COMPOSITIONS AND METHODS FOR INHIBITING *SNCA* EXPRESSION

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims priority under 35 U.S.C. § 119(e) from U.S. Provisional Application No. 63/364,639, filed May 13, 2022, which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The disclosure relates generally to biology and medicine, and more particularly it relates to oligonucleotides and compositions including the same for inhibiting or reducing (*i.e.*, modulating) alpha-synuclein (*SNCA*) gene expression, as well as their use for treating diseases and disorders associated with *SNCA* gene expression.

BACKGROUND

[0003] Synapses are functional compartment between cells where information is passed from one cell to another in the brain. SNCA is a protein primarily found in the brain which regulates synaptic vesicle trafficking and release of neurotransmitters. Among other functions, SNCA acts as a molecular chaperone to assist in folding synaptic fusion components (*e.g.*, SNAREs). Mutations (*e.g.*, insertions and mismatches) in *SNCA* that alter SNCA function and expression or general aberrant expression of SNCA are known causes of several diseases impacting the CNS (*e.g.*, Parkinson's disease and multiple system atrophy). Strategies for targeting the *SNCA* gene to prevent such diseases are needed.

[0004] The mammalian CNS is a complex system of tissues, including cells, fluids and chemicals that interact in concert to enable a wide variety of functions, including movement, navigation, cognition, speech, vision, and emotion. Unfortunately, a variety of diseases and disorders of the CNS are known (*e.g.*, neurological disorders) and affect or disrupt some or all of these functions. Typically, treatments for diseases and disorders of the CNS have been limited to small molecule drugs, antibodies and/or to adaptive or behavioral therapies. There exists an

ongoing need to develop treatment of diseases and disorders of the CNS associated with inappropriate gene expression.

SUMMARY OF DISCLOSURE

[0005] To address this need, the disclosure describes compositions for and methods of treating a disease, disorder, or condition associated with *SNCA* gene expression. The present disclosure is based, at least in part, on discovering RNAi oligonucleotides that effectively target and reduce *SNCA* gene expression in tissues of the CNS. Specifically, target sequences within SNCA mRNA were identified and oligonucleotides that bind to these target sequences and inhibiting SNCA mRNA expression were generated. As demonstrated herein, the oligonucleotides inhibited human and non-human primate (NHP) *SNCA* gene expression in CNS tissue. Further, SNCA mRNA expression was reduced in CNS tissue associated with Parkinson's disease or multiple system atrophy lipid-conjugated *SNCA*-targeting oligonucleotides. Without being bound by theory, the oligonucleotides described herein are useful for treating a disease, disorder, or condition associated with *SNCA* gene expression.

[0006] Accordingly, in some aspects, the disclosure provides a RNAi oligonucleotide for reducing *SNCA* gene expression, the oligonucleotide comprising a sense strand and an antisense strand, wherein the sense strand and the antisense strand form a duplex region, wherein the antisense strand comprises a region of complementarity to a SNCA mRNA target sequence of any one of SEQ ID NOs: 1683-2066, and wherein the region of complementarity is at least about 15 contiguous nucleotides in length.

[0007] In any of the foregoing or related aspects, the sense strand is about 15 to about 50 nucleotides in length. In some aspects, the sense strand is about 18 to about 36 nucleotides in length. In some aspects, the antisense strand is about 15 to about 30 nucleotides in length. In some aspects, the antisense strand is 22 nucleotides in length, and the antisense strand and the sense strand form a duplex region of at least 19 nucleotides in length, optionally at least 20 nucleotides in length. In some aspects, the region of complementarity is at least 19 contiguous nucleotides in length. In some aspects, the region of complementarity is at least 20 contiguous nucleotides in length.

