTCN_1881	14195	CTCN_4411	24382
TTCN_2249	14196	ATCN_2942	24383
GTCN_1199	14197	CTCN_4412	24384
ATCN_1360	14198	CTCN_4413	24385
TTCN_2250	14199	GTCN_2499	24386
CTCN_1882	14200	TTCN_4721	24387
CTCN_1883	14201	TTCN_4722	24388
ATCN_1361	14202	TTCN_4723	24389
ATCN_1362	14203	CTCN_4414	24390
CTCN_1884	14204	CTCN_4415	24391
GTCN_1200	14205	TTCN_4724	24392
CTCN_1885	14206	GTCN_2500	24393
TTCN_2251	14207	TTCN_4725	24394
GTCN_1201	14208	TTCN_4726	24395
TTCN_2252	14209	TTCN_4727	24396
GTCN_1202	14210	GTCN_2501	24397
CTCN_1886	14211	GTCN_2502	24398
ATCN_1363	14212	CTCN_4416	24399
ATCN_1364	14213	CTCN_4417	24400
TTCN_2253	14214	CTCN_4418	24401
TTCN_2254	14215	GTCN_2503	24402
CTCN_1887	14216	ATCN_2943	24403
GTCN_1203	14217	ATCN_2944	24404
CTCN_1888	14218	GTCN_2504	24405
GTCN_1204	14219	ATCN_2945	24406
CTCN_1889	14220	TTCN_4728	24407
CTCN_1890	14221	ATCN_2946	24408
GTCN_1205	14222	GTCN_2505	24409
CTCN_1891	14223	TTCN_4729	24410
ATCN_1365	14224	CTCN_4419	24411
ATCN_1366	14225	ATCN_2947	24412
CTCN_1892	14226	TTCN_4730	24413
CTCN_1893	14227	ATCN_2948	24414
CTCN_1894	14228	TTCN_4731	24415
CTCN_1895	14229	ATCN_2949	24416
TTCN_2255	14230	TTCN_4732	24417
TTCN_2256	14231	GTCN_2506	24418

FIG. 36 (continued)

CTCN_1896	14232	ATCN_2950	24419
CTCN_1897	14233	TTCN_4733	24420
CTCN_1898	14234	GTCN_2507	24421
GTCN_1206	14235	CTCN_4420	24422
CTCN_1899	14236	CTCN_4421	24423
GTCN_1207	14237	GTCN_2508	24424
CTCN_1900	14238	TTCN_4734	24425
GTCN_1208	14239	CTCN_4422	24426
TTCN_2257	14240	GTCN_2509	24427
ATCN_1367	14241	CTCN_4423	24428
ATCN_1368	14242	ATCN_2951	24429
ATCN_1369	14243	TTCN_4735	24430
CTCN_1901	14244	TTCN_4736	24431
ATCN_1370	14245	TTCN_4737	24432
ATCN_1371	14246	CTCN_4424	24433
CTCN_1902	14247	ATCN_2952	24434
GTCN_1209	14248	CTCN_4425	24435
CTCN_1903	14249	TTCN_4738	24436
ATCN_1372	14250	TTCN_4739	24437
ATCN_1373	14251	ATCN_2953	24438
CTCN_1904	14252	TTCN_4740	24439
CTCN_1905	14253	TTCN_4741	24440
ATCN_1374	14254	TTCN_4742	24441
CTCN_1906	14255	TTCN_4743	24442
TTCN_2258	14256	GTCN_2510	24443
TTCN_2259	14257	GTCN_2511	24444
ATCN_1375	14258	CTCN_4426	24445
TTCN_2260	14259	GTCN_2512	24446
CTCN_1907	14260	GTCN_2513	24447
TTCN_2261	14261	TTCN_4744	24448
ATCN_1376	14262	ATCN_2954	24449
GTCN_1210	14263	CTCN_4427	24450
CTCN_1908	14264	CTCN_4428	24451
ATCN_1377	14265	TTCN_4745	24452
TTCN_2262	14266	TTCN_4746	24453
CTCN_1909	14267	TTCN_4747	24454
ATCN_1378	14268	CTCN_4429	24455
CTCN_1910	14269	GTCN_2514	24456
GTCN_1211	14270	ATCN_2955	24457
CTCN_1911	14271	GTCN_2515	24458
CTCN_1912	14272	CTCN_4430	24459
GTCN_1212	14273	TTCN_4748	24460
GTCN_1213	14274	CTCN_4431	24461
ATCN_1379	14275	ATCN_2956	24462
TTCN_2263	14276	ATCN_2957	24463
ATCN_1380	14277	ATCN_2958	24464
ATCN_1381	14278	GTCN_2516	24465
CTCN_1913	14279	ATCN_2959	24466
TTCN_2264	14280	TTCN_4749	24467
GTCN_1214	14281	ATCN_2960	24468
ATCN_1382	14282	GTCN_2517	24469
ATCN_1383	14283	CTCN_4432	24470
CTCN_1914	14284	TTCN_4750	24471
CTCN_1915	14285	ATCN_2961	24472
CTCN_1916	14286	ATCN_2962	24473

ATCN_1384	14287	CTCN_4433	24474
ATCN_1385	14288	CTCN_4434	24475
TTCN_2265	14289	GTCN_2518	24476
CTCN_1917	14290	TTCN_4751	24477
CTCN_1918	14291	CTCN_4435	24478
CTCN_1919	14292	TTCN_4752	24479
CTCN_1920	14293	TTCN_4753	24480
ATCN_1386	14294	TTCN_4754	24481
ATCN_1387	14295	GTCN_2519	24482
CTCN_1921	14296	CTCN_4436	24483
GTCN_1215	14297	CTCN_4437	24484
CTCN_1922	14298	CTCN_4438	24485
CTCN_1923	14299	TTCN_4755	24486
GTCN_1216	14300	TTCN_4756	24487
CTCN_1924	14301	TTCN_4757	24488
ATCN_1388	14302	CTCN_4439	24489
CTCN_1925	14303	TTCN_4758	24490
ATCN_1389	14304	ATCN_2963	24491
TTCN_2266	14305	ATCN_2964	24492
TTCN_2267	14306	TTCN_4759	24493
TTCN_2268	14307	TTCN_4760	24494
ATCN_1390	14308	CTCN_4440	24495
TTCN_2269	14309	ATCN_2965	24496
CTCN_1926	14310	TTCN_4761	24497
CTCN_1927	14311	TTCN_4762	24498
GTCN_1217	14312	ATCN_2966	24499
TTCN_2270	14313	GTCN_2520	24500
ATCN_1391	14314	TTCN_4763	24501
CTCN_1928	14315	GTCN_2521	24502
TTCN_2271	14316	CTCN_4441	24503
CTCN_1929	14317	TTCN_4764	24504
TTCN_2272	14318	TTCN_4765	24505
TTCN_2273	14319	ATCN_2967	24506
ATCN_1392	14320	ATCN_2968	24507
ATCN_1393	14321	GTCN_2522	24508
TTCN_2274	14322	TTCN_4766	24509
TTCN_2275	14323	CTCN_4442	24510
CTCN_1930	14324	ATCN_2969	24511
CTCN_1931	14325	TTCN_4767	24512
TTCN_2276	14326	GTCN_2523	24513
CTCN_1932	14327	GTCN_2524	24514
GTCN_1218	14328	TTCN_4768	24515
ATCN_1394	14329	ATCN_2970	24516
TTCN_2277	14330	TTCN_4769	24517
ATCN_1395	14331	TTCN_4770	24518
TTCN_2278	14332	ATCN_2971	24519
ATCN_1396	14333	TTCN_4771	24520
ATCN_1397	14334	ATCN_2972	24521
CTCN_1933	14335	TTCN_4772	24522
TTCN_2279	14336	CTCN_4443	24523
CTCN_1934	14337	CTCN_4444	24524
CTCN_1935	14338	TTCN_4773	24525
GTCN_1219	14339	GTCN_2525	24526
GTCN_1220	14340	TTCN_4774	24527
GTCN_1221	14341	ATCN_2973	24528

FIG. 36 (continued)

GTCN_1222	14342	ATCN_2974	24529
GTCN_1223	14343	TTCN_4775	24530
CTCN_1936	14344	CTCN_4445	24531
GTCN_1224	14345	ATCN_2975	24532
CTCN_1937	14346	TTCN_4776	24533
ATCN_1398	14347	GTCN_2526	24534
ATCN_1399	14348	GTCN_2527	24535
TTCN_2280	14349	GTCN_2528	24536
ATCN_1400	14350	GTCN_2529	24537
GTCN_1225	14351	ATCN_2976	24538
CTCN_1938	14352	GTCN_2530	24539
TTCN_2281	14353	GTCN_2531	24540
GTCN_1226	14354	ATCN_2977	24541
GTCN_1227	14355	TTCN_4777	24542
CTCN_1939	14356	GTCN_2532	24543
CTCN_1940	14357	ATCN_2978	24544
GTCN_1228	14358	ATCN_2979	24545
CTCN_1941	14359	CTCN_4446	24546
CTCN_1942	14360	GTCN_2533	24547
TTCN_2282	14361	TTCN_4778	24548
GTCN_1229	14362	TTCN_4779	24549
TTCN_2283	14363	ATCN_2980	24550
CTCN_1943	14364	CTCN_4447	24551
TTCN_2284	14365	GTCN_2534	24552
CTCN_1944	14366	TTCN_4780	24553
CTCN_1945	14367	TTCN_4781	24554
GTCN_1230	14368	GTCN_2535	24555
GTCN_1231	14369	GTCN_2536	24556
CTCN_1946	14370	GTCN_2537	24557
GTCN_1232	14371	ATCN_2981	24558
CTCN_1947	14372	ATCN_2982	24559
CTCN_1948	14373	TTCN_4782	24560
CTCN_1949	14374	TTCN_4783	24561
GTCN_1233	14375	TTCN_4784	24562
ATCN_1401	14376	TTCN_4785	24563
TTCN_2285	14377	GTCN_2538	24564
CTCN_1950	14378	ATCN_2983	24565
ATCN_1402	14379	ATCN_2984	24566
CTCN_1951	14380	CTCN_4448	24567
TTCN_2286	14381	ATCN_2985	24568
CTCN_1952	14382	TTCN_4786	24569
CTCN_1953	14383	GTCN_2539	24570
CTCN_1954	14384	ATCN_2986	24571
CTCN_1955	14385	ATCN_2987	24572
TTCN_2287	14386	CTCN_4449	24573
TTCN_2288	14387	GTCN_2540	24574
GTCN_1234	14388	TTCN_4787	24575
CTCN_1956	14389	CTCN_4450	24576
CTCN_1957	14390	GTCN_2541	24577
GTCN_1235	14391	ATCN_2988	24578
TTCN_2289	14392	TTCN_4788	24579
TTCN_2290	14393	ATCN_2989	24580
TTCN_2291	14394	TTCN_4789	24581
TTCN_2292	14395	CTCN_4451	24582
TTCN_2293	14396	TTCN_4790	24583

CTCN_1958	14397	TTCN_4791	24584
TTCN_2294	14398	TTCN_4792	24585
GTCN_1236	14399	GTCN_2542	24586
TTCN_2295	14400	CTCN_4452	24587
ATCN_1403	14401	TTCN_4793	24588
TTCN_2296	14402	TTCN_4794	24589
GTCN_1237	14403	TTCN_4795	24590
TTCN_2297	14404	GTCN_2543	24591
ATCN_1404	14405	ATCN_2990	24592
TTCN_2298	14406	CTCN_4453	24593
TTCN_2299	14407	TTCN_4796	24594
TTCN_2300	14408	ATCN_2991	24595
GTCN_1238	14409	ATCN_2992	24596
ATCN_1405	14410	TTCN_4797	24597
GTCN_1239	14411	ATCN_2993	24598
CTCN_1959	14412	TTCN_4798	24599
CTCN_1960	14413	CTCN_4454	24600
TTCN_2301	14414	CTCN_4455	24601
TTCN_2302	14415	ATCN_2994	24602
CTCN_1961	14416	TTCN_4799	24603
TTCN_2303	14417	CTCN_4456	24604
TTCN_2304	14418	CTCN_4457	24605
GTCN_1240	14419	TTCN_4800	24606
TTCN_2305	14420	CTCN_4458	24607
TTCN_2306	14421	TTCN_4801	24608
TTCN_2307	14422	TTCN_4802	24609
ATCN_1406	14423	GTCN_2544	24610
TTCN_2308	14424	CTCN_4459	24611
CTCN_1962	14425	CTCN_4460	24612
TTCN_2309	14426	GTCN_2545	24613
ATCN_1407	14427	TTCN_4803	24614
ATCN_1408	14428	GTCN_2546	24615
CTCN_1963	14429	GTCN_2547	24616
GTCN_1241	14430	TTCN_4804	24617
CTCN_1964	14431	GTCN_2548	24618
CTCN_1965	14432	CTCN_4461	24619
TTCN_2310	14433	CTCN_4462	24620
TTCN_2311	14434	CTCN_4463	24621
CTCN_1966	14435	CTCN_4464	24622
CTCN_1967	14436	TTCN_4805	24623
TTCN_2312	14437	TTCN_4806	24624
TTCN_2313	14438	TTCN_4807	24625
TTCN_2314	14439	GTCN_2549	24626
CTCN_1968	14440	GTCN_2550	24627
TTCN_2315	14441	GTCN_2551	24628
CTCN_1969	14442	GTCN_2552	24629
TTCN_2316	14443	CTCN_4465	24630
CTCN_1970	14444	GTCN_2553	24631
GTCN_1242	14445	CTCN_4466	24632
ATCN_1409	14446	CTCN_4467	24633
CTCN_1971	14447	GTCN_2554	24634
TTCN_2317	14448	GTCN_2555	24635
TTCN_2318	14449	GTCN_2556	24636
CTCN_1972	14450	ATCN_2995	24637
CTCN_1973	14451	CTCN_4468	24638

FIG. 36 (continued)

GTCN_1243	14452	GTCN_2557	24639
TTCN_2319	14453	CTCN_4469	24640
CTCN_1974	14454	CTCN_4470	24641
CTCN_1975	14455	CTCN_4471	24642
GTCN_1244	14456	GTCN_2558	24643
GTCN_1245	14457	GTCN_2559	24644
ATCN_1410	14458	ATCN_2996	24645
ATCN_1411	14459	GTCN_2560	24646
GTCN_1246	14460	CTCN_4472	24647
CTCN_1976	14461	CTCN_4473	24648
TTCN_2320	14462	TTCN_4808	24649
TTCN_2321	14463	GTCN_2561	24650
TTCN_2322	14464	ATCN_2997	24651
TTCN_2323	14465	CTCN_4474	24652
ATCN_1412	14466	GTCN_2562	24653
ATCN_1413	14467	CTCN_4475	24654
TTCN_2324	14468	TTCN_4809	24655
GTCN_1247	14469	TTCN_4810	24656
ATCN_1414	14470	TTCN_4811	24657
ATCN_1415	14471	GTCN_2563	24658
CTCN_1977	14472	CTCN_4476	24659
TTCN_2325	14473	GTCN_2564	24660
TTCN_2326	14474	CTCN_4477	24661
CTCN_1978	14475	GTCN_2565	24662
CTCN_1979	14476	CTCN_4478	24663
TTCN_2327	14477	TTCN_4812	24664
CTCN_1980	14478	CTCN_4479	24665
TTCN_2328	14479	TTCN_4813	24666
CTCN_1981	14480	GTCN_2566	24667
ATCN_1416	14481	CTCN_4480	24668
CTCN_1982	14482	TTCN_4814	24669
GTCN_1248	14483	CTCN_4481	24670
CTCN_1983	14484	CTCN_4482	24671
CTCN_1984	14485	CTCN_4483	24672
CTCN_1985	14486	CTCN_4484	24673
TTCN_2329	14487	TTCN_4815	24674
CTCN_1986	14488	TTCN_4816	24675
CTCN_1987	14489	TTCN_4817	24676
TTCN_2330	14490	TTCN_4818	24677
TTCN_2331	14491	ATCN_2998	24678
CTCN_1988	14492	CTCN_4485	24679
TTCN_2332	14493	CTCN_4486	24680
CTCN_1989	14494	TTCN_4819	24681
CTCN_1990	14495	GTCN_2567	24682
GTCN_1249	14496	TTCN_4820	24683
TTCN_2333	14497	CTCN_4487	24684
TTCN_2334	14498	ATCN_2999	24685
CTCN_1991	14499	TTCN_4821	24686
GTCN_1250	14500	ATCN_3000	24687
TTCN_2335	14501	TTCN_4822	24688
ATCN_1417	14502	CTCN_4488	24689
ATCN_1418	14503	GTCN_2568	24690
CTCN_1992	14504	TTCN_4823	24691
ATCN_1419	14505	TTCN_4824	24692
ATCN_1420	14506	CTCN_4489	24693

ATCN_1421	14507	CTCN_4490	24694
GTCN_1251	14508	CTCN_4491	24695
ATCN_1422	14509	ATCN_3001	24696
TTCN_2336	14510	CTCN_4492	24697
ATCN_1423	14511	TTCN_4825	24698
CTCN_1993	14512	TTCN_4826	24699
CTCN_1994	14513	TTCN_4827	24700
TTCN_2337	14514	ATCN_3002	24701
TTCN_2338	14515	ATCN_3003	24702
TTCN_2339	14516	TTCN_4828	24703
CTCN_1995	14517	ATCN_3004	24704
ATCN_1424	14518	TTCN_4829	24705
ATCN_1425	14519	TTCN_4830	24706
ATCN_1426	14520	CTCN_4493	24707
CTCN_1996	14521	TTCN_4831	24708
ATCN_1427	14522	TTCN_4832	24709
ATCN_1428	14523	ATCN_3005	24710
TTCN_2340	14524	CTCN_4494	24711
TTCN_2341	14525	TTCN_4833	24712
TTCN_2342	14526	TTCN_4834	24713
CTCN_1997	14527	CTCN_4495	24714
ATCN_1429	14528	GTCN_2569	24715
ATCN_1430	14529	ATCN_3006	24716
CTCN_1998	14530	ATCN_3007	24717
TTCN_2343	14531	GTCN_2570	24718
ATCN_1431	14532	ATCN_3008	24719
TTCN_2344	14533	ATCN_3009	24720
CTCN_1999	14534	ATCN_3010	24721
CTCN_2000	14535	ATCN_3011	24722
CTCN_2001	14536	CTCN_4496	24723
CTCN_2002	14537	TTCN_4835	24724
GTCN_1252	14538	CTCN_4497	24725
GTCN_1253	14539	CTCN_4498	24726
GTCN_1254	14540	CTCN_4499	24727
CTCN_2003	14541	CTCN_4500	24728
GTCN_1255	14542	TTCN_4836	24729
CTCN_2004	14543	TTCN_4837	24730
CTCN_2005	14544	CTCN_4501	24731
ATCN_1432	14545	ATCN_3012	24732
ATCN_1433	14546	TTCN_4838	24733
TTCN_2345	14547	GTCN_2571	24734
TTCN_2346	14548	TTCN_4839	24735
TTCN_2347	14549	TTCN_4840	24736
TTCN_2348	14550	CTCN_4502	24737
GTCN_1256	14551	GTCN_2572	24738
CTCN_2006	14552	GTCN_2573	24739
GTCN_1257	14553	TTCN_4841	24740
TTCN_2349	14554	TTCN_4842	24741
ATCN_1434	14555	TTCN_4843	24742
CTCN_2007	14556	TTCN_4844	24743
CTCN_2008	14557	CTCN_4503	24744
CTCN_2009	14558	TTCN_4845	24745
CTCN_2010	14559	ATCN_3013	24746
TTCN_2350	14560	TTCN_4846	24747
ATCN_1435	14561	ATCN_3014	24748

FIG. 36 (continued)

TTCN_2351	14562	TTCN_4847	24749
ATCN_1436	14563	ATCN_3015	24750
TTCN_2352	14564	ATCN_3016	24751
CTCN_2011	14565	GTCN_2574	24752
CTCN_2012	14566	TTCN_4848	24753
GTCN_1258	14567	ATCN_3017	24754
ATCN_1437	14568	TTCN_4849	24755
ATCN_1438	14569	ATCN_3018	24756
TTCN_2353	14570	TTCN_4850	24757
CTCN_2013	14571	TTCN_4851	24758
TTCN_2354	14572	GTCN_2575	24759
TTCN_2355	14573	CTCN_4504	24760
CTCN_2014	14574	ATCN_3019	24761
CTCN_2015	14575	CTCN_4505	24762
ATCN_1439	14576	GTCN_2576	24763
ATCN_1440	14577	ATCN_3020	24764
ATCN_1441	14578	TTCN_4852	24765
CTCN_2016	14579	CTCN_4506	24766
CTCN_2017	14580	GTCN_2577	24767
CTCN_2018	14581	GTCN_2578	24768
TTCN_2356	14582	GTCN_2579	24769
GTCN_1259	14583	CTCN_4507	24770
TTCN_2357	14584	TTCN_4853	24771
ATCN_1442	14585	TTCN_4854	24772
CTCN_2019	14586	TTCN_4855	24773
TTCN_2358	14587	CTCN_4508	24774
CTCN_2020	14588	TTCN_4856	24775
CTCN_2021	14589	CTCN_4509	24776
TTCN_2359	14590	ATCN_3021	24777
GTCN_1260	14591	CTCN_4510	24778
TTCN_2360	14592	ATCN_3022	24779
TTCN_2361	14593	ATCN_3023	24780
TTCN_2362	14594	GTCN_2580	24781
TTCN_2363	14595	TTCN_4857	24782
ATCN_1443	14596	CTCN_4511	24783
TTCN_2364	14597	TTCN_4858	24784
TTCN_2365	14598	CTCN_4512	24785
TTCN_2366	14599	TTCN_4859	24786
ATCN_1444	14600	ATCN_3024	24787
GTCN_1261	14601	ATCN_3025	24788
ATCN_1445	14602	CTCN_4513	24789
ATCN_1446	14603	GTCN_2581	24790
GTCN_1262	14604	CTCN_4514	24791
CTCN_2022	14605	CTCN_4515	24792
CTCN_2023	14606	ATCN_3026	24793
CTCN_2024	14607	ATCN_3027	24794
TTCN_2367	14608	TTCN_4860	24795
CTCN_2025	14609	TTCN_4861	24796
CTCN_2026	14610	GTCN_2582	24797
ATCN_1447	14611	CTCN_4516	24798
ATCN_1448	14612	TTCN_4862	24799
CTCN_2027	14613	TTCN_4863	24800
CTCN_2028	14614	TTCN_4864	24801
ATCN_1449	14615	GTCN_2583	24802
TTCN_2368	14616	TTCN_4865	24803

ATCN_1450	14617	TTCN_4866	24804
TTCN_2369	14618	TTCN_4867	24805
TTCN_2370	14619	GTCN_2584	24806
TTCN_2371	14620	ATCN_3028	24807
ATCN_1451	14621	TTCN_4868	24808
GTCN_1263	14622	CTCN_4517	24809
ATCN_1452	14623	TTCN_4869	24810
TTCN_2372	14624	TTCN_4870	24811
GTCN_1264	14625	CTCN_4518	24812
CTCN_2029	14626	TTCN_4871	24813
TTCN_2373	14627	ATCN_3029	24814
GTCN_1265	14628	GTCN_2585	24815
CTCN_2030	14629	ATCN_3030	24816
CTCN_2031	14630	TTCN_4872	24817
GTCN_1266	14631	ATCN_3031	24818
CTCN_2032	14632	ATCN_3032	24819
TTCN_2374	14633	GTCN_2586	24820
ATCN_1453	14634	TTCN_4873	24821
TTCN_2375	14635	ATCN_3033	24822
TTCN_2376	14636	ATCN_3034	24823
ATCN_1454	14637	CTCN_4519	24824
ATCN_1455	14638	TTCN_4874	24825
ATCN_1456	14639	TTCN_4875	24826
GTCN_1267	14640	ATCN_3035	24827
TTCN_2377	14641	GTCN_2587	24828
CTCN_2033	14642	CTCN_4520	24829
CTCN_2034	14643	CTCN_4521	24830
TTCN_2378	14644	GTCN_2588	24831
TTCN_2379	14645	CTCN_4522	24832
CTCN_2035	14646	CTCN_4523	24833
CTCN_2036	14647	ATCN_3036	24834
TTCN_2380	14648	ATCN_3037	24835
CTCN_2037	14649	TTCN_4876	24836
TTCN_2381	14650	ATCN_3038	24837
TTCN_2382	14651	TTCN_4877	24838
CTCN_2038	14652	CTCN_4524	24839
CTCN_2039	14653	TTCN_4878	24840
CTCN_2040	14654	TTCN_4879	24841
CTCN_2041	14655	TTCN_4880	24842
ATCN_1457	14656	TTCN_4881	24843
ATCN_1458	14657	GTCN_2589	24844
GTCN_1268	14658	CTCN_4525	24845
CTCN_2042	14659	ATCN_3039	24846
CTCN_2043	14660	TTCN_4882	24847
TTCN_2383	14661	TTCN_4883	24848
TTCN_2384	14662	ATCN_3040	24849
CTCN_2044	14663	TTCN_4884	24850
CTCN_2045	14664	TTCN_4885	24851
CTCN_2046	14665	ATCN_3041	24852
GTCN_1269	14666	CTCN_4526	24853
ATCN_1459	14667	ATCN_3042	24854
ATCN_1460	14668	ATCN_3043	24855
TTCN_2385	14669	CTCN_4527	24856
TTCN_2386	14670	TTCN_4886	24857
TTCN_2387	14671	CTCN_4528	24858

FIG. 36 (continued)

GTCN_1270	14672	ATCN_3044	24859
CTCN_2047	14673	GTCN_2590	24860
CTCN_2048	14674	GTCN_2591	24861
CTCN_2049	14675	TTCN_4887	24862
CTCN_2050	14676	CTCN_4529	24863
CTCN_2051	14677	CTCN_4530	24864
ATCN_1461	14678	CTCN_4531	24865
TTCN_2388	14679	TTCN_4888	24866
GTCN_1271	14680	TTCN_4889	24867
GTCN_1272	14681	ATCN_3045	24868
TTCN_2389	14682	GTCN_2592	24869
CTCN_2052	14683	TTCN_4890	24870
TTCN_2390	14684	CTCN_4532	24871
TTCN_2391	14685	TTCN_4891	24872
TTCN_2392	14686	TTCN_4892	24873
CTCN_2053	14687	TTCN_4893	24874
GTCN_1273	14688	GTCN_2593	24875
CTCN_2054	14689	TTCN_4894	24876
TTCN_2393	14690	CTCN_4533	24877
CTCN_2055	14691	ATCN_3046	24878
CTCN_2056	14692	CTCN_4534	24879
CTCN_2057	14693	GTCN_2594	24880
TTCN_2394	14694	ATCN_3047	24881
CTCN_2058	14695	ATCN_3048	24882
ATCN_1462	14696	CTCN_4535	24883
GTCN_1274	14697	TTCN_4895	24884
ATCN_1463	14698	GTCN_2595	24885
CTCN_2059	14699	CTCN_4536	24886
ATCN_1464	14700	GTCN_2596	24887
CTCN_2060	14701	ATCN_3049	24888
CTCN_2061	14702	TTCN_4896	24889
CTCN_2062	14703	ATCN_3050	24890
CTCN_2063	14704	GTCN_2597	24891
CTCN_2064	14705	TTCN_4897	24892
TTCN_2395	14706	ATCN_3051	24893
CTCN_2065	14707	CTCN_4537	24894
CTCN_2066	14708	GTCN_2598	24895
TTCN_2396	14709	CTCN_4538	24896
CTCN_2067	14710	CTCN_4539	24897
CTCN_2068	14711	ATCN_3052	24898
TTCN_2397	14712	ATCN_3053	24899
CTCN_2069	14713	CTCN_4540	24900
GTCN_1275	14714	TTCN_4898	24901
CTCN_2070	14715	TTCN_4899	24902
TTCN_2398	14716	CTCN_4541	24903
CTCN_2071	14717	CTCN_4542	24904
CTCN_2072	14718	CTCN_4543	24905
ATCN_1465	14719	CTCN_4544	24906
CTCN_2073	14720	CTCN_4545	24907
GTCN_1276	14721	CTCN_4546	24908
TTCN_2399	14722	GTCN_2599	24909
CTCN_2074	14723	TTCN_4900	24910
TTCN_2400	14724	TTCN_4901	24911
CTCN_2075	14725	TTCN_4902	24912
GTCN_1277	14726	TTCN_4903	24913

GTCN_1278	14727	CTCN_4547	24914
ATCN_1466	14728	ATCN_3054	24915
ATCN_1467	14729	TTCN_4904	24916
TTCN_2401	14730	TTCN_4905	24917
CTCN_2076	14731	TTCN_4906	24918
CTCN_2077	14732	GTCN_2600	24919
ATCN_1468	14733	GTCN_2601	24920
CTCN_2078	14734	CTCN_4548	24921
CTCN_2079	14735	ATCN_3055	24922
TTCN_2402	14736	TTCN_4907	24923
CTCN_2080	14737	TTCN_4908	24924
CTCN_2081	14738	TTCN_4909	24925
TTCN_2403	14739	CTCN_4549	24926
ATCN_1469	14740	GTCN_2602	24927
GTCN_1279	14741	TTCN_4910	24928
TTCN_2404	14742	TTCN_4911	24929
GTCN_1280	14743	CTCN_4550	24930
GTCN_1281	14744	TTCN_4912	24931
TTCN_2405	14745	GTCN_2603	24932
ATCN_1470	14746	CTCN_4551	24933
GTCN_1282	14747	CTCN_4552	24934
CTCN_2082	14748	TTCN_4913	24935
ATCN_1471	14749	CTCN_4553	24936
TTCN_2406	14750	ATCN_3056	24937
CTCN_2083	14751	GTCN_2604	24938
GTCN_1283	14752	CTCN_4554	24939
ATCN_1472	14753	CTCN_4555	24940
CTCN_2084	14754	GTCN_2605	24941
TTCN_2407	14755	TTCN_4914	24942
GTCN_1284	14756	ATCN_3057	24943
CTCN_2085	14757	TTCN_4915	24944
CTCN_2086	14758	ATCN_3058	24945
GTCN_1285	14759	TTCN_4916	24946
GTCN_1286	14760	TTCN_4917	24947
CTCN_2087	14761	GTCN_2606	24948
CTCN_2088	14762	CTCN_4556	24949
ATCN_1473	14763	ATCN_3059	24950
CTCN_2089	14764	ATCN_3060	24951
TTCN_2408	14765	CTCN_4557	24952
TTCN_2409	14766	TTCN_4918	24953
TTCN_2410	14767	CTCN_4558	24954
CTCN_2090	14768	CTCN_4559	24955
TTCN_2411	14769	CTCN_4560	24956
TTCN_2412	14770	TTCN_4919	24957
GTCN_1287	14771	ATCN_3061	24958
CTCN_2091	14772	CTCN_4561	24959
TTCN_2413	14773	TTCN_4920	24960
TTCN_2414	14774	ATCN_3062	24961
TTCN_2415	14775	CTCN_4562	24962
TTCN_2416	14776	ATCN_3063	24963
TTCN_2417	14777	CTCN_4563	24964
ATCN_1474	14778	GTCN_2607	24965
ATCN_1475	14779	ATCN_3064	24966
CTCN_2092	14780	ATCN_3065	24967
TTCN_2418	14781	CTCN_4564	24968

FIG. 36 (continued)

CTCN_2093	14782	TTCN_4921	24969
CTCN_2094	14783	TTCN_4922	24970
GTCN_1288	14784	TTCN_4923	24971
TTCN_2419	14785	ATCN_3066	24972
CTCN_2095	14786	TTCN_4924	24973
CTCN_2096	14787	ATCN_3067	24974
GTCN_1289	14788	TTCN_4925	24975
TTCN_2420	14789	CTCN_4565	24976
CTCN_2097	14790	ATCN_3068	24977
ATCN_1476	14791	CTCN_4566	24978
CTCN_2098	14792	TTCN_4926	24979
ATCN_1477	14793	TTCN_4927	24980
ATCN_1478	14794	CTCN_4567	24981
TTCN_2421	14795	ATCN_3069	24982
GTCN_1290	14796	ATCN_3070	24983
TTCN_2422	14797	ATCN_3071	24984
CTCN_2099	14798	TTCN_4928	24985
ATCN_1479	14799	TTCN_4929	24986
TTCN_2423	14800	ATCN_3072	24987
GTCN_1291	14801	TTCN_4930	24988
GTCN_1292	14802	ATCN_3073	24989
GTCN_1293	14803	TTCN_4931	24990
TTCN_2424	14804	ATCN_3074	24991
ATCN_1480	14805	CTCN_4568	24992
ATCN_1481	14806	CTCN_4569	24993
CTCN_2100	14807	TTCN_4932	24994
CTCN_2101	14808	CTCN_4570	24995
TTCN_2425	14809	TTCN_4933	24996
CTCN_2102	14810	CTCN_4571	24997
TTCN_2426	14811	GTCN_2608	24998
CTCN_2103	14812	ATCN_3075	24999
GTCN_1294	14813	ATCN_3076	25000
CTCN_2104	14814	TTCN_4934	25001
GTCN_1295	14815	TTCN_4935	25002
CTCN_2105	14816	ATCN_3077	25003
GTCN_1296	14817	CTCN_4572	25004
CTCN_2106	14818	TTCN_4936	25005
GTCN_1297	14819	ATCN_3078	25006
TTCN_2427	14820	ATCN_3079	25007
TTCN_2428	14821	GTCN_2609	25008
ATCN_1482	14822	TTCN_4937	25009
TTCN_2429	14823	TTCN_4938	25010
CTCN_2107	14824	CTCN_4573	25011
CTCN_2108	14825	GTCN_2610	25012
CTCN_2109	14826	ATCN_3080	25013
TTCN_2430	14827	ATCN_3081	25014
TTCN_2431	14828	ATCN_3082	25015
GTCN_1298	14829	TTCN_4939	25016
CTCN_2110	14830	ATCN_3083	25017
GTCN_1299	14831	GTCN_2611	25018
CTCN_2111	14832	TTCN_4940	25019
CTCN_2112	14833	CTCN_4574	25020
GTCN_1300	14834	GTCN_2612	25021
GTCN_1301	14835	GTCN_2613	25022
TTCN_2432	14836	CTCN_4575	25023

TTCN_2433	14837	CTCN_4576	25024
ATCN_1483	14838	CTCN_4577	25025
CTCN_2113	14839	GTCN_2614	25026
TTCN_2434	14840	GTCN_2615	25027
GTCN_1302	14841	CTCN_4578	25028
TTCN_2435	14842	GTCN_2616	25029
CTCN_2114	14843	ATCN_3084	25030
TTCN_2436	14844	ATCN_3085	25031
GTCN_1303	14845	ATCN_3086	25032
CTCN_2115	14846	CTCN_4579	25033
GTCN_1304	14847	CTCN_4580	25034
ATCN_1484	14848	ATCN_3087	25035
ATCN_1485	14849	GTCN_2617	25036
ATCN_1486	14850	TTCN_4941	25037
TTCN_2437	14851	CTCN_4581	25038
CTCN_2116	14852	CTCN_4582	25039
CTCN_2117	14853	TTCN_4942	25040
CTCN_2118	14854	CTCN_4583	25041
ATCN_1487	14855	CTCN_4584	25042
TTCN_2438	14856	CTCN_4585	25043
CTCN_2119	14857	CTCN_4586	25044
ATCN_1488	14858	CTCN_4587	25045
ATCN_1489	14859	CTCN_4588	25046
TTCN_2439	14860	ATCN_3088	25047
GTCN_1305	14861	ATCN_3089	25048
CTCN_2120	14862	GTCN_2618	25049
TTCN_2440	14863	GTCN_2619	25050
CTCN_2121	14864	CTCN_4589	25051
GTCN_1306	14865	TTCN_4943	25052
TTCN_2441	14866	GTCN_2620	25053
GTCN_1307	14867	TTCN_4944	25054
CTCN_2122	14868	CTCN_4590	25055
ATCN_1490	14869	TTCN_4945	25056
CTCN_2123	14870	TTCN_4946	25057
TTCN_2442	14871	GTCN_2621	25058
CTCN_2124	14872	CTCN_4591	25059
CTCN_2125	14873	CTCN_4592	25060
TTCN_2443	14874	TTCN_4947	25061
ATCN_1491	14875	CTCN_4593	25062
TTCN_2444	14876	CTCN_4594	25063
CTCN_2126	14877	CTCN_4595	25064
CTCN_2127	14878	CTCN_4596	25065
CTCN_2128	14879	GTCN_2622	25066
ATCN_1492	14880	CTCN_4597	25067
ATCN_1493	14881	ATCN_3090	25068
CTCN_2129	14882	CTCN_4598	25069
TTCN_2445	14883	ATCN_3091	25070
TTCN_2446	14884	CTCN_4599	25071
ATCN_1494	14885	TTCN_4948	25072
CTCN_2130	14886	ATCN_3092	25073
CTCN_2131	14887	ATCN_3093	25074
CTCN_2132	14888	GTCN_2623	25075
ATCN_1495	14889	TTCN_4949	25076
CTCN_2133	14890	ATCN_3094	25077
TTCN_2447	14891	ATCN_3095	25078

FIG. 36 (continued)

TTCN_2448	14892	CTCN_4600	25079
ATCN_1496	14893	TTCN_4950	25080
ATCN_1497	14894	CTCN_4601	25081
TTCN_2449	14895	TTCN_4951	25082
CTCN_2134	14896	TTCN_4952	25083
TTCN_2450	14897	GTCN_2624	25084
CTCN_2135	14898	CTCN_4602	25085
GTCN_1308	14899	CTCN_4603	25086
ATCN_1498	14900	CTCN_4604	25087
ATCN_1499	14901	TTCN_4953	25088
GTCN_1309	14902	TTCN_4954	25089
CTCN_2136	14903	TTCN_4955	25090
CTCN_2137	14904	GTCN_2625	25091
GTCN_1310	14905	ATCN_3096	25092
GTCN_1311	14906	TTCN_4956	25093
GTCN_1312	14907	GTCN_2626	25094
CTCN_2138	14908	TTCN_4957	25095
TTCN_2451	14909	GTCN_2627	25096
ATCN_1500	14910	TTCN_4958	25097
ATCN_1501	14911	TTCN_4959	25098
GTCN_1313	14912	ATCN_3097	25099
TTCN_2452	14913	GTCN_2628	25100
GTCN_1314	14914	TTCN_4960	25101
GTCN_1315	14915	CTCN_4605	25102
TTCN_2453	14916	TTCN_4961	25103
CTCN_2139	14917	GTCN_2629	25104
CTCN_2140	14918	CTCN_4606	25105
ATCN_1502	14919	TTCN_4962	25106
GTCN_1316	14920	CTCN_4607	25107
TTCN_2454	14921	GTCN_2630	25108
TTCN_2455	14922	TTCN_4963	25109
CTCN_2141	14923	CTCN_4608	25110
TTCN_2456	14924	TTCN_4964	25111
CTCN_2142	14925	TTCN_4965	25112
TTCN_2457	14926	GTCN_2631	25113
TTCN_2458	14927	TTCN_4966	25114
ATCN_1503	14928	CTCN_4609	25115
CTCN_2143	14929	GTCN_2632	25116
ATCN_1504	14930	TTCN_4967	25117
CTCN_2144	14931	TTCN_4968	25118
ATCN_1505	14932	TTCN_4969	25119
TTCN_2459	14933	TTCN_4970	25120
CTCN_2145	14934	TTCN_4971	25121
GTCN_1317	14935	CTCN_4610	25122
TTCN_2460	14936	GTCN_2633	25123
TTCN_2461	14937	CTCN_4611	25124
GTCN_1318	14938	CTCN_4612	25125
TTCN_2462	14939	CTCN_4613	25126
CTCN_2146	14940	TTCN_4972	25127
TTCN_2463	14941	CTCN_4614	25128
CTCN_2147	14942	GTCN_2634	25129
GTCN_1319	14943	ATCN_3098	25130
GTCN_1320	14944	ATCN_3099	25131
GTCN_1321	14945	ATCN_3100	25132
TTCN_2464	14946	ATCN_3101	25133

TTCN_2465	14947	GTCN_2635	25134
CTCN_2148	14948	GTCN_2636	25135
GTCN_1322	14949	GTCN_2637	25136
GTCN_1323	14950	GTCN_2638	25137
TTCN_2466	14951	GTCN_2639	25138
CTCN_2149	14952	TTCN_4973	25139
CTCN_2150	14953	TTCN_4974	25140
TTCN_2467	14954	TTCN_4975	25141
CTCN_2151	14955	TTCN_4976	25142
GTCN_1324	14956	ATCN_3102	25143
CTCN_2152	14957	TTCN_4977	25144
TTCN_2468	14958	CTCN_4615	25145
ATCN_1506	14959	GTCN_2640	25146
TTCN_2469	14960	CTCN_4616	25147
TTCN_2470	14961	ATCN_3103	25148
TTCN_2471	14962	ATCN_3104	25149
TTCN_2472	14963	CTCN_4617	25150
CTCN_2153	14964	TTCN_4978	25151
CTCN_2154	14965	TTCN_4979	25152
ATCN_1507	14966	TTCN_4980	25153
ATCN_1508	14967	ATCN_3105	25154
GTCN_1325	14968	CTCN_4618	25155
TTCN_2473	14969	CTCN_4619	25156
ATCN_1509	14970	TTCN_4981	25157
TTCN_2474	14971	ATCN_3106	25158
CTCN_2155	14972	ATCN_3107	25159
TTCN_2475	14973	CTCN_4620	25160
CTCN_2156	14974	ATCN_3108	25161
ATCN_1510	14975	CTCN_4621	25162
GTCN_1326	14976	TTCN_4982	25163
CTCN_2157	14977	CTCN_4622	25164
TTCN_2476	14978	ATCN_3109	25165
TTCN_2477	14979	ATCN_3110	25166
TTCN_2478	14980	CTCN_4623	25167
ATCN_1511	14981	CTCN_4624	25168
ATCN_1512	14982	TTCN_4983	25169
TTCN_2479	14983	GTCN_2641	25170
CTCN_2158	14984	TTCN_4984	25171
ATCN_1513	14985	TTCN_4985	25172
ATCN_1514	14986	TTCN_4986	25173
CTCN_2159	14987	CTCN_4625	25174
ATCN_1515	14988	CTCN_4626	25175
TTCN_2480	14989	TTCN_4987	25176
TTCN_2481	14990	ATCN_3111	25177
GTCN_1327	14991	CTCN_4627	25178
ATCN_1516	14992	ATCN_3112	25179
GTCN_1328	14993	CTCN_4628	25180
ATCN_1517	14994	TTCN_4988	25181
ATCN_1518	14995	TTCN_4989	25182
CTCN_2160	14996	TTCN_4990	25183
TTCN_2482	14997	GTCN_2642	25184
ATCN_1519	14998	CTCN_4629	25185
TTCN_2483	14999	ATCN_3113	25186
GTCN_1329	15000	CTCN_4630	25187
TTCN_2484	15001	TTCN_4991	25188

FIG. 36 (continued)

CTCN_2161	15002	ATCN_3114	25189
ATCN_1520	15003	ATCN_3115	25190
TTCN_2485	15004	GTCN_2643	25191
ATCN_1521	15005	CTCN_4631	25192
ATCN_1522	15006	CTCN_4632	25193
GTCN_1330	15007	TTCN_4992	25194
ATCN_1523	15008	TTCN_4993	25195
ATCN_1524	15009	CTCN_4633	25196
GTCN_1331	15010	TTCN_4994	25197
TTCN_2486	15011	ATCN_3116	25198
TTCN_2487	15012	TTCN_4995	25199
CTCN_2162	15013	GTCN_2644	25200
CTCN_2163	15014	TTCN_4996	25201
ATCN_1525	15015	CTCN_4634	25202
CTCN_2164	15016	ATCN_3117	25203
ATCN_1526	15017	CTCN_4635	25204
TTCN_2488	15018	ATCN_3118	25205
ATCN_1527	15019	GTCN_2645	25206
GTCN_1332	15020	TTCN_4997	25207
GTCN_1333	15021	CTCN_4636	25208
ATCN_1528	15022	TTCN_4998	25209
ATCN_1529	15023	ATCN_3119	25210
ATCN_1530	15024	CTCN_4637	25211
CTCN_2165	15025	ATCN_3120	25212
CTCN_2166	15026	GTCN_2646	25213
TTCN_2489	15027	CTCN_4638	25214
CTCN_2167	15028	CTCN_4639	25215
TTCN_2490	15029	GTCN_2647	25216
GTCN_1334	15030	CTCN_4640	25217
GTCN_1335	15031	TTCN_4999	25218
ATCN_1531	15032	CTCN_4641	25219
ATCN_1532	15033	ATCN_3121	25220
ATCN_1533	15034	TTCN_5000	25221
ATCN_1534	15035	GTCN_2648	25222
GTCN_1336	15036	CTCN_4642	25223
ATCN_1535	15037	TTCN_5001	25224
TTCN_2491	15038	GTCN_2649	25225
TTCN_2492	15039	GTCN_2650	25226
TTCN_2493	15040	TTCN_5002	25227
TTCN_2494	15041	TTCN_5003	25228
ATCN_1536	15042	TTCN_5004	25229
GTCN_1337	15043	ATCN_3122	25230
TTCN_2495	15044	GTCN_2651	25231
TTCN_2496	15045	CTCN_4643	25232
TTCN_2497	15046	CTCN_4644	25233
ATCN_1537	15047	CTCN_4645	25234
ATCN_1538	15048	CTCN_4646	25235
ATCN_1539	15049	CTCN_4647	25236
GTCN_1338	15050	TTCN_5005	25237
CTCN_2168	15051	CTCN_4648	25238
CTCN_2169	15052	ATCN_3123	25239
CTCN_2170	15053	TTCN_5006	25240
GTCN_1339	15054	GTCN_2652	25241
TTCN_2498	15055	TTCN_5007	25242
CTCN_2171	15056	GTCN_2653	25243

GTCN_1340	15057	ATCN_3124	25244
CTCN_2172	15058	TTCN_5008	25245
GTCN_1341	15059	ATCN_3125	25246
TTCN_2499	15060	CTCN_4649	25247
TTCN_2500	15061	CTCN_4650	25248
CTCN_2173	15062	ATCN_3126	25249
GTCN_1342	15063	CTCN_4651	25250
TTCN_2501	15064	TTCN_5009	25251
TTCN_2502	15065	ATCN_3127	25252
CTCN_2174	15066	ATCN_3128	25253
CTCN_2175	15067	CTCN_4652	25254
CTCN_2176	15068	TTCN_5010	25255
CTCN_2177	15069	TTCN_5011	25256
TTCN_2503	15070	CTCN_4653	25257
GTCN_1343	15071	ATCN_3129	25258
TTCN_2504	15072	GTCN_2654	25259
GTCN_1344	15073	CTCN_4654	25260
TTCN_2505	15074	CTCN_4655	25261
CTCN_2178	15075	ATCN_3130	25262
ATCN_1540	15076	TTCN_5012	25263
CTCN_2179	15077	TTCN_5013	25264
TTCN_2506	15078	ATCN_3131	25265
CTCN_2180	15079	TTCN_5014	25266
CTCN_2181	15080	TTCN_5015	25267
TTCN_2507	15081	ATCN_3132	25268
CTCN_2182	15082	ATCN_3133	25269
GTCN_1345	15083	TTCN_5016	25270
ATCN_1541	15084	GTCN_2655	25271
ATCN_1542	15085	CTCN_4656	25272
GTCN_1346	15086	CTCN_4657	25273
CTCN_2183	15087	TTCN_5017	25274
TTCN_2508	15088	TTCN_5018	25275
ATCN_1543	15089	CTCN_4658	25276
GTCN_1347	15090	TTCN_5019	25277
CTCN_2184	15091	CTCN_4659	25278
GTCN_1348	15092	CTCN_4660	25279
CTCN_2185	15093	CTCN_4661	25280
TTCN_2509	15094	CTCN_4662	25281
TTCN_2510	15095	ATCN_3134	25282
CTCN_2186	15096	TTCN_5020	25283
GTCN_1349	15097	TTCN_5021	25284
ATCN_1544	15098	CTCN_4663	25285
TTCN_2511	15099	GTCN_2656	25286
ATCN_1545	15100	CTCN_4664	25287
GTCN_1350	15101	GTCN_2657	25288
TTCN_2512	15102	CTCN_4665	25289
CTCN_2187	15103	CTCN_4666	25290
CTCN_2188	15104	CTCN_4667	25291
TTCN_2513	15105	GTCN_2658	25292
ATCN_1546	15106	CTCN_4668	25293
ATCN_1547	15107	CTCN_4669	25294
TTCN_2514	15108	TTCN_5022	25295
CTCN_2189	15109	GTCN_2659	25296
ATCN_1548	15110	CTCN_4670	25297
TTCN_2515	15111	TTCN_5023	25298

FIG. 36 (continued)

TTCN_2516	15112	TTCN_5024	25299
TTCN_2517	15113	TTCN_5025	25300
CTCN_2190	15114	ATCN_3135	25301
ATCN_1549	15115	ATCN_3136	25302
TTCN_2518	15116	CTCN_4671	25303
TTCN_2519	15117	TTCN_5026	25304
TTCN_2520	15118	GTCN_2660	25305
ATCN_1550	15119	GTCN_2661	25306
GTCN_1351	15120	CTCN_4672	25307
ATCN_1551	15121	CTCN_4673	25308
TTCN_2521	15122	CTCN_4674	25309
CTCN_2191	15123	GTCN_2662	25310
CTCN_2192	15124	ATCN_3137	25311
CTCN_2193	15125	TTCN_5027	25312
ATCN_1552	15126	TTCN_5028	25313
ATCN_1553	15127	CTCN_4675	25314
TTCN_2522	15128	GTCN_2663	25315
TTCN_2523	15129	CTCN_4676	25316
GTCN_1352	15130	TTCN_5029	25317
CTCN_2194	15131	TTCN_5030	25318
ATCN_1554	15132	ATCN_3138	25319
GTCN_1353	15133	ATCN_3139	25320
CTCN_2195	15134	CTCN_4677	25321
TTCN_2524	15135	TTCN_5031	25322
TTCN_2525	15136	ATCN_3140	25323
TTCN_2526	15137	ATCN_3141	25324
TTCN_2527	15138	GTCN_2664	25325
TTCN_2528	15139	GTCN_2665	25326
GTCN_1354	15140	CTCN_4678	25327
ATCN_1555	15141	CTCN_4679	25328
ATCN_1556	15142	GTCN_2666	25329
ATCN_1557	15143	ATCN_3142	25330
TTCN_2529	15144	GTCN_2667	25331
CTCN_2196	15145	CTCN_4680	25332
GTCN_1355	15146	ATCN_3143	25333
CTCN_2197	15147	ATCN_3144	25334
CTCN_2198	15148	CTCN_4681	25335
ATCN_1558	15149	GTCN_2668	25336
TTCN_2530	15150	CTCN_4682	25337
GTCN_1356	15151	CTCN_4683	25338
CTCN_2199	15152	TTCN_5032	25339
GTCN_1357	15153	ATCN_3145	25340
CTCN_2200	15154	ATCN_3146	25341
CTCN_2201	15155	TTCN_5033	25342
ATCN_1559	15156	TTCN_5034	25343
TTCN_2531	15157	CTCN_4684	25344
TTCN_2532	15158	TTCN_5035	25345
TTCN_2533	15159	GTCN_2669	25346
GTCN_1358	15160	CTCN_4685	25347
TTCN_2534	15161	CTCN_4686	25348
CTCN_2202	15162	ATCN_3147	25349
ATCN_1560	15163	CTCN_4687	25350
GTCN_1359	15164	GTCN_2670	25351
ATCN_1561	15165	ATCN_3148	25352
ATCN_1562	15166	ATCN_3149	25353

CTCN_2203	15167	CTCN_4688	25354
CTCN_2204	15168	GTCN_2671	25355
TTCN_2535	15169	CTCN_4689	25356
CTCN_2205	15170	GTCN_2672	25357
TTCN_2536	15171	ATCN_3150	25358
GTCN_1360	15172	ATCN_3151	25359
CTCN_2206	15173	ATCN_3152	25360
GTCN_1361	15174	ATCN_3153	25361
CTCN_2207	15175	CTCN_4690	25362
ATCN_1563	15176	CTCN_4691	25363
TTCN_2537	15177	ATCN_3154	25364
ATCN_1564	15178	TTCN_5036	25365
TTCN_2538	15179	TTCN_5037	25366
GTCN_1362	15180	CTCN_4692	25367
ATCN_1565	15181	ATCN_3155	25368
CTCN_2208	15182	ATCN_3156	25369
CTCN_2209	15183	CTCN_4693	25370
CTCN_2210	15184	ATCN_3157	25371
ATCN_1566	15185	CTCN_4694	25372
TTCN_2539	15186	ATCN_3158	25373
TTCN_2540	15187	CTCN_4695	25374
TTCN_2541	15188	GTCN_2673	25375
TTCN_2542	15189	TTCN_5038	25376
GTCN_1363	15190	TTCN_5039	25377
TTCN_2543	15191	TTCN_5040	25378
ATCN_1567	15192	TTCN_5041	25379
GTCN_1364	15193	TTCN_5042	25380
TTCN_2544	15194	TTCN_5043	25381
CTCN_2211	15195	CTCN_4696	25382
ATCN_1568	15196	CTCN_4697	25383
TTCN_2545	15197	TTCN_5044	25384
GTCN_1365	15198	ATCN_3159	25385
CTCN_2212	15199	GTCN_2674	25386
GTCN_1366	15200	TTCN_5045	25387
ATCN_1569	15201	CTCN_4698	25388
ATCN_1570	15202	CTCN_4699	25389
TTCN_2546	15203	TTCN_5046	25390
TTCN_2547	15204	CTCN_4700	25391
CTCN_2213	15205	CTCN_4701	25392
TTCN_2548	15206	ATCN_3160	25393
ATCN_1571	15207	GTCN_2675	25394
ATCN_1572	15208	TTCN_5047	25395
CTCN_2214	15209	CTCN_4702	25396
ATCN_1573	15210	GTCN_2676	25397
TTCN_2549	15211	CTCN_4703	25398
TTCN_2550	15212	ATCN_3161	25399
TTCN_2551	15213	ATCN_3162	25400
GTCN_1367	15214	GTCN_2677	25401
ATCN_1574	15215	ATCN_3163	25402
ATCN_1575	15216	GTCN_2678	25403
GTCN_1368	15217	GTCN_2679	25404
GTCN_1369	15218	TTCN_5048	25405
CTCN_2215	15219	ATCN_3164	25406
ATCN_1576	15220	TTCN_5049	25407
ATCN_1577	15221	TTCN_5050	25408

FIG. 36 (continued)

TTCN_2552	15222	CTCN_4704	25409
CTCN_2216	15223	CTCN_4705	25410
TTCN_2553	15224	ATCN_3165	25411
ATCN_1578	15225	CTCN_4706	25412
CTCN_2217	15226	TTCN_5051	25413
CTCN_2218	15227	TTCN_5052	25414
GTCN_1370	15228	TTCN_5053	25415
TTCN_2554	15229	GTCN_2680	25416
CTCN_2219	15230	TTCN_5054	25417
CTCN_2220	15231	TTCN_5055	25418
TTCN_2555	15232	ATCN_3166	25419
ATCN_1579	15233	TTCN_5056	25420
CTCN_2221	15234	ATCN_3167	25421
GTCN_1371	15235	ATCN_3168	25422
TTCN_2556	15236	TTCN_5057	25423
CTCN_2222	15237	CTCN_4707	25424
TTCN_2557	15238	TTCN_5058	25425
CTCN_2223	15239	CTCN_4708	25426
TTCN_2558	15240	TTCN_5059	25427
CTCN_2224	15241	ATCN_3169	25428
TTCN_2559	15242	TTCN_5060	25429
TTCN_2560	15243	TTCN_5061	25430
TTCN_2561	15244	TTCN_5062	25431
TTCN_2562	15245	CTCN_4709	25432
TTCN_2563	15246	TTCN_5063	25433
TTCN_2564	15247	CTCN_4710	25434
TTCN_2565	15248	GTCN_2681	25435
TTCN_2566	15249	CTCN_4711	25436
ATCN_1580	15250	CTCN_4712	25437
TTCN_2567	15251	ATCN_3170	25438
TTCN_2568	15252	CTCN_4713	25439
CTCN_2225	15253	ATCN_3171	25440
TTCN_2569	15254	ATCN_3172	25441
TTCN_2570	15255	ATCN_3173	25442
GTCN_1372	15256	CTCN_4714	25443
GTCN_1373	15257	CTCN_4715	25444
CTCN_2226	15258	ATCN_3174	25445
GTCN_1374	15259	ATCN_3175	25446
GTCN_1375	15260	ATCN_3176	25447
TTCN_2571	15261	TTCN_5064	25448
TTCN_2572	15262	CTCN_4716	25449
GTCN_1376	15263	CTCN_4717	25450
CTCN_2227	15264	GTCN_2682	25451
ATCN_1581	15265	TTCN_5065	25452
CTCN_2228	15266	CTCN_4718	25453
CTCN_2229	15267	CTCN_4719	25454
TTCN_2573	15268	ATCN_3177	25455
CTCN_2230	15269	CTCN_4720	25456
CTCN_2231	15270	ATCN_3178	25457
TTCN_2574	15271	CTCN_4721	25458
ATCN_1582	15272	CTCN_4722	25459
TTCN_2575	15273	GTCN_2683	25460
CTCN_2232	15274	TTCN_5066	25461
TTCN_2576	15275	TTCN_5067	25462
CTCN_2233	15276	TTCN_5068	25463

CTCN_2234	15277	ATCN_3179	25464
ATCN_1583	15278	TTCN_5069	25465
TTCN_2577	15279	ATCN_3180	25466
GTCN_1377	15280	TTCN_5070	25467
TTCN_2578	15281	ATCN_3181	25468
TTCN_2579	15282	TTCN_5071	25469
CTCN_2235	15283	ATCN_3182	25470
TTCN_2580	15284	CTCN_4723	25471
CTCN_2236	15285	GTCN_2684	25472
ATCN_1584	15286	CTCN_4724	25473
ATCN_1585	15287	CTCN_4725	25474
CTCN_2237	15288	CTCN_4726	25475
GTCN_1378	15289	CTCN_4727	25476
TTCN_2581	15290	TTCN_5072	25477
TTCN_2582	15291	CTCN_4728	25478
CTCN_2238	15292	CTCN_4729	25479
TTCN_2583	15293	CTCN_4730	25480
TTCN_2584	15294	CTCN_4731	25481
ATCN_1586	15295	ATCN_3183	25482
GTCN_1379	15296	CTCN_4732	25483
GTCN_1380	15297	ATCN_3184	25484
CTCN_2239	15298	TTCN_5073	25485
TTCN_2585	15299	CTCN_4733	25486
TTCN_2586	15300	GTCN_2685	25487
TTCN_2587	15301	CTCN_4734	25488
TTCN_2588	15302	CTCN_4735	25489
TTCN_2589	15303	TTCN_5074	25490
TTCN_2590	15304	CTCN_4736	25491
GTCN_1381	15305	CTCN_4737	25492
GTCN_1382	15306	TTCN_5075	25493
CTCN_2240	15307	CTCN_4738	25494
CTCN_2241	15308	CTCN_4739	25495
CTCN_2242	15309	CTCN_4740	25496
GTCN_1383	15310	TTCN_5076	25497
ATCN_1587	15311	GTCN_2686	25498
GTCN_1384	15312	CTCN_4741	25499
CTCN_2243	15313	CTCN_4742	25500
CTCN_2244	15314	TTCN_5077	25501
ATCN_1588	15315	CTCN_4743	25502
ATCN_1589	15316	CTCN_4744	25503
ATCN_1590	15317	CTCN_4745	25504
ATCN_1591	15318	ATCN_3185	25505
CTCN_2245	15319	ATCN_3186	25506
GTCN_1385	15320	ATCN_3187	25507
CTCN_2246	15321	ATCN_3188	25508
GTCN_1386	15322	TTCN_5078	25509
TTCN_2591	15323	GTCN_2687	25510
CTCN_2247	15324	GTCN_2688	25511
GTCN_1387	15325	CTCN_4746	25512
GTCN_1388	15326	TTCN_5079	25513
ATCN_1592	15327	CTCN_4747	25514
TTCN_2592	15328	CTCN_4748	25515
ATCN_1593	15329	TTCN_5080	25516
CTCN_2248	15330	TTCN_5081	25517
GTCN_1389	15331	CTCN_4749	25518

FIG. 36 (continued)

CTCN_2249	15332	CTCN_4750	25519
CTCN_2250	15333	GTCN_2689	25520
CTCN_2251	15334	CTCN_4751	25521
TTCN_2593	15335	GTCN_2690	25522
TTCN_2594	15336	TTCN_5082	25523
ATCN_1594	15337	ATCN_3189	25524
ATCN_1595	15338	ATCN_3190	25525
CTCN_2252	15339	TTCN_5083	25526
TTCN_2595	15340	ATCN_3191	25527
TTCN_2596	15341	GTCN_2691	25528
TTCN_2597	15342	CTCN_4752	25529
GTCN_1390	15343	TTCN_5084	25530
CTCN_2253	15344	CTCN_4753	25531
TTCN_2598	15345	ATCN_3192	25532
TTCN_2599	15346	CTCN_4754	25533
TTCN_2600	15347	ATCN_3193	25534
CTCN_2254	15348	TTCN_5085	25535
TTCN_2601	15349	ATCN_3194	25536
TTCN_2602	15350	CTCN_4755	25537
GTCN_1391	15351	ATCN_3195	25538
TTCN_2603	15352	TTCN_5086	25539
CTCN_2255	15353	TTCN_5087	25540
CTCN_2256	15354	ATCN_3196	25541
GTCN_1392	15355	ATCN_3197	25542
TTCN_2604	15356	CTCN_4756	25543
TTCN_2605	15357	TTCN_5088	25544
TTCN_2606	15358	CTCN_4757	25545
TTCN_2607	15359	TTCN_5089	25546
TTCN_2608	15360	CTCN_4758	25547
ATCN_1596	15361	TTCN_5090	25548
TTCN_2609	15362	TTCN_5091	25549
TTCN_2610	15363	CTCN_4759	25550
ATCN_1597	15364	GTCN_2692	25551
GTCN_1393	15365	TTCN_5092	25552
CTCN_2257	15366	ATCN_3198	25553
ATCN_1598	15367	CTCN_4760	25554
TTCN_2611	15368	GTCN_2693	25555
TTCN_2612	15369	ATCN_3199	25556
CTCN_2258	15370	TTCN_5093	25557
TTCN_2613	15371	GTCN_2694	25558
CTCN_2259	15372	TTCN_5094	25559
TTCN_2614	15373	GTCN_2695	25560
CTCN_2260	15374	TTCN_5095	25561
TTCN_2615	15375	TTCN_5096	25562
TTCN_2616	15376	ATCN_3200	25563
TTCN_2617	15377	ATCN_3201	25564
GTCN_1394	15378	ATCN_3202	25565
GTCN_1395	15379	CTCN_4761	25566
GTCN_1396	15380	TTCN_5097	25567
ATCN_1599	15381	ATCN_3203	25568
CTCN_2261	15382	CTCN_4762	25569
ATCN_1600	15383	CTCN_4763	25570
GTCN_1397	15384	GTCN_2696	25571
CTCN_2262	15385	CTCN_4764	25572
TTCN_2618	15386	ATCN_3204	25573

ATCN_1601	15387	CTCN_4765	25574
TTCN_2619	15388	CTCN_4766	25575
ATCN_1602	15389	TTCN_5098	25576
ATCN_1603	15390	ATCN_3205	25577
GTCN_1398	15391	ATCN_3206	25578
CTCN_2263	15392	TTCN_5099	25579
TTCN_2620	15393	CTCN_4767	25580
TTCN_2621	15394	CTCN_4768	25581
TTCN_2622	15395	TTCN_5100	25582
TTCN_2623	15396	GTCN_2697	25583
TTCN_2624	15397	GTCN_2698	25584
GTCN_1399	15398	TTCN_5101	25585
TTCN_2625	15399	TTCN_5102	25586
TTCN_2626	15400	ATCN_3207	25587
GTCN_1400	15401	ATCN_3208	25588
ATCN_1604	15402	ATCN_3209	25589
GTCN_1401	15403	CTCN_4769	25590
TTCN_2627	15404	CTCN_4770	25591
GTCN_1402	15405	TTCN_5103	25592
TTCN_2628	15406	CTCN_4771	25593
ATCN_1605	15407	TTCN_5104	25594
ATCN_1606	15408	ATCN_3210	25595
CTCN_2264	15409	TTCN_5105	25596
ATCN_1607	15410	CTCN_4772	25597
ATCN_1608	15411	GTCN_2699	25598
CTCN_2265	15412	TTCN_5106	25599
GTCN_1403	15413	ATCN_3211	25600
TTCN_2629	15414	TTCN_5107	25601
TTCN_2630	15415	ATCN_3212	25602
CTCN_2266	15416	TTCN_5108	25603
TTCN_2631	15417	ATCN_3213	25604
TTCN_2632	15418	CTCN_4773	25605
TTCN_2633	15419	TTCN_5109	25606
CTCN_2267	15420	GTCN_2700	25607
ATCN_1609	15421	ATCN_3214	25608
TTCN_2634	15422	CTCN_4774	25609
GTCN_1404	15423	GTCN_2701	25610
ATCN_1610	15424	CTCN_4775	25611
TTCN_2635	15425	CTCN_4776	25612
CTCN_2268	15426	CTCN_4777	25613
CTCN_2269	15427	TTCN_5110	25614
CTCN_2270	15428	CTCN_4778	25615
GTCN_1405	15429	ATCN_3215	25616
GTCN_1406	15430	TTCN_5111	25617
ATCN_1611	15431	GTCN_2702	25618
TTCN_2636	15432	TTCN_5112	25619
TTCN_2637	15433	CTCN_4779	25620
ATCN_1612	15434	CTCN_4780	25621
ATCN_1613	15435	GTCN_2703	25622
CTCN_2271	15436	GTCN_2704	25623
TTCN_2638	15437	TTCN_5113	25624
CTCN_2272	15438	CTCN_4781	25625
TTCN_2639	15439	CTCN_4782	25626
TTCN_2640	15440	TTCN_5114	25627
TTCN_2641	15441	TTCN_5115	25628

