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(54) Title: MODIFIED GUIDE RNAS FOR GENE EDITING

(57) Abrégé/Abstract:
This disclosure relates to modified guide RNAs having improved in vitro and in vivo activity in gene editing methods.

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(57) Abstract: This disclosure relates to modified guide RNAs having improved in vitro and in vivo activity in gene editing methods.

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# DEMANDE OU BREVET VOLUMINEUX

LA PRÉSENTE PARTIE DE CETTE DEMANDE OU CE BREVET COMPREND PLUS D'UN TOME.

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# MODIFIED GUIDE RNAS FOR GENE EDITING

[0001] This application claims the benefit of US Provisional Patent Application No. 62/682,838, filed June 8, 2018, and US Provisional Patent Application No. 62/682,820, filed June 8, 2018, each of which is incorporated herein by reference for all purposes.

[0002] This disclosure relates to the field of gene editing using CRISPR/Cas systems, a part of the prokaryotic immune system that recognizes and cuts exogenous genetic elements. The CRISPR/Cas system relies on a single nuclease, termed CRISPR-associated protein 9 (Cas9), which induces site-specific breaks in DNA. Cas9 is guided to specific DNA sequences by small RNA molecules termed guide RNA (gRNA). A complete guide RNA comprises tracrRNA (trRNA) and crisprRNA (crRNA). A crRNA comprising a guide region may also be referred to as a gRNA, with the understanding that to form a complete gRNA it should be or become associated covalently or noncovalently with a trRNA. The trRNA and crRNA may be contained within a single guide RNA (sgRNA) or in two separate RNA molecules of a dual guide RNA (dgRNA). Cas9 in combination with trRNA and crRNA or an sgRNA is termed the Cas9 ribonucleoprotein complex (RNP).

[0003] Oligonucleotides, and in particular RNA, are sometimes degraded in cells and in serum by non-enzymatic, endonuclease or exonuclease cleavage. Improved methods and compositions for preventing such degradation, improving stability of gRNAs and enhancing gene editing efficiency is desired, especially for therapeutic applications.

## SUMMARY

[0004] In some embodiments, genome editing tools are provided comprising modified guide RNA (gRNA). The modifications of gRNAs described herein may improve the stability of the gRNA and the gRNA/Cas9 complex and improve the activity of Cas9 (e.g., SaCas9, SpyCas9, and equivalents) to cleave target DNA.

[0005] In some embodiments, modified crisprRNA (crRNA) and/or modified tracrRNA (trRNA) are provided. In some embodiments, the modified crRNA and/or modified trRNA comprise a dual guide RNA (dgRNA). In some embodiments, the modified crRNA and/or modified trRNA comprise a single guide RNA (sgRNA). The modifications of crRNA and/or trRNA described herein may improve the stability of the gRNA and the gRNA/Cas9 complex and improve the activity of Cas9 (e.g., SauCas9, SpyCas9, and equivalents) to cleave target DNA. In some embodiments, the crRNA portion of a dgRNA or an sgRNA is modified in the targeting domain.

[0006] In some embodiments, genome editing tools are provided comprising short-single guide RNA (short-sgRNA). In some embodiments, the short-sgRNA is modified. The short-sgRNAs described herein may improve the stability of the short-sgRNA and the short-sgRNA/Cas9 complex and improve the activity of Cas9 (e.g., SauCas9, SpyCas9, and equivalents) to cleave target DNA.

[0007] In some embodiments, a gRNA (e.g., sgRNA, short-sgRNA, dgRNA, or crRNA) comprises a modification at one or more YA sites, e.g., as set forth in the embodiments below, Table 1, and in the Examples and associated Figures. For the avoidance of doubt, sgRNAs include but are not limited to short-sgRNAs. As discussed in the Examples section, it has been found that gRNAs can be susceptible to an RNase A-like degradation pattern, e.g., including cleavage at unmodified YA sites. It has further been found that YA site modifications can reduce or eliminate such cleavage and that many YA site modifications appear to be tolerated without adversely affecting the ability of the gRNA to direct cleavage by a nuclease such as Cas9. It has also been found that certain gRNA positions, including but not limited to YA sites, can be modified despite statements by others (*see* Yin et al., *Nature Biotechnol.* 35:1179-1187 (2017)) that they are contacted by Cas9 and should not be modified out of concern for loss of activity. Such modifications may further reduce undesirable gRNA degradation while not compromising activity.

[0008] The following embodiments are encompassed.

Embodiment 01 is a guide RNA (gRNA) which is a short-single guide RNA (short-sgRNA) comprising a conserved portion of an sgRNA comprising a hairpin region, wherein the hairpin region lacks at least 5-10 nucleotides and wherein the short-sgRNA comprises a 5' end modification or a 3' end modification.

Embodiment 02 is the gRNA of embodiment 1, wherein the short-sgRNA comprises a 5' end modification.

Embodiment 03 is the gRNA of any one of the preceding embodiments, wherein the short-sgRNA comprises a 3' end modification.

Embodiment 04 is the gRNA of any one of the preceding embodiments, wherein the short-sgRNA comprises a 5' end modification and a 3' end modification.

Embodiment 05 is the gRNA of any one of the preceding embodiments, wherein the short-sgRNA comprises a 3' tail.

Embodiment 06 is the gRNA of embodiment 5, wherein the 3' tail comprises 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 nucleotides.

Embodiment 07 is the gRNA of embodiment 5, wherein the 3' tail comprises about 1-2, 1-3, 1-4, 1-5, 1-7, 1-10, at least 1-5, at least 1-3, at least 1-4, at least 1-5, at least 1-5, at least 1-7, or at least 1-10 nucleotides.

Embodiment 08 is the gRNA of any one of the preceding embodiments, wherein the short-sgRNA does not comprise a 3' tail.

Embodiment 09 is the gRNA of any one of the preceding embodiments, comprising a modification in the hairpin region.

Embodiment 10 is the gRNA of any one of the preceding embodiments, comprising a 3' end modification, and a modification in the hairpin region.

Embodiment 11 is the gRNA of any one of the preceding embodiments, comprising a 3' end modification, a modification in the hairpin region, and a 5' end modification.

Embodiment 12 is the gRNA of any one of the preceding embodiments, comprising a 5' end modification, and a modification in the hairpin region.

Embodiment 13 is the gRNA of any one of the preceding embodiments, wherein the at least 5-10 lacking nucleotides are consecutive.

Embodiment 14 is the gRNA of any one of the preceding embodiments, wherein the at least 5-10 lacking nucleotides:

i. are within hairpin 1;
ii. are within hairpin 1 and the "N" between hairpin 1 and hairpin 2;
iii. are within hairpin 1 and the two nucleotides immediately 3' of hairpin 1;
iv. include at least a portion of hairpin 1;
v. are within hairpin 2;
vi. include at least a portion of hairpin 2;
vii. are within hairpin 1 and hairpin 2;
viii. include at least a portion of hairpin 1 and include the "N" between hairpin 1 and hairpin 2;
ix. include at least a portion of hairpin 2 and include the "N" between hairpin 1 and hairpin 2;
x. include at least a portion of hairpin 1, include the "N" between hairpin 1 and hairpin 2, and include at least a portion of hairpin 2;
xi. are within hairpin 1 or hairpin 2, optionally including the "N" between hairpin 1 and hairpin 2;
xii. are consecutive;

xiii. are consecutive and include the "N" between hairpin 1 and hairpin 2;

xiv. are consecutive and span at least a portion of hairpin 1 and a portion of hairpin 2;

xv. are consecutive and span at least a portion of hairpin 1 and the "N" between hairpin 1 and hairpin 2; or

xvi. are consecutive and span at least a portion of hairpin 1 and two nucleotides immediately 3' of hairpin 1.

Embodiment 15 is the gRNA of any one of the preceding embodiments, further comprising a guide region.

Embodiment 16 is the gRNA of any one of the preceding embodiments, wherein the 3' and/or 5' end modification comprises a protective end modification, such as a modified nucleotide selected from 2'-O-methyl (2'-OMe) modified nucleotide, 2'-O-(2-methoxyethyl) (2'-O-moe) modified nucleotide, a 2'-fluoro (2'-F) modified nucleotide, a phosphorothioate (PS) linkage between nucleotides, an inverted abasic modified nucleotide, or combinations thereof.

Embodiment 17 is the gRNA of any one of the preceding embodiments, wherein the modification in the hairpin region comprises a modified nucleotide selected from 2'-O-methyl (2'-OMe) modified nucleotide, a 2'-fluoro (2'-F) modified nucleotide, a phosphorothioate (PS) linkage between nucleotides, or combinations thereof.

Embodiment 18 is the gRNA of any one of the preceding embodiments, wherein the 3' and/or 5' end modification comprises or further comprises a 2'-O-methyl (2'-OMe) modified nucleotide.

Embodiment 19 is the gRNA of any one of the preceding embodiments, wherein the 3' and/or 5' end modification comprises or further comprises a 2'-fluoro (2'-F) modified nucleotide.

Embodiment 20 is the gRNA of any one of the preceding embodiments, wherein the 3' and/or 5' end modification comprises or further comprises a phosphorothioate (PS) linkage between nucleotides.

Embodiment 21 is the gRNA of any one of the preceding embodiments, wherein the 3' and/or 5' end modification comprises or further comprises an inverted abasic modified nucleotide.

Embodiment 22 is the gRNA of any one of the preceding embodiments, wherein the modification in the hairpin region comprises or further comprises a 2'-O-methyl (2'-OMe) modified nucleotide.

Embodiment 23 is the gRNA of any one of the preceding embodiments, wherein the modification in the hairpin region comprises or further comprises a 2'-fluoro (2'-F) modified nucleotide.

Embodiment 24 is the gRNA of any one of the preceding embodiments, wherein the 3' end modification comprises any of:

i. a modification of any one or more of the last 7, 6, 5, 4, 3, 2, or 1 nucleotides;
ii. one modified nucleotide;
iii. two modified nucleotides;
iv. three modified nucleotides;
v. four modified nucleotides;
vi. five modified nucleotides;
vii. six modified nucleotides; and
viii. seven modified nucleotides.

Embodiment 25 is the gRNA of any one of the preceding embodiments, wherein the at least 5-10 nucleotides comprise nucleotides 54-61 of SEQ ID NO:400, nucleotides 53-60 of SEQ ID NO:400; or nucleotides 54-58 of SEQ ID NO:400, optionally wherein the short-sgRNA comprises modifications at least H1-1 to H1-5 and H2-1 to H2-12.

Embodiment 26 is the gRNA of any one of the preceding embodiments, wherein the at least 5-10 nucleotides:

i. consist of 5-10 nucleotides;
ii. consist of 6-10 nucleotides;
iii. consist of 5 nucleotides;
iv. consist of 6 nucleotides;
v. consist of 7 nucleotides;
vi. consist of 8 nucleotides;
vii. consist of 9 nucleotides;
viii. consist of 10 nucleotides;
ix. consist of 5-10 consecutive nucleotides;
x. consist of 6-10 consecutive nucleotides;
xi. consist of 5 consecutive nucleotides;
xii. consist of 6 consecutive nucleotides;
xiii. consist of 7 consecutive nucleotides;

xiv. consist of 8 consecutive nucleotides;

xv. consist of 9 consecutive nucleotides; or

xvi. consist of 10 consecutive nucleotides.

Embodiment 27 is the gRNA of any one of the preceding embodiments, wherein the 3' end modification comprises one or more of:

i. a phosphorothioate (PS) linkage between nucleotides;

ii. a 2'-OMe modified nucleotide;

iii. a 2'-O-moe modified nucleotide;

iv. a 2'-F modified nucleotide;

v. an inverted abasic modified nucleotide; and

vi. a combination of one or more of (i.) - (v.).

Embodiment 28 is the gRNA of any one of the preceding embodiments, wherein the short-sgRNA comprises a 3' tail comprising one or more of:

i. a phosphorothioate (PS) linkage between nucleotides;

ii. a 2'-OMe modified nucleotide;

iii. a 2'-O-moe modified nucleotide;

iv. a 2'-F modified nucleotide;

v. an inverted abasic modified nucleotide; and

vi. a combination of one or more of (i.) - (v.).

Embodiment 29 is the gRNA any one of the preceding embodiments, wherein the short-sgRNA comprises one or more of:

i. 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 PS linkages between nucleotides;

ii. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, or 18 PS linkages between nucleotides;

iii. about 1-3, 1-5, 1-6, 1-7, 1-8, 1-9, or 1-10 PS linkages between nucleotides;

iv. about 1-3, 1-5, 1-6, 1-7, 1-8, 1-9, 1-10, 1-12, 1-14, 1-16, 1-18, or 1-20 PS linkages between nucleotides; and

v. PS linkages between each nucleotide.

Embodiment 30 is the gRNA of any one of the preceding embodiments, wherein the 3' end modification comprises at least one PS linkage, and wherein one or more of:

i. there is one PS linkage, and the linkage is between the last and second to last nucleotide;

ii. there are two PS linkages between the last three nucleotides;

iii. there are PS linkages between any one or more of the last four nucleotides;

iv. there are PS linkages between any one or more of the last five nucleotides; and

v. there are PS linkages between any one or more of the last 2, 3, 4, 5, 6, 7, 8, 9, or 10 nucleotides.

Embodiment 31 is the gRNA of embodiment 31, wherein the 3' end modification further comprises at least one 2'-OMe, 2'-O-moe, inverted abasic, or 2'-F modified nucleotide.

Embodiment 32 is the gRNA of any one of the preceding embodiments, wherein the 3' end modification comprises:

i. a modification of one or more of the last 1-7 nucleotides, wherein the modification is a PS linkage, inverted abasic nucleotide, 2'-OMe, 2'-O-moe, 2'-F, or combinations thereof;

ii. a modification to the last nucleotide with 2'-OMe, 2'-O-moe, 2'-F, or combinations thereof, and an optional one or two PS linkages to the next nucleotide and/or the first nucleotide of the 3' tail;

iii. a modification to the last and/or second to last nucleotide with 2'-OMe, 2'-O-moe, 2'-F, or combinations thereof, and optionally one or more PS linkages;

iv. a modification to the last, second to last, and/or third to last nucleotides with 2'-OMe, 2'-O-moe, 2'-F, or combinations thereof, and optionally one or more PS linkages;

v. a modification to the last, second to last, third to last, and/or fourth to last nucleotides with 2'-OMe, 2'-O-moe, 2'-F, or combinations thereof, and optionally one or more PS linkages; or

vi. a modification to the last, second to last, third to last, fourth to last, and/or fifth to last nucleotides with 2'-OMe, 2'-O-moe, 2'-F, or combinations thereof, and optionally one or more PS linkages.

Embodiment 33 is the gRNA of any one of the preceding embodiments, wherein the sgRNA comprise a 3' tail, wherein the 3' tail comprises a modification of any one or more of the nucleotides present in the 3' tail.

Embodiment 34 is the gRNA of embodiment 33, wherein the 3' tail is fully modified.

Embodiment 35 is the gRNA of embodiment 33, wherein the at least 5-10 nucleotides comprise nucleotides 54-61 of SEQ ID NO:400, nucleotides 53-60 of SEQ ID NO:400; or nucleotides 54-58 of SEQ ID NO:400, optionally wherein the short-sgRNA comprises modifications at least H1-1 to H1-5 and H2-1 to H2-12.

Embodiment 36 is the gRNA of any one of the preceding embodiments, wherein the short-sgRNA comprises any one or more of:

i. the 3' end modification as shown in any one of SEQ ID Nos: 1-54;

ii. (i) a 2'-OMe modified nucleotide at the last nucleotide of the conserved region of an sgRNA or short-sgRNA, (ii) three consecutive 2'O-moe modified nucleotides immediately 5' to the 2'-OMe modified nucleotide, and (iii) three consecutive PS linkages between the last three nucleotides;

iii. (i) five consecutive 2'-OMe modified nucleotides from the 3' end of the 3' terminus, and (ii) three PS linkages between the last three nucleotides;

iv. an inverted abasic modified nucleotide at the last nucleotide of the conserved region of an sgRNA or short-sgRNA;

v. (i) an inverted abasic modified nucleotide at the last nucleotide of the conserved region of an sgRNA or short-sgRNA, and (ii) three consecutive 2'-OMe modified nucleotides at the last three nucleotides of the conserved region of an sgRNA or short-sgRNA;

vi. (i) 15 consecutive 2'-OMe modified nucleotides from the 3' end of the 3' terminus, (ii) five consecutive 2'-F modified nucleotides immediately 5' to the 2'-OMe modified nucleotides, and (iii) three PS linkages between the last three nucleotides;

vii. (i) alternating 2'-OMe modified nucleotides and 2'-F modified nucleotides at the last 20 nucleotides of the conserved region of an sgRNA or short-sgRNA, and (ii) three PS linkages between the last three nucleotides;

viii. (i) two or three consecutive 2'-OMe modified nucleotides, and (ii) three PS linkages between the last three nucleotides;

ix. one PS linkage between the last and next to last nucleotides; and

x. 15 or 20 consecutive 2'-OMe modified nucleotides, and (ii) three PS linkages between the last three nucleotides.

Embodiment 37 is the gRNA of any one of the preceding embodiments, wherein the 5' end modification comprises any one or more of:

i. a modification of any one or more of nucleotides 1-7 of the guide region;
ii. one modified nucleotide;
iii. two modified nucleotides;
iv. three modified nucleotides;
v. four modified nucleotides;
vi. five modified nucleotides;
vii. six modified nucleotides; and
viii. seven modified nucleotides.

Embodiment 38 is the gRNA of any one of the preceding embodiments, wherein the 5' end modification comprises a modification of between 1 and 7, between 1 and 5, between 1 and 4, between 1 and 3, or between 1 and 2 nucleotides.

Embodiment 39 is the gRNA of any one of the preceding embodiments, wherein the at least 5-10 nucleotides:

i. comprise nucleotides 54-61 of SEQ ID NO:400;
ii. comprise nucleotides 53-60 of SEQ ID NO:400;
iii. comprise nucleotides 54-58 of SEQ ID NO:400.
iv. consist of nucleotides 54-61 of SEQ ID NO:400;
v. consist of nucleotides 53-60 of SEQ ID NO:400; or
vi. consist of nucleotides 54-58 of SEQ ID NO:400.

Embodiment 40 is the gRNA of any one of the preceding embodiments, wherein the 5' end modification comprises one or more of:

i. a phosphorothioate (PS) linkage between nucleotides;
ii. a 2'-OMe modified nucleotide;
iii. a 2'-O-moe modified nucleotide;
iv. a 2'-F modified nucleotide;
v. an inverted abasic modified nucleotide;
vi. a deoxyribonucleotide;
vii. an inosine; and
viii. combinations of one or more of (i.) – (vii.).

Embodiment 41 is the gRNA any one of the preceding embodiments, wherein the 5' end modification comprises:

i. 1, 2, 3, 4, 5, 6, and/or 7 PS linkages between nucleotides; or

ii. about 1-2, 1-3, 1-4, 1-5, 1-6, or 1-7 PS linkages between nucleotides.

Embodiment 42 is the gRNA of any one of the preceding embodiments, wherein the 5' end modification comprises at least one PS linkage, and wherein:

i. there is one PS linkage, and the linkage is between nucleotides 1 and 2 of the guide region;

ii. there are two PS linkages, and the linkages are between nucleotides 1 and 2, and 2 and 3 of the guide region;

iii. there are PS linkages between any one or more of nucleotides 1 and 2, 2 and 3, and 3 and 4 of the guide region;

iv. there are PS linkages between any one or more of nucleotides 1 and 2, 2 and 3, 3 and 4, and 4 and 5 of the guide region;

v. there are PS linkages between any one or more of nucleotides 1 and 2, 2 and 3, 3 and 4, 4 and 5, and 5 and 6 of the guide region;

vi. there are PS linkages between any one or more of nucleotides 1 and 2, 2 and 3, 3 and 4, 4 and 5, 5 and 6, and 6 and 7 of the guide region; or

vii. there are PS linkages between any one or more of nucleotides 1 and 2, 2 and 3, 3 and 4, 4 and 5, 5 and 6, 6 and 7, and 7 and 8 of the guide region.

Embodiment 43 is the gRNA of embodiment 42, wherein the 5' end modification further comprises at least one 2'-OMe, 2'-O-moe, inverted abasic, or 2'-F modified nucleotide.

Embodiment 44 is the gRNA of any one of the preceding embodiments, wherein the short-sgRNA comprises:

i. a modification of one or more of nucleotides 1-7 of the variable region, wherein the modification is a PS linkage, inverted abasic nucleotide, 2'-OMe, 2'-O-moe, 2'-F, 2'-H (a deoxyribonucleotide), an inosine, and/or combinations thereof;

ii. a modification to the first nucleotide of the guide region with 2'-OMe, 2'-O-moe, 2'-F, 2'-H, an inosine, or combinations thereof, and an optional PS linkage to the next nucleotide;

iii. a modification to the first and/or second nucleotide of the variable region with 2'-OMe, 2'-O-moe, 2'-F, 2'-H, an inosine, or combinations thereof, and optionally one or more PS linkages;

iv. a modification to the first, second, and/or third nucleotides of the variable region with 2'-OMe, 2'-O-moe, 2'-F, 2'-H, an inosine, or combinations thereof, and optionally one or more PS linkages;

v. a modification to the first, second, third, and/or fourth nucleotides of the variable region with 2'-OMe, 2'-O-moe, 2'-F, 2'-H, an inosine, or combinations thereof, and optionally one or more PS linkages; or

vi. a modification to the first, second, third, fourth, and/or fifth nucleotides of the variable region with 2'-OMe, 2'-O-moe, 2'-F, 2'-H, an inosine, or combinations thereof, and optionally one or more PS linkages.

Embodiment 45 is the gRNA of any one of the preceding embodiments, wherein the short-sgRNA comprises any one or more of:

i. a 5' end modification as shown in any one of SEQ ID Nos: 1-54;

ii. 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the guide region;

iii. 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the guide region and PS linkages between nucleotides 1 and 2, 2 and 3, and 3 and 4 of the guide region;

iv. 2'-OMe modified nucleotides at nucleotides 1, 2, 3, 4, and 5 of the guide region;

v. 2'-OMe modified nucleotides at nucleotides 1, 2, 3, 4, and 5 of the guide region and PS linkages between nucleotides 1 and 2, 2 and 3, 3 and 4, 4 and 5, and 5 and 6 of the guide region;

vi. 2'O-moe modified nucleotides at nucleotides 1, 2, and 3 of the guide region;

vii. 2'O-moe modified nucleotides at nucleotides 1, 2, and 3 of the guide region and PS linkages between nucleotides 1 and 2, 2 and 3, and 3 and 4 of the guide region;

viii. an inverted abasic modified nucleotide at nucleotide 1 of the guide region;

ix. an inverted abasic modified nucleotide at nucleotide 1 of the guide region and 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the guide region; and

x. an inverted abasic modified nucleotide at nucleotide 1 of the guide region, 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the

guide region, and PS linkages between nucleotides 1 and 2, 2 and 3, 3 and 4, 4 and 5, and 5 and 6 of the variable region.

Embodiment 46 is the gRNA of any one of the preceding embodiments, wherein the upper stem region comprises at least one modification.

Embodiment 47 is the gRNA of any one of the preceding embodiments, wherein the upper stem modification comprises any one or more of:

i. a modification to any one or more of US1-US12 in the upper stem region;

ii. a modification of at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or all 12 nucleotides in the upper stem region; and

iii. a modification of about 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9, 1-10, or 1-12 nucleotides in the upper stem region.

Embodiment 48 is the gRNA of embodiment 47, wherein the upper stem modification comprises one or more of:

i. a 2'-OMe modified nucleotide;

ii. a 2'-O-moe modified nucleotide;

iii. a 2'-F modified nucleotide; and

iv. combinations of one or more of (i.) – (iii.).

Embodiment 49 is a guide RNA which is a short-sgRNA comprising a conserved portion of an sgRNA comprising a hairpin region, wherein the hairpin region lacks at least 5-10 nucleotides and wherein the short-sgRNA comprises a 5' end modification and one or more modification in one or more of:

i. the upper stem region;

ii. the hairpin 1 region; and

iii. the hairpin 2 region,

wherein the 5' end modification comprises a 5' protective end modification, such as at least two phosphorothioate (PS) linkages within the first seven nucleotides.

Embodiment 50 is the gRNA of embodiment 49, wherein at least one modification comprises a 2'-O-methyl (2'-OMe) modified nucleotide.

Embodiment 51 is the gRNA of embodiment 49 or embodiment 50, wherein at least one modification comprises a 2'-fluoro (2'-F) modified nucleotide.

Embodiment 52 is the gRNA of any one of embodiments 49-51, wherein at least one modification comprises a phosphorothioate (PS) bond between nucleotides.

Embodiment 53 is the gRNA of any one of embodiments 49-52, wherein the short-sgRNA comprises one or more modifications in the upper stem region.

Embodiment 54 is the gRNA of embodiment 53, comprising modifications at any one of US1 to US12.

Embodiment 55 is the gRNA of any one of embodiments 49-54, wherein the short-sgRNA comprises one or more modifications in the hairpin 1 region.

Embodiment 56 is the gRNA of embodiment 55, wherein the short-sgRNA comprises a modification at H1-1.

Embodiment 57 is the gRNA of any one of embodiments 49-56, wherein the short-sgRNA comprises one or more modifications in the hairpin 2 region.

Embodiment 58 is the gRNA of embodiment 57, wherein the short-sgRNA comprises a modification at H2-1.

Embodiment 59 is the gRNA of any one of embodiments 49-58, wherein the short-sgRNA comprises modifications at H1-1 to H1-12.

Embodiment 60 is the gRNA of any one of embodiments 49-59, wherein the short-sgRNA comprises modifications at H2-1 to H2-15.

Embodiment 61 is the gRNA of any one of embodiments 49-60, wherein the short-sgRNA comprises one or more modifications in each of the upper stem region, the hairpin 1 region, and the hairpin 2 region.

Embodiment 62 is the gRNA of any one of embodiments 49-61, wherein the short-sgRNA comprises a modified nucleotide between hairpin 1 and hairpin 2 regions.

Embodiment 63 is the gRNA of any one of embodiments 49-62, further comprising a lower stem region comprising a modification.

Embodiment 64 is the gRNA of any one of embodiments 49-63, further comprising a 3' end modification.

Embodiment 65 is the gRNA of embodiment 64, wherein at least two of the last four nucleotides at the 3' end of the 3' terminus are modified.

Embodiment 66 is the gRNA of embodiment 64, wherein at least two of the last four nucleotides at the 3' end of the 3' terminus are modified with 2'-OMe, 2'-F, or 2'-O-moe.

Embodiment 67 is the gRNA of any one of embodiments 64-66, further comprising phosphorothioate (PS) bonds between one or more of the last four nucleotides at the 3' end of the 3' terminus.

Embodiment 68 is the gRNA of any one of embodiments 49-67, further comprising a bulge region comprising a modification.

Embodiment 69 is the gRNA of any one of embodiments 49-68, further comprising a nexus region comprising a modification.

Embodiment 70 is the gRNA of any one of embodiments 49-69, wherein at least the first three nucleotides at the 5' end of the variable region, and the last three nucleotides at the 3' end of the 3' terminus are modified.

Embodiment 71 is the gRNA of any one of embodiments 49-70, wherein the first four nucleotides at the 5' end of the variable region, and the last four nucleotides at the 3' end of the 3' terminus are linked with phosphorothioate (PS) bonds.

Embodiment 72 is the gRNA of any one of embodiments 70-71, wherein the end modifications comprise 2'-OMe.

Embodiment 73 is the gRNA of any one of embodiments 70-71, wherein the end modifications comprise 2'-F.

Embodiment 74 is the gRNA of any one of embodiments 49-73, wherein the first four nucleotides at the 5' end of the variable region and the last four nucleotides at the 3' end of the 3' terminus are linked with a PS bond, and wherein the first three nucleotides at the 5' end of the variable region and the last three nucleotides at the 3' end of the 3' terminus comprise 2'-OMe modifications.

Embodiment 75 is the gRNA of any one of embodiments 49-74, wherein the first four nucleotides at the 5' terminus and the last four nucleotides at the 3' terminus are linked with a PS bond, and wherein the first three nucleotides at the 5' terminus and the last three nucleotides at the 3' terminus comprise 2'-OMe, 2'-F, and/or 2'-O-moe modifications.

Embodiment 76 is the gRNA of any one of embodiments 49-75, wherein LS1, LS6, LS7, LS8, LS11, and/or LS12 are modified with 2'-OMe.

Embodiment 77 is the gRNA of any one of embodiments 49-76, wherein each of the nucleotides in the bulge region are modified with 2'-OMe.

Embodiment 78 is the gRNA of any one of embodiments 49-77, wherein at least 50% of the nucleotides in the bulge region are modified with 2'-OMe.

Embodiment 79 is the gRNA of any one of embodiments 49-78, wherein each of the nucleotides in the upper stem region are modified with 2'-OMe.

Embodiment 80 is the gRNA of any one of embodiments 49-79, wherein N16, N17, and/or N18 in the nexus region are modified with 2'-OMe.

Embodiment 81 is the gRNA of any one of embodiments 49-80, wherein N15, N16, N17, and/or N18 in the nexus region are modified.

Embodiment 82 is the gRNA of embodiment 80 or 81, wherein the modifications in the nexus region are selected from 2'-OMe and 2'F.

Embodiment 83 is the gRNA of any one of embodiments 80-82, wherein N16, N17, and N18 are linked with PS bonds.

Embodiment 84 is the gRNA of any one of embodiments 49-83, wherein each of the nucleotides remaining in the hairpin 1 region are modified with 2'-OMe.

Embodiment 85 is the gRNA of any one of embodiments 49-84, wherein each of the nucleotides in the hairpin 2 region are modified with 2'-OMe.

Embodiment 86 is a guide RNA which is a short-sgRNA comprising a conserved portion of an sgRNA comprising a hairpin region, wherein the hairpin region lacks at least 5-10 nucleotides and wherein the short-sgRNA comprises a 5' end modification and a 3' end modification, wherein the short-sgRNA further comprises any one or more of:

i. at least one modification in the upper stem region; and

ii. a 3' tail.

Embodiment 87 is the gRNA of embodiment 86, wherein the upper stem modification comprises any one or more of:

i. a modification of each nucleotide (US1-US12) in the upper stem region;

ii. a modification to any one or more of US1-US12 in the upper stem region;

iii. a modification of at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or all 12 nucleotides in the upper stem region; and

iv. a modification of about 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9, 1-10, or 1-12 nucleotides in the upper stem region.

Embodiment 88 is the gRNA of any one of embodiments 86-87, wherein the 5' end modification comprises any one or more of:

i. a modification of any one or more of nucleotides 1-7 of the variable region;

ii. one modified nucleotide;

iii. two modified nucleotides;

iv. three modified nucleotides;

v. four modified nucleotides;

vi. five modified nucleotides;

vii. six modified nucleotides; and

viii. seven modified nucleotides.

Embodiment 89 is the gRNA of any one of embodiments 86-88, wherein the 5' end modification comprises any one or more of:

i. a 5' end modification as shown in any one of SEQ ID Nos: 1-54, 401-532, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, 3388-3430, or 3549-3552;

ii. 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the variable region;

iii. 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the variable region and PS linkages between nucleotides 1 and 2, 2 and 3, and 3 and 4 of the variable region;

iv. 2'-OMe modified nucleotides at nucleotides 1, 2, 3, 4, and 5 of the variable region;

v. 2'-OMe modified nucleotides at nucleotides 1, 2, 3, 4, and 5 of the variable region and PS linkages between nucleotides 1 and 2, 2 and 3, 3 and 4, 4 and 5, and 5 and 6 of the variable region;

vi. 2'O-moe modified nucleotides at nucleotides 1, 2, and 3 of the variable region;

vii. 2'O-moe modified nucleotides at nucleotides 1, 2, and 3 of the variable region and PS linkages between nucleotides 1 and 2, 2 and 3, and 3 and 4 of the variable region;

viii. an inverted abasic modified nucleotide at nucleotide 1 of the variable region;

ix. an inverted abasic modified nucleotide at nucleotide 1 of the variable region and 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the variable region; and

x. an inverted abasic modified nucleotide at nucleotide 1 of the variable region, 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the variable region, and PS linkages between nucleotides 1 and 2, 2 and 3, 3 and 4, 4 and 5, and 5 and 6 of the variable region.

Embodiment 90 is the gRNA of embodiment 89, comprising 2'-OMe modified nucleotides at at least nucleotides 1, 2, and 3, of the variable region and PS linkages between nucleotides 1 and 2, 2 and 3, and 3 and 4 of the variable region.

Embodiment 91 is the gRNA of embodiment 89, comprising 2'-OMe modified nucleotides at at least nucleotides 1, 2, 3, and 4 of the variable region and PS linkages between nucleotides 1 and 2, 2 and 3, and 3 and 4 of the variable region.

Embodiment 92 is the gRNA of any one of embodiments 86-91, comprising a 3' end modification comprising any one or more of:

i. a modification of any one or more of the last 7, 6, 5, 4, 3, 2, or 1 nucleotides;
ii. one modified nucleotide;
iii. two modified nucleotides;
iv. three modified nucleotides;
v. four modified nucleotides;
vi. five modified nucleotides;
vii. six modified nucleotides; and
viii. seven modified nucleotides.

Embodiment 93 is the gRNA of any one of embodiments 86-92, wherein the short-sgRNA comprises any one or more of:

i. a 3' end modification shown in any one of SEQ ID Nos: 1-54, 401-532, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, 3388-3430, or 3549-3552;
ii. (i) a 2'-OMe modified nucleotide at the last nucleotide of the conserved region of an sgRNA or short-sgRNA, (ii) three consecutive 2'O-moe modified nucleotides immediately 5' to the 2'-OMe modified nucleotide, and (iii) three consecutive PS linkages between the last three nucleotides;
iii. (i) five consecutive 2'-OMe modified nucleotides, and (ii) three PS linkages between the last three nucleotides;
iv. an inverted abasic modified nucleotide at the last nucleotide of the conserved region of an sgRNA or short-sgRNA;
v. (i) an inverted abasic modified nucleotide at the last nucleotide of the conserved region of an sgRNA or short-sgRNA, and (ii) three

consecutive 2'-OMe modified nucleotides at the last three nucleotides of the conserved region of an sgRNA or short-sgRNA;

vi. (i) 15 consecutive 2'-OMe modified nucleotides, (ii) five consecutive 2'-F modified nucleotides immediately 5' to the 2'-OMe modified nucleotides, and (iii) three PS linkages between the last three nucleotides;

vii. (i) alternating 2'-OMe modified nucleotides and 2'-F modified nucleotides at the last 20 nucleotides of the conserved region of an sgRNA or short-sgRNA, and (ii) three PS linkages between the last three nucleotides;

viii. (i) two or three consecutive 2'-OMe modified nucleotides, and (ii) three PS linkages between the last three nucleotides;

ix. one PS linkage between the last and next to last nucleotides; and

x. 15 or 20 consecutive 2'-OMe modified nucleotides, and (ii) three PS linkages between the last three nucleotides.

Embodiment 94 is the gRNA of any one of embodiments 86-93, wherein the sgRNA comprise a 3' tail, wherein the 3' tail comprises a modification of any one or more of the nucleotides present in the 3' tail.

Embodiment 95 is the gRNA of embodiment 94, wherein the 3' tail is fully modified.

Embodiment 96 is the gRNA of embodiment 94 wherein the 3' tail comprises 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9, or 1-10 nucleotides, optionally where any one or more of these nucleotides are modified.

Embodiment 97 is a guide RNA which is a short-sgRNA comprising any of SEQ ID Nos: 1-54, 201-254, and 301-354, including the modifications of Table 1.

Embodiment 98 is a guide RNA which is a short-sgRNA comprising nucleic acids having at least 99, 98, 97, 96, 95, 94, 93, 92, 91, 90, 85, 80, 75, or 70% identity to the nucleic acids of any one of SEQ ID Nos: 1-54, 201-254, and 301-354, wherein the modification at each nucleotide of the short-sgRNA that corresponds to a nucleotide of the reference sequence identifier in Table 1, is identical to or equivalent to the modification shown in the reference sequence identifier in Table 1.

Embodiment 99 is the gRNA of any one of the preceding embodiments, comprising a YA modification at at least one guide region YA site.

Embodiment 100 is the gRNA of any one of the preceding embodiments, comprising a YA modification at at least one guide region YA site that is not a 5' end modification.

Embodiment 101 is the gRNA of any one of the preceding embodiments, comprising a YA modification at one or more guide region YA sites, wherein the guide region YA site is at or after nucleotide 8 from the 5' end of the 5' terminus.

Embodiment 102 is the gRNA of any one of the preceding embodiments comprising a YA modification at one or more guide region YA sites, wherein the short-sgRNA comprises one or more of:

a. a modification at one or more of H1-1 and H2-1;
b. a YA modification at 1, 2, 3, 4, or 5 guide region YA sites;
c. a YA modification at 1, 2, 3, 4, or 5 guide region YA sites, wherein the modification of at least one guide region YA site is different from any 5' end modification of the sgRNA;
d. a YA modification at one or more guide region YA sites, wherein the guide region YA site is at or after nucleotide 8 from the 5' end of the 5' terminus;
e. a YA modification at one or more guide region YA sites, wherein the guide region YA site is within nucleotides 5-end, 6-end, 7-end, 8-end, 9-end, or 10-end from the 5' end of the 5' terminus;
f. a YA modification at one or more guide region YA sites, wherein the guide region YA site is within 17, 16, 15, 14, 13, 12, 11, 10, or 9 nucleotides of the 3' terminal nucleotide of the guide region;
g. a YA modification at a guide region YA site other than a 5' end modification;
h. a YA modification at two or more guide region YA sites, wherein the guide region YA sites are at or after nucleotide 8 from the 5' end of the 5' terminus;
i. a YA modification at two or more guide region YA sites, wherein the two guide region YA sites are within nucleotides 5-end, 6-end, 7-end, 8-end, 9-end, or 10-end from the 5' end of the 5' terminus;
j. a YA modification at two or more guide region YA sites, wherein the guide region YA sites are within 17, 16, 15, 14, 13, 12, 11, 10, or 9 nucleotides of the 3' terminal nucleotide of the guide region;
k. a YA modification at two or more guide region YA sites other than a 5' end modification; and
l. a YA modification at two or more guide region YA sites, wherein the modifications of the guide region YA sites comprise a modification that at least one nucleotide located 5' of the guide region YA site does not comprise.

Embodiment 103 is the gRNA of any one of the preceding embodiments, comprising a YA modification wherein the modification comprises 2'-fluoro, 2'-H, 2'-OMe, ENA, UNA, inosine, or PS.

Embodiment 104 is the gRNA of any one of the preceding embodiments, comprising a YA modification wherein the modification alters the structure of the dinucleotide motif to reduce RNA endonuclease activity.

Embodiment 105 is the gRNA of any one of the preceding embodiments, comprising a YA modification wherein the modification interferes with recognition or cleavage of a YA site by an RNase and/or stabilizes an RNA structure.

Embodiment 106 is the gRNA of any one of the preceding embodiments, comprising a YA modification wherein the modification comprises one or more of:

a. a ribose modification selected from 2'-O-alkyl, 2'-F, 2'-moe, 2'-F arabinose, and 2'-H (deoxyribose);
b. a bicyclic ribose analog, such as LNA, BNA, and ENA;
c. an unlocked nucleic acid modification;
d. a base modification, such as inosine, pseudouridine, and 5'-methylcytosine; and
e. an internucleoside linkage modification such as phosphorothioate.

Embodiment 107 is the gRNA of any one of the preceding embodiments, comprising a YA modification at one or more conserved region YA sites.

Embodiment 108 is the gRNA of any one of the preceding embodiments, comprising a YA modification at one or more of conserved region YA sites 2, 3, 4, and 10.

Embodiment 109 is the gRNA of any one of the preceding embodiments, comprising a YA modification at one or more of conserved region YA sites 1 and 8.

Embodiment 110 is the gRNA of any one of the preceding embodiments, comprising a YA modification of conserved region YA site 1.

Embodiment 111 is the gRNA of any one of the preceding embodiments, comprising a YA modification of conserved region YA site 2.

Embodiment 112 is the gRNA of any one of the preceding embodiments, comprising a YA modification of conserved region YA site 3.

Embodiment 113 is the gRNA of any one of the preceding embodiments, comprising a YA modification of conserved region YA site 4.

Embodiment 114 is the gRNA of any one of the preceding embodiments, comprising a YA modification of conserved region YA site 5.

Embodiment 115 is the gRNA of any one of the preceding embodiments, comprising a YA modification of conserved region YA site 6.

Embodiment 116 is the gRNA of any one of the preceding embodiments, comprising a YA modification of conserved region YA site 7.

Embodiment 117 is the gRNA of any one of the preceding embodiments, comprising a YA modification of conserved region YA site 8.

Embodiment 118 is the gRNA of any one of the preceding embodiments, comprising a YA modification of conserved region YA site 9.

Embodiment 119 is the gRNA of any one of the preceding embodiments, comprising a YA modification of conserved region YA site 10.

Embodiment 120 is the gRNA of any one of the preceding embodiments, comprising one or more of:

a. YA modifications of conserved region YA sites 2, 3, 4, and 10;
b. YA modifications of conserved region YA sites 2, 3, and 4;
c. YA modifications of conserved region YA sites 2, 3, and 10;
d. YA modifications of conserved region YA sites 2, 4, and 10;
e. YA modifications of conserved region YA sites 3, 4, and 10;
f. YA modifications of conserved region YA sites 2 and 10;
g. YA modifications of conserved region YA sites 2 and 4;
h. YA modifications of conserved region YA sites 2 and 3;
i. YA modifications of conserved region YA sites 3 and 4;
j. YA modifications of conserved region YA sites 3 and 10;
k. YA modifications of conserved region YA sites 4 and 10
l. YA modifications of conserved region YA sites 1 and 5;
m. YA modifications of conserved region YA sites 1 and 6;
n. YA modifications of conserved region YA sites 1 and 7;
o. YA modifications of conserved region YA sites 1 and 8;
p. YA modifications of conserved region YA sites 1 and 9;
q. YA modifications of conserved region YA sites 8 and 5;
r. YA modifications of conserved region YA sites 8 and 6;
s. YA modifications of conserved region YA sites 8 and 7; and
t. YA modifications of conserved region YA sites 8 and 9;

optionally wherein the sgRNA further comprises YA modifications of conserved region YA sites 2, 3, 4, and/or 10.

Embodiment 121 is the gRNA of any one of the preceding embodiments, wherein at least one modified YA site comprises a 2'-OMe modification, optionally at the pyrimidine of the YA site.

Embodiment 122 is the gRNA of any one of the preceding embodiments, wherein at least one modified YA site comprises a 2'-fluoro modification, optionally at the pyrimidine of the YA site.

Embodiment 123 is the gRNA of any one of the preceding embodiments, wherein at least one modified YA site comprises a PS modification, optionally at the pyrimidine of the YA site.

Embodiment 124 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises modifications at at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, or all of the following nucleotides: 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 13, 14, 17, and 18, optionally wherein the modifications are 2'-OMe, 2'-fluoro, 2'-H, inosine, or phosphorothioate modifications.

Embodiment 125 is the gRNA of any one of the preceding embodiments, wherein the short-sgRNA comprises a guide region that comprises modifications at nucleotides 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 13, 14, 17, and 18, optionally wherein the modifications are 2'-OMe, 2'-fluoro, 2'-H, inosine, or phosphorothioate modifications.

Embodiment 126 is the gRNA of embodiments 124-125, wherein 2'-OMe modifications are not present in the guide region at nucleotides 6-11 and 13-end.

Embodiment 127 is the gRNA of embodiments 124-126, wherein 2'-fluoro modifications are not present in the guide region at nucleotides 1-7, 15, 16, and 19-end.

Embodiment 128 is the gRNA of embodiments 124-127, wherein phosphorothioate modifications are not present in the guide region at nucleotides 4, 5, 11-14, 17, and 18.

Embodiment 129 is the gRNA of embodiments 124-128, wherein the guide region comprises an unmodified nucleotide 20.

Embodiment 130 is the gRNA of embodiments 124-129, wherein the guide region consists of 20 nucleotides.

Embodiment 131 is the gRNA of embodiments 124-130, wherein the guide region comprises a YA site at nucleotides 5-6 and a modification at nucleotide 5.

Embodiment 132 is the gRNA of embodiments 124-131, wherein the guide region comprises a YA site at nucleotides 12-13 and a modification at nucleotide 12.

Embodiment 133 is the gRNA of embodiments 124-132, wherein the guide region comprises a YA site at nucleotides 15-16 and a modification at nucleotide 15.

Embodiment 134 is the gRNA of embodiments 124-133, wherein the guide region comprises a YA site at nucleotides 16-17 and a modification at nucleotide 16.

Embodiment 135 is the gRNA of embodiments 124-134, wherein the guide region comprises a YA site at nucleotides 19-20 and a modification at nucleotide 19.

Embodiment 136 is the gRNA of embodiments 124-130 or 132-135, wherein the guide region does not comprise a YA site at nucleotides 5-6 and nucleotide 5 is unmodified.

Embodiment 137 is the gRNA of embodiments 124-131 or 133-136, wherein the guide region does not comprise a YA site at nucleotides 12-13 and nucleotide 12 is unmodified.

Embodiment 138 is the gRNA of embodiments 124-132 or 134-137, wherein the guide region does not comprise a YA site at nucleotides 15-16 and nucleotide 15 is unmodified.

Embodiment 139 is the gRNA of embodiments 124-133 or 135-138, wherein the guide region does not comprise a YA site at nucleotides 16-17 and nucleotide 16 is unmodified.

Embodiment 140 is the gRNA of embodiments 124-134 or 136-139, wherein the guide region does not comprise a YA site at nucleotides 19-20 and nucleotide 19 is unmodified.

Embodiment 141 is the gRNA of embodiments 124-140, wherein the short-sgRNA comprises a guide region that comprises one or more of the following:

(a) 2'-OMe and phosphorothioate modifications at nucleotide 1;
(b) 2'-OMe and phosphorothioate modifications at nucleotide 2;
(c) 2'-OMe and phosphorothioate modifications at nucleotide 3;
(d) a 2'-OMe modification at nucleotide 4;
(e) a phosphorothioate modification at nucleotide 6;
(f) a phosphorothioate modification at nucleotide 7;
(g) 2'-fluoro and phosphorothioate modifications at nucleotide 8;
(h) 2'-fluoro and phosphorothioate modifications at nucleotide 9;
(i) 2'-fluoro and phosphorothioate modifications at nucleotide 10;
(j) a 2'-fluoro modification at nucleotide 11;
(k) a 2'-fluoro modifications at nucleotide 13;
(l) a 2'-fluoro modifications at nucleotide 14;

(m)a 2'-fluoro modifications at nucleotide 17; and

(n) a 2'-fluoro modifications at nucleotide 18.

Embodiment 142 is the gRNA of embodiments 124-141, wherein the guide region comprises each of the modifications set forth in the preceding embodiment.

Embodiment 143 is the gRNA of embodiments 124-142, wherein the guide region comprises at least 1, 2, 3, or 4 of the following:

(a) a 2'-OMe modification at nucleotide 5 if nucleotides 5 and 6 form a YA site;

(b) a 2'-OMe modification at nucleotide 12 if nucleotides 12 and 13 form a YA site;

(c) a phosphorothioate or 2'-H modification at nucleotide 15 if nucleotides 15 and 16 form a YA site;

(d) a phosphorothioate modification at nucleotide 16 if nucleotides 16 and 17 form a YA site; and

(e) a phosphorothioate or 2'-fluoro modification at nucleotide 19 if nucleotides 19 and 20 form a YA site.

Embodiment 144 is the gRNA of embodiments 124-143, wherein the guide region comprises a YA site at nucleotides 5-6 and a 2'-OMe modification at nucleotide 5.

Embodiment 145 is the gRNA of embodiments 124-144, wherein the guide region comprises a YA site at nucleotides 12-13 and a 2'-OMe modification at nucleotide 12.

Embodiment 146 is the gRNA of embodiments 124-145, wherein the guide region comprises a YA site at nucleotides 15-16 and a phosphorothioate modification at nucleotide 15.

Embodiment 147 is the gRNA of embodiments 124-146, wherein the guide region comprises a YA site at nucleotides 16-17 and a phosphorothioate modification at nucleotide 16.

Embodiment 148 is the gRNA of embodiments 124-147, wherein the guide region comprises a YA site at nucleotides 19-20 and a phosphorothioate modification at nucleotide 19.

Embodiment 149 is the gRNA of embodiments 124-148, wherein the guide region comprises a 2'-fluoro modification at nucleotide 19.

Embodiment 150 is the gRNA of embodiments 124-149, wherein the guide region comprises an unmodified nucleotide 15 or only a phosphorothioate modification at nucleotide 15.

Embodiment 151 is the gRNA of embodiments 124-150, wherein the guide region comprises an unmodified nucleotide 16 or only a phosphorothioate modification at nucleotide 16.

Embodiment 152 is a guide RNA which is a single guide RNA (sgRNA) comprising:

a. a YA modification at two or more guide region YA sites;
b. a YA modification at one or more of conserved region YA sites 2, 3, 4, and 10; and
c. a YA modification at one or more of conserved region YA sites 1 and 8.

Embodiment 153 is a guide RNA which is a single guide RNA (sgRNA) comprising:

a. a YA modification at one or more guide region YA sitesthat are at or after nucleotide 8 from the 5' end of the 5' terminus;
b. a YA modification at one or more of conserved region YA sites 2, 3, 4, and 10; and optionally
c. a YA modification at one or more of conserved region YA sites 1 and 8.

Embodiment 154 is a guide RNA which is a single guide RNA (sgRNA) comprising:

a. a YA modification at one or more guide region YA sitesthat are within 13 nucleotides of the 3' terminal nucleotide of the guide region;
b. a YA modification at one or more of conserved region YA sites 2, 3, 4, and 10; and
c. a YA modification at one or more of conserved region YA sites 1 and 8.

Embodiment 155 is a guide RNA which is a single guide RNA (sgRNA) comprising:

a. a 5' end modification and a 3' end modification;
b. a YA modification at one or more of conserved region YA sites 2, 3, 4, and 10; and
c. a YA modification at one or more of conserved region YA sites 1 and 8.

Embodiment 156 is a guide RNA which is a single guide RNA (sgRNA) comprising:

a. a YA modification at at least one guide region YA site, wherein the modification of the guide region YA site comprises a modification at at least one nucleotide located 5' of the guide region YA site does not comprise;
b. a YA modification at one or more of conserved region YA sites 2, 3, 4, and 10; and
c. a YA modification at one or more of conserved region YA sites 1 and 8.

Embodiment 157 is a guide RNA which is a single guide RNA (sgRNA) comprising:

a. a YA modification at one or more of conserved region YA sites 2, 3, 4, and 10; and
b. a YA modification at conserved region YA sites 1 and 8.

Embodiment 158 is a guide RNA which is a single guide RNA (sgRNA) comprising:

a. a YA modification at one or more guide region YA sitesthat are at or after nucleotide 8 from the 5' end of the 5' terminus;
b. a YA modification at one or more of conserved region YA sites 2, 3, 4, and 10; and
c. a modification at one or more of H1-1 and H2-1.

Embodiment 159 is a guide RNA which is a single guide RNA (sgRNA) comprising:

a. a YA modification at one or more of conserved region YA sites 2, 3, 4, and 10;
b. a YA modification at one or more of conserved region YA sites 1, 5, 6, 7, 8, and 9; and
c. a modification at one or more of H1-1 and H2-1.

Embodiment 160 is a guide RNA which is an sgRNA comprising any one or more of the following:

a. a modification, such as a YA modification, at one or more nucleotides located at or after nucleotide 6 from the 5' end of the 5' terminus;
b. a YA modification at one or more guide sequence YA sites;
c. a modification at one or more of B3, B4, and B5, wherein B6 does not comprise a 2'-OMe modification or comprises a modification other than 2'-OMe;
d. a modification at LS10, wherein LS10 comprises a modification other than 2'-fluoro; and/or
e. a modification at N2, N3, N4, N5, N6, N7, N10, or N11;

and

wherein at least one of the following is true:

i. at least one of nucleotides 8-11, 13, 14, 17, or 18 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
ii. at least one of nucleotides 6-10 from the 5' end of the 5' terminus does not comprise a phosphorothioate linkage;
iii. at least one of B2, B3, B4, or B5 does not comprise a 2'-OMe modification;
iv. at least one of LS1, LS8, or LS10 does not comprise a 2'-OMe modification;
v. at least one of N2, N3, N4, N5, N6, N7, N10, N11, N16, or N17 does not comprise a 2'-OMe modification;

vi. H1-1 comprises a modification;

vii. H2-1 comprises a modification; or

viii. at least one of H1-2, H1-3, H1-4, H1-5, H1-6, H1-7, H1-8, H1-9, H1-10, H2-1, H2-2, H2-3, H2-4, H2-5, H2-6, H2-7, H2-8, H2-9, H2-10, H2-11, H2-12, H2-13, H2-14, or H2-15 does not comprise a phosphorothioate linkage.

Embodiment 161 is a guide RNA comprising any one or more of the following:

i. a modification, such as a YA modification, at one or more nucleotides located at or after nucleotide 6 from the 5' end of the 5' terminus; or

ii. a YA modification at one or more guide sequence YA sites;

wherein at least one of the following is true:

a. at least one of nucleotides 8-11, 13, 14, 17, or 18 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification; or

b. at least one of nucleotides 6-10 from the 5' end of the 5' terminus does not comprise a phosphorothioate linkage;

and wherein at least one of the following is also true:

c. at least one of nucleotides 7-10 from the 5' end of the 5' terminus does not comprise a 2'-OMe modification;

d. nucleotide 20 from the 5' end of the 5' terminus does not comprise a 2'-OMe modification; or

e. the guide RNA comprises a 2'-fluoro modification at any one or more of nucleotides 1-20 from the 5' end of the 5' terminus and at least one of nucleotides 11, 12, 13, 14, 17, or 18 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification, optionally wherein nucleotide 12 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification.

Embodiment 162 is a guide RNA which is an sgRNA comprising a guanosine at N14 and/or one or more of the following:

a. a YA modification at one or more guide region YA sitesthat are at or after nucleotide 8 from the 5' end of the 5' terminus;

b. a YA modification at one or more of conserved region YA sites 1, 5, and 6, wherein if YA site 6 is modified at LS12 and LS9is not modified, then the modification of LS12 is other than 2'-OMe;

c. a modification at LS9, wherein if LS9 is modified and LS5, LS7, and LS12 are not modified, then the modification of LS9 is other than 2'-fluoro,

d. a modification at LS12, wherein if LS12 is modified and LS9 is not modified, then the modification of LS12 is other than 2'-OMe;
e. a modification at LS8 or LS11, wherein at least one of LS8 and LS11 comprises a modification other than 2'-OMe; and/or
f. a modification at N6, N14, or N17, wherein if N17 is modified and N6 and N14 are not modified, then the modification of N17 is other than 2'-fluoro and other than 2'-OMe;

and wherein at least one of the following is true:

i. at least one of nucleotides 8-11, 13-14, 17, or 18 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
ii. at least one of nucleotides 6-10 from the 5' end of the 5' terminus does not comprise a phosphorothioate linkage;
iii. at least one of B2, B3, B4, or B5 does not comprise a 2'-OMe modification;
iv. at least one of LS1, LS8, or LS10 does not comprise a 2'-OMe modification;
v. at least one of N2, N3, N4, N5, N6, N7, N10, N11, N16, or N17 does not comprise a 2'-OMe modification;
vi. H1-1 comprises a modification;
vii. H2-1 comprises a modification; or
viii. at least one of H1-2, H1-3, H1-4, H1-5, H1-6, H1-7, H1-8, H1-9, H1-10, H2-1, H2-2, H2-3, H2-4, H2-5, H2-6, H2-7, H2-8, H2-9, H2-10, H2-11, H2-12, H2-13, H2-14, or H2-15 does not comprise a phosphorothioate linkage.

Embodiment 163 is the gRNA of embodiments 161 or 162, comprising:

a. a YA modification at 1, 2, 3, 4, or 5 guide region YA sites;
b. a YA modification at 1, 2, 3, 4, or 5 guide region YA sites, wherein the modification of at least one guide region YA site is different from any 5' end modification of the sgRNA;
c. a YA modification at one or more guide region YA sites that are at or after nucleotide 8 from the 5' end of the 5' terminus;
d. a YA modification at one or more guide region YA sites that are is within nucleotides 5-end, 6-end, 7-end, 8-end, 9-end, or 10-end from the 5' end of the 5' terminus;
e. a YA modification at one or more guide region YA sites that are within 17, 16, 15, 14, 13, 12, 11, 10, or 9 nucleotides of the 3' terminal nucleotide of the guide region;

f. a YA modification at a guide region YA site other than a 5' end modification; or

g. a YA modification at a guide region YA site, wherein the modification of the guide region YA site comprises a modification at at least one nucleotide located 5' of the guide region YA site does not comprise.

Embodiment 164 is the gRNA of embodiment 163, comprising:

a. a YA modification at two or more guide region YA sites that are at or after nucleotide 8 from the 5' end of the 5' terminus;

b. a YA modification at two or more guide region YA sites that are within nucleotides 5-end, 6-end, 7-end, 8-end, 9-end, or 10-end from the 5' end of the 5' terminus;

c. a YA modification at two or more guide region YA sites that are within 17, 16, 15, 14, 13, 12, 11, 10, or 9 nucleotides of the 3' terminal nucleotide of the guide region;

d. a YA modification at two or more guide region YA sites other than a 5' end modification; or

e. a YA modification at a two or more guide region YA sites, wherein the modifications of the guide region YA sites comprise a modification at at least one nucleotide located 5' of the guide region YA site does not comprise.

Embodiment 165 is the gRNA of embodiment 163, comprising:

a. a YA modification at three or more guide region YA sites that are at or after nucleotide 8 from the 5' end of the 5' terminus;

b. a YA modification at three or more guide region YA sites that are within nucleotides 5-end, 6-end, 7-end, 8-end, 9-end, or 10-end from the 5' end of the 5' terminus;

c. a YA modification at three or more guide region YA sites that are within 17, 16, 15, 14, 13, 12, 11, 10, or 9 nucleotides of the 3' terminal nucleotide of the guide region;

d. a YA modification at three or more guide region YA sites other than a 5' end modification; or

e. a YA modification at a three or more guide region YA sites, wherein the modifications of the guide region YA sites comprise a modification at at least one nucleotide located 5' of the guide region YA site does not comprise.

Embodiment 166 is the gRNA of any one of embodiments 161-165, comprising at least one YA modification at nucleotide 6 from the 5' end of the 5' terminus.

Embodiment 167 is the gRNA of any one of embodiments 161-166, comprising at least one YA modification at nucleotide 7 from the 5' end of the 5' terminus.

Embodiment 168 is the gRNA of any one of embodiments 161-167, comprising at least one YA modification at nucleotide 8 from the 5' end of the 5' terminus.

Embodiment 169 is the gRNA of any one of embodiments 161-168, comprising at least one YA modification at nucleotide 9 from the 5' end of the 5' terminus.

Embodiment 170 is the gRNA of any one of embodiments 161-169, comprising at least one YA modification at nucleotide 10 from the 5' end of the 5' terminus.

Embodiment 171 is the gRNA of any one of embodiments 161-170, comprising at least one YA modification at nucleotide 11 from the 5' end of the 5' terminus.

Embodiment 172 is the gRNA of any one of embodiments 161-171, comprising at least one YA modification at nucleotide 12 from the 5' end of the 5' terminus.

Embodiment 173 is the gRNA of any one of embodiments 161-172, comprising at least one YA modification at nucleotide 13 from the 5' end of the 5' terminus.

Embodiment 174 is the gRNA of any one of embodiments 161-173, comprising at least one YA modification at nucleotide 14 from the 5' end of the 5' terminus.

Embodiment 175 is the gRNA of any one of embodiments 161-174, comprising at least one YA modification at nucleotide 15 from the 5' end of the 5' terminus.

Embodiment 176 is the gRNA of any one of embodiments 161-175, comprising at least one YA modification at nucleotide 16 from the 5' end of the 5' terminus.

Embodiment 177 is the gRNA of any one of embodiments 161-176, comprising at least one YA modification at nucleotide 17 from the 5' end of the 5' terminus.

Embodiment 178 is the gRNA of any one of embodiments 161-177, comprising at least one YA modification at nucleotide 18 from the 5' end of the 5' terminus.

Embodiment 179 is the gRNA of any one of embodiments 161-178, comprising at least one YA modification at nucleotide 19 from the 5' end of the 5' terminus.

Embodiment 180 is the gRNA of any one of embodiments 161-179, comprising at least one YA modification at nucleotide 20 from the 5' end of the 5' terminus.

Embodiment 181 is the gRNA of any one of embodiments 161-180, wherein at least 1, 2, 3, 4, 5, 6, 7, or 8 of nucleotides 8-11, 13-14, and 17-18 from the 5' end of the 5' terminus comprise a YA modification, optionally wherein the modification comprises 2'-fluoro, 2'-H, 2'-OMe, or PS.

Embodiment 182 is the gRNA of embodiment 181, wherein the modification is 2'-fluoro.

Embodiment 183 is the gRNA of embodiment 181, wherein the modification is 2'-OMe or 2'-H.

Embodiment 184 is the gRNA of embodiment 181, wherein the modification is PS.

Embodiment 185 is the gRNA of any one of embodiments 161-184, wherein at least 1, 2, 3, 4, or 5 of nucleotides 6-10 from the 5' terminus comprise a YA modification, optionally wherein the modification comprises 2'-fluoro, 2'-H, 2'-OMe, inosine, or PS.

Embodiment 186 is the gRNA of embodiment 185, wherein the modification is PS.

Embodiment 187 is the gRNA of embodiment 185, wherein the modification is 2'-fluoro or 2'-H.

Embodiment 188 is the gRNA of embodiment 185, wherein the modification is 2'-OMe.

Embodiment 189 is the gRNA of any one of embodiments 161-188, comprising any one or more of the following:

a. 1, 2, 3, 4, 5, 6, 7, or 8 YA modifications of nucleotides 8-11, 13-14, and 17-18 from the 5' end of the 5' terminus, wherein the YA modifications are optionally 2'-fluoro modifications, and a modification other than 2'-fluoro at one or more of nucleotides 6-10 from the 5' end of the 5' terminus;
b. a YA modification other than PS at one or more of nucleotides 8-11, 13-14, and 17-18 from the 5' end of the 5' terminus, and 1, 2, 3, 4, or 5 YA modifications at nucleotides 6-10 from the 5' end of the 5' end of the 5' terminus, optionally wherein the modifications are PS modifications;
c. 1, 2, 3, 4, 5, 6, 7, or 8 YA modifications at nucleotides 8-11, 13-14, and 17-18 from the 5' end of the 5' terminus, wherein the YA modifications are optionally 2'-fluoro modifications, and modifications other than 2'-fluoro at nucleotides 6-10 from the 5' end of the 5' terminus;
d. YA modifications other than PS at each of nucleotides 8-11, 13-14, and 17-18 from the 5' end of the 5' end of the 5' terminus, and 1, 2, 3, 4, or 5 YA modifications at nucleotides 6-10 from the 5' end of the 5' terminus, wherein the modifications are optionally PS modifications;

e. 1, 2, 3, 4, 5, 6, 7, or 8 YA modifications at nucleotides 8-11, 13-14, and 17-18 from the 5' end of the 5' terminus, wherein the YA modifications are optionally 2'-fluoro modifications, and one or more PS modification at any one of nucleotides 6-10 from the 5' end of the 5' terminus;
f. at least one 2'-fluoro modification at any one of nucleotides 8-11, 13-14, and 17-18 from the 5' end of the 5' terminus, and 1, 2, 3, 4, or 5 YA modifications of nucleotides 6-10 from the 5' end of the 5' terminus, wherein the modifications are optionally PS modifications;
g. 1, 2, 3, 4, 5, 6, 7, or 8 YA modifications of nucleotides 8-11, 13-14, and 17-18 from the 5' end of the 5' terminus, wherein the YA modifications are optionally 2'-fluoro modifications, and a PS modification at each of nucleotides 6-10 from the 5' end of the 5' terminus; or
h. a 2'-fluoro modification at each of nucleotides 8-11, 13-14, and 17-18 from the 5' end of the 5' terminus, and 1, 2, 3, 4, or 5 YA modifications of nucleotides 6-10 from the 5' end of the 5' terminus, wherein the modifications are optionally PS modifications.

Embodiment 190 is the gRNA of any one of embodiments 161-189, wherein:

a. nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 2, 3, or 4 modified YA sites including a first modified YA site comprising a 2'-OMe modification and a second modified YA site comprising a 2'-fluoro modification or a PS modification;
b. nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 2, 3, or 4 modified YA sites including a first modified YA site comprising a 2'-fluoro modification and a second modified YA site comprising a 2'-OMe modification or a PS modification;
c. nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 2, 3, or 4 modified YA sites including a first modified YA site comprising a PS modification and a second modified YA site comprising a 2'-OMe modification or a 2'-fluoro modification;
d. nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 2, 3, or 4 modified YA sites including a YA modification;

e. nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 3 or 4 modified YA sites including a first modified YA site comprising a 2'-OMe modification, a second modified YA site comprising a 2'-fluoro modification, and a third modified YA site comprising a PS modification;
f. nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 3 or 4 modified YA sites including a first modified YA site comprising a 2'-OMe modification, a second modified YA site comprising a 2'-fluoro modification, a third modified YA site comprising a 2'-fluoro modification, and a fourth modified YA site comprising a PS modification;
g. nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 3 or 4 modified YA sites including a YA modification;
h. nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 4 modified YA sites including a first modified YA site comprising a 2'-OMe modification, a second modified YA site comprising a 2'-fluoro modification, a third modified YA site comprising a PS modification, and a fourth modified YA site comprising a PS modification; or
i. nucleotides 4-40 from the 5' end of the 5' terminus comprise at least 4 modified YA sites including a YA modification.

Embodiment 191 is the gRNA of any one of embodiments 161-190, wherein nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 5 modified YA sites.

Embodiment 192 is the gRNA of any one of embodiments 161-191, wherein the at least 5 modified YA sites include a fifth modified YA site comprising a PS modification, optionally wherein the third modified YA site comprises a 2'-fluoro modification.

Embodiment 193 is the gRNA of any one of embodiments 161-192, wherein the first, second, and (if applicable) third, fourth, and fifth of the at least 5 modified YA sites are arranged in the 5' to 3' direction.

Embodiment 194 is the gRNA of any one of embodiments 161-193, wherein the first, second, and (if applicable) third, fourth, and fifth of the at least 5 modified YA sites are not arranged in the 5' to 3' direction.

Embodiment 195 is the gRNA of any one of embodiments 161-194, wherein nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 2, 3, 4, or 5 modified YA sites comprising a deoxyribonucleotide, optionally wherein the deoxyribonucleotide is the pyrimidine of the YA sites.

Embodiment 196 is the gRNA of any one of embodiments 161-195, wherein:

a. at least 1, 2, 3, or 4 of nucleotides 8-11 from the 5' end of the 5' terminus comprise a YA modification, which is optionally a 2'-fluoro modification;
b. at least 1, 2, 3, 4, 5, 6, 7, or 8 of nucleotides 8-11, 13, 14, 17, and 18 from the 5' end of the 5' terminus comprise a YA modification, optionally wherein the YA modifications are 2'-OMe if present at nucleotides 8-11 and 2'-fluoro if present at nucleotides 13, 14, 17, or 18;
c. at least one or both of nucleotides 17 and 18 from the 5' end of the 5' terminus comprise a YA modification, which is optionally a 2'-fluoro modification;
d. at least one or both of nucleotides 17 and 18 from the 5' end of the 5' terminus comprise a YA modification, which is optionally a 2'-fluoro modification; or
e. at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, or 13 of nucleotides 4-14, 17, and 18 from the 5' end of the 5' terminus comprise a YA modification, which is optionally a 2'-fluoro modification.

Embodiment 197 is the gRNA of any one of embodiments 161-196, wherein at least 1, 2, 3, 4, 5, or 6 of nucleotides 4-10 from the 5' end of the 5' terminus comprise a YA modification, which is optionally a 2'-OMe modification.

Embodiment 198 is the gRNA of any one of embodiments 161-197, wherein nucleotides 4-10 from the 5' end of the 5' terminus comprise a YA modification, which is optionally a 2'-OMe modification.

Embodiment 199 is the gRNA of any one of embodiments 161-198, wherein:

a. at least one of nucleotides 1-3 from the 5' end of the 5' terminus comprise a 5' protective end modification, which is optionally a 2'-OMe modification;
b. at least two of nucleotides 1-3 from the 5' end of the 5' terminus comprise a 5' protective end modification, which is optionally a 2'-OMe modification; or
c. each of nucleotides 1-3 from the 5' end of the 5' terminus comprise a 5' protective end modification, which is optionally a 2'-OMe modification.

Embodiment 200 is the gRNA of any one of embodiments 161-199, wherein at least 1, 2, 3, 4, or 5 of nucleotides 11, 13, 14, 17, and 18 from the 5' end of the 5' terminus comprise a 5' end modification, which is optionally a 2'-fluoro modification.

Embodiment 201 is the gRNA of any one of embodiments 161-200, wherein nucleotide 15 from the 5' end of the 5' terminus is unmodified or modified only with phosphorothioate.

Embodiment 202 is the gRNA of any one of embodiments 161-200, wherein nucleotide 16 from the 5' end of the 5' terminus is unmodified or modified only with phosphorothioate.

Embodiment 203 is the gRNA of any one of the preceding embodiments, wherein nucleotide 3 from the 5' end of the 5' terminus is unmodified or modified only with phosphorothioate.

Embodiment 204 is the gRNA of any one of embodiments 161-203, which is a crRNA or dgRNA.

Embodiment 205 is the gRNA of any one of embodiments 161-203, which is an sgRNA.

Embodiment 206 is the gRNA of any one of embodiments 161-203, which is a short-sgRNA.

Embodiment 207 is the gRNA of any one of embodiment 205 or 206, comprising a YA modification of conserved region YA site 1.

Embodiment 208 is the gRNA of any one of embodiments 205-207, comprising a YA modification of conserved region YA site 2.

Embodiment 209 is the gRNA of any one of embodiments 205-208, comprising a YA modification of conserved region YA site 3.

Embodiment 210 is the gRNA of any one of embodiments 205-209, comprising a YA modification of conserved region YA site 4.

Embodiment 211 is the gRNA of any one of embodiments 205-210, comprising a YA modification of conserved region YA site 5.

Embodiment 212 is the gRNA of any one of embodiments 205-211, comprising a YA modification of conserved region YA site 6.

Embodiment 213 is the gRNA of any one of embodiments 205-212, comprising a YA modification of conserved region YA site 7.

Embodiment 214 is the gRNA of any one of embodiments 205-213, comprising a YA modification of conserved region YA site 8.

Embodiment 215 is the gRNA of any one of embodiments 205-214, comprising a YA modification of conserved region YA site 9.

Embodiment 216 is the gRNA of any one of embodiments 205-215, comprising a YA modification of conserved region YA site 10.

Embodiment 217 is the gRNA of any one of embodiments 205-216, comprising:

a. YA modifications of conserved region YA sites 2, 3, 4, and 10;
b. YA modifications of conserved region YA sites 2, 3, and 4;

c. YA modifications of conserved region YA sites 2, 3, and 10;
d. YA modifications of conserved region YA sites 2, 4, and 10;
e. YA modifications of conserved region YA sites 3, 4, and 10;
f. YA modifications of conserved region YA sites 2 and 10;
g. YA modifications of conserved region YA sites 2 and 4;
h. YA modifications of conserved region YA sites 2 and 3;
i. YA modifications of conserved region YA sites 3 and 4;
j. YA modifications of conserved region YA sites 3 and 10; or
k. YA modifications of conserved region YA sites 4 and 10.

Embodiment 218 is the gRNA of any one of embodiments 205-217, comprising:

a. YA modifications of conserved region YA sites 1 and 5;
b. YA modifications of conserved region YA sites 1 and 6;
c. YA modifications of conserved region YA sites 1 and 7;
d. YA modifications of conserved region YA sites 1 and 8;
e. YA modifications of conserved region YA sites 1 and 9;
f. YA modifications of conserved region YA sites 8 and 5;
g. YA modifications of conserved region YA sites 8 and 6;
h. YA modifications of conserved region YA sites 8 and 7; or
i. YA modifications of conserved region YA sites 8 and 9;

optionally wherein the sgRNA further comprises YA modifications of conserved region YA sites 2, 3, 4, and 10.

Embodiment 219 is the gRNA of any one of embodiments 205-218, wherein at least one modified YA site comprises a 2'-OMe modification, optionally at the pyrimidine of the YA site.

Embodiment 220 is the gRNA of any one of embodiments 205-219, wherein at least one modified YA site comprises a 2'-fluoro modification, optionally at the pyrimidine of the YA site.

Embodiment 221 is the gRNA of any one of embodiments 205-220, wherein at least one modified YA site comprises a PS modification, optionally at the pyrimidine of the YA site.

Embodiment 222 is the gRNA of any one of embodiments 205-221, wherein at least 2, 3, 4, 5, 6, 7, 8, 9, or 10 modified YA sites comprise a 2'-OMe modification, optionally at the pyrimidines of the YA sites.

Embodiment 223 is the gRNA of any one of embodiments205-222, wherein at least 2, 3, 4, 5, 6, 7, 8, 9, or 10 modified YA sites comprise a 2'-fluoro modification, optionally at the pyrimidines of the YA sites.

Embodiment 224 is the gRNA of any one of embodiments205-223, wherein at least 2, 3, 4, 5, 6, 7, 8, 9, or 10 modified YA sites comprise a PS modification, optionally at the pyrimidines of the YA sites.

Embodiment 225 is the gRNA of any one of embodiments205-224, wherein at least 2, 3, 4, 5, 6, 7, 8, 9, or 10 modified YA sites comprise a ribose modification at the 2' position, optionally at the pyrimidines of the YA sites, and optionally chosen from a 2'-O-alkyl, 2'-H, and 2'-fluoro modification.

Embodiment 226 is the gRNA of any one of embodiments 205-225, wherein:

a. conserved region YA sites 1 and 8 comprise 2'-fluoro modifications, optionally at the pyrimidines of the YA sites;
b. conserved region YA sites 5 and 6; 5 and 7; 5 and 9; 6 and 7; 6 and 9; 5, 6, and 7; 5, 6, and 9; 6, 7, and 9; or 5, 6, 7, and 9 comprise 2'-OMe modifications, optionally at the pyrimidines of the YA sites;
c. conserved region YA site 1 comprises a 2'-fluoro modification and conserved region YA sites 5 and 6; 5 and 7; 5 and 9; 6 and 7; 6 and 9; 5, 6, and 7; 5, 6, and 9; 6, 7, and 9; or 5, 6, 7, and 9 comprise 2'-OMe modifications, optionally at the pyrimidines of the YA sites;
d. conserved region YA site 8 comprises a 2'-fluoro modification and conserved region YA sites 5 and 6; 5 and 7; 5 and 9; 6 and 7; 6 and 9; 5, 6, and 7; 5, 6, and 9; 6, 7, and 9; or 5, 6, 7, and 9 comprise 2'-OMe modifications, optionally at the pyrimidines of the YA sites;
e. conserved region YA site 1 comprises a 2'-fluoro modification at the pyrimidine of the YA sites and YA sites 5 and 6; 5 and 7; 5 and 9; 6 and 7; 6 and 9; 5, 6, and 7; 5, 6, and 9; 6, 7, and 9; or 5, 6, 7, and 9 comprise 2'-OMe modifications, optionally at the pyrimidines of the YA sites;
f. conserved region YA site 8 comprises a 2'-fluoro modification at the pyrimidine of the YA site and YA sites 5 and 6; 5 and 7; 5 and 9; 6 and 7; 6 and 9; 5, 6, and 7; 5, 6, and 9; 6, 7, and 9; or 5, 6, 7, and 9 comprise 2'-OMe modifications, optionally at the pyrimidines of the YA sites;
g. conserved region YA sites 1 and 8 comprise 2'-fluoro modifications and conserved region YA sites 5 and 6; 5 and 7; 5 and 9; 6 and 7; 6 and 9; 5, 6,

and 7; 5, 6, and 9; 6, 7, and 9; or 5, 6, 7, and 9 comprise 2'-OMe modifications, optionally at the pyrimidines of the YA sites; or

h. conserved region YA sites 1 and 8 comprise 2'-fluoro modifications at the pyrimidines of the YA sites and conserved region YA sites 5 and 6; 5 and 7; 5 and 9; 6 and 7; 6 and 9; 5, 6, and 7; 5, 6, and 9; 6, 7, and 9; or 5, 6, 7, and 9 comprise 2'-OMe modifications, optionally at the pyrimidines of the YA sites.

Embodiment 227 is the gRNA of any one of embodiments 205-226, wherein conserved region YA sites 7 and 9 comprise YA modifications, which are optionally 2'-OMe modifications.

Embodiment 228 is the gRNA of any one of embodiments 205-227, wherein conserved region YA sites 5, 6, 7, and 9 comprise YA modifications, which are optionally 2'-OMe modifications.

Embodiment 229 is the gRNA of any one of embodiments 205-228, wherein conserved region YA site 8 comprises a 2'-fluoro modification.

Embodiment 230 is the gRNA of any one of embodiments 205-229, wherein conserved region YA site 8 comprises a deoxyribonucleotide modification.

Embodiment 231 is the gRNA of any one of embodiments 205-230, wherein conserved region YA site 8 is abolished by a base substitution, optionally wherein the base substitution eliminates the uracil of YA site 8, further optionally wherein the base substitution is a uracil to guanine substitution.

Embodiment 232 is the gRNA of any one of embodiments 205-231, wherein conserved region YA site 1 comprises a 2'-fluoro modification.

Embodiment 233 is the gRNA of any one of embodiments 205-232, wherein conserved region YA site 1 comprises a PS modification.

Embodiment 234 is the gRNA of any one of embodiments 205-233, wherein 1, 2, 3, 4, 5, 6, or 7 of LS5, LS7, LS8, LS9, LS10, LS11, and LS12 comprise modifications, optionally wherein the modifications are 2'-fluoro and/or 2'-OMe modifications.

Embodiment 235 is the gRNA of any one of embodiments 205-234, wherein modifications at LS5, LS7, LS9, and LS11, if present, comprise 2'-fluoro modifications, optionally wherein each of LS5, LS7, LS9, and LS11 comprise 2'-fluoro modifications.

Embodiment 236 is the gRNA of any one of embodiments 205-235, wherein modifications at LS8, LS10, and LS12, if present, comprise 2'-OMe modifications, optionally wherein each of LS8, LS10, and LS12 comprise 2'-OMe modifications.

Embodiment 237 is the gRNA of any one of embodiments 205-236, wherein 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 of N2, N3, N4, N5, N6, N7, N10, N11, N16, and N17 comprise modifications, which are optionally 2'-OMe modifications.

Embodiment 238 is the gRNA of any one of embodiments 205-237, wherein H2-2 comprises a modification, optionally wherein H2 is otherwise unmodified.

Embodiment 239 is the gRNA of any one of embodiments 205-238, wherein H2-2 comprises a 2'-OMe modification.

Embodiment 240 is the gRNA of any one of embodiments 205-239, wherein US3, US9, and US12 comprise modifications, optionally wherein the US is otherwise unmodified.

Embodiment 241 is the gRNA of any one of embodiments 205-240, wherein US3, US9, and US12 comprise 2'-OMe modifications.

Embodiment 242 is the gRNA of any one of embodiments 205-241, wherein nucleotides 6-10 from the 5' end of the 5' terminus comprise a PS modification and nucleotides 8-11, 13, 14, 17, and 18 from the 5' end of the 5' terminus comprise a 2'-fluoro modification.

Embodiment 243 is the gRNA of any one of embodiments 205-242, wherein each guide region YA site comprises a 2'-fluoro modification, optionally excepting nucleotides 15 and/or 16 from the 5' end of the 5' terminus.

Embodiment 244 is the gRNA of any one of embodiments 205-243, wherein nucleotides 4, 8, and 11 from the 5' end of the 5' terminus comprise YA modifications, optionally wherein nucleotide 4 comprises a 2'-OMe modification and nucleotides 8 and 11 comprise a 2'-fluoro modification.

Embodiment 245 is the gRNA of any one of embodiments 205-244, wherein 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, or more modified YA sites comprise a YA modification at the pyrimidine position of the YA site.

Embodiment 246 is the gRNA of embodiment 245, wherein 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 modified conserved region YA sites comprise a YA modification at the pyrimidine position of the YA site.

Embodiment 247 is the gRNA of any one of embodiments 205-246, wherein 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, or more modified YA sites comprise a YA modification at the adenine position of the YA site.

Embodiment 248 is the gRNA of embodiment 247, wherein 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 modified conserved region YA sites comprise a YA site modification at the adenine position of the YA site.

Embodiment 249 is the gRNA of any one of embodiments 205-248, comprising:

a. a modification of H1-1;
b. a modification of H2-1; or
c. modifications of H1-1 and H2-1.

Embodiment 250 is the gRNA of embodiment 249, wherein H1-1 and/or H2-1 comprises a 2'-OMe modification.

Embodiment 251 is the gRNA of embodiment 250, wherein H1-1 and/or H2-1 comprises a 2'-fluoro modification.

Embodiment 252 is the gRNA of embodiment 251, wherein H1-1 and/or H2-1 comprises a PS modification.

Embodiment 253 is the gRNA of any one of embodiments 205-252, comprising a modification at B3, optionally wherein B6 does not comprise a 2'-OMe modification or comprises a modification other than 2'-OMe.

Embodiment 254 is the gRNA of any one of embodiments 205-253, comprising a modification at B4, optionally wherein B6 does not comprise a 2'-OMe modification or comprises a modification other than 2'-OMe.

Embodiment 255 is the gRNA of any one of embodiments 205-254, comprising a modification at B5, optionally wherein B6 does not comprise a 2'-OMe modification or comprises a modification other than 2'-OMe.

Embodiment 256 is the gRNA of any one of embodiments 205-255, comprising a modification at LS10, optionally wherein LS10 comprises a modification other than 2'-fluoro.

Embodiment 257 is the gRNA of any one of embodiments 205-256, comprising a modification at N2.

Embodiment 258 is the gRNA of any one of embodiments 205-257, comprising a modification at N3.

Embodiment 259 is the gRNA of any one of embodiments 205-258, comprising a modification at N4.

Embodiment 260 is the gRNA of any one of embodiments 205-259, comprising a modification at N5.

Embodiment 261 is the gRNA of any one of embodiments 205-260, comprising a modification at N6.

Embodiment 262 is the gRNA of any one of embodiments 205-261, comprising a modification at N7.

Embodiment 263 is the gRNA of any one of embodiments 205-262, comprising a modification at N10.

Embodiment 264 is the gRNA of any one of embodiments 205-263, comprising a modification at N11.

Embodiment 265 is the gRNA of any one of embodiments 205-264,, wherein:

a. nucleotide 8 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
b. nucleotide 9 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
c. nucleotide 10 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
d. nucleotide 11 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
e. nucleotide 13 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
f. nucleotide 14 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
g. nucleotide 17 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification; and/or
h. nucleotide 18 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification.

Embodiment 266 is the gRNA of any one of embodiments 205-265, wherein:

a. nucleotide 6 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
b. nucleotide 7 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
c. nucleotide 8 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
d. nucleotide 9 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification; and/or

e. nucleotide 10 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification.

Embodiment 267 is the gRNA of any one of embodiments 205-266, wherein:

a. nucleotide 6 from the 5' end of the 5' terminus does not comprise a phosphorothioate linkage;
b. nucleotide 7 from the 5' end of the 5' terminus does not comprise a phosphorothioate linkage;
c. nucleotide 8 from the 5' end of the 5' terminus does not comprise a phosphorothioate linkage;
d. nucleotide 9 from the 5' end of the 5' terminus does not comprise a phosphorothioate linkage; and/or
e. nucleotide 10 from the 5' end of the 5' terminus does not comprise a phosphorothioate linkage.

Embodiment 268 is the gRNA of any one of embodiments 205-267, wherein:

a. nucleotide 7 from the 5' end of the 5' terminus does not comprise a 2'-OMe modification;
b. nucleotide 8 from the 5' end of the 5' terminus does not comprise a 2'-OMe modification;
c. nucleotide 9 from the 5' end of the 5' terminus does not comprise a 2'-OMe modification; and/or
d. nucleotide 10 from the 5' end of the 5' terminus does not comprise a 2'-OMe modification.

Embodiment 269 is the gRNA of any one of embodiments 205-268, wherein nucleotide 20 from the 5' end of the 5' terminus does not comprise a 2'-OMe modification.

Embodiment 270 is the gRNA of any one of embodiments 205-269, wherein the guide RNA comprises a 2'-fluoro modification at any one or more of nucleotides 1-11 and 13-20 from the 5' end of the 5' terminus and nucleotide 12 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification.

Embodiment 271 is the gRNA of any one of embodiments 205-270, wherein the guide RNA comprises a 2'-fluoro modification at any one or more of nucleotides 1-20 from the 5' end of the 5' terminus and:

a. nucleotide 11 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;

b. nucleotide 12 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
c. nucleotide 13 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
d. nucleotide 14 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
e. nucleotide 17 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification; and/or
f. nucleotide 18 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification.

Embodiment 272 is the gRNA of any one of embodiments 205-271, wherein:

a. B2 does not comprise a 2'-OMe modification;
b. B3 does not comprise a 2'-OMe modification;
c. B4 does not comprise a 2'-OMe modification; and/or
d. B5 does not comprise a 2'-OMe modification.

Embodiment 273 is the gRNA of any one of embodiments 205-272, wherein:

a. LS1 does not comprise a 2'-OMe modification;
b. LS8 does not comprise a 2'-OMe modification; and/or
c. LS10 does not comprise a 2'-OMe modification.

Embodiment 274 is the gRNA of any one of embodiments 205-273, wherein:

a. N2 does not comprise a 2'-OMe modification;
b. N3 does not comprise a 2'-OMe modification;
c. N4 does not comprise a 2'-OMe modification;
d. N5 does not comprise a 2'-OMe modification;
e. N6 does not comprise a 2'-OMe modification;
f. N7 does not comprise a 2'-OMe modification;
g. N10 does not comprise a 2'-OMe modification;
h. N11 does not comprise a 2'-OMe modification;
i. N16 does not comprise a 2'-OMe modification; and/or
j. N17 does not comprise a 2'-OMe modification.

Embodiment 275 is the gRNA of any one of embodiments 205-274, wherein:

a. H1-2 does not comprise a phosphorothioate linkage;
b. H1-3 does not comprise a phosphorothioate linkage;

c. H1-4 does not comprise a phosphorothioate linkage;
d. H1-5 does not comprise a phosphorothioate linkage;
e. H1-6 does not comprise a phosphorothioate linkage;
f. H1-7 does not comprise a phosphorothioate linkage;
g. H1-8 does not comprise a phosphorothioate linkage;
h. H1-9 does not comprise a phosphorothioate linkage;
i. H1-10 does not comprise a phosphorothioate linkage;
j. H2-1 does not comprise a phosphorothioate linkage;
k. H2-2 does not comprise a phosphorothioate linkage;
l. H2-3 does not comprise a phosphorothioate linkage;
m. H2-4 does not comprise a phosphorothioate linkage;
n. H2-5 does not comprise a phosphorothioate linkage;
o. H2-6 does not comprise a phosphorothioate linkage;
p. H2-7 does not comprise a phosphorothioate linkage;
q. H2-8 does not comprise a phosphorothioate linkage;
r. H2-9 does not comprise a phosphorothioate linkage;
s. H2-10 does not comprise a phosphorothioate linkage;
t. H2-11 does not comprise a phosphorothioate linkage;
u. H2-12 does not comprise a phosphorothioate linkage;
v. H2-13 does not comprise a phosphorothioate linkage;
w. H2-14 does not comprise a phosphorothioate linkage; and/or
x. H2-15 does not comprise a phosphorothioate linkage.

Embodiment 276 is a gRNA which is an sgRNA comprising modifications at:

a. nucleotides 6-10 from the 5' end of the 5' terminus, which are optionally PS modifications;
b. nucleotides 8-11, 13, 14, 17, and 18 from the 5' end of the 5' terminus, which are optionally 2'-fluoro modifications; and
c. H1-1 and H2-1, which are optionally 2'-OMe modifications, or conserved region YA site 1 or 8.

Embodiment 277 is a gRNA which is an sgRNA comprising YA modifications at:

a. conserved region YA sites 1, 5, 6, 7, and 9, which are optionally 2'-OMe modifications; and
b. conserved region YA site 8, which is optionally a 2'-fluoro modification.

Embodiment 278 is a gRNA comprising YA modifications at four guide region YA sites, wherein at least one of the YA sites is at or after nucleotide 8 from the 5' end of the 5' terminus, and wherein:

a. the first YA site comprises a 2'-OMe modification;
b. the second YA site comprises a 2'-fluoro modification;
c. the third YA site comprises a 2'-fluoro or PS modification; and
d. the fourth YA site comprises a PS modification,

optionally wherein the first, second, third, and fourth YA sites are arranged in the 5' to 3' direction.

Embodiment 279 is the gRNA of embodiment 278, wherein the third YA site comprises a PS modification.

Embodiment 280 is the gRNA of any one of embodiments 278-279, wherein the third YA site comprises a 2'-fluoro modification.

Embodiment 281 is the gRNA of any one of embodiments 278-280, further comprising a fifth YA site comprising a PS modification, which is optionally 3' of the fourth YA site.

Embodiment 282 is the gRNA of any one of the embodiments 205-281, wherein conserved region YA sites 1, 5, 6, 7, and 9 comprise YA modifications, which are optionally 2'-OMe modifications; and conserved region YA site 8 comprises a modification, which is optionally a 2'-fluoro modification.

Embodiment 283 is a gRNA which is an sgRNA comprising YA modifications at:

a. nucleotide 4 from the 5' end of the 5' terminus, wherein the YA modification is optionally a 2'-OMe modification;
b. nucleotides 6-10 from the 5' end of the 5' terminus, which are optionally PS modifications;
c. nucleotides 8-11, 13, 14, 17, and 18 from the 5' end of the 5' terminus, which are optionally 2'-fluoro modifications;
d. LS5, LS7, LS9, and LS11, which are optionally 2'-fluoro modifications;
e. LS8, LS10, and LS12, which are optionally 2'-OMe modifications;
f. N2, N3, N4, N5, N6, N7, N10, N11, N16, and N17, which are optionally 2'-OMe modifications; and
g. N14, which is optionally a 2'-fluoro modification.

Embodiment 284 is the gRNA of any one of embodiment 161-, wherein one or more of the following are true:

a. nucleotide 4 from the 5' end of the 5' terminus comprises a 2'-OMe modification;
b. nucleotides 6-10 from the 5' end of the 5' terminus comprise PS modifications;
c. nucleotides 8-11, 13, 14, 17, and 18 from the 5' end of the 5' terminus comprise 2'-fluoro modifications;
d. LS5, LS7, LS9, and LS11 comprise 2'-fluoro modifications;
e. LS8, LS10, and LS12 comprise 2'-OMe modifications;
f. N2, N3, N4, N5, N6, N7, N10, N11, N16, and N17 comprise 2'-OMe modifications; and
g. N14 comprises a 2'-fluoro modification.

Embodiment 285 is the gRNA of any one of embodiments 161-284, wherein at least one YA modification comprises a modification of the pyrimidine position of the YA site.

Embodiment 286 is the gRNA of any one of embodiments 161-285, wherein at least one YA modification comprises a modification of the adenine position of the YA site.

Embodiment 287 is the gRNA of any one of embodiments 161-286, wherein at least 2, 3, 4, 5, 6, 7, 8, 9, or 10 YA sites comprise YA modifications at the pyrimidines positions of the YA sites.

Embodiment 288 is the gRNA of any one of embodiments 161-287, wherein at least 2, 3, 4, 5, 6, 7, 8, 9, or 10 YA sites comprise YA modifications at the adenine positions of the YA sites.

Embodiment 289 is the gRNA of any one of embodiments 161-288, wherein at least one YA modification comprises a 2'-OMe modification.

Embodiment 290 is the gRNA of any one of embodiments 161-289, wherein at least 2, 3, 4, 5, 6, 7, 8, 9, or 10 YA sites comprise a 2'-OMe modification.

Embodiment 291 is the gRNA of any one of embodiments 161-290, wherein each modified conserved region YA site comprises a modification at the pyrimidine position of the YA site.

Embodiment 292 is the gRNA of any one of embodiments 161-291, wherein each modified guide region YA site, or each modified conserved region and guide region YA site, comprises a modification at the pyrimidine position of the YA site.

Embodiment 293 is the gRNA of any one of embodiments 161-292, wherein each modified conserved region YA site comprises a modification at the adenine position of the YA site.

Embodiment 294 is the gRNA of any one of embodiments 161-293, wherein each modified guide region YA site, or each modified conserved region and guide region YA site, comprises a modification at the adenine position of the YA site.

Embodiment 295 is the gRNA of any one of embodiments 161-294, which is an sgRNA comprising a modification at LS5.

Embodiment 296 is the gRNA of any one of embodiments 161-295, which is an sgRNA comprising a modification at LS7.

Embodiment 297 is the gRNA of any one of embodiments 161-296, which is an sgRNA comprising a modification at LS9, optionally wherein if LS9 is modified and LS5, LS7, and LS12 are not, then the modification of LS9 is other than 2'-fluoro.

Embodiment 298 is the gRNA of any one of embodiments 161-297, which is an sgRNA comprising a modification at LS12, optionally wherein if LS12 is modified and LS9 is not, then the modification of LS12 is other than 2'-OMe.

Embodiment 299 is the gRNA of any one of embodiments 161-298, which is an sgRNA comprising at least one YA modification that stabilizes a secondary structure, optionally wherein the secondary structure is the lower stem.

Embodiment 300 is the gRNA of any one of embodiments 161-299, which is an sgRNA comprising at least one modification of LS8 and/or LS11, optionally wherein the modification of LS8 and/or LS11 stabilizes a secondary structure.

Embodiment 301 is the gRNA of any one of embodiments 161-300, comprising a YA modification that stabilizes a secondary structure chosen from:

a. ENA;
b. LNA; or
c. a bicyclic ribose modification.

Embodiment 302 is the gRNA of any one of embodiments 161-301, which is an sgRNA comprising a modification at N6.

Embodiment 303 is the gRNA of any one of embodiments 161-302, which is an sgRNA comprising a modification at N14.

Embodiment 304 is the gRNA of any one of embodiments 161-303, which is an sgRNA comprising a modification at N17, optionally wherein if N17 is modified and N6 and N14 are not, then the modification of N17 is other than 2'-fluoro and other than 2'-OMe.

Embodiment 305 is the gRNA of any one of embodiments 161-304, wherein at least 1, 2, or 3 of nucleotides 1-3 from the 5' end of the 5' terminus comprise

deoxyribonucleotides, optionally wherein nucleotides 1-3 from the 5' end of the 5' terminus comprise PS modifications.

Embodiment 306 is the gRNA of any one of embodiments 161-305, wherein the gRNA is an sgRNA and at least 1, 2, or 3 of nucleotides 1-3 from the 3' end of the 3' terminus comprise deoxyribonucleotides, optionally wherein nucleotides 2-3 from the 3' end of the 3' terminus comprise PS modifications.

Embodiment 307 is the gRNA of any one of embodiments 161-306, wherein the gRNA is an sgRNA and nucleotide 4 from the 3' end of the 3' terminus comprises a PS modification, optionally wherein nucleotide 4 from the 3' end of the 3' terminus comprises a 2'-OMe modification.

Embodiment 308 is the gRNA of any one of embodiments 161-307, wherein the gRNA is an sgRNA and hairpin 2 comprises deoxyribonucleotides, optionally wherein all or all but 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 nucleotides of hairpin 1 and hairpin 2 are deoxyribonucleotides.

Embodiment 309 is the gRNA of any one of embodiments 161-308, wherein the gRNA is an sgRNA and hairpin 1 and hairpin 2 comprise deoxyribonucleotides, optionally wherein all or all but 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, or 13 nucleotides of hairpin 1 and hairpin 2 are deoxyribonucleotides.

Embodiment 310 is the gRNA of any one of embodiments 161-309, wherein the gRNA is an sgRNA and all or all but 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, or 13 nucleotides from the beginning of hairpin 1 to the 3' end of the sgRNA are deoxyribonucleotides, optionally wherein nucleotides 1-3 from the 3' end of the 3' terminus are deoxyribonucleotides.

Embodiment 311 is the gRNA of any one of embodiments 161-310, wherein the gRNA is an sgRNA and the upper stem comprises deoxyribonucleotides.

Embodiment 312 is the gRNA of any one of embodiments 161-311, wherein the gRNA is an sgRNA and all or all but 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 nucleotides of the upper stem are deoxyribonucleotides.

Embodiment 313 is the gRNA of any one of embodiments 161-312, wherein at least 1, 2, or 3 of nucleotides 1-3 from the 5' end of the 5' terminus comprise ENA, optionally wherein nucleotides 1-3 from the 5' end of the 5' terminus comprise PS modifications.

Embodiment 314 is the gRNA of any one of embodiments 161-313, wherein the gRNA is an sgRNA and at least 1, 2, or 3 of nucleotides 2-4 from the 3' end of the 3' terminus

comprise ENA, optionally wherein nucleotides 2-3 from the 3' end of the 3' terminus comprise PS modifications.

Embodiment 315 is the gRNA of any one of embodiments 161-314, wherein at least 1, 2, or 3 of nucleotides 1-3 from the 5' end of the 5' terminus comprise UNA, optionally wherein nucleotides 1-3 from the 5' end of the 5' terminus comprise PS modifications.

Embodiment 316 is the gRNA of any one of embodiments 161-315, wherein the gRNA is an sgRNA and at least 1, 2, or 3 of nucleotides 2-4 from the 3' end of the 3' terminus comprise UNA, optionally wherein nucleotides 2-3 from the 3' end of the 3' terminus comprise PS modifications.

Embodiment 317 is the gRNA of any one of embodiments 161-316, wherein the gRNA is an sgRNA and nucleotide 4 from the 3' end of the 3' terminus comprises a PS modification, optionally wherein nucleotide 4 from the 3' end of the 3' terminus comprises a 2'-OMe modification.

Embodiment 318 is the gRNA of any one embodiments 161-317, wherein the gRNA is an sgRNA that comprises a 3' end modification.

Embodiment 319 is the gRNA of any one of embodiments 161-318, which is an sgRNA comprising a 3' end modification, wherein the 3' end modification is a protective 3' end modification.

Embodiment 320 is the gRNA of any one embodiments 161-319, wherein the gRNA is an sgRNA that comprises a 3' tail.

Embodiment 321 is the gRNA of embodiment 320, wherein the 3' tail comprises 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 nucleotides.

Embodiment 322 is the gRNA of embodiment 320, wherein the 3' tail comprises about 1-2, 1-3, 1-4, 1-5, 1-7, 1-10, at least 1-5, at least 1-3, at least 1-4, at least 1-5, at least 1-5, at least 1-7, or at least 1-10 nucleotides.

Embodiment 323 is the gRNA of any one of embodiments 161-322, which is an sgRNA comprising a modification in the hairpin region.

Embodiment 324 is the gRNA of any one of embodiments 161-323, which is an sgRNA comprising a 3' end modification, and a modification in the hairpin region.

Embodiment 325 is the gRNA of embodiment 323 or 324, wherein the modification in the hairpin region comprises a modified nucleotide selected from 2'-O-methyl (2'-O-Me) modified nucleotide, a 2'-fluoro (2'-F) modified nucleotide, or combinations thereof.

Embodiment 326 is the gRNA of any one of embodiments 323-325, wherein the modification in the hairpin region comprises or further comprises a 2'-O-methyl (2'-O-Me) modified nucleotide.

Embodiment 327 is the gRNA of any one of embodiments 323-326, wherein the modification in the hairpin region comprises or further comprises a 2'-fluoro (2'-F) modified nucleotide.

Embodiment 328 is the gRNA of any one of embodiments 161-327, comprising 3' and/or 5' protective end modification(s).

Embodiment 329 is the gRNA of embodiment 328, wherein the 3' and/or 5' end modification comprises a modified nucleotide selected from 2'-O-methyl (2'-O-Me) modified nucleotide, 2'-O-(2-methoxyethyl) (2'-O-moe) modified nucleotide, a 2'-fluoro (2'-F) modified nucleotide, a phosphorothioate (PS) linkage between nucleotides, an inverted abasic modified nucleotide, or combinations thereof.

Embodiment 330 is the gRNA of embodiment 328 or 329, wherein the 3' and/or 5' end modification comprises or further comprises a 2'-O-methyl (2'-O-Me) modified nucleotide.

Embodiment 331 is the gRNA of embodiment 328 or 329, wherein the 3' and/or 5' end modification comprises or further comprises a 2'-fluoro (2'-F) modified nucleotide.

Embodiment 332 is the gRNA of embodiment 328 or 329, wherein the 3' and/or 5' end modification comprises or further comprises a phosphorothioate (PS) linkage between nucleotides.

Embodiment 333 is the gRNA of embodiment 328 or 329, wherein the 3' and/or 5' end modification comprises or further comprises an inverted abasic modified nucleotide.

Embodiment 334 is the gRNA of any one any one of embodiments 161-333, wherein the gRNA is an sgRNA and if the sgRNA comprises a 3' end modification, the 3' end modification comprises any one or more of the following:

i. a modification of any one or more of the last 7, 6, 5, 4, 3, 2, or 1 nucleotides;
ii. one modified nucleotide;
iii. two modified nucleotides;
iv. three modified nucleotides;
v. four modified nucleotides;
vi. five modified nucleotides;
vii. six modified nucleotides; and

viii. seven modified nucleotides.

Embodiment 335 is the gRNA of embodiment 334, wherein the 3' end modification comprises a modification of between 1 and 7, between 1 and 5, between 1 and 4, or between 2 and 4 nucleotides.

Embodiment 336 is the gRNA of any one of embodiments 161-335, wherein the gRNA is an sgRNA comprising a 3' end modification and the 3' end modification comprises one or more of the following:

i. a phosphorothioate (PS) linkage between nucleotides;
ii. a 2'-O-Me modified nucleotide;
iii. a 2'-O-moe modified nucleotide;
iv. a 2'-F modified nucleotide;
v. an inverted abasic modified nucleotide
vi. ENA, UNA, and/or DNA; and
vii. or a combination thereof.

Embodiment 337 is the gRNA of any one of embodiments 161-336, wherein the gRNA is an sgRNA comprising a 3' tail, and the 3' tail comprises any one or more of:

i. a phosphorothioate (PS) linkage between nucleotides;
ii. a 2'-O-Me modified nucleotide;
iii. a 2'-O-moe modified nucleotide;
iv. a 2'-F modified nucleotide;
v. an inverted abasic modified nucleotide
vi. ENA, UNA, and/or DNA; and
vii. or a combination thereof.

Embodiment 338 is the gRNA of embodiment 336, wherein the 3' end modification comprises:

i. 1, 2, 3, 4, 5, 6, or 7 PS linkages between nucleotides;
ii. about 1-3, 1-5, 1-6, or 1-7 PS linkages between nucleotides; or
iii. PS linkages between each nucleotide.

Embodiment 339 is the gRNA of any one of embodiments embodiment 326-328, wherein the 3' end modification further comprises at least one 2'-O-Me, 2'-O-moe, inverted abasic, or 2'-F modified nucleotide.

Embodiment 340 is the gRNA of any one of embodiments 326-329, wherein the 3' end modification comprises at least one PS linkage, and wherein:

i. there is one PS linkage, and the linkage is between the last and second to last nucleotide;

ii. there are two PS linkages between the last three nucleotides;

iii. there are PS linkages between any one or more of the last four nucleotides;

iv. there are PS linkages between any one or more of the last five nucleotides; or

v. there are PS linkages between any one or more of the last 2, 3, 4, 5, 6, 7, 8, 9, or 10 nucleotides.

Embodiment 341 is the gRNA of any one of embodiments 336-340, wherein the 3' end modification comprises:

i. a modification of one or more of the last 1-7 nucleotides, wherein the modification is a PS linkage, inverted abasic nucleotide, 2'-O-Me, 2'-O-moe, 2'-F, or combinations thereof;

ii. a modification to the last nucleotide with 2'-O-Me, 2'-O-moe, 2'-F, or combinations thereof, and an optional one or two PS linkages to the next nucleotide and/or the first nucleotide of the 3' tail;

iii. a modification to the last and/or second to last nucleotide with 2'-O-Me, 2'-O-moe, 2'-F, or combinations thereof, and optionally one or more PS linkages;

iv. a modification to the last, second to last, and/or third to last nucleotides with 2'-O-Me, 2'-O-moe, 2'-F, or combinations thereof, and optionally one or more PS linkages;

v. a modification to the last, second to last, third to last, and/or fourth to last nucleotides with 2'-O-Me, 2'-O-moe, 2'-F, or combinations thereof, and optionally one or more PS linkages; or

vi. a modification to the last, second to last, third to last, fourth to last, and/or fifth to last nucleotides with 2'-O-Me, 2'-O-moe, 2'-F, or combinations thereof, and optionally one or more PS linkages.

Embodiment 342 is the gRNA of any one of embodiments 161-341, wherein the gRNA is an sgRNA comprising a 3' tail, wherein the 3' tail comprises a modification of any one or more of the nucleotides present in the 3' tail.

Embodiment 343 is the gRNA of embodiment 342, wherein the 3' tail is fully modified.

Embodiment 344 is the gRNA of embodiment 342, wherein the 3' tail comprises 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9, or 1-10 nucleotides, optionally where any one or more of these nucleotides are modified.

Embodiment 345 is the gRNA of any one of embodiments 336-344, wherein the 3' end modification comprises any one or more of the following:

i. the 3' end modification as shown in any one of SEQ ID Nos: 401-532;

ii. (i) a 2'O-Me modified nucleotide at the last nucleotide of the conserved region of an sgRNA or short-sgRNA, (ii) three consecutive 2'O-moe modified nucleotides immediately 5' to the 2'O-Me modified nucleotide, and (iii) three consecutive PS linkages between the last three nucleotides;

iii. (i) five consecutive 2'O-Me modified nucleotides from the 3' end of the 3' terminus, and (ii) three PS linkages between the last three nucleotides;

iv. an inverted abasic modified nucleotide at the last nucleotide of the conserved region of an sgRNA or short-sgRNA;

v. (i) an inverted abasic modified nucleotide at the last nucleotide of the conserved region of an sgRNA or short-sgRNA, and (ii) three consecutive 2'O-Me modified nucleotides at the last three nucleotides of the conserved region of an sgRNA or short-sgRNA;

vi. (i) 15 consecutive 2'O-Me modified nucleotides from the 3' end of the 3' terminus, (ii) five consecutive 2'-F modified nucleotides immediately 5' to the 2'O-Me modified nucleotides, and (iii) three PS linkages between the last three nucleotides;

vii. (i) alternating 2'O-Me modified nucleotides and 2'-F modified nucleotides at the last 20 nucleotides of the conserved region of an sgRNA or short-sgRNA, and (ii) three PS linkages between the last three nucleotides;

viii. (i) two or three consecutive 2'O-Me modified nucleotides, and (ii) three PS linkages between the last three nucleotides;

ix. one PS linkage between the last and next to last nucleotides; and

x. 15 or 20 consecutive 2'O-Me modified nucleotides, and (ii) three PS linkages between the last three nucleotides.

Embodiment 346 is the gRNA of any one of embodiments 161-345, comprising a 5' end modification comprising any one or more of the following:

i. a modification of any one or more of nucleotides 1-7 of the guide region;
ii. one modified nucleotide;
iii. two modified nucleotides;
iv. three modified nucleotides;
v. four modified nucleotides;
vi. five modified nucleotides;
vii. six modified nucleotides; and
viii. seven modified nucleotides.

Embodiment 347 is the gRNA of any one of embodiments 161-346, comprising a 5' end modification, wherein the 5' end modification is a protective 5' end modification.

Embodiment 348 is the gRNA of any one of embodiments 161-347, comprising a 5' end modification, wherein the 5' end modification comprises a modification of between 1 and 7, between 1 and 5, between 1 and 4, between 1 and 3, or between 1 and 2 nucleotides.

Embodiment 349 is the gRNA of any one of embodiments 161-348, comprising a 5' end modification wherein the 5' end modification comprises any one or more of the following:

i. modifications of 1, 2, 3, 4, 5, 6, or 7 of the first 7 nucleotides;
ii. modifications of about 1-3, 1-4, 1-5, 1-6, or 1-7 of the first 7 nucleotides; and
iii. modifications at the first, second, third, fourth, fifth, sixth, and/or seventh nucleotide at the 5' end, optionally wherein the modifications are consecutive.

Embodiment 350 is the gRNA of any one of embodiments 161-349, comprising a 5' end modification, wherein the 5' end modification comprises one or more of:

i. a phosphorothioate (PS) linkage between nucleotides;
ii. a 2'-O-Me modified nucleotide;
iii. a 2'-O-moe modified nucleotide;
iv. a 2'-F modified nucleotide;
v. an inverted abasic modified nucleotide
vi. ENA, UNA, and/or DNA; and

vii. combinations thereof.

Embodiment 351 is the gRNA any one of embodiments 161-350, comprising a 5' end modification wherein the 5' end modification comprises:

i. 1, 2, 3, 4, 5, 6, and/or 7 PS linkages between nucleotides; or

ii. about 1-2, 1-3, 1-4, 1-5, 1-6, or 1-7 PS linkages between nucleotides.

Embodiment 352 is the gRNA of any one of embodiments 161-351, wherein the sgRNA comprises a 5' end modification and the 5' end modification comprises at least one 2'-O-Me, 2'-O-moe, inverted abasic, 2'-H, inosine, or 2'-F modified nucleotide.

Embodiment 353 is the gRNA of embodiment 352, wherein the 5' end modification comprises at least one PS linkage, and wherein:

i. there is one PS linkage, and the linkage is at nucleotide 1 of the guide region;

ii. there are two PS linkages, and the linkages are at nucleotides 1 and 2 of the guide region;

iii. there are PS linkages at any one or more of nucleotides 1, 2, and 3 of the guide region;

iv. there are PS linkages at any one or more of nucleotides 1, 2, 3, and 4 of the guide region;

v. there are PS linkages at any one or more of nucleotides 1, 2, 3, 4, and 5 of the guide region;

vi. there are PS linkages at any one or more of nucleotides 1, 2, 3, 4, 5, and 6 of the guide region; or

vii. there are PS linkages at any one or more of nucleotides 1, 2, 3, 4, 5, 6, and 7 of the guide region.

Embodiment 354 is the gRNA of any one of embodiments 352-353, wherein the 5' end modification comprises:

i. a modification of one or more of nucleotides 1-7 of the variable region, wherein the modification is a PS linkage, inverted abasic nucleotide, 2'-O-Me, 2'-O-moe, 2'-F, 2'-H, inosine, and/or combinations thereof;

ii. a modification to the first nucleotide of the guide region with 2'-O-Me, 2'-O-moe, 2'-F, 2'-H, inosine, or combinations thereof, and an optional PS linkage to the next nucleotide;

iii. a modification to the first and/or second nucleotide of the variable region with 2'-O-Me, 2'-O-moe, 2'-F, 2'-H, inosine, or combinations thereof, and optionally one or more PS linkages;

iv. a modification to the first, second, and/or third nucleotides of the variable region with 2'-O-Me, 2'-O-moe, 2'-F, 2'-H, inosine, or combinations thereof, and optionally one or more PS linkages;

v. a modification to the first, second, third, and/or fourth nucleotides of the variable region with 2'-O-Me, 2'-O-moe, 2'-F, 2'-H, inosine, or combinations thereof, and optionally one or more PS linkages; or

vi. a modification to the first, second, third, fourth, and/or fifth nucleotides of the variable region with 2'-O-Me, 2'-O-moe, 2'-F, 2'-H, inosine, or combinations thereof, and optionally one or more PS linkages.

Embodiment 355 is the gRNA of any one of embodiments 161-354, comprising a 5' end modification, wherein the 5' end modification comprises any one or more of the following:

i. a 5' end modification as shown in any one of SEQ ID Nos: 1-54, 401-532, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, 3388-3430, or 3549-3552;

ii. 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the guide region;

iii. 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the guide region and PS linkages between nucleotides 1 and 2, 2 and 3, and 3 and 4 of the guide region;

iv. 2'-OMe modified nucleotides at nucleotides 1, 2, 3, 4, and 5 of the guide region;

v. 2'-OMe modified nucleotides at nucleotides 1, 2, 3, 4, and 5 of the guide region and PS linkages between nucleotides 1 and 2, 2 and 3, 3 and 4, 4 and 5, and 5 and 6 of the guide region;

vi. 2'O-moe modified nucleotides at nucleotides 1, 2, and 3 of the guide region;

vii. 2'O-moe modified nucleotides at nucleotides 1, 2, and 3 of the guide region and PS linkages between nucleotides 1 and 2, 2 and 3, and 3 and 4 of the guide region;

viii. an inverted abasic modified nucleotide at nucleotide 1 of the guide region;

ix. an inverted abasic modified nucleotide at nucleotide 1 of the guide region and 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the guide region; and

x. an inverted abasic modified nucleotide at nucleotide 1 of the guide region, 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the guide region, and PS linkages between nucleotides 1 and 2, 2 and 3, 3 and 4, 4 and 5, and 5 and 6 of the variable region.

Embodiment 356 is the gRNA of any one of embodiments 161-355, wherein the gRNA is an sgRNA and the upper stem region comprises at least one modification.

Embodiment 357 is the gRNA of embodiment 346, wherein the upper stem modification comprises any one or more of the following:

i. a modification to any one or more of US1-US12 in the upper stem region;

ii. a modification of at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or all 12 nucleotides in the upper stem region; and

iii. a modification of about 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9, 1-10, or 1-12 nucleotides in the upper stem region.

Embodiment 358 is the gRNA of any one of embodiments 356-357, wherein the upper stem modification comprises one or more of:

i. a 2'-O-Me modified nucleotide;

ii. a 2'-H modified nucleotide;

iii. a 2'-F modified nucleotide; and

iv. combinations thereof.

Embodiment 359 is the gRNA of any one of embodiments 161-358, wherein the gRNA is an sgRNA comprising one or more modifications in the hairpin 1 region.

Embodiment 360 is the gRNA of embodiment 359 wherein the sgRNA comprises a modification at H1-1.

Embodiment 361 is the gRNA of any one of embodiments 161-360, wherein the gRNA is an sgRNA comprising one or more modifications in the hairpin 2 region.

Embodiment 362 is the gRNA of embodiment 361, wherein the sgRNA comprises a modification at H2-1.

Embodiment 363 is the gRNA of any one of embodiments 161-362, wherein the gRNA is an sgRNA comprising comprises modifications at H1-1 to H1-12.

Embodiment 364 is the gRNA of any one of embodiments 161-363, wherein the gRNA is an sgRNA comprising comprises modifications at H2-1 to H2-15.

Embodiment 365 is the gRNA of any one of embodiments 161-364, wherein the gRNA is an sgRNA comprising one or more modifications in each of the upper stem region, the hairpin 1 region, and the hairpin 2 region.

Embodiment 366 is the gRNA of any one of embodiments 161-365, wherein the gRNA is an sgRNA comprising a modified nucleotide between hairpin 1 and hairpin 2 regions.

Embodiment 367 is the gRNA of any one of embodiments 161-366, which is an sgRNA further comprising a lower stem region comprising a modification.

Embodiment 368 is the gRNA of any one of embodiments 161-367, further comprising a 3' end modification.

Embodiment 369 is the gRNA of embodiment 368, wherein at least two of the last four nucleotides at the 3' end of the 3' terminus are modified.

Embodiment 370 is the gRNA of embodiment 369, wherein at least two of the last four nucleotides at the 3' end of the 3' terminus are modified with 2'-O-Me, 2'-F, or 2'-O-moe.

Embodiment 371 is the gRNA of any one of embodiments 368-370, further comprising phosphorothioate (PS) bonds between one or more of the last four nucleotides at the 3' end of the 3' terminus.

Embodiment 372 is the gRNA of any one of embodiments 161-371, which is an sgRNA further comprising a bulge region comprising a modification.

Embodiment 373 is the gRNA of any one of embodiments 161-372, which is an sgRNA further comprising a nexus region comprising a modification.

Embodiment 374 is an sgRNA comprising any of SEQ ID Nos: 401-535, 601, 607-732, 801, 807-932, 1001, or 1007-1132, including the modifications of Table 1.

Embodiment 375 is an sgRNA comprising nucleic acids having at least 99, 98, 97, 96, 95, 94, 93, 92, 91, 90, 85, 80, 75, or 70% identity to the nucleic acids of any one of SEQ ID Nos: 401-535, 601, 607-732, 801, 807-932, 1001, or 1007-1132, wherein the modification at each nucleotide of the sgRNA that corresponds to a nucleotide of the

reference sequence identifier in Table 1, is identical to or equivalent to the modification shown in the reference sequence identifier in Table 1.

Embodiment 376 is the gRNA of any one of embodiments 161-375, wherein the modification reduces gRNA degradation without significantly altering the ability of the guide to cleave a target nucleic acid.

Embodiment 377 is the gRNA of any one of embodiments 161-376, comprising a YA modification wherein the modification comprises 2'-fluoro, 2'-H, 2'-O-Me, ENA, UNA, or PS.

Embodiment 378 is the gRNA of any one of embodiments 161-377, comprising a YA modification wherein the modification alters the structure of the dinucleotide motif to reduce RNA endonuclease activity.

Embodiment 379 is the gRNA of any one of embodiments 161-378, comprising a YA modification wherein the modification interferes with recognition or cleavage of a YA site by an RNase and/or stabilizes an RNA structure.

Embodiment 380 is the gRNA of any one of embodiments 161-379, comprising a YA modification wherein the modification comprises one or more of:

a. a ribose modification selected from 2'-O-alkyl, 2'-F, 2'-moe, 2'-F arabinose, and 2'-H (deoxyribose);
b. a bicyclic ribose analog, such as LNA, BNA, and ENA;
c. an unlocked nucleic acid modification;
d. a base modification, such as inosine, pseudouridine, and 5'-methylcytosine; and
e. an internucleoside linkage modification such as phosphorothioate.

Embodiment 381 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises a modification at nucleotide 5, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-10, and/or 2'-F modifications at nucleotides 8-11, 13, 14, 17, and 18.

Embodiment 382 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises a modification at nucleotide 12, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-10, and/or 2'-F modifications at nucleotides 8-11, 13, 14, 17, and 18.

Embodiment 383 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises a 2'-OMe modification at nucleotide 5 and/or nucleotide 12, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-10, and/or 2'-F modifications at nucleotides 8-11, 13, 14, 17, and 18.

Embodiment 384 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises a 2'-F modification at nucleotide 5 and/or nucleotide 12, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-10, and/or 2'-F modifications at nucleotides 8-11, 13, 14, 17, and 18.

Embodiment 385 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises a 2'-H modification at nucleotide 5 and/or nucleotide 12, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-10, and/or 2'-F modifications at nucleotides 8-11, 13, 14, 17, and 18.

Embodiment 386 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises a phosphorothioate modification at nucleotide 5 and/or nucleotide 12, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-10, and/or 2'-F modifications at nucleotides 8-11, 13, 14, 17, and 18.

Embodiment 387 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises modifications at:

i. nucleotides 8-10;

ii. nucleotides 8 and 9;

iii. nucleotides 8 and 10; or

iv. nucleotides 9 and 10,

optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-7, and/or 2'-F modifications at nucleotides 11, 13, 14, 17, and 18.

Embodiment 388 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises 2'-F modifications at:

i. nucleotides 8-10;

ii. nucleotides 8 and 9;

iii. nucleotides 8 and 10;

iv. nucleotides 9 and 10; or

v. nucleotide 8;

optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-7, and/or 2'-F modifications at nucleotides 11, 13, 14, 17, and 18.

Embodiment 389 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises 2'-F modifications at:

i. nucleotides 8-10;

ii. nucleotides 8 and 9;

iii. nucleotides 8 and 10;

iv. nucleotides 9 and 10; or

v. nucleotide 8;

wherein nucleotides 8-10 do not comprise phosphorothioate modifications, and optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-7, and/or 2'-F modifications at nucleotides 11, 13, 14, 17, and 18.

Embodiment 390 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises 2'-F modifications at nucleotides 8-10 and:

i. phosphorothioate modifications at 1, 2, or 3 of nucleotides 8-10;

ii. a phosphorothioate modification at nucleotide 8;

iii. a phosphorothioate modification at nucleotide 9;

iv. a phosphorothioate modification at nucleotide 10;

v. a phosphorothioate modification at nucleotides 8 and 9;

vi. a phosphorothioate modification at nucleotides 8 and 10;

vii. a phosphorothioate modification at nucleotides 9 and 10; or

vii. a phosphorothioate modification at nucleotides 8-10

optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-7, and/or 2'-F modifications at nucleotides 11, 13, 14, 17, and 18.

Embodiment 391 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises:

i. a 2'-F or phosphorothioate modification at nucleotides 5 and 6;

ii. a 2'-F modification at nucleotides 5 and 6;

iii. a phosphorothioate modification at nucleotides 5 and 6;

iv. a 2'-F modification at nucleotide 5 and a phosphorothioate modification at nucleotide 6; or

v. a 2'-F modification at nucleotide 6 and a phosphorothioate modification at nucleotide 5;

optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 7-10, and/or 2'-F modifications at nucleotides 8-11, 13, 14, 17, and 18.

Embodiment 392 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises 2'-F modifications at at least 1, 2, 3, 4, 5, or 6 of nucleotides 6-11, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3, and/or 2'-F modifications at nucleotides 13, 14, 17, and 18.

Embodiment 393 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises 2'-F modifications at at least 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 of nucleotides 1-4 and 6-11, optionally wherein the guide region comprises phosphorothioate modifications at nucleotides 1-3 and/or 2'-F modifications at nucleotides 13, 14, 17, and 18.

Embodiment 394 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises 2'-F modifications at nucleotides 6-11, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3, and/or 2'-F modifications at nucleotides 13, 14, 17, and 18.

Embodiment 395 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises 2'-F modifications at nucleotides 1-4, optionally wherein the guide region comprises phosphorothioate modifications at nucleotides 1-3 and 6-10, and/or 2'-F modifications at nucleotides 6-11, 13, 14, 17, and 18.

Embodiment 396 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises a 2'-F modification at nucleotide 9 and not a phosphorothioate modification at nucleotide 9, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-8 and 10, and/or 2'-F modifications at nucleotides 8, 10, 11, 13, 14, 17, and 18.

Embodiment 397 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that does not comprise 2'-F modifications at at least 1, 2, 3, 4, 5, 6, 7, or 8 of nucleotides 8-11, 13, 14, 17, and 18, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4 and/or phosphorothioate modifications at nucleotides 1-3 and 6-10.

Embodiment 398 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that does not comprise 2'-F modifications at nucleotides 8-11, 13, 14, 17, and 18, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4 and/or phosphorothioate modifications at nucleotides 1-3 and 6-10.

Embodiment 399 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises 2'-OMe modifications at at least 1, 2, 3, or 4 of nucleotides 9, 11, 13, and 14, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4 and/or phosphorothioate modifications at nucleotides 1-3 and 6-10.

Embodiment 400 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises 2'-OMe modifications at nucleotides 9, 11, 13, and 14, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4 and/or phosphorothioate modifications at nucleotides 1-3 and 6-10.

Embodiment 401 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises phosphorothioate modifications at one or both of nucleotides 8 and 10, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-7, and/or 2'-F modifications at nucleotides 8-11, 13, 14, 17, and 18.

Embodiment 402 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises modifications at at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, or all of the following nucleotides: 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 13, 14, 17, and 18, optionally wherein the modifications are 2'-OMe, 2'-fluoro, or phosphorothioate modifications.

Embodiment 403 is the gRNA of any one of the the preceding embodiments, wherein the gRNA comprises a guide region that comprises modifications at nucleotides 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 13, 14, 17, and 18, optionally wherein the modifications are 2'-OMe, 2'-fluoro, or phosphorothioate modifications.

Embodiment 404 is the gRNA of any one of the preceding embodiments, wherein 2'-OMe modifications are not present in the guide region at nucleotides 6-11 and 13-end.

Embodiment 405 is the gRNA of any one of the preceding embodiments, wherein 2'-fluoro modifications are not present in the guide region at nucleotides 1-7, 15, 16, and 19-end.

Embodiment 406 is the gRNA of any one of the preceding embodiments, wherein phosphorothioate modifications are not present in the guide region at nucleotides 4, 5, 11-14, 17, and 18.

Embodiment 407 is the gRNA of any one of the preceding embodiments, wherein the guide region comprises an unmodified nucleotide 20.

Embodiment 408 is the gRNA of any one of the preceding embodiments, wherein the guide region consists of 20 nucleotides.

Embodiment 409 is the gRNA of any one of the preceding embodiments, wherein the guide region comprises a YA site at nucleotides 5-6 and a modification at nucleotide 5.

Embodiment 410 is the gRNA of any one of the preceding embodiments, wherein the guide region comprises a YA site at nucleotides 12-13 and a modification at nucleotide 12.

Embodiment 411 is the gRNA of any one of the preceding embodiments, wherein the guide region comprises a YA site at nucleotides 15-16 and a modification at nucleotide 15.

Embodiment 412 is the gRNA of any one of the preceding embodiments, wherein the guide region comprises a YA site at nucleotides 16-17 and a modification at nucleotide 16.

Embodiment 413 is the gRNA of any one of the preceding embodiments, wherein the guide region comprises a YA site at nucleotides 19-20 and a modification at nucleotide 19.

Embodiment 414 is the gRNA of any one of the preceding embodiments, wherein the guide region does not comprise a YA site at nucleotides 5-6 and nucleotide 5 is unmodified.

Embodiment 415 is the gRNA of any one of the preceding embodiments, wherein the guide region does not comprise a YA site at nucleotides 12-13 and nucleotide 12 is unmodified.

Embodiment 416 is the gRNA of any one of the preceding embodiments, wherein the guide region does not comprise a YA site at nucleotides 15-16 and nucleotide 15 is unmodified.

Embodiment 417 is the gRNA of any one of the preceding embodiments, wherein the guide region does not comprise a YA site at nucleotides 16-17 and nucleotide 16 is unmodified.

Embodiment 418 is the gRNA of any one of the preceding embodiments, wherein the guide region does not comprise a YA site at nucleotides 19-20 and nucleotide 19 is unmodified.

Embodiment 419 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a guide region that comprises at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, or all of the following:

a. 2'-OMe and phosphorothioate modifications at nucleotide 1;
b. 2'-OMe and phosphorothioate modifications at nucleotide 2;
c. 2'-OMe and phosphorothioate modifications at nucleotide 3;
d. a 2'-OMe modification at nucleotide 4;
e. a phosphorothioate modification at nucleotide 6;
f. a phosphorothioate modification at nucleotide 7;
g. 2'-fluoro and phosphorothioate modifications at nucleotide 8;
h. 2'-fluoro and phosphorothioate modifications at nucleotide 9;
i. 2'-fluoro and phosphorothioate modifications at nucleotide 10;
j. a 2'-fluoro modification at nucleotide 11;
k. a 2'-fluoro modifications at nucleotide 13;
l. a 2'-fluoro modifications at nucleotide 14;
m. a 2'-fluoro modifications at nucleotide 17; and
n. a 2'-fluoro modifications at nucleotide 18.