[0008] In other aspects, the disclosure provides a double-stranded (ds) RNAi oligonucleotide for reducing *SNCA* gene expression, the oligonucleotide comprising:

(i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is selected from SEQ ID NOs: 2067-2450, and

(ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand, wherein the antisense and sense strands are separate strands which form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0009] In some aspects, the 3' end of the sense strand comprises a stem-loop set forth as S1-L-S2, wherein S1 is complementary to S2, and wherein L forms a loop between S1 and S2 of 3-5 nucleotides in length. In some aspects, L is a triloop or a tetraloop. In some aspects, L is a tetraloop. In some aspects, the tetraloop comprises the sequence 5'-GAAA-3'. In some aspects, the S1 and S2 are 1-10 nucleotides in length and have the same length. In some aspects, S1 and S2 are 1 nucleotide, 2 nucleotides, 3 nucleotides, 4 nucleotides, 5 nucleotides, 6 nucleotides, 7 nucleotides, 8 nucleotides, 9 nucleotides, or 10 nucleotides in length. In some aspects, S1 and S2 are 6 nucleotides in length. In some aspects, the stem-loop comprises the sequence 5'-GCAGCCGAAAGGCUGC-3' (SEQ ID NO: 1680).

[0010] In other aspects, the oligonucleotides comprise a blunt end. In some aspects, the blunt end comprises the 3' end of the sense strand. In some aspects, the sense strand is 20 to 22 nucleotides. In some aspects, the sense strand is 20 nucleotides.

[0011] In any of the foregoing or related aspects, the antisense strand comprises a 3' overhang sequence of one or more nucleotides in length. In some aspects, the overhang comprises purine nucleotides. In some aspects, the 3' overhang sequence is 2 nucleotides in length. In some aspects, the 3' overhang is selected from AA, GG, AG, and GA. In some aspects, the overhang is GG or AA. In some aspects, the overhang is GG.

[0012] In any of the foregoing or related aspects, the oligonucleotide comprises at least one modified nucleotide. In some aspects, the modified nucleotide comprises a 2′-modification. In some aspects, the 2′-modification is a modification selected from 2′-aminoethyl, 2′-fluoro (2'-F),

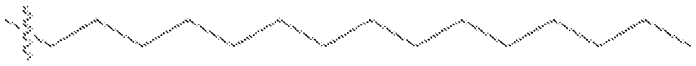
2′-O-methyl (2’-OMe), 2′-O-methoxyethyl, and 2′-deoxy-2′-fluoro-β-d-arabinonucleic acid. In some aspects, the modification is a 2’-modification selected from 2’-F and 2’-OMe. In some aspects, about 18% to about 23%, or 18%, 19%, 20%, 21%, 22% or 23%, of the nucleotides of the sense strand comprise a 2’-F modification. In some aspects, about 38-43%, 38%, 39%, 40%, 41%, 42% or 43% of the nucleotides of the sense strand comprise a 2’-F modification. In some aspects, about 25% to about 35%, or 25%, 26%, 27%, 28%, 29%, 30%, 31%, 32%, 33%, 34% or 35%, of the nucleotides of the antisense strand comprise a 2’-F modification. In some aspects, about 25% to about 35%, or 25%, 26%, 27%, 28%, 29%, 30%, 31%, 32%, 33%, 34% or 35%, of the nucleotides of the oligonucleotide comprise a 2’-F modification. In some aspects, about 35% to about 45%, or 35%, 36%, 37%, 38%, 39%, 40%, 41%, 42%, 43%, 44% or 45%, of the nucleotides of the oligonucleotide comprise a 2’-F modification. In some aspects, the sense strand comprises 36 nucleotides with positions 1-36 from 5’ to 3’, wherein each of positions 3, 5, 8, 10, 12, 13, 15, and 17 comprise a 2’-F modification. In some aspects, the sense strand comprises 20 nucleotides with positions 1-20 from 5’ to 3’, wherein each of positions 3, 5, 8, 10, 12, 13, 15, and 17 comprise a 2’-F modification. In some aspects, the antisense strand comprises 22 nucleotides with positions 1-22 from 5’ to 3’, and wherein each of positions 2, 3, 4, 5, 7, 10 14, 16 and 19 comprise a 2’-F modification. In some aspects, the remaining nucleotides comprise a 2’-OMe modification.