FIG. 36 (continued)

TTCN_2642	15442	ATCN_3216	25629
GTCN_1407	15443	ATCN_3217	25630
CTCN_2273	15444	TTCN_5116	25631
ATCN_1614	15445	CTCN_4783	25632
GTCN_1408	15446	CTCN_4784	25633
CTCN_2274	15447	GTCN_2705	25634
CTCN_2275	15448	ATCN_3218	25635
ATCN_1615	15449	TTCN_5117	25636
ATCN_1616	15450	GTCN_2706	25637
ATCN_1617	15451	TTCN_5118	25638
CTCN_2276	15452	TTCN_5119	25639
TTCN_2643	15453	CTCN_4785	25640
ATCN_1618	15454	CTCN_4786	25641
CTCN_2277	15455	CTCN_4787	25642
TTCN_2644	15456	GTCN_2707	25643
TTCN_2645	15457	CTCN_4788	25644
CTCN_2278	15458	GTCN_2708	25645
TTCN_2646	15459	CTCN_4789	25646
CTCN_2279	15460	CTCN_4790	25647
ATCN_1619	15461	ATCN_3219	25648
CTCN_2280	15462	TTCN_5120	25649
CTCN_2281	15463	TTCN_5121	25650
ATCN_1620	15464	TTCN_5122	25651
CTCN_2282	15465	GTCN_2709	25652
GTCN_1409	15466	CTCN_4791	25653
CTCN_2283	15467	ATCN_3220	25654
CTCN_2284	15468	TTCN_5123	25655
GTCN_1410	15469	TTCN_5124	25656
CTCN_2285	15470	GTCN_2710	25657
GTCN_1411	15471	CTCN_4792	25658
CTCN_2286	15472	GTCN_2711	25659
TTCN_2647	15473	TTCN_5125	25660
GTCN_1412	15474	ATCN_3221	25661
CTCN_2287	15475	CTCN_4793	25662
CTCN_2288	15476	GTCN_2712	25663
TTCN_2648	15477	CTCN_4794	25664
CTCN_2289	15478	TTCN_5126	25665
TTCN_2649	15479	TTCN_5127	25666
TTCN_2650	15480	ATCN_3222	25667
GTCN_1413	15481	TTCN_5128	25668
TTCN_2651	15482	TTCN_5129	25669
TTCN_2652	15483	ATCN_3223	25670
TTCN_2653	15484	ATCN_3224	25671
TTCN_2654	15485	ATCN_3225	25672
GTCN_1414	15486	ATCN_3226	25673
TTCN_2655	15487	GTCN_2713	25674
TTCN_2656	15488	GTCN_2714	25675
CTCN_2290	15489	ATCN_3227	25676
TTCN_2657	15490	ATCN_3228	25677
TTCN_2658	15491	TTCN_5130	25678
TTCN_2659	15492	TTCN_5131	25679
CTCN_2291	15493	ATCN_3229	25680
GTCN_1415	15494	ATCN_3230	25681
CTCN_2292	15495	TTCN_5132	25682
CTCN_2293	15496	GTCN_2715	25683

TTCN_2660	15497	CTCN_4795	25684
CTCN_2294	15498	GTCN_2716	25685
GTCN_1416	15499	CTCN_4796	25686
CTCN_2295	15500	TTCN_5133	25687
TTCN_2661	15501	ATCN_3231	25688
CTCN_2296	15502	GTCN_2717	25689
CTCN_2297	15503	CTCN_4797	25690
GTCN_1417	15504	CTCN_4798	25691
TTCN_2662	15505	CTCN_4799	25692
GTCN_1418	15506	TTCN_5134	25693
GTCN_1419	15507	GTCN_2718	25694
ATCN_1621	15508	GTCN_2719	25695
CTCN_2298	15509	CTCN_4800	25696
ATCN_1622	15510	ATCN_3232	25697
TTCN_2663	15511	CTCN_4801	25698
ATCN_1623	15512	ATCN_3233	25699
CTCN_2299	15513	CTCN_4802	25700
GTCN_1420	15514	TTCN_5135	25701
CTCN_2300	15515	TTCN_5136	25702
CTCN_2301	15516	CTCN_4803	25703
CTCN_2302	15517	CTCN_4804	25704
CTCN_2303	15518	TTCN_5137	25705
CTCN_2304	15519	ATCN_3234	25706
TTCN_2664	15520	CTCN_4805	25707
TTCN_2665	15521	CTCN_4806	25708
TTCN_2666	15522	TTCN_5025	25709
ATCN_1624	15523	ATCN_3135	25710
GTCN_1421	15524	ATCN_3136	25711
CTCN_2305	15525	CTCN_4671	25712
CTCN_2306	15526	TTCN_5026	25713
ATCN_1625	15527	GTCN_2660	25714
CTCN_2307	15528	GTCN_2661	25715
ATCN_1626	15529	CTCN_4672	25716
CTCN_2308	15530	CTCN_4673	25717
CTCN_2309	15531	CTCN_4674	25718
TTCN_2667	15532	GTCN_2662	25719
TTCN_2668	15533	ATCN_3137	25720
TTCN_2669	15534	TTCN_5027	25721
TTCN_2670	15535	TTCN_5028	25722
TTCN_2671	15536	CTCN_4675	25723
TTCN_2672	15537	GTCN_2663	25724
TTCN_2673	15538	CTCN_4676	25725
ATCN_1627	15539	TTCN_5029	25726
ATCN_1628	15540	TTCN_5030	25727
TTCN_2674	15541	ATCN_3138	25728
GTCN_1422	15542	ATCN_3139	25729
CTCN_2310	15543	CTCN_4677	25730
ATCN_1629	15544	TTCN_5031	25731
TTCN_2675	15545	ATCN_3140	25732
TTCN_2676	15546	ATCN_3141	25733
ATCN_1630	15547	GTCN_2664	25734
TTCN_2677	15548	GTCN_2665	25735
ATCN_1631	15549	CTCN_4678	25736
CTCN_2311	15550	CTCN_4679	25737
CTCN_2312	15551	GTCN_2666	25738

FIG. 36 (continued)

TTCN_2678	15552	ATCN_3142	25739
ATCN_1632	15553	GTCN_2667	25740
ATCN_1633	15554	CTCN_4680	25741
ATCN_1634	15555	ATCN_3143	25742
GTCN_1423	15556	ATCN_3144	25743
CTCN_2313	15557	CTCN_4681	25744
CTCN_2314	15558	GTCN_2668	25745
ATCN_1635	15559	CTCN_4682	25746
CTCN_2315	15560	CTCN_4683	25747
CTCN_2316	15561	TTCN_5032	25748
GTCN_1424	15562	ATCN_3145	25749
TTCN_2679	15563	ATCN_3146	25750
TTCN_2680	15564	TTCN_5033	25751
ATCN_1636	15565	TTCN_5034	25752
TTCN_2681	15566	CTCN_4684	25753
TTCN_2682	15567	TTCN_5035	25754
ATCN_1637	15568	GTCN_2669	25755
TTCN_2683	15569	CTCN_4685	25756
ATCN_1638	15570	CTCN_4686	25757
TTCN_2684	15571	ATCN_3147	25758
ATCN_1639	15572	CTCN_4687	25759
ATCN_1640	15573	GTCN_2670	25760
TTCN_2685	15574	ATCN_3148	25761
CTCN_2317	15575	ATCN_3149	25762
TTCN_2686	15576	CTCN_4688	25763
CTCN_2318	15577	GTCN_2671	25764
GTCN_1425	15578	CTCN_4689	25765
ATCN_1641	15579	GTCN_2672	25766
CTCN_2319	15580	ATCN_3150	25767
TTCN_2687	15581	ATCN_3151	25768
TTCN_2688	15582	ATCN_3152	25769
TTCN_2689	15583	ATCN_3153	25770
CTCN_2320	15584	CTCN_4690	25771
ATCN_1642	15585	CTCN_4691	25772
TTCN_2690	15586	ATCN_3154	25773
GTCN_1426	15587	TTCN_5036	25774
CTCN_2321	15588	TTCN_5037	25775
CTCN_2322	15589	CTCN_4692	25776
CTCN_2323	15590	ATCN_3155	25777
TTCN_2691	15591	ATCN_3156	25778
TTCN_2692	15592	CTCN_4693	25779
TTCN_2693	15593	ATCN_3157	25780
CTCN_2324	15594	CTCN_4694	25781
ATCN_1643	15595	ATCN_3158	25782
CTCN_2325	15596	CTCN_4695	25783
GTCN_1427	15597	GTCN_2673	25784
ATCN_1644	15598	TTCN_5038	25785
ATCN_1645	15599	TTCN_5039	25786
ATCN_1646	15600	TTCN_5040	25787
TTCN_2694	15601	TTCN_5041	25788
TTCN_2695	15602	TTCN_5042	25789
ATCN_1647	15603	TTCN_5043	25790
ATCN_1648	15604	CTCN_4696	25791
GTCN_1428	15605	CTCN_4697	25792
CTCN_2326	15606	TTCN_5044	25793

CTCN_2327	15607	ATCN_3159	25794
CTCN_2328	15608	GTCN_2674	25795
TTCN_2696	15609	TTCN_5045	25796
CTCN_2329	15610	CTCN_4698	25797
TTCN_2697	15611	CTCN_4699	25798
TTCN_2698	15612	TTCN_5046	25799
CTCN_2330	15613	CTCN_4700	25800
ATCN_1649	15614	CTCN_4701	25801
TTCN_2699	15615	ATCN_3160	25802
ATCN_1650	15616	GTCN_2675	25803
CTCN_2331	15617	TTCN_5047	25804
TTCN_2700	15618	CTCN_4702	25805
CTCN_2332	15619	GTCN_2676	25806
TTCN_2701	15620	CTCN_4703	25807
TTCN_2702	15621	ATCN_3161	25808
GTCN_1429	15622	ATCN_3162	25809
ATCN_1651	15623	GTCN_2677	25810
ATCN_1652	15624	ATCN_3163	25811
GTCN_1430	15625	GTCN_2678	25812
CTCN_2333	15626	GTCN_2679	25813
ATCN_1653	15627	TTCN_5048	25814
ATCN_1654	15628	ATCN_3164	25815
CTCN_2334	15629	TTCN_5049	25816
GTCN_1431	15630	TTCN_5050	25817
GTCN_1432	15631	CTCN_4704	25818
GTCN_1433	15632	CTCN_4705	25819
GTCN_1434	15633	ATCN_3165	25820
GTCN_1435	15634	CTCN_4706	25821
TTCN_2703	15635	TTCN_5051	25822
TTCN_2704	15636	TTCN_5052	25823
GTCN_1436	15637	TTCN_5053	25824
ATCN_1655	15638	GTCN_2680	25825
CTCN_2335	15639	TTCN_5054	25826
ATCN_1656	15640	TTCN_5055	25827
CTCN_2336	15641	ATCN_3166	25828
TTCN_2705	15642	TTCN_5056	25829
CTCN_2337	15643	ATCN_3167	25830
CTCN_2338	15644	ATCN_3168	25831
CTCN_2339	15645	TTCN_5057	25832
CTCN_2340	15646	CTCN_4707	25833
ATCN_1657	15647	TTCN_5058	25834
TTCN_2706	15648	CTCN_4708	25835
TTCN_2707	15649	TTCN_5059	25836
GTCN_1437	15650	ATCN_3169	25837
GTCN_1438	15651	TTCN_5060	25838
CTCN_2341	15652	TTCN_5061	25839
CTCN_2342	15653	TTCN_5062	25840
CTCN_2343	15654	CTCN_4709	25841
TTCN_2708	15655	TTCN_5063	25842
CTCN_2344	15656	CTCN_4710	25843
TTCN_2709	15657	GTCN_2681	25844
CTCN_2345	15658	CTCN_4711	25845
GTCN_1439	15659	CTCN_4712	25846
GTCN_1440	15660	ATCN_3170	25847
CTCN_2346	15661	CTCN_4713	25848

FIG. 36 (continued)

CTCN_2347	15662	ATCN_3171	25849
GTCN_1441	15663	ATCN_3172	25850
TTCN_2710	15664	ATCN_3173	25851
TTCN_2711	15665	CTCN_4714	25852
TTCN_2712	15666	CTCN_4715	25853
CTCN_2348	15667	ATCN_3174	25854
TTCN_2713	15668	ATCN_3175	25855
CTCN_2349	15669	ATCN_3176	25856
ATCN_1658	15670	TTCN_5064	25857
TTCN_2714	15671	CTCN_4716	25858
CTCN_2350	15672	CTCN_4717	25859
GTCN_1442	15673	GTCN_2682	25860
TTCN_2715	15674	TTCN_5065	25861
CTCN_2351	15675	CTCN_4718	25862
ATCN_1659	15676	CTCN_4719	25863
TTCN_2716	15677	ATCN_3177	25864
CTCN_2352	15678	CTCN_4720	25865
CTCN_2353	15679	ATCN_3178	25866
GTCN_1443	15680	CTCN_4721	25867
GTCN_1444	15681	CTCN_4722	25868
ATCN_1660	15682	GTCN_2683	25869
GTCN_1445	15683	TTCN_5066	25870
CTCN_2354	15684	TTCN_5067	25871
TTCN_2717	15685	TTCN_5068	25872
CTCN_2355	15686	ATCN_3179	25873
CTCN_2356	15687	TTCN_5069	25874
GTCN_1446	15688	ATCN_3180	25875
ATCN_1661	15689	TTCN_5070	25876
TTCN_2718	15690	ATCN_3181	25877
GTCN_1447	15691	TTCN_5071	25878
TTCN_2719	15692	ATCN_3182	25879
TTCN_2720	15693	CTCN_4723	25880
ATCN_1662	15694	GTCN_2684	25881
CTCN_2357	15695	CTCN_4724	25882
CTCN_2358	15696	CTCN_4725	25883
TTCN_2721	15697	CTCN_4726	25884
ATCN_1663	15698	CTCN_4727	25885
GTCN_1448	15699	TTCN_5072	25886
TTCN_2722	15700	CTCN_4728	25887
CTCN_2359	15701	CTCN_4729	25888
GTCN_1449	15702	CTCN_4730	25889
CTCN_2360	15703	CTCN_4731	25890
ATCN_1664	15704	ATCN_3183	25891
CTCN_2361	15705	CTCN_4732	25892
GTCN_1450	15706	ATCN_3184	25893
TTCN_2723	15707	TTCN_5073	25894
GTCN_1451	15708	CTCN_4733	25895
CTCN_2362	15709	GTCN_2685	25896
TTCN_2724	15710	CTCN_4734	25897
GTCN_1452	15711	CTCN_4735	25898
TTCN_2725	15712	TTCN_5074	25899
TTCN_2726	15713	CTCN_4736	25900
GTCN_1453	15714	CTCN_4737	25901
GTCN_1454	15715	TTCN_5075	25902
CTCN_2363	15716	CTCN_4738	25903

GTCN_1455	15717	CTCN_4739	25904
CTCN_2364	15718	CTCN_4740	25905
GTCN_1456	15719	TTCN_5076	25906
CTCN_2365	15720	GTCN_2686	25907
CTCN_2366	15721	CTCN_4741	25908
ATCN_1665	15722	CTCN_4742	25909
GTCN_1457	15723	TTCN_5077	25910
CTCN_2367	15724	CTCN_4743	25911
TTCN_2727	15725	CTCN_4744	25912
CTCN_2368	15726	CTCN_4745	25913
TTCN_2728	15727	ATCN_3185	25914
CTCN_2369	15728	ATCN_3186	25915
CTCN_2370	15729	ATCN_3187	25916
TTCN_2729	15730	ATCN_3188	25917
CTCN_2371	15731	TTCN_5078	25918
TTCN_2730	15732	GTCN_2687	25919
TTCN_2731	15733	GTCN_2688	25920
TTCN_2732	15734	CTCN_4746	25921
TTCN_2733	15735	TTCN_5079	25922
CTCN_2372	15736	CTCN_4747	25923
CTCN_2373	15737	CTCN_4748	25924
ATCN_1666	15738	TTCN_5080	25925
ATCN_1667	15739	TTCN_5081	25926
CTCN_2374	15740	CTCN_4749	25927
CTCN_2375	15741	CTCN_4750	25928
CTCN_2376	15742	GTCN_2689	25929
CTCN_2377	15743	CTCN_4751	25930
GTCN_1458	15744	GTCN_2690	25931
GTCN_1459	15745	TTCN_5082	25932
TTCN_2734	15746	ATCN_3189	25933
TTCN_2735	15747	ATCN_3190	25934
CTCN_2378	15748	TTCN_5083	25935
TTCN_2736	15749	ATCN_3191	25936
ATCN_1668	15750	GTCN_2691	25937
ATCN_1669	15751	CTCN_4752	25938
ATCN_1670	15752	TTCN_5084	25939
ATCN_1671	15753	CTCN_4753	25940
CTCN_2379	15754	ATCN_3192	25941
GTCN_1460	15755	CTCN_4754	25942
GTCN_1461	15756	ATCN_3193	25943
TTCN_2737	15757	TTCN_5085	25944
CTCN_2380	15758	ATCN_3194	25945
GTCN_1462	15759	CTCN_4755	25946
CTCN_2381	15760	ATCN_3195	25947
CTCN_2382	15761	TTCN_5086	25948
TTCN_2738	15762	TTCN_5087	25949
CTCN_2383	15763	ATCN_3196	25950
ATCN_1672	15764	ATCN_3197	25951
TTCN_2739	15765	CTCN_4756	25952
TTCN_2740	15766	TTCN_5088	25953
CTCN_2384	15767	CTCN_4757	25954
TTCN_2741	15768	TTCN_5089	25955
TTCN_2742	15769	CTCN_4758	25956
TTCN_2743	15770	TTCN_5090	25957
TTCN_2744	15771	TTCN_5091	25958

FIG. 36 (continued)

TTCN_2745	15772	CTCN_4759	25959
TTCN_2746	15773	GTCN_2692	25960
CTCN_2385	15774	TTCN_5092	25961
TTCN_2747	15775	ATCN_3198	25962
GTCN_1463	15776	CTCN_4760	25963
CTCN_2386	15777	GTCN_2693	25964
CTCN_2387	15778	ATCN_3199	25965
TTCN_2748	15779	TTCN_5093	25966
TTCN_2749	15780	GTCN_2694	25967
CTCN_2388	15781	TTCN_5094	25968
TTCN_2750	15782	GTCN_2695	25969
CTCN_2389	15783	TTCN_5095	25970
GTCN_1464	15784	TTCN_5096	25971
TTCN_2751	15785	ATCN_3200	25972
CTCN_2390	15786	ATCN_3201	25973
CTCN_2391	15787	ATCN_3202	25974
CTCN_2392	15788	CTCN_4761	25975
ATCN_1673	15789	TTCN_5097	25976
TTCN_2752	15790	ATCN_3203	25977
CTCN_2393	15791	CTCN_4762	25978
ATCN_1674	15792	CTCN_4763	25979
ATCN_1675	15793	GTCN_2696	25980
TTCN_2753	15794	CTCN_4764	25981
TTCN_2754	15795	ATCN_3204	25982
CTCN_2394	15796	CTCN_4765	25983
GTCN_1465	15797	CTCN_4766	25984
TTCN_2755	15798	TTCN_5098	25985
GTCN_1466	15799	ATCN_3205	25986
TTCN_2756	15800	ATCN_3206	25987
CTCN_2395	15801	TTCN_5099	25988
TTCN_2757	15802	CTCN_4767	25989
CTCN_2396	15803	CTCN_4768	25990
ATCN_1676	15804	TTCN_5100	25991
CTCN_2397	15805	GTCN_2697	25992
ATCN_1677	15806	GTCN_2698	25993
ATCN_1678	15807	TTCN_5101	25994
CTCN_2398	15808	TTCN_5102	25995
TTCN_2758	15809	ATCN_3207	25996
GTCN_1467	15810	ATCN_3208	25997
TTCN_2759	15811	ATCN_3209	25998
GTCN_1468	15812	CTCN_4769	25999
CTCN_2399	15813	CTCN_4770	26000
CTCN_2400	15814	TTCN_5103	26001
TTCN_2760	15815	CTCN_4771	26002
GTCN_1469	15816	TTCN_5104	26003
ATCN_1679	15817	ATCN_3210	26004
ATCN_1680	15818	TTCN_5105	26005
ATCN_1681	15819	CTCN_4772	26006
CTCN_2401	15820	GTCN_2699	26007
CTCN_2402	15821	TTCN_5106	26008
TTCN_2761	15822	ATCN_3211	26009
CTCN_2403	15823	TTCN_5107	26010
GTCN_1470	15824	ATCN_3212	26011
CTCN_2404	15825	TTCN_5108	26012
GTCN_1471	15826	ATCN_3213	26013

ATCN_1682	15827	CTCN_4773	26014
TTCN_2762	15828	TTCN_5109	26015
GTCN_1472	15829	GTCN_2700	26016
CTCN_2405	15830	ATCN_3214	26017
GTCN_1473	15831	CTCN_4774	26018
TTCN_2763	15832	GTCN_2701	26019
CTCN_2406	15833	CTCN_4775	26020
TTCN_2764	15834	CTCN_4776	26021
ATCN_1683	15835	CTCN_4777	26022
ATCN_1684	15836	TTCN_5110	26023
GTCN_1474	15837	CTCN_4778	26024
ATCN_1685	15838	ATCN_3215	26025
GTCN_1475	15839	TTCN_5111	26026
TTCN_2765	15840	GTCN_2702	26027
TTCN_2766	15841	TTCN_5112	26028
ATCN_1686	15842	CTCN_4779	26029
TTCN_2767	15843	CTCN_4780	26030
CTCN_2407	15844	GTCN_2703	26031
TTCN_2768	15845	GTCN_2704	26032
TTCN_2769	15846	TTCN_5113	26033
TTCN_2770	15847	CTCN_4781	26034
TTCN_2771	15848	CTCN_4782	26035
TTCN_2772	15849	TTCN_5114	26036
ATCN_1687	15850	TTCN_5115	26037
TTCN_2773	15851	ATCN_3216	26038
CTCN_2408	15852	ATCN_3217	26039
CTCN_2409	15853	TTCN_5116	26040
TTCN_2774	15854	CTCN_4783	26041
GTCN_1476	15855	CTCN_4784	26042
TTCN_2775	15856	GTCN_2705	26043
GTCN_1477	15857	ATCN_3218	26044
TTCN_2776	15858	TTCN_5117	26045
CTCN_2410	15859	GTCN_2706	26046
ATCN_1688	15860	TTCN_5118	26047
TTCN_2777	15861	TTCN_5119	26048
CTCN_2411	15862	CTCN_4785	26049
GTCN_1478	15863	CTCN_4786	26050
TTCN_2778	15864	CTCN_4787	26051
TTCN_2779	15865	GTCN_2707	26052
GTCN_1479	15866	CTCN_4788	26053
CTCN_2412	15867	GTCN_2708	26054
TTCN_2780	15868	CTCN_4789	26055
ATCN_1689	15869	CTCN_4790	26056
TTCN_2781	15870	ATCN_3219	26057
CTCN_2413	15871	TTCN_5120	26058
CTCN_2414	15872	TTCN_5121	26059
TTCN_2782	15873	TTCN_5122	26060
TTCN_2783	15874	GTCN_2709	26061
ATCN_1690	15875	CTCN_4791	26062
TTCN_2784	15876	ATCN_3220	26063
TTCN_2785	15877	TTCN_5123	26064
TTCN_2786	15878	TTCN_5124	26065
CTCN_2415	15879	GTCN_2710	26066
ATCN_1691	15880	CTCN_4792	26067
GTCN_1480	15881	GTCN_2711	26068

FIG. 36 (continued)

CTCN_2416	15882	TTCN_5125	26069
TTCN_2787	15883	ATCN_3221	26070
TTCN_2788	15884	CTCN_4793	26071
CTCN_2417	15885	GTCN_2712	26072
CTCN_2418	15886	CTCN_4794	26073
TTCN_2789	15887	TTCN_5126	26074
ATCN_1692	15888	TTCN_5127	26075
ATCN_1693	15889	ATCN_3222	26076
GTCN_1481	15890	TTCN_5128	26077
CTCN_2419	15891	TTCN_5129	26078
TTCN_2790	15892	ATCN_3223	26079
CTCN_2420	15893	ATCN_3224	26080
CTCN_2421	15894	ATCN_3225	26081
CTCN_2422	15895	ATCN_3226	26082
TTCN_2791	15896	GTCN_2713	26083
TTCN_2792	15897	GTCN_2714	26084
CTCN_2423	15898	ATCN_3227	26085
TTCN_2793	15899	ATCN_3228	26086
ATCN_1694	15900	TTCN_5130	26087
ATCN_1695	15901	TTCN_5131	26088
TTCN_2794	15902	ATCN_3229	26089
ATCN_1696	15903	ATCN_3230	26090
TTCN_2795	15904	TTCN_5132	26091
TTCN_2796	15905	GTCN_2715	26092
GTCN_1482	15906	CTCN_4795	26093
CTCN_2424	15907	GTCN_2716	26094
CTCN_2425	15908	CTCN_4796	26095
CTCN_2426	15909	TTCN_5133	26096
CTCN_2427	15910	ATCN_3231	26097
TTCN_2797	15911	GTCN_2717	26098
ATCN_1697	15912	CTCN_4797	26099
ATCN_1698	15913	CTCN_4798	26100
CTCN_2428	15914	CTCN_4799	26101
CTCN_2429	15915	TTCN_5134	26102
CTCN_2430	15916	GTCN_2718	26103
CTCN_2431	15917	GTCN_2719	26104
ATCN_1699	15918	CTCN_4800	26105
TTCN_2798	15919	ATCN_3232	26106
GTCN_1483	15920	CTCN_4801	26107
TTCN_2799	15921	ATCN_3233	26108
ATCN_1700	15922	CTCN_4802	26109
TTCN_2800	15923	TTCN_5135	26110
TTCN_2801	15924	TTCN_5136	26111
ATCN_1701	15925	CTCN_4803	26112
CTCN_2432	15926	CTCN_4804	26113
ATCN_1702	15927	TTCN_5137	26114
TTCN_2802	15928	ATCN_3234	26115
ATCN_1703	15929	CTCN_4805	26116
CTCN_2433	15930	CTCN_4806	26117
TTCN_2803	15931	TTCN_5138	26118
ATCN_1704	15932	CTCN_4807	26119
GTCN_1484	15933	CTCN_4808	26120
ATCN_1705	15934	CTCN_4809	26121
TTCN_2804	15935	CTCN_4810	26122
ATCN_1706	15936	CTCN_4811	26123

CTCN_2434	15937	ATCN_3235	26124
GTCN_1485	15938	ATCN_3236	26125
CTCN_2435	15939	TTCN_5139	26126
GTCN_1486	15940	TTCN_5140	26127
CTCN_2436	15941	GTCN_2720	26128
CTCN_2437	15942	TTCN_5141	26129
GTCN_1487	15943	ATCN_3237	26130
CTCN_2438	15944	TTCN_5142	26131
ATCN_1707	15945	TTCN_5143	26132
ATCN_1708	15946	GTCN_2721	26133
CTCN_2439	15947	TTCN_5144	26134
CTCN_2440	15948	ATCN_3238	26135
CTCN_2441	15949	ATCN_3239	26136
CTCN_2442	15950	TTCN_5145	26137
TTCN_2805	15951	TTCN_5146	26138
TTCN_2806	15952	TTCN_5147	26139
CTCN_2443	15953	TTCN_5148	26140
CTCN_2444	15954	ATCN_3240	26141
CTCN_2445	15955	TTCN_5149	26142
GTCN_1488	15956	CTCN_4812	26143
CTCN_2446	15957	CTCN_4813	26144
GTCN_1489	15958	CTCN_4814	26145
CTCN_2447	15959	CTCN_4815	26146
TTCN_2807	15960	ATCN_3241	26147
ATCN_1709	15961	CTCN_4816	26148
GTCN_1490	15962	GTCN_2722	26149
CTCN_2448	15963	GTCN_2723	26150
ATCN_1710	15964	ATCN_3242	26151
ATCN_1711	15965	TTCN_5150	26152
CTCN_2449	15966	CTCN_4817	26153
GTCN_1491	15967	CTCN_4818	26154
CTCN_2450	15968	ATCN_3243	26155
ATCN_1712	15969	ATCN_3244	26156
ATCN_1713	15970	GTCN_2724	26157
CTCN_2451	15971	CTCN_4819	26158
CTCN_2452	15972	ATCN_3245	26159
ATCN_1714	15973	CTCN_4820	26160
CTCN_2453	15974	CTCN_4821	26161
CTCN_2454	15975	CTCN_4822	26162
ATCN_1715	15976	TTCN_5151	26163
ATCN_1716	15977	CTCN_4823	26164
TTCN_2808	15978	TTCN_5152	26165
CTCN_2455	15979	CTCN_4824	26166
TTCN_2809	15980	CTCN_4825	26167
GTCN_1492	15981	TTCN_5153	26168
CTCN_2456	15982	CTCN_4826	26169
TTCN_2810	15983	CTCN_4827	26170
ATCN_1717	15984	GTCN_2725	26171
GTCN_1493	15985	CTCN_4828	26172
CTCN_2457	15986	CTCN_4829	26173
CTCN_2458	15987	GTCN_2726	26174
TTCN_2811	15988	CTCN_4830	26175
TTCN_2812	15989	CTCN_4831	26176
CTCN_2459	15990	GTCN_2727	26177
TTCN_2813	15991	TTCN_5154	26178

FIG. 36 (continued)

TTCN_2814	15992	CTCN_4832	26179
GTCN_1494	15993	CTCN_4833	26180
TTCN_2815	15994	GTCN_2728	26181
CTCN_2460	15995	TTCN_5155	26182
ATCN_1718	15996	TTCN_5156	26183
ATCN_1719	15997	GTCN_2729	26184
TTCN_2816	15998	GTCN_2730	26185
TTCN_2817	15999	TTCN_5157	26186
CTCN_2461	16000	TTCN_5158	26187
GTCN_1495	16001	CTCN_4834	26188
CTCN_2462	16002	GTCN_2731	26189
CTCN_2463	16003	TTCN_5159	26190
CTCN_2464	16004	TTCN_5160	26191
TTCN_2818	16005	TTCN_5161	26192
TTCN_2819	16006	CTCN_4835	26193
CTCN_2465	16007	CTCN_4836	26194
CTCN_2466	16008	TTCN_5162	26195
GTCN_1496	16009	TTCN_5163	26196
CTCN_2467	16010	ATCN_3246	26197
TTCN_2820	16011	CTCN_4837	26198
TTCN_2821	16012	ATCN_3247	26199
TTCN_2822	16013	CTCN_4838	26200
CTCN_2468	16014	ATCN_3248	26201
CTCN_2469	16015	TTCN_5164	26202
TTCN_2823	16016	ATCN_3249	26203
CTCN_2470	16017	CTCN_4839	26204
ATCN_1720	16018	GTCN_2732	26205
TTCN_2824	16019	TTCN_5165	26206
TTCN_2825	16020	GTCN_2733	26207
CTCN_2471	16021	CTCN_4840	26208
TTCN_2826	16022	GTCN_2734	26209
CTCN_2472	16023	TTCN_5166	26210
TTCN_2827	16024	CTCN_4841	26211
TTCN_2828	16025	GTCN_2735	26212
ATCN_1721	16026	CTCN_4842	26213
ATCN_1722	16027	CTCN_4843	26214
ATCN_1723	16028	TTCN_5167	26215
TTCN_2829	16029	GTCN_2736	26216
ATCN_1724	16030	GTCN_2737	26217
TTCN_2830	16031	ATCN_3250	26218
CTCN_2473	16032	CTCN_4844	26219
GTCN_1497	16033	ATCN_3251	26220
ATCN_1725	16034	TTCN_5168	26221
ATCN_1726	16035	TTCN_5169	26222
TTCN_2831	16036	CTCN_4845	26223
TTCN_2832	16037	CTCN_4846	26224
ATCN_1727	16038	GTCN_2738	26225
CTCN_2474	16039	GTCN_2739	26226
GTCN_1498	16040	ATCN_3252	26227
TTCN_2833	16041	CTCN_4847	26228
ATCN_1728	16042	GTCN_2740	26229
GTCN_1499	16043	GTCN_2741	26230
TTCN_2834	16044	GTCN_2742	26231
CTCN_2475	16045	CTCN_4848	26232
ATCN_1729	16046	ATCN_3253	26233

ATCN_1730	16047	GTCN_2743	26234
CTCN_2476	16048	GTCN_2744	26235
CTCN_2477	16049	GTCN_2745	26236
TTCN_2835	16050	CTCN_4849	26237
TTCN_2836	16051	ATCN_3254	26238
TTCN_2837	16052	GTCN_2746	26239
CTCN_2478	16053	CTCN_4850	26240
ATCN_1731	16054	TTCN_5170	26241
CTCN_2479	16055	TTCN_5171	26242
TTCN_2838	16056	ATCN_3255	26243
TTCN_2839	16057	TTCN_5172	26244
TTCN_2840	16058	CTCN_4851	26245
TTCN_2841	16059	CTCN_4852	26246
CTCN_2480	16060	CTCN_4853	26247
TTCN_2842	16061	CTCN_4854	26248
TTCN_2843	16062	CTCN_4855	26249
GTCN_1500	16063	TTCN_5173	26250
GTCN_1501	16064	CTCN_4856	26251
CTCN_2481	16065	CTCN_4857	26252
GTCN_1502	16066	TTCN_5174	26253
ATCN_1732	16067	CTCN_4858	26254
CTCN_2482	16068	CTCN_4859	26255
TTCN_2844	16069	TTCN_5175	26256
GTCN_1503	16070	TTCN_5176	26257
CTCN_2483	16071	GTCN_2747	26258
TTCN_2845	16072	TTCN_5177	26259
TTCN_2846	16073	CTCN_4860	26260
TTCN_2847	16074	ATCN_3256	26261
CTCN_2484	16075	GTCN_2748	26262
CTCN_2485	16076	CTCN_4861	26263
CTCN_2486	16077	TTCN_5178	26264
TTCN_2848	16078	CTCN_4862	26265
ATCN_1733	16079	CTCN_4863	26266
ATCN_1734	16080	CTCN_4864	26267
GTCN_1504	16081	ATCN_3257	26268
CTCN_2487	16082	CTCN_4865	26269
CTCN_2488	16083	CTCN_4866	26270
CTCN_2489	16084	TTCN_5179	26271
TTCN_2849	16085	GTCN_2749	26272
CTCN_2490	16086	ATCN_3258	26273
CTCN_2491	16087	TTCN_5180	26274
TTCN_2850	16088	GTCN_2750	26275
ATCN_1735	16089	CTCN_4867	26276
GTCN_1505	16090	ATCN_3259	26277
TTCN_2851	16091	ATCN_3260	26278
TTCN_2852	16092	GTCN_2751	26279
ATCN_1736	16093	TTCN_5181	26280
TTCN_2853	16094	CTCN_4868	26281
CTCN_2492	16095	ATCN_3261	26282
TTCN_2854	16096	GTCN_2752	26283
GTCN_1506	16097	ATCN_3262	26284
ATCN_1737	16098	GTCN_2753	26285
ATCN_1738	16099	TTCN_5182	26286
GTCN_1507	16100	CTCN_4869	26287
GTCN_1508	16101	TTCN_5183	26288

FIG. 36 (continued)

CTCN_2493	16102	TTCN_5184	26289
GTCN_1509	16103	CTCN_4870	26290
CTCN_2494	16104	TTCN_5185	26291
ATCN_1739	16105	CTCN_4871	26292
ATCN_1740	16106	CTCN_4872	26293
ATCN_1741	16107	TTCN_5186	26294
ATCN_1742	16108	ATCN_3263	26295
CTCN_2495	16109	TTCN_5187	26296
TTCN_2855	16110	TTCN_5188	26297
CTCN_2496	16111	CTCN_4873	26298
ATCN_1743	16112	GTCN_2754	26299
ATCN_1744	16113	CTCN_4874	26300
ATCN_1745	16114	TTCN_5189	26301
ATCN_1746	16115	TTCN_5190	26302
TTCN_2856	16116	CTCN_4875	26303
CTCN_2497	16117	ATCN_3264	26304
GTCN_1510	16118	ATCN_3265	26305
TTCN_2857	16119	CTCN_4876	26306
GTCN_1511	16120	GTCN_2755	26307
ATCN_1747	16121	ATCN_3266	26308
CTCN_2498	16122	TTCN_5191	26309
CTCN_2499	16123	TTCN_5192	26310
CTCN_2500	16124	TTCN_5193	26311
GTCN_1512	16125	ATCN_3267	26312
ATCN_1748	16126	TTCN_5194	26313
ATCN_1749	16127	GTCN_2756	26314
CTCN_2501	16128	TTCN_5195	26315
CTCN_2502	16129	TTCN_5196	26316
ATCN_1750	16130	GTCN_2757	26317
TTCN_2858	16131	GTCN_2758	26318
TTCN_2859	16132	CTCN_4877	26319
ATCN_1751	16133	CTCN_4878	26320
ATCN_1752	16134	CTCN_4879	26321
TTCN_2860	16135	GTCN_2759	26322
TTCN_2861	16136	CTCN_4880	26323
GTCN_1513	16137	CTCN_4881	26324
GTCN_1514	16138	CTCN_4882	26325
CTCN_2503	16139	ATCN_3268	26326
GTCN_1515	16140	ATCN_3269	26327
GTCN_1516	16141	CTCN_4883	26328
GTCN_1517	16142	TTCN_5197	26329
CTCN_2504	16143	TTCN_5198	26330
CTCN_2505	16144	TTCN_5199	26331
ATCN_1753	16145	TTCN_5200	26332
GTCN_1518	16146	TTCN_5201	26333
ATCN_1754	16147	TTCN_5202	26334
CTCN_2506	16148	TTCN_5203	26335
TTCN_2862	16149	CTCN_4884	26336
TTCN_2863	16150	TTCN_5204	26337
CTCN_2507	16151	TTCN_5205	26338
TTCN_2864	16152	CTCN_4885	26339
GTCN_1519	16153	GTCN_2760	26340
CTCN_2508	16154	TTCN_5206	26341
TTCN_2865	16155	CTCN_4886	26342
TTCN_2866	16156	GTCN_2761	26343

CTCN_2509	16157	GTCN_2762	26344
TTCN_2867	16158	TTCN_5207	26345
CTCN_2510	16159	ATCN_3270	26346
ATCN_1755	16160	TTCN_5208	26347
TTCN_2868	16161	CTCN_4887	26348
ATCN_1756	16162	ATCN_3271	26349
ATCN_1757	16163	TTCN_5209	26350
ATCN_1758	16164	TTCN_5210	26351
CTCN_2511	16165	CTCN_4888	26352
CTCN_2512	16166	CTCN_4889	26353
CTCN_2513	16167	TTCN_5211	26354
CTCN_2514	16168	TTCN_5212	26355
TTCN_2869	16169	CTCN_4890	26356
TTCN_2870	16170	GTCN_2763	26357
CTCN_2515	16171	TTCN_5213	26358
ATCN_1759	16172	CTCN_4891	26359
ATCN_1760	16173	GTCN_2764	26360
TTCN_2871	16174	CTCN_4892	26361
TTCN_2872	16175	TTCN_5214	26362
ATCN_1761	16176	GTCN_2765	26363
CTCN_2516	16177	CTCN_4893	26364
TTCN_2873	16178	TTCN_5215	26365
ATCN_1762	16179	TTCN_5216	26366
ATCN_1763	16180	TTCN_5217	26367
ATCN_1764	16181	GTCN_2766	26368
ATCN_1765	16182	TTCN_5218	26369
GTCN_1520	16183	TTCN_5219	26370
GTCN_1521	16184	TTCN_5220	26371
CTCN_2517	16185	ATCN_3272	26372
TTCN_2874	16186	ATCN_3273	26373
CTCN_2518	16187	CTCN_4894	26374
TTCN_2875	16188	CTCN_4895	26375
GTCN_1522	16189	CTCN_4896	26376
ATCN_1766	16190	CTCN_4897	26377
CTCN_2519	16191	ATCN_3274	26378
TTCN_2876	16192	TTCN_5221	26379
TTCN_2877	16193	GTCN_2767	26380
ATCN_1767	16194	GTCN_2768	26381
GTCN_1523	16195	GTCN_2769	26382
CTCN_2520	16196	GTCN_2770	26383
CTCN_2521	16197	CTCN_4898	26384
CTCN_2522	16198	GTCN_2771	26385
GTCN_1524	16199	TTCN_5222	26386
TTCN_2878	16200	GTCN_2772	26387
CTCN_2523	16201	TTCN_5223	26388
ATCN_1768	16202	TTCN_5224	26389
TTCN_2879	16203	CTCN_4899	26390
TTCN_2880	16204	CTCN_4900	26391
TTCN_2881	16205	GTCN_2773	26392
ATCN_1769	16206	GTCN_2774	26393
ATCN_1770	16207	TTCN_5225	26394
ATCN_1771	16208	TTCN_5226	26395
CTCN_2524	16209	ATCN_3275	26396
CTCN_2525	16210	ATCN_3276	26397
ATCN_1772	16211	CTCN_4901	26398

FIG. 36 (continued)

ATCN_1773	16212	CTCN_4902	26399
TTCN_2882	16213	TTCN_5227	26400
GTCN_1525	16214	TTCN_5228	26401
CTCN_2526	16215	ATCN_3277	26402
ATCN_1774	16216	ATCN_3278	26403
ATCN_1775	16217	GTCN_2775	26404
TTCN_2883	16218	TTCN_5229	26405
ATCN_1776	16219	ATCN_3279	26406
CTCN_2527	16220	TTCN_5230	26407
CTCN_2528	16221	GTCN_2776	26408
TTCN_2884	16222	CTCN_4903	26409
TTCN_2885	16223	GTCN_2777	26410
TTCN_2886	16224	GTCN_2778	26411
CTCN_2529	16225	ATCN_3280	26412
GTCN_1526	16226	TTCN_5231	26413
CTCN_2530	16227	TTCN_5232	26414
TTCN_2887	16228	CTCN_4904	26415
ATCN_1777	16229	ATCN_3281	26416
GTCN_1527	16230	TTCN_5233	26417
TTCN_2888	16231	CTCN_4905	26418
CTCN_2531	16232	GTCN_2779	26419
TTCN_2889	16233	GTCN_2780	26420
ATCN_1778	16234	CTCN_4906	26421
TTCN_2890	16235	ATCN_3282	26422
CTCN_2532	16236	TTCN_5234	26423
TTCN_2891	16237	ATCN_3283	26424
CTCN_2533	16238	GTCN_2781	26425
TTCN_2892	16239	CTCN_4907	26426
GTCN_1528	16240	CTCN_4908	26427
TTCN_2893	16241	CTCN_4909	26428
ATCN_1779	16242	CTCN_4910	26429
TTCN_2894	16243	TTCN_5235	26430
ATCN_1780	16244	ATCN_3284	26431
CTCN_2534	16245	TTCN_5236	26432
CTCN_2535	16246	CTCN_4911	26433
CTCN_2536	16247	CTCN_4912	26434
CTCN_2537	16248	CTCN_4913	26435
ATCN_1781	16249	GTCN_2782	26436
ATCN_1782	16250	ATCN_3285	26437
ATCN_1783	16251	ATCN_3286	26438
CTCN_2538	16252	GTCN_2783	26439
GTCN_1529	16253	TTCN_5237	26440
GTCN_1530	16254	TTCN_5238	26441
ATCN_1784	16255	TTCN_5239	26442
TTCN_2895	16256	ATCN_3287	26443
ATCN_1785	16257	ATCN_3288	26444
CTCN_2539	16258	CTCN_4914	26445
GTCN_1531	16259	TTCN_5240	26446
ATCN_1786	16260	ATCN_3289	26447
ATCN_1787	16261	GTCN_2784	26448
GTCN_1532	16262	GTCN_2785	26449
CTCN_2540	16263	TTCN_5241	26450
CTCN_2541	16264	TTCN_5242	26451
GTCN_1533	16265	CTCN_4915	26452
TTCN_2896	16266	ATCN_3290	26453

GTCN_1534	16267	CTCN_4916	26454
TTCN_2897	16268	CTCN_4917	26455
GTCN_1535	16269	TTCN_5243	26456
ATCN_1788	16270	GTCN_2786	26457
TTCN_2898	16271	ATCN_3291	26458
TTCN_2899	16272	ATCN_3292	26459
TTCN_2900	16273	TTCN_5244	26460
TTCN_2901	16274	CTCN_4918	26461
CTCN_2542	16275	ATCN_3293	26462
ATCN_1789	16276	ATCN_3294	26463
TTCN_2902	16277	CTCN_4919	26464
CTCN_2543	16278	ATCN_3295	26465
TTCN_2903	16279	TTCN_5245	26466
ATCN_1790	16280	CTCN_4920	26467
TTCN_2904	16281	ATCN_3296	26468
GTCN_1536	16282	ATCN_3297	26469
TTCN_2905	16283	ATCN_3298	26470
CTCN_2544	16284	CTCN_4921	26471
CTCN_2545	16285	TTCN_5246	26472
CTCN_2546	16286	GTCN_2787	26473
ATCN_1791	16287	TTCN_5247	26474
ATCN_1792	16288	CTCN_4922	26475
TTCN_2906	16289	ATCN_3299	26476
TTCN_2907	16290	TTCN_5248	26477
GTCN_1537	16291	GTCN_2788	26478
CTCN_2547	16292	TTCN_5249	26479
TTCN_2908	16293	ATCN_3300	26480
TTCN_2909	16294	ATCN_3301	26481
GTCN_1538	16295	ATCN_3302	26482
ATCN_1793	16296	CTCN_4923	26483
TTCN_2910	16297	GTCN_2789	26484
ATCN_1794	16298	TTCN_5250	26485
ATCN_1795	16299	ATCN_3303	26486
ATCN_1796	16300	CTCN_4924	26487
TTCN_2911	16301	ATCN_3304	26488
ATCN_1797	16302	CTCN_4925	26489
CTCN_2548	16303	GTCN_2790	26490
ATCN_1798	16304	ATCN_3305	26491
ATCN_1799	16305	TTCN_5251	26492
TTCN_2912	16306	ATCN_3306	26493
TTCN_2913	16307	ATCN_3307	26494
ATCN_1800	16308	ATCN_3308	26495
TTCN_2914	16309	GTCN_2791	26496
GTCN_1539	16310	CTCN_4926	26497
ATCN_1801	16311	ATCN_3309	26498
TTCN_2915	16312	ATCN_3310	26499
TTCN_2916	16313	ATCN_3311	26500
CTCN_2549	16314	CTCN_4927	26501
TTCN_2917	16315	CTCN_4928	26502
TTCN_2918	16316	CTCN_4929	26503
TTCN_2919	16317	ATCN_3312	26504
ATCN_1802	16318	TTCN_5252	26505
ATCN_1803	16319	CTCN_4930	26506
TTCN_2920	16320	TTCN_5253	26507
CTCN_2550	16321	ATCN_3313	26508

FIG. 36 (continued)

TTCN_2921	16322	TTCN_5254	26509
TTCN_2922	16323	TTCN_5255	26510
CTCN_2551	16324	TTCN_5256	26511
TTCN_2923	16325	TTCN_5257	26512
TTCN_2924	16326	CTCN_4931	26513
TTCN_2925	16327	CTCN_4932	26514
GTCN_1540	16328	CTCN_4933	26515
TTCN_2926	16329	TTCN_5258	26516
TTCN_2927	16330	TTCN_5259	26517
TTCN_2928	16331	TTCN_5260	26518
TTCN_2929	16332	ATCN_3314	26519
TTCN_2930	16333	ATCN_3315	26520
CTCN_2552	16334	GTCN_2792	26521
GTCN_1541	16335	GTCN_2793	26522
ATCN_1804	16336	CTCN_4934	26523
CTCN_2553	16337	TTCN_5261	26524
GTCN_1542	16338	GTCN_2794	26525
TTCN_2931	16339	GTCN_2795	26526
TTCN_2932	16340	ATCN_3316	26527
CTCN_2554	16341	CTCN_4935	26528
TTCN_2933	16342	ATCN_3317	26529
GTCN_1543	16343	TTCN_5262	26530
TTCN_2934	16344	CTCN_4936	26531
CTCN_2555	16345	GTCN_2796	26532
CTCN_2556	16346	GTCN_2797	26533
GTCN_1544	16347	CTCN_4937	26534
CTCN_2557	16348	GTCN_2798	26535
CTCN_2558	16349	CTCN_4938	26536
ATCN_1805	16350	GTCN_2799	26537
CTCN_2559	16351	TTCN_5263	26538
TTCN_2935	16352	ATCN_3318	26539
TTCN_2936	16353	CTCN_4939	26540
CTCN_2560	16354	ATCN_3319	26541
GTCN_1545	16355	CTCN_4940	26542
TTCN_2937	16356	TTCN_5264	26543
ATCN_1806	16357	TTCN_5265	26544
TTCN_2938	16358	ATCN_3320	26545
ATCN_1807	16359	ATCN_3321	26546
TTCN_2939	16360	TTCN_5266	26547
GTCN_1546	16361	GTCN_2800	26548
TTCN_2940	16362	CTCN_4941	26549
TTCN_2941	16363	ATCN_3322	26550
ATCN_1808	16364	ATCN_3323	26551
GTCN_1547	16365	GTCN_2801	26552
TTCN_2942	16366	ATCN_3324	26553
TTCN_2943	16367	TTCN_5267	26554
ATCN_1809	16368	ATCN_3325	26555
TTCN_2944	16369	TTCN_5268	26556
TTCN_2945	16370	CTCN_4942	26557
CTCN_2561	16371	CTCN_4943	26558
TTCN_2946	16372	CTCN_4944	26559
GTCN_1548	16373	TTCN_5269	26560
CTCN_2562	16374	CTCN_4945	26561
GTCN_1549	16375	CTCN_4946	26562
ATCN_1810	16376	CTCN_4947	26563

CTCN_2563	16377	CTCN_4948	26564
ATCN_1811	16378	CTCN_4949	26565
TTCN_2947	16379	ATCN_3326	26566
ATCN_1812	16380	TTCN_5270	26567
GTCN_1550	16381	TTCN_5271	26568
CTCN_2564	16382	CTCN_4950	26569
CTCN_2565	16383	ATCN_3327	26570
GTCN_1551	16384	ATCN_3328	26571
CTCN_2566	16385	GTCN_2802	26572
TTCN_2948	16386	ATCN_3329	26573
CTCN_2567	16387	ATCN_3330	26574
GTCN_1552	16388	ATCN_3331	26575
CTCN_2568	16389	ATCN_3332	26576
CTCN_2569	16390	ATCN_3333	26577
TTCN_2949	16391	GTCN_2803	26578
CTCN_2570	16392	TTCN_5272	26579
ATCN_1813	16393	TTCN_5273	26580
ATCN_1814	16394	TTCN_5274	26581
ATCN_1815	16395	GTCN_2804	26582
TTCN_2950	16396	GTCN_2805	26583
TTCN_2951	16397	CTCN_4951	26584
TTCN_2952	16398	GTCN_2806	26585
TTCN_2953	16399	CTCN_4952	26586
ATCN_1816	16400	CTCN_4953	26587
ATCN_1817	16401	TTCN_5275	26588
TTCN_2954	16402	TTCN_5276	26589
GTCN_1553	16403	ATCN_3334	26590
GTCN_1554	16404	CTCN_4954	26591
TTCN_2955	16405	TTCN_5277	26592
ATCN_1818	16406	TTCN_5278	26593
ATCN_1819	16407	GTCN_2807	26594
TTCN_2956	16408	ATCN_3335	26595
TTCN_2957	16409	ATCN_3336	26596
TTCN_2958	16410	GTCN_2808	26597
ATCN_1820	16411	ATCN_3337	26598
ATCN_1821	16412	ATCN_3338	26599
CTCN_2571	16413	ATCN_3339	26600
TTCN_2959	16414	CTCN_4955	26601
ATCN_1822	16415	TTCN_5279	26602
TTCN_2960	16416	CTCN_4956	26603
ATCN_1823	16417	TTCN_5280	26604
GTCN_1555	16418	GTCN_2809	26605
GTCN_1556	16419	TTCN_5281	26606
CTCN_2572	16420	CTCN_4957	26607
CTCN_2573	16421	TTCN_5282	26608
TTCN_2961	16422	CTCN_4958	26609
TTCN_2962	16423	CTCN_4959	26610
TTCN_2963	16424	TTCN_5283	26611
ATCN_1824	16425	CTCN_4960	26612
CTCN_2574	16426	ATCN_3340	26613
GTCN_1557	16427	ATCN_3341	26614
TTCN_2964	16428	ATCN_3342	26615
TTCN_2965	16429	CTCN_4961	26616
ATCN_1825	16430	TTCN_5284	26617
CTCN_2575	16431	TTCN_5285	26618

FIG. 36 (continued)

TTCN_2966	16432	TTCN_5286	26619
ATCN_1826	16433	TTCN_5287	26620
CTCN_2576	16434	CTCN_4962	26621
GTCN_1558	16435	CTCN_4963	26622
TTCN_2967	16436	CTCN_4964	26623
ATCN_1827	16437	ATCN_3343	26624
TTCN_2968	16438	TTCN_5288	26625
GTCN_1559	16439	GTCN_2810	26626
GTCN_1560	16440	GTCN_2811	26627
TTCN_2969	16441	TTCN_5289	26628
ATCN_1828	16442	TTCN_5290	26629
ATCN_1829	16443	CTCN_4965	26630
ATCN_1830	16444	ATCN_3344	26631
ATCN_1831	16445	TTCN_5291	26632
TTCN_2970	16446	ATCN_3345	26633
CTCN_2577	16447	TTCN_5292	26634
GTCN_1561	16448	CTCN_4966	26635
GTCN_1562	16449	GTCN_2812	26636
GTCN_1563	16450	GTCN_2813	26637
GTCN_1564	16451	GTCN_2814	26638
CTCN_2578	16452	TTCN_5293	26639
CTCN_2579	16453	TTCN_5294	26640
TTCN_2971	16454	ATCN_3346	26641
ATCN_1832	16455	TTCN_5295	26642
CTCN_2580	16456	TTCN_5296	26643
GTCN_1565	16457	ATCN_3347	26644
TTCN_2972	16458	GTCN_2815	26645
GTCN_1566	16459	CTCN_4967	26646
CTCN_2581	16460	TTCN_5297	26647
TTCN_2973	16461	GTCN_2816	26648
ATCN_1833	16462	CTCN_4968	26649
CTCN_2582	16463	CTCN_4969	26650
CTCN_2583	16464	CTCN_4970	26651
CTCN_2584	16465	TTCN_5298	26652
CTCN_2585	16466	TTCN_5299	26653
TTCN_2974	16467	GTCN_2817	26654
ATCN_1834	16468	TTCN_5300	26655
GTCN_1567	16469	ATCN_3348	26656
TTCN_2975	16470	ATCN_3349	26657
TTCN_2976	16471	GTCN_2818	26658
ATCN_1835	16472	ATCN_3350	26659
CTCN_2586	16473	ATCN_3351	26660
CTCN_2587	16474	ATCN_3352	26661
TTCN_2977	16475	TTCN_5301	26662
TTCN_2978	16476	GTCN_2819	26663
TTCN_2979	16477	CTCN_4971	26664
CTCN_2588	16478	TTCN_5302	26665
ATCN_1836	16479	TTCN_5303	26666
TTCN_2980	16480	TTCN_5304	26667
TTCN_2981	16481	TTCN_5305	26668
CTCN_2589	16482	ATCN_3353	26669
TTCN_2982	16483	ATCN_3354	26670
CTCN_2590	16484	CTCN_4972	26671
CTCN_2591	16485	ATCN_3355	26672
ATCN_1837	16486	GTCN_2820	26673

ATCN_1838	16487	ATCN_3356	26674
ATCN_1839	16488	ATCN_3357	26675
CTCN_2592	16489	TTCN_5306	26676
GTCN_1568	16490	TTCN_5307	26677
ATCN_1840	16491	GTCN_2821	26678
ATCN_1841	16492	ATCN_3358	26679
ATCN_1842	16493	TTCN_5308	26680
ATCN_1843	16494	TTCN_5309	26681
CTCN_2593	16495	TTCN_5310	26682
CTCN_2594	16496	TTCN_5311	26683
ATCN_1844	16497	ATCN_3359	26684
ATCN_1845	16498	TTCN_5312	26685
ATCN_1846	16499	CTCN_4973	26686
CTCN_2595	16500	TTCN_5313	26687
CTCN_2596	16501	TTCN_5314	26688
ATCN_1847	16502	ATCN_3360	26689
CTCN_2597	16503	CTCN_4974	26690
TTCN_2983	16504	GTCN_2822	26691
CTCN_2598	16505	CTCN_4975	26692
TTCN_2984	16506	TTCN_5315	26693
ATCN_1848	16507	TTCN_5316	26694
ATCN_1849	16508	TTCN_5317	26695
CTCN_2599	16509	TTCN_5318	26696
TTCN_2985	16510	ATCN_3361	26697
TTCN_2986	16511	TTCN_5319	26698
TTCN_2987	16512	TTCN_5320	26699
TTCN_2988	16513	ATCN_3362	26700
ATCN_1850	16514	CTCN_4976	26701
ATCN_1851	16515	TTCN_5321	26702
TTCN_2989	16516	TTCN_5322	26703
ATCN_1852	16517	CTCN_4977	26704
ATCN_1853	16518	TTCN_5323	26705
TTCN_2990	16519	TTCN_5324	26706
TTCN_2991	16520	GTCN_2823	26707
ATCN_1854	16521	GTCN_2824	26708
CTCN_2600	16522	TTCN_5325	26709
TTCN_2992	16523	TTCN_5326	26710
GTCN_1569	16524	CTCN_4978	26711
TTCN_2993	16525	ATCN_3363	26712
GTCN_1570	16526	ATCN_3364	26713
CTCN_2601	16527	TTCN_5327	26714
CTCN_2602	16528	ATCN_3365	26715
GTCN_1571	16529	CTCN_4979	26716
ATCN_1855	16530	TTCN_5328	26717
TTCN_2994	16531	ATCN_3366	26718
ATCN_1856	16532	ATCN_3367	26719
TTCN_2995	16533	TTCN_5329	26720
ATCN_1857	16534	TTCN_5330	26721
CTCN_2603	16535	CTCN_4980	26722
ATCN_1858	16536	TTCN_5331	26723
TTCN_2996	16537	TTCN_5332	26724
ATCN_1859	16538	TTCN_5333	26725
ATCN_1860	16539	TTCN_5334	26726
ATCN_1861	16540	TTCN_5335	26727
TTCN_2997	16541	ATCN_3368	26728

FIG. 36 (continued)

TTCN_2998	16542	GTCN_2825	26729
ATCN_1862	16543	TTCN_5336	26730
CTCN_2604	16544	ATCN_3369	26731
CTCN_2605	16545	ATCN_3370	26732
GTCN_1572	16546	TTCN_5337	26733
CTCN_2606	16547	CTCN_4981	26734
TTCN_2999	16548	CTCN_4982	26735
TTCN_3000	16549	CTCN_4983	26736
TTCN_3001	16550	TTCN_5338	26737
CTCN_2607	16551	TTCN_5339	26738
TTCN_3002	16552	ATCN_3371	26739
TTCN_3003	16553	GTCN_2826	26740
TTCN_3004	16554	ATCN_3372	26741
GTCN_1573	16555	GTCN_2827	26742
ATCN_1863	16556	TTCN_5340	26743
CTCN_2608	16557	TTCN_5341	26744
TTCN_3005	16558	ATCN_3373	26745
CTCN_2609	16559	CTCN_4984	26746
GTCN_1574	16560	CTCN_4985	26747
GTCN_1575	16561	TTCN_5342	26748
TTCN_3006	16562	TTCN_5343	26749
TTCN_3007	16563	CTCN_4986	26750
GTCN_1576	16564	TTCN_5344	26751
CTCN_2610	16565	ATCN_3374	26752
TTCN_3008	16566	TTCN_5345	26753
GTCN_1577	16567	GTCN_2828	26754
GTCN_1578	16568	GTCN_2829	26755
CTCN_2611	16569	TTCN_5346	26756
CTCN_2612	16570	TTCN_5347	26757
TTCN_3009	16571	TTCN_5348	26758
TTCN_3010	16572	TTCN_5349	26759
CTCN_2613	16573	GTCN_2830	26760
CTCN_2614	16574	ATCN_3375	26761
ATCN_1864	16575	TTCN_5350	26762
TTCN_3011	16576	TTCN_5351	26763
ATCN_1865	16577	TTCN_5352	26764
GTCN_1579	16578	CTCN_4987	26765
ATCN_1866	16579	CTCN_4988	26766
GTCN_1580	16580	CTCN_4989	26767
TTCN_3012	16581	GTCN_2831	26768
ATCN_1867	16582	TTCN_5353	26769
TTCN_3013	16583	TTCN_5354	26770
CTCN_2615	16584	TTCN_5355	26771
TTCN_3014	16585	ATCN_3376	26772
ATCN_1868	16586	CTCN_4990	26773
TTCN_3015	16587	TTCN_5356	26774
ATCN_1869	16588	GTCN_2832	26775
ATCN_1870	16589	GTCN_2833	26776
CTCN_2616	16590	CTCN_4991	26777
TTCN_3016	16591	TTCN_5357	26778
GTCN_1581	16592	CTCN_4992	26779
GTCN_1582	16593	TTCN_5358	26780
CTCN_2617	16594	TTCN_5359	26781
TTCN_3017	16595	GTCN_2834	26782
TTCN_3018	16596	GTCN_2835	26783

GTCN_1583	16597	GTCN_2836	26784
ATCN_1871	16598	ATCN_3377	26785
GTCN_1584	16599	TTCN_5360	26786
ATCN_1872	16600	ATCN_3378	26787
TTCN_3019	16601	GTCN_2837	26788
TTCN_3020	16602	ATCN_3379	26789
TTCN_3021	16603	TTCN_5361	26790
ATCN_1873	16604	TTCN_5362	26791
TTCN_3022	16605	CTCN_4993	26792
TTCN_3023	16606	CTCN_4994	26793
TTCN_3024	16607	GTCN_2838	26794
TTCN_3025	16608	TTCN_5363	26795
GTCN_1585	16609	GTCN_2839	26796
CTCN_2618	16610	CTCN_4995	26797
CTCN_2619	16611	GTCN_2840	26798
TTCN_3026	16612	GTCN_2841	26799
TTCN_3027	16613	ATCN_3380	26800
ATCN_1874	16614	ATCN_3381	26801
ATCN_1875	16615	ATCN_3382	26802
TTCN_3028	16616	CTCN_4996	26803
CTCN_2620	16617	GTCN_2842	26804
GTCN_1586	16618	GTCN_2843	26805
CTCN_2621	16619	CTCN_4997	26806
GTCN_1587	16620	CTCN_4998	26807
ATCN_1876	16621	TTCN_5364	26808
ATCN_1877	16622	ATCN_3383	26809
CTCN_2622	16623	CTCN_4999	26810
CTCN_2623	16624	TTCN_5365	26811
CTCN_2624	16625	TTCN_5366	26812
TTCN_3029	16626	GTCN_2844	26813
ATCN_1878	16627	CTCN_5000	26814
TTCN_3030	16628	TTCN_5367	26815
GTCN_1588	16629	GTCN_2845	26816
CTCN_2625	16630	GTCN_2846	26817
CTCN_2626	16631	TTCN_5368	26818
CTCN_2627	16632	ATCN_3384	26819
GTCN_1589	16633	ATCN_3385	26820
TTCN_3031	16634	GTCN_2847	26821
ATCN_1879	16635	TTCN_5369	26822
TTCN_3032	16636	TTCN_5370	26823
CTCN_2628	16637	TTCN_5371	26824
CTCN_2629	16638	TTCN_5372	26825
CTCN_2630	16639	TTCN_5373	26826
CTCN_2631	16640	GTCN_2848	26827
TTCN_3033	16641	CTCN_5001	26828
CTCN_2632	16642	CTCN_5002	26829
CTCN_2633	16643	GTCN_2849	26830
ATCN_1880	16644	CTCN_5003	26831
TTCN_3034	16645	GTCN_2850	26832
CTCN_2634	16646	CTCN_5004	26833
TTCN_3035	16647	TTCN_5374	26834
GTCN_1590	16648	ATCN_3386	26835
CTCN_2635	16649	TTCN_5375	26836
CTCN_2636	16650	TTCN_5376	26837
ATCN_1881	16651	ATCN_3387	26838

FIG. 36 (continued)