Embodiment 420 is the gRNA of any one of the preceding embodiments, wherein the guide region comprises each of the modifications set forth in the preceding embodiment.

Embodiment 421 is the gRNA of any one of the preceding embodiments, wherein the guide region comprises at least 1, 2, 3, or 4 of the following:

i. a 2'-OMe modification at nucleotide 5 if nucleotides 5 and 6 form a YA site;

ii. a 2'-OMe modification at nucleotide 12 if nucleotides 12 and 13 form a YA site;

iii. a phosphorothioate modification at nucleotide 15 if nucleotides 15 and 16 form a YA site;

iv. a phosphorothioate modification at nucleotide 16 if nucleotides 16 and 17 form a YA site; and

v. a phosphorothioate or 2'-fluoro modification at nucleotide 19 if nucleotides 19 and 20 form a YA site.

Embodiment 422 is the gRNA of any one of the preceding embodiments, wherein the guide region comprises a YA site at nucleotides 5-6 and a a 2'-OMe modification at nucleotide 5.

Embodiment 423 is the gRNA of any one of the preceding embodiments, wherein the guide region comprises a YA site at nucleotides 12-13 and a 2'-OMe modification at nucleotide 12.

Embodiment 424 is the gRNA of any one of the preceding embodiments, wherein the guide region comprises a YA site at nucleotides 15-16 and a phosphorothioate modification at nucleotide 15.

Embodiment 425 is the gRNA of any one of the preceding embodiments, wherein the guide region comprises a YA site at nucleotides 16-17 and a phosphorothioate modification at nucleotide 16.

Embodiment 426 is the gRNA of any one of the preceding embodiments, wherein the guide region comprises a YA site at nucleotides 19-20 and a phosphorothioate modification at nucleotide 19.

Embodiment 427 is the gRNA of any one of the preceding embodiments, wherein the guide region comprises a 2'-fluoro modification at nucleotide 19.

Embodiment 428 is the gRNA of any one of the preceding embodiments, wherein the guide region comprises an unmodified nucleotide 15 or only a phosphorothioate modification at nucleotide 15.

Embodiment 429 is the gRNA of any one of the preceding embodiments, wherein the guide region comprises an unmodified nucleotide 16 or only a phosphorothioate modification at nucleotide 16.

Embodiment 430 is the gRNA of any one of the preceding embodiments, wherein the gRNA is an sgRNA comprising a conserved portion of an sgRNA comprising a hairpin region, wherein the hairpin region lacks at least 5-10 nucleotides.

Embodiment 431 is the gRNA of embodiment 430, wherein the at least 5-10 lacking nucleotides are consecutive.

Embodiment 432 is the gRNA of embodiment 430 or 431, wherein the at least 5-10 lacking nucleotides:

i. are within hairpin 1;
ii. are within hairpin 1 and the "N" between hairpin 1 and hairpin 2;
iii. are within hairpin 1 and the two nucleotides immediately 3' of hairpin 1;
iv. include at least a portion of hairpin 1;
v. are within hairpin 2;
vi. include at least a portion of hairpin 2;
vii. are within hairpin 1 and hairpin 2;
viii. include at least a portion of hairpin 1 and include the "N" between hairpin 1 and hairpin 2;
ix. include at least a portion of hairpin 2 and include the "N" between hairpin 1 and hairpin 2;
x. include at least a portion of hairpin 1, include the "N" between hairpin 1 and hairpin 2, and include at least a portion of hairpin 2;
xi. are within hairpin 1 or hairpin 2, optionally including the "N" between hairpin 1 and hairpin 2;
xii. are consecutive;
xiii. are consecutive and include the "N" between hairpin 1 and hairpin 2;

xiv. are consecutive and span at least a portion of hairpin 1 and a portion of hairpin 2;

xv. are consecutive and span at least a portion of hairpin 1 and the "N" between hairpin 1 and hairpin 2; or

xvi. are consecutive and span at least a portion of hairpin 1 and two nucleotides immediately 3' of hairpin 1.

Embodiment 433 is the gRNA of any one of embodiments 430-432, wherein the at least 5-10 nucleotides comprise nucleotides 54-61 of SEQ ID NO:400, nucleotides 53-60 of SEQ ID NO:400; or nucleotides 54-58 of SEQ ID NO:400, optionally wherein the sgRNA comprises modifications at least H1-1 to H1-5 and H2-1 to H2-12.

Embodiment 434 is the gRNA of any one of embodiments 430-433, wherein the at least 5-10 nucleotides:

i. consist of 5-10 nucleotides;

ii. consist of 6-10 nucleotides;

iii. consist of 5 nucleotides;

iv. consist of 6 nucleotides;

v. consist of 7 nucleotides;

vi. consist of 8 nucleotides;

vii. consist of 9 nucleotides;

viii. consist of 10 nucleotides;

ix. consist of 5-10 consecutive nucleotides;

x. consist of 6-10 consecutive nucleotides;

xi. consist of 5 consecutive nucleotides;

xii. consist of 6 consecutive nucleotides;

xiii. consist of 7 consecutive nucleotides;

xiv. consist of 8 consecutive nucleotides;

xv. consist of 9 consecutive nucleotides; or

xvi. consist of 10 consecutive nucleotides.

Embodiment 435 is the gRNA of embodiment 434, wherein the at least 5-10 nucleotides comprise nucleotides 54-61 of SEQ ID NO:400, nucleotides 53-60 of SEQ ID NO:400; or nucleotides 54-58 of SEQ ID NO:400, optionally wherein the sgRNA comprises modifications at least H1-1 to H1-5 and H2-1 to H2-12.

Embodiment 436 is the gRNA of any one of embodiments 430-435, wherein the at least 5-10 nucleotides:

i. comprise nucleotides 54-61 of SEQ ID NO:400;
ii. comprise nucleotides 53-60 of SEQ ID NO:400;
iii. comprise nucleotides 54-58 of SEQ ID NO:400.
iv. consist of nucleotides 54-61 of SEQ ID NO:400;
v. consist of nucleotides 53-60 of SEQ ID NO:400; or
vi. consist of nucleotides 54-58 of SEQ ID NO:400.

Embodiment 437 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises modifications and/or unmodified nucleotides at at least 15 of nucleotides 1-20 from the 5' end of the 5' terminus that match the modification pattern at nucleotides 1-20 of any one of the gRNAs of SEQ ID NOs: 1-54, 201-254, 301-354, 401-535, 601, 607-732, 801, 807-932, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, or 3388-3430.

Embodiment 438 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises modifications and/or unmodified nucleotides at at least 16 of nucleotides 1-20 from the 5' end of the 5' terminus that match the modification pattern at nucleotides 1-20 of any one of the gRNAs of SEQ ID NOs: 1-54, 201-254, 301-354, 401-535, 601, 607-732, 801, 807-932, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, or 3388-3430.

Embodiment 439 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises modifications and/or unmodified nucleotides at at least 17 of nucleotides 1-20 from the 5' end of the 5' terminus that match the modification pattern at nucleotides 1-20 of a gRNA, wherein the gRNA is any one of SEQ ID NOs: 1-54, 201-254, 301-354, 401-535, 601, 607-732, 801, 807-932, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, or 3388-3430.

Embodiment 440 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises modifications and/or unmodified nucleotides at at least 18 of nucleotides 1-20 from the 5' end of the 5' terminus that match the modification pattern at nucleotides 1-20 of any one of the gRNAs of SEQ ID NOs: 1-54, 201-254, 301-354, 401-535, 601, 607-732, 801, 807-932, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, or 3388-3430.

Embodiment 441 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises modifications and/or unmodified nucleotides at at least 19 of nucleotides 1-20 from the 5' end of the 5' terminus that match the modification pattern at nucleotides 1-20 of any one of the gRNAs of SEQ ID NOs: 1-54, 201-254, 301-354, 401-535, 601, 607-732, 801, 807-932, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, or 3388-3430.

Embodiment 442 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises modifications and/or unmodified nucleotides at nucleotides 1-20 from the 5' end of the 5' terminus that match the modification pattern at nucleotides 1-20 of any one of the gRNAs of SEQ ID NOs: 1-54, 201-254, 301-354, 401-535, 601, 607-732, 801, 807-932, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, or 3388-3430.

Embodiment 443 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises a modification pattern that matches at least 75% of the modification pattern of any one of the gRNAs of SEQ ID NOs: 1-54, 201-254, 301-354, 401-535, 601, 607-732, 801, 807-932, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, or 3388-3430.

Embodiment 444 is the gRNA of any one of the preceding embodiments, wherein the gRNA comprises the modification pattern of any one of the gRNAs in Table 1, wherein the modification pattern is the same as any one of the gRNAs of SEQ ID NOs: 1-54, 201-254, 301-354, 401-535, 601, 607-732, 801, 807-932, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, or 3388-3430.

Embodiment 445 is the gRNA of any one of embodiments 437-444, further comprising a sequence having at least 75% identity to the sequence of nucleotides 21-end of the gRNA.

Embodiment 446 is the gRNA of any one of embodiments 437-444, further comprising a sequence having at least 80% identity to the sequence of nucleotides 21-end of the gRNA.

Embodiment 447 is the gRNA of any one of embodiments 437-444, further comprising a sequence having at least 85% identity to the sequence of nucleotides 21-end of the gRNA.

Embodiment 448 is the gRNA of any one of embodiments 437-444, further comprising a sequence having at least 90% identity to the sequence of nucleotides 21-end of the gRNA.

Embodiment 449 is the gRNA of any one of embodiments 437-444, further comprising a sequence having at least 95% identity to the sequence of nucleotides 21-end of the gRNA.

Embodiment 450 is the gRNA of any one of embodiments 437-444, further comprising a sequence having at least 98% identity to the sequence of nucleotides 21-end of the gRNA.

Embodiment 451 is the gRNA of any one of embodiments 437-444, further comprising a sequence having 100% identity to the sequence of nucleotides 21-end of the gRNA.

Embodiment 452 is an LNP composition comprising a gRNA of any one of the preceding embodiments.

Embodiment 453 is a composition comprising a gRNA of any one of embodiments 1-451 associated with a lipid nanoparticle (LNP).

Embodiment 454 is a composition comprising the gRNA of any one of embodiments 1-451, or the composition of any one of embodiments 452-453, further comprising a nuclease or an mRNA which encodes the nuclease.

Embodiment 455 is the composition of embodiment 454, wherein the nuclease is a Cas protein.

Embodiment 456 is the composition of embodiment 455, wherein the Cas protein is a Cas9.

Embodiment 457 is the composition of embodiment 456, wherein the Cas9 is an *S. pyogenes* Cas9 or an *S. aureus* Cas9.

Embodiment 458 is the composition of any one of embodiments 453-457, wherein the nuclease is a nickase or a dCas.

Embodiment 459 is the composition of any one of embodiments 453-458, wherein the nuclease is modified.

Embodiment 460 is the composition of embodiment 459 wherein the modified nuclease comprises a nuclear localization signal (NLS).

Embodiment 461 is the composition of any one of embodiments 452-460, comprising an mRNA which encodes the nuclease.

Embodiment 462 is the composition of embodiment 461, wherein the mRNA comprises the sequence of any one of SEQ ID NOs: 3499-3527 or 3529-3546.

Embodiment 463 is a pharmaceutical formulation comprising the gRNA of any one of embodiments 1-451 or the composition of any one of embodiments 452-462 and a pharmaceutically acceptable carrier.

Embodiment 464 is a method of modifying a target DNA comprising, delivering a Cas protein or a nucleic acid encoding a Cas protein, and any one or more of the following to a cell:

i. the gRNA of any one of embodiments 1-451;
ii. the composition of any one of embodiments 452-462; and
iii. the pharmaceutical formulation of embodiment 463.

Embodiment 465 is the method of embodiment 464, wherein the method results in an insertion or deletion in a gene.

Embodiment 466 is the method of embodiment 464 or embodiment 465, further comprising delivering to the cell a template, wherein at least a part of the template incorporates into a target DNA at or near a double strand break site induced by the Cas protein.

Embodiment 467 is the gRNA of any one of embodiments 1-451, the composition of embodiments 452-462, or the pharmaceutical formulation of embodiment 463 for use in preparing a medicament for treating a disease or disorder.

Embodiment 468 is the use of the gRNA of any one of embodiments 1-451, the composition of embodiments 452-462, or the pharmaceutical formulation of embodiment 463 in the manufacture of a medicament for treating a disease or disorder.

## FIGURE LEGENDS

[0009] FIGs 1A and 1B show in vivo % editing and serum TTR results, respectively, for the indicated guides.

[0010] FIGs 2A and 2B show in vivo % editing and serum TTR results, respectively, for the indicated guides.

[0011] FIGs 3A and 3B show in vivo % editing and serum TTR results, respectively, for the indicated guides. FIGs 3C and 3D show in vivo % editing and serum TTR results,

respectively, for the indicated guides. FIGs 3E and 3F show in vivo % editing and serum TTR results, respectively, for the indicated guides in rats.

[0012] FIGs 4A and 4B show in vivo % editing and serum TTR results, respectively, for the indicated guides.

[0013] FIG 5 show % editing in neuro2A cells in vitro.

[0014] FIGs 6A and 6B show in vivo % editing and serum TTR results, respectively, for the indicated guides.

[0015] FIGs 7A and 7B show in vivo % editing and serum TTR results, respectively, for the indicated guides.

[0016] FIGs 8A and 8B show in vivo % editing and serum TTR results, respectively, for the indicated guides. FIGs 8C and 8D show in vivo % editing and serum TTR results, respectively, for the indicated guides.

[0017] FIGs 9A, 9B, and 9C show % editing by concentration in PHH (9A), PCH (9B), and HepG2 (9C) cells, respectively, for the indicated guides.

[0018] FIG 10A shows an exemplary sgRNA (SEQ ID NO: 801, methylation not shown) in a possible secondary structure with labels designating individual nucleotides of the conserved region of the sgRNA, including the lower stem, bulge, upper stem, nexus (the nucleotides of which can be referred to as N1 through N18, respectively, in the 5' to 3' direction), and the hairpin region which includes hairpin 1 and hairpin 2 regions. A nucleotide between hairpin 1 and hairpin 2 is labeled n. A guide region may be present on an sgRNA and is indicated in this figure as "(N)x" preceding the conserved region of the sgRNA.

[0019] FIG 10B labels the 10 conserved region YA sites in an exemplary sgRNA sequence (SEQ ID NO: 801, methylation not shown) from 1 to 10. The numbers 25, 45, 50, 56, 64, 67, and 83 indicate the position of the pyrimidine of YA sites 1, 5, 6, 7, 8, 9, and 10 in an sgRNA with a guide region indicated as $(N)_x$, e.g., wherein x is optionally 20.

[0020] FIG 11A-E show results of nuclease stability assays in which the indicated guides were incubated with 0.01 mg/mL human liver cytosol (HLC) and cleavage sites were determined. FLP indicates signal from full-length product.

[0021] FIG 11F illustrates the location of cleavage sites observed in FIGs 11A-E mapped onto an exemplary guide sequence and possible secondary structure of SEQ ID NO: 401 (not all modifications are shown). Open triangles show YA cleavage sites in the guide region. Closed triangles show YA cleavage sites in the conserved region.

[0022] FIGs 12A-G show results of nuclease stability assays in which the indicated guides were incubated with 0.01 mg/mL human liver cytosol (HLC) and cleavage sites were determined.

[0023] FIGs 13A-B show results of nuclease stability assays in which G010039 was incubated with 0.01 mg/mL (A) or 8.5 mg/mL (B) human liver cytosol (HLC).

[0024] FIG 14 shows % editing results from experiments in which lipoplexes comprising the indicated guides were transfected into primary mouse hepatocytes (PMH).

[0025] FIG 15A-C show % editing results from experiments in which lipoplexes comprising the indicated guides were transfected into PMH, primary cynomolgous macaque hepatocytes (PCH), or primary human hepatocytes (PHH), respectively.

[0026] FIG 16A shows a scatter plot and correlation values for % editing results from experiments in which sgRNA was administered to mice in vivo or delivered to PMH via lipoplex transfection of the sgRNA.

[0027] FIGs 16B-F show correlation of in vivo and in vitro % editing results in which the in vitro results were generated by delivering the sgRNAs in LNPs to PHH.

[0028] FIG 16G shows a comparison of % editing with the indicated guides delivered to PMH by lipoplex transfection (data above left box), to PMH in LNP (data above center box), or to mice in vivo (data above right box).

[0029] FIG 16H shows a comparison of % editing with the indicated guides delivered to PMH in LNP (1 ng, 3 ng, 10 ng) or to mice in vivo (0.1 mpk, 0.3 mpk).

[0030] FIG 16I shows the results from Fig. 16G replotted to indicate differences in editing between G000282 and G000211. The barplot values were generated by dividing % editing of the G000282 value by the % editing of the G000211 value to indicate fold differences in editing. The indicated guides were delivered to PMH by lipoplex transfection (data above left box), to PMH in LNP (data above center box), or to mice in vivo (data above right box).

[0031] FIG 16J shows the results from Fig. 16H replotted to indicate differences in editing between G000283 and G000269. The barplot values were generated by dividing % editing of the G000283 value by the % editing of the G000269 value to indicate fold differences in editing. The indicated guides were delivered to PMH in LNP (data above left box) or to mice in vivo (data above right box).

[0032] FIGs 17A-B show in vivo % editing and serum TTR results, respectively, for the indicated guides.

[0033] FIGs 18A-B show in vivo % editing and serum TTR results, respectively, for the indicated guides. FIGs 18C-D show in vivo % editing and serum TTR results, respectively, for the indicated guides. FIGs 18E-F show in vivo % editing and serum TTR results, respectively, for the indicated guides.

[0034] FIGs 19A-B show in vivo % editing and serum TTR results, respectively, for the indicated guides. FIGs 19C-D show in vivo % editing and serum TTR results, respectively, for the indicated guides.

[0035] FIGs 20A-B show in vivo % editing and serum TTR results, respectively, for the indicated guides at the indicated concentrations. FIGs 20C-D show in vivo % editing and serum TTR results, respectively, for the indicated guides at the indicated concentrations. FIGs 20E-F show in vivo % editing and serum TTR results, respectively, for the indicated guides at the indicated concentrations.

[0036] FIGs 21A-B show in vivo % editing and serum TTR results, respectively, for the indicated guides.

[0037] FIGs 22A-B show in vivo % editing and serum TTR results, respectively, for the indicated guides.

[0038] FIGs 23A-B show editing frequency for the indicated guides.

[0039] FIGs 24A-B show in vivo % editing and serum TTR results, respectively, for the indicated guides.

[0040] FIGs 25A-E show indel frequency versus guide concentration for the indicated guides.

[0041] FIGs 26A-E show indel frequency versus guide concentration for the indicated guides.

[0042] FIGs 27A-D show indel frequency versus guide concentration for the indicated guides.

[0043] FIGs 28A-D show indel frequency versus guide concentration for the indicated guides.

[0044] FIGs 29A-B and 29F show editing frequency for guides with the indicated dinucleotide modification (for a given 5' modified position, the immediately subsequent position was also modified in the same way). FIGs 29C-E show editing frequency for guides with the indicated modification at an individual nucleotide.

[0045] FIGs 30A-C show influence scores for the indicated modification at guide positions 1-20.

[0046] FIGs 31A-C show editing frequency for the indicated guides. Guides are grouped into boxes based on having similar conserved region modification patterns.

## DETAILED DESCRIPTION

[0047] Provided herein are modified guide RNAs (gRNAs) for use in gene editing methods. Sequences of engineered and tested gRNAs are shown in Table 1.

[0048] Certain of the gRNAs provided herein are modified dual guide RNAs (dgRNAs) for use in gene editing methods. Sequences of engineered and tested dgRNAs are shown in Table 1. Certain of the dgRNAs have certain modifications at YA sites in the dgRNA, including modifications in the crRNA and/or the trRNA.

[0049] Certain of the gRNAs provided herein are modified single guide RNAs (sgRNAs) for use in gene editing methods. Sequences of engineered and tested sgRNAs are shown in Table 1. Certain of the sgRNAs have certain modifications at YA sites in the sgRNA, including modifications in the crRNA portion of the sgRNA and/or the trRNA portion of the sgRNA.

[0050] Also provided herein are short-single guide RNAs (short-sgRNAs), optionally modified, for use in gene editing methods. Sequences of engineered and tested short-sgRNAs are shown in Table 1. Certain of the short-sgRNAs have certain modifications at YA sites in the short-sgRNA, including modifications in the crRNA portion of the short-sgRNA and/or the trRNA portion of the short-sgRNA.

[0051] This disclosure further provides uses of these gRNAs (e.g., sgRNA, short-sgRNA, dgRNA, or crRNA) to alter the genome of a target nucleic acid *in vitro* (e.g., cells cultured *in vitro* for use in *ex vivo* therapy or other uses of genetically edited cells) or in a cell in a subject such as a human (e.g., for use in *in vivo* therapy). The present disclosure also provides methods for preventing or treating a disease in a subject by modifying a target gene associated with a disease. The disclosed gRNAs can be used with any cell type and at any genetic locus amenable to nuclease mediated genome editing technology.

**Table 1 (Table of Sequences):**

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1 | G282 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCmU*mU*mU*mU |
| 2 | G515 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCA ACUUGGCACCGAGUCGGUGC*mU*mG*mC |
| 3 | G621 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCA ACUUGGCACCGAGUCGGUGC*mU*mU*mU |
| 4 | G632 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCA mAmCmUmUmGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 5 | G638 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCA ACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 6 | G639 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 7 | G640 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 8 | G641 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCA ACUUGGCACCGAGUCGGU*mG*mC*mU |
| 9 | G211 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUC AACUUGAAAAAGUGGCACCGAGUCGGUGCmU*mU*mU*U |
| 10 | G269 | mC*mC*mC*AUACUCCUACAGCACCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCA ACUUGAAAAAGUGGCACCGAGUCGGUGCmU*mU*mU*U |
| 11 | G620 | mC*mC*mC*AUACUCCUACAGCACCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAA CUUGGCACCGAGUCGG*mU*mG*mC |
| 12 | G622 | mC*mC*mC*AUACUCCUACAGCACCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAA CUUGGCACCGAGUCGGUGC*mU*mU*mU |
| 13 | G623 | mC*mC*mC*AUACUCCUACAGCACCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCA mAmCmUmUmGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 14 | G624 | mC*mC*mC*AUACUCCUACAGCACCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAA CUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 15 | G625 | mC*mC*mC*AUACUCCUACAGCACCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAG GCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 16 | G626 | mC*mC*mC*AUACUCCUACAGCACCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAG GCUAGUCCGUUAUCAACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 17 | G627 | mC*mC*mC*AUACUCCUACAGCACCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAA CUUGGCACCGAGUCGGU*mG*mC*mU |
| 18 | G283 | mC*mC*mC*AUACUCCUACAGCACCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |
| 19 | G628 | mC*mA*mG*GGCUCUUGAAGAUCUCCGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCA ACUUGGCACCGAGUCGG*mU*mG*mC |
| 20 | G629 | mC*mA*mG*GGCUCUUGAAGAUCUCCGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCA ACUUGGCACCGAGUCGGUGC*mU*mU*mU |
| 21 | G630 | mC*mA*mG*GGCUCUUGAAGAUCUCCGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCA mAmCmUmUmGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 22 | G631 | mC*mA*mG*GGCUCUUGAAGAUCUCCGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCA ACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 23 | G633 | mC*mA*mG*GGCUCUUGAAGAUCUCCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 24 | G634 | mC*mA*mG*GGCUCUUGAAGAUCUCCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 25 | G635 | mC*mA*mG*GGCUCUUGAAGAUCUCCGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCA ACUUGGCACCGAGUCGGU*mG*mC*mU |
| 26 | G208-2 | mC*mA*mG*GGCUCUUGAAGAUCUCCGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCA ACUUGAAAAAGUGGCACCGAGUCGGUGCmU*mU*mU*U |
| 27 | G373-2 | mC*mA*mG*GGCUCUUGAAGAUCUCCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCmU*mU*mU*mU |
| 28 | G513 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 29 | G514 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmGmAmAmAmCAAGUUAAAAUAAGGCUAGUCCGUUAU CAmAmCmUmUmGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 30 | G516 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAGGAAACAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGG CACCGAGUCGG*mU*mG*mC |
| 31 | G517 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmA*mG*mU*mG |
| 32 | G518 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCA ACUUGAAAAA*mG*mU*mG |
| 33 | G642 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG *mU*mG*mC |
| 34 | G612 | moeU*moeU*moeA*CAGCCACGUCUACAGCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGU UAUCAACUUGGCACCGAGUCGmoeG*moeU*moeG*mC |
| 35 | G613 | mU*mU*mA*mC*mA*GCCACGUCUACAGCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUU AUCAACUUGGCACCGAGUC*mG*mG*mU*mU*mG*mC |
| 36 | G614 | (invd)UUACAGCCACGUCUACAGCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACU UGGCACCGAGUCGGUGC(invd) |
| 37 | G615 | (invd)mUmUmACAGCCACGUCUACAGCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUC AACUUGGCACCGAGUCGGmUmGmC(invd) |
| 38 | G643 | (invd)mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUU AUCAACUUGGCACCGAGUCGG*mU*mG*mC(invd) |
| 39 | G616 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAf AfCfUfUfGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 40 | G617 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAf AmCfUmUfGmGfCmAfCmCfGmAfGmUfCmGfG*mU*fG*mC |
| 41 | G618 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAfAfCfUfUfGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 42 | G619 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAfAmCfUmUfGmGfCmAfCmCfGmAfGmUfCmGfG*mU*fG*mC |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 43 | G534 | mA*mC*mG*CAAAUAUCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCmU*mU*mU*mU |
| 44 | G637 | mA*mC*mG*CAAAUAUCAGUCCAGCGGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCA ACUUGGCACCGAGUCGG*mU*mG*mC |
| 45 | G694 | mA*mC*mG*CAAAUAUCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 46 | G695 | mA*mC*mG*CAAAUAUCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 47 | G698 | mU*mC*mU*AGAACUUUGACCAUCAGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 48 | G699 | mU*mC*mU*AGAACUUUGACCAUCAGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 49 | G481 | mU*mC*mU*AGAACUUUGACCAUCAGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCmU*mU*mU*mU |
| 50 | G700 | mU*mG*mA*AUCCAAGUGUCCUCUGAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 51 | G701 | mU*mG*mA*AUCCAAGUGUCCUCUGAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 52 | G499 | mU*mG*mA*AUCCAAGUGUCCUCUGAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCmU*mU*mU*mU |
| 53 | G12401 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 54 | G12402 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 55-200 | Not Used | |
| 201 | G282-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 202 | G515-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 203 | G621-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGGUGC*mU*mU*mU |
| 204 | G632-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmAmCmUmUmGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 205 | G638-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 206 | G639-C | GUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 207 | G640-C | GUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 208 | G641-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGGU*mG*mC*mU |
| 209 | G211-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGAAAAAGUGGCACCGAGUCGGUGCmU*mU*mU*U |
| 210 | G269-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGAAAAAGUGGCACCGAGUCGGUGCmU*mU*mU*U |
| 211 | G620-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 212 | G622-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGGUGC*mU*mU*mU |
| 213 | G623-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmAmCmUmUmGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 214 | G624-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 215 | G625-C | GUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 216 | G626-C | GUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 217 | G627-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGGU*mG*mC*mU |
| 218 | G283-C | GUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmU*mU*mU*mU |
| 219 | G628-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 220 | G629-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGGUGC*mU*mU*mU |
| 221 | G630-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 222 | G631-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 223 | G633-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 224 | G634-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 225 | G635-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGGU*mG*mC*mU |
| 226 | G208-2-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGAAAAAGUGGCACCGAGUCGGUGCmU*mU*mU*U |
| 227 | G373-2-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmU*mU*mU*mU |
| 228 | G513-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmU*mU*mG*mC |
| 229 | G514-C | GUUUUAGAmGmGmAmAmAmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmUmGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 230 | G516-C | GUUUUAGAGGAAACAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 231 | G517-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmUmGmAmAmAmAmA*mG*mU*mG |
| 232 | G518-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGAAAAA*mG*mU*mG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 233 | G642-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 234 | G612-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGmoeG*moeU* moeG*mC |
| 235 | G613-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUC*mG*mG*mU*m G*mC |
| 236 | G614-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGGUGC(invd) |
| 237 | G615-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGGmUmGmC(inv d) |
| 238 | G643-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC (invd) |
| 239 | G616-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAfAfCfUfUfGmGmCmAmCmCmGmAmG mUmCmGmG*mU*mG*mC |
| 240 | G617-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAfAmCfUmUfGmGfCmAfCmCfGmAfGm UfCmGfG*mU*fG*mC |
| 241 | G618-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAfAfCfUfUfUfGmG mCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 242 | G619-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAfAmCfUmUfGm GfCmAfCmCfGmAfGmUfCmGfG*mU*fG*mC |
| 243 | G534-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mU*mU*mU |
| 244 | G637-C | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 245 | G694-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACC GAGUCGG*mU*mG*mC |
| 246 | G695-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGmGmC mAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 247 | G698-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACC GAGUCGG*mU*mG*mC |
| 248 | G699-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGmGmC mAmCmCmGmAmGmUmCmGmG*mU*mG*mC |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 249 | G481-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmUm GmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 250 | G700-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACC GAGUCGG*mU*mG*mC |
| 251 | G701-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGmGmC mAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 252 | G499-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmUm GmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 253 | G12401-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACC GAGUCGG*mU*mG*mC |
| 254 | G12402-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACC GAGUCGG*mU*mG*mC |
| 255-300 | Not Used | |
| 301 | G282-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAU CAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*m U*mU |
| 302 | G515-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGU CGG*mU*mG*mC |
| 303 | G621-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGU CGGUGC*mU*mU*mU |
| 304 | G632-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmG mCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 305 | G638-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGmGmCmAmC mCmGmAmGmUmCmGmG*mU*mG*mC |
| 306 | G639-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAU CAACUUGGCACCGAGUCGG*mU*mG*mC |
| 307 | G640-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAU CAACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 308 | G641-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGU CGGU*mG*mC*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 309 | G211-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGAAAAAGUGG CACCGAGUCGGUGCmU*mU*mU*U |
| 310 | G269-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGAAAAAGUGG CACCGAGUCGGUGCmU*mU*mU*U |
| 311 | G620-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGU CGG*mU*mG*mC |
| 312 | G622-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGU CGGUGC*mU*mU*mU |
| 313 | G623-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmG mCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 314 | G624-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGmGmCmAmC mCmGmAmGmUmCmGmG*mU*mG*mC |
| 315 | G625-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAU CAACUUGGCACCGAGUCGG*mU*mG*mC |
| 316 | G626-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAU CAACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 317 | G627-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGU CGGU*mG*mC*mU |
| 318 | G283-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAU CAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*m U*mU |
| 319 | G628-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGU CGG*mU*mG*mC |
| 320 | G629-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGU CGGUGC*mU*mU*mU |
| 321 | G630-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmG mCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 322 | G631-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGmGmCmAmC mCmGmAmGmUmCmGmG*mU*mG*mC |
| 323 | G633-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAU CAACUUGGCACCGAGUCGG*mU*mG*mC |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 324 | G634-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 325 | G635-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGGU*mG*mC*mU |
| 326 | G208-2-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGAAAAAGUGGCACCGAGUCGGUGCmU*mU*mU*U |
| 327 | G373-2-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC*mU*mU*mU |
| 328 | G513-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 329 | G514-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmGmAmAmAmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 330 | G516-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGGAAACAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 331 | G517-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmA*mG*mU*mG |
| 332 | G518-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGAAAAA*mG*mU*mG |
| 333 | G642-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 334 | G612-Nx | moeN*moeN*moeN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGmoeG*moeU*moeG*mC |
| 335 | G613-Nx | mN*mN*mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGGUC*mG*mG*mU*mG*mC |
| 336 | G615-Nx | (invd)mNmNmN(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGGUmGmC(invd) |
| 337 | G614-Nx | (invd)(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGGUGC(invd) |
| 338 | G643-Nx | (invd)mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC(invd) |

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|---|---|---|
| 339 | G616-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAfAfCfUfUfGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 340 | G617-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAfAmCfUmUfGmGfCmAfCmCfGmAfGmUfCmGfG*mU*fG*mC |
| 341 | G618-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAfAfCfUfUfGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 342 | G619-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAfAmCfUmUfGmGfCmAfCmCfGmAfGmUfCmGfG*mU*fG*mC |
| 343 | G534-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 344 | G637-Nx | mN*mN*mN*(N)$_x$GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 345 | G694-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 346 | G695-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 347 | G698-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 348 | G699-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 349 | G481-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 350 | G700-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 351 | G701-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGmGmCmAmCmCmGmAmGmUmCmGmG*mU*mG*mC |
| 352 | G499-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |

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|---|---|---|
| 353 | G12401-Nx | mN*mN*mN*(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 354 | G12402-Nx | mN*mN*mN*NNN*N*fN*fN*fN*fNNfNfNNNfNf(N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 355-399 | Not Used | |
| 400 | Conserved Portion of a spyCas9 sgRNA | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGAAAAAGUGGCACCGAGUCGGUGC |
| 401 | G282 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 402 | G480 | mA*mA*mA*GGCUGCUGAUGACACCUGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 403 | G481 | mU*mC*mU*AGAACUUUGACCAUCAGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 404 | G502 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 405 | G504 | mA*mA*mA*GGCUGCUGAUGAGACCUGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 406 | G509 | mA*mA*mA*GUUCUAGAUGCCGUCCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 407 | G9423 | T*T*dA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmCmGmAmGmUmCmGmGmUmGmCmU*T*T*T |
| 408 | G9424 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGdGdCdAdCdCdGdAdGTdCdGdGTdGdCT*T*T*T |

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|---|---|---|
| 409 | G9425 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAdAdCTTdGdAdAdAdAdAdGTdGdGdCdAdCdCdGdAdGTdCdGdGdTdGdCT*T*T*T |
| 410 | G9426 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAdGdCTdAdGdAdAdATdAdGdCAAGUUAAAAUAAGGCUAGUC CGUUAUCAdAdCTTdGdAdAdAdAdAdGTdGdGdCdAdCdCdGdAdGTdCdGdGdTdGdCT*T*T*T |
| 411 | G9427 | T*T*dA*CAGCCACGUCUACAGCAGUUUUAGAdGdCTdAdGdAdAdATdAdGdCAAGUUAAAAUAAGGCUAGUCCGUU AUCAdAdCTTdGdAdAdAdAdAdGTdGdGdCdAdCdCdGdAdGTdCdGdGdTdGdCT*T*T*T |
| 412 | G9553 | mU*mU*mA*CAG*C*fC*fA*fC*fGUfCfUACfAfGCAmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm AmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA*mA* mGmUmGG*mC*mA*mC*mC*mG*mA*mG*mU*mC*mG*mG*mU*mG*mC*mU*mU*mU*mU |
| 413 | G9554 | mU*mU*mA*CAGCCACGUCUACAGCAmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUm AAmAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmG G*mC*mA*mC*mC*mG*mA*mG*mU*mC*mG*mG*mU*mG*mC*mU*mU*mU*mU |
| 414 | G9555 | mU*mU*mA*CAG*C*fC*fA*fC*fGUfCfUACfAfGCAmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm AmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmCmUmUmGmAmAmAmAmAmGmUmG GmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 415 | G9556 | mU*mU*mA*CAGCCACGUCUACAGCAmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUm AAmAAUAmAmGmGmCmUmAmGUmCmCGUUAmUmCAAmCmUmUmGmAmAmAmAmAmGmUmGGmCmAmC mCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 416 | G9557 | mU*mU*mA*CAG*C*fC*fA*fC*fGUfCfUACfAfGCAGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmA mAGUUAAAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmCmUmUmGmAmAmAmAmAmGmUmGGmC mAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 417 | G9558 | mU*mU*mA*CAG*C*fC*fA*fC*fGUfCfUACfAfGCAmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm AmAGUUmAAmAAUAAGGCUAGUCCGUUAUCAAmCmUmUmGmAmAmAmAmAmGmUmGGmCmCmCmGm AmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 418 | G9559 | mU*mU*mA*CAG*C*fC*fA*fC*fGUfCfUACfAfGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGm UmCmGmGmUmGmCmU*mU*mU*mU |
| 419 | G9560 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGmG*mC*mA*mC*mC*mG*mA *mG*mU*mC*mG*mG*mU*mG*mC*mU*mU*mU*mU |

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|---|---|---|
| 420 | G9561 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCmAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 421 | G9562 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 422 | G9563 | mU*mU*mA*CAGCCACGUCUACAGCAmGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUmAAmAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 423 | G9564 | mU*mU*mA*CAG*C*fC*fA*fC*fGUfCfUACfAfGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmC*mU*mU*mG*mA*mA*mA*mA*mA*mGmUmGmG*mC*mA*mC*mC*mG*mA*mG*mU*mC*mG*mG*mC*mU*mU*mU*mU*mU |
| 424 | G9565 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA*mA*mGmUmGG*mC*mA*mC*mC*mG*mA*mA*mG*mU*mU*mG*mU*mG*mC*mU*mU*mU*mU |
| 425 | G9566 | mA*mC*mA*CAAAUACCAGUCCAGCGmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA*mA*mGmUmGG*mC*mA*mC*mC*mG*mA*mA*mG*mU*mU*mG*mA*mC*mU*mU*mU*mU |
| 426 | G9567 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmCmUmUmGmAmAmAmAmAmGmUmGGmCmAmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 427 | G9568 | mA*mC*mA*CAAAUACCAGUCCAGCGmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmCmUmUmGmAmAmAmAmAmGmUmGGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 428 | G9569 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUAAAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmCmUmUmGmAmAmAmAmAmGmUmGGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 429 | G9570 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAAGGCUAGUCCGUUAUCAAmCmUmUmGmAmAmAmAmAmGmUmGGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |

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|---|---|---|
| 430 | G9571 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGm UmCmGmGmUmGmCmU*mU*mU*mU |
| 431 | G9572 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGmG*mC*mA*mC*mC*mG*mA *mG*mU*mC*mG*mG*mU*mG*mC*mU*mU*mU*mU |
| 432 | G9573 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAm AmGmGmCmUmAGUmCmCGUUAUmUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGm AmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 433 | G9574 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUAAA AUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCm GmGmUmGmCmU*mU*mU*mU |
| 434 | G9575 | mA*mC*mA*CAAAUACCAGUCCAGCGmGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUmAAmA AUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCm GmGmUmGmCmU*mU*mU*mU |
| 435 | G9576 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAmAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGmG*mC*mA*mC* mC*mG*mA*mG*mU*mC*mG*mG*mU*mG*mC*mU*mU*mU*mU |
| 436 | G9878 | eT*eT*eA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGG CUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmU mGmCeT*eT*eT*mU |
| 437 | G9879 | xU*xU*xA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGG CUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmU mGmCxU*xU*xU*mU |
| 438 | G9981 | mU*mU*mA*C*AGCC*ACGUCU*AC*AGC*AGUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*A AAAU*AAGGCU*AGUCCGUU*AUC*AmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmG mUmCmGmGmUmGmCmU*mU*mU*mU |
| 439 | G9982 | mU*mU*mA*C*AGCC*ACGUCU*AC*AGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAA AUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCm GmGmUmGmCmU*mU*mU*mU |

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|---|---|---|
| 440 | G9983 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAAU*AAGGCU*AGUCCGUU*AUC*AmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 441 | G9984 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUfUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 442 | G9985 | mU*mU*mA*mCAGCfCACGUCfUAC*AGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 443 | G9986 | mU*mU*mA*mCAGCfCACGUCfUAC*AGC*AGUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAmUAAGGCmUAGUCCGUfUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 444 | G9987 | mU*mU*mA*mCmAmGmCmCmAmCGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 445 | G9988 | mU*mU*mA*mCmAmGmCmCmAmCfGUfCfUACfAfGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 446 | G9989 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUmUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 447 | G9990 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 448 | G9991 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAmUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 449 | G9992 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCmUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 450 | G9993 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUmUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |
| 451 | G9994 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |
| 452 | G9995 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCmU*mU*mU*mU |
| 453 | G9996 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUfUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCmU*mU*mU*mU |
| 454 | G9997 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAfUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCmU*mU*mU*mU |
| 455 | G9998 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCfUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCmU*mU*mU*mU |
| 456 | G9999 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUfUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCmU*mU*mU*mU |
| 457 | G10000 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUfCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCmU*mU*mU*mU |
| 458 | G10001 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUA AGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |
| 459 | G10002 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAAUA AGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 460 | G10003 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU*A<br>AGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm<br>GmUmGmCmU*mU*mU*mU |
| 461 | G10004 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA<br>GGCU*AGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm<br>GmUmGmCmU*mU*mU*mU |
| 462 | G10005 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA<br>GGCUAGUCCGUU*AUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm<br>GmUmGmCmU*mU*mU*mU |
| 463 | G10006 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA<br>GGCUAGUCCGUUAUC*AmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm<br>GmUmGmCmU*mU*mU*mU |
| 464 | G10007 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUeTAAAAeTA<br>AGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm<br>GmUmGmCmU*mU*mU*mU |
| 465 | G10008 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUeAAAeAUA<br>AGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm<br>GmUmGmCmU*mU*mU*mU |
| 466 | G10009 | mU*mU*mA*mCAG*C*fC*fA*fC*fGUfCfUAC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 467 | G10011 | mA*mC*mA*C*AAAU*ACC*AGUCC*AGCGGUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AA<br>AAU*AAGGCU*AGUCCGUU*AUC*AmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGm<br>UmCmGmGmUmGmCmU*mU*mU*mU |
| 468 | G10012 | mA*mC*mA*C*AAAU*ACC*AGUCC*AGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAA<br>UAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG<br>mGmUmGmCmU*mU*mU*mU |
| 469 | G10013 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAAU*<br>AAGGCU*AGUCCGUU*AUC*AmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmC<br>mGmGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 470 | G10014 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAm UAAGGCmUAGUCCGUfUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUm CmGmGmUmGmCmU*mU*mU*mU |
| 471 | G10015 | mA*mC*mA*mCAAAfUACfCAGUCC*AGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAA UAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 472 | G10016 | mA*mC*mA*mCAAAfUACfCAGUCC*AGCGGUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAA AAmUAAGGCmUAGUCCGUfUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmG mUmCmGmGmUmGmCmU*mU*mU*mU |
| 473 | G10017 | mA*mC*mA*mCmAmAmAmUmAmCCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG UUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmG mUmCmGmGmUmGmCmU*mU*mU*mU |
| 474 | G10018 | mA*mC*mA*mCmAmAmAmUmAmCfCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAm GmUmCmGmGmUmGmCmU*mU*mU*mU |
| 475 | G10019 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUmUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUA AGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |
| 476 | G10020 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAUA AGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |
| 477 | G10021 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAmUA AGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |
| 478 | G10022 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCmUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |
| 479 | G10023 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUmUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 480 | G10024 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 481 | G10025 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 482 | G10026 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUfUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 483 | G10027 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAfUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 484 | G10028 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCfUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 485 | G10029 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUfUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 486 | G10030 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUfCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 487 | G10031 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 488 | G10032 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 489 | G10033 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU*AA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 490 | G10034 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCU*AGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |
| 491 | G10035 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUU*AUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |
| 492 | G10036 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUC*AmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |
| 493 | G10037 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUeTAAAAeTA AGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |
| 494 | G10038 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUeAAAeAUA AGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |
| 495 | G10039 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 496 | G9565 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm AmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA*mA* mGmUmGG*mC*mA*mC*mC*mG*mA*mG*mU*mC*mG*mG*mU*mG*mC*mU*mU*mU*mU |
| 497 | G9571 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm UmCmGmGmUmGmCmU*mU*mU*mU |
| 498 | G12421 | mA*mC*mA*fCAAAfUACfCAGUCfCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 499 | G12422 | mA*mC*mA*fCAAAfUACfCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUA AGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 500 | G12423 | mA*mC*AfCAAAfUACfCAGUCfCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAG GCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGm UmGmCmU*mU*mU*mU |
| 501 | G12424 | mA*mC*AfCAAAfUACfCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAG GCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGm UmGmCmU*mU*mU*mU |
| 502 | G12425 | mA*mC*mA*mCAAAfUACfCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 503 | G12689 | mA*mC*mA*dCAAAdUACdCAGUCdCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAA UAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 504 | G12690 | mA*mC*mA*dCAAAdUACdCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 505 | G12426 | mA*mC*mA*CAAAfUfAfCfCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 506 | G12427 | mA*mC*mA*CAAAmUmAmCmCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU AAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmU mCmGmGmUmGmCmU*mU*mU*mU |
| 507 | G12428 | mA*mC*mA*CAAAUACCAGUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUA AGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |
| 508 | G12429 | mA*mC*mA*CAAAUACCAGUCCAGfCfGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUA AGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |
| 509 | G12430 | mA*mC*mA*fCfAfAfAfUfAfCfCfAfGfUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAA AAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmC mGmGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 510 | G12431 | mA*mC*mA*fCfAfAfAfUfAfCfCfAfGfGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 511 | G12432 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 512 | G12433 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAmAmGmGmCmUmAmGUmCmCGUUAAmUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 513 | G12434 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 514 | G12435 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUfUmAfAmAfAmUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 515 | G12436 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUmUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 516 | G12437 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUfUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 517 | G12438 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUGAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 518 | G12691 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUdUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 519 | G12439 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 520 | G12440 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAG UmUAAAAmUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmG mAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 521 | G12692 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUdUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG UmUAAAAmUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmG mAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 522 | G12441 | mA*mC*mA*fCAAAfUACfCAGUCfCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmC mGmGmUmGmCmU*mU*mU*mU |
| 523 | G12442 | mA*mC*mA*fCAAAfUACfCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUA AGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCm GmGmUmGmCmU*mU*mU*mU |
| 424 | G12443 | mA*mC*mA*fCAAAfUACfCAGUCfCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AmAmGmGmCmUmAGUmCmCGUUAmUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCm GmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 525 | G12444 | mA*mC*mA*fCAAAfUACfCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUA mAmGmGmCmUmAGUmCmCGUUAmUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmG mAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 526 | G12445 | mA*mC*mA*fCAAAfUACfCAGUCfCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAA mUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmU mCmGmGmUmGmCmU*mU*mU*mU |
| 527 | G12446 | mA*mC*mA*fCAAAfUACfCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAA mUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmU mCmGmGmUmGmCmU*mU*mU*mU |
| 528 | G12447 | mA*mC*mA*mCAAAfUACfCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmC mGmGmUmGmCmU*mU*mU*mU |
| 529 | G12448 | mA*mC*mA*mCAAAfUACfCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AmAmGmGmCmUmAGUmCmCGUUAmUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCm GmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 530 | G12449 | mA*mC*mA*mCAAAfUACfCAGUCC*AGCGGUUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAA AmUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGm UmCmGmGmUmGmCmU*mU*mU*mU |
| 531 | G12450 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUUAGAGCmUAGAAAmUAGmCAAGUUAAAAUAAGGCU AGUCCGUUAUCAACUUGAAAAAGUGGmCACCGAGUCGGUGCmU*mU*mU*mU |
| 532 | G12451 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAGCmUAGAAAmUAGmCAAGUUAAAAUAAGGCUAGUCCGUU AUCAACUUGAAAAAGUGGmCACCGAGUCGGUGCmU*mU*mU*mU |
| 533 | G211 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCA ACUUGAAAAAGUGGCACCGAGUCGGUGCmU*mU*mU*mU |
| 534 | G269 | mC*mC*mC*AUACUCCUACAGCACCAGUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAA CUUGAAAAAGUGGCACCGAGUCGGUGCmU*mU*mU*mU |
| 535 | G283 | mC*mC*mC*AUACUCCUACAGCACCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAG GCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmCmU*mU*mU*mU |
| 536-600 | Not Used | |
| 601 | G282-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmCmU*mU*mU*mU |
| 607 | G9423-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmCmU*T*T*T |
| 608 | G9424-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGdGdCdAdCdCdGdAdGTdCdGdGTdGdCT*T*T*T |
| 609 | G9425-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAdAdCTTdGdAd AdAdAdAdGTdGdGdCdAdCdCdGdAdGTdCdGdGTdGdCT*T*T*T |
| 610 | G9426-C | GUUUUAGAdGdCTdAdGdAdAdATdAdGdCAAGUUAAAAUAAGGCUAGUCCGUUAUCAdAdCTTdGdAdAdAdAdG TdGdGdCdAdCdCdGdAdGTdCdGdGTdGdCT*T*T*T |
| 611 | G9427-C | GUUUUAGAdGdCTdAdGdAdAdATdAdGdCAAGUUAAAAUAAGGCUAGUCCGUUAUCAdAdCTTdGdAdAdAdAdG TdGdGdCdAdCdCdGdAdGTdCdGdGTdGdCT*T*T*T |
| 612 | G9553-C | GUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmC GUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGG*mC*mA*mC*mC*mG*mA*mG*mU*m C*mG*mG*mU*mG*mC*mU*mU*mU*mU |

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|---|---|---|
| 613 | G9554-C | GUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGG*mC*mA*mC*mC*mG*mA*mG*mU*mC*mG*mG*mU*mU*mC*mU*mU*mU*mU |
| 614 | G9555-C | GUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmCmUmUmGmAmAmAmAmGmUmGGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmUmU*mU*mU*mU |
| 615 | G9556-C | GUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmCmUmUmGmAmAmAmAmGmUmGGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmUmU*mU*mU*mU |
| 616 | G9557-C | GUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUAAAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmCmUmUmGmAmAmAmAmGmUmUmGGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmUmU*mU*mU*mU |
| 617 | G9558-C | GUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAAGGCUAGUCCGUUAUCAAmCmUmUmGmAmAmAmAmGmUmGGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 618 | G9559-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 619 | G9560-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGmG*mC*mA*mC*mC*mG*mA*mG*mU*mC*mG*mG*mU*mC*mU*mU*mU*mU |
| 620 | G9561-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 621 | G9562-C | GUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 622 | G9563-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUmAAmAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 623 | G9564-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGmG*mC*mA*mC*mC*mG*mA*mG*mU*mC*mG*mG*mU*mC*mU*mU*mU*mU |
| 624 | G9565-C | GUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGG*mC*mA*mC*mC*mG*mA*mG*mU*mC*mG*mG*mU*mC*mU*mU*mU*mU |

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|---|---|---|
| 625 | G9566-C | GUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmC GUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGG*mC*mA*mC*mC*mG*mA*mG*mU*m C*mG*mG*mU*mG*mC*mU*mU*mU*mU |
| 626 | G9567-C | GUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmC GUUAmUmCAAmCmUmUmGmAmAmAmAmGmUmGGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU *mU*mU*mU |
| 627 | G9568-C | GUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmC GUUAmUmCAAmCmUmUmGmAmAmAmAmGmUmGGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU *mU*mU*mU |
| 628 | G9569-C | GUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUAAAAUAmAmGmGmCmUmAGUmCmCGU UAmUmCAAmCmUmUmGmAmAmAmAmGmUmGGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*m U*mU*mU |
| 629 | G9570-C | GUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAAGGCUAGUCCGUUAUCAAmC mUmUmGmAmAmAmAmGmUmGGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 630 | G9571-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 631 | G9572-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmC*mU*m U*mG*mA*mA*mA*mA*mGmUmGmG*mC*mA*mC*mC*mG*mA*mG*mU*mC*mG*mG*mU*mG*mC *mU*mU*mU*mU |
| 632 | G9573-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAmAmGmGmCmUmAGUmCmCGUUAmU mCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU* mU*mU |
| 633 | G9574-C | GUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCm UmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 634 | G9575-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUmAAmAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 635 | G9576-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmC*mU*m U*mG*mA*mA*mA*mA*mGmUmGmG*mC*mA*mA*mG*mU*mU*mC*mG*mG*mU*mG*mC *mU*mU*mU*mU |
| 636 | G9878-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCeT*eT*eT*mU |

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|---|---|---|
| 637 | G9879-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmUmCmGmUmGmCxU*xU*xU*mU |
| 638 | G9981-C | GUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAAU*AAGGCU*AGUCCGUU*AUC*AmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmUmCmGmUmGmCmU*mU*mU*mU |
| 639 | G9982-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmUmCmGmUmGmCmU*mU*mU*mU |
| 640 | G9983-C | GUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAAU*AAGGCU*AGUCCGUU*AUC*AmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmUmCmGmUmGmCmU*mU*mU*mU |
| 641 | G9984-C | GUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUfUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmUmCmGmUmGmCmU*mU*mU*mU |
| 642 | G9985-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmUmCmGmUmGmCmU*mU*mU*mU |
| 643 | G9986-C | GUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUfUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmUmCmGmUmGmCmU*mU*mU*mU |
| 644 | G9987-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmUmCmGmUmGmCmU*mU*mU*mU |
| 645 | G9988-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmUmCmGmUmGmCmU*mU*mU*mU |
| 646 | G9989-C | GUUUmUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmUmCmGmUmGmCmU*mU*mU*mU |
| 647 | G9990-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmUmCmGmUmGmCmU*mU*mU*mU |
| 648 | G9991-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAmUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmUmCmGmUmGmCmU*mU*mU*mU |
| 649 | G9992-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCmUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmUmCmGmUmGmCmU*mU*mU*mU |
| 650 | G9993-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUmUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmUmCmGmUmGmCmU*mU*mU*mU |
| 651 | G9994-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUAmCmAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmUmCmGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 652 | G9995-C | GUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 653 | G9996-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUfUAAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 654 | G9997-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAAfUAAGGCUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 655 | G9998-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAAUAAGGCfUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 656 | G9999-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAAUAAGGCUAGUCCGUfUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 657 | G10000-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAAUAAGGCUAGUCCGUUAUfCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 658 | G10001-C | GUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 659 | G10002-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAAUAAGGCUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 660 | G10003-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU*AAGGCUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 661 | G10004-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAAUAAGGCU*AGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 662 | G10005-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAAUAAGGCUAGUCCGUU*AUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 663 | G10006-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAAUAAGGCUAGUCCGUUAUC*AmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 664 | G10007-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUeTAAAAeTAAGGCUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 665 | G10008-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUeAAAeAUAAGGCUAGUCCGUUAUCAmAmCmUm UmGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmGmCmU*mU*mU*mU |
| 666 | G10009-C | GUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUm CmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmU mGmCmU*mU*mU*mU |

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|---|---|---|
| 667 | G10011-C | GUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAAU*AAGGCU*AGUCCGUU*AUC*AmAmC mUmUmGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 668 | G10012-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 669 | G10013-C | GUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAAU*AAGGCU*AGUCCGUU*AUC*AmAmC mUmUmGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 670 | G10014-C | GUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUfUAUmCAmAm CmUmUmGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 671 | G10015-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 672 | G10016-C | GUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUfUAUmCAmAm CmUmUmGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 673 | G10017-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 674 | G10018-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 675 | G10019-C | GUUUmUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 676 | G10020-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 677 | G10021-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAmUAAGGCUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 678 | G10022-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCmUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 679 | G10023-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUmUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 680 | G10024-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUmCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 681 | G10025-C | GUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |

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|---|---|---|
| 682 | G10026-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUfUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 683 | G10027-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAfUAAGGCUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 684 | G10028-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCfUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 685 | G10029-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUfUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 686 | G10030-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUfCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 687 | G10031-C | GUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 688 | G10032-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAAUAAGGCUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 689 | G10033-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU*AAGGCUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 690 | G10034-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCU*AGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 691 | G10035-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUU*AUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 692 | G10036-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUC*AmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 693 | G10037-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUeTAAAAeTAAGGCUAGUCCGUUAUCAmAmCmUmU mGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 694 | G10038-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUeAAAeAUAAGGCUAGUCCGUUAUCAmAmCmUm UmGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 695 | G10039-C | GUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUm CmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmUmGmGmCmAmCmCmGmAmGmUmCmGmGmU mGmCmU*mU*mU*mU |

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|---|---|---|
| 696 | G9565-C | GUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmC GUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA*mA*mGmUmGG*mC*mA*mC*mC*mG*mA*mG*mU*m C*mG*mG*mU*mG*mC*mU*mU*mU*mU |
| 697 | G9571-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 698 | G12421-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 699 | G12422-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 700 | G12423-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 701 | G12424-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 702 | G12425-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 703 | G12689-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 704 | G12690-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 705 | G12426-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 706 | G12427-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 707 | G12428-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 708 | G12429-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 709 | G12430-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 710 | G12431-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUm GmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |

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|---|---|---|
| 711 | G12432-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCmUAGUCCGUUAUmCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 712 | G12433-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAmGmGmCmUmAGUmCmCGUUAmU mCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU* mU*mU |
| 713 | G12434-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUUAUmCAmAmC mUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 714 | G12435-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUfUmAfAmAfAmUAAGGCmUAGUCCGUUAUmCAmA mCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*m U |
| 715 | G12436-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUmUAUmCAmAm CmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 716 | G12437-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUfUAUmCAmAmC mUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 717 | G12438-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUGAUmCAmAmC mUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 718 | G12691-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUdUAUmCAmAm CmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 719 | G12439-C | GUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUUAUmCAmAmC mUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 720 | G12440-C | GUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUUAUmCAmAmC mUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 721 | G12692-C | GUUUdUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUUAUmCAmAm CmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 722 | G12441-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCmUAGUCCGUUAUmCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 723 | G12442-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCmUAGUCCGUUAUmCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 724 | G12443-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAmGmGmCmUmAGUmCmCGUUAmU mCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU* mU*mU |

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|---|---|---|
| 725 | G12444-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAmAmGmGmCmUmAmGUmCmCGUUAmU mCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU* mU*mU |
| 726 | G12445-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAAGGCmUAGUCCGUUAUmCAmAmC mUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 727 | G12446-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAAGGCmUAGUCCGUUAUmCAmAmC mUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 728 | G12447-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCmUAGUCCGUUAUmCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 729 | G12448-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAmAmGmGmCmUmAmGUmCmCGUUAmU mCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU* mU*mU |
| 730 | G12449-C | GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAAGGCmUAGUCCGUUAUmCAmAmC mUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 731 | G12450-C | GUUUUAGAGCmUAGAAAmUAGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGAAAAAGUGGmCACCGAG UCGGUGCmU*mU*mU*mU |
| 732 | G12451-C | GUUUUAGAGCmUAGAAAmUAGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGAAAAAGUGGmCACCGAG UCGGUGCmU*mU*mU*mU |
| 733-800 | Not Used | |
| 801 | G282-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU |
| 802-806 | Not Used | |
| 807 | G9423-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*T*T*T |
| 808 | G9424-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmGmGdCdAdCdCdGdAdGTdCdGdGTdGdCT*T*T*T |
| 809 | G9425-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAdAdCTTdGd AdAdAdAdAdGTdGdGdCdAdCdCdGdAdGTdCdGdGTdGdCT*T*T*T |
| 810 | G9426-Nx | (N)$_x$GUUUUAGAdGdCTdAdGdAdAdATdAdGdCAAGUUAAAAUAAGGCUAGUCCGUUAUCAdAdCTTdGdAdAdAd AdGTdGdGdCdAdCdCdGdAdGTdCdGdGTdGdCT*T*T*T |

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|---|---|---|
| 811 | G9427-Nx | (N)$_x$GUUUUAGAdGdCTdAdGdAdAdATdAdGdCAAGUUAAAAUAAGGCUAGUCCGUUAUCAdAdCTTdGdAdAdAdAd AdGTdGdGdCdAdCdCdGdAdGTdCdGdGTdGdCT*T*T*T |
| 812 | G9553-Nx | (N)$_x$GUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmC mCGUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGG*mC*mA*mC*mC*mG*mA*mG*mU *mC*mG*mG*mU*mG*mC*mC*mU*mU*mU*mU |
| 813 | G9554-Nx | (N)$_x$GUUUUAGmAmGmCmUmAmGmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmC mCGUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGG*mC*mA*mC*mC*mG*mA*mG*mU *mC*mG*mG*mU*mG*mC*mC*mU*mU*mU*mU |
| 814 | G9555-Nx | (N)$_x$GUUUUAGmAmGmCmUmAmGmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmC mCGUUAmUmCAAmCmUmUmGmAmAmAmAmGmUmUGGmCmAmCmCmGmAmGmUmCmGmGmUmGmC mU*mU*mU*mU |
| 815 | G9556-Nx | (N)$_x$GUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmC mCGUUAmUmCAAmCmUmUmGmAmAmAmAmGmUmUGGmCmAmCmCmGmAmGmUmCmGmGmUmGmC mU*mU*mU*mU |
| 816 | G9557-Nx | (N)$_x$GUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUAAAAUAmAmGmGmCmUmAGUmCmC GUUAmUmCAAmCmUmUmGmAmAmAmAmGmUmUGGmCmAmCmCmGmAmGmUmGmGmCmU *mU*mU*mU |
| 817 | G9558-Nx | (N)$_x$GUUUUAGmAmGmCmUmAmGmAmAmUmAmGmCmAmAGUUmAAmAAUAAGGCUAGUCCGUUAUCAA mCmUmUmGmAmAmAmAmGmUmUGGmCmAmCmCmGmAmGmUmUmGmCmU*mU*mU*mU |
| 818 | G9559-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmUmGmCmU*mU*mU*mU |
| 819 | G9560-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmC*mU *mU*mG*mA*mA*mA*mA*mGmUmGmG*mC*mC*mG*mA*mG*mU*mG*mU* mC*mU*mU*mU*mU |
| 820 | G9561-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGUUAAAAUAmAmGmGmCmUmAGUmCmCGUUA mUmCAmAmCmUmUmGmAmAmAmAmGmUmUmGmCmAmCmCmGmAmGmUmUmGmCmU* mU*mU*mU |
| 821 | G9562-Nx | (N)$_x$GUUUUAGmAmGmCmUmAmGmAmAmUmAmGmCmAmAGUUAAAAUAAGGCUAGUCCGUUAUCAmAm CmUmUmGmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmUmGmCmU*mU*mU*mU |
| 822 | G9563-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGUUmAAmAAUAAGGCUAGUCCGUUAUCAmAmC mUmUmGmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmUmGmCmU*mU*mU*mU |

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|---|---|---|
| 823 | G9564-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmC*mU*mU*mG*mA*mA*mA*mA*mA*mGmUmGmG*mC*mA*mC*mC*mG*mA*mG*mU*mG*mC*mU*mU*mU*mU |
| 824 | G9565-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGG*mC*mA*mC*mC*mG*mA*mG*mU*mC*mG*mG*mU*mU*mC*mU*mU*mU |
| 825 | G9566-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGG*mC*mA*mC*mC*mG*mA*mA*mG*mU*mC*mG*mG*mU*mU*mC*mU*mU*mU |
| 826 | G9567-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmCmUmUmGmAmAmAmAmGmUmGGmCmAmCmCmGmAmGmUmCmGmUmGmCmU*mU*mU*mU*mU |
| 827 | G9568-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmCmUmUmGmAmAmAmAmGmUmGGmCmAmCmCmGmAmGmUmCmGmUmGmCmU*mU*mU*mU*mU |
| 828 | G9569-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUAAAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmCmUmUmGmAmAmAmAmGmUmGGmCmAmCmCmGmAmGmUmCmGmUmGmCmU*mU*mU*mU |
| 829 | G9570-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAAGGCUAGUCCGUUAUCAAmCmUmUmGmAmAmAmAmGmUmGGmCmAmCmCmGmAmGmUmCmGmUmGmCmU*mU*mU*mU |
| 830 | G9571-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmCmCmAmCmCmGmAmGmUmCmGmUmGmCmU*mU*mU*mU |
| 831 | G9572-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGmG*mC*mA*mC*mC*mG*mA*mG*mU*mG*mC*mU*mU*mU*mU |
| 832 | G9573-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAAGUUAAAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmUmGmCmU*mU*mU*mU |
| 833 | G9574-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmUmGmCmU*mU*mU*mU |
| 834 | G9575-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAAGUUmAAmAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmUmGmCmU*mU*mU*mU |

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|---|---|---|
| 835 | G9576-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGmG*mC*mA*mC*mC*mG*mA*mA*mG*mU*mC*mG*mG*mU*mC*mU*mU*mU |
| 836 | G9878-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCeT*eT*eT*eT*mU |
| 837 | G9879-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCxU*xU*xU*mU |
| 838 | G9981-Nx | (N)$_x$GUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAAU*AAGGCU*AGUCCGUU*AUC*AmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 839 | G9982-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 840 | G9983-Nx | (N)$_x$GUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAAU*AAGGCU*AGUCCGUU*AUC*AmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 841 | G9984-Nx | (N)$_x$GUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUfUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 842 | G9985-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 843 | G9986-Nx | (N)$_x$GUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUfUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 844 | G9987-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 845 | G9988-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 846 | G9989-Nx | (N)$_x$GUUUmUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 847 | G9990-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |

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|---|---|---|
| 848 | G9991-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAmUAAGGCUAGUCCGUUAUCAmAmCm UmUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 849 | G9992-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCmUAGUCCGUUAUCAmAmCm UmUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 850 | G9993-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUmUAUCAmAmCm UmUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 851 | G9994-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUmCAmAmCm UmUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 852 | G9995-Nx | (N)$_x$GUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 853 | G9996-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUfUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 854 | G9997-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAfUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 855 | G9998-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCfUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 856 | G9999-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUfUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 857 | G10000-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUfCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 858 | G10001-Nx | (N)$_x$GUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 859 | G10002-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 860 | G10003-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAAU*AAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 861 | G10004-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCU*AGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 862 | G10005-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUU*AUCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |

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|---|---|---|
| 863 | G10006-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUC*AmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 864 | G10007-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUeTAAAAeTAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmCmU*mU*mU*mU |
| 865 | G10008-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUeAAAeAUAAGGCUAGUCCGUUAUCAmAmCm UmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmCmU*mU*mU*mU |
| 866 | G10009-Nx | (N)$_x$GUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAG UmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmCmGmG mUmGmCmU*mU*mU*mU |
| 867 | G10011-Nx | (N)$_x$GUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAAU*AAGGCU*AGUCCGUU*AUC*AmA mCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*m U |
| 868 | G10012Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmCmU*mU*mU*mU |
| 869 | G10013-Nx | (N)$_x$GUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAAU*AAGGCU*AGUCCGUU*AUC*AmA mCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*m U |
| 870 | G10014-Nx | (N)$_x$GUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUfUAUmCAm AmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*m U |
| 871 | G10015-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmCmU*mU*mU*mU |
| 872 | G10016-Nx | (N)$_x$GUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUfUAUmCAm AmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*m U |
| 873 | G10017-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmCmU*mU*mU*mU |
| 874 | G10018-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmCmU*mU*mU*mU |
| 875 | G10019-Nx | (N)$_x$GUUUmUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCm UmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 876 | G10020-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAUAAGGCUAGUCCGUUAUCAmAmCm UmUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 877 | G10021-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAmUAAGGCUAGUCCGUUAUCAmAmCm UmUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 878 | G10022-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCmUAGUCCGUUAUCAmAmCm UmUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 879 | G10023-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUmUAUCAmAmCm UmUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 880 | G10024-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUmCAmAmCm UmUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 881 | G10025-Nx | (N)$_x$GUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 882 | G10026-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUfUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 883 | G10027-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAfUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 884 | G10028-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCfUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 885 | G10029-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUfUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 886 | G10030-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUfCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 887 | G10031-Nx | (N)$_x$GUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 888 | G10032-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 889 | G10033-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU*AAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 890 | G10034-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCU*AGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmAmGmUmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |

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|---|---|---|
| 891 | G10035-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUU*AUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 892 | G10036-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUC*AmAmCmU mUmGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 893 | G10037-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUeTAAAAeTAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 894 | G10038-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUeAAAeAUAAGGCUAGUCCGUUAUCAmAmCm UmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 895 | G10039-Nx | (N)$_x$GUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAG UmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmUmGmCmG mUmGmCmU*mU*mU*mU |
| 896 | G9565-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAAmAmGmGmCmUmAGUmC mCGUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGG*mC*mA*mC*mC*mG*mA*mG*mU *mC*mG*mG*mU*mG*mC*mC*mU*mU*mU*mU |
| 897 | G9571-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 898 | G12421-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 899 | G12422-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 900 | G12423-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 901 | G12424-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 902 | G12425-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 903 | G12689-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 904 | G12690-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 905 | G12426-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 906 | G12427-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 907 | G12428-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 908 | G12429-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 909 | G12430-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 910 | G12431-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmU mUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 911 | G12432-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCmUAGUCCGUUAUmCAmAmC mUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 912 | G12433-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAmAmGmGmCmUmAGUmCmCGUUA mUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmGmCmU* mU*mU*mU |
| 913 | G12434-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUUAUmCAmA mCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*m U |
| 914 | G12435-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUfUmAfAmAfAmUAAGGCmUAGUCCGUUAUmC AmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmGmCmU*mU*m U*mU |
| 915 | G12436-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUmUAUmCAm AmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmGmCmU*mU*mU*m U |
| 916 | G12437-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUfUAUmCAmA mCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmGmCmU*mU*mU*m U |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 917 | G12438-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUGAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 918 | G12691-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUdUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 919 | G12439-Nx | (N)$_x$GUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 920 | G12440-Nx | (N)$_x$GUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 921 | G12692-Nx | (N)$_x$GUUUdUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 922 | G12441-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 923 | G12442-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 924 | G12443-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAmAmGmGmCmUmAmAGUmCmCGUUAmUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 925 | G12444-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAmAmGmGmCmUmAmAGUmCmCGUUAmUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 926 | G12445-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 927 | G12446-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 928 | G12447-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCmUAGUCCGUUAUmCAmAmC mUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmUmGmCmU*mU*mU*mU |
| 929 | G12448-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAmGmGmCmUmAGUmCmCGUUA mUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmUmGmCmU* mU*mU*mU |
| 930 | G12449-Nx | (N)$_x$GUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAAmUAAGGCmUAGUCCGUUAUmCAmA mCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmUmGmCmU*mU*mU*m U |
| 931 | G12450-Nx | (N)$_x$GUUUUAGAGCmUAGAAAmUAGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGAAAAAGUGGmCACCG AGUCGGUGCmU*mU*mU*mU |
| 932 | G12451-Nx | (N)$_x$GUUUUAGAGCmUAGAAAmUAGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGAAAAAGUGGmCACCG AGUCGGUGCmU*mU*mU*mU |
| 933-1000 | Not Used | |
| 1001 | G282-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1002-1006 | Not Used | |
| 1007 | G9423-N20 | N*N*dN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAG GCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGm UmGmCmU*T*T*T |
| 1008 | G9424-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGdGdCdAdCdCdGdAdGTdCdGdGTdGdCT *T*T*T |
| 1009 | G9425-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUUAUCAdAdCTTdGdAdAdAdAdAdGTdGdGdCdAdCdCdGdAdGTdCdGdGTdGdCT*T*T*T |
| 1010 | G9426-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAdGdCTdAdGdAdAdATdAdGdCAAGUUAAAAUAAGGCUAG UCCGUUAUCAdAdCTTdGdAdAdAdAdAdGTdGdGdCdAdCdCdGdAdGTdCdGdGTdGdCT*T*T*T |
| 1011 | G9427-N20 | N*N*dN*NNNNNNNNNNNNNNNNGUUUUAGAdGdCTdAdGdAdAdATdAdGdCAAGUUAAAAUAAGGCUAGUCC GUUAUCAdAdCTTdGdAdAdAdAdAdGTdGdGdCdAdCdCdGdAdGTdCdGdGTdGdCT*T*T*T |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1012 | G9553-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNfNfNNNmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA*mA*mGmUmGG*mC*mA*mC*mC*mG*mA*mG*mU*mC*mG*mG*mG*mC*mC*mU*mU*mU*mU |
| 1013 | G9554-N20 | mN*mN*mN*NNNNNNNNNNNNNNNmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGG*mC*mA*mC*mC*mG*mA*mA*mG*mU*mC*mC*mG*mG*mG*mC*mC*mU*mU*mU*mU |
| 1014 | G9555-N20 | mN*mN*mN*NNN*N*fN*fN*fNNfNfNNNmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmCmUmUmGmAmAmAmAmGmU mGGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1015 | G9556-N20 | mN*mN*mN*NNNNNNNNNNNNNNNmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmCmUmUmGmAmAmAmAmGmUmGGmCmAm CmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1016 | G9557-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNfNfNNNfNNNGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmC mAmAGUUAAAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmCmUmUmGmAmAmAmAmGmUmGG mCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1017 | G9558-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNfNfNNNmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGm CmAmAGUUmAAmAAUAAGGCUAGUCCGUUAUCAAmCmUmUmGmAmAmAmAmGmUmGGmCmAmCmCm GmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1018 | G9559-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmCmAmCmCmGmAmG mUmCmGmGmUmGmCmU*mU*mU*mU |
| 1019 | G9560-N20 | mN*mN*mN*NNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUUAUCAmAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGmG*mC*mA*mC*mC*mG* mA*mG*mU*mC*mG*mG*mU*mG*mC*mU*mU*mU*mU |
| 1020 | G9561-N20 | mN*mN*mN*NNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AmAmGmGmCmUmAGUmCmCGUUAmUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCm GmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1021 | G9562-N20 | mN*mN*mN*NNNNNNNNNNNNNNNGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUA AAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUm CmGmGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1022 | G9563-N20 | mN*mN*mN*NNNNNNNNNNNNNNNmGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUmAA mAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUm CmGmGmUmGmCmU*mU*mU*mU |
| 1023 | G9564-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAmAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGmG*mC*mA*m C*mC*mG*mA*mG*mU*mC*mG*mG*mU*mC*mU*mU*mU*mU |
| 1024 | G9565-N20 | mN*mN*mN*NNN*N*fN*fN*fNNfNfNNNfNfNNNmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGm CmAmAGUUmAAmAmAAUAAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA* mA*mGmUmGG*mC*mA*mC*mC*mG*mA*mG*mU*mC*mG*mG*mU*mC*mU*mU*mU*mU |
| 1025 | G9566-N20 | mN*mN*mN*NNNNNNNNNNNNNNNmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUU mAAmAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA*mGmUm GG*mC*mA*mC*mC*mG*mA*mG*mU*mC*mG*mG*mU*mC*mC*mU*mU*mU*mU |
| 1026 | G9567-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNfNfNNNfNfNNNmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGm CmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmCmUmUmGmAmAmAmAmAmGmU mGGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1027 | G9568-N20 | mN*mN*mN*NNNNNNNNNNNNNNNmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUU mAAmAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmCmUmUmGmAmAmAmAmAmGmUmGGmCmAm CmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1028 | G9569-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNfNfNNNfNfNNNGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGmC mAmAGUUAAAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmCmUmUmGmAmAmAmAmAmGmUmGG mCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1029 | G9570-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNfNfNNNfNfNNNmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGm CmAmAGUUmAAmAAUAAGGCUAGUCCGUUAUCAAmCmUmUmGmAmAmAmAmAmGmUmGGmCmAmCmCm GmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1030 | G9571-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmG mUmCmGmGmUmGmCmU*mU*mU*mU |
| 1031 | G9572-N20 | mN*mN*mN*NNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUUAUCAmAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGmG*mC*mA*mC*mC*mG* mA*mG*mU*mC*mG*mG*mU*mG*mC*mC*mU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1032 | G9573-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AmAmGmGmCmUmAGUmCmCGUUAmUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCm GmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1033 | G9574-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAmAGUUA AAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUm CmGmGmUmGmCmU*mU*mU*mU |
| 1034 | G9575-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNmGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUmAA mAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUm CmGmGmUmGmCmU*mU*mU*mU |
| 1035 | G9576-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNfNfNNNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAmAmC*mU*mU*mG*mA*mA*mA*mA*mGmUmGmG*mC*mA*m C*mC*mG*mA*mG*mU*mC*mG*mG*mU*mG*mC*mU*mU*mU*mU |
| 1036 | G9878-N20 | eN*eN*eN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCeT*eT*eT*eT*mU |
| 1037 | G9879-N20 | xN*xN*xN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCxU*xU*xU*mU |
| 1038 | G9981-N20 | mN*mN*mN*N*NNNN*NNNNNN*NN*NNN*NGUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU *AAAAU*AAGGCU*AGUCCGUU*AUC*AmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAm GmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1039 | G9982-N20 | mN*mN*mN*N*NNNN*NNNNNN*NN*NNN*NGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUA AAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUm CmGmGmUmGmCmU*mU*mU*mU |
| 1040 | G9983-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAA U*AAGGCU*AGUCCGUU*AUC*AmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUm CmGmGmUmGmCmU*mU*mU*mU |
| 1041 | G9984-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAA AmUAAGGCmUAGUCCGUfUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGm UmCmGmGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1042 | G9985-N20 | mN*mN*mN*mNNNNfNNNNNfNNN*NNN*NGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUA AAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUm CmGmGmUmGmCmU*mU*mU*mU |
| 1043 | G9986-N20 | mN*mN*mN*mNNNNfNNNNNfNNN*NNN*NGUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUm UAAAAmUAAGGCmUAGUCCGUfUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmA mGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1044 | G9987-N20 | mN*mN*mN*mNmNmNmNmNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAm GmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1045 | G9988-N20 | mN*mN*mN*mNmNmNmNmNfNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmG mCAAGUUAAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmG mAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1046 | G9989-N20 | mN*mN*mN*NNNNNNNNNNNNNNNGUUUmUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAA UAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmG mGmUmGmCmU*mU*mU*mU |
| 1047 | G9990-N20 | mN*mN*mN*NNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAA UAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmG mGmUmGmCmU*mU*mU*mU |
| 1048 | G9991-N20 | mN*mN*mN*NNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAm UAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1049 | G9992-N20 | mN*mN*mN*NNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCmUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCm GmGmUmGmCmU*mU*mU*mU |
| 1050 | G9993-N20 | mN*mN*mN*NNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUmUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCm GmGmUmGmCmU*mU*mU*mU |
| 1051 | G9994-N20 | mN*mN*mN*NNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCm GmGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1052 | G9995-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1053 | G9996-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUfUAAAAU AAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1054 | G9997-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAfU AAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1055 | G9998-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCfUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1056 | G9999-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUfUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1057 | G10000-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUUAUfCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1058 | G10001-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAA UAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1059 | G10002-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAA UAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1060 | G10003-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU *AAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1061 | G10004-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCU*AGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1062 | G10005-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUU*AUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1063 | G10006-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUUAUC*AmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1064 | G10007-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUeTAAAAe TAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1065 | G10008-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUeAAAeA UAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1066 | G10009-N20 | mN*mN*mN*mNNN*N*fN*fN*fN*fNNfNfNNN*fNfNN*NmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmA mGmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmUmGmAmAmAm AmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1067 | G10011-N20 | mN*mN*mN*N*NNNN*NNN*NNNNN*NNNNGUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU* AAAAU*AAGGCU*AGUCCGUU*AUC*AmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAm GmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1068 | G10012-N20 | mN*mN*mN*N*NNNN*NNN*NNNNN*NNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAA AAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmC mGmGmUmGmCmU*mU*mU*mU |
| 1069 | G10013-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAA U*AAGGCU*AGUCCGUU*AUC*AmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUm CmGmGmUmGmCmU*mU*mU*mU |
| 1070 | G10014-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAA AmUAAGGCmUAGUCCGUfUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGm UmCmGmGmUmGmCmU*mU*mU*mU |
| 1071 | G10015-N20 | mN*mN*mN*mNNNNfNNNfNNNNNN*NNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAA AAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmC mGmGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1072 | G10016-N20 | mN*mN*mN*mNNNNfNNNfNNNNNN*NNNNGUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmU AAAAmUAAGGCmUAGUCCGUfUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmA mGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1073 | G10017-N20 | mN*mN*mN*mNmNmNmNmNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAm GmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1074 | G10018-N20 | mN*mN*mN*mNmNmNmNmNfNNNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmG mCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmG mAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1075 | G10019-N20 | mN*mN*mN*NNNNNNNNNNNNNNNGUUUUmUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAA UAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1076 | G10020-N20 | mN*mN*mN*NNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAAAA UAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1077 | G10021-N20 | mN*mN*mN*NNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAm UAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1078 | G10022-N20 | mN*mN*mN*NNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCmUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCm GmGmUmGmCmU*mU*mU*mU |
| 1079 | G10023-N20 | mN*mN*mN*NNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUmUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCm GmGmUmGmCmU*mU*mU*mU |
| 1080 | G10024-N20 | mN*mN*mN*NNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCm GmGmUmGmCmU*mU*mU*mU |
| 1081 | G10025-N20 | mN*mN*mN*NNNNNNNNNNNNNNNGUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1082 | G10026-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUfUAAAAU AAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1083 | G10027-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAfU AAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1084 | G10028-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCfUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1085 | G10029-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUfUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1086 | G10030-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUUAUfCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1087 | G10031-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAA UAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1088 | G10032-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU*AAAA UAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1089 | G10033-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU *AAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1090 | G10034-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCU*AGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1091 | G10035-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUU*AUCAmAmCmUmUmGmAmGmAmAmAmGmUmGmGmCmAmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1092 | G10036-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUUAUC*AmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1093 | G10037-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUeTAAAAe TAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1094 | G10038-N20 | mN*mN*mN*NNNNNNNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUeAAAeA UAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1095 | G10039-N20 | mN*mN*mN*mNNN*N*fN*fN*fN*fNNfNfNNN*fNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm GmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1096 | G9565-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNfNfNNNfNfNNNmGUUUUAGmAmGmCmUmAmGmAmAmAmUmAmGm CmAmAGUUmAAmAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAAmC*mU*mU*mG*mA*mA*mA*mA* mA*mGmUmGG*mC*mA*mC*mC*mG*mA*mG*mU*mC*mG*mG*mU*mG*mC*mU*mU*mU*mU |
| 1097 | G9571-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmG mUmCmGmGmUmGmCmU*mU*mU*mU |
| 1098 | G12421-N20 | mN*mN*mN*fNNNNfNNNfNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAA AUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCm GmGmUmGmCmU*mU*mU*mU |
| 1099 | G12422-N20 | mN*mN*mN*fNNNNfNNNfNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAA UAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1100 | G12423-N20 | mN*mN*NfNNNNfNNNfNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |
| 1101 | G12424-N20 | mN*mN*NfNNNNfNNNfNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUA AGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1102 | G12425-N20 | mN*mN*mN*mNNNNfNNNfNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1103 | G12689-N20 | mN*mN*mN*dNNNNdNNNdNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1104 | G12690-N20 | mN*mN*mN*dNNNNdNNNdNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1105 | G12426-N20 | mN*mN*mN*NNNNfNfNfNNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1106 | G12427-N20 | mN*mN*mN*NNNNmNmNmNNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1107 | G12428-N20 | mN*mN*mN*NNNNNNNNNNNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1108 | G12429-N20 | mN*mN*mN*NNNNNNNNNNNNNfNfNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1109 | G12430-N20 | mN*mN*mN*fNfNfNfNfNfNfNfNfNfNNNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1110 | G12431-N20 | mN*mN*mN*fNfNfNfNfNfNfNfNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1111 | G12432-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1112 | G12433-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCmAmAmCmUmUmGmAmAmAmAmGmUmGmGmC mAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1113 | G12434-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUmUAAAAmUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCm GmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1114 | G12435-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUfUmAfAmAfAmUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmC mCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1115 | G12436-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUmUAAAAmUAAGGCmUAGUCCGUmUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmC mGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1116 | G12437-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUmUAAAAmUAAGGCmUAGUCCGUfUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmC mGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1117 | G12438-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUmUAAAAmUAAGGCmUAGUCCGUGAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCm GmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1118 | G12691-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUmUAAAAmUAAGGCmUAGUCCGUdUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmC mGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1119 | G12439-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNNfNfNNNGUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUmUAAAAmUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmC mGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1120 | G12440-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNNfNfNNNGUUUU*AGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUmUAAAAmUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmC mGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1121 | G12692-N20 | mN*mN*mN*NNN*N*fN*fN*fN*fNNNfNfNNNGUUUdUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUmUAAAAmUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmC mGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |

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|---|---|---|
| 1122 | G12441-N20 | mN*mN*mN*fNNNNfNNNNfNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAA AUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmU mCmGmGmUmGmCmU*mU*mU*mU |
| 1123 | G12442-N20 | mN*mN*mN*fNNNNfNNNNfNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAA UAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUm CmGmGmUmGmCmU*mU*mU*mU |
| 1124 | G12443-N20 | mN*mN*mN*fNNNNfNNNNfNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAA AUAmAmGmGmCmUmAmGUmCmCGUUAmUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCm CmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1125 | G12444-N20 | mN*mN*mN*fNNNNfNNNNfNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAA UAmAmGmGmCmUmAmGUmCmCGUUAmUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmC mGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1126 | G12445-N20 | mN*mN*mN*fNNNNfNNNNfNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAA AAmUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmG mUmCmGmGmUmGmCmU*mU*mU*mU |
| 1127 | G12446-N20 | mN*mN*mN*fNNNNfNNNNfNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUAA AAmUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmG mUmCmGmGmUmGmCmU*mU*mU*mU |
| 1128 | G12447-N20 | mN*mN*mN*mNNNNfNNNNfNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAA AUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmU mCmGmGmUmGmCmU*mU*mU*mU |
| 1129 | G12448-N20 | mN*mN*mN*mNNNNfNNNNfNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAA AUAmAmGmGmCmUmAmGUmCmCGUUAmUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCm CmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1130 | G12449-N20 | mN*mN*mN*mNNNNfNNNNfNNNNNN*NNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUmUA AAAmUAAGGCmUAGUCCGUUAUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmG mUmCmGmGmUmGmCmU*mU*mU*mU |
| 1131 | G12450-N20 | mN*mN*mN*NNN*N*fN*fN*fNNfNfNNNfNNNGUUUUAGAGCmUAGAAAmUAGmCAAGUUAAAAUAAGG CUAGUCCGUUAUCAACUUGAAAAAGUGGmCACCGAGUCGGUGCmU*mU*mU*mU |
| 1132 | G12451-N20 | mN*mN*mN*NNNNNNNNNNNNNNNGUUUUAGAGCmUAGAAAmUAGmCAAGUUAAAAUAAGGCUAGUCCG UUAUCAACUUGAAAAAGUGGmCACCGAGUCGGUGCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1133-1199 | Not Used | |
| 1200 | Conserved Portion of a spyCas9 sgRNA | GUUUUAGAGCUAGAAAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGAAAAAGUGGCAC CGAGUCGGUGC |
| 1201 | G009428 | mA*mA*mC*CUGUGAAAAUGCUCCCCGUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCmU*mU*mU*mU |
| 1202 | G009429 | mU*mG*mU*UCUGCCAGAAAUUGUGGGUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGUUAAAAUA AGGCUAGUCCGUUAUCAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |
| 1203 | G009430 | mG*mC*mC*CGUUCCCAGGGACUGACGUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCmU*mU*mU*mU |
| 1204 | G009432 | mA*mA*mU*AGACCCAUCUAUCAGCUGUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCmU*mU*mU*mU |
| 1205 | G013964 | mA*mA*mC*mCUG*U*fG*fA*fA*fAAfUfGCUfCfCCCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGmC mAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm GmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1206 | G013965 | mU*mG*mU*mUCU*G*fC*fC*fA*fGAfAfAUUfGfUGGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGm CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1207 | G013966 | mG*mC*mC*mCGU*U*fC*fC*fC*fAGfGfGACfUfGACmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGm CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1208 | G013967 | mA*mA*mU*mAGA*C*fC*fC*fA*fUCfUfAUC*fAfGCUmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAm AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1209 | G013968 | mA*mA*mC*CUGUGAAAAUGCUCCCCGUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1210 | G013969 | mU*mG*mU*UCUGCCAGAAAUUGUGGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUA AGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 1211 | G013970 | mG*mC*mC*CGUUCCCAGGGACUGACGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 1212 | G013971 | mA*mA*mU*AGACCCAUCUAUCAGCUGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 1213 | TR000002 | AACAGCAUAGCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGAAAAAGUGGCACCGAGUCGGUGCUUUUUUU |
| 1214 | CR000309 | CACGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1215 | CR003102 | CGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1216 | CR005081 | CCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1217 | CR005082 | GCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1218 | CR005083 | ACGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1219 | CR005084 | mCmACGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1220 | CR005085 | CAmCmGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1221 | CR005086 | CACGmCmCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1222 | CR005087 | CACGCCmCmCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1223 | CR005088 | CACGCCCCmCmACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1224 | CR005089 | CACGCCCCCAmCmCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1225 | CR005090 | CACGCCCCCACCmCmCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1226 | CR005091 | CACGCCCCCACCCUmAmAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1227 | CR005092 | CACGCCCCCACCCUAAmUmCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1228 | CR005093 | CACGCCCCCACCCUAAUCmAmGGUUUUAGAGCUAUGCUGUUUUG |
| 1229 | CR005094 | GGCACGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1230 | CR005095 | mC*mA*CGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1231 | CR005096 | mC*mA*mC*GCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1232 | CR005097 | C*A*C*GCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1233 | CR005098 | C*A*C*G*C*CCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1234 | CR005099 | CACGCCCCCACCCUAA*U*C*A*G*GUUUUAGAGCUAUGCUGUUUUG |
| 1235 | CR005100 | C*A*CGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1236 | CR005101 | CAC*G*CCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1237 | CR005102 | CACGC*C*CCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1238 | CR005103 | CACGCCC*C*CACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1239 | CR005104 | CACGCCCCC*A*CCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1240 | CR005105 | CACGCCCCCAC*C*CUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1241 | CR005106 | CACGCCCCCACCC*U*AAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1242 | CR005107 | CACGCCCCCACCCUA*A*UCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1243 | CR005108 | CACGCCCCCACCCUAAU*C*AGGUUUUAGAGCUAUGCUGUUUUG |
| 1244 | CR005109 | CACGCCCCCACCCUAAUCA*G*GUUUUAGAGCUAUGCUGUUUUG |
| 1245 | CR007531 | xCACGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1246 | CR007532 | CxACGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1247 | CR007533 | CAxCGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1248 | CR007534 | CACxGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1249 | CR007535 | CACGxCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1250 | CR007536 | CACGCxCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1251 | CR007537 | CACGCCxCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1252 | CR007538 | CACGCCCxCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1253 | CR007539 | CACGCCCCxCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1254 | CR007540 | CACGCCCCCxACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1255 | CR007541 | CACGCCCCCAxCCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1256 | CR007542 | CACGCCCCCACxCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1257 | CR007543 | CACGCCCCCACCxCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1258 | CR007544 | CACGCCCCCACCCxUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1259 | CR007545 | CACGCCCCCACCCUxAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1260 | CR007546 | CACGCCCCCACCCUAxAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1261 | CR007547 | CACGCCCCCACCCUAAxUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1262 | CR007548 | CACGCCCCCACCCUAAUxCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1263 | CR007549 | CACGCCCCCACCCUAAUCxAGGUUUUAGAGCUAUGCUGUUUUG |
| 1264 | CR007550 | CACGCCCCCACCCUAAUCAxGGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1265 | CR007551 | xGxGCACGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1266 | CR007552 | xCxCCACGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1267 | CR007553 | xCxACGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1268 | CR007554 | xCxAxCGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1269 | CR007555 | lACGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1270 | CR007556 | ClCGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1271 | CR007557 | CAlGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1272 | CR007558 | CACICCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1273 | CR007559 | CACGlCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1274 | CR007560 | CACGCICCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1275 | CR007561 | CACGCCICCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1276 | CR007562 | CACGCCCICACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1277 | CR007563 | CACGCCCCIACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1278 | CR007564 | CACGCCCCCICCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1279 | CR007565 | CACGCCCCCAICCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1280 | CR007566 | CACGCCCCCACICUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1281 | CR007567 | CACGCCCCCACCIUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1282 | CR007568 | CACGCCCCCACCCIAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1283 | CR007569 | CACGCCCCCACCCUIAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1284 | CR007570 | CACGCCCCCACCCUAIUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1285 | CR007571 | CACGCCCCCACCCUAAICAGGUUUUAGAGCUAUGCUGUUUUG |
| 1286 | CR007572 | CACGCCCCCACCCUAAUIAGGUUUUAGAGCUAUGCUGUUUUG |
| 1287 | CR007573 | CACGCCCCCACCCUAAUCIGGUUUUAGAGCUAUGCUGUUUUG |
| 1288 | CR007574 | CACGCCCCCACCCUAAUCAIGUUUUAGAGCUAUGCUGUUUUG |
| 1289 | CR007575 | dCACGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1290 | CR007576 | CdACGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1291 | CR007577 | CAdCGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1292 | CR007578 | CACdGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1293 | CR007579 | CACGdCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1294 | CR007580 | CACGCdCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1295 | CR007581 | CACGCCdCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1296 | CR007582 | CACGCCCdCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1297 | CR007583 | CACGCCCCdCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1298 | CR007584 | CACGCCCCCdACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1299 | CR007585 | CACGCCCCCAdCCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1300 | CR007586 | CACGCCCCCACdCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1301 | CR007587 | CACGCCCCCACCdCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1302 | CR007588 | CACGCCCCCACCCdTAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1303 | CR007589 | CACGCCCCCACCCUdAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1304 | CR007590 | CACGCCCCCACCCUAdAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1305 | CR007591 | CACGCCCCCACCCUAAdTCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1306 | CR007592 | CACGCCCCCACCCUAAUdCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1307 | CR007593 | CACGCCCCCACCCUAAUCdAGGUUUUAGAGCUAUGCUGUUUUG |
| 1308 | CR007594 | CACGCCCCCACCCUAAUCAdGGUUUUAGAGCUAUGCUGUUUUG |
| 1309 | CR007595 | dCdACGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1310 | CR007596 | CAdCdGCCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1311 | CR007597 | CACGdCdCCCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1312 | CR007598 | CACGCCdCdCCACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1313 | CR007599 | CACGCCCCdCdACCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1314 | CR007600 | CACGCCCCCAdCdCCUAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1315 | CR007601 | CACGCCCCCACCdCdTAAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1316 | CR007602 | CACGCCCCCACCCUdAdAUCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1317 | CR007603 | CACGCCCCCACCCUAAdTdCAGGUUUUAGAGCUAUGCUGUUUUG |
| 1318 | CR007604 | CACGCCCCCACCCUAAUCdAdGGUUUUAGAGCUAUGCUGUUUUG |
| 1319 | G013496 | mA*mC*mG*mCAA*A*fU*fA*fU*fCAfGfUCfCfAfGCGmGUUUUfUAGmAmGmCmUmAmGmUmAmGmCmAmAmGmAmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1320 | G013771 | mA*mC*mG*mCAA*A*fU*fA*fU*fCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmGmAmAmAmUmAmGm CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmGmAmAmAmAmA mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 1321 | CR003346 | AAAGUUCUAGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 1322 | CR010415 | mU*mG*mA*AfUCCAAGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1323 | CR010416 | mU*mG*mA*AUCCAAGUGUCCUCUfGAGUUUUAGAGCUAUGCUGUUUUG |
| 1324 | CR010417 | mU*mG*mA*AUCCAAGUGUCCfUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1325 | CR010418 | mU*mG*mA*AUCfCAAGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1326 | CR010419 | mU*mG*mA*AUCCAAGUGUCCUCUGfAGUUUUAGAGCUAUGCUGUUUUG |
| 1327 | CR010420 | mU*mG*mA*AUCCAAGUGUCCUfCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1328 | CR010421 | mU*mG*mA*AUCCAAGUGfUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1329 | CR010422 | mU*mG*mA*AUCCAfAGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1330 | CR010423 | mU*mG*mA*AUCCAAGUGUfCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1331 | CR010424 | mU*mG*mA*AUCCAAGfUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1332 | CR010425 | mU*mG*mA*fAUCCAAGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1333 | CR010426 | mU*mG*mA*AUCCAAGUGUCfCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1334 | CR010427 | mU*mG*mA*AUCCAAGUfGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1335 | CR010428 | mU*mG*mA*AUCCAAfGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1336 | CR010429 | mU*mG*mA*AUfCCAAGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1337 | CR010430 | mU*mG*mA*AUCCfAAGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1338 | CR010431 | mU*mG*mA*AUCCAAGUGUCCUCfUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1339 | CR010432 | mU*mG*mA*fAUCCAAGUGUCCUCfUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1340 | CR010433 | mU*mG*mA*AUCCAAGUfGUCCfUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1341 | CR010434 | mU*mG*mA*AUCfCAAGUGUfCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1342 | CR010435 | mU*mG*mA*AUCCAAGfUGfUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1343 | CR010436 | mU*mG*mA*AUCCAfAGUGUCfCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1344 | CR010437 | mU*mG*mA*AUCCfAAGUGUCCUCUfGAGUUUUAGAGCUAUGCUGUUUUG |
| 1345 | CR010438 | mU*mG*mA*AfUCCAAGUGUCCUfCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1346 | CR010439 | mU*mG*mA*AUCCAAfGUGUCCUCUGfAGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1347 | CR010440 | mU*mG*mA*AUfCCAAGUfGUCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1348 | CR010441 | mU*mG*mA*AUCCAAGUGfUCCUCUfGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1349 | CR010442 | mU*mG*mA*AUCCAfAGfUGUCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1350 | CR010443 | mU*mG*mA*AUCCAAGUGUCCUfCfUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1351 | CR010444 | mU*mG*mA*AUCfCAAGUGUCCUCUGfAGUUUUUAGAGCUAUGCUGUUUUG |
| 1352 | CR010445 | mU*mG*mA*AUfCCAAGUGUfCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1353 | CR010446 | mU*mG*mA*AfUCCAAGUGUCfCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1354 | CR010447 | mU*mG*mA*AUCCfAAGUGUCCfUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1355 | CR010448 | mU*mG*mA*fAUCCAAfGUGUCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1356 | CR010449 | mU*mG*mA*fAUCCAAGUGUCfCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1357 | CR010450 | mU*mG*mA*AUCCfAAGUGUfCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1358 | CR010451 | mU*mG*mA*AUCCAfAGUGUCCUCUfGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1359 | CR010452 | mU*mG*mA*AUCCAAGUGUCCfUCUGfAGUUUUUAGAGCUAUGCUGUUUUG |
| 1360 | CR010453 | mU*mG*mA*AUCCAAGfUGUCCUCfUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1361 | CR010454 | mU*mG*mA*AUCCAAGUGfUCCUfCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1362 | CR010455 | mU*mG*mA*AUCCAAfGUfGUCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1363 | CR010456 | mU*mG*mA*AfUCfCAAGUGUCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1364 | CR010457 | mU*mG*mA*AUfCCAAGUGUCCUCUfGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1365 | CR010458 | mU*mG*mA*AUCCAfAGUGUCCfUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1366 | CR010459 | mU*mG*mA*AUCCfAAGUfGUCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1367 | CR010460 | mU*mG*mA*AUCCAAGUGUCCUCfUGfAGUUUUUAGAGCUAUGCUGUUUUG |
| 1368 | CR010461 | mU*mG*mA*AUCCAAfGUGUfCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1369 | CR010462 | mU*mG*mA*AUCCAAGUGfUCfCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1370 | CR010463 | mU*mG*mA*AfUfCCAAGUGUCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1371 | CR010464 | mU*mG*mA*fAUCCAAGfUGUCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1372 | CR010465 | mU*mG*mA*AUCfCAAGUGUCCUfCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1373 | CR010466 | mU*mG*mA*AUCfCAAGUGUCCUfCUGfAGUUUUUAGAGCUAUGCUGUUUUG |
| 1374 | CR010467 | mU*mG*mA*fAUCCAAGUfGUCfCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1375 | CR010468 | mU*mG*mA*AUCCAAGUGUCCfUCfUfGAGUUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1376 | CR010469 | mU*mG*mA*AUCCfAAGUGfUfCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1377 | CR010470 | mU*mG*mA*AUfCCAfAfGUGUCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1378 | CR010471 | mU*mG*mA*AfUCCAAGfUGUCCfUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1379 | CR010472 | mU*mG*mA*AfUCCAAGUGUfCCUCUfGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1380 | CR010473 | mU*mG*mA*AUCCAAGfUGUCCUCfUGfAGUUUUUAGAGCUAUGCUGUUUUG |
| 1381 | CR010474 | mU*mG*mA*AUCCAAGUGfUCfUCfUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1382 | CR010475 | mU*mG*mA*AUCfCAfAGUfGUCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1383 | CR010476 | mU*mG*mA*fAUCCfAAfGUGUCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1384 | CR010477 | mU*mG*mA*AUfCCAAGUGfUCCUfCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1385 | CR010478 | mU*mG*mA*AUCCAfAfGUGUCCUCUGfAGUUUUUAGAGCUAUGCUGUUUUG |
| 1386 | CR010479 | mU*mG*mA*AUCCfAAGUfGUCCUCfUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1387 | CR010480 | mU*mG*mA*AUfCCAAGUGUCfCUCUfGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1388 | CR010481 | mU*mG*mA*AfUCfCAAGUGUCCfUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1389 | CR010482 | mU*mG*mA*fAUCCAAGfUGUfCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1390 | CR010483 | mU*mG*mA*AUCfCfAAfGUGUCCfUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1391 | CR010484 | mU*mG*mA*AUCCAAGUGUfCCUfCUfUfGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1392 | CR010485 | mU*mG*mA*AUCCAfAGfUGfUCCUCUGfAGUUUUUAGAGCUAUGCUGUUUUG |
| 1393 | CR010486 | mU*mG*mA*fAUfCCAAGUfGUCfCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1394 | CR010487 | mU*mG*mA*AfUCCfAAGUfGfUCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1395 | CR010488 | mU*mG*mA*AUCCAAfGfUGUfCfCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1396 | CR010489 | mU*mG*mA*fAUCfCAfAGUGUCCUCfUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1397 | CR010490 | mU*mG*mA*AfUCCAAGUGUCCfUfCUGfAGUUUUUAGAGCUAUGCUGUUUUG |
| 1398 | CR010491 | mU*mG*mA*AUfCCAAfGUGUCCUCUfGfAGUUUUUAGAGCUAUGCUGUUUUG |
| 1399 | CR010492 | mU*mG*mA*AUCfCAAGUGfUCfCfUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1400 | CR010493 | mU*mG*mA*AUCCfAfAGUfGUCCUCUfGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1401 | CR010494 | mU*mG*mA*AfUfCCAAGUGUfCCUCfUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1402 | CR010495 | mU*mG*mA*fAUCCAAGfUfGUCCUfCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1403 | CR010496 | mU*mG*mA*AfUCCAfAGUGUCfCUCfUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1404 | CR010497 | mU*mG*mA*AUCCfAAGfUGUfCCUCUGfAGUUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1405 | CR010498 | mU*mG*mA*fAUCCAAGUGfUCCUfCUfGAGUUUUAGAGCUAUGCUGUUUUG |
| 1406 | CR010499 | mU*mG*mA*AUfCfCAAfGUGUCCfUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1407 | CR010500 | UGAAUCCAAGUGUCCUfCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1408 | CR010501 | UGAAUfCCAAGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1409 | CR010502 | UGAAUCCAfAGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1410 | CR010503 | UGAAUCCfAAGUGUCCfUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1411 | CR010504 | UGAAUCCAAfGUfGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1412 | CR010505 | UGAfAUCCAAGfUGUfCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1413 | CR010506 | UGAAUCfCAAGUGUCCUfCUGfAGUUUUAGAGCUAUGCUGUUUUG |
| 1414 | CR010507 | UGAAfUCCAfAGUGUCfCUCfUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1415 | CR010508 | UGAfAUCCAAGUGfUCCUfCUfGAGUUUUAGAGCUAUGCUGUUUUG |
| 1416 | CR010509 | mU*mG*mA*AUCCAAGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1417 | CR010973 | mU*mG*mA*AmUCCAAGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1418 | CR010974 | mU*mG*mA*AUCCAAGUGUCCUCUmGAGUUUUAGAGCUAUGCUGUUUUG |
| 1419 | CR010975 | mU*mG*mA*AUCCAAGUGUCCmUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1420 | CR010976 | mU*mG*mA*AUCmCAAGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1421 | CR010977 | mU*mG*mA*AUCCAAGUGUCCUCUGmAGUUUUAGAGCUAUGCUGUUUUG |
| 1422 | CR010978 | mU*mG*mA*AUCCAAGUGUCCUmCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1423 | CR010979 | mU*mG*mA*AUCCAAGUGmUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1424 | CR010980 | mU*mG*mA*AUCCAmAGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1425 | CR010981 | mU*mG*mA*AUCCAAGUGUmCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1426 | CR010982 | mU*mG*mA*AUCCAAGmUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1427 | CR010983 | mU*mG*mA*mAUCCAAGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1428 | CR010984 | mU*mG*mA*AUCCAAGUGUCmCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1429 | CR010985 | mU*mG*mA*AUCCAAGUmGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1430 | CR010986 | mU*mG*mA*AUCCAAmGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1431 | CR010987 | mU*mG*mA*AUmCCAAGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1432 | CR010988 | mU*mG*mA*AUCCmAAGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1433 | CR010989 | mU*mG*mA*AUCCAAGUGUCCUCmUGAGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1434 | CR010990 | mU*mG*mA*mAUCCAAGUGUCCUCmUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1435 | CR010991 | mU*mG*mA*AUCCAAGUmGUCCmUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1436 | CR010992 | mU*mG*mA*AUCmCAAGUGUmCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1437 | CR010993 | mU*mG*mA*AUCCAAGmUGmUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1438 | CR010994 | mU*mG*mA*AUCCAmAGUGUCmCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1439 | CR010995 | mU*mG*mA*AUCCmAAGUGUCCUCUmGAGUUUUAGAGCUAUGCUGUUUUG |
| 1440 | CR010996 | mU*mG*mA*AmUCCAAGUGUCCUmCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1441 | CR010997 | mU*mG*mA*AUCCAAmGUGUCCUCUGmAGUUUUAGAGCUAUGCUGUUUUG |
| 1442 | CR010998 | mU*mG*mA*AUmCCAAGUmGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1443 | CR010999 | mU*mG*mA*AUCCAAGUGmUCCUCUmGAGUUUUAGAGCUAUGCUGUUUUG |
| 1444 | CR011000 | mU*mG*mA*AUCCAmAGmUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1445 | CR011001 | mU*mG*mA*AUCCAAGUGUCCUmCmUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1446 | CR011002 | mU*mG*mA*AUCmCAAGUGUCCUCUGmAGUUUUAGAGCUAUGCUGUUUUG |
| 1447 | CR011003 | mU*mG*mA*AUmCCAAGUGUmCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1448 | CR011004 | mU*mG*mA*AmUCCAAGUGUCmCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1449 | CR011005 | mU*mG*mA*AUCCmAAGUGUCCmUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1450 | CR011006 | mU*mG*mA*mAUCCAAmGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1451 | CR011007 | mU*mG*mA*mAUCCAAGUGUCmCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1452 | CR011008 | mU*mG*mA*AUCCmAAGUGUmCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1453 | CR011009 | mU*mG*mA*AUCCAmAGUGUCCUCUmGAGUUUUAGAGCUAUGCUGUUUUG |
| 1454 | CR011010 | mU*mG*mA*AUCCAAGUGUCCmUCUGmAGUUUUAGAGCUAUGCUGUUUUG |
| 1455 | CR011011 | mU*mG*mA*AUCCAAGmUGUCCUCmUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1456 | CR011012 | mU*mG*mA*AUCCAAGUGmUCCUmCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1457 | CR011013 | mU*mG*mA*AUCCAAmGUmGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1458 | CR011014 | mU*mG*mA*AmUCmCAAGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1459 | CR011015 | mU*mG*mA*AUmCCAAGUGUCCUCUmGAGUUUUAGAGCUAUGCUGUUUUG |
| 1460 | CR011016 | mU*mG*mA*AUCCAmAGUGUCCmUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1461 | CR011017 | mU*mG*mA*AUCCmAAGUmGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1462 | CR011018 | mU*mG*mA*AUCCAAGUGUCCUCmUGmAGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1463 | CR011019 | mU*mG*mA*AUCCAAmGUGUmCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1464 | CR011020 | mU*mG*mA*AUCCAAGUGmUCmCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1465 | CR011021 | mU*mG*mA*AmUmCCAAGUGUCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1466 | CR011022 | mU*mG*mA*mAUCCAAGmUGUCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1467 | CR011023 | mU*mG*mA*AUCmCAAGUGUCCUmCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1468 | CR011024 | mU*mG*mA*AUCmCAAGUGUCCUmCUGmAGUUUUUAGAGCUAUGCUGUUUUG |
| 1469 | CR011025 | mU*mG*mA*mAUCCAAGUmGUCmCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1470 | CR011026 | mU*mG*mA*AUCCAAGUGUCCmUCmUmGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1471 | CR011027 | mU*mG*mA*AUCCmAAGUGmUmCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1472 | CR011028 | mU*mG*mA*AUmCCAmAmGUGUCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1473 | CR011029 | mU*mG*mA*AmUCCAAGmUGUCCmUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1474 | CR011030 | mU*mG*mA*AmUCCAAGUGUmCCUCUmGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1475 | CR011031 | mU*mG*mA*AUCCAAGmUGUCCUCmUGmAGUUUUUAGAGCUAUGCUGUUUUG |
| 1476 | CR011032 | mU*mG*mA*AUCCAAGUGmUCmCUmCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1477 | CR011033 | mU*mG*mA*AUCmCAmAGUmGUCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1478 | CR011034 | mU*mG*mA*mAUCCmAAmGUGUCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1479 | CR011035 | mU*mG*mA*AUmCCAAGUGmUCCUmCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1480 | CR011036 | mU*mG*mA*AUCCAmAmGUGUCCUCUGmAGUUUUUAGAGCUAUGCUGUUUUG |
| 1481 | CR011037 | mU*mG*mA*AUCCmAAGUmGUCCUCmUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1482 | CR011038 | mU*mG*mA*AUmCCAAGUGUCCmCUCUmGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1483 | CR011039 | mU*mG*mA*AmUCmCAAGUGUCCmUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1484 | CR011040 | mU*mG*mA*mAUCCAAGmUGUmCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1485 | CR011041 | mU*mG*mA*AUCmCmAAmGUGUCCmUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1486 | CR011042 | mU*mG*mA*AUCCAAGUGUmCCUmCmUmGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1487 | CR011043 | mU*mG*mA*AUCCAmAGmUGmUCCUCUGmAGUUUUUAGAGCUAUGCUGUUUUG |
| 1488 | CR011044 | mU*mG*mA*mAUmCCAAGUmGUCmCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1489 | CR011045 | mU*mG*mA*AmUCCmAAGUmGmUCCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1490 | CR011046 | mU*mG*mA*AUCCAAmGmUGUmCmCUCUGAGUUUUUAGAGCUAUGCUGUUUUG |
| 1491 | CR011047 | mU*mG*mA*mAUCmCAmAGUGUCCUCmUGAGUUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1492 | CR011048 | mU*mG*mA*AmUCCAAGUGUCCmUmCUGmAGUUUUAGAGCUAUGCUGUUUUG |
| 1493 | CR011049 | mU*mG*mA*AUmCCAAmGUGUCCUCUmGmAGUUUUAGAGCUAUGCUGUUUUG |
| 1494 | CR011050 | mU*mG*mA*AUCmCAAGUGmUCmCmUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1495 | CR011051 | mU*mG*mA*AUCCmAmAGUmGUCCUCUmGAGUUUUAGAGCUAUGCUGUUUUG |
| 1496 | CR011052 | mU*mG*mA*AmUmCCAAGUGUmCCUCmUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1497 | CR011053 | mU*mG*mA*mAUCCAAGmUmGUCCUmCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1498 | CR011054 | mU*mG*mA*AmUCCAmAGUGUCmCUCmUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1499 | CR011055 | mU*mG*mA*AUCCmAAGmUGUmCCUCUGmAGUUUUAGAGCUAUGCUGUUUUG |
| 1500 | CR011056 | mU*mG*mA*mAUCCAAGUGmUCCUmCUmGAGUUUUAGAGCUAUGCUGUUUUG |
| 1501 | CR011057 | mU*mG*mA*AUmCmCAAmGUGUCCmUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1502 | CR011058 | UGAAUCCAAGUGUCCUmCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1503 | CR011059 | UGAAUmCCAAGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1504 | CR011060 | UGAAUCCAmAGUGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1505 | CR011061 | UGAAUCCmAAGUGUCCmUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1506 | CR011062 | UGAAUCCAAmGUmGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1507 | CR011063 | UGAmAUCCAAGmUGUmCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1508 | CR011064 | UGAAUCmCAAGUGUCCUmCUGmAGUUUUAGAGCUAUGCUGUUUUG |
| 1509 | CR011065 | UGAAmUCCAmAGUGUCmCUCmUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1510 | CR011066 | UGAmAUCCAAGUGmUCCUmCUmGAGUUUUAGAGCUAUGCUGUUUUG |
| 1511 | CR011534 | mU*mG*mA*A*UCCAAGUGUCCUCU*GAGUUUUAGAGCUAUGCUGUUUUG |
| 1512 | CR011535 | mU*mG*mA*AUCCAAGUG*UCCU*CUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1513 | CR011536 | mU*mG*mA*AUCC*AAGUGUC*CUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1514 | CR011537 | mU*mG*mA*AUCCAAGU*GU*CCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1515 | CR011538 | mU*mG*mA*AUCCAA*GUGUCC*UCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1516 | CR011539 | mU*mG*mA*AUCCA*AGUGUCCUCUG*AGUUUUAGAGCUAUGCUGUUUUG |
| 1517 | CR011540 | mU*mG*mA*AU*CCAAGUGUCCUC*UGAGUUUUAGAGCUAUGCUGUUUUG |
| 1518 | CR011541 | mU*mG*mA*AUCCAAG*UGUCCUCUGA*GUUUUAGAGCUAUGCUGUUUUG |
| 1519 | CR011542 | mU*mG*mA*AUCC*AAGUGUCCUC*UGA*GUUUUAGAGCUAUGCUGUUUUG |
| 1520 | CR011543 | mU*mG*mA*A*UCCAAGUG*UCC*UCUGAGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1521 | CR011544 | mU*mG*mA*AUCCAAGUGUCCU*CU*G*AGUUUUAGAGCUAUGCUGUUUUG |
| 1522 | CR011545 | mU*mG*mA*AUCCA*AGUGU*C*CUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1523 | CR011546 | mU*mG*mA*AUC*CAA*G*UGUCCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1524 | CR011547 | mU*mG*mA*AU*CCAAGU*GUCCU*CUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1525 | CR011548 | mU*mG*mA*AU*CCAAGUGUC*CUCUG*AGUUUUAGAGCUAUGCUGUUUUG |
| 1526 | CR011549 | mU*mG*mA*AUCCAAGU*GUCCUCU*GA*GUUUUAGAGCUAUGCUGUUUUG |
| 1527 | CR011550 | mU*mG*mA*AUCC*A*AG*UGUCCU*CUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1528 | CR011551 | mU*mG*mA*AUCCAAGUGUC*CUC*U*G*AGUUUUAGAGCUAUGCUGUUUUG |
| 1529 | CR011552 | mU*mG*mA*AUCCAA*GU*GU*CCUCUGA*GUUUUAGAGCUAUGCUGUUUUG |
| 1530 | CR011553 | mU*mG*mA*A*UC*CAAGUG*UCC*UCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1531 | CR011554 | mU*mG*mA*AU*CCA*AGUG*U*CCUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1532 | CR011555 | mU*mG*mA*AUCCAAG*U*GUC*C*UCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1533 | CR011556 | mU*mG*mA*A*UCC*AA*GUGUCCUCU*GAGUUUUAGAGCUAUGCUGUUUUG |
| 1534 | CR011557 | mU*mG*mA*AU*CCAAGUGUCCU*C*UGA*GUUUUAGAGCUAUGCUGUUUUG |
| 1535 | CR011558 | mU*mG*mA*AUCC*A*AG*UGUCCUC*U*GAGUUUUAGAGCUAUGCUGUUUUG |
| 1536 | CR011559 | mU*mG*mA*AUCCAA*GUG*U*CC*UCUG*AGUUUUAGAGCUAUGCUGUUUUG |
| 1537 | CR011560 | mU*mG*mA*A*UCCAAGU*GUC*CU*CUGA*GUUUUAGAGCUAUGCUGUUUUG |
| 1538 | CR011561 | mU*mG*mA*AU*C*CAAGU*GUCC*UC*UGAGUUUUAGAGCUAUGCUGUUUUG |
| 1539 | CR011562 | mU*mG*mA*A*UC*CAAG*UGU*CCU*CUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1540 | CR011563 | mU*mG*mA*AU*CCAAGUGUC*CUCU*G*A*GUUUUAGAGCUAUGCUGUUUUG |
| 1541 | CR011564 | mU*mG*mA*AUCC*A*A*GUG*UCCU*CUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1542 | CR011565 | mU*mG*mA*AUC*C*AA*GUGU*CCUCUGA*GUUUUAGAGCUAUGCUGUUUUG |
| 1543 | CR011566 | mU*mG*mA*AUC*C*A*AGUGU*CCUC*U*GAGUUUUAGAGCUAUGCUGUUUUG |
| 1544 | CR011567 | mU*mG*mA*AU*CCAA*G*UG*UC*CU*CUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1545 | CR011568 | mU*mG*mA*A*UCCAAGU*GUC*C*UCUG*A*GUUUUAGAGCUAUGCUGUUUUG |
| 1546 | CR011569 | mU*mG*mA*A*UC*CA*A*GUG*UCC*UCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1547 | CR011570 | mU*mG*mA*AU*CCAAG*UGUCCUC*U*G*A*GUUUUAGAGCUAUGCUGUUUUG |
| 1548 | CR011571 | mU*mG*mA*AUCC*AA*GU*GU*CCU*CUGA*GUUUUAGAGCUAUGCUGUUUUG |
| 1549 | CR011572 | mU*mG*mA*AU*CC*AAGU*G*UCC*UCU*GAGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1550 | CR011573 | mU*mG*mA*A*UCCA*AGUGU*CCU*C*UG*AGUUUUAGAGCUAUGCUGUUUUG |
| 1551 | CR011574 | mU*mG*mA*AUCC*A*A*GUGU*C*CUCU*GA*GUUUUAGAGCUAUGCUGUUUUG |
| 1552 | CR011575 | mU*mG*mA*A*UCCAAG*U*G*UCC*U*CUG*AGUUUUAGAGCUAUGCUGUUUUG |
| 1553 | CR011576 | mU*mG*mA*AU*C*CA*AG*UGUC*CU*C*UGAGUUUUAGAGCUAUGCUGUUUUG |
| 1554 | CR011577 | mU*mG*mA*A*U*C*CAAGUG*UCCUC*U*GA*GUUUUAGAGCUAUGCUGUUUUG |
| 1555 | CR011578 | mU*mG*mA*AU*CC*AA*GU*GU*CC*UCUG*AGUUUUAGAGCUAUGCUGUUUUG |
| 1556 | CR011579 | mU*mG*mA*AUCCAA*G*UG*UC*CUC*U*G*AGUUUUAGAGCUAUGCUGUUUUG |
| 1557 | CR011580 | mU*mG*mA*A*UC*CA*AGU*GU*CC*UCUGA*GUUUUAGAGCUAUGCUGUUUUG |
| 1558 | CR011581 | mU*mG*mA*AUC*C*AAGUG*UCC*U*C*U*GAGUUUUAGAGCUAUGCUGUUUUG |
| 1559 | CR011582 | mU*mG*mA*A*U*CC*AA*GU*GUC*CU*CUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1560 | CR011583 | mU*mG*mA*A*U*CCAA*G*U*GU*CCUCUG*A*GUUUUAGAGCUAUGCUGUUUUG |
| 1561 | CR011584 | mU*mG*mA*AUC*C*A*AGUG*UC*CU*C*U*GAGUUUUAGAGCUAUGCUGUUUUG |
| 1562 | CR011585 | mU*mG*mA*AUCC*AAG*UG*U*CC*U*CU*G*AGUUUUAGAGCUAUGCUGUUUUG |
| 1563 | CR011586 | mU*mG*mA*A*U*C*CA*AGU*GUCC*UC*UGA*GUUUUAGAGCUAUGCUGUUUUG |
| 1564 | CR011587 | mU*mG*mA*AUC*CA*A*G*UGU*C*CU*CUGA*GUUUUAGAGCUAUGCUGUUUUG |
| 1565 | CR011588 | mU*mG*mA*AU*CC*AA*GU*GUC*CUC*U*G*AGUUUUAGAGCUAUGCUGUUUUG |
| 1566 | CR011589 | mU*mG*mA*A*UC*C*AAGU*G*U*C*C*UCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1567 | CR011590 | mU*mG*mA*A*UCCA*A*G*UG*UCC*UC*U*GAGUUUUAGAGCUAUGCUGUUUUG |
| 1568 | CR011591 | mU*mG*mA*AU*CC*A*AGU*G*UCCU*CUG*A*GUUUUAGAGCUAUGCUGUUUUG |
| 1569 | CR011592 | mU*mG*mA*AUC*CA*A*GUG*UC*C*U*C*UGA*GUUUUAGAGCUAUGCUGUUUUG |
| 1570 | CR011593 | mU*mG*mA*A*U*CC*A*AG*U*GU*CCUCU*G*AGUUUUAGAGCUAUGCUGUUUUG |
| 1571 | CR011594 | mU*mG*mA*AUC*C*AAGU*GU*C*C*U*CU*G*AGUUUUAGAGCUAUGCUGUUUUG |
| 1572 | CR011595 | mU*mG*mA*A*U*CCAA*G*U*G*UCCUC*U*GA*GUUUUAGAGCUAUGCUGUUUUG |
| 1573 | CR011596 | mU*mG*mA*AU*C*CA*A*G*UGUC*C*U*CU*GA*GUUUUAGAGCUAUGCUGUUUUG |
| 1574 | CR011597 | mU*mG*mA*A*UCC*AA*GU*G*U*CC*UC*UG*A*GUUUUAGAGCUAUGCUGUUUUG |
| 1575 | CR011598 | mU*mG*mA*A*U*CCAAG*U*G*U*C*CU*C*U*GAGUUUUAGAGCUAUGCUGUUUUG |
| 1576 | CR011599 | mU*mG*mA*AUC*C*A*AG*UG*U*CCU*C*U*G*AGUUUUAGAGCUAUGCUGUUUUG |
| 1577 | CR011600 | mU*mG*mA*A*UC*CA*A*G*U*G*UCCU*C*U*G*AGUUUUAGAGCUAUGCUGUUUUG |
| 1578 | CR011601 | mU*mG*mA*AU*C*C*A*AGU*GU*C*C*UC*U*GA*GUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1579 | CR011602 | mU*mG*mA*A*U*CC*AA*G*UG*U*C*C*UCUG*A*GUUUUAGAGCUAUGCUGUUUUG |
| 1580 | CR011603 | mU*mG*mA*AUC*CA*A*GUG*U*C*C*U*C*UG*A*GUUUUAGAGCUAUGCUGUUUUG |
| 1581 | CR011604 | mU*mG*mA*AUCC*A*A*GU*G*U*CC*U*C*U*G*A*GUUUUAGAGCUAUGCUGUUUUG |
| 1582 | CR011605 | mU*mG*mA*A*U*C*CAAG*UG*U*C*C*UC*U*G*A*GUUUUAGAGCUAUGCUGUUUUG |
| 1583 | CR011606 | mU*mG*mA*A*U*C*C*A*A*G*U*GUC*C*U*CUG*AGUUUUAGAGCUAUGCUGUUUUG |
| 1584 | CR011607 | mU*mG*mA*A*U*C*C*C*A*AGU*G*U*C*CU*C*UGA*GUUUUAGAGCUAUGCUGUUUUG |
| 1585 | CR011608 | mU*mG*mA*A*U*C*C*CA*AGU*G*UC*C*U*C*U*G*A*GUUUUAGAGCUAUGCUGUUUUG |
| 1586 | CR011609 | mU*mG*mA*AU*C*C*C*A*A*G*U*G*U*C*C*U*CUGA*GUUUUAGAGCUAUGCUGUUUUG |
| 1587 | CR011610 | mU*mG*mA*A*U*C*C*C*A*A*G*UG*U*CC*UC*U*G*AGUUUUAGAGCUAUGCUGUUUUG |
| 1588 | CR011611 | mU*mG*mA*A*U*C*C*C*AA*G*U*GU*C*CU*C*U*G*A*GUUUUAGAGCUAUGCUGUUUUG |
| 1589 | CR011612 | mU*mG*mA*A*U*C*CC*A*AG*U*GU*C*C*U*C*U*G*A*GUUUUAGAGCUAUGCUGUUUUG |
| 1590 | CR011613 | mU*mG*mA*A*U*C*CAA*G*U*G*U*C*C*U*C*U*G*A*GUUUUAGAGCUAUGCUGUUUUG |
| 1591 | CR011614 | mU*mG*mA*AU*C*C*C*A*A*G*UG*U*C*C*UC*U*G*A*GUUUUAGAGCUAUGCUGUUUUG |
| 1592 | CR011615 | mU*mG*mA*A*U*C*C*C*A*A*GU*G*UC*C*U*CU*G*A*GUUUUAGAGCUAUGCUGUUUUG |
| 1593 | CR011616 | mU*mG*mA*A*U*C*C*C*AA*G*U*G*U*C*C*U*C*UG*A*GUUUUAGAGCUAUGCUGUUUUG |
| 1594 | CR011617 | mU*mG*mA*AU*C*C*C*A*A*G*U*G*U*C*C*U*C*U*GA*GUUUUAGAGCUAUGCUGUUUUG |
| 1595 | CR011618 | mU*mG*mA*A*UC*C*A*A*G*U*G*U*CC*U*C*U*G*A*GUUUUAGAGCUAUGCUGUUUUG |
| 1596 | CR011619 | mU*mG*mA*A*U*C*C*C*A*A*GU*GU*C*C*U*C*U*G*A*GUUUUAGAGCUAUGCUGUUUUG |
| 1597 | CR011620 | UGAAU*CCAAGUGUCCUC*UGAGUUUUAGAGCUAUGCUGUUUUG |
| 1598 | CR011621 | UGAAUCCA*AGUGU*C*CUCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1599 | CR011622 | UGAA*UCC*AA*GUGUCCUCU*GAGUUUUAGAGCUAUGCUGUUUUG |
| 1600 | CR011623 | UGAA*UCCAAGU*GUC*CU*CUGA*GUUUUAGAGCUAUGCUGUUUUG |
| 1601 | CR011624 | UGAA*UC*CA*A*GUG*UCC*UCUGAGUUUUAGAGCUAUGCUGUUUUG |
| 1602 | CR011625 | UGAA*UCCAAG*U*G*UCC*U*CUG*AGUUUUAGAGCUAUGCUGUUUUG |
| 1603 | CR011626 | UGAAU*CC*AA*GU*GUC*CUC*U*G*AGUUUUAGAGCUAUGCUGUUUUG |
| 1604 | CR011627 | UGAAUC*C*AAGU*GU*C*C*U*CU*G*AGUUUUAGAGCUAUGCUGUUUUG |
| 1605 | CR010320 | mG*mU*mG*AfGUCUGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1606 | CR010321 | mG*mU*mG*AGUCUGGAGAGCUGCfAUGUUUUAGAGCUAUGCUGUUUUG |
| 1607 | CR010322 | mG*mU*mG*AGUCUGGAGAGCfUGCAUGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1608 | CR010323 | mG*mU*mG*AGUfCUGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1609 | CR010324 | mG*mU*mG*AGUCUGGAGAGCUGCAfUGUUUUAGAGCUAUGCUGUUUUG |
| 1610 | CR010325 | mG*mU*mG*AGUCUGGAGAGCUfGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1611 | CR010326 | mG*mU*mG*AGUCUGGAGfAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1612 | CR010327 | mG*mU*mG*AGUCUfGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1613 | CR010328 | mG*mU*mG*AGUCUGGAGAfGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1614 | CR010329 | mG*mU*mG*AGUCUGGfAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1615 | CR010330 | mG*mU*mG*fAGUCUGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1616 | CR010331 | mG*mU*mG*AGUCUGGAGAfCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1617 | CR010332 | mG*mU*mG*AGUCUGGAfGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1618 | CR010333 | mG*mU*mG*AGUCUGfGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1619 | CR010334 | mG*mU*mG*AGfUCUGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1620 | CR010335 | mG*mU*mG*AGUCfUGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1621 | CR010336 | mG*mU*mG*AGUCUGGAGAGCUGfCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1622 | CR010337 | mG*mU*mG*fAGUCUGGAGAGCUGfCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1623 | CR010338 | mG*mU*mG*AGUCUGGAfGAGCfUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1624 | CR010339 | mG*mU*mG*AGUfCUGGAGAfGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1625 | CR010340 | mG*mU*mG*AGUCUGGfAGfAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1626 | CR010341 | mG*mU*mG*AGUCUfGGAGAGfCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1627 | CR010342 | mG*mU*mG*AGUCfUGGAGAGCUGCfAUGUUUUAGAGCUAUGCUGUUUUG |
| 1628 | CR010343 | mG*mU*mG*AfGUCUGGAGAGCUfGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1629 | CR010344 | mG*mU*mG*AGUCUGfGAGAGCUGCAfUGUUUUAGAGCUAUGCUGUUUUG |
| 1630 | CR010345 | mG*mU*mG*AGfUCUGGAfGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1631 | CR010346 | mG*mU*mG*AGUCUGGAGfAGCUGCfAUGUUUUAGAGCUAUGCUGUUUUG |
| 1632 | CR010347 | mG*mU*mG*AGUCUfGGfAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1633 | CR010348 | mG*mU*mG*AGUCUGGAGAGCUfGfGfCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1634 | CR010349 | mG*mU*mG*AGUfCUGGAGAGCUGCAfUGUUUUAGAGCUAUGCUGUUUUG |
| 1635 | CR010350 | mG*mU*mG*AGfUCUGGAGAfGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1636 | CR010351 | mG*mU*mG*AfGUCUGGAGAGfCUGCAUGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1637 | CR010352 | mG*mU*mG*AGUCfUGGAGAGCfUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1638 | CR010353 | mG*mU*mG*fAGUCUGfGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1639 | CR010354 | mG*mU*mG*fAGUCUGGAGAGfCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1640 | CR010355 | mG*mU*mG*AGUCfUGGAGAfGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1641 | CR010356 | mG*mU*mG*AGUCUfGGAGAGCUGCfAUGUUUUAGAGCUAUGCUGUUUUG |
| 1642 | CR010357 | mG*mU*mG*AGUCUGGAGAGCfUGCAfUGUUUUAGAGCUAUGCUGUUUUG |
| 1643 | CR010358 | mG*mU*mG*AGUCUGGfAGAGCUGfCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1644 | CR010359 | mG*mU*mG*AGUCUGGAGfAGCUfGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1645 | CR010360 | mG*mU*mG*AGUCUGfGAfGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1646 | CR010361 | mG*mU*mG*AfGUfCUGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1647 | CR010362 | mG*mU*mG*AGfUCUGGAGAGCUGCfAUGUUUUAGAGCUAUGCUGUUUUG |
| 1648 | CR010363 | mG*mU*mG*AGUCUfGGAGAGCfUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1649 | CR010364 | mG*mU*mG*AGUCfUGGAfGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1650 | CR010365 | mG*mU*mG*AGUCUGGAGAGCUGfCAfUGUUUUAGAGCUAUGCUGUUUUG |
| 1651 | CR010366 | mG*mU*mG*AGUCUGfGAGAfGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1652 | CR010367 | mG*mU*mG*AGUCUGGAGfAGfCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1653 | CR010368 | mG*mU*mG*AfGfUCUGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1654 | CR010369 | mG*mU*mG*fAGUCUGGfAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1655 | CR010370 | mG*mU*mG*AGUfCUGGAGAGCUfGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1656 | CR010371 | mG*mU*mG*AGUfCUGGAGAGCUfGCAfUGUUUUAGAGCUAUGCUGUUUUG |
| 1657 | CR010372 | mG*mU*mG*fAGUCUGGAfGAGfCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1658 | CR010373 | mG*mU*mG*AGUCUGGAGAGCfUGfCfAUGUUUUAGAGCUAUGCUGUUUUG |
| 1659 | CR010374 | mG*mU*mG*AGUCfUGGAGfAfGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1660 | CR010375 | mG*mU*mG*AGfUCUfGfGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1661 | CR010376 | mG*mU*mG*AfGUCUGGfAGAGCfUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1662 | CR010377 | mG*mU*mG*AfGUCUGGAGAfGCUGCfAUGUUUUAGAGCUAUGCUGUUUUG |
| 1663 | CR010378 | mG*mU*mG*AGUCUGGfAGAGCUGfCAfUGUUUUAGAGCUAUGCUGUUUUG |
| 1664 | CR010379 | mG*mU*mG*AGUCUGGAGfAGfCUfGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1665 | CR010380 | mG*mU*mG*AGUfCUfGGAfGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1666 | CR010381 | mG*mU*mG*fAGUCfUGfGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1667 | CR010382 | mG*mU*mG*AGfUCUGGGAGfAGCUfGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1668 | CR010383 | mG*mU*mG*AGUCUfGfGAGAGCUGCAfUGUUUUAGAGCUAUGCUGUUUUG |
| 1669 | CR010384 | mG*mU*mG*AGUCfUGGAfGAGCUGfCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1670 | CR010385 | mG*mU*mG*AGfUCUGGAGAGfCUGCfAUGUUUUAGAGCUAUGCUGUUUUG |
| 1671 | CR010386 | mG*mU*mG*AfGUfCUGGAGAGCfUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1672 | CR010387 | mG*mU*mG*fAGUCUGGfAGAfGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1673 | CR010388 | mG*mU*mG*AGUfCfUGfGAGAGCfUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1674 | CR010389 | mG*mU*mG*AGUCUGGAGAfGCUfGfCfAUGUUUUAGAGCUAUGCUGUUUUG |
| 1675 | CR010390 | mG*mU*mG*AGUCUfGGfAGfAGCUGCAfUGUUUUAGAGCUAUGCUGUUUUG |
| 1676 | CR010391 | mG*mU*mG*fAGfUCUGGGAfGAGfCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1677 | CR010392 | mG*mU*mG*AfGUCfUGGAfGfAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1678 | CR010393 | mG*mU*mG*AGUCUGfGfAGAfGfCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1679 | CR010394 | mG*mU*mG*fAGUfCUfGGAGAGCUGfCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1680 | CR010395 | mG*mU*mG*AfGUCUGGAGAGCfUfGCAfUGUUUUAGAGCUAUGCUGUUUUG |
| 1681 | CR010396 | mG*mU*mG*AGfUCUGfGAGAGCUGCfAfUGUUUUAGAGCUAUGCUGUUUUG |
| 1682 | CR010397 | mG*mU*mG*AGUfCUGGAGfAGfCfUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1683 | CR010398 | mG*mU*mG*AGUCfUfGGAfGAGCUGCfAUGUUUUAGAGCUAUGCUGUUUUG |
| 1684 | CR010399 | mG*mU*mG*AfGfUCUGGGAGAfGCUGfCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1685 | CR010400 | mG*mU*mG*fAGUCUGGfAfGAGCUfGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1686 | CR010401 | mG*mU*mG*AfGUCUfGGAGAGfCUGfCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1687 | CR010402 | mG*mU*mG*AGUCfUGGfAGAfGCUGCAfUGUUUUAGAGCUAUGCUGUUUUG |
| 1688 | CR010403 | mG*mU*mG*fAGUCUGGAGfAGCUfGfCfAUGUUUUAGAGCUAUGCUGUUUUG |
| 1689 | CR010404 | mG*mU*mG*AGfUfCUGfGAGAGCfUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1690 | CR010405 | GUGAGUCUGGGAGAGCUfGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1691 | CR010406 | GUGAGfUCUGGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1692 | CR010407 | GUGAGUCUfGGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1693 | CR010408 | GUGAGUCfUGGGAGAGCfUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1694 | CR010409 | GUGAGUCUGfGAfGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1695 | CR010410 | GUGfAGUCUGGfAGAfGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1696 | CR010411 | GUGAGUfCUGGAGAGCUfGCAfUGUUUUAGAGCUAUGCUGUUUUG |
| 1697 | CR010412 | GUGAfGUCUfGGAGAGfCUGfCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1698 | CR010413 | GUGfAGUCUGGAGfAGCUfGCfAUGUUUUAGAGCUAUGCUGUUUUG |
| 1699 | CR010414 | mG*mU*mG*AGUCUGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1700 | CR010879 | mG*mU*mG*AmGUCUGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1701 | CR010880 | mG*mU*mG*AGUCUGGAGAGCUGCmAUGUUUUAGAGCUAUGCUGUUUUG |
| 1702 | CR010881 | mG*mU*mG*AGUCUGGAGAGCmUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1703 | CR010882 | mG*mU*mG*AGUmCUGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1704 | CR010883 | mG*mU*mG*AGUCUGGAGAGCUGCAmUGUUUUAGAGCUAUGCUGUUUUG |
| 1705 | CR010884 | mG*mU*mG*AGUCUGGAGAGCUmGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1706 | CR010885 | mG*mU*mG*AGUCUGGAGmAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1707 | CR010886 | mG*mU*mG*AGUCUmGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1708 | CR010887 | mG*mU*mG*AGUCUGGAGAmGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1709 | CR010888 | mG*mU*mG*AGUCUGGmAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1710 | CR010889 | mG*mU*mG*mAGUCUGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1711 | CR010890 | mG*mU*mG*AGUCUGGAGAGmCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1712 | CR010891 | mG*mU*mG*AGUCUGGAmGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1713 | CR010892 | mG*mU*mG*AGUCUGmGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1714 | CR010893 | mG*mU*mG*AGmUCUGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1715 | CR010894 | mG*mU*mG*AGUCmUGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1716 | CR010895 | mG*mU*mG*AGUCUGGAGAGCUGmCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1717 | CR010896 | mG*mU*mG*mAGUCUGGAGAGCUGmCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1718 | CR010897 | mG*mU*mG*AGUCUGGAmGAGCmUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1719 | CR010898 | mG*mU*mG*AGUmCUGGAGAmGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1720 | CR010899 | mG*mU*mG*AGUCUGGmAGmAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1721 | CR010900 | mG*mU*mG*AGUCUmGGAGAGmCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1722 | CR010901 | mG*mU*mG*AGUCmUGGAGAGCUGCmAUGUUUUAGAGCUAUGCUGUUUUG |
| 1723 | CR010902 | mG*mU*mG*AmGUCUGGAGAGCUmGCAUGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1724 | CR010903 | mG*mU*mG*AGUCUGmGAGAGCUGCAmUGUUUUAGAGCUAUGCUGUUUUG |
| 1725 | CR010904 | mG*mU*mG*AGmUCUGGAmGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1726 | CR010905 | mG*mU*mG*AGUCUGGAGmAGCUGCmAUGUUUUAGAGCUAUGCUGUUUUG |
| 1727 | CR010906 | mG*mU*mG*AGUCUmGGmAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1728 | CR010907 | mG*mU*mG*AGUCUGGAGAGCUmGmCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1729 | CR010908 | mG*mU*mG*AGUmCUGGAGAGCUGCAmUGUUUUAGAGCUAUGCUGUUUUG |
| 1730 | CR010909 | mG*mU*mG*AGmUCUGGAGAmGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1731 | CR010910 | mG*mU*mG*AmGUCUGGAGAGmCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1732 | CR010911 | mG*mU*mG*AGUCmUGGAGAGCmUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1733 | CR010912 | mG*mU*mG*mAGUCUGmGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1734 | CR010913 | mG*mU*mG*mAGUCUGGAGAGmCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1735 | CR010914 | mG*mU*mG*AGUCmUGGAGAmGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1736 | CR010915 | mG*mU*mG*AGUCUmGGAGAGCUGCmAUGUUUUAGAGCUAUGCUGUUUUG |
| 1737 | CR010916 | mG*mU*mG*AGUCUGGAGAGCmUGCAmUGUUUUAGAGCUAUGCUGUUUUG |
| 1738 | CR010917 | mG*mU*mG*AGUCUGGmAGAGCUGmCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1739 | CR010918 | mG*mU*mG*AGUCUGGAGmAGCUmGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1740 | CR010919 | mG*mU*mG*AGUCUGmGAmGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1741 | CR010920 | mG*mU*mG*AmGUmCUGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1742 | CR010921 | mG*mU*mG*AGmUCUGGAGAGCUGCmAUGUUUUAGAGCUAUGCUGUUUUG |
| 1743 | CR010922 | mG*mU*mG*AGUCUmGGAGAGCmUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1744 | CR010923 | mG*mU*mG*AGUCmUGGAmGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1745 | CR010924 | mG*mU*mG*AGUCUGGAGAGCUGmCAmUGUUUUAGAGCUAUGCUGUUUUG |
| 1746 | CR010925 | mG*mU*mG*AGUCUGmGAGAmGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1747 | CR010926 | mG*mU*mG*AGUCUGGAGmAGmCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1748 | CR010927 | mG*mU*mG*AmGmUCUGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1749 | CR010928 | mG*mU*mG*mAGUCUGGmAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1750 | CR010929 | mG*mU*mG*AGUmCUGGAGAGCUmGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1751 | CR010930 | mG*mU*mG*AGUmCUGGAGAGCUmGCAmUGUUUUAGAGCUAUGCUGUUUUG |
| 1752 | CR010931 | mG*mU*mG*mAGUCUGGAmGAGmCUGCAUGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1753 | CR010932 | mG*mU*mG*AGUCUGGAGAGCmUGmCmAUGUUUUAGAGCUAUGCUGUUUUG |
| 1754 | CR010933 | mG*mU*mG*AGUCmUGGAGmAmGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1755 | CR010934 | mG*mU*mG*AGmUCUmGmGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1756 | CR010935 | mG*mU*mG*AmGUCUGGmAGAGCmUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1757 | CR010936 | mG*mU*mG*AmGUCUGGAGAmGCUGCmAUGUUUUAGAGCUAUGCUGUUUUG |
| 1758 | CR010937 | mG*mU*mG*AGUCUGGmAGAGCUGmCAmUGUUUUAGAGCUAUGCUGUUUUG |
| 1759 | CR010938 | mG*mU*mG*AGUCUGGAGmAGmCUmGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1760 | CR010939 | mG*mU*mG*AGUmCUmGGAmGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1761 | CR010940 | mG*mU*mG*mAGUCmUGmGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1762 | CR010941 | mG*mU*mG*AGmUCUGGAGmAGCUmGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1763 | CR010942 | mG*mU*mG*AGUCUmGmGAGAGCUGCAmUGUUUUAGAGCUAUGCUGUUUUG |
| 1764 | CR010943 | mG*mU*mG*AGUCmUGGAmGAGCUGmCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1765 | CR010944 | mG*mU*mG*AGmUCUGGAGAGmCUGCmAUGUUUUAGAGCUAUGCUGUUUUG |
| 1766 | CR010945 | mG*mU*mG*AmGUmCUGGAGAGCmUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1767 | CR010946 | mG*mU*mG*mAGUCUGGmAGAmGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1768 | CR010947 | mG*mU*mG*AGUmCmUGmGAGAGCmUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1769 | CR010948 | mG*mU*mG*AGUCUGGAGAmGCUmGmCmAUGUUUUAGAGCUAUGCUGUUUUG |
| 1770 | CR010949 | mG*mU*mG*AGUCUmGGmAGmAGCUGCAmUGUUUUAGAGCUAUGCUGUUUUG |
| 1771 | CR010950 | mG*mU*mG*mAGmUCUGGAmGAGmCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1772 | CR010951 | mG*mU*mG*AmGUCmUGGAmGmAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1773 | CR010952 | mG*mU*mG*AGUCUGmGmAGAmGmCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1774 | CR010953 | mG*mU*mG*mAGUmCUmGGAGAGCUGmCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1775 | CR010954 | mG*mU*mG*AmGUCUGGAGAGCmUmGCAmUGUUUUAGAGCUAUGCUGUUUUG |
| 1776 | CR010955 | mG*mU*mG*AGmUCUGmGAGAGCUGCmAmUGUUUUAGAGCUAUGCUGUUUUG |
| 1777 | CR010956 | mG*mU*mG*AGUmCUGGAGmAGmCmUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1778 | CR010957 | mG*mU*mG*AGUCmUmGGAmGAGCUGCmAUGUUUUAGAGCUAUGCUGUUUUG |
| 1779 | CR010958 | mG*mU*mG*AmGmUCUGGAGAmGCUGmCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1780 | CR010959 | mG*mU*mG*mAGUCUGGmAmGAGCUmGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1781 | CR010960 | mG*mU*mG*AmGUCUmGGAGAGmCUGmCAUGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1782 | CR010961 | mG*mU*mG*AGUCmUGGmAGAmGCUGCAmUGUUUUAGAGCUAUGCUGUUUUG |
| 1783 | CR010962 | mG*mU*mG*mAGUCUGGAGmAGCUmGCmAUGUUUUAGAGCUAUGCUGUUUUG |
| 1784 | CR010963 | mG*mU*mG*AGmUmCUGmGAGAGCmUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1785 | CR010964 | GUGAGUCUGGAGAGCUmGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1786 | CR010965 | GUGAGmUCUGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1787 | CR010966 | GUGAGUCUmGGAGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1788 | CR010967 | GUGAGUCmUGGAGAGCmUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1789 | CR010968 | GUGAGUCUGmGAmGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1790 | CR010969 | GUGmAGUCUGGmAGAmGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1791 | CR010970 | GUGAGUmCUGGAGAGCUmGCAmUGUUUUAGAGCUAUGCUGUUUUG |
| 1792 | CR010971 | GUGAmGUCUmGGAGAGmCUGmCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1793 | CR010972 | GUGmAGUCUGGAGmAGCUmGCmAUGUUUUAGAGCUAUGCUGUUUUG |
| 1794 | CR011440 | mG*mU*mG*A*GUCUGGAGAGCUGC*AUGUUUUAGAGCUAUGCUGUUUUG |
| 1795 | CR011441 | mG*mU*mG*AGUCUGGAG*AGCU*GCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1796 | CR011442 | mG*mU*mG*AGUC*UGGAGAG*CUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1797 | CR011443 | mG*mU*mG*AGUCUGGA*GA*GCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1798 | CR011444 | mG*mU*mG*AGUCUG*GAGAGC*UGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1799 | CR011445 | mG*mU*mG*AGUCU*GGAGAGCUGCA*UGUUUUAGAGCUAUGCUGUUUUG |
| 1800 | CR011446 | mG*mU*mG*AG*UCUGGAGAGCUG*CAUGUUUUAGAGCUAUGCUGUUUUG |
| 1801 | CR011447 | mG*mU*mG*AGUCUGG*AGAGCUGCAU*GUUUUAGAGCUAUGCUGUUUUG |
| 1802 | CR011448 | mG*mU*mG*AGUC*UGGAGAGCUG*CAU*GUUUUAGAGCUAUGCUGUUUUG |
| 1803 | CR011449 | mG*mU*mG*A*GUCUGGAG*AGC*UGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1804 | CR011450 | mG*mU*mG*AGUCUGGAGAGCU*GC*A*UGUUUUAGAGCUAUGCUGUUUUG |
| 1805 | CR011451 | mG*mU*mG*AGUCU*GGAGA*G*CUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1806 | CR011452 | mG*mU*mG*AGU*CUG*G*AGAGCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1807 | CR011453 | mG*mU*mG*AG*UCUGGA*GAGCU*GCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1808 | CR011454 | mG*mU*mG*AG*UCUGGAGAG*CUGCA*UGUUUUAGAGCUAUGCUGUUUUG |
| 1809 | CR011455 | mG*mU*mG*AGUCUGGA*GAGCUGC*AU*GUUUUAGAGCUAUGCUGUUUUG |
| 1810 | CR011456 | mG*mU*mG*AGUC*U*GG*AGAGCU*GCAUGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1811 | CR011457 | mG*mU*mG*AGUCUGGAGAG*CUG*C*A*UGUUUUAGAGCUAUGCUGUUUUG |
| 1812 | CR011458 | mG*mU*mG*AGUCUG*GA*GA*GCUGCAU*GUUUUAGAGCUAUGCUGUUUUG |
| 1813 | CR011459 | mG*mU*mG*A*GU*CUGGAG*AGC*UGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1814 | CR011460 | mG*mU*mG*AG*UCU*GGAG*A*GCUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1815 | CR011461 | mG*mU*mG*AGUCUGG*A*GAG*C*UGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1816 | CR011462 | mG*mU*mG*A*GUC*UG*GAGAGCUGC*AUGUUUUAGAGCUAUGCUGUUUUG |
| 1817 | CR011463 | mG*mU*mG*AG*UCUGGAGAGCU*G*CAU*GUUUUAGAGCUAUGCUGUUUUG |
| 1818 | CR011464 | mG*mU*mG*AGUC*U*GG*AGAGCUG*C*AUGUUUUAGAGCUAUGCUGUUUUG |
| 1819 | CR011465 | mG*mU*mG*AGUCUG*GAG*A*GC*UGCA*UGUUUUAGAGCUAUGCUGUUUUG |
| 1820 | CR011466 | mG*mU*mG*A*GUCUGGA*GAG*CU*GCAU*GUUUUAGAGCUAUGCUGUUUUG |
| 1821 | CR011467 | mG*mU*mG*AG*U*CUGGA*GAGC*UG*CAUGUUUUAGAGCUAUGCUGUUUUG |
| 1822 | CR011468 | mG*mU*mG*A*GU*CUGG*AGA*GCU*GCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1823 | CR011469 | mG*mU*mG*AG*UCUGGAGAG*CUGC*A*U*GUUUUAGAGCUAUGCUGUUUUG |
| 1824 | CR011470 | mG*mU*mG*AGUC*U*G*GAG*AGCU*GCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1825 | CR011471 | mG*mU*mG*AGU*C*UG*GAGA*GCUGCAU*GUUUUAGAGCUAUGCUGUUUUG |
| 1826 | CR011472 | mG*mU*mG*AGU*C*U*GGAGA*GCUG*C*AUGUUUUAGAGCUAUGCUGUUUUG |
| 1827 | CR011473 | mG*mU*mG*AG*UCUG*G*AG*AG*CU*GCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1828 | CR011474 | mG*mU*mG*A*GUCUGGA*GAG*C*UGCA*U*GUUUUAGAGCUAUGCUGUUUUG |
| 1829 | CR011475 | mG*mU*mG*A*GU*CU*G*GAG*AGC*UGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1830 | CR011476 | mG*mU*mG*AG*UCUGG*AGAGCUG*C*A*U*GUUUUAGAGCUAUGCUGUUUUG |
| 1831 | CR011477 | mG*mU*mG*AGUC*UG*GA*GA*GCU*GCAU*GUUUUAGAGCUAUGCUGUUUUG |
| 1832 | CR011478 | mG*mU*mG*AG*UC*UGGA*G*AGC*UGC*AUGUUUUAGAGCUAUGCUGUUUUG |
| 1833 | CR011479 | mG*mU*mG*A*GUCU*GGAGA*GCU*G*CA*UGUUUUAGAGCUAUGCUGUUUUG |
| 1834 | CR011480 | mG*mU*mG*AGUC*U*G*GAGA*G*CUGC*AU*GUUUUAGAGCUAUGCUGUUUUG |
| 1835 | CR011481 | mG*mU*mG*A*GUCUGG*A*G*AGC*U*GCA*UGUUUUAGAGCUAUGCUGUUUUG |
| 1836 | CR011482 | mG*mU*mG*AG*U*CU*GG*AGAG*CU*G*CAUGUUUUAGAGCUAUGCUGUUUUG |
| 1837 | CR011483 | mG*mU*mG*A*G*U*CUGGAG*AGCUG*C*AU*GUUUUAGAGCUAUGCUGUUUUG |
| 1838 | CR011484 | mG*mU*mG*AG*UC*UG*GA*GA*GC*UGCA*UGUUUUAGAGCUAUGCUGUUUUG |
| 1839 | CR011485 | mG*mU*mG*AGUCUG*G*AG*AG*CUG*C*A*UGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1840 | CR011486 | mG*mU*mG*A*GU*CU*GGA*GA*GC*UGCAU*GUUUUAGAGCUAUGCUGUUUUG |
| 1841 | CR011487 | mG*mU*mG*AGU*C*UGGAG*AGC*U*G*C*AUGUUUUAGAGCUAUGCUGUUUUG |
| 1842 | CR011488 | mG*mU*mG*A*G*UC*UG*GA*GAG*CU*GCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1843 | CR011489 | mG*mU*mG*A*G*UCUG*G*A*GA*GCUGCA*U*GUUUUAGAGCUAUGCUGUUUUG |
| 1844 | CR011490 | mG*mU*mG*AGU*C*U*GGAG*AG*CU*G*C*AUGUUUUAGAGCUAUGCUGUUUUG |
| 1845 | CR011491 | mG*mU*mG*AGUC*UGG*AG*A*GC*U*GC*A*UGUUUUAGAGCUAUGCUGUUUUG |
| 1846 | CR011492 | mG*mU*mG*A*G*U*CU*GGA*GAGC*UG*CAU*GUUUUAGAGCUAUGCUGUUUUG |
| 1847 | CR011493 | mG*mU*mG*AGU*CU*G*G*AGA*G*CU*GCAU*GUUUUAGAGCUAUGCUGUUUUG |
| 1848 | CR011494 | mG*mU*mG*AG*UC*UG*GA*GAG*CUG*C*A*UGUUUUAGAGCUAUGCUGUUUUG |
| 1849 | CR011495 | mG*mU*mG*A*GU*C*UGGA*G*A*G*C*UGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1850 | CR011496 | mG*mU*mG*A*GUCU*G*G*AG*AGC*UG*C*AUGUUUUAGAGCUAUGCUGUUUUG |
| 1851 | CR011497 | mG*mU*mG*AG*UC*U*GGA*G*AGCU*GCA*U*GUUUUAGAGCUAUGCUGUUUUG |
| 1852 | CR011498 | mG*mU*mG*AGU*CU*G*GAG*AG*C*U*G*CAU*GUUUUAGAGCUAUGCUGUUUUG |
| 1853 | CR011499 | mG*mU*mG*A*G*UC*U*GG*A*GA*GCUGC*A*UGUUUUAGAGCUAUGCUGUUUUG |
| 1854 | CR011500 | mG*mU*mG*AGU*C*UGGA*GA*G*C*U*GC*A*UGUUUUAGAGCUAUGCUGUUUUG |
| 1855 | CR011501 | mG*mU*mG*A*G*UCUG*G*A*G*AGCUG*C*AU*GUUUUAGAGCUAUGCUGUUUUG |
| 1856 | CR011502 | mG*mU*mG*AG*U*CU*G*G*AGAG*C*U*GC*AU*GUUUUAGAGCUAUGCUGUUUUG |
| 1857 | CR011503 | mG*mU*mG*A*GUC*UG*GA*G*A*GC*UG*CA*U*GUUUUAGAGCUAUGCUGUUUUG |
| 1858 | CR011504 | mG*mU*mG*A*G*UCUGG*A*G*A*G*CU*G*C*AUGUUUUAGAGCUAUGCUGUUUUG |
| 1859 | CR011505 | mG*mU*mG*AGU*C*U*GG*AG*A*GCU*G*C*A*UGUUUUAGAGCUAUGCUGUUUUG |
| 1860 | CR011506 | mG*mU*mG*A*GU*CU*G*G*A*G*AGCU*G*C*A*UGUUUUAGAGCUAUGCUGUUUUG |
| 1861 | CR011507 | mG*mU*mG*AG*U*C*U*GGA*GA*G*C*UG*C*AU*GUUUUAGAGCUAUGCUGUUUUG |
| 1862 | CR011508 | mG*mU*mG*A*G*UC*UG*G*AG*A*G*C*UGCA*U*GUUUUAGAGCUAUGCUGUUUUG |
| 1863 | CR011509 | mG*mU*mG*AGU*CU*G*GAG*A*G*C*U*G*CA*U*GUUUUAGAGCUAUGCUGUUUUG |
| 1864 | CR011510 | mG*mU*mG*AGUC*U*G*GA*G*A*GC*U*G*C*A*U*GUUUUAGAGCUAUGCUGUUUUG |
| 1865 | CR011511 | mG*mU*mG*A*G*U*CUGG*AG*A*G*C*UG*C*A*U*GUUUUAGAGCUAUGCUGUUUUG |
| 1866 | CR011512 | mG*mU*mG*A*G*U*C*U*G*G*A*GAG*C*U*GCA*UGUUUUAGAGCUAUGCUGUUUUG |
| 1867 | CR011513 | mG*mU*mG*A*G*U*C*U*GGA*G*A*G*CU*G*CAU*GUUUUAGAGCUAUGCUGUUUUG |
| 1868 | CR011514 | mG*mU*mG*A*G*U*CU*GGA*G*AG*C*U*G*C*A*U*GUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1869 | CR011515 | mG*mU*mG*AG*U*C*U*G*G*A*G*A*G*C*U*GCAU*GUUUUAGAGCUAUGCUGUUUUG |
| 1870 | CR011516 | mG*mU*mG*A*G*U*C*U*G*G*AG*A*GC*UG*C*A*UGUUUUAGAGCUAUGCUGUUUUG |
| 1871 | CR011517 | mG*mU*mG*A*GU*C*UG*G*A*GA*G*CU*G*C*A*U*GUUUUAGAGCUAUGCUGUUUUG |
| 1872 | CR011518 | mG*mU*mG*A*G*UC*U*GG*A*GA*G*C*U*G*C*A*U*GUUUUAGAGCUAUGCUGUUUUG |
| 1873 | CR011519 | mG*mU*mG*A*GU*CUG*G*A*G*A*G*C*U*G*C*A*U*GUUUUAGAGCUAUGCUGUUUUG |
| 1874 | CR011520 | mG*mU*mG*AG*U*C*U*G*G*AG*A*G*C*UG*C*A*U*GUUUUAGAGCUAUGCUGUUUUG |
| 1875 | CR011521 | mG*mU*mG*A*G*U*C*U*G*GA*G*AG*C*U*GC*A*U*GUUUUAGAGCUAUGCUGUUUUG |
| 1876 | CR011522 | mG*mU*mG*A*G*U*C*UG*G*A*G*A*G*C*U*G*CA*U*GUUUUAGAGCUAUGCUGUUUUG |
| 1877 | CR011523 | mG*mU*mG*AG*U*C*U*G*G*A*G*A*G*C*U*G*C*AU*GUUUUAGAGCUAUGCUGUUUUG |
| 1878 | CR011524 | mG*mU*mG*A*GU*C*U*G*G*A*G*A*GC*U*G*C*A*U*GUUUUAGAGCUAUGCUGUUUUG |
| 1879 | CR011525 | mG*mU*mG*A*G*U*C*U*G*GA*G*A*G*C*U*G*C*A*U*GUUUUAGAGCUAUGCUGUUUUG |
| 1880 | CR011526 | GUGAG*UCUGGGAGAGCUG*CAUGUUUUAGAGCUAUGCUGUUUUG |
| 1881 | CR011527 | GUGAGUCU*GGAGA*G*CUGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1882 | CR011528 | GUGA*GUC*UG*GAGAGCUGC*AUGUUUUAGAGCUAUGCUGUUUUG |
| 1883 | CR011529 | GUGA*GUCUGGA*GAG*CU*GCAU*GUUUUAGAGCUAUGCUGUUUUG |
| 1884 | CR011530 | GUGA*GU*CU*G*GAG*AGC*UGCAUGUUUUAGAGCUAUGCUGUUUUG |
| 1885 | CR011531 | GUGA*GUCUGG*A*G*AGC*U*GCA*UGUUUUAGAGCUAUGCUGUUUUG |
| 1886 | CR011532 | GUGAG*UC*UG*GA*GAG*CUG*C*A*UGUUUUAGAGCUAUGCUGUUUUG |
| 1887 | CR011533 | GUGAGU*C*UGGA*GA*G*C*U*GC*A*UGUUUUAGAGCUAUGCUGUUUUG |
| 1888 | CR010225 | mA*mA*mA*UfAGACACCAAAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 1889 | CR010226 | mA*mA*mA*UAGACACCAAAUCUUfACGUUUUAGAGCUAUGCUGUUUUG |
| 1890 | CR010227 | mA*mA*mA*UAGACACCAAAUfCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 1891 | CR010228 | mA*mA*mA*UAGfACACCAAAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 1892 | CR010229 | mA*mA*mA*UAGACACCAAAUCUUAfCGUUUUAGAGCUAUGCUGUUUUG |
| 1893 | CR010230 | mA*mA*mA*UAGACACCAAAUCfUUACGUUUUAGAGCUAUGCUGUUUUG |
| 1894 | CR010231 | mA*mA*mA*UAGACACCAfAAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 1895 | CR010232 | mA*mA*mA*UAGACfACCAAAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 1896 | CR010233 | mA*mA*mA*UAGACACCAAfAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 1897 | CR010234 | mA*mA*mA*UAGACACfCAAAUCUUACGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1898 | CR010235 | mA*mA*mA*fUAGACACCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1899 | CR010236 | mA*mA*mA*UAGACACCAAAfUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1900 | CR010237 | mA*mA*mA*UAGACACCfAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1901 | CR010238 | mA*mA*mA*UAGACAfCCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1902 | CR010239 | mA*mA*mA*UAfGACACCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1903 | CR010240 | mA*mA*mA*UAGAfCACCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1904 | CR010241 | mA*mA*mA*UAGACACCAAAUCUfUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1905 | CR010242 | mA*mA*mA*fUAGACACCAAAUCUfUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1906 | CR010243 | mA*mA*mA*UAGACACCfAAAUfCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1907 | CR010244 | mA*mA*mA*UAGfACACCAAfAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1908 | CR010245 | mA*mA*mA*UAGACACfCAfAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1909 | CR010246 | mA*mA*mA*UAGACfACCAAAfUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1910 | CR010247 | mA*mA*mA*UAGAfCACCAAAUCUUfACGUUUUUAGAGCUAUGCUGUUUUG |
| 1911 | CR010248 | mA*mA*mA*UfAGACACCAAAUCfUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1912 | CR010249 | mA*mA*mA*UAGACAfCCAAAUCUUAfCGUUUUUAGAGCUAUGCUGUUUUG |
| 1913 | CR010250 | mA*mA*mA*UAfGACACCfAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1914 | CR010251 | mA*mA*mA*UAGACACCAfAUCUUfACGUUUUUAGAGCUAUGCUGUUUUG |
| 1915 | CR010252 | mA*mA*mA*UAGACfACfCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1916 | CR010253 | mA*mA*mA*UAGACACCAAAUCfUfUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1917 | CR010254 | mA*mA*mA*UAGfACACCAAAUCUUAfCGUUUUUAGAGCUAUGCUGUUUUG |
| 1918 | CR010255 | mA*mA*mA*UAfGACACCAAfAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1919 | CR010256 | mA*mA*mA*UfAGACACCAAAfUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1920 | CR010257 | mA*mA*mA*UAGAfCACCAAAUfCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1921 | CR010258 | mA*mA*mA*fUAGACAfCCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1922 | CR010259 | mA*mA*mA*fUAGACACCAAAfUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1923 | CR010260 | mA*mA*mA*UAGAfCACCAAfAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1924 | CR010261 | mA*mA*mA*UAGACfACCAAAUCUUfACGUUUUUAGAGCUAUGCUGUUUUG |
| 1925 | CR010262 | mA*mA*mA*UAGACACCAAAUfCUUAfCGUUUUUAGAGCUAUGCUGUUUUG |
| 1926 | CR010263 | mA*mA*mA*UAGACACfCAAAUCUfUACGUUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1927 | CR010264 | mA*mA*mA*UAGACACCAfAAUCfUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1928 | CR010265 | mA*mA*mA*UAGACAfCCfAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1929 | CR010266 | mA*mA*mA*UfAGfACACCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1930 | CR010267 | mA*mA*mA*UAfGACACCAAAUCUUfACGUUUUUAGAGCUAUGCUGUUUUG |
| 1931 | CR010268 | mA*mA*mA*UAGACfACCAAAUfCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1932 | CR010269 | mA*mA*mA*UAGAfCACCfAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1933 | CR010270 | mA*mA*mA*UAGACACCAAAUCUfUAfCGUUUUUAGAGCUAUGCUGUUUUG |
| 1934 | CR010271 | mA*mA*mA*UAGACAfCCAAfAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1935 | CR010272 | mA*mA*mA*UAGACACCAfAAfUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1936 | CR010273 | mA*mA*mA*UfAfGACACCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1937 | CR010274 | mA*mA*mA*fUAGACACfCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1938 | CR010275 | mA*mA*mA*UAGfACACCAAAUCfUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1939 | CR010276 | mA*mA*mA*UAGfACACCAAAUCfUUAfCGUUUUUAGAGCUAUGCUGUUUUG |
| 1940 | CR010277 | mA*mA*mA*fUAGACACCfAAAfUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1941 | CR010278 | mA*mA*mA*UAGACACCAAAUfCUfUfACGUUUUUAGAGCUAUGCUGUUUUG |
| 1942 | CR010279 | mA*mA*mA*UAGAfCACCAfAfAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1943 | CR010280 | mA*mA*mA*UAfGACfAfCCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1944 | CR010281 | mA*mA*mA*UfAGACACfCAAAUfCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1945 | CR010282 | mA*mA*mA*UfAGACACCAAfAUCUUfACGUUUUUAGAGCUAUGCUGUUUUG |
| 1946 | CR010283 | mA*mA*mA*UAGACACfCAAAUCUUfAfCGUUUUUAGAGCUAUGCUGUUUUG |
| 1947 | CR010284 | mA*mA*mA*UAGACACCAfAAfUCfUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1948 | CR010285 | mA*mA*mA*UAGfACfACCfAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1949 | CR010286 | mA*mA*mA*fUAGAfCAfCCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1950 | CR010287 | mA*mA*mA*UAfGACACCAfAAUCfUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1951 | CR010288 | mA*mA*mA*UAGACfAfCCAAAUCUUAfCGUUUUUAGAGCUAUGCUGUUUUG |
| 1952 | CR010289 | mA*mA*mA*UAGAfCACCfAAAUCUfUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1953 | CR010290 | mA*mA*mA*UAfGACACCAAAfUCUUfACGUUUUUAGAGCUAUGCUGUUUUG |
| 1954 | CR010291 | mA*mA*mA*UfAGfACACCAAAUfCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1955 | CR010292 | mA*mA*mA*fUAGACACfCAAfAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1956 | CR010293 | mA*mA*mA*UAGfAfCAfCCAAAUfCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1957 | CR010294 | mA*mA*mA*UAGACACCAAfAUCfUfUfACGUUUUUAGAGCUAUGCUGUUUUG |
| 1958 | CR010295 | mA*mA*mA*UAGACfACfCAfAAUCUUAfCGUUUUUAGAGCUAUGCUGUUUUG |
| 1959 | CR010296 | mA*mA*mA*fUAfGACACCfAAAfUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1960 | CR010297 | mA*mA*mA*UfAGAfCACCfAfAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1961 | CR010298 | mA*mA*mA*UAGACAfCfCAAfAfUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1962 | CR010299 | mA*mA*mA*fUAGfACfACCAAAUCUfUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1963 | CR010300 | mA*mA*mA*UfAGACACCAAAUfCfUUAfCGUUUUUAGAGCUAUGCUGUUUUG |
| 1964 | CR010301 | mA*mA*mA*UAfGACAfCCAAAUCUUfAfCGUUUUUAGAGCUAUGCUGUUUUG |
| 1965 | CR010302 | mA*mA*mA*UAGfACACCAfAAfUfCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1966 | CR010303 | mA*mA*mA*UAGAfCfACCfAAAUCUUfAfCGUUUUUAGAGCUAUGCUGUUUUG |
| 1967 | CR010304 | mA*mA*mA*UfAfGACACCAAfAUCUfUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1968 | CR010305 | mA*mA*mA*fUAGACACfCfAAAUCfUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1969 | CR010306 | mA*mA*mA*UfAGACfACCAAAfUCUfUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1970 | CR010307 | mA*mA*mA*UAGAfCACfCAAfAUCUUAfCGUUUUUAGAGCUAUGCUGUUUUG |
| 1971 | CR010308 | mA*mA*mA*fUAGACACCAfAAUCfUUfACGUUUUUAGAGCUAUGCUGUUUUG |
| 1972 | CR010309 | mA*mA*mA*UAfGfACAfCCAAAUfCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1973 | CR010310 | AAAUAGACACCAAAUCfUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1974 | CR010311 | AAAUAfGACACCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1975 | CR010312 | AAAUAGACfACCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1976 | CR010313 | AAAUAGAfCACCAAAUfCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1977 | CR010314 | AAAUAGACAfCCfAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1978 | CR010315 | AAAfUAGACACfCAAfAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1979 | CR010316 | AAAUAGfACACCAAAUCfUUAfCGUUUUUAGAGCUAUGCUGUUUUG |
| 1980 | CR010317 | AAAUfAGACfACCAAAfUCUfUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1981 | CR010318 | AAAfUAGACACCAfAAUCfUUfACGUUUUUAGAGCUAUGCUGUUUUG |
| 1982 | CR010319 | mA*mA*mA*UAGACACCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1983 | CR010785 | mA*mA*mA*UmAGACACCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1984 | CR010786 | mA*mA*mA*UAGACACCAAAUCUUmACGUUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 1985 | CR010787 | mA*mA*mA*UAGACACCAAAUmCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1986 | CR010788 | mA*mA*mA*UAGmACACCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1987 | CR010789 | mA*mA*mA*UAGACACCAAAUCUUAmCGUUUUUAGAGCUAUGCUGUUUUG |
| 1988 | CR010790 | mA*mA*mA*UAGACACCAAAUCmUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1989 | CR010791 | mA*mA*mA*UAGACACCAmAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1990 | CR010792 | mA*mA*mA*UAGACmACCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1991 | CR010793 | mA*mA*mA*UAGACACCAAmAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1992 | CR010794 | mA*mA*mA*UAGACACmCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1993 | CR010795 | mA*mA*mA*mUAGACACCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1994 | CR010796 | mA*mA*mA*UAGACACCAAAmUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1995 | CR010797 | mA*mA*mA*UAGACACCmAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1996 | CR010798 | mA*mA*mA*UAGACAmCCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1997 | CR010799 | mA*mA*mA*UAmGACACCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1998 | CR010800 | mA*mA*mA*UAGAmCACCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 1999 | CR010801 | mA*mA*mA*UAGACACCAAAUCUmUACGUUUUUAGAGCUAUGCUGUUUUG |
| 2000 | CR010802 | mA*mA*mA*mUAGACACCAAAUCUmUACGUUUUUAGAGCUAUGCUGUUUUG |
| 2001 | CR010803 | mA*mA*mA*UAGACACCmAAAUmCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 2002 | CR010804 | mA*mA*mA*UAGmACACCAAmAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 2003 | CR010805 | mA*mA*mA*UAGACACmCAmAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 2004 | CR010806 | mA*mA*mA*UAGACmACCAAAmUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 2005 | CR010807 | mA*mA*mA*UAGAmCACCAAAUCUUmACGUUUUUAGAGCUAUGCUGUUUUG |
| 2006 | CR010808 | mA*mA*mA*UmAGACACCAAAUCmUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 2007 | CR010809 | mA*mA*mA*UAGACAmCCAAAUCUUAmCGUUUUUAGAGCUAUGCUGUUUUG |
| 2008 | CR010810 | mA*mA*mA*UAmGACACCmAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 2009 | CR010811 | mA*mA*mA*UAGACACCAmAAUCUUmACGUUUUUAGAGCUAUGCUGUUUUG |
| 2010 | CR010812 | mA*mA*mA*UAGACmACmCAAAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |
| 2011 | CR010813 | mA*mA*mA*UAGACACCAAAUCmUmUACGUUUUUAGAGCUAUGCUGUUUUG |
| 2012 | CR010814 | mA*mA*mA*UAGmACACCAAAUCUUAmCGUUUUUAGAGCUAUGCUGUUUUG |
| 2013 | CR010815 | mA*mA*mA*UAmGACACCAAmAUCUUACGUUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2014 | CR010816 | mA*mA*mA*UmAGACACCAAAmUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2015 | CR010817 | mA*mA*mA*UAGAmCACCAAAUmCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2016 | CR010818 | mA*mA*mA*mUAGACAmCCAAAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2017 | CR010819 | mA*mA*mA*mUAGACACCAAAmUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2018 | CR010820 | mA*mA*mA*UAGAmCACCAAmAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2019 | CR010821 | mA*mA*mA*UAGACmACCAAAUCUUmACGUUUUAGAGCUAUGCUGUUUUG |
| 2020 | CR010822 | mA*mA*mA*UAGACACCAAAUmCUUAmCGUUUUAGAGCUAUGCUGUUUUG |
| 2021 | CR010823 | mA*mA*mA*UAGACACmCAAAUCUmUACGUUUUAGAGCUAUGCUGUUUUG |
| 2022 | CR010824 | mA*mA*mA*UAGACACCAmAAUCmUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2023 | CR010825 | mA*mA*mA*UAGACAmCCmAAAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2024 | CR010826 | mA*mA*mA*UmAGmACACCAAAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2025 | CR010827 | mA*mA*mA*UAmGACACCAAAUCUUmACGUUUUAGAGCUAUGCUGUUUUG |
| 2026 | CR010828 | mA*mA*mA*UAGACmACCAAAUmCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2027 | CR010829 | mA*mA*mA*UAGAmCACCmAAAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2028 | CR010830 | mA*mA*mA*UAGACACCAAAUCUmUAmCGUUUUAGAGCUAUGCUGUUUUG |
| 2029 | CR010831 | mA*mA*mA*UAGACAmCCAAmAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2030 | CR010832 | mA*mA*mA*UAGACACCAmAAmUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2031 | CR010833 | mA*mA*mA*UmAmGACACCAAAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2032 | CR010834 | mA*mA*mA*mUAGACACmCAAAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2033 | CR010835 | mA*mA*mA*UAGmACACCAAAUCmUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2034 | CR010836 | mA*mA*mA*UAGmACACCAAAUCmUUAmCGUUUUAGAGCUAUGCUGUUUUG |
| 2035 | CR010837 | mA*mA*mA*mUAGACACCmAAAmUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2036 | CR010838 | mA*mA*mA*UAGACACCAAAUmCUmACGUUUUAGAGCUAUGCUGUUUUG |
| 2037 | CR010839 | mA*mA*mA*UAGAmCACCAmAmAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2038 | CR010840 | mA*mA*mA*UAmGACmAmCCAAAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2039 | CR010841 | mA*mA*mA*UmAGACACmCAAAUmCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2040 | CR010842 | mA*mA*mA*UmAGACACCAAmAUCUUmACGUUUUAGAGCUAUGCUGUUUUG |
| 2041 | CR010843 | mA*mA*mA*UAGACACmCAAAUCUmUAmCGUUUUAGAGCUAUGCUGUUUUG |
| 2042 | CR010844 | mA*mA*mA*UAGACACCAmAAmUCmUUACGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2043 | CR010845 | mA*mA*mA*UAGmACmACCmAAAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2044 | CR010846 | mA*mA*mA*mUAGAmCAmCCAAAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2045 | CR010847 | mA*mA*mA*UAmGACACCAmAAUCmUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2046 | CR010848 | mA*mA*mA*UAGACmAmCCAAAUCUUAmCGUUUUAGAGCUAUGCUGUUUUG |
| 2047 | CR010849 | mA*mA*mA*UAGAmCACCmAAAUCUmUACGUUUUAGAGCUAUGCUGUUUUG |
| 2048 | CR010850 | mA*mA*mA*UAmGACACCAAAmUCUUmACGUUUUAGAGCUAUGCUGUUUUG |
| 2049 | CR010851 | mA*mA*mA*UmAGmACACCAAAUmCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2050 | CR010852 | mA*mA*mA*mUAGACACmCAAmAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2051 | CR010853 | mA*mA*mA*UAGmAmCAmCCAAAUmCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2052 | CR010854 | mA*mA*mA*UAGACACCAAmAUCmUmUmACGUUUUAGAGCUAUGCUGUUUUG |
| 2053 | CR010855 | mA*mA*mA*UAGACmACmCAmAAUCUUAmCGUUUUAGAGCUAUGCUGUUUUG |
| 2054 | CR010856 | mA*mA*mA*mUAmGACACCmAAAmUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2055 | CR010857 | mA*mA*mA*UmAGAmCACCmAmAAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2056 | CR010858 | mA*mA*mA*UAGACAmCmCAAmAmUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2057 | CR010859 | mA*mA*mA*mUAGmACmACCAAAUCUmUACGUUUUAGAGCUAUGCUGUUUUG |
| 2058 | CR010860 | mA*mA*mA*UmAGACACCAAAUmCmUUAmCGUUUUAGAGCUAUGCUGUUUUG |
| 2059 | CR010861 | mA*mA*mA*UAmGACAmCCAAAUCUUmAmCGUUUUAGAGCUAUGCUGUUUUG |
| 2060 | CR010862 | mA*mA*mA*UAGmACACCAmAAmUmCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2061 | CR010863 | mA*mA*mA*UAGAmCmACCmAAAUCUUmACGUUUUAGAGCUAUGCUGUUUUG |
| 2062 | CR010864 | mA*mA*mA*UmAmGACACCAAmAUCUmUACGUUUUAGAGCUAUGCUGUUUUG |
| 2063 | CR010865 | mA*mA*mA*mUAGACACmCmCmAAAUCmUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2064 | CR010866 | mA*mA*mA*UmAGACmACCAAAmUCUmUACGUUUUAGAGCUAUGCUGUUUUG |
| 2065 | CR010867 | mA*mA*mA*UAGAmCACmCAAmAUCUUAmCGUUUUAGAGCUAUGCUGUUUUG |
| 2066 | CR010868 | mA*mA*mA*mUAGACACCAmAAUCmUUmACGUUUUAGAGCUAUGCUGUUUUG |
| 2067 | CR010869 | mA*mA*mA*UAmGmACAmCCAAAUmCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2068 | CR010870 | AAAUAGACACCAAAUCmUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2069 | CR010871 | AAAUAmGACACCAAAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2070 | CR010872 | AAAUAGACmACCAAAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2071 | CR010873 | AAAUAGAmCACCAAAUmCUUACGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2072 | CR010874 | AAAUAGACAmCCmAAAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2073 | CR010875 | AAAmUAGACACmCAAmAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2074 | CR010876 | AAAUAGmACACCAAAUCmUUAmCGUUUUAGAGCUAUGCUGUUUUG |
| 2075 | CR010877 | AAAUmAGACmACCAAAmUCUmUACGUUUUAGAGCUAUGCUGUUUUG |
| 2076 | CR010878 | AAAmUAGACACCAmAAUCmUUmACGUUUUAGAGCUAUGCUGUUUUG |
| 2077 | CR011346 | mA*mA*mA*U*AGACACCAAAUCUU*ACGUUUUAGAGCUAUGCUGUUUUG |
| 2078 | CR011347 | mA*mA*mA*UAGACACCA*AAUC*UUACGUUUUAGAGCUAUGCUGUUUUG |
| 2079 | CR011348 | mA*mA*mA*UAGA*CACCAAA*UCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2080 | CR011349 | mA*mA*mA*UAGACACC*AA*AUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2081 | CR011350 | mA*mA*mA*UAGACA*CCAAAU*CUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2082 | CR011351 | mA*mA*mA*UAGAC*ACCAAAUCUUA*CGUUUUAGAGCUAUGCUGUUUUG |
| 2083 | CR011352 | mA*mA*mA*UA*GACACCAAAUCU*UACGUUUUAGAGCUAUGCUGUUUUG |
| 2084 | CR011353 | mA*mA*mA*UAGACAC*CAAAUCUUAC*GUUUUAGAGCUAUGCUGUUUUG |
| 2085 | CR011354 | mA*mA*mA*UAGA*CACCAAAUCU*UAC*GUUUUAGAGCUAUGCUGUUUUG |
| 2086 | CR011355 | mA*mA*mA*U*AGACACCA*AAU*CUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2087 | CR011356 | mA*mA*mA*UAGACACCAAAUC*UU*A*CGUUUUAGAGCUAUGCUGUUUUG |
| 2088 | CR011357 | mA*mA*mA*UAGAC*ACCAA*A*UCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2089 | CR011358 | mA*mA*mA*UAG*ACA*C*CAAAUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2090 | CR011359 | mA*mA*mA*UA*GACACC*AAAUC*UUACGUUUUAGAGCUAUGCUGUUUUG |
| 2091 | CR011360 | mA*mA*mA*UA*GACACCAAA*UCUUA*CGUUUUAGAGCUAUGCUGUUUUG |
| 2092 | CR011361 | mA*mA*mA*UAGACACC*AAAUCUU*AC*GUUUUAGAGCUAUGCUGUUUUG |
| 2093 | CR011362 | mA*mA*mA*UAGA*C*AC*CAAAUC*UUACGUUUUAGAGCUAUGCUGUUUUG |
| 2094 | CR011363 | mA*mA*mA*UAGACACCAAA*UCU*U*A*CGUUUUAGAGCUAUGCUGUUUUG |
| 2095 | CR011364 | mA*mA*mA*UAGACA*CC*AA*AUCUUAC*GUUUUAGAGCUAUGCUGUUUUG |
| 2096 | CR011365 | mA*mA*mA*U*AG*ACACCA*AAU*CUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2097 | CR011366 | mA*mA*mA*UA*GAC*ACCA*A*AUCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2098 | CR011367 | mA*mA*mA*UAGACAC*C*AAA*U*CUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2099 | CR011368 | mA*mA*mA*U*AGA*CA*CCAAAUCUU*ACGUUUUAGAGCUAUGCUGUUUUG |
| 2100 | CR011369 | mA*mA*mA*UA*GACACCAAAUC*U*UAC*GUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2101 | CR011370 | mA*mA*mA*UAGA*C*AC*CAAAUCU*U*ACGUUUUAGAGCUAUGCUGUUUUG |
| 2102 | CR011371 | mA*mA*mA*UAGACA*CCA*A*AU*CUUA*CGUUUUAGAGCUAUGCUGUUUUG |
| 2103 | CR011372 | mA*mA*mA*U*AGACACC*AAA*UC*UUAC*GUUUUAGAGCUAUGCUGUUUUG |
| 2104 | CR011373 | mA*mA*mA*UA*G*ACACC*AAAU*CU*UACGUUUUAGAGCUAUGCUGUUUUG |
| 2105 | CR011374 | mA*mA*mA*U*AG*ACAC*CAA*AUC*UUACGUUUUAGAGCUAUGCUGUUUUG |
| 2106 | CR011375 | mA*mA*mA*UA*GACACCAAA*UCUU*A*C*GUUUUAGAGCUAUGCUGUUUUG |
| 2107 | CR011376 | mA*mA*mA*UAGA*C*A*CCA*AAUC*UUACGUUUUAGAGCUAUGCUGUUUUG |
| 2108 | CR011377 | mA*mA*mA*UAG*A*CA*CCAA*AUCUUAC*GUUUUAGAGCUAUGCUGUUUUG |
| 2109 | CR011378 | mA*mA*mA*UAG*A*C*ACCAA*AUCU*U*ACGUUUUAGAGCUAUGCUGUUUUG |
| 2110 | CR011379 | mA*mA*mA*UA*GACA*C*CA*AA*UC*UUACGUUUUAGAGCUAUGCUGUUUUG |
| 2111 | CR011380 | mA*mA*mA*U*AGACACC*AAA*U*CUUA*C*GUUUUAGAGCUAUGCUGUUUUG |
| 2112 | CR011381 | mA*mA*mA*U*AG*AC*A*CCA*AAU*CUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2113 | CR011382 | mA*mA*mA*UA*GACAC*CAAAUCU*U*A*C*GUUUUAGAGCUAUGCUGUUUUG |
| 2114 | CR011383 | mA*mA*mA*UAGA*CA*CC*AA*AUC*UUAC*GUUUUAGAGCUAUGCUGUUUUG |
| 2115 | CR011384 | mA*mA*mA*UA*GA*CACC*A*AAU*CUU*ACGUUUUAGAGCUAUGCUGUUUUG |
| 2116 | CR011385 | mA*mA*mA*U*AGAC*ACCAA*AUC*U*UA*CGUUUUAGAGCUAUGCUGUUUUG |
| 2117 | CR011386 | mA*mA*mA*UAGA*C*A*CCAA*A*UCUU*AC*GUUUUAGAGCUAUGCUGUUUUG |
| 2118 | CR011387 | mA*mA*mA*U*AGACAC*C*A*AAU*C*UUA*CGUUUUAGAGCUAUGCUGUUUUG |
| 2119 | CR011388 | mA*mA*mA*UA*G*AC*AC*CAAA*UC*U*UACGUUUUAGAGCUAUGCUGUUUUG |
| 2120 | CR011389 | mA*mA*mA*U*A*G*ACACCA*AAUCU*U*AC*GUUUUAGAGCUAUGCUGUUUUG |
| 2121 | CR011390 | mA*mA*mA*UA*GA*CA*CC*AA*AU*CUUA*CGUUUUAGAGCUAUGCUGUUUUG |
| 2122 | CR011391 | mA*mA*mA*UAGACA*C*CA*AA*UCU*U*A*CGUUUUAGAGCUAUGCUGUUUUG |
| 2123 | CR011392 | mA*mA*mA*U*AG*AC*ACC*AA*AU*CUUAC*GUUUUAGAGCUAUGCUGUUUUG |
| 2124 | CR011393 | mA*mA*mA*UAG*A*CACCA*AAU*C*U*U*ACGUUUUAGAGCUAUGCUGUUUUG |
| 2125 | CR011394 | mA*mA*mA*U*A*GA*CA*CC*AAA*UC*UUACGUUUUAGAGCUAUGCUGUUUUG |
| 2126 | CR011395 | mA*mA*mA*U*A*GACA*C*C*AA*AUCUUA*C*GUUUUAGAGCUAUGCUGUUUUG |
| 2127 | CR011396 | mA*mA*mA*UAG*A*C*ACCA*AA*UC*U*U*ACGUUUUAGAGCUAUGCUGUUUUG |
| 2128 | CR011397 | mA*mA*mA*UAGA*CAC*CA*A*AU*C*UU*A*CGUUUUAGAGCUAUGCUGUUUUG |
| 2129 | CR011398 | mA*mA*mA*U*A*G*AC*ACC*AAAU*CU*UAC*GUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2130 | CR011399 | mA*mA*mA*UAG*AC*A*C*CAA*A*UC*UUAC*GUUUUAGAGCUAUGCUGUUUUG |
| 2131 | CR011400 | mA*mA*mA*UA*GA*CA*CC*AAA*UCU*U*A*CGUUUUAGAGCUAUGCUGUUUUG |
| 2132 | CR011401 | mA*mA*mA*U*AG*A*CACC*A*A*A*U*CUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2133 | CR011402 | mA*mA*mA*U*AGAC*A*C*CA*AAU*CU*U*ACGUUUUAGAGCUAUGCUGUUUUG |
| 2134 | CR011403 | mA*mA*mA*UA*GA*C*ACC*A*AAUC*UUA*C*GUUUUAGAGCUAUGCUGUUUUG |
| 2135 | CR011404 | mA*mA*mA*UAG*AC*A*CCA*AA*U*C*U*UAC*GUUUUAGAGCUAUGCUGUUUUG |
| 2136 | CR011405 | mA*mA*mA*U*A*GA*C*AC*C*AA*AUCUU*A*CGUUUUAGAGCUAUGCUGUUUUG |
| 2137 | CR011406 | mA*mA*mA*UAG*A*CACC*AA*A*U*C*UU*A*CGUUUUAGAGCUAUGCUGUUUUG |
| 2138 | CR011407 | mA*mA*mA*U*A*GACA*C*C*A*AAUCU*U*AC*GUUUUAGAGCUAUGCUGUUUUG |
| 2139 | CR011408 | mA*mA*mA*UA*G*AC*A*C*CAAA*U*C*UU*AC*GUUUUAGAGCUAUGCUGUUUUG |
| 2140 | CR011409 | mA*mA*mA*U*AGA*CA*CC*A*A*AU*CU*UA*C*GUUUUAGAGCUAUGCUGUUUUG |
| 2141 | CR011410 | mA*mA*mA*U*A*GACAC*C*A*A*A*UC*U*U*ACGUUUUAGAGCUAUGCUGUUUUG |
| 2142 | CR011411 | mA*mA*mA*UAG*A*C*AC*CA*A*AUC*U*U*A*CGUUUUAGAGCUAUGCUGUUUUG |
| 2143 | CR011412 | mA*mA*mA*U*AG*AC*A*C*C*A*AAUC*U*U*A*CGUUUUAGAGCUAUGCUGUUUUG |
| 2144 | CR011413 | mA*mA*mA*UA*G*A*C*ACC*AA*A*U*CU*U*AC*GUUUUAGAGCUAUGCUGUUUUG |
| 2145 | CR011414 | mA*mA*mA*U*A*GA*CA*C*CA*A*A*U*CUUA*C*GUUUUAGAGCUAUGCUGUUUUG |
| 2146 | CR011415 | mA*mA*mA*UAG*AC*A*CCA*A*A*U*C*U*UA*C*GUUUUAGAGCUAUGCUGUUUUG |
| 2147 | CR011416 | mA*mA*mA*UAGA*C*A*CC*A*A*AU*C*U*U*A*C*GUUUUAGAGCUAUGCUGUUUUG |
| 2148 | CR011417 | mA*mA*mA*U*A*G*ACAC*CA*A*A*U*CU*U*A*C*GUUUUAGAGCUAUGCUGUUUUG |
| 2149 | CR011418 | mA*mA*mA*U*A*G*A*C*A*C*C*AAA*U*C*UUA*CGUUUUAGAGCUAUGCUGUUUUG |
| 2150 | CR011419 | mA*mA*mA*U*A*G*A*C*ACC*A*A*A*UC*U*UAC*GUUUUAGAGCUAUGCUGUUUUG |
| 2151 | CR011420 | mA*mA*mA*U*A*G*AC*ACC*A*AA*U*C*U*U*A*C*GUUUUAGAGCUAUGCUGUUUUG |
| 2152 | CR011421 | mA*mA*mA*UA*G*A*C*A*C*C*A*A*A*U*C*UUAC*GUUUUAGAGCUAUGCUGUUUUG |
| 2153 | CR011422 | mA*mA*mA*U*A*G*A*C*A*C*CA*A*AU*CU*U*A*CGUUUUAGAGCUAUGCUGUUUUG |
| 2154 | CR011423 | mA*mA*mA*U*AG*A*CA*C*C*AA*A*UC*U*U*A*C*GUUUUAGAGCUAUGCUGUUUUG |
| 2155 | CR011424 | mA*mA*mA*U*A*GA*C*AC*C*AA*A*U*C*U*U*A*C*GUUUUAGAGCUAUGCUGUUUUG |
| 2156 | CR011425 | mA*mA*mA*U*AG*ACA*C*C*A*A*A*U*C*U*U*A*C*GUUUUAGAGCUAUGCUGUUUUG |
| 2157 | CR011426 | mA*mA*mA*UA*G*A*C*A*C*CA*A*A*U*CU*U*A*C*GUUUUAGAGCUAUGCUGUUUUG |
| 2158 | CR011427 | mA*mA*mA*U*A*G*A*C*A*CC*A*AA*U*C*UU*A*C*GUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2159 | CR011428 | mA*mA*mA*U*A*G*A*CA*C*C*A*A*A*U*C*U*UA*C*GUUUUAGAGCUAUGCUGUUUUG |
| 2160 | CR011429 | mA*mA*mA*UA*G*A*C*A*C*C*A*A*A*U*C*U*U*AC*GUUUUAGAGCUAUGCUGUUUUG |
| 2161 | CR011430 | mA*mA*mA*U*AG*A*C*A*C*C*A*A*A*AU*C*U*U*A*C*GUUUUAGAGCUAUGCUGUUUUG |
| 2162 | CR011431 | mA*mA*mA*U*A*G*A*C*A*CC*AA*A*U*C*U*U*A*C*GUUUUAGAGCUAUGCUGUUUUG |
| 2163 | CR011432 | AAAUA*GACACCAAAUCU*UACGUUUUAGAGCUAUGCUGUUUUG |
| 2164 | CR011433 | AAAUAGAC*ACCAA*A*UCUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2165 | CR011434 | AAAU*AGA*CA*CCAAAUCUU*ACGUUUUAGAGCUAUGCUGUUUUG |
| 2166 | CR011435 | AAAU*AGACACC*AAA*UC*UUAC*GUUUUAGAGCUAUGCUGUUUUG |
| 2167 | CR011436 | AAAU*AG*AC*A*CCA*AAU*CUUACGUUUUAGAGCUAUGCUGUUUUG |
| 2168 | CR011437 | AAAU*AGACAC*C*A*AAU*C*UUA*CGUUUUAGAGCUAUGCUGUUUUG |
| 2169 | CR011438 | AAAUA*GA*CA*CC*AAA*UCU*U*A*CGUUUUAGAGCUAUGCUGUUUUG |
| 2170 | CR011439 | AAAUAG*A*CACC*AA*A*U*C*UU*A*CGUUUUAGAGCUAUGCUGUUUUG |
| 2171 | CR010130 | mA*mA*mA*GfUUCUAGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2172 | CR010131 | mA*mA*mA*GUUCUAGAUGCUGUCfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2173 | CR010132 | mA*mA*mA*GUUCUAGAUGCUfGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2174 | CR010133 | mA*mA*mA*GUUfCUAGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2175 | CR010134 | mA*mA*mA*GUUCUAGAUGCUGUCCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2176 | CR010135 | mA*mA*mA*GUUCUAGAUGCUGfUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2177 | CR010136 | mA*mA*mA*GUUCUAGAUfGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2178 | CR010137 | mA*mA*mA*GUUCUfAGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2179 | CR010138 | mA*mA*mA*GUUCUAGAUGfCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2180 | CR010139 | mA*mA*mA*GUUCUAGfAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2181 | CR010140 | mA*mA*mA*fGUUCUAGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2182 | CR010141 | mA*mA*mA*GUUCUAGAUGCfUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2183 | CR010142 | mA*mA*mA*GUUCUAGAfUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2184 | CR010143 | mA*mA*mA*GUUCUAfGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2185 | CR010144 | mA*mA*mA*GUfUCUAGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2186 | CR010145 | mA*mA*mA*GUUCfUAGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2187 | CR010146 | mA*mA*mA*GUUCUAGAUGCUGUfCCGGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2188 | CR010147 | mA*mA*mA*fGUUCUAGAUGCUGUfCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2189 | CR010148 | mA*mA*mA*GUUCUAGAfUGCUfGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2190 | CR010149 | mA*mA*mA*GUUfCUAGAUGfCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2191 | CR010150 | mA*mA*mA*GUUCUAGfAUfGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2192 | CR010151 | mA*mA*mA*GUUCUfAGAUGCfUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2193 | CR010152 | mA*mA*mA*GUUCfUAGAUGCUGUCfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2194 | CR010153 | mA*mA*mA*GfUUCUAGAUGCUGfUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2195 | CR010154 | mA*mA*mA*GUUCUAfGAUGCUGUCCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2196 | CR010155 | mA*mA*mA*GUfUCUAGAfUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2197 | CR010156 | mA*mA*mA*GUUCUAGAUfGCUGUCfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2198 | CR010157 | mA*mA*mA*GUUCUfAGfAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2199 | CR010159 | mA*mA*mA*GUUfCUAGAUGCUGUCCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2200 | CR010160 | mA*mA*mA*GUfUCUAGAUGfCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2201 | CR010161 | mA*mA*mA*GfUUCUAGAUGCfUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2202 | CR010162 | mA*mA*mA*GUUCfUAGAUGCUfGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2203 | CR010163 | mA*mA*mA*fGUUCUAfGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2204 | CR010164 | mA*mA*mA*fGUUCUAGAUGCfUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2205 | CR010165 | mA*mA*mA*GUUCfUAGAUGfCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2206 | CR010166 | mA*mA*mA*GUUCUfAGAUGCUGUCfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2207 | CR010167 | mA*mA*mA*GUUCUAGAUGCUfGUCCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2208 | CR010168 | mA*mA*mA*GUUCUAGfAUGCUGUfCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2209 | CR010169 | mA*mA*mA*GUUCUAGAUfGCUGfUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2210 | CR010170 | mA*mA*mA*GUUCUAfGAfUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2211 | CR010171 | mA*mA*mA*GfUUfCUAGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2212 | CR010172 | mA*mA*mA*GUfUCUAGAUGCUGUCfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2213 | CR010173 | mA*mA*mA*GUUCUfAGAUGCUfGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2214 | CR010174 | mA*mA*mA*GUUCfUAGAfUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2215 | CR010175 | mA*mA*mA*GUUCUAGAUGCUGUfCCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2216 | CR010176 | mA*mA*mA*GUUCUAfGAUGfCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2217 | CR010177 | mA*mA*mA*GUUCUAGAUfGCfUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2218 | CR010178 | mA*mA*mA*GfUfUCUAGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2219 | CR010179 | mA*mA*mA*fGUUCUAGfAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2220 | CR010180 | mA*mA*mA*GUUfCUAGAUGCUGfUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2221 | CR010181 | mA*mA*mA*GUUfCUAGAUGCUGfUCCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2222 | CR010182 | mA*mA*mA*fGUUCUAGAfUGCfUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2223 | CR010183 | mA*mA*mA*GUUCUAGAUGCUfGUfCfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2224 | CR010184 | mA*mA*mA*GUUCfUAGAUfGfCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2225 | CR010185 | mA*mA*mA*GUfUCUfAfGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2226 | CR010186 | mA*mA*mA*GfUUCUAGfAUGCUfGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2227 | CR010187 | mA*mA*mA*GfUUCUAGAUGfCUGUCfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2228 | CR010188 | mA*mA*mA*GUUCUAGfAUGCUGUfCCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2229 | CR010189 | mA*mA*mA*GUUCUAGAUfGCfUGfUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2230 | CR010190 | mA*mA*mA*GUUfCUfAGAfUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2231 | CR010191 | mA*mA*mA*fGUUCfUAfGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2232 | CR010192 | mA*mA*mA*GUfUCUAGAUfGCUGfUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2233 | CR010193 | mA*mA*mA*GUUCUfAfGAUGCUGUCCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2234 | CR010194 | mA*mA*mA*GUUCfUAGAfUGCUGUfCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2235 | CR010195 | mA*mA*mA*GUfUCUAGAUGCfUGUCfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2236 | CR010196 | mA*mA*mA*GfUUfCUAGAUGCUfGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2237 | CR010197 | mA*mA*mA*fGUUCUAGfAUGfCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2238 | CR010198 | mA*mA*mA*GUUfCfUAfGAUGCUfGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2239 | CR010199 | mA*mA*mA*GUUCUAGAUGfCUGfUfCfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2240 | CR010200 | mA*mA*mA*GUUCUfAGfAUfGCUGUCCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2241 | CR010201 | mA*mA*mA*fGUfUCUAGAfUGCfUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2242 | CR010202 | mA*mA*mA*GfUUCfUAGAfUfGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2243 | CR010203 | mA*mA*mA*GUUCUAfGfAUGfCfUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2244 | CR010204 | mA*mA*mA*fGUUfCUfAGAUGCUGUfCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2245 | CR010205 | mA*mA*mA*GfUUCUAGAUGCUfGfUCCfGGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2246 | CR010206 | mA*mA*mA*GUfUCUAfGAUGCUGUCfCfGGUUUUUAGAGCUAUGCUGUUUUG |
| 2247 | CR010207 | mA*mA*mA*GUUfCUAGAUfGCfUfGUCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2248 | CR010208 | mA*mA*mA*GUUCfUfAGAfUGCUGUCfCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2249 | CR010209 | mA*mA*mA*GfUfUCUAGAUGfCUGUfCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2250 | CR010210 | mA*mA*mA*fGUUCUAGfAfUGCUGfUCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2251 | CR010211 | mA*mA*mA*GfUUCUfAGAUGCfUGUfCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2252 | CR010212 | mA*mA*mA*GUUCfUAGfAUGfCUGUCCfGGUUUUUAGAGCUAUGCUGUUUUG |
| 2253 | CR010213 | mA*mA*mA*fGUUCUAGAUfGCUGfUCfCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2254 | CR010214 | mA*mA*mA*GUfUfCUAfGAUGCUfGUCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2255 | CR010215 | AAAGUUCUAGAUGCUGfUCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2256 | CR010216 | AAAGUfUCUAGAUGCUGUCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2257 | CR010217 | AAAGUUCUfAGAUGCUGUCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2258 | CR010218 | AAAGUUCfUAGAUGCUfGUCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2259 | CR010219 | AAAGUUCUAfGAfUGCUGUCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2260 | CR010220 | AAAfGUUCUAGfAUGfCUGUCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2261 | CR010221 | AAAGUUfCUAGAUGCUGfUCCfGGUUUUUAGAGCUAUGCUGUUUUG |
| 2262 | CR010222 | AAAGfUUCUfAGAUGCfUGUfCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2263 | CR010223 | AAAfGUUCUAGAUfGCUGfUCfCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2264 | CR010224 | mA*mA*mA*GUUCUAGAUGCUGUCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2265 | CR010691 | mA*mA*mA*GmUUCUAGAUGCUGUCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2266 | CR010692 | mA*mA*mA*GUUCUAGAUGCUGUCmCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2267 | CR010693 | mA*mA*mA*GUUCUAGAUGCUmGUCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2268 | CR010694 | mA*mA*mA*GUUmCUAGAUGCUGUCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2269 | CR010695 | mA*mA*mA*GUUCUAGAUGCUGUCCmGGUUUUUAGAGCUAUGCUGUUUUG |
| 2270 | CR010696 | mA*mA*mA*GUUCUAGAUGCUGmUCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2271 | CR010697 | mA*mA*mA*GUUCUAGAUmGCUGUCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2272 | CR010698 | mA*mA*mA*GUUCUmAGAUGCUGUCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2273 | CR010699 | mA*mA*mA*GUUCUAGAUGmCUGUCCGGUUUUUAGAGCUAUGCUGUUUUG |
| 2274 | CR010700 | mA*mA*mA*GUUCUAGmAUGCUGUCCGGUUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2275 | CR010701 | mA*mA*mA*mGUUCUAGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2276 | CR010702 | mA*mA*mA*GUUCUAGAUGCmUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2277 | CR010703 | mA*mA*mA*GUUCUAGAmUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2278 | CR010704 | mA*mA*mA*GUUCUAmGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2279 | CR010705 | mA*mA*mA*GUmUCUAGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2280 | CR010706 | mA*mA*mA*GUUCmUAGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2281 | CR010707 | mA*mA*mA*GUUCUAGAUGCUGUmCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2282 | CR010708 | mA*mA*mA*mGUUCUAGAUGCUGUmCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2283 | CR010709 | mA*mA*mA*GUUCUAGAmUGCUmGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2284 | CR010710 | mA*mA*mA*GUUmCUAGAUGmCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2285 | CR010711 | mA*mA*mA*GUUCUAGmAUmGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2286 | CR010712 | mA*mA*mA*GUUCUmAGAUGCmUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2287 | CR010713 | mA*mA*mA*GUUCmUAGAUGCUGUCmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2288 | CR010714 | mA*mA*mA*GmUUCUAGAUGCUGmUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2289 | CR010715 | mA*mA*mA*GUUCUAmGAUGCUGUCCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2290 | CR010716 | mA*mA*mA*GUmUCUAGAmUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2291 | CR010717 | mA*mA*mA*GUUCUAGAUmGCUGUCmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2292 | CR010718 | mA*mA*mA*GUUCUmAGmAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2293 | CR010719 | mA*mA*mA*GUUCUAGAUGCUGmUmCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2294 | CR010720 | mA*mA*mA*GUUmCUAGAUGCUGUCCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2295 | CR010721 | mA*mA*mA*GUmUCUAGAUGmCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2296 | CR010722 | mA*mA*mA*GmUUCUAGAUGCmUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2297 | CR010723 | mA*mA*mA*GUUCmUAGAUGCUmGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2298 | CR010724 | mA*mA*mA*mGUUCUAmGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2299 | CR010725 | mA*mA*mA*mGUUCUAGAUGCmUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2300 | CR010726 | mA*mA*mA*GUUCmUAGAUGmCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2301 | CR010727 | mA*mA*mA*GUUCUmAGAUGCUGUCmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2302 | CR010728 | mA*mA*mA*GUUCUAGAUGCUmGUCCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2303 | CR010729 | mA*mA*mA*GUUCUAGmAUGCUGUmCCGGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2304 | CR010730 | mA*mA*mA*GUUCUAGAUmGCUGmUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2305 | CR010731 | mA*mA*mA*GUUCUAmGAmUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2306 | CR010732 | mA*mA*mA*GmUUmCUAGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2307 | CR010733 | mA*mA*mA*GUmUCUAGAUGCUGUCmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2308 | CR010734 | mA*mA*mA*GUUCUmAGAUGCUmGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2309 | CR010735 | mA*mA*mA*GUUCmUAGAmUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2310 | CR010736 | mA*mA*mA*GUUCUAGAUGCUGUmCCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2311 | CR010737 | mA*mA*mA*GUUCUAmGAUGmCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2312 | CR010738 | mA*mA*mA*GUUCUAGAUmGCmUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2313 | CR010739 | mA*mA*mA*GmUmUCUAGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2314 | CR010740 | mA*mA*mA*mGUUCUAGmAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2315 | CR010741 | mA*mA*mA*GUUmCUAGAUGCUGmUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2316 | CR010742 | mA*mA*mA*GUUmCUAGAUGCUGmUCCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2317 | CR010743 | mA*mA*mA*mGUUCUAGAmUGCmUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2318 | CR010744 | mA*mA*mA*GUUCUAGAUGCUmGUmCmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2319 | CR010745 | mA*mA*mA*GUUCmUAGAUmGmCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2320 | CR010746 | mA*mA*mA*GUmUCUmAmGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2321 | CR010747 | mA*mA*mA*GmUUCUAGmAUGCUmGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2322 | CR010748 | mA*mA*mA*GmUUCUAGAUGmCUGUCmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2323 | CR010749 | mA*mA*mA*GUUCUAGmAUGCUGUmCCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2324 | CR010750 | mA*mA*mA*GUUCUAGAUmGCmUGmUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2325 | CR010751 | mA*mA*mA*GUUmCUmAGAmUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2326 | CR010752 | mA*mA*mA*mGUUCmUAmGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2327 | CR010753 | mA*mA*mA*GUmUCUAGAUmGCUGmUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2328 | CR010754 | mA*mA*mA*GUUCUmAmGAUGCUGUCCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2329 | CR010755 | mA*mA*mA*GUUCmUAGAmUGCUGUmCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2330 | CR010756 | mA*mA*mA*GUmUCUAGAUGCmUGUCmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2331 | CR010757 | mA*mA*mA*GmUUmCUAGAUGCUmGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2332 | CR010758 | mA*mA*mA*mGUUCUAGmAUGmCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2333 | CR010759 | mA*mA*mA*GUUmCmUAmGAUGCUmGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2334 | CR010760 | mA*mA*mA*GUUCUAGAUGmCUGmUmCmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2335 | CR010761 | mA*mA*mA*GUUCUmAGmAUmGCUGUCCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2336 | CR010762 | mA*mA*mA*mGUmUCUAGAmUGCmUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2337 | CR010763 | mA*mA*mA*GmUUCmUAGAmUmGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2338 | CR010764 | mA*mA*mA*GUUCUAmGmAUGmCmUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2339 | CR010765 | mA*mA*mA*mGUUmCUmAGAUGCUGUmCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2340 | CR010766 | mA*mA*mA*GmUUCUAGAUGCUmGmUCCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2341 | CR010767 | mA*mA*mA*GUmUCUAmGAUGCUGUCmCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2342 | CR010768 | mA*mA*mA*GUUmCUAGAUmGCmUmGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2343 | CR010769 | mA*mA*mA*GUUCmUmAGAmUGCUGUCmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2344 | CR010770 | mA*mA*mA*GmUmUCUAGAUGmCUGUmCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2345 | CR010771 | mA*mA*mA*mGUUCUAGmAmUGCUGmUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2346 | CR010772 | mA*mA*mA*GmUUCUmAGAUGCmUGUmCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2347 | CR010773 | mA*mA*mA*GUUCmUAGmAUGmCUGUCCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2348 | CR010774 | mA*mA*mA*mGUUCUAGAUmGCUGmUCmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2349 | CR010775 | mA*mA*mA*GUmUmCUAmGAUGCUmGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2350 | CR010776 | AAAGUUCUAGAUGCUGmUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2351 | CR010777 | AAAGUmUCUAGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2352 | CR010778 | AAAGUUCUmAGAUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2353 | CR010779 | AAAGUUCmUAGAUGCUmGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2354 | CR010780 | AAAGUUCUAmGAmUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2355 | CR010781 | AAAmGUUCUAGmAUGmCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2356 | CR010782 | AAAGUUmCUAGAUGCUGmUCCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2357 | CR010783 | AAAGmUUCUmAGAUGCmUGUmCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2358 | CR010784 | AAAmGUUCUAGAUmGCUGmUCmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2359 | CR011252 | mA*mA*mA*G*UUCUAGAUGCUGUC*CGGUUUUAGAGCUAUGCUGUUUUG |
| 2360 | CR011253 | mA*mA*mA*GUUCUAGAU*GCUG*UCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2361 | CR011254 | mA*mA*mA*GUUC*UAGAUGC*UGUCCGGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2362 | CR011255 | mA*mA*mA*GUUCUAGA*UG*CUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2363 | CR011256 | mA*mA*mA*GUUCUA*GAUGCU*GUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2364 | CR011257 | mA*mA*mA*GUUCU*AGAUGCUGUCC*GGUUUUAGAGCUAUGCUGUUUUG |
| 2365 | CR011258 | mA*mA*mA*GU*UCUAGAUGCUGU*CCGGUUUUAGAGCUAUGCUGUUUUG |
| 2366 | CR011259 | mA*mA*mA*GUUCUAG*AUGCUGUCCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2367 | CR011260 | mA*mA*mA*GUUC*UAGAUGCUGU*CCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2368 | CR011261 | mA*mA*mA*G*UUCUAGAU*GCU*GUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2369 | CR011262 | mA*mA*mA*GUUCUAGAUGCUG*UC*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 2370 | CR011263 | mA*mA*mA*GUUCU*AGAUG*C*UGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2371 | CR011264 | mA*mA*mA*GUU*CUA*G*AUGCUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2372 | CR011265 | mA*mA*mA*GU*UCUAGA*UGCUG*UCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2373 | CR011266 | mA*mA*mA*GU*UCUAGAUGC*UGUCC*GGUUUUAGAGCUAUGCUGUUUUG |
| 2374 | CR011267 | mA*mA*mA*GUUCUAGA*UGCUGUC*CG*GUUUUAGAGCUAUGCUGUUUUG |
| 2375 | CR011268 | mA*mA*mA*GUUC*U*AG*AUGCUG*UCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2376 | CR011269 | mA*mA*mA*GUUCUAGAUGC*UGU*C*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 2377 | CR011270 | mA*mA*mA*GUUCUA*GA*UG*CUGUCCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2378 | CR011271 | mA*mA*mA*G*UU*CUAGAU*GCU*GUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2379 | CR011272 | mA*mA*mA*GU*UCU*AGAU*G*CUGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2380 | CR011273 | mA*mA*mA*GUUCUAG*A*UGC*U*GUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2381 | CR011274 | mA*mA*mA*G*UUC*UA*GAUGCUGUC*CGGUUUUAGAGCUAUGCUGUUUUG |
| 2382 | CR011275 | mA*mA*mA*GU*UCUAGAUGCUG*U*CCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2383 | CR011276 | mA*mA*mA*GUUC*U*AG*AUGCUGU*C*CGGUUUUAGAGCUAUGCUGUUUUG |
| 2384 | CR011277 | mA*mA*mA*GUUCUA*GAU*G*CU*GUCC*GGUUUUAGAGCUAUGCUGUUUUG |
| 2385 | CR011278 | mA*mA*mA*G*UUCUAGA*UGC*UG*UCCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2386 | CR011279 | mA*mA*mA*GU*U*CUAGA*UGCU*GU*CCGGUUUUAGAGCUAUGCUGUUUUG |
| 2387 | CR011280 | mA*mA*mA*G*UU*CUAG*AUG*CUG*UCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2388 | CR011281 | mA*mA*mA*GU*UCUAGAUGC*UGUC*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2389 | CR011282 | mA*mA*mA*GUUC*U*A*GAU*GCUG*UCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2390 | CR011283 | mA*mA*mA*GUU*C*UA*GAUG*CUGUCCG*GUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2391 | CR011284 | mA*mA*mA*GUU*C*U*AGAUG*CUGU*C*CGGUUUUAGAGCUAUGCUGUUUUG |
| 2392 | CR011285 | mA*mA*mA*GU*UCUA*G*AU*GC*UG*UCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2393 | CR011286 | mA*mA*mA*G*UUCUAGA*UGC*U*GUCC*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2394 | CR011287 | mA*mA*mA*G*UU*CU*A*GAU*GCU*GUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2395 | CR011288 | mA*mA*mA*GU*UCUAG*AUGCUGU*C*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2396 | CR011289 | mA*mA*mA*GUUC*UA*GA*UG*CUG*UCCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2397 | CR011290 | mA*mA*mA*GU*UC*UAGA*U*GCU*GUC*CGGUUUUAGAGCUAUGCUGUUUUG |
| 2398 | CR011291 | mA*mA*mA*G*UUCU*AGAUG*CUG*U*CC*GGUUUUAGAGCUAUGCUGUUUUG |
| 2399 | CR011292 | mA*mA*mA*GUUC*U*A*GAUG*C*UGUC*CG*GUUUUAGAGCUAUGCUGUUUUG |
| 2400 | CR011293 | mA*mA*mA*G*UUCUAG*A*U*GCU*G*UCC*GGUUUUAGAGCUAUGCUGUUUUG |
| 2401 | CR011294 | mA*mA*mA*GU*U*CU*AG*AUGC*UG*U*CCGGUUUUAGAGCUAUGCUGUUUUG |
| 2402 | CR011295 | mA*mA*mA*G*U*U*CUAGAU*GCUGU*C*CG*GUUUUAGAGCUAUGCUGUUUUG |
| 2403 | CR011296 | mA*mA*mA*GU*UC*UA*GA*UG*CU*GUCC*GGUUUUAGAGCUAUGCUGUUUUG |
| 2404 | CR011297 | mA*mA*mA*GUUCUA*G*AU*GC*UGU*C*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 2405 | CR011298 | mA*mA*mA*G*UU*CU*AGA*UG*CU*GUCCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2406 | CR011299 | mA*mA*mA*GUU*C*UAGAU*GCU*G*U*C*CGGUUUUAGAGCUAUGCUGUUUUG |
| 2407 | CR011300 | mA*mA*mA*G*U*UC*UA*GA*UGC*UG*UCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2408 | CR011301 | mA*mA*mA*G*U*UCUA*G*A*UG*CUGUCC*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2409 | CR011302 | mA*mA*mA*GUU*C*U*AGAU*GC*UG*U*C*CGGUUUUAGAGCUAUGCUGUUUUG |
| 2410 | CR011303 | mA*mA*mA*GUUC*UAG*AU*G*CU*G*UC*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 2411 | CR011304 | mA*mA*mA*G*U*U*CU*AGA*UGCU*GU*CCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2412 | CR011305 | mA*mA*mA*GUU*CU*A*G*AUG*C*UG*UCCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2413 | CR011306 | mA*mA*mA*GU*UC*UA*GA*UGC*UGU*C*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 2414 | CR011307 | mA*mA*mA*G*UU*C*UAGA*U*G*C*U*GUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2415 | CR011308 | mA*mA*mA*G*UUCU*A*G*AU*GCU*GU*C*CGGUUUUAGAGCUAUGCUGUUUUG |
| 2416 | CR011309 | mA*mA*mA*GU*UC*U*AGA*U*GCUG*UCC*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2417 | CR011310 | mA*mA*mA*GUU*CU*A*GAU*GC*U*G*U*CCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2418 | CR011311 | mA*mA*mA*G*U*UC*U*AG*A*UG*CUGUC*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 2419 | CR011312 | mA*mA*mA*GUU*C*UAGA*UG*C*U*G*UC*C*GGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2420 | CR011313 | mA*mA*mA*G*U*UCUA*G*A*U*GCUGU*C*CG*GUUUUAGAGCUAUGCUGUUUUG |
| 2421 | CR011314 | mA*mA*mA*GU*U*CU*A*G*AUGC*U*G*UC*CG*GUUUUAGAGCUAUGCUGUUUUG |
| 2422 | CR011315 | mA*mA*mA*G*UUC*UA*GA*U*G*CU*GU*CC*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2423 | CR011316 | mA*mA*mA*G*U*UCUAG*A*U*G*C*UG*U*C*CGGUUUUAGAGCUAUGCUGUUUUG |
| 2424 | CR011317 | mA*mA*mA*GUU*C*U*AG*AU*G*CUG*U*C*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 2425 | CR011318 | mA*mA*mA*G*UU*CU*A*G*A*U*GCUG*U*C*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 2426 | CR011319 | mA*mA*mA*GU*U*C*U*AGA*UG*C*U*GU*C*CG*GUUUUAGAGCUAUGCUGUUUUG |
| 2427 | CR011320 | mA*mA*mA*G*U*UC*UA*G*AU*G*C*U*GUCC*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2428 | CR011321 | mA*mA*mA*GUU*CU*A*GAU*G*C*U*G*U*CC*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2429 | CR011322 | mA*mA*mA*GUUC*U*A*GA*U*G*CU*G*U*C*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2430 | CR011323 | mA*mA*mA*G*U*U*CUAG*AU*G*C*U*GU*C*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2431 | CR011324 | mA*mA*mA*G*U*U*C*U*A*G*A*UGC*U*G*UCC*GGUUUUAGAGCUAUGCUGUUUUG |
| 2432 | CR011325 | mA*mA*mA*G*U*U*C*U*AGA*U*G*C*UG*U*CCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2433 | CR011326 | mA*mA*mA*G*U*U*CU*AGA*U*GC*U*G*U*C*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2434 | CR011327 | mA*mA*mA*GU*U*C*U*A*G*A*U*G*C*U*G*UCCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2435 | CR011328 | mA*mA*mA*G*U*U*C*U*A*G*AU*G*CU*GU*C*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 2436 | CR011329 | mA*mA*mA*G*UU*C*UA*G*A*UG*C*UG*U*C*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2437 | CR011330 | mA*mA*mA*G*U*UC*U*AG*A*UG*C*U*G*U*C*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2438 | CR011331 | mA*mA*mA*G*UU*CUA*G*A*U*G*C*U*G*U*C*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2439 | CR011332 | mA*mA*mA*GU*U*C*U*A*G*AU*G*C*U*GU*C*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2440 | CR011333 | mA*mA*mA*G*U*U*C*U*A*GA*U*GC*U*G*UC*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2441 | CR011334 | mA*mA*mA*G*U*U*C*UA*G*A*U*G*C*U*G*U*CC*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2442 | CR011335 | mA*mA*mA*GU*U*C*U*A*G*A*U*G*C*U*G*U*C*CG*GUUUUAGAGCUAUGCUGUUUUG |
| 2443 | CR011336 | mA*mA*mA*G*UU*C*U*A*G*A*U*G*CU*G*U*C*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2444 | CR011337 | mA*mA*mA*G*U*U*C*U*A*GA*UG*C*U*G*U*C*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2445 | CR011338 | AAAGU*UCUAGAUGCUGU*CCGGUUUUAGAGCUAUGCUGUUUUG |
| 2446 | CR011339 | AAAGUUCU*AGAUG*C*UGUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2447 | CR011340 | AAAG*UUC*UA*GAUGCUGUC*CGGUUUUAGAGCUAUGCUGUUUUG |
| 2448 | CR011341 | AAAG*UUCUAGA*UGC*UG*UCCG*GUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2449 | CR011342 | AAAG*UU*CU*A*GAU*GCU*GUCCGGUUUUAGAGCUAUGCUGUUUUG |
| 2450 | CR011343 | AAAG*UUCUAG*A*U*GCU*G*UCC*GGUUUUAGAGCUAUGCUGUUUUG |
| 2451 | CR011344 | AAAGU*UC*UA*GA*UGC*UGU*C*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 2452 | CR011345 | AAAGUU*C*UAGA*UG*C*U*G*UC*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 2453 | CR009676 | AAAGGmCUGCUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2454 | CR009679 | AAAGGCUGmCUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2455 | CR009687 | AAAGGCUGCUGAUGACmACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2456 | CR009711 | mA*mA*mA*GGCUGCUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2457 | CR009723 | AAAGGfCUGCUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2458 | CR009726 | AAAGGCUGfCUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2459 | CR009734 | AAAGGCUGCUGAUGACfACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2460 | CR010040 | mA*mA*mA*GfGCUGCUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2461 | CR010041 | mA*mA*mA*GGCUGCUGAUGACACfCUGUUUUAGAGCUAUGCUGUUUUG |
| 2462 | CR010042 | mA*mA*mA*GGCUGCUGAUGAfCACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2463 | CR010043 | mA*mA*mA*GGCfUGCUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2464 | CR010044 | mA*mA*mA*GGCUGCUGAUGACACCfUGUUUUAGAGCUAUGCUGUUUUG |
| 2465 | CR010045 | mA*mA*mA*GGCUGCUGAUGACfACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2466 | CR010046 | mA*mA*mA*GGCUGCUGAfUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2467 | CR010047 | mA*mA*mA*GGCUGfCUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2468 | CR010048 | mA*mA*mA*GGCUGCUGAUfGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2469 | CR010049 | mA*mA*mA*GGCUGCUfGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2470 | CR010050 | mA*mA*mA*fGGCUGCUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2471 | CR010051 | mA*mA*mA*GGCUGCUGAUGfACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2472 | CR010052 | mA*mA*mA*GGCUGCUGfAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2473 | CR010053 | mA*mA*mA*GGCUGCfUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2474 | CR010054 | mA*mA*mA*GGfCUGCUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2475 | CR010055 | mA*mA*mA*GGCUfGCUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2476 | CR010056 | mA*mA*mA*GGCUGCUGAUGACAfCCUGUUUUAGAGCUAUGCUGUUUUG |
| 2477 | CR010057 | mA*mA*mA*fGGCUGCUGAUGACAfCCUGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2478 | CR010058 | mA*mA*mA*GGCUGCUGfAUGAfCACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2479 | CR010059 | mA*mA*mA*GGCfUGCUGAUfGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2480 | CR010060 | mA*mA*mA*GGCUGCUfGAfUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2481 | CR010061 | mA*mA*mA*GGCUGfCUGAUGfACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2482 | CR010062 | mA*mA*mA*GGCUfGCUGAUGACACfCUGUUUUAGAGCUAUGCUGUUUUG |
| 2483 | CR010063 | mA*mA*mA*GfGCUGCUGAUGACfACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2484 | CR010064 | mA*mA*mA*GGCUGCfUGAUGACACCfUGUUUUAGAGCUAUGCUGUUUUG |
| 2485 | CR010065 | mA*mA*mA*GGfCUGCUGfAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2486 | CR010066 | mA*mA*mA*GGCUGCUGAfUGACACfCUGUUUUAGAGCUAUGCUGUUUUG |
| 2487 | CR010067 | mA*mA*mA*GGCUGfCUfGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2488 | CR010068 | mA*mA*mA*GGCfUGCUGAUGACACCfUGUUUUAGAGCUAUGCUGUUUUG |
| 2489 | CR010069 | mA*mA*mA*GGfCUGCUGAUfGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2490 | CR010070 | mA*mA*mA*GfGCUGCUGAUGfACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2491 | CR010071 | mA*mA*mA*GGCUfGCUGAUGAfCACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2492 | CR010072 | mA*mA*mA*fGGCUGCfUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2493 | CR010073 | mA*mA*mA*fGGCUGCUGAUGfACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2494 | CR010074 | mA*mA*mA*GGCUfGCUGAUfGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2495 | CR010075 | mA*mA*mA*GGCUGfCUGAUGACACfCUGUUUUAGAGCUAUGCUGUUUUG |
| 2496 | CR010076 | mA*mA*mA*GGCUGCUGAUGAfCACCfUGUUUUAGAGCUAUGCUGUUUUG |
| 2497 | CR010077 | mA*mA*mA*GGCUGCUfGAUGACAfCCUGUUUUAGAGCUAUGCUGUUUUG |
| 2498 | CR010078 | mA*mA*mA*GGCUGCUGAfUGACfACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2499 | CR010079 | mA*mA*mA*GGCUGCfUGfAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2500 | CR010080 | mA*mA*mA*GfGCfUGCUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2501 | CR010081 | mA*mA*mA*GGfCUGCUGAUGACACfCUGUUUUAGAGCUAUGCUGUUUUG |
| 2502 | CR010082 | mA*mA*mA*GGCUGfCUGAUGAfCACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2503 | CR010083 | mA*mA*mA*GGCUfGCUGfAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2504 | CR010084 | mA*mA*mA*GGCUGCUGAUGACAfCCfUGUUUUAGAGCUAUGCUGUUUUG |
| 2505 | CR010085 | mA*mA*mA*GGCUGCfUGAUfGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2506 | CR010086 | mA*mA*mA*GGCUGCUGAfUGfACACCUGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
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| 2507 | CR010087 | mA*mA*mA*GfGfCUGCUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2508 | CR010088 | mA*mA*mA*fGGCUGCUfGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2509 | CR010089 | mA*mA*mA*GGCfUGCUGAUGACfACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2510 | CR010090 | mA*mA*mA*GGCfUGCUGAUGACfACCfUGUUUUAGAGCUAUGCUGUUUUG |
| 2511 | CR010091 | mA*mA*mA*fGGCUGCUGfAUGfACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2512 | CR010092 | mA*mA*mA*GGCUGCUGAUGAfCAfCfCUGUUUUAGAGCUAUGCUGUUUUG |
| 2513 | CR010093 | mA*mA*mA*GGCUfGCUGAfUfGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2514 | CR010094 | mA*mA*mA*GGfCUGfCfUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2515 | CR010095 | mA*mA*mA*GfGCUGCUfGAUGAfCACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2516 | CR010096 | mA*mA*mA*GfGCUGCUGAUfGACACfCUGUUUUAGAGCUAUGCUGUUUUG |
| 2517 | CR010097 | mA*mA*mA*GGCUGCUfGAUGACAfCCfUGUUUUAGAGCUAUGCUGUUUUG |
| 2518 | CR010098 | mA*mA*mA*GGCUGCUGAfUGfACfACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2519 | CR010099 | mA*mA*mA*GGCfUGfCUGfAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2520 | CR010100 | mA*mA*mA*fGGCUfGCfUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2521 | CR010101 | mA*mA*mA*GGfCUGCUGAfUGACfACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2522 | CR010102 | mA*mA*mA*GGCUGfCfUGAUGACACCfUGUUUUAGAGCUAUGCUGUUUUG |
| 2523 | CR010103 | mA*mA*mA*GGCUfGCUGfAUGACAfCCUGUUUUAGAGCUAUGCUGUUUUG |
| 2524 | CR010104 | mA*mA*mA*GGfCUGCUGAUGfACACfCUGUUUUAGAGCUAUGCUGUUUUG |
| 2525 | CR010105 | mA*mA*mA*GfGCfUGCUGAUGAfCACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2526 | CR010106 | mA*mA*mA*fGGCUGCUfGAUfGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2527 | CR010107 | mA*mA*mA*GGCfUfGCfUGAUGAfCACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2528 | CR010108 | mA*mA*mA*GGCUGCUGAUfGACfAfCfCUGUUUUAGAGCUAUGCUGUUUUG |
| 2529 | CR010109 | mA*mA*mA*GGCUGfCUfGAfUGACACCfUGUUUUAGAGCUAUGCUGUUUUG |
| 2530 | CR010110 | mA*mA*mA*fGGfCUGCUGfAUGfACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2531 | CR010111 | mA*mA*mA*GfGCUfGCUGfAfUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2532 | CR010112 | mA*mA*mA*GGCUGCfUfGAUfGfACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2533 | CR010113 | mA*mA*mA*fGGCfUGfCUGAUGACAfCCUGUUUUAGAGCUAUGCUGUUUUG |
| 2534 | CR010114 | mA*mA*mA*GfGCUGCUGAUGAfCfACCfUGUUUUAGAGCUAUGCUGUUUUG |
| 2535 | CR010115 | mA*mA*mA*GGfCUGCfUGAUGACACfCfUGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2536 | CR010116 | mA*mA*mA*GGCfUGCUGAfUGfAfCACCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2537 | CR010117 | mA*mA*mA*GGCUfGfCUGfAUGACACfCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2538 | CR010118 | mA*mA*mA*GfGfCUGCUGAUfGACAfCCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2539 | CR010119 | mA*mA*mA*fGGCUGCUfGfAUGACfACCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2540 | CR010120 | mA*mA*mA*GfGCUGfCUGAUGfACAfCCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2541 | CR010121 | mA*mA*mA*GGCUfGCUfGAUfGACACCfUGUUUUUAGAGCUAUGCUGUUUUG |
| 2542 | CR010122 | mA*mA*mA*fGGCUGCUGAfUGACfACfCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2543 | CR010123 | mA*mA*mA*GGfCfUGCfUGAUGAfCACCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2544 | CR010124 | AAAGGCUfGCUGAUGAfCACCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2545 | CR010125 | AAAGGCUGCfUGfAUGACACCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2546 | CR010126 | AAAfGGCUGCUfGAUfGACACCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2547 | CR010127 | AAAGGCfUGCUGAUGACfACCfUGUUUUUAGAGCUAUGCUGUUUUG |
| 2548 | CR010128 | AAAGfGCUGfCUGAUGfACAfCCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2549 | CR010129 | AAAfGGCUGCUGAfUGACfACfCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2550 | CR010600 | mA*mA*mA*GmGCUGCUGAUGACACCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2551 | CR010601 | mA*mA*mA*GGCUGCUGAUGACACmCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2552 | CR010602 | mA*mA*mA*GGCUGCUGAUGAmCACCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2553 | CR010603 | mA*mA*mA*GGCmUGCUGAUGACACCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2554 | CR010604 | mA*mA*mA*GGCUGCUGAUGACACCmUGUUUUUAGAGCUAUGCUGUUUUG |
| 2555 | CR010605 | mA*mA*mA*GGCUGCUGAUGACmACCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2556 | CR010606 | mA*mA*mA*GGCUGCUGAmUGACACCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2557 | CR010607 | mA*mA*mA*GGCUGmCUGAUGACACCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2558 | CR010608 | mA*mA*mA*GGCUGCUGAUmGACACCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2559 | CR010609 | mA*mA*mA*GGCUGCUmGAUGACACCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2560 | CR010610 | mA*mA*mA*mGGCUGCUGAUGACACCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2561 | CR010611 | mA*mA*mA*GGCUGCUGAUGmACACCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2562 | CR010612 | mA*mA*mA*GGCUGCUGmAUGACACCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2563 | CR010613 | mA*mA*mA*GGCUGCmUGAUGACACCUGUUUUUAGAGCUAUGCUGUUUUG |
| 2564 | CR010614 | mA*mA*mA*GGmCUGCUGAUGACACCUGUUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
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| 2566 | CR010616 | mA*mA*mA*GGCUGCUGAUGACAmCCUGUUUUAGAGCUAUGCUGUUUUG |
| 2567 | CR010617 | mA*mA*mA*mGGCUGCUGAUGACAmCCUGUUUUAGAGCUAUGCUGUUUUG |
| 2568 | CR010618 | mA*mA*mA*GGCUGCUGmAUGAmCACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2569 | CR010619 | mA*mA*mA*GGCmUGCUGAUmGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2570 | CR010620 | mA*mA*mA*GGCUGCUmGAmUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2571 | CR010621 | mA*mA*mA*GGCUGmCUGAUGmACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2572 | CR010622 | mA*mA*mA*GGCUmGCUGAUGACACmCUGUUUUAGAGCUAUGCUGUUUUG |
| 2573 | CR010623 | mA*mA*mA*GmGCUGCUGAUGACmACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2574 | CR010624 | mA*mA*mA*GGCUGCmUGAUGACACCmUGUUUUAGAGCUAUGCUGUUUUG |
| 2575 | CR010625 | mA*mA*mA*GGmCUGCUGmAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2576 | CR010626 | mA*mA*mA*GGCUGCUGAmUGACACmCUGUUUUAGAGCUAUGCUGUUUUG |
| 2577 | CR010627 | mA*mA*mA*GGCUGmCUmGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2578 | CR010628 | mA*mA*mA*GGCUGCUGAUGACmAmCCUGUUUUAGAGCUAUGCUGUUUUG |
| 2579 | CR010629 | mA*mA*mA*GGCmUGCUGAUGACACCmUGUUUUAGAGCUAUGCUGUUUUG |
| 2580 | CR010630 | mA*mA*mA*GGmCUGCUGAUmGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2581 | CR010631 | mA*mA*mA*GmGCUGCUGAUGmACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2582 | CR010632 | mA*mA*mA*GGCUmGCUGAUGAmCACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2583 | CR010633 | mA*mA*mA*mGGCUGCmUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2584 | CR010634 | mA*mA*mA*mGGCUGCUGAUGmACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2585 | CR010635 | mA*mA*mA*GGCUmGCUGAUmGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2586 | CR010636 | mA*mA*mA*GGCUGmCUGAUGACACmCUGUUUUAGAGCUAUGCUGUUUUG |
| 2587 | CR010637 | mA*mA*mA*GGCUGCUGAUGAmCACCmUGUUUUAGAGCUAUGCUGUUUUG |
| 2588 | CR010638 | mA*mA*mA*GGCUGCUmGAUGACAmCCUGUUUUAGAGCUAUGCUGUUUUG |
| 2589 | CR010639 | mA*mA*mA*GGCUGCUGAmUGACmACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2590 | CR010640 | mA*mA*mA*GGCUGCmUGmAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2591 | CR010641 | mA*mA*mA*GmGCmUGCUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2592 | CR010642 | mA*mA*mA*GGmCUGCUGAUGACACmCUGUUUUAGAGCUAUGCUGUUUUG |
| 2593 | CR010643 | mA*mA*mA*GGCUGmCUGAUGAmCACCUGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2594 | CR010644 | mA*mA*mA*GGCUmGCUGmAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2595 | CR010645 | mA*mA*mA*GGCUGCUGAUGACAmCCmUGUUUUAGAGCUAUGCUGUUUUG |
| 2596 | CR010646 | mA*mA*mA*GGCUGCmUGAUmGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2597 | CR010647 | mA*mA*mA*GGCUGCUGAmUGmACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2598 | CR010648 | mA*mA*mA*GmGmCUGCUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2599 | CR010649 | mA*mA*mA*mGGCUGCUmGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2600 | CR010650 | mA*mA*mA*GGCmUGCUGAUGACmACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2601 | CR010651 | mA*mA*mA*GGCmUGCUGAUGACmACCmUGUUUUAGAGCUAUGCUGUUUUG |
| 2602 | CR010652 | mA*mA*mA*mGGCUGCUGmAUGmACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2603 | CR010653 | mA*mA*mA*GGCUGCUGAUGAmCAmCmCUGUUUUAGAGCUAUGCUGUUUUG |
| 2604 | CR010654 | mA*mA*mA*GGCUmGCUGAmUmGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2605 | CR010655 | mA*mA*mA*GGmCUGmCmUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2606 | CR010656 | mA*mA*mA*GmGCUGCUmGAUGAmCACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2607 | CR010657 | mA*mA*mA*GmGCUGCUGAUmGACACmCUGUUUUAGAGCUAUGCUGUUUUG |
| 2608 | CR010658 | mA*mA*mA*GGCUGCUmGAUGACAmCCmUGUUUUAGAGCUAUGCUGUUUUG |
| 2609 | CR010659 | mA*mA*mA*GGCUGCUGAmUGmACmACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2610 | CR010660 | mA*mA*mA*GGCmUGmCUGmAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2611 | CR010661 | mA*mA*mA*mGGCUmGCmUGAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2612 | CR010662 | mA*mA*mA*GGmCUGCUGAmUGACmACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2613 | CR010663 | mA*mA*mA*GGCUGmCmUGAUGACACCmUGUUUUAGAGCUAUGCUGUUUUG |
| 2614 | CR010664 | mA*mA*mA*GGCUmGCUGmAUGACAmCCUGUUUUAGAGCUAUGCUGUUUUG |
| 2615 | CR010665 | mA*mA*mA*GGmCUGCUGAUGmACACmCUGUUUUAGAGCUAUGCUGUUUUG |
| 2616 | CR010666 | mA*mA*mA*GmGCmUGCUGAUGAmCACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2617 | CR010667 | mA*mA*mA*mGGCUGCUmGAUmGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2618 | CR010668 | mA*mA*mA*GGCmUmGCmUGAUGAmCACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2619 | CR010669 | mA*mA*mA*GGCUGCUGAUmGACmAmCmCUGUUUUAGAGCUAUGCUGUUUUG |
| 2620 | CR010670 | mA*mA*mA*GGCUGmCUmGAmUGACACCmUGUUUUAGAGCUAUGCUGUUUUG |
| 2621 | CR010671 | mA*mA*mA*mGGmCUGCUGmAUGmACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2622 | CR010672 | mA*mA*mA*GmGCUmGCUGmAmUGACACCUGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2623 | CR010673 | mA*mA*mA*GGCUGCmUmGAUmGmACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2624 | CR010674 | mA*mA*mA*mGGCmUGmCUGAUGACAmCCUGUUUUAGAGCUAUGCUGUUUUG |
| 2625 | CR010675 | mA*mA*mA*GmGCUGCUGAUGAmCmACCmUGUUUUAGAGCUAUGCUGUUUUG |
| 2626 | CR010676 | mA*mA*mA*GGmCUGCmUGAUGACACmCmUGUUUUAGAGCUAUGCUGUUUUG |
| 2627 | CR010677 | mA*mA*mA*GGCmUGCUGAmUGmAmCACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2628 | CR010678 | mA*mA*mA*GGCUmGmCUGmAUGACACmCUGUUUUAGAGCUAUGCUGUUUUG |
| 2629 | CR010679 | mA*mA*mA*GmGmCUGCUGAUmGACAmCCUGUUUUAGAGCUAUGCUGUUUUG |
| 2630 | CR010680 | mA*mA*mA*mGGCUGCUmGmAUGACmACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2631 | CR010681 | mA*mA*mA*GmGCUGmCUGAUGmACAmCCUGUUUUAGAGCUAUGCUGUUUUG |
| 2632 | CR010682 | mA*mA*mA*GGCUmGCUmGAUmGACACCmUGUUUUAGAGCUAUGCUGUUUUG |
| 2633 | CR010683 | mA*mA*mA*mGGCUGCUGAmUGACmACmCUGUUUUAGAGCUAUGCUGUUUUG |
| 2634 | CR010684 | mA*mA*mA*GGmCmUGCmUGAUGAmCACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2635 | CR010685 | AAAGGCUmGCUGAUGAmCACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2636 | CR010686 | AAAGGCUGCmUGmAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2637 | CR010687 | AAAmGGCUGCUmGAUmGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2638 | CR010688 | AAAGGCmUGCUGAUGACmACCmUGUUUUAGAGCUAUGCUGUUUUG |
| 2639 | CR010689 | AAAGmGCUGmCUGAUGmACAmCCUGUUUUAGAGCUAUGCUGUUUUG |
| 2640 | CR010690 | AAAmGGCUGCUGAmUGACmACmCUGUUUUAGAGCUAUGCUGUUUUG |
| 2641 | CR011158 | mA*mA*mA*G*GCUGCUGAUGACAC*CUGUUUUAGAGCUAUGCUGUUUUG |
| 2642 | CR011159 | mA*mA*mA*GGCUGCUGA*UGAC*ACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2643 | CR011160 | mA*mA*mA*GGCU*GCUGAUG*ACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2644 | CR011161 | mA*mA*mA*GGCUGCUG*AU*GACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2645 | CR011162 | mA*mA*mA*GGCUGC*UGAUGA*CACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2646 | CR011163 | mA*mA*mA*GGCUG*CUGAUGACACC*UGUUUUAGAGCUAUGCUGUUUUG |
| 2647 | CR011164 | mA*mA*mA*GG*CUGCUGAUGACA*CCUGUUUUAGAGCUAUGCUGUUUUG |
| 2648 | CR011165 | mA*mA*mA*GGCUGCU*GAUGACACCU*GUUUUAGAGCUAUGCUGUUUUG |
| 2649 | CR011166 | mA*mA*mA*GGCU*GCUGAUGACA*CCU*GUUUUAGAGCUAUGCUGUUUUG |
| 2650 | CR011167 | mA*mA*mA*G*GCUGCUGA*UGA*CACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2651 | CR011168 | mA*mA*mA*GGCUGCUGAUGAC*AC*C*UGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2652 | CR011169 | mA*mA*mA*GGCUG*CUGAU*G*ACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2653 | CR011170 | mA*mA*mA*GGC*UGC*U*GAUGACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2654 | CR011171 | mA*mA*mA*GG*CUGCUG*AUGAC*ACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2655 | CR011172 | mA*mA*mA*GG*CUGCUGAUG*ACACC*UGUUUUAGAGCUAUGCUGUUUUG |
| 2656 | CR011173 | mA*mA*mA*GGCUGCUG*AUGACAC*CU*GUUUUAGAGCUAUGCUGUUUUG |
| 2657 | CR011174 | mA*mA*mA*GGCU*G*CU*GAUGAC*ACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2658 | CR011175 | mA*mA*mA*GGCUGCUGAUG*ACA*C*C*UGUUUUAGAGCUAUGCUGUUUUG |
| 2659 | CR011176 | mA*mA*mA*GGCUGC*UG*AU*GACACCU*GUUUUAGAGCUAUGCUGUUUUG |
| 2660 | CR011177 | mA*mA*mA*G*GC*UGCUGA*UGA*CACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2661 | CR011178 | mA*mA*mA*GG*CUG*CUGA*U*GACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2662 | CR011179 | mA*mA*mA*GGCUGCU*G*AUG*A*CACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2663 | CR011180 | mA*mA*mA*G*GCU*GC*UGAUGACAC*CUGUUUUAGAGCUAUGCUGUUUUG |
| 2664 | CR011181 | mA*mA*mA*GG*CUGCUGAUGAC*A*CCU*GUUUUAGAGCUAUGCUGUUUUG |
| 2665 | CR011182 | mA*mA*mA*GGCU*G*CU*GAUGACA*C*CUGUUUUAGAGCUAUGCUGUUUUG |
| 2666 | CR011183 | mA*mA*mA*GGCUGC*UGA*U*GA*CACC*UGUUUUAGAGCUAUGCUGUUUUG |
| 2667 | CR011184 | mA*mA*mA*G*GCUGCUG*AUG*AC*ACCU*GUUUUAGAGCUAUGCUGUUUUG |
| 2668 | CR011185 | mA*mA*mA*GG*C*UGCUG*AUGA*CA*CCUGUUUUAGAGCUAUGCUGUUUUG |
| 2669 | CR011186 | mA*mA*mA*G*GC*UGCU*GAU*GAC*ACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2670 | CR011187 | mA*mA*mA*GG*CUGCUGAUG*ACAC*C*U*GUUUUAGAGCUAUGCUGUUUUG |
| 2671 | CR011188 | mA*mA*mA*GGCU*G*C*UGA*UGAC*ACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2672 | CR011189 | mA*mA*mA*GGC*U*GC*UGAU*GACACCU*GUUUUAGAGCUAUGCUGUUUUG |
| 2673 | CR011190 | mA*mA*mA*GGC*U*G*CUGAU*GACA*C*CUGUUUUAGAGCUAUGCUGUUUUG |
| 2674 | CR011191 | mA*mA*mA*GG*CUGC*U*GA*UG*AC*ACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2675 | CR011192 | mA*mA*mA*G*GCUGCUG*AUG*A*CACC*U*GUUUUAGAGCUAUGCUGUUUUG |
| 2676 | CR011193 | mA*mA*mA*G*GC*UG*C*UGA*UGA*CACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2677 | CR011194 | mA*mA*mA*GG*CUGCU*GAUGACA*C*C*U*GUUUUAGAGCUAUGCUGUUUUG |
| 2678 | CR011195 | mA*mA*mA*GGCU*GC*UG*AU*GAC*ACCU*GUUUUAGAGCUAUGCUGUUUUG |
| 2679 | CR011196 | mA*mA*mA*GG*CU*GCUG*A*UGA*CAC*CUGUUUUAGAGCUAUGCUGUUUUG |
| 2680 | CR011197 | mA*mA*mA*G*GCUG*CUGAU*GAC*A*CC*UGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2681 | CR011198 | mA*mA*mA*GGCU*G*C*UGAU*G*ACAC*CU*GUUUUAGAGCUAUGCUGUUUUG |
| 2682 | CR011199 | mA*mA*mA*G*GCUGCU*G*A*UGA*C*ACC*UGUUUUAGAGCUAUGCUGUUUUG |
| 2683 | CR011200 | mA*mA*mA*GG*C*UG*CU*GAUG*AC*A*CCUGUUUUAGAGCUAUGCUGUUUUG |
| 2684 | CR011201 | mA*mA*mA*G*G*C*UGCUGA*UGACA*C*CU*GUUUUAGAGCUAUGCUGUUUUG |
| 2685 | CR011202 | mA*mA*mA*GG*CU*GC*UG*AU*GA*CACC*UGUUUUAGAGCUAUGCUGUUUUG |
| 2686 | CR011203 | mA*mA*mA*GGCUGC*U*GA*UG*ACA*C*C*UGUUUUAGAGCUAUGCUGUUUUG |
| 2687 | CR011204 | mA*mA*mA*G*GC*UG*CUG*AU*GA*CACCU*GUUUUAGAGCUAUGCUGUUUUG |
| 2688 | CR011205 | mA*mA*mA*GGC*U*GCUGA*UGA*C*A*C*CUGUUUUAGAGCUAUGCUGUUUUG |
| 2689 | CR011206 | mA*mA*mA*G*G*CU*GC*UG*AUG*AC*ACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2690 | CR011207 | mA*mA*mA*G*G*CUGC*U*G*AU*GACACC*U*GUUUUAGAGCUAUGCUGUUUUG |
| 2691 | CR011208 | mA*mA*mA*GGC*U*G*CUGA*UG*AC*A*C*CUGUUUUAGAGCUAUGCUGUUUUG |
| 2692 | CR011209 | mA*mA*mA*GGCU*GCU*GA*U*GA*C*AC*C*UGUUUUAGAGCUAUGCUGUUUUG |
| 2693 | CR011210 | mA*mA*mA*G*G*C*UG*CUG*AUGA*CA*CCU*GUUUUAGAGCUAUGCUGUUUUG |
| 2694 | CR011211 | mA*mA*mA*GGC*UG*C*U*GAU*G*AC*ACCU*GUUUUAGAGCUAUGCUGUUUUG |
| 2695 | CR011212 | mA*mA*mA*GG*CU*GC*UG*AUG*ACA*C*C*UGUUUUAGAGCUAUGCUGUUUUG |
| 2696 | CR011213 | mA*mA*mA*G*GC*U*GCUG*A*U*G*A*CACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2697 | CR011214 | mA*mA*mA*G*GCUG*C*U*GA*UGA*CA*C*CUGUUUUAGAGCUAUGCUGUUUUG |
| 2698 | CR011215 | mA*mA*mA*GG*CU*G*CUG*A*UGAC*ACC*U*GUUUUAGAGCUAUGCUGUUUUG |
| 2699 | CR011216 | mA*mA*mA*GGC*UG*C*UGA*UG*A*C*A*CCU*GUUUUAGAGCUAUGCUGUUUUG |
| 2700 | CR011217 | mA*mA*mA*G*G*CU*G*CU*G*AU*GACAC*C*UGUUUUAGAGCUAUGCUGUUUUG |
| 2701 | CR011218 | mA*mA*mA*GGC*U*GCUG*AU*G*A*C*AC*C*UGUUUUAGAGCUAUGCUGUUUUG |
| 2702 | CR011219 | mA*mA*mA*G*G*CUGC*U*G*A*UGACA*C*CU*GUUUUAGAGCUAUGCUGUUUUG |
| 2703 | CR011220 | mA*mA*mA*GG*C*UG*C*U*GAUG*A*C*AC*CU*GUUUUAGAGCUAUGCUGUUUUG |
| 2704 | CR011221 | mA*mA*mA*G*GCU*GC*UG*A*U*GA*CA*CC*U*GUUUUAGAGCUAUGCUGUUUUG |
| 2705 | CR011222 | mA*mA*mA*G*G*CUGCU*G*A*U*G*AC*A*C*CUGUUUUAGAGCUAUGCUGUUUUG |
| 2706 | CR011223 | mA*mA*mA*GGC*U*G*CU*GA*U*GAC*A*C*C*UGUUUUAGAGCUAUGCUGUUUUG |
| 2707 | CR011224 | mA*mA*mA*G*GC*UG*C*U*G*A*UGAC*A*C*C*UGUUUUAGAGCUAUGCUGUUUUG |
| 2708 | CR011225 | mA*mA*mA*GG*C*U*G*CUG*AU*G*A*CA*C*CU*GUUUUAGAGCUAUGCUGUUUUG |
| 2709 | CR011226 | mA*mA*mA*G*G*CU*GC*U*GA*U*G*A*CACC*U*GUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2710 | CR011227 | mA*mA*mA*GGC*UG*C*UGA*U*G*A*C*A*CC*U*GUUUUAGAGCUAUGCUGUUUUG |
| 2711 | CR011228 | mA*mA*mA*GGCU*G*C*UG*A*U*GA*C*A*C*C*U*GUUUUAGAGCUAUGCUGUUUUG |
| 2712 | CR011229 | mA*mA*mA*G*G*C*UGCU*GA*U*G*A*CA*C*C*U*GUUUUAGAGCUAUGCUGUUUUG |
| 2713 | CR011230 | mA*mA*mA*G*G*C*U*G*C*U*G*AUG*A*C*ACC*UGUUUUAGAGCUAUGCUGUUUUG |
| 2714 | CR011231 | mA*mA*mA*G*G*C*U*G*CUG*A*U*G*AC*A*CCU*GUUUUAGAGCUAUGCUGUUUUG |
| 2715 | CR011232 | mA*mA*mA*G*G*C*UG*CUG*A*UG*A*C*A*C*C*U*GUUUUAGAGCUAUGCUGUUUUG |
| 2716 | CR011233 | mA*mA*mA*GG*C*U*G*C*U*G*A*U*G*A*C*ACCU*GUUUUAGAGCUAUGCUGUUUUG |
| 2717 | CR011234 | mA*mA*mA*G*G*C*U*G*C*U*GA*U*GA*CA*C*C*C*UGUUUUAGAGCUAUGCUGUUUUG |
| 2718 | CR011235 | mA*mA*mA*G*GC*U*G*AU*G*AC*A*C*C*U*GUUUUAGAGCUAUGCUGUUUUG |
| 2719 | CR011236 | mA*mA*mA*G*G*CU*G*CU*G*AU*G*A*C*A*C*C*U*GUUUUAGAGCUAUGCUGUUUUG |
| 2720 | CR011237 | mA*mA*mA*G*GC*UGC*U*G*A*U*G*A*C*A*C*C*U*GUUUUAGAGCUAUGCUGUUUUG |
| 2721 | CR011238 | mA*mA*mA*GG*C*U*G*C*U*GA*U*G*A*CA*C*C*U*GUUUUAGAGCUAUGCUGUUUUG |
| 2722 | CR011239 | mA*mA*mA*G*G*C*U*G*C*UG*A*UG*A*C*AC*C*U*GUUUUAGAGCUAUGCUGUUUUG |
| 2723 | CR011240 | mA*mA*mA*G*G*C*U*GC*U*G*A*U*G*A*C*A*CC*U*GUUUUAGAGCUAUGCUGUUUUG |
| 2724 | CR011241 | mA*mA*mA*GG*C*U*G*C*U*G*A*U*G*A*C*A*C*CU*GUUUUAGAGCUAUGCUGUUUUG |
| 2725 | CR011242 | mA*mA*mA*G*GC*U*G*C*U*G*A*U*GA*C*A*C*C*U*GUUUUAGAGCUAUGCUGUUUUG |
| 2726 | CR011243 | mA*mA*mA*G*G*C*U*G*C*UG*AU*G*A*C*A*C*C*U*GUUUUAGAGCUAUGCUGUUUUG |
| 2727 | CR011244 | AAAGG*CUGCUGAUGACA*CCUGUUUUAGAGCUAUGCUGUUUUG |
| 2728 | CR011245 | AAAGGCUG*CUGAU*G*ACACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2729 | CR011246 | AAAG*GCU*GC*UGAUGACAC*CUGUUUUAGAGCUAUGCUGUUUUG |
| 2730 | CR011247 | AAAG*GCUGCUG*AUG*AC*ACCU*GUUUUAGAGCUAUGCUGUUUUG |
| 2731 | CR011248 | AAAG*GC*UG*C*UGA*UGA*CACCUGUUUUAGAGCUAUGCUGUUUUG |
| 2732 | CR011249 | AAAG*GCUGCU*G*A*UGA*C*ACC*UGUUUUAGAGCUAUGCUGUUUUG |
| 2733 | CR011250 | AAAGG*CU*GC*UG*AUG*ACA*C*C*UGUUUUAGAGCUAUGCUGUUUUG |
| 2734 | CR011251 | AAAGGC*U*GCUG*AU*G*A*C*AC*C*UGUUUUAGAGCUAUGCUGUUUUG |
| 2735 | CR000689 | ACACAAAUACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2736 | CR009583 | ACACAmAAUACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2737 | CR009586 | ACACAAAUmACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2738 | CR009594 | ACACAAAUACCAGUCCmAGCGGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2739 | CR009618 | mA*mC*mA*CAAAUACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2740 | CR009630 | ACACAfAAUACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2741 | CR009633 | ACACAAAUfACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2742 | CR009641 | ACACAAAUACCAGUCCfAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2743 | CR010510 | mA*mC*mA*CfAAAUACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2744 | CR010511 | mA*mC*mA*CAAAUACCAGUCCAGfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2745 | CR010512 | mA*mC*mA*CAAAUACCAGUCfCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2746 | CR010513 | mA*mC*mA*CAAfAUACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2747 | CR010514 | mA*mC*mA*CAAAUACCAGUCCAGCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2748 | CR010515 | mA*mC*mA*CAAAUACCAGUCCfAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2749 | CR010516 | mA*mC*mA*CAAAUACCAfGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2750 | CR010517 | mA*mC*mA*CAAAUfACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2751 | CR010518 | mA*mC*mA*CAAAUACCAGfUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2752 | CR010519 | mA*mC*mA*CAAAUACfCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2753 | CR010520 | mA*mC*mA*fCAAAUACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2754 | CR010521 | mA*mC*mA*CAAAUACCAGUfCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2755 | CR010522 | mA*mC*mA*CAAAUACCfAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2756 | CR010523 | mA*mC*mA*CAAAUAfCCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2757 | CR010524 | mA*mC*mA*CAfAAUACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2758 | CR010525 | mA*mC*mA*CAAAfUACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2759 | CR010526 | mA*mC*mA*CAAAUACCAGUCCAfGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2760 | CR010527 | mA*mC*mA*fCAAAUACCAGUCCAfGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2761 | CR010528 | mA*mC*mA*CAAAUACCfAGUCfCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2762 | CR010529 | mA*mC*mA*CAAfAUACCAGfUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2763 | CR010530 | mA*mC*mA*CAAAUACfCAfGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2764 | CR010531 | mA*mC*mA*CAAAUfACCAGUfCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2765 | CR010532 | mA*mC*mA*CAAAfUACCAGUCCAGfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2766 | CR010533 | mA*mC*mA*CfAAAUACCAGUCCfAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2767 | CR010534 | mA*mC*mA*CAAAUAfCCAGUCCAGCfGGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2768 | CR010535 | mA*mC*mA*CAfAAUACCfAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2769 | CR010536 | mA*mC*mA*CAAAUACCAfGUCCAGfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2770 | CR010537 | mA*mC*mA*CAAAUfACfCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2771 | CR010538 | mA*mC*mA*CAAfAUACCAGUCCAGCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2772 | CR010539 | mA*mC*mA*CAfAAUACCAGfUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2773 | CR010540 | mA*mC*mA*CfAAAUACCAGUfCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2774 | CR010541 | mA*mC*mA*CAAAfUACCAGUCfCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2775 | CR010542 | mA*mC*mA*fCAAAUAfCCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2776 | CR010543 | mA*mC*mA*fCAAAUACCAGUfCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2777 | CR010544 | mA*mC*mA*CAAAfUACCAGfUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2778 | CR010545 | mA*mC*mA*CAAAUfACCAGUCCAGfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2779 | CR010546 | mA*mC*mA*CAAAUACCAGUCfCAGCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2780 | CR010547 | mA*mC*mA*CAAAUACfCAGUCCAfGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2781 | CR010548 | mA*mC*mA*CAAAUACCAfGUCCfAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2782 | CR010549 | mA*mC*mA*CAAAUAfCCfAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2783 | CR010550 | mA*mC*mA*CfAAfAUACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2784 | CR010551 | mA*mC*mA*CAfAAUACCAGUCCAGfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2785 | CR010552 | mA*mC*mA*CAAAUfACCAGUCfCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2786 | CR010553 | mA*mC*mA*CAAAfUACCfAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2787 | CR010554 | mA*mC*mA*CAAAUACCAGUCCAfGCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2788 | CR010555 | mA*mC*mA*CAAAUAfCCAGfUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2789 | CR010556 | mA*mC*mA*CAAAUACCAfGUfCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2790 | CR010557 | mA*mC*mA*CfAfAAUACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2791 | CR010558 | mA*mC*mA*fCAAAUACfCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2792 | CR010559 | mA*mC*mA*CAAfAUACCAGUCCfAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2793 | CR010560 | mA*mC*mA*CAAfAUACCAGUCCfAGCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2794 | CR010561 | mA*mC*mA*fCAAAUACCfAGUfCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2795 | CR010562 | mA*mC*mA*CAAAUACCAGUCfCAfGfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2796 | CR010563 | mA*mC*mA*CAAAfUACCAfGfUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2797 | CR010564 | mA*mC*mA*CAfAAUfAfCCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2798 | CR010565 | mA*mC*mA*CfAAAUACfCAGUCfCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2799 | CR010566 | mA*mC*mA*CfAAAUACCAGfUCCAGfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2800 | CR010567 | mA*mC*mA*CAAAUACfCAGUCCAfGCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2801 | CR010568 | mA*mC*mA*CAAAUACCAfGUfCCfAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2802 | CR010569 | mA*mC*mA*CAAfAUfACCfAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2803 | CR010570 | mA*mC*mA*fCAAAfUAfCCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2804 | CR010571 | mA*mC*mA*CAfAAUACCAfGUCCfAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2805 | CR010572 | mA*mC*mA*CAAAUfAfCCAGUCCAGCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2806 | CR010573 | mA*mC*mA*CAAAfUACCfAGUCCAfGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2807 | CR010574 | mA*mC*mA*CAfAAUACCAGUfCCAGfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2808 | CR010575 | mA*mC*mA*CfAAfAUACCAGUCfCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2809 | CR010576 | mA*mC*mA*fCAAAUACfCAGfUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2810 | CR010577 | mA*mC*mA*CAAfAfUAfCCAGUCfCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2811 | CR010578 | mA*mC*mA*CAAAUACCAGfUCCfAfGfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2812 | CR010579 | mA*mC*mA*CAAAUfACfCAfGUCCAGCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2813 | CR010580 | mA*mC*mA*fCAfAAUACCfAGUfCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2814 | CR010581 | mA*mC*mA*CfAAAfUACCfAfGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2815 | CR010582 | mA*mC*mA*CAAAUAfCfCAGfUfCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2816 | CR010583 | mA*mC*mA*fCAAfAUfACCAGUCCAfGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2817 | CR010584 | mA*mC*mA*CfAAAUACCAGUCfCfAGCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2818 | CR010585 | mA*mC*mA*CAfAAUAfCCAGUCCAGfCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2819 | CR010586 | mA*mC*mA*CAAfAUACCAfGUfCfCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2820 | CR010587 | mA*mC*mA*CAAAfUfACCfAGUCCAGfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2821 | CR010588 | mA*mC*mA*CfAfAAUACCAGfUCCAfGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2822 | CR010589 | mA*mC*mA*fCAAAUACfCfAGUCCfAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2823 | CR010590 | mA*mC*mA*CfAAAUfACCAGUfCCAfGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2824 | CR010591 | mA*mC*mA*CAAAfUACfCAGfUCCAGCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2825 | CR010592 | mA*mC*mA*fCAAAUACCAfGUCCfAGfCGGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2826 | CR010593 | mA*mC*mA*CAfAfAUAfCCAGUCfCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2827 | CR010594 | ACACAAAfUACCAGUCfCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2828 | CR010595 | ACACAAAUAfCCfAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2829 | CR010596 | ACAfCAAAUACfCAGfUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2830 | CR010597 | ACACAAfAUACCAGUCCfAGCfGGUUUUAGAGCUAUGCUGUUUUG |
| 2831 | CR010598 | ACACfAAAUfACCAGUfCCAfGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2832 | CR010599 | ACAfCAAAUACCAfGUCCfAGfCGGUUUUAGAGCUAUGCUGUUUUG |
| 2833 | CR011067 | mA*mC*mA*CmAAAUACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2834 | CR011068 | mA*mC*mA*CAAAUACCAGUCCAGmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2835 | CR011069 | mA*mC*mA*CAAAUACCAGUCmCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2836 | CR011070 | mA*mC*mA*CAAmAUACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2837 | CR011071 | mA*mC*mA*CAAAUACCAGUCCAGCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2838 | CR011072 | mA*mC*mA*CAAAUACCAGUCCmAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2839 | CR011073 | mA*mC*mA*CAAAUACCAmGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2840 | CR011074 | mA*mC*mA*CAAAUmACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2841 | CR011075 | mA*mC*mA*CAAAUACCAGmUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2842 | CR011076 | mA*mC*mA*CAAAUACmCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2843 | CR011077 | mA*mC*mA*mCAAAUACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2844 | CR011078 | mA*mC*mA*CAAAUACCAGUmCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2845 | CR011079 | mA*mC*mA*CAAAUACCmAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2846 | CR011080 | mA*mC*mA*CAAAUAmCCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2847 | CR011081 | mA*mC*mA*CAmAAUACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2848 | CR011082 | mA*mC*mA*CAAAmUACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2849 | CR011083 | mA*mC*mA*CAAAUACCAGUCCAmGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2850 | CR011084 | mA*mC*mA*mCAAAUACCAGUCCAmGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2851 | CR011085 | mA*mC*mA*CAAAUACCmAGUCmCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2852 | CR011086 | mA*mC*mA*CAAmAUACCAGmUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2853 | CR011087 | mA*mC*mA*CAAAUACmCAmGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2854 | CR011088 | mA*mC*mA*CAAAUmACCAGUmCCAGCGGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2855 | CR011089 | mA*mC*mA*CAAAmUACCAGUCCAGmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2856 | CR011090 | mA*mC*mA*CmAAAUACCAGUCCmAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2857 | CR011091 | mA*mC*mA*CAAAUAmCCAGUCCAGCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2858 | CR011092 | mA*mC*mA*CAmAAUACCmAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2859 | CR011093 | mA*mC*mA*CAAAUACCAmGUCCAGmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2860 | CR011094 | mA*mC*mA*CAAAUmACmCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2861 | CR011095 | mA*mC*mA*CAAAUACCAGUCCmAmGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2862 | CR011096 | mA*mC*mA*CAAmAUACCAGUCCAGCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2863 | CR011097 | mA*mC*mA*CAmAAUACCAGmUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2864 | CR011098 | mA*mC*mA*CmAAAUACCAGUmCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2865 | CR011099 | mA*mC*mA*CAAAmUACCAGUCmCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2866 | CR011100 | mA*mC*mA*mCAAAUAmCCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2867 | CR011101 | mA*mC*mA*mCAAAUACCAGUmCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2868 | CR011102 | mA*mC*mA*CAAAmUACCAGmUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2869 | CR011103 | mA*mC*mA*CAAAUmACCAGUCCAGmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2870 | CR011104 | mA*mC*mA*CAAAUACCAGUCmCAGCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2871 | CR011105 | mA*mC*mA*CAAAUACmCAGUCCAmGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2872 | CR011106 | mA*mC*mA*CAAAUACCAmGUCCmAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2873 | CR011107 | mA*mC*mA*CAAAUAmCCmAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2874 | CR011108 | mA*mC*mA*CmAAmAUACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2875 | CR011109 | mA*mC*mA*CAmAAUACCAGUCCAGmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2876 | CR011110 | mA*mC*mA*CAAAUmACCAGUCmCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2877 | CR011111 | mA*mC*mA*CAAAmUACCmAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2878 | CR011112 | mA*mC*mA*CAAAUACCAGUCCAmGCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2879 | CR011113 | mA*mC*mA*CAAAUAmCCAGmUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2880 | CR011114 | mA*mC*mA*CAAAUACCAmGUmCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2881 | CR011115 | mA*mC*mA*CmAmAAUACCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2882 | CR011116 | mA*mC*mA*mCAAAUACmCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2883 | CR011117 | mA*mC*mA*CAAmAUACCAGUCCmAGCGGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2884 | CR011118 | mA*mC*mA*CAAmAUACCAGUCCmAGCmGGUUUUAGAGCUAUGCUGUUUUG |
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| 2886 | CR011120 | mA*mC*mA*CAAAUACCAGUCmCAmGmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2887 | CR011121 | mA*mC*mA*CAAAmUACCAmGmUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2888 | CR011122 | mA*mC*mA*CAmAAUmAmCCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2889 | CR011123 | mA*mC*mA*CmAAAUACmCAGUCmCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2890 | CR011124 | mA*mC*mA*CmAAAUACCAGmUCCAGmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2891 | CR011125 | mA*mC*mA*CAAAUACmCAGUCCAmGCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2892 | CR011126 | mA*mC*mA*CAAAUACCAmGUmCCmAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2893 | CR011127 | mA*mC*mA*CAAmAUmACCmAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2894 | CR011128 | mA*mC*mA*mCAAAmUAmCCAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2895 | CR011129 | mA*mC*mA*CAmAAUACCAmGUCCmAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2896 | CR011130 | mA*mC*mA*CAAAUmAmCCAGUCCAGCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2897 | CR011131 | mA*mC*mA*CAAAmUACCmAGUCCAmGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2898 | CR011132 | mA*mC*mA*CAmAAUACCAGUmCCAGmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2899 | CR011133 | mA*mC*mA*CmAAmAUACCAGUCmCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2900 | CR011134 | mA*mC*mA*mCAAAUACmCAGmUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2901 | CR011135 | mA*mC*mA*CAAmAmUAmCCAGUCmCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2902 | CR011136 | mA*mC*mA*CAAAUACCAGmUCCmAmGmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2903 | CR011137 | mA*mC*mA*CAAAUmACmCAmGUCCAGCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2904 | CR011138 | mA*mC*mA*mCAmAAUACCmAGUmCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2905 | CR011139 | mA*mC*mA*CmAAAmUACCmAmGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2906 | CR011140 | mA*mC*mA*CAAAUAmCmCAGmUmCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2907 | CR011141 | mA*mC*mA*mCAAmAUmACCAGUCCAmGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2908 | CR011142 | mA*mC*mA*CmAAAUACCAGUCmCmAGCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2909 | CR011143 | mA*mC*mA*CAmAAUAmCCAGUCCAGmCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2910 | CR011144 | mA*mC*mA*CAAmAUACCAmGUmCmCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2911 | CR011145 | mA*mC*mA*CAAAmUmACCmAGUCCAGmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2912 | CR011146 | mA*mC*mA*CmAmAAUACCAGmUCCAmGCGGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
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| 2913 | CR011147 | mA*mC*mA*mCAAAUACmCmAGUCCmAGCGGUUUUAGAGCUAUGCUGUUUUG |
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| 2915 | CR011149 | mA*mC*mA*CAAAmUACmCAGmUCCAGCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2916 | CR011150 | mA*mC*mA*mCAAAUACCAmGUCCmAGmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2917 | CR011151 | mA*mC*mA*CAmAmAUAmCCAGUCmCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2918 | CR011152 | ACACAAAmUACCAGUCmCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2919 | CR011153 | ACACAAAUAmCCmAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2920 | CR011154 | ACAmCAAAUACmCAGmUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2921 | CR011155 | ACACAAmAUACCAGUCCmAGCmGGUUUUAGAGCUAUGCUGUUUUG |
| 2922 | CR011156 | ACACmAAAUmACCAGUmCCAmGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2923 | CR011157 | ACAmCAAAUACCAmGUCCmAGmCGGUUUUAGAGCUAUGCUGUUUUG |
| 2924 | CR011628 | mA*mC*mA*C*AAAUACCAGUCCAG*CGGUUUUAGAGCUAUGCUGUUUUG |
| 2925 | CR011629 | mA*mC*mA*CAAAUACCA*GUCC*AGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2926 | CR011630 | mA*mC*mA*CAAA*UACCAGU*CCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2927 | CR011631 | mA*mC*mA*CAAAUACC*AG*UCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2928 | CR011632 | mA*mC*mA*CAAAUA*CCAGUC*CAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2929 | CR011633 | mA*mC*mA*CAAAU*ACCAGUCCAGC*GGUUUUAGAGCUAUGCUGUUUUG |
| 2930 | CR011634 | mA*mC*mA*CA*AAUACCAGUCCA*GCGGUUUUAGAGCUAUGCUGUUUUG |
| 2931 | CR011635 | mA*mC*mA*CAAAUAC*CAGUCCAGCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2932 | CR011636 | mA*mC*mA*CAAA*UACCAGUCCA*GCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2933 | CR011637 | mA*mC*mA*C*AAAUACCA*GUC*CAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2934 | CR011638 | mA*mC*mA*CAAAUACCAGUCC*AG*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 2935 | CR011639 | mA*mC*mA*CAAAU*ACCAG*U*CCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2936 | CR011640 | mA*mC*mA*CAA*AUA*C*CAGUCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2937 | CR011641 | mA*mC*mA*CA*AAUACC*AGUCC*AGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2938 | CR011642 | mA*mC*mA*CA*AAUACCAGU*CCAGC*GGUUUUAGAGCUAUGCUGUUUUG |
| 2939 | CR011643 | mA*mC*mA*CAAAUACC*AGUCCAG*CG*GUUUUAGAGCUAUGCUGUUUUG |
| 2940 | CR011644 | mA*mC*mA*CAAA*U*AC*CAGUCC*AGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2941 | CR011645 | mA*mC*mA*CAAAUACCAGU*CCA*G*C*GGUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 2942 | CR011646 | mA*mC*mA*CAAAUA*CC*AG*UCCAGCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2943 | CR011647 | mA*mC*mA*C*AA*AUACCA*GUC*CAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2944 | CR011648 | mA*mC*mA*CA*AAU*ACCA*G*UCCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2945 | CR011649 | mA*mC*mA*CAAAUAC*C*AGU*C*CAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2946 | CR011650 | mA*mC*mA*C*AAA*UA*CCAGUCCAG*CGGUUUUAGAGCUAUGCUGUUUUG |
| 2947 | CR011651 | mA*mC*mA*CA*AAUACCAGUCC*A*GCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2948 | CR011652 | mA*mC*mA*CAAA*U*AC*CAGUCCA*G*CGGUUUUAGAGCUAUGCUGUUUUG |
| 2949 | CR011653 | mA*mC*mA*CAAAUA*CCA*G*UC*CAGC*GGUUUUAGAGCUAUGCUGUUUUG |
| 2950 | CR011654 | mA*mC*mA*C*AAAUACC*AGU*CC*AGCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2951 | CR011655 | mA*mC*mA*CA*A*AUACC*AGUC*CA*GCGGUUUUAGAGCUAUGCUGUUUUG |
| 2952 | CR011656 | mA*mC*mA*C*AA*AUAC*CAG*UCC*AGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2953 | CR011657 | mA*mC*mA*CA*AAUACCAGU*CCAG*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2954 | CR011658 | mA*mC*mA*CAAA*U*A*CCA*GUCC*AGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2955 | CR011659 | mA*mC*mA*CAA*A*UA*CCAG*UCCAGCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2956 | CR011660 | mA*mC*mA*CAA*A*U*ACCAG*UCCA*G*CGGUUUUAGAGCUAUGCUGUUUUG |
| 2957 | CR011661 | mA*mC*mA*CA*AAUA*C*CA*GU*CC*AGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2958 | CR011662 | mA*mC*mA*C*AAAUACC*AGU*C*CAGC*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2959 | CR011663 | mA*mC*mA*C*AA*AU*A*CCA*GUC*CAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2960 | CR011664 | mA*mC*mA*CA*AAUAC*CAGUCCA*G*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2961 | CR011665 | mA*mC*mA*CAAA*UA*CC*AG*UCC*AGCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2962 | CR011666 | mA*mC*mA*CA*AA*UACC*A*GUC*CAG*CGGUUUUAGAGCUAUGCUGUUUUG |
| 2963 | CR011667 | mA*mC*mA*C*AAAU*ACCAG*UCC*A*GC*GGUUUUAGAGCUAUGCUGUUUUG |
| 2964 | CR011668 | mA*mC*mA*CAAA*U*A*CCAG*U*CCAG*CG*GUUUUAGAGCUAUGCUGUUUUG |
| 2965 | CR011669 | mA*mC*mA*C*AAAUAC*C*A*GUC*C*AGC*GGUUUUAGAGCUAUGCUGUUUUG |
| 2966 | CR011670 | mA*mC*mA*CA*A*AU*AC*CAGU*CC*A*GCGGUUUUAGAGCUAUGCUGUUUUG |
| 2967 | CR011671 | mA*mC*mA*C*A*A*AUACCA*GUCCA*G*CG*GUUUUAGAGCUAUGCUGUUUUG |
| 2968 | CR011672 | mA*mC*mA*CA*AA*UA*CC*AG*UC*CAGC*GGUUUUAGAGCUAUGCUGUUUUG |
| 2969 | CR011673 | mA*mC*mA*CAAAUA*C*CA*GU*CCA*G*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 2970 | CR011674 | mA*mC*mA*C*AA*AU*ACC*AG*UC*CAGCG*GUUUUAGAGCUAUGCUGUUUUG |