[0013] In any of the foregoing or related aspects, the oligonucleotide comprises at least one modified internucleotide linkage. In some aspects, the at least one modified internucleotide linkage is a phosphorothioate linkage. In some aspects, the antisense strand comprises a phosphorothioate linkage (i) between positions 1 and 2, and between positions 2 and 3; or (ii) between positions 1 and 2, between positions 2 and 3, and between positions 3 and 4, wherein positions are numbered 1-4 from 5’ to 3’. In some aspects, the antisense strand is 22 nucleotides in length, and the antisense strand comprises a phosphorothioate linkage between positions 20 and 21 and between positions 21 and 22, wherein positions are numbered 1-22 from 5’ to 3’. In some aspects, the sense strand comprises a phosphorothioate linkage between positions 1 and 2, wherein positions are numbered 1-2 from 5’ to 3’. In some aspects, the sense strand is 20 nucleotides in length, and the sense strand comprises a phosphorothioate linkage between positions between positions 1 and 2, between

positions 18 and 19 and between positions 19 and 20, wherein positions are numbered 1-20 from 5' to 3'.

[0014] In any of the foregoing or related aspects, the 4'-carbon of the sugar of the 5'-nucleotide of the antisense strand comprises a phosphate analog. In some aspects, the phosphate analog is oxymethyl phosphonate, vinyl phosphonate or malonyl phosphonate, optionally wherein the phosphate analog is a 4'-phosphate analog comprising 4'-oxymethylphosphonate.

[0015] In any of the foregoing or related aspects, at least one nucleotide of the oligonucleotide is conjugated to one or more targeting ligands. In some aspects, each targeting ligand comprises a carbohydrate, amino sugar, lipid, cholesterol, or polypeptide. In some aspects, the stem-loop comprises one or more targeting ligands conjugated to one or more nucleotides of the stem-loop. In some aspects, the one or more targeting ligands is conjugated to one or more nucleotides of the loop. In some aspects, the loop comprises 4 nucleotides numbered 1-4 from 5' to 3', wherein nucleotides at positions 2, 3, and 4 each comprise one or more targeting ligands, wherein the targeting ligands are the same or different. In some aspects, each targeting ligand comprises a N-acetylgalactosamine (GalNAc) moiety. In some aspects, the GalNAc moiety is a monovalent GalNAc moiety, a bivalent GalNAc moiety, a trivalent GalNAc moiety or a tetravalent GalNAc moiety. In some aspects, up to 4 nucleotides of L of the stem-loop are each conjugated to a monovalent GalNAc moiety.

[0016] In other aspects, the one or more targeting ligands is a lipid moiety. In some aspects, the lipid moiety is conjugated to the 5'terminal nucleotide of the sense strand. In some aspects, the lipid moiety is a hydrocarbon chain. In some aspects, the hydrocarbon chain is a C_8-C_{30} hydrocarbon chain. In some aspects, the hydrocarbon chain is a C_{16} hydrocarbon chain. In some aspects, the C_{16} hydrocarbon chain is represented by:  . In some aspects, the lipid moiety is conjugated to the 2' carbon of the ribose ring of the 5' terminal nucleotide.

[0017] In any of the foregoing or related aspects, the region of complementarity is fully complementary to the *SNCA* mRNA target sequence at nucleotide positions 2-8 of the antisense strand, wherein nucleotide positions are numbered 5' to 3'. In some aspects, the region of

complementarity is fully complementary to the *SNCA* mRNA target sequence at nucleotide positions 2-11 of the antisense strand, wherein nucleotide positions are numbered 5' to 3'.