ATCN_1882	16652	TTCN_5377	26839
CTCN_2637	16653	CTCN_5005	26840
CTCN_2638	16654	CTCN_5006	26841
CTCN_2639	16655	TTCN_5378	26842
TTCN_3036	16656	TTCN_5379	26843
CTCN_2640	16657	CTCN_5007	26844
GTCN_1591	16658	GTCN_2851	26845
CTCN_2641	16659	CTCN_5008	26846
TTCN_3037	16660	TTCN_5380	26847
CTCN_2642	16661	ATCN_3388	26848
CTCN_2643	16662	CTCN_5009	26849
ATCN_1883	16663	TTCN_5381	26850
TTCN_3038	16664	TTCN_5382	26851
TTCN_3039	16665	GTCN_2852	26852
GTCN_1592	16666	TTCN_5383	26853
TTCN_3040	16667	GTCN_2853	26854
TTCN_3041	16668	TTCN_5384	26855
ATCN_1884	16669	ATCN_3389	26856
GTCN_1593	16670	CTCN_5010	26857
ATCN_1885	16671	TTCN_5385	26858
ATCN_1886	16672	ATCN_3390	26859
TTCN_3042	16673	ATCN_3391	26860
TTCN_3043	16674	TTCN_5386	26861
GTCN_1594	16675	ATCN_3392	26862
ATCN_1887	16676	CTCN_5011	26863
ATCN_1888	16677	CTCN_5012	26864
TTCN_3044	16678	ATCN_3393	26865
TTCN_3045	16679	TTCN_5387	26866
TTCN_3046	16680	GTCN_2854	26867
TTCN_3047	16681	ATCN_3394	26868
GTCN_1595	16682	TTCN_5388	26869
TTCN_3048	16683	ATCN_3395	26870
ATCN_1889	16684	ATCN_3396	26871
CTCN_2644	16685	TTCN_5389	26872
ATCN_1890	16686	TTCN_5390	26873
TTCN_3049	16687	CTCN_5013	26874
CTCN_2645	16688	GTCN_2855	26875
CTCN_2646	16689	GTCN_2856	26876
TTCN_3050	16690	GTCN_2857	26877
CTCN_2647	16691	CTCN_5014	26878
CTCN_2648	16692	GTCN_2858	26879
ATCN_1891	16693	ATCN_3397	26880
CTCN_2649	16694	CTCN_5015	26881
TTCN_3051	16695	TTCN_5391	26882
TTCN_3052	16696	TTCN_5392	26883
CTCN_2650	16697	GTCN_2859	26884
TTCN_3053	16698	ATCN_3398	26885
CTCN_2651	16699	GTCN_2860	26886
TTCN_3054	16700	GTCN_2861	26887
GTCN_1596	16701	CTCN_5016	26888
ATCN_1892	16702	CTCN_5017	26889
ATCN_1893	16703	GTCN_2862	26890
ATCN_1894	16704	GTCN_2863	26891
ATCN_1895	16705	GTCN_2864	26892
TTCN_3055	16706	CTCN_5018	26893

TTCN_3056	16707	ATCN_3399	26894
GTCN_1597	16708	GTCN_2865	26895
CTCN_2652	16709	TTCN_5393	26896
TTCN_3057	16710	GTCN_2866	26897
CTCN_2653	16711	GTCN_2867	26898
TTCN_3058	16712	CTCN_5019	26899
GTCN_1598	16713	GTCN_2868	26900
CTCN_2654	16714	CTCN_5020	26901
TTCN_3059	16715	GTCN_2869	26902
TTCN_3060	16716	TTCN_5394	26903
CTCN_2655	16717	CTCN_5021	26904
ATCN_1896	16718	TTCN_5395	26905
ATCN_1897	16719	TTCN_5396	26906
ATCN_1898	16720	TTCN_5397	26907
TTCN_3061	16721	CTCN_5022	26908
CTCN_2656	16722	TTCN_5398	26909
GTCN_1599	16723	GTCN_2870	26910
TTCN_3062	16724	TTCN_5399	26911
CTCN_2657	16725	TTCN_5400	26912
TTCN_3063	16726	CTCN_5023	26913
TTCN_3064	16727	TTCN_5401	26914
TTCN_3065	16728	TTCN_5402	26915
TTCN_3066	16729	TTCN_5403	26916
GTCN_1600	16730	TTCN_5404	26917
CTCN_2658	16731	ATCN_3400	26918
TTCN_3067	16732	TTCN_5405	26919
ATCN_1899	16733	GTCN_2871	26920
GTCN_1601	16734	TTCN_5406	26921
ATCN_1900	16735	GTCN_2872	26922
ATCN_1901	16736	TTCN_5407	26923
TTCN_3068	16737	CTCN_5024	26924
CTCN_2659	16738	GTCN_2873	26925
GTCN_1602	16739	GTCN_2874	26926
CTCN_2660	16740	CTCN_5025	26927
CTCN_2661	16741	TTCN_5408	26928
CTCN_2662	16742	CTCN_5026	26929
GTCN_1603	16743	TTCN_5409	26930
CTCN_2663	16744	TTCN_5410	26931
CTCN_2664	16745	TTCN_5411	26932
ATCN_1902	16746	CTCN_5027	26933
CTCN_2665	16747	TTCN_5412	26934
GTCN_1604	16748	CTCN_5028	26935
CTCN_2666	16749	ATCN_3401	26936
ATCN_1903	16750	CTCN_5029	26937
TTCN_3069	16751	CTCN_5030	26938
ATCN_1904	16752	GTCN_2875	26939
TTCN_3070	16753	TTCN_5413	26940
CTCN_2667	16754	ATCN_3402	26941
CTCN_2668	16755	CTCN_5031	26942
GTCN_1605	16756	GTCN_2876	26943
CTCN_2669	16757	ATCN_3403	26944
CTCN_2670	16758	CTCN_5032	26945
CTCN_2671	16759	CTCN_5033	26946
TTCN_3071	16760	CTCN_5034	26947
ATCN_1905	16761	TTCN_5414	26948

FIG. 36 (continued)

CTCN_2672	16762	ATCN_3404	26949
TTCN_3072	16763	ATCN_3405	26950
TTCN_3073	16764	TTCN_5415	26951
GTCN_1606	16765	CTCN_5035	26952
CTCN_2673	16766	ATCN_3406	26953
TTCN_3074	16767	ATCN_3407	26954
ATCN_1906	16768	CTCN_5036	26955
TTCN_3075	16769	TTCN_5416	26956
ATCN_1907	16770	TTCN_5417	26957
CTCN_2674	16771	GTCN_2877	26958
GTCN_1607	16772	TTCN_5418	26959
ATCN_1908	16773	GTCN_2878	26960
ATCN_1909	16774	CTCN_5037	26961
ATCN_1910	16775	TTCN_5419	26962
GTCN_1608	16776	TTCN_5420	26963
TTCN_3076	16777	TTCN_5421	26964
TTCN_3077	16778	TTCN_5422	26965
ATCN_1911	16779	TTCN_5423	26966
TTCN_3078	16780	CTCN_5038	26967
CTCN_2675	16781	GTCN_2879	26968
CTCN_2676	16782	ATCN_3408	26969
TTCN_3079	16783	GTCN_2880	26970
ATCN_1912	16784	TTCN_5424	26971
TTCN_3080	16785	ATCN_3409	26972
TTCN_3081	16786	ATCN_3410	26973
CTCN_2677	16787	GTCN_2881	26974
CTCN_2678	16788	TTCN_5425	26975
CTCN_2679	16789	ATCN_3411	26976
TTCN_3082	16790	CTCN_5039	26977
TTCN_3083	16791	GTCN_2882	26978
ATCN_1913	16792	CTCN_5040	26979
ATCN_1914	16793	CTCN_5041	26980
GTCN_1609	16794	ATCN_3412	26981
GTCN_1610	16795	GTCN_2883	26982
CTCN_2680	16796	CTCN_5042	26983
TTCN_3084	16797	ATCN_3413	26984
TTCN_3085	16798	CTCN_5043	26985
CTCN_2681	16799	TTCN_5426	26986
GTCN_1611	16800	ATCN_3414	26987
CTCN_2682	16801	CTCN_5044	26988
GTCN_1612	16802	GTCN_2884	26989
CTCN_2683	16803	TTCN_5427	26990
GTCN_1613	16804	GTCN_2885	26991
CTCN_2684	16805	TTCN_5428	26992
GTCN_1614	16806	CTCN_5045	26993
CTCN_2685	16807	TTCN_5429	26994
CTCN_2686	16808	GTCN_2886	26995
CTCN_2687	16809	TTCN_5430	26996
CTCN_2688	16810	GTCN_2887	26997
TTCN_3086	16811	TTCN_5431	26998
ATCN_1915	16812	CTCN_5046	26999
TTCN_3087	16813	CTCN_5047	27000
ATCN_1916	16814	GTCN_2888	27001
TTCN_3088	16815	ATCN_3415	27002
CTCN_2689	16816	GTCN_2889	27003

CTCN_2690	16817	TTCN_5432	27004
CTCN_2691	16818	TTCN_5433	27005
TTCN_3089	16819	GTCN_2890	27006
CTCN_2692	16820	TTCN_5434	27007
TTCN_3090	16821	ATCN_3416	27008
ATCN_1917	16822	ATCN_3417	27009
GTCN_1615	16823	ATCN_3418	27010
CTCN_2693	16824	CTCN_5048	27011
CTCN_2694	16825	TTCN_5435	27012
TTCN_3091	16826	TTCN_5436	27013
CTCN_2695	16827	TTCN_5437	27014
CTCN_2696	16828	ATCN_3419	27015
ATCN_1918	16829	ATCN_3420	27016
ATCN_1919	16830	CTCN_5049	27017
GTCN_1616	16831	ATCN_3421	27018
TTCN_3092	16832	TTCN_5438	27019
TTCN_3093	16833	TTCN_5439	27020
ATCN_1920	16834	CTCN_5050	27021
TTCN_3094	16835	GTCN_2891	27022
ATCN_1921	16836	ATCN_3422	27023
CTCN_2697	16837	CTCN_5051	27024
CTCN_2698	16838	GTCN_2892	27025
CTCN_2699	16839	CTCN_5052	27026
TTCN_3095	16840	GTCN_2893	27027
TTCN_3096	16841	TTCN_5440	27028
ATCN_1922	16842	CTCN_5053	27029
GTCN_1617	16843	CTCN_5054	27030
ATCN_1923	16844	CTCN_5055	27031
GTCN_1618	16845	TTCN_5441	27032
CTCN_2700	16846	CTCN_5056	27033
TTCN_3097	16847	GTCN_2894	27034
CTCN_2701	16848	CTCN_5057	27035
CTCN_2702	16849	TTCN_5442	27036
TTCN_3098	16850	ATCN_3423	27037
GTCN_1619	16851	ATCN_3424	27038
CTCN_2703	16852	ATCN_3425	27039
CTCN_2704	16853	ATCN_3426	27040
CTCN_2705	16854	TTCN_5443	27041
TTCN_3099	16855	ATCN_3427	27042
CTCN_2706	16856	GTCN_2895	27043
CTCN_2707	16857	GTCN_2896	27044
CTCN_2708	16858	TTCN_5444	27045
CTCN_2709	16859	TTCN_5445	27046
TTCN_3100	16860	TTCN_5446	27047
GTCN_1620	16861	TTCN_5447	27048
GTCN_1621	16862	TTCN_5448	27049
TTCN_3101	16863	TTCN_5449	27050
TTCN_3102	16864	GTCN_2897	27051
TTCN_3103	16865	ATCN_3428	27052
TTCN_3104	16866	ATCN_3429	27053
GTCN_1622	16867	TTCN_5450	27054
ATCN_1924	16868	CTCN_5058	27055
ATCN_1925	16869	GTCN_2898	27056
CTCN_2710	16870	CTCN_5059	27057
GTCN_1623	16871	ATCN_3430	27058

FIG. 36 (continued)

CTCN_2711	16872	GTCN_2899	27059
CTCN_2712	16873	ATCN_3431	27060
CTCN_2713	16874	ATCN_3432	27061
TTCN_3105	16875	CTCN_5060	27062
TTCN_3106	16876	ATCN_3433	27063
TTCN_3107	16877	GTCN_2900	27064
CTCN_2714	16878	GTCN_2901	27065
CTCN_2715	16879	GTCN_2902	27066
CTCN_2716	16880	TTCN_5451	27067
GTCN_1624	16881	TTCN_5452	27068
CTCN_2717	16882	ATCN_3434	27069
ATCN_1926	16883	CTCN_5061	27070
TTCN_3108	16884	TTCN_5453	27071
CTCN_2718	16885	CTCN_5062	27072
TTCN_3109	16886	ATCN_3435	27073
TTCN_3110	16887	CTCN_5063	27074
GTCN_1625	16888	ATCN_3436	27075
CTCN_2719	16889	TTCN_5454	27076
CTCN_2720	16890	CTCN_5064	27077
TTCN_3111	16891	GTCN_2903	27078
GTCN_1626	16892	TTCN_5455	27079
GTCN_1627	16893	GTCN_2904	27080
TTCN_3112	16894	CTCN_5065	27081
GTCN_1628	16895	ATCN_3437	27082
TTCN_3113	16896	ATCN_3438	27083
CTCN_2721	16897	GTCN_2905	27084
ATCN_1927	16898	GTCN_2906	27085
ATCN_1928	16899	GTCN_2907	27086
GTCN_1629	16900	GTCN_2908	27087
TTCN_3114	16901	CTCN_5066	27088
GTCN_1630	16902	TTCN_5456	27089
TTCN_3115	16903	CTCN_5067	27090
TTCN_3116	16904	TTCN_5457	27091
ATCN_1929	16905	TTCN_5458	27092
TTCN_3117	16906	ATCN_3439	27093
CTCN_2722	16907	ATCN_3440	27094
CTCN_2723	16908	CTCN_5068	27095
TTCN_3118	16909	ATCN_3441	27096
CTCN_2724	16910	ATCN_3442	27097
GTCN_1631	16911	ATCN_3443	27098
CTCN_2725	16912	ATCN_3444	27099
CTCN_2726	16913	CTCN_5069	27100
GTCN_1632	16914	CTCN_5070	27101
CTCN_2727	16915	ATCN_3445	27102
TTCN_3119	16916	GTCN_2909	27103
CTCN_2728	16917	CTCN_5071	27104
TTCN_3120	16918	TTCN_5459	27105
TTCN_3121	16919	CTCN_5072	27106
GTCN_1633	16920	ATCN_3446	27107
ATCN_1930	16921	GTCN_2910	27108
TTCN_3122	16922	ATCN_3447	27109
CTCN_2729	16923	CTCN_5073	27110
TTCN_3123	16924	CTCN_5074	27111
ATCN_1931	16925	TTCN_5460	27112
CTCN_2730	16926	TTCN_5461	27113

TTCN_3124	16927	CTCN_5075	27114
GTCN_1634	16928	CTCN_5076	27115
TTCN_3125	16929	GTCN_2911	27116
TTCN_3126	16930	CTCN_5077	27117
ATCN_1932	16931	ATCN_3448	27118
TTCN_3127	16932	ATCN_3449	27119
TTCN_3128	16933	CTCN_5078	27120
ATCN_1933	16934	TTCN_5462	27121
TTCN_3129	16935	TTCN_5463	27122
ATCN_1934	16936	CTCN_5079	27123
TTCN_3130	16937	GTCN_2912	27124
TTCN_3131	16938	TTCN_5464	27125
GTCN_1635	16939	CTCN_5080	27126
GTCN_1636	16940	CTCN_5081	27127
TTCN_3132	16941	CTCN_5082	27128
ATCN_1935	16942	CTCN_5083	27129
ATCN_1936	16943	CTCN_5084	27130
ATCN_1937	16944	TTCN_5465	27131
CTCN_2731	16945	TTCN_5466	27132
TTCN_3133	16946	CTCN_5085	27133
ATCN_1938	16947	GTCN_2913	27134
ATCN_1939	16948	GTCN_2914	27135
TTCN_3134	16949	GTCN_2915	27136
GTCN_1637	16950	TTCN_5467	27137
ATCN_1940	16951	CTCN_5086	27138
TTCN_3135	16952	ATCN_3450	27139
TTCN_3136	16953	CTCN_5087	27140
CTCN_2732	16954	GTCN_2916	27141
TTCN_3137	16955	TTCN_5468	27142
GTCN_1638	16956	ATCN_3451	27143
TTCN_3138	16957	ATCN_3452	27144
ATCN_1941	16958	TTCN_5469	27145
TTCN_3139	16959	TTCN_5470	27146
TTCN_3140	16960	TTCN_5471	27147
ATCN_1942	16961	GTCN_2917	27148
ATCN_1943	16962	TTCN_5472	27149
GTCN_1639	16963	ATCN_3453	27150
ATCN_1944	16964	TTCN_5473	27151
TTCN_3141	16965	ATCN_3454	27152
GTCN_1640	16966	CTCN_5088	27153
TTCN_3142	16967	ATCN_3455	27154
ATCN_1945	16968	GTCN_2918	27155
ATCN_1946	16969	ATCN_3456	27156
CTCN_2733	16970	CTCN_5089	27157
GTCN_1641	16971	ATCN_3457	27158
TTCN_3143	16972	GTCN_2919	27159
GTCN_1642	16973	ATCN_3458	27160
ATCN_1947	16974	ATCN_3459	27161
GTCN_1643	16975	ATCN_3460	27162
GTCN_1644	16976	TTCN_5474	27163
CTCN_2734	16977	TTCN_5475	27164
GTCN_1645	16978	CTCN_5090	27165
CTCN_2735	16979	CTCN_5091	27166
TTCN_3144	16980	TTCN_5476	27167
TTCN_3145	16981	TTCN_5477	27168

FIG. 36 (continued)

TTCN_3146	16982	GTCN_2920	27169
TTCN_3147	16983	TTCN_5478	27170
GTCN_1646	16984	TTCN_5479	27171
TTCN_3148	16985	TTCN_5480	27172
GTCN_1647	16986	TTCN_5481	27173
GTCN_1648	16987	TTCN_5482	27174
GTCN_1649	16988	TTCN_5483	27175
ATCN_1948	16989	CTCN_5092	27176
TTCN_3149	16990	CTCN_5093	27177
ATCN_1949	16991	TTCN_5484	27178
CTCN_2736	16992	ATCN_3461	27179
ATCN_1950	16993	ATCN_3462	27180
TTCN_3150	16994	ATCN_3463	27181
GTCN_1650	16995	CTCN_5094	27182
ATCN_1951	16996	TTCN_5485	27183
TTCN_3151	16997	GTCN_2921	27184
ATCN_1952	16998	CTCN_5095	27185
TTCN_3152	16999	CTCN_5096	27186
TTCN_3153	17000	CTCN_5097	27187
CTCN_2737	17001	CTCN_5098	27188
TTCN_3154	17002	CTCN_5099	27189
GTCN_1651	17003	CTCN_5100	27190
ATCN_1953	17004	CTCN_5101	27191
ATCN_1954	17005	CTCN_5102	27192
CTCN_2738	17006	CTCN_5103	27193
TTCN_3155	17007	CTCN_5104	27194
TTCN_3156	17008	CTCN_5105	27195
TTCN_3157	17009	TTCN_5486	27196
CTCN_2739	17010	GTCN_2922	27197
GTCN_1652	17011	ATCN_3464	27198
TTCN_3158	17012	TTCN_5487	27199
TTCN_3159	17013	TTCN_5488	27200
GTCN_1653	17014	CTCN_5106	27201
TTCN_3160	17015	CTCN_5107	27202
CTCN_2740	17016	GTCN_2923	27203
CTCN_2741	17017	TTCN_5489	27204
CTCN_2742	17018	TTCN_5490	27205
GTCN_1654	17019	CTCN_5108	27206
TTCN_3161	17020	CTCN_5109	27207
CTCN_2743	17021	CTCN_5110	27208
ATCN_1955	17022	CTCN_5111	27209
TTCN_3162	17023	TTCN_5491	27210
ATCN_1956	17024	CTCN_5112	27211
CTCN_2744	17025	CTCN_5113	27212
CTCN_2745	17026	CTCN_5114	27213
TTCN_3163	17027	CTCN_5115	27214
TTCN_3164	17028	TTCN_5492	27215
TTCN_3165	17029	TTCN_5493	27216
ATCN_1957	17030	CTCN_5116	27217
CTCN_2746	17031	CTCN_5117	27218
CTCN_2747	17032	TTCN_5494	27219
CTCN_2748	17033	CTCN_5118	27220
CTCN_2749	17034	GTCN_2924	27221
CTCN_2750	17035	GTCN_2925	27222
GTCN_1655	17036	CTCN_5119	27223

GTCN_1656	17037	GTCN_2926	27224
TTCN_3166	17038	CTCN_5120	27225
TTCN_3167	17039	CTCN_5121	27226
ATCN_1958	17040	TTCN_5495	27227
CTCN_2751	17041	ATCN_3465	27228
ATCN_1959	17042	TTCN_5496	27229
ATCN_1960	17043	TTCN_5497	27230
TTCN_3168	17044	TTCN_5498	27231
ATCN_1961	17045	TTCN_5499	27232
ATCN_1962	17046	ATCN_3466	27233
TTCN_3169	17047	TTCN_5500	27234
TTCN_3170	17048	CTCN_5122	27235
TTCN_3171	17049	CTCN_5123	27236
TTCN_3172	17050	ATCN_3467	27237
ATCN_1963	17051	GTCN_2927	27238
TTCN_3173	17052	GTCN_2928	27239
ATCN_1964	17053	CTCN_5124	27240
ATCN_1965	17054	CTCN_5125	27241
CTCN_2752	17055	GTCN_2929	27242
TTCN_3174	17056	TTCN_5501	27243
TTCN_3175	17057	CTCN_5126	27244
GTCN_1657	17058	CTCN_5127	27245
ATCN_1966	17059	TTCN_5502	27246
CTCN_2753	17060	GTCN_2930	27247
TTCN_3176	17061	TTCN_5503	27248
CTCN_2754	17062	CTCN_5128	27249
GTCN_1658	17063	TTCN_5504	27250
ATCN_1967	17064	ATCN_3468	27251
TTCN_3177	17065	CTCN_5129	27252
CTCN_2755	17066	CTCN_5130	27253
CTCN_2756	17067	TTCN_5505	27254
GTCN_1659	17068	CTCN_5131	27255
GTCN_1660	17069	ATCN_3469	27256
GTCN_1661	17070	ATCN_3470	27257
TTCN_3178	17071	CTCN_5132	27258
CTCN_2757	17072	GTCN_2931	27259
TTCN_3179	17073	CTCN_5133	27260
ATCN_1968	17074	CTCN_5134	27261
TTCN_3180	17075	GTCN_2932	27262
TTCN_3181	17076	CTCN_5135	27263
TTCN_3182	17077	TTCN_5506	27264
TTCN_3183	17078	TTCN_5507	27265
CTCN_2758	17079	TTCN_5508	27266
GTCN_1662	17080	CTCN_5136	27267
TTCN_3184	17081	CTCN_5137	27268
CTCN_2759	17082	CTCN_5138	27269
ATCN_1969	17083	CTCN_5139	27270
ATCN_1970	17084	CTCN_5140	27271
GTCN_1663	17085	CTCN_5141	27272
TTCN_3185	17086	TTCN_5509	27273
CTCN_2760	17087	CTCN_5142	27274
GTCN_1664	17088	CTCN_5143	27275
ATCN_1971	17089	GTCN_2933	27276
CTCN_2761	17090	CTCN_5144	27277
CTCN_2762	17091	CTCN_5145	27278

FIG. 36 (continued)

GTCN_1665	17092	CTCN_5146	27279
TTCN_3186	17093	CTCN_5147	27280
TTCN_3187	17094	TTCN_5510	27281
CTCN_2763	17095	ATCN_3471	27282
GTCN_1666	17096	TTCN_5511	27283
CTCN_2764	17097	TTCN_5512	27284
GTCN_1667	17098	TTCN_5513	27285
GTCN_1668	17099	TTCN_5514	27286
CTCN_2765	17100	TTCN_5515	27287
CTCN_2766	17101	TTCN_5516	27288
CTCN_2767	17102	TTCN_5517	27289
CTCN_2768	17103	TTCN_5518	27290
ATCN_1972	17104	TTCN_5519	27291
CTCN_2769	17105	TTCN_5520	27292
GTCN_1669	17106	TTCN_5521	27293
CTCN_2770	17107	TTCN_5522	27294
CTCN_2771	17108	TTCN_5523	27295
GTCN_1670	17109	CTCN_5148	27296
CTCN_2772	17110	TTCN_5524	27297
GTCN_1671	17111	GTCN_2934	27298
CTCN_2773	17112	CTCN_5149	27299
TTCN_3188	17113	ATCN_3472	27300
GTCN_1672	17114	TTCN_5525	27301
TTCN_3189	17115	TTCN_5526	27302
TTCN_3190	17116	ATCN_3473	27303
TTCN_3191	17117	TTCN_5527	27304
CTCN_2774	17118	TTCN_5528	27305
ATCN_1973	17119	ATCN_3474	27306
TTCN_3192	17120	TTCN_5529	27307
TTCN_3193	17121	CTCN_5150	27308
CTCN_2775	17122	TTCN_5530	27309
CTCN_2776	17123	GTCN_2935	27310
ATCN_1974	17124	TTCN_5531	27311
TTCN_3194	17125	ATCN_3475	27312
CTCN_2777	17126	GTCN_2936	27313
ATCN_1975	17127	GTCN_2937	27314
ATCN_1976	17128	TTCN_5532	27315
TTCN_3195	17129	TTCN_5533	27316
TTCN_3196	17130	ATCN_3476	27317
TTCN_3197	17131	ATCN_3477	27318
ATCN_1977	17132	TTCN_5534	27319
TTCN_3198	17133	GTCN_2938	27320
TTCN_3199	17134	GTCN_2939	27321
CTCN_2778	17135	TTCN_5535	27322
TTCN_3200	17136	TTCN_5536	27323
ATCN_1978	17137	GTCN_2940	27324
ATCN_1979	17138	ATCN_3478	27325
CTCN_2779	17139	ATCN_3479	27326
TTCN_3201	17140	TTCN_5537	27327
TTCN_3202	17141	CTCN_5151	27328
GTCN_1673	17142	ATCN_3480	27329
CTCN_2780	17143	CTCN_5152	27330
TTCN_3203	17144	GTCN_2941	27331
TTCN_3204	17145	CTCN_5153	27332
GTCN_1674	17146	CTCN_5154	27333

TTCN_3205	17147	GTCN_2942	27334
TTCN_3206	17148	TTCN_5538	27335
ATCN_1980	17149	TTCN_5539	27336
TTCN_3207	17150	GTCN_2943	27337
TTCN_3208	17151	ATCN_3481	27338
ATCN_1981	17152	TTCN_5540	27339
ATCN_1982	17153	GTCN_2944	27340
CTCN_2781	17154	TTCN_5541	27341
TTCN_3209	17155	TTCN_5542	27342
ATCN_1983	17156	ATCN_3482	27343
GTCN_1675	17157	GTCN_2945	27344
TTCN_3210	17158	ATCN_3483	27345
CTCN_2782	17159	TTCN_5543	27346
TTCN_3211	17160	TTCN_5544	27347
CTCN_2783	17161	TTCN_5545	27348
GTCN_1676	17162	ATCN_3484	27349
TTCN_3212	17163	TTCN_5546	27350
GTCN_1677	17164	CTCN_5155	27351
CTCN_2784	17165	ATCN_3485	27352
TTCN_3213	17166	TTCN_5547	27353
TTCN_3214	17167	TTCN_5548	27354
GTCN_1678	17168	TTCN_5549	27355
CTCN_2785	17169	ATCN_3486	27356
ATCN_1984	17170	CTCN_5156	27357
ATCN_1985	17171	ATCN_3487	27358
CTCN_2786	17172	TTCN_5550	27359
ATCN_1986	17173	ATCN_3488	27360
CTCN_2787	17174	GTCN_2946	27361
CTCN_2788	17175	ATCN_3489	27362
CTCN_2789	17176	TTCN_5551	27363
ATCN_1987	17177	TTCN_5552	27364
TTCN_3215	17178	CTCN_5157	27365
CTCN_2790	17179	GTCN_2947	27366
TTCN_3216	17180	CTCN_5158	27367
GTCN_1679	17181	ATCN_3490	27368
TTCN_3217	17182	ATCN_3491	27369
ATCN_1988	17183	TTCN_5553	27370
ATCN_1989	17184	CTCN_5159	27371
TTCN_3218	17185	GTCN_2948	27372
TTCN_3219	17186	GTCN_2949	27373
GTCN_1680	17187	GTCN_2950	27374
ATCN_1990	17188	TTCN_5554	27375
GTCN_1681	17189	CTCN_5160	27376
TTCN_3220	17190	TTCN_5555	27377
TTCN_3221	17191	CTCN_5161	27378
CTCN_2791	17192	CTCN_5162	27379
CTCN_2792	17193	TTCN_5556	27380
TTCN_3222	17194	CTCN_5163	27381
CTCN_2793	17195	CTCN_5164	27382
ATCN_1991	17196	CTCN_5165	27383
CTCN_2794	17197	TTCN_5557	27384
GTCN_1682	17198	TTCN_5558	27385
CTCN_2795	17199	ATCN_3492	27386
TTCN_3223	17200	CTCN_5166	27387
CTCN_2796	17201	ATCN_3493	27388

FIG. 36 (continued)

ATCN_1992	17202	ATCN_3494	27389
ATCN_1993	17203	ATCN_3495	27390
TTCN_3224	17204	ATCN_3496	27391
CTCN_2797	17205	ATCN_3497	27392
ATCN_1994	17206	ATCN_3498	27393
TTCN_3225	17207	TTCN_5559	27394
ATCN_1995	17208	TTCN_5560	27395
TTCN_3226	17209	CTCN_5167	27396
GTCN_1683	17210	TTCN_5561	27397
CTCN_2798	17211	TTCN_5562	27398
CTCN_2799	17212	TTCN_5563	27399
CTCN_2800	17213	ATCN_3499	27400
GTCN_1684	17214	TTCN_5564	27401
GTCN_1685	17215	GTCN_2951	27402
ATCN_1996	17216	CTCN_5168	27403
CTCN_2801	17217	ATCN_3500	27404
CTCN_2802	17218	ATCN_3501	27405
GTCN_1686	17219	ATCN_3502	27406
ATCN_1997	17220	ATCN_3503	27407
GTCN_1687	17221	CTCN_5169	27408
ATCN_1998	17222	TTCN_5565	27409
GTCN_1688	17223	TTCN_5566	27410
GTCN_1689	17224	GTCN_2952	27411
ATCN_1999	17225	TTCN_5567	27412
GTCN_1690	17226	ATCN_3504	27413
CTCN_2803	17227	TTCN_5568	27414
CTCN_2804	17228	CTCN_5170	27415
CTCN_2805	17229	GTCN_2953	27416
CTCN_2806	17230	CTCN_5171	27417
CTCN_2807	17231	TTCN_5569	27418
GTCN_1691	17232	CTCN_5172	27419
CTCN_2808	17233	CTCN_5173	27420
CTCN_2809	17234	CTCN_5174	27421
ATCN_2000	17235	CTCN_5175	27422
CTCN_2810	17236	CTCN_5176	27423
GTCN_1692	17237	TTCN_5570	27424
TTCN_3227	17238	GTCN_2954	27425
CTCN_2811	17239	TTCN_5571	27426
TTCN_3228	17240	CTCN_5177	27427
CTCN_2812	17241	GTCN_2955	27428
GTCN_1693	17242	ATCN_3505	27429
GTCN_1694	17243	CTCN_5178	27430
CTCN_2813	17244	TTCN_5572	27431
CTCN_2814	17245	ATCN_3506	27432
CTCN_2815	17246	ATCN_3507	27433
TTCN_3229	17247	TTCN_5573	27434
ATCN_2001	17248	TTCN_5574	27435
CTCN_2816	17249	CTCN_5179	27436
TTCN_3230	17250	CTCN_5180	27437
GTCN_1695	17251	ATCN_3508	27438
GTCN_1696	17252	ATCN_3509	27439
CTCN_2817	17253	TTCN_5575	27440
TTCN_3231	17254	TTCN_5576	27441
CTCN_2818	17255	ATCN_3510	27442
ATCN_2002	17256	TTCN_5577	27443
TTCN_3232	17257	ATCN_3511	27444
TTCN_3233	17258	TTCN_5578	27445
TTCN_3234	17259	CTCN_5181	27446
GTCN_1697	17260	TTCN_5579	27447
TTCN_3235	17261	TTCN_5580	27448
CTCN_2819	17262	ATCN_3512	27449
TTCN_3236	17263	TTCN_5581	27450
CTCN_2820	17264	CTCN_5182	27451
GTCN_1698	17265	TTCN_5582	27452
CTCN_2821	17266	GTCN_2956	27453
GTCN_1699	17267	TTCN_5583	27454
GTCN_1700	17268		
TTCN_3237	17269		
TTCN_3238	17270		
ATCN_2003	17271		
ATCN_2004	17272		

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FIG. 37: Table 3C

Spacer	SEQ ID NO.	Spacer	SEQ ID NO.
CTCN_0	27455	CTCN_4863	41514
TTCN_0	27456	TTCN_3918	41515
ATCN_0	27457	GTCN_2506	41516
CTCN_1	27458	CTCN_4864	41517
GTCN_0	27459	CTCN_4865	41518
GTCN_1	27460	GTCN_2507	41519
TTCN_1	27461	CTCN_4866	41520
GTCN_2	27462	TTCN_3919	41521
TTCN_2	27463	ATCN_2772	41522
TTCN_3	27464	GTCN_2508	41523
ATCN_1	27465	TTCN_3920	41524
GTCN_3	27466	TTCN_3921	41525
TTCN_4	27467	TTCN_3922	41526
GTCN_4	27468	TTCN_3923	41527
ATCN_2	27469	ATCN_2773	41528
TTCN_5	27470	ATCN_2774	41529
CTCN_2	27471	TTCN_3924	41530
CTCN_3	27472	CTCN_4867	41531
ATCN_3	27473	CTCN_4868	41532
CTCN_4	27474	GTCN_2509	41533
ATCN_4	27475	CTCN_4869	41534
ATCN_5	27476	ATCN_2775	41535
CTCN_5	27477	ATCN_2776	41536
GTCN_5	27478	CTCN_4870	41537
CTCN_6	27479	GTCN_2510	41538
ATCN_6	27480	CTCN_4871	41539
ATCN_7	27481	TTCN_3925	41540
CTCN_7	27482	CTCN_4872	41541
GTCN_6	27483	CTCN_4873	41542
TTCN_6	27484	GTCN_2511	41543
TTCN_7	27485	CTCN_4874	41544
GTCN_7	27486	ATCN_2777	41545
CTCN_8	27487	TTCN_3926	41546
GTCN_8	27488	TTCN_3927	41547
CTCN_9	27489	TTCN_3928	41548
CTCN_10	27490	GTCN_2512	41549
CTCN_11	27491	TTCN_3929	41550
CTCN_12	27492	TTCN_3930	41551
TTCN_8	27493	GTCN_2513	41552
GTCN_9	27494	TTCN_3931	41553
TTCN_9	27495	GTCN_2514	41554
TTCN_10	27496	TTCN_3932	41555
CTCN_13	27497	CTCN_4875	41556
CTCN_14	27498	GTCN_2515	41557
CTCN_15	27499	CTCN_4876	41558
ATCN_8	27500	TTCN_3933	41559
ATCN_9	27501	GTCN_2516	41560
CTCN_16	27502	CTCN_4877	41561
GTCN_10	27503	CTCN_4878	41562
CTCN_17	27504	CTCN_4879	41563
CTCN_18	27505	GTCN_2517	41564
TTCN_11	27506	GTCN_2518	41565
ATCN_10	27507	ATCN_2778	41566
CTCN_19	27508	GTCN_2519	41567
TTCN_12	27509	CTCN_4880	41568
TTCN_13	27510	GTCN_2520	41569
GTCN_11	27511	CTCN_4881	41570
TTCN_14	27512	GTCN_2521	41571
CTCN_20	27513	CTCN_4882	41572
TTCN_15	27514	ATCN_2779	41573
CTCN_21	27515	ATCN_2780	41574
GTCN_12	27516	TTCN_3934	41575
CTCN_22	27517	ATCN_2781	41576
CTCN_23	27518	TTCN_3935	41577
ATCN_11	27519	CTCN_4883	41578
ATCN_12	27520	TTCN_3936	41579
TTCN_16	27521	GTCN_2522	41580
TTCN_17	27522	GTCN_2523	41581
GTCN_13	27523	TTCN_3937	41582
CTCN_24	27524	CTCN_4884	41583
TTCN_18	27525	GTCN_2524	41584
TTCN_19	27526	TTCN_3938	41585
GTCN_14	27527	TTCN_3939	41586
CTCN_25	27528	CTCN_4885	41587
TTCN_20	27529	TTCN_3940	41588
ATCN_13	27530	ATCN_2782	41589
GTCN_15	27531	TTCN_3941	41590
TTCN_21	27532	TTCN_3942	41591
ATCN_14	27533	ATCN_2783	41592
ATCN_15	27534	CTCN_4886	41593
TTCN_22	27535	ATCN_2784	41594
TTCN_23	27536	TTCN_3943	41595

FIG. 37 (continued)

CTCN_26	27537	TTCN_3944	41596
TTCN_24	27538	ATCN_2785	41597
ATCN_16	27539	GTCN_2525	41598
TTCN_25	27540	TTCN_3945	41599
TTCN_26	27541	TTCN_3946	41600
GTCN_16	27542	ATCN_2786	41601
TTCN_27	27543	ATCN_2787	41602
TTCN_28	27544	TTCN_3947	41603
ATCN_17	27545	TTCN_3948	41604
TTCN_29	27546	GTCN_2526	41605
ATCN_18	27547	CTCN_4887	41606
GTCN_17	27548	ATCN_2788	41607
TTCN_30	27549	CTCN_4888	41608
TTCN_31	27550	CTCN_4889	41609
ATCN_19	27551	TTCN_3949	41610
GTCN_18	27552	GTCN_2527	41611
ATCN_20	27553	ATCN_2789	41612
TTCN_32	27554	GTCN_2528	41613
ATCN_21	27555	CTCN_4890	41614
CTCN_27	27556	CTCN_4891	41615
GTCN_19	27557	CTCN_4892	41616
TTCN_33	27558	CTCN_4893	41617
TTCN_34	27559	TTCN_3950	41618
TTCN_35	27560	GTCN_2529	41619
CTCN_28	27561	GTCN_2530	41620
CTCN_29	27562	CTCN_4894	41621
ATCN_22	27563	ATCN_2790	41622
ATCN_23	27564	CTCN_4895	41623
ATCN_24	27565	CTCN_4896	41624
ATCN_25	27566	CTCN_4897	41625
CTCN_30	27567	GTCN_2531	41626
TTCN_36	27568	CTCN_4898	41627
ATCN_26	27569	CTCN_4899	41628
CTCN_31	27570	GTCN_2532	41629
TTCN_37	27571	TTCN_3951	41630
TTCN_38	27572	GTCN_2533	41631
ATCN_27	27573	CTCN_4900	41632
GTCN_20	27574	CTCN_4901	41633
CTCN_32	27575	GTCN_2534	41634
CTCN_33	27576	TTCN_3952	41635
TTCN_39	27577	CTCN_4902	41636
TTCN_40	27578	ATCN_2791	41637
TTCN_41	27579	GTCN_2535	41638

CTCN_34	27580	CTCN_4903	41639
TTCN_42	27581	CTCN_4904	41640
GTCN_21	27582	GTCN_2536	41641
ATCN_28	27583	CTCN_4905	41642
ATCN_29	27584	TTCN_3953	41643
TTCN_43	27585	CTCN_4906	41644
GTCN_22	27586	GTCN_2537	41645
GTCN_23	27587	TTCN_3954	41646
ATCN_30	27588	CTCN_4907	41647
TTCN_44	27589	TTCN_3955	41648
TTCN_45	27590	CTCN_4908	41649
TTCN_46	27591	GTCN_2538	41650
ATCN_31	27592	CTCN_4909	41651
CTCN_35	27593	CTCN_4910	41652
CTCN_36	27594	GTCN_2539	41653
CTCN_37	27595	GTCN_2540	41654
ATCN_32	27596	CTCN_4911	41655
GTCN_24	27597	TTCN_3956	41656
ATCN_33	27598	CTCN_4912	41657
TTCN_47	27599	CTCN_4913	41658
ATCN_34	27600	GTCN_2541	41659
TTCN_48	27601	CTCN_4914	41660
GTCN_25	27602	CTCN_4915	41661
GTCN_26	27603	ATCN_2792	41662
GTCN_27	27604	CTCN_4916	41663
ATCN_35	27605	TTCN_3957	41664
ATCN_36	27606	TTCN_3958	41665
CTCN_38	27607	ATCN_2793	41666
GTCN_28	27608	CTCN_4917	41667
TTCN_49	27609	GTCN_2542	41668
GTCN_29	27610	TTCN_3959	41669
ATCN_37	27611	CTCN_4918	41670
ATCN_38	27612	TTCN_3960	41671
TTCN_50	27613	TTCN_3961	41672
CTCN_39	27614	TTCN_3962	41673
GTCN_30	27615	ATCN_2794	41674
TTCN_51	27616	GTCN_2543	41675
CTCN_40	27617	ATCN_2795	41676
TTCN_52	27618	CTCN_4919	41677
CTCN_41	27619	CTCN_4920	41678
CTCN_42	27620	ATCN_2796	41679
TTCN_53	27621	CTCN_4921	41680
ATCN_39	27622	TTCN_3963	41681

FIG. 37 (continued)

CTCN_43	27623	TTCN_3964	41682
GTCN_31	27624	GTCN_2544	41683
TTCN_54	27625	ATCN_2797	41684
TTCN_55	27626	GTCN_2545	41685
GTCN_32	27627	TTCN_3965	41686
ATCN_40	27628	TTCN_3966	41687
ATCN_41	27629	ATCN_2798	41688
ATCN_42	27630	GTCN_2546	41689
CTCN_44	27631	ATCN_2799	41690
TTCN_56	27632	GTCN_2547	41691
ATCN_43	27633	TTCN_3967	41692
GTCN_33	27634	TTCN_3968	41693
TTCN_57	27635	ATCN_2800	41694
TTCN_58	27636	CTCN_4922	41695
TTCN_59	27637	ATCN_2801	41696
CTCN_45	27638	CTCN_4923	41697
ATCN_44	27639	CTCN_4924	41698
TTCN_60	27640	TTCN_3969	41699
ATCN_45	27641	GTCN_2548	41700
TTCN_61	27642	GTCN_2549	41701
ATCN_46	27643	GTCN_2550	41702
CTCN_46	27644	ATCN_2802	41703
TTCN_62	27645	CTCN_4925	41704
TTCN_63	27646	TTCN_3970	41705
GTCN_34	27647	CTCN_4926	41706
CTCN_47	27648	TTCN_3971	41707
GTCN_35	27649	GTCN_2551	41708
GTCN_36	27650	GTCN_2552	41709
TTCN_64	27651	TTCN_3972	41710
TTCN_65	27652	TTCN_3973	41711
TTCN_66	27653	ATCN_2803	41712
CTCN_48	27654	CTCN_4927	41713
GTCN_37	27655	CTCN_4928	41714
TTCN_67	27656	TTCN_3974	41715
GTCN_38	27657	CTCN_4929	41716
CTCN_49	27658	TTCN_3975	41717
TTCN_68	27659	GTCN_2553	41718
ATCN_47	27660	GTCN_2554	41719
ATCN_48	27661	ATCN_2804	41720
TTCN_69	27662	TTCN_3976	41721
GTCN_39	27663	GTCN_2555	41722
TTCN_70	27664	TTCN_3977	41723
GTCN_40	27665	TTCN_3978	41724

TTCN_71	27666	CTCN_4930	41725
GTCN_41	27667	ATCN_2805	41726
TTCN_72	27668	GTCN_2556	41727
CTCN_50	27669	CTCN_4931	41728
CTCN_51	27670	CTCN_4932	41729
CTCN_52	27671	CTCN_4933	41730
CTCN_53	27672	CTCN_4934	41731
CTCN_54	27673	CTCN_4935	41732
GTCN_42	27674	CTCN_4936	41733
TTCN_73	27675	GTCN_2557	41734
GTCN_43	27676	ATCN_2806	41735
CTCN_55	27677	ATCN_2807	41736
CTCN_56	27678	GTCN_2558	41737
GTCN_44	27679	ATCN_2808	41738
GTCN_45	27680	TTCN_3979	41739
CTCN_57	27681	GTCN_2559	41740
GTCN_46	27682	TTCN_3980	41741
GTCN_47	27683	ATCN_2809	41742
GTCN_48	27684	TTCN_3981	41743
CTCN_58	27685	ATCN_2810	41744
TTCN_74	27686	ATCN_2811	41745
GTCN_49	27687	CTCN_4937	41746
ATCN_49	27688	ATCN_2812	41747
TTCN_75	27689	ATCN_2813	41748
CTCN_59	27690	ATCN_2814	41749
CTCN_60	27691	CTCN_4938	41750
GTCN_50	27692	GTCN_2560	41751
CTCN_61	27693	CTCN_4939	41752
TTCN_76	27694	CTCN_4940	41753
CTCN_62	27695	CTCN_4941	41754
TTCN_77	27696	GTCN_2561	41755
CTCN_63	27697	TTCN_3982	41756
TTCN_78	27698	TTCN_3983	41757
CTCN_64	27699	GTCN_2562	41758
CTCN_65	27700	GTCN_2563	41759
ATCN_50	27701	GTCN_2564	41760
ATCN_51	27702	ATCN_2815	41761
TTCN_79	27703	CTCN_4942	41762
GTCN_51	27704	GTCN_2565	41763
GTCN_52	27705	ATCN_2816	41764
TTCN_80	27706	CTCN_4943	41765
TTCN_81	27707	ATCN_2817	41766
CTCN_66	27708	CTCN_4944	41767

FIG. 37 (continued)

CTCN_67	27709	CTCN_4945	41768
TTCN_82	27710	CTCN_4946	41769
TTCN_83	27711	GTCN_2566	41770
CTCN_68	27712	CTCN_4947	41771
CTCN_69	27713	CTCN_4948	41772
TTCN_84	27714	GTCN_2567	41773
GTCN_53	27715	GTCN_2568	41774
GTCN_54	27716	CTCN_4949	41775
TTCN_85	27717	ATCN_2818	41776
CTCN_70	27718	ATCN_2819	41777
TTCN_86	27719	GTCN_2569	41778
CTCN_71	27720	TTCN_3984	41779
TTCN_87	27721	ATCN_2820	41780
GTCN_55	27722	ATCN_2821	41781
ATCN_52	27723	CTCN_4950	41782
CTCN_72	27724	TTCN_3985	41783
CTCN_73	27725	CTCN_4951	41784
GTCN_56	27726	TTCN_3986	41785
GTCN_57	27727	GTCN_2570	41786
CTCN_74	27728	CTCN_4952	41787
GTCN_58	27729	TTCN_3987	41788
TTCN_88	27730	TTCN_3988	41789
GTCN_59	27731	ATCN_2822	41790
CTCN_75	27732	CTCN_4953	41791
GTCN_60	27733	GTCN_2571	41792
CTCN_76	27734	CTCN_4954	41793
CTCN_77	27735	ATCN_2823	41794
GTCN_61	27736	TTCN_3989	41795
GTCN_62	27737	GTCN_2572	41796
CTCN_78	27738	GTCN_2573	41797
TTCN_89	27739	CTCN_4955	41798
ATCN_53	27740	CTCN_4956	41799
TTCN_90	27741	CTCN_4957	41800
TTCN_91	27742	TTCN_3990	41801
GTCN_63	27743	ATCN_2824	41802
CTCN_79	27744	ATCN_2825	41803
GTCN_64	27745	GTCN_2574	41804
TTCN_92	27746	CTCN_4958	41805
GTCN_65	27747	GTCN_2575	41806
ATCN_54	27748	CTCN_4959	41807
CTCN_80	27749	TTCN_3991	41808
TTCN_93	27750	CTCN_4960	41809
GTCN_66	27751	ATCN_2826	41810

TTCN_94	27752	ATCN_2827	41811
TTCN_95	27753	ATCN_2828	41812
CTCN_81	27754	TTCN_3992	41813
CTCN_82	27755	GTCN_2576	41814
ATCN_55	27756	CTCN_4961	41815
TTCN_96	27757	CTCN_4962	41816
CTCN_83	27758	GTCN_2577	41817
CTCN_84	27759	CTCN_4963	41818
TTCN_97	27760	CTCN_4964	41819
TTCN_98	27761	CTCN_4965	41820
ATCN_56	27762	CTCN_4966	41821
ATCN_57	27763	TTCN_3993	41822
CTCN_85	27764	CTCN_4967	41823
GTCN_67	27765	CTCN_4968	41824
GTCN_68	27766	GTCN_2578	41825
ATCN_58	27767	GTCN_2579	41826
ATCN_59	27768	TTCN_3994	41827
GTCN_69	27769	GTCN_2580	41828
CTCN_86	27770	CTCN_4969	41829
CTCN_87	27771	TTCN_3995	41830
TTCN_99	27772	CTCN_4970	41831
CTCN_88	27773	ATCN_2829	41832
TTCN_100	27774	CTCN_4971	41833
ATCN_60	27775	CTCN_4972	41834
TTCN_101	27776	ATCN_2830	41835
ATCN_61	27777	TTCN_3996	41836
CTCN_89	27778	TTCN_3997	41837
CTCN_90	27779	TTCN_3998	41838
GTCN_70	27780	ATCN_2831	41839
CTCN_91	27781	CTCN_4973	41840
CTCN_92	27782	GTCN_2581	41841
TTCN_102	27783	GTCN_2582	41842
GTCN_71	27784	CTCN_4974	41843
CTCN_93	27785	CTCN_4975	41844
CTCN_94	27786	ATCN_2832	41845
GTCN_72	27787	GTCN_2583	41846
TTCN_103	27788	CTCN_4976	41847
TTCN_104	27789	CTCN_4977	41848
GTCN_73	27790	TTCN_3999	41849
CTCN_95	27791	CTCN_4978	41850
GTCN_74	27792	TTCN_4000	41851
GTCN_75	27793	GTCN_2584	41852
CTCN_96	27794	GTCN_2585	41853

FIG. 37 (continued)

ATCN_62	27795	CTCN_4979	41854
ATCN_63	27796	CTCN_4980	41855
CTCN_97	27797	GTCN_2586	41856
CTCN_98	27798	CTCN_4981	41857
TTCN_105	27799	TTCN_4001	41858
CTCN_99	27800	CTCN_4982	41859
CTCN_100	27801	TTCN_4002	41860
TTCN_106	27802	TTCN_4003	41861
ATCN_64	27803	GTCN_2587	41862
TTCN_107	27804	CTCN_4983	41863
CTCN_101	27805	GTCN_2588	41864
CTCN_102	27806	CTCN_4984	41865
GTCN_76	27807	ATCN_2833	41866
CTCN_103	27808	ATCN_2834	41867
CTCN_104	27809	TTCN_4004	41868
GTCN_77	27810	CTCN_4985	41869
TTCN_108	27811	CTCN_4986	41870
CTCN_105	27812	TTCN_4005	41871
TTCN_109	27813	ATCN_2835	41872
GTCN_78	27814	TTCN_4006	41873
GTCN_79	27815	TTCN_4007	41874
CTCN_106	27816	TTCN_4008	41875
TTCN_110	27817	CTCN_4987	41876
CTCN_107	27818	CTCN_4988	41877
GTCN_80	27819	GTCN_2589	41878
CTCN_108	27820	ATCN_2836	41879
ATCN_65	27821	GTCN_2590	41880
ATCN_66	27822	TTCN_4009	41881
CTCN_109	27823	CTCN_4989	41882
ATCN_67	27824	GTCN_2591	41883
CTCN_110	27825	GTCN_2592	41884
CTCN_111	27826	CTCN_4990	41885
TTCN_111	27827	CTCN_4991	41886
ATCN_68	27828	GTCN_2593	41887
TTCN_112	27829	CTCN_4992	41888
CTCN_112	27830	ATCN_2837	41889
TTCN_113	27831	ATCN_2838	41890
CTCN_113	27832	CTCN_4993	41891
CTCN_114	27833	CTCN_4994	41892
CTCN_115	27834	ATCN_2839	41893
GTCN_81	27835	CTCN_4995	41894
ATCN_69	27836	CTCN_4996	41895
ATCN_70	27837	TTCN_4010	41896

TTCN_114	27838	TTCN_4011	41897
ATCN_71	27839	CTCN_4997	41898
ATCN_72	27840	CTCN_4998	41899
GTCN_82	27841	CTCN_4999	41900
TTCN_115	27842	GTCN_2594	41901
GTCN_83	27843	GTCN_2595	41902
CTCN_116	27844	GTCN_2596	41903
CTCN_117	27845	CTCN_5000	41904
CTCN_118	27846	TTCN_4012	41905
TTCN_116	27847	GTCN_2597	41906
TTCN_117	27848	ATCN_2840	41907
CTCN_119	27849	TTCN_4013	41908
ATCN_73	27850	ATCN_2841	41909
CTCN_120	27851	TTCN_4014	41910
GTCN_84	27852	GTCN_2598	41911
CTCN_121	27853	GTCN_2599	41912
ATCN_74	27854	CTCN_5001	41913
CTCN_122	27855	GTCN_2600	41914
CTCN_123	27856	ATCN_2842	41915
ATCN_75	27857	TTCN_4015	41916
ATCN_76	27858	GTCN_2601	41917
ATCN_77	27859	CTCN_5002	41918
CTCN_124	27860	CTCN_5003	41919
GTCN_85	27861	TTCN_4016	41920
CTCN_125	27862	GTCN_2602	41921
TTCN_118	27863	TTCN_4017	41922
CTCN_126	27864	TTCN_4018	41923
GTCN_86	27865	TTCN_4019	41924
TTCN_119	27866	GTCN_2603	41925
GTCN_87	27867	TTCN_4020	41926
CTCN_127	27868	GTCN_2604	41927
CTCN_128	27869	CTCN_5004	41928
CTCN_129	27870	GTCN_2605	41929
CTCN_130	27871	GTCN_2606	41930
CTCN_131	27872	CTCN_5005	41931
ATCN_78	27873	TTCN_4021	41932
ATCN_79	27874	CTCN_5006	41933
TTCN_120	27875	ATCN_2843	41934
CTCN_132	27876	ATCN_2844	41935
CTCN_133	27877	CTCN_5007	41936
CTCN_134	27878	TTCN_4022	41937
CTCN_135	27879	CTCN_5008	41938
ATCN_80	27880	ATCN_2845	41939

FIG. 37 (continued)

ATCN_81	27881	GTCN_2607	41940
CTCN_136	27882	CTCN_5009	41941
GTCN_88	27883	CTCN_5010	41942
CTCN_137	27884	GTCN_2608	41943
CTCN_138	27885	CTCN_5011	41944
GTCN_89	27886	TTCN_4023	41945
GTCN_90	27887	GTCN_2609	41946
CTCN_139	27888	CTCN_5012	41947
TTCN_121	27889	GTCN_2610	41948
TTCN_122	27890	CTCN_5013	41949
CTCN_140	27891	GTCN_2611	41950
TTCN_123	27892	TTCN_4024	41951
ATCN_82	27893	GTCN_2612	41952
CTCN_141	27894	CTCN_5014	41953
GTCN_91	27895	TTCN_4025	41954
CTCN_142	27896	TTCN_4026	41955
CTCN_143	27897	GTCN_2613	41956
GTCN_92	27898	GTCN_2614	41957
TTCN_124	27899	CTCN_5015	41958
CTCN_144	27900	TTCN_4027	41959
CTCN_145	27901	GTCN_2615	41960
CTCN_146	27902	CTCN_5016	41961
CTCN_147	27903	TTCN_4028	41962
CTCN_148	27904	CTCN_5017	41963
TTCN_125	27905	CTCN_5018	41964
GTCN_93	27906	GTCN_2616	41965
TTCN_126	27907	TTCN_4029	41966
ATCN_83	27908	CTCN_5019	41967
CTCN_149	27909	ATCN_2846	41968
ATCN_84	27910	CTCN_5020	41969
CTCN_150	27911	CTCN_5021	41970
TTCN_127	27912	CTCN_5022	41971
TTCN_128	27913	GTCN_2617	41972
TTCN_129	27914	TTCN_4030	41973
TTCN_130	27915	TTCN_4031	41974
TTCN_131	27916	GTCN_2618	41975
CTCN_151	27917	TTCN_4032	41976
TTCN_132	27918	CTCN_5023	41977
CTCN_152	27919	GTCN_2619	41978
TTCN_133	27920	CTCN_5024	41979
ATCN_85	27921	CTCN_5025	41980
TTCN_134	27922	GTCN_2620	41981
TTCN_135	27923	GTCN_2621	41982

TTCN_136	27924	TTCN_4033	41983
CTCN_153	27925	ATCN_2847	41984
TTCN_137	27926	ATCN_2848	41985
TTCN_138	27927	CTCN_5026	41986
TTCN_139	27928	CTCN_5027	41987
GTCN_94	27929	CTCN_5028	41988
GTCN_95	27930	ATCN_2849	41989
CTCN_154	27931	ATCN_2850	41990
CTCN_155	27932	CTCN_5029	41991
CTCN_156	27933	CTCN_5030	41992
TTCN_140	27934	CTCN_5031	41993
GTCN_96	27935	TTCN_4034	41994
ATCN_86	27936	GTCN_2622	41995
CTCN_157	27937	CTCN_5032	41996
ATCN_87	27938	GTCN_2623	41997
ATCN_88	27939	ATCN_2851	41998
CTCN_158	27940	CTCN_5033	41999
ATCN_89	27941	GTCN_2624	42000
GTCN_97	27942	CTCN_5034	42001
GTCN_98	27943	GTCN_2625	42002
GTCN_99	27944	TTCN_4035	42003
ATCN_90	27945	CTCN_5035	42004
TTCN_141	27946	CTCN_5036	42005
CTCN_159	27947	ATCN_2852	42006
GTCN_100	27948	TTCN_4036	42007
CTCN_160	27949	CTCN_5037	42008
GTCN_101	27950	CTCN_5038	42009
GTCN_102	27951	CTCN_5039	42010
CTCN_161	27952	ATCN_2853	42011
ATCN_91	27953	TTCN_4037	42012
CTCN_162	27954	TTCN_4038	42013
ATCN_92	27955	TTCN_4039	42014
TTCN_142	27956	GTCN_2626	42015
ATCN_93	27957	ATCN_2854	42016
CTCN_163	27958	GTCN_2627	42017
TTCN_143	27959	CTCN_5040	42018
CTCN_164	27960	TTCN_4040	42019
CTCN_165	27961	CTCN_5041	42020
GTCN_103	27962	CTCN_5042	42021
ATCN_94	27963	GTCN_2628	42022
ATCN_95	27964	CTCN_5043	42023
GTCN_104	27965	TTCN_4041	42024
TTCN_144	27966	CTCN_5044	42025

FIG. 37 (continued)

GTCN_105	27967	CTCN_5045	42026
TTCN_145	27968	GTCN_2629	42027
GTCN_106	27969	TTCN_4042	42028
ATCN_96	27970	TTCN_4043	42029
CTCN_166	27971	TTCN_4044	42030
CTCN_167	27972	TTCN_4045	42031
GTCN_107	27973	ATCN_2855	42032
ATCN_97	27974	CTCN_5046	42033
GTCN_108	27975	TTCN_4046	42034
CTCN_168	27976	TTCN_4047	42035
CTCN_169	27977	TTCN_4048	42036
TTCN_146	27978	CTCN_5047	42037
CTCN_170	27979	CTCN_5048	42038
ATCN_98	27980	GTCN_2630	42039
GTCN_109	27981	CTCN_5049	42040
CTCN_171	27982	GTCN_2631	42041
GTCN_110	27983	CTCN_5050	42042
CTCN_172	27984	CTCN_5051	42043
CTCN_173	27985	CTCN_5052	42044
ATCN_99	27986	GTCN_2632	42045
GTCN_111	27987	CTCN_5053	42046
TTCN_147	27988	GTCN_2633	42047
GTCN_112	27989	CTCN_5054	42048
CTCN_174	27990	GTCN_2634	42049
GTCN_113	27991	TTCN_4049	42050
ATCN_100	27992	GTCN_2635	42051
TTCN_148	27993	TTCN_4050	42052
CTCN_175	27994	CTCN_5055	42053
CTCN_176	27995	TTCN_4051	42054
ATCN_101	27996	CTCN_5056	42055
TTCN_149	27997	GTCN_2636	42056
ATCN_102	27998	TTCN_4052	42057
ATCN_103	27999	CTCN_5057	42058
ATCN_104	28000	GTCN_2637	42059
ATCN_105	28001	CTCN_5058	42060
CTCN_177	28002	TTCN_4053	42061
ATCN_106	28003	TTCN_4054	42062
CTCN_178	28004	GTCN_2638	42063
ATCN_107	28005	ATCN_2856	42064
TTCN_150	28006	CTCN_5059	42065
ATCN_108	28007	CTCN_5060	42066
CTCN_179	28008	TTCN_4055	42067
CTCN_180	28009	CTCN_5061	42068

ATCN_109	28010	CTCN_5062	42069
ATCN_110	28011	ATCN_2857	42070
CTCN_181	28012	ATCN_2858	42071
GTCN_114	28013	GTCN_2639	42072
CTCN_182	28014	ATCN_2859	42073
CTCN_183	28015	TTCN_4056	42074
GTCN_115	28016	CTCN_5063	42075
TTCN_151	28017	CTCN_5064	42076
GTCN_116	28018	CTCN_5065	42077
CTCN_184	28019	CTCN_5066	42078
GTCN_117	28020	CTCN_5067	42079
CTCN_185	28021	CTCN_5068	42080
CTCN_186	28022	GTCN_2640	42081
CTCN_187	28023	CTCN_5069	42082
CTCN_188	28024	GTCN_2641	42083
TTCN_152	28025	CTCN_5070	42084
ATCN_111	28026	TTCN_4057	42085
TTCN_153	28027	ATCN_2860	42086
CTCN_189	28028	GTCN_2642	42087
CTCN_190	28029	ATCN_2861	42088
GTCN_118	28030	ATCN_2862	42089
ATCN_112	28031	ATCN_2863	42090
CTCN_191	28032	GTCN_2643	42091
GTCN_119	28033	CTCN_5071	42092
GTCN_120	28034	CTCN_5072	42093
GTCN_121	28035	TTCN_4058	42094
CTCN_192	28036	ATCN_2864	42095
ATCN_113	28037	ATCN_2865	42096
ATCN_114	28038	TTCN_4059	42097
ATCN_115	28039	CTCN_5073	42098
GTCN_122	28040	GTCN_2644	42099
ATCN_116	28041	ATCN_2866	42100
TTCN_154	28042	ATCN_2867	42101
GTCN_123	28043	GTCN_2645	42102
TTCN_155	28044	CTCN_5074	42103
CTCN_193	28045	CTCN_5075	42104
GTCN_124	28046	CTCN_5076	42105
ATCN_117	28047	CTCN_5077	42106
ATCN_118	28048	CTCN_5078	42107
CTCN_194	28049	CTCN_5079	42108
CTCN_195	28050	ATCN_2868	42109
GTCN_125	28051	ATCN_2869	42110
ATCN_119	28052	ATCN_2870	42111

FIG. 37 (continued)

TTCN_156	28053	GTCN_2646	42112
ATCN_120	28054	GTCN_2647	42113
TTCN_157	28055	GTCN_2648	42114
CTCN_196	28056	ATCN_2871	42115
ATCN_121	28057	ATCN_2872	42116
GTCN_126	28058	TTCN_4060	42117
ATCN_122	28059	CTCN_5080	42118
TTCN_158	28060	GTCN_2649	42119
TTCN_159	28061	CTCN_5081	42120
ATCN_123	28062	ATCN_2873	42121
TTCN_160	28063	ATCN_2874	42122
TTCN_161	28064	CTCN_5082	42123
GTCN_127	28065	GTCN_2650	42124
TTCN_162	28066	CTCN_5083	42125
TTCN_163	28067	TTCN_4061	42126
CTCN_197	28068	CTCN_5084	42127
CTCN_198	28069	CTCN_5085	42128
ATCN_124	28070	ATCN_2875	42129
TTCN_164	28071	ATCN_2876	42130
ATCN_125	28072	CTCN_5086	42131
CTCN_199	28073	CTCN_5087	42132
CTCN_200	28074	CTCN_5088	42133
GTCN_128	28075	CTCN_5089	42134
ATCN_126	28076	TTCN_4062	42135
TTCN_165	28077	TTCN_4063	42136
TTCN_166	28078	CTCN_5090	42137
TTCN_167	28079	CTCN_5091	42138
TTCN_168	28080	CTCN_5092	42139
GTCN_129	28081	ATCN_2877	42140
GTCN_130	28082	CTCN_5093	42141
GTCN_131	28083	ATCN_2878	42142
TTCN_169	28084	CTCN_5094	42143
TTCN_170	28085	TTCN_4064	42144
TTCN_171	28086	ATCN_2879	42145
TTCN_172	28087	CTCN_5095	42146
ATCN_127	28088	ATCN_2880	42147
ATCN_128	28089	CTCN_5096	42148
TTCN_173	28090	CTCN_5097	42149
GTCN_132	28091	ATCN_2881	42150
TTCN_174	28092	ATCN_2882	42151
TTCN_175	28093	TTCN_4065	42152
GTCN_133	28094	TTCN_4066	42153
CTCN_201	28095	CTCN_5098	42154