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|---|---|---|
| 2971 | CR011675 | mA*mC*mA*CAA*A*UACCA*GUC*C*A*G*CGGUUUUAGAGCUAUGCUGUUUUG |
| 2972 | CR011676 | mA*mC*mA*C*A*AA*UA*CC*AGU*CC*AGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2973 | CR011677 | mA*mC*mA*C*A*AAUA*C*C*AG*UCCAGC*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2974 | CR011678 | mA*mC*mA*CAA*A*U*ACCA*GU*CC*A*G*CGGUUUUAGAGCUAUGCUGUUUUG |
| 2975 | CR011679 | mA*mC*mA*CAAA*UAC*CA*G*UC*C*AG*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 2976 | CR011680 | mA*mC*mA*C*A*A*AU*ACC*AGUC*CA*GCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2977 | CR011681 | mA*mC*mA*CAA*AU*A*C*CAG*U*CC*AGCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2978 | CR011682 | mA*mC*mA*CA*AA*UA*CC*AGU*CCA*G*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 2979 | CR011683 | mA*mC*mA*C*AA*A*UACC*A*G*U*C*CAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 2980 | CR011684 | mA*mC*mA*C*AAAU*A*C*CA*GUC*CA*G*CGGUUUUAGAGCUAUGCUGUUUUG |
| 2981 | CR011685 | mA*mC*mA*CA*AA*U*ACC*A*GUCC*AGC*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2982 | CR011686 | mA*mC*mA*CAA*AU*A*CCA*GU*C*C*A*GCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2983 | CR011687 | mA*mC*mA*C*A*AA*U*AC*C*AG*UCCAG*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 2984 | CR011688 | mA*mC*mA*CAA*A*UACC*AG*U*C*C*AG*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 2985 | CR011689 | mA*mC*mA*C*A*AAUA*C*C*A*GUCCA*G*CG*GUUUUAGAGCUAUGCUGUUUUG |
| 2986 | CR011690 | mA*mC*mA*CA*A*AU*A*C*CAGU*C*C*AG*CG*GUUUUAGAGCUAUGCUGUUUUG |
| 2987 | CR011691 | mA*mC*mA*C*AAA*UA*CC*A*G*UC*CA*GC*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2988 | CR011692 | mA*mC*mA*C*A*AAUAC*C*A*G*U*CC*A*G*CGGUUUUAGAGCUAUGCUGUUUUG |
| 2989 | CR011693 | mA*mC*mA*CAA*A*U*AC*CA*G*UCC*A*G*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 2990 | CR011694 | mA*mC*mA*C*AA*AU*A*C*C*A*GUCC*A*G*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 2991 | CR011695 | mA*mC*mA*CA*A*A*U*ACC*AG*U*C*CA*G*CG*GUUUUAGAGCUAUGCUGUUUUG |
| 2992 | CR011696 | mA*mC*mA*C*A*AA*UA*C*CA*G*U*C*CAGC*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2993 | CR011697 | mA*mC*mA*CAA*AU*A*CCA*G*U*C*C*A*GC*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2994 | CR011698 | mA*mC*mA*CAAA*U*A*CC*A*G*UC*C*A*G*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2995 | CR011699 | mA*mC*mA*C*A*A*AUAC*CA*G*U*C*CA*G*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2996 | CR011700 | mA*mC*mA*C*A*A*AU*A*C*C*AGU*C*C*AGC*GGUUUUAGAGCUAUGCUGUUUUG |
| 2997 | CR011701 | mA*mC*mA*C*A*A*A*U*ACC*A*G*U*CC*A*GCG*GUUUUAGAGCUAUGCUGUUUUG |
| 2998 | CR011702 | mA*mC*mA*C*A*AU*ACC*A*GU*C*C*A*G*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 2999 | CR011703 | mA*mC*mA*CA*A*A*U*A*C*C*A*G*U*C*C*AGCG*GUUUUAGAGCUAUGCUGUUUUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 3000 | CR011704 | mA*mC*mA*C*A*A*A*U*A*C*CA*G*UC*CA*G*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 3001 | CR011705 | mA*mC*mA*C*AA*A*UA*C*C*AG*U*CC*A*G*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 3002 | CR011706 | mA*mC*mA*C*A*AA*U*AC*C*AG*U*C*C*A*G*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 3003 | CR011707 | mA*mC*mA*C*AA*AUA*C*C*A*G*U*C*C*A*G*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 3004 | CR011708 | mA*mC*mA*CA*A*A*U*A*C*C*CA*G*U*C*CA*G*C*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 3005 | CR011709 | mA*mC*mA*C*A*A*A*U*A*CC*C*A*GU*C*C*AG*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 3006 | CR011710 | mA*mC*mA*C*A*A*A*UA*C*C*C*A*G*U*C*C*A*GC*G*GUUUUAGAGCUAUGCUGUUUUG |
| 3007 | CR011711 | mA*mC*mA*CA*A*A*U*A*C*C*C*A*G*U*C*C*A*G*CG*GUUUUAGAGCUAUGCUGUUUUG |
| 3008 | CR011712 | mA*mC*mA*C*AA*A*U*A*C*C*C*A*G*UC*C*A*G*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 3009 | CR011713 | mA*mC*mA*C*A*A*A*U*A*CC*AG*U*C*C*A*G*C*G*GUUUUAGAGCUAUGCUGUUUUG |
| 3010 | CR011714 | ACACA*AAUACCAGUCCA*GCGGUUUUAGAGCUAUGCUGUUUUG |
| 3011 | CR011715 | ACACAAAU*ACCAG*U*CCAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 3012 | CR011716 | ACAC*AAA*UA*CCAGUCCAG*CGGUUUUAGAGCUAUGCUGUUUUG |
| 3013 | CR011717 | ACAC*AAAUACC*AGU*CC*AGCG*GUUUUAGAGCUAUGCUGUUUUG |
| 3014 | CR011718 | ACAC*AA*AU*A*CCA*GUC*CAGCGGUUUUAGAGCUAUGCUGUUUUG |
| 3015 | CR011719 | ACAC*AAAUAC*C*A*GUC*C*AGC*GGUUUUAGAGCUAUGCUGUUUUG |
| 3016 | CR011720 | ACACA*AA*UA*CC*AGU*CCA*G*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 3017 | CR011721 | ACACAA*A*UACC*AG*U*C*C*AG*C*GGUUUUAGAGCUAUGCUGUUUUG |
| 3018 | G014462 | mA*mC*mA*mCmAA*A*fU*fA*fC*fCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3019 | G014463 | mA*mC*mA*mCfAA*A*fU*fA*fC*fCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3020 | G014464 | mA*mC*mA*mCA*A*A*fU*fA*fC*fCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3021 | G014465 | mA*mC*mA*mCdAA*A*fU*fA*fC*fCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |

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|---|---|---|
| 3022 | G014466 | mA*mC*mA*mCAA*A*fU*fA*fC*fCmAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3023 | G014467 | mA*mC*mA*mCAA*A*fU*fA*fC*fCfAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3024 | G014468 | mA*mC*mA*mCAA*A*fU*fA*fC*fCA*fGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3025 | G014469 | mA*mC*mA*mCAA*A*fU*fA*fC*fCdAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3026 | G014470 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUmCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3027 | G014471 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUfCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3028 | G014472 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUC*C*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3029 | G014473 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUdCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3030 | G014474 | mA*mC*mA*mCAA*A*fUfA*fC*fCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGmC<br>mAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>GmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3031 | G014475 | mA*mC*mA*mCAA*A*fU*fAfC*fCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGmC<br>mAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>GmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 3032 | G014476 | mA*mC*mA*mCAA*A*fU*fA*fCfCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGmC<br>mAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>GmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3033 | G014477 | mA*mC*mA*mCAA*A*fU*fAfCfCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGmC<br>mAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>GmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3034 | G014478 | mA*mC*mA*mCAA*A*fU*fAfCfCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGmC<br>mAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>GmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3035 | G014479 | mA*mC*mA*mCAA*A*fUfA*fCfCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGmC<br>mAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>GmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3036 | G014480 | mA*mC*mA*mCAA*A*fUfAfCfCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGmCm<br>AmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmG<br>mUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3037 | G014481 | mA*mC*mA*mCAfAA*fU*fA*fC*fCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3038 | G014482 | mA*mC*mA*mCAA*fAfU*fA*fC*fCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3039 | G014483 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUCfCfAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3040 | G014484 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUCC*fAfGfCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3041 | G014485 | mA*mC*mA*mCAfAfAfU*fA*fC*fCAfGfUCC*fAfGfCGmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 3042 | G014486 | mA*mC*mA*mCAfAfAfU*fA*fC*fCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmC mAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAm GmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3043 | G014487 | mA*mC*mA*mCAfAA*fU*fA*fC*fCAfGfUCC*fAfGfCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm CmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3044 | G014488 | mA*mC*mA*mCAA*fAfU*fA*fC*fCAfGfUCC*fAfGfCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm CmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3045 | G014489 | mA*mC*mA*mCAfAfAfUfAfCfCAfGfUCfCfAfGfCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmA mAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAmGm UmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3046 | G014490 | mA*mC*mA*mCAfAfAfUfAfCfCAfGfUCfCfAfGfCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmA mAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAmGm UmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3047 | G014491 | fA*fC*fA*fCAfAfAfUfAfCfCAfGfUCfCfAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAG UfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAmGmUmG mGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3048 | G014492 | fA*fC*fA*fCAfAfAfUfAfCfCAfGfUCfCfAfGfCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmA GUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAmGmUmUm GmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3049 | G014493 | mA*mC*mA*mCAfAfAfUfAfCfCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmA mAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAmGm UmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3050 | G014494 | mA*mC*mA*mCAfAfAfUfAfCfCAfGfUCC*fAfGfCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm AmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAmG mUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3051 | G014495 | fA*fC*fA*fCAfAfAfUfAfCfCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAG UfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAmGmUmG mGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |

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|---|---|---|
| 3052 | G014496 | fA*fC*fA*fCAfAfAfUfAfCfCAfGfUCC*fAfGfCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmA GUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGmUm GmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3053 | G014497 | mA*mC*mA*fCfAfAfAfUfAfCfCfAfGfUCC*fAfGfCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm AmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAmG mUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3054 | G014498 | fA*fC*fA*fCfAfAfAfUfAfCfCfAfGfUCC*fAfGfCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAm AGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAmGmU mGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3055 | G014499 | mA*mC*mA*mCAA*A*fU*fAfC*fCAfGfUCC*fAfGfCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA mGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3056 | G014500 | mA*mC*mA*mCAA*A*U*mAC*mCAmGmUCC*AGCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3057 | G014501 | mA*mC*mA*mCAA*A*fUACfCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmA mAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGm UmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3058 | G014502 | mA*mC*mA*mCAA*A*fUAfCfCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmA mAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGm UmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3059 | G014503 | mA*mC*mA*mCAA*A*fUfACfCAfGfUCC*fAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmA mAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGm UmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3060 | G014504 | fA*fC*fA*fCfAfAfAfUfAfCfCfAfGfUfCfCfAfGfCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAm AGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGmU mGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3061 | G014505 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUmCmCfAfGmCmGmUUUfUAGmAmGmAmAmUmAmA mGmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAm AmAmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |

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|---|---|---|
| 3062 | G014506 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUfCfCfAfGCGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3063 | G014507 | mA*mC*mA*mCmAA*A*fU*fA*fC*fCAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm GmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3064 | G014508 | mA*mC*mA*mCfAA*A*fU*fA*fC*fCAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3065 | G014509 | mA*mC*mA*mCA*A*A*fU*fA*fC*fCAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3066 | G014510 | mA*mC*mA*mCdAA*A*fU*fA*fC*fCAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm GmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3067 | G014511 | mA*mC*mA*mCAA*A*fU*fA*fC*fCmAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm GmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3068 | G014512 | mA*mC*mA*mCAA*A*fU*fA*fC*fCfAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3069 | G014513 | mA*mC*mA*mCAA*A*fU*fA*fC*fCA*fGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3070 | G014514 | mA*mC*mA*mCAA*A*fU*fA*fC*fCdAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm GmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3071 | G014515 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUmCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm GmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |

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|---|---|---|
| 3072 | G014516 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUfCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3073 | G014517 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUC*C*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3074 | G014518 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUdCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm<br>GmCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3075 | G014519 | mA*mC*mA*mCAA*A*fU*fAfC*fCAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3076 | G014520 | mA*mC*mA*mCAA*A*fU*fAfC*fCAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3077 | G014521 | mA*mC*mA*mCAA*A*fU*fA*fCfCAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3078 | G014522 | mA*mC*mA*mCAA*A*fUfAfC*fCAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmC<br>mAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA<br>GmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3079 | G014523 | mA*mC*mA*mCAA*A*fU*fAfCfCAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmC<br>mAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA<br>GmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3080 | G014524 | mA*mC*mA*mCAA*A*fUfA*fCfCAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmC<br>mAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA<br>GmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3081 | G014525 | mA*mC*mA*mCAA*A*fUfAfCfCAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmC<br>mAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA<br>GmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |

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| 3082 | G014526 | mA*mC*mA*mCAfAA*fU*fA*fC*fCAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3083 | G014527 | mA*mC*mA*mCAA*fAfU*fA*fC*fCAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3084 | G014528 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUCfCfAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3085 | G014529 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUCC*fAfGfCAmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3086 | G014530 | mA*mC*mA*mCAfAfAfU*fA*fC*fCAfGfUCC*fAfGfCAmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3087 | G014531 | mA*mC*mA*mCAfAfAfU*fA*fC*fCAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 3088 | G014532 | mA*mC*mA*mCAfAA*fU*fA*fC*fCAfGfUCC*fAfGfCAmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 3089 | G014533 | mA*mC*mA*mCAA*fAfU*fA*fC*fCAfGfUCC*fAfGfCAmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 3090 | G014534 | mA*mC*mA*mCAfAfAfUfAfCfCAfGfUCfCfAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm<br>AmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmG<br>mUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3091 | G014535 | mA*mC*mA*mCAfAfAfUfAfCfCAfGfUCfCfAfGfCAmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmA<br>mAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGm<br>UmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |

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|---|---|---|
| 3092 | G014536 | fA*fC*fA*fCAfAfAfUfAfCfCAfGfUCfCfAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmA GUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGmUm GmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3093 | G014537 | fA*fC*fA*fCAfAfAfUfAfCfCAfGfUCfCfAfGfCAmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAG UfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGmUmG mGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3094 | G014538 | mA*mC*mA*mCAfAfAfUfAfCfCAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm AmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGmG mUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3095 | G014539 | mA*mC*mA*mCAfAfAfUfAfCfCAfGfUCC*fAfGfCAmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm AmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGmG mUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3096 | G014540 | fA*fC*fA*fCAfAfAfUfAfCfCAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmA GUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGmUm GmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3097 | G014541 | fA*fC*fA*fCAfAfAfUfAfCfCAfGfUCC*fAfGfCAmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmA GUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGmUm GmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3098 | G014542 | mA*mC*mA*fCfAfAfAfUfAfCfCfAfGfUCC*fAfGfCAmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm AmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGmG mUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3099 | G014543 | fA*fC*fA*fCfAfAfAfUfAfCfCfAfGfUCC*fAfGfCAmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAm AGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGmU mGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3100 | G014544 | mA*mC*mA*mCAA*A*fU*fAfC*fCAfGfUCC*fAfGfCAmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3101 | G014545 | mA*mC*mA*mCAA*A*U*mAC*mCAmGmUCC*AGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmG mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |

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|---|---|---|
| 3102 | G014546 | mA*mC*mA*mCAA*A*fUACfCAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm AmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmG mUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3103 | G014547 | mA*mC*mA*mCAA*A*fUAfCfCAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm AmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmG mUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3104 | G014548 | mA*mC*mA*mCAA*A*fUfACfCAfGfUCC*fAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm AmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmG mUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3105 | G014549 | fA*fC*fA*fCfAfAfAfUfAfCfCfAfGfCAmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAm AGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGmU mGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3106 | G014550 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUmCmCfAfGmCAmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmA mGmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAm AmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3107 | G014551 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUfCfCfAfGC*AmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3108 | G014554 | mU*mG*mU*mUmGG*A*fC*fU*fG*fGUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3109 | G014555 | mU*mG*mU*mUfGG*A*fC*fU*fG*fGUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3110 | G014556 | mU*mG*mU*mUG*G*A*fC*fU*fG*fGUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3111 | G014557 | mU*mG*mU*mUdGG*A*fC*fU*fG*fGUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |

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|---|---|---|
| 3112 | G014558 | mU*mG*mU*mUGG*A*fC*fU*fG*fGmUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAmGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3113 | G014559 | mU*mG*mU*mUGG*A*fC*fU*fG*fGfUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAmGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3114 | G014560 | mU*mG*mU*mUGG*A*fC*fU*fG*fGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAmGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3115 | G014561 | mU*mG*mU*mUGG*A*fC*fU*fG*fGdUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAmGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3116 | G014562 | mU*mG*mU*mUGG*A*fC*fU*fG*fGUfGfUmGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAmGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3117 | G014563 | mU*mG*mU*mUGG*A*fC*fU*fG*fGUfGfUfGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAmGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3118 | G014564 | mU*mG*mU*mUGG*A*fC*fU*fG*fGUfGfUG*CfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAmGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3119 | G014565 | mU*mG*mU*mUGG*A*fC*fU*fG*fGUfGfUdGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAmGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3120 | G014566 | mU*mG*mU*mUGG*A*fCfU*fG*fGUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAmGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3121 | G014567 | mU*mG*mU*mUGG*A*fC*fUfG*fGUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAmGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |

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|---|---|---|
| 3122 | G014568 | mU*mG*mU*mUGG*A*fC*fU*fGfGUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3123 | G014569 | mU*mG*mU*mUGG*A*fC*fUfGfGUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGmC<br>mAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>GmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3124 | G014570 | mU*mG*mU*mUGG*A*fC*fUfGfGUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGmC<br>mAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>GmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3125 | G014571 | mU*mG*mU*mUGG*A*fCfU*fGfGUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGmC<br>mAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>GmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3126 | G014572 | mU*mG*mU*mUGG*A*fCfUfGfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGmCm<br>AmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmG<br>mUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3127 | G014573 | mU*mG*mU*mUGfGA*fC*fU*fG*fGUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3128 | G014574 | mU*mG*mU*mUGG*fAfC*fU*fG*fGUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3129 | G014575 | mU*mG*mU*mUGG*A*fC*fU*fG*fGUfGfUGfCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3130 | G014576 | mU*mG*mU*mUGG*A*fC*fU*fG*fGUfGfUGCfCfAfGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3131 | G014577 | mU*mG*mU*mUGfGfAfC*fU*fG*fGUfGfUGCfCfAfGCmGUUUfUAGmAmGmCmUmAmGmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |

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|---|---|---|
| 3132 | G014578 | mU*mG*mU*mUGfGfAfC*fU*fG*fGUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3133 | G014579 | mU*mG*mU*mUGfGA*fC*fU*fG*fGUfGfUGCfCfAfGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3134 | G014580 | mU*mG*mU*mUGG*fAfC*fU*fG*fGUfGfUGCfCfAfGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3135 | G014581 | mU*mG*mU*mUGfGfAfCfUfGfGfUGfGfUGfCfCfAfGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm AmAGUfUmAfAmAfAmUAmAmGmGmCmUmAmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAmG mUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3136 | G014582 | mU*mG*mU*mUGfGfAfCfUfGfGfUGfGfUGfCfCfAfGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmC mAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAm GmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3137 | G014583 | fU*fG*fU*fUGfGfAfCfUfGfGfUGfGfUGfCfCfAfGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmA GUfUmAfAmAfAmUAmAmGmGmCmUmAmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAmGmUm GmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3138 | G014584 | fU*fG*fU*fUGfGfAfCfUfGfGfUGfGfUGfCfCfAfGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm AGUfUmAfAmAfAmUAmAmGmGmCmUmAmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAmGmU mGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3139 | G014585 | mU*mG*mU*mUGfGfAfCfUfGfGfUGfGfUGfCfCfAfGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm AmAGUfUmAfAmAfAmUAmAmGmGmCmUmAmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAmG mUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3140 | G014586 | mU*mG*mU*mUGfGfAfCfUfGfGfUGfGfUGfCfCfAfGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm AmAGUfUmAfAmAfAmUAmAmGmGmCmUmAmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAmG mUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3141 | G014587 | fU*fG*fU*fUGfGfAfCfUfGfGfUGfGfUGfCfCfAfGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmA GUfUmAfAmAfAmUAmAmGmGmCmUmAmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAmGmUm GmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |

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|---|---|---|
| 3142 | G014588 | fU*fG*fU*fUGfGfAfCfUfGfGfUfGfUGCfCfAfGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmA GUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGmUm GmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3143 | G014589 | mU*mG*mU*fUfGfGfAfCfUfGfGfUfGfUGCfCfAfGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm AmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAmG mUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3144 | G014590 | fU*fG*fU*fUfGfGfAfCfUfGfGfUfGfUGCfCfAfGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmAm AGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAmGmU mGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3145 | G014591 | mU*mG*mU*mUGG*A*fC*fUfG*fGUfGfUGCfCfAfGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA mGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3146 | G014592 | mU*mG*mU*mUGG*A*C*mUG*mGUmGmUGCCAGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3147 | G014593 | mU*mG*mU*mUGG*A*fCUGfGUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmA mAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGm UmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3148 | G014594 | mU*mG*mU*mUGG*A*fCUfGfUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm AmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmG mUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3149 | G014595 | mU*mG*mU*mUGG*A*fCfUGfGUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm AmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmG mUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3150 | G014596 | fU*fG*fU*fUfGfGfAfCfUfGfGfUfGfUfGfCfCfAfGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmA mAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGm UmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3151 | G014597 | mU*mG*mU*mUGG*A*fC*fU*fG*fGUfGfUmGmCfCfAmGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUm AmGmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA mAmAmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 3152 | G014598 | mU*mG*mU*mUGG*A*fC*fU*fG*fGUfGfUfGfCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm AmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3153 | G014644 | mA*mC*mA*mCmAA*A*fU*fA*fC*fCAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3154 | G014645 | mA*mC*mA*mCfAA*A*fU*fA*fC*fCAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3155 | G014646 | mA*mC*mA*mCA*A*A*fU*fA*fC*fCAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3156 | G014647 | mA*mC*mA*mCdAA*A*fU*fA*fC*fCAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3157 | G014648 | mA*mC*mA*mCAA*A*fU*fA*fC*fCmAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3158 | G014649 | mA*mC*mA*mCAA*A*fU*fA*fC*fCfAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3159 | G014650 | mA*mC*mA*mCAA*A*fU*fA*fC*fCA*fGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3160 | G014651 | mA*mC*mA*mCAA*A*fU*fA*fC*fCdAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3161 | G014652 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUmCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3162 | G014653 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUfCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3163 | G014654 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUC*C*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3164 | G014655 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUdCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3165 | G014656 | mA*mC*mA*mCAA*A*fUfA*fC*fCAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG UUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3166 | G014657 | mA*mC*mA*mCAA*A*fU*fAfC*fCAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG UUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 3167 | G014658 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG UUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3168 | G014659 | mA*mC*mA*mCAA*A*fU*fAfC*fCAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3169 | G014660 | mA*mC*mA*mCAA*A*fU*fAfCfCAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3170 | G014661 | mA*mC*mA*mCAA*A*fUfA*fCfCAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3171 | G014662 | mA*mC*mA*mCAA*A*fUfAfCfCAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3172 | G014663 | mA*mC*mA*mCAfAA*fU*fA*fC*fCAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3173 | G014664 | mA*mC*mA*mCAA*fAfU*fA*fC*fCAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3174 | G014665 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUCfCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3175 | G014666 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUCC*fAfGfCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3176 | G014667 | mA*mC*mA*mCAfAfAfU*fA*fC*fCAfGfUCC*fAfGfCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3177 | G014668 | mA*mC*mA*mCAfAfAfU*fA*fC*fCAfGfUCC*fAfGfCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG UUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3178 | G014669 | mA*mC*mA*mCAfAA*fU*fA*fC*fCAfGfUCC*fAfGfCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3179 | G014670 | mA*mC*mA*mCAA*fAfU*fA*fC*fCAfGfUCC*fAfGfCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3180 | G014671 | mA*mC*mA*mCAfAfAfUfAfCfCAfGfUCfCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU AAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3181 | G014672 | mA*mC*mA*mCAfAfAfUfAfCfCAfGfUCfCfAfGfCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU AAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |

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|---|---|---|
| 3182 | G014673 | fA*fC*fA*fCAfAfAfUfAfCfCAfGfUCfCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAA UAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3183 | G014674 | fA*fC*fA*fCAfAfAfUfAfCfCAfGfUCfCfAfGfCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAA AUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3184 | G014675 | mA*mC*mA*mCAfAfAfUfAfCfCAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU AAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3185 | G014676 | mA*mC*mA*mCAfAfAfUfAfCfCAfGfUCC*fAfGfCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU AAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3186 | G014677 | fA*fC*fA*fCAfAfAfUfAfCfCAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAA UAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3187 | G014678 | fA*fC*fA*fCAfAfAfUfAfCfCAfGfUCC*fAfGfCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAA AUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3188 | G014679 | mA*mC*mA*fCfAfAfAfUfAfCfCfAfGfUCC*fAfGfCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3189 | G014680 | fA*fC*fA*fCfAfAfAfUfAfCfCfAfGfUCC*fAfGfCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAA AAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3190 | G014681 | mA*mC*mA*mCAA*A*fU*fAfC*fCAfGfUCC*fAfGfCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3191 | G014682 | mA*mC*mA*mCAA*A*U*mAC*mCAmGmUCC*AGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3192 | G014683 | mA*mC*mA*mCAA*A*fUACfCAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU AAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3193 | G014684 | mA*mC*mA*mCAA*A*fUAfCfCAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU AAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3194 | G014685 | mA*mC*mA*mCAA*A*fUfACfCAfGfUCC*fAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU AAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3195 | G014686 | fA*fC*fA*fCfAfAfUfAfCfCfAfGfUCfCfAfGfCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAA AAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3196 | G014687 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUmCmCfAfGmCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGm CAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |

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|---|---|---|
| 3197 | G014688 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUfCfCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3198 | G014689 | mA*mC*mA*mCmAA*A*fU*fA*fC*fCAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3199 | G014690 | mA*mC*mA*mCfAA*A*fU*fA*fC*fCAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3200 | G014691 | mA*mC*mA*mCA*A*A*fU*fA*fC*fCAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3201 | G014692 | mA*mC*mA*mCdAA*A*fU*fA*fC*fCAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3202 | G014693 | mA*mC*mA*mCAA*A*fU*fA*fC*fCmAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3203 | G014694 | mA*mC*mA*mCAA*A*fU*fA*fC*fCfAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3204 | G014695 | mA*mC*mA*mCAA*A*fU*fA*fC*fCA*fGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3205 | G014696 | mA*mC*mA*mCAA*A*fU*fA*fC*fCdAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3206 | G014697 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUmCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3207 | G014698 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUfCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3208 | G014699 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUC*C*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3209 | G014700 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUdCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3210 | G014701 | mA*mC*mA*mCAA*A*fUfA*fC*fCAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3211 | G014702 | mA*mC*mA*mCAA*A*fU*fAfC*fCAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |

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|---|---|---|
| 3212 | G014703 | mA*mC*mA*mCAA*A*fU*fA*fCfCAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3213 | G014704 | mA*mC*mA*mCAA*A*fUfAfC*fCAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG UUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3214 | G014705 | mA*mC*mA*mCAA*A*fU*fAfCfCAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG UUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3215 | G014706 | mA*mC*mA*mCAA*A*fUfA*fCfCAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG UUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3216 | G014707 | mA*mC*mA*mCAA*A*fUfAfCfCAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3217 | G014708 | mA*mC*mA*mCAfAA*fU*fA*fC*fCAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3218 | G014709 | mA*mC*mA*mCAA*fAfU*fA*fC*fCAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3219 | G014710 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUCfCfAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3220 | G014711 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUCC*fAfGfCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3221 | G014712 | mA*mC*mA*mCAfAfAfU*fA*fC*fCAfGfUCC*fAfGfCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3222 | G014713 | mA*mC*mA*mCAfAfAfU*fA*fC*fCAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3223 | G014714 | mA*mC*mA*mCAfAA*fU*fA*fC*fCAfGfUCC*fAfGfCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3224 | G014715 | mA*mC*mA*mCAA*fAfU*fA*fC*fCAfGfUCC*fAfGfCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3225 | G014716 | mA*mC*mA*mCAfAfAfUfAfCfCAfGfUCfCfAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU AAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3226 | G014717 | mA*mC*mA*mCAfAfAfUfAfCfCAfGfUCfCfAfGfCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU AAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 3227 | G014718 | fA*fC*fA*fCAfAfAfUfAfCfCAfGfUCfCfAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAA AUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3228 | G014719 | fA*fC*fA*fCAfAfAfUfAfCfCAfGfUCfCfAfGfCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAA AUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3229 | G014720 | mA*mC*mA*mCAfAfAfUfAfCfCAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3230 | G014721 | mA*mC*mA*mCAfAfAfUfAfCfCAfGfUCC*fAfGfCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU AAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3231 | G014722 | fA*fC*fA*fCAfAfAfUfAfCfCAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAA AUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3232 | G014723 | fA*fC*fA*fCAfAfAfUfAfCfCAfGfUCC*fAfGfCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAA AUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3233 | G014724 | mA*mC*mA*fCfAfAfAfUfAfCfCfAfGfUCC*fAfGfCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3234 | G014725 | fA*fC*fA*fCfAfAfAfUfAfCfCfAfGfUCC*fAfGfCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAA AAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3235 | G014726 | mA*mC*mA*mCAA*A*fU*fAfC*fCAfGfUCC*fAfGfCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3236 | G014727 | mA*mC*mA*mCAA*A*U*mAC*mCAmGmUCC*AGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3237 | G014728 | mA*mC*mA*mCAA*A*fUAfCfCAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU AAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3238 | G014729 | mA*mC*mA*mCAA*A*fUAfCfCAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3239 | G014730 | mA*mC*mA*mCAA*A*fUfAfCfCAfGfUCC*fAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3240 | G014731 | fA*fC*fA*fCfAfAfUfAfCfCfAfGfUfCfCfAfGfCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAA AAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3241 | G014732 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUmCmCfAfGmCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGm CAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 3242 | G014733 | mA*mC*mA*mCAA*A*fU*fA*fC*fCAfGfUfCfCfAfGC*AGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA<br>AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3243 | G014734 | mU*mG*mU*mUmGG*A*fC*fU*fG*fGUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA<br>AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3244 | G014735 | mU*mG*mU*mUfGG*A*fC*fU*fG*fGUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA<br>AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3245 | G014736 | mU*mG*mU*mUG*G*A*fC*fU*fG*fGUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA<br>AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3246 | G014737 | mU*mG*mU*mUdGG*A*fC*fU*fG*fGUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA<br>AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3247 | G014738 | mU*mG*mU*mUGG*A*fC*fU*fG*fGmUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA<br>AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3248 | G014739 | mU*mG*mU*mUGG*A*fC*fU*fG*fGfUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA<br>AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3249 | G014740 | mU*mG*mU*mUGG*A*fC*fU*fG*fGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA<br>AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3250 | G014741 | mU*mG*mU*mUGG*A*fC*fU*fG*fGdUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA<br>AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3251 | G014742 | mU*mG*mU*mUGG*A*fC*fU*fG*fGUfGfUmGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA<br>AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3252 | G014743 | mU*mG*mU*mUGG*A*fC*fU*fG*fGUfGfUfGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA<br>AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3253 | G014744 | mU*mG*mU*mUGG*A*fC*fU*fG*fGUfGfUG*CfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA<br>AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3254 | G014745 | mU*mG*mU*mUGG*A*fC*fU*fG*fGUfGfUdGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA<br>AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3255 | G014746 | mU*mG*mU*mUGG*A*fCfU*fG*fGUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG<br>UUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3256 | G014747 | mU*mG*mU*mUGG*A*fC*fUfG*fGUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG<br>UUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |

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|---|---|---|
| 3257 | G014748 | mU*mG*mU*mUGG*A*fC*fU*fGfGUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG UUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3258 | G014749 | mU*mG*mU*mUGG*A*fCfUfG*fGUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG UUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3259 | G014750 | mU*mG*mU*mUGG*A*fC*fUfGfGUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG UUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3260 | G014751 | mU*mG*mU*mUGG*A*fCfU*fGfGUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG UUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3261 | G014752 | mU*mG*mU*mUGG*A*fCfUfGfGUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3262 | G014753 | mU*mG*mU*mUGfGA*fC*fU*fG*fGUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3263 | G014754 | mU*mG*mU*mUGG*fAfC*fU*fG*fGUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3264 | G014755 | mU*mG*mU*mUGG*A*fC*fU*fG*fGUfGfUGfCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3265 | G014756 | mU*mG*mU*mUGG*A*fC*fU*fG*fGUfGfUGCfCfAfGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3266 | G014757 | mU*mG*mU*mUGfGfAfC*fU*fG*fGUfGfUGCfCfAfGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3267 | G014758 | mU*mG*mU*mUGfGfAfC*fU*fG*fGUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3268 | G014759 | mU*mG*mU*mUGfGA*fC*fU*fG*fGUfGfUGCfCfAfGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3269 | G014760 | mU*mG*mU*mUGG*fAfC*fU*fG*fGUfGfUGCfCfAfGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3270 | G014761 | mU*mG*mU*mUGfGfAfCfUfGfGUfGfUGfCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3271 | G014762 | mU*mG*mU*mUGfGfAfCfUfGfGUfGfUGfCfCfAfGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |

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|---|---|---|
| 3272 | G014763 | fU*fG*fU*fUGfGfAfCfUfGfGfUfGfUGfCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAA AUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3273 | G014764 | fU*fG*fU*fUGfGfAfCfUfGfGfUfGfCfCfAfGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAA AAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3274 | G014765 | mU*mG*mU*mUGfGfAfCfUfGfGfUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU AAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3275 | G014766 | mU*mG*mU*mUGfGfAfCfUfGfGfUfGfUGCfCfAfGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3276 | G014767 | fU*fG*fU*fUGfGfAfCfUfGfGfUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAA AUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3277 | G014768 | fU*fG*fU*fUGfGfAfCfUfGfGfUfGfUGCfCfAfGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAA AUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3278 | G014769 | mU*mG*mU*fUfGfGfAfCfUfGfGfUfGfUGCfCfAfGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3279 | G014770 | fU*fG*fU*fUfGfGfAfCfUfGfGfUfGfUGCfCfAfGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAA AAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3280 | G014771 | mU*mG*mU*mUGG*A*fC*fUfG*fGUfGfUGCfCfAfGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3281 | G014772 | mU*mG*mU*mUGG*A*C*mUG*mGUmGmUGCCAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3282 | G014773 | mU*mG*mU*mUGG*A*fCUGfGUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU AAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3283 | G014774 | mU*mG*mU*mUGG*A*fCUfGfGUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU AAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3284 | G014775 | mU*mG*mU*mUGG*A*fCfUGfGUfGfUGCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU AAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3285 | G014776 | fU*fG*fU*fUfGfGfAfCfUfGfGfUfGfUGCfCfAfGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUA AAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3286 | G014777 | mU*mG*mU*mUGG*A*fC*fU*fG*fGUfGfUmGmCfCfAmGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmG mCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |

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|---|---|---|
| 3287 | G014778 | mU*mG*mU*mUGG*A*fC*fU*fG*fGUfGfUfGfCfCfAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3288 | G000407 | mA*mG*mC*CAGCUCCAGCUGACCACGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCmU*mU*mU*mU |
| 3289 | G000408 | mG*mC*mU*GAGGAACAGGCCAUUGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCmU*mU*mU*mU |
| 3290 | G000409 | mA*mC*mU*CACGAUGAAAUCCUGGAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCmU*mU*mU*mU |
| 3291 | G000412 | mG*mA*mU*CUGUUUCUUGGCCUCUUGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUA AGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |
| 3292 | G000413 | mG*mA*mA*GGCGAACUCAGCCAGGUGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCmU*mU*mU*mU |
| 3293 | G000414 | mC*mA*mA*CCUCACGGAGAUUCCGGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmG mUmGmCmU*mU*mU*mU |
| 3294 | G000415 | mU*mG*mU*UGGACUGGUGUGCCAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUA AGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGm GmUmGmCmU*mU*mU*mU |
| 3295 | G013954 | mA*mG*mC*mCAG*C*fU*fC*fC*fAGfCfUGAfCfCACmGUUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmC mAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAm GmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3296 | G013955 | mA*mC*mU*mCAC*G*fA*fU*fG*fAAfAfUCCfUfGGAmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 3297 | G013956 | mG*mA*mU*mCUG*U*fU*fU*fC*fUUfGfGCCfUfCUUmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmA mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 3298 | G013957 | mC*mA*mA*mCCU*C*fA*fC*fG*fGAfGfAUUfCfCGGmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm CmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmGmAmAmAmA mGmUmGmGmCmAmCmCmGmAmAmGmUmGmUmGmCmU*mU*mU*mU |
| 3299 | G013958 | mU*mG*mU*mUGG*A*fC*fU*fG*fGUfGfUGCfCfAGCmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm CmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmGmAmAmAmA mGmUmGmGmCmAmCmCmGmAmAmGmUmGmUmGmCmU*mU*mU*mU |
| 3300 | G013959 | mA*mG*mC*CAGCUCCAGCUGACCACGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAAGUUAAAAUAA GGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3301 | G013960 | mA*mC*mU*CACGAUGAAAUCCUGGAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAAGUUAAAAUAA GGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3302 | G013961 | mG*mA*mU*CUGUUUCUUGGCCUCUUGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAAGUUAAAAUA AGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3303 | G013962 | mC*mA*mA*CCUCACGGAGAUUUCCGGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAAGUUAAAAUAA GGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3304 | G013963 | mU*mG*mU*UGGACUGGUGUGCCAGCGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAAGUUAAAAUA AGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3305 | G012452 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGmCACCGAGUCGG*mU*mG*mC |
| 3306 | G012453 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAAGU UAAAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3307 | G012454 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAAGU UAAAAUAAGGCmUAGUCCGUUAUmCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3308 | G012455 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAAGU mUAAAAmUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3309 | G012456 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAAGU mUAAAAmUAAGGCmUAGUCCGUUAUmCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3310 | G012457 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAAGU mUAAAAmUAmAmGmGmCmUmAGUmCmCGUUAmUmCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3311 | G012458 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCmAAGU mUAAAAmUAAGGCmUAGUCCGUUAUmCAACUUGGmCACCGAGUCGG*mU*mG*mC |

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|---|---|---|
| 3312 | G012459 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGU UAAAAUAAGGCmUAGUCCGUUAUmCAACUUGGmCACCGAGUCGG*mU*mG*mC |
| 3313 | G012460 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGU mUAAAAAmUAAGGCmUAGUCCGUfUAUmCAACUUGGmCACCGAGUCGG*mU*mG*mC |
| 3314 | G012461 | mA*mC*mA*CAA*A*fU*fA*fC*fCAfGfUCCfAfGCGGUUUUfUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU mUAAAAAmUAAGGCmUAGUCCGUUAUmCAACUUGGmCACCGAGUCGG*mU*mG*mC |
| 3315 | G012728 | mU*mU*mA*CAG*C*fC*fA*fC*fGUfCfUACfAfGCAGUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGmCACCGAGUCGG*mU*mG*mC |
| 3316 | G012729 | mU*mU*mA*CAG*C*fC*fA*fC*fGUfCfUACfAfGCAGUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGU UAAAAUAmGmGmCmUmAGUmCmCGUUAmUmCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3317 | G012730 | mU*mU*mA*CAG*C*fC*fA*fC*fGUfCfUACfAfGCAGUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGU UAAAAUAAGGCmUAGUCCGUUAUmCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3318 | G012731 | mU*mU*mA*CAG*C*fC*fA*fC*fGUfCfUACfAfGCAGUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGU mUAAAAAmUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3319 | G012732 | mU*mU*mA*CAG*C*fC*fA*fC*fGUfCfUACfAfGCAGUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGU mUAAAAAmUAAGGCmUAGUCCGUUAUmCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3320 | G012733 | mU*mU*mA*CAG*C*fC*fA*fC*fGUfCfUACfAfGCAGUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGU mUAAAAAmUAmAmGmGmCmUmAGUmCmCGUUAmUmCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3321 | G012734 | mU*mU*mA*CAG*C*fC*fA*fC*fGUfCfUACfAfGCAGUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGU mUAAAAAmUAAGGCmUAGUCCGUUAUmCAACUUGGmCACCGAGUCGG*mU*mG*mC |
| 3322 | G012735 | mU*mU*mA*CAG*C*fC*fA*fC*fGUfCfUACfAfGCAGUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGU UAAAAUAAGGCmUAGUCCGUUAUmCAACUUGGmCACCGAGUCGG*mU*mG*mC |
| 3323 | G012736 | mU*mU*mA*CAG*C*fC*fA*fC*fGUfCfUACfAfGCAGUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGU mUAAAAAmUAAGGCmUAGUCCGUfUAUmCAACUUGGmCACCGAGUCGG*mU*mG*mC |
| 3324 | G012737 | mU*mU*mA*CAG*C*fC*fA*fC*fGUfCfUACfAfGCAGUUUfUAGAmGmCmUmAmGmAmAmUmAmGmCAAG UmUAAAAAmUAAGGCmUAGUCCGUUAUmCAACUUGGmCACCGAGUCGG*mU*mG*mC |
| 3325 | G012741 | mU*mU*mA*CAG*C*fC*fA*fC*fGUfCfUACfAfGCAGUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mC |
| 3326 | G012421 | mA*mC*mA*fCAAAfUACfCAGUCfCAGCGGUUUUAGAmGmCmUmAmGmAmAmUmAmGmCAAGUUAAAAU AAGGCUAGUCCGUUAUCAmAmCmUmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmG mGmUmGmCmU*mU*mU*mU |

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|---|---|---|
| 3327 | G012422 | mA*mC*mA*fCAAAfUACfCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmCmGmGmUmGmCmU*mU*mU*mU |
| 3328 | G012423 | mA*mC*AfCAAAfUACfCAGUCfCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmCmGmGmUmGmCmU*mU*mU*mU |
| 3329 | G012424 | mA*mC*AfCAAAfUACfCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmCmGmGmUmGmCmU*mU*mU*mU |
| 3330 | G012426 | mA*mC*mA*CAAAfUfAfCfCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmGmCmGmGmUmGmCmU*mU*mU*mU |
| 3331 | G012443 | mA*mC*mA*fCAAAfUACfCAGUCfCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3332 | G012448 | mA*mC*mA*mCAAAfUACfCAGUCCAGCGGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAmAmGmGmCmUmAGUmCmCGUUAmUmCAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3333 | G012973 | mA*mC*mA*mCmAmAmAmUmAmCfCfAfGfUfCfCfAfGfCmGmGfUfUfUfUfAmGmAmGmCmUmAmGmAmAmAmUmUmAmGmCmAmAmGfUfUmAfAmAmAfUmAmAmGmGfCfUmAfGfUfCmCfGfUfUmAmUmCmAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3334 | G012974 | mA*mC*mA*mCmAmAmAmUmAmCfCfAfGfUfCfCfAfGfCmGmGfUfUfUfUfAmGmAmGmCmUmAmGmAmAmAmUmUmAmGmCmAmAmGfUfUmAfAmAmAfUmAmAmGmGfCfUmAfGfUfCmCfGfUfUmAmUmCmAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3335 | G012975 | mA*mC*mA*mCmAmAmAmUmAmCfCfAfGfUfCfCfAfGfCmGmGfUfUfUfUfAmGmAmGmCmUmAmGmAmAmAmUmUmAmGmCmAmAmGmGmGCUmAGUCmCGUUmAmUmCmAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3336 | G012976 | mA*mC*mA*mCmAmAmAmUmAmCfCfAfGfUfC*C*fAfGC*mGmGU*U*U*fUfAmGmAmGmCmUmAmGmAmAmAmUmAmGmCmAmAmGfUfUmAfAmAmAfUmAmAmGmGfCfUmAfGfUfCmCfGfUfUmAmUmCmAmAmCmUmUmGmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmUmCmGmGmUmGmCmU*mU*mU*mU |

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|---|---|---|
| 3337 | G012977 | mA*mC*mA*mCmAmAmAmUmAmCfCfAfGfUC*C*fAfGC*mGmGU*U*U*fUfAmGmAmGmCmUmAmGmAmA mAmUmAmAmGmCmAmAmGU*U*mAA*mAmAU*mAmAmGmGC*U*mAG*U*C*mCG*U*U*mAmUmCmCmAmAm CmUmUmGmAmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 3338 | G012978 | mA*mC*mA*mCmAmAmAmUmAmCfCfAfGfUC*C*fAfGC*mGmGU*U*U*fUfAmGmAmGmCmUmAmGmAmA mAmUmAmAmGmCmAmAmGUUmAAmAmAUmAmAmGmGCUmAGUCmCGUUmAmUmCmAmAmCmUmUmGm AmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 3339 | G012979 | mA*mC*mA*mCmAmAmAmUmAmCfCfAfGfUC*C*fAfGC*mGmGU*U*U*mUmAmGmAmGmCmUmAmGmAm AmAmUmAmAmGmCmAmAmGU*U*mAA*mAmAU*mAmAmGmGC*U*mAG*U*C*mCG*U*U*mAmUmCmCmAmA mCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*m U |
| 3340 | G011771 | mU*mU*mA*CAGCCACGUCUACAGCAGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAAAAUAA GGCUAGUCCGUUAUCAACUUGGCACCGAGUCGGmUmGmC |
| 3341 | CR012980 | mA*mC*mA*mCmAmAmAmUmAmCfCfAfGfUfCfCfAfGfCmGmGfUfUfUfUfAmGmAmGmCmUmAmU*mG*mC* mU |
| 3342 | TR012982 | mA*mG*mC*mAmUmAmGmCmAmAmGfUfUmAfAmAmAfUmAmAmGmGfCfUmAfGfUfCmCfGfUfUmAmUmC mAmAmCmUmUmGmAmAmAmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmC*mU*mU* mU |
| 3343 | N20-G014462 | mN*mN*mN*mNmNN*N*fN*fN*fNNfNfNNNfNfNNmGUUUfUAGmAmGmCmUmAmGmAmAmUmA mGmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAm AmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 3344 | N20-G014463 | mN*mN*mN*mNfNN*N*fN*fN*fNNfNfNNNfNfNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm GmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAm mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 3345 | N20-G014464 | mN*mN*mN*mNN*N*N*fN*fN*fNNfNfNNNfNfNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm GmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAm mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 3346 | N20-G014465 | mN*mN*mN*mNdNN*N*fN*fN*fNNfNfNNNfNfNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm GmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAm mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |
| 3347 | N20-G014466 | mN*mN*mN*mNNN*N*fN*fN*fNmNfNfNNNfNfNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmA mGmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAm AmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU |

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|---|---|---|
| 3348 | N20-G014467 | mN*mN*mN*mNNN*N*fN*fN*fNfNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm<br>GmCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3349 | N20-G014468 | mN*mN*mN*mNNN*N*fN*fN*fN*fNfNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm<br>GmCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3350 | N20-G014469 | mN*mN*mN*mNNN*N*fN*fN*fNdNfNfNNNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm<br>GmCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3351 | N20-G014470 | mN*mN*mN*mNNN*N*fN*fN*fNfNfNfNNNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmA<br>mGmCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>AmAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3352 | N20-G014471 | mN*mN*mN*mNNN*N*fN*fN*fNfNfNfNNNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm<br>GmCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3353 | N20-G014472 | mN*mN*mN*mNNN*N*fN*fN*fN*fNNfNfNN*NfNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm<br>GmCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3354 | N20-G014473 | mN*mN*mN*mNNN*N*fN*fN*fN*fNNfNfNdNNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm<br>GmCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3355 | N20-G014474 | mN*mN*mN*mNNN*N*fNfN*fN*fNfNfNfNNNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3356 | N20-G014475 | mN*mN*mN*mNNN*N*fN*fN*fNfNfNfNNNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3357 | N20-G014476 | mN*mN*mN*mNNN*N*fN*fN*fNfNfNfNNNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |

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|---|---|---|
| 3358 | N20-G014477 | mN*mN*mN*mNNN*N*fNNfNfNNNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3359 | N20-G014478 | mN*mN*mN*mNNN*N*fN*fNfNfNNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3360 | N20-G014479 | mN*mN*mN*mNNN*N*fNfN*fNfNNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGm<br>CmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3361 | N20-G014480 | mN*mN*mN*mNNN*N*fNfNfNNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmC<br>mAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>GmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3362 | N20-G014481 | mN*mN*mN*mNNfNN*fN*fN*fNNfNfNNNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3363 | N20-G014482 | mN*mN*mN*mNNN*fNfN*fN*fN*fNNfNfNNNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3364 | N20-G014483 | mN*mN*mN*mNNN*N*fN*fN*fN*fNNfNfNNNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm<br>GmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3365 | N20-G014484 | mN*mN*mN*mNNN*N*fN*fN*fN*fNNfNfNNNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm<br>GmCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3366 | N20-G014485 | mN*mN*mN*mNNfNfNfN*fN*fN*fNNfNfNNNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3367 | N20-G014486 | mN*mN*mN*mNNfNfNfN*fN*fN*fNNfNfNNNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 3368 | N20-G014487 | mN*mN*mN*mNNfNN*fN*fN*fNNfNfNfNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm GmCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3369 | N20-G014488 | mN*mN*mN*mNNN*fNfN*fN*fN*fNNfNfNfNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm GmCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA mAmGmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3370 | N20-G014489 | mN*mN*mN*mNNfNfNfNfNNfNfNfNNmGUUUfUAGmAmGmCmUmAmGmAmGmC mAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm GmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3371 | N20-G014490 | mN*mN*mN*mNNfNfNfNfNNfNfNfNNmGUUUfUAGmAmGmCmUmAmGmAmGmC mAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm GmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3372 | N20-G014491 | fN*fN*fN*fNNfNfNfNfNNfNfNfNNmGUUUfUAGmAmGmCmUmAmGmAmGmCmAm AGUfUmAfAmAfAmUAmAmAmGmGmCmUmAmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmGmU mGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3373 | N20-G014492 | fN*fN*fN*fNNfNfNfNfNNfNfNfNNmGUUUfUAGmAmGmCmUmAmGmAmGmCmAm mAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmGm UmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3374 | N20-G014493 | mN*mN*mN*mNNfNfNfNfNNfNfNfNNmGUUUfUAGmAmGmCmUmAmGmAmGmC mAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm GmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3375 | N20-G014494 | mN*mN*mN*mNNfNfNfNfNNfNfNfNNmGUUUfUAGmAmGmCmUmAmGmAmGmCmAm mAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmGm GmUmGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3376 | N20-G014495 | fN*fN*fN*fNNfNfNfNfNNfNfNfNNmGUUUfUAGmAmGmCmUmAmGmAmGmCmAm AGUfUmAfAmAfAmUAmAmAmGmGmCmUmAmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmGmU mGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |
| 3377 | N20-G014496 | fN*fN*fN*fNNfNfNfNfNNfNfNfNNmGUUUfUAGmAmGmCmUmAmGmAmGmCmAm AGUfUmAfAmAfAmUAmAmAmGmGmCmUmAmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmGmU mGmGmCmAmCmCmGmAmGmUmCmGmGmUmGmGmCmU*mU*mU*mU |

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| 3378 | N20-G014497 | mN*mN*mN*fNfNfNfNfNfNfNfNfNfNNNfNfNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmC<br>mAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmAm<br>GmUmGmGmCmAmCmCmGmAmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3379 | N20-G014498 | fN*fN*fN*fNfNfNfNfNfNfNfNfNfNNNfNfNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCmA<br>mAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmGm<br>UmGmGmCmAmCmCmGmAmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3380 | N20-G014499 | mN*mN*mN*mNNN*N*fN*fNfN*fNNfNfNfNfNfNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmG<br>mCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>AmGmUmGmGmCmAmCmCmGmAmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3381 | N20-G014500 | mN*mN*mN*mNNN*N*N*mNN*mNNmNmNNNNNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm<br>GmCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mAmGmUmGmGmCmAmCmCmGmAmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3382 | N20-G014501 | mN*mN*mN*mNNN*N*fNNNfNNfNfNNNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm<br>AmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmG<br>mUmGmGmCmAmCmCmGmAmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3383 | N20-G014502 | mN*mN*mN*mNNN*N*fNNfNfNNfNfNNNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmC<br>mAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>GmUmGmGmCmAmCmCmGmAmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3384 | N20-G014503 | mN*mN*mN*mNNN*N*fNfNNfNfNfNfNfNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmC<br>mAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAm<br>GmUmGmGmCmAmCmCmGmAmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3385 | N20-G014504 | fN*fN*fN*fNfNfNfNfNfNfNfNfNfNfNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAmGmCm<br>AmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmAmG<br>mUmGmGmCmAmCmCmGmAmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3386 | N20-G014505 | mN*mN*mN*mNNN*N*fN*fN*fN*fNNfNfNmNmNfNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm<br>mAmGmCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAm<br>AmAmAmGmUmGmGmCmAmCmCmGmAmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3387 | N20-G014506 | mN*mN*mN*mNNN*N*fN*fN*fN*fNNfNfNfNfNfNfNNNmGUUUfUAGmAmGmCmUmAmGmAmAmAmUmAm<br>GmCmAmAGUfUmAfAmAfAmUAmAmAmGmGmCmUmAGUmCmCGUfUAmUmCAmAmCmUmUmGmAmAmAmA<br>mAmGmUmGmGmCmAmCmCmGmAmAmGmUmCmGmGmUmGmCmU*mU*mU*mU |
| 3388 | N20-G014644 | mN*mN*mN*mNmNN*N*fN*fN*fNNfNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGm<br>CAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |

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|---|---|---|
| 3389 | N20-G014645 | mN*mN*mN*mNfNN*N*fN*fN*fN*fNNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3390 | N20-G014646 | mN*mN*mN*mNNN*N*N*fN*fN*fNNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3391 | N20-G014647 | mN*mN*mN*mNdNN*N*fN*fN*fN*fNNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3392 | N20-G014648 | mN*mN*mN*mNNN*N*fN*fN*fNmNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGm CAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3393 | N20-G014649 | mN*mN*mN*mNNN*N*fN*fN*fNfNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3394 | N20-G014650 | mN*mN*mN*mNNN*N*fN*fN*fNN*fNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3395 | N20-G014651 | mN*mN*mN*mNNN*N*fN*fN*fN*fNdNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3396 | N20-G014652 | mN*mN*mN*mNNN*N*fN*fN*fN*fNNfNfNmNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGm CAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3397 | N20-G014653 | mN*mN*mN*mNNN*N*fN*fN*fNNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3398 | N20-G014654 | mN*mN*mN*mNNN*N*fN*fN*fNNfNfNN*NfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3399 | N20-G014655 | mN*mN*mN*mNNN*N*fN*fN*fN*fNNfNfNdNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3400 | N20-G014656 | mN*mN*mN*mNNN*N*fNfN*fN*fNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3401 | N20-G014657 | mN*mN*mN*mNNN*N*fN*fNfN*fNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3402 | N20-G014658 | mN*mN*mN*mNNN*N*fN*fN*fNfNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3403 | N20-G014659 | mN*mN*mN*mNNN*N*fNfNfN*fNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |

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| 3404 | N20-G014660 | mN*mN*mN*mNNN*N*fN*fNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3405 | N20-G014661 | mN*mN*mN*mNNN*N*fNfN*fNfNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAA GUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3406 | N20-G014662 | mN*mN*mN*mNNN*N*fNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG UUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3407 | N20-G014663 | mN*mN*mN*mNNfNfNN*fN*fN*fNNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3408 | N20-G014664 | mN*mN*mN*mNNN*fNfN*fN*fN*fNNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3409 | N20-G014665 | mN*mN*mN*mNNN*N*fN*fN*fN*fNNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3410 | N20-G014666 | mN*mN*mN*mNNN*N*fN*fN*fN*fNNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3411 | N20-G014667 | mN*mN*mN*mNNfNfNfN*fN*fN*fNNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3412 | N20-G014668 | mN*mN*mN*mNNfNfNfN*fN*fN*fNNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3413 | N20-G014669 | mN*mN*mN*mNNfNN*fN*fN*fN*fNNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3414 | N20-G014670 | mN*mN*mN*mNNN*fNfN*fN*fN*fNNfNfNNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3415 | N20-G014671 | mN*mN*mN*mNNfNfNfNfNfNNNfNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG UUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3416 | N20-G014672 | mN*mN*mN*mNNfNfNfNfNfNNNfNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG UUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3417 | N20-G014673 | fN*fN*fN*fNNfNfNfNfNfNNNfNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUA AAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3418 | N20-G014674 | fN*fN*fN*fNNfNfNfNfNfNNNfNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUA AAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |

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|---|---|---|
| 3419 | N20-G014675 | mN*mN*mN*mNNfNfNfNfNfNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3420 | N20-G014676 | mN*mN*mN*mNNfNfNfNfNfNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG UUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3421 | N20-G014677 | fN*fN*fN*fNNfNfNfNfNfNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUAA AAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3422 | N20-G014678 | fN*fN*fN*fNNfNfNfNfNfNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUUA AAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3423 | N20-G014679 | mN*mN*mN*fNfNfNfNfNfNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAG UUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3424 | N20-G014680 | fN*fN*fN*fNfNfNfNfNfNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGUU AAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3425 | N20-G014681 | mN*mN*mN*mNNN*N*fN*fNfNfNNNfNfNfNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCA AGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3426 | N20-G014682 | mN*mN*mN*mNNN*N*fN*mNNmNmNNNNNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3427 | N20-G014683 | mN*mN*mN*mNNN*N*fNNNfNfNfNNNfNfNfNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3428 | N20-G014684 | mN*mN*mN*mNNN*N*fNNfNfNfNfNfNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3429 | N20-G014685 | mN*mN*mN*mNNN*N*fNfNfNfNfNfNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3430 | N20-G014686 | fN*fN*fN*fNfNfNfNfNfNNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmCAAGU UAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3431 | N20-G014687 | mN*mN*mN*mNNN*N*fN*fN*fN*fNNfNfNfNmNmNfNfNmNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAm GmCAAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3432 | N20-G014688 | mN*mN*mN*mNNN*N*fN*fN*fN*fNNfNfNfNfNfNNNGUUUUAGAmGmCmUmAmGmAmAmAmUmAmGmC AAGUUAAAAUAAGGCUAGUCCGUUAUCAACUUGGCACCGAGUCGG*mU*mG*mCmU |
| 3433-3498 | | Not Used |
| 3499 | Cas9 mRNA sequence | GGGUCCCGCAGUCGGCGUCCAGCGGCUCUGCUUGUUCGUGUGUGUCGUUGCAGGCCUUAUUCGGAUCCGCCA CCAUGGACAAGAAGUACAGCAUCGGACUGGACAUCGGAACAAACAGCGUCGGAUGGGCAGUCAUCACAGACGAAUA |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| | | CAAGGUCCCGAGCAAGAAGUUCAAGGUCCUGGGAAACACAGACAGCACAUCAAGAAGAACCUGAUCGGAGCA |
| | | CUGCUGUUCGACAGCGGAGAAACAGCAGAAGCAACAAGACUGAAGAGAACAGCAAGAAGAAGAUACACAAGAAGAA |
| | | AGAACAGAAUCUGCUACCUGCAGGAAAUCUUCAGCAACGAAAUGGCAAAGGUCGACGACAGCUUCUUCCACAGACU |
| | | GGAAGAAAGCUUCCUGGUCGAAGAAGACAAGAAGCACGAAAGACACCCGAUCUUCGGAAACAUCGUCGACGAAGUC |
| | | GCAUACCACGAAAAGUACCCGACAAUCUACCACCUGAGAAAGAAGCUGGUCGACAGCACAGACAAGGCAGACCUGA |
| | | GACUGAUCUACCUGGCACUGGCACACAUGAUCAAGUUCAGAGGACACUUCCUGAUCGAAGGAGACCUGAACCCGGA |
| | | CAACAGCGACGUCGACAAGCUGUUCAUCCAGCUGGUCCAGACAUACAACCAGCUGUUCGAAGAAAACCCGAUCAAC |
| | | GCAAGCGGAGUCGACGCAAAGGCAAUCCUGAGCGCAAGACUGAGCAAGAGCAGAAGACUGGGAAAACCUGAUCGCAC |
| | | AGCUGCCGGGAGAAAAGAAGAACGGACUGUUCGGAAACCUGAUCGCACUGAGCCUGGGACUGACACCGAACUUCA |
| | | AGAGCAACUUCGACCUGGCAGAAGACGCAAAGCUGCAGCUGAGCAAGGACACAUACGACGACGACCUGGACAACCU |
| | | GCUGGCACAGAUCGGAGACCAGUACGCAGACCUGUUCCUGGCAGCAAAGAACCUGAGCGACGCAAUCCUGCUGAGC |
| | | GACAUCCUGAGAGUCAACACACAGAAAUCACAAAGGCACCGCUGAGCGCAAGCAUGAUCAAGAGAUACGACGAACACC |
| | | ACCAGGACCUGACACUGCUGAAGGCACUGGUCAGACAGCAGCUGCCGGAAAAGUACAAGGAAAUCUUCGACCA |
| | | GAGCAAGAACGGAUACGCAGGAGGAGCAAGCCAGGAAGAAUUCUACAAGUUCAUCAAGCCGAU |
| | | CCUGGAAAAGAUGGACGGAACAGAAGAACUGCUGGUCAAGCUGAACAGAGAAGACCUGCUGAGAAAGCAGAGAAC |
| | | AUUCGACAACGGAAGCAUCCCGCACCAGAUCCACCUGGGAGAACUGCACGCAAUCCUGAGAAGACAGGAAGACUUC |
| | | UACCCGUUCCUGAAGGACAACAGAGAAAAGAUCGAAAAGAUCCUGACAUUCAGAAUCCCGUACUACGUCGGACCGC |
| | | UGGCAAGAGGAAACAGCAGAUUCGCAUGGAUGACAAGAAAGAGCGAAGAAACAAUCACACCGUGGAACUUCGAAG |
| | | AAGUCGUCGACAAGGGAGCAAGCGCACAGAGCUUCAUCGAAAGAAUGACAAACUUCGACAAGAACCUGCCGAACGA |
| | | AAAGGUCCUGCCGAAGCACAGCCUGCUGUACGAAUACUUCACAGUCUACAACGAACUGACAAAGGUCAAGUACGUC |
| | | ACAGAAGGAAUGAGAAAGCCGGCAUUCCUGAGCGGAGAACAGAAGAAGGCAAUCGUCGACCUGCUGUUCAAGACA |
| | | AACAGAAAGGUCACAGUCAAGCAGCUGAAGGAAGACUACUUCAAGAAGAUCGAAUGCUUCGACAGCGUCGAAAUC |
| | | AGCGGAGUCGAAGACAGAUUCAACGCAAGCCUGGGAACAUACCACGACCUGCUGAAGAUCAUCAAGGACAAGGACU |
| | | UCCUGGACAACGAAGAAAACGAAGACAUCCUGGAAGACAUCGUCCUGACACUGACCUGUUCGAAGACAGAGAAAU |
| | | GAUCGAAGAAAGACUGAAGACAUACGCACACCUGUUCGACGACAAGGUCAUGAAGCAGCUGAAGAGAAGAAGAUA |
| | | CACAGGAUGGGGAAGACUGAGCAGAAAGCUGAUCAACGGAAUCAGAGACAAGCAGAGCGGAAAGACAAUCCUGGA |
| | | CUUCCUGAAGAGCGACGGAUUCGCAAACAGAAACUUCAUGCAGCUGAUCCACGACGACAGCCUGACAUUCAAGGAA |
| | | GACAUCCAGAAGGCACAGGUCAGCGGAGACAGGGAGACAGCCUGCACGAACACAUCGCAAACCUGGCAGGAAGCCCGG |
| | | CAAUCAAGAAGGGAAUCCUGCAGACAGUCAAGGUCGUCGACGAACUGGUCAAGGUCAUGGGAAGACACAAGCCGG |
| | | AAAACAUCGUCAUCGAAAUGGCAAGAGAAACCAGACAACACAGAAGGGACAGAAGAACAGCAGAGAAAGAAUGAA |
| | | GAGAAUCGAAGAAGGAAUCAAGGAACUGGGAAGCCAGAUCCUGAAGGAACACCCGGUCGAAAACACACAGCUGCAG |
| | | AACGAAAAGCUGUACCUGUACUACCUGCAGAACGGAAGAGACAUGUACGUCGACCAGGAACUGGACAUCAACAGAC |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| | | UGAGCGACUACGACGUCGACCACAUCGUCCCGCAGAGCUUCCUGAAGGACGACAGCAUCGACAACAAGGUCCUGAC |
| | | AAGAAGCGACAAGAACAGAGGAAAGAGCGACAACGUCCCGAGCGAAGAAGUCGUCAAGAAGAUGAAGAACUACUG |
| | | GAGACAGCUGCUGAACGCAAAGCUGAUCACACAGAGAAAGUUCGACAACCUGACAAAGGCAGAGAGAGGAGGACU |
| | | GAGCGAACUGGACAAGGCAGGAUUUCAUCAAGAGACAGCUGGUCGAAACAAGACAGAUCACACAAAGCACGUCGCACAG |
| | | AUCCUGGACAGCAGAAUGAACACAAAGUACGACGAAAACGACAAGCUGAUCAGAGAAGUCAAGGUCACUCACACUGA |
| | | AGAGCAAGCUGGUCAGCGACUUCAGAAAGGACUUCCAGUUCUACAAGGUCAGAGAAAUCAACAACUACCACCACGC |
| | | ACACGACGCAUACCUGAACGCAGUCGUCGGAACACAGCACUGAUCAAGAAGUACCCGAAGCUGGAAAGCGAAUUCGUC |
| | | UACGGAGACUACAAGGUCUACGACGUCAGAAAGAUGAUCGCAAAGAGCGAACAGGAAAUCGGAAAGGCAACAGCAA |
| | | AGUACUUCUUCUACAGCAACAUCAUGAACUUCUUCAAGACAGAAAUCACACUGGCAAACGGAGAAAUCAGAAAGAG |
| | | ACCGCUGAUCGAAACAAACGGAGAAACAGGAGAAAUCGUCUGGGACAAGGGAAGAGACUUCGCAACAGUCAGAAA |
| | | GGUCCUGAGCAUGCCGCAGGUCAACAUCGUCAAGAAGACAGAAGUCCAGACAGGAGGAUUCAGCAAGGAAAGCAU |
| | | CCUGCCGAAGAGAAACAGCGACAAGCUGAUCGCAAGAAAGAAGGACUGGGACCCGAAGAAGUACGGAGGAUUUCGAC |
| | | AGCCCGACAGUCGCAUACAGCGUCCUGGUCGUCGCAAAGGUCGAAAAGGGAAAGAGCAAGAAGCUGAAGAGCGUC |
| | | AAGGAACUGCUGGGGAAUCACACAAUCAUGGAAAGAAGCAGCUUCGAAAAGAACCCGAUCGACUUCCUGGAAGCAAAG |
| | | GGAUACAAGGAAGUCAAGAAGGACCUGAUCAUCAAGCUGCCGAAGUACAGCCUGUUCGAACUGGAAAACGGAAGA |
| | | AAGAGAAUGCUGGCAAGCGCAGGAGAACUGCAGAAGGGAAACGAACUGGCACUGCCGAGCAAGUACGUCAACUUC |
| | | CUGUACCUGGCAAGCCACUACGAAAAGCUGAAGGGAAGCCCGGAAGACAACGAACAGAAGCAGCUGUUCGUCGAAC |
| | | AGCACAAGCACUACCUGGACGAAAUCAUCGAACAGAUCAGCGAAUUCAGCAAGAGAGUCAUCCUGGCAGACGCAAA |
| | | CCUGGACAAGGUCCUGAGCGCAUACAACAAGCACAGAGACAAGCCGAUCAGAGAACAGGCAGAAAACAUCAUCCACC |
| | | UGUUCACACUGACAAACCUGGGAGCACCGGCAGCAUUCAAGUACUUCGACACAACAAUCGACAGAAAGAGAUACAC |
| | | AAGCACAAAGGAAGUCCUGGACGCAACACUGAUCCACCAGAGCAUCACAGGACUGUACGAAACAAGAAUCGACCUG |
| | | AGCCAGCUGGGAGGAGGACGGAGGAGGAAGCCCGAAGAAGAGAAAGGUCUAGCUAGCCAUCACAUUUAAAAGC |
| | | AUCUCAGCCUACCAUGAGAAUAAGAGAAAGAAAUGAAGAUCAAUAGCUUAUUUCAUCUCUUUUUCUUUUUCGUU |
| | | GGUGUAAAGCCAACACCCUGUCUAAAAAACAUAAAUUUCUUUAAUCAUUUUGCCUCUUUUUCUCUGUGCUUCAAUU |
| | | AAUAAAAAAUGGAAAGAACCUCGAGAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA |
| | | AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA |
| 3500 | Cas9 mRNA sequence | GGGUCCCGCAGUCGGCGUCCAGCGGCUCUGCUUGUUCGUGUGUGUCGUUGCAGGCCUUAUUCGGAUCCAUGG |
| | | AUAAGAAGUACUCAAUCGGGCUGGAUAUCGGAACUAAUUCCGUGGGUUGGGCAGUGAUCACGGAUGAAUACAAA |
| | | GUGCCGUCCAAGAAGUUCAAGGUCCUGGGGAACACCGAUAGACACAGCAUCAAGAAAAAUCUCAUCGGAGCCCUGC |
| | | UGUUUGACUCCGGCGAAACCGCAGAAGCGACCCGGCUCAAACGUACCGCGAGGCGACGCUACACCCGGCGGAAGAA |
| | | UCGCAUCUGCUAUCUGCAAGAGAUCUUUUUCGAACGAAAUGGCAAAGGUCGACGACAGCUUCUUCCACCGCCUGGA |
| | | AGAAUCUUUCCUGGUGGAGGACAAGAAGCAUGAACGGCAUCCUAUCUUUGGGAAACAUCGUCGACGAAGUGGC |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| | | GUACCACGAAAAGUACCCGACCAUCUACCAUCUGCGGAAGAAGUUGGUUGACUCAACUGACAAGGCCGACCUCAGA |
| | | UUGAUCUACUUGGCCCUCGCCCAUAUGAUCAAAUUCCGCGGACACUUCCUGAUCGAAGGCGAUCUGAACCCUGAU |
| | | AACUCCGACGUGGAUAAGCUUUUCAUUCAACUGGUGCAGACCUACAACCAACUGUUCGAAGAAAACCCAAUCAAUG |
| | | CUAGCGGCGUCGAUGCCAAGGCCAUCCUGUCCGCCCGGCUGUCGAAGUCGCGGCGCCUCGAAAACCUGAUCGCACA |
| | | GCUGCCGGGAGAGAAAAAGAACGGACUUUUUCGGCAACUUGAUCGCUCUCUCACUGGGACUCACUCCCAAUUUCAA |
| | | GUCCAAUUUUUGACCUGGCCGAGGACGCGAAGCUGCAACUCUCAAAGGACACCUACGACGACGACUUGGACAAUUU |
| | | GCUGGCACAAAUUGGCGAUCAGUACGCGGAUCUGUUCCUUGCCGCUAAGAACCUUUCGGACGCAAUCUUGCUGUC |
| | | CGAUAUCCUGCGCGUGAACACCGAAAUAACCAAAGCGCCGCUUAGCGCCUCGAUGAUUAAGCGGUACGACGAGCAU |
| | | CACCAGGAUCUCACGCUGCUCAAAGCGCUCGUGAGACAGCAACUGCCUGAAAAGUACAAGGAGAUCUUCUUCGACC |
| | | AGUCCAAGAAUGGGUACGCAGGGUACAUCGAUGGAGGCGCUAGCCAGGAAGAGUUCUAUAAGUUCAUCAAGCCAA |
| | | UCCUGGAAAAGAUGGACGGAACCGAAGAACUGCUGGUCAAGCUGAACAGGGAGGAUCUGCUCCGGAAACAGAGAA |
| | | CCUUUGACAACGGAUCCAUUCCCCACCAGAUCCAUCUGGGUGAGCUGCACGCCAUCUUGCGGCGCCAGGGAGGACUU |
| | | UUACCCAUUCCUCAAGGACAACCGGGAAAAGAUCGAGAAAAUUCUGACGUUCCGCAUCCCGUAUUACGUGGGCCCA |
| | | CUGGCGCGCGGCAAUUCGCGCUUCGCGUGGAUGACUAGAAAAUCAGAGGAAACCAUCACUCCUUGGAAUUUCGAG |
| | | GAAGUUGUGGAUAAGGGAGCUUCGGCACAAAGCUUCAUCGAACGAAUGACCAACUUCGACAAGAAUCUCCCAAAC |
| | | GAGAAGGUGCUUCCUAAGCACAGCCUCCUUUACGAAUACUUCACUGUCUACAACGAACUGACUAAAGUGAAAUAC |
| | | GUUACUGAAGGAAUGAGGAAGCCGGCCUUUCUGUCCGGAGAACAGAAGAAAGCAAUUGUCGAUCUGCUGUUCAA |
| | | GACCAACCGCAAGGUGACCGUCAAGCAGCUUAAAGAGGACUACUUCAAGAAGAUCGAGUGUUUCGACUCAGUGGA |
| | | AAUCAGCGGGGUGGAGGACAGAUUCAACGCUUCGCUGGGAACCUAUCAUGAUCUCCUGAAGAUCAUCAAGGACAA |
| | | GGACUUCCUUGACAACGAGGAGAACGAGGACAUCCUGGAAGAUAUCGUCCUGACCUUGACCCUUUUCGAGGAUCG |
| | | CGAGAUGAUCGAGGAGAGGCUUAAGACCUACGCUCACUUCUCUUCGACGAUAAGGUCAUGAAACAACUCAAGCGCCG |
| | | CCGGUACACUGGUUGGGGCCGCCUCUCCCGCAAGCUGAUCAACGGUAUUCGCGAUAAACAGAGCGGUAAAACUAU |
| | | CCUGGAUUUCCUCAAAUCGGAUGGCUUCGCUAAUCGUAACUUCAUGCAAUUGAUCCACGACGACAGCCUGACCUU |
| | | UAAGGAGGACAUCCAAAAAGCACAAGUGUCCGGACAGGGAGACUCACUCCAUGAACACAUCGCGAAUCUGGCCGGU |
| | | UCGCCGGCGAUUAAGAAGGGAAUUCUGCAAACUGUGAAGGUGGUCGACGAGCUGGUGAAGGUCAUGGGACGGCA |
| | | CAAACCGGAGAAUAUCGUGAUUGAAAUGGCCCGAGAAAACCAGACUACCCAGAAGGGCCAGAAAAACUCCCGCGAA |
| | | AGGAUGAAGCGGAUCGAAGAAGGAAUCAAGGAGCUGGGCAGCCAGAUCCUGAAAGAGCACCCGGUGGAAAACACG |
| | | CAGCUGCAGAACGAGAAGCUCUACCUGUACUAUUUGCAAAAUGGACGGGACAUGUACGUGGACCAAGAGCUGGAC |
| | | AUCAAUCGGUUGUCUGAUUACGACGUGGACCACAUCGUUCCACAGUCCUUUCUGAAGGAUGACUCGAUCGAUAAC |
| | | AAGGUGUUGACUCGCAGCGACAAGAACAGAGGGAAGUCAGAUAAAUGUGCCAUCGGAGGAGGUCGUGAAGAAGAU |
| | | GAAGAAUUACUGGCGGCAGCUCCUGAAUGCGAAGCUGAUUACCCAGAGAAAGUUUGACAAUCUCACUAAAGCCGA |
| | | GCGCGGCGGACUCUCAGAGCUGGAUAAGGCUGGAUUCAUCAAACGGCAGCUGGUCGAGACUCGGCAGAUUACCAA |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| | | GCACGUGGCGCAGAUCUUGGACUCCCGCAUGAACACUAAAUACGACGAGAACGAUAAGCUCAUCCGGGAAGUGAA |
| | | GGUGAUUACCCUGAAAAGCAAACUUGUGUCGGACUUUCGGAAGGACUUUUCAGUUUUACAAAGUGAGAGAAAUCA |
| | | ACAACUACCAUCACGCGCAUGACGCAUACCUCAACGCUGUGGUCGGUACCGCCCUGAUCAAAAAGUACCCUAAACU |
| | | UGAAUCGGAGUUUGUGUACGGAGACUACAAGGUCUACGACGUGAGGAAGAUGAUAGCCAAGUCCGAACAGGAAA |
| | | UCGGGAAAGCAACUGCGAAAUACUUCUUUUACUCAAACAUCAUGAACUUUUUCAAGACUGAAAUUACGCUGGCCA |
| | | AUGGAGAAAUCAGGAAGAGGCCACUGAUCGAAACUAACGGAGAAACGGGCGAAAUCGUGUGGGACAAGGGCAGGG |
| | | ACUUCGCAACUGUUCGCAAAGUGCUCUCUAUGCCGCAAGUCAAUAUUUGUGAAGAAAACCGAAGUGCAAACCGGCG |
| | | GAUUUUCAAAGGAAUCGAUCCUCCCAAAGAGAAAUAGCGACAAGCUCAUUGCACGCAAGAAAGACUGGGACCCGAA |
| | | GAAGUACGGAGGAUUUCGAUUCGCCGACUGUCGCAUACUCCGUCCUCGUGGUGGCCAAGGUGGAGAAGGGAAAGA |
| | | GCAAAAAGCUCAAAUCCGUCAAAGAGCUGCUGGGGAUUACCAUCAUGGAACGAUCCUCGUUCGAGAAGAACCCGA |
| | | UUGAUUUCCUCGAGGCGAAGGGUUACAAGGAGGUGAAGAAGGAUCUGAUCAUCAAACUCCCCAAGUACUCACUGU |
| | | UCGAACUGGAAAAUGGUCGGAAGCGCAUGCUGGCUUCGGCCGGAGAACUCCAAAAAGGAAAUGAGCUGGCCUUGC |
| | | CUAGCAAGUACGUCAACUUCCUCUAUCUUGCUUCGCACUACGAAAAACUCAAAGGGUCACCGGAAGAUAACGAACA |
| | | GAAGCAGCUUUUUCGUGGAGCAGCACAAGCAUUAUCUGGAUGAAAUCAUCGAACAAAUCUCCGAGUUUUCAAAGCG |
| | | CGUGAUCCUCGCCGACGCCAACCUCGACAAAGUCCUGUCGGCCUACAAUAAGCAUAGAGAUAAGCCGAUCAGAGAA |
| | | CAGGCCGAGAACAUUAUCCACUUGUUCACCCUGACUAACCUGGGAGCCCCAGCCGCCUUCAAGUACUUCGAUACUA |
| | | CUAUCGAUCGCAAAAGAUACACGUCCACCAAGGAAGUUCUGGACGCGACCCUGAUCCACCAAAGCAUCACUGGACU |
| | | CUACGAAACUAGGAUCGAUCUGUCGCAGCUGGGUGGCGAUGGCGGUGGAUCUCCGAAAAAGAAGAGAAAGGUGU |
| | | AAUGAGCUAGCCAUCACACAUUUAAAAGCAUCUCAGCCUACCAUGAGAAAUAAGAGAAAAGAAAAUGAAGAUCAAUAGC |
| | | UUAUUCAUCUCUUUUUCUUUUUUCGUUGGUGUAAAGCCAACACCCUGUCUAAAAAACAUAAAUUUUCUUUAAUCAU |
| | | UUUGCCUCUUUUUCUCUGUGCUUCAAUUAAUAAAAAUGGAAAGAACCUCGAGAAAAAAAAAAAAAAAAAAAAAAAAAA |
| | | AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA |
| 3501 | Cas9 transcript with 5' UTR of HSD, ORF corresponding to SEQ ID NO: 3504, Kozak sequence, and 3' UTR of ALB | GGGTCCCGCAGTCGGCGTCCAGCGGCTCTGCTTGTTCGTGTGTGTCGTTGCAGGCCTTATTCGGATCCGCCACCATGG |
| | | ACAAGAAGTACAGCATCGGACTGGACATCGGAACAAACAGCGTCGGATGGGCAGTCATCACAGACGAATACAAGGTCC |
| | | CGAGCAAGAAGTTCAAGGTCCTGGGAAACACAGACACAGCATCAAGAAGAACCTGATCGGAGCACTGCTGTTCG |
| | | ACAGCGGAGAAACAGCAGAAGCAACAAGACTGAAGAGAACAGCAAGAAGAAGATACACAAGAAAGAACAGAATC |
| | | TGCTACCTGCAGGAAATCTTCAGCAACGAAATGGCAAAGGTCGACGACAGCTTCTTCCACAGACTGGAAGAAAGCTTCCT |
| | | GGTCGAAGAAGACAAGAAGCACGAAAGACACCCGATCTTCGGAAACATCGTCGACGAAGTCGCATACCACGAAAAGTA |
| | | CCCGACAATCTACCACCTGAGAAAGAAGCTGGTCGACAGCACAGACAAGGCAGACCTGAGACTGATCTACCTGGCACTG |
| | | GCACACATGATCAAGTTCAGAGGACACTTCCTGATCGAAGGAGACCTGAACCCGGACAACAGCGACGTCGACAAGCTGT |
| | | TCATCCAGCTGGTCCAGACATACAACCAGCTGTTCGAAGAAAACCCGATCAACGCAAGCGGAGTCGACGCAAAGGCAAT |
| | | CCTGAGCGCAAGACTGAGCAAGAGCAGAAGACTGGAAAACCTGATCGCCAGCTGCCGGGAGAAAAGAAGAACGGAC |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| | | TGTTCGGAAACCTGATCGCACTGAGCCTGGGACTGACACCGAACTTCAAGAGCAACTTCGACCTGGCAGAAGACGCAAA |
| | | GCTGCAGCTGAGCAAGGACACATACGACGACGACCTGGACAACCTGCTGGCACAGATCGGAGACCAGTACGCAGACCT |
| | | GTTCCTGGCAGCAAAGAACCTGAGCGACGCAATCCTGCTGAGCGACATCCTGAGAGTCAACACAGAAATCACAAAGGCA |
| | | CCGCTGAGCGCAAGCATGATCAAGAGATACGACGAACACCACCAGGACCTGACACTGCTGAAGGCACTGGTCAGACAGC |
| | | AGCTGCCGGAAAAGTACAAGGAAATCTTCTTCGACCAGAGCAAGAACGGATACGCAGGATACATCGACGGAGGAGCAA |
| | | GCCAGGAAGAATTCTACAAGTTCATCAAGCCGATCCTGGAAAAGATGGACGGAACAGAAGAACTGCTGGTCAAGCTGAA |
| | | CAGAGAAGACCTGCTGAGAAAGCAGAGAAACATTCGACAACGGAAGCATCCCGCACCAGATCCACCTGGGAGAACTGCA |
| | | CGCAATCCTGAGAAGACAGGAAGACTTCTACCCGTTCCTGAAGGACAACAGAGAAAAGATCGAAAAGATCCTGACATTC |
| | | AGAATCCCGTACTACGTCGGACCGCTGGCAAGAGGAAACAGCAGATTCGCATGGATGACAAGAAAGAGCGAAGAAACA |
| | | ATCACACCGTGGAACTTCGAAGAAGTCGTCGACAAGGGAGCAAGCGCACAGAGCTTCATCGAAAGAATGACAAACTTCG |
| | | ACAAGAACCTGCCGAACGAAAAGGTCCTGCCGAAGCACAGCCTGCTGTACGAATACTTCACAGTCTACAACGAACTGAC |
| | | AAAGGTCAAGTACGTCACAGAAGGAATGAGAAAGCCGGCATTCCTGAGCGGAGAACAGAAGAAGGCAATCGTCGACCT |
| | | GCTGTTCAAGACAAACAGAAAGGTCACAGTCAAGCAGCTGAAGGAAGACTACTTCAAGAAGATCGAATGCTTCGACAGC |
| | | GTCGAAATCAGCGGGAGTCGAAGACAGATTCAACGCAAGCCTGGGAACATACCACGACCTGCTGAAGATCATCAAGGACA |
| | | AGGACTTCCTGGACAACGAAGAAAACGAAGACATCCTGGAAGACATCGTCCTGACACTGACACTGTTCGAAGACAGAGA |
| | | AATGATCGAAGAAAGACTGAAGACATACGCACACCTGTTCGACGACAAGGTCATGAAGCAGCTGAAGAGAAGAAGATA |
| | | CACAGGATGGGGAAGACTGAGCAGAAAGCTGATCAACGGAATCAGAGACAAGCAGAGCGGAAAGACAATCCTGGACTT |
| | | CCTGAAGAGCGACGGATTCGCAAACAGAAACTTCATGCAGCTGATCCACGACGACAGCCTGACATTCAAGGAAGACATC |
| | | CAGAAGGCACAGGTCAGCGGACAGGGAGACAGCCTGCACGAACACATCGCAAACCTGGCAGGAAGCCCGGCAATCAAG |
| | | AAGGGAATCCTGCAGACAGTCAAGGTCGTCGACGAACTGGTCAAGGTCATGGGAAGACACAAGCCGGAAAACATCGTC |
| | | ATCGAAATGGCAAGAGAAAACCAGACAACACAGAAGGGACAGAAGAAACAGCAGAGAAAGAATGAAGAGAATCGAAGA |
| | | AGGAATCAAGGAACTGGGAAGCCAGATCCTGAAGGAACACCCGGTCGAAAACACACAGCTGCAGAACGAAAAGCTGTA |
| | | CCTGTACTACCTGCAGAACGGAAGAGACATGTACGTCGACCAGGAACTGGACATCAACAGACTGAGCGACTACGACGTC |
| | | GACCACATCGTCCCGCAGAGCTTCCTGAAGGACGACAGCATCGACAACAAGGTCCTGACAAGAAGCGACAAGAACAGA |
| | | GGAAAGAGCGACAACGTCCCGAGCGAAGAAGTCGTCAAGAAGATGAAGAACTACTGGAGACAGCTGCTGAACGCAAA |
| | | GCTGATCACACAGAGAAAGTTCGACAACCTGACAAAGGCAGAGAGAGGAGGACTGAGCGAACTGGACAAGGCAGGAT |
| | | TCATCAAGAGACAGCTGGTCGAAACAAGACAGATCACAAAGCACGTCGCACAGATCCTGGACAGCAGAATGAACACAAA |
| | | GTACGACGAAAACGACAAGCTGATCAGAGAAGTCAAGGTCATCACACTGAAGAGCAAGCTGGTCAGCGACTTCAGAAA |
| | | GGACTTCCAGTTCTACAAGGTCAGAGAAATCAACAACTACCACCACGCACACGACGCATACCTGAACGCAGTCGTCGGAA |
| | | CAGCACTGATCAAGAAGTACCCGAAGCTGGAAAGCGAATTCGTCTACGGAGACTACAAGGTCTACGACGTCAGAAAGAT |
| | | GATCGCAAAGAGCGAACAGGAAATCGGAAAGGCAACAGCAAAGTACTTCTTCTACAGCAACATCATGAACTTCTTCAAG |
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| SEQ ID NO | Name | Sequence |
|---|---|---|
| | | TGGGACAAGGGAAGAGACTTCGCAACAGTCAGAAAGGTCCTGAGCATGCCGCAGGTCAACATCGTCAAGAAGACAGAA |
| | | GTCCAGACAGGAGGGATTCAGCAAGGAAAGCATCCTGCCGAAGAGAAACAGCGACAAGCTGATCGCAAGAAAGAAGGA |
| | | CTGGGACCCGAAGAAGTACGGAGGATTCGACAGCCCGACAGTCGCATACAGCGTCCTGGTCGTCGCAAAGGTCGAAAA |
| | | GGGAAAGAGCAAGAAGCTGAAGAGCGTCAAGGAACTGCTGGGAATCACAATCATGGAAAGAAGCAGCTTCGAAAAGA |
| | | ACCCGATCGACTTCCTGGAAGCAAAGGGATACAAGGAAGTCAAGAAGGACCTGATCATCAAGCTGCCGAAGTACAGCCT |
| | | GTTCGAACTGGAAAACGGAAGAAAGAGAATGCTGGCAAGCGCAGGAGAAACTGCAGAAGGGAAACGAACTGGCACTGC |
| | | CGAGCAAGTACGTCAACTTCCTGTACCTGGCAAGCCACTACGAAAAGCTGAAGGGAAGCCCGGAAGACAACGAACAGA |
| | | AGCAGCTGTTCGTCGAACAGCACAAGCACTACCTGGACGAAATCATCGAACAGATCAGCGAATTCAGCAAGAGAGTCAT |
| | | CCTGGCAGACGCAAACCTGGACAAGGTCCTGAGCGCATACAACAAGCACAGAGACAAGCCGATCAGAGAACAGGCAGA |
| | | AAACATCATCCACCTGTTCACACTGACAAACCTGGGAGCACCGGCAGCATTCAAGTACTTCGACACAACAATCGACAGAA |
| | | AGAGATACACAAGCACAAAGGAAGTCCTGGACGCAACACTGATCCACCAGAGCATCACAGGACTGTACGAAACAAGAAT |
| | | CGACCTGAGCCAGCTGGGAGGAGACGGAGGAAGCCCGAAGAAGAAGAGAAAGGTCTAGCTAGCCATCACATTTA |
| | | AAAGCATCTCAGCCTACCATGAGAATAAGAGAAAGAAAATGAAGATCAATAGCTTATTCATCTCTTTTTCTTTTTCGTTGG |
| | | TGTAAAGCCAACACCCTGTCTAAAAAACATAAATTTCTTTAATCATTTTTGCCTCTTTTTCTCTGTGCTTCAATTAATAAAAAT |
| | | GGAAAGAACCTCGAG |
| 3502 | Cas9 DNA coding sequence | ATGGACAAGAAGTACAGCATCGGACTGGACATCGGAACAAACAGCGTCGGATGGGCAGTCATCACAGACGAATACAAG |
| | | GTCCCGAGCAAGAAGTTCAAGGTCCTGGGAAACACAGACACAGCATCAAGAAGAACCTGATCGGAGCACTGCTGT |
| | | TCGACAGCGGAGAAACAGCAGAAGCAACAAGACTGAAGAGAACAGCAAGAAGATACACAAGAAGAAAGAACAGA |
| | | ATCTGCTACCTGCAGGAAATCTTCAGCAACGAAATGGCAAAGGTCGACGACAGCTTCTTCCACAGACTGGAAGAAAGCTT |
| | | CCTGGTCGAAGAAGACAAGAAGCACGAAAGACACCCGATCTTCGGAAACATCGTCGACGAAGTCGCATACCACGAAAA |
| | | GTACCCGACAATCTACCACCTGAGAAAGAAGCTGGTCGACAGCACAGACAAGGCAGACCTGAGACTGATCTACCTGGCA |
| | | CTGGCACACATGATCAAGTTCAGAGGACACTTCCTGATCGAAGGAGACCTGAACCCGGACAACAGCGACGTCGACAAGC |
| | | TGTTCATCCAGCTGGTCCAGACATACAACCAGCTGTTCGAAGAAAACCCGATCAACGCAAGCGGAGTCGACGCAAAGGC |
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| | | GACTGTTCGGAAACCTGATCGCACTGAGCCTGGGACTGACACCGAACTTCAAGAGCAACTTCGACCTGGCAGAAGACGC |
| | | AAAGCTGCAGCTGAGCAAGGACACATACGACGACGACCTGGACAACCTGCTGGCACAGATCGGAGACCAGTACGCAGA |
| | | CCTGTTCCTGGCAGCAAAGAACCTGAGCGACGCAATCCTGCTGAGCGACATCCTGAGAGTCAACACAGAAATCACAAAG |
| | | GCACCGCTGAGCGCAAGCATGATCAAGAGATACGACGAACACCACCAGGACCTGACACTGCTGAAGGCACTGGTCAGAC |
| | | AGCAGCTGCCGGAAAAGTACAAGGAAATCTTCTTCGACCAGAGCAAGAACGGATACGCAGGATACATCGACGGAGGAG |
| | | CAAGCCAGGAAGAATTCTACAAGTTCATCAAGCCGATCCTGGAAAAGATGGACGGAACAGAAGAACTGCTGGTCAAGCT |
| | | GAACAGAGAAGACCTGCTGAGAAAGCAGAGAACATTCGACAACGGAAGCATCCCGCACCAGATCCACCTGGGAGAACT |
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| SEQ ID NO | Name | Sequence |
|---|---|---|
| | | TTCAGAATCCCGTACTACGTCGGACCGCTGGCAAGAGGAAACAGCAGATTCGCATGGATGACAAGAAAGAGCGAAGAA |
| | | ACAATCACACCGTGGAACTTCGAAGAAGTCGTCGACAAGGGAGCAAGCGCACAGAGCTTCATCGAAAGAATGACAAACT |
| | | TCGACAAGAACCTGCCGAACGAAAAGGTCCTGCCGAAGCACAGCCTGCTGTACGAATACTTCACAGTCTACAACGAACT |
| | | GACAAAGGTCAAGTACGTCACAGAAGGAATGAGAAAAGCCGGCATTCCTGAGCGGAGAACAGAAAGAAGGCAATCGTCGA |
| | | CCTGCTGTTCAAGACAAACAGAAAGGTCACAGTCAAGCAGCTGAAGGAAGACTACTTCAAGAAGATCGAATGCTTCGAC |
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| | | AGAAATGATCGAAGAAAGACTGAAGACATACGCACACCTGTTCGACGACAAGGTCATGAAGCAGCTGAAGAGAAGAAG |
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| | | CATCCAGAAGGCACAGGTCAGCGGACAGGGAGACAGCCTGCACGAACACATCGCAACCTGGCAGGAAGCCCGGCAAT |
| | | CAAGAAGGGAATCCTGCAGACAGTCAAGGTCGTCGACGAACTGGTCAAGGTCATGGGAAGACACAAGCCGGAAAACAT |
| | | CGTCATCGAAATGGCAAGAGAAAACCAGACACAACACAGAAGGGACAGAAGAACAGCAGAGAAAGAATGAAGAGAATCG |
| | | AAGAAGGAATCAAGGAACTGGGAAGCCAGATCCTGAAGGAACACCCGGTCGAAAACACACAGCTGCAGAACGAAAAGC |
| | | TGTACCTGTACTACCTGCAGAACGGAAGAGACATGTACGTCGACCAGGAACTGGACATCAACAGACTGAGCGACTACGA |
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| | | GATTCATCAAGAGACAGCTGGTCGAAACAAGACAGATCACACAAAGCACGTCGCACAGATCCTGGACAGCAGAATGAACAC |
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| | | GAACAGCACTGATCAAGAAGTACCCGAAGCTGGAAAGCGAATTCGTCTACGGAGACTACAAGGTCTACGACGTCAGAAA |
| | | GATGATCGCAAAGAGCGAACAGGAAATCGGAAAGGCAACAGCAAAGTACTTCTTCTACAGCAACATCATGAACTTCTTC |
| | | AAGACAGAAATCACACTGGCAAACGGAGAAATCAGAAAGAGACCGCTGATCGAAACAAACGGAGAAACAGGAGAAATC |
| | | GTCTGGGACAAGGGAAGAGACTTCGCAACAGTCAGAAAGGTCCTGAGCATGCCGCAGGTCAACATCGTCAAGAAGACA |
| | | GAAGTCCAGACAGGAGGATTCAGCAAGGAAAGCATCCTGCCGAAGAGAAACAGCGACAAGCTGATCGCAAGAAAGAA |
| | | GGACTGGGACCCGAAGAAGTACGGAGGATTCGACAGCCCGACAGTCGCATACAGCGTCCTGGTCGTCGCAAAGGTCGA |
| | | AAAGGGAAAGAGCAAGAAGCTGAAGAGCGTCAAGGAACTGCTGGGAATCACAATCATGGAAAGAAGCAGCTTCGAAA |
| | | AGAACCCGATCGACTTCCTGGAAGCAAAGGGATACAAGGAAGTCAAGAAGGACCTGATCATCAAGCTGCCGAAGTACA |
| | | GCCTGTTCGAACTGGAAAACGGAAGAAAGAGAATGCTGGCAAGCGCAGGAGAACTGCAGAAGGGAAACGAACTGGCA |
| | | CTGCCGAGCAAGTACGTCAACTTCCTGTACCTGGCAAGCCACTACGAAAAGCTGAAGGGAAGCCCGGAAGACAACGAAC |
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| SEQ ID NO | Name | Sequence |
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| | | CATCCTGGCAGACGCAAACCTGGACAAGGTCCTGAGCGCATACAACAAGCACAGAGACAAGCCGATCAGAGAACAGGC |
| | | AGAAAACATCATCCACCTGTTCACACTGACAAACCTGGGAGCACCGGCAGCATTCAAGTACTTCGACACACAACAATCGACA |
| | | GAAAGAGATACACAAGCACAAAGGAAGTCCTGGACGCAACACTGATCCACCAGAGCATCACAGGACTGTACGAAACAA |
| | | GAATCGACCTGAGCCAGCTGGGAGGAGACGGAGGAGGAAGCCCGAAGAAGAAGAGAAAGGTCTAG |
| 3503 | Cas9 DNA coding sequence 1 | ATGGATAAGAAGTACTCAATCGGGCTGGATATCGGAACTAATTCCGTGGGTTGGGCAGTGATCACGGATGAATACAAAG |
| | | TGCCGTCCAAGAAGTTCAAGGTCCTGGGGAACACCGATAGACACAGCATCAAGAAAAATCTCATCGGAGCCCTGCTGTTT |
| | | GACTCCGGCGAAACCGCAGAAGCGACCCGGCTCAAACGTACCGCGAGGCGACGCTACACCCGGCGGAAGAATCGCATC |
| | | TGCTATCTGCAAGAGATCTTTTCGAACGAAATGGCAAAGGTCGACGACAGCTTCTTCCACCGCCTGGAAGAATCTTTCCT |
| | | GGTGGAGGAGGACAAGAAGCATGAACGGCATCCTATCTTTGGAAACATCGTCGACGAAGTGGCGTACCACGAAAAGTA |
| | | CCCGACCATCTACCATCTGCGGAAGAAGTTGGTTGACTCAACTGACAAGGCCGACCTCAGATTGATCTACTTGGCCCTCG |
| | | CCCATATGATCAAATTCCGCGGACACTTCCTGATCGAAGGCGATCTGAACCCTGATAACTCCGACGTGGATAAGCTTTTCA |
| | | TTCAACTGGTGCAGACCTACAACCAACTGTTCGAAGAAAACCCAATCAATGCTAGCGGCGTCGATGCCAAGGCCATCCTG |
| | | TCCGCCCGGCTGTCGAAGTCGCGGCGCCTCGAAAACCTGATCGCCACAGCTGCCGGGAGAGAAAAAGAACGGACTTTTCG |
| | | GCAACTTGATCGCTCTCTCACTGGGACTCACTCCCAATTTCAAGTCCAATTTTGACCTGGCCGAGGACGCGAAGCTGCAAC |
| | | TCTCAAAGGACACCTACGACGACGACTTGGACAATTTGCTGGCACAAATTGGCGATCAGTACGCGGATCTGTTCCTTGCC |
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| | | AAGTACAAGGAGATCTTCTTCGACCAGTCCAAGAATGGGTACGCAGGGTACATCGATGGAGGCGCTAGCCAGGAAGAG |
| | | TTCTATAAGTTCATCAAGCCAATCCTGGAAAAGATGGACGGAACCGAAGAACTGCTGGTCAAGCTGAACAGGGAGGATC |
| | | TGCTCCGGAAACAGAGAAACCTTTGACAACGGATCCATTCCCCACCAGATCCATCTGGGTGAGCTGCACGCCATCTTGCGG |
| | | CGCCAGGAGGACTTTTACCCATTCCTCAAGGACAACCGGGAAAAGATCGAGAAAATTCTGACGTTCCGCATCCCGTATTA |
| | | CGTGGGCCCACTGGCGCGCGGCAATTCGCGCTTCGCGTGGATGACTAGAAAATCAGAGGAAACCATCACTCCTTGGAAT |
| | | TTCGAGGAAGTTGTGGATAAGGGAGCTTCGGCACAAAGCTTCATCGAACGAATGACCAACTTCGACAAGAATCTCCCAA |
| | | ACGAGAAGGTGCTTCCTAAGCACAGCCTCCTTTACGAATACTTCACTGTCTACAACGAACTGACTAAAGTGAAATACGTTA |
| | | CTGAAGGAATGAGGAAGCCGGCCTTTCTGTCCGGAGAACAGAAGAAAGCAATTGTCGATCTGCTGTTCAAGACCAACCG |
| | | CAAGGTGACCGTCAAGCAGCTTAAAGAGGACTACTTCAAGAAGATCGAGTGTTTCGACTCAGTGGAAATCAGCGGGGTG |
| | | GAGGACAGATTCAACGCTTCGCTGGGAAACCTATCATGATCTCCTGAAGATCATCAAGGACAAGGACTTCCTTGACAACGA |
| | | GGAGAACGAGGACATCCTGGAAGATATCGTCCTGACCTTGACCCTTTTCGAGGATCGCGAGATGATCGAGGAGAGGCTT |
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| | | CCGCAAGCTGATCAACGGTATTCGCGATAAACAGAGCGGTAAAACTATCCTGGATTTCCTCAAATCGGATGGCTTCGCTA |
| | | ATCGTAACTTCATGCAATTGATCCACGACGACAGCCTGACCTTTAAGGAGGACATCCAAAAAGCACAAGTGTCCGGACAG |
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| SEQ ID NO | Name | Sequence |
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| | | ATCCTGAAAGAGCACCCGGTGGAAAACACGCAGCTGCAGAACGAGAAGCTCTACCTGTACTATTTGCAAAATGGACGGG |
| | | ACATGTACGTGGACCAAGAGCTGGACATCAATCGGTTGTCTGATTACGACGTGGACCACATCGTTCCACAGTCCTTTCTG |
| | | AAGGATGACTCGATCGATAACAAGGTGTTGACTCGCAGCGACAAGAACAGAGGGAAGTCAGATAATGTGCCATCGGAG |
| | | GAGGTCGTGAAGAAGATGAAGAATTACTGGCGGCAGCTCCTGAATGCGAAGCTGATTACCCAGAGAAAGTTTGACAATC |
| | | TCACTAAAGCCGAGCGCGGCGGACTCTCAGAGCTGGATAAGGCTGGATTCATCAAACGGCAGCTGGTCGAGACTCGGCA |
| | | GATTACCAAGCACGTGGCGCAGATCTTGGACTCCCGCATGAACACTAAATACGACGAGAACGATAAGCTCATCCGGGAA |
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| | | CAACTACCATCACGCGCATGACGCATACCTCAACGCTGTGGTCGGTACCGCCCTGATCAAAAAGTACCCTAAACTTGAAT |
| | | CGGAGTTTGTGTACGGAGACTACAAGGTCTACGACGTGAGGAAGATGATAGCCAAGTCCGAACAGGAAATCGGGAAAG |
| | | CAACTGCGAAATACTTCTTTTACTCAAACATCATGAACTTTTTCAAGACTGAAATTACGCTGGCCAATGGAGAAATCAGGA |
| | | AGAGGCCACTGATCGAAACTAACGGAGAAACGGGCGAAATCGTGTGGGACAAGGGCAGGGACTTCGCAACTGTTCGCA |
| | | AAGTGCTCTCTATGCCGCAAGTCAATATTGTGAAGAAAACCGAAGTGCAAACCGGCGGATTTTCAAAGGAATCGATCCTC |
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| | | TGGGGATTACCATCATGGAACGATCCTCGTTCGAGAAGAACCCGATTGATTTCCTCGAGGCGAAGGGTTACAAGGAGGT |
| | | GAAGAAGGATCTGATCATCAAACTCCCCAAGTACTCACTGTTCGAACTGGAAAATGGTCGGAAGCGCATGCTGGCTTCG |
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| | | GCATAGAGATAAGCCGATCAGAGAACAGGCCGAGAACATTATCCACTTGTTCACCCTGACTAACCTGGGAGCCCCAGCC |
| | | GCCTTCAAGTACTTCGATACTACTATCGATCGCAAAAGATACACGTCCACCAAGGAAGTTCTGGACGCGACCCTGATCCA |
| | | CCAAGCATCACTGGACTCTACGAAACTAGGATCGATCTGTCGCAGCTGGGTGGCGATGGCGGTGGATCTCCGAAAAAG |
| | | AAGAGAAAGGTGTAATGA |
| 3504 | Cas9 mRNA open reading frame (ORF) 2 | AUGGACAAGAAGUACAGCAUCGGACUGGACAUCGGAACAAACAGCGUCGGAUGGGCAGUCAUCACAGACGAAUAC |
| | | AAGGUCCCGAGCAAGAAGUUCAAGGUCCUGGGAAACACAGACAGAGACACAGCAUCAAGAAGAACCUGAUCGGAGCAC |
| | | UGCUGUUCGACAGCGGAGAAACAGCAGAAGCAACAAGAGUGAAGAGAAGCAAGAAGAAGGUCGACGACAGCUUCUUCCACAGACUG |
| | | GAACAGAAUCUGCUACCUGCAGGAAAUCUUCAGCAACGAAAUGGCAAAGGUCGACGACAGCUUCUUCCACAGACUG |
| | | GAAGAAAGCUUCCUGGUCGAAGAAGACAAGAAGCACGAAAGACACCCGAUCUUCGGAAACAUCGUCGACGAAGUCG |
| | | CAUACCACGAAAAGUACCCGACAAUCUACCACCUGAGAAAGAAGCUGGUCGACAGCACAGACAAGGCAGACCUGAG |
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| SEQ ID NO | Name | Sequence |
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| | | GCUGCCGGGAGAAAAGAAGAACGGACUGUUCGGAAACCUGAUCGCACUGAGCCUGGGACUGACACCGAACUUCAA |
| | | GAGCAACUUCGACCUGGCAGAAGACGCAAAGCUGCAGCUGAGCAAGGACACAUACGACGACGACCUGGACAACCUG |
| | | CUGGCACAGAUCGGAGACCAGUACGCAGACCUGUUCCUGGCAGCAAAGAACCUGAGCGACGCAAUCCUGCUGAGCG |
| | | ACAUCCUGAGAGUCAACACAGAAAUCACAAAGGCACCGCUGAGCGCAAGCAUGAUCAAGAGAUACGACGAACACCAC |
| | | CAGGACCUGACACUGCUGAAGGCACUGGUCAGACAGCAGCUGCCGGAAAAGUACAAGGAAAUCUUCUUCGACCAGA |
| | | GCAAGAACGGAUACGCAGGAUACAUCGACGGAGGAGCAAGCCAGGAAGAAUUCUACAAGUUCAUCAAGCCGAUCCU |
| | | GGAAAAGAUGGACGGAACAGAAGAACUGCUGGUCAAGCUGAACAGAGAAGACCUGCUGAGAAAGCAGAGAACAUU |
| | | CGACAACGGAAGCAUCCCGCACCAGAUCCACCUGGGAGAACUGCACGCAAUCCUGAGAAGACAGGAAGACUUCUAC |
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| | | CAAGAGGAAACAGCAGAUUCGCAUGGAUGACAAGAAAGAGCGAAGAAACAAUCACACCGUGGAACUUCGAAGAAG |
| | | UCGUCGACAAGGGAGCAAGCGCACAGAGCUUCAUCGAAAGAAUGACAAACUUCGACAAGAACCUGCCGAACGAAAA |
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| | | GAAGGAAUGAGAAAGCCGGCAUUCCUGAGCGGAGAACAGAAGAAGGCAAUCGUCGACCUGCUGUUCAAGACAAAC |
| | | AGAAAGGUCACAGUCAAGCAGCUGAAGGAAGACUACUUCAAGAAGAUCGAAUGCUUCGACAGCGUCGAAAUCAGC |
| | | GGAGUCGAAGACAGAUUCAACGCAAGCCUGGGAACAUACCACGACCUGCUGAAGAUCAUCAAGGACAAGGACUUCC |
| | | UGGACAACGAAGAAAACGAAGACAUCCUGGAAGACAUCGUCCUGACACUGACACUGUUCGAAGACAGAGAAAUGA |
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| | | CCUGAAGAGCGACGGAUUCGCAAACAGAAACUUCAUGCAGCUGAUCCACGACAGCCUGACAUUCAAGGAAGACC |
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| | | UCAAGAAGGGAAUCCUGCAGACAGUCAAGGUCGUCGACGAACUGGUCAUGGGAAGACACAAGCCGGAAA |
| | | ACAUCGUCAUCGAAAUGGCAAGAGAAAACCAGACACACAGAAGGGACAGAAGAACAGCAGAGAAAGAAUGAAGAG |
| | | AAUCGAAGAAGGAAUCAAGGAACUGGGAAGCCAGAUCCUGAAGGAACACCCGGUCGAAAACACACAGCUGCAGAAC |
| | | GAAAAGCUGUACCUGUACUACCUGCAGAACGGAAGAGACAUGUACGUCGACCAGGAACUGGACAUCAACAGACUG |
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| | | GAAGCGACAAGAACAGAGGAAAGAGCGACAACGUCCCGAGCGAAGAAGUCGUCAAGAAGAUGAAGAACUACUGGA |
| | | GACAGCUGCUGAACGCAAAGCUGAUCACACAGAGAAAGUUCGACAACCUGACAAAGGCAGAGAGAGGAGGACUGA |
| | | GCGAACUGGACAAGGCAGGAUUCAUCAAGAGACAGCUGGUCGAAACAAGACAGAUCACAAAGCACGUCGCACAGAU |
| | | CCUGGACAGCAGAAUGAACACAAAGUACGACGAAAACGACAAGCUGAUCAGAGAAGUCAAGGUCAUCACACUGAAG |
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| SEQ ID NO | Name | Sequence |
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| | | UACUUCUUCUACAGCAACAUCAUGAACUUCUUCAAGACAGAAAUCACACUGGCAAACGGAGAAAUCAGAAAGAGAC |
| | | CGCUGAUCGAAACAAACGGAGAAACAGGAGAAAUCGUCUGGGACAAGGGAAGAGACUUCGCAACAGUCAGAAAGG |
| | | UCCUGAGCAUGCCGCAGGUCAACAUCGUCAAGAAGACAGAAGUCCAGACAGGAGGAUUCAGCAAGGAAAGCAUCCU |
| | | GCCGAAGAGAAACAGCGACAAGCUGAUCGCAAGAAAGAAGGACUGGGACCCGAAGAAGUACGGAGGAUUCGACAG |
| | | CCCGACAGUCGCAUACAGCGUCCUGGUCGUCGCAAAGGUCGAAAAGGGAAAGAGCAAGAAGCUGAAAGAGCGUCAA |
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| | | AUACAAGGAAGUCAAGAAAGGACCUGAUCAUCAAGCUGCCGAAGUACAGCCUGUUCGAACUGGAAAACGGAAGAAA |
| | | GAGAAUGCUGGCAAGCGCAGGAGAACUGCAGAAGGGAAACGAACUGGCACUGCCGAGCAAGUACGUCAACUUCCU |
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| | | CACAAGCACUACCUGGACGAAAUCAUCGAACAGAUCAGCGAAUUCAGCAAGAGAGUCAUCCUGGCAGACGCAAACC |
| | | UGGACAAGGUCCUGAGCGCAUACAACAAGCACAGAGACAAGCCGGAUCAGAGAACAGGCAGAAAACAUCAUCCACCU |
| | | GUUCACACUGACAAACCUGGGAGCACCGGCAGCAUUCAAGUACUUCGACACAACAAUCGACAGAAAGAGAUACACA |
| | | AGCACAAAGGAAGUCCUGGACGCAACACUGAUCCACCAGAGCAUCACAGGACUGUACGAAACAAGAAUCGACCUGA |
| | | GCCAGCUGGGAGGAGACGGAGGAGGAAGCCCGAAGAAGAAGAGAAAGGUCUAG |
| 3505 | Cas9 mRNA ORF 1 | AUGGAUAAGAAGUACUCAAUCGGGCUGGAUAUCGGAACUAAUUCCGUGGGUUGGGCAGUGAUCACGGAUGAAUA |
| | | CAAAGUGCCGUCCAAGAAGUUCAAGGUCCUGGGGAACACCGAUAGACACAGCAUCAAGAAAAAUCUCAUCGGAGCC |
| | | CUGCUGUUUGACUCCGGCGAAACCGCAGAAGCGACCCGGCUCAAACGUACCGCGAGGCGACGCUACACCCGGCGGA |
| | | AGAAUCGCAUCUGCUAUCUGCAAGAGAUCUUUUCGAACGAAAUGGCAAAGGUCGACGACACAGCUUCUUCCACCGCC |
| | | UGGAAGAAUCUUUCCUGGUGGAGGAGGACAAGAAGCAUGAACGGCAUCCUAUCUUUGGAAACAUCGUCGACGAA |
| | | GUGGCGUACCACGAAAAGUACCCGACCAUCUACCAUCUGCGGAAGAAGUUGGUUGACUCAACUGACAAGGCCGACC |
| | | UCAGAUUGAUCUACUUGGCCCUCGCCAUAUGAUCAAAUUCCGCGGACACUUCCUGAUCGAAGGCGAUCUGAACCC |
| | | UGAUAACUCCGACGUGGAUAAGCUUUUCAUUCAACUGGUGCAGACCUACAACCAACUGUUCGAAGAAAACCCAAUC |
| | | AAUGCUAGCGGCGUCGAUGCCAAGGCCAUCCUGUCCGCCCGGCUGUCGAAGUCGCGGCGCCUCGAAAACCUGAUCG |
| | | CACAGCUGCCGGGAGAAAAAGAACGGACUUUUUCGGCAACUUGAUCGCUCUCUCACUGGGACUCACUCCCAAUU |
| | | UCAAGUCCAAUUUUGACCUGGCCGAGGACGCGAAGCUGCAACUCUCAAAGGACACCUACGACGACGACUUGGACAA |
| | | UUUGCUGGCACAAAUUGGCGAUCAGUACGCGGAUCUGUUCCUUGCCGCUAAGAACCUUUCGGACGCAAUCUUGCU |
| | | GUCCGAUAUCCUGCGCGUGAACACCGAAUAACCAAAGCGCCGCUUAGCGCCUCGAUGAUUAAGCGGUACGACGAG |
| | | CAUCACCAGGAUCUCACGCUGCUCAAAGCGCUCGUGAGACAGCAACUGCCUGAAAAGUACAAGGAGAUCUUCUUCG |
| | | ACCAGUCCAAGAAUGGGUACGCAGGGUACAUCGAUGGAGGGCGCUAGCCAGGAAGAGUUCUAUAAAUUCAUCAAGC |
| | | CAAUCCUGGAAAAGAUGGACGGAACGAAGAACUGCUGGUCAAGCUGAACAGGGAGGAUCUGCUCCGGAAACAGA |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| | | GAACCUUUGACAACGGAUCCAUUCCCCACCAGAUCCAUCUGGGUGAGCUGCACGCCAUCUUGCGGCGCCCAGGAGGA |
| | | CUUUUACCCAUUCCUCAAGGACAACCGGGAAAAGAUCGAGAAAAUUCUGACGUUCCGCAUCCCGUAUUACGUGGG |
| | | CCCACUGGCGCGCGGCAAUUCGCGCUUCGCGUGGAUGACUAGAAAAUCAGAGGAAACCAUCACUCCUUGGAAUUU |
| | | CGAGGAAGUUUGUGGAUAAGGGAGCUUCGGCACAAAGCUUCAUCGAACGAAUGACCAACUUCGACAAGAAUCUCCC |
| | | AAACGAGAAGGUGCUUCCUAAGCACACGCCUCCUUUACGAAUACUUCACUGUCUACAACGAACUGACUAAAGUGAAA |
| | | UACGUUACUGAAGGAAUGAGGAAGCCGGCCUUUCUGUCCGGAGAACAGAAGAAAGCAAUUGUCGAUCUGCUGUU |
| | | CAAGACCAACCGCAAGGUGACCGUCAAGCAGCUUAAAGAGGACUACUUCAAGAAGAUCGAGUGUUUCGACUCAGU |
| | | GGAAAUCAGCGGGGUGGAGGACAGAUUCAACGCUUCGCUGGGAACCUAUCAUGAUCUCCUGAAGAUCAUCAAGGA |
| | | CAAGGACUUCCUUGACAACGAGGAGAACGAGGACAUCCUGGAAGAUAUCGUCCUGACCUUGACCCUUUUCGAGGA |
| | | UCGCGAGAUGAUCGAGGAGAGGCUUAAGACCUACGCUCACUUCUUCGACGAUAAGGUCAUGAAACAACUCAAGCG |
| | | CCGCCGGUACACUGGUUGGGGCCGCCUCUCCCGCAAGCUGAUCAACGGUAUUCGCGAUAAACAGAGCGGUAAAAC |
| | | UAUCCUGGAUUUCCUCAAAUCGGAUGGCUUCGCUAAUCGUAACUUCAUGCAAUUGAUCCACGACGACAGCCUGAC |
| | | CUUUAAGGAGGACAUCCAAAAAGCACAAGUGUCCGGACAGGGAGACUCACUCCAUGAACACAUCGCGAAUCUGGCC |
| | | GGUUCGCCGGCGAUUAAGAAGGGAAUUUCUGCAAACUGUGAAGGUGGUCGACGAGCUGGUGAAGGUCAUGGGACG |
| | | GCACAAACCGGAGAAUAUCGUGAUUGAAAUGGCCCGAGAAAACCAGACUACCCAGAAGGGCCAGAAAAACUCCCGC |
| | | GAAAGGAUGAAGCGGAUCGAAGAAGGAAUCAAGGAGCUGGGCAGCCAGAUCCUGAAAGAGCACACCCGGUGGAAAAC |
| | | ACGCAGCUGCAGAACGAGAAGCUCUACCUGUACUUAUUUGCAAAAUGGGACGGGACAUGUACGUGGACCAAGAGCUG |
| | | GACAUCAAUCGGUUGUCUGAUUACGACGUGGACCACAUCGUUCCACAGUCCUUUCUGAAGGAUGACUCGAUCGAU |
| | | AACAAGGUGUUGACUCGCAGCGACAAGAACAGAGGGAAGUCAGAUAAAUGUGCCAUCGGAGGAGGUCGUGAAGAA |
| | | GAUGAAGAAUUACUGGCGGCAGCUCCUGAAUGCGAAGCUGAUUACCCAGAGAAAGUUUGACAAUCUCACUAAAGC |
| | | CGAGCGCGGCGGACUCUCAGAGCUGGAUAAGGCUGGAUUCAUCAAACGGCAGCUGGUCGAGACUCGGCAGAUUAC |
| | | CAAGCACGUGGCGCAGAUCUUGGACUCCCGCAUGAACACUAAAUACGACGAGAACGAUAAGCUCAUCCGGGAAGUG |
| | | AAGGUGAUUACCCUGAAAAGCAAACUUGUGUCGGACUUUUCGGAAGGACUUUUACAAAGUGAGAGAAAU |
| | | CAACAACUACCAUCACGCGCAUGACGCAUACCUCAACGCUGUGGUCGGUACCGCCCUGAUCAAAAAGUACCCUAAAC |
| | | UUGAAUCGGAGUUUGUGUACGGAGACUACAAGGUCUACGACGUGAGGAAGAUGAUAGCCAAGUCCGAACAGGAA |
| | | AUCGGGAAAGCAACUGCGAAAUACUUCUUUUACUCAAACAUCAUGAACUUUUUCAAGACUGAAAUUACGCUGGCC |
| | | AAUGGAGAAAUCAGGAAGAGGCCACUGAUCGAAACUAACGGAGAAACGGGCGAAAUCGUGUGGGACAAGGGCAGG |
| | | GACUUCGCAACUGUUCGCAAAGUGCUCUCUAUGCCGCAAGUCAAUAUUGUGAAGAAAACCGAAGUGCAAACCGGC |
| | | GGAUUUUCAAAGGAAUCGAUCCUCCCAAAGAGAAAUAGCGACAAGCUCAUUGCACGCAAGAAAGACUGGGACCCGA |
| | | AGAAGUACGGAGGAUUCGAUUCGCCGACUGUCGCAUACUCCGUCCUCGUGGUGGCCAAGGUGGAGAAGGGAAAG |
| | | AGCAAAAAGCUCAAAUCCGUCAAAGAGCUGCUGGGGAUUACCAUCAUGGAACGAUCCUCGUUCGAGAAGAACCCGA |
| | | UUGAUUUCCUCGAGGCGAAGGGUUACAAGGAGGUGAAGAAGGAUCUGAUCAUCAAACUCCCCAAGUACUCACUGU |