[0018] In any of the foregoing or related aspects, the sense strand comprises a nucleotide sequence of any one of SEQ ID NOs: 1537-1571 and 1681. In some aspects, the antisense strand comprises a nucleotide sequence of any one of SEQ ID NOs: 1572-1606. In some aspects, the sense strand and antisense strands comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1537 and 1572, respectively;
b) SEQ ID NOs: 1538 and 1573, respectively;
c) SEQ ID NOs: 1539 and 1574, respectively;
d) SEQ ID NOs: 1540 and 1575, respectively;
e) SEQ ID NOs: 1541 and 1576, respectively;
f) SEQ ID NOs: 1542 and 1577, respectively;
g) SEQ ID NOs: 1543 and 1578, respectively;
h) SEQ ID NOs: 1544 and 1579, respectively;
i) SEQ ID NOs: 1545 and 1580, respectively;
j) SEQ ID NOs: 1546 and 1581, respectively;
k) SEQ ID NOs: 1547 and 1582, respectively;
l) SEQ ID NOs: 1548 and 1583, respectively;
m) SEQ ID NOs: 1549 and 1584, respectively;
n) SEQ ID NOs: 1550 and 1585, respectively;
o) SEQ ID NOs: 1551 and 1586, respectively;
p) SEQ ID NOs: 1552 and 1587, respectively;
q) SEQ ID NOs: 1553 and 1588, respectively;
r) SEQ ID NOs: 1554 and 1589, respectively;
s) SEQ ID NOs: 1555 and 1590, respectively;
t) SEQ ID NOs: 1556 and 1591, respectively;
u) SEQ ID NOs: 1557 and 1592, respectively;
v) SEQ ID NOs: 1558 and 1593, respectively;

w) SEQ ID NOs: 1559 and 1594, respectively;

x) SEQ ID NOs: 1560 and 1595, respectively;

y) SEQ ID NOs: 1561 and 1596, respectively;

z) SEQ ID NOs: 1562 and 1597, respectively;

aa) SEQ ID NOs: 1563 and 1598, respectively;

bb) SEQ ID NOs: 1564 and 1599, respectively;

cc) SEQ ID NOs: 1565 and 1600, respectively;

dd) SEQ ID NOs: 1566 and 1601, respectively;

ee) SEQ ID NOs: 1567 and 1602, respectively;

ff) SEQ ID NOs: 1568 and 1603, respectively;

gg) SEQ ID NOs: 1569 and 1604, respectively;

hh) SEQ ID NOs: 1570 and 1605, respectively;

ii) SEQ ID NOs: 1571 and 1606, respectively; and

jj) SEQ ID NOs: 1681 and 1586, respectively.

[0019] In some aspects, the sense strand and antisense strands comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1540 and 1575, respectively;

b) SEQ ID NOs: 1544 and 1579, respectively;

c) SEQ ID NOs: 1546 and 1581, respectively;

d) SEQ ID NOs: 1551and 1586, respectively;

e) SEQ ID NOs: 1552 and 1587, respectively;

f) SEQ ID NOs: 1553 and 1588, respectively;

g) SEQ ID NOs: 1558 and 1594, respectively;

h) SEQ ID NOs: 1560 and 1595, respectively;

i) SEQ ID NOs: 1564 and 1599, respectively;

j) SEQ ID NOs: 1565 and 1600, respectively;

k) SEQ ID NOs: 1566 and 1601, respectively;

l) SEQ ID NOs: 1570 and 1605, respectively; and

m) SEQ ID NOs: 1681 and 1586, respectively.

[0020] In some aspects, the sense strand and antisense strands comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1553 and 1588, respectively;

b) SEQ ID NOs: 1560 and 1595, respectively;

c) SEQ ID NOs: 1564 and 1599, respectively;

d) SEQ ID NOs: 1551 and 1586, respectively;

e) SEQ ID NOs: 1570 and 1605, respectively; and,

f) SEQ ID NOs: 1681 and 1586, respectively.

[0021] In some aspects, the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1553, and the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1588. In some aspects, the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1560, and the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1595. In some aspects, the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1564, and the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1599. In some aspects, the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1551, and the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1586. In some aspects, the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1570, and the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1605. In some aspects, the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1681, and the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1586.

[0022] In any of the foregoing or related aspects, the antisense strand is 22 nucleotides in length. In some aspects, the antisense strand comprises a nucleotide sequence comprising the nucleotide sequence selected from SEQ ID NOs: 1588, 1595, 1599, 1586, and 1605. In some aspects, the sense strand is 36 nucleotides in length. In some aspects, the sense strand comprises a nucleotide sequence comprising the nucleotide sequence selected from SEQ ID NOs: 1865, 1721, 1847, 1846, and 1955. In some aspects, the sense strand comprises a nucleotide sequence selected from SEQ ID NOs: 1553, 1560, 1564, 1551, and 1570.