GTCN_134	28096	TTCN_4067	42155
GTCN_135	28097	CTCN_5099	42156
ATCN_129	28098	ATCN_2883	42157
ATCN_130	28099	GTCN_2651	42158
GTCN_136	28100	GTCN_2652	42159
TTCN_176	28101	CTCN_5100	42160
TTCN_177	28102	CTCN_5101	42161
GTCN_137	28103	CTCN_5102	42162
ATCN_131	28104	ATCN_2884	42163
GTCN_138	28105	CTCN_5103	42164
ATCN_132	28106	GTCN_2653	42165
TTCN_178	28107	CTCN_5104	42166
CTCN_202	28108	GTCN_2654	42167
ATCN_133	28109	CTCN_5105	42168
GTCN_139	28110	TTCN_4068	42169
GTCN_140	28111	CTCN_5106	42170
TTCN_179	28112	ATCN_2885	42171
ATCN_134	28113	CTCN_5107	42172
TTCN_180	28114	CTCN_5108	42173
CTCN_203	28115	TTCN_4069	42174
CTCN_204	28116	CTCN_5109	42175
GTCN_141	28117	CTCN_5110	42176
TTCN_181	28118	GTCN_2655	42177
CTCN_205	28119	CTCN_5111	42178
GTCN_142	28120	CTCN_5112	42179
ATCN_135	28121	TTCN_4070	42180
CTCN_206	28122	ATCN_2886	42181
ATCN_136	28123	TTCN_4071	42182
ATCN_137	28124	CTCN_5113	42183
CTCN_207	28125	TTCN_4072	42184
CTCN_208	28126	CTCN_5114	42185
CTCN_209	28127	CTCN_5115	42186
TTCN_182	28128	GTCN_2656	42187
TTCN_183	28129	ATCN_2887	42188
GTCN_143	28130	TTCN_4073	42189
CTCN_210	28131	TTCN_4074	42190
GTCN_144	28132	CTCN_5116	42191
CTCN_211	28133	TTCN_4075	42192
TTCN_184	28134	TTCN_4076	42193
TTCN_185	28135	TTCN_4077	42194
CTCN_212	28136	CTCN_5117	42195
CTCN_213	28137	CTCN_5118	42196
CTCN_214	28138	ATCN_2888	42197

FIG. 37 (continued)

CTCN_215	28139	TTCN_4078	42198
GTCN_145	28140	CTCN_5119	42199
CTCN_216	28141	ATCN_2889	42200
GTCN_146	28142	TTCN_4079	42201
GTCN_147	28143	GTCN_2657	42202
TTCN_186	28144	TTCN_4080	42203
GTCN_148	28145	CTCN_5120	42204
GTCN_149	28146	ATCN_2890	42205
CTCN_217	28147	ATCN_2891	42206
TTCN_187	28148	TTCN_4081	42207
CTCN_218	28149	GTCN_2658	42208
GTCN_150	28150	CTCN_5121	42209
GTCN_151	28151	GTCN_2659	42210
CTCN_219	28152	GTCN_2660	42211
GTCN_152	28153	CTCN_5122	42212
CTCN_220	28154	CTCN_5123	42213
CTCN_221	28155	CTCN_5124	42214
GTCN_153	28156	TTCN_4082	42215
TTCN_188	28157	ATCN_2892	42216
TTCN_189	28158	CTCN_5125	42217
CTCN_222	28159	CTCN_5126	42218
TTCN_190	28160	CTCN_5127	42219
ATCN_138	28161	TTCN_4083	42220
TTCN_191	28162	ATCN_2893	42221
TTCN_192	28163	CTCN_5128	42222
CTCN_223	28164	TTCN_4084	42223
GTCN_154	28165	TTCN_4085	42224
CTCN_224	28166	TTCN_4086	42225
GTCN_155	28167	GTCN_2661	42226
TTCN_193	28168	GTCN_2662	42227
CTCN_225	28169	TTCN_4087	42228
CTCN_226	28170	ATCN_2894	42229
ATCN_139	28171	TTCN_4088	42230
CTCN_227	28172	CTCN_5129	42231
TTCN_194	28173	GTCN_2663	42232
GTCN_156	28174	CTCN_5130	42233
CTCN_228	28175	GTCN_2664	42234
ATCN_140	28176	CTCN_5131	42235
GTCN_157	28177	GTCN_2665	42236
ATCN_141	28178	GTCN_2666	42237
GTCN_158	28179	TTCN_4089	42238
TTCN_195	28180	GTCN_2667	42239
ATCN_142	28181	TTCN_4090	42240

ATCN_143	28182	CTCN_5132	42241
GTCN_159	28183	GTCN_2668	42242
ATCN_144	28184	CTCN_5133	42243
GTCN_160	28185	CTCN_5134	42244
ATCN_145	28186	ATCN_2895	42245
GTCN_161	28187	TTCN_4091	42246
CTCN_229	28188	GTCN_2669	42247
CTCN_230	28189	ATCN_2896	42248
CTCN_231	28190	ATCN_2897	42249
GTCN_162	28191	ATCN_2898	42250
TTCN_196	28192	GTCN_2670	42251
ATCN_146	28193	CTCN_5135	42252
ATCN_147	28194	GTCN_2671	42253
GTCN_163	28195	ATCN_2899	42254
CTCN_232	28196	ATCN_2900	42255
TTCN_197	28197	ATCN_2901	42256
CTCN_233	28198	GTCN_2672	42257
ATCN_148	28199	CTCN_5136	42258
CTCN_234	28200	TTCN_4092	42259
CTCN_235	28201	GTCN_2673	42260
CTCN_236	28202	TTCN_4093	42261
GTCN_164	28203	GTCN_2674	42262
ATCN_149	28204	TTCN_4094	42263
TTCN_198	28205	CTCN_5137	42264
CTCN_237	28206	GTCN_2675	42265
GTCN_165	28207	CTCN_5138	42266
CTCN_238	28208	CTCN_5139	42267
TTCN_199	28209	GTCN_2676	42268
CTCN_239	28210	TTCN_4095	42269
CTCN_240	28211	TTCN_4096	42270
CTCN_241	28212	GTCN_2677	42271
ATCN_150	28213	CTCN_5140	42272
TTCN_200	28214	CTCN_5141	42273
CTCN_242	28215	TTCN_4097	42274
TTCN_201	28216	ATCN_2902	42275
TTCN_202	28217	ATCN_2903	42276
GTCN_166	28218	TTCN_4098	42277
CTCN_243	28219	GTCN_2678	42278
ATCN_151	28220	ATCN_2904	42279
ATCN_152	28221	GTCN_2679	42280
CTCN_244	28222	TTCN_4099	42281
GTCN_167	28223	GTCN_2680	42282
ATCN_153	28224	CTCN_5142	42283

FIG. 37 (continued)

TTCN_203	28225	TTCN_4100	42284
CTCN_245	28226	CTCN_5143	42285
CTCN_246	28227	CTCN_5144	42286
TTCN_204	28228	CTCN_5145	42287
CTCN_247	28229	CTCN_5146	42288
TTCN_205	28230	GTCN_2681	42289
TTCN_206	28231	CTCN_5147	42290
CTCN_248	28232	CTCN_5148	42291
CTCN_249	28233	GTCN_2682	42292
TTCN_207	28234	CTCN_5149	42293
GTCN_168	28235	TTCN_4101	42294
CTCN_250	28236	CTCN_5150	42295
CTCN_251	28237	CTCN_5151	42296
CTCN_252	28238	GTCN_2683	42297
CTCN_253	28239	TTCN_4102	42298
GTCN_169	28240	TTCN_4103	42299
GTCN_170	28241	ATCN_2905	42300
CTCN_254	28242	TTCN_4104	42301
CTCN_255	28243	TTCN_4105	42302
GTCN_171	28244	TTCN_4106	42303
CTCN_256	28245	ATCN_2906	42304
CTCN_257	28246	CTCN_5152	42305
CTCN_258	28247	CTCN_5153	42306
CTCN_259	28248	GTCN_2684	42307
CTCN_260	28249	CTCN_5154	42308
TTCN_208	28250	CTCN_5155	42309
ATCN_154	28251	TTCN_4107	42310
TTCN_209	28252	CTCN_5156	42311
CTCN_261	28253	CTCN_5157	42312
CTCN_262	28254	CTCN_5158	42313
CTCN_263	28255	GTCN_2685	42314
GTCN_172	28256	CTCN_5159	42315
ATCN_155	28257	CTCN_5160	42316
CTCN_264	28258	TTCN_4108	42317
GTCN_173	28259	GTCN_2686	42318
TTCN_210	28260	ATCN_2907	42319
CTCN_265	28261	TTCN_4109	42320
CTCN_266	28262	TTCN_4110	42321
GTCN_174	28263	TTCN_4111	42322
CTCN_267	28264	TTCN_4112	42323
ATCN_156	28265	ATCN_2908	42324
ATCN_157	28266	CTCN_5161	42325
CTCN_268	28267	CTCN_5162	42326

CTCN_269	28268	CTCN_5163	42327
ATCN_158	28269	TTCN_4113	42328
CTCN_270	28270	TTCN_4114	42329
GTCN_175	28271	TTCN_4115	42330
CTCN_271	28272	CTCN_5164	42331
CTCN_272	28273	TTCN_4116	42332
CTCN_273	28274	CTCN_5165	42333
CTCN_274	28275	ATCN_2909	42334
GTCN_176	28276	CTCN_5166	42335
ATCN_159	28277	CTCN_5167	42336
GTCN_177	28278	CTCN_5168	42337
CTCN_275	28279	TTCN_4117	42338
GTCN_178	28280	ATCN_2910	42339
CTCN_276	28281	ATCN_2911	42340
ATCN_160	28282	CTCN_5169	42341
TTCN_211	28283	CTCN_5170	42342
GTCN_179	28284	CTCN_5171	42343
GTCN_180	28285	CTCN_5172	42344
CTCN_277	28286	TTCN_4118	42345
TTCN_212	28287	TTCN_4119	42346
TTCN_213	28288	CTCN_5173	42347
ATCN_161	28289	CTCN_5174	42348
CTCN_278	28290	CTCN_5175	42349
CTCN_279	28291	CTCN_5176	42350
CTCN_280	28292	GTCN_2687	42351
TTCN_214	28293	CTCN_5177	42352
TTCN_215	28294	ATCN_2912	42353
TTCN_216	28295	TTCN_4120	42354
TTCN_217	28296	GTCN_2688	42355
GTCN_181	28297	CTCN_5178	42356
TTCN_218	28298	TTCN_4121	42357
CTCN_281	28299	CTCN_5179	42358
GTCN_182	28300	CTCN_5180	42359
TTCN_219	28301	ATCN_2913	42360
GTCN_183	28302	ATCN_2914	42361
GTCN_184	28303	CTCN_5181	42362
TTCN_220	28304	TTCN_4122	42363
TTCN_221	28305	ATCN_2915	42364
TTCN_222	28306	CTCN_5182	42365
GTCN_185	28307	TTCN_4123	42366
CTCN_282	28308	ATCN_2916	42367
TTCN_223	28309	TTCN_4124	42368
CTCN_283	28310	GTCN_2689	42369

FIG. 37 (continued)

GTCN_186	28311	GTCN_2690	42370
CTCN_284	28312	ATCN_2917	42371
ATCN_162	28313	TTCN_4125	42372
GTCN_187	28314	ATCN_2918	42373
CTCN_285	28315	TTCN_4126	42374
TTCN_224	28316	TTCN_4127	42375
TTCN_225	28317	TTCN_4128	42376
CTCN_286	28318	TTCN_4129	42377
CTCN_287	28319	GTCN_2691	42378
CTCN_288	28320	CTCN_5183	42379
CTCN_289	28321	GTCN_2692	42380
ATCN_163	28322	TTCN_4130	42381
TTCN_226	28323	GTCN_2693	42382
TTCN_227	28324	GTCN_2694	42383
ATCN_164	28325	CTCN_5184	42384
GTCN_188	28326	CTCN_5185	42385
CTCN_290	28327	CTCN_5186	42386
CTCN_291	28328	ATCN_2919	42387
GTCN_189	28329	ATCN_2920	42388
CTCN_292	28330	TTCN_4131	42389
ATCN_165	28331	GTCN_2695	42390
TTCN_228	28332	TTCN_4132	42391
TTCN_229	28333	TTCN_4133	42392
TTCN_230	28334	CTCN_5187	42393
ATCN_166	28335	TTCN_4134	42394
ATCN_167	28336	TTCN_4135	42395
TTCN_231	28337	ATCN_2921	42396
GTCN_190	28338	CTCN_5188	42397
TTCN_232	28339	CTCN_5189	42398
GTCN_191	28340	ATCN_2922	42399
GTCN_192	28341	TTCN_4136	42400
CTCN_293	28342	CTCN_5190	42401
TTCN_233	28343	GTCN_2696	42402
ATCN_168	28344	ATCN_2923	42403
ATCN_169	28345	TTCN_4137	42404
TTCN_234	28346	CTCN_5191	42405
CTCN_294	28347	TTCN_4138	42406
CTCN_295	28348	TTCN_4139	42407
ATCN_170	28349	TTCN_4140	42408
GTCN_193	28350	CTCN_5192	42409
CTCN_296	28351	CTCN_5193	42410
GTCN_194	28352	ATCN_2924	42411
CTCN_297	28353	GTCN_2697	42412

CTCN_298	28354	TTCN_4141	42413
GTCN_195	28355	TTCN_4142	42414
CTCN_299	28356	CTCN_5194	42415
CTCN_300	28357	TTCN_4143	42416
ATCN_171	28358	TTCN_4144	42417
CTCN_301	28359	CTCN_5195	42418
CTCN_302	28360	CTCN_5196	42419
ATCN_172	28361	TTCN_4145	42420
GTCN_196	28362	ATCN_2925	42421
CTCN_303	28363	CTCN_5197	42422
CTCN_304	28364	TTCN_4146	42423
CTCN_305	28365	CTCN_5198	42424
TTCN_235	28366	TTCN_4147	42425
TTCN_236	28367	TTCN_4148	42426
CTCN_306	28368	TTCN_4149	42427
GTCN_197	28369	CTCN_5199	42428
GTCN_198	28370	GTCN_2698	42429
GTCN_199	28371	TTCN_4150	42430
CTCN_307	28372	GTCN_2699	42431
CTCN_308	28373	ATCN_2926	42432
GTCN_200	28374	GTCN_2700	42433
CTCN_309	28375	CTCN_5200	42434
CTCN_310	28376	TTCN_4151	42435
TTCN_237	28377	CTCN_5201	42436
ATCN_173	28378	CTCN_5202	42437
TTCN_238	28379	ATCN_2927	42438
TTCN_239	28380	CTCN_5203	42439
CTCN_311	28381	CTCN_5204	42440
CTCN_312	28382	GTCN_2701	42441
TTCN_240	28383	GTCN_2702	42442
CTCN_313	28384	TTCN_4152	42443
CTCN_314	28385	GTCN_2703	42444
ATCN_174	28386	CTCN_5205	42445
GTCN_201	28387	CTCN_5206	42446
CTCN_315	28388	TTCN_4153	42447
GTCN_202	28389	TTCN_4154	42448
ATCN_175	28390	TTCN_4155	42449
TTCN_241	28391	CTCN_5207	42450
GTCN_203	28392	ATCN_2928	42451
ATCN_176	28393	TTCN_4156	42452
TTCN_242	28394	CTCN_5208	42453
TTCN_243	28395	CTCN_5209	42454
TTCN_244	28396	TTCN_4157	42455

FIG. 37 (continued)

TTCN_245	28397	ATCN_2929	42456
TTCN_246	28398	ATCN_2930	42457
TTCN_247	28399	ATCN_2931	42458
TTCN_248	28400	TTCN_4158	42459
TTCN_249	28401	ATCN_2932	42460
CTCN_316	28402	ATCN_2933	42461
ATCN_177	28403	GTCN_2704	42462
ATCN_178	28404	ATCN_2934	42463
ATCN_179	28405	CTCN_5210	42464
GTCN_204	28406	GTCN_2705	42465
GTCN_205	28407	ATCN_2935	42466
GTCN_206	28408	CTCN_5211	42467
ATCN_180	28409	TTCN_4159	42468
CTCN_317	28410	TTCN_4160	42469
ATCN_181	28411	CTCN_5212	42470
GTCN_207	28412	TTCN_4161	42471
TTCN_250	28413	CTCN_5213	42472
CTCN_318	28414	CTCN_5214	42473
TTCN_251	28415	GTCN_2706	42474
CTCN_319	28416	ATCN_2936	42475
GTCN_208	28417	CTCN_5215	42476
GTCN_209	28418	CTCN_5216	42477
TTCN_252	28419	TTCN_4162	42478
ATCN_182	28420	CTCN_5217	42479
GTCN_210	28421	CTCN_5218	42480
CTCN_320	28422	TTCN_4163	42481
ATCN_183	28423	TTCN_4164	42482
CTCN_321	28424	CTCN_5219	42483
TTCN_253	28425	CTCN_5220	42484
TTCN_254	28426	TTCN_4165	42485
ATCN_184	28427	CTCN_5221	42486
TTCN_255	28428	CTCN_5222	42487
TTCN_256	28429	GTCN_2707	42488
GTCN_211	28430	TTCN_4166	42489
TTCN_257	28431	TTCN_4167	42490
CTCN_322	28432	TTCN_4168	42491
GTCN_212	28433	GTCN_2708	42492
TTCN_258	28434	GTCN_2709	42493
ATCN_185	28435	ATCN_2937	42494
TTCN_259	28436	CTCN_5223	42495
CTCN_323	28437	CTCN_5224	42496
TTCN_260	28438	TTCN_4169	42497
ATCN_186	28439	GTCN_2710	42498

CTCN_324	28440	TTCN_4170	42499
TTCN_261	28441	CTCN_5225	42500
TTCN_262	28442	ATCN_2938	42501
TTCN_263	28443	CTCN_5226	42502
CTCN_325	28444	TTCN_4171	42503
GTCN_213	28445	CTCN_5227	42504
TTCN_264	28446	GTCN_2711	42505
CTCN_326	28447	CTCN_5228	42506
TTCN_265	28448	TTCN_4172	42507
ATCN_187	28449	GTCN_2712	42508
TTCN_266	28450	TTCN_4173	42509
TTCN_267	28451	CTCN_5229	42510
TTCN_268	28452	TTCN_4174	42511
TTCN_269	28453	TTCN_4175	42512
ATCN_188	28454	CTCN_5230	42513
TTCN_270	28455	CTCN_5231	42514
CTCN_327	28456	GTCN_2713	42515
CTCN_328	28457	CTCN_5232	42516
CTCN_329	28458	TTCN_4176	42517
CTCN_330	28459	GTCN_2714	42518
CTCN_331	28460	CTCN_5233	42519
CTCN_332	28461	CTCN_5234	42520
TTCN_271	28462	TTCN_4177	42521
GTCN_214	28463	GTCN_2715	42522
ATCN_189	28464	GTCN_2716	42523
ATCN_190	28465	CTCN_5235	42524
ATCN_191	28466	CTCN_5236	42525
CTCN_333	28467	CTCN_5237	42526
TTCN_272	28468	ATCN_2939	42527
CTCN_334	28469	CTCN_5238	42528
ATCN_192	28470	CTCN_5239	42529
CTCN_335	28471	GTCN_2717	42530
GTCN_215	28472	GTCN_2718	42531
TTCN_273	28473	CTCN_5240	42532
ATCN_193	28474	GTCN_2719	42533
ATCN_194	28475	CTCN_5241	42534
ATCN_195	28476	CTCN_5242	42535
CTCN_336	28477	TTCN_4178	42536
TTCN_274	28478	TTCN_4179	42537
TTCN_275	28479	TTCN_4180	42538
ATCN_196	28480	CTCN_5243	42539
ATCN_197	28481	CTCN_5244	42540
ATCN_198	28482	TTCN_4181	42541

FIG. 37 (continued)

ATCN_199	28483	CTCN_5245	42542
TTCN_276	28484	ATCN_2940	42543
CTCN_337	28485	ATCN_2941	42544
CTCN_338	28486	ATCN_2942	42545
ATCN_200	28487	CTCN_5246	42546
ATCN_201	28488	GTCN_2720	42547
GTCN_216	28489	TTCN_4182	42548
CTCN_339	28490	TTCN_4183	42549
ATCN_202	28491	CTCN_5247	42550
TTCN_277	28492	GTCN_2721	42551
CTCN_340	28493	CTCN_5248	42552
ATCN_203	28494	CTCN_5249	42553
ATCN_204	28495	TTCN_4184	42554
ATCN_205	28496	CTCN_5250	42555
ATCN_206	28497	CTCN_5251	42556
ATCN_207	28498	CTCN_5252	42557
CTCN_341	28499	ATCN_2943	42558
GTCN_217	28500	TTCN_4185	42559
TTCN_278	28501	CTCN_5253	42560
TTCN_279	28502	ATCN_2944	42561
CTCN_342	28503	CTCN_5254	42562
ATCN_208	28504	CTCN_5255	42563
TTCN_280	28505	ATCN_2945	42564
ATCN_209	28506	TTCN_4186	42565
GTCN_218	28507	TTCN_4187	42566
TTCN_281	28508	TTCN_4188	42567
TTCN_282	28509	ATCN_2946	42568
CTCN_343	28510	CTCN_5256	42569
GTCN_219	28511	TTCN_4189	42570
CTCN_344	28512	GTCN_2722	42571
ATCN_210	28513	GTCN_2723	42572
GTCN_220	28514	GTCN_2724	42573
TTCN_283	28515	GTCN_2725	42574
TTCN_284	28516	TTCN_4190	42575
ATCN_211	28517	CTCN_5257	42576
TTCN_285	28518	TTCN_4191	42577
TTCN_286	28519	CTCN_5258	42578
ATCN_212	28520	ATCN_2947	42579
ATCN_213	28521	CTCN_5259	42580
CTCN_345	28522	CTCN_5260	42581
TTCN_287	28523	TTCN_4192	42582
CTCN_346	28524	CTCN_5261	42583
TTCN_288	28525	TTCN_4193	42584

ATCN_214	28526	GTCN_2726	42585
GTCN_221	28527	GTCN_2727	42586
CTCN_347	28528	TTCN_4194	42587
CTCN_348	28529	TTCN_4195	42588
ATCN_215	28530	CTCN_5262	42589
ATCN_216	28531	GTCN_2728	42590
CTCN_349	28532	ATCN_2948	42591
CTCN_350	28533	ATCN_2949	42592
ATCN_217	28534	TTCN_4196	42593
CTCN_351	28535	CTCN_5263	42594
TTCN_289	28536	TTCN_4197	42595
ATCN_218	28537	ATCN_2950	42596
ATCN_219	28538	ATCN_2951	42597
TTCN_290	28539	TTCN_4198	42598
CTCN_352	28540	CTCN_5264	42599
TTCN_291	28541	TTCN_4199	42600
TTCN_292	28542	CTCN_5265	42601
GTCN_222	28543	TTCN_4200	42602
TTCN_293	28544	ATCN_2952	42603
TTCN_294	28545	CTCN_5266	42604
ATCN_220	28546	CTCN_5267	42605
ATCN_221	28547	ATCN_2953	42606
TTCN_295	28548	TTCN_4201	42607
GTCN_223	28549	GTCN_2729	42608
TTCN_296	28550	TTCN_4202	42609
TTCN_297	28551	CTCN_5268	42610
TTCN_298	28552	CTCN_5269	42611
TTCN_299	28553	TTCN_4203	42612
TTCN_300	28554	CTCN_5270	42613
GTCN_224	28555	CTCN_5271	42614
ATCN_222	28556	GTCN_2730	42615
ATCN_223	28557	CTCN_5272	42616
TTCN_301	28558	GTCN_2731	42617
TTCN_302	28559	CTCN_5273	42618
CTCN_353	28560	GTCN_2732	42619
TTCN_303	28561	CTCN_5274	42620
TTCN_304	28562	TTCN_4204	42621
TTCN_305	28563	CTCN_5275	42622
ATCN_224	28564	CTCN_5276	42623
CTCN_354	28565	CTCN_5277	42624
ATCN_225	28566	TTCN_4205	42625
TTCN_306	28567	GTCN_2733	42626
CTCN_355	28568	GTCN_2734	42627

FIG. 37 (continued)

CTCN_356	28569	TTCN_4206	42628
CTCN_357	28570	CTCN_5278	42629
GTCN_225	28571	TTCN_4207	42630
CTCN_358	28572	CTCN_5279	42631
GTCN_226	28573	CTCN_5280	42632
CTCN_359	28574	CTCN_5281	42633
CTCN_360	28575	GTCN_2735	42634
CTCN_361	28576	CTCN_5282	42635
CTCN_362	28577	CTCN_5283	42636
ATCN_226	28578	GTCN_2736	42637
ATCN_227	28579	CTCN_5284	42638
CTCN_363	28580	CTCN_5285	42639
GTCN_227	28581	CTCN_5286	42640
CTCN_364	28582	CTCN_5287	42641
CTCN_365	28583	CTCN_5288	42642
CTCN_366	28584	GTCN_2737	42643
GTCN_228	28585	TTCN_4208	42644
GTCN_229	28586	TTCN_4209	42645
CTCN_367	28587	ATCN_2954	42646
CTCN_368	28588	CTCN_5289	42647
TTCN_307	28589	ATCN_2955	42648
CTCN_369	28590	TTCN_4210	42649
CTCN_370	28591	ATCN_2956	42650
GTCN_230	28592	CTCN_5290	42651
CTCN_371	28593	CTCN_5291	42652
GTCN_231	28594	ATCN_2957	42653
CTCN_372	28595	ATCN_2958	42654
CTCN_373	28596	CTCN_5292	42655
CTCN_374	28597	GTCN_2738	42656
CTCN_375	28598	ATCN_2959	42657
CTCN_376	28599	CTCN_5293	42658
CTCN_377	28600	ATCN_2960	42659
GTCN_232	28601	CTCN_5294	42660
CTCN_378	28602	ATCN_2961	42661
CTCN_379	28603	ATCN_2962	42662
CTCN_380	28604	CTCN_5295	42663
CTCN_381	28605	TTCN_4211	42664
TTCN_308	28606	TTCN_4212	42665
TTCN_309	28607	ATCN_2963	42666
CTCN_382	28608	ATCN_2964	42667
CTCN_383	28609	CTCN_5296	42668
GTCN_233	28610	TTCN_4213	42669
CTCN_384	28611	ATCN_2965	42670

CTCN_385	28612	CTCN_5297	42671
ATCN_228	28613	CTCN_5298	42672
CTCN_386	28614	ATCN_2966	42673
CTCN_387	28615	ATCN_2967	42674
ATCN_229	28616	CTCN_5299	42675
GTCN_234	28617	CTCN_5300	42676
CTCN_388	28618	CTCN_5301	42677
TTCN_310	28619	GTCN_2739	42678
CTCN_389	28620	CTCN_5302	42679
TTCN_311	28621	GTCN_2740	42680
ATCN_230	28622	GTCN_2741	42681
TTCN_312	28623	CTCN_5303	42682
CTCN_390	28624	GTCN_2742	42683
CTCN_391	28625	CTCN_5304	42684
TTCN_313	28626	TTCN_4214	42685
ATCN_231	28627	CTCN_5305	42686
CTCN_392	28628	CTCN_5306	42687
GTCN_235	28629	ATCN_2968	42688
CTCN_393	28630	CTCN_5307	42689
GTCN_236	28631	TTCN_4215	42690
GTCN_237	28632	TTCN_4216	42691
TTCN_314	28633	GTCN_2743	42692
ATCN_232	28634	GTCN_2744	42693
ATCN_233	28635	CTCN_5308	42694
CTCN_394	28636	GTCN_2745	42695
TTCN_315	28637	GTCN_2746	42696
CTCN_395	28638	CTCN_5309	42697
TTCN_316	28639	CTCN_5310	42698
GTCN_238	28640	TTCN_4217	42699
CTCN_396	28641	ATCN_2969	42700
ATCN_234	28642	TTCN_4218	42701
ATCN_235	28643	ATCN_2970	42702
CTCN_397	28644	CTCN_5311	42703
ATCN_236	28645	CTCN_5312	42704
CTCN_398	28646	GTCN_2747	42705
CTCN_399	28647	CTCN_5313	42706
CTCN_400	28648	CTCN_5314	42707
TTCN_317	28649	CTCN_5315	42708
CTCN_401	28650	CTCN_5316	42709
GTCN_239	28651	GTCN_2748	42710
TTCN_318	28652	GTCN_2749	42711
GTCN_240	28653	ATCN_2971	42712
CTCN_402	28654	GTCN_2750	42713

FIG. 37 (continued)

CTCN_403	28655	GTCN_2751	42714
CTCN_404	28656	GTCN_2752	42715
TTCN_319	28657	CTCN_5317	42716
CTCN_405	28658	ATCN_2972	42717
CTCN_406	28659	ATCN_2973	42718
GTCN_241	28660	CTCN_5318	42719
GTCN_242	28661	GTCN_2753	42720
CTCN_407	28662	TTCN_4219	42721
CTCN_408	28663	TTCN_4220	42722
CTCN_409	28664	CTCN_5319	42723
GTCN_243	28665	TTCN_4221	42724
CTCN_410	28666	ATCN_2974	42725
GTCN_244	28667	TTCN_4222	42726
CTCN_411	28668	ATCN_2975	42727
CTCN_412	28669	TTCN_4223	42728
TTCN_320	28670	TTCN_4224	42729
CTCN_413	28671	TTCN_4225	42730
CTCN_414	28672	TTCN_4226	42731
CTCN_415	28673	GTCN_2754	42732
TTCN_321	28674	CTCN_5320	42733
CTCN_416	28675	ATCN_2976	42734
CTCN_417	28676	CTCN_5321	42735
ATCN_237	28677	ATCN_2977	42736
ATCN_238	28678	ATCN_2978	42737
CTCN_418	28679	CTCN_5322	42738
CTCN_419	28680	ATCN_2979	42739
TTCN_322	28681	ATCN_2980	42740
TTCN_323	28682	CTCN_5323	42741
CTCN_420	28683	CTCN_5324	42742
GTCN_245	28684	GTCN_2755	42743
TTCN_324	28685	TTCN_4227	42744
CTCN_421	28686	CTCN_5325	42745
GTCN_246	28687	GTCN_2756	42746
GTCN_247	28688	GTCN_2757	42747
CTCN_422	28689	TTCN_4228	42748
CTCN_423	28690	GTCN_2758	42749
CTCN_424	28691	CTCN_5326	42750
TTCN_325	28692	TTCN_4229	42751
CTCN_425	28693	CTCN_5327	42752
CTCN_426	28694	GTCN_2759	42753
CTCN_427	28695	CTCN_5328	42754
CTCN_428	28696	CTCN_5329	42755
CTCN_429	28697	CTCN_5330	42756

CTCN_430	28698	TTCN_4230	42757
CTCN_431	28699	TTCN_4231	42758
CTCN_432	28700	ATCN_2981	42759
CTCN_433	28701	CTCN_5331	42760
CTCN_434	28702	CTCN_5332	42761
TTCN_326	28703	CTCN_5333	42762
CTCN_435	28704	CTCN_5334	42763
TTCN_327	28705	CTCN_5335	42764
CTCN_436	28706	ATCN_2982	42765
TTCN_328	28707	ATCN_2983	42766
GTCN_248	28708	GTCN_2760	42767
GTCN_249	28709	CTCN_5336	42768
GTCN_250	28710	CTCN_5337	42769
TTCN_329	28711	GTCN_2761	42770
CTCN_437	28712	CTCN_5338	42771
CTCN_438	28713	GTCN_2762	42772
CTCN_439	28714	CTCN_5339	42773
ATCN_239	28715	TTCN_4232	42774
TTCN_330	28716	CTCN_5340	42775
ATCN_240	28717	TTCN_4233	42776
CTCN_440	28718	CTCN_5341	42777
TTCN_331	28719	TTCN_4234	42778
TTCN_332	28720	TTCN_4235	42779
TTCN_333	28721	ATCN_2984	42780
GTCN_251	28722	TTCN_4236	42781
CTCN_441	28723	GTCN_2763	42782
CTCN_442	28724	CTCN_5342	42783
TTCN_334	28725	CTCN_5343	42784
GTCN_252	28726	ATCN_2985	42785
ATCN_241	28727	ATCN_2986	42786
CTCN_443	28728	ATCN_2987	42787
GTCN_253	28729	GTCN_2764	42788
GTCN_254	28730	CTCN_5344	42789
GTCN_255	28731	GTCN_2765	42790
CTCN_444	28732	CTCN_5345	42791
CTCN_445	28733	TTCN_4237	42792
GTCN_256	28734	TTCN_4238	42793
GTCN_257	28735	CTCN_5346	42794
CTCN_446	28736	CTCN_5347	42795
CTCN_447	28737	GTCN_2766	42796
GTCN_258	28738	CTCN_5348	42797
TTCN_335	28739	TTCN_4239	42798
CTCN_448	28740	GTCN_2767	42799

FIG. 37 (continued)

CTCN_449	28741	CTCN_5349	42800
CTCN_450	28742	GTCN_2768	42801
CTCN_451	28743	CTCN_5350	42802
CTCN_452	28744	GTCN_2769	42803
GTCN_259	28745	CTCN_5351	42804
TTCN_336	28746	GTCN_2770	42805
GTCN_260	28747	TTCN_4240	42806
GTCN_261	28748	CTCN_5352	42807
CTCN_453	28749	ATCN_2988	42808
TTCN_337	28750	TTCN_4241	42809
TTCN_338	28751	GTCN_2771	42810
GTCN_262	28752	TTCN_4242	42811
CTCN_454	28753	TTCN_4243	42812
TTCN_339	28754	CTCN_5353	42813
GTCN_263	28755	GTCN_2772	42814
GTCN_264	28756	CTCN_5354	42815
ATCN_242	28757	ATCN_2989	42816
TTCN_340	28758	ATCN_2990	42817
CTCN_455	28759	TTCN_4244	42818
CTCN_456	28760	CTCN_5355	42819
GTCN_265	28761	GTCN_2773	42820
ATCN_243	28762	TTCN_4245	42821
CTCN_457	28763	ATCN_2991	42822
CTCN_458	28764	GTCN_2774	42823
TTCN_341	28765	TTCN_4246	42824
CTCN_459	28766	TTCN_4247	42825
CTCN_460	28767	CTCN_5356	42826
TTCN_342	28768	TTCN_4248	42827
ATCN_244	28769	CTCN_5357	42828
TTCN_343	28770	GTCN_2775	42829
CTCN_461	28771	CTCN_5358	42830
TTCN_344	28772	ATCN_2992	42831
CTCN_462	28773	CTCN_5359	42832
GTCN_266	28774	CTCN_5360	42833
CTCN_463	28775	CTCN_5361	42834
GTCN_267	28776	GTCN_2776	42835
ATCN_245	28777	ATCN_2993	42836
TTCN_345	28778	ATCN_2994	42837
TTCN_346	28779	TTCN_4249	42838
ATCN_246	28780	CTCN_5362	42839
TTCN_347	28781	CTCN_5363	42840
CTCN_464	28782	CTCN_5364	42841
ATCN_247	28783	CTCN_5365	42842

TTCN_348	28784	CTCN_5366	42843
TTCN_349	28785	CTCN_5367	42844
TTCN_350	28786	ATCN_2995	42845
CTCN_465	28787	TTCN_4250	42846
TTCN_351	28788	GTCN_2777	42847
ATCN_248	28789	TTCN_4251	42848
CTCN_466	28790	CTCN_5368	42849
TTCN_352	28791	TTCN_4252	42850
ATCN_249	28792	GTCN_2778	42851
CTCN_467	28793	TTCN_4253	42852
CTCN_468	28794	CTCN_5369	42853
CTCN_469	28795	CTCN_5370	42854
CTCN_470	28796	ATCN_2996	42855
CTCN_471	28797	ATCN_2997	42856
TTCN_353	28798	ATCN_2998	42857
ATCN_250	28799	TTCN_4254	42858
ATCN_251	28800	TTCN_4255	42859
GTCN_268	28801	TTCN_4256	42860
CTCN_472	28802	GTCN_2779	42861
ATCN_252	28803	ATCN_2999	42862
TTCN_354	28804	CTCN_5371	42863
CTCN_473	28805	CTCN_5372	42864
TTCN_355	28806	ATCN_3000	42865
CTCN_474	28807	TTCN_4257	42866
CTCN_475	28808	CTCN_5373	42867
ATCN_253	28809	GTCN_2780	42868
ATCN_254	28810	GTCN_2781	42869
GTCN_269	28811	GTCN_2782	42870
GTCN_270	28812	CTCN_5374	42871
TTCN_356	28813	ATCN_3001	42872
ATCN_255	28814	ATCN_3002	42873
CTCN_476	28815	CTCN_5375	42874
TTCN_357	28816	TTCN_4258	42875
GTCN_271	28817	TTCN_4259	42876
CTCN_477	28818	TTCN_4260	42877
CTCN_478	28819	CTCN_5376	42878
ATCN_256	28820	CTCN_5377	42879
TTCN_358	28821	CTCN_5378	42880
CTCN_479	28822	CTCN_5379	42881
TTCN_359	28823	GTCN_2783	42882
TTCN_360	28824	GTCN_2784	42883
GTCN_272	28825	ATCN_3003	42884
GTCN_273	28826	CTCN_5380	42885

FIG. 37 (continued)

CTCN_480	28827	ATCN_3004	42886
ATCN_257	28828	TTCN_4261	42887
CTCN_481	28829	ATCN_3005	42888
GTCN_274	28830	CTCN_5381	42889
CTCN_482	28831	TTCN_4262	42890
GTCN_275	28832	TTCN_4263	42891
GTCN_276	28833	ATCN_3006	42892
CTCN_483	28834	GTCN_2785	42893
ATCN_258	28835	GTCN_2786	42894
CTCN_484	28836	CTCN_5382	42895
GTCN_277	28837	ATCN_3007	42896
CTCN_485	28838	TTCN_4264	42897
GTCN_278	28839	TTCN_4265	42898
GTCN_279	28840	TTCN_4266	42899
CTCN_486	28841	ATCN_3008	42900
ATCN_259	28842	CTCN_5383	42901
CTCN_487	28843	TTCN_4267	42902
GTCN_280	28844	CTCN_5384	42903
CTCN_488	28845	CTCN_5385	42904
GTCN_281	28846	TTCN_4268	42905
CTCN_489	28847	TTCN_4269	42906
ATCN_260	28848	CTCN_5386	42907
CTCN_490	28849	TTCN_4270	42908
GTCN_282	28850	GTCN_2787	42909
CTCN_491	28851	ATCN_3009	42910
GTCN_283	28852	ATCN_3010	42911
GTCN_284	28853	CTCN_5387	42912
CTCN_492	28854	GTCN_2788	42913
ATCN_261	28855	ATCN_3011	42914
CTCN_493	28856	ATCN_3012	42915
GTCN_285	28857	TTCN_4271	42916
CTCN_494	28858	TTCN_4272	42917
GTCN_286	28859	TTCN_4273	42918
GTCN_287	28860	TTCN_4274	42919
CTCN_495	28861	TTCN_4275	42920
ATCN_262	28862	TTCN_4276	42921
CTCN_496	28863	CTCN_5388	42922
GTCN_288	28864	GTCN_2789	42923
CTCN_497	28865	CTCN_5389	42924
GTCN_289	28866	GTCN_2790	42925
GTCN_290	28867	TTCN_4277	42926
CTCN_498	28868	GTCN_2791	42927
ATCN_263	28869	TTCN_4278	42928

CTCN_499	28870	GTCN_2792	42929
GTCN_291	28871	ATCN_3013	42930
CTCN_500	28872	ATCN_3014	42931
GTCN_292	28873	TTCN_4279	42932
GTCN_293	28874	TTCN_4280	42933
CTCN_501	28875	GTCN_2793	42934
ATCN_264	28876	CTCN_5390	42935
GTCN_294	28877	CTCN_5391	42936
CTCN_502	28878	CTCN_5392	42937
GTCN_295	28879	TTCN_4281	42938
GTCN_296	28880	TTCN_4282	42939
CTCN_503	28881	ATCN_3015	42940
ATCN_265	28882	TTCN_4283	42941
CTCN_504	28883	ATCN_3016	42942
GTCN_297	28884	CTCN_5393	42943
CTCN_505	28885	CTCN_5394	42944
GTCN_298	28886	TTCN_4284	42945
GTCN_299	28887	TTCN_4285	42946
CTCN_506	28888	TTCN_4286	42947
ATCN_266	28889	TTCN_4287	42948
GTCN_300	28890	TTCN_4288	42949
CTCN_507	28891	CTCN_5395	42950
GTCN_301	28892	TTCN_4289	42951
GTCN_302	28893	GTCN_2794	42952
CTCN_508	28894	CTCN_5396	42953
TTCN_361	28895	CTCN_5397	42954
TTCN_362	28896	CTCN_5398	42955
CTCN_509	28897	ATCN_3017	42956
ATCN_267	28898	ATCN_3018	42957
CTCN_510	28899	GTCN_2795	42958
ATCN_268	28900	ATCN_3019	42959
CTCN_511	28901	TTCN_4290	42960
TTCN_363	28902	TTCN_4291	42961
CTCN_512	28903	GTCN_2796	42962
CTCN_513	28904	CTCN_5399	42963
GTCN_303	28905	GTCN_2797	42964
CTCN_514	28906	GTCN_2798	42965
GTCN_304	28907	CTCN_5400	42966
CTCN_515	28908	CTCN_5401	42967
CTCN_516	28909	TTCN_4292	42968
CTCN_517	28910	CTCN_5402	42969
ATCN_269	28911	ATCN_3020	42970
CTCN_518	28912	TTCN_4293	42971

FIG. 37 (continued)

CTCN_519	28913	GTCN_2799	42972
ATCN_270	28914	GTCN_2800	42973
ATCN_271	28915	CTCN_5403	42974
CTCN_520	28916	GTCN_2801	42975
GTCN_305	28917	CTCN_5404	42976
ATCN_272	28918	GTCN_2802	42977
TTCN_364	28919	ATCN_3021	42978
TTCN_365	28920	TTCN_4294	42979
CTCN_521	28921	TTCN_4295	42980
TTCN_366	28922	CTCN_5405	42981
ATCN_273	28923	TTCN_4296	42982
ATCN_274	28924	TTCN_4297	42983
GTCN_306	28925	TTCN_4298	42984
CTCN_522	28926	TTCN_4299	42985
ATCN_275	28927	CTCN_5406	42986
ATCN_276	28928	TTCN_4300	42987
CTCN_523	28929	TTCN_4301	42988
CTCN_524	28930	TTCN_4302	42989
TTCN_367	28931	CTCN_5407	42990
ATCN_277	28932	TTCN_4303	42991
CTCN_525	28933	GTCN_2803	42992
ATCN_278	28934	TTCN_4304	42993
CTCN_526	28935	TTCN_4305	42994
TTCN_368	28936	CTCN_5408	42995
TTCN_369	28937	TTCN_4306	42996
GTCN_307	28938	TTCN_4307	42997
CTCN_527	28939	CTCN_5409	42998
CTCN_528	28940	ATCN_3022	42999
CTCN_529	28941	GTCN_2804	43000
ATCN_279	28942	GTCN_2805	43001
ATCN_280	28943	GTCN_2806	43002
CTCN_530	28944	CTCN_5410	43003
CTCN_531	28945	CTCN_5411	43004
CTCN_532	28946	TTCN_4308	43005
CTCN_533	28947	ATCN_3023	43006
ATCN_281	28948	ATCN_3024	43007
ATCN_282	28949	CTCN_5412	43008
CTCN_534	28950	GTCN_2807	43009
GTCN_308	28951	CTCN_5413	43010
CTCN_535	28952	GTCN_2808	43011
TTCN_370	28953	CTCN_5414	43012
GTCN_309	28954	ATCN_3025	43013
CTCN_536	28955	CTCN_5415	43014

GTCN_310	28956	TTCN_4309	43015
GTCN_311	28957	TTCN_4310	43016
GTCN_312	28958	GTCN_2809	43017
GTCN_313	28959	GTCN_2810	43018
ATCN_283	28960	CTCN_5416	43019
ATCN_284	28961	TTCN_4311	43020
TTCN_371	28962	CTCN_5417	43021
GTCN_314	28963	GTCN_2811	43022
ATCN_285	28964	GTCN_2812	43023
ATCN_286	28965	CTCN_5418	43024
ATCN_287	28966	TTCN_4312	43025
TTCN_372	28967	GTCN_2813	43026
TTCN_373	28968	CTCN_5419	43027
CTCN_537	28969	GTCN_2814	43028
CTCN_538	28970	GTCN_2815	43029
ATCN_288	28971	CTCN_5420	43030
TTCN_374	28972	TTCN_4313	43031
CTCN_539	28973	GTCN_2816	43032
CTCN_540	28974	CTCN_5421	43033
GTCN_315	28975	TTCN_4314	43034
TTCN_375	28976	ATCN_3026	43035
TTCN_376	28977	GTCN_2817	43036
TTCN_377	28978	TTCN_4315	43037
TTCN_378	28979	CTCN_5422	43038
TTCN_379	28980	TTCN_4316	43039
TTCN_380	28981	ATCN_3027	43040
CTCN_541	28982	ATCN_3028	43041
TTCN_381	28983	ATCN_3029	43042
CTCN_542	28984	TTCN_4317	43043
CTCN_543	28985	ATCN_3030	43044
GTCN_316	28986	GTCN_2818	43045
CTCN_544	28987	CTCN_5423	43046
CTCN_545	28988	GTCN_2819	43047
TTCN_382	28989	GTCN_2820	43048
CTCN_546	28990	CTCN_5424	43049
CTCN_547	28991	CTCN_5425	43050
TTCN_383	28992	CTCN_5426	43051
TTCN_384	28993	TTCN_4318	43052
GTCN_317	28994	CTCN_5427	43053
GTCN_318	28995	CTCN_5428	43054
TTCN_385	28996	GTCN_2821	43055
CTCN_548	28997	ATCN_3031	43056
CTCN_549	28998	TTCN_4319	43057

FIG. 37 (continued)

TTCN_386	28999	GTCN_2822	43058
ATCN_289	29000	CTCN_5429	43059
CTCN_550	29001	ATCN_3032	43060
TTCN_387	29002	ATCN_3033	43061
TTCN_388	29003	GTCN_2823	43062
GTCN_319	29004	TTCN_4320	43063
CTCN_551	29005	GTCN_2824	43064
CTCN_552	29006	TTCN_4321	43065
CTCN_553	29007	TTCN_4322	43066
GTCN_320	29008	TTCN_4323	43067
GTCN_321	29009	TTCN_4324	43068
ATCN_290	29010	GTCN_2825	43069
GTCN_322	29011	ATCN_3034	43070
GTCN_323	29012	CTCN_5430	43071
CTCN_554	29013	CTCN_5431	43072
TTCN_389	29014	GTCN_2826	43073
TTCN_390	29015	CTCN_5432	43074
TTCN_391	29016	CTCN_5433	43075
GTCN_324	29017	ATCN_3035	43076
TTCN_392	29018	ATCN_3036	43077
CTCN_555	29019	ATCN_3037	43078
GTCN_325	29020	ATCN_3038	43079
TTCN_393	29021	TTCN_4325	43080
GTCN_326	29022	GTCN_2827	43081
CTCN_556	29023	CTCN_5434	43082
CTCN_557	29024	GTCN_2828	43083
GTCN_327	29025	CTCN_5435	43084
CTCN_558	29026	TTCN_4326	43085
ATCN_291	29027	ATCN_3039	43086
CTCN_559	29028	GTCN_2829	43087
GTCN_328	29029	CTCN_5436	43088
GTCN_329	29030	CTCN_5437	43089
CTCN_560	29031	ATCN_3040	43090
ATCN_292	29032	ATCN_3041	43091
ATCN_293	29033	CTCN_5438	43092
TTCN_394	29034	ATCN_3042	43093
CTCN_561	29035	CTCN_5439	43094
CTCN_562	29036	GTCN_2830	43095
CTCN_563	29037	ATCN_3043	43096
GTCN_330	29038	TTCN_4327	43097
GTCN_331	29039	TTCN_4328	43098
TTCN_395	29040	CTCN_5440	43099
CTCN_564	29041	TTCN_4329	43100

CTCN_565	29042	CTCN_5441	43101
CTCN_566	29043	GTCN_2831	43102
ATCN_294	29044	TTCN_4330	43103
GTCN_332	29045	CTCN_5442	43104
CTCN_567	29046	TTCN_4331	43105
CTCN_568	29047	ATCN_3044	43106
ATCN_295	29048	ATCN_3045	43107
ATCN_296	29049	CTCN_5443	43108
CTCN_569	29050	ATCN_3046	43109
CTCN_570	29051	CTCN_5444	43110
ATCN_297	29052	CTCN_5445	43111
ATCN_298	29053	CTCN_5446	43112
ATCN_299	29054	GTCN_2832	43113
CTCN_571	29055	CTCN_5447	43114
TTCN_396	29056	TTCN_4332	43115
CTCN_572	29057	TTCN_4333	43116
TTCN_397	29058	CTCN_5448	43117
ATCN_300	29059	CTCN_5449	43118
TTCN_398	29060	TTCN_4334	43119
CTCN_573	29061	CTCN_5450	43120
CTCN_574	29062	ATCN_3047	43121
CTCN_575	29063	CTCN_5451	43122
TTCN_399	29064	ATCN_3048	43123
TTCN_400	29065	GTCN_2833	43124
TTCN_401	29066	CTCN_5452	43125
CTCN_576	29067	ATCN_3049	43126
CTCN_577	29068	TTCN_4335	43127
CTCN_578	29069	GTCN_2834	43128
TTCN_402	29070	CTCN_5453	43129
CTCN_579	29071	GTCN_2835	43130
GTCN_333	29072	CTCN_5454	43131
TTCN_403	29073	CTCN_5455	43132
GTCN_334	29074	TTCN_4336	43133
GTCN_335	29075	TTCN_4337	43134
TTCN_404	29076	TTCN_4338	43135
GTCN_336	29077	TTCN_4339	43136
TTCN_405	29078	CTCN_5456	43137
ATCN_301	29079	TTCN_4340	43138
ATCN_302	29080	GTCN_2836	43139
CTCN_580	29081	GTCN_2837	43140
GTCN_337	29082	GTCN_2838	43141
TTCN_406	29083	GTCN_2839	43142
CTCN_581	29084	GTCN_2840	43143

FIG. 37 (continued)

CTCN_582	29085	TTCN_4341	43144
ATCN_303	29086	ATCN_3050	43145
TTCN_407	29087	TTCN_4342	43146
TTCN_408	29088	ATCN_3051	43147
GTCN_338	29089	ATCN_3052	43148
TTCN_409	29090	ATCN_3053	43149
TTCN_410	29091	CTCN_5457	43150
GTCN_339	29092	TTCN_4343	43151
CTCN_583	29093	TTCN_4344	43152
ATCN_304	29094	CTCN_5458	43153
CTCN_584	29095	CTCN_5459	43154
GTCN_340	29096	ATCN_3054	43155
CTCN_585	29097	TTCN_4345	43156
TTCN_411	29098	GTCN_2841	43157
TTCN_412	29099	CTCN_5460	43158
ATCN_305	29100	CTCN_5461	43159
TTCN_413	29101	ATCN_3055	43160
CTCN_586	29102	GTCN_2842	43161
TTCN_414	29103	CTCN_5462	43162
GTCN_341	29104	CTCN_5463	43163
TTCN_415	29105	GTCN_2843	43164
GTCN_342	29106	TTCN_4346	43165
TTCN_416	29107	ATCN_3056	43166
TTCN_417	29108	CTCN_5464	43167
TTCN_418	29109	TTCN_4347	43168
GTCN_343	29110	GTCN_2844	43169
GTCN_344	29111	ATCN_3057	43170
TTCN_419	29112	ATCN_3058	43171
GTCN_345	29113	CTCN_5465	43172
ATCN_306	29114	CTCN_5466	43173
TTCN_420	29115	TTCN_4348	43174
TTCN_421	29116	TTCN_4349	43175
TTCN_422	29117	ATCN_3059	43176
CTCN_587	29118	ATCN_3060	43177
TTCN_423	29119	GTCN_2845	43178
CTCN_588	29120	ATCN_3061	43179
ATCN_307	29121	CTCN_5467	43180
CTCN_589	29122	TTCN_4350	43181
TTCN_424	29123	GTCN_2846	43182
TTCN_425	29124	GTCN_2847	43183
ATCN_308	29125	ATCN_3062	43184
ATCN_309	29126	ATCN_3063	43185
TTCN_426	29127	ATCN_3064	43186

CTCN_590	29128	ATCN_3065	43187
GTCN_346	29129	TTCN_4351	43188
GTCN_347	29130	CTCN_5468	43189
TTCN_427	29131	GTCN_2848	43190
TTCN_428	29132	GTCN_2849	43191
ATCN_310	29133	TTCN_4352	43192
CTCN_591	29134	ATCN_3066	43193
ATCN_311	29135	TTCN_4353	43194
CTCN_592	29136	TTCN_4354	43195
ATCN_312	29137	ATCN_3067	43196
GTCN_348	29138	TTCN_4355	43197
TTCN_429	29139	GTCN_2850	43198
CTCN_593	29140	CTCN_5469	43199
TTCN_430	29141	CTCN_5470	43200
CTCN_594	29142	GTCN_2851	43201
ATCN_313	29143	GTCN_2852	43202
TTCN_431	29144	TTCN_4356	43203
TTCN_432	29145	ATCN_3068	43204
CTCN_595	29146	ATCN_3069	43205
CTCN_596	29147	ATCN_3070	43206
TTCN_433	29148	TTCN_4357	43207
TTCN_434	29149	GTCN_2853	43208
GTCN_349	29150	ATCN_3071	43209
CTCN_597	29151	CTCN_5471	43210
ATCN_314	29152	CTCN_5472	43211
GTCN_350	29153	ATCN_3072	43212
TTCN_435	29154	ATCN_3073	43213
TTCN_436	29155	TTCN_4358	43214
CTCN_598	29156	GTCN_2854	43215
CTCN_599	29157	CTCN_5473	43216
GTCN_351	29158	TTCN_4359	43217
ATCN_315	29159	TTCN_4360	43218
CTCN_600	29160	TTCN_4361	43219
TTCN_437	29161	CTCN_5474	43220
TTCN_438	29162	ATCN_3074	43221
CTCN_601	29163	TTCN_4362	43222
TTCN_439	29164	ATCN_3075	43223
CTCN_602	29165	ATCN_3076	43224
ATCN_316	29166	CTCN_5475	43225
CTCN_603	29167	CTCN_5476	43226
CTCN_604	29168	ATCN_3077	43227
CTCN_605	29169	GTCN_2855	43228
TTCN_440	29170	CTCN_5477	43229

FIG. 37 (continued)

ATCN_317	29171	CTCN_5478	43230
CTCN_606	29172	GTCN_2856	43231
CTCN_607	29173	CTCN_5479	43232
TTCN_441	29174	GTCN_2857	43233
TTCN_442	29175	GTCN_2858	43234
ATCN_318	29176	CTCN_5480	43235
GTCN_352	29177	CTCN_5481	43236
GTCN_353	29178	TTCN_4363	43237
ATCN_319	29179	GTCN_2859	43238
TTCN_443	29180	GTCN_2860	43239
CTCN_608	29181	TTCN_4364	43240
GTCN_354	29182	CTCN_5482	43241
TTCN_444	29183	ATCN_3078	43242
ATCN_320	29184	ATCN_3079	43243
GTCN_355	29185	GTCN_2861	43244
TTCN_445	29186	TTCN_4365	43245
GTCN_356	29187	TTCN_4366	43246
TTCN_446	29188	CTCN_5483	43247
ATCN_321	29189	CTCN_5484	43248
GTCN_357	29190	ATCN_3080	43249
GTCN_358	29191	ATCN_3081	43250
TTCN_447	29192	ATCN_3082	43251
CTCN_609	29193	ATCN_3083	43252
GTCN_359	29194	ATCN_3084	43253
ATCN_322	29195	GTCN_2862	43254
CTCN_610	29196	CTCN_5485	43255
ATCN_323	29197	CTCN_5486	43256
ATCN_324	29198	CTCN_5487	43257
ATCN_325	29199	GTCN_2863	43258
CTCN_611	29200	GTCN_2864	43259
CTCN_612	29201	TTCN_4367	43260
CTCN_613	29202	CTCN_5488	43261
CTCN_614	29203	GTCN_2865	43262
GTCN_360	29204	GTCN_2866	43263
ATCN_326	29205	CTCN_5489	43264
ATCN_327	29206	CTCN_5490	43265
CTCN_615	29207	GTCN_2867	43266
GTCN_361	29208	CTCN_5491	43267
CTCN_616	29209	TTCN_4368	43268
TTCN_448	29210	CTCN_5492	43269
CTCN_617	29211	TTCN_4369	43270
TTCN_449	29212	CTCN_5493	43271
TTCN_450	29213	GTCN_2868	43272

CTCN_618	29214	CTCN_5494	43273
CTCN_619	29215	ATCN_3085	43274
TTCN_451	29216	CTCN_5495	43275
TTCN_452	29217	CTCN_5496	43276
ATCN_328	29218	TTCN_4370	43277
TTCN_453	29219	CTCN_5497	43278
TTCN_454	29220	GTCN_2869	43279
CTCN_620	29221	CTCN_5498	43280
GTCN_362	29222	TTCN_4371	43281
CTCN_621	29223	CTCN_5499	43282
TTCN_455	29224	GTCN_2870	43283
CTCN_622	29225	GTCN_2871	43284
TTCN_456	29226	CTCN_5500	43285
GTCN_363	29227	TTCN_4372	43286
ATCN_329	29228	CTCN_5501	43287
ATCN_330	29229	ATCN_3086	43288
ATCN_331	29230	ATCN_3087	43289
TTCN_457	29231	TTCN_4373	43290
CTCN_623	29232	CTCN_5502	43291
TTCN_458	29233	CTCN_5503	43292
GTCN_364	29234	TTCN_4374	43293
CTCN_624	29235	ATCN_3088	43294
GTCN_365	29236	CTCN_5504	43295
CTCN_625	29237	ATCN_3089	43296
CTCN_626	29238	GTCN_2872	43297
CTCN_627	29239	ATCN_3090	43298
CTCN_628	29240	ATCN_3091	43299
GTCN_366	29241	ATCN_3092	43300
TTCN_459	29242	ATCN_3093	43301
GTCN_367	29243	GTCN_2873	43302
TTCN_460	29244	GTCN_2874	43303
TTCN_461	29245	TTCN_4375	43304
GTCN_368	29246	TTCN_4376	43305
CTCN_629	29247	TTCN_4377	43306
TTCN_462	29248	CTCN_5505	43307
TTCN_463	29249	TTCN_4378	43308
TTCN_464	29250	TTCN_4379	43309
TTCN_465	29251	TTCN_4380	43310
CTCN_630	29252	CTCN_5506	43311
ATCN_332	29253	TTCN_4381	43312
ATCN_333	29254	CTCN_5507	43313
TTCN_466	29255	CTCN_5508	43314
CTCN_631	29256	CTCN_5509	43315

FIG. 37 (continued)

TTCN_467	29257	CTCN_5510	43316
ATCN_334	29258	TTCN_4382	43317
CTCN_632	29259	TTCN_4383	43318
CTCN_633	29260	TTCN_4384	43319
CTCN_634	29261	CTCN_5511	43320
TTCN_468	29262	TTCN_4385	43321
TTCN_469	29263	TTCN_4386	43322
GTCN_369	29264	TTCN_4387	43323
TTCN_470	29265	CTCN_5512	43324
GTCN_370	29266	TTCN_4388	43325
TTCN_471	29267	TTCN_4389	43326
GTCN_371	29268	CTCN_5513	43327
CTCN_635	29269	TTCN_4390	43328
ATCN_335	29270	GTCN_2875	43329
ATCN_336	29271	ATCN_3094	43330
ATCN_337	29272	CTCN_5514	43331
TTCN_472	29273	CTCN_5515	43332
CTCN_636	29274	CTCN_5516	43333
TTCN_473	29275	CTCN_5517	43334
TTCN_474	29276	CTCN_5518	43335
TTCN_475	29277	TTCN_4391	43336
ATCN_338	29278	GTCN_2876	43337
GTCN_372	29279	TTCN_4392	43338
TTCN_476	29280	CTCN_5519	43339
GTCN_373	29281	CTCN_5520	43340
TTCN_477	29282	TTCN_4393	43341
TTCN_478	29283	TTCN_4394	43342
ATCN_339	29284	CTCN_5521	43343
TTCN_479	29285	CTCN_5522	43344
GTCN_374	29286	GTCN_2877	43345
TTCN_480	29287	ATCN_3095	43346
GTCN_375	29288	CTCN_5523	43347
TTCN_481	29289	GTCN_2878	43348
GTCN_376	29290	ATCN_3096	43349
CTCN_637	29291	ATCN_3097	43350
CTCN_638	29292	TTCN_4395	43351
TTCN_482	29293	CTCN_5524	43352
ATCN_340	29294	TTCN_4396	43353
CTCN_639	29295	TTCN_4397	43354
ATCN_341	29296	TTCN_4398	43355
CTCN_640	29297	CTCN_5525	43356
ATCN_342	29298	TTCN_4399	43357
ATCN_343	29299	ATCN_3098	43358

CTCN_641	29300	TTCN_4400	43359
CTCN_642	29301	TTCN_4401	43360
TTCN_483	29302	ATCN_3099	43361
CTCN_643	29303	CTCN_5526	43362
GTCN_377	29304	CTCN_5527	43363
GTCN_378	29305	TTCN_4402	43364
CTCN_644	29306	CTCN_5528	43365
CTCN_645	29307	TTCN_4403	43366
GTCN_379	29308	TTCN_4404	43367
GTCN_380	29309	GTCN_2879	43368
ATCN_344	29310	CTCN_5529	43369
CTCN_646	29311	GTCN_2880	43370
CTCN_647	29312	TTCN_4405	43371
CTCN_648	29313	TTCN_4406	43372
TTCN_484	29314	ATCN_3100	43373
ATCN_345	29315	CTCN_5530	43374
TTCN_485	29316	TTCN_4407	43375
CTCN_649	29317	CTCN_5531	43376
CTCN_650	29318	CTCN_5532	43377
CTCN_651	29319	GTCN_2881	43378
CTCN_652	29320	CTCN_5533	43379
CTCN_653	29321	GTCN_2882	43380
CTCN_654	29322	ATCN_3101	43381
CTCN_655	29323	CTCN_5534	43382
GTCN_381	29324	GTCN_2883	43383
CTCN_656	29325	CTCN_5535	43384
ATCN_346	29326	GTCN_2884	43385
CTCN_657	29327	TTCN_4408	43386
TTCN_486	29328	CTCN_5536	43387
GTCN_382	29329	GTCN_2885	43388
CTCN_658	29330	TTCN_4409	43389
TTCN_487	29331	GTCN_2886	43390
TTCN_488	29332	GTCN_2887	43391
ATCN_347	29333	TTCN_4410	43392
TTCN_489	29334	CTCN_5537	43393
GTCN_383	29335	CTCN_5538	43394
GTCN_384	29336	GTCN_2888	43395
CTCN_659	29337	CTCN_5539	43396
GTCN_385	29338	CTCN_5540	43397
GTCN_386	29339	CTCN_5541	43398
ATCN_348	29340	CTCN_5542	43399
TTCN_490	29341	CTCN_5543	43400
TTCN_491	29342	GTCN_2889	43401

FIG. 37 (continued)

CTCN_660	29343	GTCN_2890	43402
CTCN_661	29344	GTCN_2891	43403
CTCN_662	29345	CTCN_5544	43404
CTCN_663	29346	ATCN_3102	43405
CTCN_664	29347	GTCN_2892	43406
CTCN_665	29348	TTCN_4411	43407
ATCN_349	29349	TTCN_4412	43408
TTCN_492	29350	ATCN_3103	43409
TTCN_493	29351	GTCN_2893	43410
CTCN_666	29352	ATCN_3104	43411
TTCN_494	29353	ATCN_3105	43412
TTCN_495	29354	CTCN_5545	43413
ATCN_350	29355	CTCN_5546	43414
CTCN_667	29356	ATCN_3106	43415
CTCN_668	29357	GTCN_2894	43416
ATCN_351	29358	GTCN_2895	43417
CTCN_669	29359	TTCN_4413	43418
CTCN_670	29360	TTCN_4414	43419
CTCN_671	29361	GTCN_2896	43420
CTCN_672	29362	CTCN_5547	43421
TTCN_496	29363	GTCN_2897	43422
CTCN_673	29364	TTCN_4415	43423
TTCN_497	29365	ATCN_3107	43424
GTCN_387	29366	ATCN_3108	43425
CTCN_674	29367	CTCN_5548	43426
GTCN_388	29368	GTCN_2898	43427
CTCN_675	29369	TTCN_4416	43428
CTCN_676	29370	CTCN_5549	43429
CTCN_677	29371	TTCN_4417	43430
ATCN_352	29372	CTCN_5550	43431
ATCN_353	29373	ATCN_3109	43432
CTCN_678	29374	TTCN_4418	43433
CTCN_679	29375	TTCN_4419	43434
ATCN_354	29376	ATCN_3110	43435
CTCN_680	29377	TTCN_4420	43436
ATCN_355	29378	ATCN_3111	43437
ATCN_356	29379	GTCN_2899	43438
CTCN_681	29380	ATCN_3112	43439
GTCN_389	29381	ATCN_3113	43440
CTCN_682	29382	CTCN_5551	43441
CTCN_683	29383	CTCN_5552	43442
ATCN_357	29384	ATCN_3114	43443
ATCN_358	29385	CTCN_5553	43444