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|---|---|---|
| | | UCGAACUGGAAAAUGGUCGGAAGCGCAUGCUGGCUUCGGCCGGAGAACUCCAAAAAGGAAAUGAGCUGGCCUUGC |
| | | CUAGCAAGUACGUCAACUUCCUCUAUCUUGCUUCGCACUACGAAAAACUCAAGGGGUCACCGGAAGAUAACGAACA |
| | | GAAGCAGCUUUUCGUGGAGCAGCACAAGCAUUAUCUGGAUGAAAUCAUCGAACAAAUCUCCGAGUUUUCAAAGCG |
| | | CGUGAUCCUCGCCGACGCCAACCUCGACAAAGUCCUGUCGGCCUACAAUAAGCAUAGAGAUAAGCCGAUCAGAGAA |
| | | CAGGCCGAGAACAUUAUCCACUUGUUCACCCUGACUAACCUGGGAGCCCCAGCCGCCUUCAAGUACUUCGAUACUA |
| | | CUAUCGAUCGCAAAAGAUACACGUCCACCAAGGAAGUUCUGGACGCGACCCUGAUCCACCAAAGCAUCACUGGACU |
| | | CUACGAAACUAGGAUCGAUCUGUCGCAGCUGGGUGGCGAUGGCGGUGGAUCUCCGAAAAAGAAGAGAAAGGUGU |
| | | AAUGA |
| 3506 | Cas9 nickase (D10A) mRNA ORF | AUGGACAAGAAGUACAGCAUCGGACUGGCAAUCGGAACAAACAGCGUCGGAUGGGCAGUCAUCACAGACGAAUAC |
| | | AAGGUCCCGAGCAAGAAGUUCAAGGUCCUGGGAAACACAGACACAGCAUCAAGAAGAACCUGAUCGGAGCAC |
| | | UGCUGUUCGACAGCGGAGAAACAGCAGAAGCAACAAGACUGAAGAGAACAGCAAGAAGAAGAUACACAAGAAGAAA |
| | | GAACAGAAUCUGCUACCUGCAGGAAAUCUUCAGCAACGAAAUGGCAAAGGUCGACGACAGCUUCUUCCACAGACUG |
| | | GAAGAAAGCUUCCUGGUCGAAGAAGACAAGAAGCACGAAAGACACCCGAUCUUCGGAAACAUCGUCGACGAAGUCG |
| | | CAUACCACGAAAAGUACCCGACAAUCUACCACCUGAGAAAGAAGCUGGUCGACAGCACAGACAAGGCAGACCUGAG |
| | | ACUGAUCUACCUGGCACUGGCACACAUGAUCAAGUUCAGAGGACACUUCCUGAUCGAAGGAGACCUGAACCCGGAC |
| | | AACAGCGACGUCGACAAGCUGUUCAUCCAGCUGGUCCAGACAUACAACCAGCUGUUCGAAGAAAACCCGAUCAACG |
| | | CAAGCGGAGUCGACGCAAAGGCAAUCCUGAGCGCAAGACUGAGCAAGAGCAGAAGACUGGAAAACCUGAUCGCACA |
| | | GCUGCCGGGAGAAAAGAAGAACGGACUGUUUCGGAAACCUGAUCGCACUGAGCCUGGGACUGACACCGAACUUCAA |
| | | GAGCAACUUCGACCUGGCAGAAGACGCAAAGCUGCAGCUGAGCAAGGACACAUACGACGACGACCUGGACAACCUG |
| | | CUGGCACAGAUCGGAGACCAGUACGCAGACCUGUUCCUGGCAGCAAAGAACCUGAGCGACGCAAUCCUGCUGAGCG |
| | | ACAUCCUGAGAGUCAACACACAGAAAUCACAAAGGCACCGCUGAGCGCAAGCAUGAUCAAGAGAUACGACGAACACCAC |
| | | CAGGACCUGACACUGCUGAAGGCACUGGUCAGACAGCAGCUGCCGGAAAAGUACAAGGAAAUCUUCUUCGACCAGA |
| | | GCAAGAACGGAUACGCAGGAUACAUCGACGGAGGAGCAAGCCAGGAAGAAUUCUACAAGUUCAUCAAGCCGAUCCU |
| | | GGAAAAGAUGGACGGAACAGAAGAACUGCUGGUCAAGCUGAACAGAGAAGACCUGCUGAGAAAGCAGAGAACAUU |
| | | CGACAACGGAAGCAUCCCGCACCAGAUCCACCUGGGAGAACUGCACGCAAUCCUGAGAAGACAGGAAGACUUCUAC |
| | | CCGUUCCUGAAGGACAACAGAGAAAAGAUCGAAAAGAUCCUGACAUUCAGAAUCCCGUACUACGUCGGACCGCUGG |
| | | CAAGAGGAAACAGCAGAUUCGCAUGGAUGACAAGAAAGAGCGAAGAAACAAUCACACCGUGGAACUUCGAAGAAG |
| | | UCGUCGACAAGGGAGCAAGCGCACAGAGCUUCAUCGAAAGAAUGACAAACUUCGACAAGAACCUGCCGAACGAAAA |
| | | GGUCCUGCCGAAGCACAGCCUGCUGUACGAAUACUUCACAGUCUACAACGAACUGACAAAGGUCAAGUACGUCACA |
| | | GAAGGAAUGAGAAAGCCGGCAUUCCUGAGCGGAGAACAGAAGAAGGGCAAUCGUCGACCUGCUGUUCAAGACAAAC |
| | | AGAAAGGUCACAGUCAAGCAGCUGAAGGAAGACUACUUCAAGAAGAUCGAAUGCUUCGACAGCGUCGAAAUCAGC |
| | | GGAGUCGAAGACAGAUUCAACGCAAGCCUGGGAACAUACCACGACCUGCUGAAGAUCAUCAAGGACAAGGACUUCC |

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|---|---|---|
| | | UGGACAACGAAGAAAACGAAGACAUCCUGGAAGACAUCGUCCUGACACUGACACUGUUCGAAGACAGAGAAAUGA |
| | | UCGAAGAAAGACUGAAGACAUACGCACACCUGUUCGACGACAAGGUCAUGAAGCAGCUGAAGAGAAGAAGAUACAC |
| | | AGGAUGGGGAAGACUGAGCAGAAAGCUGAAUCAACGGAAUCAGAGACAAGCAGAGCGGAAAGACAAUCCUGGACUU |
| | | CCUGAAGAGCGACGGAUUCGCAAACAGAAACUUCAUGCAGCUGAUCCACGACACAGCCUGACACAUUCAAGGAAGAC |
| | | AUCCAGAAGGCACAGGUCAGCGGACAGGGAGACAGCCUGCACGAACACAUCGCAAACCUGGCAGGAAGCCCGGCAA |
| | | UCAAGAAGGGAAUCCUGCAGACAGUCAAGGUCGUCGACGAACUGGUCAAGGUCAUGGGAAGACACAAGCCGGAAA |
| | | ACAUCGUCAUCGAAAUGGCAAGAGAAAACCAGACAACACAGAAGGGACAGAAGAACAGCAGAGAAAGAAUGAAGAG |
| | | AAUCGAAGAAGGAAUCAAGGAACUGGGAAGCCAGAUCCUGAAGGAACACCCGGUCGAAAACACACAGCUGCAGAAC |
| | | GAAAAGCUGUACCUGUACUACCUGCAGAACGGAAGAGACAUGUACGUCGACCAGGAACUGGACAUCAACAGACUG |
| | | AGCGACUACGACGUCGACCACAUCGUCCCGCAGAGCUUCCUGAAGGACGACAGCAUCGACAACAAGGUCCUGACAA |
| | | GAAGCGACAAGAACAGAGGAAAGAGCGACAACGUCCCGAGCGAAGAAGUCGUCAAGAAGAUGAAGAACUACUGGA |
| | | GACAGCUGCUGAACGCAAAGCUGAUCACACAGAGAAAGUUCGACAACCUGACAAAGGCAGAGAGGAGGGACUGA |
| | | GCGAACUGGACAAGGCAGGAUUCAUCAAGAGACAGCUGGUCGAAACAAGACAGAUCACACAAAGCACGUCGCACAGAU |
| | | CCUGGACAGCAGAAUGAACACAAAGUACGACGAAAACGACAAGCUGAUCAGAGAAGUCAAGGUCAUCACACUGAAG |
| | | AGCAAGCUGGUCAGCGACUUCAGAAAGGACUUCCAGUUCUACAAGGUCAGAGAAAUCAACAACUACCACCACGCAC |
| | | ACGACGCAUACCUGAACGCAGUCGUCGGAACAGCACUGAUCAAGAAGUACCCGAAGCUGGAAAGCGAAUUCGUCUA |
| | | CGGAGACUACAAGGUCUACGACGUCAGAAAGAUGAUCGCAAAGAGCGAACAGGAAAUCGGAAAGGCAACAGCAAAG |
| | | UACUUCUUCUACAGCAACAUCAUGAACUUCUUCAAGACAGAAAUCACACUGGCAAACGGAGAAAUCAGAAAGAGAC |
| | | CGCUGAUCGAAACAAACGGAGAAACAGGAGAAAUCGUCUGGGACAAGGGAAGAGACUUCGCAACAGUCAGAAAGG |
| | | UCCUGAGCAUGCCGCAGGUCAACAUCGUCAAGAAGACAGAAGUCCAGACAGGAGGAUUCAGCAAGGAAAGCAUCCU |
| | | GCCGAAGAGAAACAGCGACAAGCUGAUCGCAAGAAAGAAGGACUGGGACCCGAAGAAGUACGGAGGAUUCGACAG |
| | | CCCGACAGUCGCAUACAGCGUCCUGGUCGUCGCAAGGUCGAAAAGGGAAAGAGCAAGAAGCUGAAGAGCGUCAA |
| | | GGAACUGCUGGGAAUCACAAUCAUGGAAAGAAGCAGCUUCGAAAAGAACCCGAUCGACUUCCUGGAAGCAAAGGG |
| | | AUACAAGGAAGUCAAGAAAGGACCUGAUCAUCAAGCUGCCGAAGUACAGCCUGUUCGAACUGGAAAACGGAAGAAA |
| | | GAGAAUGCUGGCAAGCGCAGGAGAACUGCAGAAGGGAAACGAACUGGCACUGCCGAGCAAGUACGUCAACUUCCU |
| | | GUACCUGGCAAGCCACUACGAAAAGCUGAAGGGAAGCCCGGAAGACAACGAACAGAAGCAGCUGUUCGUCGAACAG |
| | | CACAAGCACUACCUGGACGAAAUCAUCGAACAGAUCAGCGAAUUCAGCAAGAGAGUCAUCCUGGCAGACGCAAACC |
| | | UGGACAAGGUCCUGAGCGCAUACAACAAGCACAGAGACAAGCCGAUCAGAGAACAGGCAGAAAACAUCAUCCACCU |
| | | GUUCACACUGACAAACCUGGGAGCACCGGCAGCAUUCAAGUACUUCGACACAACAAUCGACAGAAAGAGAUACACA |
| | | AGCACAAAGGAAGUCCUGGACGCAACACUGAUCCACCAGAGCAUCACAGGACUGUACGAAACAAGAAUCGACCUGA |
| | | GCCAGCUGGGAGGAGACGGAGGAGGAAGCCCGAAGAAGAAGAGAAAGGUCUAG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| 3507 | dCas9 (D10A H840A) mRNA ORF | AUGGACAAGAAGUACAGCAUCGGACUGGCAAUCGGAACAAACAGCGUCGGAUGGGCAGUCAUCACAGACGAAUAC |
| | | AAGGUCCCGAGCAAGAAGUUCAAGGUCCUGGGAAACACAGACACAGCAUCAAGAAGAACCUGAUCGGAGCAC |
| | | UGCUGUUCGACAGCGGAGAAACAGCAGAAGCAACAAGAGUGAAGAGAACAGCAAGAAGAAGAUACACAAGAAGAAA |
| | | GAACAGAAUCUGCUACCUGCAGGAAAUCUUCAGCAACGAAAUGGCAAAGGUCGACGACAGCUUCUUCCACAGACUG |
| | | GAAGAAAGCUUCCUGGUCGAAGAAGACAAGAAGCACGAAAGACACCCGAUCUUCGGAAACAUCGUCGACGAAGUCG |
| | | CAUACCACGAAAAGUACCCGACAAUCUACCACCUGAGAAAGAAGCUGGUCGACAGCACAGACAAGGCAGACCUGAG |
| | | ACUGAUCUACCUGGCACUGGCACACAUGAUCAAGUUCAGAGGACACUUCCUGAUCGAAGGAGACCUGAACCCGGAC |
| | | AACAGCGACGUCGACAAGCUGUUCAUCCAGCUGGUCCAGACAUACAACCAGCUGUUCGAAGAAAACCCGAUCAACG |
| | | CAAGCGGAGUCGACGCAAAGGCAAUCCUGAGCGCAAGACUGAGCAAGAGCAGAAGACUGGAAAACCUGAUCGCACA |
| | | GCUGCCGGGAGAAAAGAAGAACGGACUGUUCGGAAACCUGAUCGCACUGAGCCUGGGACUGACACCGAACUUCAA |
| | | GAGCAACUUCGACCUGGCAGAAGACGCAAAGCUGCAGCUGAGCAAGGACACAUACGACGACGACCUGGACAACCUG |
| | | CUGGCACAGAUCGGAGACCAGUACGCAGACCUGUUCCUGGCAGCAAAGAACCUGAGCGACGCAATCCUGCUGAGCG |
| | | ACAUCCUGAGAGUCAACACAGAAAUCACAAAGGCACCGCUGAGCGCAAGCAUGAUCAAGAGAUACGACGAACACCAC |
| | | CAGGACCUGACACUGCUGAAGGCACUGGUCAGACAGCAGCUGCCGGAAAAGUACAAGGAAAUCUUCUUCGACCAGA |
| | | GCAAGAACGGAUACGCAGGAUACAUCGACGGAGGAGCAAGCCAGGAAGAAUUCUACAAGUUCAUCAAGCCGAUCCU |
| | | GGAAAAGAUGGACGGAACAGAAGAACUGCUGGUCAAGCUGAACAGAGAAGACCUGCUGAGAAAGCAGAGAACAUU |
| | | CGACAACGGAAGCAUCCCGCACCAGAUCCACCUGGGGAGAACUGCACGCAAUCCUGAGAAGACAGGAAGACUUCUAC |
| | | CCGUUCCUGAAGGACAACAGAGAAAAGAUCGAAAAGAUCCUGACAUUCAGAAUCCCGUACUACGUCGGACCGCUGG |
| | | CAAGAGGAAACAGCAGAUUUCGCAUGGAUGACAAGAAAGAGCGAAGAAACAAUCACACCGUGGAACUUCGAAGAAG |
| | | UCGUCGACAAGGGAGCAAGCGCACAGAGCUUCAUCGAAAGAAUGACAAACUUCGACAAGAACCUGCCGAACGAAAA |
| | | GGUCCUGCCGAAGCACAGCCUGCUGUACGAAUACUUCACAGUCUACAACGAACUGACAAAGGUCAAGUACGUCACA |
| | | GAAGGAAUGAGAAAGCCGGCAUUCCUGAGCGGAGAACAGAAGAAGGCAAUCGUCGACCUGCUGUUCAAGACAAAC |
| | | AGAAAGGUCACAGUCAAGCAGCUGAAGGAAGACUACUUCAAGAAGAUCGAAUGCUUCGACAGCGUCGAAAUCAGC |
| | | GGAGUCGAAGACAGAUUUCAACGCAAGCCUGGGGAACAUACCACGACCUGCUGAAGAUCAUCAAGGACAAGGACUUCCUC |
| | | UGGACAACGAAGAAAACGAAGACAUCCUGGAAGACAUCGUCCUGACACUGACCUUGUUCGAAGACAGAGAAAUGA |
| | | UCGAAGAAAGACUGAAGACAUACGCACACCUGUUCGACGACAAGGUCAUGAAGCAGCUGAAGAGAAGAAGAUACAC |
| | | AGGAUGGGGAAGACUGAGCAGAAAGCUGAUCAACGGAAUCAGAGACAAGCAGAGCGGAAAGACAAUCCUGGACUU |
| | | CCUGAAGAGCGACGGAUUCGCAAACAGAAACUUCAUGCAGCUGAUCCACGACAGCCUGACAUUCAAGGAAGAC |
| | | AUCCAGAAGGCACAGGUCAGCGGACAGGGAGACAGCCUGCACGAACACAUCGCAAACCUGGCAGGAAGCCCGGCAA |
| | | UCAAGAAGGGAAUCCUGCAGACAGUCAAGGUCGUCGACGAACUGGUCAAGGUCAUGGGAAGACACAAGCCGGAAA |
| | | ACAUCGUCAUCGAAUGGCAAGAGAAAACCAGACAACACAGAAGGGACAGAAGAACAGCAGAGAAAGAAUGAAGAG |
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| SEQ ID NO | Name | Sequence |
|---|---|---|
| | | GAAAAGCUGUACCUGUACUACCUGCAGAACGGAAGAGACAUGUACGUCGACCAGGAACUGGACAUCAACAGACUG |
| | | AGCGACUACGACGUCGACGCAAUCGUCCCGCAGAGCUUCCUGAAGGACGACAGCAUCGACAACAAGGUCCUGACAA |
| | | GAAGCGACAAGAACAGAGGAAAGAGCGACAACGUCCCGAGCGAAGAAGUCGUCAAGAAGAUGAAGAACUACUGGA |
| | | GACAGCUGCUGAACGCAAAGCUGAUCACACAGAGAAAGUUCGACAACCUGACAAAGGCAGAGAGGAGGGACUGA |
| | | GCGAACUGGACAAGGCAGGAUUCAUCAAGAGACAGCUGGUCGAAACAAGACAGAUCACACAAAGCACGUCGCACAGAU |
| | | CCUGGACAGCAGAAUGAACACAAAGUACGACGAAAACGACAAGCUGAUCAGAGAAGUCAAGGUCAUCACACUGAAG |
| | | AGCAAGCUGGUCAGCGACUUCAGAAAGGACUUCCAGUUCUACAAGGUCAGAGAAAUCAACAACUACCACCACGCAC |
| | | ACGACGCAUACCUGAACGCAGUCGUCGGAACACAGCACUGAUCAAGAAGUACCCGAAGCUGGAAAGCGAAUUCGUCUA |
| | | CGGAGACUACAAGGUCUACGACGUCAGAAAGAUGAUCGCAAAGAGCGAACAGGAAAUCGGAAAGGCAACAGCAAAG |
| | | UACUUCUUCUACAGCAACAUCAUGAACUUCUUCAAGACAGAAAUCACACUGGCAAACGGAGAAAUCAGAAAGAGAC |
| | | CGCUGAUCGAAACAAACGGAGAAACAGGAGAAAUCGUCUGGGACAAGGGAAAGAGACUUUCGCAACAGUCAGAAAGG |
| | | UCCUGAGCAUGCCGCAGGUCAACAUCGUCAAGAAGACAGAAGGUCCAGACAGGAGGAUUCAGCAAGGAAAGCAUCCU |
| | | GCCGAAGAGAAACAGCGACAAGCUGAUCGCAAGAAAGAAGGACUGGGACCCGAAGAAGUACGGAGGAUUCGACAG |
| | | CCCGACAGUCGCAUACAGCGUCCUGGUCGUCGCAAAGGUCGAAAAGGGAAAGAGCAAGAAGCUGAAGAGCGUCAA |
| | | GGAACUGCUGGGAAUCACAAUCAUGGAAAGAAGCAGCUUCGAAAAGAACCCGAUCGACUUCCUGGAAGCAAAGGG |
| | | AUACAAGGAAGUCAAGAAGGACCUGAUCAUCAAGCUGCCGAAGUACAGCCUGUUCGAACUGGAAAACGGAAGAAA |
| | | GAGAAUGCUGGCAAGCGCAGGAGAACUGCAGAAGGGAAACGAACUGGCACUGCCGAGCAAGUACGUCAACUUCCU |
| | | GUACCUGGCAAGCCACUACGAAAAGCUGAAGGGAAGCCCGGAAGACAACGAACAGAAGCAGCUGUUCGUCGAACAG |
| | | CACAAGCACUACCUGGACGAAAUCAUCGAACAGAUCAGCGAAUUCAGCAAGAGAGUCAUCCUGGCAGACGCAAACC |
| | | UGGACAAGGUCCUGAGCGCAUACAACAAGCACAGAGACAAGCCGAUCAGAGAACAGGCAGAAAACAUCAUCCACCU |
| | | GUUCACACUGACAAACCUGGGAGCACCGGCAGCAUUCAAGUACUUCGACACAACAAUCGACAGAAAGAGAUACACA |
| | | AGCACAAAGGAAGUCCUGGACGCAACACUGAUCCACCAGAGCAUCACAGGACUGUACGAAACAAGAAUCGACCUGA |
| | | GCCAGCUGGGAGGAGACGGAGGAGGAAGCCCGAAGAAGAAGAGAAAGGUCUAG |
| 3508 | Cas9 bare coding sequence | GACAAGAAGUACAGCAUCGGACUGGACAUCGGAACAAACAGCGUCGGAUGGGCAGUCAUCACAGACGAAUACAAG |
| | | GUCCCGAGCAAGAAGUUCAAGGUCCUGGGAAACACAGACGACACAGCAUCAAGAAGAACCUGAUCGGAGCACUGC |
| | | UGUUCGACAGCGGAGAAACAGCAGAAGCAACAAGACUGAAGAGAACAGCAAGAAGAAGAUACACAAGAAGAAAGAA |
| | | CAGAAUCUGCUACCUGCAGGAAAUCUUCAGCAACGAAAUGGCAAAGGUCGACGACAGCUUCUUCCACAGACUGGAA |
| | | GAAAGCUUCCUGGUCGAAGAAGACAAGAAGCACGAAAGACACCCGAUCUUCGGAAACAUCGUCGACGAAGUCGCAU |
| | | ACCACGAAAAGUACCCGACAAUCUACCACCUGAGAAAGAAGCUGGUCGACAGCACAGACAAGGCAGACCUGAGACU |
| | | GAUCUACCUGGCACUGGCACACAUGAUCAAGUUCAGAGGACACUUCCUGAUCGAAGGAGACCUGAACCCGGACAAC |
| | | AGCGACGUCGACACAAGCUGUUCAUCCAGCUGGUCCAGACAUACAACCAGCUGUUCGAAGAAAACCCGAUCAACGCAA |
| | | GCGGAGUCGACGCAAAGGCAAUCCUGAGCGCAAGACUGAGCAAGAGCAGAAGACUGGAAAACCUGAUCGCACAGCU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| | | GCCGGGAGAAAAGAAGAACGGACUGUUCGGAAACCUGAUCGCACUGAGCCUGGGACUGACACCGAACUUCAAGAG |
| | | CAACUUCGACCUGGCAGAAGACGCAAAGCUGCAGCUGAGCAAGGACACAUACGACGACGACCUGGACAACCUGCUG |
| | | GCACAGAUCGGAGACCAGUACGCAGACCUGUUCCUGGCAGCAAAGAACCUGAGCGACGCAAUCCUGCUGAGCGACA |
| | | UCCUGAGAGUCAACACAGAAAUCACACAAAGGCACCGCUGAGCGCAAGCAUGAUCAAGAGAUACGACGAACACCACCA |
| | | GGACCUGACACUGCUGAAGGCACUGGUCAGACAGCUGCCGGAAAAGUACAAGGAAAUCUUCUUCGACCAGAAG |
| | | CAAGAACGGAUACGCAGGAUACAUCGACGGAGGAGCAAGCCAGGAAGAAUUCUACAAGUUCAUCAAGCCGAUCCUG |
| | | GAAAAGAUGGACGGAACAGAAGAACUGCUGGUCAAGCUGAACAGAGAAGACCUGCUGAGAAAGCAGAGAACAUUC |
| | | GACAACGGAAGCAUCCCGCACCAGAUCCACCUGGGAGAACUGCACGCAAUCCUGAGAAGACAGGAAGACUUCUACC |
| | | CGUUCCUGAAGGACAACAGAGAAAAGAUCGAAAAGAUCCUGACAUUCAGAAUCCCGUACUACGUCGGACCGCUGGC |
| | | AAGAGGAAACAGCAGAUUCGCAUGGAUGACAAGAAAGAGCGAAGAAACAAUCACACCGUGGAACUUCGAAGAAGU |
| | | CGUCGACAAGGGAGCAAGCGCACAGAGCUUCAUCGAAAGAAUGACAAACUUCGACAAGAACCUGCCGAACGAAAAG |
| | | GUCCUGCCGAAGCACAGCCUGCUGUACGAAUACUUCACAGUCUACAACGAACUGACAAAGGUCAAGUACGUCACAG |
| | | AAGGAAUGAGAAAGCCGGCAUUCCUGAGCGGAGAACAGAAGAAGGCAAUCGUCGACCUGCUGUUCAAGACAAACA |
| | | GAAAGGUCACAGUCAAGCAGCUGAAGGAAGACUACUUCAAGAAGAUCGAAUGCUUCGACAGCGUCGAAAUCAGCG |
| | | GAGUCGAAGACAGAUUCAACGCAAGCCUGGGAACAUACCACGACCUGCUGAAGAUCAUCAAGGACAAGGACUUCCU |
| | | GGACAACGAAGAAAACGAAGACAUCCUGGAAGACAUCGUCCUGACACUGACACUGUUCGAAGACAGAGAAAUGAUC |
| | | GAAGAAAGACUGAAGACAUACGCACACCUGUUCGACGACAAGGUCAUGAAGCAGCUGAAGAGAAGAAGAUACACA |
| | | GGAUGGGGAAGACUGAGCAGAAAGCUGAUCAACGGAAUCAGAGACAAGCAGAGCGGAAAGACAAUCCUGGACUUC |
| | | CUGAAGAGCGACGGAUUCGCAAACAGAAACUUCAUGCAGCUGAUCCACGACGACAGCCUGACAUUCAAGGAAGACA |
| | | UCCAGAAGGCACAGGUCAGCGGACAGGGAGACAGCCUGCACGAACACAUCGCAAACCUGGCAGGAAGCCCGGCAAU |
| | | CAAGAAGGGAAUCCUGCAGACAGUCAAGGUCGUCGACGAACUGGUCAAGGUCAUGGGAAGACACAAGCCGGAAAA |
| | | CAUCGUCAUCGAAAUGGCAAGAGAAAACCAGACAACACAGAAGGGACAGAAGAACAGCAGAGAAAGAAUGAAGAGA |
| | | AUCGAAGAAGGAAUCAAGGAACUGGGAAGCCAGAUCCUGAAGGAACACCCGGUCGAAAACACACAGCUGCAGAACG |
| | | AAAAGCUGUACCUGUACUACCUGCAGAACGGAAGAGACAUGUACGUCGACCAGGAACUGGACAUCAACAGACUGA |
| | | GCGACUACGACGUCGACCACAUCGUCCCGCAGAGCUUCCUGAAGGACGACAUCGACAACAACAAGGUCCUGACAAG |
| | | AAGCGACAAGAACAGAGGAAAGAGCGACAACGUCCCGAGCGAAGAAGUCGUCAAGAAGAUGAAGAACUACUGGAG |
| | | ACAGCUGCUGAACGCAAAGCUGAUCACACAGAGAAAGUUCGACAACCUGACAAAGGCAGAGAGGAGGACUGAGC |
| | | GAACUGGACAAGGCAGGAUUCAUCAAGAGACAGCUGGUCGAAACAAGACAGAUCACACAAAGCACGUCGCACAGAUCC |
| | | UGGACAGCAGAAUGAACACAAAGUACGACGAAAACGACAAGCUGAUCAGAGAAGUCAAGGUCACUCACACUGAAGAG |
| | | CAAGCUGGUCAGCGACUUCAGAAAGGACUUCCAGUUCUACAAGGUCAGAGAAAUCAACAACUACCACGCACAC |
| | | GACGCAUACCUGAACGCAGUCGUCGGAACAGCACUGAUCAAGAAGUACCCGAAGCUGGAAAGCGAAUUCGUCUACG |
| | | GAGACUACAAGGUCUACGACGUCAGAAAGAUGAUCGCAAAGAGCGAACAGGAAAUCGGAAAGGCAACAGCAAAGU |

| SEQ ID NO | Name | Sequence |
|---|---|---|
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| | | GCUGAUCGAAACAAACGGAGAAACAGGAGAAAUCGUCUGGGACAAGGGAAGAGACUUCGCAACAGUCAGAAAGGU |
| | | CCUGAGCAUGCCGCAGGUCAACAUCGUCAAGAAGACAGAAGUCCAGACACGAGGAGGAUUCAGCAAGGAAAGCAUCCUG |
| | | CCGAAGAGAAACAGCGACAAGCUGAUCGCAAGAAAGAAGGACUGGGACCCGAAGAAGUACGGAGGAUUCGACAGCC |
| | | CGACAGUCGCAUACAGCGUCCUGGUCGUCGCAAGGUCGAAAAGGGAAAGAGCAAGAAGCUGAAGAGCGUCAAGG |
| | | AACUGCUGGGAAUCACAAUCAUGGAAAGAAGCAGCUUCGAAAAGAACCCGAUCGACUUCCUGGAAGCAAAGGGAU |
| | | ACAAGGAAGUCAAGAAGGACCUGAUCAUCAAGCUGCCGAAGUACAGCCUGUUCGAACUGGAAAACGGAAGAAAGA |
| | | GAAUGCUGGCAAGCGCAGGAGAACUGCAGAAGGGAAACGAACUGGCACUGCCGAGCAAGUACGUCAACUUCCUGU |
| | | ACCUGGCAAGCCACUACGAAAAGCUGAAGGGAAGCCCGGAAGACAACGAACAGAAGCAGCUGUUCGUCGAACAGCA |
| | | CAAGCACUACCUGGACGAAAUCAUCGAACAGAUCAGCGAAUUCAGCAAGAGAGUCAUCCUGGCAGACGCAAACCUG |
| | | GACAAGGUCCUGAGCGCAUACAACAAGCACAGAGACAAGCCGAUCAGAGAACAGGCAGAAAACAUCAUCCACCUGU |
| | | UCACACUGACAAACCUGGGAGCACCGGCAGCAUUCAAGUACUUCGACACAACAAUCGACAGAAAGAGAUACACAAG |
| | | CACAAAGGAAGUCCUGGACGCAACACUGAUCCACCAGAGCAUCACAGGACUGUACGAAACAAGAAUCGACCUGAGC |
| | | CAGCUGGGAGGAGACGGAGGAGGAAGCCCGAAGAAGAAGAGAAAGGUC |
| 3509 | Cas9 nickase bare coding sequence | GACAAGAAGUACAGCAUCGGACUGGCAAUCGGAACAAACAGCGUCGGAUGGGCAGUCAUCACAGACGAAUACAAG |
| | | GUCCCGAGCAAGAAGUUCAAGGUCCUGGGAAACACAGACGACACAGCAUCAAGAAGAACCUGAUCGGAGCACUGC |
| | | UGUUCGACAGCGGAGAAACAGCAGAAGCAACAAGACUGAAGAGAACAGCAAGAAGAAGAUACACAAGAAGAAAGAA |
| | | CAGAAUCUGCUACCUGCAGGAAAUCUUCAGCAACGAAAUGGCAAAGGUCGACGACAGCUUCUUCCACAGACUGGAA |
| | | GAAAGCUUCCUGGUCGAAGAAGACAAGAAGCACGAAAGACACCCGAUCUUCGGAAACAUCGUCGACGAAGUCGCAU |
| | | ACCACGAAAAGUACCCGACAAUCUACCACCUGAGAAAGAAGCUGGUCGACAGCACAGACAAGGCAGACCUGAGACU |
| | | GAUCUACCUGGCACUGGCCUUCAAGUCAAGUUCAGAGGACACUUCCUGAUCGAAGGAGACCUGAACCCGGACAAC |
| | | AGCGACGUCGACAAGCUGUUCAUCCAGCUGGUCCAGACAUACAACCAGCUGUUCGAAGAAAACCCGAUCAACGCAA |
| | | GCGGAGUCGACGCAAAGGCAAUCCUGAGCGCAAGACUGAGCAAGAGCAGAAGACUGGAAAACCUGAUCGCACAGCU |
| | | GCCGGGGAGAAAAGAAGAACGGACUGUUCGGAAACCUGAUCGCACUGAGCCUGGGACUGACACCGAACUUCAAGAG |
| | | CAACUUCGACCUGGCAGAAGACGCAAAGCUGCAGCUGAGCAAGGACACAUACGACGACGACCUGGACAACCUGCUG |
| | | GCACAGAUCGGAGACCAGUACGCAGACCUGUUUCCUGGCAGCAAAGAACCUGAGCGACGCAAUCCUGCUGAGCGACA |
| | | UCCUGAGAGUCAACACAGAAAUCACAAAGGCACCGCUGAGCGCAAGCAUGAUCAAGAGAUACGACGAACACCACCA |
| | | GGACCUGACACUGCUGAAGGCACUGGUCAGACAGCAGCUGCCGGAAAAGUACAAGGAAAUCUUCUUCGACCAGAG |
| | | CAAGAACGGAUACGCAGGAUACAUCGACGGAGGAGCAAGCCAGGAAGAAUUCUACAAGUUCAUCAAGCCGAUCCUG |
| | | GAAAAGAUGGACGGAACAGAAGAACUGCUGGUCAAGCUGAACAGAGAAGACCUGCUGAGAAAGCAGAGAACAUUC |
| | | GACAACGGAAGCAUCCCGCACCAGAUCCACCUGGGAGAACUGCACGCAAUCCUGAGAAGACAGGAAGACUUCUACC |
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| SEQ ID NO | Name | Sequence |
|---|---|---|
| | | AAGAGGAAACAGCAGAUUCGCAUGGAUGACAAGAAAGAGCGAAGAAACAAUCACACCGUGGAACUUCGAAGAAGU |
| | | CGUCGACAAGGGAGCAAGCGCACAGAGCUUCAUCGAAAGAAUGACAAACUUCGACACAAGAACCUGCCGAACGAAAAG |
| | | GUCCUGCCGAAGCACAGCCUGCUGUACGAAUACUUCACAGUCUACAACGAACUGACAAAGGUCAAGUACGUCACAG |
| | | AAGGAAUGAGAAAGCCGGCAUUCCUGAGCGGAGAACAGAAGAAGGCAAUCGUCGACCUGCUGUUCAAGACAAACA |
| | | GAAAGGUCACAGUCAAGCAGCUGAAGGAAGACUACUUCAAGAAGAUCGAAUGCUUCGACAGCGUCGAAAUCAGCG |
| | | GAGUCGAAGACAGAUUCAACGCAAGCCUGGGAACAUACCACGACCUGCUGAAGAUCAUCAAGGACAAGGACUUCCU |
| | | GGACAACGAAGAAAACGAAGACAUCCUGGAAGACAUCGUCCUGACACUGACGUUUCGAAGACAGAGAAAUGAUC |
| | | GAAGAAAGACUGAAGACAUACGCACACCUGUUCGACGACAAGGUCAUGAAGCAGCUGAAGAGAAGAAGAUACACA |
| | | GGAUGGGGAAGACUGAGCAGAAAGCUGAUCAACGGAAUCAGAGACAAGCAGAGCGGAAAGACAAUCCUGGACUUC |
| | | CUGAAGAGCGACGGAUUCGCAAACAGAAACUUCAUGCAGCUGAUCCACGACGACAGCCUGACAUUCAAGGAAGACA |
| | | UCCAGAAGGCACAGGUCAGCGGACAGGGAGACAGCCUGCACGAACACAUCGCAAACCUGGCAGGAAGCCCGGCAAU |
| | | CAAGAAGGGAAUCCUGCAGACAGUCAAGGUCGUCGACGAACUGGUCAAGGUCAUGGGAAGACACAAGCCGGAAAA |
| | | CAUCGUCAUCGAAAUGGCAAGAGAAAACCAGACAACACAGAAGGGACAGAAGAACAGCAGAGAAAGAAUGAAGAGA |
| | | AUCGAAGAAGGAAUCAAGGAACUGGGAAGCCAGAUCCUGAAGGAACACCCGGUCGAAAACACACAGCUGCAGAACG |
| | | AAAAGCUGUACCUGUACUACCUGCAGAACGGAAGAGACAUGUACGUCGACCAGGAACUGGACAUCAACAGACUGA |
| | | GCGACUACGACGUCGACCACACAUCGUCCCGCAGAGCUUCCUGAAGGACGACAGCAUCGACAACAAGGUCCUGACAAG |
| | | AAGCGACAAGAACAGAGGAAAGAGCGACAACGUCCCGAGCGAAGAAGUCGUCAAGAAGAUGAAGAACUACUGGAG |
| | | ACAGCUGCUGAACGCAAAGCUGAUCACACAGAGAAAGUUCGACAACCUGACAAAGGCAGAGAGAGGAGGACUGAGC |
| | | GAACUGGACAAGGCAGGAUUCAUCAAGAGACAGCUGGUCGAAACAAGACAGAUCACAAAGCACGUCGCACAGAUCC |
| | | UGGACAGCAGAAUGAACACAAAGUACGACGAAAACGACAAGCUGAUCAGAGAAGUCAAGGUCAUCACACUGAAGAG |
| | | CAAGCUGGUCAGCGACUUCAGAAAGGACUUCCAGUUCUACAAGGUCAGAGAAAUCAACAACUACCACCACGCACAC |
| | | GACGCAUACCUGAACGCAGUCGUCGGAACACAGCACUGAUCAAGAAGUACCCGAAGCUGGAAAGCGAAUUCGUCUACG |
| | | GAGACUACAAGGUCUACGACGUCAGAAAGAUGAUCGCAAAGAGCGAACAGGAAAUCGGAAAGGCAACAGCAAAGU |
| | | ACUUCUUCUACAGCAACAUCAUGAACUUCUUCAAGACAGAAAUCACACUGGCAAACGGAGAAAUCAGAAAGAGACC |
| | | GCUGAUCGAAACAAACGGAGAAACAGGAGAAAUCGUCUGGGACAAGGGAAGAGACUUCGCAACAGUCAGAAAGGU |
| | | CCUGAGCAUGCCGCAGGUCAACAUCGUCAAGAAGACAGAAGUCCAGACAGGAGGAUUCAGCAAGGAAAGCAUCCUG |
| | | CCGAAGAGAAACAGCGACAAGCUGAUCGCAAGAAAGAAGGACUGGGACCCGAAGAAGUACGGAGGAUUCGACAGCC |
| | | CGACAGUCGCAUACAGCGUCCUGGUCGUCGCAAAGGUCGAAAAGGGAAAGAGCAAGAAGCUGAAGAGCGUCAAGG |
| | | AACUGCUGGGAAUCACAAUCAUGGAAAGAAGCAGCUUCGAAAAGAACCCGAUCGACUUCCUGGAAGCAAAGGGAU |
| | | ACAAGGAAGUCAAGAAGGACCUGAUCAUCAAGCUGCCGAAGUACAGCCUGUUCGAACUGGAAAACGGAAGAAAGA |
| | | GAAUGCUGGCAAGCGCAGGAGAACUGCAGAAGGGAAACGAACUGGCACUGCCGAGCAAGUACGUCAACUUCCUGU |
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| SEQ ID NO | Name | Sequence |
|---|---|---|
| | | CAAGCACUACCUGGACGAAAUCAUCGAACAGAUCAGCGAAUUCAGCAAGAGAGUCAUCCUGGCAGACGCAAACCUG |
| | | GACAAGGUCCUGAGCGCAUACAACAAGCACAGAGACAAGCCGAUCAGAGAACAGGCAGAAAACAUCAUCCACCUGU |
| | | UCACACUGACAAACCUGGGAGCACCGGCAGCAUUCAAGUACUUCGACACAACAAUCGACAGAAAGAGAUACACAAG |
| | | CACAAAGGAAGUCCUGGACGCAACACUGAUCCACCAGAGCAUCACAGGACUGUACGAAACAAGAAUCGACCUGAGC |
| | | CAGCUGGGAGGAGACGGAGGAAGCCCGAAGAAGAAGAGAAAGGUC |
| 3510 | dCas9 bare coding sequence | GACAAGAAGUACAGCAUCGGACUGGCAAUCGGAACAAACAGCGUCGGAUGGGCAGUCAUCACAGACGAAUACAAG |
| | | GUCCCGAGCAAGAAGUUCAAGGUCCUGGGAAACACAGACACAGCAUCAAGAAGAACCUGAUCGGAGCACUGC |
| | | UGUUCGACAGCGGAGAAACAGCAGAAGCAACAAGACUGAAGAGAACAGCAAGAAGAUACACAAGAAGAAAGAA |
| | | CAGAAUCUGCUACCUGCAGGAAAUCUUCAGCAACGAAAUGGCAAAGGUCGACGACAGCUUCUUCCACAGACUGGAA |
| | | GAAAGCUUCCUGGUCGAAGAAGACAAGAAGCACGAAAGACACCCGAUCUUCGGAAACAUCGUCGACGAAGUCGCAU |
| | | ACCACGAAAAGUACCCGACAAUCUACCACCUGAGAAAGAAGCUGGUCGACAGCACAGACAAGGCAGACCUGAGACU |
| | | GAUCUACCUGGCACUGGCACACAUGAUCAAGUUCAGAGGACACUUCCUGAUCGAAGGAGACCUGAACCCGGACAAC |
| | | AGCGACGUCGACAAGCUGUUCAUCCAGCUGGUCCAGACAUACAACCAGCUGUUCGAAGAAAACCCGAUCAACGCAA |
| | | GCGGAGUCGACGCAAAGGCAAUCCUGAGCGCAAGACUGAGCAAGAGCAGAAGACUGGAAAACCUGAUCGCACAGCU |
| | | GCCGGGAGAAAAGAAGAACGGACUGUUCGGAAACCUGAUCGCACUGAGCCUGGGACUGACACCGAACUUCAAGAG |
| | | CAACUUCGACCUGGCAGAAGACGCAAAGCUGCAGCUGAGCAAGGACACAUACGACGACGACCUGGACAACCUGCUG |
| | | GCACAGAUCGGAGACCAGUACGCAGACCUGUUCCUGGCAGCAAAGAACCUGAGCGACGCAAUCCUGCUGAGCGACA |
| | | UCCUGAGAGUCAACACAGAAAUCACAAAGGCACCGCUGAGCGCAAGCAUGAUCAAGAGAUACGACGAACACCACCA |
| | | GGACCUGACACUGCUGAAGGCACUGGUCAGACAGCAGCUGCCGGAAAAGUACAAGGAAAUCUUCUUCGACCAGAG |
| | | CAAGAACGGAUACGCAGGAUACAUCGACGGAGGAGCAAGCCAGGAAGAAUUCUACAAGUUCAUCAAGCCGAUCCUG |
| | | GAAAAGAUGGACGGAACAGAAGAACUGCUGGUCAAGCUGAACAGAGAAGACCUGCUGAGAAAGCAGAGAACAUUC |
| | | GACAACGGAAGCAUCCCGCACCAGAUCCACCUGGGAGAACUGCACGCAAUCCUGAGAAGACAGGAAGACUUCUACC |
| | | CGUUCCUGAAGGACAACAGAGAAAAGAUCGAAAAGAUCCUGACAUUCAGAAUCCCGUACUACGUCGGACCGCUGGC |
| | | AAGAGGAAACAGCAGAUUCGCAUGGAUGACAAGAAAGAGCGAAGAAACAAUCACACCGUGGAACUUCGAAGAAGU |
| | | CGUCGACAAGGGAGCAAGCGCACAGAGCUUCAUCGAAAGAAUGACAAACUUCGACAAGAACCUGCCGAACGAAAAG |
| | | GUCCUGCCGAAGCACAGCCUGCUGUACGAAUACUUCACAGUCUACAACGAACUGACAAAGGUCAAGUACGUCACAG |
| | | AAGGAAUGAGAAAGCCGGCAUUCCUGAGCGGAGAACAGAAGAAGGCAAUCGUCGACCUGCUGUUCAAGACAAACA |
| | | GAAAGGUCACAGUCAAGCAGCUGAAGGAAGACUACUUCAAGAAGAUCGAAUGCUUCGACAGCGUCGAAAUCAGCG |
| | | GAGUCGAAGACAGAUUCAACGCAAGCCUGGGAACAUACCACGACCUGCUGAAGAUCAUCAAGGACAAGGACUUCCU |
| | | GGACAACGAAGAAAACGAAGACAUCCUGGAAGACAUCGUCCUGACACUGACGUUUCGAAGACAGAGAAAUUGAUC |
| | | GAAGAAAGACUGAAGACAUACGCACACCUGUUCGACGACAAGGUCAUGAAGCAGCUGAAGAGAAGAAGAUACACA |
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| SEQ ID NO | Name | Sequence |
|---|---|---|
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| | | CAAGAAGGGAAUCCUGCAGACAGUCAAGGUCGUCGACGAACUGGUCAAGGUCAUGGGAAGACACAAGCCGGAAAA |
| | | CAUCGUCAUCGAAAUGGCAAGAGAAAACCAGACAACACAGAAGGGACAGAAGAACAGCAGAGAAAGAAUGAAGAGA |
| | | AUCGAAGAAGGAAUCAAGGAACUGGGAAGCCAGAUCCUGAAGGAACACCCGGUCGAAAACACACAGCUGCAGAACG |
| | | AAAAGCUGUACCUGUACUACCUGCAGAACGGAAGAGACAUGUACGUCGACCAGGAACUGGACAUCAACAGACUGA |
| | | GCGACUACGACGUCGACGCAAUCGUCCCGCAGAGCUUCCUGAAGGACGACAGCAUCGACAACAAGGUCCUGACAAG |
| | | AAGCGACAAGAACAGAGGAAAGAGCGACAACGUCCCGAGCGAAGAAGUCGUCAAGAAGAUGAAGAACUACUGGAG |
| | | ACAGCUGCUGAACGCAAAGCUGAUCACACAGAGAAAGUUCGACACAACCUGACAAAGGCAGAGAGAGGAGGACUGAGC |
| | | GAACUGGACAAGGCAGGAUUCAUCAAGAGACAGCUGGUCGAAACAAGACAGAUCACAAAGCACGUCGCACAGAUCC |
| | | UGGACAGCAGAAUGAACACAAAGUACGACGAAAACGACAAGCUGAUCAGAGAAGUCAAGGUCAUCACACUGAAGAG |
| | | CAAGCUGGUCAGCGACUUCAGAAAGGACUUCCAGUUCUACAAGGUCAGAGAAAUCAACAACUACCACGCACACAC |
| | | GACGCAUACCUGAACGCAGUCGUCGGAACAGCACUGAUCAAGAAGUACCCGAAGCUGGAAAGCGAAUUCGUCUACG |
| | | GAGACUACAAGGUCUACGACGUCAGAAAGAUGAUCGCAAAGAGCGAACAGGAAAUCGGAAAGGCAACAGCAAAGU |
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| | | CCUGAGCAUGCCGCAGGUCAACAUCGUCAAGAAGACAGAAGUCCAGACAGGAGGAUUCAGCAAGGAAAGCAUCCUG |
| | | CCGAAGAGAAACAGCGACAAGCUGAUCGCAAGAAAGAAGGACUGGGACCCGAAGAAGUACGGAGGAUUCGACAGCC |
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| | | AACUGCUGGGAAUCACAAUCAUGGAAAGAAGCAGCUUCGAAAAGAACCCGAUCGACUUCCUGGAAGCAAAGGGAU |
| | | ACAAGGAAGUCAAGAAAGGACCUGAUCAUCAAGCUGCCGAAGUACAGCCUGUUCGAACUGGAAAACGGAAGAAAGA |
| | | GAAUGCUGGGCAAGCGCAGGAGAACUGCAGAAGGGAAACGAACUGGCACUGCCGAGCAAGUACGUCAACUUCCUGU |
| | | ACCUGGCAAGCCACUACGAAAAGCUGAAGGGAAGCCCGGAAGACAACGAAGCAGCUGUUCGUCGAACAGCA |
| | | CAAGCACUACCUGGACGAAAUCAUCGAACAGAUCAGCGAAUUCAGCAAGAGAGUCAUCCUGGCAGACGCAAACCUG |
| | | GACAAGGUCCUGAGCGCAUACAACAAGCACAGAGACAAGCCGAUCAGAGAACAGGCAGAAAACAUCAUCCACCUGU |
| | | UCACACUGACAAACCUGGGAGCACCGGCAGCAUUCAAGUACUUCGACACAACAAUCGACAGAAAGAGAUACACAAG |
| | | CACAAAGGAAGUCCUGGACGCAACACUGAUCCACCAGAGCAUCACAGGACUGUACGAAACAAGAAUCGACCUGAGC |
| | | CAGCUGGGAGGAGACGGAGGAGGAAGCCCGAAGAAGAAGAGAAAGGUC |
| 3511 | Cas9 mRNA ORF using minimal uridine codons, with start and stop codons | AUGGACAAGAAGUACAGCAUCGGACUGGACAUCGGUCGGAACAAACAGCGUCGGAUGGGCAGUCAUCACAGACGAAUAC |
| | | AAGGUCCCGAGCAAGAAGUUCAAGGUCCUGGGAAACACAGACACAGCAUCAAGAAGAACCUGAUCGGAGCAC |
| | | UGCUGUUCGACAGCGGAGAAACAGCAGAAGCAACAAGACUGAAGAGAACAGCAAGAAGAAGAUACACAAGAAAA |
| | | GAACAGAAUCUGCUACCUGCAGGAAAUCUUCAGCAACGAAAUGGCAAAGGUCGACGACAGCUUCUUCCACAGACUG |

| SEQ ID NO | Name | Sequence |
|---|---|---|
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| | | ACUGAUCUACCUGGCACACAUGAUCAAGUUCAGAGGACACUUCCUGAUCGAAGGAGACCUGAACCCGGAC |
| | | AACAGCGACGUCGACAAGCUGUUCAUCCAGCUGGUCCAGACAUACAACCAGCUGUUCGAAGAAAACCCGAUCAACG |
| | | CAAGCGGAGUCGACGCAAAGGCAAUCCUGAGCGCAAGACUGAGAAGCAGAAGACUGGAAAACCUGAUCGCACA |
| | | GCUGCCGGGAGAAAAGAAGAACGGACUGUUCGGAAACCUGAUCGCACUGAGCCCUGGGACUGACACCGAACUUCAA |
| | | GAGCAACUUCGACCUGGCAGAAGACGCAAAGCUGCAGCUGAGCAAGGACACAUACGACGACGACCUGGACAACCUG |
| | | CUGGCACAGAUCGGAGACCAGUACGCAGACCUGUUCCUGGCAGCAAAGAACCUGAGCGACGCAAUCCUGCUGAGCG |
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| | | CAGGACCUGACACUGCUGAAGGCACUGGUCAGACAGCAGCUGCCGGAAAAGUACAAGGAAAUCUUCUUCGACCAGA |
| | | GCAAGAACGGAUACGCAGGAUACAUCGACGGAGGAGCAAGCCAGGAAGAAUUCUACAAGUUCAUCAAGCCGAUCCU |
| | | GGAAAAGAUGGACGGAACAGAAGAACUGCUGGUCAAGCUGAACAGAGAAGACCUGCUGAGAAAGCAGAAGAACAUU |
| | | CGACAACGGAAGCAUCCCGCACCAGAUCCACCUGGGAGAACUGCACGCAAUCCUGAGAAGACAGGAAGACUUCUAC |
| | | CCGUUCCUGAAGGACAACAGAGAAAAGAUCGAAAAGAUCCUGACAUUCAGAAUCCCGUACUACGUCGGACCGCUGG |
| | | CAAGAGGAAACAGCAGAUUCGCAUGGAUGACAAGAAAGAGCGAAGAAACAAUCACACCGUGGAACUUCGAAGAAG |
| | | UCGUCGACAAGGGAGCAAGCGCACAGAGCUUCAUCGAAAGAAUGACAAACUUCGACAAGAACCUGCCGAACGAAAA |
| | | GGUCCUGCCGAAGCACAGCCUGCUGUACGAAUACUUCACAGUCUACAACGAACUGACAAAGGUCAAGUACGUCACA |
| | | GAAGGAAUGAGAAAGCCGGCAUUCCUGAGCGGAGAACAGAAGAAGGCAAUCGUCGACCUGCUGUUCAAGACAAAC |
| | | AGAAAGGUCACAGUCAAGCAGCUGAAGGAAGACUACUUCAAGAAGAUCGAAUGCUUCGACAGCGUCGAAAUCAGC |
| | | GGAGUCGAAGACAGAUUCAACGCAAGCCUGGGAACAUACCACGACCUGCUGAAGAUCAUCAAGGACAAGGACUUCC |
| | | UGGACAACGAAGAAAACGAAGACAUCCUGGAAGACAUCGUCCUGACACUGACACUGUUCGAAGACAGAGAAAUGA |
| | | UCGAAGAAAGACUGAAGACAUACGCACACCUGUUCGACGACAAGGUCAUGAAGCAGCUGAAGAGAAGAAGAUACAC |
| | | AGGAUGGGGAAGACUGAGCAGAAAGCUGAUCAACGGAAUCAGAGACAAGCAGAGCGGAAAGACAAUCCUGGACUU |
| | | CCUGAAGAGCGACGGAUUCGCAAACAGAAACUUCAUGCAGCUGAUCCACGACGACAGCCUGACAUUCAAGGAAGAC |
| | | AUCCAGAAGGCACAGGUCAGCGGACAGGGAGACAGCCUGCACGAACACAUCGCAAACCUGGCAGGAAGCCCGGCAA |
| | | UCAAGAAGGGAAUCCUGCAGACAGUCAAGGUCGUCGACGAACUGGUCAAGGUCAUGGGAAGACACAAGCCGGAAA |
| | | ACAUCGUCAUCGAAAUGGCAAGAGAAAACCAGACAACACAGAAGGGACAGAAGAACAGCAGAGAAAGAAUGAAGAG |
| | | AAUCGAAGAAGGAAUCAAGGAACUGGGAAGCCAGAUCCUGAAGGAACACCCGGUCGAAAACACACAGCUGCAGAAC |
| | | GAAAAGCUGUACCUGUACUACCUGCAGAACGGAAGAGACAUGUACGUCGACCAGGAACUGGACAUCAACAGACUG |
| | | AGCGACUACGACGUCGACCACAUCGUCCCGCAGAGCUUCCUGAAGGACGACAGCAUCGACAACAAGGUCCUGACAA |
| | | GAAGCGACAAGAACAGAGGAAAGAGCGACAACGUCCCGAGCGAAGAAGUCGUCAAGAAGAUGAAGAACUACUGGA |
| | | GACAGCUGCUGAACGCAAAGCUGAUCACACAGAGAAAGUUCGACAACCUGACAAAGGCAGAGAGAGGGAGGGACUGA |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| | | GCGAACUGGACAAGGCAGGAUUCAUCAAGAGACAGCUGGUCGAAACAAGACAGAUCACAAAGCACGUCGCACAGAU |
| | | CCUGGACAGCAGAAUGAACACAAAGUACGACGAAAACGACAAGCUGAUCAGAGAAGUCAAGGUCACUCACACUGAAG |
| | | AGCAAGCUGGUCAGCGACUUCAGAAAGGACUUCCAGUUCUACAAGGUCAGAGAAAUCAACAACUACCACCACGCAC |
| | | ACGACGCAUACCUGAACGCAGUCGUCGGAACACAGCACUGAUCAAGAAGUACCCGAAGCUGGAAAGCGAAUUCGUCUA |
| | | CGGAGACUACAAGGUCUACGACGUCAGAAAGAUGAUCGCAAAGAGCGAACAGGAAAUCGGAAAGGCAACAGCAAAG |
| | | UACUUCUUCUACAGCAACAUCAUGAACUUCUUCAAGACAGAAAUCACACUGGCAAACGGAGAAAUCAGAAAGAGAC |
| | | CGCUGAUCGAAACAAACGGAGAAACAGGAGAAAUCGUCUGGGACAAGGGAAGAGACUUCGCAACAGUCAGAAAGG |
| | | UCCUGAGCAUGCCGCAGGUCAACAUCGUCAAGAAGACAGAAGUCCAGACAGGAGGAUUCAGCAAGGAAAGCAUCCU |
| | | GCCGAAGAGAAACAGCGACAAGCUGAUCGCAAGAAAGAAGGACUGGGACCCGAAGAAGUACGGAGGAUUCGACAG |
| | | CCCGACAGUCGCAUACAGCGUCCUGGUCGUCGCAAAGGUCGAAAAGGGAAAGAGCAAGAAGCUGAAGAGCGUCAA |
| | | GGAACUGCUGGGAAUCACAAUCAUGGAAAGAAGCAGCUUCGAAAAGAACCCGAUCGACUUCCUGGAAGCAAAGGG |
| | | AUACAAGGAAGUCAAGAAGGACCUGAUCAUCAAGCUGCCGAAGUACAGCCUGUUCGAACUGGAAAACGGAAGAAA |
| | | GAGAAUGCUGGCAAGCGCAGGAGAACUGCAGAAGGGAAACGAACUGGCACUGCCGAGCAAGUACGUCAACUUCCU |
| | | GUACCUGGCAAGCCACUACGAAAAGCUGAAGGGAAGCCCGGAAGACAACGAACAGAAGCAGCUGUUCGUCGAACAG |
| | | CACAAGCACUACCUGGACGAAAUCAUCGAACAGAUCAGCGAAUUCAGCAAGAGAGUCAUCCUGGCAGACGCAAACC |
| | | UGGACAAGGUCCUGAGCGCAUACAACAAGCACAGAGACAAGCCGAUCAGAGAACAGGCAGAAAACAUCAUCCACCU |
| | | GUUCACACUGACAAACCUGGGAGCACCGGCAGCAUUCAAGUACUUCGACACAACAAUCGACAGAAAGAGAUACACA |
| | | AGCACAAAGGAAGUCCUGGACGCAACACUGAUCCACCAGAGCAUCACAGGACUGUACGAAACAAGAAUCGACCUGA |
| | | GCCAGCUGGGAGGAGACUAG |
| 3512 | Cas9 coding sequence using minimal uridine codons (no start or stop codons; suitable for inclusion in fusion protein coding sequence) | GACAAGAAGUACAGCAUCGGACUGGACAUCGGAACAAACAGCGUCGGAUGGGCAGUCAUCACAGACGAAUACAAG |
| | | GUCCCGAGCAAGAAGUUCAAGGUCCUGGGAAACACAGACACAGCAUCAAGAAGAACCUGAUCGGAGCACUGC |
| | | UGUUCGACAGCGGAGAAACAGCAGAAGCAACAAGACUGAAGAGAACAGCAAGAAGAAGAUACACAAGAAGAAAGAA |
| | | CAGAAUCUGCUACCUGCAGGAAAUCUUCAGCAACGAAAUGGCAAAGGUCGACGACAGCUUCUUCCACAGACUGGAA |
| | | GAAAGCUUCCUGGUCGAAGAAGACAAGAAGCACGAAAGACACCCGAUCUUCGGAAACAUCGUCGACGAAGUCGCAU |
| | | ACCACGAAAAGUACCCGACAAUCUACCACCUGAGAAAGAAGCUGGUCGACAGCACAGACAAGGCAGACCUGAGACU |
| | | GAUCUACCUGGCACUGGCCCACACAUGAUCAAGUUCAGAGGACACUUCCUGAUCGAAGGAGACCUGAACCCGGACAAC |
| | | AGCGACGUCGACAAGCUGUUCAUCCAGCUGGUCCAGACAUACAACCAGCUGUUCGAAGAAAACCCGAUCAACGCAA |
| | | GCGGAGUCGACGCAAAGGCAAUCCUGAGCGCAAGACUGAGCAAGAAGCAGAAGACUGGAAAACCUGAUCGCACAGCU |
| | | GCCGGGAGAAAAGAAGAACGGACUGUUCGGAAACCUGAUCGCACUGAGCCUGGGACUGACACCGAACUUCAAGAG |
| | | CAACUUCGACCUGGCAGAAGACGCAAAGCUGCAGCUGAGCAAGGACACAUACGACGACGACCUGGACAACCUGCUG |
| | | GCACAGAUCGGAGACCAGUACGCAGACCUGUUUCCUGGCAGCAAAGAACCUGAGCGACGCAAUCCUGCUGAGCGACA |
| | | UCCUGAGAGUCAACACAGAAAUCACAAAGGCACCGCUGAGCGCAAGCAUGAUCAAGAGAUACGACGAACACCACCA |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| | | GGACCUGACACUGCUGAAGGCACUGGUCAGACAGCAGCUGCCGGAAAAGUACAAGGAAAUCUUCUUCGACCAGAG |
| | | CAAGAACGGAUACGCAGGAUACAUCGACGGAGGAGCAAGCCAGGAAGAAUUCUACAAGUUCAUCAAGCCGAUCCUG |
| | | GAAAAGAUGGACGGAACAGAAGAACUGCUGGUCAAGCUGAACAGAGAAGACCUGCUGAGAAAGCAGAGAACAUUC |
| | | GACAACGGAAGCAUCCCGCACCAGAUCCACACCUGGGAGAACUGCACGCAAUCCUGAGAAGACAGGAAGACUUCUACC |
| | | CGUUCCUGAAGGACAACAGAGAAAAGAUCGAAAAGAUCCUGACAUUCAGAAUCCCGUACUACGUCGGACCGCUGGC |
| | | AAGAGGAAACAGCAGAUUCGCAUGGAUGACAAGAAAGAGCGAAGAAACAAUCACACCGUGGAACUUCGAAGAAGU |
| | | CGUCGACAAGGGAGCAAGCGCACAGAGCUUCAUCGAAAGAAUGACAAACUUCGACACAAGAACCUGCCGAACGAAAAG |
| | | GUCCUGCCGAAGCACAGCCUGCUGUACGAAUACUUCACACAGUCUACAACGAACUGACAAAGGUCAAGUACGUCACAG |
| | | AAGGAAUGAGAAAGCCGGCAUUCCUGAGCGGAGAACAGAAGAAGGGCAAUCGUCGACCUGCUGUUCAAGACAAACA |
| | | GAAAGGUCACAGUCAAGCAGCUGAAGGAAGACUACUUCAAGAAGAUCGAAUGCUUCGACAGCGUCGAAAUCAGCG |
| | | GAGUCGAAGACAGAUUCAACGCAAGCCUGGGAACAUACCACGACCUGCUGAAGAUCAUCAAGGACAAGGACUUCCU |
| | | GGACAACGAAGAAAACGAAGACAUCCUGGAAGACAUCGUCCUGACACUGACGUUGAAGACAGAGAAGAAAUGAUC |
| | | GAAGAAAGACUGAAGACAUACGCACACCUGUUCGACGACAAGGUCAUGAAGCAGCUGAAGAGAAGAAGAUACACA |
| | | GGAUGGGGAAGACUGAGCAGAAAGCUGAUCAACGGAAUCAGAGACAAGCAGAGCGGAAAGACAAUCCUGGACUUC |
| | | CUGAAGAGCGACGGAUUCGCAAACAGAAACUUCAUGCAGCUGAUCCACGACGACCUGACAUUCAAGGAAGACA |
| | | UCCAGAAGGCACAGGUCAGCGGACAGGGAGACAGCCUGCACGAACACAUCGCAAACCUGGCAGGAAGCCCGGCAAU |
| | | CAAGAAGGGAAUCCUGCAGACAGUCAAGGUCGUCGACGAACUGGUCAAGGUCAUGGGAAGACACAAGCCGGAAAA |
| | | CAUCGUCAUCGAAAUGGCAAGAGAAAACCAGACAACACAGAAGGGACAGAAGAACAGCAGAGAAAGAAUGAAGAGA |
| | | AUCGAAGAAGGAAUCAAGGAACUGGGAAGCCAGAUCCUGAAGGAACACCCGGUCGAAAACACACAGCUGCAGAACG |
| | | AAAAGCUGUACCUGUACUACCUGCAGAACGGAAGAGACAUGUACGUCGACCAGGAACUGGACAUCAACAGACUGA |
| | | GCGACUACGACGUCGACCACACAUCGUCCCGCAGAGCUUCCUGAAGGACGACAGCAUCGACAACAAGGUCCUGACAAG |
| | | AAGCGACAAGAACAGAGGAAAGAGCGACAACGUCCCGAGCGAAGAAGUCGUCAAGAAGAUGAAGAACUACUGGAG |
| | | ACAGCUGCUGAACGCAAAGCUGAUCACACAGAGAAAGUUCGACAACCUGACAAAGGCAGAGAGAGGAGGACUGAGC |
| | | GAACUGGACAAGGCAGGAUUCAUCAAGAGACAGCUGGUCGAAACAAGACAGAUCACACAAAGCACGUCGCACAGAUCC |
| | | UGGACAGCAGAAUGAACACAAAGUACGACGAAAACGACACAAGCUGAUCAGAGAAGUCAAGGUCAUCACACUGAAGAG |
| | | CAAGCUGGUCAGCGACUUCAGAAAGGACUUCCAGUUCUACAAGGUCAGAGAAAUCAACAACUACCACGCACAC |
| | | GACGCAUACCUGAACGCAGUCGUCGGAACACAGCACUGAUCAAGAAGUACCCGAAGCUGGAAAGCGAAUUCGUCUACG |
| | | GAGACUACAAGGUCUACGACGUCAGAAAGAUGAUCGCAAAGAGCGAACAGGAAAUCGGAAAGGCAACAGCAAGUU |
| | | ACUUCUUCUACAGCAACAUCAUGAACUUCUUCAAGACAGAAAUCACACUGGCAAACGGAGAAAUCAGAAAGAGACC |
| | | GCUGAUCGAAACAAACGGAGAAACAGGAGAAAUCGUCUGGGACAAGGGAAGAGACUUCGCAACAGUCAGAAAGGU |
| | | CCUGAGCAUGCCGCAGGUCAACAUCGUCAAGAAGACAGAAGUCCAGACAGGAGGAUUCAGCAAGGAAAGCAUCCUG |
| | | CCGAAGAGAAACAGCGACAAGCUGAUCGCAAGAAAGAAGGACUGGGACCCGAAGAAGUACGGAGGAUUCGACAGCC |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| | | CGACAGUCGCAUACAGCGUCCUGGUCGUCGCAAAGGUCGAAAAGGGAAAGAGCAAGAAGCUGAAGAGCGUCAAGG |
| | | AACUGCUGGGGAAUCACAAUCAUGGAAAGAAGCAGCUUCGAAAAGAACCCGAUCGACUUCCUGGAAGCAAAGGGAU |
| | | ACAAGGAAGUCAAGAAGGACCUGAUCAUCAAGCUGCCGAAGUACAGCCUGUUCGAACUGGAAAACGGAAGAAAGA |
| | | GAAUGCUGGCAAGCGCAGGAGAACUGCAGAAGGGAAACGAACUGGCACUGCCGAGCAAGUACGUCAACUUCCUGU |
| | | ACCUGGCAAGCCACUACGAAAAGCUGAAGGGAAGCCCGGAAGACAACGAACAGAAGCAGCUGUUCGUCGAACAGCA |
| | | CAAGCACUACCUGGACGAAAUCAUCGAACAGAUCAGCGAAUUCAGCAAGAGAGUCAUCCUGGCAGACGCAAACCUG |
| | | GACAAGGUCCUGAGCGCAUACAACAAGCACAGAGACAAGCCGAUCAGAGAACAGGCAGAAAACAUCAUCCACCUGU |
| | | UCACACUGACAAACCUGGGAGCACCGGCAGCAUUCAAGUACUUCGACACAACAAUCGACAGAAAGAGAUACACAAG |
| | | CACAAAGGAAGUCCUGGACGCAACACUGAUCCACCAGAGCAUCACAGGACUGUACGAAACAAGAAUCGACCUGAGC |
| | | CAGCUGGGAGGAGAC |
| 3513 | Cas9 nickase mRNA ORF using minimal uridine codons, with start and stop codons | AUGGACAAGAAGUACAGCAUCGGACUGGCAAUCGGAACAAACAGCGUCGGAUGGGCAGUCAUCACAGACGAAUAC |
| | | AAGGUCCCGAGCAAGAAGUUCAAGGUCCUGGGAAACACAGACAGCAUCAAGAAGAACCUGAUCGGAGCAC |
| | | UGCUGUUCGACAGCGGAGAAACAGCAAGAAGCAACAAGACUGAAGAGAACAGCAAGAAGAUACACAAGAAGAAA |
| | | GAACAGAAUCUGCUACCUGCAGGAAAUCUUCAGCAACGAAAUGGCAAGGUCGACGACAGCUUCUUCCACAGACUG |
| | | GAAGAAAGCUUCCUGGUCGAAGAAGACAAGAAGCACGAAAGACACCCGAUCUUCGGAAACAUCGUCGACGAAGUCG |
| | | CAUACCACGAAAAGUACCCGACAAUCUACCACCUGAGAAAGAAGCUGGUCGACAGCACAGACAAGGCAGACCUGAG |
| | | ACUGAUCUACCUGGCACUGGCACACAUGAUCAAGUUCAGAGGACACUUCCUGAUCGAAGGAGACCUGAACCCGGAC |
| | | AACAGCGACGUCGACAAGCUGUUCAUCCAGCUGGUCCAGACAUACAACCAGCUGUUCGAAGAAAACCCGAUCAACG |
| | | CAAGCGGAGUCGACGCAAAGGCAAUCCUGAGCGCAAGACUGAGCAAGAGCAGAAGACUGGAAAACCUGAUCGCACA |
| | | GCUGCCGGGAGAAAAGAAGAACGGACUGUUCGGAAACCUGAUCGCACUGAGCCUGGGACUGACACCGAACUUCAA |
| | | GAGCAACUUCGACCUGGCAGAAGACGCAAAGCUGCAGCUGAGCAAGGACACAUACGACGACGACCUGGACAACCUG |
| | | CUGGCACAGAUCGGAGACCAGUACGCAGACCUGUUCCUGGCAGCAAAGAACCUGAGCGACGCAAUCCUGCUGAGCG |
| | | ACAUCCUGAGAGUCAACACAGAAAUCACAAAGGCACCGCUGAGCGCAAGCAUGAUCAAGAGAUACGACGAACACCAC |
| | | CAGGACCUGACACUGCUGAAGGCACUGGUCAGACAGCAGCUGCCGGAAAAGUACAAGGAAAUCUUCUUCGACCAGA |
| | | GCAAGAACGGAUACGCAGGAUACAUCGACGGAGGAGCAAGCCAGGAAGAAUUCUACAAGUUCAUCAAGCCGAUCCU |
| | | GGAAAAGAUGGACGGAACAGAAGAACUGCUGGUCAAGCUGAACAGAGAAGACCUGCUGAGAAAGCAGAGAACAUU |
| | | CGACAACGGAAGCAUCCCGCACCAGAUCCACCUGGGAGAACUGCACGCAAUCCUGAGAAGACAGGAAGACUUCUAC |
| | | CCGUUCCUGAAGGACAACAGAGAAAAGAUCGAAAAGAUCCUGACAUUCAGAAUCCCGUACUACGUCGGACCGCUGG |
| | | CAAGAGGAAACAGCAGAUUCGCAUGGAUGACAAGAAAGAGCGAAGAAACAAUCACACCGUGGAACUUCGAAGAAG |
| | | UCGUCGACAAGGGAGCAAGCGCACAGAGCUUCAUCGAAAGAAUGACAAACUUCGACAAGAACCUGCCGAACGAAAA |
| | | GGUCCUGCCGAAGCACAGCCUGCUGUACGAAUACUUCACAGUCUACAACGAACUGACAAAGGUCAAGUACGUCACA |
| | | GAAGGAAUGAGAAAGCCGGCAUUCCUGAGCGGAGAACAGAAGAAGGCAAUCGUCGACCUGCUGUUCAAGACAAAC |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| | | AGAAAGGUCACAGUCAAGCAGCUGAAGGAAGACUACUUCAAGAAGAUCGAAUGCUUCGACAGCGUCGAAAUCAGC |
| | | GGAGUCGAAGACAGAUUUCAACGCAAGCCUGGGAACAUACCACGACCUGCUGAAGAUCAUCAAGGACAAGGACUUCC |
| | | UGGACAACGAAGAAAACGAAGACAUCCUGGAAGACAUCGUCCUGACACUGACACUGUUCGAAGACAGAGAAAUGA |
| | | UCGAAGAAAGACUGAAGACAUACGCACACCUGUUCGACGACAAGGUCAUGAAGCAGCUGAAGAGAAGAAGAUACAC |
| | | AGGAUGGGGAAGACUGAGCAGAAAGCUGAUCAACGGAAUCAGAGACAAGCAGAGCGGAAAGACAAUCCUGGACUU |
| | | CCUGAAGAGCGACGGAUUCGCAAACAGAAACUUCAUGCAGCUGAUCCACGACGACAGCCUGACAUUCAAGGAAGAC |
| | | AUCCAGAAGGCACAGGUCAGCGGACAGGGAGACAGCCUGCACGAACACAUCGCAAACCUGGCAGGAAGCCCGGCAA |
| | | UCAAGAAGGGAAUCCUGCAGACAGUCAAGGUCGUCGACGAACUGGUCAAGGUCAUGGGAAGACACAAGCCGGAAA |
| | | ACAUCGUCAUCGAAAUGGCAAGAGAAAACCAGACACAACACAGAAGGGACACAGAAGAACAGCAGAGAAAGAAUGAAGAG |
| | | AAUCGAAGAAGGAAUCAAGGAACUGGGAAGCCAGAUCCUGAAGGAACACCCGGUCGAAAACACACAGCUGCAGAAC |
| | | GAAAAGCUGUACCUGUACUACCUGCAGAACGGAAGAGACAUGUACGUCGACCAGGAACUGGACAUCAACAGACUG |
| | | AGCGACUACGACGUCGACCACACAUCGUCCCGCAGAGCUUCCUGAAGGACGACAGCAUCGACAACAACAAGGUCCUGACAA |
| | | GAAGCGACAAGAACAGAGGAAAGAGCGACAACGUCCCGAGCGAAGAAGUCGUCAAGAAGAUGAAGAACUACUGGA |
| | | GACAGCUGCUGAACGCAAAGCUGAUCACACAGAGAAAGUUCGACAACCUGACAAAGGCAGAGAGAGGAGGACUGA |
| | | GCGAACUGGACAAGGCAGGAUUCAUCAAGAGACAGCUGGUCGAAACAAGACAGAUCACACAAAGCACGUCGCACAGAU |
| | | CCUGGACAGCAGAAUGAACACAAAGUACGACGAAAACGACAAGCUGAUCAGAGAAGUCAAGGUCAUCACACUGAAG |
| | | AGCAAGCUGGUCAGCGACUUCAGAAAGGACUUCCAGUUCUACAAGGUCAGAGAAAUCAACAACUACCACCACGCAC |
| | | ACGACGCAUACCUGAACGCAGUCGUCGGAACAGCACUGAUCAAGAAGUACCCGAAGCUGGAAAGCGAAUUCGUCUA |
| | | CGGAGACUACAAGGUCUACGACGUCAGAAAGAUGAUCGCAAAGAGCGAACAGGAAAUCGGAAAGGCAACAGCAAAG |
| | | UACUUCUUCUACAGCAACAUCAUGAACUUCUUCAAGACAGAAAUCACACUGGCAAACGGAGAAAUCAGAAAGAGAC |
| | | CGCUGAUCGAAACAAACGGAGAAACAGGAGAAAUCGUCUGGGACAAGGGAAAGAGACUUUCGCAACAGUCAGAAAGG |
| | | UCCUGAGCAUGCCGCAGGUCAACAUCGUCAAGAAGACAGAAGUCCAGACAGGAGGAUUCAGCAAGGAAAGCAUCCU |
| | | GCCGAAGAGAAACAGCGACAAGCUGAUCGCAAGAAAGAAGGACUGGGACCCGAAGAAGUACGGAGGAUUCGACAG |
| | | CCCGACAGUCGCAUACAGCGUCCUGGUCGUCGCAAAGGUCGAAAAGGGAAAGAGCAAGAAGCUGAAGAGCGUCAA |
| | | GGAACUGCUGGGAAUCACAAUCAUGGAAAGAAGCAGCUUCGAAAAGAACCCGAUCGACUUCCUGGAAGCAAAGGG |
| | | AUACAAGGAAGUCAAGAAGGACCUGAUCAUCAAGCUGCCGAAGUACAGCCUGUUCGAACUGGAAAACGGAAGAAA |
| | | GAGAAUGCUGGCAAGCGCAGGAGAACUGCAGAAGGGAAACGAACUGGCACUGCCGAGCAAGUACGUCAACUUCCU |
| | | GUACCUGGCAAGCCACUACGAAAAGCUGAAGGGAAGCCCGGAAGACAACGAAGCAGAAGCAGCUGUUCGUCGAACAG |
| | | CACAAGCACUACCUGGACGAAAUCAUCGAACAGAUCAGCGAAUUCAGCAAGAGAGUCAUCCUGGCAGACGCAAACC |
| | | UGGACAAGGUCCUGAGCGCAUACAACAAGCACAGAGACAAGCCGAUCAGAGAACAGGCAGAAAACAUCAUCCACCU |
| | | GUUCACACUGACAAACCUGGGAGCACCGGCAGCAUUCAAGUACUUCGACACAACAAUCGACAGAAAGAGAUACACA |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| | | AGCACAAAGGAAGUCCUGGACGCAACACUGAUCCACCAGAGCAUCACAGGACUGUACGAAACAAGAAUCGACCUGA |
| | | GCCAGCUGGGAGGAGACUAG |
| 3514 | Cas9 nickase coding sequence encoding SEQ ID NO: 16 using minimal uridine codons (no start or stop codons; suitable for inclusion in fusion protein coding sequence) | GACAAGAAGUACAGCAUCGGACUGGCAAUCGGAACAAACAGCGUCGGAUGGGCAGUCAUCACAGACGAAUACAAG |
| | | GUCCCGAGCAAGAAGUUCAAGGUCCUGGGAAACACAGACACAGCAUCAAGAAGAACCUGAUCGGAGCACUGC |
| | | UGUUCGACAGCGGAGAAACAGCAGAAGCAACAAGACUGAAGAGAACAGCAAGAAGAAGAUACACAAGAAAGAA |
| | | CAGAAUCUGCUACCUGCAGGAAAUCUUCAGCAACGAAAUGGCAAAGGUCGACGACAGCUUCUUCCACAGACUGGAA |
| | | GAAAGCUUCCUGGUCGAAGAAGACAAGAAGCACGAAAGACACCCGAUCUUCGGAAACAUCGUCGACGAAGUCGCAU |
| | | ACCACGAAAAGUACCCGACAAUCUACCACCUGAGAAAGAAGCUGGUCGACAGCACAGACAAGGCAGACCUGAGACU |
| | | GAUCUACCUGGCACUGGCACACAUGAUCAAGUUCAGAGGACACUUCCUGAUCGAAGGAGACCUGAACCCGGACAAC |
| | | AGCGACGUCGACAAGCUGUUCAUCCAGCUGGUCCAGACAUACAACCAGCUGUUCGAAGAAAACCCGAUCAACGCAA |
| | | GCGGAGUCGACGCAAAGGCAAUCCUGAGCGCAAGACUGAGCAAGAGCAGAAGACUGGAAAACCUGAUCGCACAGCU |
| | | GCCGGGAGAAAAGAAGAACGGACUGUUCGGAAACCUGAUCGCACUGAGCCUGGGACUGACACCGAACUUCAAGAG |
| | | CAACUUCGACCUGGCAGAAGACGCAAAGCUGCAGCUGAGCAAGGACACAUACGACGACGACCUGGACAACCUGCUG |
| | | GCACAGAUCGGAGACCAGUACGCAGACCUGUUUCUGGCAGCAAAGAACCUGAGCGACGCAAUCCUGCUGAGCGACA |
| | | UCCUGAGAGUCAACACAGAAAUCACAAAGGCACCGCUGAGCGCAAGCAUGAUCAAGAGAUACGACGAACACCACCA |
| | | GGACCUGACACUGCUGAAGGCACUGGUCAGACAGCAGCUGCCGGAAAAGUACAAGGAAAUCUUCUUCGACCAGAG |
| | | CAAGAACGGAUACGCAGGAUACAUCGACGGAGGAGCAAGCCAGGAAGAAUUCUACAAGUUCAUCAAGCCGAUCCUG |
| | | GAAAAGAUGGACGGAACAGAAGAACUGCUGGUCAAGCUGAACAGAGAAGACCUGCUGAGAAAGCAGAGAACAUUC |
| | | GACAACGGAAGCAUCCCGCACCAGAUCCACCUGGGAGAACUGCACGCAAUCCUGAGAAGACAGGAAGACUUCUACC |
| | | CGUUCCUGAAGGACAACAGAGAAAAGAUCGAAAAGAUCCUGACAUUCAGAAUCCCGUACUACGUCGGACCGCUGGC |
| | | AAGAGGAAACAGCAGAUUUCGCAUGGAUGACAAGAAAGAGCGAAGAAACAAUCACACACCGUGGAACUUCGAAGAAGU |
| | | CGUCGACAAGGGAGCAAGCGCACAGAGCUUCAUCGAAAGAAUGACAAACUUCGACAAGAACCUGCCGAACGAAAAG |
| | | GUCCUGCCGAAGCACAGCCUGCUGUACGAAUACUUCACAGUCUACAACGAACUGACAAAGGUCAAGUACGUCACAG |
| | | AAGGAAUGAGAAAGCCGGCAUUCCUGAGCGGAGAACAGAAGAAGGGCAAUCGUCGACCUGCUGUUCAAGACAAACA |
| | | GAAAGGUCACAGUCAAGCAGCUGAAGGAAGACUACUUCAAGAAGAUCGAAUGCUUCGACAGCGUCGAAAUCAGCG |
| | | GAGUCGAAGACAGAUUCAACGCAAGCCUGGGAACAUACCACGACCUGCUGAAGAUCAUCAAGGACAAGGACUUCCU |
| | | GGACAACGAAGAAAACGAAGACAUCCUGGAAGACAUCGUCCUGACACUGACGUUGUUCGAAGACAGAGAAAUGAUC |
| | | GAAGAAAGACUGAAAGACAUACGCACACCUGUUCGACGACAAGGUCAUGAAGCAGCUGAAGAGAAGAAGAUACACA |
| | | GGAUGGGGAAGACUGAGCAGAAAGCUGAUCAACGGAAUCAGAGACAAGCAGAGCGGAAAGACAAUCCUGGACUUC |
| | | CUGAAGAGCGACGGAUUCGCAAACAGAAACUUCAUGCAGCUGAUCCACGACAGCCUGACAUUCAAGGAAGACA |
| | | UCCAGAAGGCACAGGUCAGCGGACAGGGAGACAGCCUGCACGAACACAUCGCAAACCUGGCAGGAAGCCCGGCAAU |
| | | CAAGAAGGGAAUCCUGCAGACAGUCAAGGUCGUCGACGAACUGGUCAAGGUCAUGGGAAGACACAAGCCGGAAAA |

| SEQ ID NO | Name | Sequence |
|---|---|---|
| | | CAUCGUCAUCGAAAUGGCAAGAGAAAACCAGACAACACAGAAGGGACAGAAGAACAGCAGAGAAAGAAUGAAGAGA |
| | | AUCGAAGAAGGAAUCAAGGAACUGGGAAGCCAGAUCCUGAAGGAACACCCGGUCGAAAACACACAGCUGCAGAACG |
| | | AAAAGCUGUACCUGUACUACCUGCAGAACGGAAGAGACAUGUACGUCGACCAGGAACUGGACAUCAACAGACUGA |
| | | GCGACUACGACGUCGACCACAUCGUCCCGCAGAGCUUCCUGAAGGACGACAGCAUCGACAACAAGGUCCUGACAAG |
| | | AAGCGACAAGAACAGAGGAAAGAGCGACAACGUCCCGAGCGAAGAAGUCGUCAAGAAGAUGAAGAACUACUGGAG |
| | | ACAGCUGCUGAACGCAAAGCUGAUCACACAGAGAAAGUUCGACAACCUGACAAAGGCAGAGAGGAGGACUGAGC |
| | | GAACUGGACAAGGCAGGAUUCAUCAAGAGACAGCUGGUCGAAACAAGACAGAUCACAAAGCACGUCGCACAGAUCC |
| | | UGGACAGCAGAAUGAACACAAAGUACGACGAAAACGACAAGCUGAUCAGAGAAGUCAAGGUCAUCACACUGAAGAG |
| | | CAAGCUGGUCAGCGACUUCAGAAAGGACUUCCAGUUCUACAAGGUCAGAGAAAUCAACAACUACCACGCACAC |
| | | GACGCAUACCUGAACGCAGUCGUCGGAACACGCACUGAUCAAGAAGUACCCGAAGCUGGAAAGCGAAUUCGUCUACG |
| | | GAGACUACAAGGUCUACGACGUCAGAAAGAUGAUCGCAAAGAGCGAACAGGAAAUCGGAAAGGCAACAGCAAAGU |
| | | ACUUCUUCUACAGCAACAUCAUGAACUUCUUCAAGACAGAAAUCACACUGGCAAACGGAGAAAUCAGAAAGAGACC |
| | | GCUGAUCGAAACAAACGGAGAAACAGGAGAAAUCGUCUGGGACAAGGGAAGAGACUUCGCAACAGUCAGAAAGGU |
| | | CCUGAGCAUGCCGCAGGUCAACAUCGUCAAGAAGACAGAAGUCCAGACAGGAGGAUUCAGCAAGGAAAGCAUCCUG |
| | | CCGAAGAGAAACAGCGACAAGCUGAUCGCAAGAAAGAAGGACUGGGACCCGAAGAAGUACGGAGGAUUCGACAGCC |
| | | CGACAGUCGCAUACAGCGUCCUGGUCGUCGCAAAGGUCGAAAAGGGAAAGAGCAAGAAGCUGAAGAGCGUCAAGG |
| | | AACUGCUGGGAAUCACAAUCAUGGAAAGAAGCAGCUUCGAAAAGAACCCGAUCGACUUCCUGGAAGCAAAGGGAU |
| | | ACAAGGAAGUCAAGAAGGACCUGAUCAUCAAGCUGCCGAAGUACAGCCUGUUCGAACUGGAAAACGGAAGAAAGA |
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| | | UCACACUGACAAACCUGGGAGCACCGGCAGCAUUCAAGUACUUCGACACAACAAUCGACAGAAAGAGAUACACAAG |
| | | CACAAAGGAAGUCCUGGACGCAACACUGAUCCACCAGAGCAUCACAGGACUGUACGAAACAAGAAUCGACCUGAGC |
| | | CAGCUGGGAGGAGAC |
| 3515 | dCas9 mRNA ORF using minimal uridine codons, with start and stop codons | AUGGACAAGAAGUACAGCAUCGGACUGGCAAUCGGAACAAACAGCGUCGGAUGGGCAGUCAUCACAGACGAAUAC |
| | | AAGGUCCCGAGCAAGAAGUUCAAGGUCCUGGGAAACACAGACAGAGACACAGCAUCAAGAAGAACCUGAUCGGAGCAC |
| | | UGCUGUUCGACAGCGGAGAAACAGCAAGAAGACUGAAGAGAAGAACAGCAAGAAGAUACACAAGAAGAAA |
| | | GAACAGAAUCUGCUACCUGCAGGAAAUCUUCAGCAACGAAAUGGCAAAGGUCGACGACAGCUUCUUCCACAGACUG |
| | | GAAGAAAGCUUCCUGGUCGAAGAAGACAAGAAGCACGAAAGAAGAAGCUGGUCGACAGCACAGACAAGGCAGACCUGAG |
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| SEQ ID NO | Name | Sequence |
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| | | CAAGAGGAAACAGCAGAUUCGCAUGGAUGACAAGAAAGAGCGAAGAAACAAUCACACCGUGGAACUUCGAAGAAG |
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| | | GCGAACUGGACAAGGCAGGAUUCAUCAAGAGACAGCUGGUCGAAACAAGACAGAUCACAAAGCACGUCGCACAGAU |
| | | CCUGGACAGCAGAAUGAACACAAAGUACGACGAAAACGACAAGCUGAUCAGAGAAGUCAAGGUCAUCACACUGAAG |
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| | | GUUCACACUGACAAACCUGGGAGCACCGGCAGCAUUCAAGUACUUCGACACAACAAUCGACAGAAAGAGAUACACA |
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| 3516 | dCas9 coding sequence using minimal uridine codons (no start or stop codons; suitable for inclusion in fusion protein coding sequence) | GACAAGAAGUACAGCAUCGGACUGGCAAUCGGAACAAACAGCGUCGGAUGGGCAGUCAUCACAGACGAAUACAAG |
| | | GUCCCGAGCAAGAAGUUCAAGGUCCUGGGAAACACAGACACAGCAUCAAGAAGAACCUGAUCGGAGCACUGC |
| | | UGUUCGACAGCGGAGAAACAGCAGAAGCAACAAGACUGAAGAGAACAGCAAGAAGAUACACAAGAAGAAAGAA |
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| | | AAGAGGAAACAGCAGAUUCGCAUGGAUGACAAGAAAGAGCGAAGAAACAAUCACACCGUGGAACUUCGAAGAAGU |
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| | | ACAGCUGCUGAACGCAAAGCUGAUCACACAGAGAAAGUUCGACAACCUGACAAAGGCAGAGAGGAGGACUGAGC |
| | | GAACUGGACAAGGCAGGAUUCAUCAUCAAGAGACAGCUGGUCGAAACAAGACAGAUCACACAAAGCACGUCGCACAGAUCC |
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| SEQ ID NO | Name | Sequence |
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| | | GAAUGCUGGCAAGCGCAGGAGAACUGCAGAAGGGAAACGAACUGGCACUGCCGAGCAAGUACGUCAACUUCCUGU |
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| | | CAAGCACUACCUGGACGAAAUCAUCGAACAGAUCAGCGAAUUCAGCAAGAGAGUCAUCCUGGCAGACGCAAACCUG |
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| | | CACAAAGGAAGUCCUGGACGCAACACUGAUCCACCAGAGCAUCACACAGGACUGUACGAAACAAGAAUCGACCUGAGC |
| | | CAGCUGGGAGGAGACGGAGGAGGAAGC |
| 3517 | Cas9 mRNA ORF using minimal uridine codons, with start and stop codons | AUGGACAAGAAGUACAGCAUCGGACUGGACAUCGGAACAAACAGCGUCGGAUGGGCAGUCAUCACAGACGAAUAC |
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| | | UGCUGUUCGACAGCGGAGAAACAGCAAGCAACAAGAGAACAGCAAGAAGAAGAUACACAAGAAGAAA |
| | | GAACAGAAUCUGCUACCUGCAGGAAAUCUUCAGCAACGAAAUGGCAAAGGUCGACGACAGCUUCUUCCACAGACUG |
| | | GAAGAAAGCUUCCUGGUCGAAGAAGACACAAGAAAGCACGGAAAGACACCCGAUCUUCGGAAACAUCGUCGACGAAGUCG |
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| | | CUGGCACAGAUCGGAGACCAGUACGCAGACCUGUUCCUGGCAGCAAAGAACCUGAGCGACGCAAUCCUGCUGAGCG |
| | | ACAUCCUGAGAGUCAACACAGAAAUCACAAAGGCACCGCUGAGCGCAAGCAUGAUCAAGAGAUACGACGAACACCAC |
| | | CAGGACCUGACACUGCUGAAGGCACUGGUCAGACAGCAGCUGCCGGAAAAGUACAAGGAAAUCUUCUUCGACCAGA |
| | | GCAAGAACGGAUACGCAGGAUACAUCGACGGAGGAGCAAGCCAGGAAGAAUUCUACAAGUUCAUCAAGCCGAUCCU |
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| | | CGACAACGGAAGCAUCCCGCACCAGAUCCACCUGGGAGAACUGCACGCAAUCCUGAGAAGACAGGAAGACUUCUAC |
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| | | CAAGAGGAAACAGCAGAUUCGCAUGGAUGACAAGAAAGAGCGAAGAAACAAUCACACCGUGGAACUUCGAAGAAG |
| | | UCGUCGACAAGGGAGCAAGCGCACAGAGCUUCAUCGAAAGAAUGACAAACUUCGACAAGAACCUGCCGAACGAAAA |
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| | | AGAAAGGUCACAGUCAAGCAGCUGAAGGAAGACUACUUCAAGAAGAUCGAAUGCUUCGACAGCGUCGAAAUCAGC |
| | | GGAGUCGAAGACAGAUUCAACGCAAGCCUGGGAACAUACCACGACCUGCUGAAGAUCAUCAAGGACAAGGACUUCC |
| | | UGGACAACGAAGAAAACGAAGACAUCCUGGAAGACAUCGUCCUGACACUGACCUUGUUCGAAGACAGAGAAAUGA |

# 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 262

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 262

NOTE: For additional volumes, please contact the Canadian Patent Office

NOM DU FICHIER / FILE NAME :

NOTE POUR LE TOME / VOLUME NOTE:

**We claim:**

1. A guide RNA (gRNA) which is a short-single guide RNA (short-sgRNA) comprising a conserved portion of an sgRNA comprising a hairpin region, wherein the hairpin region lacks at least 5-10 nucleotides and wherein the short-sgRNA comprises a 5' end modification or a 3' end modification.
2. The gRNA of claim 1, wherein the short-sgRNA comprises a 5' end modification.
3. The gRNA of any one of the preceding claims, wherein the short-sgRNA comprises a 3' end modification.
4. The gRNA of any one of the preceding claims, wherein the short-sgRNA comprises a 5' end modification and a 3' end modification.
5. The gRNA of any one of the preceding claims, wherein the short-sgRNA comprises a 3' tail.
6. The gRNA of claim 5, wherein the 3' tail comprises 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 nucleotides.
7. The gRNA of claim 5, wherein the 3' tail comprises about 1-2, 1-3, 1-4, 1-5, 1-7, 1-10, at least 1-5, at least 1-3, at least 1-4, at least 1-5, at least 1-5, at least 1-7, or at least 1-10 nucleotides.
8. The gRNA of any one of the preceding claims, wherein the short-sgRNA does not comprise a 3' tail.
9. The gRNA of any one of the preceding claims, comprising a modification in the hairpin region.
10. The gRNA of any one of the preceding claims, comprising a 3' end modification, and a modification in the hairpin region.
11. The gRNA of any one of the preceding claims, comprising a 3' end modification, a modification in the hairpin region, and a 5' end modification.
12. The gRNA of any one of the preceding claims, comprising a 5' end modification, and a modification in the hairpin region.
13. The gRNA of any one of the preceding claims, wherein the at least 5-10 lacking nucleotides are consecutive.
14. The gRNA of any one of the preceding claims, wherein the at least 5-10 lacking nucleotides:

i. are within hairpin 1;
ii. are within hairpin 1 and the "N" between hairpin 1 and hairpin 2;
iii. are within hairpin 1 and the two nucleotides immediately 3' of hairpin 1;
iv. include at least a portion of hairpin 1;
v. are within hairpin 2;
vi. include at least a portion of hairpin 2;
vii. are within hairpin 1 and hairpin 2;
viii. include at least a portion of hairpin 1 and include the "N" between hairpin 1 and hairpin 2;
ix. include at least a portion of hairpin 2 and include the "N" between hairpin 1 and hairpin 2;
x. include at least a portion of hairpin 1, include the "N" between hairpin 1 and hairpin 2, and include at least a portion of hairpin 2;
xi. are within hairpin 1 or hairpin 2, optionally including the "N" between hairpin 1 and hairpin 2;
xii. are consecutive;
xiii. are consecutive and include the "N" between hairpin 1 and hairpin 2;
xiv. are consecutive and span at least a portion of hairpin 1 and a portion of hairpin 2;
xv. are consecutive and span at least a portion of hairpin 1 and the "N" between hairpin 1 and hairpin 2; or
xvi. are consecutive and span at least a portion of hairpin 1 and two nucleotides immediately 3' of hairpin 1.

15. The gRNA of any one of the preceding claims, further comprising a guide region.

16. The gRNA of any one of the preceding claims, wherein the 3' and/or 5' end modification comprises a protective end modification, such as a modified nucleotide selected from 2'-O-methyl (2'-OMe) modified nucleotide, 2'-O-(2-methoxyethyl) (2'-O-moe) modified nucleotide, a 2'-fluoro (2'-F) modified nucleotide, a phosphorothioate (PS) linkage between nucleotides, an inverted abasic modified nucleotide, or combinations thereof.

17. The gRNA of any one of the preceding claims, wherein the modification in the hairpin region comprises a modified nucleotide selected from 2'-O-methyl (2'-OMe)

modified nucleotide, a 2'-fluoro (2'-F) modified nucleotide, a phosphorothioate (PS) linkage between nucleotides, or combinations thereof.

18. The gRNA of any one of the preceding claims, wherein the 3' and/or 5' end modification comprises or further comprises a 2'-O-methyl (2'-OMe) modified nucleotide.

19. The gRNA of any one of the preceding claims, wherein the 3' and/or 5' end modification comprises or further comprises a 2'-fluoro (2'-F) modified nucleotide.

20. The gRNA of any one of the preceding claims, wherein the 3' and/or 5' end modification comprises or further comprises a phosphorothioate (PS) linkage between nucleotides.

21. The gRNA of any one of the preceding claims, wherein the 3' and/or 5' end modification comprises or further comprises an inverted abasic modified nucleotide.

22. The gRNA of any one of the preceding claims, wherein the modification in the hairpin region comprises or further comprises a 2'-O-methyl (2'-OMe) modified nucleotide.

23. The gRNA of any one of the preceding claims, wherein the modification in the hairpin region comprises or further comprises a 2'-fluoro (2'-F) modified nucleotide.

24. The gRNA of any one of the preceding claims, wherein the 3' end modification comprises any of:

    i. a modification of any one or more of the last 7, 6, 5, 4, 3, 2, or 1 nucleotides;
    ii. one modified nucleotide;
    iii. two modified nucleotides;
    iv. three modified nucleotides;
    v. four modified nucleotides;
    vi. five modified nucleotides;
    vii. six modified nucleotides; and
    viii. seven modified nucleotides.

25. The gRNA of any one of the preceding claims, wherein the at least 5-10 nucleotides comprise nucleotides 54-61 of SEQ ID NO:400, nucleotides 53-60 of SEQ ID NO:400; or nucleotides 54-58 of SEQ ID NO:400, optionally wherein the short-sgRNA comprises modifications at least H1-1 to H1-5 and H2-1 to H2-12.

26. The gRNA of any one of the preceding claims, wherein the at least 5-10 nucleotides:

i. consist of 5-10 nucleotides;
ii. consist of 6-10 nucleotides;
iii. consist of 5 nucleotides;
iv. consist of 6 nucleotides;
v. consist of 7 nucleotides;
vi. consist of 8 nucleotides;
vii. consist of 9 nucleotides;
viii. consist of 10 nucleotides;
ix. consist of 5-10 consecutive nucleotides;
x. consist of 6-10 consecutive nucleotides;
xi. consist of 5 consecutive nucleotides;
xii. consist of 6 consecutive nucleotides;
xiii. consist of 7 consecutive nucleotides;
xiv. consist of 8 consecutive nucleotides;
xv. consist of 9 consecutive nucleotides; or
xvi. consist of 10 consecutive nucleotides.

27. The gRNA of any one of the preceding claims, wherein the 3' end modification comprises one or more of:
i. a phosphorothioate (PS) linkage between nucleotides;
ii. a 2'-OMe modified nucleotide;
iii. a 2'-O-moe modified nucleotide;
iv. a 2'-F modified nucleotide;
v. an inverted abasic modified nucleotide; and
vi. a combination of one or more of (i.) - (v.).

28. The gRNA of any one of the preceding claims, wherein the short-sgRNA comprises a 3' tail comprising one or more of:
i. a phosphorothioate (PS) linkage between nucleotides;
ii. a 2'-OMe modified nucleotide;
iii. a 2'-O-moe modified nucleotide;
iv. a 2'-F modified nucleotide;
v. an inverted abasic modified nucleotide; and
vi. a combination of one or more of (i.) - (v.).

29. The gRNA any one of the preceding claims, wherein the short-sgRNA comprises one or more of:

i. 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 PS linkages between nucleotides;
ii. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 16, or 18 PS linkages between nucleotides;
iii. about 1-3, 1-5, 1-6, 1-7, 1-8, 1-9, or 1-10 PS linkages between nucleotides;
iv. about 1-3, 1-5, 1-6, 1-7, 1-8, 1-9, 1-10, 1-12, 1-14, 1-16, 1-18, or 1-20 PS linkages between nucleotides; and
v. PS linkages between each nucleotide.

30. The gRNA of any one of the preceding claims, wherein the 3' end modification comprises at least one PS linkage, and wherein one or more of:
i. there is one PS linkage, and the linkage is between the last and second to last nucleotide;
ii. there are two PS linkages between the last three nucleotides;
iii. there are PS linkages between any one or more of the last four nucleotides;
iv. there are PS linkages between any one or more of the last five nucleotides; and
v. there are PS linkages between any one or more of the last 2, 3, 4, 5, 6, 7, 8, 9, or 10 nucleotides.

31. The gRNA of claim 30, wherein the 3' end modification further comprises at least one 2'-OMe, 2'-O-moe, inverted abasic, or 2'-F modified nucleotide.

32. The gRNA of any one of the preceding claims, wherein the 3' end modification comprises:
i. a modification of one or more of the last 1-7 nucleotides, wherein the modification is a PS linkage, inverted abasic nucleotide, 2'-OMe, 2'-O-moe, 2'-F, or combinations thereof;
ii. a modification to the last nucleotide with 2'-OMe, 2'-O-moe, 2'-F, or combinations thereof, and an optional one or two PS linkages to the next nucleotide and/or the first nucleotide of the 3' tail;
iii. a modification to the last and/or second to last nucleotide with 2'-OMe, 2'-O-moe, 2'-F, or combinations thereof, and optionally one or more PS linkages;

iv. a modification to the last, second to last, and/or third to last nucleotides with 2'-OMe, 2'-O-moe, 2'-F, or combinations thereof, and optionally one or more PS linkages;

v. a modification to the last, second to last, third to last, and/or fourth to last nucleotides with 2'-OMe, 2'-O-moe, 2'-F, or combinations thereof, and optionally one or more PS linkages; or

vi. a modification to the last, second to last, third to last, fourth to last, and/or fifth to last nucleotides with 2'-OMe, 2'-O-moe, 2'-F, or combinations thereof, and optionally one or more PS linkages.

33. The gRNA of any one of the preceding claims, wherein the sgRNA comprise a 3' tail, wherein the 3' tail comprises a modification of any one or more of the nucleotides present in the 3' tail.

34. The gRNA of claim 33, wherein the 3' tail is fully modified.

35. The gRNA of claim 33, wherein the at least 5-10 nucleotides comprise nucleotides 54-61 of SEQ ID NO:400, nucleotides 53-60 of SEQ ID NO:400; or nucleotides 54-58 of SEQ ID NO:400, optionally wherein the short-sgRNA comprises modifications at least H1-1 to H1-5 and H2-1 to H2-12.

36. The gRNA of any one of the preceding claims, wherein the short-sgRNA comprises any one or more of:

i. the 3' end modification as shown in any one of SEQ ID Nos: 1-54;

ii. (i) a 2'-OMe modified nucleotide at the last nucleotide of the conserved region of an sgRNA or short-sgRNA, (ii) three consecutive 2'O-moe modified nucleotides immediately 5' to the 2'-OMe modified nucleotide, and (iii) three consecutive PS linkages between the last three nucleotides;

iii. (i) five consecutive 2'-OMe modified nucleotides from the 3' end of the 3' terminus, and (ii) three PS linkages between the last three nucleotides;

iv. an inverted abasic modified nucleotide at the last nucleotide of the conserved region of an sgRNA or short-sgRNA;

v. (i) an inverted abasic modified nucleotide at the last nucleotide of the conserved region of an sgRNA or short-sgRNA, and (ii) three consecutive 2'-OMe modified nucleotides at the last three nucleotides of the conserved region of an sgRNA or short-sgRNA;

vi. (i) 15 consecutive 2'-OMe modified nucleotides from the 3' end of the 3' terminus, (ii) five consecutive 2'-F modified nucleotides immediately 5' to the 2'-OMe modified nucleotides, and (iii) three PS linkages between the last three nucleotides;

vii. (i) alternating 2'-OMe modified nucleotides and 2'-F modified nucleotides at the last 20 nucleotides of the conserved region of an sgRNA or short-sgRNA, and (ii) three PS linkages between the last three nucleotides;

viii. (i) two or three consecutive 2'-OMe modified nucleotides, and (ii) three PS linkages between the last three nucleotides;

ix. one PS linkage between the last and next to last nucleotides; and

x. 15 or 20 consecutive 2'-OMe modified nucleotides, and (ii) three PS linkages between the last three nucleotides.

37. The gRNA of any one of the preceding claims, wherein the 5' end modification comprises any one or more of:

i. a modification of any one or more of nucleotides 1-7 of the guide region;

ii. one modified nucleotide;

iii. two modified nucleotides;

iv. three modified nucleotides;

v. four modified nucleotides;

vi. five modified nucleotides;

vii. six modified nucleotides; and

viii. seven modified nucleotides.

38. The gRNA of any one of the preceding claims, wherein the 5' end modification comprises a modification of between 1 and 7, between 1 and 5, between 1 and 4, between 1 and 3, or between 1 and 2 nucleotides.

39. The gRNA of any one of the preceding claims, wherein the at least 5-10 nucleotides:

i. comprise nucleotides 54-61 of SEQ ID NO:400;

ii. comprise nucleotides 53-60 of SEQ ID NO:400;

iii. comprise nucleotides 54-58 of SEQ ID NO:400.

iv. consist of nucleotides 54-61 of SEQ ID NO:400;

v. consist of nucleotides 53-60 of SEQ ID NO:400; or

vi. consist of nucleotides 54-58 of SEQ ID NO:400.

40. The gRNA of any one of the preceding claims, wherein the 5' end modification comprises one or more of:
    i. a phosphorothioate (PS) linkage between nucleotides;
    ii. a 2'-OMe modified nucleotide;
    iii. a 2'-O-moe modified nucleotide;
    iv. a 2'-F modified nucleotide;
    v. an inverted abasic modified nucleotide;
    vi. a deoxyribonucleotide;
    vii. an inosine; and
    viii. combinations of one or more of (i.) – (vii.).
41. The gRNA any one of the preceding claims, wherein the 5' end modification comprises:
    i. 1, 2, 3, 4, 5, 6, and/or 7 PS linkages between nucleotides; or
    ii. about 1-2, 1-3, 1-4, 1-5, 1-6, or 1-7 PS linkages between nucleotides.
42. The gRNA of any one of the preceding claims, wherein the 5' end modification comprises at least one PS linkage, and wherein:
    i. there is one PS linkage, and the linkage is between nucleotides 1 and 2 of the guide region;
    ii. there are two PS linkages, and the linkages are between nucleotides 1 and 2, and 2 and 3 of the guide region;
    iii. there are PS linkages between any one or more of nucleotides 1 and 2, 2 and 3, and 3 and 4 of the guide region;
    iv. there are PS linkages between any one or more of nucleotides 1 and 2, 2 and 3, 3 and 4, and 4 and 5 of the guide region;
    v. there are PS linkages between any one or more of nucleotides 1 and 2, 2 and 3, 3 and 4, 4 and 5, and 5 and 6 of the guide region;
    vi. there are PS linkages between any one or more of nucleotides 1 and 2, 2 and 3, 3 and 4, 4 and 5, 5 and 6, and 6 and 7 of the guide region; or
    vii. there are PS linkages between any one or more of nucleotides 1 and 2, 2 and 3, 3 and 4, 4 and 5, 5 and 6, 6 and 7, and 7 and 8 of the guide region.
43. The gRNA of claim 42, wherein the 5' end modification further comprises at least one 2'-OMe, 2'-O-moe, inverted abasic, or 2'-F modified nucleotide.
44. The gRNA of any one of the preceding claims, wherein the short-sgRNA comprises:

i. a modification of one or more of nucleotides 1-7 of the variable region, wherein the modification is a PS linkage, inverted abasic nucleotide, 2'-OMe, 2'-O-moe, 2'-F, 2'-H (a deoxyribonucleotide), an inosine, and/or combinations thereof;
ii. a modification to the first nucleotide of the guide region with 2'-OMe, 2'-O-moe, 2'-F, 2'-H, an inosine, or combinations thereof, and an optional PS linkage to the next nucleotide;
iii. a modification to the first and/or second nucleotide of the variable region with 2'-OMe, 2'-O-moe, 2'-F, 2'-H, an inosine, or combinations thereof, and optionally one or more PS linkages;
iv. a modification to the first, second, and/or third nucleotides of the variable region with 2'-OMe, 2'-O-moe, 2'-F, 2'-H, an inosine, or combinations thereof, and optionally one or more PS linkages;
v. a modification to the first, second, third, and/or fourth nucleotides of the variable region with 2'-OMe, 2'-O-moe, 2'-F, 2'-H, an inosine, or combinations thereof, and optionally one or more PS linkages; or
vi. a modification to the first, second, third, fourth, and/or fifth nucleotides of the variable region with 2'-OMe, 2'-O-moe, 2'-F, 2'-H, an inosine, or combinations thereof, and optionally one or more PS linkages.

45. The gRNA of any one of the preceding claims, wherein the short-sgRNA comprises any one or more of:

i. a 5' end modification as shown in any one of SEQ ID Nos: 1-54;
ii. 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the guide region;
iii. 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the guide region and PS linkages between nucleotides 1 and 2, 2 and 3, and 3 and 4 of the guide region;
iv. 2'-OMe modified nucleotides at nucleotides 1, 2, 3, 4, and 5 of the guide region;
v. 2'-OMe modified nucleotides at nucleotides 1, 2, 3, 4, and 5 of the guide region and PS linkages between nucleotides 1 and 2, 2 and 3, 3 and 4, 4 and 5, and 5 and 6 of the guide region;
vi. 2'O-moe modified nucleotides at nucleotides 1, 2, and 3 of the guide region;

vii. 2'O-moe modified nucleotides at nucleotides 1, 2, and 3 of the guide region and PS linkages between nucleotides 1 and 2, 2 and 3, and 3 and 4 of the guide region;

viii. an inverted abasic modified nucleotide at nucleotide 1 of the guide region;

ix. an inverted abasic modified nucleotide at nucleotide 1 of the guide region and 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the guide region; and

x. an inverted abasic modified nucleotide at nucleotide 1 of the guide region, 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the guide region, and PS linkages between nucleotides 1 and 2, 2 and 3, 3 and 4, 4 and 5, and 5 and 6 of the variable region.

46. The gRNA of any one of the preceding claims, wherein the upper stem region comprises at least one modification.

47. The gRNA of any one of the preceding claims, wherein the upper stem modification comprises any one or more of:

i. a modification to any one or more of US1-US12 in the upper stem region;

ii. a modification of at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or all 12 nucleotides in the upper stem region; and

iii. a modification of about 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9, 1-10, or 1-12 nucleotides in the upper stem region.

48. The gRNA of claim 47, wherein the upper stem modification comprises one or more of:

i. a 2'-OMe modified nucleotide;

ii. a 2'-O-moe modified nucleotide;

iii. a 2'-F modified nucleotide; and

iv. combinations of one or more of (i.) – (iii.).

49. A guide RNA which is a short-sgRNA comprising a conserved portion of an sgRNA comprising a hairpin region, wherein the hairpin region lacks at least 5-10 nucleotides and wherein the short-sgRNA comprises a 5' end modification and one or more modification in one or more of:

i. the upper stem region;

ii. the hairpin 1 region; and

iii. the hairpin 2 region,

wherein the 5' end modification comprises a 5' protective end modification, such as at least two phosphorothioate (PS) linkages within the first seven nucleotides.

50. The gRNA of claim 49, wherein at least one modification comprises a 2'-O-methyl (2'-OMe) modified nucleotide.

51. The gRNA of claim 49 or claim 50, wherein at least one modification comprises a 2'-fluoro (2'-F) modified nucleotide.

52. The gRNA of any one of claims 49-51, wherein at least one modification comprises a phosphorothioate (PS) bond between nucleotides.

53. The gRNA of any one of claims 49-52, wherein the short-sgRNA comprises one or more modifications in the upper stem region.

54. The gRNA of claim 53, comprising modifications at any one of US1 to US12.

55. The gRNA of any one of claims 49-54, wherein the short-sgRNA comprises one or more modifications in the hairpin 1 region.

56. The gRNA of claim 55, wherein the short-sgRNA comprises a modification at H1-1.

57. The gRNA of any one of claims 49-56, wherein the short-sgRNA comprises one or more modifications in the hairpin 2 region.

58. The gRNA of claim 57, wherein the short-sgRNA comprises a modification at H2-1.

59. The gRNA of any one of claims 49-58, wherein the short-sgRNA comprises modifications at H1-1 to H1-12.

60. The gRNA of any one of claims 49-59, wherein the short-sgRNA comprises modifications at H2-1 to H2-15.

61. The gRNA of any one of claims 49-60, wherein the short-sgRNA comprises one or more modifications in each of the upper stem region, the hairpin 1 region, and the hairpin 2 region.

62. The gRNA of any one of claims 49-61, wherein the short-sgRNA comprises a modified nucleotide between hairpin 1 and hairpin 2 regions.

63. The gRNA of any one of claims 49-62, further comprising a lower stem region comprising a modification.

64. The gRNA of any one of claims 49-63, further comprising a 3' end modification.

65. The gRNA of claim 64, wherein at least two of the last four nucleotides at the 3' end of the 3' terminus are modified.

66. The gRNA of claim 64, wherein at least two of the last four nucleotides at the 3' end of the 3' terminus are modified with 2'-OMe, 2'-F, or 2'-O-moe.

67. The gRNA of any one of claims 64-66, further comprising phosphorothioate (PS) bonds between one or more of the last four nucleotides at the 3' end of the 3' terminus.

68. The gRNA of any one of claims 49-67, further comprising a bulge region comprising a modification.

69. The gRNA of any one of claims 49-68, further comprising a nexus region comprising a modification.

70. The gRNA of any one of claims 49-69, wherein at least the first three nucleotides at the 5' end of the variable region, and the last three nucleotides at the 3' end of the 3' terminus are modified.

71. The gRNA of any one of claims 49-70, wherein the first four nucleotides at the 5' end of the variable region, and the last four nucleotides at the 3' end of the 3' terminus are linked with phosphorothioate (PS) bonds.

72. The gRNA of any one of claims 70-71, wherein the end modifications comprise 2'-OMe.

73. The gRNA of any one of claims 70-71, wherein the end modifications comprise 2'-F.

74. The gRNA of any one of claims 49-73, wherein the first four nucleotides at the 5' end of the variable region and the last four nucleotides at the 3' end of the 3' terminus are linked with a PS bond, and wherein the first three nucleotides at the 5' end of the variable region and the last three nucleotides at the 3' end of the 3' terminus comprise 2'-OMe modifications.