[0023] In any of the foregoing or related aspects, the sense strand comprises the nucleotide sequence of any one of SEQ ID NOs: 1607-1641, and 1682. In some aspects, the antisense strand comprises a nucleotide sequence of any one of SEQ ID NOs: 1642-1676.

[0024] In some aspects, the sense strand and antisense strands comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1607 and 1642, respectively;

b) SEQ ID NOs: 1608 and 1643, respectively;

c) SEQ ID NOs: 1609 and 1644, respectively;

d) SEQ ID NOs: 1610 and 1645, respectively;

e) SEQ ID NOs: 1611 and 1646, respectively;

f) SEQ ID NOs: 1612 and 1647, respectively;

g) SEQ ID NOs: 1613 and 1648, respectively;

h) SEQ ID NOs: 1614 and 1649, respectively;

i) SEQ ID NOs: 1615 and 1650, respectively;

j) SEQ ID NOs: 1616 and 1651, respectively;

k) SEQ ID NOs: 1617 and 1652, respectively;

l) SEQ ID NOs: 1618 and 1653, respectively;

m) SEQ ID NOs: 1619 and 1654, respectively;

n) SEQ ID NOs: 1620 and 1655, respectively;

o) SEQ ID NOs: 1621 and 1656, respectively;

p) SEQ ID NOs: 1622 and 1657, respectively;

q) SEQ ID NOs: 1623 and 1658, respectively;

r) SEQ ID NOs: 1624 and 1659, respectively;

s) SEQ ID NOs: 1625 and 1660, respectively;

t) SEQ ID NOs: 1626 and 1661, respectively;

u) SEQ ID NOs: 1627 and 1662, respectively;

v) SEQ ID NOs: 1628 and 1663, respectively;

w) SEQ ID NOs: 1629 and 1664, respectively;

x) SEQ ID NOs: 1630 and 1665, respectively;

y) SEQ ID NOs: 1631 and 1666, respectively;

z) SEQ ID NOs: 1632 and 1667, respectively;

aa) SEQ ID NOs: 1633 and 1668, respectively;

bb) SEQ ID NOs: 1634 and 1669, respectively;

cc) SEQ ID NOs: 1635 and 1670, respectively;

dd) SEQ ID NOs: 1636 and 1671, respectively;

ee) SEQ ID NOs: 1637 and 1672, respectively;

ff) SEQ ID NOs: 1638 and 1673, respectively;

gg) SEQ ID NOs: 1639 and 1674, respectively;

hh) SEQ ID NOs: 1640 and 1675, respectively;

ii) SEQ ID NOs: 1641 and 1676, respectively; and,

jj) SEQ ID NOs: 1682 and 1656, respectively.

[0025] In some aspects, the sense strand and antisense strands comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1610 and 1645, respectively;

b) SEQ ID NOs: 1614 and 1649, respectively;

c) SEQ ID NOs: 1616 and 1651, respectively;

d) SEQ ID NOs: 1621 and 1656, respectively;

e) SEQ ID NOs: 1622 and 1657, respectively;

f) SEQ ID NOs: 1623 and 1658, respectively;

g) SEQ ID NOs: 1629 and 1664, respectively;

h) SEQ ID NOs: 1630 and 1665, respectively;

i) SEQ ID NOs: 1634 and 1669, respectively;

j) SEQ ID NOs: 1635 and 1670, respectively;

k) SEQ ID NOs: 1636 and 1671, respectively;

l) SEQ ID NOs: 1640 and 1675, respectively; and,

m) SEQ ID NOs: 1682 and 1656, respectively.