GTCN_390	29386	GTCN_2900	43445
CTCN_684	29387	GTCN_2901	43446
ATCN_359	29388	CTCN_5554	43447
GTCN_391	29389	TTCN_4421	43448
GTCN_392	29390	CTCN_5555	43449
CTCN_685	29391	GTCN_2902	43450
CTCN_686	29392	CTCN_5556	43451
CTCN_687	29393	TTCN_4422	43452
GTCN_393	29394	CTCN_5557	43453
CTCN_688	29395	CTCN_5558	43454
GTCN_394	29396	CTCN_5559	43455
GTCN_395	29397	TTCN_4423	43456
CTCN_689	29398	TTCN_4424	43457
CTCN_690	29399	TTCN_4425	43458
GTCN_396	29400	GTCN_2903	43459
TTCN_498	29401	TTCN_4426	43460
GTCN_397	29402	ATCN_3115	43461
GTCN_398	29403	CTCN_5560	43462
TTCN_499	29404	CTCN_5561	43463
GTCN_399	29405	TTCN_4427	43464
GTCN_400	29406	GTCN_2904	43465
CTCN_691	29407	TTCN_4428	43466
ATCN_360	29408	GTCN_2905	43467
ATCN_361	29409	CTCN_5562	43468
CTCN_692	29410	CTCN_5563	43469
CTCN_693	29411	CTCN_5564	43470
CTCN_694	29412	TTCN_4429	43471
ATCN_362	29413	CTCN_5565	43472
ATCN_363	29414	TTCN_4430	43473
CTCN_695	29415	CTCN_5566	43474
CTCN_696	29416	CTCN_5567	43475
GTCN_401	29417	CTCN_5568	43476
TTCN_500	29418	ATCN_3116	43477
GTCN_402	29419	TTCN_4431	43478
CTCN_697	29420	TTCN_4432	43479
GTCN_403	29421	CTCN_5569	43480
CTCN_698	29422	CTCN_5570	43481
TTCN_501	29423	TTCN_4433	43482
CTCN_699	29424	CTCN_5571	43483
GTCN_404	29425	ATCN_3117	43484
CTCN_700	29426	TTCN_4434	43485
ATCN_364	29427	GTCN_2906	43486
ATCN_365	29428	TTCN_4435	43487

FIG. 37 (continued)

CTCN_701	29429	TTCN_4436	43488
CTCN_702	29430	CTCN_5572	43489
TTCN_502	29431	GTCN_2907	43490
CTCN_703	29432	TTCN_4437	43491
TTCN_503	29433	CTCN_5573	43492
TTCN_504	29434	TTCN_4438	43493
CTCN_704	29435	GTCN_2908	43494
CTCN_705	29436	CTCN_5574	43495
CTCN_706	29437	GTCN_2909	43496
CTCN_707	29438	GTCN_2910	43497
GTCN_405	29439	CTCN_5575	43498
GTCN_406	29440	CTCN_5576	43499
CTCN_708	29441	GTCN_2911	43500
GTCN_407	29442	CTCN_5577	43501
TTCN_505	29443	TTCN_4439	43502
ATCN_366	29444	CTCN_5578	43503
GTCN_408	29445	ATCN_3118	43504
CTCN_709	29446	TTCN_4440	43505
ATCN_367	29447	CTCN_5579	43506
GTCN_409	29448	TTCN_4441	43507
GTCN_410	29449	ATCN_3119	43508
TTCN_506	29450	GTCN_2912	43509
CTCN_710	29451	TTCN_4442	43510
TTCN_507	29452	CTCN_5580	43511
CTCN_711	29453	ATCN_3120	43512
CTCN_712	29454	CTCN_5581	43513
TTCN_508	29455	CTCN_5582	43514
CTCN_713	29456	ATCN_3121	43515
TTCN_509	29457	ATCN_3122	43516
CTCN_714	29458	ATCN_3123	43517
GTCN_411	29459	CTCN_5583	43518
CTCN_715	29460	ATCN_3124	43519
TTCN_510	29461	CTCN_5584	43520
ATCN_368	29462	CTCN_5585	43521
CTCN_716	29463	ATCN_3125	43522
CTCN_717	29464	TTCN_4443	43523
ATCN_369	29465	TTCN_4444	43524
ATCN_370	29466	ATCN_3126	43525
ATCN_371	29467	TTCN_4445	43526
CTCN_718	29468	TTCN_4446	43527
TTCN_511	29469	CTCN_5586	43528
CTCN_719	29470	TTCN_4447	43529
CTCN_720	29471	CTCN_5587	43530

TTCN_512	29472	GTCN_2913	43531
GTCN_412	29473	ATCN_3127	43532
TTCN_513	29474	TTCN_4448	43533
GTCN_413	29475	CTCN_5588	43534
CTCN_721	29476	GTCN_2914	43535
CTCN_722	29477	CTCN_5589	43536
GTCN_414	29478	CTCN_5590	43537
CTCN_723	29479	CTCN_5591	43538
ATCN_372	29480	CTCN_5592	43539
ATCN_373	29481	TTCN_4449	43540
TTCN_514	29482	TTCN_4450	43541
TTCN_515	29483	GTCN_2915	43542
GTCN_415	29484	CTCN_5593	43543
ATCN_374	29485	TTCN_4451	43544
TTCN_516	29486	CTCN_5594	43545
CTCN_724	29487	CTCN_5595	43546
ATCN_375	29488	TTCN_4452	43547
GTCN_416	29489	ATCN_3128	43548
CTCN_725	29490	CTCN_5596	43549
CTCN_726	29491	ATCN_3129	43550
CTCN_727	29492	TTCN_4453	43551
GTCN_417	29493	ATCN_3130	43552
TTCN_517	29494	GTCN_2916	43553
ATCN_376	29495	CTCN_5597	43554
ATCN_377	29496	GTCN_2917	43555
CTCN_728	29497	TTCN_4454	43556
CTCN_729	29498	ATCN_3131	43557
CTCN_730	29499	TTCN_4455	43558
TTCN_518	29500	GTCN_2918	43559
ATCN_378	29501	CTCN_5598	43560
TTCN_519	29502	TTCN_4456	43561
CTCN_731	29503	CTCN_5599	43562
CTCN_732	29504	TTCN_4457	43563
CTCN_733	29505	CTCN_5600	43564
CTCN_734	29506	GTCN_2919	43565
ATCN_379	29507	GTCN_2920	43566
ATCN_380	29508	TTCN_4458	43567
GTCN_418	29509	TTCN_4459	43568
GTCN_419	29510	CTCN_5601	43569
CTCN_735	29511	ATCN_3132	43570
CTCN_736	29512	CTCN_5602	43571
GTCN_420	29513	CTCN_5603	43572
CTCN_737	29514	GTCN_2921	43573

FIG. 37 (continued)

ATCN_381	29515	ATCN_3133	43574
TTCN_520	29516	ATCN_3134	43575
CTCN_738	29517	ATCN_3135	43576
ATCN_382	29518	CTCN_5604	43577
ATCN_383	29519	GTCN_2922	43578
CTCN_739	29520	TTCN_4460	43579
CTCN_740	29521	TTCN_4461	43580
GTCN_421	29522	CTCN_5605	43581
TTCN_521	29523	CTCN_5606	43582
TTCN_522	29524	TTCN_4462	43583
ATCN_384	29525	CTCN_5607	43584
TTCN_523	29526	TTCN_4463	43585
TTCN_524	29527	CTCN_5608	43586
CTCN_741	29528	CTCN_5609	43587
TTCN_525	29529	ATCN_3136	43588
TTCN_526	29530	CTCN_5610	43589
TTCN_527	29531	CTCN_5611	43590
GTCN_422	29532	CTCN_5612	43591
TTCN_528	29533	TTCN_4464	43592
TTCN_529	29534	TTCN_4465	43593
ATCN_385	29535	TTCN_4466	43594
TTCN_530	29536	CTCN_5613	43595
TTCN_531	29537	CTCN_5614	43596
ATCN_386	29538	TTCN_4467	43597
CTCN_742	29539	GTCN_2923	43598
GTCN_423	29540	GTCN_2924	43599
TTCN_532	29541	CTCN_5615	43600
TTCN_533	29542	CTCN_5616	43601
TTCN_534	29543	GTCN_2925	43602
CTCN_743	29544	CTCN_5617	43603
GTCN_424	29545	CTCN_5618	43604
GTCN_425	29546	ATCN_3137	43605
CTCN_744	29547	TTCN_4468	43606
CTCN_745	29548	TTCN_4469	43607
CTCN_746	29549	GTCN_2926	43608
ATCN_387	29550	TTCN_4470	43609
CTCN_747	29551	ATCN_3138	43610
TTCN_535	29552	TTCN_4471	43611
CTCN_748	29553	TTCN_4472	43612
ATCN_388	29554	TTCN_4473	43613
CTCN_749	29555	TTCN_4474	43614
ATCN_389	29556	TTCN_4475	43615
GTCN_426	29557	TTCN_4476	43616

CTCN_750	29558	TTCN_4477	43617
TTCN_536	29559	ATCN_3139	43618
CTCN_751	29560	CTCN_5619	43619
CTCN_752	29561	ATCN_3140	43620
CTCN_753	29562	GTCN_2927	43621
ATCN_390	29563	TTCN_4478	43622
TTCN_537	29564	CTCN_5620	43623
CTCN_754	29565	TTCN_4479	43624
ATCN_391	29566	GTCN_2928	43625
TTCN_538	29567	CTCN_5621	43626
ATCN_392	29568	GTCN_2929	43627
CTCN_755	29569	ATCN_3141	43628
ATCN_393	29570	ATCN_3142	43629
ATCN_394	29571	ATCN_3143	43630
ATCN_395	29572	ATCN_3144	43631
ATCN_396	29573	TTCN_4480	43632
CTCN_756	29574	CTCN_5622	43633
GTCN_427	29575	GTCN_2930	43634
ATCN_397	29576	GTCN_2931	43635
TTCN_539	29577	TTCN_4481	43636
GTCN_428	29578	CTCN_5623	43637
ATCN_398	29579	CTCN_5624	43638
ATCN_399	29580	GTCN_2932	43639
TTCN_540	29581	CTCN_5625	43640
TTCN_541	29582	ATCN_3145	43641
ATCN_400	29583	ATCN_3146	43642
ATCN_401	29584	CTCN_5626	43643
ATCN_402	29585	ATCN_3147	43644
CTCN_757	29586	TTCN_4482	43645
TTCN_542	29587	ATCN_3148	43646
ATCN_403	29588	TTCN_4483	43647
TTCN_543	29589	TTCN_4484	43648
TTCN_544	29590	CTCN_5627	43649
TTCN_545	29591	CTCN_5628	43650
TTCN_546	29592	TTCN_4485	43651
CTCN_758	29593	CTCN_5629	43652
CTCN_759	29594	GTCN_2933	43653
GTCN_429	29595	TTCN_4486	43654
TTCN_547	29596	TTCN_4487	43655
TTCN_548	29597	CTCN_5630	43656
GTCN_430	29598	ATCN_3149	43657
TTCN_549	29599	TTCN_4488	43658
CTCN_760	29600	CTCN_5631	43659

FIG. 37 (continued)

CTCN_761	29601	CTCN_5632	43660
TTCN_550	29602	ATCN_3150	43661
ATCN_404	29603	CTCN_5633	43662
ATCN_405	29604	GTCN_2934	43663
CTCN_762	29605	CTCN_5634	43664
GTCN_431	29606	GTCN_2935	43665
GTCN_432	29607	ATCN_3151	43666
CTCN_763	29608	CTCN_5635	43667
GTCN_433	29609	TTCN_4489	43668
CTCN_764	29610	CTCN_5636	43669
ATCN_406	29611	CTCN_5637	43670
ATCN_407	29612	CTCN_5638	43671
CTCN_765	29613	TTCN_4490	43672
TTCN_551	29614	GTCN_2936	43673
CTCN_766	29615	CTCN_5639	43674
CTCN_767	29616	GTCN_2937	43675
TTCN_552	29617	TTCN_4491	43676
ATCN_408	29618	ATCN_3152	43677
TTCN_553	29619	GTCN_2938	43678
CTCN_768	29620	ATCN_3153	43679
CTCN_769	29621	CTCN_5640	43680
CTCN_770	29622	TTCN_4492	43681
CTCN_771	29623	TTCN_4493	43682
TTCN_554	29624	TTCN_4494	43683
CTCN_772	29625	CTCN_5641	43684
GTCN_434	29626	TTCN_4495	43685
TTCN_555	29627	GTCN_2939	43686
GTCN_435	29628	CTCN_5642	43687
CTCN_773	29629	CTCN_5643	43688
CTCN_774	29630	CTCN_5644	43689
CTCN_775	29631	GTCN_2940	43690
ATCN_409	29632	TTCN_4496	43691
ATCN_410	29633	TTCN_4497	43692
CTCN_776	29634	CTCN_5645	43693
CTCN_777	29635	CTCN_5646	43694
ATCN_411	29636	TTCN_4498	43695
CTCN_778	29637	CTCN_5647	43696
GTCN_436	29638	CTCN_5648	43697
CTCN_779	29639	CTCN_5649	43698
GTCN_437	29640	CTCN_5650	43699
TTCN_556	29641	TTCN_4499	43700
CTCN_780	29642	GTCN_2941	43701
TTCN_557	29643	ATCN_3154	43702

ATCN_412	29644	TTCN_4500	43703
ATCN_413	29645	CTCN_5651	43704
CTCN_781	29646	GTCN_2942	43705
TTCN_558	29647	TTCN_4501	43706
TTCN_559	29648	CTCN_5652	43707
TTCN_560	29649	ATCN_3155	43708
ATCN_414	29650	ATCN_3156	43709
CTCN_782	29651	TTCN_4502	43710
TTCN_561	29652	ATCN_3157	43711
CTCN_783	29653	CTCN_5653	43712
GTCN_438	29654	CTCN_5654	43713
CTCN_784	29655	ATCN_3158	43714
TTCN_562	29656	ATCN_3159	43715
TTCN_563	29657	CTCN_5655	43716
TTCN_564	29658	CTCN_5656	43717
ATCN_415	29659	CTCN_5657	43718
ATCN_416	29660	TTCN_4503	43719
CTCN_785	29661	CTCN_5658	43720
TTCN_565	29662	GTCN_2943	43721
ATCN_417	29663	CTCN_5659	43722
TTCN_566	29664	ATCN_3160	43723
ATCN_418	29665	CTCN_5660	43724
ATCN_419	29666	ATCN_3161	43725
TTCN_567	29667	TTCN_4504	43726
ATCN_420	29668	TTCN_4505	43727
TTCN_568	29669	TTCN_4506	43728
CTCN_786	29670	CTCN_5661	43729
GTCN_439	29671	GTCN_2944	43730
TTCN_569	29672	CTCN_5662	43731
TTCN_570	29673	GTCN_2945	43732
CTCN_787	29674	GTCN_2946	43733
TTCN_571	29675	CTCN_5663	43734
GTCN_440	29676	CTCN_5664	43735
GTCN_441	29677	GTCN_2947	43736
CTCN_788	29678	TTCN_4507	43737
CTCN_789	29679	TTCN_4508	43738
GTCN_442	29680	CTCN_5665	43739
CTCN_790	29681	GTCN_2948	43740
TTCN_572	29682	TTCN_4509	43741
ATCN_421	29683	TTCN_4510	43742
TTCN_573	29684	TTCN_4511	43743
ATCN_422	29685	TTCN_4512	43744
TTCN_574	29686	ATCN_3162	43745

FIG. 37 (continued)

TTCN_575	29687	ATCN_3163	43746
GTCN_443	29688	TTCN_4513	43747
CTCN_791	29689	CTCN_5666	43748
CTCN_792	29690	TTCN_4514	43749
CTCN_793	29691	GTCN_2949	43750
CTCN_794	29692	TTCN_4515	43751
TTCN_576	29693	CTCN_5667	43752
CTCN_795	29694	GTCN_2950	43753
CTCN_796	29695	GTCN_2951	43754
CTCN_797	29696	TTCN_4516	43755
TTCN_577	29697	TTCN_4517	43756
CTCN_798	29698	ATCN_3164	43757
GTCN_444	29699	TTCN_4518	43758
CTCN_799	29700	TTCN_4519	43759
GTCN_445	29701	TTCN_4520	43760
CTCN_800	29702	TTCN_4521	43761
GTCN_446	29703	GTCN_2952	43762
ATCN_423	29704	ATCN_3165	43763
CTCN_801	29705	ATCN_3166	43764
GTCN_447	29706	CTCN_5668	43765
TTCN_578	29707	CTCN_5669	43766
CTCN_802	29708	CTCN_5670	43767
TTCN_579	29709	TTCN_4522	43768
TTCN_580	29710	CTCN_5671	43769
TTCN_581	29711	ATCN_3167	43770
ATCN_424	29712	CTCN_5672	43771
GTCN_448	29713	CTCN_5673	43772
ATCN_425	29714	TTCN_4523	43773
TTCN_582	29715	TTCN_4524	43774
CTCN_803	29716	TTCN_4525	43775
TTCN_583	29717	TTCN_4526	43776
GTCN_449	29718	ATCN_3168	43777
TTCN_584	29719	CTCN_5674	43778
GTCN_450	29720	TTCN_4527	43779
GTCN_451	29721	CTCN_5675	43780
CTCN_804	29722	CTCN_5676	43781
CTCN_805	29723	CTCN_5677	43782
GTCN_452	29724	GTCN_2953	43783
CTCN_806	29725	GTCN_2954	43784
TTCN_585	29726	ATCN_3169	43785
GTCN_453	29727	GTCN_2955	43786
CTCN_807	29728	CTCN_5678	43787
GTCN_454	29729	GTCN_2956	43788

ATCN_426	29730	CTCN_5679	43789
CTCN_808	29731	CTCN_5680	43790
CTCN_809	29732	TTCN_4528	43791
TTCN_586	29733	TTCN_4529	43792
TTCN_587	29734	CTCN_5681	43793
GTCN_455	29735	ATCN_3170	43794
TTCN_588	29736	ATCN_3171	43795
GTCN_456	29737	ATCN_3172	43796
TTCN_589	29738	CTCN_5682	43797
CTCN_810	29739	ATCN_3173	43798
CTCN_811	29740	GTCN_2957	43799
CTCN_812	29741	TTCN_4530	43800
TTCN_590	29742	CTCN_5683	43801
TTCN_591	29743	TTCN_4531	43802
CTCN_813	29744	ATCN_3174	43803
GTCN_457	29745	TTCN_4532	43804
TTCN_592	29746	CTCN_5684	43805
CTCN_814	29747	ATCN_3175	43806
GTCN_458	29748	GTCN_2958	43807
ATCN_427	29749	TTCN_4533	43808
GTCN_459	29750	GTCN_2959	43809
GTCN_460	29751	TTCN_4534	43810
GTCN_461	29752	GTCN_2960	43811
TTCN_593	29753	CTCN_5685	43812
CTCN_815	29754	GTCN_2961	43813
TTCN_594	29755	CTCN_5686	43814
TTCN_595	29756	CTCN_5687	43815
TTCN_596	29757	GTCN_2962	43816
ATCN_428	29758	CTCN_5688	43817
TTCN_597	29759	TTCN_4535	43818
GTCN_462	29760	GTCN_2963	43819
CTCN_816	29761	TTCN_4536	43820
ATCN_429	29762	CTCN_5689	43821
CTCN_817	29763	ATCN_3176	43822
TTCN_598	29764	CTCN_5690	43823
TTCN_599	29765	ATCN_3177	43824
GTCN_463	29766	CTCN_5691	43825
ATCN_430	29767	TTCN_4537	43826
TTCN_600	29768	GTCN_2964	43827
TTCN_601	29769	GTCN_2965	43828
GTCN_464	29770	CTCN_5692	43829
GTCN_465	29771	GTCN_2966	43830
TTCN_602	29772	GTCN_2967	43831

FIG. 37 (continued)

CTCN_818	29773	CTCN_5693	43832
ATCN_431	29774	CTCN_5694	43833
GTCN_466	29775	TTCN_4538	43834
TTCN_603	29776	GTCN_2968	43835
TTCN_604	29777	CTCN_5695	43836
GTCN_467	29778	GTCN_2969	43837
CTCN_819	29779	GTCN_2970	43838
CTCN_820	29780	GTCN_2971	43839
CTCN_821	29781	CTCN_5696	43840
GTCN_468	29782	TTCN_4539	43841
CTCN_822	29783	CTCN_5697	43842
TTCN_605	29784	CTCN_5698	43843
GTCN_469	29785	CTCN_5699	43844
TTCN_606	29786	GTCN_2972	43845
TTCN_607	29787	CTCN_5700	43846
CTCN_823	29788	CTCN_5701	43847
CTCN_824	29789	TTCN_4540	43848
TTCN_608	29790	GTCN_2973	43849
CTCN_825	29791	GTCN_2974	43850
CTCN_826	29792	GTCN_2975	43851
TTCN_609	29793	CTCN_5702	43852
ATCN_432	29794	TTCN_4541	43853
TTCN_610	29795	GTCN_2976	43854
CTCN_827	29796	TTCN_4542	43855
CTCN_828	29797	TTCN_4543	43856
CTCN_829	29798	CTCN_5703	43857
ATCN_433	29799	CTCN_5704	43858
ATCN_434	29800	ATCN_3178	43859
CTCN_830	29801	ATCN_3179	43860
TTCN_611	29802	CTCN_5705	43861
GTCN_470	29803	CTCN_5706	43862
GTCN_471	29804	GTCN_2977	43863
CTCN_831	29805	GTCN_2978	43864
CTCN_832	29806	GTCN_2979	43865
TTCN_612	29807	GTCN_2980	43866
TTCN_613	29808	ATCN_3180	43867
CTCN_833	29809	CTCN_5707	43868
ATCN_435	29810	GTCN_2981	43869
ATCN_436	29811	TTCN_4544	43870
GTCN_472	29812	CTCN_5708	43871
TTCN_614	29813	CTCN_5709	43872
GTCN_473	29814	GTCN_2982	43873
TTCN_615	29815	CTCN_5710	43874

TTCN_616	29816	CTCN_5711	43875
TTCN_617	29817	GTCN_2983	43876
TTCN_618	29818	CTCN_5712	43877
CTCN_834	29819	CTCN_5713	43878
CTCN_835	29820	TTCN_4545	43879
TTCN_619	29821	TTCN_4546	43880
ATCN_437	29822	CTCN_5714	43881
CTCN_836	29823	TTCN_4547	43882
ATCN_438	29824	CTCN_5715	43883
ATCN_439	29825	TTCN_4548	43884
TTCN_620	29826	ATCN_3181	43885
ATCN_440	29827	CTCN_5716	43886
CTCN_837	29828	TTCN_4549	43887
TTCN_621	29829	GTCN_2984	43888
TTCN_622	29830	CTCN_5717	43889
ATCN_441	29831	TTCN_4550	43890
ATCN_442	29832	TTCN_4551	43891
GTCN_474	29833	ATCN_3182	43892
CTCN_838	29834	TTCN_4552	43893
CTCN_839	29835	CTCN_5718	43894
TTCN_623	29836	CTCN_5719	43895
ATCN_443	29837	CTCN_5720	43896
ATCN_444	29838	CTCN_5721	43897
CTCN_840	29839	ATCN_3183	43898
TTCN_624	29840	ATCN_3184	43899
TTCN_625	29841	TTCN_4553	43900
TTCN_626	29842	CTCN_5722	43901
GTCN_475	29843	GTCN_2985	43902
CTCN_841	29844	TTCN_4554	43903
TTCN_627	29845	GTCN_2986	43904
TTCN_628	29846	ATCN_3185	43905
TTCN_629	29847	ATCN_3186	43906
TTCN_630	29848	TTCN_4555	43907
GTCN_476	29849	GTCN_2987	43908
ATCN_445	29850	CTCN_5723	43909
CTCN_842	29851	TTCN_4556	43910
GTCN_477	29852	ATCN_3187	43911
GTCN_478	29853	GTCN_2988	43912
CTCN_843	29854	ATCN_3188	43913
ATCN_446	29855	ATCN_3189	43914
TTCN_631	29856	ATCN_3190	43915
CTCN_844	29857	CTCN_5724	43916
TTCN_632	29858	GTCN_2989	43917

FIG. 37 (continued)

GTCN_479	29859	CTCN_5725	43918
TTCN_633	29860	CTCN_5726	43919
ATCN_447	29861	CTCN_5727	43920
GTCN_480	29862	GTCN_2990	43921
TTCN_634	29863	CTCN_5728	43922
ATCN_448	29864	CTCN_5729	43923
ATCN_449	29865	ATCN_3191	43924
ATCN_450	29866	CTCN_5730	43925
ATCN_451	29867	TTCN_4557	43926
TTCN_635	29868	TTCN_4558	43927
TTCN_636	29869	GTCN_2991	43928
CTCN_845	29870	CTCN_5731	43929
TTCN_637	29871	GTCN_2992	43930
TTCN_638	29872	CTCN_5732	43931
ATCN_452	29873	GTCN_2993	43932
GTCN_481	29874	CTCN_5733	43933
CTCN_846	29875	TTCN_4559	43934
GTCN_482	29876	TTCN_4560	43935
CTCN_847	29877	GTCN_2994	43936
ATCN_453	29878	CTCN_5734	43937
GTCN_483	29879	TTCN_4561	43938
CTCN_848	29880	TTCN_4562	43939
TTCN_639	29881	TTCN_4563	43940
ATCN_454	29882	CTCN_5735	43941
CTCN_849	29883	CTCN_5736	43942
GTCN_484	29884	GTCN_2995	43943
ATCN_455	29885	TTCN_4564	43944
CTCN_850	29886	ATCN_3192	43945
CTCN_851	29887	GTCN_2996	43946
ATCN_456	29888	CTCN_5737	43947
ATCN_457	29889	CTCN_5738	43948
TTCN_640	29890	TTCN_4565	43949
GTCN_485	29891	CTCN_5739	43950
CTCN_852	29892	CTCN_5740	43951
TTCN_641	29893	TTCN_4566	43952
CTCN_853	29894	CTCN_5741	43953
CTCN_854	29895	CTCN_5742	43954
GTCN_486	29896	ATCN_3193	43955
TTCN_642	29897	TTCN_4567	43956
TTCN_643	29898	TTCN_4568	43957
TTCN_644	29899	CTCN_5743	43958
ATCN_458	29900	CTCN_5744	43959
TTCN_645	29901	CTCN_5745	43960

TTCN_646	29902	CTCN_5746	43961
TTCN_647	29903	ATCN_3194	43962
CTCN_855	29904	TTCN_4569	43963
CTCN_856	29905	CTCN_5747	43964
TTCN_648	29906	CTCN_5748	43965
TTCN_649	29907	CTCN_5749	43966
ATCN_459	29908	CTCN_5750	43967
TTCN_650	29909	CTCN_5751	43968
ATCN_460	29910	GTCN_2997	43969
ATCN_461	29911	CTCN_5752	43970
ATCN_462	29912	CTCN_5753	43971
CTCN_857	29913	TTCN_4570	43972
GTCN_487	29914	ATCN_3195	43973
TTCN_651	29915	GTCN_2998	43974
GTCN_488	29916	ATCN_3196	43975
TTCN_652	29917	ATCN_3197	43976
CTCN_858	29918	ATCN_3198	43977
CTCN_859	29919	GTCN_2999	43978
CTCN_860	29920	ATCN_3199	43979
ATCN_463	29921	ATCN_3200	43980
GTCN_489	29922	TTCN_4571	43981
ATCN_464	29923	CTCN_5754	43982
ATCN_465	29924	TTCN_4572	43983
GTCN_490	29925	GTCN_3000	43984
CTCN_861	29926	CTCN_5755	43985
ATCN_466	29927	GTCN_3001	43986
GTCN_491	29928	CTCN_5756	43987
CTCN_862	29929	ATCN_3201	43988
GTCN_492	29930	GTCN_3002	43989
TTCN_653	29931	GTCN_3003	43990
CTCN_863	29932	CTCN_5757	43991
CTCN_864	29933	CTCN_5758	43992
CTCN_865	29934	CTCN_5759	43993
TTCN_654	29935	GTCN_3004	43994
CTCN_866	29936	ATCN_3202	43995
TTCN_655	29937	CTCN_5760	43996
CTCN_867	29938	GTCN_3005	43997
GTCN_493	29939	CTCN_5761	43998
CTCN_868	29940	CTCN_5762	43999
TTCN_656	29941	CTCN_5763	44000
CTCN_869	29942	GTCN_3006	44001
TTCN_657	29943	CTCN_5764	44002
TTCN_658	29944	GTCN_3007	44003

FIG. 37 (continued)

CTCN_870	29945	GTCN_3008	44004
GTCN_494	29946	CTCN_5765	44005
TTCN_659	29947	TTCN_4573	44006
CTCN_871	29948	GTCN_3009	44007
CTCN_872	29949	CTCN_5766	44008
CTCN_873	29950	CTCN_5767	44009
CTCN_874	29951	GTCN_3010	44010
GTCN_495	29952	ATCN_3203	44011
GTCN_496	29953	CTCN_5768	44012
ATCN_467	29954	CTCN_5769	44013
ATCN_468	29955	TTCN_4574	44014
CTCN_875	29956	ATCN_3204	44015
GTCN_497	29957	ATCN_3205	44016
CTCN_876	29958	GTCN_3011	44017
CTCN_877	29959	TTCN_4575	44018
TTCN_660	29960	TTCN_4576	44019
ATCN_469	29961	TTCN_4577	44020
TTCN_661	29962	CTCN_5770	44021
CTCN_878	29963	GTCN_3012	44022
TTCN_662	29964	GTCN_3013	44023
ATCN_470	29965	GTCN_3014	44024
TTCN_663	29966	CTCN_5771	44025
ATCN_471	29967	ATCN_3206	44026
TTCN_664	29968	ATCN_3207	44027
GTCN_498	29969	TTCN_4578	44028
CTCN_879	29970	CTCN_5772	44029
CTCN_880	29971	CTCN_5773	44030
CTCN_881	29972	ATCN_3208	44031
CTCN_882	29973	CTCN_5774	44032
TTCN_665	29974	GTCN_3015	44033
TTCN_666	29975	TTCN_4579	44034
ATCN_472	29976	CTCN_5775	44035
CTCN_883	29977	ATCN_3209	44036
ATCN_473	29978	GTCN_3016	44037
ATCN_474	29979	GTCN_3017	44038
TTCN_667	29980	TTCN_4580	44039
ATCN_475	29981	GTCN_3018	44040
ATCN_476	29982	CTCN_5776	44041
GTCN_499	29983	ATCN_3210	44042
TTCN_668	29984	ATCN_3211	44043
GTCN_500	29985	ATCN_3212	44044
ATCN_477	29986	CTCN_5777	44045
TTCN_669	29987	CTCN_5778	44046

ATCN_478	29988	GTCN_3019	44047
CTCN_884	29989	CTCN_5779	44048
GTCN_501	29990	TTCN_4581	44049
GTCN_502	29991	CTCN_5780	44050
CTCN_885	29992	CTCN_5781	44051
TTCN_670	29993	CTCN_5782	44052
TTCN_671	29994	CTCN_5783	44053
CTCN_886	29995	CTCN_5784	44054
TTCN_672	29996	CTCN_5785	44055
CTCN_887	29997	ATCN_3213	44056
CTCN_888	29998	ATCN_3214	44057
ATCN_479	29999	CTCN_5786	44058
ATCN_480	30000	GTCN_3020	44059
GTCN_503	30001	GTCN_3021	44060
CTCN_889	30002	TTCN_4582	44061
GTCN_504	30003	CTCN_5787	44062
CTCN_890	30004	CTCN_5788	44063
GTCN_505	30005	GTCN_3022	44064
ATCN_481	30006	CTCN_5789	44065
ATCN_482	30007	CTCN_5790	44066
TTCN_673	30008	CTCN_5791	44067
GTCN_506	30009	CTCN_5792	44068
TTCN_674	30010	CTCN_5793	44069
TTCN_675	30011	CTCN_5794	44070
TTCN_676	30012	CTCN_5795	44071
ATCN_483	30013	CTCN_5796	44072
TTCN_677	30014	CTCN_5797	44073
CTCN_891	30015	CTCN_5798	44074
ATCN_484	30016	ATCN_3215	44075
ATCN_485	30017	CTCN_5799	44076
ATCN_486	30018	TTCN_4583	44077
TTCN_678	30019	CTCN_5800	44078
GTCN_507	30020	CTCN_5801	44079
TTCN_679	30021	GTCN_3023	44080
TTCN_680	30022	CTCN_5802	44081
CTCN_892	30023	TTCN_4584	44082
TTCN_681	30024	TTCN_4585	44083
TTCN_682	30025	GTCN_3024	44084
TTCN_683	30026	CTCN_5803	44085
TTCN_684	30027	ATCN_3216	44086
TTCN_685	30028	ATCN_3217	44087
ATCN_487	30029	CTCN_5804	44088
TTCN_686	30030	ATCN_3218	44089

FIG. 37 (continued)

ATCN_488	30031	TTCN_4586	44090
TTCN_687	30032	TTCN_4587	44091
ATCN_489	30033	CTCN_5805	44092
GTCN_508	30034	ATCN_3219	44093
GTCN_509	30035	TTCN_4588	44094
ATCN_490	30036	CTCN_5806	44095
CTCN_893	30037	CTCN_5807	44096
GTCN_510	30038	GTCN_3025	44097
ATCN_491	30039	TTCN_4589	44098
TTCN_688	30040	TTCN_4590	44099
TTCN_689	30041	GTCN_3026	44100
TTCN_690	30042	TTCN_4591	44101
TTCN_691	30043	TTCN_4592	44102
GTCN_511	30044	CTCN_5808	44103
TTCN_692	30045	GTCN_3027	44104
TTCN_693	30046	CTCN_5809	44105
TTCN_694	30047	TTCN_4593	44106
CTCN_894	30048	CTCN_5810	44107
CTCN_895	30049	CTCN_5811	44108
TTCN_695	30050	GTCN_3028	44109
CTCN_896	30051	CTCN_5812	44110
ATCN_492	30052	GTCN_3029	44111
ATCN_493	30053	GTCN_3030	44112
CTCN_897	30054	TTCN_4594	44113
TTCN_696	30055	GTCN_3031	44114
CTCN_898	30056	TTCN_4595	44115
ATCN_494	30057	TTCN_4596	44116
CTCN_899	30058	CTCN_5813	44117
GTCN_512	30059	ATCN_3220	44118
ATCN_495	30060	ATCN_3221	44119
ATCN_496	30061	GTCN_3032	44120
TTCN_697	30062	TTCN_4597	44121
ATCN_497	30063	TTCN_4598	44122
ATCN_498	30064	CTCN_5814	44123
TTCN_698	30065	CTCN_5815	44124
ATCN_499	30066	TTCN_4599	44125
CTCN_900	30067	GTCN_3033	44126
CTCN_901	30068	TTCN_4600	44127
ATCN_500	30069	ATCN_3222	44128
ATCN_501	30070	CTCN_5816	44129
CTCN_902	30071	TTCN_4601	44130
GTCN_513	30072	TTCN_4602	44131
ATCN_502	30073	CTCN_5817	44132

TTCN_699	30074	ATCN_3223	44133
ATCN_503	30075	TTCN_4603	44134
TTCN_700	30076	CTCN_5818	44135
CTCN_903	30077	TTCN_4604	44136
GTCN_514	30078	ATCN_3224	44137
CTCN_904	30079	ATCN_3225	44138
TTCN_701	30080	TTCN_4605	44139
TTCN_702	30081	ATCN_3226	44140
TTCN_703	30082	TTCN_4606	44141
TTCN_704	30083	TTCN_4607	44142
TTCN_705	30084	ATCN_3227	44143
TTCN_706	30085	TTCN_4608	44144
GTCN_515	30086	TTCN_4609	44145
CTCN_905	30087	TTCN_4610	44146
TTCN_707	30088	CTCN_5819	44147
CTCN_906	30089	GTCN_3034	44148
ATCN_504	30090	CTCN_5820	44149
CTCN_907	30091	CTCN_5821	44150
TTCN_708	30092	TTCN_4611	44151
TTCN_709	30093	CTCN_5822	44152
TTCN_710	30094	GTCN_3035	44153
TTCN_711	30095	TTCN_4612	44154
TTCN_712	30096	TTCN_4613	44155
ATCN_505	30097	ATCN_3228	44156
TTCN_713	30098	ATCN_3229	44157
TTCN_714	30099	CTCN_5823	44158
CTCN_908	30100	CTCN_5824	44159
ATCN_506	30101	TTCN_4614	44160
GTCN_516	30102	TTCN_4615	44161
GTCN_517	30103	TTCN_4616	44162
TTCN_715	30104	ATCN_3230	44163
TTCN_716	30105	CTCN_5825	44164
TTCN_717	30106	CTCN_5826	44165
CTCN_909	30107	CTCN_5827	44166
ATCN_507	30108	ATCN_3231	44167
CTCN_910	30109	ATCN_3232	44168
TTCN_718	30110	CTCN_5828	44169
TTCN_719	30111	ATCN_3233	44170
GTCN_518	30112	TTCN_4617	44171
CTCN_911	30113	CTCN_5829	44172
TTCN_720	30114	ATCN_3234	44173
TTCN_721	30115	ATCN_3235	44174
TTCN_722	30116	TTCN_4618	44175

FIG. 37 (continued)

TTCN_723	30117	CTCN_5830	44176
CTCN_912	30118	TTCN_4619	44177
TTCN_724	30119	CTCN_5831	44178
CTCN_913	30120	ATCN_3236	44179
TTCN_725	30121	ATCN_3237	44180
TTCN_726	30122	TTCN_4620	44181
TTCN_727	30123	CTCN_5832	44182
CTCN_914	30124	GTCN_3036	44183
GTCN_519	30125	GTCN_3037	44184
CTCN_915	30126	CTCN_5833	44185
CTCN_916	30127	TTCN_4621	44186
ATCN_508	30128	GTCN_3038	44187
TTCN_728	30129	CTCN_5834	44188
TTCN_729	30130	CTCN_5835	44189
CTCN_917	30131	CTCN_5836	44190
CTCN_918	30132	ATCN_3238	44191
TTCN_730	30133	TTCN_4622	44192
CTCN_919	30134	CTCN_5837	44193
ATCN_509	30135	TTCN_4623	44194
GTCN_520	30136	TTCN_4624	44195
CTCN_920	30137	CTCN_5838	44196
CTCN_921	30138	TTCN_4625	44197
TTCN_731	30139	CTCN_5839	44198
CTCN_922	30140	CTCN_5840	44199
TTCN_732	30141	TTCN_4626	44200
CTCN_923	30142	CTCN_5841	44201
GTCN_521	30143	TTCN_4627	44202
GTCN_522	30144	TTCN_4628	44203
TTCN_733	30145	CTCN_5842	44204
ATCN_510	30146	CTCN_5843	44205
CTCN_924	30147	GTCN_3039	44206
CTCN_925	30148	GTCN_3040	44207
CTCN_926	30149	ATCN_3239	44208
TTCN_734	30150	TTCN_4629	44209
ATCN_511	30151	GTCN_3041	44210
CTCN_927	30152	TTCN_4630	44211
GTCN_523	30153	TTCN_4631	44212
TTCN_735	30154	TTCN_4632	44213
TTCN_736	30155	ATCN_3240	44214
TTCN_737	30156	CTCN_5844	44215
GTCN_524	30157	TTCN_4633	44216
CTCN_928	30158	GTCN_3042	44217
GTCN_525	30159	TTCN_4634	44218

TTCN_738	30160	TTCN_4635	44219
CTCN_929	30161	ATCN_3241	44220
GTCN_526	30162	TTCN_4636	44221
ATCN_512	30163	ATCN_3242	44222
GTCN_527	30164	TTCN_4637	44223
CTCN_930	30165	CTCN_5845	44224
CTCN_931	30166	TTCN_4638	44225
GTCN_528	30167	TTCN_4639	44226
TTCN_739	30168	TTCN_4640	44227
ATCN_513	30169	TTCN_4641	44228
GTCN_529	30170	ATCN_3243	44229
CTCN_932	30171	TTCN_4642	44230
CTCN_933	30172	TTCN_4643	44231
GTCN_530	30173	GTCN_3043	44232
CTCN_934	30174	CTCN_5846	44233
CTCN_935	30175	TTCN_4644	44234
ATCN_514	30176	ATCN_3244	44235
GTCN_531	30177	CTCN_5847	44236
TTCN_740	30178	TTCN_4645	44237
CTCN_936	30179	TTCN_4646	44238
CTCN_937	30180	ATCN_3245	44239
CTCN_938	30181	TTCN_4647	44240
CTCN_939	30182	TTCN_4648	44241
GTCN_532	30183	TTCN_4649	44242
GTCN_533	30184	TTCN_4650	44243
TTCN_741	30185	GTCN_3044	44244
TTCN_742	30186	GTCN_3045	44245
GTCN_534	30187	ATCN_3246	44246
CTCN_940	30188	TTCN_4651	44247
TTCN_743	30189	TTCN_4652	44248
ATCN_515	30190	TTCN_4653	44249
GTCN_535	30191	ATCN_3247	44250
TTCN_744	30192	ATCN_3248	44251
TTCN_745	30193	GTCN_3046	44252
TTCN_746	30194	CTCN_5848	44253
CTCN_941	30195	CTCN_5849	44254
TTCN_747	30196	GTCN_3047	44255
ATCN_516	30197	CTCN_5850	44256
TTCN_748	30198	TTCN_4654	44257
TTCN_749	30199	ATCN_3249	44258
ATCN_517	30200	ATCN_3250	44259
GTCN_536	30201	TTCN_4655	44260
TTCN_750	30202	ATCN_3251	44261

FIG. 37 (continued)

TTCN_751	30203	TTCN_4656	44262
ATCN_518	30204	ATCN_3252	44263
TTCN_752	30205	TTCN_4657	44264
ATCN_519	30206	ATCN_3253	44265
CTCN_942	30207	ATCN_3254	44266
TTCN_753	30208	TTCN_4658	44267
GTCN_537	30209	TTCN_4659	44268
ATCN_520	30210	ATCN_3255	44269
CTCN_943	30211	GTCN_3048	44270
GTCN_538	30212	TTCN_4660	44271
TTCN_754	30213	GTCN_3049	44272
CTCN_944	30214	ATCN_3256	44273
ATCN_521	30215	ATCN_3257	44274
CTCN_945	30216	TTCN_4661	44275
ATCN_522	30217	CTCN_5851	44276
ATCN_523	30218	CTCN_5852	44277
GTCN_539	30219	GTCN_3050	44278
TTCN_755	30220	TTCN_4662	44279
CTCN_946	30221	TTCN_4663	44280
CTCN_947	30222	CTCN_5853	44281
CTCN_948	30223	ATCN_3258	44282
CTCN_949	30224	TTCN_4664	44283
TTCN_756	30225	GTCN_3051	44284
ATCN_524	30226	CTCN_5854	44285
GTCN_540	30227	CTCN_5855	44286
CTCN_950	30228	CTCN_5856	44287
TTCN_757	30229	CTCN_5857	44288
ATCN_525	30230	ATCN_3259	44289
TTCN_758	30231	ATCN_3260	44290
ATCN_526	30232	GTCN_3052	44291
GTCN_541	30233	TTCN_4665	44292
CTCN_951	30234	CTCN_5858	44293
CTCN_952	30235	GTCN_3053	44294
GTCN_542	30236	TTCN_4666	44295
ATCN_527	30237	TTCN_4667	44296
CTCN_953	30238	TTCN_4668	44297
TTCN_759	30239	GTCN_3054	44298
CTCN_954	30240	TTCN_4669	44299
GTCN_543	30241	TTCN_4670	44300
CTCN_955	30242	TTCN_4671	44301
TTCN_760	30243	GTCN_3055	44302
GTCN_544	30244	CTCN_5859	44303
CTCN_956	30245	TTCN_4672	44304

GTCN_545	30246	CTCN_5860	44305
GTCN_546	30247	TTCN_4673	44306
ATCN_528	30248	CTCN_5861	44307
CTCN_957	30249	CTCN_5862	44308
ATCN_529	30250	ATCN_3261	44309
TTCN_761	30251	CTCN_5863	44310
ATCN_530	30252	CTCN_5864	44311
GTCN_547	30253	GTCN_3056	44312
GTCN_548	30254	CTCN_5865	44313
TTCN_762	30255	GTCN_3057	44314
ATCN_531	30256	CTCN_5866	44315
TTCN_763	30257	GTCN_3058	44316
ATCN_532	30258	CTCN_5867	44317
TTCN_764	30259	CTCN_5868	44318
ATCN_533	30260	GTCN_3059	44319
GTCN_549	30261	GTCN_3060	44320
TTCN_765	30262	GTCN_3061	44321
TTCN_766	30263	CTCN_5869	44322
TTCN_767	30264	CTCN_5870	44323
CTCN_958	30265	GTCN_3062	44324
TTCN_768	30266	TTCN_4674	44325
ATCN_534	30267	ATCN_3262	44326
CTCN_959	30268	CTCN_5871	44327
TTCN_769	30269	GTCN_3063	44328
TTCN_770	30270	CTCN_5872	44329
ATCN_535	30271	CTCN_5873	44330
CTCN_960	30272	CTCN_5874	44331
TTCN_771	30273	CTCN_5875	44332
TTCN_772	30274	GTCN_3064	44333
GTCN_550	30275	GTCN_3065	44334
TTCN_773	30276	CTCN_5876	44335
ATCN_536	30277	CTCN_5877	44336
TTCN_774	30278	GTCN_3066	44337
TTCN_775	30279	CTCN_5878	44338
ATCN_537	30280	CTCN_5879	44339
GTCN_551	30281	CTCN_5880	44340
TTCN_776	30282	CTCN_5881	44341
ATCN_538	30283	TTCN_4675	44342
CTCN_961	30284	TTCN_4676	44343
ATCN_539	30285	CTCN_5882	44344
GTCN_552	30286	CTCN_5883	44345
GTCN_553	30287	CTCN_5884	44346
TTCN_777	30288	CTCN_5885	44347

FIG. 37 (continued)

TTCN_778	30289	GTCN_3067	44348
ATCN_540	30290	TTCN_4677	44349
CTCN_962	30291	TTCN_4678	44350
CTCN_963	30292	GTCN_3068	44351
GTCN_554	30293	GTCN_3069	44352
TTCN_779	30294	CTCN_5886	44353
TTCN_780	30295	GTCN_3070	44354
GTCN_555	30296	GTCN_3071	44355
CTCN_964	30297	GTCN_3072	44356
GTCN_556	30298	TTCN_4679	44357
CTCN_965	30299	CTCN_5887	44358
GTCN_557	30300	CTCN_5888	44359
ATCN_541	30301	GTCN_3073	44360
ATCN_542	30302	CTCN_5889	44361
TTCN_781	30303	ATCN_3263	44362
ATCN_543	30304	CTCN_5890	44363
TTCN_782	30305	CTCN_5891	44364
TTCN_783	30306	ATCN_3264	44365
TTCN_784	30307	ATCN_3265	44366
GTCN_558	30308	TTCN_4680	44367
GTCN_559	30309	GTCN_3074	44368
TTCN_785	30310	GTCN_3075	44369
ATCN_544	30311	TTCN_4681	44370
TTCN_786	30312	GTCN_3076	44371
TTCN_787	30313	GTCN_3077	44372
CTCN_966	30314	TTCN_4682	44373
TTCN_788	30315	TTCN_4683	44374
ATCN_545	30316	TTCN_4684	44375
ATCN_546	30317	CTCN_5892	44376
ATCN_547	30318	GTCN_3078	44377
TTCN_789	30319	GTCN_3079	44378
TTCN_790	30320	CTCN_5893	44379
TTCN_791	30321	GTCN_3080	44380
ATCN_548	30322	ATCN_3266	44381
CTCN_967	30323	ATCN_3267	44382
CTCN_968	30324	GTCN_3081	44383
ATCN_549	30325	TTCN_4685	44384
TTCN_792	30326	ATCN_3268	44385
CTCN_969	30327	ATCN_3269	44386
CTCN_970	30328	TTCN_4686	44387
CTCN_971	30329	CTCN_5894	44388
TTCN_793	30330	TTCN_4687	44389
ATCN_550	30331	CTCN_5895	44390

TTCN_794	30332	CTCN_5896	44391
CTCN_972	30333	GTCN_3082	44392
TTCN_795	30334	TTCN_4688	44393
TTCN_796	30335	CTCN_5897	44394
CTCN_973	30336	CTCN_5898	44395
GTCN_560	30337	ATCN_3270	44396
TTCN_797	30338	CTCN_5899	44397
GTCN_561	30339	TTCN_4689	44398
TTCN_798	30340	TTCN_4690	44399
CTCN_974	30341	CTCN_5900	44400
CTCN_975	30342	TTCN_4691	44401
GTCN_562	30343	CTCN_5901	44402
CTCN_976	30344	TTCN_4692	44403
CTCN_977	30345	ATCN_3271	44404
ATCN_551	30346	TTCN_4693	44405
ATCN_552	30347	CTCN_5902	44406
GTCN_563	30348	CTCN_5903	44407
CTCN_978	30349	GTCN_3083	44408
GTCN_564	30350	CTCN_5904	44409
GTCN_565	30351	GTCN_3084	44410
ATCN_553	30352	ATCN_3272	44411
CTCN_979	30353	ATCN_3273	44412
GTCN_566	30354	CTCN_5905	44413
ATCN_554	30355	ATCN_3274	44414
ATCN_555	30356	ATCN_3275	44415
TTCN_799	30357	TTCN_4694	44416
CTCN_980	30358	CTCN_5906	44417
TTCN_800	30359	GTCN_3085	44418
CTCN_981	30360	CTCN_5907	44419
TTCN_801	30361	CTCN_5908	44420
ATCN_556	30362	CTCN_5909	44421
TTCN_802	30363	TTCN_4695	44422
TTCN_803	30364	GTCN_3086	44423
ATCN_557	30365	CTCN_5910	44424
TTCN_804	30366	CTCN_5911	44425
ATCN_558	30367	CTCN_5912	44426
TTCN_805	30368	GTCN_3087	44427
TTCN_806	30369	ATCN_3276	44428
TTCN_807	30370	GTCN_3088	44429
ATCN_559	30371	GTCN_3089	44430
TTCN_808	30372	CTCN_5913	44431
GTCN_567	30373	TTCN_4696	44432
TTCN_809	30374	CTCN_5914	44433

FIG. 37 (continued)

ATCN_560	30375	TTCN_4697	44434
ATCN_561	30376	ATCN_3277	44435
ATCN_562	30377	TTCN_4698	44436
TTCN_810	30378	GTCN_3090	44437
CTCN_982	30379	TTCN_4699	44438
TTCN_811	30380	CTCN_5915	44439
ATCN_563	30381	CTCN_5916	44440
GTCN_568	30382	CTCN_5917	44441
ATCN_564	30383	CTCN_5918	44442
CTCN_983	30384	ATCN_3278	44443
ATCN_565	30385	TTCN_4700	44444
TTCN_812	30386	ATCN_3279	44445
TTCN_813	30387	ATCN_3280	44446
GTCN_569	30388	TTCN_4701	44447
GTCN_570	30389	TTCN_4702	44448
TTCN_814	30390	TTCN_4703	44449
CTCN_984	30391	GTCN_3091	44450
CTCN_985	30392	GTCN_3092	44451
CTCN_986	30393	ATCN_3281	44452
ATCN_566	30394	CTCN_5919	44453
TTCN_815	30395	CTCN_5920	44454
GTCN_571	30396	TTCN_4704	44455
CTCN_987	30397	GTCN_3093	44456
ATCN_567	30398	CTCN_5921	44457
ATCN_568	30399	ATCN_3282	44458
ATCN_569	30400	TTCN_4705	44459
TTCN_816	30401	ATCN_3283	44460
CTCN_988	30402	ATCN_3284	44461
CTCN_989	30403	ATCN_3285	44462
CTCN_990	30404	TTCN_4706	44463
TTCN_817	30405	CTCN_5922	44464
GTCN_572	30406	TTCN_4707	44465
GTCN_573	30407	CTCN_5923	44466
ATCN_570	30408	TTCN_4708	44467
CTCN_991	30409	CTCN_5924	44468
ATCN_571	30410	CTCN_5925	44469
GTCN_574	30411	CTCN_5926	44470
CTCN_992	30412	ATCN_3286	44471
CTCN_993	30413	TTCN_4709	44472
CTCN_994	30414	TTCN_4710	44473
CTCN_995	30415	GTCN_3094	44474
ATCN_572	30416	TTCN_4711	44475
CTCN_996	30417	TTCN_4712	44476

TTCN_818	30418	CTCN_5927	44477
ATCN_573	30419	GTCN_3095	44478
CTCN_997	30420	TTCN_4713	44479
CTCN_998	30421	TTCN_4714	44480
CTCN_999	30422	ATCN_3287	44481
TTCN_819	30423	GTCN_3096	44482
CTCN_1000	30424	CTCN_5928	44483
CTCN_1001	30425	CTCN_5929	44484
GTCN_575	30426	CTCN_5930	44485
CTCN_1002	30427	TTCN_4715	44486
CTCN_1003	30428	TTCN_4716	44487
CTCN_1004	30429	ATCN_3288	44488
GTCN_576	30430	TTCN_4717	44489
CTCN_1005	30431	CTCN_5931	44490
CTCN_1006	30432	CTCN_5932	44491
TTCN_820	30433	ATCN_3289	44492
GTCN_577	30434	TTCN_4718	44493
TTCN_821	30435	CTCN_5933	44494
TTCN_822	30436	GTCN_3097	44495
TTCN_823	30437	ATCN_3290	44496
GTCN_578	30438	CTCN_5934	44497
TTCN_824	30439	ATCN_3291	44498
CTCN_1007	30440	ATCN_3292	44499
TTCN_825	30441	TTCN_4719	44500
TTCN_826	30442	CTCN_5935	44501
GTCN_579	30443	ATCN_3293	44502
CTCN_1008	30444	ATCN_3294	44503
GTCN_580	30445	TTCN_4720	44504
TTCN_827	30446	TTCN_4721	44505
GTCN_581	30447	CTCN_5936	44506
GTCN_582	30448	TTCN_4722	44507
CTCN_1009	30449	ATCN_3295	44508
CTCN_1010	30450	TTCN_4723	44509
CTCN_1011	30451	CTCN_5937	44510
CTCN_1012	30452	CTCN_5938	44511
CTCN_1013	30453	GTCN_3098	44512
CTCN_1014	30454	ATCN_3296	44513
GTCN_583	30455	TTCN_4724	44514
ATCN_574	30456	GTCN_3099	44515
ATCN_575	30457	TTCN_4725	44516
GTCN_584	30458	TTCN_4726	44517
CTCN_1015	30459	TTCN_4727	44518
CTCN_1016	30460	CTCN_5939	44519

FIG. 37 (continued)

ATCN_576	30461	ATCN_3297	44520
CTCN_1017	30462	ATCN_3298	44521
ATCN_577	30463	CTCN_5940	44522
GTCN_585	30464	GTCN_3100	44523
CTCN_1018	30465	TTCN_4728	44524
GTCN_586	30466	CTCN_5941	44525
GTCN_587	30467	TTCN_4729	44526
GTCN_588	30468	ATCN_3299	44527
CTCN_1019	30469	ATCN_3300	44528
CTCN_1020	30470	TTCN_4730	44529
GTCN_589	30471	TTCN_4731	44530
TTCN_828	30472	CTCN_5942	44531
GTCN_590	30473	GTCN_3101	44532
CTCN_1021	30474	TTCN_4732	44533
CTCN_1022	30475	ATCN_3301	44534
CTCN_1023	30476	CTCN_5943	44535
CTCN_1024	30477	TTCN_4733	44536
GTCN_591	30478	ATCN_3302	44537
CTCN_1025	30479	GTCN_3102	44538
ATCN_578	30480	TTCN_4734	44539
CTCN_1026	30481	CTCN_5944	44540
ATCN_579	30482	GTCN_3103	44541
ATCN_580	30483	CTCN_5945	44542
TTCN_829	30484	TTCN_4735	44543
TTCN_830	30485	CTCN_5946	44544
GTCN_592	30486	GTCN_3104	44545
CTCN_1027	30487	TTCN_4736	44546
TTCN_831	30488	CTCN_5947	44547
GTCN_593	30489	CTCN_5948	44548
CTCN_1028	30490	GTCN_3105	44549
TTCN_832	30491	TTCN_4737	44550
TTCN_833	30492	CTCN_5949	44551
CTCN_1029	30493	CTCN_5950	44552
TTCN_834	30494	CTCN_5951	44553
CTCN_1030	30495	TTCN_4738	44554
CTCN_1031	30496	CTCN_5952	44555
ATCN_581	30497	CTCN_5953	44556
CTCN_1032	30498	CTCN_5954	44557
TTCN_835	30499	CTCN_5955	44558
CTCN_1033	30500	CTCN_5956	44559
GTCN_594	30501	TTCN_4739	44560
CTCN_1034	30502	GTCN_3106	44561
ATCN_582	30503	CTCN_5957	44562

ATCN_583	30504	TTCN_4740	44563
CTCN_1035	30505	CTCN_5958	44564
CTCN_1036	30506	GTCN_3107	44565
CTCN_1037	30507	GTCN_3108	44566
TTCN_836	30508	CTCN_5959	44567
TTCN_837	30509	ATCN_3303	44568
CTCN_1038	30510	ATCN_3304	44569
CTCN_1039	30511	ATCN_3305	44570
CTCN_1040	30512	CTCN_5960	44571
GTCN_595	30513	TTCN_4741	44572
ATCN_584	30514	CTCN_5961	44573
CTCN_1041	30515	TTCN_4742	44574
CTCN_1042	30516	ATCN_3306	44575
TTCN_838	30517	TTCN_4743	44576
GTCN_596	30518	TTCN_4744	44577
CTCN_1043	30519	ATCN_3307	44578
CTCN_1044	30520	CTCN_5962	44579
GTCN_597	30521	CTCN_5963	44580
ATCN_585	30522	CTCN_5964	44581
ATCN_586	30523	CTCN_5965	44582
CTCN_1045	30524	CTCN_5966	44583
CTCN_1046	30525	CTCN_5967	44584
ATCN_587	30526	ATCN_3308	44585
TTCN_839	30527	CTCN_5968	44586
CTCN_1047	30528	CTCN_5969	44587
ATCN_588	30529	CTCN_5970	44588
ATCN_589	30530	ATCN_3309	44589
TTCN_840	30531	CTCN_5971	44590
TTCN_841	30532	TTCN_4745	44591
ATCN_590	30533	CTCN_5972	44592
CTCN_1048	30534	CTCN_5973	44593
ATCN_591	30535	CTCN_5974	44594
ATCN_592	30536	ATCN_3310	44595
TTCN_842	30537	TTCN_4746	44596
GTCN_598	30538	TTCN_4747	44597
ATCN_593	30539	GTCN_3109	44598
GTCN_599	30540	TTCN_4748	44599
ATCN_594	30541	GTCN_3110	44600
CTCN_1049	30542	CTCN_5975	44601
CTCN_1050	30543	GTCN_3111	44602
ATCN_595	30544	CTCN_5976	44603
GTCN_600	30545	TTCN_4749	44604
CTCN_1051	30546	TTCN_4750	44605

FIG. 37 (continued)

TTCN_843	30547	TTCN_4751	44606
ATCN_596	30548	TTCN_4752	44607
CTCN_1052	30549	TTCN_4753	44608
TTCN_844	30550	TTCN_4754	44609
GTCN_601	30551	GTCN_3112	44610
CTCN_1053	30552	GTCN_3113	44611
ATCN_597	30553	TTCN_4755	44612
TTCN_845	30554	CTCN_5977	44613
ATCN_598	30555	ATCN_3311	44614
CTCN_1054	30556	GTCN_3114	44615
TTCN_846	30557	CTCN_5978	44616
ATCN_599	30558	CTCN_5979	44617
GTCN_602	30559	CTCN_5980	44618
CTCN_1055	30560	GTCN_3115	44619
TTCN_847	30561	TTCN_4756	44620
GTCN_603	30562	TTCN_4757	44621
GTCN_604	30563	TTCN_4758	44622
CTCN_1056	30564	GTCN_3116	44623
ATCN_600	30565	CTCN_5981	44624
TTCN_848	30566	TTCN_4759	44625
TTCN_849	30567	GTCN_3117	44626
TTCN_850	30568	CTCN_5982	44627
TTCN_851	30569	GTCN_3118	44628
TTCN_852	30570	CTCN_5983	44629
TTCN_853	30571	ATCN_3312	44630
TTCN_854	30572	ATCN_3313	44631
TTCN_855	30573	TTCN_4760	44632
TTCN_856	30574	GTCN_3119	44633
CTCN_1057	30575	CTCN_5984	44634
TTCN_857	30576	TTCN_4761	44635
TTCN_858	30577	ATCN_3314	44636
TTCN_859	30578	TTCN_4762	44637
TTCN_860	30579	TTCN_4763	44638
TTCN_861	30580	ATCN_3315	44639
TTCN_862	30581	ATCN_3316	44640
CTCN_1058	30582	GTCN_3120	44641
ATCN_601	30583	ATCN_3317	44642
CTCN_1059	30584	ATCN_3318	44643
GTCN_605	30585	TTCN_4764	44644
ATCN_602	30586	TTCN_4765	44645
ATCN_603	30587	TTCN_4766	44646
CTCN_1060	30588	ATCN_3319	44647
CTCN_1061	30589	ATCN_3320	44648

CTCN_1062	30590	ATCN_3321	44649
CTCN_1063	30591	ATCN_3322	44650
TTCN_863	30592	TTCN_4767	44651
ATCN_604	30593	CTCN_5985	44652
TTCN_864	30594	ATCN_3323	44653
CTCN_1064	30595	TTCN_4768	44654
GTCN_606	30596	ATCN_3324	44655
TTCN_865	30597	ATCN_3325	44656
CTCN_1065	30598	GTCN_3121	44657
GTCN_607	30599	TTCN_4769	44658
TTCN_866	30600	CTCN_5986	44659
GTCN_608	30601	CTCN_5987	44660
CTCN_1066	30602	CTCN_5988	44661
TTCN_867	30603	ATCN_3326	44662
CTCN_1067	30604	GTCN_3122	44663
GTCN_609	30605	TTCN_4770	44664
CTCN_1068	30606	CTCN_5989	44665
ATCN_605	30607	TTCN_4771	44666
ATCN_606	30608	CTCN_5990	44667
TTCN_868	30609	CTCN_5991	44668
CTCN_1069	30610	CTCN_5992	44669
TTCN_869	30611	GTCN_3123	44670
CTCN_1070	30612	CTCN_5993	44671
ATCN_607	30613	GTCN_3124	44672
CTCN_1071	30614	ATCN_3327	44673
ATCN_608	30615	CTCN_5994	44674
ATCN_609	30616	ATCN_3328	44675
TTCN_870	30617	ATCN_3329	44676
CTCN_1072	30618	GTCN_3125	44677
CTCN_1073	30619	TTCN_4772	44678
CTCN_1074	30620	TTCN_4773	44679
TTCN_871	30621	CTCN_5995	44680
ATCN_610	30622	TTCN_4774	44681
CTCN_1075	30623	CTCN_5996	44682
GTCN_610	30624	CTCN_5997	44683
TTCN_872	30625	GTCN_3126	44684
ATCN_611	30626	TTCN_4775	44685
ATCN_612	30627	CTCN_5998	44686
TTCN_873	30628	TTCN_4776	44687
TTCN_874	30629	TTCN_4777	44688
CTCN_1076	30630	TTCN_4778	44689
CTCN_1077	30631	CTCN_5999	44690
TTCN_875	30632	CTCN_6000	44691

FIG. 37 (continued)

TTCN_876	30633	GTCN_3127	44692
TTCN_877	30634	GTCN_3128	44693
CTCN_1078	30635	GTCN_3129	44694
CTCN_1079	30636	ATCN_3330	44695
CTCN_1080	30637	TTCN_4779	44696
TTCN_878	30638	TTCN_4780	44697
ATCN_613	30639	TTCN_4781	44698
CTCN_1081	30640	ATCN_3331	44699
TTCN_879	30641	ATCN_3332	44700
CTCN_1082	30642	GTCN_3130	44701
CTCN_1083	30643	TTCN_4782	44702
CTCN_1084	30644	GTCN_3131	44703
TTCN_880	30645	GTCN_3132	44704
TTCN_881	30646	CTCN_6001	44705
TTCN_882	30647	TTCN_4783	44706
TTCN_883	30648	ATCN_3333	44707
CTCN_1085	30649	GTCN_3133	44708
GTCN_611	30650	TTCN_4784	44709
TTCN_884	30651	TTCN_4785	44710
ATCN_614	30652	GTCN_3134	44711
GTCN_612	30653	GTCN_3135	44712
CTCN_1086	30654	GTCN_3136	44713
TTCN_885	30655	GTCN_3137	44714
CTCN_1087	30656	GTCN_3138	44715
GTCN_613	30657	TTCN_4786	44716
TTCN_886	30658	CTCN_6002	44717
TTCN_887	30659	GTCN_3139	44718
ATCN_615	30660	CTCN_6003	44719
GTCN_614	30661	ATCN_3334	44720
GTCN_615	30662	CTCN_6004	44721
GTCN_616	30663	CTCN_6005	44722
TTCN_888	30664	TTCN_4787	44723
CTCN_1088	30665	ATCN_3335	44724
CTCN_1089	30666	TTCN_4788	44725
TTCN_889	30667	ATCN_3336	44726
CTCN_1090	30668	TTCN_4789	44727
TTCN_890	30669	CTCN_6006	44728
ATCN_616	30670	TTCN_4790	44729
CTCN_1091	30671	CTCN_6007	44730
CTCN_1092	30672	ATCN_3337	44731
ATCN_617	30673	CTCN_6008	44732
CTCN_1093	30674	GTCN_3140	44733
CTCN_1094	30675	CTCN_6009	44734