75. The gRNA of any one of claims 49-74, wherein the first four nucleotides at the 5' terminus and the last four nucleotides at the 3' terminus are linked with a PS bond, and wherein the first three nucleotides at the 5' terminus and the last three nucleotides at the 3' terminus comprise 2'-OMe, 2'-F, and/or 2'-O-moe modifications.

76. The gRNA of any one of claims 49-75, wherein LS1, LS6, LS7, LS8, LS11, and/or LS12 are modified with 2'-OMe.

77. The gRNA of any one of claims 49-76, wherein each of the nucleotides in the bulge region are modified with 2'-OMe.

78. The gRNA of any one of claims 49-77, wherein at least 50% of the nucleotides in the bulge region are modified with 2'-OMe.

79. The gRNA of any one of claims 49-78, wherein each of the nucleotides in the upper stem region are modified with 2'-OMe.

80. The gRNA of any one of claims 49-79, wherein N16, N17, and/or N18 in the nexus region are modified with 2'-OMe.

81. The gRNA of any one of claims 49-80, wherein N15, N16, N17, and/or N18 in the nexus region are modified.

82. The gRNA of claim 80 or 81, wherein the modifications in the nexus region are selected from 2'-OMe and 2'F.

83. The gRNA of any one of claims 80-82, wherein N16, N17, and N18 are linked with PS bonds.

84. The gRNA of any one of claims 49-83, wherein each of the nucleotides remaining in the hairpin 1 region are modified with 2'-OMe.

85. The gRNA of any one of claims 49-84, wherein each of the nucleotides in the hairpin 2 region are modified with 2'-OMe.

86. A guide RNA which is a short-sgRNA comprising a conserved portion of an sgRNA comprising a hairpin region, wherein the hairpin region lacks at least 5-10 nucleotides and wherein the short-sgRNA comprises a 5' end modification and a 3' end modification, wherein the short-sgRNA further comprises any one or more of:

i. at least one modification in the upper stem region; and
ii. a 3' tail.

87. The gRNA of claim 86, wherein the upper stem modification comprises any one or more of:

i. a modification of each nucleotide (US1-US12) in the upper stem region;
ii. a modification to any one or more of US1-US12 in the upper stem region;
iii. a modification of at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or all 12 nucleotides in the upper stem region; and
iv. a modification of about 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9, 1-10, or 1-12 nucleotides in the upper stem region.

88. The gRNA of any one of claims 86-87, wherein the 5' end modification comprises any one or more of:

i. a modification of any one or more of nucleotides 1-7 of the variable region;
ii. one modified nucleotide;
iii. two modified nucleotides;
iv. three modified nucleotides;
v. four modified nucleotides;
vi. five modified nucleotides;
vii. six modified nucleotides; and
viii. seven modified nucleotides.

89. The gRNA of any one of claims 86-88, wherein the 5' end modification comprises any one or more of:

i. a 5' end modification as shown in any one of SEQ ID Nos: 1-54, 401-532, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, 3388-3430, or 3549-3552;
ii. 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the variable region;
iii. 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the variable region and PS linkages between nucleotides 1 and 2, 2 and 3, and 3 and 4 of the variable region;
iv. 2'-OMe modified nucleotides at nucleotides 1, 2, 3, 4, and 5 of the variable region;
v. 2'-OMe modified nucleotides at nucleotides 1, 2, 3, 4, and 5 of the variable region and PS linkages between nucleotides 1 and 2, 2 and 3, 3 and 4, 4 and 5, and 5 and 6 of the variable region;
vi. 2'O-moe modified nucleotides at nucleotides 1, 2, and 3 of the variable region;
vii. 2'O-moe modified nucleotides at nucleotides 1, 2, and 3 of the variable region and PS linkages between nucleotides 1 and 2, 2 and 3, and 3 and 4 of the variable region;
viii. an inverted abasic modified nucleotide at nucleotide 1 of the variable region;

ix. an inverted abasic modified nucleotide at nucleotide 1 of the variable region and 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the variable region; and

x. an inverted abasic modified nucleotide at nucleotide 1 of the variable region, 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the variable region, and PS linkages between nucleotides 1 and 2, 2 and 3, 3 and 4, 4 and 5, and 5 and 6 of the variable region.

90. The gRNA of claim 89, comprising 2'-OMe modified nucleotides at at least nucleotides 1, 2, and 3, of the variable region and PS linkages between nucleotides 1 and 2, 2 and 3, and 3 and 4 of the variable region.

91. The gRNA of claim 89, comprising 2'-OMe modified nucleotides at at least nucleotides 1, 2, 3, and 4 of the variable region and PS linkages between nucleotides 1 and 2, 2 and 3, and 3 and 4 of the variable region.

92. The gRNA of any one of claims 86-91, comprising a 3' end modification comprising any one or more of:

i. a modification of any one or more of the last 7, 6, 5, 4, 3, 2, or 1 nucleotides;

ii. one modified nucleotide;

iii. two modified nucleotides;

iv. three modified nucleotides;

v. four modified nucleotides;

vi. five modified nucleotides;

vii. six modified nucleotides; and

viii. seven modified nucleotides.

93. The gRNA of any one of claims 86-92, wherein the short-sgRNA comprises any one or more of:

i. a 3' end modification shown in any one of SEQ ID Nos: 1-54, 401-532, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, 3388-3430, or 3549-3552;

ii. (i) a 2'-OMe modified nucleotide at the last nucleotide of the conserved region of an sgRNA or short-sgRNA, (ii) three consecutive 2'O-moe modified nucleotides immediately 5' to the 2'-OMe modified nucleotide,

and (iii) three consecutive PS linkages between the last three nucleotides;

iii. (i) five consecutive 2'-OMe modified nucleotides, and (ii) three PS linkages between the last three nucleotides;

iv. an inverted abasic modified nucleotide at the last nucleotide of the conserved region of an sgRNA or short-sgRNA;

v. (i) an inverted abasic modified nucleotide at the last nucleotide of the conserved region of an sgRNA or short-sgRNA, and (ii) three consecutive 2'-OMe modified nucleotides at the last three nucleotides of the conserved region of an sgRNA or short-sgRNA;

vi. (i) 15 consecutive 2'-OMe modified nucleotides, (ii) five consecutive 2'-F modified nucleotides immediately 5' to the 2'-OMe modified nucleotides, and (iii) three PS linkages between the last three nucleotides;

vii. (i) alternating 2'-OMe modified nucleotides and 2'-F modified nucleotides at the last 20 nucleotides of the conserved region of an sgRNA or short-sgRNA, and (ii) three PS linkages between the last three nucleotides;

viii. (i) two or three consecutive 2'-OMe modified nucleotides, and (ii) three PS linkages between the last three nucleotides;

ix. one PS linkage between the last and next to last nucleotides; and

x. 15 or 20 consecutive 2'-OMe modified nucleotides, and (ii) three PS linkages between the last three nucleotides.

94. The gRNA of any one of claims 86-93, wherein the sgRNA comprise a 3' tail, wherein the 3' tail comprises a modification of any one or more of the nucleotides present in the 3' tail.

95. The gRNA of claim 94, wherein the 3' tail is fully modified.

96. The gRNA of claim 94 wherein the 3' tail comprises 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9, or 1-10 nucleotides, optionally where any one or more of these nucleotides are modified.

97. A guide RNA which is a short-sgRNA comprising any of SEQ ID Nos: 1-54, 201-254, and 301-354, including the modifications of Table 1.

98. A guide RNA which is a short-sgRNA comprising nucleic acids having at least 99, 98, 97, 96, 95, 94, 93, 92, 91, 90, 85, 80, 75, or 70% identity to the nucleic

acids of any one of SEQ ID Nos: 1-54, 201-254, and 301-354, wherein the modification at each nucleotide of the short-sgRNA that corresponds to a nucleotide of the reference sequence identifier in Table 1, is identical to or equivalent to the modification shown in the reference sequence identifier in Table 1.

99. The gRNA of any one of the preceding claims, comprising a YA modification at at least one guide region YA site.

100. The gRNA of any one of the preceding claims, comprising a YA modification at at least one guide region YA site that is not a 5' end modification.

101. The gRNA of any one of the preceding claims, comprising a YA modification at one or more guide region YA sites, wherein the guide region YA site is at or after nucleotide 8 from the 5' end of the 5' terminus.

102. The gRNA of any one of the preceding claims comprising a YA modification at one or more guide region YA sites, wherein the short-sgRNA comprises one or more of:

i. a modification at one or more of H1-1 and H2-1;
ii. a YA modification at 1, 2, 3, 4, or 5 guide region YA sites;
iii. a YA modification at 1, 2, 3, 4, or 5 guide region YA sites, wherein the modification of at least one guide region YA site is different from any 5' end modification of the sgRNA;
iv. a YA modification at one or more guide region YA sites, wherein the guide region YA site is at or after nucleotide 8 from the 5' end of the 5' terminus;
v. a YA modification at one or more guide region YA sites, wherein the guide region YA site is within nucleotides 5-end, 6-end, 7-end, 8-end, 9-end, or 10-end from the 5' end of the 5' terminus;
vi. a YA modification at one or more guide region YA sites, wherein the guide region YA site is within 17, 16, 15, 14, 13, 12, 11, 10, or 9 nucleotides of the 3' terminal nucleotide of the guide region;
vii. a YA modification at a guide region YA site other than a 5' end modification;
viii. a YA modification at two or more guide region YA sites, wherein the guide region YA sites are at or after nucleotide 8 from the 5' end of the 5' terminus;

ix. a YA modification at two or more guide region YA sites, wherein the two guide region YA sites are within nucleotides 5-end, 6-end, 7-end, 8-end, 9-end, or 10-end from the 5' end of the 5' terminus;

x. a YA modification at two or more guide region YA sites, wherein the guide region YA sites are within 17, 16, 15, 14, 13, 12, 11, 10, or 9 nucleotides of the 3' terminal nucleotide of the guide region;

xi. a YA modification at two or more guide region YA sites other than a 5' end modification; and

xii. a YA modification at two or more guide region YA sites, wherein the modifications of the guide region YA sites comprise a modification that at least one nucleotide located 5' of the guide region YA site does not comprise.

103. The gRNA of any one of the preceding claims, comprising a YA modification wherein the modification comprises 2'-fluoro, 2'-H, 2'-OMe, ENA, UNA, inosine, or PS.

104. The gRNA of any one of the preceding claims, comprising a YA modification wherein the modification alters the structure of the dinucleotide motif to reduce RNA endonuclease activity.

105. The gRNA of any one of the preceding claims, comprising a YA modification wherein the modification interferes with recognition or cleavage of a YA site by an RNase and/or stabilizes an RNA structure.

106. The gRNA of any one of the preceding claims, comprising a YA modification wherein the modification comprises one or more of:

i. a ribose modification selected from 2'-O-alkyl, 2'-F, 2'-moe, 2'-F arabinose, and 2'-H (deoxyribose);

ii. a bicyclic ribose analog, such as LNA, BNA, and ENA;

iii. an unlocked nucleic acid modification;

iv. a base modification, such as inosine, pseudouridine, and 5'-methylcytosine; and

v. an internucleoside linkage modification such as phosphorothioate.

107. The gRNA of any one of the preceding claims, comprising a YA modification at one or more conserved region YA sites.

108. The gRNA of any one of the preceding claims, comprising a YA modification at one or more of conserved region YA sites 2, 3, 4, and 10.

109. The gRNA of any one of the preceding claims, comprising a YA modification at one or more of conserved region YA sites 1 and 8.

110. The gRNA of any one of the preceding claims, comprising a YA modification of conserved region YA site 1.

111. The gRNA of any one of the preceding claims, comprising a YA modification of conserved region YA site 2.

112. The gRNA of any one of the preceding claims, comprising a YA modification of conserved region YA site 3.

113. The gRNA of any one of the preceding claims, comprising a YA modification of conserved region YA site 4.

114. The gRNA of any one of the preceding claims, comprising a YA modification of conserved region YA site 5.

115. The gRNA of any one of the preceding claims, comprising a YA modification of conserved region YA site 6.

116. The gRNA of any one of the preceding claims, comprising a YA modification of conserved region YA site 7.

117. The gRNA of any one of the preceding claims, comprising a YA modification of conserved region YA site 8.

118. The gRNA of any one of the preceding claims, comprising a YA modification of conserved region YA site 9.

119. The gRNA of any one of the preceding claims, comprising a YA modification of conserved region YA site 10.

120. The gRNA of any one of the preceding claims, comprising one or more of:

i. YA modifications of conserved region YA sites 2, 3, 4, and 10;
ii. YA modifications of conserved region YA sites 2, 3, and 4;
iii. YA modifications of conserved region YA sites 2, 3, and 10;
iv. YA modifications of conserved region YA sites 2, 4, and 10;
v. YA modifications of conserved region YA sites 3, 4, and 10;
vi. YA modifications of conserved region YA sites 2 and 10;
vii. YA modifications of conserved region YA sites 2 and 4;
viii. YA modifications of conserved region YA sites 2 and 3;
ix. YA modifications of conserved region YA sites 3 and 4;
x. YA modifications of conserved region YA sites 3 and 10;
xi. YA modifications of conserved region YA sites 4 and 10

xii. YA modifications of conserved region YA sites 1 and 5;
xiii. YA modifications of conserved region YA sites 1 and 6;
xiv. YA modifications of conserved region YA sites 1 and 7;
xv. YA modifications of conserved region YA sites 1 and 8;
xvi. YA modifications of conserved region YA sites 1 and 9;
xvii. YA modifications of conserved region YA sites 8 and 5;
xviii. YA modifications of conserved region YA sites 8 and 6;
xix. YA modifications of conserved region YA sites 8 and 7; and
xx. YA modifications of conserved region YA sites 8 and 9;
xxi. optionally wherein the sgRNA further comprises YA modifications of conserved region YA sites 2, 3, 4, and/or 10.

121. The gRNA of any one of the preceding claims, wherein at least one modified YA site comprises a 2'-OMe modification, optionally at the pyrimidine of the YA site.

122. The gRNA of any one of the preceding claims, wherein at least one modified YA site comprises a 2'-fluoro modification, optionally at the pyrimidine of the YA site.

123. The gRNA of any one of the preceding claims, wherein at least one modified YA site comprises a PS modification, optionally at the pyrimidine of the YA site.

124. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises modifications at at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, or all of the following nucleotides: 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 13, 14, 17, and 18, optionally wherein the modifications are 2'-OMe, 2'-fluoro, 2'-H, inosine, or phosphorothioate modifications.

125. The gRNA of any one of the preceding claims, wherein the short-sgRNA comprises a guide region that comprises modifications at nucleotides 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 13, 14, 17, and 18, optionally wherein the modifications are 2'-OMe, 2'-fluoro, 2'-H, inosine, or phosphorothioate modifications.

126. The gRNA of claims 124-125, wherein 2'-OMe modifications are not present in the guide region at nucleotides 6-11 and 13-end.

127. The gRNA of claims 124-126, wherein 2'-fluoro modifications are not present in the guide region at nucleotides 1-7, 15, 16, and 19-end.

128. The gRNA of claims 124-127, wherein phosphorothioate modifications are not present in the guide region at nucleotides 4, 5, 11-14, 17, and 18.

129. The gRNA of claims 124-128, wherein the guide region comprises an unmodified nucleotide 20.

130. The gRNA of claims 124-129, wherein the guide region consists of 20 nucleotides.

131. The gRNA of claims 124-130, wherein the guide region comprises a YA site at nucleotides 5-6 and a modification at nucleotide 5.

132. The gRNA of claims 124-131, wherein the guide region comprises a YA site at nucleotides 12-13 and a modification at nucleotide 12.

133. The gRNA of claims 124-132, wherein the guide region comprises a YA site at nucleotides 15-16 and a modification at nucleotide 15.

134. The gRNA of claims 124-133, wherein the guide region comprises a YA site at nucleotides 16-17 and a modification at nucleotide 16.

135. The gRNA of claims 124-134, wherein the guide region comprises a YA site at nucleotides 19-20 and a modification at nucleotide 19.

136. The gRNA of claims 124-130 or 132-135, wherein the guide region does not comprise a YA site at nucleotides 5-6 and nucleotide 5 is unmodified.

137. The gRNA of claims 124-131 or 133-136, wherein the guide region does not comprise a YA site at nucleotides 12-13 and nucleotide 12 is unmodified.

138. The gRNA of claims 124-132 or 134-137, wherein the guide region does not comprise a YA site at nucleotides 15-16 and nucleotide 15 is unmodified.

139. The gRNA of claims 124-133 or 135-138, wherein the guide region does not comprise a YA site at nucleotides 16-17 and nucleotide 16 is unmodified.

140. The gRNA of claims 124-134 or 136-139, wherein the guide region does not comprise a YA site at nucleotides 19-20 and nucleotide 19 is unmodified.

141. The gRNA of claims 124-140, wherein the short-sgRNA comprises a guide region that comprises one or more of the following:

i. 2'-OMe and phosphorothioate modifications at nucleotide 1;
ii. 2'-OMe and phosphorothioate modifications at nucleotide 2;
iii. 2'-OMe and phosphorothioate modifications at nucleotide 3;
iv. a 2'-OMe modification at nucleotide 4;
v. a phosphorothioate modification at nucleotide 6;
vi. a phosphorothioate modification at nucleotide 7;
vii. 2'-fluoro and phosphorothioate modifications at nucleotide 8;
viii. 2'-fluoro and phosphorothioate modifications at nucleotide 9;

ix. 2'-fluoro and phosphorothioate modifications at nucleotide 10;
x. a 2'-fluoro modification at nucleotide 11;
xi. a 2'-fluoro modifications at nucleotide 13;
xii. a 2'-fluoro modifications at nucleotide 14;
xiii. a 2'-fluoro modifications at nucleotide 17; and
xiv. a 2'-fluoro modifications at nucleotide 18.

142. The gRNA of claims 124-141, wherein the guide region comprises each of the modifications set forth in the preceding claim.

143. The gRNA of claims 124-142, wherein the guide region comprises at least 1, 2, 3, or 4 of the following:
i. a 2'-OMe modification at nucleotide 5 if nucleotides 5 and 6 form a YA site;
ii. a 2'-OMe modification at nucleotide 12 if nucleotides 12 and 13 form a YA site;
iii. a phosphorothioate modification at nucleotide 15 if nucleotides 15 and 16 form a YA site;
iv. a phosphorothioate modification at nucleotide 16 if nucleotides 16 and 17 form a YA site; and
v. a phosphorothioate or 2'-fluoro modification at nucleotide 19 if nucleotides 19 and 20 form a YA site.

144. The gRNA of claims 124-143, wherein the guide region comprises a YA site at nucleotides 5-6 and a 2'-OMe modification at nucleotide 5.

145. The gRNA of claims 124-144, wherein the guide region comprises a YA site at nucleotides 12-13 and a 2'-OMe modification at nucleotide 12.

146. The gRNA of claims 124-145, wherein the guide region comprises a YA site at nucleotides 15-16 and a phosphorothioate modification at nucleotide 15.

147. The gRNA of claims 124-146, wherein the guide region comprises a YA site at nucleotides 16-17 and a phosphorothioate modification at nucleotide 16.

148. The gRNA of claims 124-147, wherein the guide region comprises a YA site at nucleotides 19-20 and a phosphorothioate modification at nucleotide 19.

149. The gRNA of claims 124-148, wherein the guide region comprises a 2'-fluoro modification at nucleotide 19.

150. The gRNA of claims 124-149, wherein the guide region comprises an unmodified nucleotide 15 or only a phosphorothioate modification at nucleotide 15.

151. The gRNA of claims 124-150, wherein the guide region comprises an unmodified nucleotide 16 or only a phosphorothioate modification at nucleotide 16.

152. A guide RNA which is a single guide RNA (sgRNA) comprising:

i. a YA modification at two or more guide region YA sites;
ii. a YA modification at one or more of conserved region YA sites 2, 3, 4, and 10; and
iii. a YA modification at one or more of conserved region YA sites 1 and 8.

153. A guide RNA which is a single guide RNA (sgRNA) comprising:

i. a YA modification at one or more guide region YA sitesthat are at or after nucleotide 8 from the 5' end of the 5' terminus;
ii. a YA modification at one or more of conserved region YA sites 2, 3, 4, and 10; and optionally
iii. a YA modification at one or more of conserved region YA sites 1 and 8.

154. A guide RNA which is a single guide RNA (sgRNA) comprising:

i. a YA modification at one or more guide region YA sitesthat are within 13 nucleotides of the 3' terminal nucleotide of the guide region;
ii. a YA modification at one or more of conserved region YA sites 2, 3, 4, and 10; and
iii. a YA modification at one or more of conserved region YA sites 1 and

155. A guide RNA which is a single guide RNA (sgRNA) comprising:

i. a 5' end modification and a 3' end modification;
ii. a YA modification at one or more of conserved region YA sites 2, 3, 4, and 10; and
iii. a YA modification at one or more of conserved region YA sites 1 and 8.

156. A guide RNA which is a single guide RNA (sgRNA) comprising:

i. a YA modification at at least one guide region YA site, wherein the modification of the guide region YA site comprises a modification at at

least one nucleotide located 5' of the guide region YA site does not comprise;

ii. a YA modification at one or more of conserved region YA sites 2, 3, 4, and 10; and

iii. a YA modification at one or more of conserved region YA sites 1 and 8.

157. A guide RNA which is a single guide RNA (sgRNA) comprising:

i. a YA modification at one or more of conserved region YA sites 2, 3, 4, and 10; and

ii. a YA modification at conserved region YA sites 1 and 8.

158. A guide RNA which is a single guide RNA (sgRNA) comprising:

i. a YA modification at one or more guide region YA sitesthat are at or after nucleotide 8 from the 5' end of the 5' terminus;

ii. a YA modification at one or more of conserved region YA sites 2, 3, 4, and 10; and

iii. a modification at one or more of H1-1 and H2-1.

159. A guide RNA which is a single guide RNA (sgRNA) comprising:

i. a YA modification at one or more of conserved region YA sites 2, 3, 4, and 10;

ii. a YA modification at one or more of conserved region YA sites 1, 5, 6, 7, 8, and 9; and

iii. a modification at one or more of H1-1 and H2-1.

160. A guide RNA which is an sgRNA comprising any one or more of the following:

i. a modification, such as a YA modification, at one or more nucleotides located at or after nucleotide 6 from the 5' end of the 5' terminus;

ii. a YA modification at one or more guide sequence YA sites;

iii. a modification at one or more of B3, B4, and B5, wherein B6 does not comprise a 2'-OMe modification or comprises a modification other than 2'-OMe;

iv. a modification at LS10, wherein LS10 comprises a modification other than 2'-fluoro; and/or

v. a modification at N2, N3, N4, N5, N6, N7, N10, or N11;

and

wherein at least one of the following is true:

a. at least one of nucleotides 8-11, 13, 14, 17, or 18 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;

b. at least one of nucleotides 6-10 from the 5' end of the 5' terminus does not comprise a phosphorothioate linkage;

c. at least one of B2, B3, B4, or B5 does not comprise a 2'-OMe modification;

d. at least one of LS1, LS8, or LS10 does not comprise a 2'-OMe modification;

e. at least one of N2, N3, N4, N5, N6, N7, N10, N11, N16, or N17 does not comprise a 2'-OMe modification;

f. H1-1 comprises a modification;

g. H2-1 comprises a modification; or

h. at least one of H1-2, H1-3, H1-4, H1-5, H1-6, H1-7, H1-8, H1-9, H1-10, H2-1, H2-2, H2-3, H2-4, H2-5, H2-6, H2-7, H2-8, H2-9, H2-10, H2-11, H2-12, H2-13, H2-14, or H2-15 does not comprise a phosphorothioate linkage.

161. A guide RNA comprising any one or more of the following:

i. a modification, such as a YA modification, at one or more nucleotides located at or after nucleotide 6 from the 5' end of the 5' terminus; or

ii. a YA modification at one or more guide sequence YA sites;

wherein at least one of the following is true:

a. at least one of nucleotides 8-11, 13, 14, 17, or 18 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification; or

b. at least one of nucleotides 6-10 from the 5' end of the 5' terminus does not comprise a phosphorothioate linkage;

and wherein at least one of the following is also true:

c. at least one of nucleotides 7-10 from the 5' end of the 5' terminus does not comprise a 2'-OMe modification;
d. nucleotide 20 from the 5' end of the 5' terminus does not comprise a 2'-OMe modification; or
e. the guide RNA comprises a 2'-fluoro modification at any one or more of nucleotides 1-20 from the 5' end of the 5' terminus and at least one of nucleotides 11, 12, 13, 14, 17, or 18 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification, optionally wherein nucleotide 12 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification.

162. A guide RNA which is an sgRNA comprising a guanosine at N14 and/or one or more of the following:

i. a YA modification at one or more guide region YA sitesthat are at or after nucleotide 8 from the 5' end of the 5' terminus;
ii. a YA modification at one or more of conserved region YA sites 1, 5, and 6, wherein if YA site 6 is modified at LS12 and LS9is not modified, then the modification of LS12 is other than 2'-OMe;
iii. a modification at LS9, wherein if LS9 is modified and LS5, LS7, and LS12 are not modified, then the modification of LS9 is other than 2'-fluoro,
iv. a modification at LS12, wherein if LS12 is modified and LS9 is not modified, then the modification of LS12 is other than 2'-OMe;
v. a modification at LS8 or LS11, wherein at least one of LS8 and LS11 comprises a modification other than 2'-OMe; and/or
vi. a modification at N6, N14, or N17, wherein if N17 is modified and N6 and N14 are not modified, then the modification of N17 is other than 2'-fluoro and other than 2'-OMe;

and wherein at least one of the following is true:

a. at least one of nucleotides 8-11, 13-14, 17, or 18 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
b. at least one of nucleotides 6-10 from the 5' end of the 5' terminus does not comprise a phosphorothioate linkage;
c. at least one of B2, B3, B4, or B5 does not comprise a 2'-OMe modification;
d. at least one of LS1, LS8, or LS10 does not comprise a 2'-OMe modification;
e. at least one of N2, N3, N4, N5, N6, N7, N10, N11, N16, or N17 does not comprise a 2'-OMe modification;
f. H1-1 comprises a modification;
g. H2-1 comprises a modification; or
h. at least one of H1-2, H1-3, H1-4, H1-5, H1-6, H1-7, H1-8, H1-9, H1-10, H2-1, H2-2, H2-3, H2-4, H2-5, H2-6, H2-7, H2-8, H2-9, H2-10, H2-11, H2-12, H2-13, H2-14, or H2-15 does not comprise a phosphorothioate linkage.

163. The gRNA of claims 161 or 162, comprising:

i. a YA modification at 1, 2, 3, 4, or 5 guide region YA sites;
ii. a YA modification at 1, 2, 3, 4, or 5 guide region YA sites, wherein the modification of at least one guide region YA site is different from any 5' end modification of the sgRNA;
iii. a YA modification at one or more guide region YA sites that are at or after nucleotide 8 from the 5' end of the 5' terminus;
iv. a YA modification at one or more guide region YA sites that are is within nucleotides 5-end, 6-end, 7-end, 8-end, 9-end, or 10-end from the 5' end of the 5' terminus;
v. a YA modification at one or more guide region YA sites that are within 17, 16, 15, 14, 13, 12, 11, 10, or 9 nucleotides of the 3' terminal nucleotide of the guide region;
vi. a YA modification at a guide region YA site other than a 5' end modification; or

vii. a YA modification at a guide region YA site, wherein the modification of the guide region YA site comprises a modification at at least one nucleotide located 5' of the guide region YA site does not comprise.

164. The gRNA of claim 163, comprising:

i. a YA modification at two or more guide region YA sites that are at or after nucleotide 8 from the 5' end of the 5' terminus;
ii. a YA modification at two or more guide region YA sites that are within nucleotides 5-end, 6-end, 7-end, 8-end, 9-end, or 10-end from the 5' end of the 5' terminus;
iii. a YA modification at two or more guide region YA sites that are within 17, 16, 15, 14, 13, 12, 11, 10, or 9 nucleotides of the 3' terminal nucleotide of the guide region;
iv. a YA modification at two or more guide region YA sites other than a 5' end modification; or
v. a YA modification at a two or more guide region YA sites, wherein the modifications of the guide region YA sites comprise a modification at at least one nucleotide located 5' of the guide region YA site does not comprise.

165. The gRNA of claim 163, comprising:

i. a YA modification at three or more guide region YA sites that are at or after nucleotide 8 from the 5' end of the 5' terminus;
ii. a YA modification at three or more guide region YA sites that are within nucleotides 5-end, 6-end, 7-end, 8-end, 9-end, or 10-end from the 5' end of the 5' terminus;
iii. a YA modification at three or more guide region YA sites that are within 17, 16, 15, 14, 13, 12, 11, 10, or 9 nucleotides of the 3' terminal nucleotide of the guide region;
iv. a YA modification at three or more guide region YA sites other than a 5' end modification; or
v. a YA modification at a three or more guide region YA sites, wherein the modifications of the guide region YA sites comprise a modification at at

least one nucleotide located 5' of the guide region YA site does not comprise.

166. The gRNA of any one of claims 161-165, comprising at least one YA modification at nucleotide 6 from the 5' end of the 5' terminus.

167. The gRNA of any one of claims 161-166, comprising at least one YA modification at nucleotide 7 from the 5' end of the 5' terminus.

168. The gRNA of any one of claims 161-167, comprising at least one YA modification at nucleotide 8 from the 5' end of the 5' terminus.

169. The gRNA of any one of claims 161-168, comprising at least one YA modification at nucleotide 9 from the 5' end of the 5' terminus.

170. The gRNA of any one of claims 161-169, comprising at least one YA modification at nucleotide 10 from the 5' end of the 5' terminus.

171. The gRNA of any one of claims 161-170, comprising at least one YA modification at nucleotide 11 from the 5' end of the 5' terminus.

172. The gRNA of any one of claims 161-171, comprising at least one YA modification at nucleotide 12 from the 5' end of the 5' terminus.

173. The gRNA of any one of claims 161-172, comprising at least one YA modification at nucleotide 13 from the 5' end of the 5' terminus.

174. The gRNA of any one of claims 161-173, comprising at least one YA modification at nucleotide 14 from the 5' end of the 5' terminus.

175. The gRNA of any one of claims 161-174, comprising at least one YA modification at nucleotide 15 from the 5' end of the 5' terminus.

176. The gRNA of any one of claims 161-175, comprising at least one YA modification at nucleotide 16 from the 5' end of the 5' terminus.

177. The gRNA of any one of claims 161-176, comprising at least one YA modification at nucleotide 17 from the 5' end of the 5' terminus.

178. The gRNA of any one of claims 161-177, comprising at least one YA modification at nucleotide 18 from the 5' end of the 5' terminus.

179. The gRNA of any one of claims 161-178, comprising at least one YA modification at nucleotide 19 from the 5' end of the 5' terminus.

180. The gRNA of any one of claims 161-179, comprising at least one YA modification at nucleotide 20 from the 5' end of the 5' terminus.

181. The gRNA of any one of claims 161-180, wherein at least 1, 2, 3, 4, 5, 6, 7, or 8 of nucleotides 8-11, 13-14, and 17-18 from the 5' end of the 5' terminus comprise a YA modification, optionally wherein the modification comprises 2'-fluoro, 2'-H, 2'-OMe, or PS.

182. The gRNA of claim 181, wherein the modification is 2'-fluoro.

183. The gRNA of claim 181, wherein the modification is 2'-OMe or 2'-H.

184. The gRNA of claim 181, wherein the modification is PS.

185. The gRNA of any one of claims 161-184, wherein at least 1, 2, 3, 4, or 5 of nucleotides 6-10 from the 5' end of the 5' terminus comprise a YA modification, optionally wherein the modification comprises 2'-fluoro, 2'-H, 2'-OMe, inosine, or PS.

186. The gRNA of claim 185, wherein the modification is PS.

187. The gRNA of claim 185, wherein the modification is 2'-fluoro or 2'-H.

188. The gRNA of claim 185, wherein the modification is 2'-OMe.

189. The gRNA of any one of claims 161-188, comprising any one or more of the following:

i. 1, 2, 3, 4, 5, 6, 7, or 8 YA modifications of nucleotides 8-11, 13-14, and 17-18 from the 5' end of the 5' terminus, wherein the YA modifications are optionally 2'-fluoro modifications, and a modification other than 2'-fluoro at one or more of nucleotides 6-10 from the 5' terminus;
ii. a YA modification other than PS at one or more of nucleotides 8-11, 13-14, and 17-18 from the 5' end of the 5' terminus, and 1, 2, 3, 4, or 5 YA modifications at nucleotides 6-10 from the 5' end of the 5' terminus, optionally wherein the modifications are PS modifications;

iii. 1, 2, 3, 4, 5, 6, 7, or 8 YA modifications at nucleotides 8-11, 13-14, and 17-18 from the 5' end of the 5' terminus, wherein the YA modifications are optionally 2'-fluoro modifications, and modifications other than 2'-fluoro at nucleotides 6-10 from the 5' end of the 5' terminus;

iv. YA modifications other than PS at each of nucleotides 8-11, 13-14, and 17-18 from the 5' end of the 5' terminus, and 1, 2, 3, 4, or 5 YA modifications at nucleotides 6-10 from the 5' end of the 5' terminus, wherein the modifications are optionally PS modifications;

v. 1, 2, 3, 4, 5, 6, 7, or 8 YA modifications at nucleotides 8-11, 13-14, and 17-18 from the 5' end of the 5' terminus, wherein the YA modifications are optionally 2'-fluoro modifications, and one or more PS modification at any one of nucleotides 6-10 from the 5' end of the 5' terminus;

vi. at least one 2'-fluoro modification at any one of nucleotides 8-11, 13-14, and 17-18 from the 5' end of the 5' terminus, and 1, 2, 3, 4, or 5 YA modifications of nucleotides 6-10 from the 5' end of the 5' terminus, wherein the modifications are optionally PS modifications;

vii. 1, 2, 3, 4, 5, 6, 7, or 8 YA modifications of nucleotides 8-11, 13-14, and 17-18 from the 5' end of the 5' terminus, wherein the YA modifications are optionally 2'-fluoro modifications, and a PS modification at each of nucleotides 6-10 from the 5' end of the 5' terminus; or

viii. a 2'-fluoro modification at each of nucleotides 8-11, 13-14, and 17-18 from the 5' end of the 5' terminus, and 1, 2, 3, 4, or 5 YA modifications of nucleotides 6-10 from the 5' end of the 5' terminus, wherein the modifications are optionally PS modifications.

190. The gRNA of any one of claims 161-189, wherein:

i. nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 2, 3, or 4 modified YA sites including a first modified YA site comprising a 2'-OMe modification and a second modified YA site comprising a 2'-fluoro modification or a PS modification;

ii. nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 2, 3, or 4 modified YA sites including a first modified YA site comprising a 2'-fluoro modification and a second modified YA site comprising a 2'-OMe modification or a PS modification;

iii. nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 2, 3, or 4 modified YA sites including a first modified YA site comprising a PS modification and a second modified YA site comprising a 2'-OMe modification or a 2'-fluoro modification;

iv. nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 2, 3, or 4 modified YA sites including a YA modification;

v. nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 3 or 4 modified YA sites including a first modified YA site comprising a 2'-OMe modification, a second modified YA site comprising a 2'-fluoro modification, and a third modified YA site comprising a PS modification;

vi. nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 3 or 4 modified YA sites including a first modified YA site comprising a 2'-OMe modification, a second modified YA site comprising a 2'-fluoro modification, a third modified YA site comprising a 2'-fluoro modification, and a fourth modified YA site comprising a PS modification;

vii. nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 3 or 4 modified YA sites including a YA modification;

viii. nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 4 modified YA sites including a first modified YA site comprising a 2'-OMe modification, a second modified YA site comprising a 2'-fluoro modification, a third modified YA site comprising a PS modification, and a fourth modified YA site comprising a PS modification; or

ix. nucleotides 4-40 from the 5' end of the 5' terminus comprise at least 4 modified YA sites including a YA modification.

191. The gRNA of any one of claims 161-190, wherein nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 5 modified YA sites.

192. The gRNA of any one of claims 161-191, wherein the at least 5 modified YA sites include a fifth modified YA site comprising a PS modification, optionally wherein the third modified YA site comprises a 2'-fluoro modification.

193. The gRNA of any one of claims 161-192, wherein the first, second, and (if applicable) third, fourth, and fifth of the at least 5 modified YA sites are arranged in the 5' to 3' direction.

194. The gRNA of any one of claims 161-193, wherein the first, second, and (if applicable) third, fourth, and fifth of the at least 5 modified YA sites are not arranged in the 5' to 3' direction.

195. The gRNA of any one of claims 161-194, wherein nucleotides 4-20 from the 5' end of the 5' terminus comprise at least 2, 3, 4, or 5 modified YA sites comprising a deoxyribonucleotide, optionally wherein the deoxyribonucleotide is the pyrimidine of the YA sites.

196. The gRNA of any one of claims 161-195, wherein:

i. at least 1, 2, 3, or 4 of nucleotides 8-11 from the 5' end of the 5' terminus comprise a YA modification, which is optionally a 2'-fluoro modification;
ii. at least 1, 2, 3, 4, 5, 6, 7, or 8 of nucleotides 8-11, 13, 14, 17, and 18 from the 5' end of the 5' terminus comprise a YA modification, optionally wherein the YA modifications are 2'-OMe if present at nucleotides 8-11 and 2'-fluoro if present at nucleotides 13, 14, 17, or 18;
iii. at least one or both of nucleotides 17 and 18 from the 5' end of the 5' terminus comprise a YA modification, which is optionally a 2'-fluoro modification;
iv. at least one or both of nucleotides 17 and 18 from the 5' end of the 5' terminus comprise a YA modification, which is optionally a 2'-fluoro modification; or
v. at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, or 13 of nucleotides 4-14, 17, and 18 from the 5' end of the 5' terminus comprise a YA modification, which is optionally a 2'-fluoro modification.

197. The gRNA of any one of claims 161-196, wherein at least 1, 2, 3, 4, 5, or 6 of nucleotides 4-10 from the 5' end of the 5' terminus comprise a YA modification, which is optionally a 2'-OMe modification.

198. The gRNA of any one of claims 161-197, wherein nucleotides 4-10 from the 5' end of the 5' terminus comprise a YA modification, which is optionally a 2'-OMe modification.

199. The gRNA of any one of claims 161-198, wherein:

i. at least one of nucleotides 1-3 from the 5' end of the 5' terminus comprise a 5' protective end modification, which is optionally a 2'-OMe modification;
ii. at least two of nucleotides 1-3 from the 5' end of the 5' terminus comprise a 5' protective end modification, which is optionally a 2'-OMe modification; or
iii. each of nucleotides 1-3 from the 5' end of the 5' terminus comprise a 5' protective end modification, which is optionally a 2'-OMe modification.

200. The gRNA of any one of claims 161-199, wherein at least 1, 2, 3, 4, or 5 of nucleotides 11, 13, 14, 17, and 18 from the 5' end of the 5' terminus comprise a 5' end modification, which is optionally a 2'-fluoro modification.

201. The gRNA of any one of claims 161-200, wherein nucleotide 15 from the 5' end of the 5' terminus is unmodified or modified only with phosphorothioate.

202. The gRNA of any one of claims 161-200, wherein nucleotide 16 from the 5' terminus is unmodified or modified only with phosphorothioate.

203. The gRNA of any one of the preceding claims, wherein nucleotide 3 from the 5' end of the 5' terminus is unmodified or modified only with phosphorothioate.

204. The gRNA of any one of claims 161-203, which is a crRNA or dgRNA.

205. The gRNA of any one of claims 161-203, which is an sgRNA.

206. The gRNA of any one of claims 161-203, which is a short-sgRNA.

207. The gRNA of any one of claim 205 or 206, comprising a YA modification of conserved region YA site 1.

208. The gRNA of any one of claims 205-207, comprising a YA modification of conserved region YA site 2.

209. The gRNA of any one of claims 205-208, comprising a YA modification of conserved region YA site 3.

210. The gRNA of any one of claims 205-209, comprising a YA modification of conserved region YA site 4.

211. The gRNA of any one of claims 205-210, comprising a YA modification of conserved region YA site 5.

212. The gRNA of any one of claims 205-211, comprising a YA modification of conserved region YA site 6.

213. The gRNA of any one of claims 205-212, comprising a YA modification of conserved region YA site 7.

214. The gRNA of any one of claims 205-213, comprising a YA modification of conserved region YA site 8.

215. The gRNA of any one of claims 205-214, comprising a YA modification of conserved region YA site 9.

216. The gRNA of any one of claims 205-215, comprising a YA modification of conserved region YA site 10.

217. The gRNA of any one of claims 205-216, comprising:

i. YA modifications of conserved region YA sites 2, 3, 4, and 10;
ii. YA modifications of conserved region YA sites 2, 3, and 4;
iii. YA modifications of conserved region YA sites 2, 3, and 10;
iv. YA modifications of conserved region YA sites 2, 4, and 10;
v. YA modifications of conserved region YA sites 3, 4, and 10;
vi. YA modifications of conserved region YA sites 2 and 10;
vii. YA modifications of conserved region YA sites 2 and 4;
viii. YA modifications of conserved region YA sites 2 and 3;
ix. YA modifications of conserved region YA sites 3 and 4;
x. YA modifications of conserved region YA sites 3 and 10; or
xi. YA modifications of conserved region YA sites 4 and 10.

218. The gRNA of any one of claims 205-217, comprising:

i. YA modifications of conserved region YA sites 1 and 5;
ii. YA modifications of conserved region YA sites 1 and 6;
iii. YA modifications of conserved region YA sites 1 and 7;
iv. YA modifications of conserved region YA sites 1 and 8;
v. YA modifications of conserved region YA sites 1 and 9;
vi. YA modifications of conserved region YA sites 8 and 5;
vii. YA modifications of conserved region YA sites 8 and 6;
viii. YA modifications of conserved region YA sites 8 and 7; or
ix. YA modifications of conserved region YA sites 8 and 9;

optionally wherein the sgRNA further comprises YA modifications of conserved region YA sites 2, 3, 4, and 10.

219. The gRNA of any one of claims 205-218, wherein at least one modified YA site comprises a 2'-OMe modification, optionally at the pyrimidine of the YA site.

220. The gRNA of any one of claims 205-219, wherein at least one modified YA site comprises a 2'-fluoro modification, optionally at the pyrimidine of the YA site.

221. The gRNA of any one of claims 205-220, wherein at least one modified YA site comprises a PS modification, optionally at the pyrimidine of the YA site.

222. The gRNA of any one of claims 205-221, wherein at least 2, 3, 4, 5, 6, 7, 8, 9, or 10 modified YA sites comprise a 2'-OMe modification, optionally at the pyrimidines of the YA sites.

223. The gRNA of any one of claims205-222, wherein at least 2, 3, 4, 5, 6, 7, 8, 9, or 10 modified YA sites comprise a 2'-fluoro modification, optionally at the pyrimidines of the YA sites.

224. The gRNA of any one of claims205-223, wherein at least 2, 3, 4, 5, 6, 7, 8, 9, or 10 modified YA sites comprise a PS modification, optionally at the pyrimidines of the YA sites.

225. The gRNA of any one of claims205-224, wherein at least 2, 3, 4, 5, 6, 7, 8, 9, or 10 modified YA sites comprise a ribose modification at the 2' position, optionally at the pyrimidines of the YA sites, and optionally chosen from a 2'-O-alkyl, 2'-H, and 2'-fluoro modification.

226. The gRNA of any one of claims 205-225, wherein:

i. conserved region YA sites 1 and 8 comprise 2'-fluoro modifications, optionally at the pyrimidines of the YA sites;
ii. conserved region YA sites 5 and 6; 5 and 7; 5 and 9; 6 and 7; 6 and 9; 5, 6, and 7; 5, 6, and 9; 6, 7, and 9; or 5, 6, 7, and 9 comprise 2'-OMe modifications, optionally at the pyrimidines of the YA sites;
iii. conserved region YA site 1 comprises a 2'-fluoro modification and conserved region YA sites 5 and 6; 5 and 7; 5 and 9; 6 and 7; 6 and 9; 5, 6, and 7; 5, 6, and 9; 6, 7, and 9; or 5, 6, 7, and 9 comprise 2'-OMe modifications, optionally at the pyrimidines of the YA sites;
iv. conserved region YA site 8 comprises a 2'-fluoro modification and conserved region YA sites 5 and 6; 5 and 7; 5 and 9; 6 and 7; 6 and 9; 5, 6, and 7; 5, 6, and 9; 6, 7, and 9; or 5, 6, 7, and 9 comprise 2'-OMe modifications, optionally at the pyrimidines of the YA sites;
v. conserved region YA site 1 comprises a 2'-fluoro modification at the pyrimidine of the YA sites and YA sites 5 and 6; 5 and 7; 5 and 9; 6 and 7; 6 and 9; 5, 6, and 7; 5, 6, and 9; 6, 7, and 9; or 5, 6, 7, and 9 comprise 2'-OMe modifications, optionally at the pyrimidines of the YA sites;
vi. conserved region YA site 8 comprises a 2'-fluoro modification at the pyrimidine of the YA site and YA sites 5 and 6; 5 and 7; 5 and 9; 6 and 7; 6 and 9; 5, 6, and 7; 5, 6, and 9; 6, 7, and 9; or 5, 6, 7, and 9 comprise 2'-OMe modifications, optionally at the pyrimidines of the YA sites;
vii. conserved region YA sites 1 and 8 comprise 2'-fluoro modifications and conserved region YA sites 5 and 6; 5 and 7; 5 and 9; 6 and 7; 6 and 9; 5, 6, and 7; 5, 6, and 9; 6, 7, and 9; or 5, 6, 7, and 9 comprise 2'-OMe modifications, optionally at the pyrimidines of the YA sites; or
viii. conserved region YA sites 1 and 8 comprise 2'-fluoro modifications at the pyrimidines of the YA sites and conserved region YA sites 5 and 6; 5 and 7; 5 and 9; 6 and 7; 6 and 9; 5, 6, and 7; 5, 6, and 9; 6, 7, and 9; or 5, 6, 7, and 9 comprise 2'-OMe modifications, optionally at the pyrimidines of the YA sites.

227. The gRNA of any one of claims 205-226, wherein conserved region YA sites 7 and 9 comprise YA modifications, which are optionally 2'-OMe modifications.

228. The gRNA of any one of claims 205-227, wherein conserved region YA sites 5, 6, 7, and 9 comprise YA modifications, which are optionally 2'-OMe modifications.

229. The gRNA of any one of claims 205-228, wherein conserved region YA site 8 comprises a 2'-fluoro modification.

230. The gRNA of any one of claims 205-229, wherein conserved region YA site 8 comprises a deoxyribonucleotide modification.

231. The gRNA of any one of claims 205-230, wherein conserved region YA site 8 is abolished by a base substitution, optionally wherein the base substitution eliminates the uracil of YA site 8, further optionally wherein the base substitution is a uracil to guanine substitution.

232. The gRNA of any one of claims 205-231, wherein conserved region YA site 1 comprises a 2'-fluoro modification.

233. The gRNA of any one of claims 205-232, wherein conserved region YA site 1 comprises a PS modification.

234. The gRNA of any one of claims 205-233, wherein 1, 2, 3, 4, 5, 6, or 7 of LS5, LS7, LS8, LS9, LS10, LS11, and LS12 comprise modifications, optionally wherein the modifications are 2'-fluoro and/or 2'-OMe modifications.

235. The gRNA of any one of claims 205-234, wherein modifications at LS5, LS7, LS9, and LS11, if present, comprise 2'-fluoro modifications, optionally wherein each of LS5, LS7, LS9, and LS11 comprise 2'-fluoro modifications.

236. The gRNA of any one of claims 205-235, wherein modifications at LS8, LS10, and LS12, if present, comprise 2'-OMe modifications, optionally wherein each of LS8, LS10, and LS12 comprise 2'-OMe modifications.

237. The gRNA of any one of claims 205-236, wherein 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 of N2, N3, N4, N5, N6, N7, N10, N11, N16, and N17 comprise modifications, which are optionally 2'-OMe modifications.

238. The gRNA of any one of claims 205-237, wherein H2-2 comprises a modification, optionally wherein H2 is otherwise unmodified.

239. The gRNA of any one of claims 205-238, wherein H2-2 comprises a 2'-OMe modification.

240. The gRNA of any one of claims 205-239, wherein US3, US9, and US12 comprise modifications, optionally wherein the US is otherwise unmodified.

241. The gRNA of any one of claims 205-240, wherein US3, US9, and US12 comprise 2'-OMe modifications.

242. The gRNA of any one of claims 205-241, wherein nucleotides 6-10 from the 5' end of the 5' terminus comprise a PS modification and nucleotides 8-11, 13, 14, 17, and 18 from the 5' end of the 5' terminus comprise a 2'-fluoro modification.

243. The gRNA of any one of claims 205-242, wherein each guide region YA site comprises a 2'-fluoro modification, optionally excepting nucleotides 15 and/or 16 from the 5' end of the 5' terminus.

244. The gRNA of any one of claims 205-243, wherein nucleotides 4, 8, and 11 from the 5' end of the 5' terminus comprise YA modifications, optionally wherein nucleotide 4 comprises a 2'-OMe modification and nucleotides 8 and 11 comprise a 2'-fluoro modification.

245. The gRNA of any one of claims 205-244, wherein 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, or more modified YA sites comprise a YA modification at the pyrimidine position of the YA site.

246. The gRNA of claim 245, wherein 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 modified conserved region YA sites comprise a YA modification at the pyrimidine position of the YA site.

247. The gRNA of any one of claims 205-246, wherein 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, or more modified YA sites comprise a YA modification at the adenine position of the YA site.

248. The gRNA of claim 247, wherein 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 modified conserved region YA sites comprise a YA site modification at the adenine position of the YA site.

249. The gRNA of any one of claims 205-248, comprising:

i. a modification of H1-1;
ii. a modification of H2-1; or
iii. modifications of H1-1 and H2-1.

250. The gRNA of claim 249, wherein H1-1 and/or H2-1 comprises a 2'-OMe modification.

251. The gRNA of claim 250, wherein H1-1 and/or H2-1 comprises a 2'-fluoro modification.

252. The gRNA of claim 251, wherein H1-1 and/or H2-1 comprises a PS modification.

253. The gRNA of any one of claims 205-252, comprising a modification at B3, optionally wherein B6 does not comprise a 2'-OMe modification or comprises a modification other than 2'-OMe.

254. The gRNA of any one of claims 205-253, comprising a modification at B4, optionally wherein B6 does not comprise a 2'-OMe modification or comprises a modification other than 2'-OMe.

255. The gRNA of any one of claims 205-254, comprising a modification at B5, optionally wherein B6 does not comprise a 2'-OMe modification or comprises a modification other than 2'-OMe.

256. The gRNA of any one of claims 205-255, comprising a modification at LS10, optionally wherein LS10 comprises a modification other than 2'-fluoro.

257. The gRNA of any one of claims 205-256, comprising a modification at N2.

258. The gRNA of any one of claims 205-257, comprising a modification at N3.

259. The gRNA of any one of claims 205-258, comprising a modification at N4.

260. The gRNA of any one of claims 205-259, comprising a modification at N5.

261. The gRNA of any one of claims 205-260, comprising a modification at N6.

262. The gRNA of any one of claims 205-261, comprising a modification at N7.

263. The gRNA of any one of claims 205-262, comprising a modification at N10.

264. The gRNA of any one of claims 205-263, comprising a modification at N11.

265. The gRNA of any one of claims 205-264,, wherein:

i. nucleotide 8 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
ii. nucleotide 9 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
iii. nucleotide 10 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
iv. nucleotide 11 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
v. nucleotide 13 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
vi. nucleotide 14 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
vii. nucleotide 17 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification; and/or
viii. nucleotide 18 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification.

266. The gRNA of any one of claims 205-265, wherein:

i. nucleotide 6 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
ii. nucleotide 7 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
iii. nucleotide 8 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
iv. nucleotide 9 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification; and/or
v. nucleotide 10 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification.

267. The gRNA of any one of claims 205-266, wherein:

i. nucleotide 6 from the 5' end of the 5' terminus does not comprise a phosphorothioate linkage;
ii. nucleotide 7 from the 5' end of the 5' terminus does not comprise a phosphorothioate linkage;
iii. nucleotide 8 from the 5' end of the 5' terminus does not comprise a phosphorothioate linkage;
iv. nucleotide 9 from the 5' end of the 5' terminus does not comprise a phosphorothioate linkage; and/or
v. nucleotide 10 from the 5' end of the 5' terminus does not comprise a phosphorothioate linkage.

268. The gRNA of any one of claims 205-267, wherein:

i. nucleotide 7 from the 5' end of the 5' terminus does not comprise a 2'-OMe modification;
ii. nucleotide 8 from the 5' end of the 5' terminus does not comprise a 2'-OMe modification;
iii. nucleotide 9 from the 5' end of the 5' terminus does not comprise a 2'-OMe modification; and/or
iv. nucleotide 10 from the 5' end of the 5' terminus does not comprise a 2'-OMe modification.

269. The gRNA of any one of claims 205-268, wherein nucleotide 20 from the 5' end of the 5' terminus does not comprise a 2'-OMe modification.

270. The gRNA of any one of claims 205-269, wherein the guide RNA comprises a 2'-fluoro modification at any one or more of nucleotides 1-11 and 13-20 from the 5' end of the 5' terminus and nucleotide 12 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification.

271. The gRNA of any one of claims 205-270, wherein the guide RNA comprises a 2'-fluoro modification at any one or more of nucleotides 1-20 from the 5' end of the 5' terminus and:

i. nucleotide 11 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;

ii. nucleotide 12 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
iii. nucleotide 13 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
iv. nucleotide 14 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification;
v. nucleotide 17 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification; and/or
vi. nucleotide 18 from the 5' end of the 5' terminus does not comprise a 2'-fluoro modification.

272. The gRNA of any one of claims 205-271, wherein:

i. B2 does not comprise a 2'-OMe modification;
ii. B3 does not comprise a 2'-OMe modification;
iii. B4 does not comprise a 2'-OMe modification; and/or
iv. B5 does not comprise a 2'-OMe modification.

273. The gRNA of any one of claims 205-272, wherein:

i. LS1 does not comprise a 2'-OMe modification;
ii. LS8 does not comprise a 2'-OMe modification; and/or
iii. LS10 does not comprise a 2'-OMe modification.

274. The gRNA of any one of claims 205-273, wherein:

i. N2 does not comprise a 2'-OMe modification;
ii. N3 does not comprise a 2'-OMe modification;
iii. N4 does not comprise a 2'-OMe modification;
iv. N5 does not comprise a 2'-OMe modification;
v. N6 does not comprise a 2'-OMe modification;
vi. N7 does not comprise a 2'-OMe modification;
vii. N10 does not comprise a 2'-OMe modification;
viii. N11 does not comprise a 2'-OMe modification;
ix. N16 does not comprise a 2'-OMe modification; and/or
x. N17 does not comprise a 2'-OMe modification.

275. The gRNA of any one of claims 205-274, wherein:

i. H1-2 does not comprise a phosphorothioate linkage;
ii. H1-3 does not comprise a phosphorothioate linkage;
iii. H1-4 does not comprise a phosphorothioate linkage;
iv. H1-5 does not comprise a phosphorothioate linkage;
v. H1-6 does not comprise a phosphorothioate linkage;
vi. H1-7 does not comprise a phosphorothioate linkage;
vii. H1-8 does not comprise a phosphorothioate linkage;
viii. H1-9 does not comprise a phosphorothioate linkage;
ix. H1-10 does not comprise a phosphorothioate linkage;
x. H2-1 does not comprise a phosphorothioate linkage;
xi. H2-2 does not comprise a phosphorothioate linkage;
xii. H2-3 does not comprise a phosphorothioate linkage;
xiii. H2-4 does not comprise a phosphorothioate linkage;
xiv. H2-5 does not comprise a phosphorothioate linkage;
xv. H2-6 does not comprise a phosphorothioate linkage;
xvi. H2-7 does not comprise a phosphorothioate linkage;
xvii. H2-8 does not comprise a phosphorothioate linkage;
xviii. H2-9 does not comprise a phosphorothioate linkage;
xix. H2-10 does not comprise a phosphorothioate linkage;
xx. H2-11 does not comprise a phosphorothioate linkage;
xxi. H2-12 does not comprise a phosphorothioate linkage;
xxii. H2-13 does not comprise a phosphorothioate linkage;
xxiii. H2-14 does not comprise a phosphorothioate linkage; and/or
xxiv. H2-15 does not comprise a phosphorothioate linkage.

276. A gRNA which is an sgRNA comprising modifications at:

i. nucleotides 6-10 from the 5' end of the 5' terminus, which are optionally PS modifications;
ii. nucleotides 8-11, 13, 14, 17, and 18 from the 5' end of the 5' terminus, which are optionally 2'-fluoro modifications; and
iii. H1-1 and H2-1, which are optionally 2'-OMe modifications, or conserved region YA site 1 or 8.

277. A gRNA which is an sgRNA comprising YA modifications at:

i. conserved region YA sites 1, 5, 6, 7, and 9, which are optionally 2'-OMe modifications; and
ii. conserved region YA site 8, which is optionally a 2'-fluoro modification.

278. A gRNA comprising YA modifications at four guide region YA sites, wherein at least one of the YA sites is at or after nucleotide 8 from the 5' end of the 5' terminus, and wherein:

i. the first YA site comprises a 2'-OMe modification;
ii. the second YA site comprises a 2'-fluoro modification;
iii. the third YA site comprises a 2'-fluoro or PS modification; and
iv. the fourth YA site comprises a PS modification,

optionally wherein the first, second, third, and fourth YA sites are arranged in the 5' to 3' direction.

279. The gRNA of claim 278, wherein the third YA site comprises a PS modification.

280. The gRNA of any one of claims 278-279, wherein the third YA site comprises a 2'-fluoro modification.

281. The gRNA of any one of claims 278-280, further comprising a fifth YA site comprising a PS modification, which is optionally 3' of the fourth YA site.

282. The gRNA of any one of the claims 205-281, wherein conserved region YA sites 1, 5, 6, 7, and 9 comprise YA modifications, which are optionally 2'-OMe modifications; and conserved region YA site 8 comprises a modification, which is optionally a 2'-fluoro modification.

283. A gRNA which is an sgRNA comprising YA modifications at:

i. nucleotide 4 from the 5' end of the 5' terminus, wherein the YA modification is optionally a 2'-OMe modification;
ii. nucleotides 6-10 from the 5' end of the 5' terminus, which are optionally PS modifications;
iii. nucleotides 8-11, 13, 14, 17, and 18 from the 5' end of the 5' terminus, which are optionally 2'-fluoro modifications;

iv. LS5, LS7, LS9, and LS11, which are optionally 2'-fluoro modifications;
v. LS8, LS10, and LS12, which are optionally 2'-OMe modifications;
vi. N2, N3, N4, N5, N6, N7, N10, N11, N16, and N17, which are optionally 2'-OMe modifications; and
vii. N14, which is optionally a 2'-fluoro modification.

284. The gRNA of any one of claim 161-, wherein one or more of the following are true:

i. nucleotide 4 from the 5' end of the 5' terminus comprises a 2'-OMe modification;
ii. nucleotides 6-10 from the 5' end of the 5' terminus comprise PS modifications;
iii. nucleotides 8-11, 13, 14, 17, and 18 from the 5' end of the 5' terminus comprise 2'-fluoro modifications;
iv. LS5, LS7, LS9, and LS11 comprise 2'-fluoro modifications;
v. LS8, LS10, and LS12 comprise 2'-OMe modifications;
vi. N2, N3, N4, N5, N6, N7, N10, N11, N16, and N17 comprise 2'-OMe modifications; and
vii. N14 comprises a 2'-fluoro modification.

285. The gRNA of any one of claims 161-284, wherein at least one YA modification comprises a modification of the pyrimidine position of the YA site.

286. The gRNA of any one of claims 161-285, wherein at least one YA modification comprises a modification of the adenine position of the YA site.

287. The gRNA of any one of claims 161-286, wherein at least 2, 3, 4, 5, 6, 7, 8, 9, or 10 YA sites comprise YA modifications at the pyrimidines positions of the YA sites.

288. The gRNA of any one of claims 161-287, wherein at least 2, 3, 4, 5, 6, 7, 8, 9, or 10 YA sites comprise YA modifications at the adenine positions of the YA sites.

289. The gRNA of any one of claims 161-288, wherein at least one YA modification comprises a 2'-OMe modification.

290. The gRNA of any one of claims 161-289, wherein at least 2, 3, 4, 5, 6, 7, 8, 9, or 10 YA sites comprise a 2'-OMe modification.

291. The gRNA of any one of claims 161-290, wherein each modified conserved region YA site comprises a modification at the pyrimidine position of the YA site.

292. The gRNA of any one of claims 161-291, wherein each modified guide region YA site, or each modified conserved region and guide region YA site, comprises a modification at the pyrimidine position of the YA site.

293. The gRNA of any one of claims 161-292, wherein each modified conserved region YA site comprises a modification at the adenine position of the YA site.

294. The gRNA of any one of claims 161-293, wherein each modified guide region YA site, or each modified conserved region and guide region YA site, comprises a modification at the adenine position of the YA site.

295. The gRNA of any one of claims 161-294, which is an sgRNA comprising a modification at LS5.

296. The gRNA of any one of claims 161-295, which is an sgRNA comprising a modification at LS7.

297. The gRNA of any one of claims 161-296, which is an sgRNA comprising a modification at LS9, optionally wherein if LS9 is modified and LS5, LS7, and LS12 are not, then the modification of LS9 is other than 2'-fluoro.

298. The gRNA of any one of claims 161-297, which is an sgRNA comprising a modification at LS12, optionally wherein if LS12 is modified and LS9 is not, then the modification of LS12 is other than 2'-OMe.

299. The gRNA of any one of claims 161-298, which is an sgRNA comprising at least one YA modification that stabilizes a secondary structure, optionally wherein the secondary structure is the lower stem.

300. The gRNA of any one of claims 161-299, which is an sgRNA comprising at least one modification of LS8 and/or LS11, optionally wherein the modification of LS8 and/or LS11 stabilizes a secondary structure.

301. The gRNA of any one of claims 161-300, comprising a YA modification that stabilizes a secondary structure chosen from:

i. ENA;
ii. LNA; or
iii. a bicyclic ribose modification.

302. The gRNA of any one of claims 161-301, which is an sgRNA comprising a modification at N6.

303. The gRNA of any one of claims 161-302, which is an sgRNA comprising a modification at N14.

304. The gRNA of any one of claims 161-303, which is an sgRNA comprising a modification at N17, optionally wherein if N17 is modified and N6 and N14 are not, then the modification of N17 is other than 2'-fluoro and other than 2'-OMe.

305. The gRNA of any one of claims 161-304, wherein at least 1, 2, or 3 of nucleotides 1-3 from the 5' end of the 5' terminus comprise deoxyribonucleotides, optionally wherein nucleotides 1-3 from the 5' end of the 5' terminus comprise PS modifications.

306. The gRNA of any one of claims 161-305, wherein the gRNA is an sgRNA and at least 1, 2, or 3 of nucleotides 1-3 from the 3' end of the 3' terminus comprise deoxyribonucleotides, optionally wherein nucleotides 2-3 from the 3' end of the 3' terminus comprise PS modifications.

307. The gRNA of any one of claims 161-306, wherein the gRNA is an sgRNA and nucleotide 4 from the 3' end of the 3' terminus comprises a PS modification, optionally wherein nucleotide 4 from the 3' end of the 3' terminus comprises a 2'-OMe modification.

308. The gRNA of any one of claims 161-307, wherein the gRNA is an sgRNA and hairpin 2 comprises deoxyribonucleotides, optionally wherein all or all but 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 nucleotides of hairpin 1 and hairpin 2 are deoxyribonucleotides.

309. The gRNA of any one of claims 161-308, wherein the gRNA is an sgRNA and hairpin 1 and hairpin 2 comprise deoxyribonucleotides, optionally wherein all or all

but 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, or 13 nucleotides of hairpin 1 and hairpin 2 are deoxyribonucleotides.

310. The gRNA of any one of claims 161-309, wherein the gRNA is an sgRNA and all or all but 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, or 13 nucleotides from the beginning of hairpin 1 to the 3' end of the sgRNA are deoxyribonucleotides, optionally wherein nucleotides 1-3 from the 3' end of the 3' terminus are deoxyribonucleotides.

311. The gRNA of any one of claims 161-310, wherein the gRNA is an sgRNA and the upper stem comprises deoxyribonucleotides.

312. The gRNA of any one of claims 161-311, wherein the gRNA is an sgRNA and all or all but 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 nucleotides of the upper stem are deoxyribonucleotides.

313. The gRNA of any one of claims 161-312, wherein at least 1, 2, or 3 of nucleotides 1-3 from the 5' end of the 5' terminus comprise ENA, optionally wherein nucleotides 1-3 from the 5' end of the 5' terminus comprise PS modifications.

314. The gRNA of any one of claims 161-313, wherein the gRNA is an sgRNA and at least 1, 2, or 3 of nucleotides 2-4 from the 3' end of the 3' terminus comprise ENA, optionally wherein nucleotides 2-3 from the 3' end of the 3' terminus comprise PS modifications.

315. The gRNA of any one of claims 161-314, wherein at least 1, 2, or 3 of nucleotides 1-3 from the 5' end of the 5' terminus comprise UNA, optionally wherein nucleotides 1-3 from the 5' end of the 5' terminus comprise PS modifications.

316. The gRNA of any one of claims 161-315, wherein the gRNA is an sgRNA and at least 1, 2, or 3 of nucleotides 2-4 from the 3' end of the 3' terminus comprise UNA, optionally wherein nucleotides 2-3 from the 3' end of the 3' terminus comprise PS modifications.

317. The gRNA of any one of claims 161-316, wherein the gRNA is an sgRNA and nucleotide 4 from the 3' end of the 3' terminus comprises a PS modification, optionally wherein nucleotide 4 from the 3' end of the 3' terminus comprises a 2'-OMe modification.

318. The gRNA of any one claims 161-317, wherein the gRNA is an sgRNA that comprises a 3' end modification.

319. The gRNA of any one of claims 161-318, which is an sgRNA comprising a 3' end modification, wherein the 3' end modification is a protective 3' end modification.

320. The gRNA of any one claims 161-319, wherein the gRNA is an sgRNA that comprises a 3' tail.

321. The gRNA of claim 320, wherein the 3' tail comprises 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 nucleotides.

322. The gRNA of claim 320, wherein the 3' tail comprises about 1-2, 1-3, 1-4, 1-5, 1-7, 1-10, at least 1-5, at least 1-3, at least 1-4, at least 1-5, at least 1-5, at least 1-7, or at least 1-10 nucleotides.

323. The gRNA of any one of claims 161-322, which is an sgRNA comprising a modification in the hairpin region.

324. The gRNA of any one of claims 161-323, which is an sgRNA comprising a 3' end modification, and a modification in the hairpin region.

325. The gRNA of claim 323 or 324, wherein the modification in the hairpin region comprises a modified nucleotide selected from 2'-O-methyl (2'-O-Me) modified nucleotide, a 2'-fluoro (2'-F) modified nucleotide, or combinations thereof.

326. The gRNA of any one of claims 323-325, wherein the modification in the hairpin region comprises or further comprises a 2'-O-methyl (2'-O-Me) modified nucleotide.

327. The gRNA of any one of claims 323-326, wherein the modification in the hairpin region comprises or further comprises a 2'-fluoro (2'-F) modified nucleotide.

328. The gRNA of any one of claims 161-327, comprising 3' and/or 5' protective end modification(s).

329. The gRNA of claim 328, wherein the 3' and/or 5' end modification comprises a modified nucleotide selected from 2'-O-methyl (2'-O-Me) modified nucleotide, 2'-O-(2-methoxyethyl) (2'-O-moe) modified nucleotide, a 2'-fluoro (2'-F) modified

nucleotide, a phosphorothioate (PS) linkage between nucleotides, an inverted abasic modified nucleotide, or combinations thereof.

330. The gRNA of claim 328 or 329, wherein the 3' and/or 5' end modification comprises or further comprises a 2'-O-methyl (2'-O-Me) modified nucleotide.

331. The gRNA of claim 328 or 329, wherein the 3' and/or 5' end modification comprises or further comprises a 2'-fluoro (2'-F) modified nucleotide.

332. The gRNA of claim 328 or 329, wherein the 3' and/or 5' end modification comprises or further comprises a phosphorothioate (PS) linkage between nucleotides.

333. The gRNA of claim 328 or 329, wherein the 3' and/or 5' end modification comprises or further comprises an inverted abasic modified nucleotide.

334. The gRNA of any one any one of claims 161-333, wherein the gRNA is an sgRNA and if the sgRNA comprises a 3' end modification, the 3' end modification comprises any one or more of the following:

i. a modification of any one or more of the last 7, 6, 5, 4, 3, 2, or 1 nucleotides;
ii. one modified nucleotide;
iii. two modified nucleotides;
iv. three modified nucleotides;
v. four modified nucleotides;
vi. five modified nucleotides;
vii. six modified nucleotides; and
viii. seven modified nucleotides.

335. The gRNA of claim 334, wherein the 3' end modification comprises a modification of between 1 and 7, between 1 and 5, between 1 and 4, or between 2 and 4 nucleotides.

336. The gRNA of any one of claims 161-335, wherein the gRNA is an sgRNA comprising a 3' end modification and the 3' end modification comprises one or more of the following:

i. a phosphorothioate (PS) linkage between nucleotides;
ii. a 2'-O-Me modified nucleotide;

iii. a 2'-O-moe modified nucleotide;
iv. a 2'-F modified nucleotide;
v. an inverted abasic modified nucleotide
vi. ENA, UNA, and/or DNA; and
vii. or a combination thereof.

337. The gRNA of any one of claims 161-336, wherein the gRNA is an sgRNA comprising a 3' tail, and the 3' tail comprises any one or more of:

i. a phosphorothioate (PS) linkage between nucleotides;
ii. a 2'-O-Me modified nucleotide;
iii. a 2'-O-moe modified nucleotide;
iv. a 2'-F modified nucleotide;
v. an inverted abasic modified nucleotide
vi. ENA, UNA, and/or DNA; and
vii. or a combination thereof.

338. The gRNA of claim 336, wherein the 3' end modification comprises:

i. 1, 2, 3, 4, 5, 6, or 7 PS linkages between nucleotides;
ii. about 1-3, 1-5, 1-6, or 1-7 PS linkages between nucleotides; or
iii. PS linkages between each nucleotide.

339. The gRNA of any one of claims claim 326-328, wherein the 3' end modification further comprises at least one 2'-O-Me, 2'-O-moe, inverted abasic, or 2'-F modified nucleotide.

340. The gRNA of any one of claims 326-329, wherein the 3' end modification comprises at least one PS linkage, and wherein:

i. there is one PS linkage, and the linkage is between the last and second to last nucleotide;
ii. there are two PS linkages between the last three nucleotides;
iii. there are PS linkages between any one or more of the last four nucleotides;
iv. there are PS linkages between any one or more of the last five nucleotides; or

v. there are PS linkages between any one or more of the last 2, 3, 4, 5, 6, 7, 8, 9, or 10 nucleotides.

341. The gRNA of any one of claims 336-340, wherein the 3' end modification comprises:

i. a modification of one or more of the last 1-7 nucleotides, wherein the modification is a PS linkage, inverted abasic nucleotide, 2'-O-Me, 2'-O-moe, 2'-F, or combinations thereof;
ii. a modification to the last nucleotide with 2'-O-Me, 2'-O-moe, 2'-F, or combinations thereof, and an optional one or two PS linkages to the next nucleotide and/or the first nucleotide of the 3' tail;
iii. a modification to the last and/or second to last nucleotide with 2'-O-Me, 2'-O-moe, 2'-F, or combinations thereof, and optionally one or more PS linkages;
iv. a modification to the last, second to last, and/or third to last nucleotides with 2'-O-Me, 2'-O-moe, 2'-F, or combinations thereof, and optionally one or more PS linkages;
v. a modification to the last, second to last, third to last, and/or fourth to last nucleotides with 2'-O-Me, 2'-O-moe, 2'-F, or combinations thereof, and optionally one or more PS linkages; or
vi. a modification to the last, second to last, third to last, fourth to last, and/or fifth to last nucleotides with 2'-O-Me, 2'-O-moe, 2'-F, or combinations thereof, and optionally one or more PS linkages.

342. The gRNA of any one of claims 161-341, wherein the gRNA is an sgRNA comprising a 3' tail, wherein the 3' tail comprises a modification of any one or more of the nucleotides present in the 3' tail.

343. The gRNA of claim 342, wherein the 3' tail is fully modified.

344. The gRNA of claim 342, wherein the 3' tail comprises 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9, or 1-10 nucleotides, optionally where any one or more of these nucleotides are modified.

345. The gRNA of any one of claims 336-344, wherein the 3' end modification comprises any one or more of the following:

i. the 3' end modification as shown in any one of SEQ ID Nos: 401-532;
ii. (i) a 2'O-Me modified nucleotide at the last nucleotide of the conserved region of an sgRNA or short-sgRNA, (ii) three consecutive 2'O-moe modified nucleotides immediately 5' to the 2'O-Me modified nucleotide, and (iii) three consecutive PS linkages between the last three nucleotides;
iii. (i) five consecutive 2'O-Me modified nucleotides from the 3' terminus, and (ii) three PS linkages between the last three nucleotides;
iv. an inverted abasic modified nucleotide at the last nucleotide of the conserved region of an sgRNA or short-sgRNA;
v. (i) an inverted abasic modified nucleotide at the last nucleotide of the conserved region of an sgRNA or short-sgRNA, and (ii) three consecutive 2'O-Me modified nucleotides at the last three nucleotides of the conserved region of an sgRNA or short-sgRNA;
vi. (i) 15 consecutive 2'O-Me modified nucleotides from the 3' terminus, (ii) five consecutive 2'-F modified nucleotides immediately 5' to the 2'O-Me modified nucleotides, and (iii) three PS linkages between the last three nucleotides;
vii. (i) alternating 2'O-Me modified nucleotides and 2'-F modified nucleotides at the last 20 nucleotides of the conserved region of an sgRNA or short-sgRNA, and (ii) three PS linkages between the last three nucleotides;
viii. (i) two or three consecutive 2'O-Me modified nucleotides, and (ii) three PS linkages between the last three nucleotides;
ix. one PS linkage between the last and next to last nucleotides; and
x. 15 or 20 consecutive 2'O-Me modified nucleotides, and (ii) three PS linkages between the last three nucleotides.

346. The gRNA of any one of claims 161-345, comprising a 5' end modification comprising any one or more of the following:

i. a modification of any one or more of nucleotides 1-7 of the guide region;
ii. one modified nucleotide;
iii. two modified nucleotides;
iv. three modified nucleotides;

v. four modified nucleotides;
vi. five modified nucleotides;
vii. six modified nucleotides; and
viii. seven modified nucleotides.

347. The gRNA of any one of claims 161-346, comprising a 5' end modification, wherein the 5' end modification is a protective 5' end modification.

348. The gRNA of any one of claims 161-347, comprising a 5' end modification, wherein the 5' end modification comprises a modification of between 1 and 7, between 1 and 5, between 1 and 4, between 1 and 3, or between 1 and 2 nucleotides.

349. The gRNA of any one of claims 161-348, comprising a 5' end modification wherein the 5' end modification comprises any one or more of the following:

i. modifications of 1, 2, 3, 4, 5, 6, or 7 of the first 7 nucleotides;
ii. modifications of about 1-3, 1-4, 1-5, 1-6, or 1-7 of the first 7 nucleotides; and
iii. modifications at the first, second, third, fourth, fifth, sixth, and/or seventh nucleotide at the 5' end, optionally wherein the modifications are consecutive.

350. The gRNA of any one of claims 161-349, comprising a 5' end modification, wherein the 5' end modification comprises one or more of:

i. a phosphorothioate (PS) linkage between nucleotides;
ii. a 2'-O-Me modified nucleotide;
iii. a 2'-O-moe modified nucleotide;
iv. a 2'-F modified nucleotide;
v. an inverted abasic modified nucleotide
vi. ENA, UNA, and/or DNA; and
vii. combinations thereof.

351. The gRNA any one of claims 161-350, comprising a 5' end modification wherein the 5' end modification comprises:

i. 1, 2, 3, 4, 5, 6, and/or 7 PS linkages between nucleotides; or
ii. about 1-2, 1-3, 1-4, 1-5, 1-6, or 1-7 PS linkages between nucleotides.

352. The gRNA of any one of claims 161-351, wherein the sgRNA comprises a 5' end modification and the 5' end modification comprises at least one 2'-O-Me, 2'-O-moe, inverted abasic, 2'-H, inosine, or 2'-F modified nucleotide.

353. The gRNA of claim 352, wherein the 5' end modification comprises at least one PS linkage, and wherein:

i. there is one PS linkage, and the linkage is at nucleotide 1 of the guide region;
ii. there are two PS linkages, and the linkages are at nucleotides 1 and 2 of the guide region;
iii. there are PS linkages at any one or more of nucleotides 1, 2, and 3 of the guide region;
iv. there are PS linkages at any one or more of nucleotides 1, 2, 3, and 4 of the guide region;
v. there are PS linkages at any one or more of nucleotides 1, 2, 3, 4, and 5 of the guide region;
vi. there are PS linkages at any one or more of nucleotides 1, 2, 3, 4, 5, and 6 of the guide region; or
vii. there are PS linkages at any one or more of nucleotides 1, 2, 3, 4, 5, 6, and 7 of the guide region.

354. The gRNA of any one of claims 352-353, wherein the 5' end modification comprises:

i. a modification of one or more of nucleotides 1-7 of the variable region, wherein the modification is a PS linkage, inverted abasic nucleotide, 2'-O-Me, 2'-O-moe, 2'-F, 2'-H, inosine, and/or combinations thereof;
ii. a modification to the first nucleotide of the guide region with 2'-O-Me, 2'-O-moe, 2'-F, 2'-H, inosine, or combinations thereof, and an optional PS linkage to the next nucleotide;
iii. a modification to the first and/or second nucleotide of the variable region with 2'-O-Me, 2'-O-moe, 2'-F, 2'-H, inosine, or combinations thereof, and optionally one or more PS linkages;

iv. a modification to the first, second, and/or third nucleotides of the variable region with 2'-O-Me, 2'-O-moe, 2'-F, 2'-H, inosine, or combinations thereof, and optionally one or more PS linkages;
v. a modification to the first, second, third, and/or fourth nucleotides of the variable region with 2'-O-Me, 2'-O-moe, 2'-F, 2'-H, inosine, or combinations thereof, and optionally one or more PS linkages; or
vi. a modification to the first, second, third, fourth, and/or fifth nucleotides of the variable region with 2'-O-Me, 2'-O-moe, 2'-F, 2'-H, inosine, or combinations thereof, and optionally one or more PS linkages.

355. The gRNA of any one of claims 161-354, comprising a 5' end modification, wherein the 5' end modification comprises any one or more of the following:

i. a 5' end modification as shown in any one of SEQ ID Nos: 1-54, 401-532, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, 3388-3430, or 3549-3552;
ii. 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the guide region;
iii. 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the guide region and PS linkages between nucleotides 1 and 2, 2 and 3, and 3 and 4 of the guide region;
iv. 2'-OMe modified nucleotides at nucleotides 1, 2, 3, 4, and 5 of the guide region;
v. 2'-OMe modified nucleotides at nucleotides 1, 2, 3, 4, and 5 of the guide region and PS linkages between nucleotides 1 and 2, 2 and 3, 3 and 4, 4 and 5, and 5 and 6 of the guide region;
vi. 2'O-moe modified nucleotides at nucleotides 1, 2, and 3 of the guide region;
vii. 2'O-moe modified nucleotides at nucleotides 1, 2, and 3 of the guide region and PS linkages between nucleotides 1 and 2, 2 and 3, and 3 and 4 of the guide region;
viii. an inverted abasic modified nucleotide at nucleotide 1 of the guide region;

ix. an inverted abasic modified nucleotide at nucleotide 1 of the guide region and 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the guide region; and

x. an inverted abasic modified nucleotide at nucleotide 1 of the guide region, 2'-OMe modified nucleotides at nucleotides 1, 2, and 3 of the guide region, and PS linkages between nucleotides 1 and 2, 2 and 3, 3 and 4, 4 and 5, and 5 and 6 of the variable region.

356. The gRNA of any one of claims 161-355, wherein the gRNA is an sgRNA and the upper stem region comprises at least one modification.

357. The gRNA of claim 346, wherein the upper stem modification comprises any one or more of the following:

i. a modification to any one or more of US1-US12 in the upper stem region;

ii. a modification of at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or all 12 nucleotides in the upper stem region; and

iii. a modification of about 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9, 1-10, or 1-12 nucleotides in the upper stem region.

358. The gRNA of any one of claims 356-357, wherein the upper stem modification comprises one or more of:

i. a 2'-O-Me modified nucleotide;

ii. a 2'-H modified nucleotide;

iii. a 2'-F modified nucleotide; and

iv. combinations thereof.

359. The gRNA of any one of claims 161-358, wherein the gRNA is an sgRNA comprising one or more modifications in the hairpin 1 region.

360. The gRNA of claim 359 wherein the sgRNA comprises a modification at H1-1.

361. The gRNA of any one of claims 161-360, wherein the gRNA is an sgRNA comprising one or more modifications in the hairpin 2 region.

362. The gRNA of claim 361, wherein the sgRNA comprises a modification at H2-1.

363. The gRNA of any one of claims 161-362, wherein the gRNA is an sgRNA comprising comprises modifications at H1-1 to H1-12.

364. The gRNA of any one of claims 161-363, wherein the gRNA is an sgRNA comprising comprises modifications at H2-1 to H2-15.

365. The gRNA of any one of claims 161-364, wherein the gRNA is an sgRNA comprising one or more modifications in each of the upper stem region, the hairpin 1 region, and the hairpin 2 region.

366. The gRNA of any one of claims 161-365, wherein the gRNA is an sgRNA comprising a modified nucleotide between hairpin 1 and hairpin 2 regions.

367. The gRNA of any one of claims 161-366, which is an sgRNA further comprising a lower stem region comprising a modification.

368. The gRNA of any one of claims 161-367, further comprising a 3' end modification.

369. The gRNA of claim 368, wherein at least two of the last four nucleotides at the 3' end of the 3' terminus are modified.

370. The gRNA of claim 369, wherein at least two of the last four nucleotides at the 3' end of the 3' terminus are modified with 2'-O-Me, 2'-F, or 2'-O-moe.

371. The gRNA of any one of claims 368-370, further comprising phosphorothioate (PS) bonds between one or more of the last four nucleotides at the 3' end of the 3' terminus.

372. The gRNA of any one of claims 161-371, which is an sgRNA further comprising a bulge region comprising a modification.

373. The gRNA of any one of claims 161-372, which is an sgRNA further comprising a nexus region comprising a modification.

374. An sgRNA comprising any of SEQ ID Nos: 401-535, 601, 607-732, 801, 807-932, 1001, or 1007-1132, including the modifications of Table 1.

375. An sgRNA comprising nucleic acids having at least 99, 98, 97, 96, 95, 94, 93, 92, 91, 90, 85, 80, 75, or 70% identity to the nucleic acids of any one of SEQ ID Nos: 401-535, 601, 607-732, 801, 807-932, 1001, or 1007-1132, wherein the modification at each nucleotide of the sgRNA that corresponds to a nucleotide of the reference sequence identifier in Table 1, is identical to or equivalent to the modification shown in the reference sequence identifier in Table 1.

376. The gRNA of any one of claims 161-375, wherein the modification reduces gRNA degradation without significantly altering the ability of the guide to cleave a target nucleic acid.

377. The gRNA of any one of claims 161-376, comprising a YA modification wherein the modification comprises 2'-fluoro, 2'-H, 2'-O-Me, ENA, UNA, or PS.

378. The gRNA of any one of claims 161-377, comprising a YA modification wherein the modification alters the structure of the dinucleotide motif to reduce RNA endonuclease activity.

379. The gRNA of any one of claims 161-378, comprising a YA modification wherein the modification interferes with recognition or cleavage of a YA site by an RNase and/or stabilizes an RNA structure.

380. The gRNA of any one of claims 161-379, comprising a YA modification wherein the modification comprises one or more of:

i. a ribose modification selected from 2'-O-alkyl, 2'-F, 2'-moe, 2'-F arabinose, and 2'-H (deoxyribose);
ii. a bicyclic ribose analog, such as LNA, BNA, and ENA;
iii. an unlocked nucleic acid modification;
iv. a base modification, such as inosine, pseudouridine, and 5'-methylcytosine; and
v. an internucleoside linkage modification such as phosphorothioate.

381. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises a modification at nucleotide 5, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-10, and/or 2'-F modifications at nucleotides 8-11, 13, 14, 17, and 18.

382. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises a modification at nucleotide 12, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-10, and/or 2'-F modifications at nucleotides 8-11, 13, 14, 17, and 18.

383. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises a 2'-OMe modification at nucleotide 5 and/or nucleotide 12, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-10, and/or 2'-F modifications at nucleotides 8-11, 13, 14, 17, and 18.

384. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises a 2'-F modification at nucleotide 5 and/or nucleotide 12, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-10, and/or 2'-F modifications at nucleotides 8-11, 13, 14, 17, and 18.

385. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises a 2'-H modification at nucleotide 5 and/or nucleotide 12, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-10, and/or 2'-F modifications at nucleotides 8-11, 13, 14, 17, and 18.

386. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises a phosphorothioate modification at nucleotide 5 and/or nucleotide 12, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-10, and/or 2'-F modifications at nucleotides 8-11, 13, 14, 17, and 18.

387. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises modifications at:

i. nucleotides 8-10;
ii. nucleotides 8 and 9;
iii. nucleotides 8 and 10; or
iv. nucleotides 9 and 10,

optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-7, and/or 2'-F modifications at nucleotides 11, 13, 14, 17, and 18.

388. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises 2'-F modifications at:

i. nucleotides 8-10;
ii. nucleotides 8 and 9;
iii. nucleotides 8 and 10;
iv. nucleotides 9 and 10; or
v. nucleotide 8;

optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-7, and/or 2'-F modifications at nucleotides 11, 13, 14, 17, and 18.

389. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises 2'-F modifications at:

i. nucleotides 8-10;
ii. nucleotides 8 and 9;
iii. nucleotides 8 and 10;
iv. nucleotides 9 and 10; or
v. nucleotide 8;

wherein nucleotides 8-10 do not comprise phosphorothioate modifications, and optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-7, and/or 2'-F modifications at nucleotides 11, 13, 14, 17, and 18.

390. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises 2'-F modifications at nucleotides 8-10 and:

i. phosphorothioate modifications at 1, 2, or 3 of nucleotides 8-10;
ii. a phosphorothioate modification at nucleotide 8;
iii. a phosphorothioate modification at nucleotide 9;
iv. a phosphorothioate modification at nucleotide 10;
v. a phosphorothioate modification at nucleotides 8 and 9;

vi. a phosphorothioate modification at nucleotides 8 and 10;
vii. a phosphorothioate modification at nucleotides 9 and 10; or
viii. a phosphorothioate modification at nucleotides 8-10

optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-7, and/or 2'-F modifications at nucleotides 11, 13, 14, 17, and 18.

391. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises:

i. a 2'-F or phosphorothioate modification at nucleotides 5 and 6;
ii. a 2'-F modification at nucleotides 5 and 6;
iii. a phosphorothioate modification at nucleotides 5 and 6;
iv. a 2'-F modification at nucleotide 5 and a phosphorothioate modification at nucleotide 6; or
v. a 2'-F modification at nucleotide 6 and a phosphorothioate modification at nucleotide 5;

optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 7-10, and/or 2'-F modifications at nucleotides 8-11, 13, 14, 17, and 18.

392. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises 2'-F modifications at at least 1, 2, 3, 4, 5, or 6 of nucleotides 6-11, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3, and/or 2'-F modifications at nucleotides 13, 14, 17, and 18.

393. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises 2'-F modifications at at least 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 of nucleotides 1-4 and 6-11, optionally wherein the guide region comprises phosphorothioate modifications at nucleotides 1-3 and/or 2'-F modifications at nucleotides 13, 14, 17, and 18.

394. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises 2'-F modifications at nucleotides 6-11, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4,

phosphorothioate modifications at nucleotides 1-3, and/or 2'-F modifications at nucleotides 13, 14, 17, and 18.

395. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises 2'-F modifications at nucleotides 1-4, optionally wherein the guide region comprises phosphorothioate modifications at nucleotides 1-3 and 6-10, and/or 2'-F modifications at nucleotides 6-11, 13, 14, 17, and 18.

396. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises a 2'-F modification at nucleotide 9 and not a phosphorothioate modification at nucleotide 9, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-8 and 10, and/or 2'-F modifications at nucleotides 8, 10, 11, 13, 14, 17, and 18.

397. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that does not comprise 2'-F modifications at at least 1, 2, 3, 4, 5, 6, 7, or 8 of nucleotides 8-11, 13, 14, 17, and 18, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4 and/or phosphorothioate modifications at nucleotides 1-3 and 6-10.

398. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that does not comprise 2'-F modifications at nucleotides 8-11, 13, 14, 17, and 18, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4 and/or phosphorothioate modifications at nucleotides 1-3 and 6-10.

399. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises 2'-OMe modifications at at least 1, 2, 3, or 4 of nucleotides 9, 11, 13, and 14, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4 and/or phosphorothioate modifications at nucleotides 1-3 and 6-10.

400. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises 2'-OMe modifications at nucleotides 9, 11, 13, and 14, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4 and/or phosphorothioate modifications at nucleotides 1-3 and 6-10.

401. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises phosphorothioate modifications at one or both of nucleotides 8 and 10, optionally wherein the guide region comprises 2'-OMe modifications at nucleotides 1-4, phosphorothioate modifications at nucleotides 1-3 and 6-7, and/or 2'-F modifications at nucleotides 8-11, 13, 14, 17, and 18.

402. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises modifications at at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, or all of the following nucleotides: 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 13, 14, 17, and 18, optionally wherein the modifications are 2'-OMe, 2'-fluoro, or phosphorothioate modifications.

403. The gRNA of any one of the the preceding claims, wherein the gRNA comprises a guide region that comprises modifications at nucleotides 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 13, 14, 17, and 18, optionally wherein the modifications are 2'-OMe, 2'-fluoro, or phosphorothioate modifications.

404. The gRNA of any one of the preceding claims, wherein 2'-OMe modifications are not present in the guide region at nucleotides 6-11 and 13-end.

405. The gRNA of any one of the preceding claims, wherein 2'-fluoro modifications are not present in the guide region at nucleotides 1-7, 15, 16, and 19-end.

406. The gRNA of any one of the preceding claims, wherein phosphorothioate modifications are not present in the guide region at nucleotides 4, 5, 11-14, 17, and 18.

407. The gRNA of any one of the preceding claims, wherein the guide region comprises an unmodified nucleotide 20.

408. The gRNA of any one of the preceding claims, wherein the guide region consists of 20 nucleotides.

409. The gRNA of any one of the preceding claims, wherein the guide region comprises a YA site at nucleotides 5-6 and a modification at nucleotide 5.

410. The gRNA of any one of the preceding claims, wherein the guide region comprises a YA site at nucleotides 12-13 and a modification at nucleotide 12.

411. The gRNA of any one of the preceding claims, wherein the guide region comprises a YA site at nucleotides 15-16 and a modification at nucleotide 15.

412. The gRNA of any one of the preceding claims, wherein the guide region comprises a YA site at nucleotides 16-17 and a modification at nucleotide 16.

413. The gRNA of any one of the preceding claims, wherein the guide region comprises a YA site at nucleotides 19-20 and a modification at nucleotide 19.

414. The gRNA of any one of the preceding claims, wherein the guide region does not comprise a YA site at nucleotides 5-6 and nucleotide 5 is unmodified.

415. The gRNA of any one of the preceding claims, wherein the guide region does not comprise a YA site at nucleotides 12-13 and nucleotide 12 is unmodified.

416. The gRNA of any one of the preceding claims, wherein the guide region does not comprise a YA site at nucleotides 15-16 and nucleotide 15 is unmodified.

417. The gRNA of any one of the preceding claims, wherein the guide region does not comprise a YA site at nucleotides 16-17 and nucleotide 16 is unmodified.

418. The gRNA of any one of the preceding claims, wherein the guide region does not comprise a YA site at nucleotides 19-20 and nucleotide 19 is unmodified.

419. The gRNA of any one of the preceding claims, wherein the gRNA comprises a guide region that comprises at least 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, or all of the following:

i. 2'-OMe and phosphorothioate modifications at nucleotide 1;
ii. 2'-OMe and phosphorothioate modifications at nucleotide 2;
iii. 2'-OMe and phosphorothioate modifications at nucleotide 3;
iv. a 2'-OMe modification at nucleotide 4;
v. a phosphorothioate modification at nucleotide 6;
vi. a phosphorothioate modification at nucleotide 7;
vii. 2'-fluoro and phosphorothioate modifications at nucleotide 8;
viii. 2'-fluoro and phosphorothioate modifications at nucleotide 9;
ix. 2'-fluoro and phosphorothioate modifications at nucleotide 10;
x. a 2'-fluoro modification at nucleotide 11;
xi. a 2'-fluoro modifications at nucleotide 13;

xii. a 2'-fluoro modifications at nucleotide 14;
xiii. a 2'-fluoro modifications at nucleotide 17; and
xiv. a 2'-fluoro modifications at nucleotide 18.

420. The gRNA of any one of the preceding claims, wherein the guide region comprises each of the modifications set forth in the preceding claim.

421. The gRNA of any one of the preceding claims, wherein the guide region comprises at least 1, 2, 3, or 4 of the following:

i. a 2'-OMe modification at nucleotide 5 if nucleotides 5 and 6 form a YA site;
ii. a 2'-OMe modification at nucleotide 12 if nucleotides 12 and 13 form a YA site;
iii. a phosphorothioate or 2'-H modification at nucleotide 15 if nucleotides 15 and 16 form a YA site;
iv. a phosphorothioate modification at nucleotide 16 if nucleotides 16 and 17 form a YA site; and
v. a phosphorothioate or 2'-fluoro modification at nucleotide 19 if nucleotides 19 and 20 form a YA site.

422. The gRNA of any one of the preceding claims, wherein the guide region comprises a YA site at nucleotides 5-6 and a a 2'-OMe modification at nucleotide 5.

423. The gRNA of any one of the preceding claims, wherein the guide region comprises a YA site at nucleotides 12-13 and a 2'-OMe modification at nucleotide 12.

424. The gRNA of any one of the preceding claims, wherein the guide region comprises a YA site at nucleotides 15-16 and a phosphorothioate modification at nucleotide 15.

425. The gRNA of any one of the preceding claims, wherein the guide region comprises a YA site at nucleotides 16-17 and a phosphorothioate modification at nucleotide 16.

426. The gRNA of any one of the preceding claims, wherein the guide region comprises a YA site at nucleotides 19-20 and a phosphorothioate modification at nucleotide 19.

427. The gRNA of any one of the preceding claims, wherein the guide region comprises a 2'-fluoro modification at nucleotide 19.

428. The gRNA of any one of the preceding claims, wherein the guide region comprises an unmodified nucleotide 15 or only a phosphorothioate modification at nucleotide 15.

429. The gRNA of any one of the preceding claims, wherein the guide region comprises an unmodified nucleotide 16 or only a phosphorothioate modification at nucleotide 16.

430. The gRNA of any one of the preceding claims, wherein the gRNA is an sgRNA comprising a conserved portion of an sgRNA comprising a hairpin region, wherein the hairpin region lacks at least 5-10 nucleotides.

431. The gRNA of claim 430, wherein the at least 5-10 lacking nucleotides are consecutive.

432. The gRNA of claim 430 or 431, wherein the at least 5-10 lacking nucleotides:

i. are within hairpin 1;
ii. are within hairpin 1 and the "N" between hairpin 1 and hairpin 2;
iii. are within hairpin 1 and the two nucleotides immediately 3' of hairpin 1;
iv. include at least a portion of hairpin 1;
v. are within hairpin 2;
vi. include at least a portion of hairpin 2;
vii. are within hairpin 1 and hairpin 2;
viii. include at least a portion of hairpin 1 and include the "N" between hairpin 1 and hairpin 2;
ix. include at least a portion of hairpin 2 and include the "N" between hairpin 1 and hairpin 2;
x. include at least a portion of hairpin 1, include the "N" between hairpin 1 and hairpin 2, and include at least a portion of hairpin 2;
xi. are within hairpin 1 or hairpin 2, optionally including the "N" between hairpin 1 and hairpin 2;
xii. are consecutive;
xiii. are consecutive and include the "N" between hairpin 1 and hairpin 2;

xiv. are consecutive and span at least a portion of hairpin 1 and a portion of hairpin 2;

xv. are consecutive and span at least a portion of hairpin 1 and the "N" between hairpin 1 and hairpin 2; or

xvi. are consecutive and span at least a portion of hairpin 1 and two nucleotides immediately 3' of hairpin 1.

433. The gRNA of any one of claims 430-432, wherein the at least 5-10 nucleotides comprise nucleotides 54-61 of SEQ ID NO:400, nucleotides 53-60 of SEQ ID NO:400; or nucleotides 54-58 of SEQ ID NO:400, optionally wherein the sgRNA comprises modifications at least H1-1 to H1-5 and H2-1 to H2-12.

434. The gRNA of any one of claims 430-433, wherein the at least 5-10 nucleotides:

i. consist of 5-10 nucleotides;

ii. consist of 6-10 nucleotides;

iii. consist of 5 nucleotides;

iv. consist of 6 nucleotides;

v. consist of 7 nucleotides;

vi. consist of 8 nucleotides;

vii. consist of 9 nucleotides;

viii. consist of 10 nucleotides;

ix. consist of 5-10 consecutive nucleotides;

x. consist of 6-10 consecutive nucleotides;

xi. consist of 5 consecutive nucleotides;

xii. consist of 6 consecutive nucleotides;

xiii. consist of 7 consecutive nucleotides;

xiv. consist of 8 consecutive nucleotides;

xv. consist of 9 consecutive nucleotides; or

xvi. consist of 10 consecutive nucleotides.

435. The gRNA of claim 434, wherein the at least 5-10 nucleotides comprise nucleotides 54-61 of SEQ ID NO:400, nucleotides 53-60 of SEQ ID NO:400; or nucleotides 54-58 of SEQ ID NO:400, optionally wherein the sgRNA comprises modifications at least H1-1 to H1-5 and H2-1 to H2-12.

436. The gRNA of any one of claims 430-435, wherein the at least 5-10 nucleotides:

i. comprise nucleotides 54-61 of SEQ ID NO:400;
ii. comprise nucleotides 53-60 of SEQ ID NO:400;
iii. comprise nucleotides 54-58 of SEQ ID NO:400.
iv. consist of nucleotides 54-61 of SEQ ID NO:400;
v. consist of nucleotides 53-60 of SEQ ID NO:400; or
vi. consist of nucleotides 54-58 of SEQ ID NO:400.

437. The gRNA of any one of the preceding claims, wherein the gRNA comprises modifications and/or unmodified nucleotides at at least 15 of nucleotides 1-20 from the 5' end of the 5' terminus that match the modification pattern at nucleotides 1-20 of any one of the gRNAs of SEQ ID NOs: 1-54, 201-254, 301-354, 401-535, 601, 607-732, 801, 807-932, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, or 3388-3430.

438. The gRNA of any one of the preceding claims, wherein the gRNA comprises modifications and/or unmodified nucleotides at at least 16 of nucleotides 1-20 from the 5' end of the 5' terminus that match the modification pattern at nucleotides 1-20 of any one of the gRNAs of SEQ ID NOs: 1-54, 201-254, 301-354, 401-535, 601, 607-732, 801, 807-932, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, or 3388-3430.

439. The gRNA of any one of the preceding claims, wherein the gRNA comprises modifications and/or unmodified nucleotides at at least 17 of nucleotides 1-20 from the 5' end of the 5' terminus that match the modification pattern at nucleotides 1-20 of a gRNA, wherein the gRNA is any one of SEQ ID NOs: 1-54, 201-254, 301-354, 401-535, 601, 607-732, 801, 807-932, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, or 3388-3430.

440. The gRNA of any one of the preceding claims, wherein the gRNA comprises modifications and/or unmodified nucleotides at at least 18 of nucleotides 1-20 from the 5' end of the 5' terminus that match the modification pattern at nucleotides 1-20 of any one of the gRNAs of SEQ ID NOs: 1-54, 201-254, 301-354, 401-535, 601,

607-732, 801, 807-932, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, or 3388-3430.

441. The gRNA of any one of the preceding claims, wherein the gRNA comprises modifications and/or unmodified nucleotides at at least 19 of nucleotides 1-20 from the 5' end of the 5' terminus that match the modification pattern at nucleotides 1-20 of any one of the gRNAs of SEQ ID NOs: 1-54, 201-254, 301-354, 401-535, 601, 607-732, 801, 807-932, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, or 3388-3430.

442. The gRNA of any one of the preceding claims, wherein the gRNA comprises modifications and/or unmodified nucleotides at nucleotides 1-20 from the 5' end of the 5' terminus that match the modification pattern at nucleotides 1-20 of any one of the gRNAs of SEQ ID NOs: 1-54, 201-254, 301-354, 401-535, 601, 607-732, 801, 807-932, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, or 3388-3430.

443. The gRNA of any one of the preceding claims, wherein the gRNA comprises a modification pattern that matches at least 75% of the modification pattern of any one of the gRNAs of SEQ ID NOs: 1-54, 201-254, 301-354, 401-535, 601, 607-732, 801, 807-932, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, or 3388-3430.

444. The gRNA of any one of the preceding claims, wherein the gRNA comprises the modification pattern of any one of the gRNAs in Table 1, wherein the modification pattern is the same as any one of the gRNAs of SEQ ID NOs: 1-54, 201-254, 301-354, 401-535, 601, 607-732, 801, 807-932, 1001, 1007-1132, 1205-1212, 1322-1406, 1417-1501, 1511-1596, 3018-3059, 3063-3104, 3108-3149, 3153-3194, 3198-3239, 3243-3284, 3295-3341, 3343-3385, or 3388-3430.

445. The gRNA of any one of claims 437-444, further comprising a sequence having at least 75% identity to the sequence of nucleotides 21-end of the gRNA.

446. The gRNA of any one of claims 437-444, further comprising a sequence having at least 80% identity to the sequence of nucleotides 21-end of the gRNA.

447. The gRNA of any one of claims 437-444, further comprising a sequence having at least 85% identity to the sequence of nucleotides 21-end of the gRNA.

448. The gRNA of any one of claims 437-444, further comprising a sequence having at least 90% identity to the sequence of nucleotides 21-end of the gRNA.

449. The gRNA of any one of claims 437-444, further comprising a sequence having at least 95% identity to the sequence of nucleotides 21-end of the gRNA.

450. The gRNA of any one of claims 437-444, further comprising a sequence having at least 98% identity to the sequence of nucleotides 21-end of the gRNA.

451. The gRNA of any one of claims 437-444, further comprising a sequence having 100% identity to the sequence of nucleotides 21-end of the gRNA.

452. An LNP composition comprising a gRNA of any one of the preceding claims.

453. A composition comprising a gRNA of any one of claims 1-451 associated with a lipid nanoparticle (LNP).

454. A composition comprising the gRNA of any one of claims 1-451, or the composition of any one of claims 452-453, further comprising a nuclease or an mRNA which encodes the nuclease.

455. The composition of claim 454, wherein the nuclease is a Cas protein.

456. The composition of claim 455, wherein the Cas protein is a Cas9.

457. The composition of claim 456, wherein the Cas9 is an *S. pyogenes* Cas9 or an *S. aureus* Cas9.

458. The composition of any one of claims 453-457, wherein the nuclease is a nickase or a dCas.

459. The composition of any one of claims 453-458, wherein the nuclease is modified.

460. The composition of claim 459 wherein the modified nuclease comprises a nuclear localization signal (NLS).

461. The composition of any one of claims 452-460, comprising an mRNA which encodes the nuclease.

462. The composition of claim 461, wherein the mRNA comprises the sequence of any one of SEQ ID NOs: 3499-3527 or 3529-3546.

463. A pharmaceutical formulation comprising the gRNA of any one of claims 1-451 or the composition of any one of claims 452-462 and a pharmaceutically acceptable carrier.

464. A method of modifying a target DNA comprising, delivering a Cas protein or a nucleic acid encoding a Cas protein, and any one or more of the following to a cell:

i. the gRNA of any one of claims 1-451;

ii. the composition of any one of claims 452-462; and

iii. the pharmaceutical formulation of claim 463.

465. The method of claim 464, wherein the method results in an insertion or deletion in a gene.

466. The method of claim 464 or claim 465, further comprising delivering to the cell a template, wherein at least a part of the template incorporates into a target DNA at or near a double strand break site induced by the Cas protein.

467. The gRNA of any one of claims 1-451, the composition of claims 452-462, or the pharmaceutical formulation of claim 463 for use in preparing a medicament for treating a disease or disorder.

468. Use of the gRNA of any one of claims 1-451, the composition of claims 452-462, or the pharmaceutical formulation of claim 463 in the manufacture of a medicament for treating a disease or disorder.

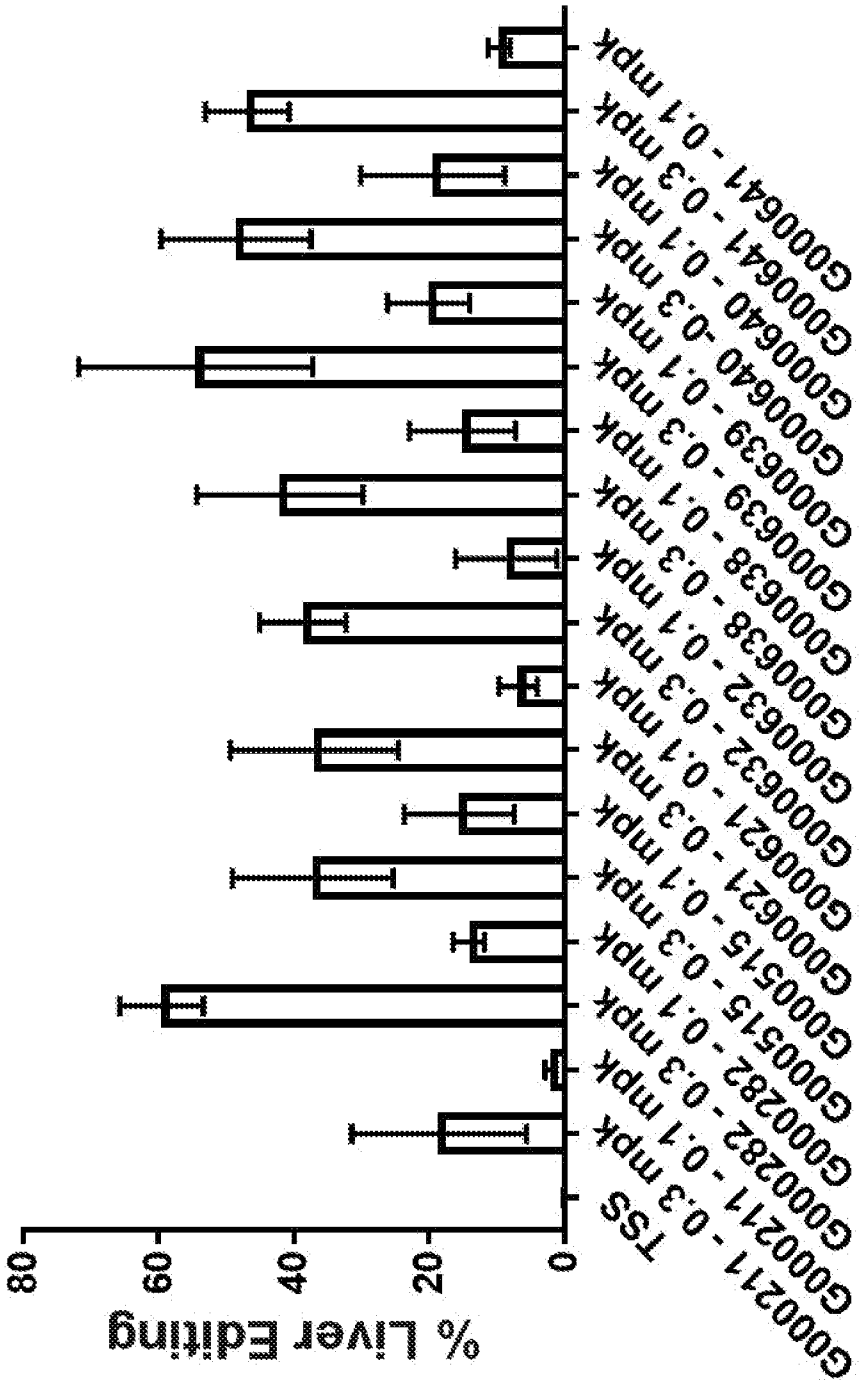
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Fig. 1A

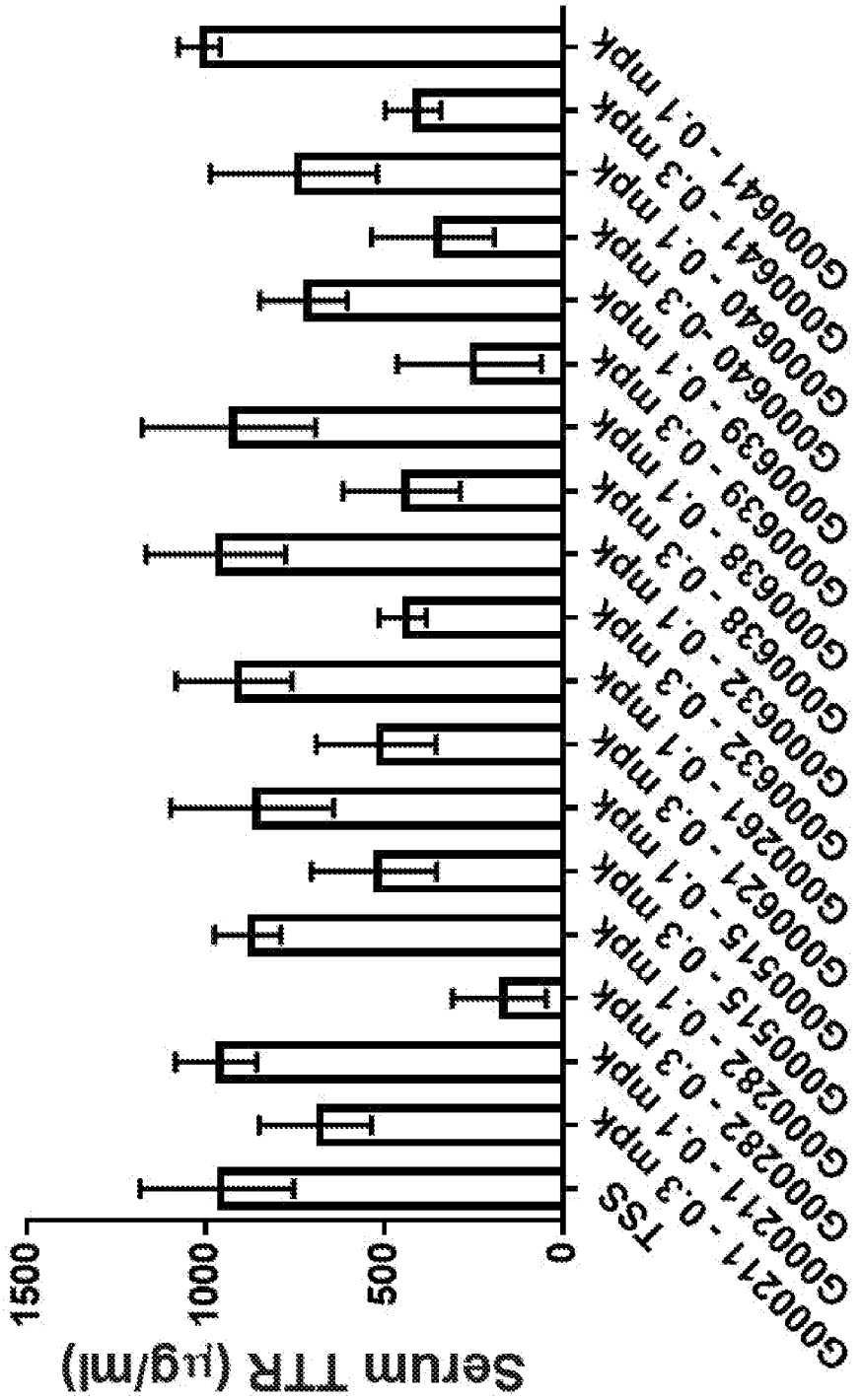
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*Fig. 1B*

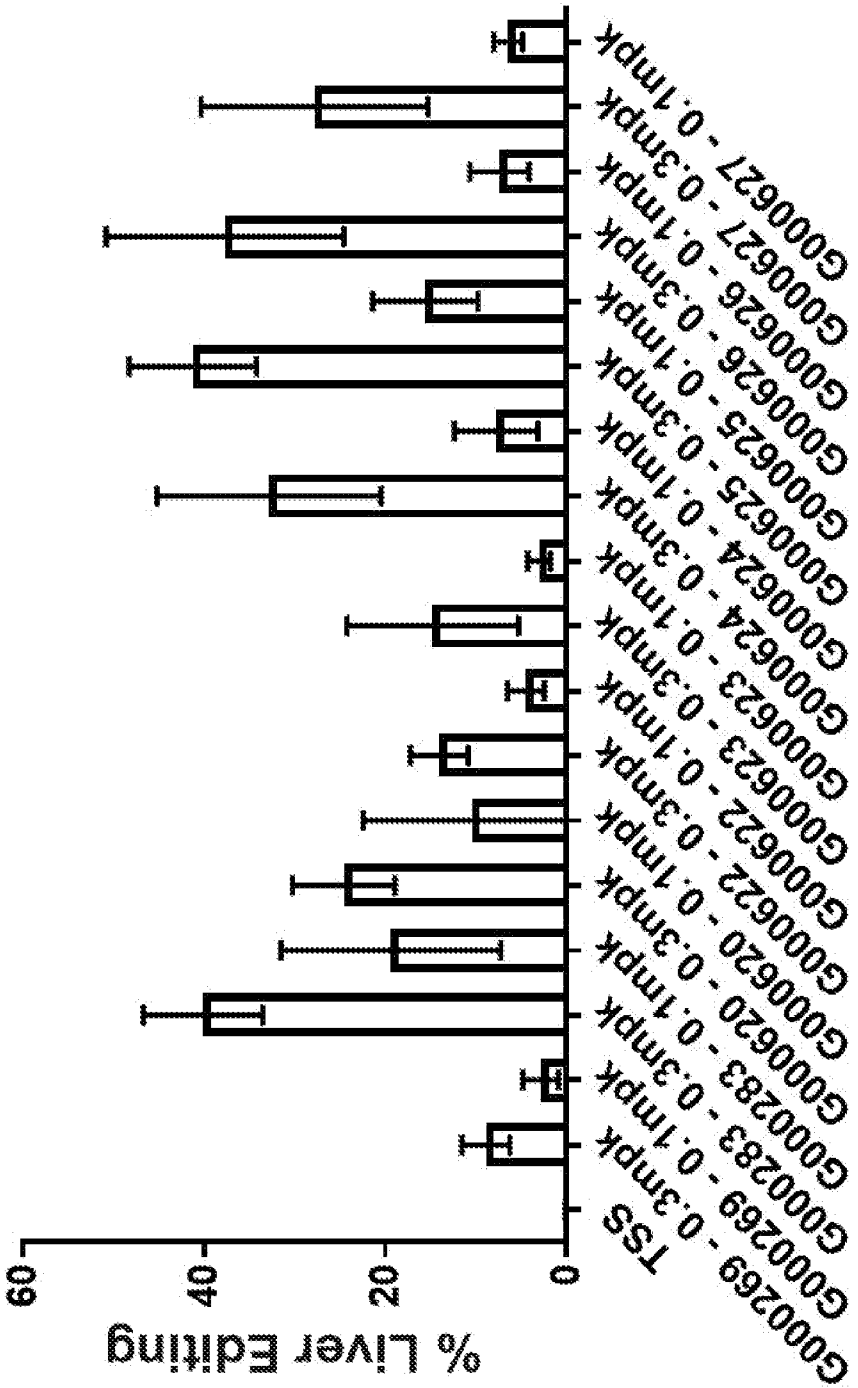
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*Fig. 2A*

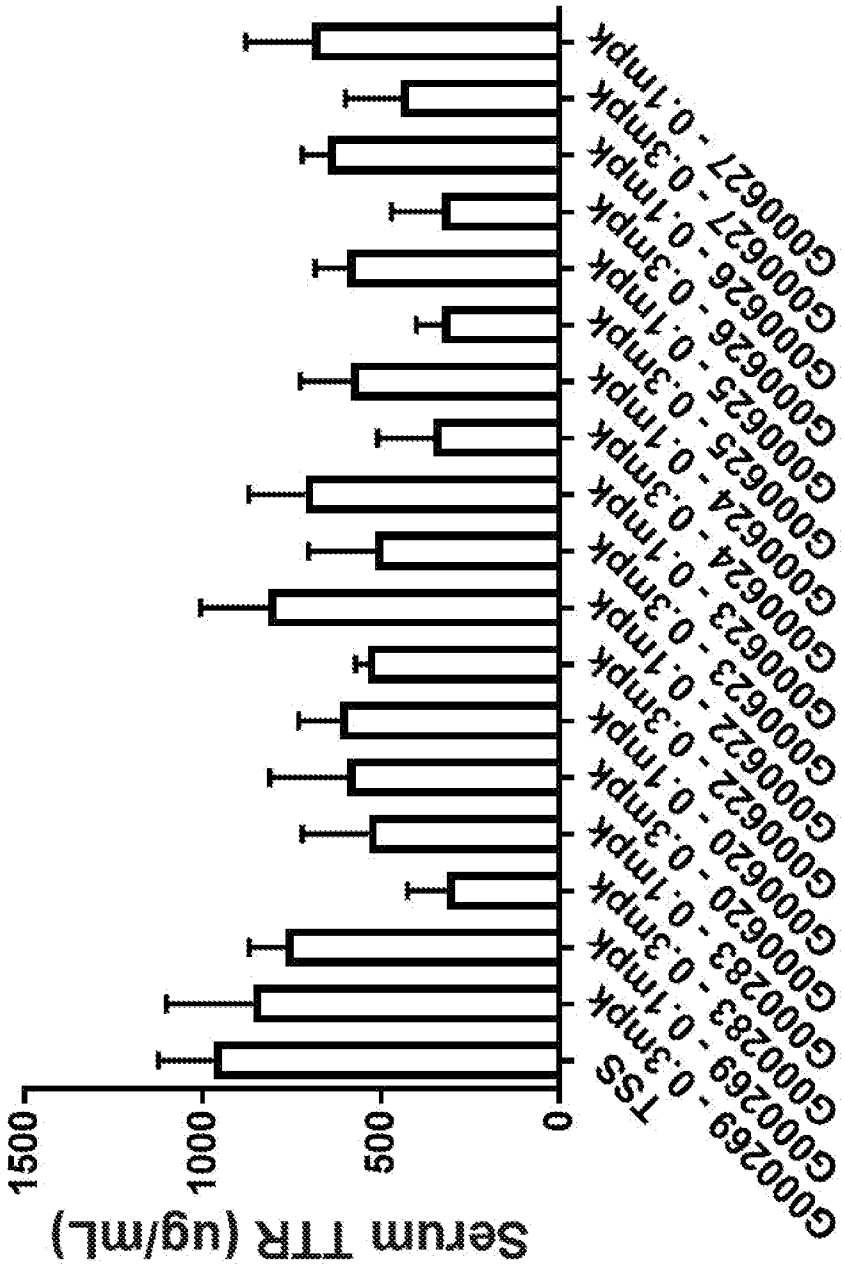
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*Fig. 2B*

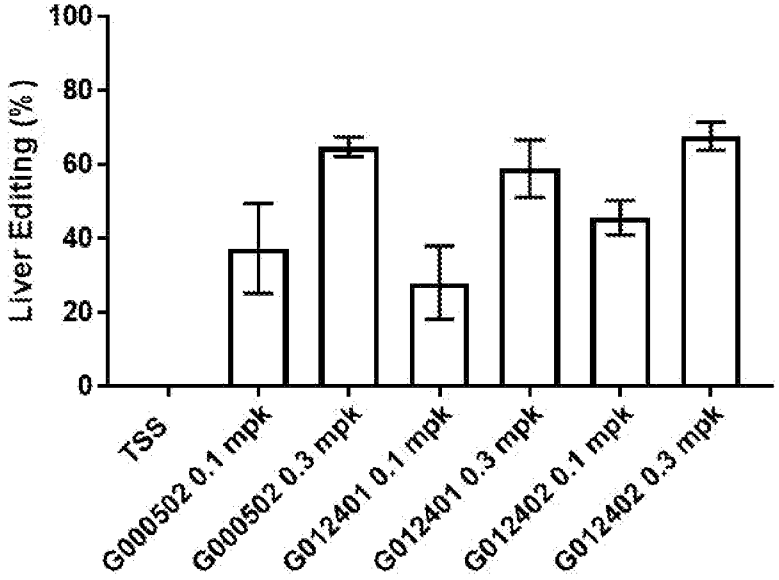
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*Fig. 3A*

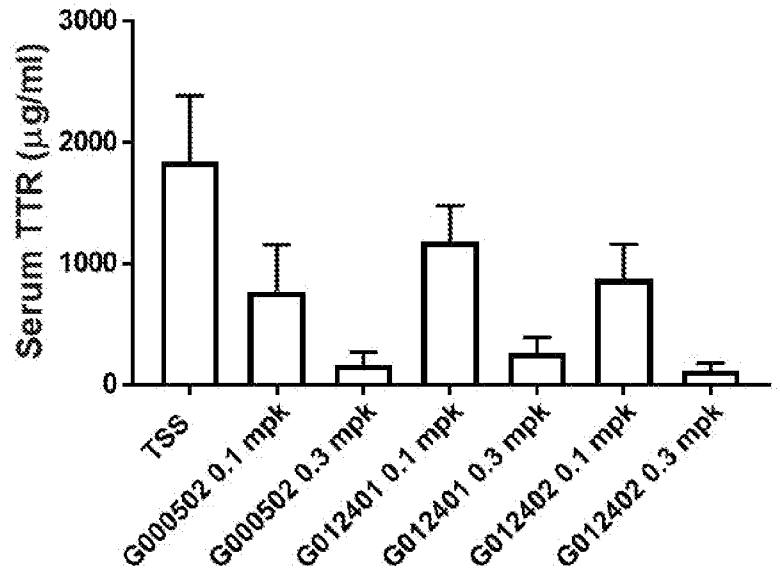
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*Fig. 3B*

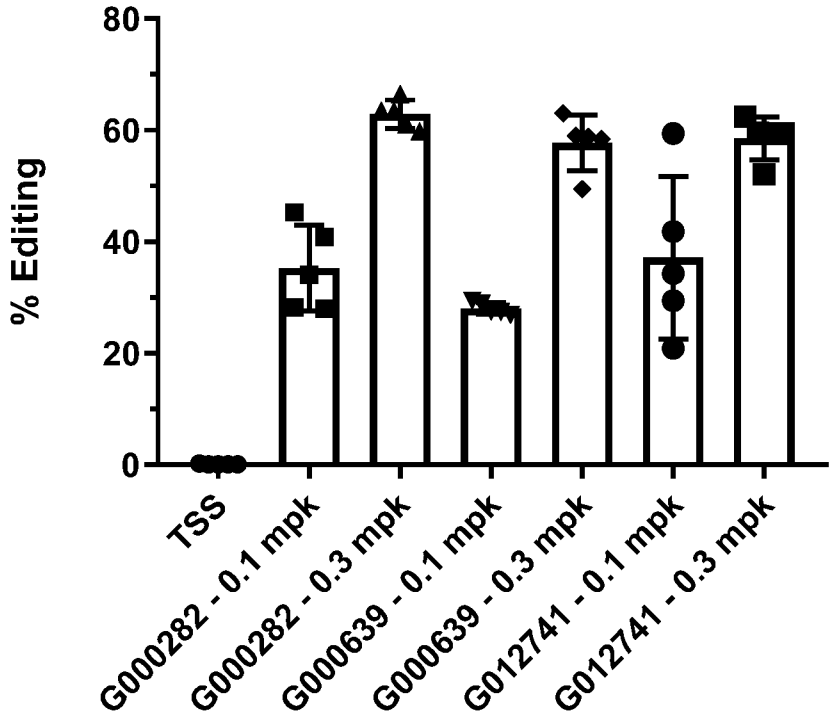
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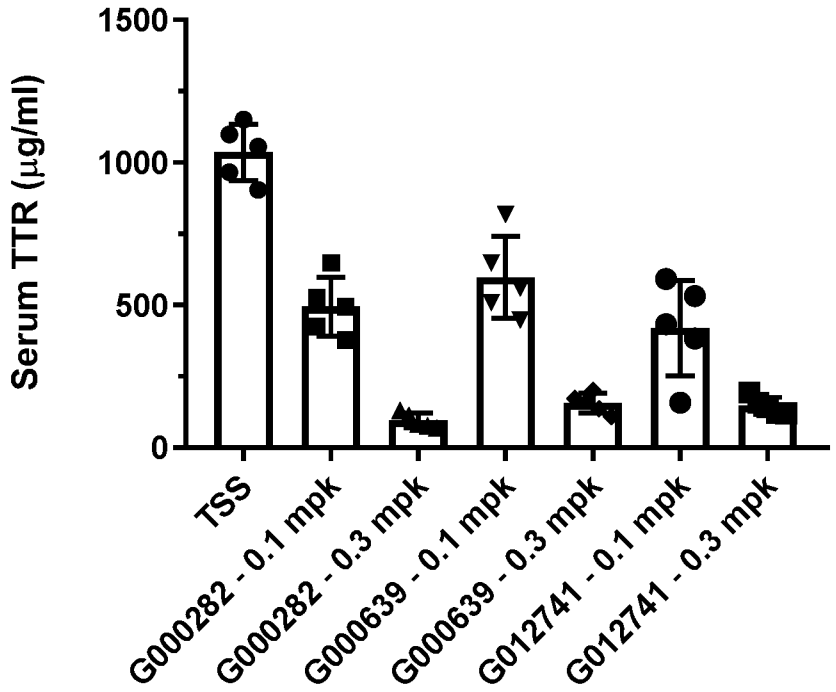
*Fig. 3C*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G000282 - 0.3 mpk
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G000639 - 0.3 mpk
G012741 - 0.1 mpk
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*Fig. 3D*