[0026] In some aspects, the sense strand and antisense strands comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1623 and 1658, respectively;

b) SEQ ID NOs: 1630 and 1665, respectively;

c) SEQ ID NOs: 1634 and 1669, respectively;

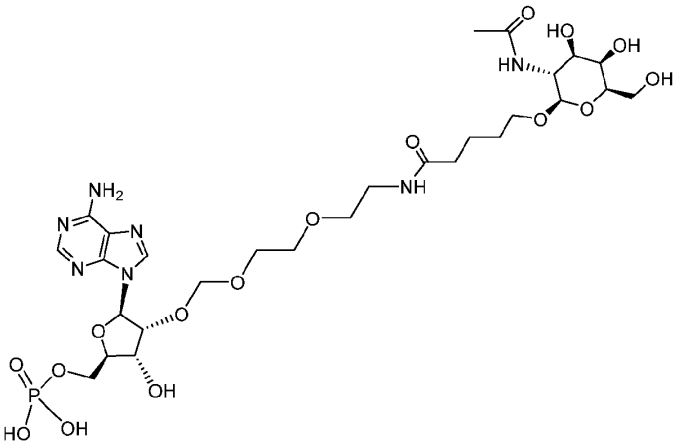
d) SEQ ID NOs: 1621 and 1656, respectively;

e) SEQ ID NOs: 1640 and 1675, respectively; and,

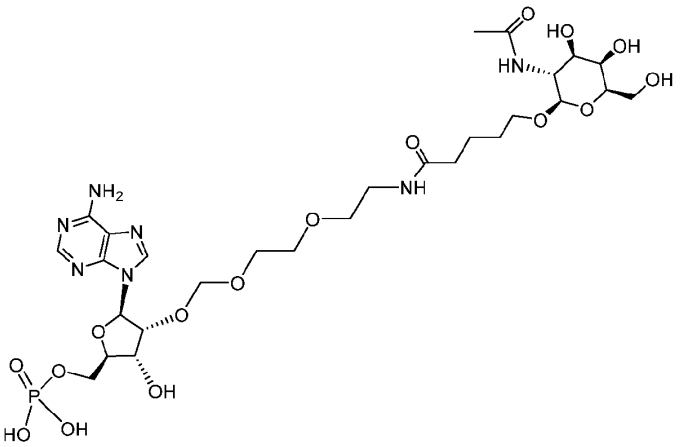
f) SEQ ID NOs: 1682 and 1656, respectively.

[0027] In some aspects, the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1623, and the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1658. In some aspects, the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1630, and the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1665. In some aspects, the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1634, and the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1669. In some aspects, the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1621, and the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1656. In some aspects, the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1640, and the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1676. In some aspects, the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1682, and the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1656.

[0028] In some aspects, the sense strand comprises the sequence and all of the modifications of 5′-[mCs][mA][fG][mC][fA][mG][mU][fG][mA][fU][mU][fG][fA][mA][fG][mU][fA][mU][mC][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]-3’ (SEQ ID NO: 1623), and wherein the antisense strand comprises the sequence and all of the modifications of 5′-[MePhosphonate-4O-mUs][fGs][fA][fU][fA][mC][fU][mU][mC][fA][mA][mU][mC][fA][mC][fU][mG][mC][fU][mGs][mGs][mG]-3′ (SEQ ID NO: 1658), wherein mC, mA, mG, mU = 2'-OMe ribonucleosides; fA, fC, fG, fU = 2'-F ribonucleosides; s = phosphorothioate, and wherein ademA-GalNAc =