GTCN_617	30676	CTCN_6010	44735
TTCN_891	30677	ATCN_3338	44736
ATCN_618	30678	ATCN_3339	44737
CTCN_1095	30679	CTCN_6011	44738
GTCN_618	30680	CTCN_6012	44739
GTCN_619	30681	CTCN_6013	44740
CTCN_1096	30682	TTCN_4791	44741
CTCN_1097	30683	TTCN_4792	44742
ATCN_619	30684	CTCN_6014	44743
ATCN_620	30685	CTCN_6015	44744
TTCN_892	30686	CTCN_6016	44745
TTCN_893	30687	CTCN_6017	44746
CTCN_1098	30688	GTCN_3141	44747
TTCN_894	30689	CTCN_6018	44748
TTCN_895	30690	GTCN_3142	44749
CTCN_1099	30691	TTCN_4793	44750
CTCN_1100	30692	ATCN_3340	44751
GTCN_620	30693	GTCN_3143	44752
CTCN_1101	30694	CTCN_6019	44753
GTCN_621	30695	ATCN_3341	44754
TTCN_896	30696	ATCN_3342	44755
TTCN_897	30697	CTCN_6020	44756
ATCN_621	30698	GTCN_3144	44757
CTCN_1102	30699	ATCN_3343	44758
CTCN_1103	30700	ATCN_3344	44759
CTCN_1104	30701	CTCN_6021	44760
CTCN_1105	30702	GTCN_3145	44761
TTCN_898	30703	CTCN_6022	44762
CTCN_1106	30704	ATCN_3345	44763
ATCN_622	30705	CTCN_6023	44764
CTCN_1107	30706	GTCN_3146	44765
GTCN_622	30707	TTCN_4794	44766
TTCN_899	30708	CTCN_6024	44767
ATCN_623	30709	ATCN_3346	44768
CTCN_1108	30710	TTCN_4795	44769
ATCN_624	30711	CTCN_6025	44770
CTCN_1109	30712	TTCN_4796	44771
CTCN_1110	30713	ATCN_3347	44772
ATCN_625	30714	CTCN_6026	44773
ATCN_626	30715	CTCN_6027	44774
TTCN_900	30716	TTCN_4797	44775
GTCN_623	30717	TTCN_4798	44776
CTCN_1111	30718	TTCN_4799	44777

FIG. 37 (continued)

CTCN_1112	30719	CTCN_6028	44778
ATCN_627	30720	TTCN_4800	44779
ATCN_628	30721	TTCN_4801	44780
TTCN_901	30722	TTCN_4802	44781
ATCN_629	30723	TTCN_4803	44782
CTCN_1113	30724	TTCN_4804	44783
CTCN_1114	30725	GTCN_3147	44784
ATCN_630	30726	CTCN_6029	44785
CTCN_1115	30727	GTCN_3148	44786
CTCN_1116	30728	TTCN_4805	44787
CTCN_1117	30729	CTCN_6030	44788
CTCN_1118	30730	ATCN_3348	44789
CTCN_1119	30731	CTCN_6031	44790
TTCN_902	30732	ATCN_3349	44791
ATCN_631	30733	TTCN_4806	44792
TTCN_903	30734	GTCN_3149	44793
TTCN_904	30735	CTCN_6032	44794
CTCN_1120	30736	GTCN_3150	44795
CTCN_1121	30737	ATCN_3350	44796
ATCN_632	30738	GTCN_3151	44797
CTCN_1122	30739	GTCN_3152	44798
CTCN_1123	30740	GTCN_3153	44799
ATCN_633	30741	GTCN_3154	44800
TTCN_905	30742	TTCN_4807	44801
GTCN_624	30743	CTCN_6033	44802
CTCN_1124	30744	ATCN_3351	44803
TTCN_906	30745	TTCN_4808	44804
ATCN_634	30746	ATCN_3352	44805
ATCN_635	30747	ATCN_3353	44806
ATCN_636	30748	TTCN_4809	44807
CTCN_1125	30749	ATCN_3354	44808
CTCN_1126	30750	ATCN_3355	44809
TTCN_907	30751	GTCN_3155	44810
TTCN_908	30752	GTCN_3156	44811
CTCN_1127	30753	TTCN_4810	44812
CTCN_1128	30754	GTCN_3157	44813
ATCN_637	30755	TTCN_4811	44814
ATCN_638	30756	TTCN_4812	44815
CTCN_1129	30757	GTCN_3158	44816
CTCN_1130	30758	GTCN_3159	44817
CTCN_1131	30759	ATCN_3356	44818
TTCN_909	30760	TTCN_4813	44819
GTCN_625	30761	GTCN_3160	44820

TTCN_910	30762	TTCN_4814	44821
CTCN_1132	30763	TTCN_4815	44822
CTCN_1133	30764	CTCN_6034	44823
CTCN_1134	30765	ATCN_3357	44824
GTCN_626	30766	TTCN_4816	44825
TTCN_911	30767	CTCN_6035	44826
ATCN_639	30768	GTCN_3161	44827
CTCN_1135	30769	TTCN_4817	44828
GTCN_627	30770	GTCN_3162	44829
CTCN_1136	30771	GTCN_3163	44830
TTCN_912	30772	TTCN_4818	44831
ATCN_640	30773	ATCN_3358	44832
CTCN_1137	30774	CTCN_6036	44833
ATCN_641	30775	GTCN_3164	44834
ATCN_642	30776	TTCN_4819	44835
GTCN_628	30777	ATCN_3359	44836
TTCN_913	30778	TTCN_4820	44837
TTCN_914	30779	TTCN_4821	44838
TTCN_915	30780	CTCN_6037	44839
CTCN_1138	30781	TTCN_4822	44840
GTCN_629	30782	GTCN_3165	44841
CTCN_1139	30783	TTCN_4823	44842
CTCN_1140	30784	ATCN_3360	44843
GTCN_630	30785	ATCN_3361	44844
CTCN_1141	30786	TTCN_4824	44845
GTCN_631	30787	CTCN_6038	44846
ATCN_643	30788	TTCN_4825	44847
CTCN_1142	30789	CTCN_6039	44848
GTCN_632	30790	CTCN_6040	44849
ATCN_644	30791	TTCN_4826	44850
ATCN_645	30792	TTCN_4827	44851
TTCN_916	30793	CTCN_6041	44852
TTCN_917	30794	TTCN_4828	44853
ATCN_646	30795	GTCN_3166	44854
TTCN_918	30796	TTCN_4829	44855
GTCN_633	30797	CTCN_6042	44856
CTCN_1143	30798	ATCN_3362	44857
ATCN_647	30799	CTCN_6043	44858
ATCN_648	30800	ATCN_3363	44859
GTCN_634	30801	GTCN_3167	44860
CTCN_1144	30802	GTCN_3168	44861
ATCN_649	30803	CTCN_6044	44862
TTCN_919	30804	TTCN_4830	44863

FIG. 37 (continued)

TTCN_920	30805	GTCN_3169	44864
GTCN_635	30806	CTCN_6045	44865
TTCN_921	30807	ATCN_3364	44866
TTCN_922	30808	ATCN_3365	44867
TTCN_923	30809	ATCN_3366	44868
TTCN_924	30810	TTCN_4831	44869
CTCN_1145	30811	CTCN_6046	44870
CTCN_1146	30812	CTCN_6047	44871
GTCN_636	30813	TTCN_4832	44872
TTCN_925	30814	TTCN_4833	44873
CTCN_1147	30815	CTCN_6048	44874
GTCN_637	30816	CTCN_6049	44875
TTCN_926	30817	ATCN_3367	44876
CTCN_1148	30818	CTCN_6050	44877
ATCN_650	30819	CTCN_6051	44878
ATCN_651	30820	TTCN_4834	44879
CTCN_1149	30821	TTCN_4835	44880
GTCN_638	30822	CTCN_6052	44881
TTCN_927	30823	CTCN_6053	44882
CTCN_1150	30824	TTCN_4836	44883
GTCN_639	30825	CTCN_6054	44884
CTCN_1151	30826	TTCN_4837	44885
GTCN_640	30827	CTCN_6055	44886
GTCN_641	30828	TTCN_4838	44887
CTCN_1152	30829	ATCN_3368	44888
CTCN_1153	30830	TTCN_4839	44889
CTCN_1154	30831	CTCN_6056	44890
CTCN_1155	30832	TTCN_4840	44891
CTCN_1156	30833	ATCN_3369	44892
CTCN_1157	30834	ATCN_3370	44893
ATCN_652	30835	GTCN_3170	44894
ATCN_653	30836	GTCN_3171	44895
CTCN_1158	30837	CTCN_6057	44896
CTCN_1159	30838	TTCN_4841	44897
CTCN_1160	30839	GTCN_3172	44898
GTCN_642	30840	CTCN_6058	44899
CTCN_1161	30841	ATCN_3371	44900
GTCN_643	30842	TTCN_4842	44901
GTCN_644	30843	ATCN_3372	44902
CTCN_1162	30844	GTCN_3173	44903
TTCN_928	30845	TTCN_4843	44904
TTCN_929	30846	GTCN_3174	44905
CTCN_1163	30847	CTCN_6059	44906

GTCN_645	30848	GTCN_3175	44907
TTCN_930	30849	GTCN_3176	44908
ATCN_654	30850	TTCN_4844	44909
CTCN_1164	30851	TTCN_4845	44910
CTCN_1165	30852	TTCN_4846	44911
CTCN_1166	30853	ATCN_3373	44912
TTCN_931	30854	CTCN_6060	44913
ATCN_655	30855	CTCN_6061	44914
ATCN_656	30856	TTCN_4847	44915
GTCN_646	30857	ATCN_3374	44916
CTCN_1167	30858	GTCN_3177	44917
ATCN_657	30859	CTCN_6062	44918
ATCN_658	30860	GTCN_3178	44919
CTCN_1168	30861	CTCN_6063	44920
TTCN_932	30862	GTCN_3179	44921
GTCN_647	30863	GTCN_3180	44922
CTCN_1169	30864	TTCN_4848	44923
GTCN_648	30865	TTCN_4849	44924
ATCN_659	30866	ATCN_3375	44925
TTCN_933	30867	TTCN_4850	44926
CTCN_1170	30868	CTCN_6064	44927
TTCN_934	30869	TTCN_4851	44928
TTCN_935	30870	CTCN_6065	44929
TTCN_936	30871	TTCN_4852	44930
ATCN_660	30872	CTCN_6066	44931
ATCN_661	30873	TTCN_4853	44932
CTCN_1171	30874	CTCN_6067	44933
CTCN_1172	30875	TTCN_4854	44934
CTCN_1173	30876	CTCN_6068	44935
GTCN_649	30877	TTCN_4855	44936
CTCN_1174	30878	TTCN_4856	44937
TTCN_937	30879	CTCN_6069	44938
TTCN_938	30880	TTCN_4857	44939
GTCN_650	30881	CTCN_6070	44940
CTCN_1175	30882	GTCN_3181	44941
CTCN_1176	30883	CTCN_6071	44942
TTCN_939	30884	CTCN_6072	44943
CTCN_1177	30885	GTCN_3182	44944
ATCN_662	30886	CTCN_6073	44945
ATCN_663	30887	CTCN_6074	44946
GTCN_651	30888	GTCN_3183	44947
CTCN_1178	30889	ATCN_3376	44948
TTCN_940	30890	TTCN_4858	44949

FIG. 37 (continued)

CTCN_1179	30891	TTCN_4859	44950
GTCN_652	30892	GTCN_3184	44951
ATCN_664	30893	CTCN_6075	44952
TTCN_941	30894	CTCN_6076	44953
GTCN_653	30895	TTCN_4860	44954
CTCN_1180	30896	CTCN_6077	44955
ATCN_665	30897	TTCN_4861	44956
CTCN_1181	30898	TTCN_4862	44957
CTCN_1182	30899	GTCN_3185	44958
GTCN_654	30900	TTCN_4863	44959
CTCN_1183	30901	TTCN_4864	44960
TTCN_942	30902	ATCN_3377	44961
ATCN_666	30903	ATCN_3378	44962
TTCN_943	30904	CTCN_6078	44963
CTCN_1184	30905	GTCN_3186	44964
CTCN_1185	30906	CTCN_6079	44965
CTCN_1186	30907	CTCN_6080	44966
CTCN_1187	30908	CTCN_6081	44967
ATCN_667	30909	CTCN_6082	44968
ATCN_668	30910	GTCN_3187	44969
CTCN_1188	30911	CTCN_6083	44970
CTCN_1189	30912	GTCN_3188	44971
CTCN_1190	30913	ATCN_3379	44972
GTCN_655	30914	ATCN_3380	44973
CTCN_1191	30915	CTCN_6084	44974
GTCN_656	30916	GTCN_3189	44975
CTCN_1192	30917	CTCN_6085	44976
TTCN_944	30918	CTCN_6086	44977
CTCN_1193	30919	CTCN_6087	44978
GTCN_657	30920	GTCN_3190	44979
CTCN_1194	30921	CTCN_6088	44980
GTCN_658	30922	TTCN_4865	44981
ATCN_669	30923	CTCN_6089	44982
CTCN_1195	30924	ATCN_3381	44983
GTCN_659	30925	ATCN_3382	44984
CTCN_1196	30926	CTCN_6090	44985
TTCN_945	30927	ATCN_3383	44986
ATCN_670	30928	TTCN_4866	44987
TTCN_946	30929	TTCN_4867	44988
GTCN_660	30930	TTCN_4868	44989
GTCN_661	30931	GTCN_3191	44990
ATCN_671	30932	TTCN_4869	44991
GTCN_662	30933	CTCN_6091	44992

TTCN_947	30934	GTCN_3192	44993
GTCN_663	30935	TTCN_4870	44994
TTCN_948	30936	CTCN_6092	44995
CTCN_1197	30937	TTCN_4871	44996
GTCN_664	30938	TTCN_4872	44997
ATCN_672	30939	TTCN_4873	44998
CTCN_1198	30940	GTCN_3193	44999
CTCN_1199	30941	TTCN_4874	45000
CTCN_1200	30942	CTCN_6093	45001
GTCN_665	30943	ATCN_3384	45002
GTCN_666	30944	CTCN_6094	45003
TTCN_949	30945	GTCN_3194	45004
CTCN_1201	30946	CTCN_6095	45005
TTCN_950	30947	TTCN_4875	45006
GTCN_667	30948	TTCN_4876	45007
CTCN_1202	30949	ATCN_3385	45008
ATCN_673	30950	CTCN_6096	45009
ATCN_674	30951	CTCN_6097	45010
CTCN_1203	30952	GTCN_3195	45011
GTCN_668	30953	CTCN_6098	45012
CTCN_1204	30954	TTCN_4877	45013
GTCN_669	30955	TTCN_4878	45014
CTCN_1205	30956	GTCN_3196	45015
GTCN_670	30957	ATCN_3386	45016
CTCN_1206	30958	GTCN_3197	45017
ATCN_675	30959	GTCN_3198	45018
CTCN_1207	30960	TTCN_4879	45019
ATCN_676	30961	ATCN_3387	45020
ATCN_677	30962	TTCN_4880	45021
CTCN_1208	30963	CTCN_6099	45022
CTCN_1209	30964	TTCN_4881	45023
CTCN_1210	30965	TTCN_4882	45024
GTCN_671	30966	ATCN_3388	45025
CTCN_1211	30967	TTCN_4883	45026
ATCN_678	30968	TTCN_4884	45027
CTCN_1212	30969	GTCN_3199	45028
GTCN_672	30970	ATCN_3389	45029
CTCN_1213	30971	ATCN_3390	45030
GTCN_673	30972	GTCN_3200	45031
CTCN_1214	30973	ATCN_3391	45032
GTCN_674	30974	TTCN_4885	45033
CTCN_1215	30975	CTCN_6100	45034
ATCN_679	30976	CTCN_6101	45035

FIG. 37 (continued)

CTCN_1216	30977	GTCN_3201	45036
CTCN_1217	30978	CTCN_6102	45037
ATCN_680	30979	TTCN_4886	45038
CTCN_1218	30980	TTCN_4887	45039
CTCN_1219	30981	GTCN_3202	45040
TTCN_951	30982	TTCN_4888	45041
TTCN_952	30983	TTCN_4889	45042
CTCN_1220	30984	CTCN_6103	45043
CTCN_1221	30985	GTCN_3203	45044
CTCN_1222	30986	GTCN_3204	45045
ATCN_681	30987	TTCN_4890	45046
CTCN_1223	30988	CTCN_6104	45047
ATCN_682	30989	TTCN_4891	45048
TTCN_953	30990	ATCN_3392	45049
GTCN_675	30991	CTCN_6105	45050
TTCN_954	30992	GTCN_3205	45051
CTCN_1224	30993	ATCN_3393	45052
GTCN_676	30994	ATCN_3394	45053
CTCN_1225	30995	ATCN_3395	45054
ATCN_683	30996	TTCN_4892	45055
ATCN_684	30997	TTCN_4893	45056
CTCN_1226	30998	TTCN_4894	45057
GTCN_677	30999	TTCN_4895	45058
CTCN_1227	31000	CTCN_6106	45059
CTCN_1228	31001	ATCN_3396	45060
ATCN_685	31002	CTCN_6107	45061
ATCN_686	31003	ATCN_3397	45062
CTCN_1229	31004	TTCN_4896	45063
GTCN_678	31005	CTCN_6108	45064
ATCN_687	31006	TTCN_4897	45065
TTCN_955	31007	TTCN_4898	45066
CTCN_1230	31008	CTCN_6109	45067
CTCN_1231	31009	GTCN_3206	45068
TTCN_956	31010	TTCN_4899	45069
TTCN_957	31011	TTCN_4900	45070
GTCN_679	31012	GTCN_3207	45071
TTCN_958	31013	ATCN_3398	45072
GTCN_680	31014	TTCN_4901	45073
ATCN_688	31015	CTCN_6110	45074
CTCN_1232	31016	GTCN_3208	45075
GTCN_681	31017	TTCN_4902	45076
GTCN_682	31018	GTCN_3209	45077
CTCN_1233	31019	CTCN_6111	45078

TTCN_959	31020	CTCN_6112	45079
GTCN_683	31021	TTCN_4903	45080
TTCN_960	31022	GTCN_3210	45081
CTCN_1234	31023	ATCN_3399	45082
GTCN_684	31024	CTCN_6113	45083
CTCN_1235	31025	GTCN_3211	45084
GTCN_685	31026	CTCN_6114	45085
CTCN_1236	31027	ATCN_3400	45086
GTCN_686	31028	CTCN_6115	45087
TTCN_961	31029	CTCN_6116	45088
GTCN_687	31030	GTCN_3212	45089
GTCN_688	31031	CTCN_6117	45090
TTCN_962	31032	GTCN_3213	45091
CTCN_1237	31033	TTCN_4904	45092
ATCN_689	31034	GTCN_3214	45093
GTCN_689	31035	CTCN_6118	45094
GTCN_690	31036	ATCN_3401	45095
GTCN_691	31037	TTCN_4905	45096
ATCN_690	31038	ATCN_3402	45097
GTCN_692	31039	TTCN_4906	45098
CTCN_1238	31040	CTCN_6119	45099
CTCN_1239	31041	TTCN_4907	45100
CTCN_1240	31042	ATCN_3403	45101
CTCN_1241	31043	TTCN_4908	45102
GTCN_693	31044	CTCN_6120	45103
CTCN_1242	31045	CTCN_6121	45104
CTCN_1243	31046	ATCN_3404	45105
CTCN_1244	31047	CTCN_6122	45106
GTCN_694	31048	TTCN_4909	45107
GTCN_695	31049	GTCN_3215	45108
GTCN_696	31050	TTCN_4910	45109
CTCN_1245	31051	TTCN_4911	45110
GTCN_697	31052	GTCN_3216	45111
TTCN_963	31053	TTCN_4912	45112
GTCN_698	31054	GTCN_3217	45113
CTCN_1246	31055	CTCN_6123	45114
TTCN_964	31056	TTCN_4913	45115
GTCN_699	31057	GTCN_3218	45116
GTCN_700	31058	TTCN_4914	45117
TTCN_965	31059	TTCN_4915	45118
ATCN_691	31060	ATCN_3405	45119
ATCN_692	31061	TTCN_4916	45120
TTCN_966	31062	GTCN_3219	45121

FIG. 37 (continued)

TTCN_967	31063	CTCN_6124	45122
CTCN_1247	31064	CTCN_6125	45123
CTCN_1248	31065	TTCN_4917	45124
ATCN_693	31066	CTCN_6126	45125
CTCN_1249	31067	CTCN_6127	45126
GTCN_701	31068	ATCN_3406	45127
GTCN_702	31069	GTCN_3220	45128
CTCN_1250	31070	GTCN_3221	45129
ATCN_694	31071	ATCN_3407	45130
TTCN_968	31072	ATCN_3408	45131
TTCN_969	31073	CTCN_6128	45132
TTCN_970	31074	CTCN_6129	45133
CTCN_1251	31075	TTCN_4918	45134
TTCN_971	31076	CTCN_6130	45135
CTCN_1252	31077	TTCN_4919	45136
TTCN_972	31078	CTCN_6131	45137
CTCN_1253	31079	TTCN_4920	45138
GTCN_703	31080	CTCN_6132	45139
CTCN_1254	31081	TTCN_4921	45140
TTCN_973	31082	CTCN_6133	45141
TTCN_974	31083	ATCN_3409	45142
CTCN_1255	31084	GTCN_3222	45143
CTCN_1256	31085	CTCN_6134	45144
ATCN_695	31086	CTCN_6135	45145
TTCN_975	31087	CTCN_6136	45146
CTCN_1257	31088	ATCN_3410	45147
TTCN_976	31089	CTCN_6137	45148
CTCN_1258	31090	GTCN_3223	45149
GTCN_704	31091	ATCN_3411	45150
CTCN_1259	31092	CTCN_6138	45151
TTCN_977	31093	CTCN_6139	45152
TTCN_978	31094	ATCN_3412	45153
CTCN_1260	31095	CTCN_6140	45154
GTCN_705	31096	TTCN_4922	45155
TTCN_979	31097	CTCN_6141	45156
CTCN_1261	31098	TTCN_4923	45157
GTCN_706	31099	GTCN_3224	45158
CTCN_1262	31100	CTCN_6142	45159
CTCN_1263	31101	CTCN_6143	45160
GTCN_707	31102	GTCN_3225	45161
ATCN_696	31103	TTCN_4924	45162
ATCN_697	31104	ATCN_3413	45163
GTCN_708	31105	ATCN_3414	45164

GTCN_709	31106	ATCN_3415	45165
TTCN_980	31107	TTCN_4925	45166
TTCN_981	31108	ATCN_3416	45167
TTCN_982	31109	TTCN_4926	45168
ATCN_698	31110	CTCN_6144	45169
ATCN_699	31111	TTCN_4927	45170
CTCN_1264	31112	TTCN_4928	45171
TTCN_983	31113	TTCN_4929	45172
CTCN_1265	31114	GTCN_3226	45173
TTCN_984	31115	TTCN_4930	45174
ATCN_700	31116	ATCN_3417	45175
TTCN_985	31117	GTCN_3227	45176
CTCN_1266	31118	CTCN_6145	45177
CTCN_1267	31119	TTCN_4931	45178
GTCN_710	31120	GTCN_3228	45179
CTCN_1268	31121	CTCN_6146	45180
GTCN_711	31122	ATCN_3418	45181
CTCN_1269	31123	CTCN_6147	45182
TTCN_986	31124	CTCN_6148	45183
CTCN_1270	31125	CTCN_6149	45184
TTCN_987	31126	ATCN_3419	45185
CTCN_1271	31127	ATCN_3420	45186
CTCN_1272	31128	GTCN_3229	45187
TTCN_988	31129	ATCN_3421	45188
ATCN_701	31130	TTCN_4932	45189
CTCN_1273	31131	ATCN_3422	45190
GTCN_712	31132	TTCN_4933	45191
CTCN_1274	31133	CTCN_6150	45192
TTCN_989	31134	GTCN_3230	45193
TTCN_990	31135	CTCN_6151	45194
ATCN_702	31136	GTCN_3231	45195
CTCN_1275	31137	TTCN_4934	45196
CTCN_1276	31138	TTCN_4935	45197
GTCN_713	31139	ATCN_3423	45198
ATCN_703	31140	CTCN_6152	45199
CTCN_1277	31141	CTCN_6153	45200
GTCN_714	31142	TTCN_4936	45201
TTCN_991	31143	GTCN_3232	45202
GTCN_715	31144	TTCN_4937	45203
CTCN_1278	31145	ATCN_3424	45204
GTCN_716	31146	CTCN_6154	45205
ATCN_704	31147	TTCN_4938	45206
CTCN_1279	31148	TTCN_4939	45207

FIG. 37 (continued)

CTCN_1280	31149	GTCN_3233	45208
GTCN_717	31150	TTCN_4940	45209
GTCN_718	31151	TTCN_4941	45210
CTCN_1281	31152	CTCN_6155	45211
ATCN_705	31153	ATCN_3425	45212
TTCN_992	31154	GTCN_3234	45213
CTCN_1282	31155	TTCN_4942	45214
CTCN_1283	31156	ATCN_3426	45215
TTCN_993	31157	GTCN_3235	45216
TTCN_994	31158	ATCN_3427	45217
GTCN_719	31159	CTCN_6156	45218
ATCN_706	31160	TTCN_4943	45219
CTCN_1284	31161	ATCN_3428	45220
GTCN_720	31162	TTCN_4944	45221
CTCN_1285	31163	CTCN_6157	45222
GTCN_721	31164	GTCN_3236	45223
CTCN_1286	31165	TTCN_4945	45224
CTCN_1287	31166	GTCN_3237	45225
CTCN_1288	31167	ATCN_3429	45226
CTCN_1289	31168	GTCN_3238	45227
CTCN_1290	31169	CTCN_6158	45228
GTCN_722	31170	TTCN_4946	45229
ATCN_707	31171	ATCN_3430	45230
GTCN_723	31172	TTCN_4947	45231
ATCN_708	31173	ATCN_3431	45232
CTCN_1291	31174	GTCN_3239	45233
CTCN_1292	31175	CTCN_6159	45234
CTCN_1293	31176	ATCN_3432	45235
CTCN_1294	31177	TTCN_4948	45236
GTCN_724	31178	GTCN_3240	45237
CTCN_1295	31179	CTCN_6160	45238
TTCN_995	31180	TTCN_4949	45239
CTCN_1296	31181	ATCN_3433	45240
CTCN_1297	31182	CTCN_6161	45241
CTCN_1298	31183	GTCN_3241	45242
TTCN_996	31184	ATCN_3434	45243
CTCN_1299	31185	CTCN_6162	45244
GTCN_725	31186	TTCN_4950	45245
GTCN_726	31187	CTCN_6163	45246
GTCN_727	31188	TTCN_4951	45247
TTCN_997	31189	GTCN_3242	45248
GTCN_728	31190	TTCN_4952	45249
CTCN_1300	31191	TTCN_4953	45250

TTCN_998	31192	CTCN_6164	45251
CTCN_1301	31193	TTCN_4954	45252
GTCN_729	31194	ATCN_3435	45253
GTCN_730	31195	TTCN_4955	45254
CTCN_1302	31196	CTCN_6165	45255
GTCN_731	31197	CTCN_6166	45256
CTCN_1303	31198	ATCN_3436	45257
GTCN_732	31199	TTCN_4956	45258
ATCN_709	31200	CTCN_6167	45259
CTCN_1304	31201	ATCN_3437	45260
CTCN_1305	31202	ATCN_3438	45261
CTCN_1306	31203	CTCN_6168	45262
TTCN_999	31204	GTCN_3243	45263
ATCN_710	31205	CTCN_6169	45264
GTCN_733	31206	TTCN_4957	45265
CTCN_1307	31207	GTCN_3244	45266
GTCN_734	31208	ATCN_3439	45267
GTCN_735	31209	CTCN_6170	45268
TTCN_1000	31210	CTCN_6171	45269
CTCN_1308	31211	TTCN_4958	45270
CTCN_1309	31212	ATCN_3440	45271
CTCN_1310	31213	CTCN_6172	45272
ATCN_711	31214	CTCN_6173	45273
TTCN_1001	31215	TTCN_4959	45274
GTCN_736	31216	ATCN_3441	45275
CTCN_1311	31217	TTCN_4960	45276
CTCN_1312	31218	CTCN_6174	45277
TTCN_1002	31219	CTCN_6175	45278
CTCN_1313	31220	CTCN_6176	45279
TTCN_1003	31221	ATCN_3442	45280
TTCN_1004	31222	ATCN_3443	45281
TTCN_1005	31223	CTCN_6177	45282
CTCN_1314	31224	ATCN_3444	45283
TTCN_1006	31225	GTCN_3245	45284
ATCN_712	31226	CTCN_6178	45285
GTCN_737	31227	GTCN_3246	45286
TTCN_1007	31228	CTCN_6179	45287
CTCN_1315	31229	ATCN_3445	45288
TTCN_1008	31230	CTCN_6180	45289
GTCN_738	31231	TTCN_4961	45290
ATCN_713	31232	GTCN_3247	45291
GTCN_739	31233	ATCN_3446	45292
CTCN_1316	31234	CTCN_6181	45293

FIG. 37 (continued)

GTCN_740	31235	CTCN_6182	45294
CTCN_1317	31236	TTCN_4962	45295
TTCN_1009	31237	ATCN_3447	45296
TTCN_1010	31238	TTCN_4963	45297
GTCN_741	31239	TTCN_4964	45298
CTCN_1318	31240	ATCN_3448	45299
GTCN_742	31241	ATCN_3449	45300
CTCN_1319	31242	ATCN_3450	45301
TTCN_1011	31243	TTCN_4965	45302
GTCN_743	31244	TTCN_4966	45303
CTCN_1320	31245	TTCN_4967	45304
GTCN_744	31246	CTCN_6183	45305
GTCN_745	31247	ATCN_3451	45306
CTCN_1321	31248	CTCN_6184	45307
CTCN_1322	31249	TTCN_4968	45308
TTCN_1012	31250	GTCN_3248	45309
CTCN_1323	31251	TTCN_4969	45310
ATCN_714	31252	GTCN_3249	45311
ATCN_715	31253	CTCN_6185	45312
ATCN_716	31254	TTCN_4970	45313
TTCN_1013	31255	CTCN_6186	45314
TTCN_1014	31256	CTCN_6187	45315
TTCN_1015	31257	CTCN_6188	45316
CTCN_1324	31258	GTCN_3250	45317
ATCN_717	31259	CTCN_6189	45318
CTCN_1325	31260	TTCN_4971	45319
TTCN_1016	31261	GTCN_3251	45320
ATCN_718	31262	TTCN_4972	45321
ATCN_719	31263	TTCN_4973	45322
CTCN_1326	31264	TTCN_4974	45323
TTCN_1017	31265	ATCN_3452	45324
ATCN_720	31266	GTCN_3252	45325
GTCN_746	31267	GTCN_3253	45326
TTCN_1018	31268	CTCN_6190	45327
TTCN_1019	31269	ATCN_3453	45328
TTCN_1020	31270	ATCN_3454	45329
GTCN_747	31271	ATCN_3455	45330
GTCN_748	31272	TTCN_4975	45331
ATCN_721	31273	GTCN_3254	45332
TTCN_1021	31274	CTCN_6191	45333
CTCN_1327	31275	TTCN_4976	45334
CTCN_1328	31276	ATCN_3456	45335
ATCN_722	31277	TTCN_4977	45336

CTCN_1329	31278	GTCN_3255	45337
CTCN_1330	31279	TTCN_4978	45338
TTCN_1022	31280	CTCN_6192	45339
GTCN_749	31281	CTCN_6193	45340
CTCN_1331	31282	ATCN_3457	45341
CTCN_1332	31283	GTCN_3256	45342
TTCN_1023	31284	TTCN_4979	45343
CTCN_1333	31285	TTCN_4980	45344
CTCN_1334	31286	TTCN_4981	45345
ATCN_723	31287	TTCN_4982	45346
CTCN_1335	31288	ATCN_3458	45347
TTCN_1024	31289	TTCN_4983	45348
TTCN_1025	31290	CTCN_6194	45349
ATCN_724	31291	ATCN_3459	45350
CTCN_1336	31292	TTCN_4984	45351
GTCN_750	31293	TTCN_4985	45352
TTCN_1026	31294	TTCN_4986	45353
TTCN_1027	31295	TTCN_4987	45354
CTCN_1337	31296	TTCN_4988	45355
GTCN_751	31297	TTCN_4989	45356
TTCN_1028	31298	GTCN_3257	45357
CTCN_1338	31299	ATCN_3460	45358
ATCN_725	31300	ATCN_3461	45359
CTCN_1339	31301	GTCN_3258	45360
CTCN_1340	31302	GTCN_3259	45361
TTCN_1029	31303	ATCN_3462	45362
CTCN_1341	31304	ATCN_3463	45363
CTCN_1342	31305	GTCN_3260	45364
GTCN_752	31306	ATCN_3464	45365
CTCN_1343	31307	ATCN_3465	45366
GTCN_753	31308	TTCN_4990	45367
GTCN_754	31309	CTCN_6195	45368
GTCN_755	31310	ATCN_3466	45369
GTCN_756	31311	TTCN_4991	45370
GTCN_757	31312	CTCN_6196	45371
TTCN_1030	31313	GTCN_3261	45372
CTCN_1344	31314	GTCN_3262	45373
ATCN_726	31315	ATCN_3467	45374
CTCN_1345	31316	GTCN_3263	45375
GTCN_758	31317	CTCN_6197	45376
TTCN_1031	31318	CTCN_6198	45377
GTCN_759	31319	TTCN_4992	45378
ATCN_727	31320	CTCN_6199	45379

FIG. 37 (continued)

CTCN_1346	31321	TTCN_4993	45380
TTCN_1032	31322	GTCN_3264	45381
GTCN_760	31323	ATCN_3468	45382
TTCN_1033	31324	TTCN_4994	45383
CTCN_1347	31325	TTCN_4995	45384
GTCN_761	31326	CTCN_6200	45385
TTCN_1034	31327	ATCN_3469	45386
CTCN_1348	31328	TTCN_4996	45387
GTCN_762	31329	ATCN_3470	45388
CTCN_1349	31330	TTCN_4997	45389
TTCN_1035	31331	ATCN_3471	45390
GTCN_763	31332	CTCN_6201	45391
ATCN_728	31333	GTCN_3265	45392
ATCN_729	31334	TTCN_4998	45393
ATCN_730	31335	TTCN_4999	45394
TTCN_1036	31336	CTCN_6202	45395
CTCN_1350	31337	TTCN_5000	45396
CTCN_1351	31338	TTCN_5001	45397
GTCN_764	31339	TTCN_5002	45398
ATCN_731	31340	CTCN_6203	45399
CTCN_1352	31341	ATCN_3472	45400
GTCN_765	31342	TTCN_5003	45401
TTCN_1037	31343	ATCN_3473	45402
CTCN_1353	31344	TTCN_5004	45403
GTCN_766	31345	ATCN_3474	45404
CTCN_1354	31346	TTCN_5005	45405
GTCN_767	31347	TTCN_5006	45406
TTCN_1038	31348	CTCN_6204	45407
TTCN_1039	31349	CTCN_6205	45408
GTCN_768	31350	ATCN_3475	45409
GTCN_769	31351	GTCN_3266	45410
ATCN_732	31352	TTCN_5007	45411
ATCN_733	31353	TTCN_5008	45412
CTCN_1355	31354	ATCN_3476	45413
CTCN_1356	31355	CTCN_6206	45414
TTCN_1040	31356	TTCN_5009	45415
TTCN_1041	31357	ATCN_3477	45416
ATCN_734	31358	CTCN_6207	45417
TTCN_1042	31359	GTCN_3267	45418
CTCN_1357	31360	CTCN_6208	45419
TTCN_1043	31361	TTCN_5010	45420
TTCN_1044	31362	TTCN_5011	45421
ATCN_735	31363	CTCN_6209	45422

GTCN_770	31364	ATCN_3478	45423
CTCN_1358	31365	CTCN_6210	45424
GTCN_771	31366	CTCN_6211	45425
CTCN_1359	31367	ATCN_3479	45426
ATCN_736	31368	ATCN_3480	45427
GTCN_772	31369	CTCN_6212	45428
CTCN_1360	31370	GTCN_3268	45429
CTCN_1361	31371	CTCN_6213	45430
TTCN_1045	31372	ATCN_3481	45431
CTCN_1362	31373	ATCN_3482	45432
ATCN_737	31374	CTCN_6214	45433
CTCN_1363	31375	GTCN_3269	45434
CTCN_1364	31376	ATCN_3483	45435
GTCN_773	31377	TTCN_5012	45436
TTCN_1046	31378	GTCN_3270	45437
CTCN_1365	31379	CTCN_6215	45438
CTCN_1366	31380	GTCN_3271	45439
GTCN_774	31381	TTCN_5013	45440
GTCN_775	31382	TTCN_5014	45441
GTCN_776	31383	CTCN_6216	45442
TTCN_1047	31384	TTCN_5015	45443
GTCN_777	31385	TTCN_5016	45444
CTCN_1367	31386	CTCN_6217	45445
ATCN_738	31387	CTCN_6218	45446
ATCN_739	31388	CTCN_6219	45447
CTCN_1368	31389	CTCN_6220	45448
CTCN_1369	31390	ATCN_3484	45449
GTCN_778	31391	ATCN_3485	45450
TTCN_1048	31392	CTCN_6221	45451
CTCN_1370	31393	GTCN_3272	45452
GTCN_779	31394	CTCN_6222	45453
CTCN_1371	31395	GTCN_3273	45454
TTCN_1049	31396	CTCN_6223	45455
TTCN_1050	31397	GTCN_3274	45456
CTCN_1372	31398	CTCN_6224	45457
CTCN_1373	31399	GTCN_3275	45458
ATCN_740	31400	CTCN_6225	45459
ATCN_741	31401	TTCN_5017	45460
CTCN_1374	31402	ATCN_3486	45461
TTCN_1051	31403	TTCN_5018	45462
GTCN_780	31404	GTCN_3276	45463
TTCN_1052	31405	TTCN_5019	45464
ATCN_742	31406	TTCN_5020	45465

FIG. 37 (continued)

TTCN_1053	31407	TTCN_5021	45466
CTCN_1375	31408	TTCN_5022	45467
CTCN_1376	31409	ATCN_3487	45468
GTCN_781	31410	ATCN_3488	45469
ATCN_743	31411	GTCN_3277	45470
TTCN_1054	31412	TTCN_5023	45471
TTCN_1055	31413	CTCN_6226	45472
CTCN_1377	31414	CTCN_6227	45473
CTCN_1378	31415	TTCN_5024	45474
CTCN_1379	31416	CTCN_6228	45475
CTCN_1380	31417	TTCN_5025	45476
GTCN_782	31418	CTCN_6229	45477
TTCN_1056	31419	GTCN_3278	45478
TTCN_1057	31420	TTCN_5026	45479
CTCN_1381	31421	TTCN_5027	45480
TTCN_1058	31422	GTCN_3279	45481
TTCN_1059	31423	CTCN_6230	45482
CTCN_1382	31424	TTCN_5028	45483
TTCN_1060	31425	GTCN_3280	45484
CTCN_1383	31426	CTCN_6231	45485
TTCN_1061	31427	GTCN_3281	45486
GTCN_783	31428	GTCN_3282	45487
GTCN_784	31429	ATCN_3489	45488
TTCN_1062	31430	TTCN_5029	45489
GTCN_785	31431	CTCN_6232	45490
CTCN_1384	31432	GTCN_3283	45491
TTCN_1063	31433	GTCN_3284	45492
CTCN_1385	31434	TTCN_5030	45493
GTCN_786	31435	CTCN_6233	45494
TTCN_1064	31436	CTCN_6234	45495
ATCN_744	31437	TTCN_5031	45496
GTCN_787	31438	CTCN_6235	45497
TTCN_1065	31439	TTCN_5032	45498
CTCN_1386	31440	ATCN_3490	45499
CTCN_1387	31441	TTCN_5033	45500
GTCN_788	31442	GTCN_3285	45501
TTCN_1066	31443	CTCN_6236	45502
CTCN_1388	31444	CTCN_6237	45503
GTCN_789	31445	TTCN_5034	45504
CTCN_1389	31446	GTCN_3286	45505
CTCN_1390	31447	TTCN_5035	45506
ATCN_745	31448	TTCN_5036	45507
TTCN_1067	31449	ATCN_3491	45508

CTCN_1391	31450	ATCN_3492	45509
CTCN_1392	31451	ATCN_3493	45510
TTCN_1068	31452	CTCN_6238	45511
TTCN_1069	31453	ATCN_3494	45512
CTCN_1393	31454	TTCN_5037	45513
CTCN_1394	31455	CTCN_6239	45514
GTCN_790	31456	GTCN_3287	45515
GTCN_791	31457	CTCN_6240	45516
ATCN_746	31458	CTCN_6241	45517
TTCN_1070	31459	TTCN_5038	45518
TTCN_1071	31460	CTCN_6242	45519
TTCN_1072	31461	ATCN_3495	45520
GTCN_792	31462	ATCN_3496	45521
CTCN_1395	31463	ATCN_3497	45522
CTCN_1396	31464	CTCN_6243	45523
ATCN_747	31465	CTCN_6244	45524
GTCN_793	31466	GTCN_3288	45525
TTCN_1073	31467	TTCN_5039	45526
TTCN_1074	31468	GTCN_3289	45527
TTCN_1075	31469	ATCN_3498	45528
ATCN_748	31470	TTCN_5040	45529
CTCN_1397	31471	CTCN_6245	45530
CTCN_1398	31472	CTCN_6246	45531
TTCN_1076	31473	CTCN_6247	45532
CTCN_1399	31474	TTCN_5041	45533
TTCN_1077	31475	GTCN_3290	45534
CTCN_1400	31476	TTCN_5042	45535
CTCN_1401	31477	CTCN_6248	45536
CTCN_1402	31478	TTCN_5043	45537
ATCN_749	31479	CTCN_6249	45538
GTCN_794	31480	TTCN_5044	45539
GTCN_795	31481	TTCN_5045	45540
CTCN_1403	31482	TTCN_5046	45541
GTCN_796	31483	ATCN_3499	45542
GTCN_797	31484	GTCN_3291	45543
ATCN_750	31485	CTCN_6250	45544
CTCN_1404	31486	TTCN_5047	45545
CTCN_1405	31487	CTCN_6251	45546
TTCN_1078	31488	TTCN_5048	45547
TTCN_1079	31489	TTCN_5049	45548
CTCN_1406	31490	ATCN_3500	45549
TTCN_1080	31491	ATCN_3501	45550
ATCN_751	31492	ATCN_3502	45551

FIG. 37 (continued)

CTCN_1407	31493	CTCN_6252	45552
TTCN_1081	31494	TTCN_5050	45553
TTCN_1082	31495	TTCN_5051	45554
GTCN_798	31496	TTCN_5052	45555
ATCN_752	31497	TTCN_5053	45556
TTCN_1083	31498	ATCN_3503	45557
ATCN_753	31499	TTCN_5054	45558
GTCN_799	31500	GTCN_3292	45559
CTCN_1408	31501	ATCN_3504	45560
ATCN_754	31502	ATCN_3505	45561
GTCN_800	31503	TTCN_5055	45562
TTCN_1084	31504	CTCN_6253	45563
CTCN_1409	31505	CTCN_6254	45564
TTCN_1085	31506	CTCN_6255	45565
GTCN_801	31507	TTCN_5056	45566
CTCN_1410	31508	GTCN_3293	45567
GTCN_802	31509	CTCN_6256	45568
CTCN_1411	31510	CTCN_6257	45569
TTCN_1086	31511	TTCN_5057	45570
CTCN_1412	31512	CTCN_6258	45571
CTCN_1413	31513	TTCN_5058	45572
ATCN_755	31514	GTCN_3294	45573
TTCN_1087	31515	TTCN_5059	45574
TTCN_1088	31516	TTCN_5060	45575
ATCN_756	31517	ATCN_3506	45576
TTCN_1089	31518	CTCN_6259	45577
CTCN_1414	31519	CTCN_6260	45578
GTCN_803	31520	CTCN_6261	45579
TTCN_1090	31521	TTCN_5061	45580
CTCN_1415	31522	GTCN_3295	45581
CTCN_1416	31523	CTCN_6262	45582
CTCN_1417	31524	GTCN_3296	45583
ATCN_757	31525	GTCN_3297	45584
CTCN_1418	31526	GTCN_3298	45585
TTCN_1091	31527	GTCN_3299	45586
CTCN_1419	31528	CTCN_6263	45587
TTCN_1092	31529	TTCN_5062	45588
ATCN_758	31530	GTCN_3300	45589
GTCN_804	31531	CTCN_6264	45590
CTCN_1420	31532	TTCN_5063	45591
CTCN_1421	31533	CTCN_6265	45592
ATCN_759	31534	CTCN_6266	45593
CTCN_1422	31535	GTCN_3301	45594

TTCN_1093	31536	GTCN_3302	45595
CTCN_1423	31537	ATCN_3507	45596
TTCN_1094	31538	ATCN_3508	45597
CTCN_1424	31539	TTCN_5064	45598
ATCN_760	31540	GTCN_3303	45599
GTCN_805	31541	ATCN_3509	45600
CTCN_1425	31542	ATCN_3510	45601
ATCN_761	31543	GTCN_3304	45602
CTCN_1426	31544	ATCN_3511	45603
CTCN_1427	31545	TTCN_5065	45604
TTCN_1095	31546	TTCN_5066	45605
CTCN_1428	31547	ATCN_3512	45606
CTCN_1429	31548	GTCN_3305	45607
CTCN_1430	31549	CTCN_6267	45608
ATCN_762	31550	GTCN_3306	45609
TTCN_1096	31551	ATCN_3513	45610
GTCN_806	31552	ATCN_3514	45611
TTCN_1097	31553	ATCN_3515	45612
TTCN_1098	31554	GTCN_3307	45613
TTCN_1099	31555	CTCN_6268	45614
ATCN_763	31556	CTCN_6269	45615
ATCN_764	31557	CTCN_6270	45616
CTCN_1431	31558	GTCN_3308	45617
TTCN_1100	31559	CTCN_6271	45618
ATCN_765	31560	ATCN_3516	45619
ATCN_766	31561	ATCN_3517	45620
CTCN_1432	31562	CTCN_6272	45621
ATCN_767	31563	CTCN_6273	45622
ATCN_768	31564	CTCN_6274	45623
TTCN_1101	31565	CTCN_6275	45624
TTCN_1102	31566	TTCN_5067	45625
ATCN_769	31567	ATCN_3518	45626
ATCN_770	31568	CTCN_6276	45627
TTCN_1103	31569	TTCN_5068	45628
TTCN_1104	31570	CTCN_6277	45629
ATCN_771	31571	ATCN_3519	45630
TTCN_1105	31572	CTCN_6278	45631
CTCN_1433	31573	TTCN_5069	45632
ATCN_772	31574	ATCN_3520	45633
ATCN_773	31575	GTCN_3309	45634
CTCN_1434	31576	GTCN_3310	45635
TTCN_1106	31577	TTCN_5070	45636
CTCN_1435	31578	TTCN_5071	45637

FIG. 37 (continued)

TTCN_1107	31579	ATCN_3521	45638
GTCN_807	31580	TTCN_5072	45639
GTCN_808	31581	GTCN_3311	45640
GTCN_809	31582	GTCN_3312	45641
CTCN_1436	31583	TTCN_5073	45642
TTCN_1108	31584	TTCN_5074	45643
TTCN_1109	31585	TTCN_5075	45644
TTCN_1110	31586	TTCN_5076	45645
TTCN_1111	31587	ATCN_3522	45646
TTCN_1112	31588	ATCN_3523	45647
ATCN_774	31589	TTCN_5077	45648
TTCN_1113	31590	CTCN_6279	45649
GTCN_810	31591	GTCN_3313	45650
ATCN_775	31592	GTCN_3314	45651
TTCN_1114	31593	CTCN_6280	45652
GTCN_811	31594	GTCN_3315	45653
TTCN_1115	31595	CTCN_6281	45654
TTCN_1116	31596	ATCN_3524	45655
TTCN_1117	31597	ATCN_3525	45656
ATCN_776	31598	ATCN_3526	45657
TTCN_1118	31599	TTCN_5078	45658
TTCN_1119	31600	CTCN_6282	45659
ATCN_777	31601	CTCN_6283	45660
ATCN_778	31602	CTCN_6284	45661
ATCN_779	31603	CTCN_6285	45662
ATCN_780	31604	TTCN_5079	45663
TTCN_1120	31605	ATCN_3527	45664
ATCN_781	31606	TTCN_5080	45665
ATCN_782	31607	CTCN_6286	45666
ATCN_783	31608	ATCN_3528	45667
TTCN_1121	31609	GTCN_3316	45668
ATCN_784	31610	GTCN_3317	45669
TTCN_1122	31611	GTCN_3318	45670
TTCN_1123	31612	CTCN_6287	45671
ATCN_785	31613	CTCN_6288	45672
TTCN_1124	31614	GTCN_3319	45673
GTCN_812	31615	ATCN_3529	45674
CTCN_1437	31616	CTCN_6289	45675
ATCN_786	31617	GTCN_3320	45676
TTCN_1125	31618	GTCN_3321	45677
CTCN_1438	31619	GTCN_3322	45678
ATCN_787	31620	TTCN_5081	45679
ATCN_788	31621	ATCN_3530	45680

TTCN_1126	31622	GTCN_3323	45681
GTCN_813	31623	TTCN_5082	45682
TTCN_1127	31624	GTCN_3324	45683
TTCN_1128	31625	GTCN_3325	45684
TTCN_1129	31626	ATCN_3531	45685
ATCN_789	31627	TTCN_5083	45686
TTCN_1130	31628	ATCN_3532	45687
ATCN_790	31629	ATCN_3533	45688
TTCN_1131	31630	TTCN_5084	45689
TTCN_1132	31631	TTCN_5085	45690
ATCN_791	31632	CTCN_6290	45691
TTCN_1133	31633	TTCN_5086	45692
ATCN_792	31634	CTCN_6291	45693
CTCN_1439	31635	TTCN_5087	45694
TTCN_1134	31636	ATCN_3534	45695
ATCN_793	31637	CTCN_6292	45696
TTCN_1135	31638	ATCN_3535	45697
TTCN_1136	31639	TTCN_5088	45698
ATCN_794	31640	ATCN_3536	45699
TTCN_1137	31641	ATCN_3537	45700
TTCN_1138	31642	CTCN_6293	45701
GTCN_814	31643	GTCN_3326	45702
CTCN_1440	31644	CTCN_6294	45703
CTCN_1441	31645	ATCN_3538	45704
GTCN_815	31646	TTCN_5089	45705
ATCN_795	31647	ATCN_3539	45706
ATCN_796	31648	TTCN_5090	45707
TTCN_1139	31649	CTCN_6295	45708
TTCN_1140	31650	CTCN_6296	45709
ATCN_797	31651	TTCN_5091	45710
TTCN_1141	31652	CTCN_6297	45711
TTCN_1142	31653	ATCN_3540	45712
TTCN_1143	31654	CTCN_6298	45713
TTCN_1144	31655	ATCN_3541	45714
GTCN_816	31656	CTCN_6299	45715
CTCN_1442	31657	CTCN_6300	45716
TTCN_1145	31658	TTCN_5092	45717
CTCN_1443	31659	TTCN_5093	45718
GTCN_817	31660	ATCN_3542	45719
GTCN_818	31661	GTCN_3327	45720
ATCN_798	31662	TTCN_5094	45721
TTCN_1146	31663	ATCN_3543	45722
ATCN_799	31664	TTCN_5095	45723

FIG. 37 (continued)

CTCN_1444	31665	TTCN_5096	45724
TTCN_1147	31666	ATCN_3544	45725
GTCN_819	31667	TTCN_5097	45726
CTCN_1445	31668	TTCN_5098	45727
TTCN_1148	31669	CTCN_6301	45728
TTCN_1149	31670	GTCN_3328	45729
CTCN_1446	31671	CTCN_6302	45730
TTCN_1150	31672	ATCN_3545	45731
TTCN_1151	31673	ATCN_3546	45732
TTCN_1152	31674	GTCN_3329	45733
CTCN_1447	31675	ATCN_3547	45734
GTCN_820	31676	ATCN_3548	45735
GTCN_821	31677	GTCN_3330	45736
TTCN_1153	31678	TTCN_5099	45737
TTCN_1154	31679	TTCN_5100	45738
TTCN_1155	31680	CTCN_6303	45739
TTCN_1156	31681	CTCN_6304	45740
TTCN_1157	31682	GTCN_3331	45741
GTCN_822	31683	TTCN_5101	45742
GTCN_823	31684	TTCN_5102	45743
GTCN_824	31685	TTCN_5103	45744
GTCN_825	31686	ATCN_3549	45745
TTCN_1158	31687	CTCN_6305	45746
CTCN_1448	31688	CTCN_6306	45747
GTCN_826	31689	CTCN_6307	45748
TTCN_1159	31690	TTCN_5104	45749
CTCN_1449	31691	CTCN_6308	45750
ATCN_800	31692	GTCN_3332	45751
ATCN_801	31693	TTCN_5105	45752
CTCN_1450	31694	CTCN_6309	45753
TTCN_1160	31695	GTCN_3333	45754
CTCN_1451	31696	TTCN_5106	45755
GTCN_827	31697	TTCN_5107	45756
CTCN_1452	31698	CTCN_6310	45757
TTCN_1161	31699	CTCN_6311	45758
GTCN_828	31700	CTCN_6312	45759
CTCN_1453	31701	GTCN_3334	45760
ATCN_802	31702	TTCN_5108	45761
TTCN_1162	31703	CTCN_6313	45762
GTCN_829	31704	TTCN_5109	45763
CTCN_1454	31705	ATCN_3550	45764
TTCN_1163	31706	CTCN_6314	45765
TTCN_1164	31707	ATCN_3551	45766

ATCN_803	31708	TTCN_5110	45767
TTCN_1165	31709	GTCN_3335	45768
CTCN_1455	31710	CTCN_6315	45769
CTCN_1456	31711	GTCN_3336	45770
CTCN_1457	31712	CTCN_6316	45771
CTCN_1458	31713	ATCN_3552	45772
CTCN_1459	31714	TTCN_5111	45773
TTCN_1166	31715	GTCN_3337	45774
TTCN_1167	31716	CTCN_6317	45775
ATCN_804	31717	CTCN_6318	45776
TTCN_1168	31718	CTCN_6319	45777
ATCN_805	31719	GTCN_3338	45778
CTCN_1460	31720	TTCN_5112	45779
CTCN_1461	31721	GTCN_3339	45780
GTCN_830	31722	GTCN_3340	45781
TTCN_1169	31723	CTCN_6320	45782
GTCN_831	31724	CTCN_6321	45783
TTCN_1170	31725	TTCN_5113	45784
ATCN_806	31726	ATCN_3553	45785
TTCN_1171	31727	TTCN_5114	45786
CTCN_1462	31728	CTCN_6322	45787
GTCN_832	31729	GTCN_3341	45788
ATCN_807	31730	CTCN_6323	45789
CTCN_1463	31731	CTCN_6324	45790
GTCN_833	31732	CTCN_6325	45791
CTCN_1464	31733	GTCN_3342	45792
ATCN_808	31734	CTCN_6326	45793
ATCN_809	31735	ATCN_3554	45794
TTCN_1172	31736	ATCN_3555	45795
TTCN_1173	31737	CTCN_6327	45796
ATCN_810	31738	CTCN_6328	45797
TTCN_1174	31739	CTCN_6329	45798
TTCN_1175	31740	CTCN_6330	45799
ATCN_811	31741	TTCN_5115	45800
ATCN_812	31742	TTCN_5116	45801
CTCN_1465	31743	CTCN_6331	45802
GTCN_834	31744	CTCN_6332	45803
CTCN_1466	31745	TTCN_5117	45804
GTCN_835	31746	CTCN_6333	45805
TTCN_1176	31747	ATCN_3556	45806
TTCN_1177	31748	GTCN_3343	45807
ATCN_813	31749	TTCN_5118	45808
TTCN_1178	31750	CTCN_6334	45809

FIG. 37 (continued)

TTCN_1179	31751	GTCN_3344	45810
TTCN_1180	31752	TTCN_5119	45811
CTCN_1467	31753	GTCN_3345	45812
TTCN_1181	31754	GTCN_3346	45813
ATCN_814	31755	CTCN_6335	45814
CTCN_1468	31756	CTCN_6336	45815
GTCN_836	31757	GTCN_3347	45816
TTCN_1182	31758	CTCN_6337	45817
GTCN_837	31759	ATCN_3557	45818
GTCN_838	31760	ATCN_3558	45819
TTCN_1183	31761	CTCN_6338	45820
ATCN_815	31762	ATCN_3559	45821
CTCN_1469	31763	CTCN_6339	45822
ATCN_816	31764	CTCN_6340	45823
TTCN_1184	31765	CTCN_6341	45824
CTCN_1470	31766	TTCN_5120	45825
CTCN_1471	31767	ATCN_3560	45826
TTCN_1185	31768	TTCN_5121	45827
ATCN_817	31769	CTCN_6342	45828
ATCN_818	31770	GTCN_3348	45829
CTCN_1472	31771	ATCN_3561	45830
TTCN_1186	31772	ATCN_3562	45831
TTCN_1187	31773	CTCN_6343	45832
CTCN_1473	31774	TTCN_5122	45833
GTCN_839	31775	ATCN_3563	45834
CTCN_1474	31776	CTCN_6344	45835
ATCN_819	31777	CTCN_6345	45836
ATCN_820	31778	TTCN_5123	45837
TTCN_1188	31779	ATCN_3564	45838
CTCN_1475	31780	CTCN_6346	45839
TTCN_1189	31781	TTCN_5124	45840
TTCN_1190	31782	TTCN_5125	45841
TTCN_1191	31783	ATCN_3565	45842
TTCN_1192	31784	GTCN_3349	45843
TTCN_1193	31785	GTCN_3350	45844
CTCN_1476	31786	TTCN_5126	45845
CTCN_1477	31787	CTCN_6347	45846
GTCN_840	31788	ATCN_3566	45847
TTCN_1194	31789	CTCN_6348	45848
CTCN_1478	31790	CTCN_6349	45849
TTCN_1195	31791	CTCN_6350	45850
CTCN_1479	31792	ATCN_3567	45851
CTCN_1480	31793	CTCN_6351	45852

TTCN_1196	31794	GTCN_3351	45853
GTCN_841	31795	CTCN_6352	45854
TTCN_1197	31796	TTCN_5127	45855
TTCN_1198	31797	ATCN_3568	45856
CTCN_1481	31798	ATCN_3569	45857
TTCN_1199	31799	TTCN_5128	45858
GTCN_842	31800	TTCN_5129	45859
TTCN_1200	31801	CTCN_6353	45860
TTCN_1201	31802	TTCN_5130	45861
ATCN_821	31803	CTCN_6354	45862
ATCN_822	31804	CTCN_6355	45863
TTCN_1202	31805	GTCN_3352	45864
TTCN_1203	31806	TTCN_5131	45865
CTCN_1482	31807	ATCN_3570	45866
GTCN_843	31808	TTCN_5132	45867
GTCN_844	31809	TTCN_5133	45868
CTCN_1483	31810	CTCN_6356	45869
GTCN_845	31811	CTCN_6357	45870
CTCN_1484	31812	CTCN_6358	45871
CTCN_1485	31813	ATCN_3571	45872
GTCN_846	31814	TTCN_5134	45873
CTCN_1486	31815	TTCN_5135	45874
CTCN_1487	31816	CTCN_6359	45875
GTCN_847	31817	TTCN_5136	45876
CTCN_1488	31818	CTCN_6360	45877
GTCN_848	31819	CTCN_6361	45878
GTCN_849	31820	CTCN_6362	45879
GTCN_850	31821	GTCN_3353	45880
ATCN_823	31822	TTCN_5137	45881
TTCN_1204	31823	GTCN_3354	45882
ATCN_824	31824	ATCN_3572	45883
CTCN_1489	31825	TTCN_5138	45884
ATCN_825	31826	GTCN_3355	45885
GTCN_851	31827	CTCN_6363	45886
CTCN_1490	31828	GTCN_3356	45887
TTCN_1205	31829	GTCN_3357	45888
TTCN_1206	31830	TTCN_5139	45889
TTCN_1207	31831	GTCN_3358	45890
TTCN_1208	31832	TTCN_5140	45891
CTCN_1491	31833	CTCN_6364	45892
TTCN_1209	31834	ATCN_3573	45893
CTCN_1492	31835	ATCN_3574	45894
ATCN_826	31836	TTCN_5141	45895

FIG. 37 (continued)

CTCN_1493	31837	TTCN_5142	45896
CTCN_1494	31838	TTCN_5143	45897
ATCN_827	31839	GTCN_3359	45898
ATCN_828	31840	CTCN_6365	45899
CTCN_1495	31841	GTCN_3360	45900
CTCN_1496	31842	TTCN_5144	45901
CTCN_1497	31843	TTCN_5145	45902
CTCN_1498	31844	TTCN_5146	45903
CTCN_1499	31845	TTCN_5147	45904
CTCN_1500	31846	CTCN_6366	45905
CTCN_1501	31847	CTCN_6367	45906
GTCN_852	31848	TTCN_5148	45907
CTCN_1502	31849	CTCN_6368	45908
CTCN_1503	31850	CTCN_6369	45909
GTCN_853	31851	ATCN_3575	45910
CTCN_1504	31852	GTCN_3361	45911
CTCN_1505	31853	GTCN_3362	45912
TTCN_1210	31854	TTCN_5149	45913
TTCN_1211	31855	TTCN_5150	45914
TTCN_1212	31856	TTCN_5151	45915
CTCN_1506	31857	CTCN_6370	45916
ATCN_829	31858	GTCN_3363	45917
CTCN_1507	31859	ATCN_3576	45918
TTCN_1213	31860	TTCN_5152	45919
CTCN_1508	31861	ATCN_3577	45920
TTCN_1214	31862	CTCN_6371	45921
CTCN_1509	31863	ATCN_3578	45922
CTCN_1510	31864	ATCN_3579	45923
CTCN_1511	31865	ATCN_3580	45924
CTCN_1512	31866	ATCN_3581	45925
ATCN_830	31867	CTCN_6372	45926
GTCN_854	31868	ATCN_3582	45927
TTCN_1215	31869	ATCN_3583	45928
CTCN_1513	31870	GTCN_3364	45929
TTCN_1216	31871	CTCN_6373	45930
CTCN_1514	31872	CTCN_6374	45931
ATCN_831	31873	TTCN_5153	45932
ATCN_832	31874	ATCN_3584	45933
TTCN_1217	31875	TTCN_5154	45934
CTCN_1515	31876	ATCN_3585	45935
CTCN_1516	31877	TTCN_5155	45936
CTCN_1517	31878	TTCN_5156	45937
CTCN_1518	31879	TTCN_5157	45938

GTCN_855	31880	TTCN_5158	45939
CTCN_1519	31881	CTCN_6375	45940
TTCN_1218	31882	GTCN_3365	45941
CTCN_1520	31883	TTCN_5159	45942
CTCN_1521	31884	ATCN_3586	45943
TTCN_1219	31885	ATCN_3587	45944
CTCN_1522	31886	GTCN_3366	45945
TTCN_1220	31887	ATCN_3588	45946
CTCN_1523	31888	GTCN_3367	45947
TTCN_1221	31889	ATCN_3589	45948
GTCN_856	31890	ATCN_3590	45949
TTCN_1222	31891	ATCN_3591	45950
CTCN_1524	31892	ATCN_3592	45951
GTCN_857	31893	ATCN_3593	45952
CTCN_1525	31894	CTCN_6376	45953
GTCN_858	31895	GTCN_3368	45954
TTCN_1223	31896	TTCN_5160	45955
TTCN_1224	31897	TTCN_5161	45956
GTCN_859	31898	TTCN_5162	45957
TTCN_1225	31899	TTCN_5163	45958
ATCN_833	31900	CTCN_6377	45959
GTCN_860	31901	GTCN_3369	45960
CTCN_1526	31902	CTCN_6378	45961
TTCN_1226	31903	TTCN_5164	45962
CTCN_1527	31904	TTCN_5165	45963
ATCN_834	31905	GTCN_3370	45964
GTCN_861	31906	TTCN_5166	45965
GTCN_862	31907	TTCN_5167	45966
GTCN_863	31908	GTCN_3371	45967
ATCN_835	31909	ATCN_3594	45968
GTCN_864	31910	TTCN_5168	45969
ATCN_836	31911	TTCN_5169	45970
TTCN_1227	31912	CTCN_6379	45971
CTCN_1528	31913	TTCN_5170	45972
CTCN_1529	31914	GTCN_3372	45973
GTCN_865	31915	ATCN_3595	45974
GTCN_866	31916	GTCN_3373	45975
CTCN_1530	31917	TTCN_5171	45976
GTCN_867	31918	TTCN_5172	45977
TTCN_1228	31919	CTCN_6380	45978
TTCN_1229	31920	GTCN_3374	45979
CTCN_1531	31921	CTCN_6381	45980
TTCN_1230	31922	CTCN_6382	45981