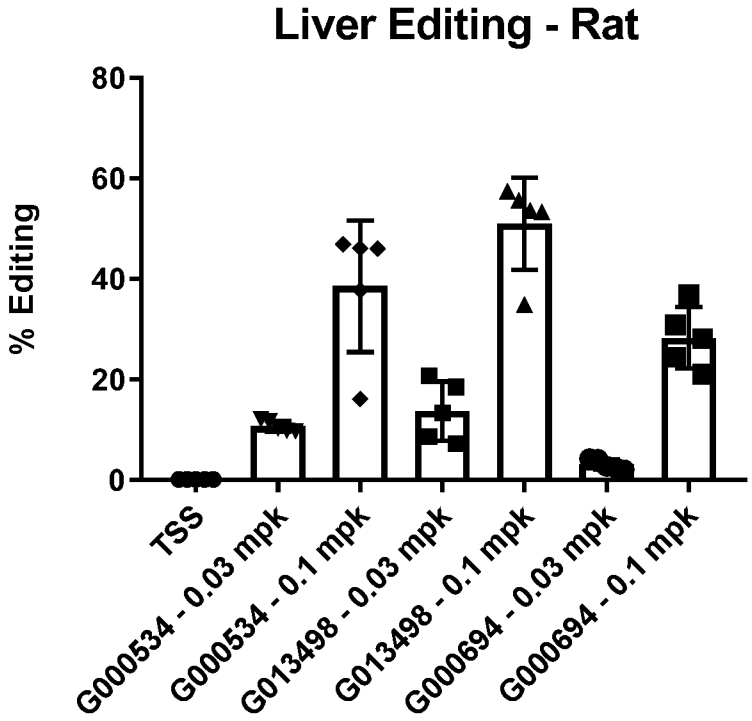
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*Fig. 3E*

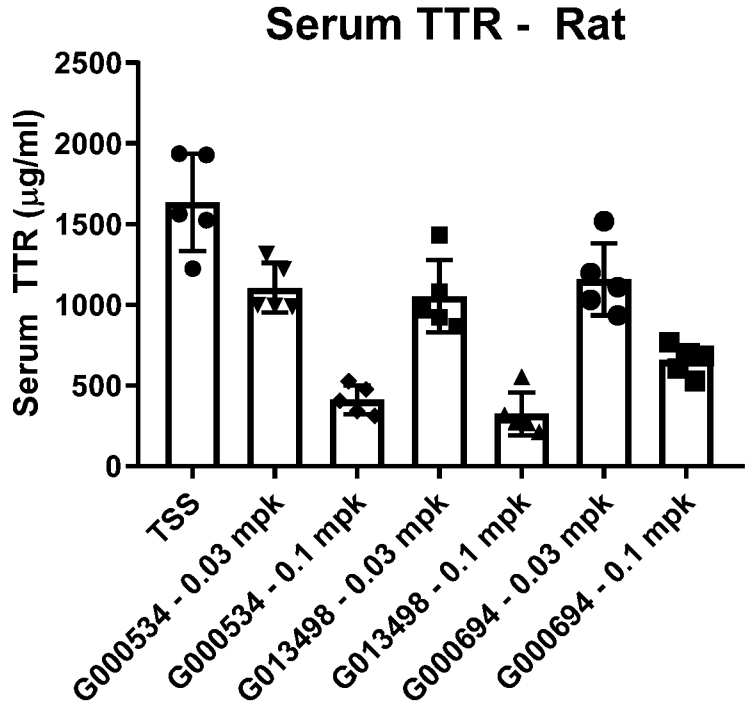
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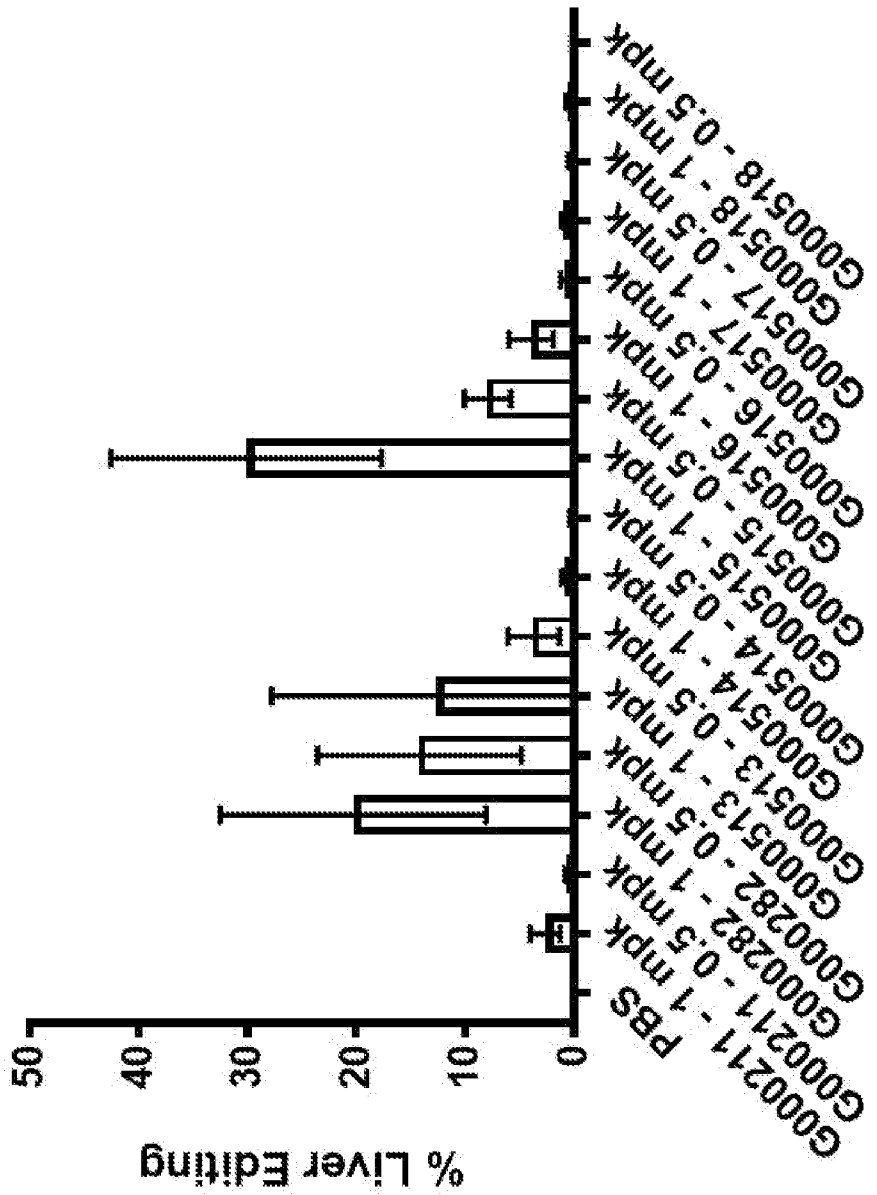
*Fig. 3F*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G000518 - 0.5 mpk

*Fig. 4A*

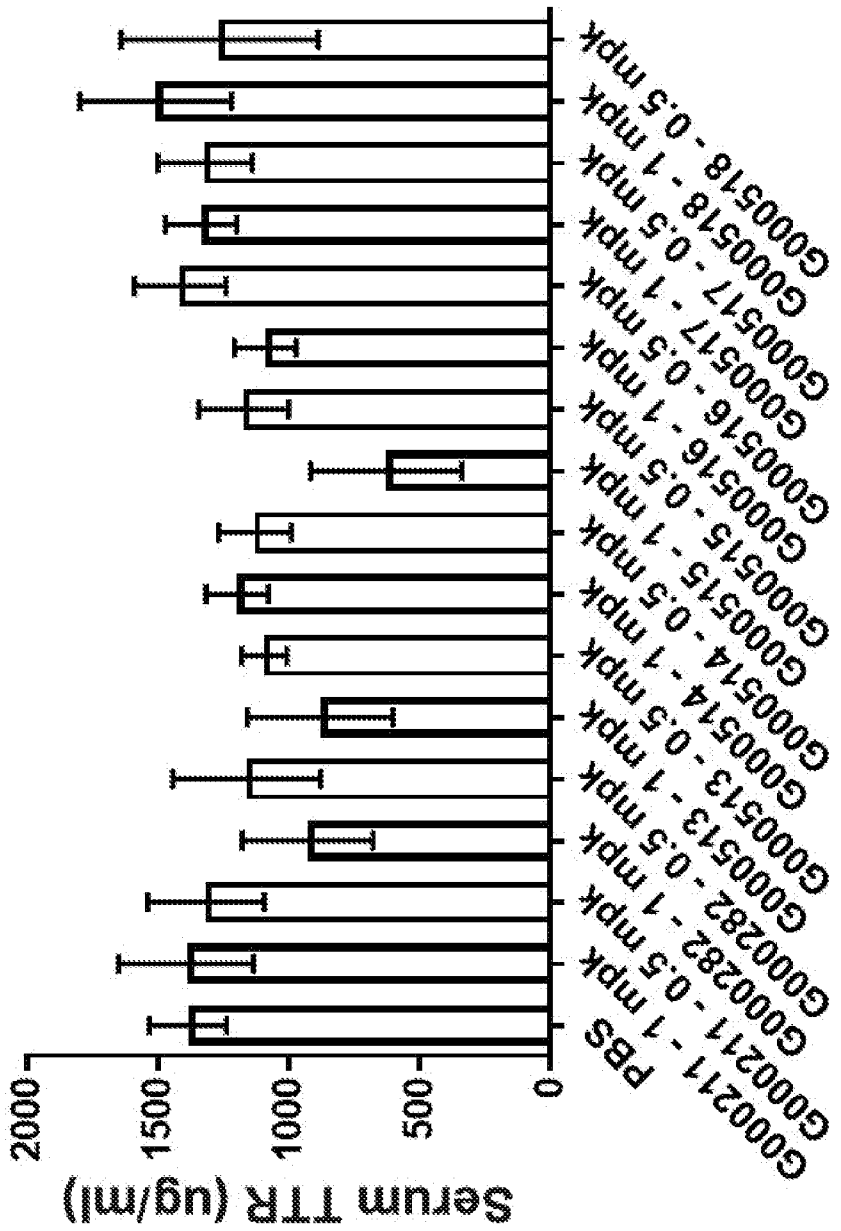

Serum TTR (ug/ml)
2000
1500
1000
500
0
PBS
G000211 - 1 mpk
G000211 - 0.5 mpk
G000282 - 1 mpk
G000282 - 0.5 mpk
G000513 - 1 mpk
G000513 - 0.5 mpk
G000514 - 1 mpk
G000514 - 0.5 mpk
G000515 - 1 mpk
G000515 - 0.5 mpk
G000516 - 1 mpk
G000516 - 0.5 mpk
G000517 - 1 mpk
G000517 - 0.5 mpk
G000518 - 1 mpk
G000518 - 0.5 mpk

*Fig. 4B*

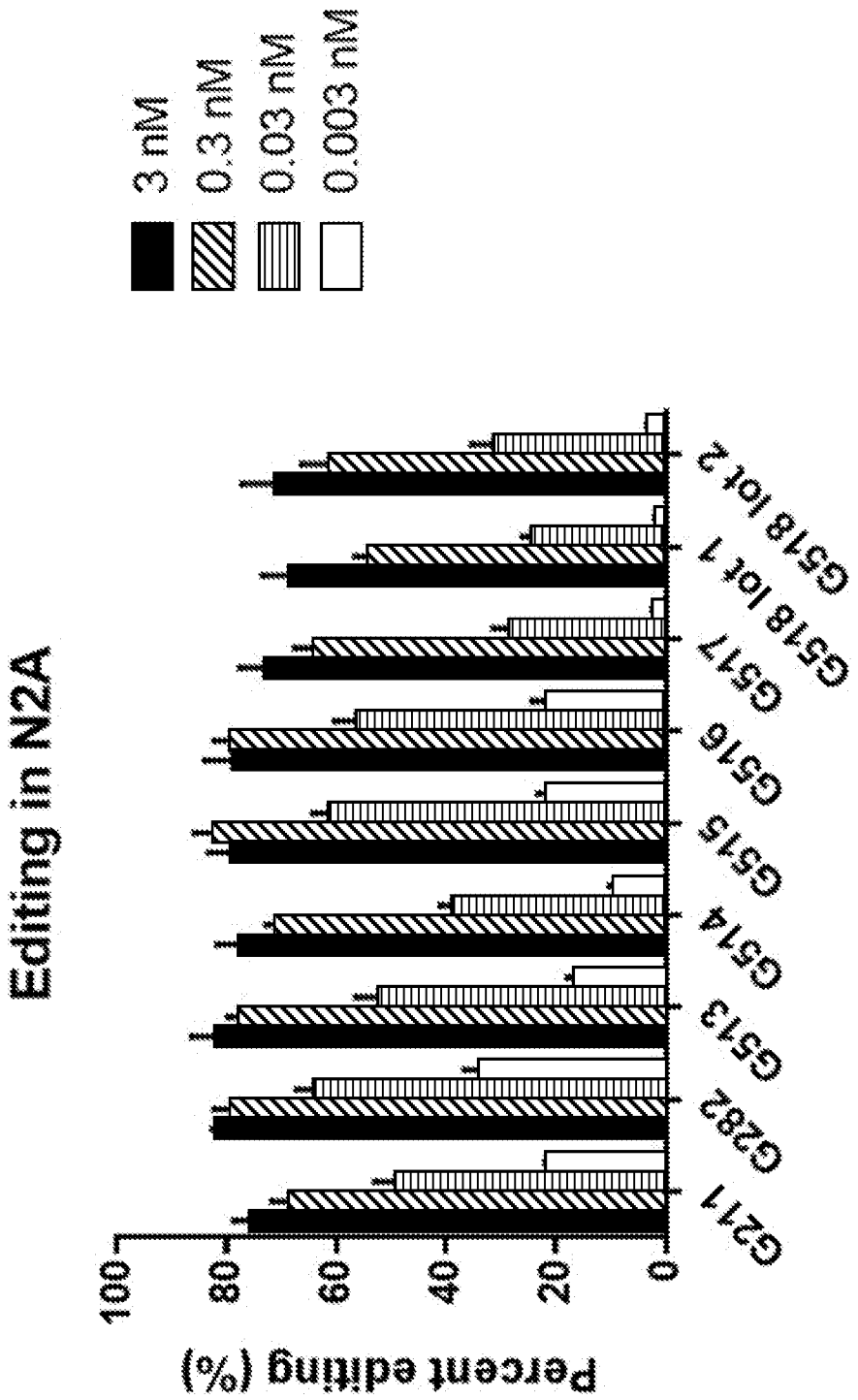

3 nM
0.3 nM
0.03 nM
0.003 nM
Editing in N2A
Percent editing (%)
100
80
60
40
20
0
G211
G282
G513
G514
G515
G516
G517
G518 lot 1
G518 lot 2

Fig. 5

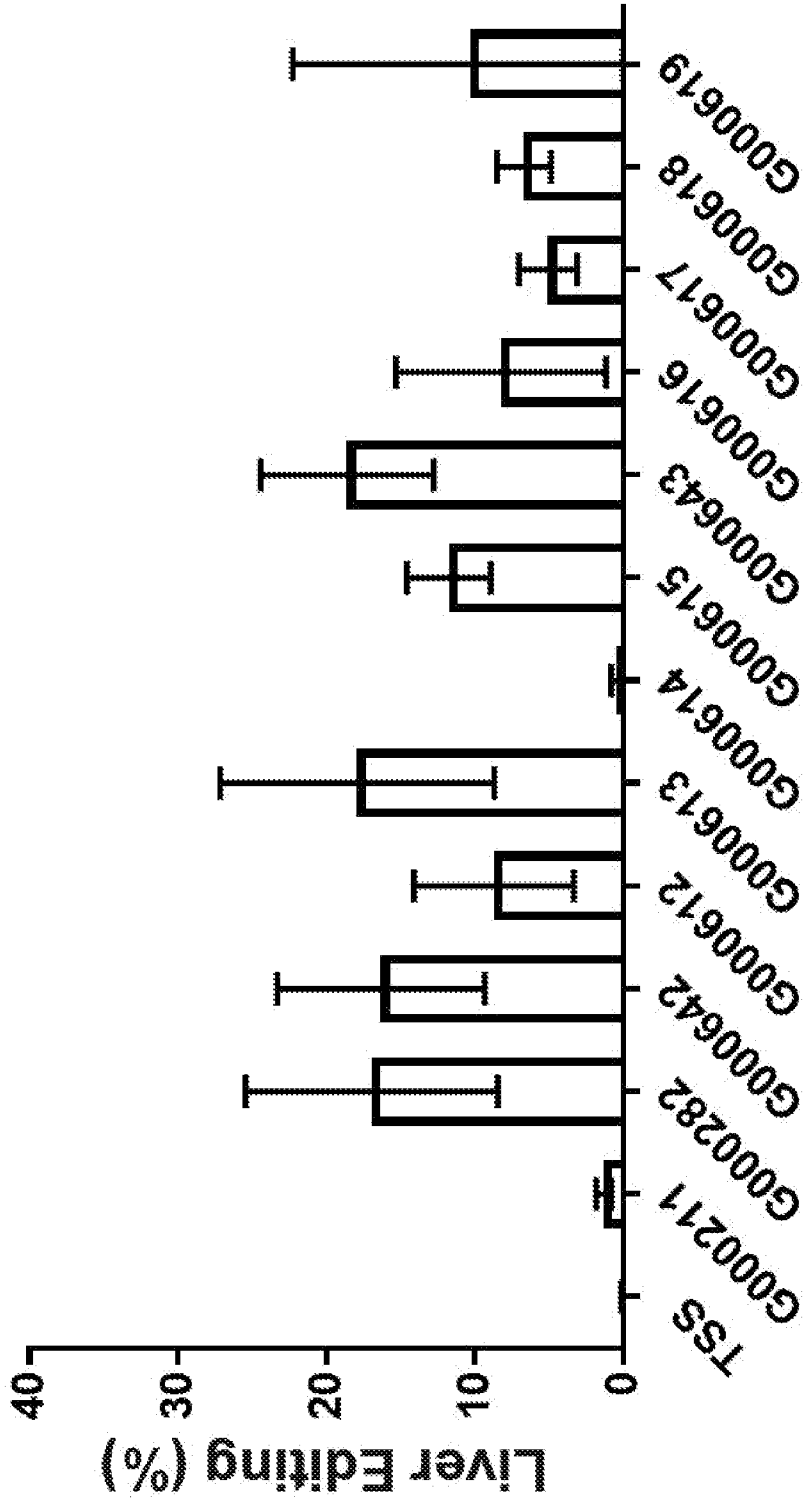

Liver Editing (%)
0
10
20
30
40
TSS
G000211
G000282
G000642
G000612
G000613
G000614
G000615
G000643
G000616
G000617
G000618
G000619

Fig. 6A

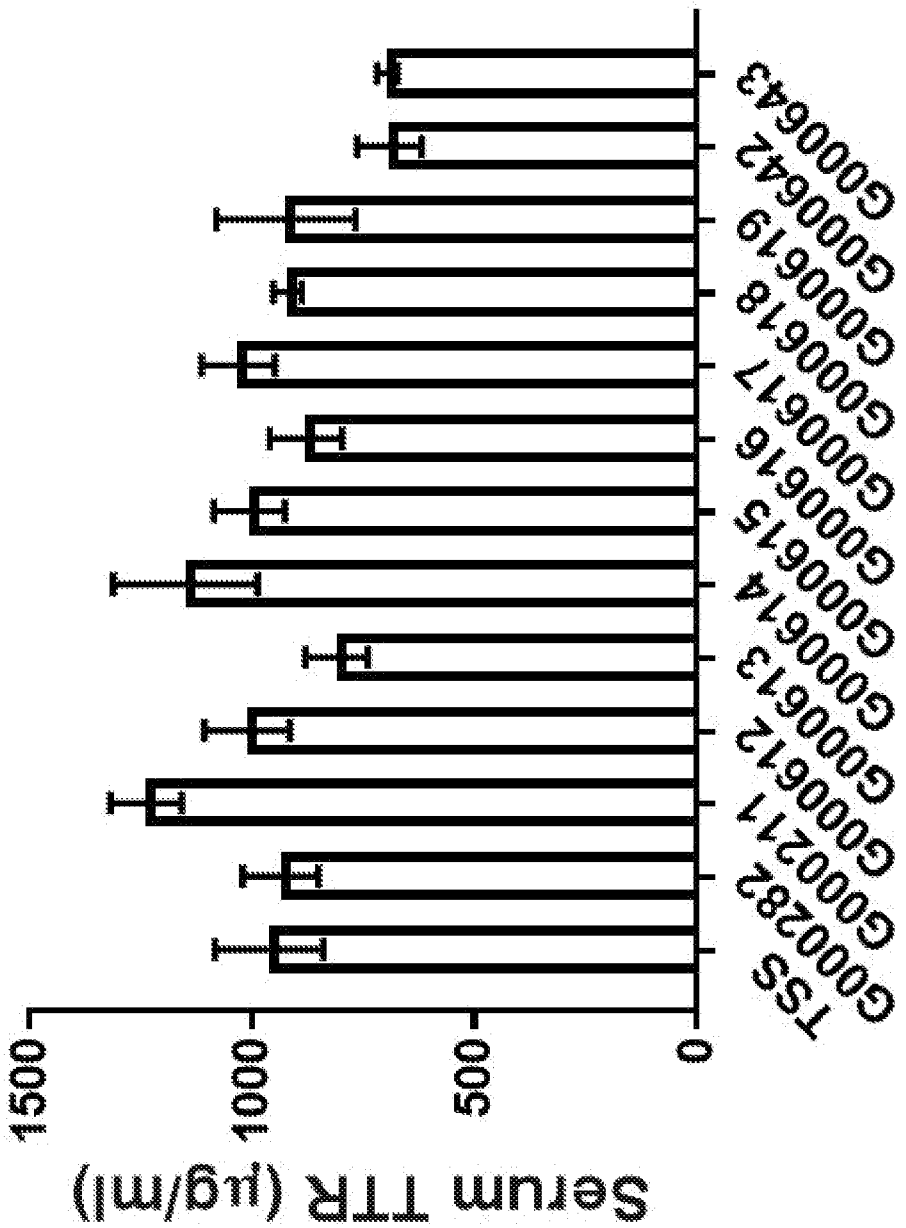

Serum TTR (µg/ml)
1500
1000
500
0
TSS
G000282
G000271
G000612
G000613
G000614
G000615
G000616
G000617
G000618
G000619
G000642
G000643

*Fig. 6B*

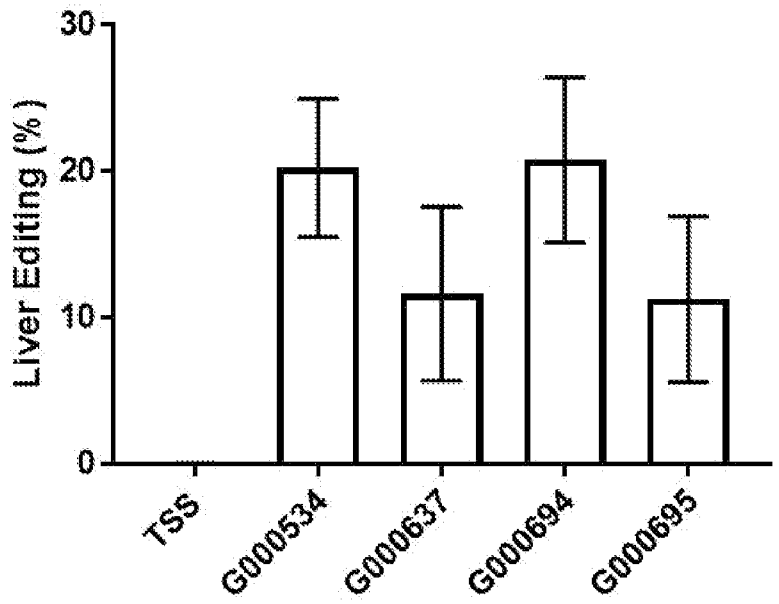

Liver Editing (%)
30
20
10
0
TSS
G000534
G000637
G000694
G000695

*Fig. 7A*

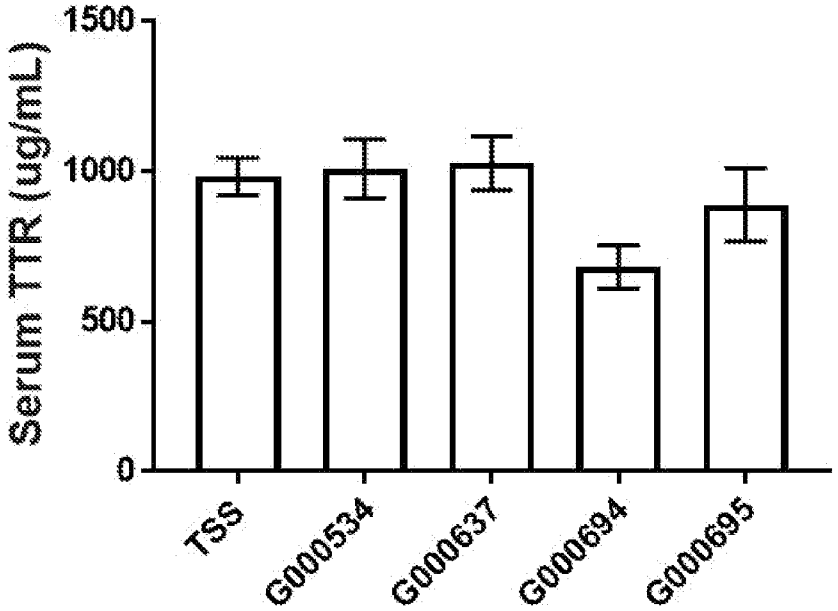

Serum TTR (ug/mL)
1500
1000
500
0
TSS
G000534
G000637
G000694
G000695

*Fig. 7B*

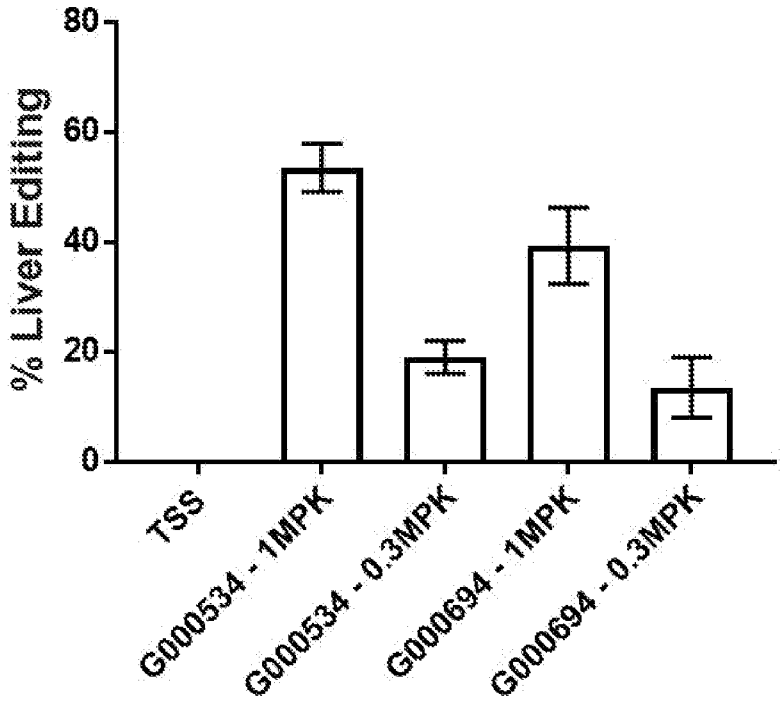

% Liver Editing
80
60
40
20
0
TSS
G000534 - 1MPK
G000534 - 0.3MPK
G000694 - 1MPK
G000694 - 0.3MPK

*Fig. 8A*

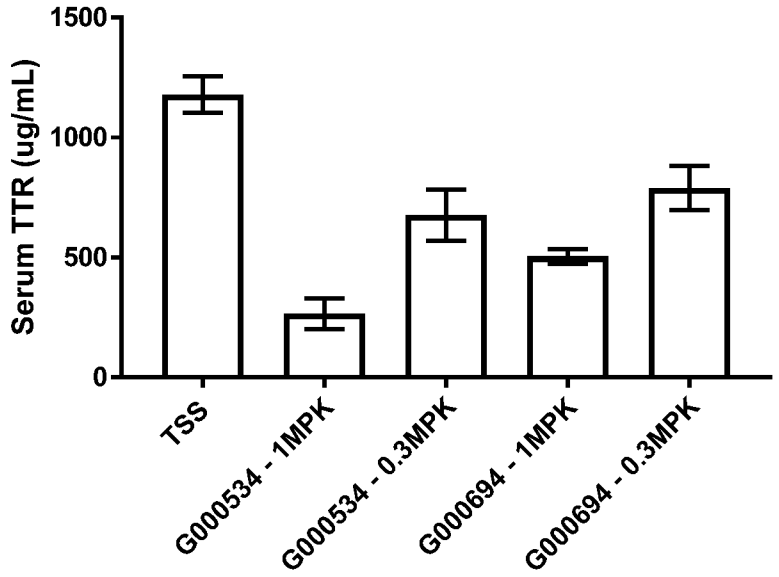

Serum TTR (ug/mL)
1500
1000
500
0
TSS
G000534 - 1MPK
G000534 - 0.3MPK
G000694 - 1MPK
G000694 - 0.3MPK

*Fig. 8B*

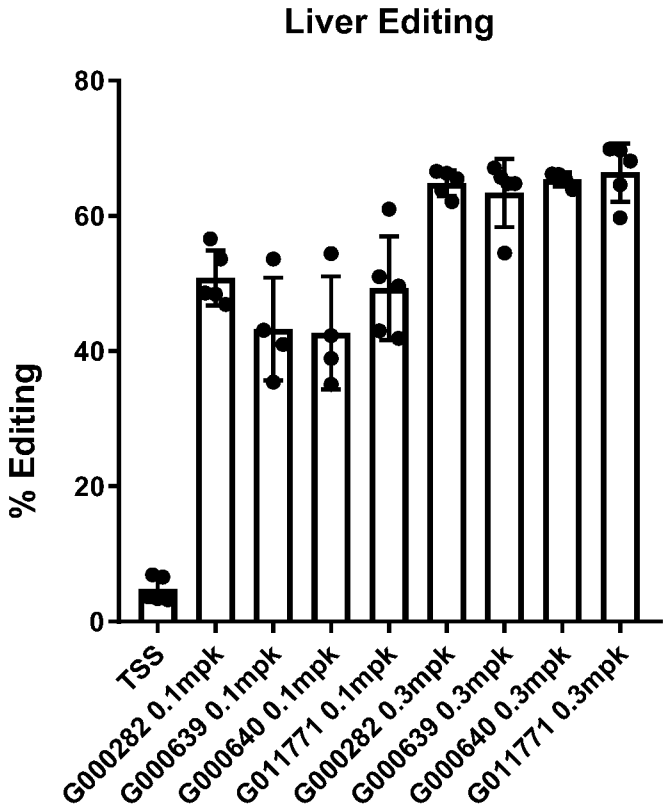

Liver Editing
% Editing
80
60
40
20
0
TSS
G000282 0.1mpk
G000639 0.1mpk
G000640 0.1mpk
G011771 0.1mpk
G000282 0.3mpk
G000639 0.3mpk
G000640 0.3mpk
G011771 0.3mpk

*Fig. 8C*

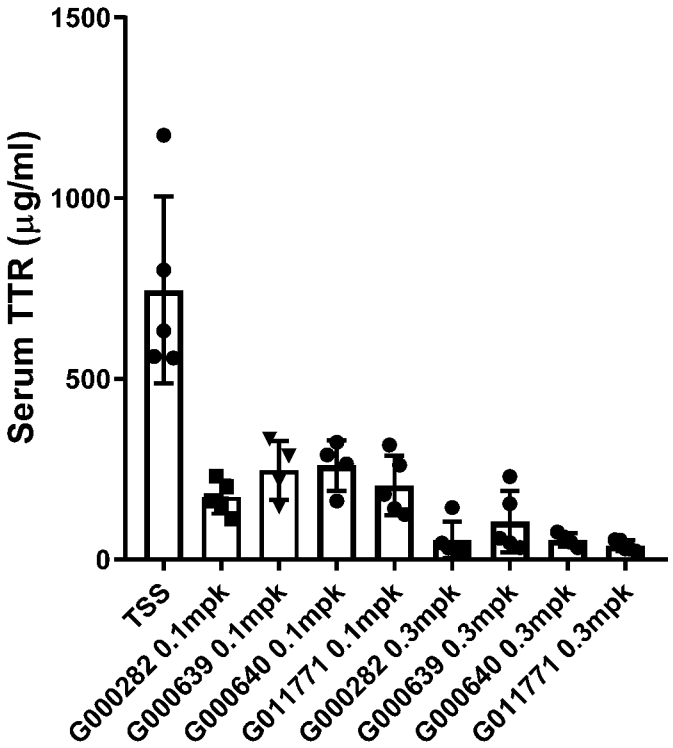

Serum TTR (μg/ml)
1500
1000
500
0
TSS
G000282 0.1mpk
G000639 0.1mpk
G000640 0.1mpk
G011771 0.1mpk
G000282 0.3mpk
G000639 0.3mpk
G000640 0.3mpk
G011771 0.3mpk

*Fig. 8D*

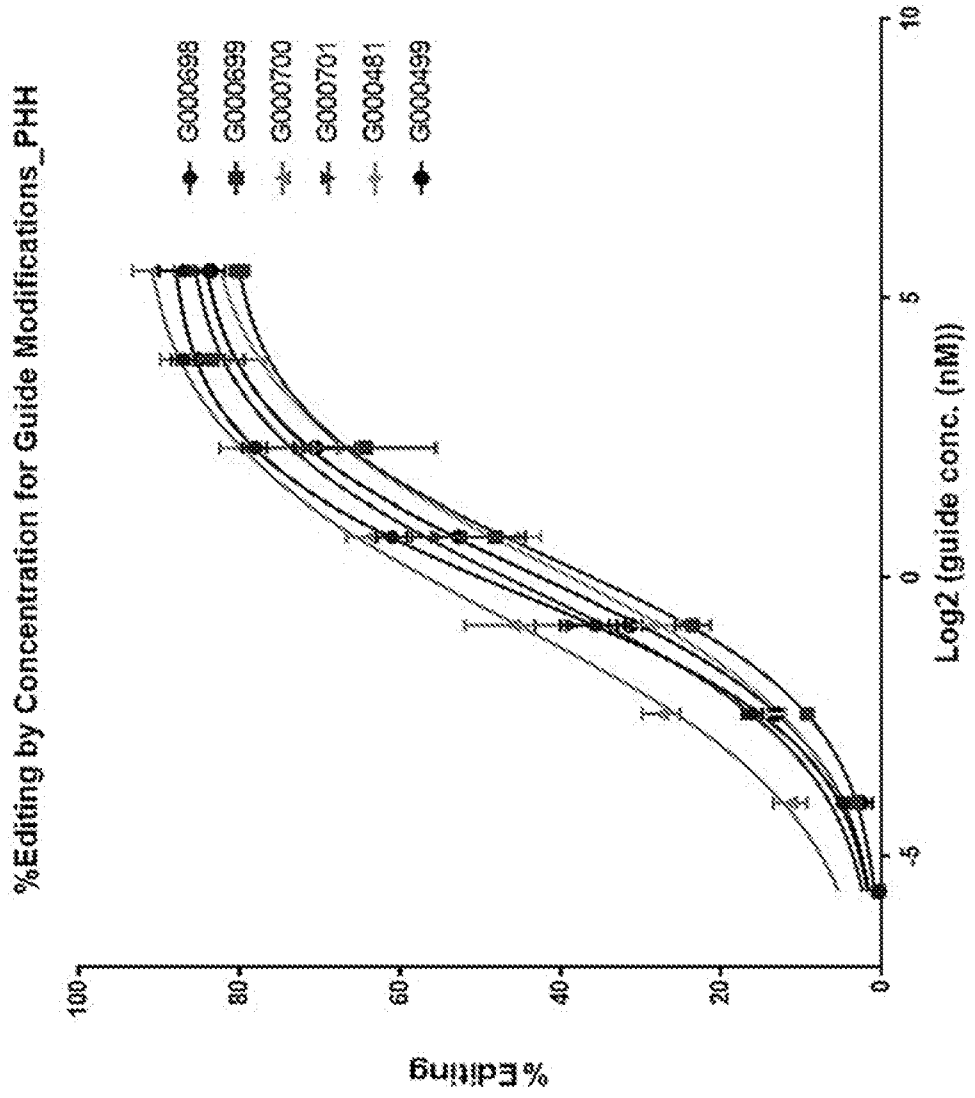

%Editing by Concentration for Guide Modifications_PHH
G000698
G000699
G000700
G000701
G000481
G000499
% Editing
100
80
60
40
20
0
-5
0
5
10
Log2 (guide conc. (nM))

*Fig. 9A*

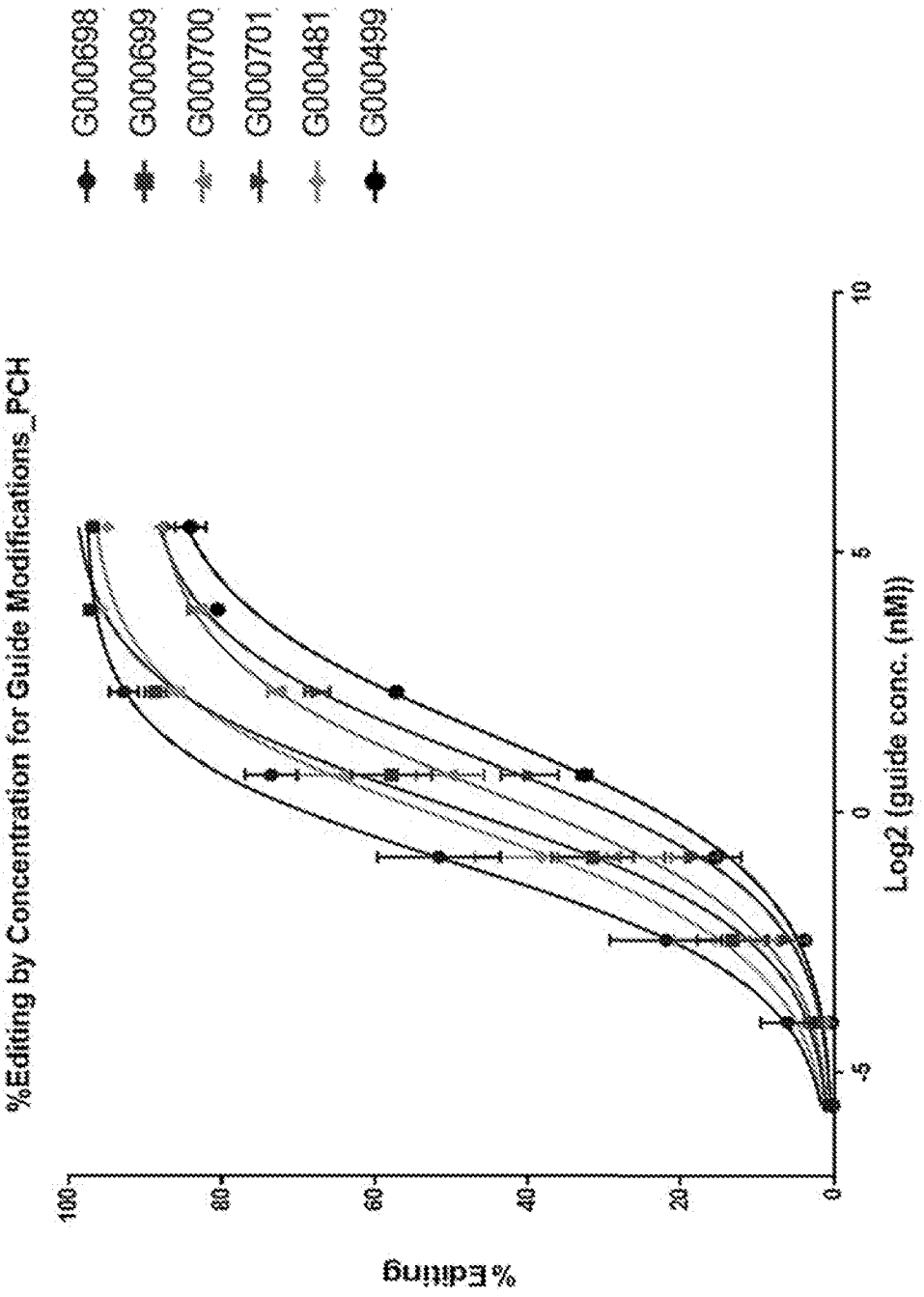

%Editing by Concentration for Guide Modifications_PCH
G000698
G000699
G000700
G000701
G000481
G000499
%Editing
100
80
60
40
20
0
-5
0
5
10
Log2 (guide conc. (nM))

*Fig. 9B*

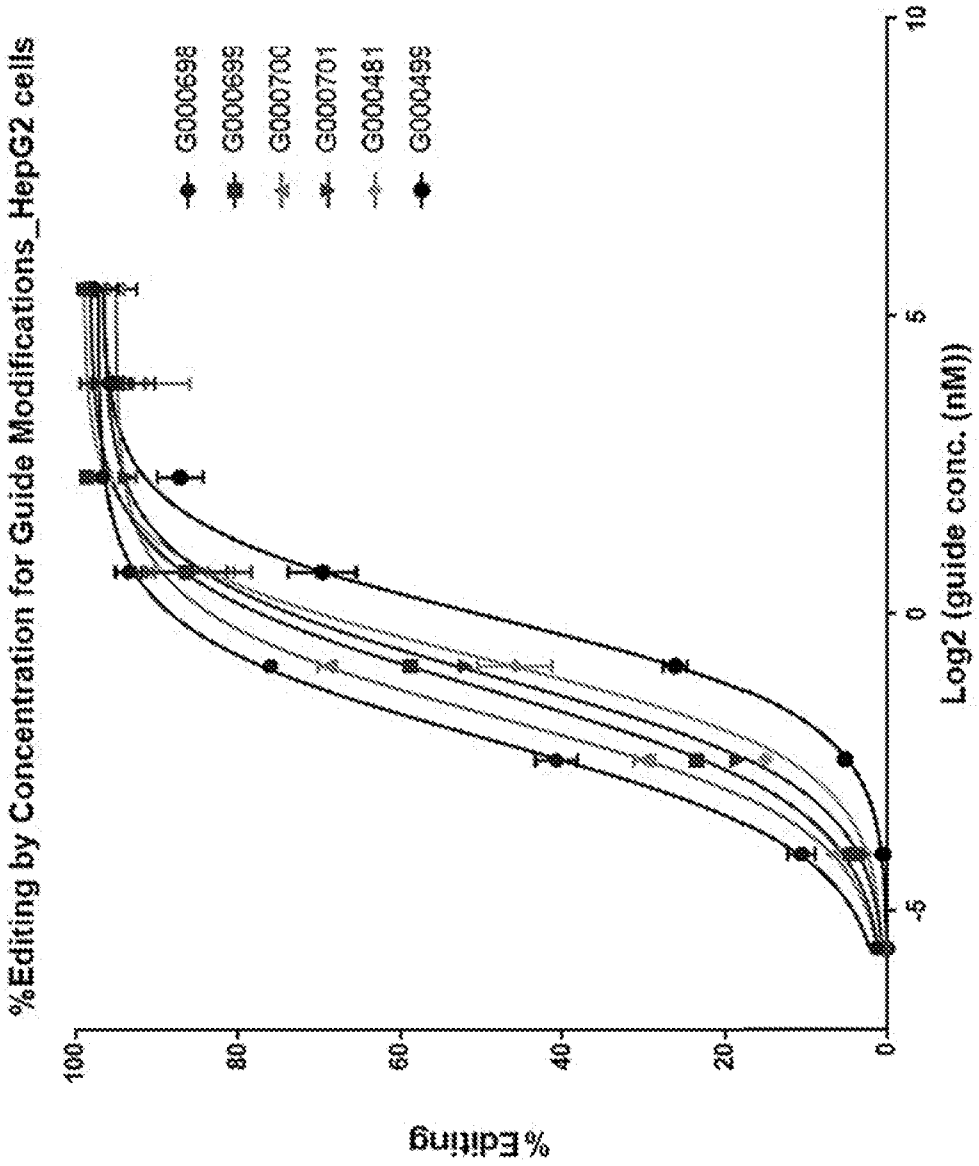

%Editing by Concentration for Guide Modifications_HepG2 cells
G000698
G000699
G000700
G000701
G000481
G000495
% Editing
100
80
60
40
20
0
-5
0
5
10
Log2 (guide conc. (nM))

*Fig. 9C*

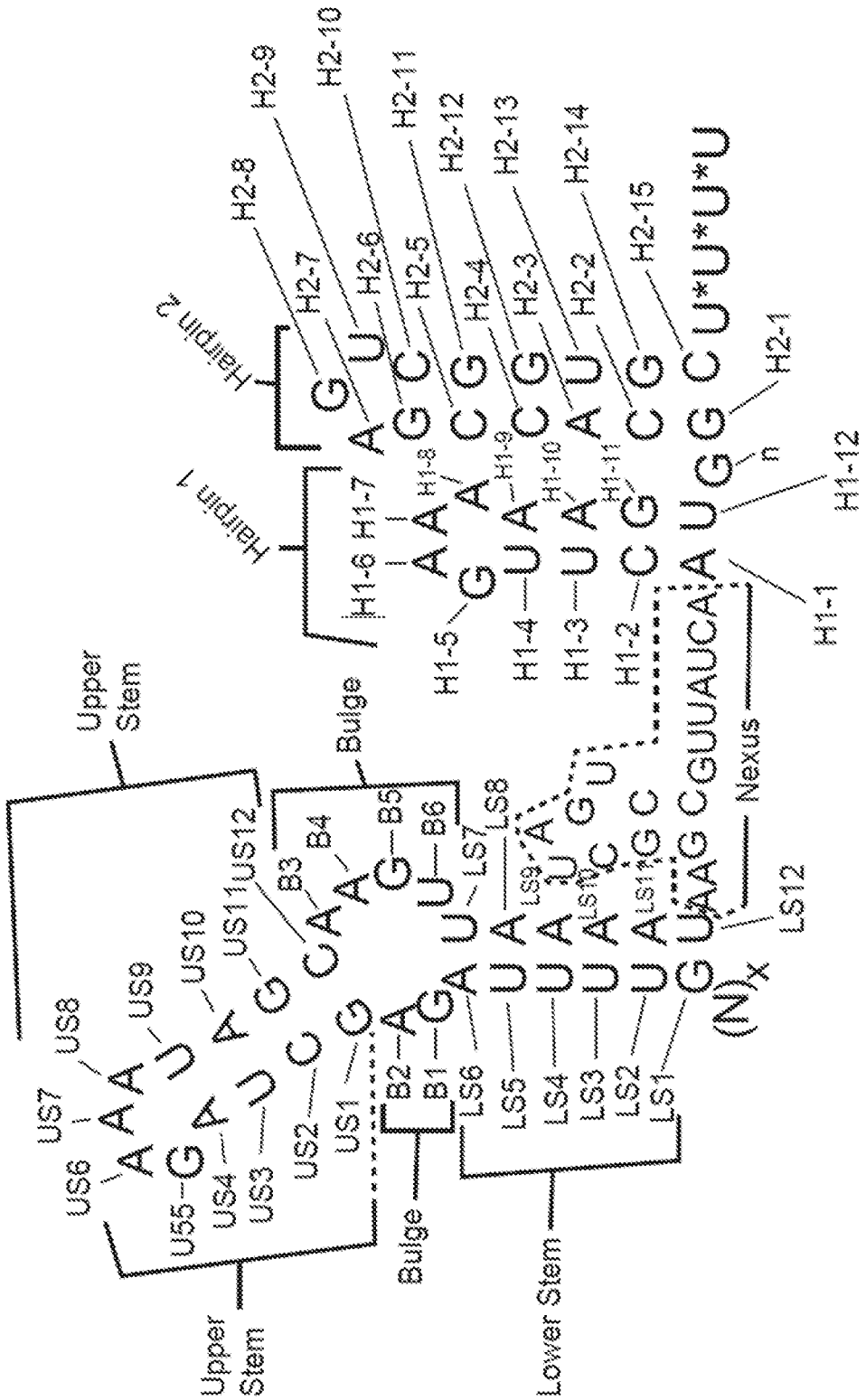

Hairpin 2
Hairpin 1
Upper Stem
Bulge
Lower Stem
Nexus
H2-1
H2-2
H2-3
H2-4
H2-5
H2-6
H2-7
H2-8
H2-9
H2-10
H2-11
H2-12
H2-13
H2-14
H2-15
H1-1
H1-2
H1-3
H1-4
H1-5
H1-6
H1-7
H1-8
H1-9
H1-10
H1-11
H1-12
US1
US2
US3
US4
US5
US6
US7
US8
US9
US10
US11
US12
LS1
LS2
LS3
LS4
LS5
LS6
LS7
LS8
LS9
LS10
LS11
LS12
B1
B2
B3
B4
B5
B6
n
(N)x

*Fig. 10A*

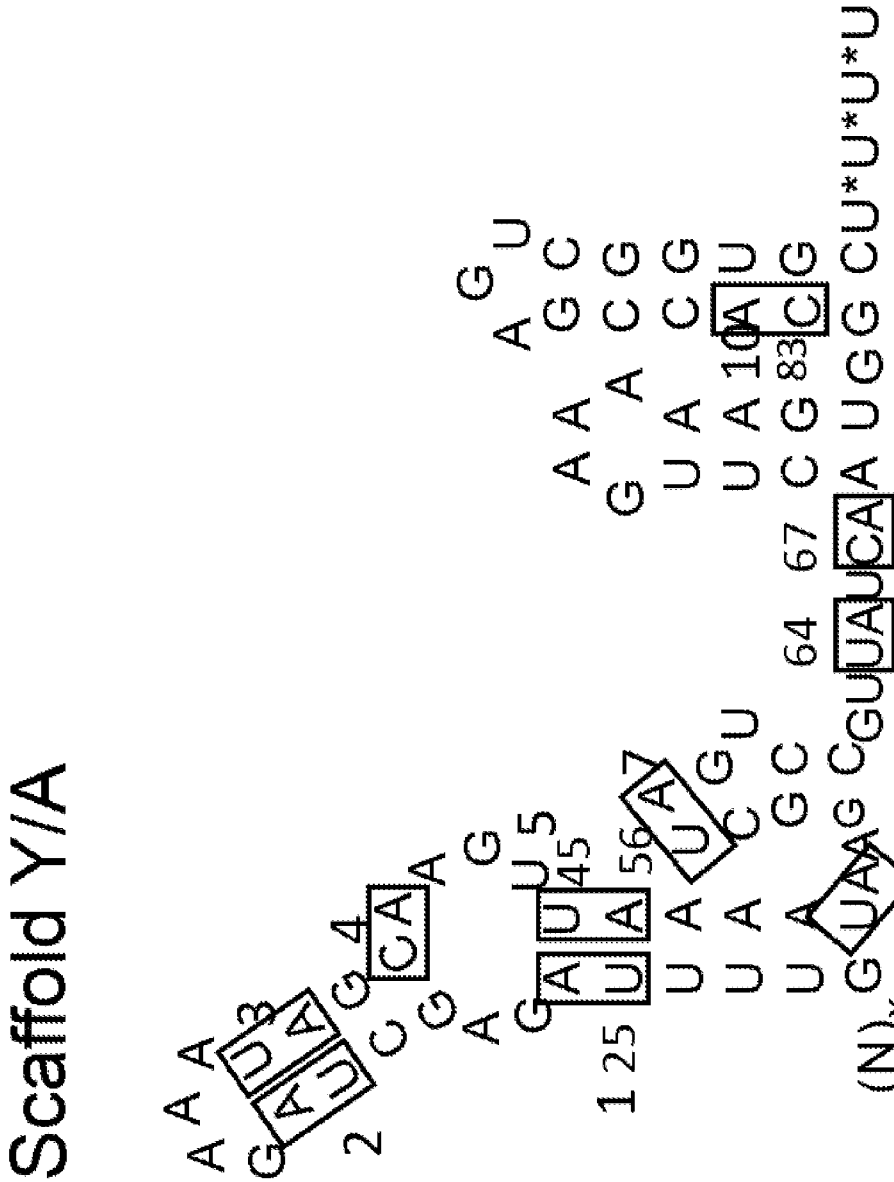

Scaffold Y/A
A A A
G A U 3
U A
2 C G 4
G C A
A
A G
G U 5
A U 45
1 25 U A 56
U A 7
U A C G U
U A G C
U A 64 67 C G
G U U A U C A A U G G C U*U*U*U
A G C G U U A U C A 8 9
G U A A
(N)x 50 6
A G C
A C G
G A C G
A A A C G
G A C G
U A U
U A 10 A U
U A 83 C G
C G

*Fig. 10B*

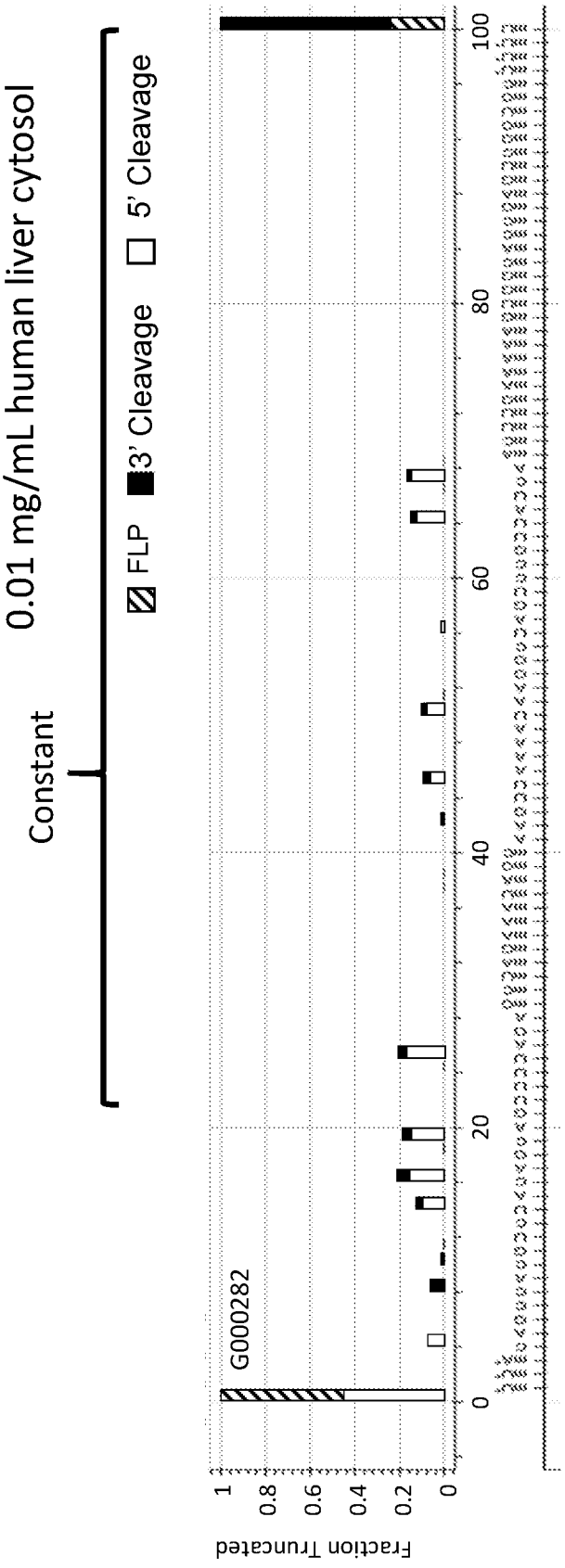

Constant
0.01 mg/mL human liver cytosol
FLP
3' Cleavage
5' Cleavage
G000282
Fraction Truncated
0
0.2
0.4
0.6
0.8
1
0
20
40
60
80
100

*Fig. 11A*

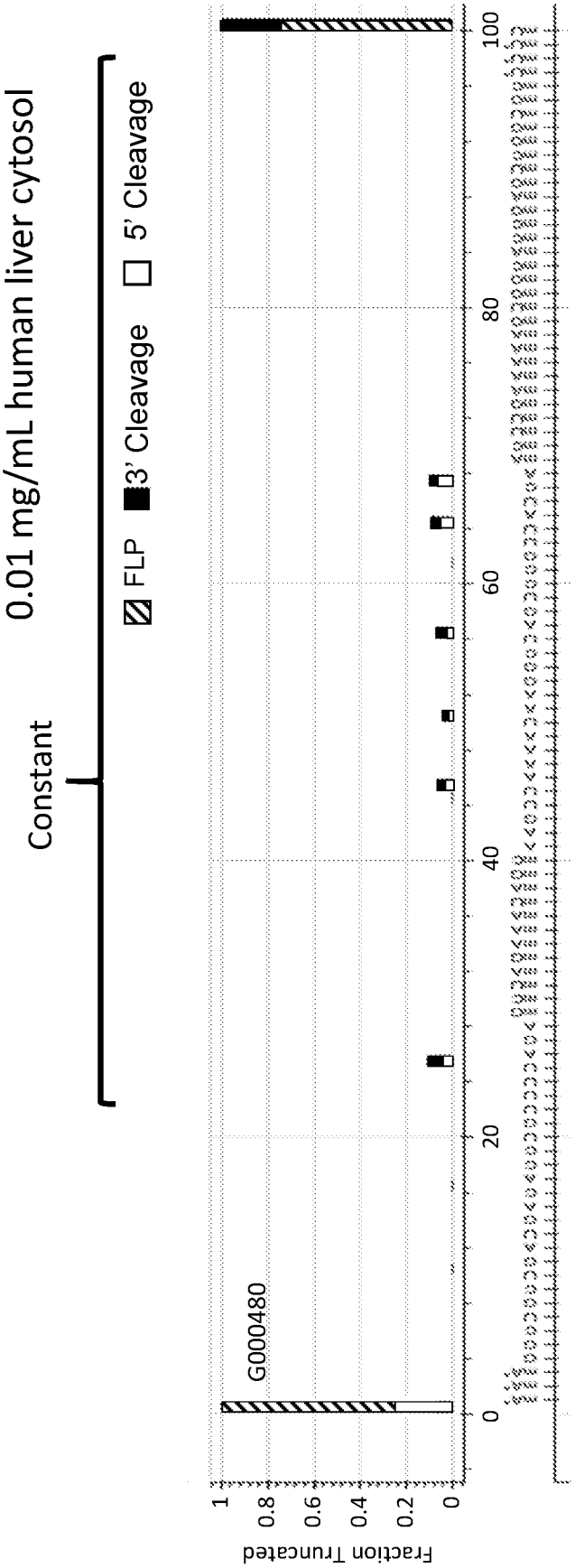

Constant
0.01 mg/mL human liver cytosol
FLP
3' Cleavage
5' Cleavage
G000480
Fraction Truncated
0
0.2
0.4
0.6
0.8
1
0
20
40
60
80
100

*Fig. 11B*

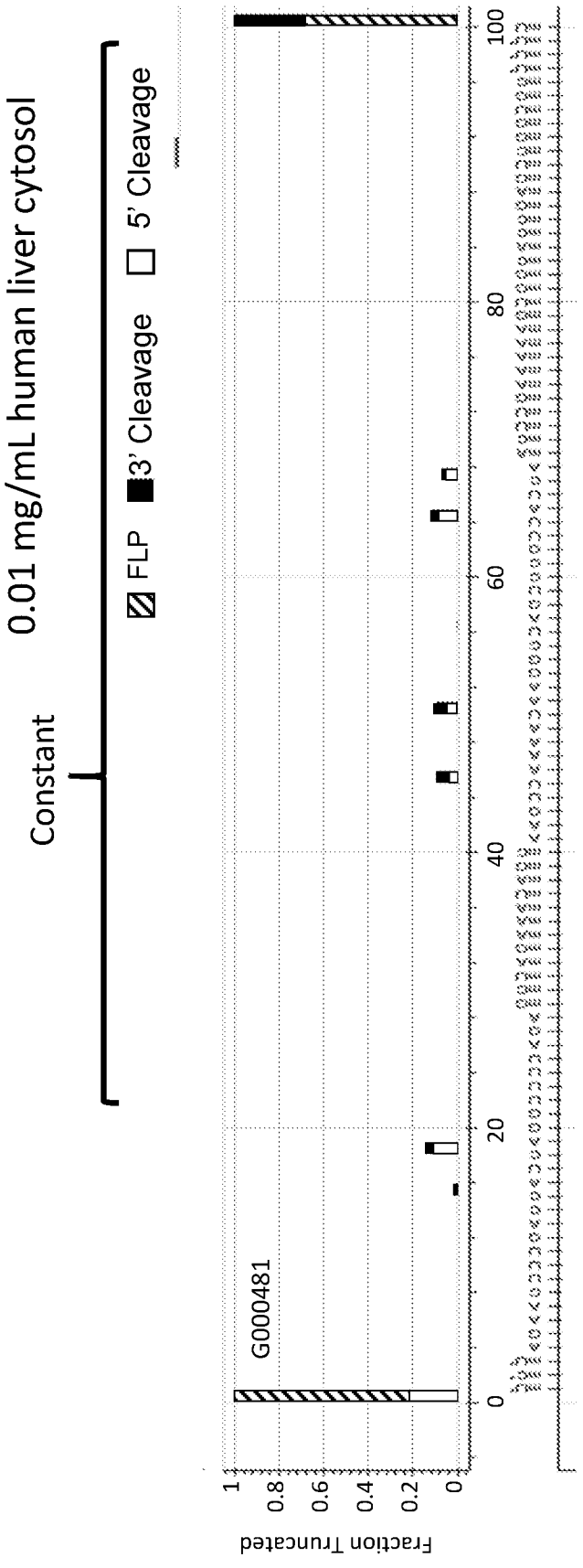

Constant
0.01 mg/mL human liver cytosol
FLP
3' Cleavage
5' Cleavage
G000481
Fraction Truncated
0
0.2
0.4
0.6
0.8
1
0
20
40
60
80
100

*Fig. 11C*

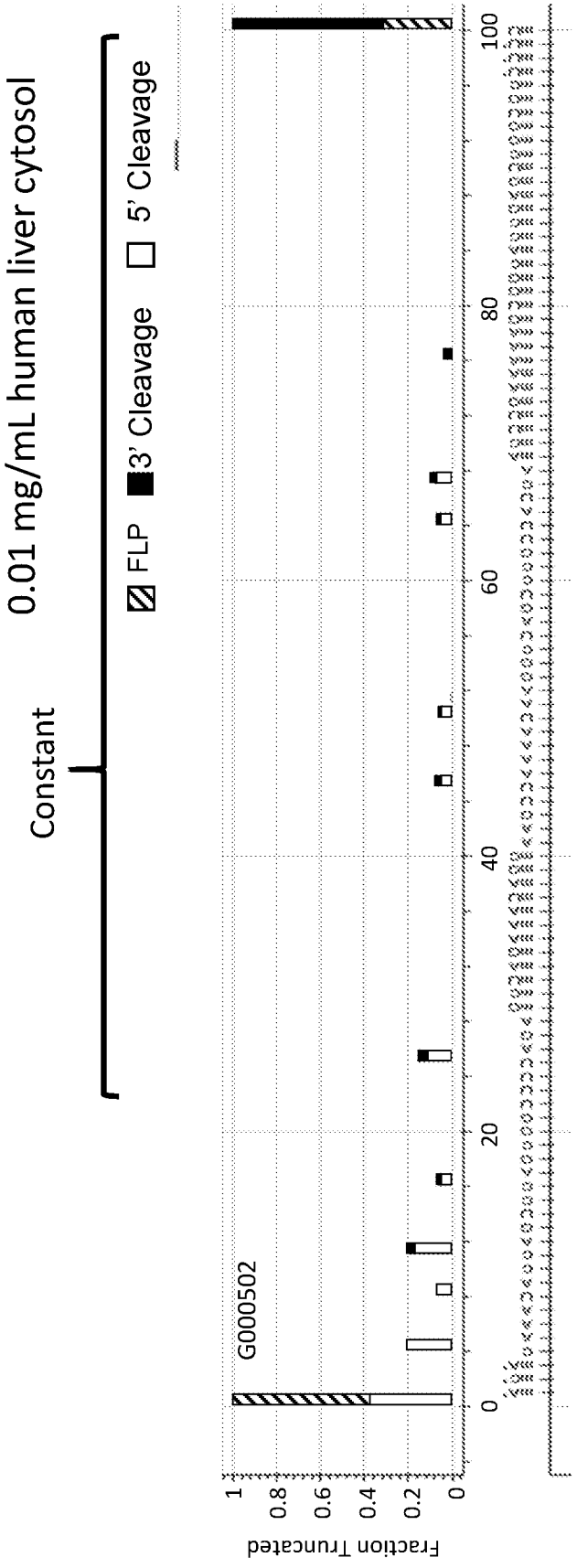

Constant
0.01 mg/mL human liver cytosol
FLP
3' Cleavage
5' Cleavage
G000502
Fraction Truncated
0
0.2
0.4
0.6
0.8
1
0
20
40
60
80
100

*Fig. 11D*

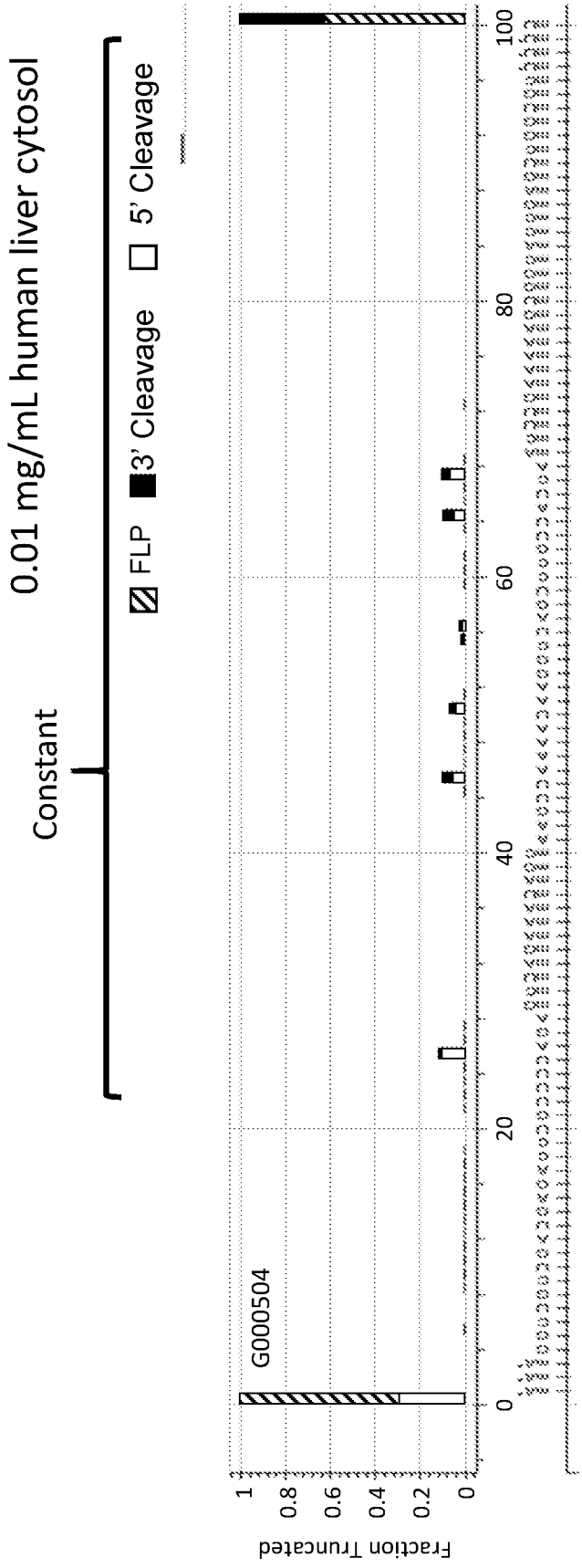

Constant
0.01 mg/mL human liver cytosol
FLP
3' Cleavage
5' Cleavage
G000504
Fraction Truncated
0
0.2
0.4
0.6
0.8
1
0
20
40
60
80
100

*Fig. 11E*

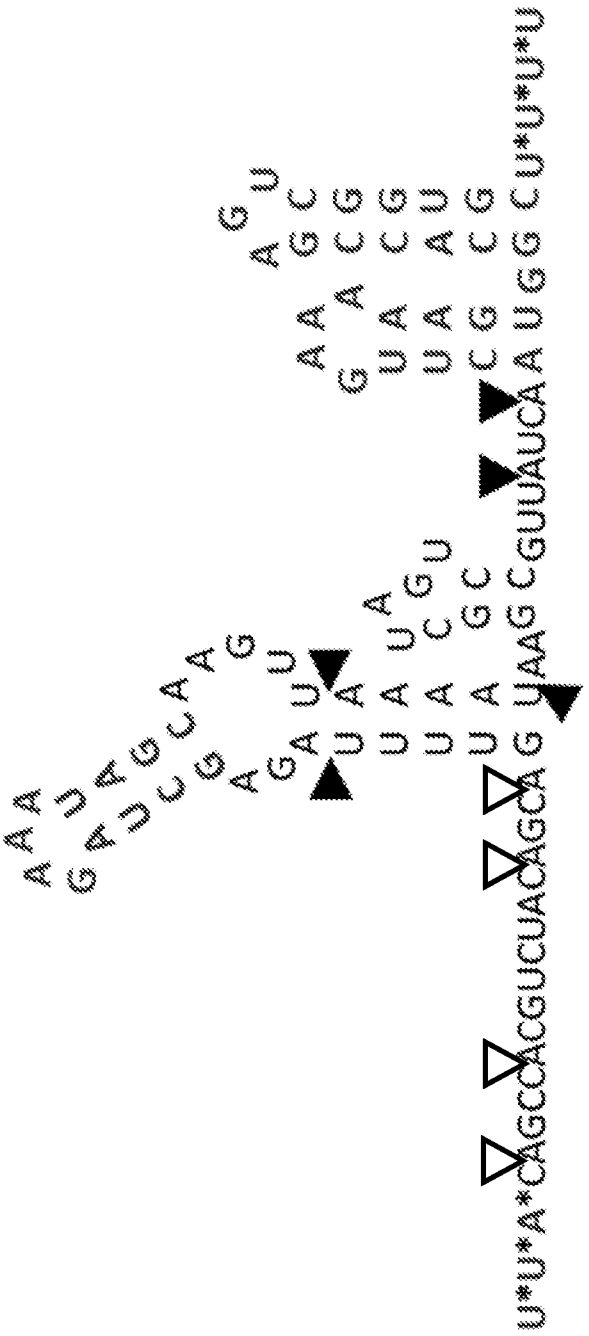



Fig. 11F

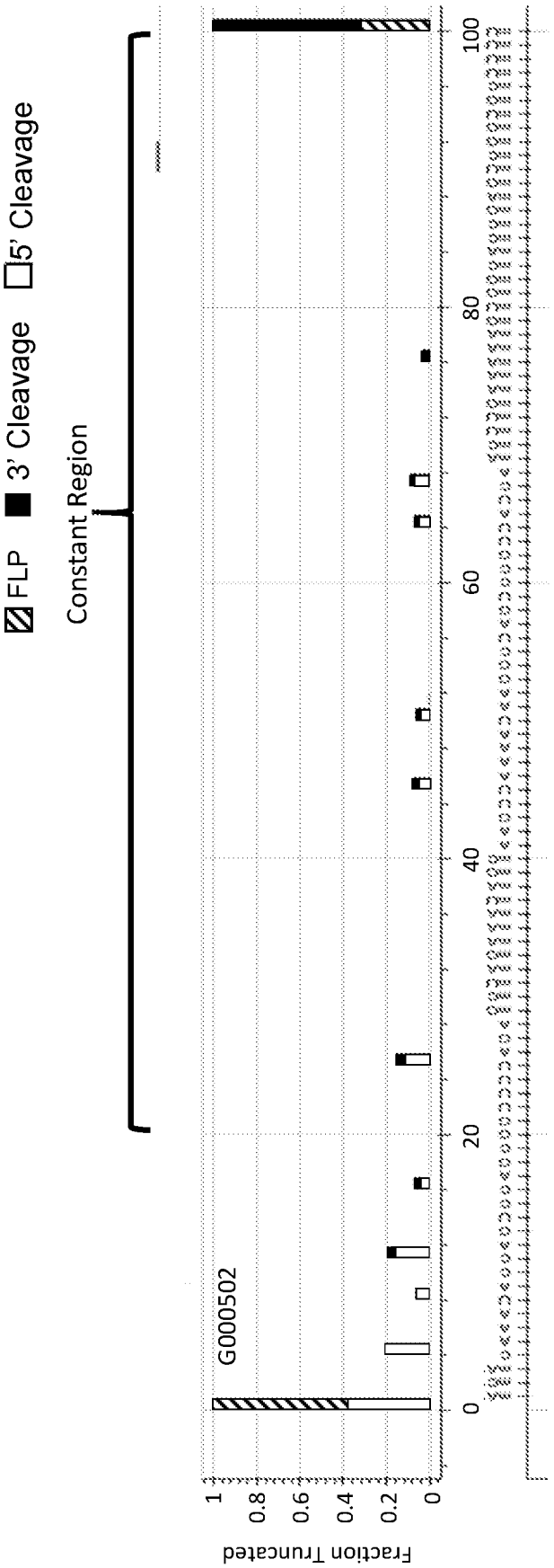

FLP
3' Cleavage
5' Cleavage
Constant Region
G000502
Fraction Truncated
0
0.2
0.4
0.6
0.8
1
0
20
40
60
80
100

*Fig. 12A*

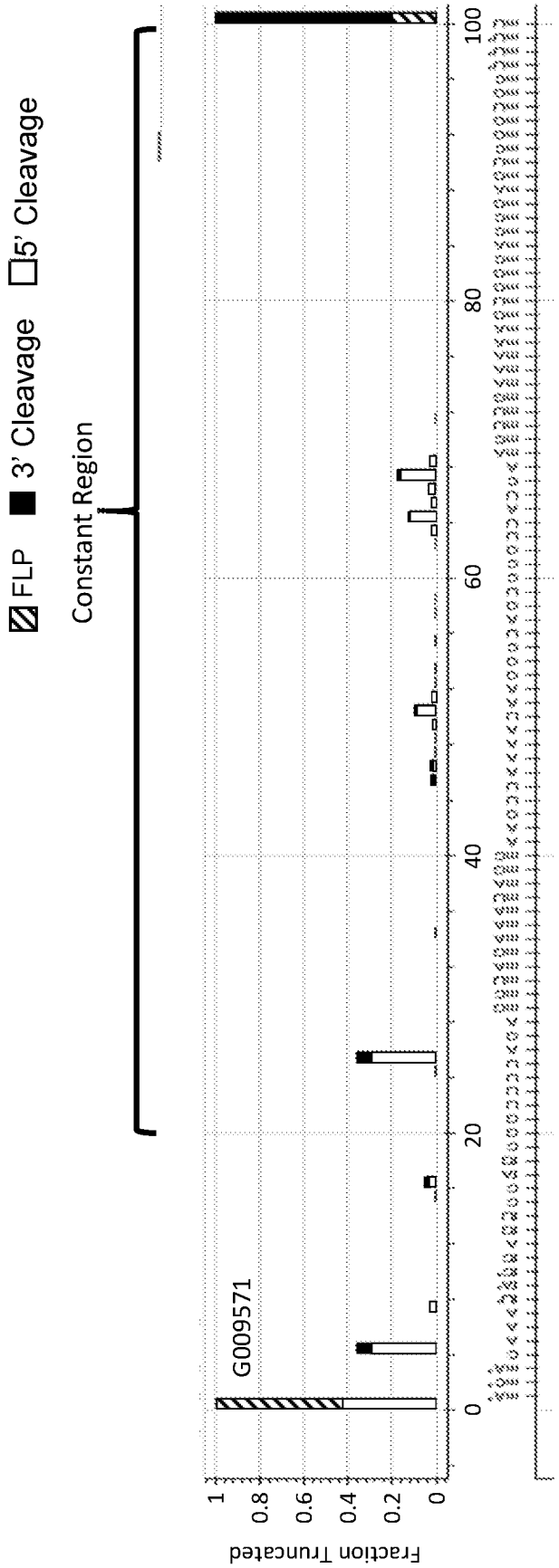

FLP
3' Cleavage
5' Cleavage
Constant Region
G009571
Fraction Truncated
0
0.2
0.4
0.6
0.8
1
0
20
40
60
80
100

*Fig. 12B*

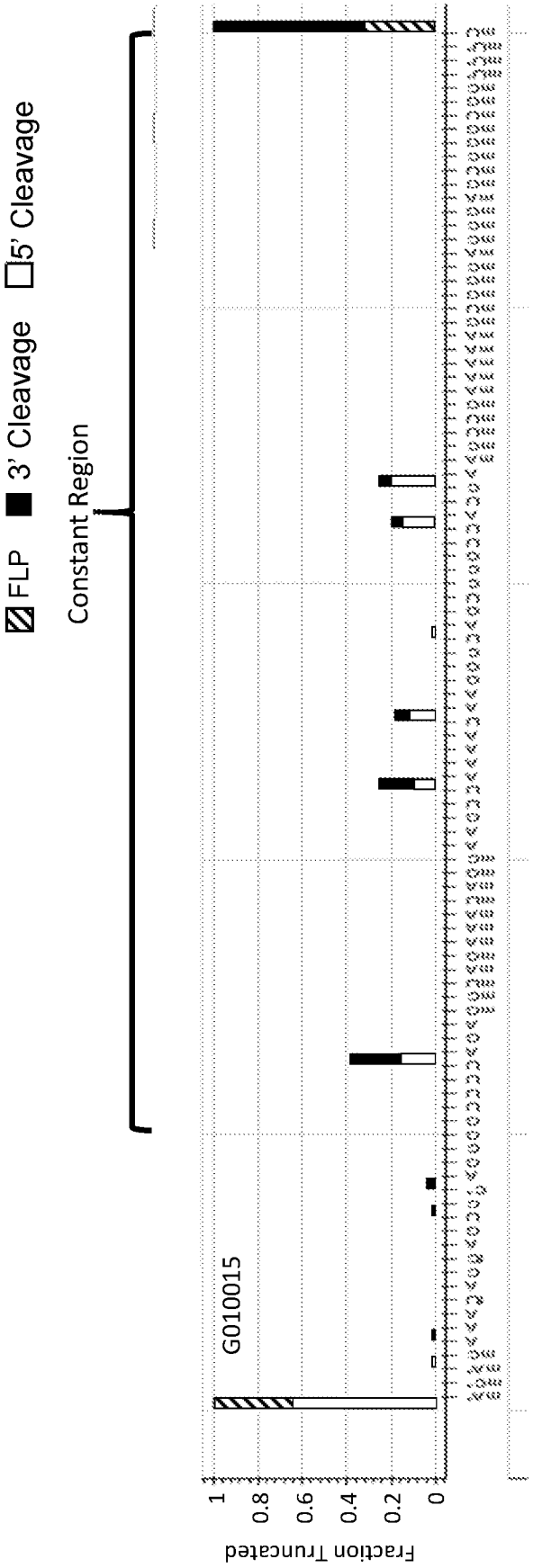

FLP
3' Cleavage
5' Cleavage
Constant Region
G010015
Fraction Truncated
0
0.2
0.4
0.6
0.8
1

*Fig. 12C*

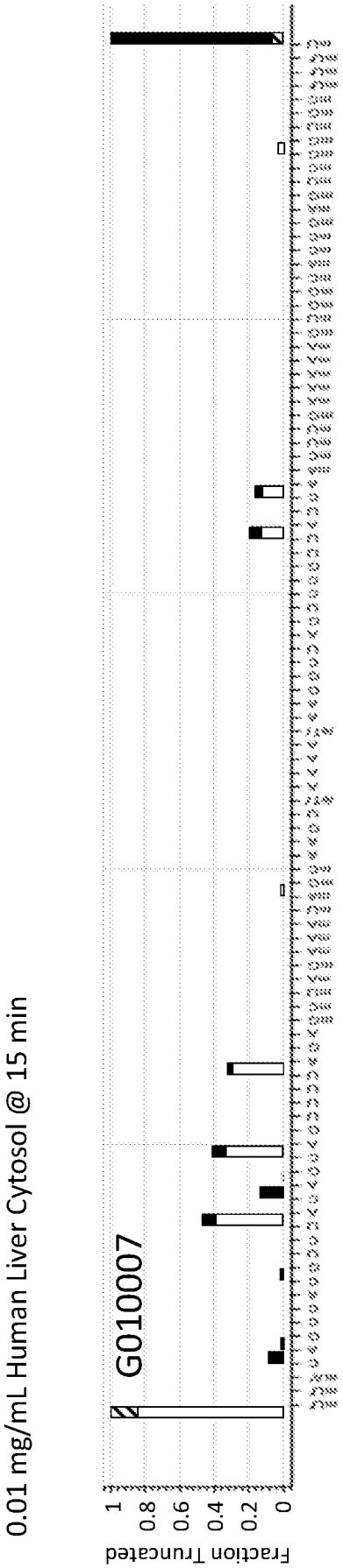



Fig. 12D

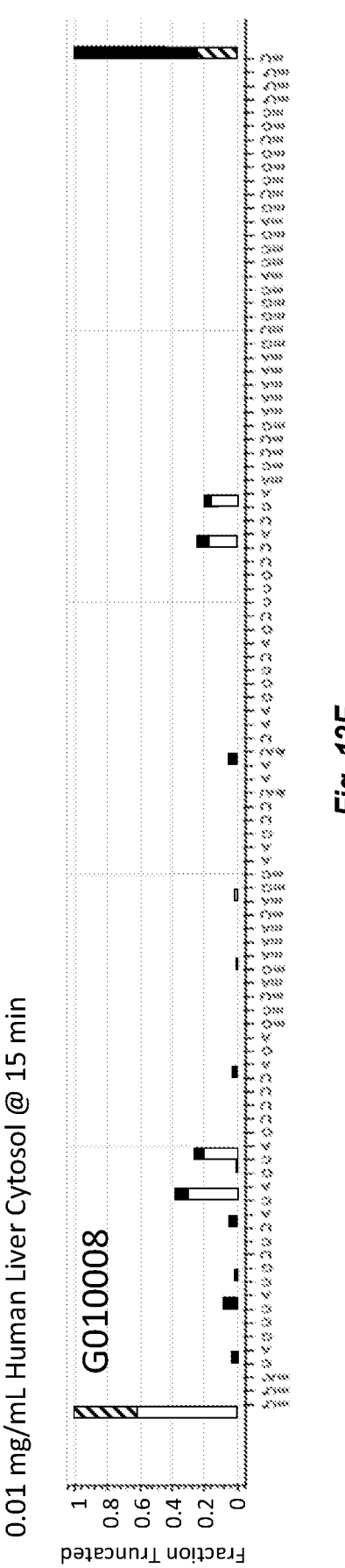



Fig. 12E

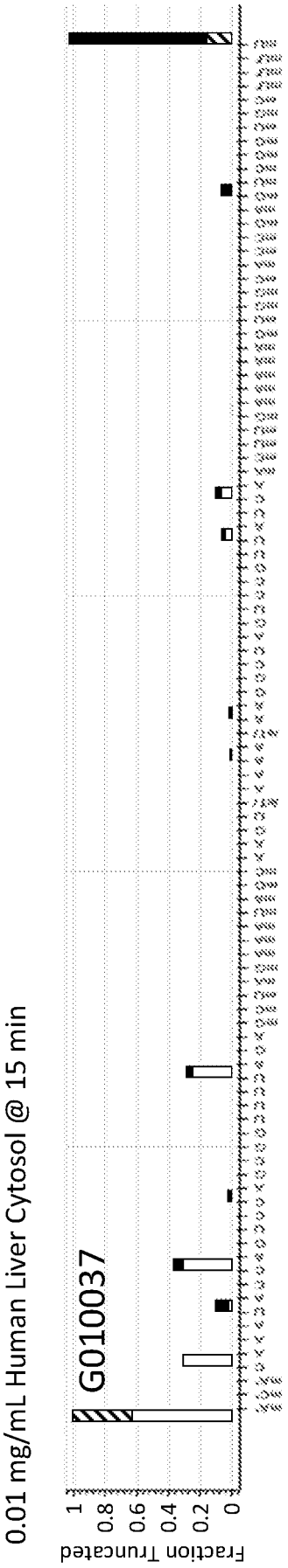



*Fig. 12F*

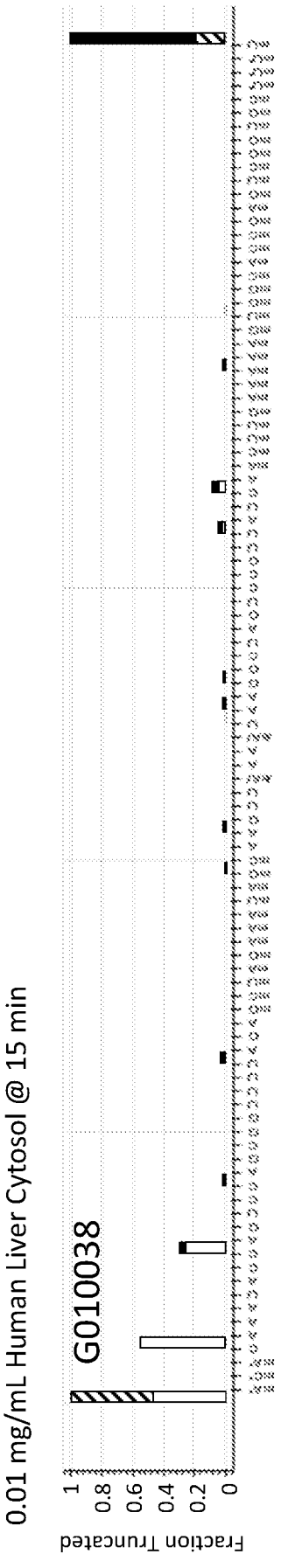



*Fig. 12G*

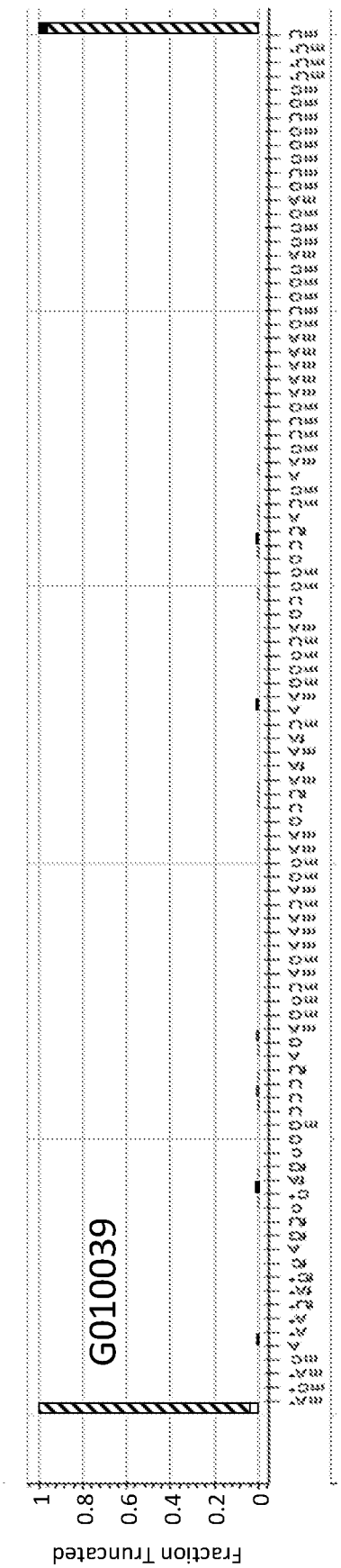



Fig. 13A

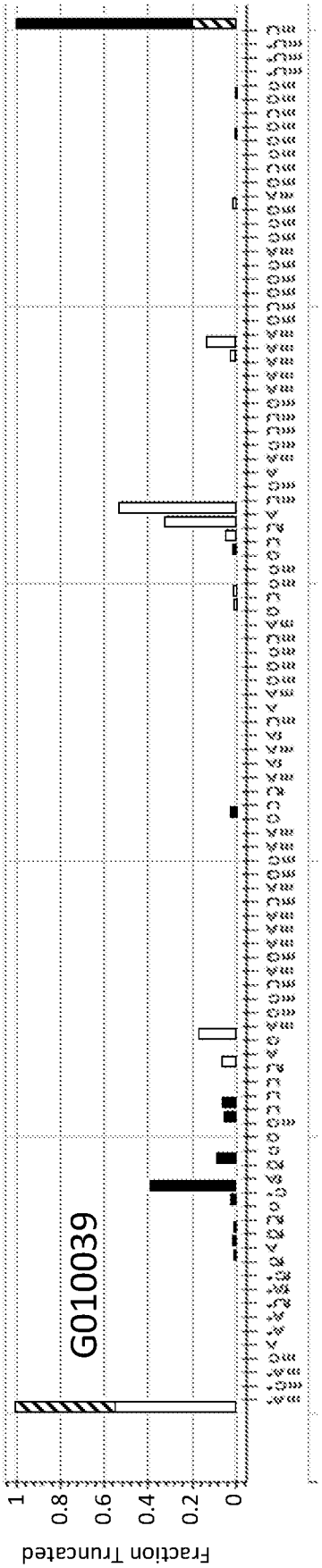



Fig. 13B

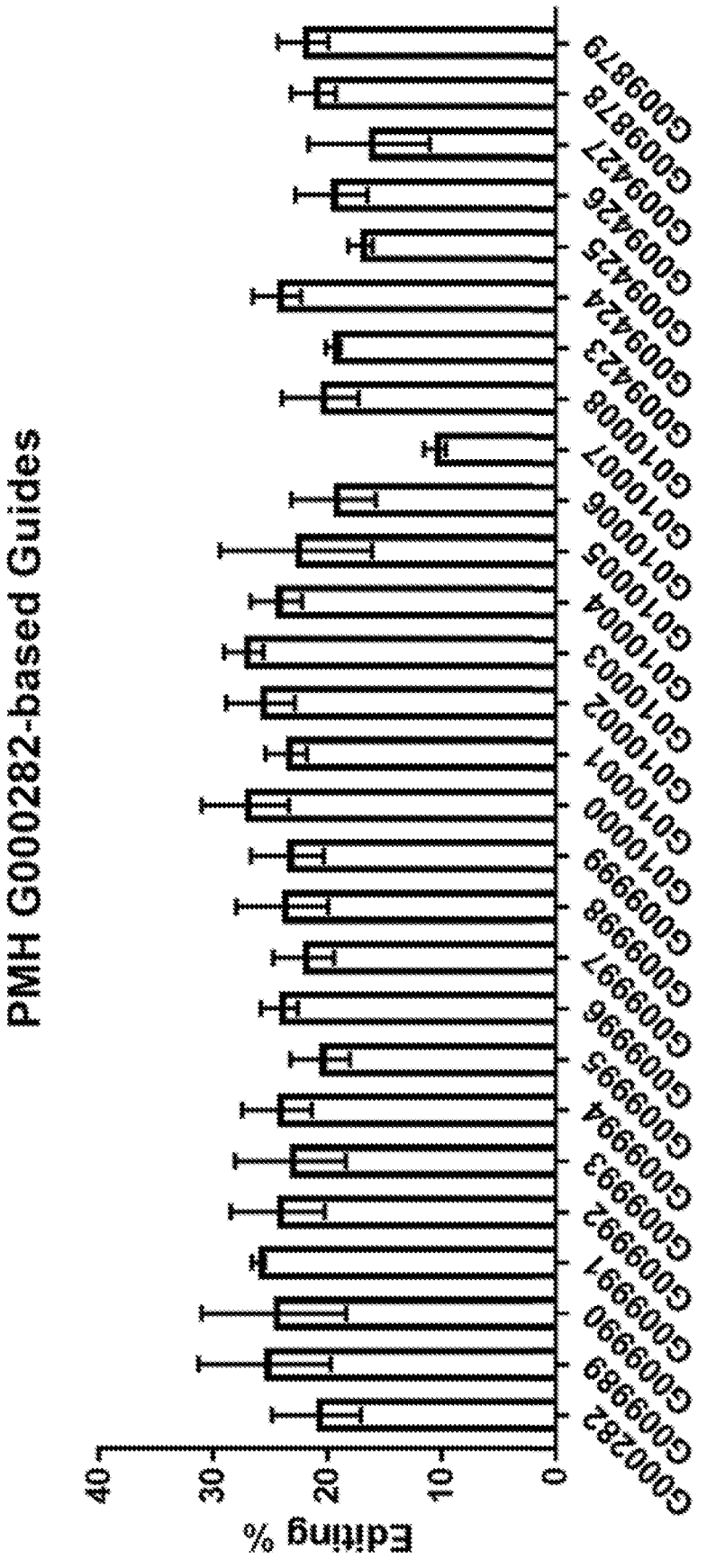

PMH G000282-based Guides
Editing %
40
30
20
10
0
G000282
G000989
G000990
G000991
G000992
G000993
G000994
G000995
G000996
G000997
G000998
G000999
G001000
G001001
G001002
G001003
G001004
G001005
G001006
G001007
G001008
G009423
G009424
G009425
G009426
G009427
G009878
G009879

*Fig. 14*

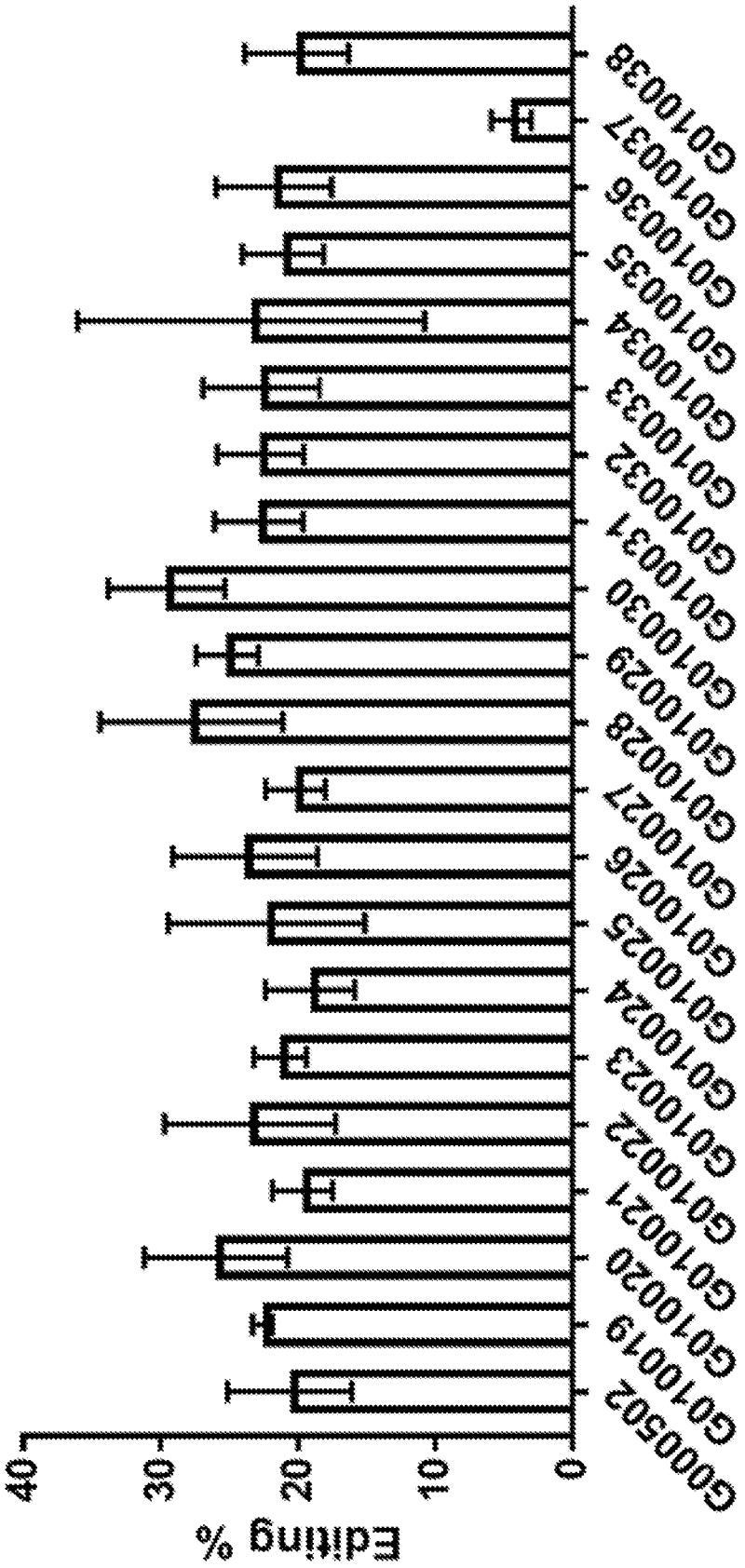

PMH G000502-based Guides
Editing %
0
10
20
30
40
G000502
G0100019
G0100020
G0100021
G0100022
G0100023
G0100024
G0100025
G0100026
G0100027
G0100028
G0100029
G0100030
G0100031
G0100032
G0100033
G0100034
G0100035
G0100036
G0100037
G0100038

*Fig. 15A*

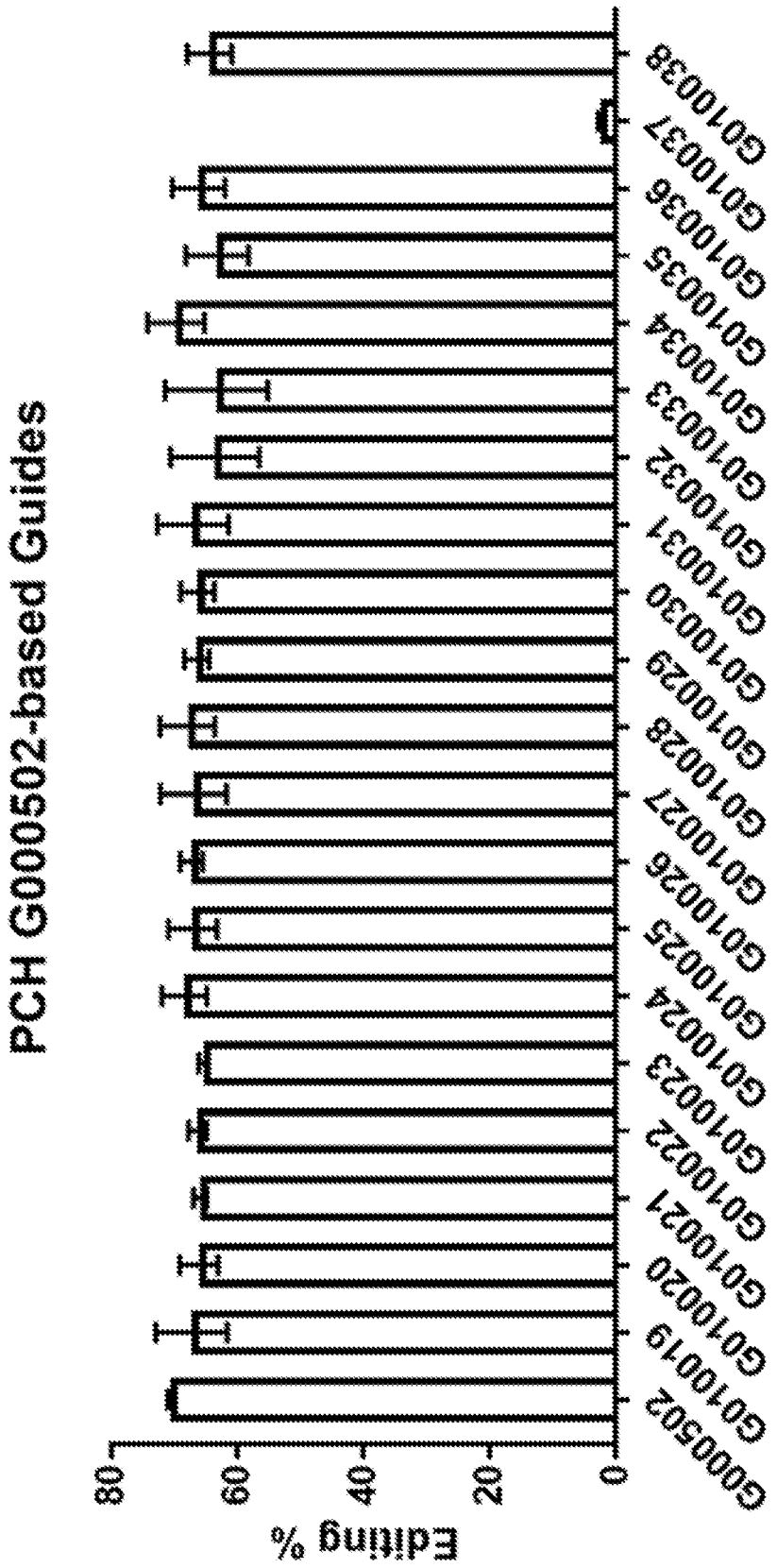

PCH G000502-based Guides
Editing %
0
20
40
60
80
G000502
G0100019
G0100020
G0100021
G0100022
G0100023
G0100024
G0100025
G0100026
G0100027
G0100028
G0100029
G0100030
G0100031
G0100032
G0100033
G0100034
G0100035
G0100036
G0100037
G0100038

*Fig. 15B*

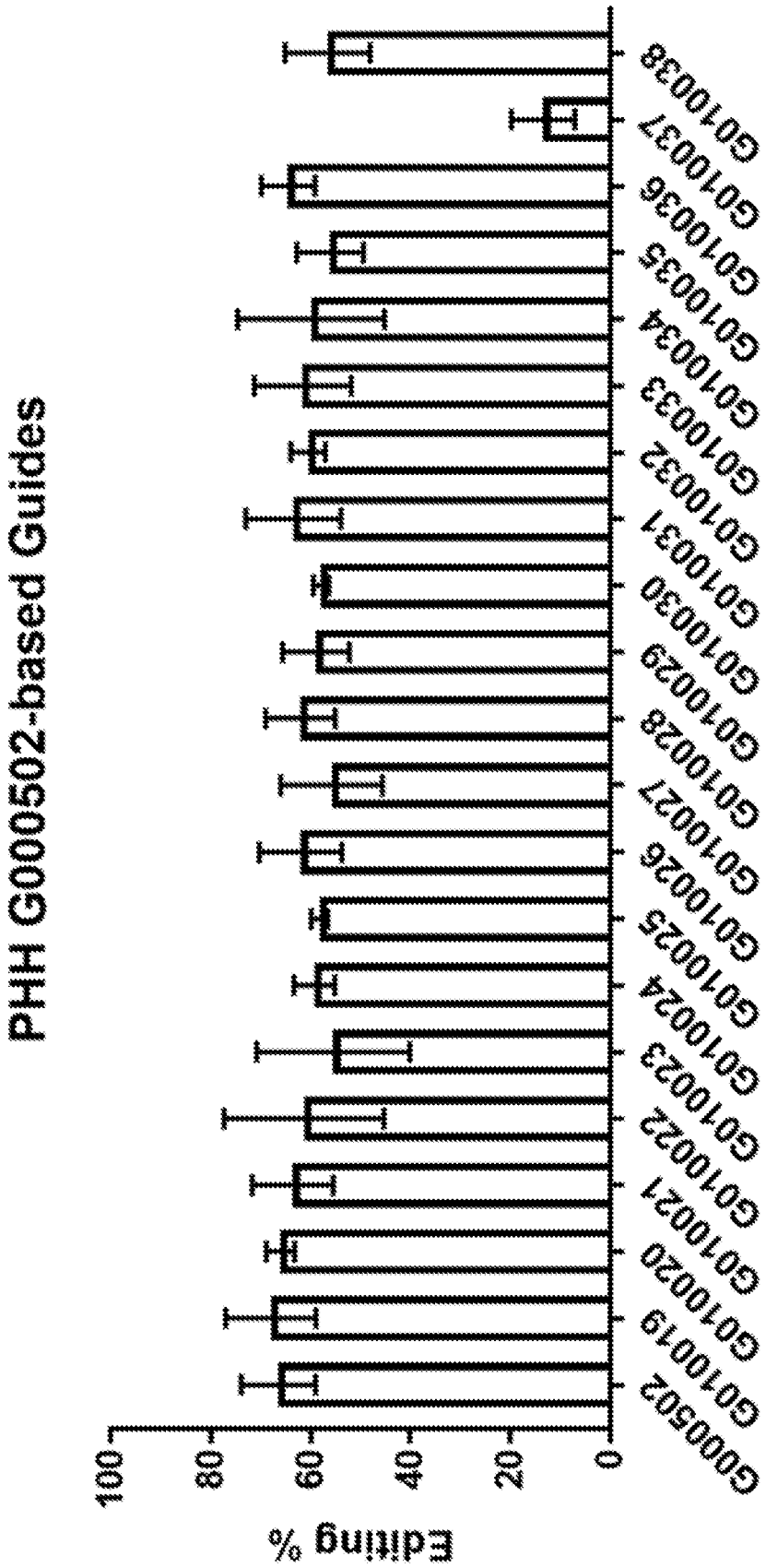

PHH G000502-based Guides
Editing %
100
80
60
40
20
0
G000502
G100019
G100020
G100021
G100022
G100023
G100024
G100025
G100026
G100027
G100028
G100029
G100030
G100031
G100032
G100033
G100034
G100035
G100036
G100037
G100038

Fig. 15C

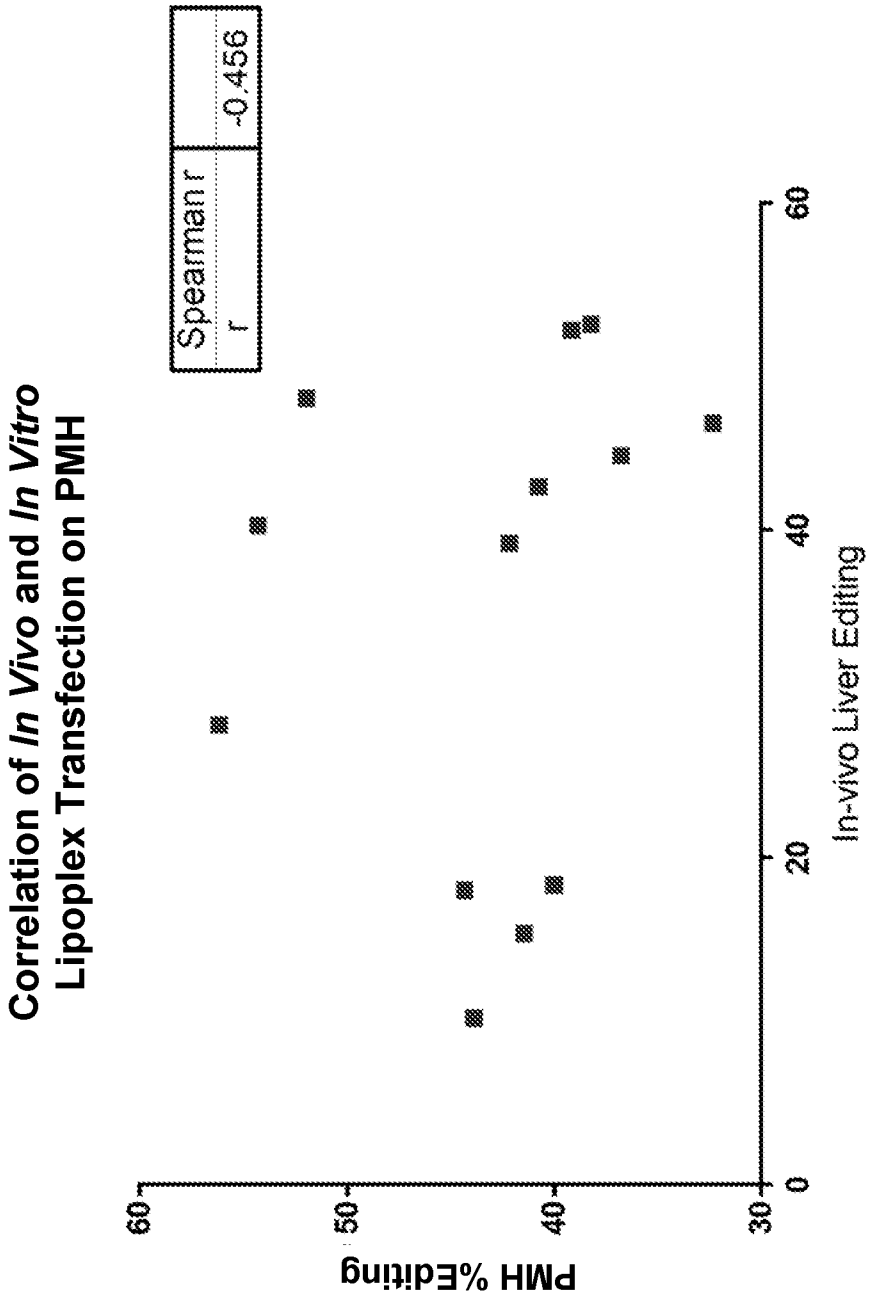

Correlation of In Vivo and In Vitro
Lipoplex Transfection on PMH
Spearman r
r
-0.456
PMH %Editing
In-vivo Liver Editing
60
50
40
30
0
20
40
60

*Fig. 16A*

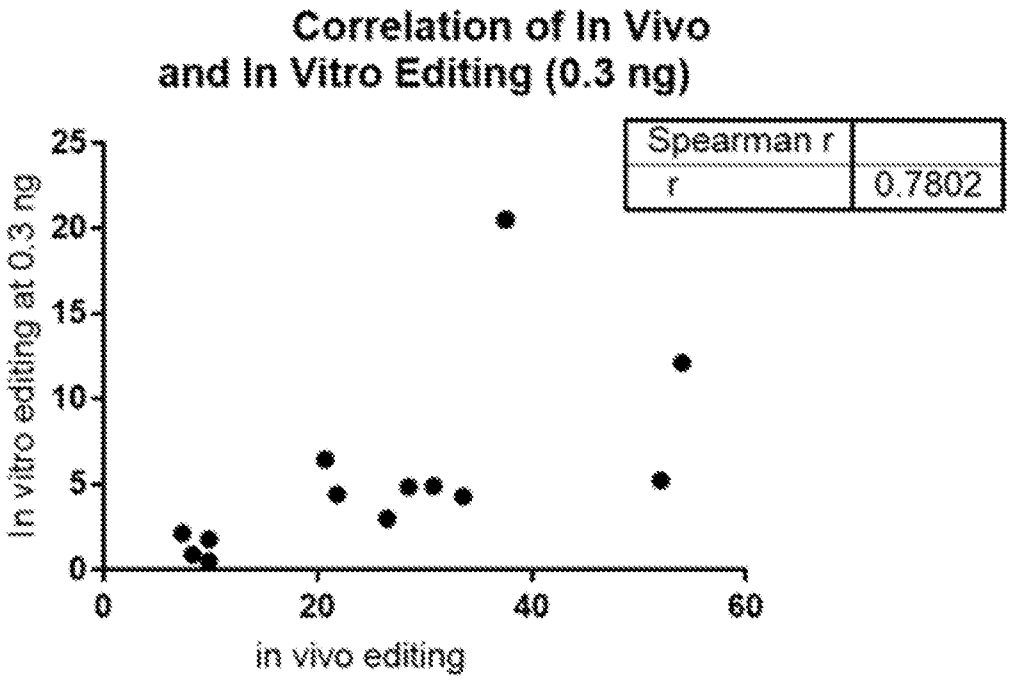



*Fig. 16B*

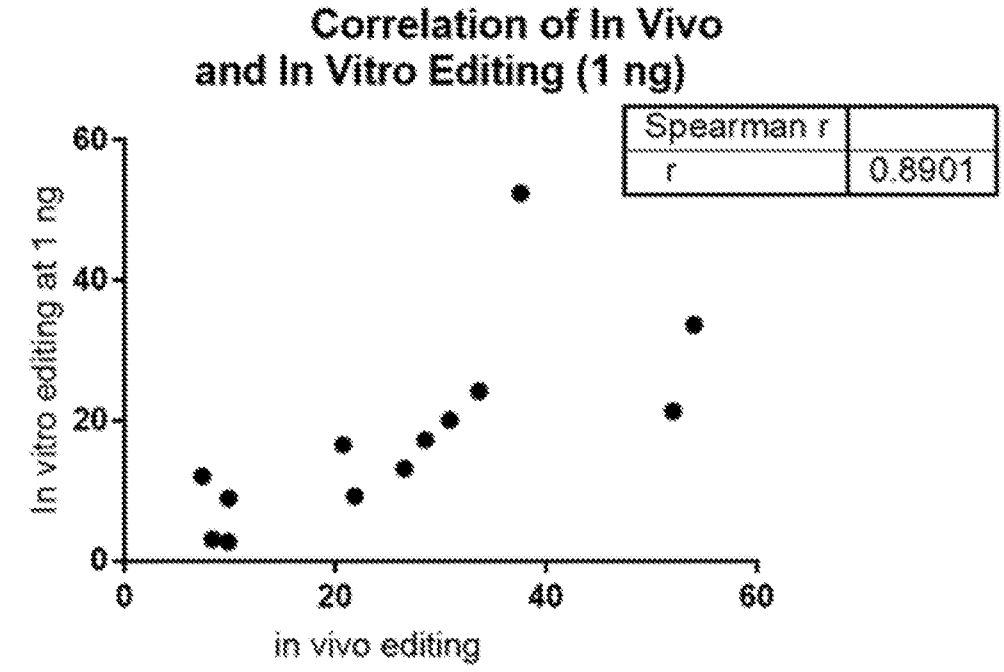



*Fig. 16C*

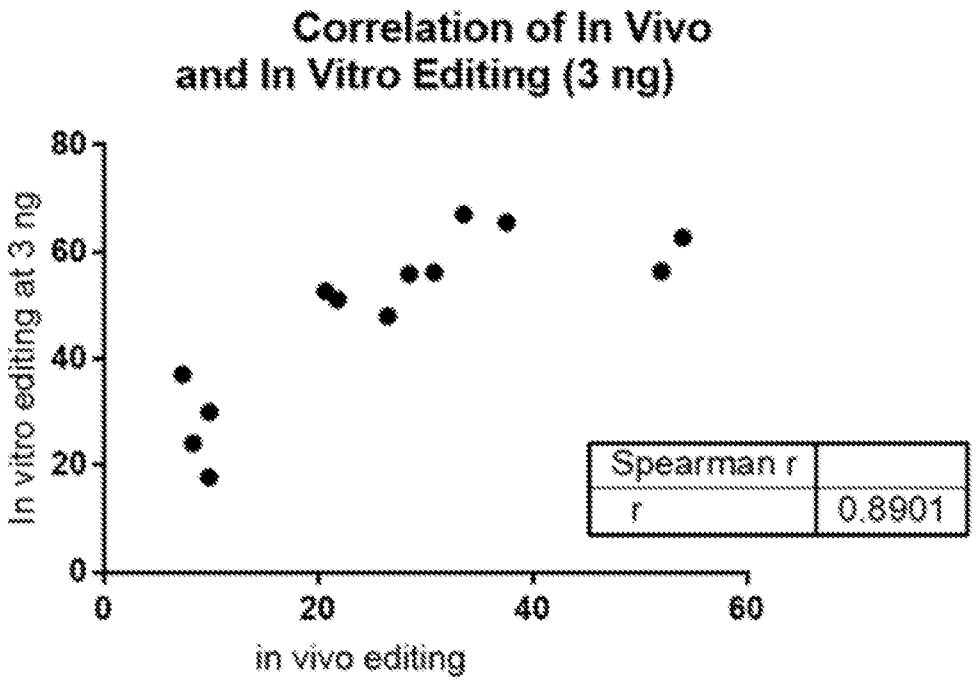



*Fig. 16D*

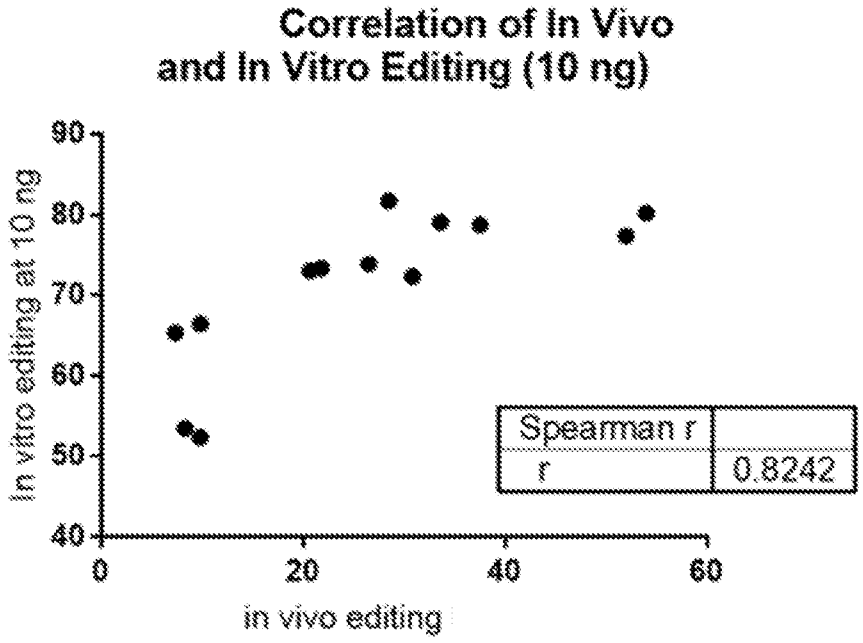



*Fig. 16E*

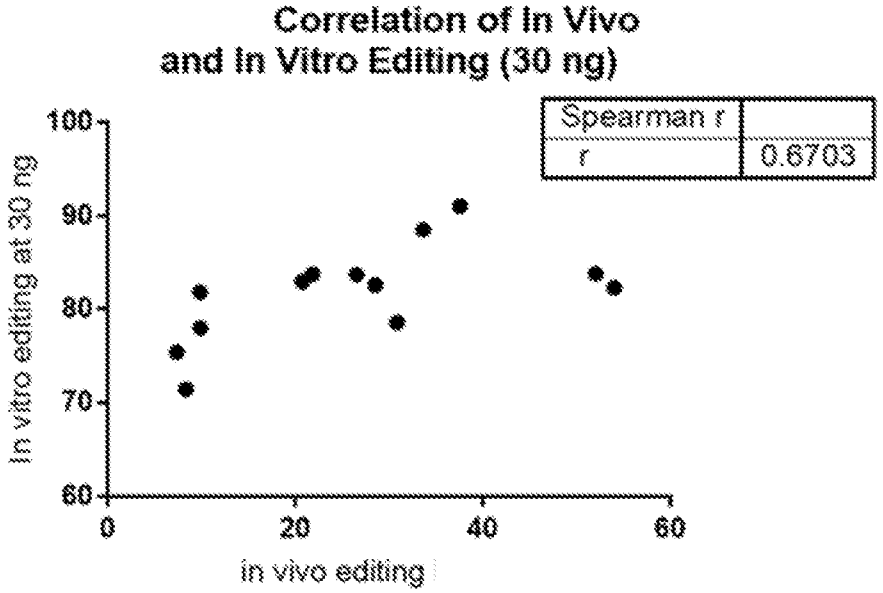



*Fig. 16F*

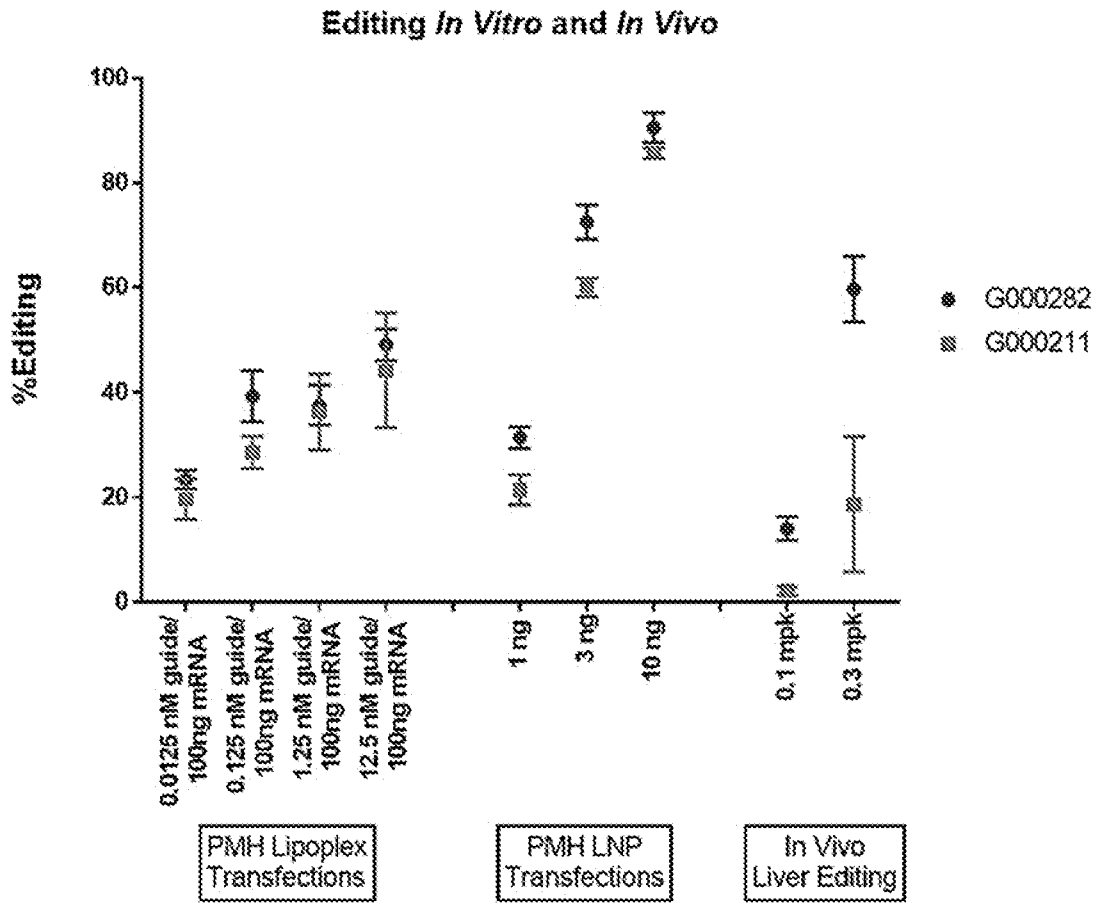



*Fig. 16G*

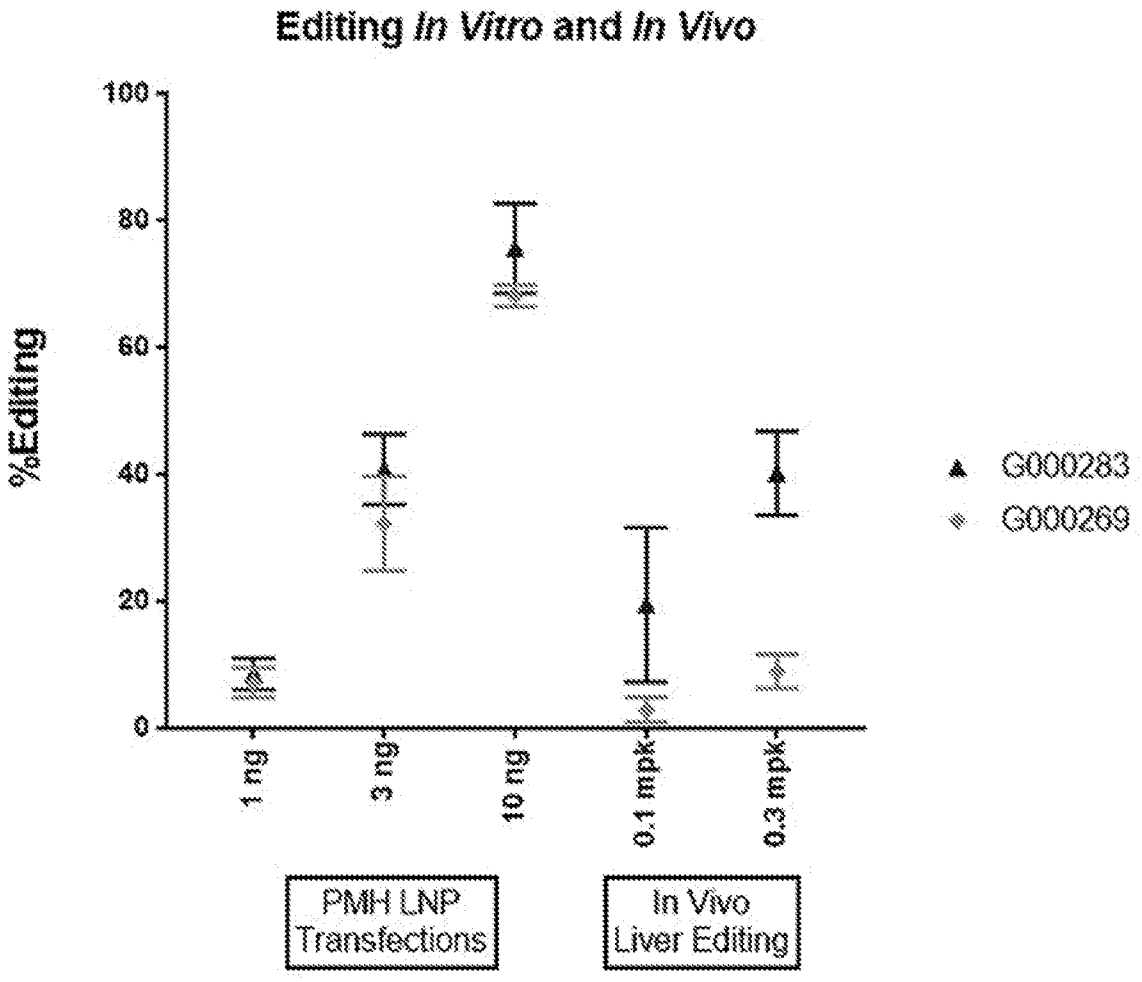

Editing *In Vitro* and *In Vivo*
%Editing
100
80
60
40
20
0
1 ng
3 ng
10 ng
0.1 mpk
0.3 mpk
PMH LNP Transfections
In Vivo Liver Editing
G000283
G000269