FIG. 37 (continued)

TTCN_1231	31923	ATCN_3596	45982
CTCN_1532	31924	GTCN_3375	45983
GTCN_868	31925	CTCN_6383	45984
TTCN_1232	31926	CTCN_6384	45985
TTCN_1233	31927	ATCN_3597	45986
GTCN_869	31928	CTCN_6385	45987
GTCN_870	31929	ATCN_3598	45988
GTCN_871	31930	GTCN_3376	45989
CTCN_1533	31931	TTCN_5173	45990
ATCN_837	31932	CTCN_6386	45991
CTCN_1534	31933	GTCN_3377	45992
GTCN_872	31934	CTCN_6387	45993
CTCN_1535	31935	GTCN_3378	45994
CTCN_1536	31936	TTCN_5174	45995
ATCN_838	31937	GTCN_3379	45996
ATCN_839	31938	TTCN_5175	45997
TTCN_1234	31939	ATCN_3599	45998
TTCN_1235	31940	CTCN_6388	45999
CTCN_1537	31941	GTCN_3380	46000
GTCN_873	31942	CTCN_6389	46001
CTCN_1538	31943	TTCN_5176	46002
GTCN_874	31944	CTCN_6390	46003
ATCN_840	31945	GTCN_3381	46004
CTCN_1539	31946	CTCN_6391	46005
ATCN_841	31947	CTCN_6392	46006
ATCN_842	31948	TTCN_5177	46007
TTCN_1236	31949	ATCN_3600	46008
GTCN_875	31950	CTCN_6393	46009
CTCN_1540	31951	CTCN_6394	46010
CTCN_1541	31952	TTCN_5178	46011
CTCN_1542	31953	CTCN_6395	46012
ATCN_843	31954	CTCN_6396	46013
ATCN_844	31955	CTCN_6397	46014
CTCN_1543	31956	TTCN_5179	46015
CTCN_1544	31957	TTCN_5180	46016
ATCN_845	31958	CTCN_6398	46017
ATCN_846	31959	GTCN_3382	46018
ATCN_847	31960	TTCN_5181	46019
TTCN_1237	31961	ATCN_3601	46020
GTCN_876	31962	ATCN_3602	46021
GTCN_877	31963	GTCN_3383	46022
ATCN_848	31964	GTCN_3384	46023
GTCN_878	31965	CTCN_6399	46024

ATCN_849	31966	GTCN_3385	46025
CTCN_1545	31967	CTCN_6400	46026
TTCN_1238	31968	ATCN_3603	46027
TTCN_1239	31969	CTCN_6401	46028
TTCN_1240	31970	CTCN_6402	46029
CTCN_1546	31971	CTCN_6403	46030
CTCN_1547	31972	ATCN_3604	46031
ATCN_850	31973	ATCN_3605	46032
TTCN_1241	31974	CTCN_6404	46033
CTCN_1548	31975	CTCN_6405	46034
TTCN_1242	31976	CTCN_6406	46035
CTCN_1549	31977	GTCN_3386	46036
TTCN_1243	31978	CTCN_6407	46037
TTCN_1244	31979	GTCN_3387	46038
GTCN_879	31980	CTCN_6408	46039
ATCN_851	31981	GTCN_3388	46040
GTCN_880	31982	CTCN_6409	46041
CTCN_1550	31983	GTCN_3389	46042
ATCN_852	31984	TTCN_5182	46043
CTCN_1551	31985	CTCN_6410	46044
GTCN_881	31986	TTCN_5183	46045
CTCN_1552	31987	CTCN_6411	46046
ATCN_853	31988	CTCN_6412	46047
TTCN_1245	31989	ATCN_3606	46048
CTCN_1553	31990	CTCN_6413	46049
CTCN_1554	31991	CTCN_6414	46050
TTCN_1246	31992	GTCN_3390	46051
CTCN_1555	31993	CTCN_6415	46052
CTCN_1556	31994	ATCN_3607	46053
CTCN_1557	31995	ATCN_3608	46054
ATCN_854	31996	CTCN_6416	46055
ATCN_855	31997	GTCN_3391	46056
CTCN_1558	31998	CTCN_6417	46057
TTCN_1247	31999	CTCN_6418	46058
CTCN_1559	32000	GTCN_3392	46059
GTCN_882	32001	GTCN_3393	46060
TTCN_1248	32002	CTCN_6419	46061
GTCN_883	32003	TTCN_5184	46062
CTCN_1560	32004	CTCN_6420	46063
CTCN_1561	32005	ATCN_3609	46064
GTCN_884	32006	ATCN_3610	46065
TTCN_1249	32007	ATCN_3611	46066
TTCN_1250	32008	GTCN_3394	46067

FIG. 37 (continued)

CTCN_1562	32009	TTCN_5185	46068
ATCN_856	32010	ATCN_3612	46069
TTCN_1251	32011	GTCN_3395	46070
ATCN_857	32012	GTCN_3396	46071
TTCN_1252	32013	CTCN_6421	46072
TTCN_1253	32014	CTCN_6422	46073
TTCN_1254	32015	TTCN_5186	46074
GTCN_885	32016	TTCN_5187	46075
GTCN_886	32017	TTCN_5188	46076
CTCN_1563	32018	ATCN_3613	46077
ATCN_858	32019	ATCN_3614	46078
TTCN_1255	32020	TTCN_5189	46079
CTCN_1564	32021	TTCN_5190	46080
CTCN_1565	32022	ATCN_3615	46081
TTCN_1256	32023	TTCN_5191	46082
CTCN_1566	32024	ATCN_3616	46083
TTCN_1257	32025	TTCN_5192	46084
TTCN_1258	32026	GTCN_3397	46085
CTCN_1567	32027	TTCN_5193	46086
TTCN_1259	32028	CTCN_6423	46087
TTCN_1260	32029	TTCN_5194	46088
ATCN_859	32030	TTCN_5195	46089
TTCN_1261	32031	TTCN_5196	46090
TTCN_1262	32032	TTCN_5197	46091
TTCN_1263	32033	ATCN_3617	46092
TTCN_1264	32034	ATCN_3618	46093
TTCN_1265	32035	TTCN_5198	46094
TTCN_1266	32036	GTCN_3398	46095
CTCN_1568	32037	CTCN_6424	46096
ATCN_860	32038	ATCN_3619	46097
TTCN_1267	32039	ATCN_3620	46098
TTCN_1268	32040	CTCN_6425	46099
TTCN_1269	32041	TTCN_5199	46100
GTCN_887	32042	CTCN_6426	46101
TTCN_1270	32043	GTCN_3399	46102
TTCN_1271	32044	TTCN_5200	46103
CTCN_1569	32045	GTCN_3400	46104
ATCN_861	32046	TTCN_5201	46105
CTCN_1570	32047	ATCN_3621	46106
ATCN_862	32048	ATCN_3622	46107
CTCN_1571	32049	TTCN_5202	46108
GTCN_888	32050	CTCN_6427	46109
TTCN_1272	32051	ATCN_3623	46110

ATCN_863	32052	CTCN_6428	46111
GTCN_889	32053	GTCN_3401	46112
TTCN_1273	32054	CTCN_6429	46113
CTCN_1572	32055	GTCN_3402	46114
GTCN_890	32056	ATCN_3624	46115
CTCN_1573	32057	CTCN_6430	46116
GTCN_891	32058	ATCN_3625	46117
TTCN_1274	32059	ATCN_3626	46118
CTCN_1574	32060	CTCN_6431	46119
GTCN_892	32061	CTCN_6432	46120
TTCN_1275	32062	CTCN_6433	46121
TTCN_1276	32063	TTCN_5203	46122
GTCN_893	32064	TTCN_5204	46123
CTCN_1575	32065	CTCN_6434	46124
TTCN_1277	32066	CTCN_6435	46125
TTCN_1278	32067	CTCN_6436	46126
TTCN_1279	32068	CTCN_6437	46127
GTCN_894	32069	ATCN_3627	46128
TTCN_1280	32070	CTCN_6438	46129
TTCN_1281	32071	ATCN_3628	46130
TTCN_1282	32072	TTCN_5205	46131
TTCN_1283	32073	GTCN_3403	46132
CTCN_1576	32074	CTCN_6439	46133
GTCN_895	32075	CTCN_6440	46134
ATCN_864	32076	GTCN_3404	46135
CTCN_1577	32077	CTCN_6441	46136
TTCN_1284	32078	ATCN_3629	46137
GTCN_896	32079	ATCN_3630	46138
CTCN_1578	32080	CTCN_6442	46139
TTCN_1285	32081	TTCN_5206	46140
ATCN_865	32082	ATCN_3631	46141
ATCN_866	32083	CTCN_6443	46142
ATCN_867	32084	TTCN_5207	46143
ATCN_868	32085	ATCN_3632	46144
CTCN_1579	32086	TTCN_5208	46145
CTCN_1580	32087	ATCN_3633	46146
TTCN_1286	32088	GTCN_3405	46147
GTCN_897	32089	ATCN_3634	46148
CTCN_1581	32090	CTCN_6444	46149
ATCN_869	32091	TTCN_5209	46150
CTCN_1582	32092	GTCN_3406	46151
GTCN_898	32093	GTCN_3407	46152
CTCN_1583	32094	TTCN_5210	46153

FIG. 37 (continued)

CTCN_1584	32095	GTCN_3408	46154
TTCN_1287	32096	CTCN_6445	46155
TTCN_1288	32097	GTCN_3409	46156
TTCN_1289	32098	GTCN_3410	46157
CTCN_1585	32099	GTCN_3411	46158
GTCN_899	32100	CTCN_6446	46159
CTCN_1586	32101	CTCN_6447	46160
CTCN_1587	32102	CTCN_6448	46161
CTCN_1588	32103	CTCN_6449	46162
TTCN_1290	32104	ATCN_3635	46163
CTCN_1589	32105	TTCN_5211	46164
TTCN_1291	32106	TTCN_5212	46165
ATCN_870	32107	CTCN_6450	46166
TTCN_1292	32108	CTCN_6451	46167
TTCN_1293	32109	CTCN_6452	46168
GTCN_900	32110	ATCN_3636	46169
TTCN_1294	32111	CTCN_6453	46170
TTCN_1295	32112	TTCN_5213	46171
TTCN_1296	32113	GTCN_3412	46172
ATCN_871	32114	GTCN_3413	46173
CTCN_1590	32115	TTCN_5214	46174
TTCN_1297	32116	GTCN_3414	46175
TTCN_1298	32117	ATCN_3637	46176
ATCN_872	32118	GTCN_3415	46177
GTCN_901	32119	GTCN_3416	46178
TTCN_1299	32120	ATCN_3638	46179
CTCN_1591	32121	GTCN_3417	46180
TTCN_1300	32122	ATCN_3639	46181
ATCN_873	32123	TTCN_5215	46182
TTCN_1301	32124	CTCN_6454	46183
CTCN_1592	32125	CTCN_6455	46184
TTCN_1302	32126	GTCN_3418	46185
TTCN_1303	32127	CTCN_6456	46186
CTCN_1593	32128	ATCN_3640	46187
GTCN_902	32129	TTCN_5216	46188
CTCN_1594	32130	ATCN_3641	46189
TTCN_1304	32131	GTCN_3419	46190
TTCN_1305	32132	TTCN_5217	46191
TTCN_1306	32133	TTCN_5218	46192
TTCN_1307	32134	ATCN_3642	46193
TTCN_1308	32135	TTCN_5219	46194
TTCN_1309	32136	TTCN_5220	46195
TTCN_1310	32137	ATCN_3643	46196

ATCN_874	32138	TTCN_5221	46197
ATCN_875	32139	TTCN_5222	46198
ATCN_876	32140	GTCN_3420	46199
ATCN_877	32141	TTCN_5223	46200
CTCN_1595	32142	TTCN_5224	46201
GTCN_903	32143	GTCN_3421	46202
TTCN_1311	32144	CTCN_6457	46203
CTCN_1596	32145	GTCN_3422	46204
GTCN_904	32146	TTCN_5225	46205
CTCN_1597	32147	CTCN_6458	46206
CTCN_1598	32148	ATCN_3644	46207
TTCN_1312	32149	TTCN_5226	46208
GTCN_905	32150	ATCN_3645	46209
TTCN_1313	32151	CTCN_6459	46210
GTCN_906	32152	TTCN_5227	46211
ATCN_878	32153	GTCN_3423	46212
ATCN_879	32154	ATCN_3646	46213
ATCN_880	32155	ATCN_3647	46214
CTCN_1599	32156	TTCN_5228	46215
CTCN_1600	32157	GTCN_3424	46216
CTCN_1601	32158	ATCN_3648	46217
CTCN_1602	32159	CTCN_6460	46218
TTCN_1314	32160	ATCN_3649	46219
CTCN_1603	32161	ATCN_3650	46220
GTCN_907	32162	GTCN_3425	46221
TTCN_1315	32163	CTCN_6461	46222
TTCN_1316	32164	GTCN_3426	46223
ATCN_881	32165	TTCN_5229	46224
CTCN_1604	32166	TTCN_5230	46225
CTCN_1605	32167	CTCN_6462	46226
CTCN_1606	32168	TTCN_5231	46227
TTCN_1317	32169	GTCN_3427	46228
CTCN_1607	32170	CTCN_6463	46229
TTCN_1318	32171	TTCN_5232	46230
CTCN_1608	32172	GTCN_3428	46231
TTCN_1319	32173	CTCN_6464	46232
TTCN_1320	32174	ATCN_3651	46233
TTCN_1321	32175	GTCN_3429	46234
TTCN_1322	32176	CTCN_6465	46235
CTCN_1609	32177	TTCN_5233	46236
ATCN_882	32178	CTCN_6466	46237
ATCN_883	32179	ATCN_3652	46238
TTCN_1323	32180	TTCN_5234	46239

FIG. 37 (continued)

GTCN_908	32181	TTCN_5235	46240
CTCN_1610	32182	CTCN_6467	46241
ATCN_884	32183	TTCN_5236	46242
TTCN_1324	32184	CTCN_6468	46243
CTCN_1611	32185	CTCN_6469	46244
TTCN_1325	32186	ATCN_3653	46245
GTCN_909	32187	ATCN_3654	46246
CTCN_1612	32188	TTCN_5237	46247
ATCN_885	32189	ATCN_3655	46248
ATCN_886	32190	GTCN_3430	46249
TTCN_1326	32191	ATCN_3656	46250
ATCN_887	32192	ATCN_3657	46251
ATCN_888	32193	ATCN_3658	46252
TTCN_1327	32194	GTCN_3431	46253
TTCN_1328	32195	TTCN_5238	46254
ATCN_889	32196	CTCN_6470	46255
CTCN_1613	32197	GTCN_3432	46256
GTCN_910	32198	TTCN_5239	46257
TTCN_1329	32199	CTCN_6471	46258
CTCN_1614	32200	TTCN_5240	46259
GTCN_911	32201	TTCN_5241	46260
TTCN_1330	32202	TTCN_5242	46261
TTCN_1331	32203	CTCN_6472	46262
ATCN_890	32204	CTCN_6473	46263
CTCN_1615	32205	GTCN_3433	46264
TTCN_1332	32206	GTCN_3434	46265
ATCN_891	32207	TTCN_5243	46266
TTCN_1333	32208	ATCN_3659	46267
TTCN_1334	32209	CTCN_6474	46268
ATCN_892	32210	GTCN_3435	46269
ATCN_893	32211	TTCN_5244	46270
TTCN_1335	32212	TTCN_5245	46271
TTCN_1336	32213	ATCN_3660	46272
TTCN_1337	32214	TTCN_5246	46273
ATCN_894	32215	TTCN_5247	46274
CTCN_1616	32216	TTCN_5248	46275
ATCN_895	32217	TTCN_5249	46276
TTCN_1338	32218	ATCN_3661	46277
TTCN_1339	32219	TTCN_5250	46278
CTCN_1617	32220	ATCN_3662	46279
TTCN_1340	32221	CTCN_6475	46280
ATCN_896	32222	TTCN_5251	46281
TTCN_1341	32223	CTCN_6476	46282

CTCN_1618	32224	CTCN_6477	46283
TTCN_1342	32225	CTCN_6478	46284
GTCN_912	32226	GTCN_3436	46285
CTCN_1619	32227	GTCN_3437	46286
GTCN_913	32228	CTCN_6479	46287
ATCN_897	32229	ATCN_3663	46288
CTCN_1620	32230	TTCN_5252	46289
ATCN_898	32231	CTCN_6480	46290
ATCN_899	32232	TTCN_5253	46291
GTCN_914	32233	CTCN_6481	46292
GTCN_915	32234	CTCN_6482	46293
TTCN_1343	32235	TTCN_5254	46294
ATCN_900	32236	TTCN_5255	46295
CTCN_1621	32237	ATCN_3664	46296
CTCN_1622	32238	CTCN_6483	46297
ATCN_901	32239	ATCN_3665	46298
CTCN_1623	32240	CTCN_6484	46299
CTCN_1624	32241	CTCN_6485	46300
TTCN_1344	32242	TTCN_5256	46301
ATCN_902	32243	CTCN_6486	46302
CTCN_1625	32244	TTCN_5257	46303
GTCN_916	32245	TTCN_5258	46304
GTCN_917	32246	CTCN_6487	46305
GTCN_918	32247	GTCN_3438	46306
GTCN_919	32248	ATCN_3666	46307
CTCN_1626	32249	TTCN_5259	46308
TTCN_1345	32250	TTCN_5260	46309
GTCN_920	32251	CTCN_6488	46310
CTCN_1627	32252	CTCN_6489	46311
CTCN_1628	32253	ATCN_3667	46312
CTCN_1629	32254	TTCN_5261	46313
ATCN_903	32255	ATCN_3668	46314
ATCN_904	32256	GTCN_3439	46315
CTCN_1630	32257	GTCN_3440	46316
CTCN_1631	32258	ATCN_3669	46317
CTCN_1632	32259	ATCN_3670	46318
CTCN_1633	32260	ATCN_3671	46319
ATCN_905	32261	TTCN_5262	46320
ATCN_906	32262	GTCN_3441	46321
CTCN_1634	32263	CTCN_6490	46322
GTCN_921	32264	CTCN_6491	46323
CTCN_1635	32265	GTCN_3442	46324
GTCN_922	32266	ATCN_3672	46325

FIG. 37 (continued)

CTCN_1636	32267	TTCN_5263	46326
CTCN_1637	32268	TTCN_5264	46327
GTCN_923	32269	GTCN_3443	46328
TTCN_1346	32270	GTCN_3444	46329
GTCN_924	32271	TTCN_5265	46330
GTCN_925	32272	CTCN_6492	46331
CTCN_1638	32273	CTCN_6493	46332
TTCN_1347	32274	GTCN_3445	46333
TTCN_1348	32275	TTCN_5266	46334
CTCN_1639	32276	ATCN_3673	46335
TTCN_1349	32277	CTCN_6494	46336
TTCN_1350	32278	CTCN_6495	46337
TTCN_1351	32279	CTCN_6496	46338
ATCN_907	32280	TTCN_5267	46339
CTCN_1640	32281	ATCN_3674	46340
CTCN_1641	32282	GTCN_3446	46341
TTCN_1352	32283	TTCN_5268	46342
GTCN_926	32284	ATCN_3675	46343
CTCN_1642	32285	TTCN_5269	46344
CTCN_1643	32286	ATCN_3676	46345
CTCN_1644	32287	TTCN_5270	46346
ATCN_908	32288	GTCN_3447	46347
ATCN_909	32289	TTCN_5271	46348
TTCN_1353	32290	ATCN_3677	46349
CTCN_1645	32291	CTCN_6497	46350
ATCN_910	32292	TTCN_5272	46351
GTCN_927	32293	GTCN_3448	46352
TTCN_1354	32294	CTCN_6498	46353
TTCN_1355	32295	CTCN_6499	46354
TTCN_1356	32296	ATCN_3678	46355
GTCN_928	32297	GTCN_3449	46356
GTCN_929	32298	CTCN_6500	46357
CTCN_1646	32299	GTCN_3450	46358
TTCN_1357	32300	CTCN_6501	46359
CTCN_1647	32301	CTCN_6502	46360
ATCN_911	32302	CTCN_6503	46361
ATCN_912	32303	GTCN_3451	46362
CTCN_1648	32304	CTCN_6504	46363
TTCN_1358	32305	TTCN_5273	46364
TTCN_1359	32306	TTCN_5274	46365
TTCN_1360	32307	GTCN_3452	46366
TTCN_1361	32308	ATCN_3679	46367
ATCN_913	32309	ATCN_3680	46368

TTCN_1362	32310	ATCN_3681	46369
ATCN_914	32311	CTCN_6505	46370
ATCN_915	32312	CTCN_6506	46371
CTCN_1649	32313	TTCN_5275	46372
TTCN_1363	32314	TTCN_5276	46373
CTCN_1650	32315	GTCN_3453	46374
CTCN_1651	32316	TTCN_5277	46375
GTCN_930	32317	CTCN_6507	46376
TTCN_1364	32318	TTCN_5278	46377
GTCN_931	32319	CTCN_6508	46378
GTCN_932	32320	TTCN_5279	46379
ATCN_916	32321	ATCN_3682	46380
GTCN_933	32322	GTCN_3454	46381
ATCN_917	32323	TTCN_5280	46382
ATCN_918	32324	TTCN_5281	46383
TTCN_1365	32325	GTCN_3455	46384
TTCN_1366	32326	TTCN_5282	46385
TTCN_1367	32327	CTCN_6509	46386
CTCN_1652	32328	TTCN_5283	46387
TTCN_1368	32329	GTCN_3456	46388
TTCN_1369	32330	ATCN_3683	46389
CTCN_1653	32331	ATCN_3684	46390
ATCN_919	32332	CTCN_6510	46391
CTCN_1654	32333	TTCN_5284	46392
CTCN_1655	32334	TTCN_5285	46393
CTCN_1656	32335	GTCN_3457	46394
CTCN_1657	32336	ATCN_3685	46395
ATCN_920	32337	TTCN_5286	46396
ATCN_921	32338	CTCN_6511	46397
CTCN_1658	32339	ATCN_3686	46398
CTCN_1659	32340	TTCN_5287	46399
CTCN_1660	32341	TTCN_5288	46400
GTCN_934	32342	TTCN_5289	46401
TTCN_1370	32343	TTCN_5290	46402
TTCN_1371	32344	GTCN_3458	46403
ATCN_922	32345	CTCN_6512	46404
CTCN_1661	32346	GTCN_3459	46405
CTCN_1662	32347	ATCN_3687	46406
GTCN_935	32348	CTCN_6513	46407
CTCN_1663	32349	CTCN_6514	46408
TTCN_1372	32350	CTCN_6515	46409
ATCN_923	32351	TTCN_5291	46410
TTCN_1373	32352	GTCN_3460	46411

FIG. 37 (continued)

CTCN_1664	32353	CTCN_6516	46412
GTCN_936	32354	GTCN_3461	46413
CTCN_1665	32355	TTCN_5292	46414
TTCN_1374	32356	GTCN_3462	46415
CTCN_1666	32357	TTCN_5293	46416
TTCN_1375	32358	CTCN_6517	46417
GTCN_937	32359	TTCN_5294	46418
CTCN_1667	32360	GTCN_3463	46419
TTCN_1376	32361	TTCN_5295	46420
ATCN_924	32362	TTCN_5296	46421
ATCN_925	32363	GTCN_3464	46422
CTCN_1668	32364	GTCN_3465	46423
CTCN_1669	32365	CTCN_6518	46424
CTCN_1670	32366	TTCN_5297	46425
TTCN_1377	32367	CTCN_6519	46426
ATCN_926	32368	ATCN_3688	46427
TTCN_1378	32369	TTCN_5298	46428
ATCN_927	32370	TTCN_5299	46429
CTCN_1671	32371	TTCN_5300	46430
CTCN_1672	32372	TTCN_5301	46431
CTCN_1673	32373	TTCN_5302	46432
CTCN_1674	32374	CTCN_6520	46433
ATCN_928	32375	GTCN_3466	46434
ATCN_929	32376	CTCN_6521	46435
CTCN_1675	32377	ATCN_3689	46436
CTCN_1676	32378	ATCN_3690	46437
TTCN_1379	32379	ATCN_3691	46438
ATCN_930	32380	CTCN_6522	46439
CTCN_1677	32381	TTCN_5303	46440
CTCN_1678	32382	CTCN_6523	46441
CTCN_1679	32383	CTCN_6524	46442
CTCN_1680	32384	GTCN_3467	46443
TTCN_1380	32385	CTCN_6525	46444
CTCN_1681	32386	CTCN_6526	46445
CTCN_1682	32387	CTCN_6527	46446
TTCN_1381	32388	TTCN_5304	46447
CTCN_1683	32389	TTCN_5305	46448
CTCN_1684	32390	TTCN_5306	46449
CTCN_1685	32391	CTCN_6528	46450
TTCN_1382	32392	CTCN_6529	46451
CTCN_1686	32393	GTCN_3468	46452
ATCN_931	32394	GTCN_3469	46453
CTCN_1687	32395	TTCN_5307	46454

TTCN_1383	32396	CTCN_6530	46455
CTCN_1688	32397	ATCN_3692	46456
CTCN_1689	32398	ATCN_3693	46457
TTCN_1384	32399	ATCN_3694	46458
TTCN_1385	32400	CTCN_6531	46459
TTCN_1386	32401	CTCN_6532	46460
CTCN_1690	32402	ATCN_3695	46461
GTCN_938	32403	CTCN_6533	46462
ATCN_932	32404	ATCN_3696	46463
TTCN_1387	32405	ATCN_3697	46464
ATCN_933	32406	CTCN_6534	46465
GTCN_939	32407	CTCN_6535	46466
CTCN_1691	32408	ATCN_3698	46467
CTCN_1692	32409	TTCN_5308	46468
CTCN_1693	32410	TTCN_5309	46469
CTCN_1694	32411	TTCN_5310	46470
CTCN_1695	32412	GTCN_3470	46471
CTCN_1696	32413	GTCN_3471	46472
ATCN_934	32414	ATCN_3699	46473
CTCN_1697	32415	CTCN_6536	46474
CTCN_1698	32416	CTCN_6537	46475
TTCN_1388	32417	TTCN_5311	46476
GTCN_940	32418	ATCN_3700	46477
CTCN_1699	32419	TTCN_5312	46478
ATCN_935	32420	TTCN_5313	46479
CTCN_1700	32421	ATCN_3701	46480
CTCN_1701	32422	TTCN_5314	46481
CTCN_1702	32423	TTCN_5315	46482
TTCN_1389	32424	TTCN_5316	46483
ATCN_936	32425	ATCN_3702	46484
ATCN_937	32426	TTCN_5317	46485
TTCN_1390	32427	TTCN_5318	46486
CTCN_1703	32428	CTCN_6538	46487
GTCN_941	32429	CTCN_6539	46488
CTCN_1704	32430	TTCN_5319	46489
CTCN_1705	32431	TTCN_5320	46490
GTCN_942	32432	CTCN_6540	46491
ATCN_938	32433	TTCN_5321	46492
CTCN_1706	32434	TTCN_5322	46493
GTCN_943	32435	TTCN_5323	46494
CTCN_1707	32436	TTCN_5324	46495
CTCN_1708	32437	TTCN_5325	46496
GTCN_944	32438	ATCN_3703	46497

FIG. 37 (continued)

ATCN_939	32439	GTCN_3472	46498
CTCN_1709	32440	TTCN_5326	46499
ATCN_940	32441	GTCN_3473	46500
GTCN_945	32442	TTCN_5327	46501
CTCN_1710	32443	ATCN_3704	46502
GTCN_946	32444	CTCN_6541	46503
CTCN_1711	32445	CTCN_6542	46504
CTCN_1712	32446	TTCN_5328	46505
GTCN_947	32447	ATCN_3705	46506
GTCN_948	32448	GTCN_3474	46507
CTCN_1713	32449	CTCN_6543	46508
GTCN_949	32450	GTCN_3475	46509
TTCN_1391	32451	CTCN_6544	46510
CTCN_1714	32452	GTCN_3476	46511
GTCN_950	32453	TTCN_5329	46512
TTCN_1392	32454	CTCN_6545	46513
CTCN_1715	32455	TTCN_5330	46514
GTCN_951	32456	TTCN_5331	46515
CTCN_1716	32457	GTCN_3477	46516
ATCN_941	32458	TTCN_5332	46517
CTCN_1717	32459	GTCN_3478	46518
TTCN_1393	32460	CTCN_6546	46519
GTCN_952	32461	ATCN_3706	46520
TTCN_1394	32462	GTCN_3479	46521
TTCN_1395	32463	CTCN_6547	46522
TTCN_1396	32464	CTCN_6548	46523
TTCN_1397	32465	ATCN_3707	46524
TTCN_1398	32466	TTCN_5333	46525
TTCN_1399	32467	CTCN_6549	46526
TTCN_1400	32468	TTCN_5334	46527
CTCN_1718	32469	CTCN_6550	46528
TTCN_1401	32470	TTCN_5335	46529
CTCN_1719	32471	GTCN_3480	46530
TTCN_1402	32472	ATCN_3708	46531
TTCN_1403	32473	ATCN_3709	46532
ATCN_942	32474	CTCN_6551	46533
CTCN_1720	32475	ATCN_3710	46534
GTCN_953	32476	CTCN_6552	46535
CTCN_1721	32477	ATCN_3711	46536
CTCN_1722	32478	ATCN_3712	46537
ATCN_943	32479	CTCN_6553	46538
TTCN_1404	32480	CTCN_6554	46539
CTCN_1723	32481	CTCN_6555	46540

GTCN_954	32482	CTCN_6556	46541
CTCN_1724	32483	TTCN_5336	46542
CTCN_1725	32484	GTCN_3481	46543
CTCN_1726	32485	TTCN_5337	46544
CTCN_1727	32486	GTCN_3482	46545
ATCN_944	32487	CTCN_6557	46546
TTCN_1405	32488	GTCN_3483	46547
ATCN_945	32489	CTCN_6558	46548
CTCN_1728	32490	CTCN_6559	46549
CTCN_1729	32491	CTCN_6560	46550
TTCN_1406	32492	TTCN_5338	46551
CTCN_1730	32493	ATCN_3713	46552
GTCN_955	32494	GTCN_3484	46553
CTCN_1731	32495	TTCN_5339	46554
CTCN_1732	32496	GTCN_3485	46555
ATCN_946	32497	CTCN_6561	46556
GTCN_956	32498	CTCN_6562	46557
GTCN_957	32499	ATCN_3714	46558
CTCN_1733	32500	CTCN_6563	46559
ATCN_947	32501	GTCN_3486	46560
ATCN_948	32502	CTCN_6564	46561
CTCN_1734	32503	TTCN_5340	46562
ATCN_949	32504	GTCN_3487	46563
TTCN_1407	32505	TTCN_5341	46564
CTCN_1735	32506	ATCN_3715	46565
CTCN_1736	32507	CTCN_6565	46566
ATCN_950	32508	TTCN_5342	46567
CTCN_1737	32509	CTCN_6566	46568
TTCN_1408	32510	ATCN_3716	46569
TTCN_1409	32511	ATCN_3717	46570
CTCN_1738	32512	TTCN_5343	46571
CTCN_1739	32513	TTCN_5344	46572
TTCN_1410	32514	GTCN_3488	46573
TTCN_1411	32515	CTCN_6567	46574
TTCN_1412	32516	GTCN_3489	46575
ATCN_951	32517	TTCN_5345	46576
ATCN_952	32518	ATCN_3718	46577
ATCN_953	32519	ATCN_3719	46578
CTCN_1740	32520	TTCN_5346	46579
ATCN_954	32521	TTCN_5347	46580
TTCN_1413	32522	TTCN_5348	46581
TTCN_1414	32523	GTCN_3490	46582
CTCN_1741	32524	TTCN_5349	46583

FIG. 37 (continued)

ATCN_955	32525	ATCN_3720	46584
TTCN_1415	32526	ATCN_3721	46585
GTCN_958	32527	CTCN_6568	46586
CTCN_1742	32528	CTCN_6569	46587
TTCN_1416	32529	CTCN_6570	46588
ATCN_956	32530	TTCN_5350	46589
CTCN_1743	32531	GTCN_3491	46590
TTCN_1417	32532	CTCN_6571	46591
CTCN_1744	32533	CTCN_6572	46592
ATCN_957	32534	GTCN_3492	46593
TTCN_1418	32535	CTCN_6573	46594
TTCN_1419	32536	TTCN_5351	46595
TTCN_1420	32537	TTCN_5352	46596
TTCN_1421	32538	CTCN_6574	46597
GTCN_959	32539	CTCN_6575	46598
TTCN_1422	32540	TTCN_5353	46599
TTCN_1423	32541	GTCN_3493	46600
CTCN_1745	32542	ATCN_3722	46601
ATCN_958	32543	CTCN_6576	46602
ATCN_959	32544	CTCN_6577	46603
CTCN_1746	32545	ATCN_3723	46604
TTCN_1424	32546	TTCN_5354	46605
GTCN_960	32547	CTCN_6578	46606
TTCN_1425	32548	TTCN_5355	46607
GTCN_961	32549	CTCN_6579	46608
CTCN_1747	32550	TTCN_5356	46609
GTCN_962	32551	TTCN_5357	46610
CTCN_1748	32552	ATCN_3724	46611
CTCN_1749	32553	ATCN_3725	46612
TTCN_1426	32554	CTCN_6580	46613
ATCN_960	32555	GTCN_3494	46614
TTCN_1427	32556	TTCN_5358	46615
CTCN_1750	32557	CTCN_6581	46616
TTCN_1428	32558	GTCN_3495	46617
ATCN_961	32559	ATCN_3726	46618
GTCN_963	32560	ATCN_3727	46619
CTCN_1751	32561	TTCN_5359	46620
CTCN_1752	32562	GTCN_3496	46621
TTCN_1429	32563	ATCN_3728	46622
ATCN_962	32564	CTCN_6582	46623
ATCN_963	32565	GTCN_3497	46624
ATCN_964	32566	TTCN_5360	46625
GTCN_964	32567	GTCN_3498	46626

CTCN_1753	32568	CTCN_6583	46627
CTCN_1754	32569	CTCN_6584	46628
CTCN_1755	32570	TTCN_5361	46629
GTCN_965	32571	TTCN_5362	46630
TTCN_1430	32572	ATCN_3729	46631
CTCN_1756	32573	CTCN_6585	46632
TTCN_1431	32574	GTCN_3499	46633
TTCN_1432	32575	TTCN_5363	46634
GTCN_966	32576	GTCN_3500	46635
ATCN_965	32577	TTCN_5364	46636
TTCN_1433	32578	TTCN_5365	46637
ATCN_966	32579	GTCN_3501	46638
GTCN_967	32580	GTCN_3502	46639
TTCN_1434	32581	ATCN_3730	46640
GTCN_968	32582	CTCN_6586	46641
GTCN_969	32583	CTCN_6587	46642
ATCN_967	32584	GTCN_3503	46643
ATCN_968	32585	GTCN_3504	46644
GTCN_970	32586	GTCN_3505	46645
GTCN_971	32587	TTCN_5366	46646
GTCN_972	32588	GTCN_3506	46647
ATCN_969	32589	TTCN_5367	46648
TTCN_1435	32590	CTCN_6588	46649
CTCN_1757	32591	CTCN_6589	46650
TTCN_1436	32592	ATCN_3731	46651
TTCN_1437	32593	TTCN_5368	46652
TTCN_1438	32594	CTCN_6590	46653
TTCN_1439	32595	CTCN_6591	46654
ATCN_970	32596	CTCN_6592	46655
GTCN_973	32597	CTCN_6593	46656
TTCN_1440	32598	TTCN_5369	46657
GTCN_974	32599	CTCN_6594	46658
TTCN_1441	32600	ATCN_3732	46659
CTCN_1758	32601	CTCN_6595	46660
CTCN_1759	32602	CTCN_6596	46661
GTCN_975	32603	CTCN_6597	46662
TTCN_1442	32604	CTCN_6598	46663
ATCN_971	32605	GTCN_3507	46664
ATCN_972	32606	TTCN_5370	46665
TTCN_1443	32607	GTCN_3508	46666
ATCN_973	32608	GTCN_3509	46667
CTCN_1760	32609	GTCN_3510	46668
TTCN_1444	32610	CTCN_6599	46669

FIG. 37 (continued)

CTCN_1761	32611	GTCN_3511	46670
CTCN_1762	32612	CTCN_6600	46671
GTCN_976	32613	TTCN_5371	46672
GTCN_977	32614	TTCN_5372	46673
ATCN_974	32615	ATCN_3733	46674
TTCN_1445	32616	TTCN_5373	46675
TTCN_1446	32617	GTCN_3512	46676
CTCN_1763	32618	TTCN_5374	46677
TTCN_1447	32619	CTCN_6601	46678
TTCN_1448	32620	CTCN_6602	46679
CTCN_1764	32621	TTCN_5375	46680
TTCN_1449	32622	ATCN_3734	46681
GTCN_978	32623	ATCN_3735	46682
TTCN_1450	32624	CTCN_6603	46683
TTCN_1451	32625	GTCN_3513	46684
CTCN_1765	32626	CTCN_6604	46685
TTCN_1452	32627	GTCN_3514	46686
ATCN_975	32628	TTCN_5376	46687
CTCN_1766	32629	GTCN_3515	46688
TTCN_1453	32630	TTCN_5377	46689
TTCN_1454	32631	CTCN_6605	46690
TTCN_1455	32632	GTCN_3516	46691
CTCN_1767	32633	TTCN_5378	46692
TTCN_1456	32634	CTCN_6606	46693
CTCN_1768	32635	CTCN_6607	46694
TTCN_1457	32636	ATCN_3736	46695
ATCN_976	32637	GTCN_3517	46696
CTCN_1769	32638	CTCN_6608	46697
CTCN_1770	32639	CTCN_6609	46698
TTCN_1458	32640	CTCN_6610	46699
CTCN_1771	32641	CTCN_6611	46700
TTCN_1459	32642	CTCN_6612	46701
TTCN_1460	32643	CTCN_6613	46702
CTCN_1772	32644	CTCN_6614	46703
GTCN_979	32645	TTCN_5379	46704
CTCN_1773	32646	CTCN_6615	46705
GTCN_980	32647	CTCN_6616	46706
CTCN_1774	32648	GTCN_3518	46707
CTCN_1775	32649	ATCN_3737	46708
CTCN_1776	32650	GTCN_3519	46709
CTCN_1777	32651	GTCN_3520	46710
ATCN_977	32652	ATCN_3738	46711
ATCN_978	32653	ATCN_3739	46712

CTCN_1778	32654	CTCN_6617	46713
CTCN_1779	32655	GTCN_3521	46714
CTCN_1780	32656	TTCN_5380	46715
CTCN_1781	32657	CTCN_6618	46716
TTCN_1461	32658	CTCN_6619	46717
TTCN_1462	32659	GTCN_3522	46718
CTCN_1782	32660	GTCN_3523	46719
CTCN_1783	32661	ATCN_3740	46720
CTCN_1784	32662	CTCN_6620	46721
ATCN_979	32663	ATCN_3741	46722
CTCN_1785	32664	ATCN_3742	46723
GTCN_981	32665	ATCN_3743	46724
TTCN_1463	32666	CTCN_6621	46725
GTCN_982	32667	TTCN_5381	46726
CTCN_1786	32668	CTCN_6622	46727
TTCN_1464	32669	TTCN_5382	46728
CTCN_1787	32670	ATCN_3744	46729
GTCN_983	32671	TTCN_5383	46730
CTCN_1788	32672	ATCN_3745	46731
ATCN_980	32673	ATCN_3746	46732
ATCN_981	32674	TTCN_5384	46733
CTCN_1789	32675	ATCN_3747	46734
ATCN_982	32676	ATCN_3748	46735
CTCN_1790	32677	CTCN_6623	46736
ATCN_983	32678	ATCN_3749	46737
CTCN_1791	32679	TTCN_5385	46738
TTCN_1465	32680	ATCN_3750	46739
TTCN_1466	32681	ATCN_3751	46740
ATCN_984	32682	ATCN_3752	46741
TTCN_1467	32683	TTCN_5386	46742
ATCN_985	32684	GTCN_3524	46743
GTCN_984	32685	ATCN_3753	46744
TTCN_1468	32686	GTCN_3525	46745
CTCN_1792	32687	GTCN_3526	46746
ATCN_986	32688	CTCN_6624	46747
TTCN_1469	32689	CTCN_6625	46748
TTCN_1470	32690	CTCN_6626	46749
CTCN_1793	32691	TTCN_5387	46750
TTCN_1471	32692	CTCN_6627	46751
TTCN_1472	32693	ATCN_3754	46752
CTCN_1794	32694	GTCN_3527	46753
CTCN_1795	32695	ATCN_3755	46754
ATCN_987	32696	ATCN_3756	46755

FIG. 37 (continued)

TTCN_1473	32697	GTCN_3528	46756
CTCN_1796	32698	CTCN_6628	46757
CTCN_1797	32699	TTCN_5388	46758
GTCN_985	32700	CTCN_6629	46759
ATCN_988	32701	CTCN_6630	46760
CTCN_1798	32702	GTCN_3529	46761
TTCN_1474	32703	GTCN_3530	46762
TTCN_1475	32704	CTCN_6631	46763
ATCN_989	32705	CTCN_6632	46764
ATCN_990	32706	TTCN_5389	46765
TTCN_1476	32707	TTCN_5390	46766
TTCN_1477	32708	GTCN_3531	46767
TTCN_1478	32709	GTCN_3532	46768
CTCN_1799	32710	ATCN_3757	46769
TTCN_1479	32711	TTCN_5391	46770
TTCN_1480	32712	CTCN_6633	46771
GTCN_986	32713	CTCN_6634	46772
ATCN_991	32714	ATCN_3758	46773
CTCN_1800	32715	ATCN_3759	46774
TTCN_1481	32716	TTCN_5392	46775
TTCN_1482	32717	GTCN_3533	46776
TTCN_1483	32718	TTCN_5393	46777
TTCN_1484	32719	TTCN_5394	46778
TTCN_1485	32720	ATCN_3760	46779
TTCN_1486	32721	TTCN_5395	46780
ATCN_992	32722	TTCN_5396	46781
ATCN_993	32723	ATCN_3761	46782
TTCN_1487	32724	TTCN_5397	46783
TTCN_1488	32725	ATCN_3762	46784
GTCN_987	32726	CTCN_6635	46785
GTCN_988	32727	CTCN_6636	46786
TTCN_1489	32728	ATCN_3763	46787
TTCN_1490	32729	TTCN_5398	46788
CTCN_1801	32730	GTCN_3534	46789
GTCN_989	32731	TTCN_5399	46790
CTCN_1802	32732	ATCN_3764	46791
TTCN_1491	32733	TTCN_5400	46792
GTCN_990	32734	TTCN_5401	46793
TTCN_1492	32735	GTCN_3535	46794
TTCN_1493	32736	CTCN_6637	46795
GTCN_991	32737	TTCN_5402	46796
TTCN_1494	32738	TTCN_5403	46797
ATCN_994	32739	GTCN_3536	46798

TTCN_1495	32740	TTCN_5404	46799
ATCN_995	32741	TTCN_5405	46800
TTCN_1496	32742	TTCN_5406	46801
ATCN_996	32743	ATCN_3765	46802
ATCN_997	32744	ATCN_3766	46803
GTCN_992	32745	TTCN_5407	46804
TTCN_1497	32746	TTCN_5408	46805
GTCN_993	32747	TTCN_5409	46806
TTCN_1498	32748	TTCN_5410	46807
TTCN_1499	32749	ATCN_3767	46808
TTCN_1500	32750	ATCN_3768	46809
TTCN_1501	32751	ATCN_3769	46810
GTCN_994	32752	CTCN_6638	46811
CTCN_1803	32753	GTCN_3537	46812
TTCN_1502	32754	TTCN_5411	46813
GTCN_995	32755	CTCN_6639	46814
CTCN_1804	32756	ATCN_3770	46815
GTCN_996	32757	GTCN_3538	46816
CTCN_1805	32758	TTCN_5412	46817
GTCN_997	32759	TTCN_5413	46818
ATCN_998	32760	TTCN_5414	46819
TTCN_1503	32761	GTCN_3539	46820
CTCN_1806	32762	GTCN_3540	46821
TTCN_1504	32763	CTCN_6640	46822
TTCN_1505	32764	GTCN_3541	46823
ATCN_999	32765	CTCN_6641	46824
CTCN_1807	32766	CTCN_6642	46825
TTCN_1506	32767	GTCN_3542	46826
GTCN_998	32768	CTCN_6643	46827
ATCN_1000	32769	ATCN_3771	46828
GTCN_999	32770	CTCN_6644	46829
TTCN_1507	32771	TTCN_5415	46830
GTCN_1000	32772	ATCN_3772	46831
CTCN_1808	32773	TTCN_5416	46832
GTCN_1001	32774	GTCN_3543	46833
TTCN_1508	32775	CTCN_6645	46834
TTCN_1509	32776	TTCN_5417	46835
TTCN_1510	32777	ATCN_3773	46836
GTCN_1002	32778	ATCN_3774	46837
CTCN_1809	32779	CTCN_6646	46838
GTCN_1003	32780	CTCN_6647	46839
ATCN_1001	32781	GTCN_3544	46840
ATCN_1002	32782	CTCN_6648	46841

FIG. 37 (continued)

CTCN_1810	32783	GTCN_3545	46842
GTCN_1004	32784	ATCN_3775	46843
GTCN_1005	32785	CTCN_6649	46844
GTCN_1006	32786	CTCN_6650	46845
CTCN_1811	32787	TTCN_5418	46846
CTCN_1812	32788	GTCN_3546	46847
ATCN_1003	32789	CTCN_6651	46848
TTCN_1511	32790	CTCN_6652	46849
ATCN_1004	32791	CTCN_6653	46850
TTCN_1512	32792	GTCN_3547	46851
TTCN_1513	32793	TTCN_5419	46852
TTCN_1514	32794	CTCN_6654	46853
GTCN_1007	32795	CTCN_6655	46854
ATCN_1005	32796	CTCN_6656	46855
ATCN_1006	32797	GTCN_3548	46856
ATCN_1007	32798	CTCN_6657	46857
ATCN_1008	32799	ATCN_3776	46858
GTCN_1008	32800	TTCN_5420	46859
TTCN_1515	32801	CTCN_6658	46860
CTCN_1813	32802	GTCN_3549	46861
TTCN_1516	32803	GTCN_3550	46862
CTCN_1814	32804	TTCN_5421	46863
TTCN_1517	32805	GTCN_3551	46864
GTCN_1009	32806	CTCN_6659	46865
TTCN_1518	32807	GTCN_3552	46866
GTCN_1010	32808	CTCN_6660	46867
GTCN_1011	32809	ATCN_3777	46868
ATCN_1009	32810	CTCN_6661	46869
TTCN_1519	32811	TTCN_5422	46870
TTCN_1520	32812	CTCN_6662	46871
GTCN_1012	32813	CTCN_6663	46872
TTCN_1521	32814	TTCN_5423	46873
GTCN_1013	32815	GTCN_3553	46874
TTCN_1522	32816	TTCN_5424	46875
TTCN_1523	32817	TTCN_5425	46876
GTCN_1014	32818	TTCN_5426	46877
TTCN_1524	32819	CTCN_6664	46878
TTCN_1525	32820	ATCN_3778	46879
ATCN_1010	32821	TTCN_5427	46880
ATCN_1011	32822	ATCN_3779	46881
TTCN_1526	32823	GTCN_3554	46882
TTCN_1527	32824	ATCN_3780	46883
GTCN_1015	32825	GTCN_3555	46884

ATCN_1012	32826	CTCN_6665	46885
TTCN_1528	32827	ATCN_3781	46886
ATCN_1013	32828	GTCN_3556	46887
TTCN_1529	32829	TTCN_5428	46888
TTCN_1530	32830	CTCN_6666	46889
ATCN_1014	32831	TTCN_5429	46890
CTCN_1815	32832	TTCN_5430	46891
TTCN_1531	32833	TTCN_5431	46892
CTCN_1816	32834	TTCN_5432	46893
TTCN_1532	32835	TTCN_5433	46894
TTCN_1533	32836	TTCN_5434	46895
TTCN_1534	32837	TTCN_5435	46896
GTCN_1016	32838	TTCN_5436	46897
TTCN_1535	32839	TTCN_5437	46898
GTCN_1017	32840	CTCN_6667	46899
TTCN_1536	32841	ATCN_3782	46900
TTCN_1537	32842	TTCN_5438	46901
CTCN_1817	32843	CTCN_6668	46902
GTCN_1018	32844	GTCN_3557	46903
CTCN_1818	32845	TTCN_5439	46904
ATCN_1015	32846	GTCN_3558	46905
ATCN_1016	32847	TTCN_5440	46906
ATCN_1017	32848	ATCN_3783	46907
TTCN_1538	32849	TTCN_5441	46908
CTCN_1819	32850	GTCN_3559	46909
TTCN_1539	32851	CTCN_6669	46910
GTCN_1019	32852	GTCN_3560	46911
TTCN_1540	32853	ATCN_3784	46912
GTCN_1020	32854	TTCN_5442	46913
ATCN_1018	32855	TTCN_5443	46914
GTCN_1021	32856	GTCN_3561	46915
TTCN_1541	32857	CTCN_6670	46916
CTCN_1820	32858	TTCN_5444	46917
ATCN_1019	32859	GTCN_3562	46918
ATCN_1020	32860	TTCN_5445	46919
TTCN_1542	32861	CTCN_6671	46920
ATCN_1021	32862	CTCN_6672	46921
ATCN_1022	32863	TTCN_5446	46922
GTCN_1022	32864	GTCN_3563	46923
TTCN_1543	32865	ATCN_3785	46924
TTCN_1544	32866	ATCN_3786	46925
CTCN_1821	32867	ATCN_3787	46926
TTCN_1545	32868	ATCN_3788	46927

FIG. 37 (continued)

TTCN_1546	32869	TTCN_5447	46928
TTCN_1547	32870	ATCN_3789	46929
ATCN_1023	32871	ATCN_3790	46930
CTCN_1822	32872	ATCN_3791	46931
TTCN_1548	32873	CTCN_6673	46932
TTCN_1549	32874	TTCN_5448	46933
TTCN_1550	32875	CTCN_6674	46934
CTCN_1823	32876	TTCN_5449	46935
TTCN_1551	32877	GTCN_3564	46936
ATCN_1024	32878	CTCN_6675	46937
CTCN_1824	32879	CTCN_6676	46938
TTCN_1552	32880	CTCN_6677	46939
GTCN_1023	32881	TTCN_5450	46940
CTCN_1825	32882	ATCN_3792	46941
GTCN_1024	32883	TTCN_5451	46942
CTCN_1826	32884	TTCN_5452	46943
TTCN_1553	32885	ATCN_3793	46944
GTCN_1025	32886	TTCN_5453	46945
CTCN_1827	32887	TTCN_5454	46946
TTCN_1554	32888	CTCN_6678	46947
TTCN_1555	32889	TTCN_5455	46948
TTCN_1556	32890	TTCN_5456	46949
ATCN_1025	32891	CTCN_6679	46950
GTCN_1026	32892	CTCN_6680	46951
CTCN_1828	32893	TTCN_5457	46952
CTCN_1829	32894	ATCN_3794	46953
TTCN_1557	32895	ATCN_3795	46954
TTCN_1558	32896	CTCN_6681	46955
TTCN_1559	32897	CTCN_6682	46956
TTCN_1560	32898	TTCN_5458	46957
TTCN_1561	32899	CTCN_6683	46958
ATCN_1026	32900	ATCN_3796	46959
ATCN_1027	32901	CTCN_6684	46960
CTCN_1830	32902	TTCN_5459	46961
TTCN_1562	32903	ATCN_3797	46962
CTCN_1831	32904	TTCN_5460	46963
GTCN_1027	32905	ATCN_3798	46964
TTCN_1563	32906	TTCN_5461	46965
CTCN_1832	32907	ATCN_3799	46966
GTCN_1028	32908	CTCN_6685	46967
TTCN_1564	32909	ATCN_3800	46968
ATCN_1028	32910	ATCN_3801	46969
TTCN_1565	32911	CTCN_6686	46970

CTCN_1833	32912	ATCN_3802	46971
ATCN_1029	32913	TTCN_5462	46972
CTCN_1834	32914	TTCN_5463	46973
GTCN_1029	32915	ATCN_3803	46974
GTCN_1030	32916	CTCN_6687	46975
TTCN_1566	32917	GTCN_3565	46976
ATCN_1030	32918	GTCN_3566	46977
ATCN_1031	32919	ATCN_3804	46978
CTCN_1835	32920	TTCN_5464	46979
ATCN_1032	32921	GTCN_3567	46980
GTCN_1031	32922	GTCN_3568	46981
TTCN_1567	32923	ATCN_3805	46982
TTCN_1568	32924	ATCN_3806	46983
CTCN_1836	32925	ATCN_3807	46984
GTCN_1032	32926	ATCN_3808	46985
CTCN_1837	32927	TTCN_5465	46986
GTCN_1033	32928	ATCN_3809	46987
CTCN_1838	32929	TTCN_5466	46988
GTCN_1034	32930	GTCN_3569	46989
CTCN_1839	32931	GTCN_3570	46990
ATCN_1033	32932	CTCN_6688	46991
ATCN_1034	32933	CTCN_6689	46992
CTCN_1840	32934	TTCN_5467	46993
CTCN_1841	32935	GTCN_3571	46994
CTCN_1842	32936	TTCN_5468	46995
TTCN_1569	32937	CTCN_6690	46996
TTCN_1570	32938	ATCN_3810	46997
CTCN_1843	32939	TTCN_5469	46998
TTCN_1571	32940	CTCN_6691	46999
CTCN_1844	32941	GTCN_3572	47000
GTCN_1035	32942	GTCN_3573	47001
TTCN_1572	32943	CTCN_6692	47002
TTCN_1573	32944	GTCN_3574	47003
CTCN_1845	32945	GTCN_3575	47004
GTCN_1036	32946	CTCN_6693	47005
TTCN_1574	32947	ATCN_3811	47006
GTCN_1037	32948	ATCN_3812	47007
CTCN_1846	32949	ATCN_3813	47008
TTCN_1575	32950	CTCN_6694	47009
CTCN_1847	32951	TTCN_5470	47010
GTCN_1038	32952	CTCN_6695	47011
CTCN_1848	32953	CTCN_6696	47012
ATCN_1035	32954	ATCN_3814	47013

FIG. 37 (continued)

ATCN_1036	32955	CTCN_6697	47014
CTCN_1849	32956	CTCN_6698	47015
ATCN_1037	32957	TTCN_5471	47016
CTCN_1850	32958	ATCN_3815	47017
TTCN_1576	32959	ATCN_3816	47018
CTCN_1851	32960	TTCN_5472	47019
ATCN_1038	32961	GTCN_3576	47020
CTCN_1852	32962	TTCN_5473	47021
GTCN_1039	32963	ATCN_3817	47022
CTCN_1853	32964	CTCN_6699	47023
ATCN_1039	32965	CTCN_6700	47024
CTCN_1854	32966	ATCN_3818	47025
GTCN_1040	32967	ATCN_3819	47026
CTCN_1855	32968	TTCN_5474	47027
GTCN_1041	32969	TTCN_5475	47028
CTCN_1856	32970	TTCN_5476	47029
GTCN_1042	32971	CTCN_6701	47030
GTCN_1043	32972	GTCN_3577	47031
CTCN_1857	32973	TTCN_5477	47032
ATCN_1040	32974	CTCN_6702	47033
CTCN_1858	32975	CTCN_6703	47034
CTCN_1859	32976	TTCN_5478	47035
TTCN_1577	32977	TTCN_5479	47036
TTCN_1578	32978	CTCN_6704	47037
ATCN_1041	32979	GTCN_3578	47038
TTCN_1579	32980	GTCN_3579	47039
ATCN_1042	32981	TTCN_5480	47040
ATCN_1043	32982	GTCN_3580	47041
ATCN_1044	32983	GTCN_3581	47042
CTCN_1860	32984	TTCN_5481	47043
GTCN_1044	32985	GTCN_3582	47044
TTCN_1580	32986	TTCN_5482	47045
GTCN_1045	32987	GTCN_3583	47046
GTCN_1046	32988	GTCN_3584	47047
CTCN_1861	32989	TTCN_5483	47048
TTCN_1581	32990	TTCN_5484	47049
ATCN_1045	32991	CTCN_6705	47050
CTCN_1862	32992	TTCN_5485	47051
TTCN_1582	32993	CTCN_6706	47052
GTCN_1047	32994	ATCN_3820	47053
TTCN_1583	32995	CTCN_6707	47054
CTCN_1863	32996	TTCN_5486	47055
TTCN_1584	32997	ATCN_3821	47056

ATCN_1046	32998	TTCN_5487	47057
ATCN_1047	32999	ATCN_3822	47058
CTCN_1864	33000	ATCN_3823	47059
ATCN_1048	33001	ATCN_3824	47060
CTCN_1865	33002	GTCN_3585	47061
TTCN_1585	33003	GTCN_3586	47062
ATCN_1049	33004	TTCN_5488	47063
ATCN_1050	33005	CTCN_6708	47064
CTCN_1866	33006	TTCN_5489	47065
GTCN_1048	33007	TTCN_5490	47066
CTCN_1867	33008	ATCN_3825	47067
TTCN_1586	33009	CTCN_6709	47068
GTCN_1049	33010	TTCN_5491	47069
GTCN_1050	33011	CTCN_6710	47070
ATCN_1051	33012	GTCN_3587	47071
TTCN_1587	33013	ATCN_3826	47072
GTCN_1051	33014	CTCN_6711	47073
CTCN_1868	33015	ATCN_3827	47074
CTCN_1869	33016	ATCN_3828	47075
ATCN_1052	33017	TTCN_5492	47076
CTCN_1870	33018	TTCN_5493	47077
CTCN_1871	33019	GTCN_3588	47078
ATCN_1053	33020	TTCN_5494	47079
ATCN_1054	33021	TTCN_5495	47080
TTCN_1588	33022	TTCN_5496	47081
GTCN_1052	33023	CTCN_6712	47082
CTCN_1872	33024	TTCN_5497	47083
ATCN_1055	33025	TTCN_5498	47084
ATCN_1056	33026	CTCN_6713	47085
CTCN_1873	33027	TTCN_5499	47086
GTCN_1053	33028	CTCN_6714	47087
ATCN_1057	33029	TTCN_5500	47088
TTCN_1589	33030	TTCN_5501	47089
ATCN_1058	33031	TTCN_5502	47090
CTCN_1874	33032	GTCN_3589	47091
CTCN_1875	33033	TTCN_5503	47092
GTCN_1054	33034	ATCN_3829	47093
CTCN_1876	33035	TTCN_5504	47094
CTCN_1877	33036	TTCN_5505	47095
CTCN_1878	33037	TTCN_5506	47096
CTCN_1879	33038	TTCN_5507	47097
TTCN_1590	33039	TTCN_5508	47098
TTCN_1591	33040	GTCN_3590	47099

FIG. 37 (continued)

CTCN_1880	33041	GTCN_3591	47100
CTCN_1881	33042	CTCN_6715	47101
CTCN_1882	33043	GTCN_3592	47102
CTCN_1883	33044	CTCN_6716	47103
ATCN_1059	33045	ATCN_3830	47104
ATCN_1060	33046	TTCN_5509	47105
CTCN_1884	33047	GTCN_3593	47106
GTCN_1055	33048	GTCN_3594	47107
CTCN_1885	33049	TTCN_5510	47108
GTCN_1056	33050	TTCN_5511	47109
CTCN_1886	33051	TTCN_5512	47110
GTCN_1057	33052	CTCN_6717	47111
CTCN_1887	33053	GTCN_3595	47112
ATCN_1061	33054	CTCN_6718	47113
TTCN_1592	33055	CTCN_6719	47114
CTCN_1888	33056	TTCN_5513	47115
CTCN_1889	33057	TTCN_5514	47116
CTCN_1890	33058	CTCN_6720	47117
TTCN_1593	33059	TTCN_5515	47118
ATCN_1062	33060	CTCN_6721	47119
CTCN_1891	33061	CTCN_6722	47120
TTCN_1594	33062	TTCN_5516	47121
CTCN_1892	33063	CTCN_6723	47122
GTCN_1058	33064	GTCN_3596	47123
CTCN_1893	33065	CTCN_6724	47124
CTCN_1894	33066	TTCN_5517	47125
GTCN_1059	33067	ATCN_3831	47126
CTCN_1895	33068	CTCN_6725	47127
CTCN_1896	33069	CTCN_6726	47128
CTCN_1897	33070	ATCN_3832	47129
GTCN_1060	33071	CTCN_6727	47130
TTCN_1595	33072	GTCN_3597	47131
GTCN_1061	33073	CTCN_6728	47132
CTCN_1898	33074	CTCN_6729	47133
ATCN_1063	33075	CTCN_6730	47134
ATCN_1064	33076	CTCN_6731	47135
CTCN_1899	33077	CTCN_6732	47136
ATCN_1065	33078	CTCN_6733	47137
TTCN_1596	33079	CTCN_6734	47138
ATCN_1066	33080	CTCN_6735	47139
CTCN_1900	33081	TTCN_5518	47140
TTCN_1597	33082	GTCN_3598	47141
CTCN_1901	33083	GTCN_3599	47142

GTCN_1062	33084	TTCN_5519	47143
CTCN_1902	33085	TTCN_5520	47144
TTCN_1598	33086	GTCN_3600	47145
ATCN_1067	33087	ATCN_3833	47146
TTCN_1599	33088	TTCN_5521	47147
ATCN_1068	33089	TTCN_5522	47148
CTCN_1903	33090	TTCN_5523	47149
GTCN_1063	33091	GTCN_3601	47150
TTCN_1600	33092	CTCN_6736	47151
ATCN_1069	33093	TTCN_5524	47152
CTCN_1904	33094	TTCN_5525	47153
GTCN_1064	33095	ATCN_3834	47154
TTCN_1601	33096	CTCN_6737	47155
ATCN_1070	33097	TTCN_5526	47156
ATCN_1071	33098	TTCN_5527	47157
TTCN_1602	33099	CTCN_6738	47158
GTCN_1065	33100	ATCN_3835	47159
CTCN_1905	33101	TTCN_5528	47160
GTCN_1066	33102	ATCN_3836	47161
CTCN_1906	33103	GTCN_3602	47162
TTCN_1603	33104	TTCN_5529	47163
TTCN_1604	33105	ATCN_3837	47164
ATCN_1072	33106	TTCN_5530	47165
TTCN_1605	33107	TTCN_5531	47166
GTCN_1067	33108	GTCN_3603	47167
CTCN_1907	33109	GTCN_3604	47168
TTCN_1606	33110	TTCN_5532	47169
ATCN_1073	33111	ATCN_3838	47170
CTCN_1908	33112	CTCN_6739	47171
GTCN_1068	33113	TTCN_5533	47172
CTCN_1909	33114	ATCN_3839	47173
TTCN_1607	33115	TTCN_5534	47174
CTCN_1910	33116	GTCN_3605	47175
ATCN_1074	33117	TTCN_5535	47176
CTCN_1911	33118	TTCN_5536	47177
TTCN_1608	33119	TTCN_5537	47178
GTCN_1069	33120	TTCN_5538	47179
TTCN_1609	33121	CTCN_6740	47180
ATCN_1075	33122	ATCN_3840	47181
ATCN_1076	33123	ATCN_3841	47182
TTCN_1610	33124	CTCN_6741	47183
ATCN_1077	33125	ATCN_3842	47184
CTCN_1912	33126	TTCN_5539	47185

FIG. 37 (continued)

TTCN_1611	33127	TTCN_5540	47186
TTCN_1612	33128	CTCN_6742	47187
CTCN_1913	33129	GTCN_3606	47188
ATCN_1078	33130	TTCN_5541	47189
CTCN_1914	33131	CTCN_6743	47190
TTCN_1613	33132	ATCN_3843	47191
CTCN_1915	33133	ATCN_3844	47192
CTCN_1916	33134	TTCN_5542	47193
GTCN_1070	33135	CTCN_6744	47194
CTCN_1917	33136	ATCN_3845	47195
CTCN_1918	33137	GTCN_3607	47196
CTCN_1919	33138	GTCN_3608	47197
TTCN_1614	33139	ATCN_3846	47198
ATCN_1079	33140	CTCN_6745	47199
TTCN_1615	33141	CTCN_6746	47200
CTCN_1920	33142	GTCN_3609	47201
CTCN_1921	33143	CTCN_6747	47202
CTCN_1922	33144	ATCN_3847	47203
TTCN_1616	33145	GTCN_3610	47204
CTCN_1923	33146	TTCN_5543	47205
GTCN_1071	33147	CTCN_6748	47206
TTCN_1617	33148	TTCN_5544	47207
GTCN_1072	33149	TTCN_5545	47208
CTCN_1924	33150	TTCN_5546	47209
TTCN_1618	33151	ATCN_3848	47210
CTCN_1925	33152	TTCN_5547	47211
GTCN_1073	33153	ATCN_3849	47212
CTCN_1926	33154	TTCN_5548	47213
ATCN_1080	33155	GTCN_3611	47214
ATCN_1081	33156	ATCN_3850	47215
CTCN_1927	33157	CTCN_6749	47216
GTCN_1074	33158	GTCN_3612	47217
CTCN_1928	33159	CTCN_6750	47218
ATCN_1082	33160	GTCN_3613	47219
CTCN_1929	33161	TTCN_5549	47220
CTCN_1930	33162	TTCN_5550	47221
TTCN_1619	33163	TTCN_5551	47222
GTCN_1075	33164	TTCN_5552	47223
ATCN_1083	33165	ATCN_3851	47224
TTCN_1620	33166	GTCN_3614	47225
TTCN_1621	33167	CTCN_6751	47226
GTCN_1076	33168	CTCN_6752	47227
ATCN_1084	33169	CTCN_6753	47228