*Fig. 16H*

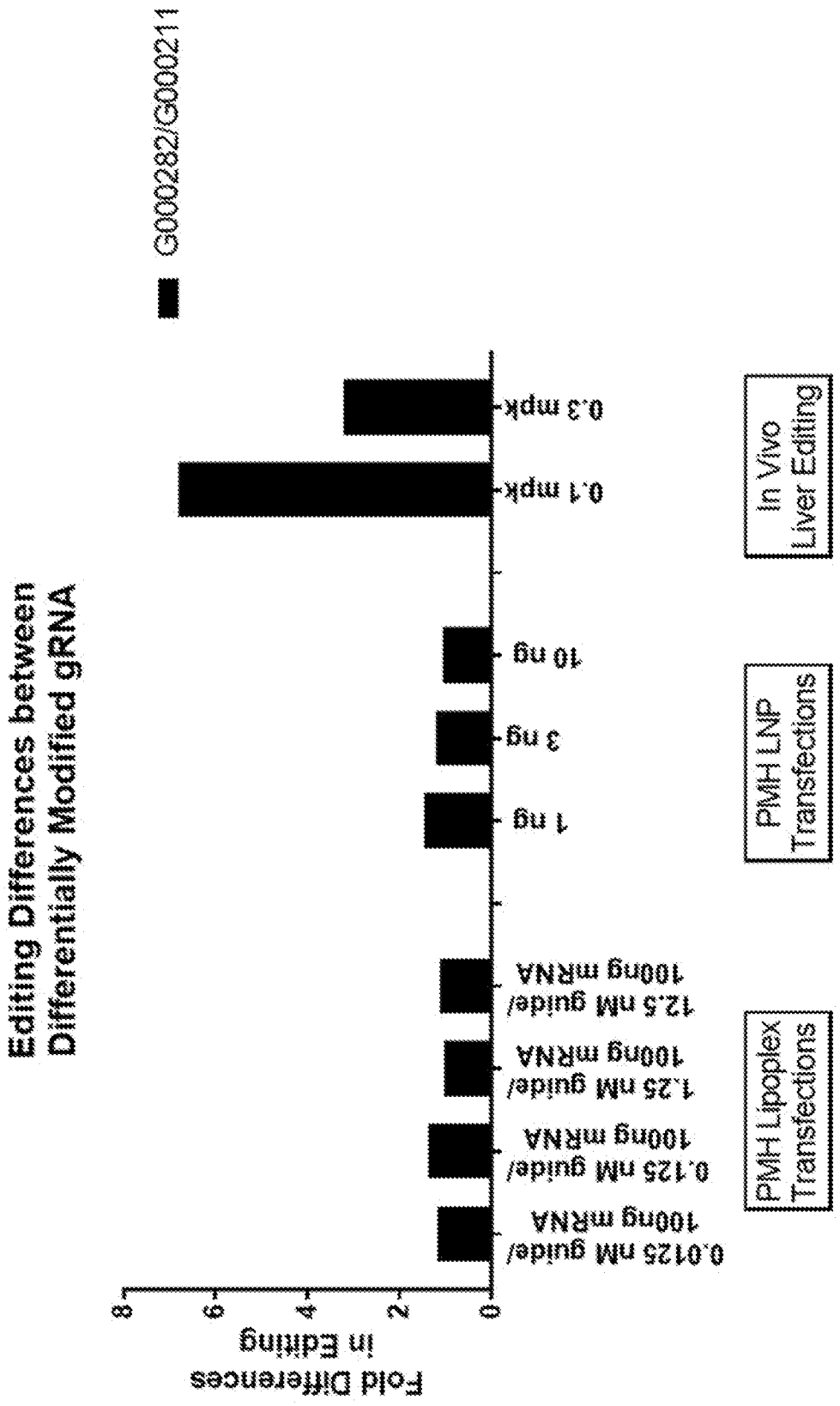

Editing Differences between Differentially Modified gRNA
G000282/G000211
Fold Differences in Editing
0
2
4
6
8
0.0125 nM guide/ 100ng mRNA
0.125 nM guide/ 100ng mRNA
1.25 nM guide/ 100ng mRNA
12.5 nM guide/ 100ng mRNA
1 ng
3 ng
10 ng
0.1 mpk
0.3 mpk
PMH Lipoplex Transfections
PMH LNP Transfections
In Vivo Liver Editing

*Fig. 16I*

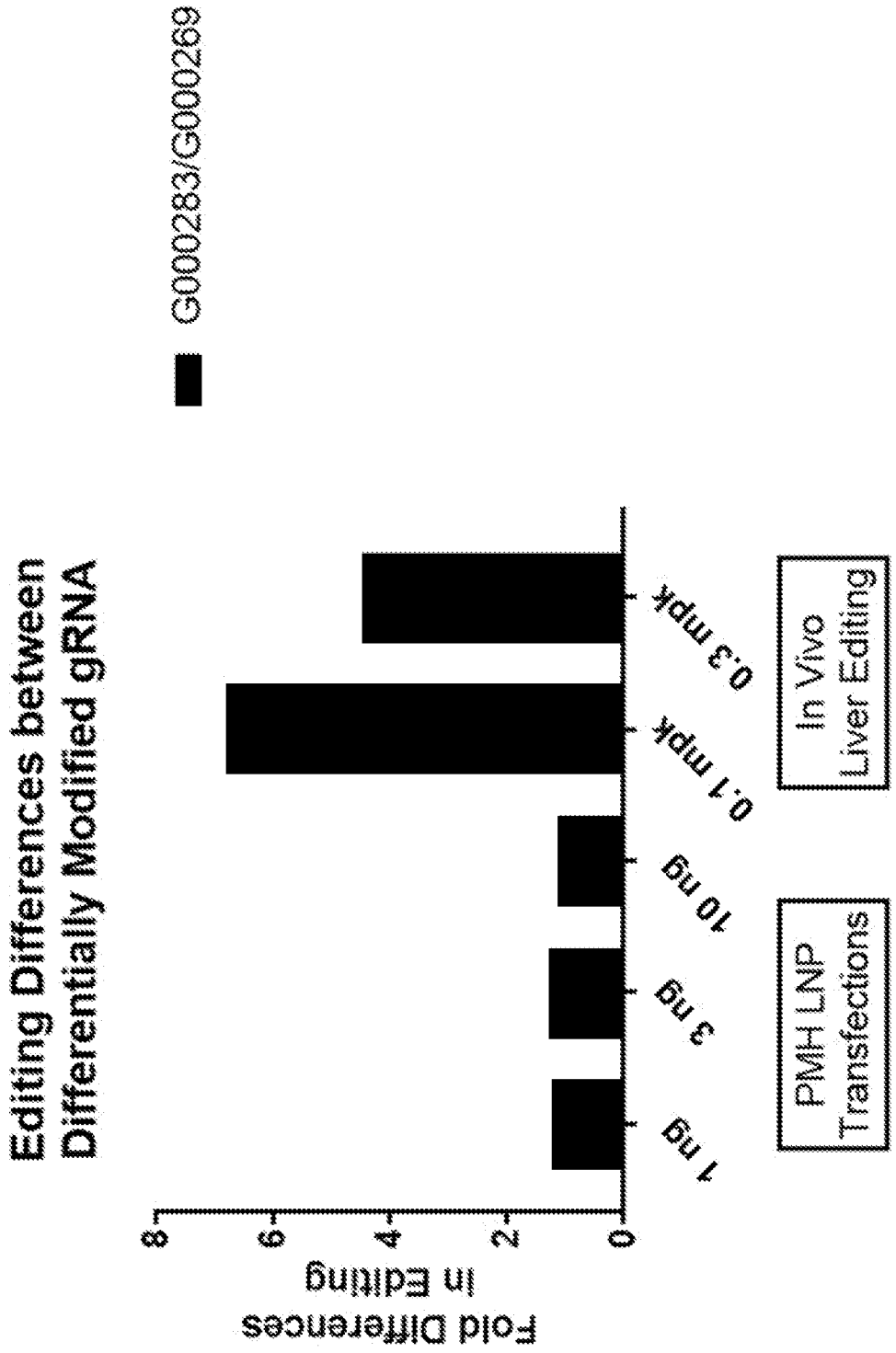

Editing Differences between Differentially Modified gRNA
G000283/G000269
Fold Differences in Editing
0
2
4
6
8
1 ng
3 ng
10 ng
0.1 mpk
0.3 mpk
PMH LNP Transfections
In Vivo Liver Editing

Fig. 16J

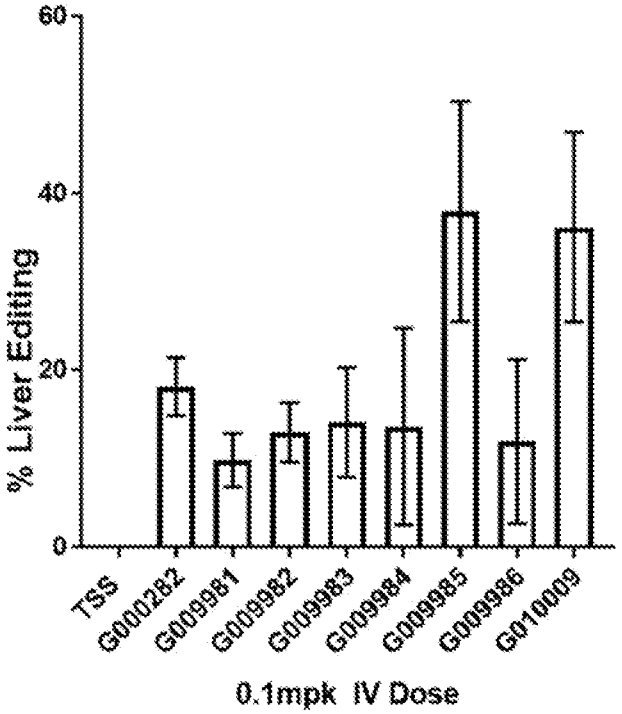



*Fig. 17A*

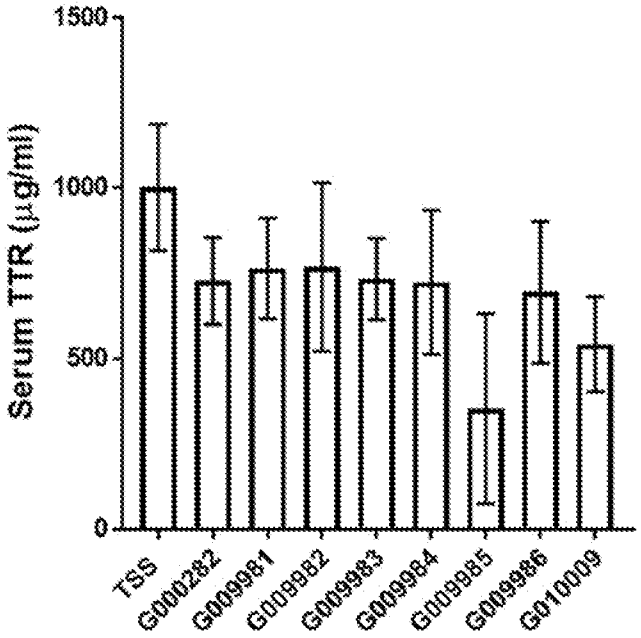



*Fig. 17B*

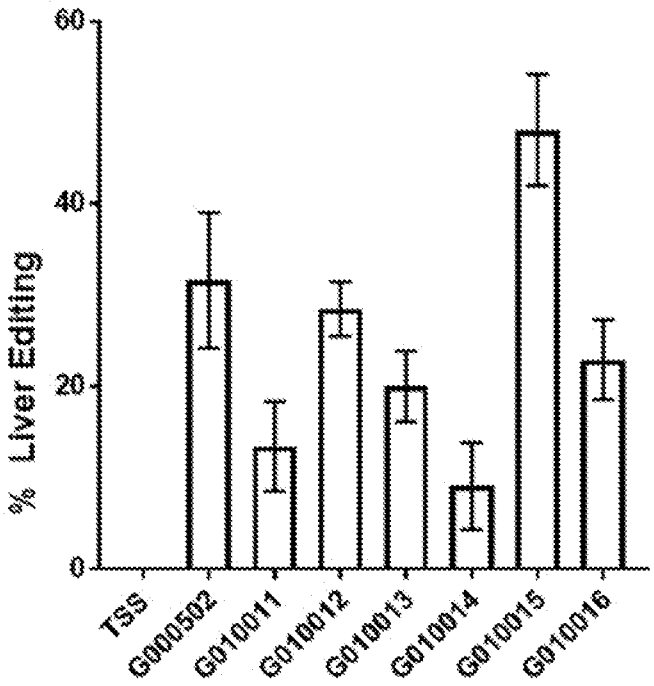



*Fig. 18A*

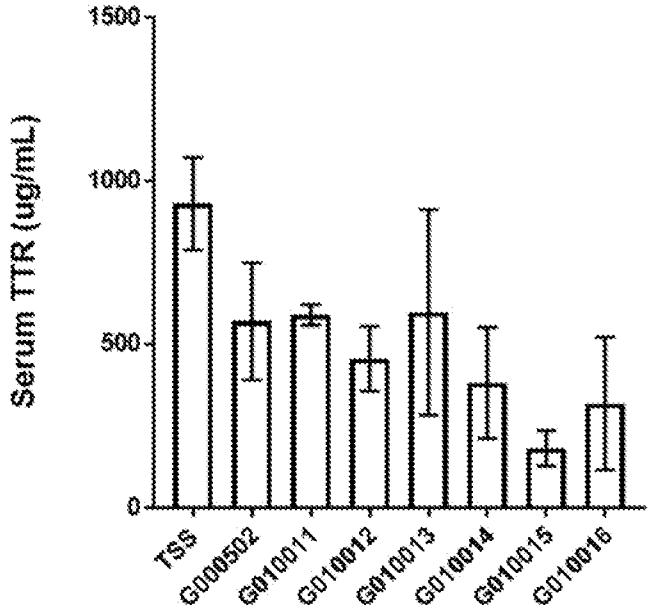



*Fig. 18B*

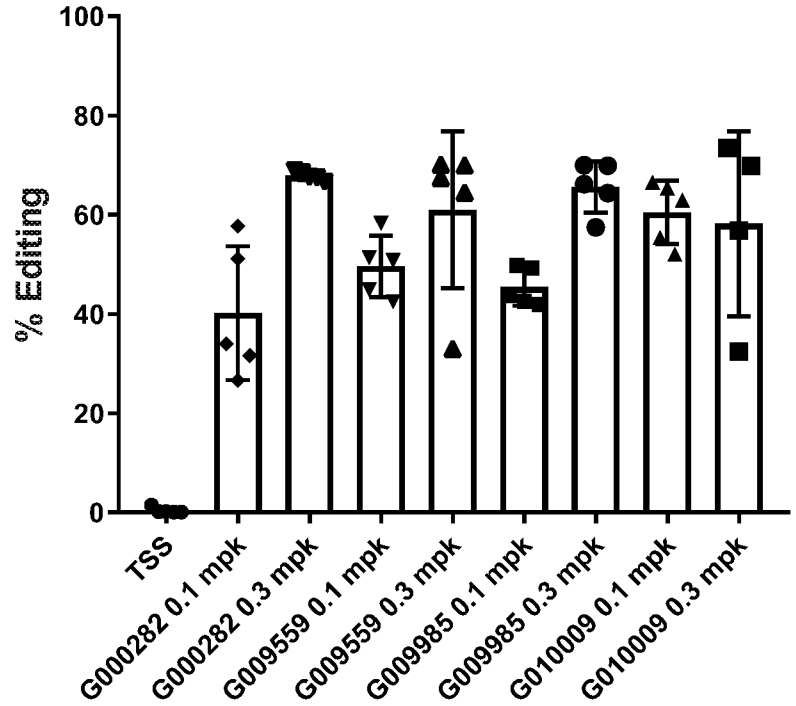



*Fig. 18C*

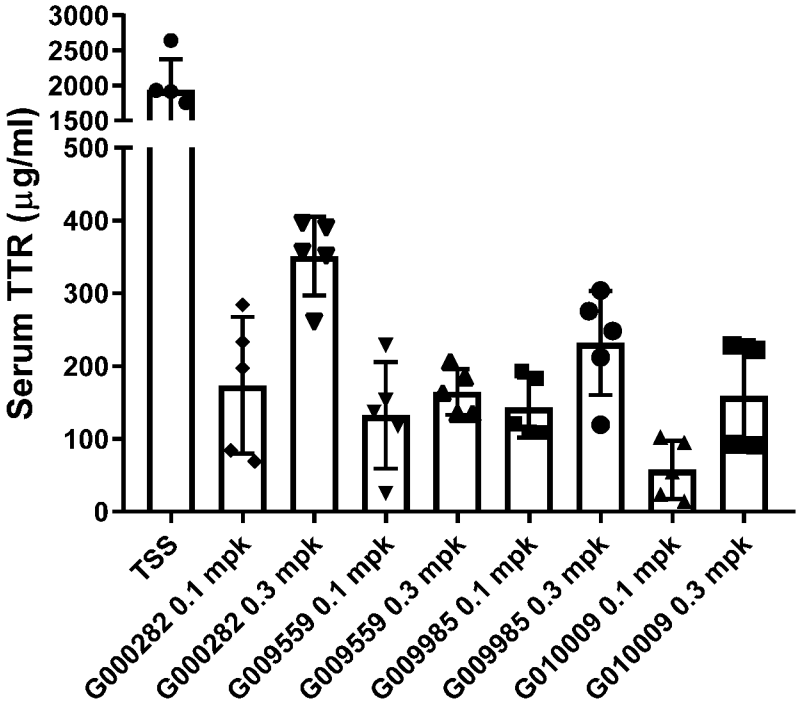



*Fig. 18D*

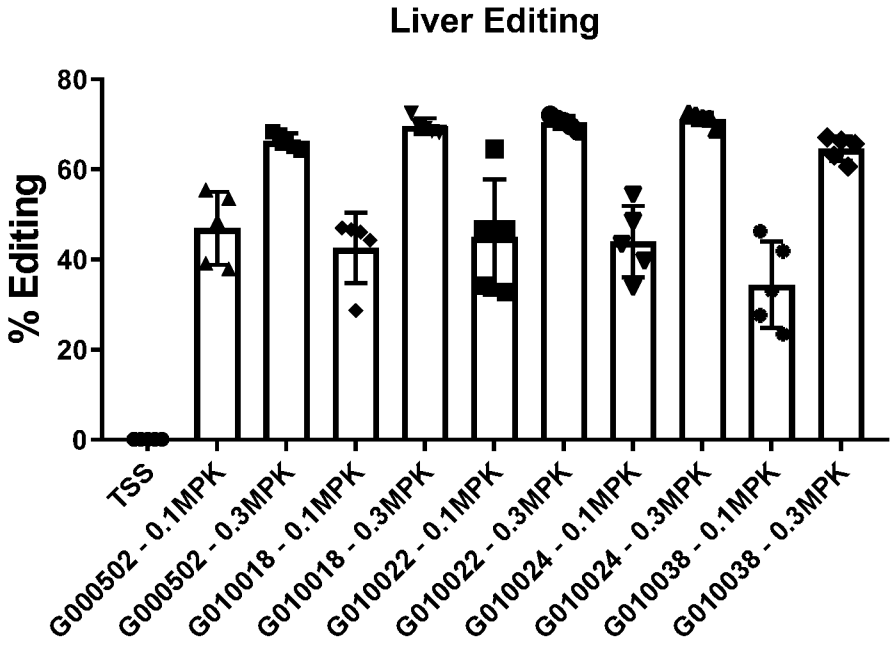



*Fig. 18E*

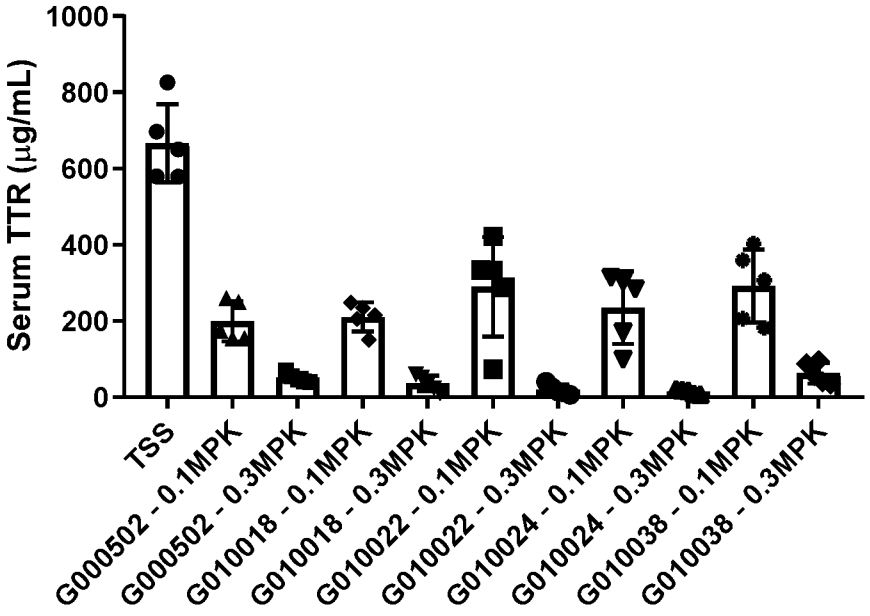



*Fig. 18F*

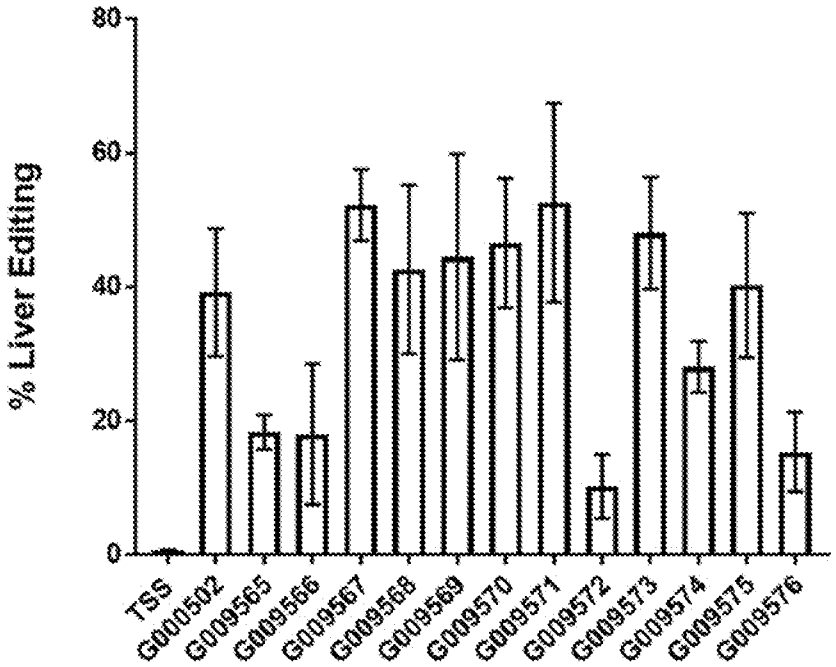



*Fig. 19A*

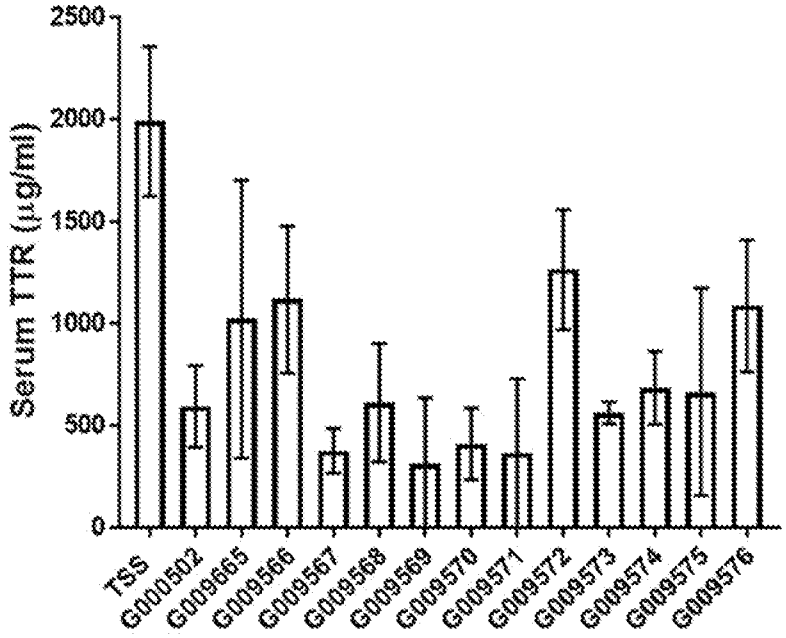



*Fig. 19B*

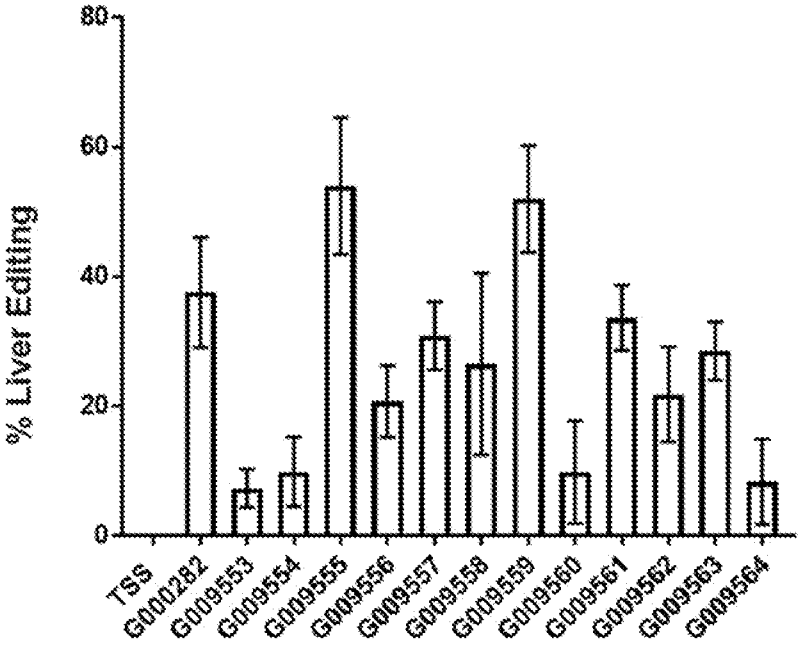



*Fig. 19C*

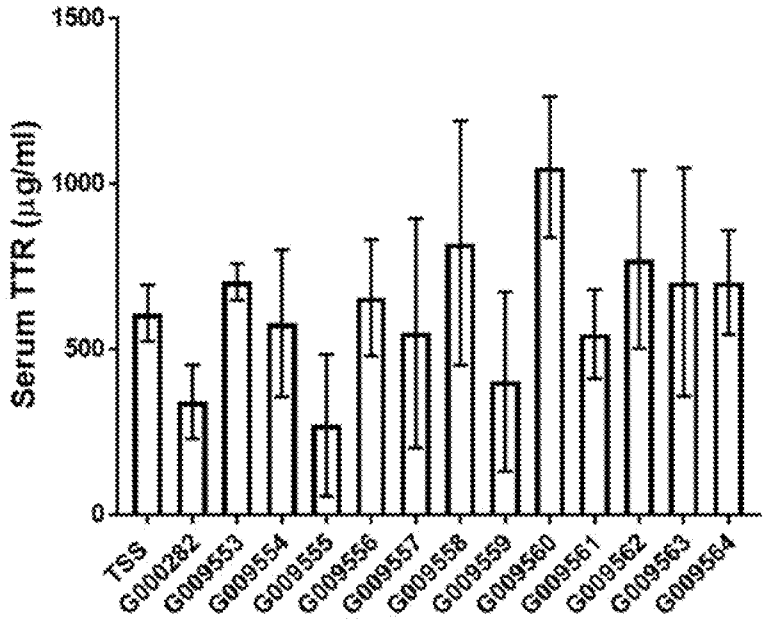



*Fig. 19D*

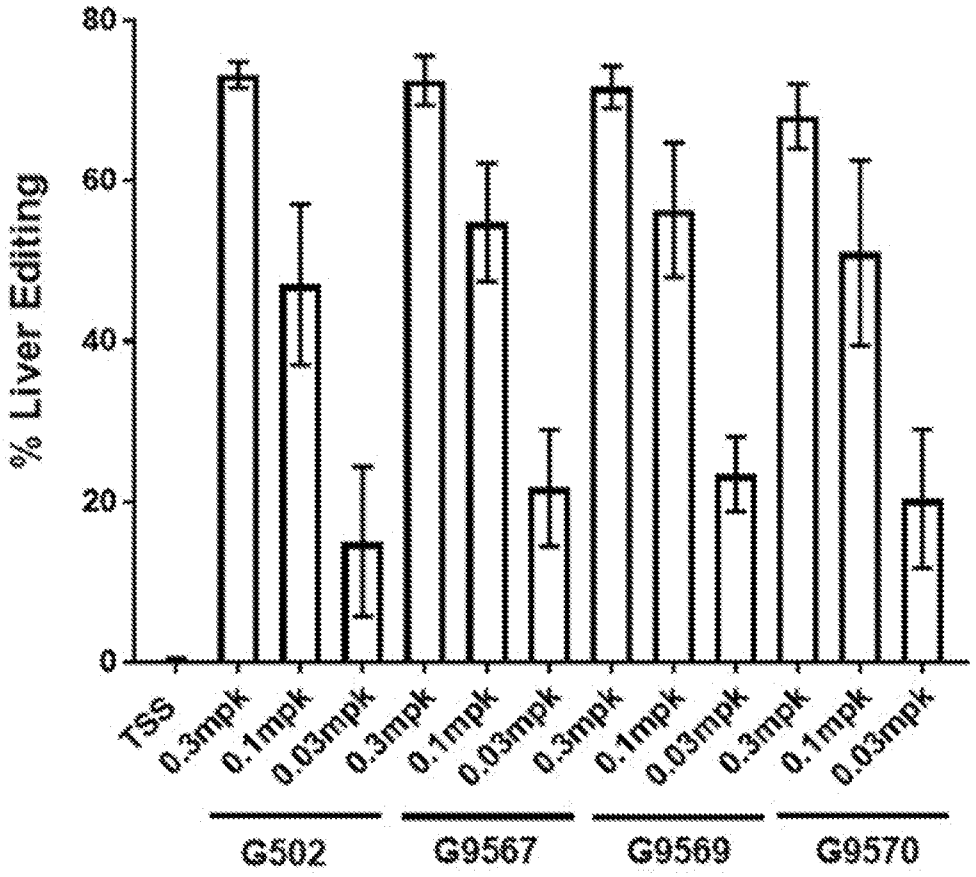

% Liver Editing
80
60
40
20
0
TSS
0.3mpk
0.1mpk
0.03mpk
0.3mpk
0.1mpk
0.03mpk
0.3mpk
0.1mpk
0.03mpk
0.3mpk
0.1mpk
0.03mpk
G502
G9567
G9569
G9570

*Fig. 20A*

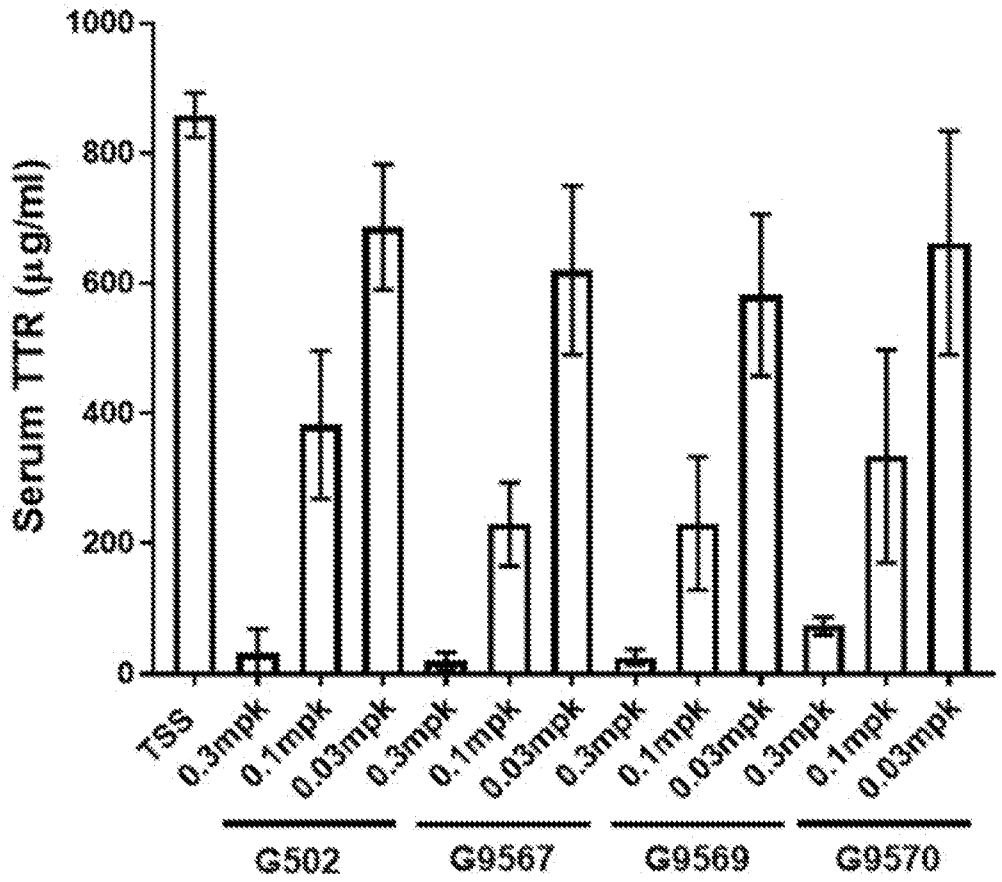

Serum TTR (µg/ml)
1000
800
600
400
200
0
TSS
0.3mpk
0.1mpk
0.03mpk
0.3mpk
0.1mpk
0.03mpk
0.3mpk
0.1mpk
0.03mpk
0.3mpk
0.1mpk
0.03mpk
G502
G9567
G9569
G9570

*Fig. 20B*

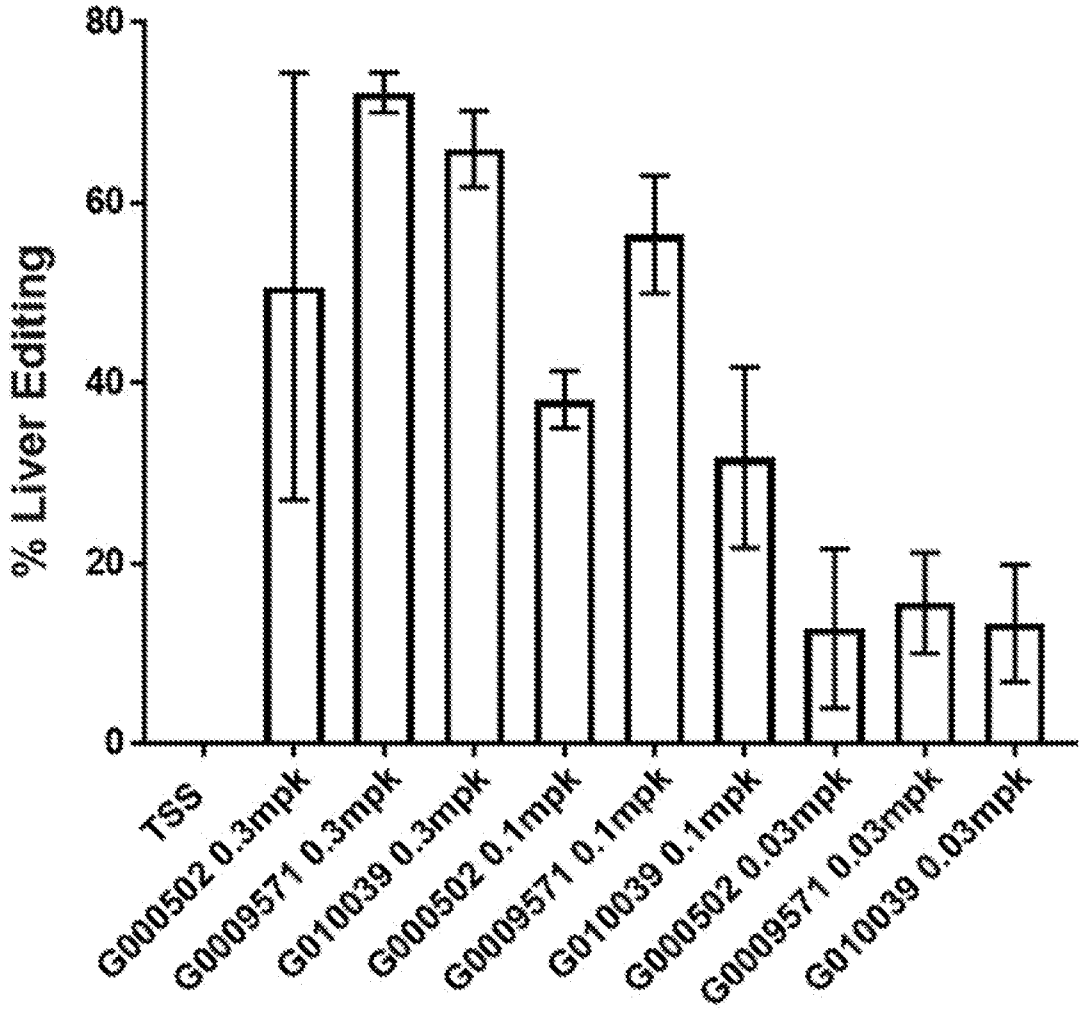

% Liver Editing
80
60
40
20
0
TSS
G000502 0.3mpk
G0009571 0.3mpk
G010039 0.3mpk
G000502 0.1mpk
G0009571 0.1mpk
G010039 0.1mpk
G000502 0.03mpk
G0009571 0.03mpk
G010039 0.03mpk

*Fig. 20C*

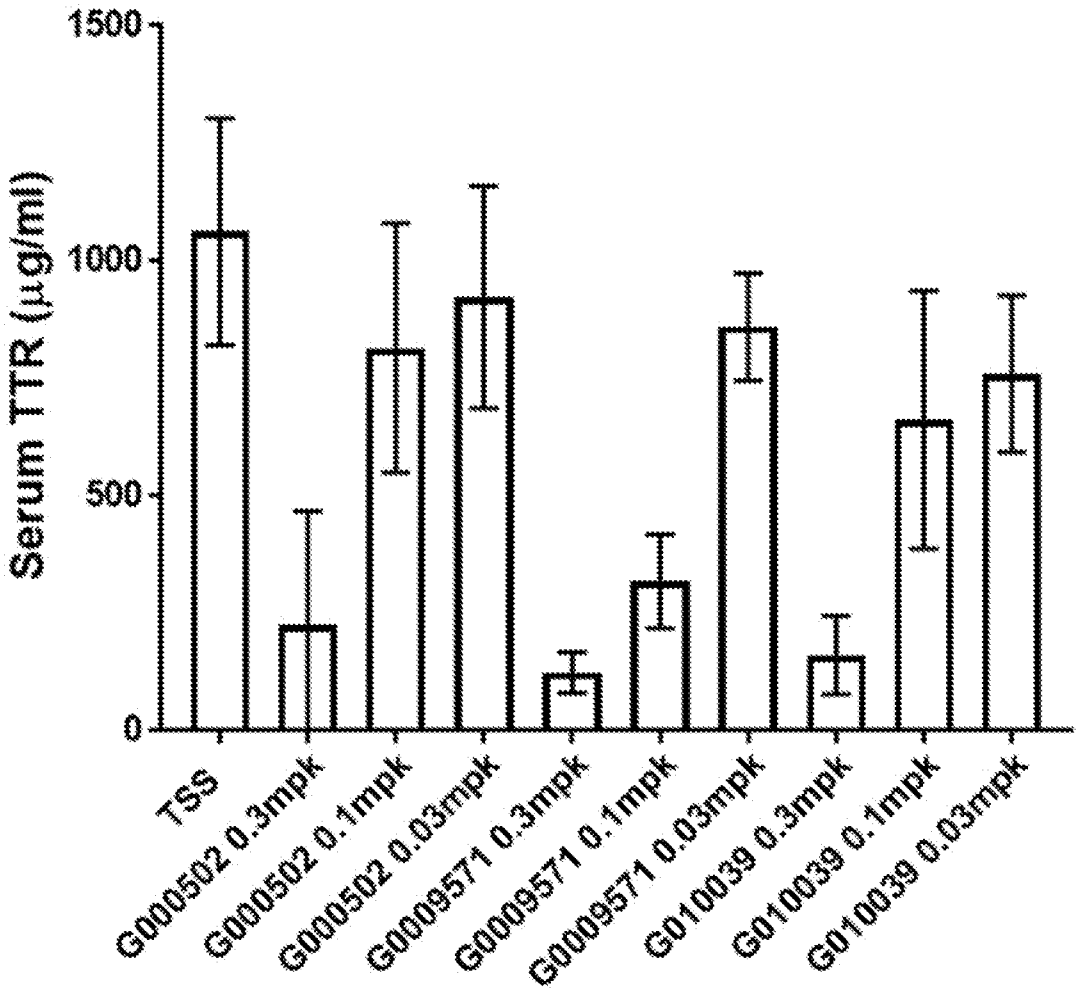

Serum TTR (µg/ml)
1500
1000
500
0
TSS
G000502 0.3mpk
G000502 0.1mpk
G000502 0.03mpk
G0009571 0.3mpk
G0009571 0.1mpk
G0009571 0.03mpk
G010039 0.3mpk
G010039 0.1mpk
G010039 0.03mpk

*Fig. 20D*

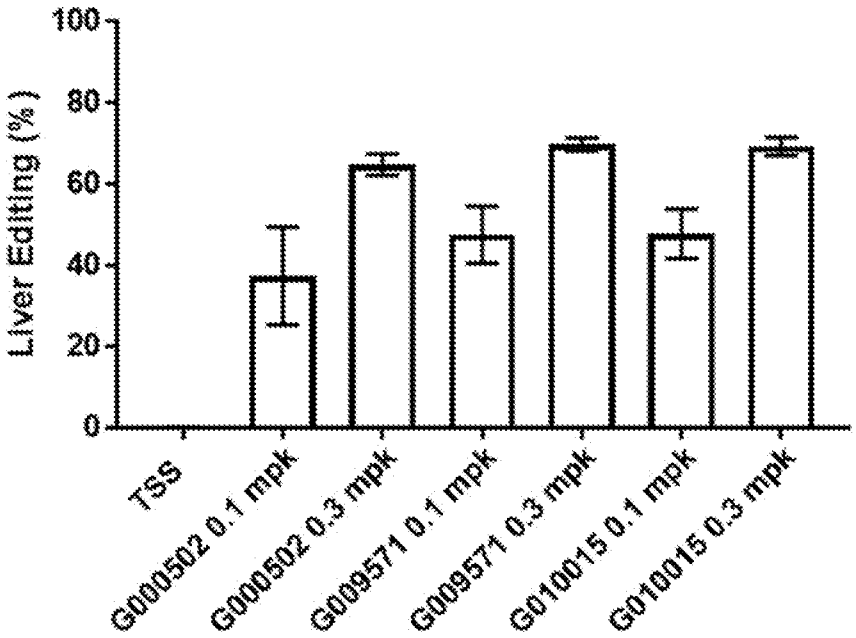



*Fig. 20E*

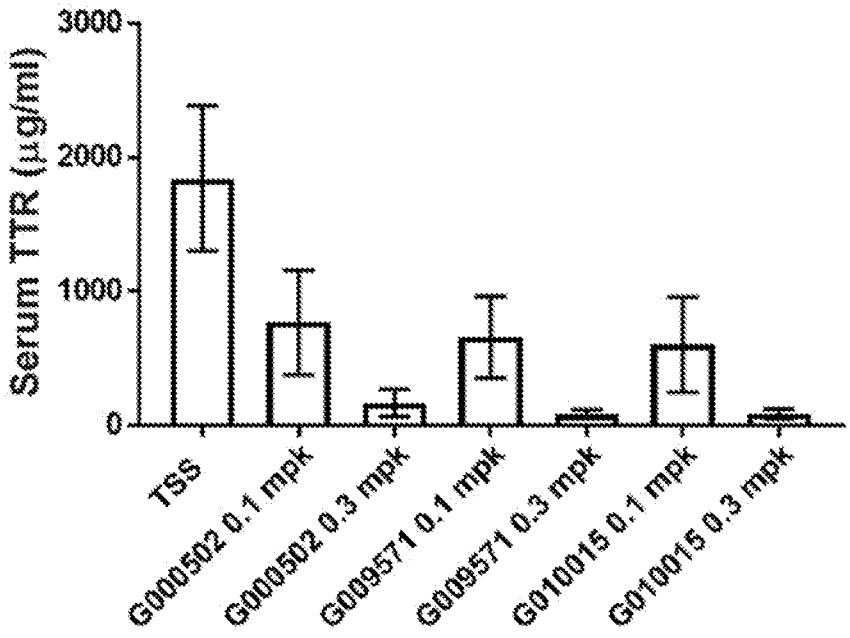



*Fig. 20F*

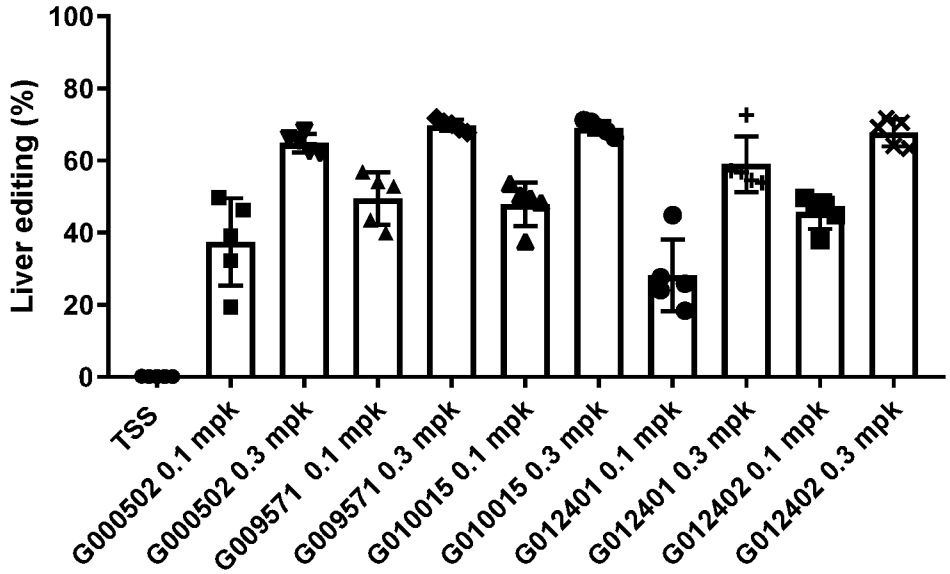



*Fig. 21A*

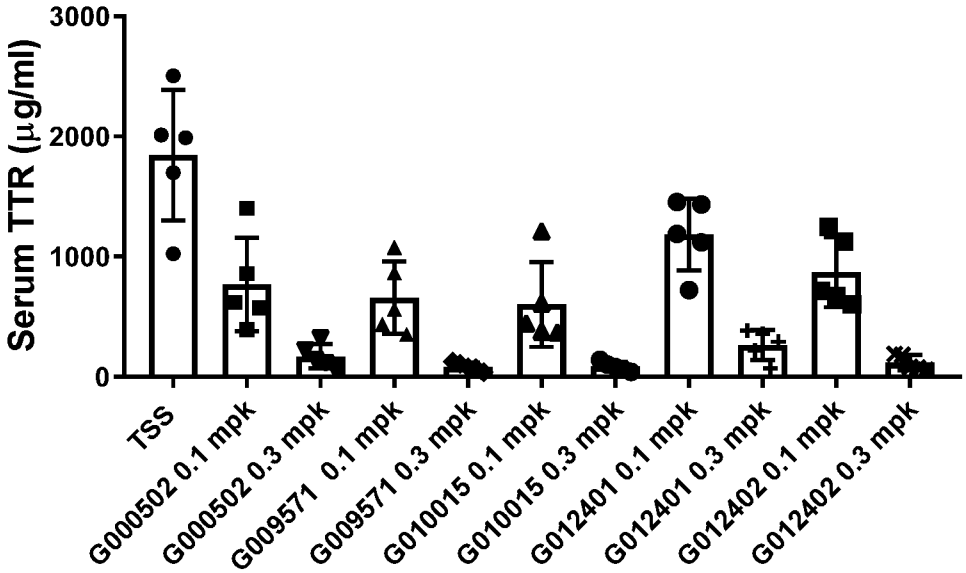



*Fig. 21B*

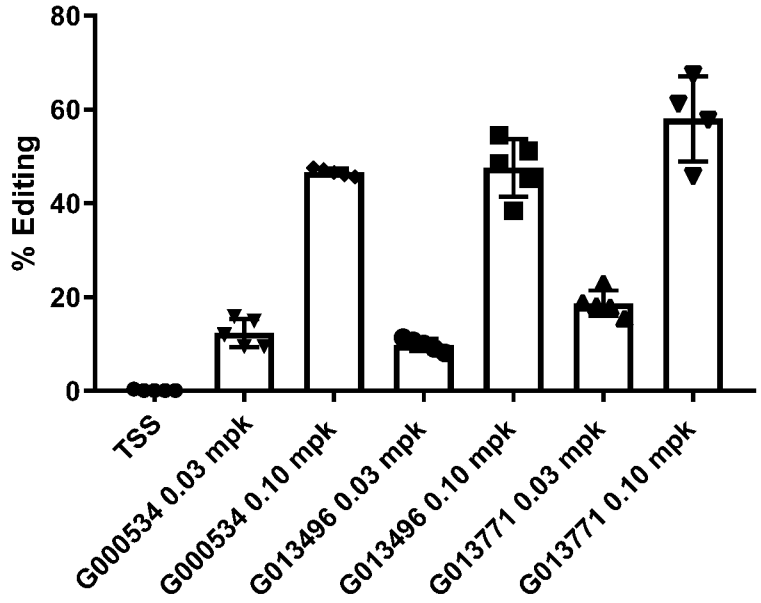



*Fig. 22A*

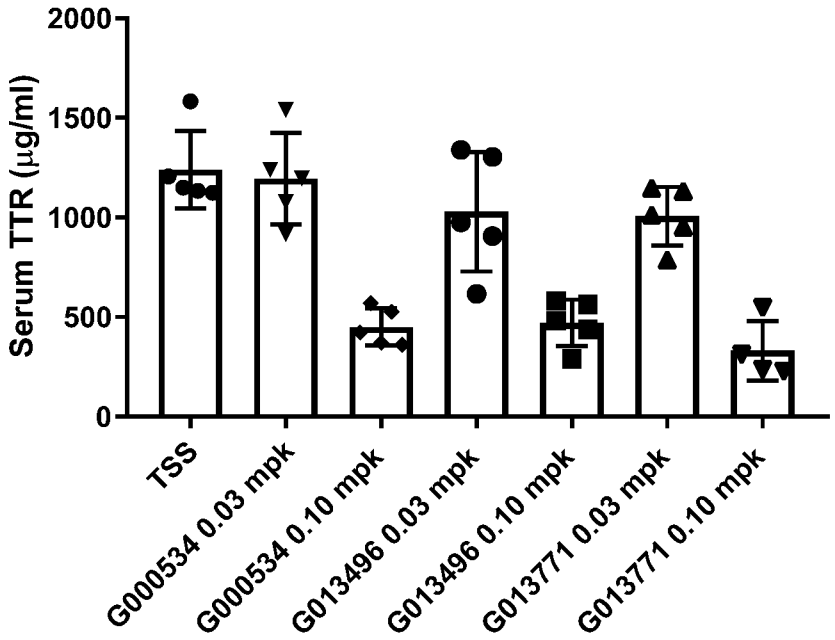



*Fig. 22B*

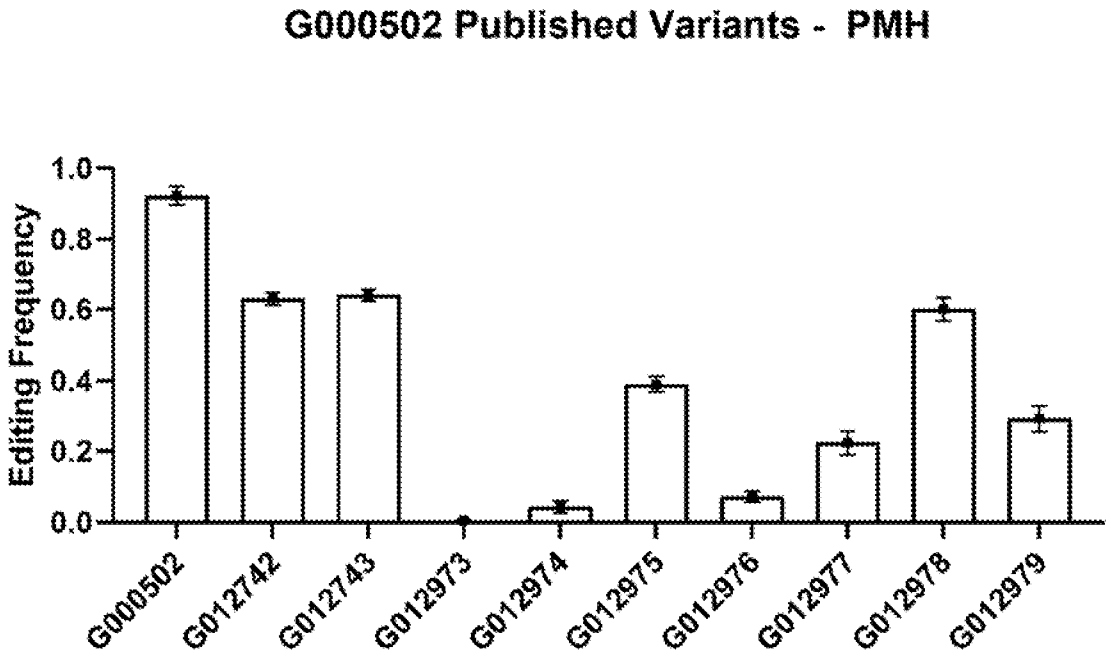



*Fig. 23A*

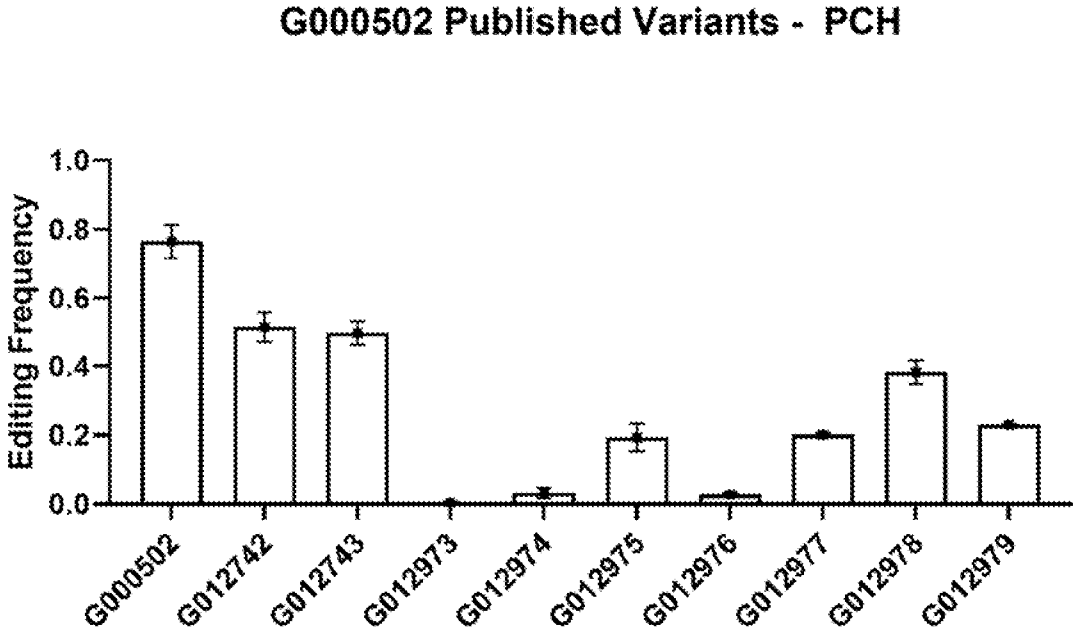



*Fig. 23B*

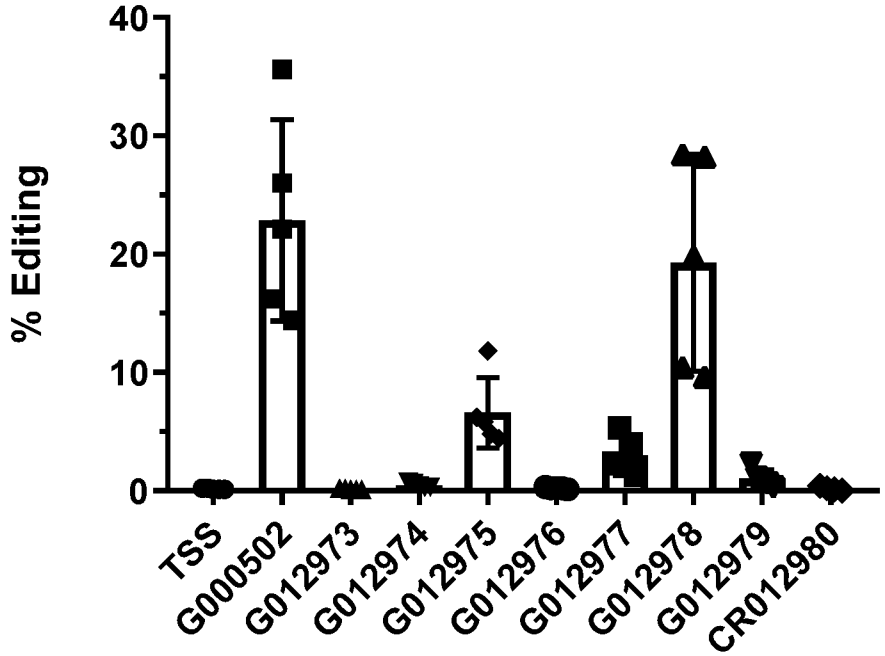



*Fig. 24A*

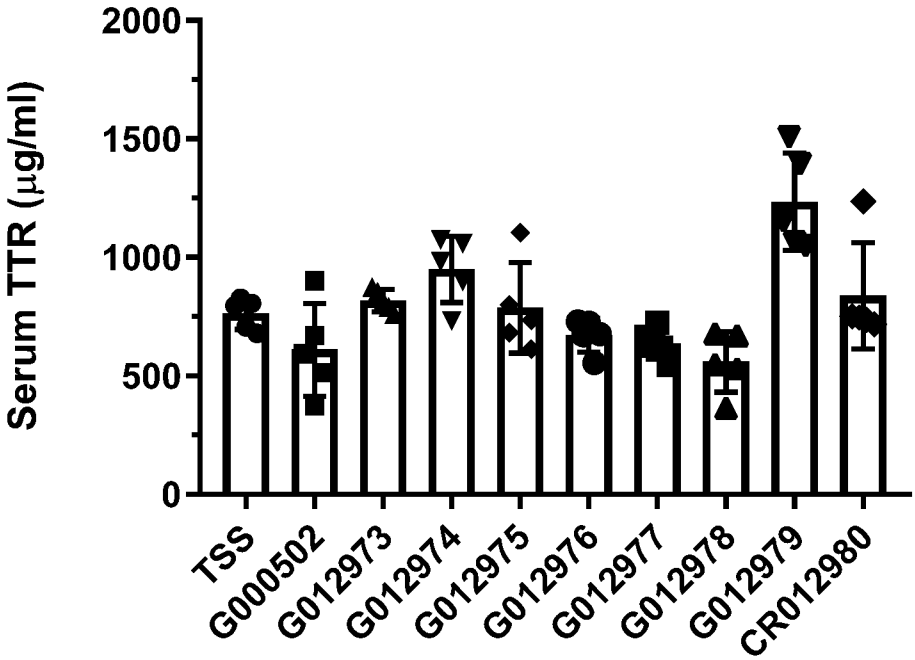



*Fig. 24B*

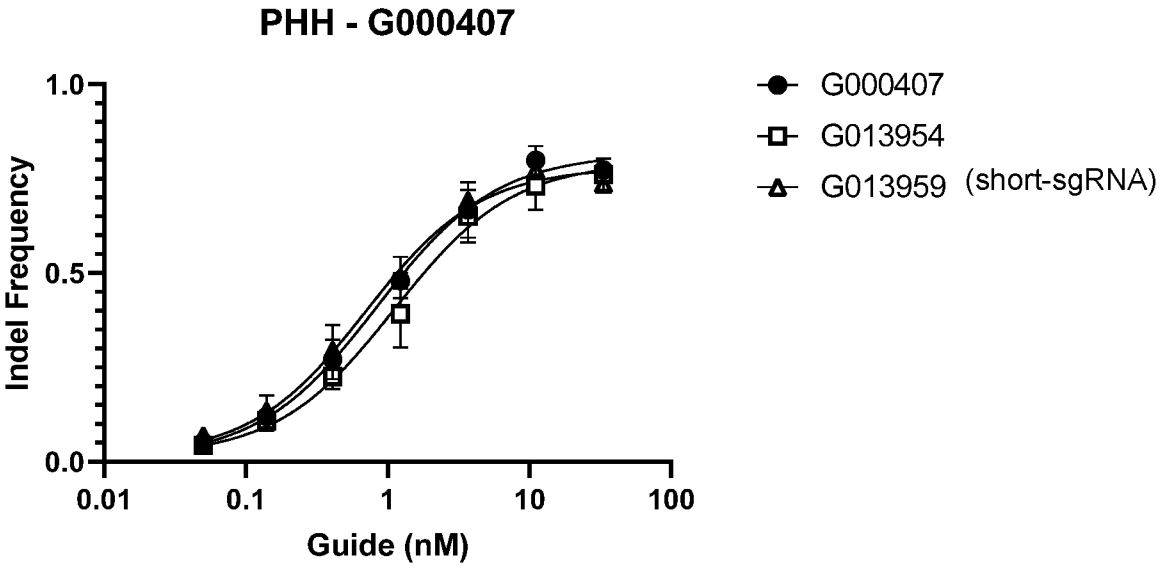



*Fig. 25A*

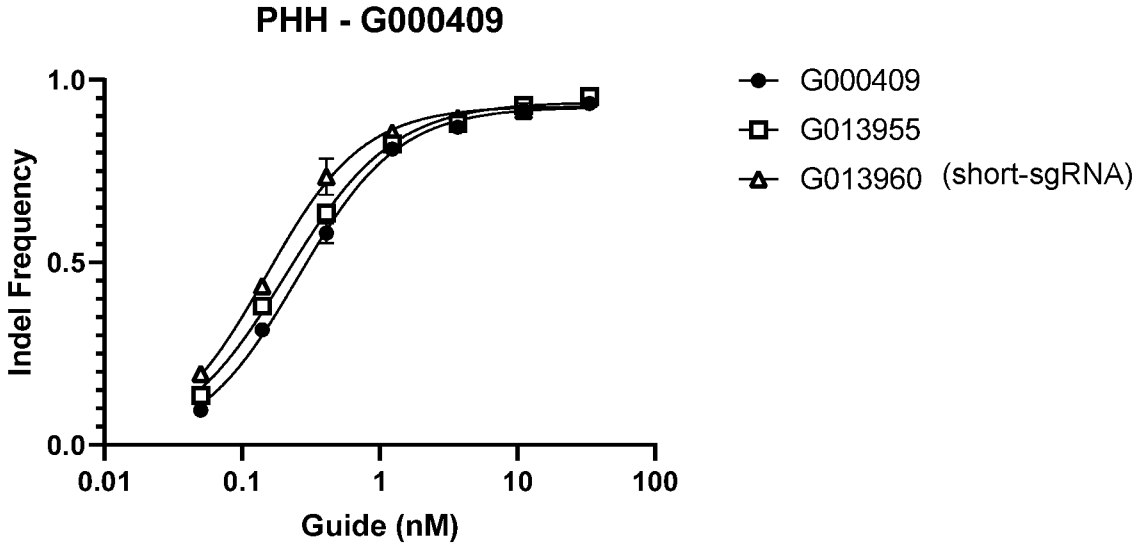



*Fig. 25B*

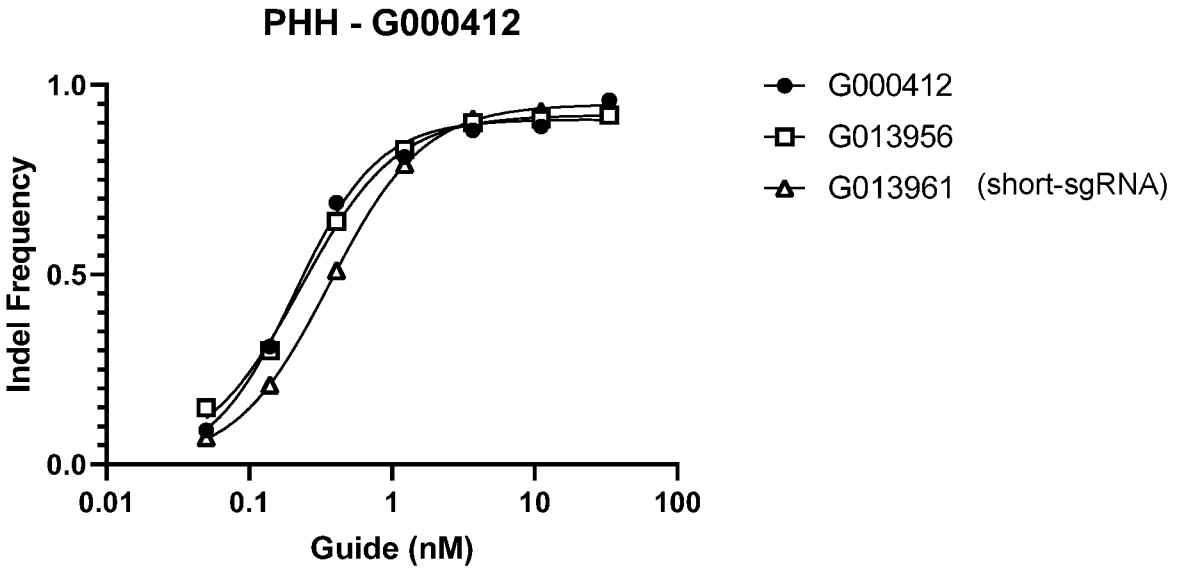



*Fig. 25C*

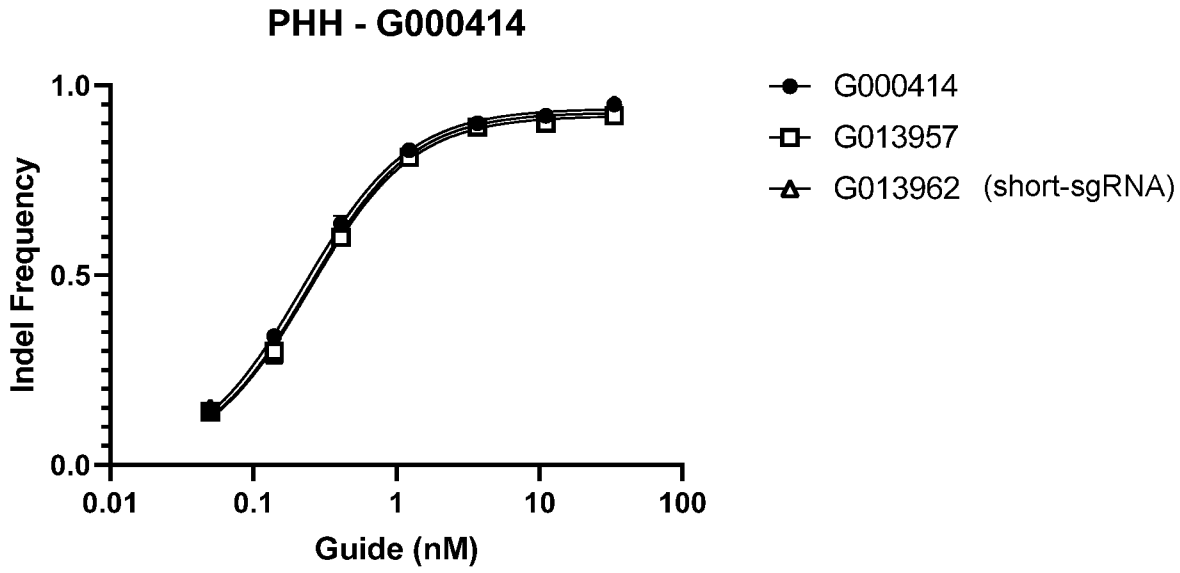



*Fig. 25D*

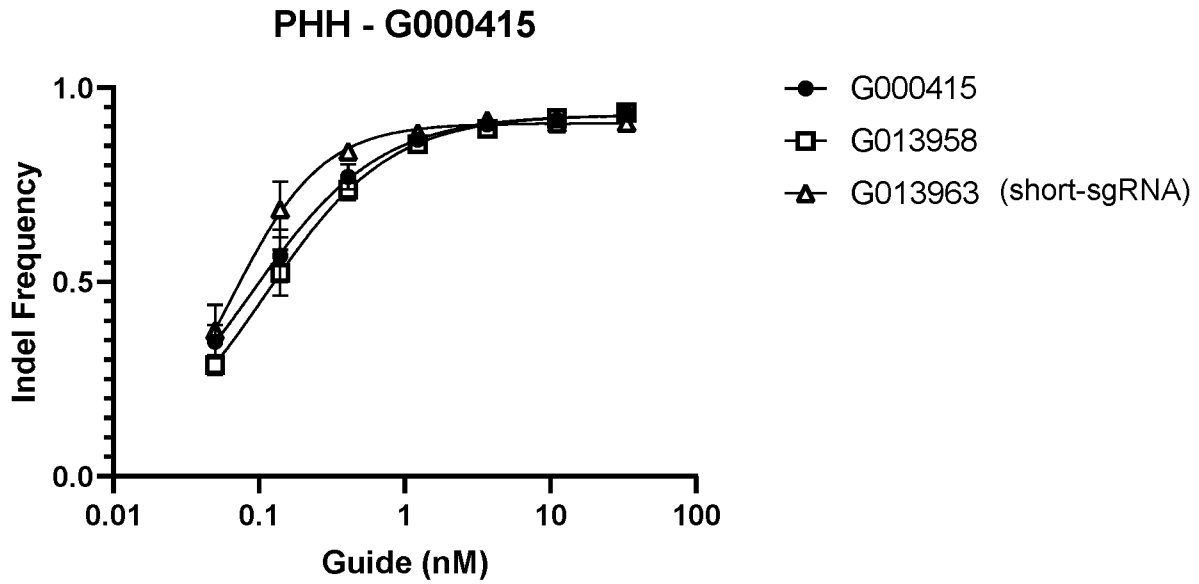



*Fig. 25E*

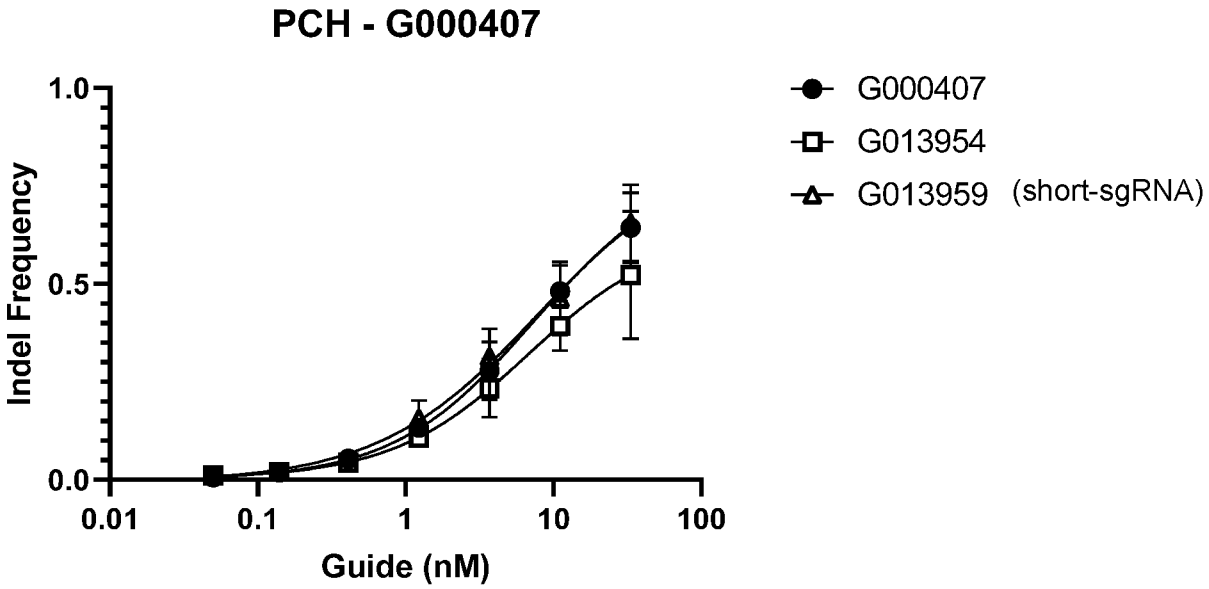



*Fig. 26A*

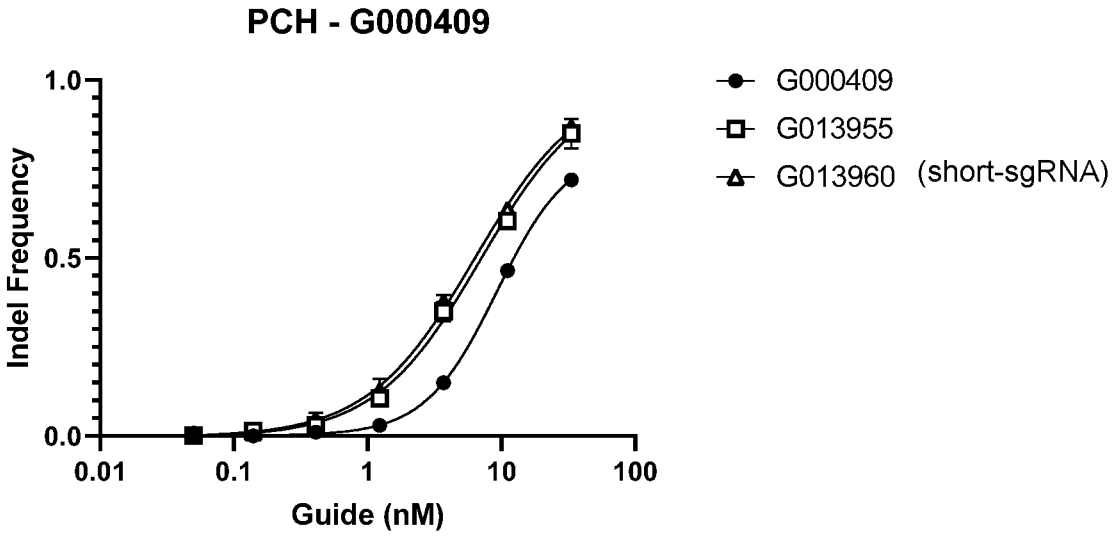



*Fig. 26B*

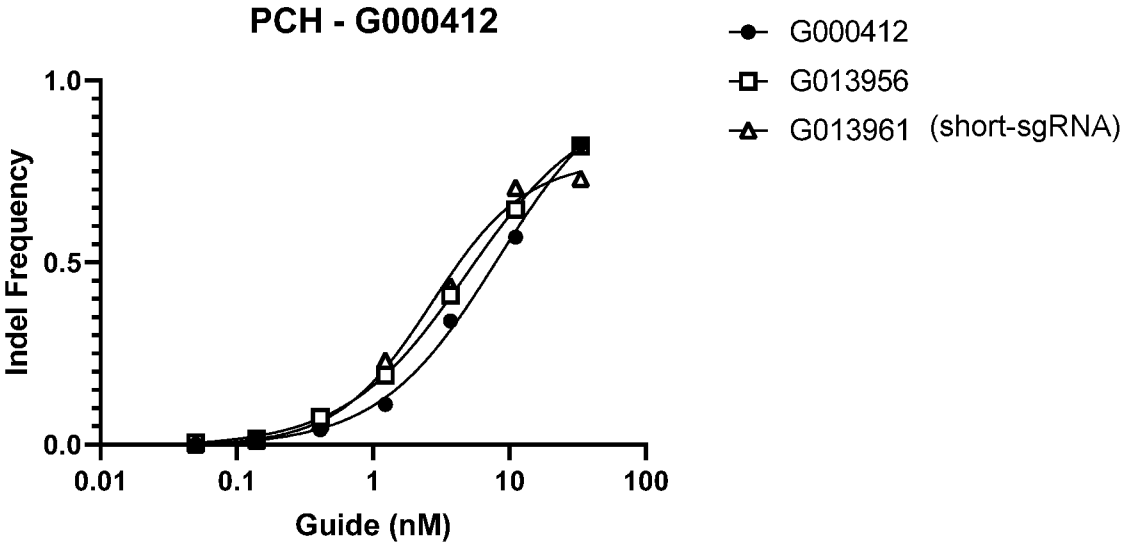



*Fig. 26C*

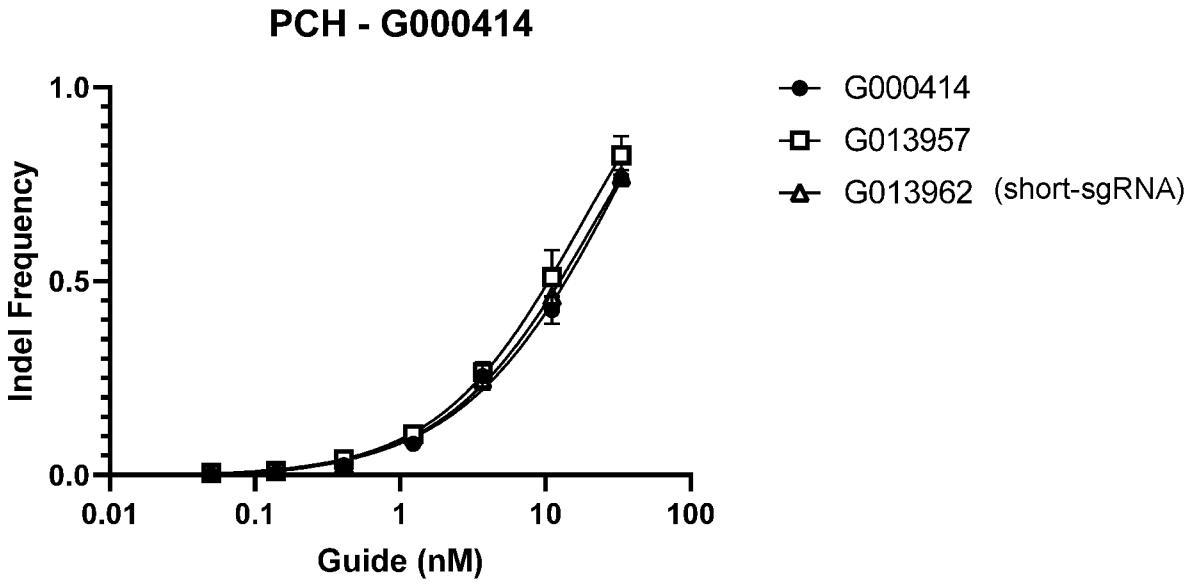



*Fig. 26D*

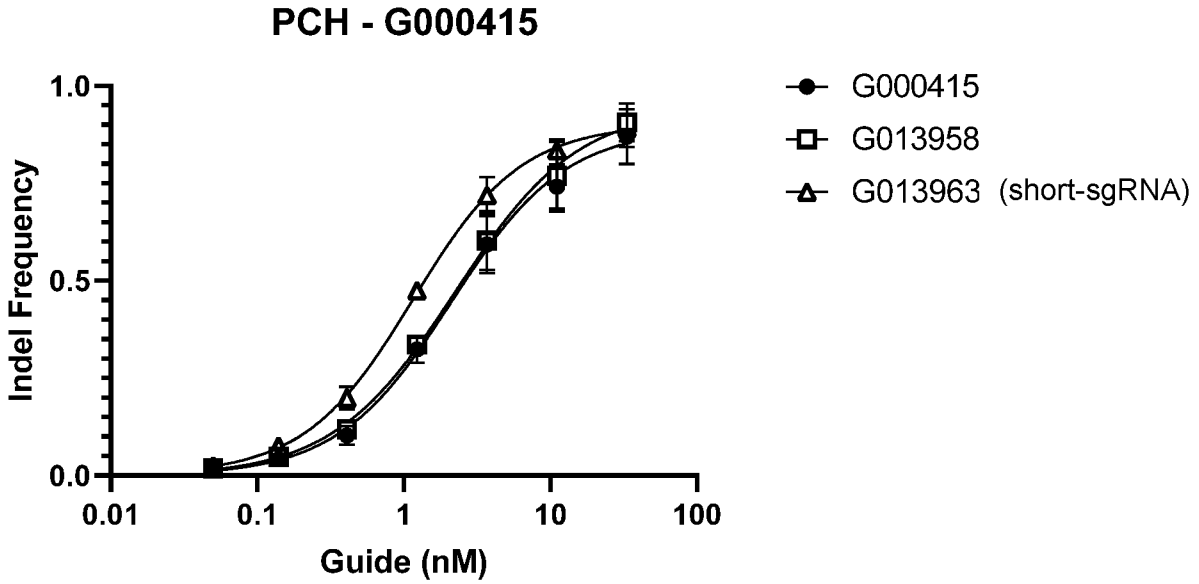



*Fig. 26E*

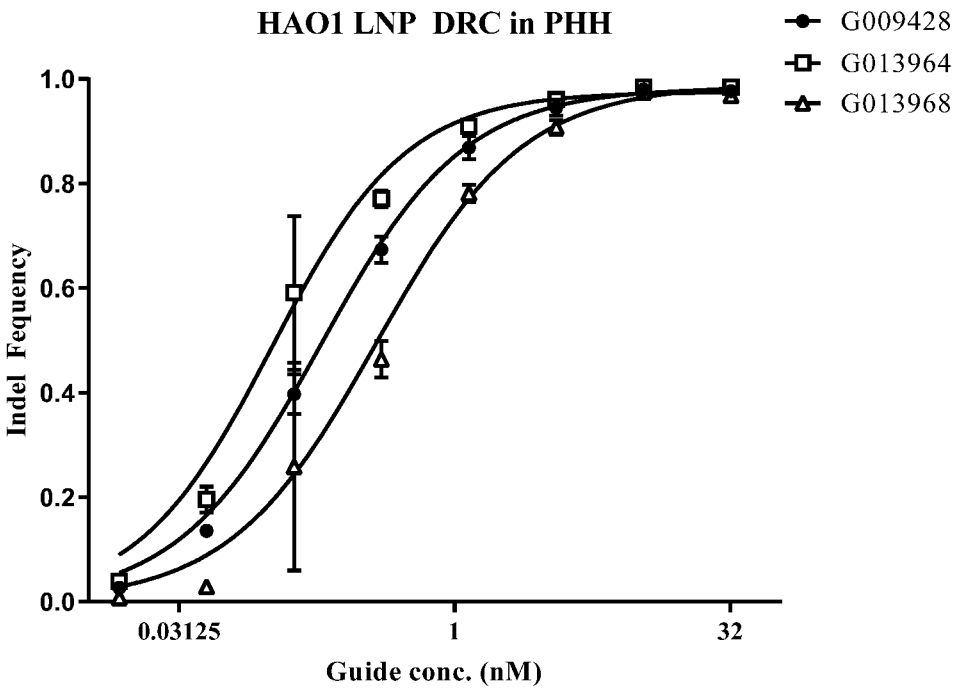



*Fig. 27A*

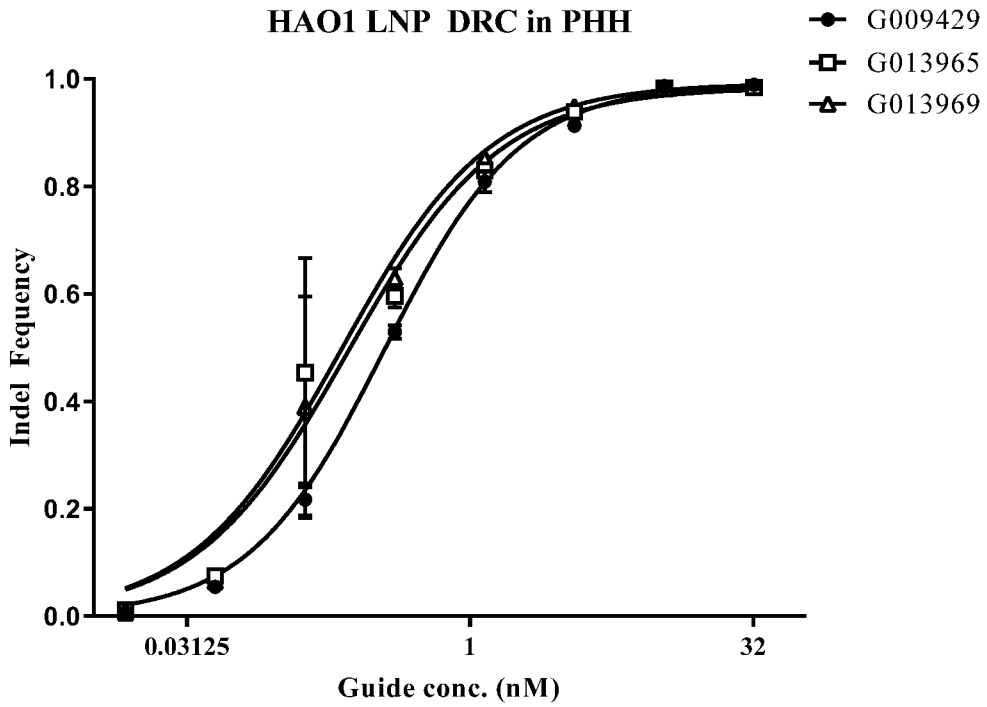



*Fig. 27B*

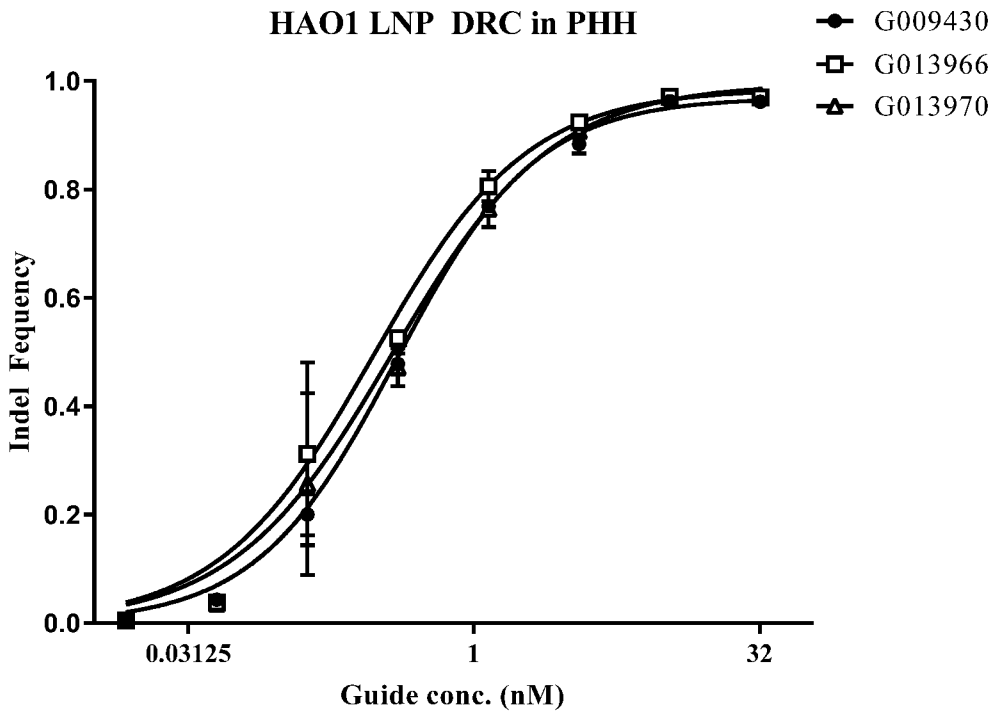



*Fig. 27C*

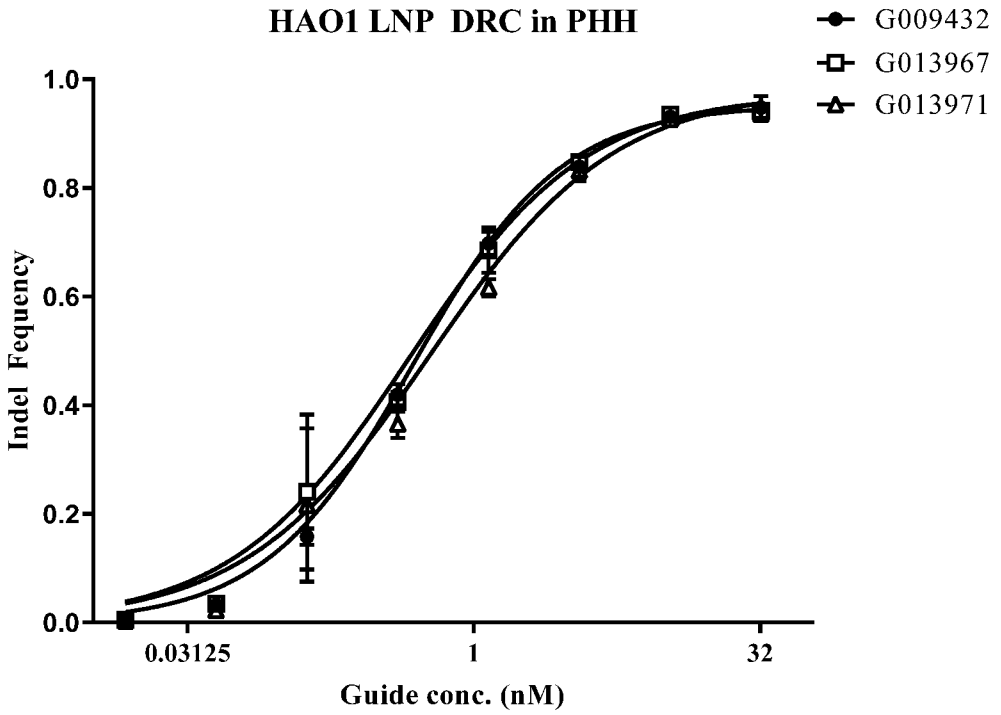



*Fig. 27D*

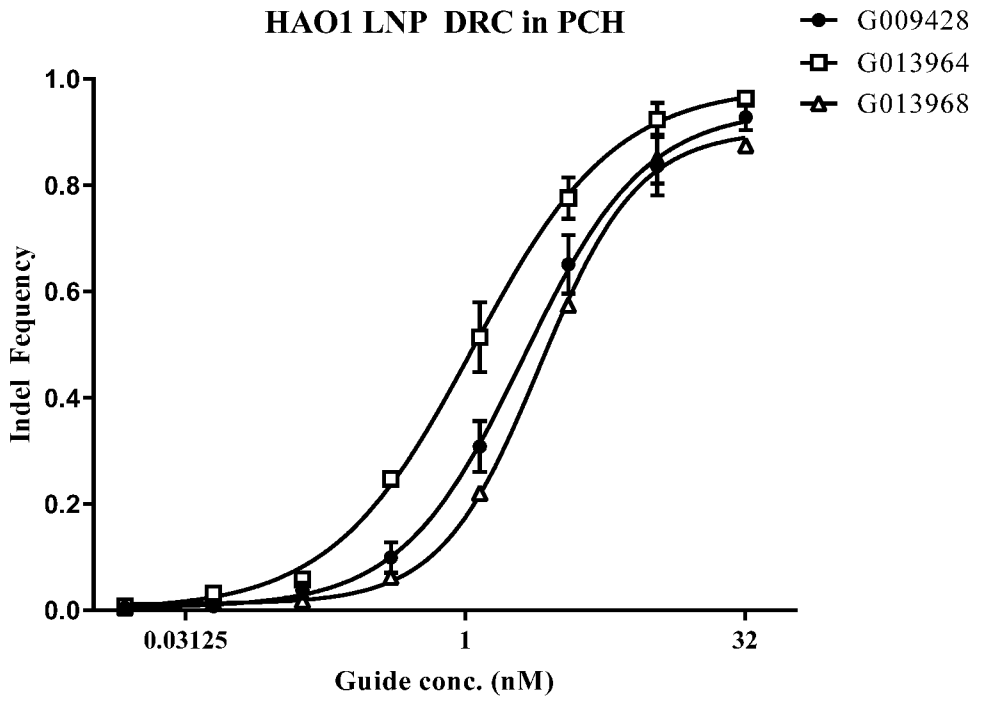



*Fig. 28A*

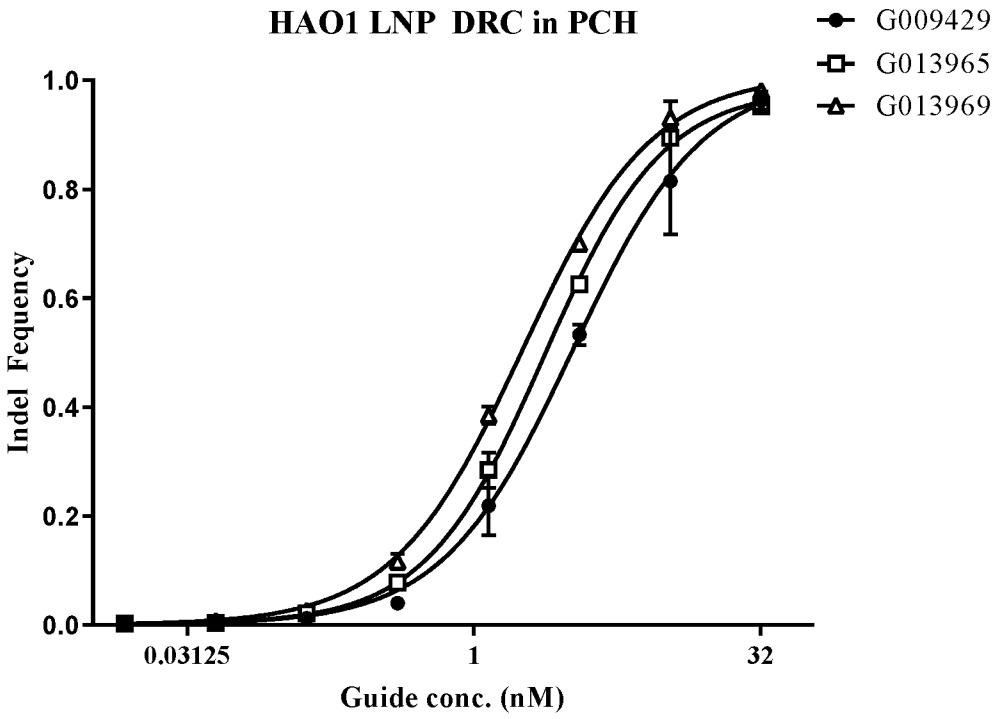



*Fig. 28B*

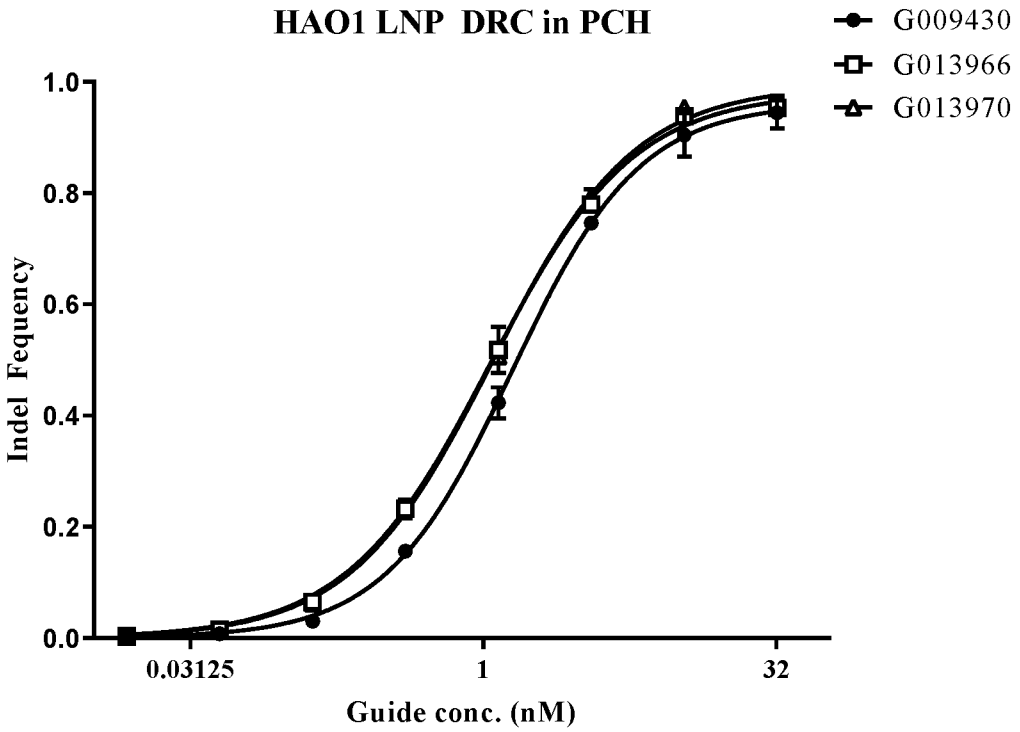



*Fig. 28C*

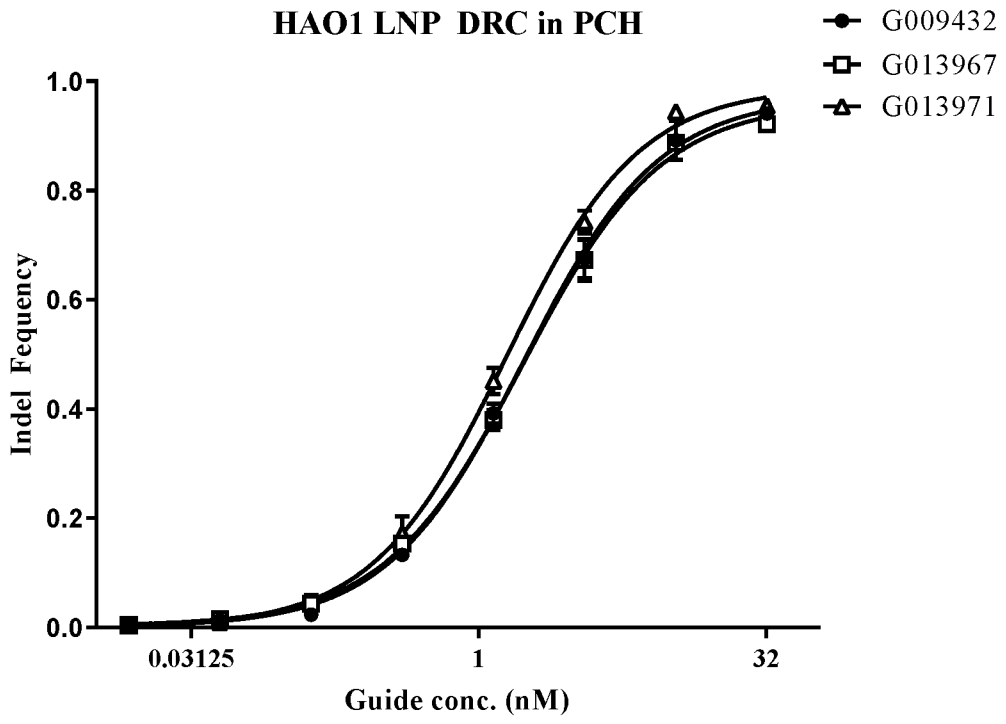



*Fig. 28D*

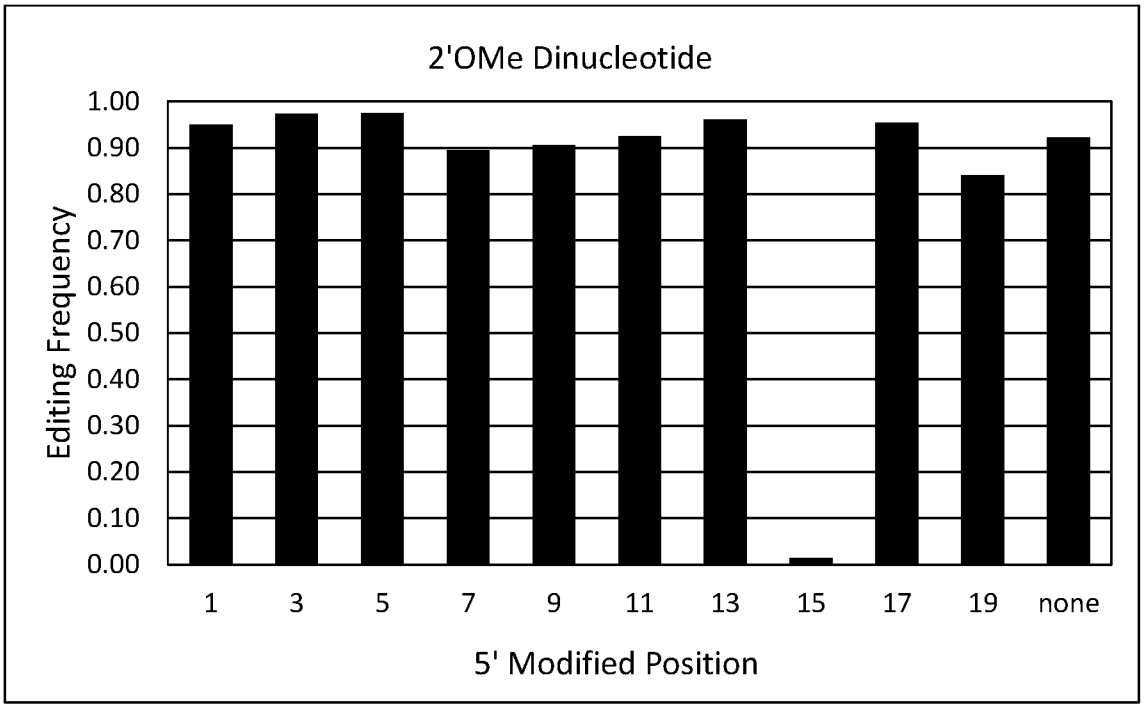



*Fig. 29A*

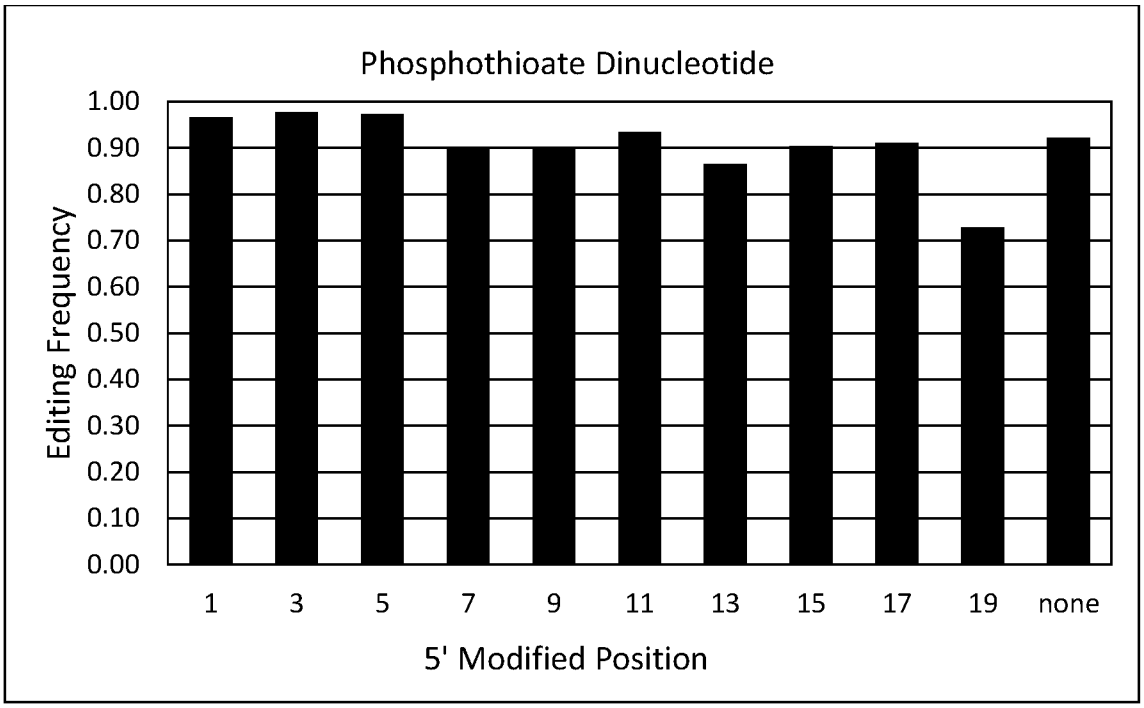



*Fig. 29B*

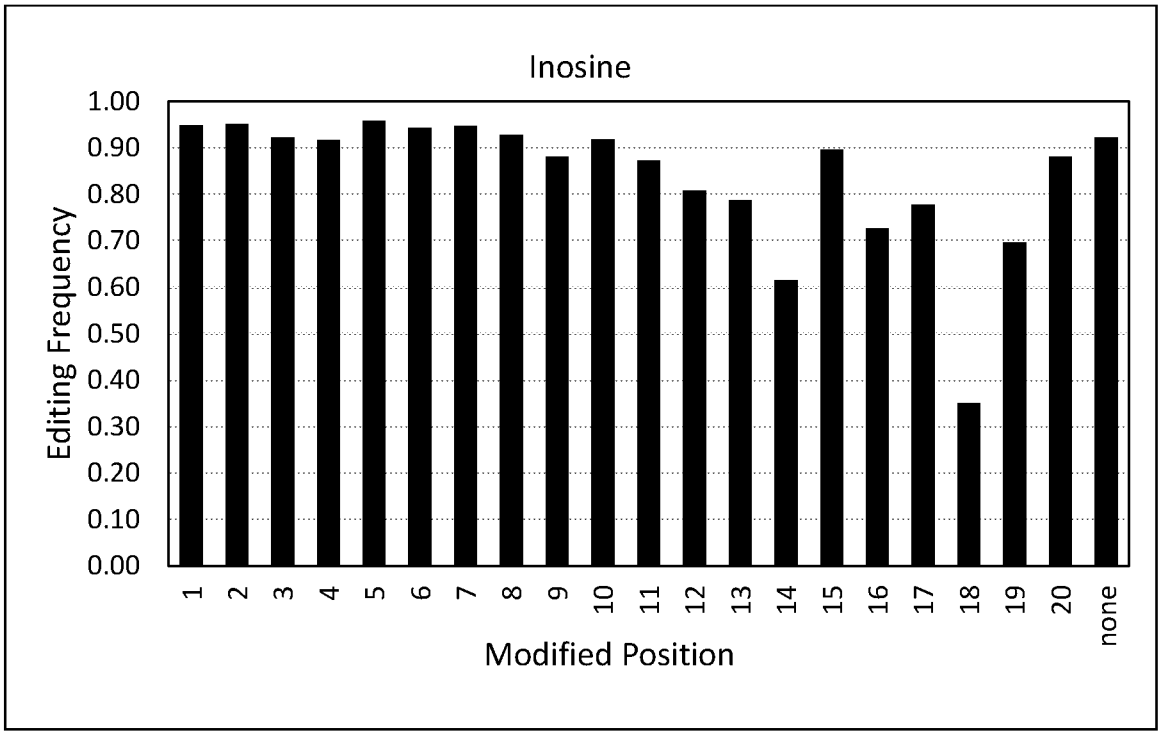



*Fig. 29C*

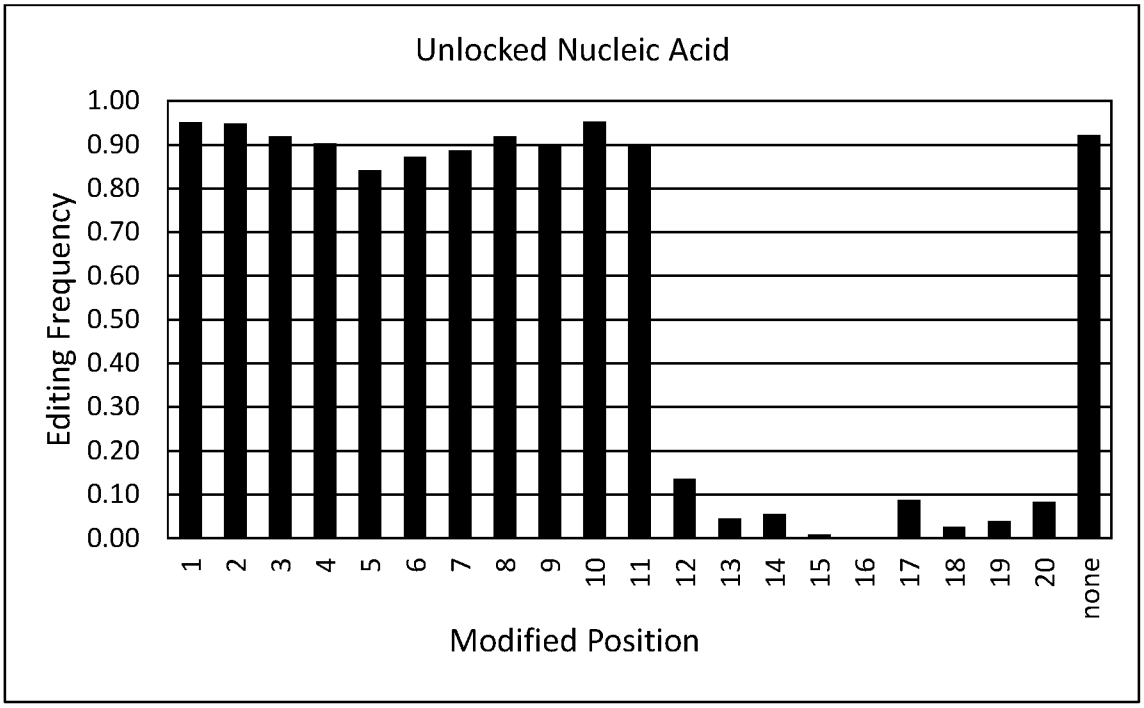



*Fig. 29D*

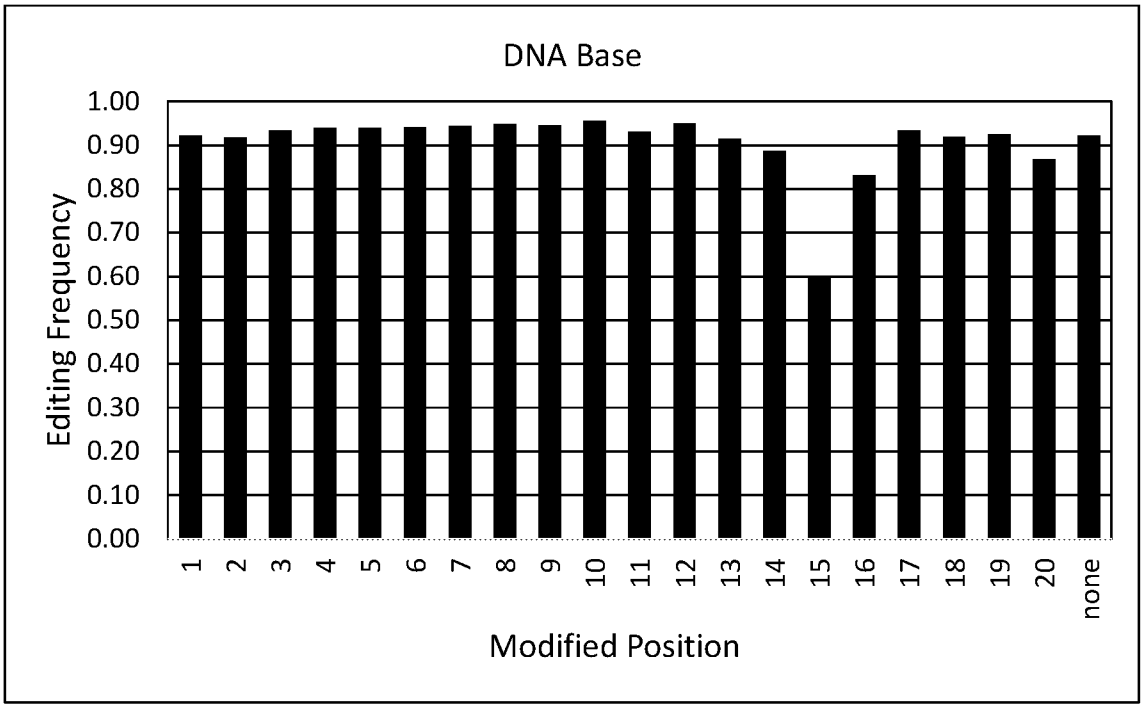



*Fig. 29E*

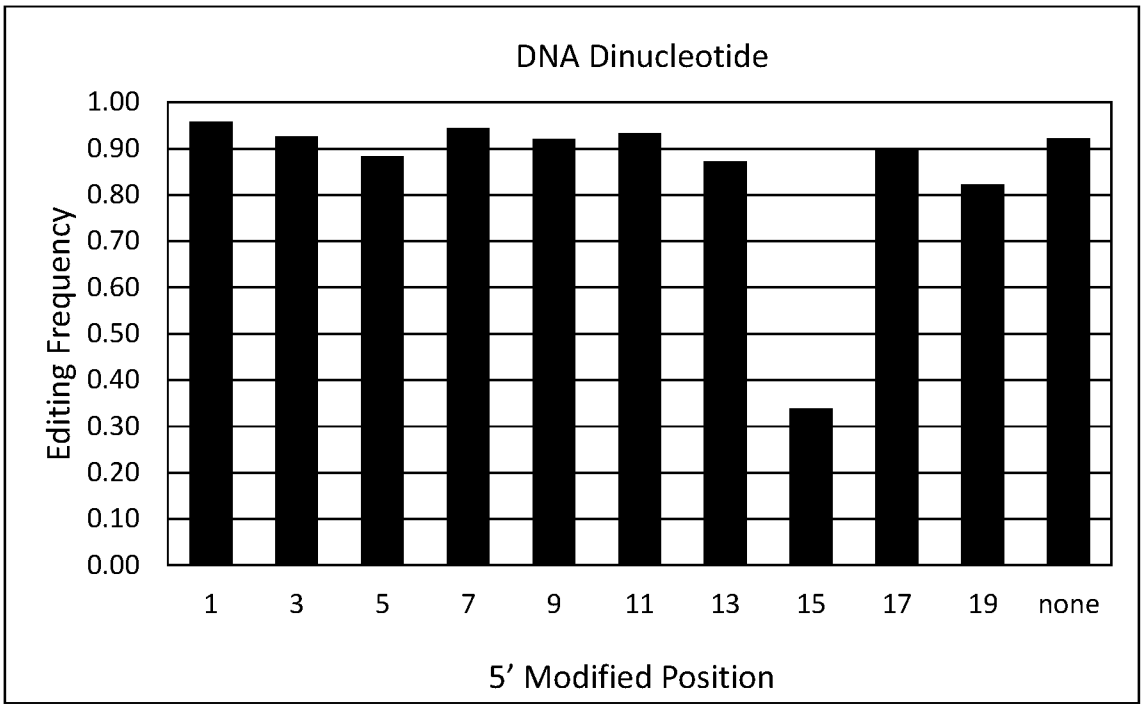



*Fig. 29F*

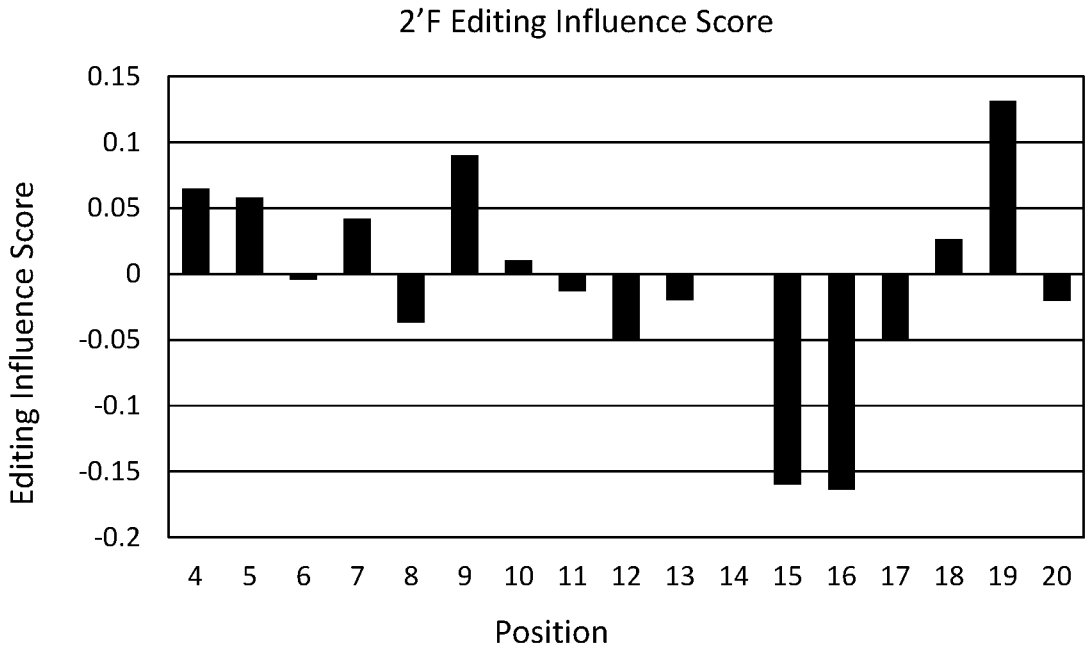



*Fig. 30A*

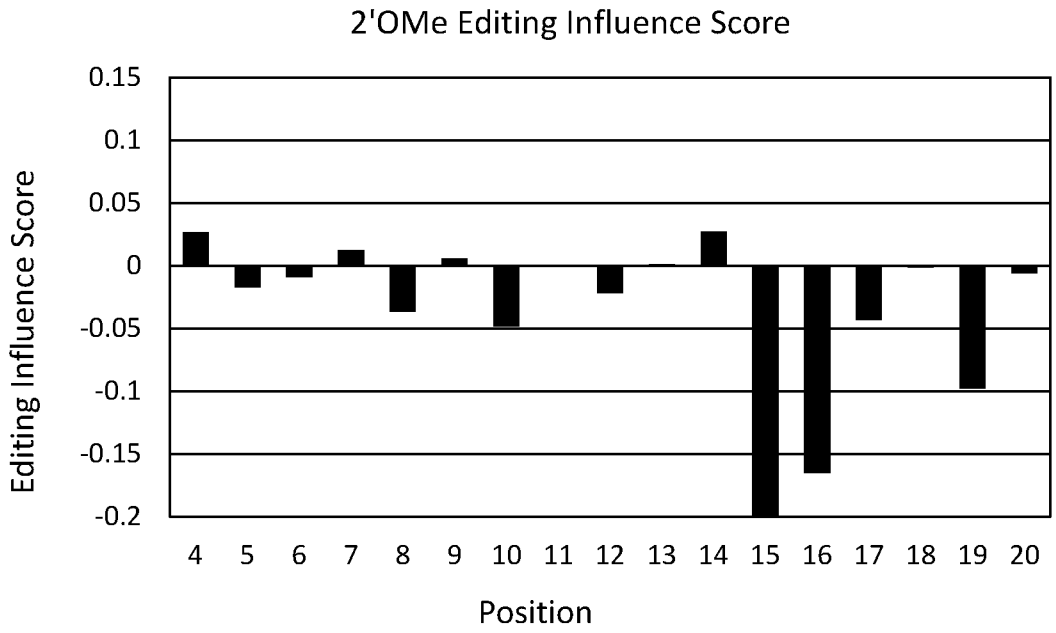
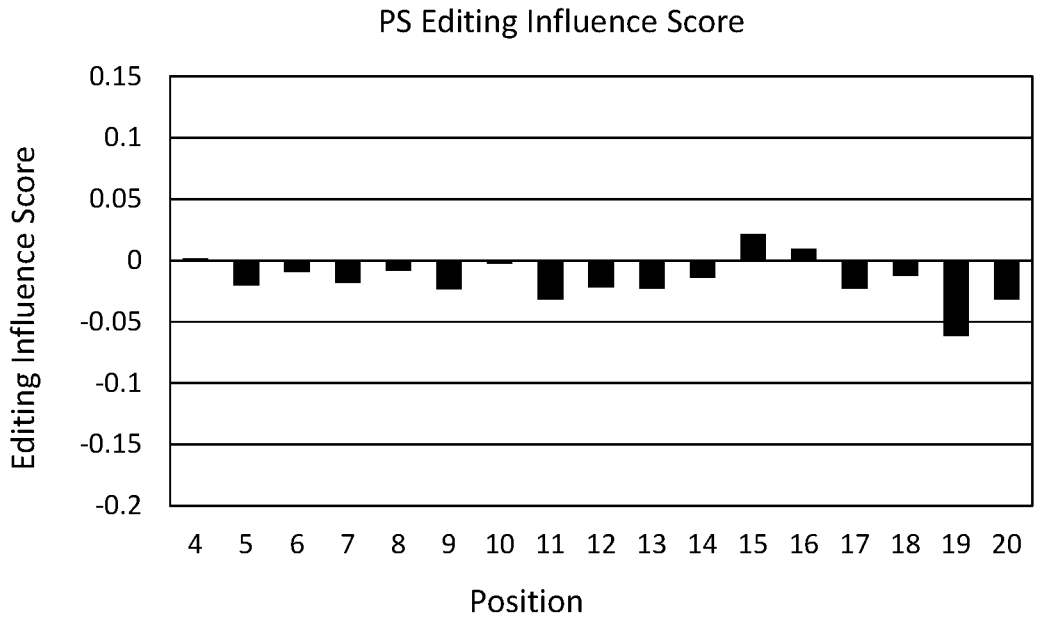



*Fig. 30B*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Position

*Fig. 30C*

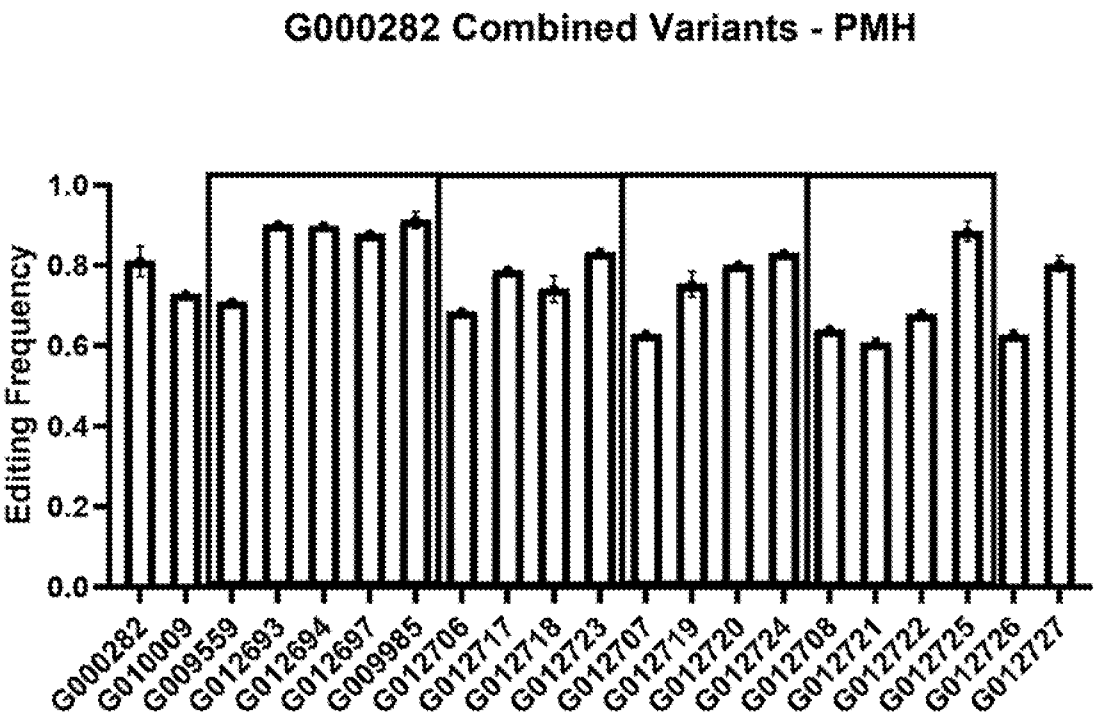



*Fig. 31A*

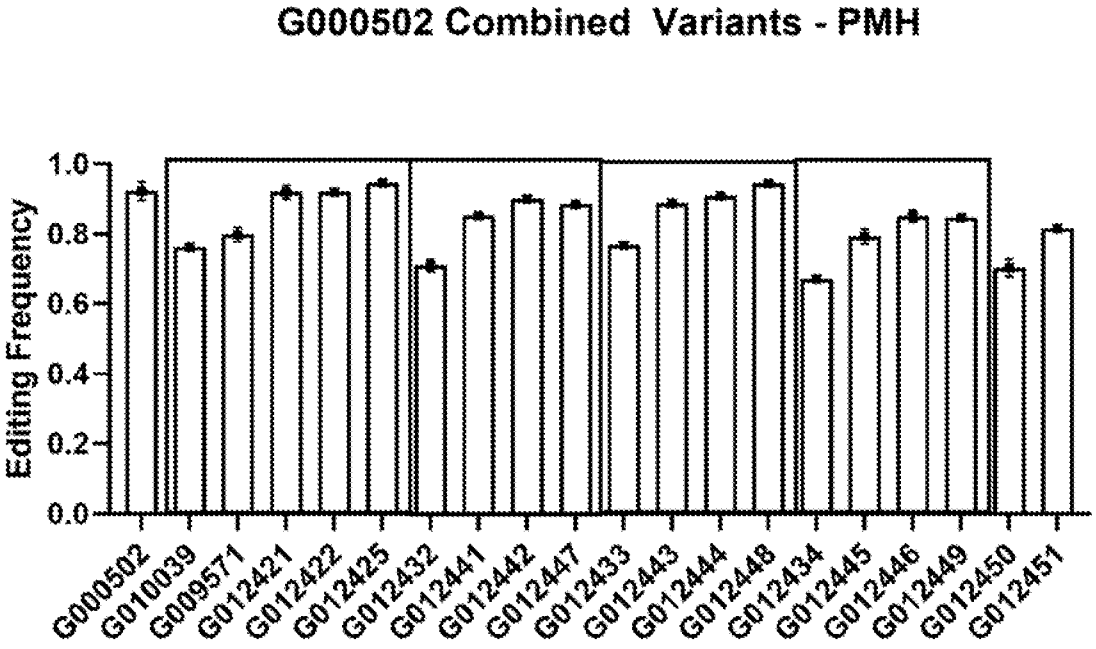
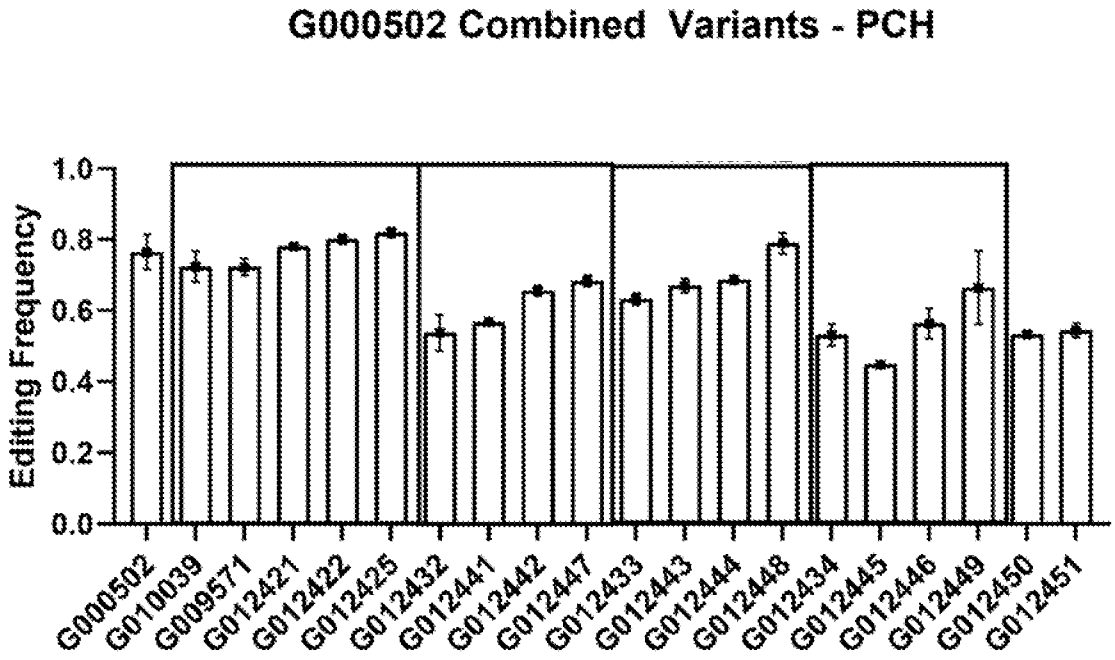



*Fig. 31B*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G012450
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*Fig. 31C*