CTCN_1931	33170	CTCN_6754	47229
CTCN_1932	33171	TTCN_5553	47230
TTCN_1622	33172	GTCN_3615	47231
CTCN_1933	33173	ATCN_3852	47232
CTCN_1934	33174	CTCN_6755	47233
GTCN_1077	33175	GTCN_3616	47234
CTCN_1935	33176	ATCN_3853	47235
CTCN_1936	33177	TTCN_5554	47236
CTCN_1937	33178	TTCN_5555	47237
CTCN_1938	33179	CTCN_6756	47238
TTCN_1623	33180	ATCN_3854	47239
GTCN_1078	33181	CTCN_6757	47240
CTCN_1939	33182	GTCN_3617	47241
TTCN_1624	33183	CTCN_6758	47242
TTCN_1625	33184	GTCN_3618	47243
ATCN_1085	33185	CTCN_6759	47244
GTCN_1079	33186	ATCN_3855	47245
GTCN_1080	33187	GTCN_3619	47246
GTCN_1081	33188	CTCN_6760	47247
TTCN_1626	33189	TTCN_5556	47248
TTCN_1627	33190	CTCN_6761	47249
CTCN_1940	33191	GTCN_3620	47250
ATCN_1086	33192	ATCN_3856	47251
ATCN_1087	33193	CTCN_6762	47252
TTCN_1628	33194	ATCN_3857	47253
GTCN_1082	33195	GTCN_3621	47254
CTCN_1941	33196	CTCN_6763	47255
CTCN_1942	33197	TTCN_5557	47256
CTCN_1943	33198	ATCN_3858	47257
TTCN_1629	33199	CTCN_6764	47258
ATCN_1088	33200	CTCN_6765	47259
ATCN_1089	33201	TTCN_5558	47260
CTCN_1944	33202	ATCN_3859	47261
ATCN_1090	33203	ATCN_3860	47262
CTCN_1945	33204	CTCN_6766	47263
GTCN_1083	33205	GTCN_3622	47264
CTCN_1946	33206	CTCN_6767	47265
CTCN_1947	33207	CTCN_6768	47266
ATCN_1091	33208	GTCN_3623	47267
CTCN_1948	33209	CTCN_6769	47268
CTCN_1949	33210	GTCN_3624	47269
CTCN_1950	33211	CTCN_6770	47270
CTCN_1951	33212	CTCN_6771	47271

FIG. 37 (continued)

ATCN_1092	33213	GTCN_3625	47272
ATCN_1093	33214	TTCN_5559	47273
ATCN_1094	33215	TTCN_5560	47274
CTCN_1952	33216	GTCN_3626	47275
TTCN_1630	33217	ATCN_3861	47276
GTCN_1084	33218	ATCN_3862	47277
CTCN_1953	33219	ATCN_3863	47278
GTCN_1085	33220	CTCN_6772	47279
CTCN_1954	33221	CTCN_6773	47280
GTCN_1086	33222	TTCN_5561	47281
TTCN_1631	33223	CTCN_6774	47282
ATCN_1095	33224	TTCN_5562	47283
CTCN_1955	33225	CTCN_6775	47284
ATCN_1096	33226	CTCN_6776	47285
ATCN_1097	33227	CTCN_6777	47286
CTCN_1956	33228	ATCN_3864	47287
CTCN_1957	33229	CTCN_6778	47288
GTCN_1087	33230	ATCN_3865	47289
ATCN_1098	33231	CTCN_6779	47290
ATCN_1099	33232	ATCN_3866	47291
ATCN_1100	33233	ATCN_3867	47292
CTCN_1958	33234	CTCN_6780	47293
CTCN_1959	33235	CTCN_6781	47294
CTCN_1960	33236	CTCN_6782	47295
TTCN_1632	33237	CTCN_6783	47296
TTCN_1633	33238	GTCN_3627	47297
CTCN_1961	33239	TTCN_5563	47298
GTCN_1088	33240	CTCN_6784	47299
CTCN_1962	33241	ATCN_3868	47300
CTCN_1963	33242	TTCN_5564	47301
CTCN_1964	33243	ATCN_3869	47302
ATCN_1101	33244	CTCN_6785	47303
CTCN_1965	33245	ATCN_3870	47304
CTCN_1966	33246	ATCN_3871	47305
GTCN_1089	33247	CTCN_6786	47306
CTCN_1967	33248	GTCN_3628	47307
GTCN_1090	33249	ATCN_3872	47308
CTCN_1968	33250	CTCN_6787	47309
GTCN_1091	33251	GTCN_3629	47310
ATCN_1102	33252	ATCN_3873	47311
CTCN_1969	33253	ATCN_3874	47312
ATCN_1103	33254	ATCN_3875	47313
ATCN_1104	33255	ATCN_3876	47314

TTCN_1634	33256	CTCN_6788	47315
TTCN_1635	33257	TTCN_5565	47316
CTCN_1970	33258	CTCN_6789	47317
CTCN_1971	33259	ATCN_3877	47318
TTCN_1636	33260	CTCN_6790	47319
TTCN_1637	33261	GTCN_3630	47320
TTCN_1638	33262	CTCN_6791	47321
ATCN_1105	33263	CTCN_6792	47322
CTCN_1972	33264	TTCN_5566	47323
CTCN_1973	33265	CTCN_6793	47324
TTCN_1639	33266	CTCN_6794	47325
CTCN_1974	33267	CTCN_6795	47326
TTCN_1640	33268	TTCN_5567	47327
CTCN_1975	33269	GTCN_3631	47328
TTCN_1641	33270	GTCN_3632	47329
CTCN_1976	33271	CTCN_6796	47330
CTCN_1977	33272	TTCN_5568	47331
TTCN_1642	33273	ATCN_3878	47332
CTCN_1978	33274	CTCN_6797	47333
CTCN_1979	33275	GTCN_3633	47334
TTCN_1643	33276	CTCN_6798	47335
TTCN_1644	33277	CTCN_6799	47336
CTCN_1980	33278	TTCN_5569	47337
GTCN_1092	33279	GTCN_3634	47338
GTCN_1093	33280	TTCN_5570	47339
CTCN_1981	33281	CTCN_6800	47340
CTCN_1982	33282	TTCN_5571	47341
ATCN_1106	33283	ATCN_3879	47342
CTCN_1983	33284	GTCN_3635	47343
TTCN_1645	33285	ATCN_3880	47344
TTCN_1646	33286	CTCN_6801	47345
CTCN_1984	33287	TTCN_5572	47346
CTCN_1985	33288	TTCN_5573	47347
ATCN_1107	33289	ATCN_3881	47348
ATCN_1108	33290	TTCN_5574	47349
CTCN_1986	33291	TTCN_5575	47350
CTCN_1987	33292	CTCN_6802	47351
CTCN_1988	33293	CTCN_6803	47352
CTCN_1989	33294	TTCN_5576	47353
GTCN_1094	33295	TTCN_5577	47354
CTCN_1990	33296	CTCN_6804	47355
CTCN_1991	33297	CTCN_6805	47356
GTCN_1095	33298	CTCN_6806	47357

FIG. 37 (continued)

TTCN_1647	33299	TTCN_5578	47358
GTCN_1096	33300	CTCN_6807	47359
CTCN_1992	33301	TTCN_5579	47360
ATCN_1109	33302	CTCN_6808	47361
CTCN_1993	33303	GTCN_3636	47362
CTCN_1994	33304	CTCN_6809	47363
ATCN_1110	33305	CTCN_6810	47364
ATCN_1111	33306	ATCN_3882	47365
ATCN_1112	33307	CTCN_6811	47366
ATCN_1113	33308	ATCN_3883	47367
CTCN_1995	33309	ATCN_3884	47368
GTCN_1097	33310	CTCN_6812	47369
ATCN_1114	33311	CTCN_6813	47370
GTCN_1098	33312	CTCN_6814	47371
CTCN_1996	33313	CTCN_6815	47372
GTCN_1099	33314	CTCN_6816	47373
ATCN_1115	33315	CTCN_6817	47374
ATCN_1116	33316	CTCN_6818	47375
TTCN_1648	33317	CTCN_6819	47376
TTCN_1649	33318	CTCN_6820	47377
CTCN_1997	33319	TTCN_5580	47378
GTCN_1100	33320	TTCN_5581	47379
TTCN_1650	33321	GTCN_3637	47380
CTCN_1998	33322	CTCN_6821	47381
CTCN_1999	33323	ATCN_3885	47382
CTCN_2000	33324	TTCN_5582	47383
TTCN_1651	33325	GTCN_3638	47384
TTCN_1652	33326	ATCN_3886	47385
GTCN_1101	33327	ATCN_3887	47386
ATCN_1117	33328	TTCN_5583	47387
TTCN_1653	33329	GTCN_3639	47388
TTCN_1654	33330	ATCN_3888	47389
TTCN_1655	33331	TTCN_5584	47390
ATCN_1118	33332	TTCN_5585	47391
CTCN_2001	33333	ATCN_3889	47392
TTCN_1656	33334	TTCN_5586	47393
GTCN_1102	33335	TTCN_5587	47394
GTCN_1103	33336	ATCN_3890	47395
CTCN_2002	33337	CTCN_6822	47396
GTCN_1104	33338	CTCN_6823	47397
TTCN_1657	33339	ATCN_3891	47398
TTCN_1658	33340	GTCN_3640	47399
ATCN_1119	33341	CTCN_6824	47400

ATCN_1120	33342	ATCN_3892	47401
TTCN_1659	33343	CTCN_6825	47402
ATCN_1121	33344	CTCN_6826	47403
CTCN_2003	33345	CTCN_6827	47404
CTCN_2004	33346	TTCN_5588	47405
GTCN_1105	33347	TTCN_5589	47406
CTCN_2005	33348	TTCN_5590	47407
CTCN_2006	33349	TTCN_5591	47408
CTCN_2007	33350	TTCN_5592	47409
TTCN_1660	33351	CTCN_6828	47410
TTCN_1661	33352	GTCN_3641	47411
ATCN_1122	33353	GTCN_3642	47412
TTCN_1662	33354	GTCN_3643	47413
GTCN_1106	33355	CTCN_6829	47414
TTCN_1663	33356	CTCN_6830	47415
TTCN_1664	33357	ATCN_3893	47416
TTCN_1665	33358	CTCN_6831	47417
TTCN_1666	33359	GTCN_3644	47418
CTCN_2008	33360	GTCN_3645	47419
CTCN_2009	33361	TTCN_5593	47420
TTCN_1667	33362	TTCN_5594	47421
ATCN_1123	33363	TTCN_5595	47422
CTCN_2010	33364	ATCN_3894	47423
TTCN_1668	33365	CTCN_6832	47424
TTCN_1669	33366	CTCN_6833	47425
GTCN_1107	33367	GTCN_3646	47426
CTCN_2011	33368	TTCN_5596	47427
GTCN_1108	33369	CTCN_6834	47428
CTCN_2012	33370	CTCN_6835	47429
CTCN_2013	33371	CTCN_6836	47430
CTCN_2014	33372	CTCN_6837	47431
GTCN_1109	33373	GTCN_3647	47432
TTCN_1670	33374	TTCN_5597	47433
ATCN_1124	33375	CTCN_6838	47434
ATCN_1125	33376	GTCN_3648	47435
TTCN_1671	33377	CTCN_6839	47436
GTCN_1110	33378	CTCN_6840	47437
CTCN_2015	33379	CTCN_6841	47438
ATCN_1126	33380	CTCN_6842	47439
CTCN_2016	33381	TTCN_5598	47440
ATCN_1127	33382	GTCN_3649	47441
CTCN_2017	33383	ATCN_3895	47442
CTCN_2018	33384	CTCN_6843	47443

FIG. 37 (continued)

CTCN_2019	33385	CTCN_6844	47444
ATCN_1128	33386	ATCN_3896	47445
CTCN_2020	33387	TTCN_5599	47446
CTCN_2021	33388	CTCN_6845	47447
TTCN_1672	33389	CTCN_6846	47448
TTCN_1673	33390	GTCN_3650	47449
ATCN_1129	33391	GTCN_3651	47450
TTCN_1674	33392	TTCN_5600	47451
TTCN_1675	33393	CTCN_6847	47452
CTCN_2022	33394	TTCN_5601	47453
TTCN_1676	33395	ATCN_3897	47454
TTCN_1677	33396	TTCN_5602	47455
CTCN_2023	33397	ATCN_3898	47456
GTCN_1111	33398	CTCN_6848	47457
CTCN_2024	33399	GTCN_3652	47458
GTCN_1112	33400	TTCN_5603	47459
CTCN_2025	33401	TTCN_5604	47460
GTCN_1113	33402	TTCN_5605	47461
CTCN_2026	33403	GTCN_3653	47462
GTCN_1114	33404	TTCN_5606	47463
TTCN_1678	33405	ATCN_3899	47464
ATCN_1130	33406	ATCN_3900	47465
TTCN_1679	33407	GTCN_3654	47466
CTCN_2027	33408	TTCN_5607	47467
ATCN_1131	33409	CTCN_6849	47468
ATCN_1132	33410	GTCN_3655	47469
ATCN_1133	33411	ATCN_3901	47470
CTCN_2028	33412	CTCN_6850	47471
CTCN_2029	33413	GTCN_3656	47472
CTCN_2030	33414	ATCN_3902	47473
CTCN_2031	33415	CTCN_6851	47474
ATCN_1134	33416	GTCN_3657	47475
ATCN_1135	33417	GTCN_3658	47476
CTCN_2032	33418	ATCN_3903	47477
TTCN_1680	33419	CTCN_6852	47478
CTCN_2033	33420	GTCN_3659	47479
ATCN_1136	33421	CTCN_6853	47480
GTCN_1115	33422	ATCN_3904	47481
GTCN_1116	33423	TTCN_5608	47482
TTCN_1681	33424	TTCN_5609	47483
CTCN_2034	33425	CTCN_6854	47484
CTCN_2035	33426	GTCN_3660	47485
TTCN_1682	33427	ATCN_3905	47486

CTCN_2036	33428	CTCN_6855	47487
GTCN_1117	33429	ATCN_3906	47488
ATCN_1137	33430	TTCN_5610	47489
TTCN_1683	33431	ATCN_3907	47490
GTCN_1118	33432	CTCN_6856	47491
TTCN_1684	33433	CTCN_6857	47492
TTCN_1685	33434	GTCN_3661	47493
CTCN_2037	33435	ATCN_3908	47494
ATCN_1138	33436	TTCN_5611	47495
ATCN_1139	33437	CTCN_6858	47496
TTCN_1686	33438	CTCN_6859	47497
TTCN_1687	33439	TTCN_5612	47498
ATCN_1140	33440	TTCN_5613	47499
CTCN_2038	33441	GTCN_3662	47500
TTCN_1688	33442	TTCN_5614	47501
ATCN_1141	33443	GTCN_3663	47502
TTCN_1689	33444	TTCN_5615	47503
GTCN_1119	33445	CTCN_6860	47504
TTCN_1690	33446	GTCN_3664	47505
GTCN_1120	33447	TTCN_5616	47506
TTCN_1691	33448	TTCN_5617	47507
TTCN_1692	33449	CTCN_6861	47508
CTCN_2039	33450	TTCN_5618	47509
CTCN_2040	33451	TTCN_5619	47510
CTCN_2041	33452	CTCN_6862	47511
GTCN_1121	33453	TTCN_5620	47512
CTCN_2042	33454	ATCN_3909	47513
GTCN_1122	33455	TTCN_5621	47514
TTCN_1693	33456	CTCN_6863	47515
GTCN_1123	33457	GTCN_3665	47516
GTCN_1124	33458	GTCN_3666	47517
CTCN_2043	33459	CTCN_6864	47518
CTCN_2044	33460	TTCN_5622	47519
CTCN_2045	33461	TTCN_5623	47520
TTCN_1694	33462	CTCN_6865	47521
CTCN_2046	33463	TTCN_5624	47522
CTCN_2047	33464	CTCN_6866	47523
CTCN_2048	33465	GTCN_3667	47524
CTCN_2049	33466	TTCN_5625	47525
CTCN_2050	33467	CTCN_6867	47526
ATCN_1142	33468	CTCN_6868	47527
CTCN_2051	33469	GTCN_3668	47528
GTCN_1125	33470	GTCN_3669	47529

FIG. 37 (continued)

CTCN_2052	33471	TTCN_5626	47530
GTCN_1126	33472	ATCN_3910	47531
CTCN_2053	33473	TTCN_5627	47532
TTCN_1695	33474	TTCN_5628	47533
GTCN_1127	33475	GTCN_3670	47534
TTCN_1696	33476	TTCN_5629	47535
TTCN_1697	33477	ATCN_3911	47536
TTCN_1698	33478	TTCN_5630	47537
TTCN_1699	33479	CTCN_6869	47538
ATCN_1143	33480	TTCN_5631	47539
TTCN_1700	33481	GTCN_3671	47540
ATCN_1144	33482	TTCN_5632	47541
TTCN_1701	33483	TTCN_5633	47542
TTCN_1702	33484	ATCN_3912	47543
TTCN_1703	33485	ATCN_3913	47544
TTCN_1704	33486	GTCN_3672	47545
TTCN_1705	33487	CTCN_6870	47546
ATCN_1145	33488	ATCN_3914	47547
CTCN_2054	33489	GTCN_3673	47548
ATCN_1146	33490	TTCN_5634	47549
GTCN_1128	33491	ATCN_3915	47550
TTCN_1706	33492	TTCN_5635	47551
GTCN_1129	33493	CTCN_6871	47552
CTCN_2055	33494	TTCN_5636	47553
TTCN_1707	33495	TTCN_5637	47554
TTCN_1708	33496	GTCN_3674	47555
CTCN_2056	33497	TTCN_5638	47556
TTCN_1709	33498	GTCN_3675	47557
TTCN_1710	33499	GTCN_3676	47558
ATCN_1147	33500	TTCN_5639	47559
GTCN_1130	33501	CTCN_6872	47560
ATCN_1148	33502	ATCN_3916	47561
CTCN_2057	33503	TTCN_5640	47562
TTCN_1711	33504	CTCN_6873	47563
CTCN_2058	33505	ATCN_3917	47564
TTCN_1712	33506	TTCN_5641	47565
ATCN_1149	33507	TTCN_5642	47566
TTCN_1713	33508	TTCN_5643	47567
CTCN_2059	33509	ATCN_3918	47568
ATCN_1150	33510	ATCN_3919	47569
GTCN_1131	33511	ATCN_3920	47570
TTCN_1714	33512	CTCN_6874	47571
TTCN_1715	33513	GTCN_3677	47572
TTCN_1716	33514	ATCN_3921	47573
CTCN_2060	33515	GTCN_3678	47574
GTCN_1132	33516	CTCN_6875	47575
TTCN_1717	33517	TTCN_5644	47576
ATCN_1151	33518	ATCN_3922	47577
ATCN_1152	33519	CTCN_6876	47578
GTCN_1133	33520	TTCN_5645	47579
GTCN_1134	33521	GTCN_3679	47580
GTCN_1135	33522	TTCN_5646	47581
GTCN_1136	33523	CTCN_6877	47582
TTCN_1718	33524	CTCN_6878	47583
TTCN_1719	33525	CTCN_6879	47584
CTCN_2061	33526	CTCN_6880	47585
CTCN_2062	33527	TTCN_5647	47586
ATCN_1153	33528	TTCN_5648	47587
GTCN_1137	33529	CTCN_6881	47588
TTCN_1720	33530	ATCN_3923	47589
CTCN_2063	33531	ATCN_3924	47590
TTCN_1721	33532	CTCN_6882	47591
CTCN_2064	33533	CTCN_6883	47592
ATCN_1154	33534	CTCN_6884	47593
ATCN_1155	33535	ATCN_3925	47594
CTCN_2065	33536	CTCN_6885	47595
ATCN_1156	33537	TTCN_5649	47596
ATCN_1157	33538	TTCN_5650	47597
CTCN_2066	33539	CTCN_6886	47598
GTCN_1138	33540	CTCN_6887	47599
ATCN_1158	33541	CTCN_6888	47600
GTCN_1139	33542	CTCN_6889	47601
GTCN_1140	33543	GTCN_3680	47602
TTCN_1722	33544	TTCN_5651	47603
TTCN_1723	33545	CTCN_6890	47604
ATCN_1159	33546	CTCN_6891	47605
TTCN_1724	33547	TTCN_5652	47606
ATCN_1160	33548	TTCN_5653	47607
TTCN_1725	33549	TTCN_5654	47608
TTCN_1726	33550	CTCN_6892	47609
ATCN_1161	33551	GTCN_3681	47610
TTCN_1727	33552	TTCN_5655	47611
TTCN_1728	33553	ATCN_3926	47612
TTCN_1729	33554	TTCN_5656	47613
CTCN_2067	33555	GTCN_3682	47614
ATCN_1162	33556	ATCN_3927	47615

FIG. 37 (continued)

GTCN_1141	33557	TTCN_5657	47616
ATCN_1163	33558	ATCN_3928	47617
TTCN_1730	33559	GTCN_3683	47618
ATCN_1164	33560	CTCN_6893	47619
TTCN_1731	33561	GTCN_3684	47620
CTCN_2068	33562	TTCN_5658	47621
TTCN_1732	33563	CTCN_6894	47622
GTCN_1142	33564	CTCN_6895	47623
TTCN_1733	33565	CTCN_6896	47624
ATCN_1165	33566	GTCN_3685	47625
TTCN_1734	33567	ATCN_3929	47626
ATCN_1166	33568	ATCN_3930	47627
GTCN_1143	33569	ATCN_3931	47628
CTCN_2069	33570	TTCN_5659	47629
GTCN_1144	33571	ATCN_3932	47630
ATCN_1167	33572	TTCN_5660	47631
CTCN_2070	33573	CTCN_6897	47632
CTCN_2071	33574	GTCN_3686	47633
CTCN_2072	33575	TTCN_5661	47634
GTCN_1145	33576	ATCN_3933	47635
TTCN_1735	33577	ATCN_3934	47636
GTCN_1146	33578	GTCN_3687	47637
CTCN_2073	33579	ATCN_3935	47638
CTCN_2074	33580	TTCN_5662	47639
ATCN_1168	33581	TTCN_5663	47640
ATCN_1169	33582	TTCN_5664	47641
CTCN_2075	33583	GTCN_3688	47642
CTCN_2076	33584	CTCN_6898	47643
CTCN_2077	33585	GTCN_3689	47644
TTCN_1736	33586	ATCN_3936	47645
ATCN_1170	33587	TTCN_5665	47646
TTCN_1737	33588	CTCN_6899	47647
CTCN_2078	33589	ATCN_3937	47648
CTCN_2079	33590	TTCN_5666	47649
CTCN_2080	33591	ATCN_3938	47650
CTCN_2081	33592	CTCN_6900	47651
ATCN_1171	33593	CTCN_6901	47652
ATCN_1172	33594	ATCN_3939	47653
CTCN_2082	33595	TTCN_5667	47654
GTCN_1147	33596	ATCN_3940	47655
GTCN_1148	33597	TTCN_5668	47656
GTCN_1149	33598	ATCN_3941	47657
CTCN_2083	33599	TTCN_5669	47658

CTCN_2084	33600	CTCN_6902	47659
CTCN_2085	33601	CTCN_6903	47660
CTCN_2086	33602	CTCN_6904	47661
TTCN_1738	33603	CTCN_6905	47662
TTCN_1739	33604	GTCN_3690	47663
TTCN_1740	33605	ATCN_3942	47664
ATCN_1173	33606	CTCN_6906	47665
TTCN_1741	33607	TTCN_5670	47666
ATCN_1174	33608	ATCN_3943	47667
ATCN_1175	33609	TTCN_5671	47668
ATCN_1176	33610	CTCN_6907	47669
GTCN_1150	33611	ATCN_3944	47670
ATCN_1177	33612	ATCN_3945	47671
ATCN_1178	33613	GTCN_3691	47672
ATCN_1179	33614	ATCN_3946	47673
ATCN_1180	33615	ATCN_3947	47674
ATCN_1181	33616	CTCN_6908	47675
ATCN_1182	33617	CTCN_6909	47676
ATCN_1183	33618	CTCN_6910	47677
ATCN_1184	33619	GTCN_3692	47678
ATCN_1185	33620	GTCN_3693	47679
ATCN_1186	33621	CTCN_6911	47680
ATCN_1187	33622	CTCN_6912	47681
ATCN_1188	33623	TTCN_5672	47682
GTCN_1151	33624	GTCN_3694	47683
ATCN_1189	33625	TTCN_5673	47684
ATCN_1190	33626	TTCN_5674	47685
ATCN_1191	33627	TTCN_5675	47686
ATCN_1192	33628	CTCN_6913	47687
ATCN_1193	33629	CTCN_6914	47688
GTCN_1152	33630	TTCN_5676	47689
ATCN_1194	33631	ATCN_3948	47690
ATCN_1195	33632	ATCN_3949	47691
ATCN_1196	33633	GTCN_3695	47692
ATCN_1197	33634	ATCN_3950	47693
ATCN_1198	33635	TTCN_5677	47694
ATCN_1199	33636	TTCN_5678	47695
ATCN_1200	33637	CTCN_6915	47696
ATCN_1201	33638	TTCN_5679	47697
ATCN_1202	33639	TTCN_5680	47698
ATCN_1203	33640	TTCN_5681	47699
ATCN_1204	33641	GTCN_3696	47700
ATCN_1205	33642	ATCN_3951	47701

FIG. 37 (continued)

ATCN_1206	33643	GTCN_3697	47702
ATCN_1207	33644	ATCN_3952	47703
ATCN_1208	33645	TTCN_5682	47704
ATCN_1209	33646	TTCN_5683	47705
ATCN_1210	33647	CTCN_6916	47706
ATCN_1211	33648	CTCN_6917	47707
ATCN_1212	33649	TTCN_5684	47708
ATCN_1213	33650	GTCN_3698	47709
ATCN_1214	33651	CTCN_6918	47710
ATCN_1215	33652	TTCN_5685	47711
ATCN_1216	33653	CTCN_6919	47712
ATCN_1217	33654	ATCN_3953	47713
ATCN_1218	33655	ATCN_3954	47714
ATCN_1219	33656	TTCN_5686	47715
ATCN_1220	33657	GTCN_3699	47716
GTCN_1153	33658	TTCN_5687	47717
ATCN_1221	33659	CTCN_6920	47718
ATCN_1222	33660	TTCN_5688	47719
ATCN_1223	33661	ATCN_3955	47720
ATCN_1224	33662	CTCN_6921	47721
ATCN_1225	33663	GTCN_3700	47722
ATCN_1226	33664	TTCN_5689	47723
ATCN_1227	33665	TTCN_5690	47724
ATCN_1228	33666	CTCN_6922	47725
GTCN_1154	33667	CTCN_6923	47726
ATCN_1229	33668	CTCN_6924	47727
ATCN_1230	33669	TTCN_5691	47728
ATCN_1231	33670	CTCN_6925	47729
ATCN_1232	33671	CTCN_6926	47730
ATCN_1233	33672	ATCN_3956	47731
ATCN_1234	33673	ATCN_3957	47732
ATCN_1235	33674	TTCN_5692	47733
ATCN_1236	33675	GTCN_3701	47734
CTCN_2087	33676	TTCN_5693	47735
ATCN_1237	33677	ATCN_3958	47736
GTCN_1155	33678	ATCN_3959	47737
CTCN_2088	33679	TTCN_5694	47738
ATCN_1238	33680	GTCN_3702	47739
GTCN_1156	33681	TTCN_5695	47740
ATCN_1239	33682	TTCN_5696	47741
GTCN_1157	33683	ATCN_3960	47742
GTCN_1158	33684	ATCN_3961	47743
CTCN_2089	33685	TTCN_5697	47744

CTCN_2090	33686	TTCN_5698	47745
TTCN_1742	33687	TTCN_5699	47746
GTCN_1159	33688	TTCN_5700	47747
CTCN_2091	33689	CTCN_6927	47748
TTCN_1743	33690	ATCN_3962	47749
CTCN_2092	33691	TTCN_5701	47750
GTCN_1160	33692	TTCN_5702	47751
TTCN_1744	33693	ATCN_3963	47752
GTCN_1161	33694	CTCN_6928	47753
CTCN_2093	33695	GTCN_3703	47754
GTCN_1162	33696	TTCN_5703	47755
CTCN_2094	33697	TTCN_5704	47756
CTCN_2095	33698	ATCN_3964	47757
ATCN_1240	33699	CTCN_6929	47758
GTCN_1163	33700	TTCN_5705	47759
GTCN_1164	33701	TTCN_5706	47760
GTCN_1165	33702	CTCN_6930	47761
ATCN_1241	33703	GTCN_3704	47762
ATCN_1242	33704	CTCN_6931	47763
CTCN_2096	33705	CTCN_6932	47764
ATCN_1243	33706	GTCN_3705	47765
ATCN_1244	33707	TTCN_5707	47766
CTCN_2097	33708	GTCN_3706	47767
TTCN_1745	33709	CTCN_6933	47768
CTCN_2098	33710	CTCN_6934	47769
CTCN_2099	33711	CTCN_6935	47770
TTCN_1746	33712	TTCN_5708	47771
CTCN_2100	33713	GTCN_3707	47772
ATCN_1245	33714	TTCN_5709	47773
TTCN_1747	33715	TTCN_5710	47774
CTCN_2101	33716	CTCN_6936	47775
TTCN_1748	33717	GTCN_3708	47776
CTCN_2102	33718	CTCN_6937	47777
TTCN_1749	33719	CTCN_6938	47778
ATCN_1246	33720	TTCN_5711	47779
TTCN_1750	33721	ATCN_3965	47780
CTCN_2103	33722	ATCN_3966	47781
TTCN_1751	33723	TTCN_5712	47782
GTCN_1166	33724	TTCN_5713	47783
TTCN_1752	33725	TTCN_5714	47784
ATCN_1247	33726	TTCN_5715	47785
CTCN_2104	33727	TTCN_5716	47786
ATCN_1248	33728	TTCN_5717	47787

FIG. 37 (continued)

ATCN_1249	33729	TTCN_5718	47788
ATCN_1250	33730	CTCN_6939	47789
TTCN_1753	33731	TTCN_5719	47790
TTCN_1754	33732	ATCN_3967	47791
ATCN_1251	33733	TTCN_5720	47792
ATCN_1252	33734	ATCN_3968	47793
ATCN_1253	33735	ATCN_3969	47794
ATCN_1254	33736	GTCN_3709	47795
TTCN_1755	33737	TTCN_5721	47796
ATCN_1255	33738	GTCN_3710	47797
CTCN_2105	33739	GTCN_3711	47798
TTCN_1756	33740	CTCN_6940	47799
CTCN_2106	33741	TTCN_5722	47800
CTCN_2107	33742	ATCN_3970	47801
TTCN_1757	33743	CTCN_6941	47802
ATCN_1256	33744	TTCN_5723	47803
ATCN_1257	33745	TTCN_5724	47804
TTCN_1758	33746	CTCN_6942	47805
ATCN_1258	33747	GTCN_3712	47806
ATCN_1259	33748	CTCN_6943	47807
ATCN_1260	33749	TTCN_5725	47808
TTCN_1759	33750	GTCN_3713	47809
CTCN_2108	33751	TTCN_5726	47810
CTCN_2109	33752	GTCN_3714	47811
TTCN_1760	33753	CTCN_6944	47812
CTCN_2110	33754	ATCN_3971	47813
TTCN_1761	33755	TTCN_5727	47814
GTCN_1167	33756	CTCN_6945	47815
GTCN_1168	33757	TTCN_5728	47816
GTCN_1169	33758	TTCN_5729	47817
CTCN_2111	33759	TTCN_5730	47818
TTCN_1762	33760	CTCN_6946	47819
TTCN_1763	33761	TTCN_5731	47820
CTCN_2112	33762	CTCN_6947	47821
TTCN_1764	33763	CTCN_6948	47822
CTCN_2113	33764	ATCN_3972	47823
CTCN_2114	33765	CTCN_6949	47824
ATCN_1261	33766	GTCN_3715	47825
ATCN_1262	33767	ATCN_3973	47826
CTCN_2115	33768	TTCN_5732	47827
CTCN_2116	33769	GTCN_3716	47828
CTCN_2117	33770	CTCN_6950	47829
TTCN_1765	33771	GTCN_3717	47830
TTCN_1766	33772	GTCN_3718	47831
CTCN_2118	33773	CTCN_6951	47832
CTCN_2119	33774	CTCN_6952	47833
TTCN_1767	33775	CTCN_6953	47834
CTCN_2120	33776	CTCN_6954	47835
ATCN_1263	33777	TTCN_5733	47836
GTCN_1170	33778	ATCN_3974	47837
TTCN_1768	33779	CTCN_6955	47838
CTCN_2121	33780	ATCN_3975	47839
GTCN_1171	33781	ATCN_3976	47840
GTCN_1172	33782	TTCN_5734	47841
ATCN_1264	33783	TTCN_5735	47842
ATCN_1265	33784	TTCN_5736	47843
ATCN_1266	33785	CTCN_6956	47844
TTCN_1769	33786	TTCN_5737	47845
GTCN_1173	33787	ATCN_3977	47846
TTCN_1770	33788	CTCN_6957	47847
TTCN_1771	33789	TTCN_5738	47848
GTCN_1174	33790	CTCN_6958	47849
TTCN_1772	33791	ATCN_3978	47850
ATCN_1267	33792	CTCN_6959	47851
TTCN_1773	33793	GTCN_3719	47852
TTCN_1774	33794	ATCN_3979	47853
ATCN_1268	33795	ATCN_3980	47854
TTCN_1775	33796	ATCN_3981	47855
CTCN_2122	33797	CTCN_6960	47856
CTCN_2123	33798	TTCN_5739	47857
ATCN_1269	33799	CTCN_6961	47858
ATCN_1270	33800	CTCN_6962	47859
ATCN_1271	33801	TTCN_5740	47860
ATCN_1272	33802	TTCN_5741	47861
TTCN_1776	33803	CTCN_6963	47862
ATCN_1273	33804	GTCN_3720	47863
TTCN_1777	33805	CTCN_6964	47864
TTCN_1778	33806	CTCN_6965	47865
ATCN_1274	33807	GTCN_3721	47866
ATCN_1275	33808	GTCN_3722	47867
GTCN_1175	33809	TTCN_5742	47868
CTCN_2124	33810	GTCN_3723	47869
ATCN_1276	33811	ATCN_3982	47870
ATCN_1277	33812	CTCN_6966	47871
TTCN_1779	33813	CTCN_6967	47872
GTCN_1176	33814	GTCN_3724	47873

FIG. 37 (continued)

TTCN_1780	33815	GTCN_3725	47874
ATCN_1278	33816	GTCN_3726	47875
CTCN_2125	33817	TTCN_5743	47876
TTCN_1781	33818	CTCN_6968	47877
CTCN_2126	33819	CTCN_6969	47878
GTCN_1177	33820	CTCN_6970	47879
CTCN_2127	33821	TTCN_5744	47880
ATCN_1279	33822	GTCN_3727	47881
ATCN_1280	33823	ATCN_3983	47882
CTCN_2128	33824	TTCN_5745	47883
CTCN_2129	33825	TTCN_5746	47884
ATCN_1281	33826	ATCN_3984	47885
ATCN_1282	33827	CTCN_6971	47886
TTCN_1782	33828	CTCN_6972	47887
GTCN_1178	33829	ATCN_3985	47888
CTCN_2130	33830	GTCN_3728	47889
ATCN_1283	33831	CTCN_6973	47890
CTCN_2131	33832	TTCN_5747	47891
CTCN_2132	33833	TTCN_5748	47892
CTCN_2133	33834	GTCN_3729	47893
ATCN_1284	33835	CTCN_6974	47894
ATCN_1285	33836	CTCN_6975	47895
TTCN_1783	33837	ATCN_3986	47896
CTCN_2134	33838	TTCN_5749	47897
CTCN_2135	33839	CTCN_6976	47898
CTCN_2136	33840	CTCN_6977	47899
CTCN_2137	33841	TTCN_5750	47900
ATCN_1286	33842	TTCN_5751	47901
ATCN_1287	33843	CTCN_6978	47902
CTCN_2138	33844	TTCN_5752	47903
CTCN_2139	33845	TTCN_5753	47904
CTCN_2140	33846	GTCN_3730	47905
GTCN_1179	33847	CTCN_6979	47906
CTCN_2141	33848	TTCN_5754	47907
TTCN_1784	33849	GTCN_3731	47908
CTCN_2142	33850	GTCN_3732	47909
CTCN_2143	33851	TTCN_5755	47910
CTCN_2144	33852	TTCN_5756	47911
ATCN_1288	33853	TTCN_5757	47912
GTCN_1180	33854	ATCN_3987	47913
CTCN_2145	33855	ATCN_3988	47914
CTCN_2146	33856	TTCN_5758	47915
CTCN_2147	33857	CTCN_6980	47916

TTCN_1785	33858	TTCN_5759	47917
ATCN_1289	33859	TTCN_5760	47918
TTCN_1786	33860	TTCN_5761	47919
TTCN_1787	33861	CTCN_6981	47920
TTCN_1788	33862	CTCN_6982	47921
CTCN_2148	33863	TTCN_5762	47922
GTCN_1181	33864	GTCN_3733	47923
CTCN_2149	33865	ATCN_3989	47924
GTCN_1182	33866	CTCN_6983	47925
TTCN_1789	33867	TTCN_5763	47926
CTCN_2150	33868	TTCN_5764	47927
TTCN_1790	33869	CTCN_6984	47928
CTCN_2151	33870	ATCN_3990	47929
CTCN_2152	33871	TTCN_5765	47930
CTCN_2153	33872	TTCN_5766	47931
ATCN_1290	33873	ATCN_3991	47932
ATCN_1291	33874	TTCN_5767	47933
CTCN_2154	33875	ATCN_3992	47934
CTCN_2155	33876	CTCN_6985	47935
TTCN_1791	33877	TTCN_5768	47936
CTCN_2156	33878	GTCN_3734	47937
TTCN_1792	33879	ATCN_3993	47938
ATCN_1292	33880	TTCN_5769	47939
TTCN_1793	33881	TTCN_5770	47940
GTCN_1183	33882	GTCN_3735	47941
CTCN_2157	33883	CTCN_6986	47942
CTCN_2158	33884	ATCN_3994	47943
ATCN_1293	33885	ATCN_3995	47944
ATCN_1294	33886	CTCN_6987	47945
TTCN_1794	33887	ATCN_3996	47946
ATCN_1295	33888	GTCN_3736	47947
TTCN_1795	33889	TTCN_5771	47948
TTCN_1796	33890	TTCN_5772	47949
TTCN_1797	33891	GTCN_3737	47950
ATCN_1296	33892	TTCN_5773	47951
TTCN_1798	33893	TTCN_5774	47952
TTCN_1799	33894	CTCN_6988	47953
GTCN_1184	33895	GTCN_3738	47954
TTCN_1800	33896	ATCN_3997	47955
CTCN_2159	33897	ATCN_3998	47956
GTCN_1185	33898	CTCN_6989	47957
CTCN_2160	33899	TTCN_5775	47958
CTCN_2161	33900	ATCN_3999	47959

FIG. 37 (continued)

ATCN_1297	33901	ATCN_4000	47960
ATCN_1298	33902	TTCN_5776	47961
ATCN_1299	33903	TTCN_5777	47962
TTCN_1801	33904	TTCN_5778	47963
TTCN_1802	33905	ATCN_4001	47964
TTCN_1803	33906	TTCN_5779	47965
ATCN_1300	33907	ATCN_4002	47966
ATCN_1301	33908	CTCN_6990	47967
GTCN_1186	33909	CTCN_6991	47968
CTCN_2162	33910	TTCN_5780	47969
ATCN_1302	33911	ATCN_4003	47970
CTCN_2163	33912	GTCN_3739	47971
CTCN_2164	33913	TTCN_5781	47972
CTCN_2165	33914	TTCN_5782	47973
CTCN_2166	33915	CTCN_6992	47974
TTCN_1804	33916	TTCN_5783	47975
GTCN_1187	33917	GTCN_3740	47976
CTCN_2167	33918	CTCN_6993	47977
TTCN_1805	33919	TTCN_5784	47978
ATCN_1303	33920	TTCN_5785	47979
TTCN_1806	33921	CTCN_6994	47980
GTCN_1188	33922	ATCN_4004	47981
CTCN_2168	33923	CTCN_6995	47982
TTCN_1807	33924	TTCN_5786	47983
TTCN_1808	33925	TTCN_5787	47984
GTCN_1189	33926	ATCN_4005	47985
GTCN_1190	33927	TTCN_5788	47986
ATCN_1304	33928	CTCN_6996	47987
TTCN_1809	33929	TTCN_5789	47988
ATCN_1305	33930	TTCN_5790	47989
TTCN_1810	33931	ATCN_4006	47990
TTCN_1811	33932	ATCN_4007	47991
CTCN_2169	33933	ATCN_4008	47992
CTCN_2170	33934	CTCN_6997	47993
TTCN_1812	33935	ATCN_4009	47994
ATCN_1306	33936	ATCN_4010	47995
ATCN_1307	33937	GTCN_3741	47996
ATCN_1308	33938	GTCN_3742	47997
TTCN_1813	33939	TTCN_5791	47998
CTCN_2171	33940	CTCN_6998	47999
CTCN_2172	33941	TTCN_5792	48000
GTCN_1191	33942	CTCN_6999	48001
TTCN_1814	33943	ATCN_4011	48002

ATCN_1309	33944	CTCN_7000	48003
TTCN_1815	33945	GTCN_3743	48004
ATCN_1310	33946	ATCN_4012	48005
GTCN_1192	33947	TTCN_5793	48006
TTCN_1816	33948	GTCN_3744	48007
CTCN_2173	33949	TTCN_5794	48008
TTCN_1817	33950	ATCN_4013	48009
GTCN_1193	33951	GTCN_3745	48010
TTCN_1818	33952	TTCN_5795	48011
ATCN_1311	33953	ATCN_4014	48012
TTCN_1819	33954	ATCN_4015	48013
ATCN_1312	33955	TTCN_5796	48014
TTCN_1820	33956	TTCN_5797	48015
TTCN_1821	33957	CTCN_7001	48016
CTCN_2174	33958	TTCN_5798	48017
TTCN_1822	33959	ATCN_4016	48018
GTCN_1194	33960	TTCN_5799	48019
CTCN_2175	33961	CTCN_7002	48020
TTCN_1823	33962	TTCN_5800	48021
TTCN_1824	33963	TTCN_5801	48022
TTCN_1825	33964	GTCN_3746	48023
CTCN_2176	33965	TTCN_5802	48024
TTCN_1826	33966	ATCN_4017	48025
ATCN_1313	33967	ATCN_4018	48026
CTCN_2177	33968	ATCN_4019	48027
ATCN_1314	33969	ATCN_4020	48028
TTCN_1827	33970	ATCN_4021	48029
CTCN_2178	33971	TTCN_5803	48030
CTCN_2179	33972	TTCN_5804	48031
TTCN_1828	33973	ATCN_4022	48032
TTCN_1829	33974	ATCN_4023	48033
TTCN_1830	33975	TTCN_5805	48034
ATCN_1315	33976	TTCN_5806	48035
ATCN_1316	33977	GTCN_3747	48036
CTCN_2180	33978	CTCN_7003	48037
CTCN_2181	33979	ATCN_4024	48038
CTCN_2182	33980	CTCN_7004	48039
ATCN_1317	33981	TTCN_5807	48040
TTCN_1831	33982	TTCN_5808	48041
GTCN_1195	33983	CTCN_7005	48042
CTCN_2183	33984	GTCN_3748	48043
ATCN_1318	33985	ATCN_4025	48044
GTCN_1196	33986	CTCN_7006	48045

FIG. 37 (continued)

ATCN_1319	33987	CTCN_7007	48046
ATCN_1320	33988	GTCN_3749	48047
TTCN_1832	33989	CTCN_7008	48048
CTCN_2184	33990	CTCN_7009	48049
CTCN_2185	33991	CTCN_7010	48050
TTCN_1833	33992	CTCN_7011	48051
TTCN_1834	33993	TTCN_5809	48052
ATCN_1321	33994	CTCN_7012	48053
TTCN_1835	33995	TTCN_5810	48054
ATCN_1322	33996	TTCN_5811	48055
TTCN_1836	33997	TTCN_5812	48056
TTCN_1837	33998	CTCN_7013	48057
TTCN_1838	33999	CTCN_7014	48058
ATCN_1323	34000	TTCN_5813	48059
TTCN_1839	34001	TTCN_5814	48060
ATCN_1324	34002	CTCN_7015	48061
ATCN_1325	34003	CTCN_7016	48062
TTCN_1840	34004	TTCN_5815	48063
TTCN_1841	34005	CTCN_7017	48064
ATCN_1326	34006	ATCN_4026	48065
GTCN_1197	34007	GTCN_3750	48066
CTCN_2186	34008	ATCN_4027	48067
ATCN_1327	34009	TTCN_5816	48068
ATCN_1328	34010	TTCN_5817	48069
CTCN_2187	34011	GTCN_3751	48070
CTCN_2188	34012	GTCN_3752	48071
TTCN_1842	34013	ATCN_4028	48072
CTCN_2189	34014	ATCN_4029	48073
CTCN_2190	34015	ATCN_4030	48074
TTCN_1843	34016	ATCN_4031	48075
ATCN_1329	34017	CTCN_7018	48076
CTCN_2191	34018	GTCN_3753	48077
TTCN_1844	34019	CTCN_7019	48078
ATCN_1330	34020	GTCN_3754	48079
TTCN_1845	34021	ATCN_4032	48080
CTCN_2192	34022	ATCN_4033	48081
CTCN_2193	34023	CTCN_7020	48082
GTCN_1198	34024	CTCN_7021	48083
TTCN_1846	34025	CTCN_7022	48084
CTCN_2194	34026	TTCN_5818	48085
TTCN_1847	34027	GTCN_3755	48086
TTCN_1848	34028	CTCN_7023	48087
TTCN_1849	34029	TTCN_5819	48088

TTCN_1850	34030	ATCN_4034	48089
ATCN_1331	34031	ATCN_4035	48090
ATCN_1332	34032	GTCN_3756	48091
ATCN_1333	34033	TTCN_5820	48092
ATCN_1334	34034	GTCN_3757	48093
TTCN_1851	34035	CTCN_7024	48094
GTCN_1199	34036	ATCN_4036	48095
GTCN_1200	34037	ATCN_4037	48096
GTCN_1201	34038	TTCN_5821	48097
CTCN_2195	34039	CTCN_7025	48098
CTCN_2196	34040	ATCN_4038	48099
CTCN_2197	34041	CTCN_7026	48100
TTCN_1852	34042	TTCN_5822	48101
TTCN_1853	34043	TTCN_5823	48102
CTCN_2198	34044	TTCN_5824	48103
GTCN_1202	34045	TTCN_5825	48104
CTCN_2199	34046	GTCN_3758	48105
TTCN_1854	34047	TTCN_5826	48106
GTCN_1203	34048	TTCN_5827	48107
ATCN_1335	34049	TTCN_5828	48108
ATCN_1336	34050	CTCN_7027	48109
TTCN_1855	34051	GTCN_3759	48110
ATCN_1337	34052	CTCN_7028	48111
GTCN_1204	34053	CTCN_7029	48112
ATCN_1338	34054	GTCN_3760	48113
GTCN_1205	34055	CTCN_7030	48114
ATCN_1339	34056	ATCN_4039	48115
ATCN_1340	34057	TTCN_5829	48116
GTCN_1206	34058	CTCN_7031	48117
CTCN_2200	34059	CTCN_7032	48118
TTCN_1856	34060	GTCN_3761	48119
ATCN_1341	34061	TTCN_5830	48120
ATCN_1342	34062	TTCN_5831	48121
ATCN_1343	34063	TTCN_5832	48122
ATCN_1344	34064	ATCN_4040	48123
CTCN_2201	34065	CTCN_7033	48124
ATCN_1345	34066	CTCN_7034	48125
TTCN_1857	34067	TTCN_5833	48126
ATCN_1346	34068	CTCN_7035	48127
TTCN_1858	34069	ATCN_4041	48128
GTCN_1207	34070	TTCN_5834	48129
TTCN_1859	34071	GTCN_3762	48130
GTCN_1208	34072	CTCN_7036	48131

FIG. 37 (continued)

TTCN_1860	34073	TTCN_5835	48132
CTCN_2202	34074	CTCN_7037	48133
ATCN_1347	34075	TTCN_5836	48134
TTCN_1861	34076	ATCN_4042	48135
TTCN_1862	34077	GTCN_3763	48136
CTCN_2203	34078	CTCN_7038	48137
ATCN_1348	34079	CTCN_7039	48138
TTCN_1863	34080	CTCN_7040	48139
ATCN_1349	34081	TTCN_5837	48140
ATCN_1350	34082	CTCN_7041	48141
CTCN_2204	34083	GTCN_3764	48142
TTCN_1864	34084	TTCN_5838	48143
ATCN_1351	34085	ATCN_4043	48144
TTCN_1865	34086	TTCN_5839	48145
TTCN_1866	34087	ATCN_4044	48146
GTCN_1209	34088	TTCN_5840	48147
TTCN_1867	34089	CTCN_7042	48148
TTCN_1868	34090	CTCN_7043	48149
TTCN_1869	34091	TTCN_5841	48150
GTCN_1210	34092	CTCN_7044	48151
ATCN_1352	34093	CTCN_7045	48152
ATCN_1353	34094	GTCN_3765	48153
TTCN_1870	34095	GTCN_3766	48154
TTCN_1871	34096	TTCN_5842	48155
TTCN_1872	34097	CTCN_7046	48156
TTCN_1873	34098	CTCN_7047	48157
CTCN_2205	34099	CTCN_7048	48158
ATCN_1354	34100	GTCN_3767	48159
ATCN_1355	34101	CTCN_7049	48160
TTCN_1874	34102	GTCN_3768	48161
TTCN_1875	34103	CTCN_7050	48162
ATCN_1356	34104	GTCN_3769	48163
ATCN_1357	34105	GTCN_3770	48164
TTCN_1876	34106	CTCN_7051	48165
CTCN_2206	34107	CTCN_7052	48166
ATCN_1358	34108	ATCN_4045	48167
TTCN_1877	34109	GTCN_3771	48168
TTCN_1878	34110	TTCN_5843	48169
TTCN_1879	34111	GTCN_3772	48170
TTCN_1880	34112	TTCN_5844	48171
TTCN_1881	34113	ATCN_4046	48172
TTCN_1882	34114	ATCN_4047	48173
GTCN_1211	34115	TTCN_5845	48174

ATCN_1359	34116	TTCN_5846	48175
ATCN_1360	34117	ATCN_4048	48176
TTCN_1883	34118	CTCN_7053	48177
ATCN_1361	34119	TTCN_5847	48178
TTCN_1884	34120	GTCN_3773	48179
TTCN_1885	34121	TTCN_5848	48180
CTCN_2207	34122	ATCN_4049	48181
TTCN_1886	34123	CTCN_7054	48182
ATCN_1362	34124	TTCN_5849	48183
TTCN_1887	34125	GTCN_3774	48184
TTCN_1888	34126	ATCN_4050	48185
TTCN_1889	34127	TTCN_5850	48186
TTCN_1890	34128	CTCN_7055	48187
CTCN_2208	34129	TTCN_5851	48188
GTCN_1212	34130	CTCN_7056	48189
TTCN_1891	34131	ATCN_4051	48190
TTCN_1892	34132	ATCN_4052	48191
TTCN_1893	34133	TTCN_5852	48192
ATCN_1363	34134	ATCN_4053	48193
CTCN_2209	34135	CTCN_7057	48194
TTCN_1894	34136	TTCN_5853	48195
ATCN_1364	34137	TTCN_5854	48196
CTCN_2210	34138	GTCN_3775	48197
GTCN_1213	34139	ATCN_4054	48198
GTCN_1214	34140	CTCN_7058	48199
TTCN_1895	34141	CTCN_7059	48200
GTCN_1215	34142	CTCN_7060	48201
ATCN_1365	34143	GTCN_3776	48202
GTCN_1216	34144	ATCN_4055	48203
TTCN_1896	34145	ATCN_4056	48204
TTCN_1897	34146	GTCN_3777	48205
TTCN_1898	34147	ATCN_4057	48206
TTCN_1899	34148	ATCN_4058	48207
GTCN_1217	34149	GTCN_3778	48208
TTCN_1900	34150	GTCN_3779	48209
CTCN_2211	34151	TTCN_5855	48210
ATCN_1366	34152	CTCN_7061	48211
CTCN_2212	34153	CTCN_7062	48212
ATCN_1367	34154	GTCN_3780	48213
ATCN_1368	34155	ATCN_4059	48214
TTCN_1901	34156	CTCN_7063	48215
GTCN_1218	34157	TTCN_5856	48216
GTCN_1219	34158	CTCN_7064	48217

FIG. 37 (continued)

ATCN_1369	34159	GTCN_3781	48218
TTCN_1902	34160	TTCN_5857	48219
ATCN_1370	34161	ATCN_4060	48220
CTCN_2213	34162	ATCN_4061	48221
CTCN_2214	34163	ATCN_4062	48222
CTCN_2215	34164	GTCN_3782	48223
TTCN_1903	34165	GTCN_3783	48224
ATCN_1371	34166	CTCN_7065	48225
ATCN_1372	34167	GTCN_3784	48226
CTCN_2216	34168	ATCN_4063	48227
ATCN_1373	34169	ATCN_4064	48228
TTCN_1904	34170	TTCN_5858	48229
ATCN_1374	34171	TTCN_5859	48230
ATCN_1375	34172	CTCN_7066	48231
GTCN_1220	34173	GTCN_3785	48232
TTCN_1905	34174	TTCN_5860	48233
CTCN_2217	34175	GTCN_3786	48234
ATCN_1376	34176	TTCN_5861	48235
ATCN_1377	34177	TTCN_5862	48236
GTCN_1221	34178	TTCN_5863	48237
TTCN_1906	34179	CTCN_7067	48238
ATCN_1378	34180	CTCN_7068	48239
ATCN_1379	34181	CTCN_7069	48240
ATCN_1380	34182	ATCN_4065	48241
CTCN_2218	34183	ATCN_4066	48242
TTCN_1907	34184	TTCN_5864	48243
ATCN_1381	34185	ATCN_4067	48244
GTCN_1222	34186	TTCN_5865	48245
TTCN_1908	34187	GTCN_3787	48246
CTCN_2219	34188	TTCN_5866	48247
TTCN_1909	34189	CTCN_7070	48248
TTCN_1910	34190	GTCN_3788	48249
TTCN_1911	34191	CTCN_7071	48250
GTCN_1223	34192	GTCN_3789	48251
CTCN_2220	34193	ATCN_4068	48252
ATCN_1382	34194	TTCN_5867	48253
CTCN_2221	34195	TTCN_5868	48254
GTCN_1224	34196	CTCN_7072	48255
CTCN_2222	34197	CTCN_7073	48256
GTCN_1225	34198	ATCN_4069	48257
CTCN_2223	34199	CTCN_7074	48258
ATCN_1383	34200	GTCN_3790	48259
CTCN_2224	34201	TTCN_5869	48260

CTCN_2225	34202	TTCN_5870	48261
TTCN_1912	34203	TTCN_5871	48262
TTCN_1913	34204	ATCN_4070	48263
TTCN_1914	34205	CTCN_7075	48264
CTCN_2226	34206	TTCN_5872	48265
CTCN_2227	34207	GTCN_3791	48266
CTCN_2228	34208	CTCN_7076	48267
CTCN_2229	34209	TTCN_5873	48268
ATCN_1384	34210	CTCN_7077	48269
GTCN_1226	34211	CTCN_7078	48270
CTCN_2230	34212	GTCN_3792	48271
ATCN_1385	34213	GTCN_3793	48272
TTCN_1915	34214	CTCN_7079	48273
GTCN_1227	34215	TTCN_5874	48274
TTCN_1916	34216	TTCN_5875	48275
TTCN_1917	34217	ATCN_4071	48276
CTCN_2231	34218	TTCN_5876	48277
GTCN_1228	34219	TTCN_5877	48278
CTCN_2232	34220	ATCN_4072	48279
ATCN_1386	34221	ATCN_4073	48280
ATCN_1387	34222	ATCN_4074	48281
CTCN_2233	34223	GTCN_3794	48282
ATCN_1388	34224	TTCN_5878	48283
CTCN_2234	34225	TTCN_5879	48284
GTCN_1229	34226	CTCN_7080	48285
TTCN_1918	34227	TTCN_5880	48286
GTCN_1230	34228	GTCN_3795	48287
ATCN_1389	34229	TTCN_5881	48288
CTCN_2235	34230	CTCN_7081	48289
ATCN_1390	34231	GTCN_3796	48290
TTCN_1919	34232	TTCN_5882	48291
ATCN_1391	34233	GTCN_3797	48292
TTCN_1920	34234	ATCN_4075	48293
TTCN_1921	34235	CTCN_7082	48294
GTCN_1231	34236	TTCN_5883	48295
TTCN_1922	34237	CTCN_7083	48296
ATCN_1392	34238	GTCN_3798	48297
ATCN_1393	34239	TTCN_5884	48298
CTCN_2236	34240	CTCN_7084	48299
CTCN_2237	34241	ATCN_4076	48300
ATCN_1394	34242	TTCN_5885	48301
TTCN_1923	34243	GTCN_3799	48302
TTCN_1924	34244	GTCN_3800	48303

FIG. 37 (continued)

CTCN_2238	34245	ATCN_4077	48304
CTCN_2239	34246	ATCN_4078	48305
GTCN_1232	34247	TTCN_5886	48306
GTCN_1233	34248	TTCN_5887	48307
TTCN_1925	34249	CTCN_7085	48308
GTCN_1234	34250	CTCN_7086	48309
TTCN_1926	34251	TTCN_5888	48310
ATCN_1395	34252	ATCN_4079	48311
GTCN_1235	34253	TTCN_5889	48312
TTCN_1927	34254	TTCN_5890	48313
CTCN_2240	34255	GTCN_3801	48314
TTCN_1928	34256	GTCN_3802	48315
CTCN_2241	34257	CTCN_7087	48316
TTCN_1929	34258	TTCN_5891	48317
CTCN_2242	34259	TTCN_5892	48318
GTCN_1236	34260	TTCN_5893	48319
ATCN_1396	34261	ATCN_4080	48320
TTCN_1930	34262	ATCN_4081	48321
TTCN_1931	34263	TTCN_5894	48322
TTCN_1932	34264	TTCN_5895	48323
ATCN_1397	34265	GTCN_3803	48324
CTCN_2243	34266	ATCN_4082	48325
ATCN_1398	34267	CTCN_7088	48326
TTCN_1933	34268	TTCN_5896	48327
CTCN_2244	34269	CTCN_7089	48328
ATCN_1399	34270	GTCN_3804	48329
CTCN_2245	34271	CTCN_7090	48330
GTCN_1237	34272	ATCN_4083	48331
GTCN_1238	34273	TTCN_5897	48332
CTCN_2246	34274	CTCN_7091	48333
ATCN_1400	34275	TTCN_5898	48334
CTCN_2247	34276	ATCN_4084	48335
CTCN_2248	34277	CTCN_7092	48336
CTCN_2249	34278	GTCN_3805	48337
CTCN_2250	34279	CTCN_7093	48338
CTCN_2251	34280	CTCN_7094	48339
CTCN_2252	34281	TTCN_5899	48340
CTCN_2253	34282	GTCN_3806	48341
TTCN_1934	34283	GTCN_3807	48342
GTCN_1239	34284	TTCN_5900	48343
TTCN_1935	34285	TTCN_5901	48344
GTCN_1240	34286	TTCN_5902	48345
ATCN_1401	34287	TTCN_5903	48346

TTCN_1936	34288	ATCN_4085	48347
TTCN_1937	34289	GTCN_3808	48348
GTCN_1241	34290	ATCN_4086	48349
CTCN_2254	34291	GTCN_3809	48350
TTCN_1938	34292	CTCN_7095	48351
TTCN_1939	34293	ATCN_4087	48352
TTCN_1940	34294	TTCN_5904	48353
TTCN_1941	34295	TTCN_5905	48354
TTCN_1942	34296	ATCN_4088	48355
CTCN_2255	34297	GTCN_3810	48356
TTCN_1943	34298	TTCN_5906	48357
GTCN_1242	34299	CTCN_7096	48358
CTCN_2256	34300	GTCN_3811	48359
TTCN_1944	34301	ATCN_4089	48360
ATCN_1402	34302	CTCN_7097	48361
GTCN_1243	34303	ATCN_4090	48362
CTCN_2257	34304	GTCN_3812	48363
CTCN_2258	34305	TTCN_5907	48364
TTCN_1945	34306	GTCN_3813	48365
ATCN_1403	34307	CTCN_7098	48366
TTCN_1946	34308	ATCN_4091	48367
CTCN_2259	34309	TTCN_5908	48368
CTCN_2260	34310	GTCN_3814	48369
ATCN_1404	34311	GTCN_3815	48370
ATCN_1405	34312	TTCN_5909	48371
CTCN_2261	34313	ATCN_4092	48372
GTCN_1244	34314	CTCN_7099	48373
TTCN_1947	34315	GTCN_3816	48374
TTCN_1948	34316	CTCN_7100	48375
ATCN_1406	34317	ATCN_4093	48376
GTCN_1245	34318	TTCN_5910	48377
CTCN_2262	34319	TTCN_5911	48378
TTCN_1949	34320	GTCN_3817	48379
CTCN_2263	34321	CTCN_7101	48380
CTCN_2264	34322	ATCN_4094	48381
ATCN_1407	34323	ATCN_4095	48382
ATCN_1408	34324	TTCN_5912	48383
CTCN_2265	34325	TTCN_5913	48384
GTCN_1246	34326	TTCN_5914	48385
TTCN_1950	34327	CTCN_7102	48386
TTCN_1951	34328	GTCN_3818	48387
GTCN_1247	34329	ATCN_4096	48388
TTCN_1952	34330	TTCN_5915	48389

DEMANDE OU BREVET VOLUMINEUX

LA PRÉSENTE PARTIE DE CETTE DEMANDE OU CE BREVET COMPREND PLUS D'UN TOME.

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NOTE: For additional volumes, please contact the Canadian Patent Office

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NOTE POUR LE TOME / VOLUME NOTE:

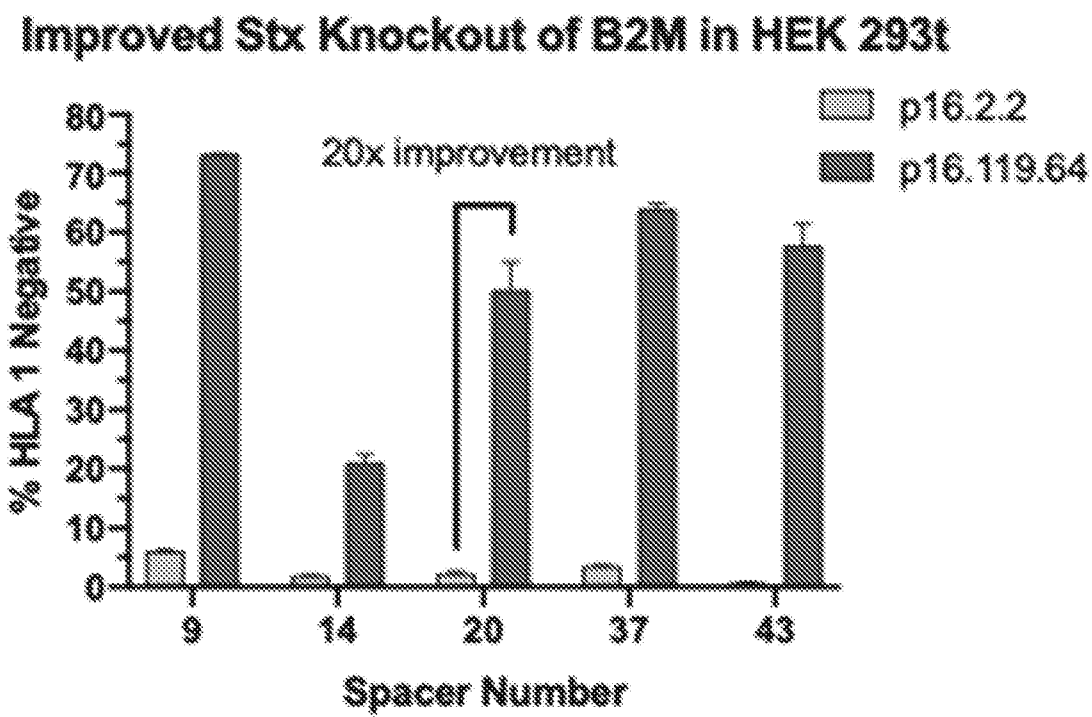

Improved Stx Knockout of B2M in HEK 293t
p16.2.2
p16.119.64
20x improvement
% HLA 1 Negative
0
10
20
30
40
50
60
70
80
9
14
20
37
43
Spacer Number

FIG. 26