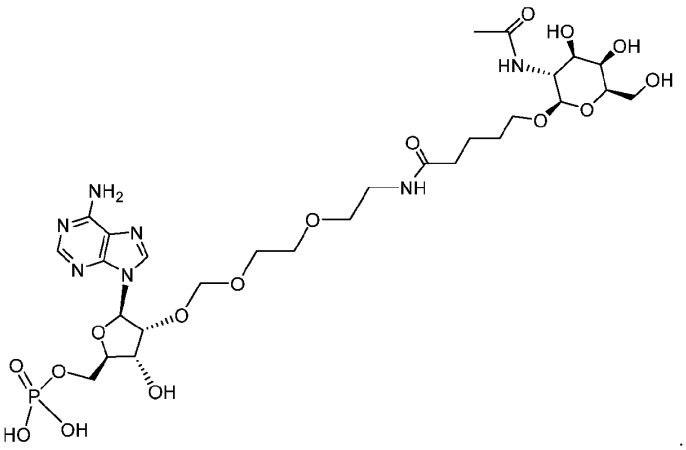


[0029] In some aspects, the sense strand comprises the sequence and all of the modifications of 5′-[mAs][mG][fA][mG][fC][mA][mA][fG][mU][fG][mA][fC][fA][mA][fA][mU][fG][mU][mU][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]-3’ (SEQ ID NO: 1630), and wherein the antisense strand comprises the sequence and all of the modifications of 5′-[MePhosphonate-4O-mUs][fAs][fA][fC][fA][mU][fU][mU][mG][fU][mC][mA][mC][fU][mU][fG][mC][mU][fC][mUs][mGs][mG]-3′ (SEQ ID NO: 1665), wherein mC, mA, mG, mU = 2'-OMe ribonucleosides; fA, fC, fG, fU = 2'-F ribonucleosides; s = phosphorothioate, and wherein ademA-GalNAc =

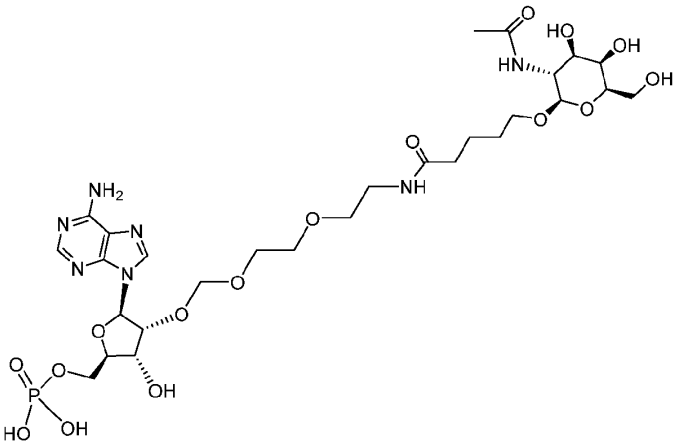


[0030] In some aspects, the sense strand comprises the sequence and all of the modifications of 5′-[mAs][mG][fU][mC][fA][mU][mG][fA][mC][fA][mU][fU][fU][mC][fU][mC][fA][mA][mA]

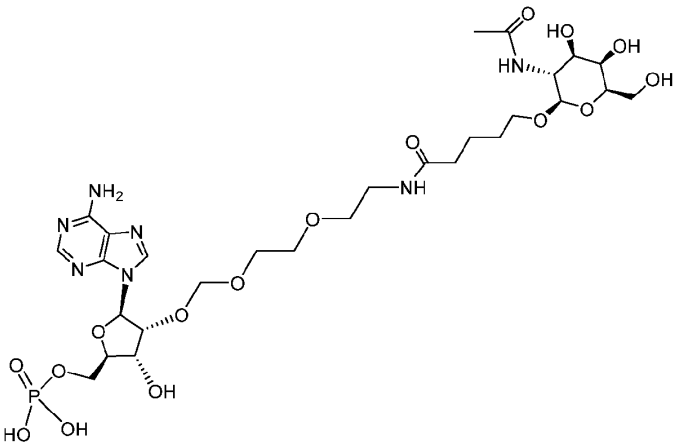
[mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]-3' (SEQ ID NO: 1634), and wherein the antisense strand comprises the sequence and all of the modifications of 5'-[MePhosphonate-4O-mUs][fUs][fU][fU][fG][mA][fG][mA][mA][fA][mU][mG][mU][fC][mA][fU][mG][mA][fC][mUs][mGs][mG]-3' (SEQ ID NO: 1669), wherein mC, mA, mG, mU = 2'-OMe ribonucleosides; fA, fC, fG, fU = 2'-F ribonucleosides; s = phosphorothioate, and wherein ademA-GalNAc =



[0031] In some aspects, the sense strand comprises the sequence and all of the modifications of 5'-[mCs][mA][fG][mU][fC][mA][mU][fG][mA][fC][mA][fU][fU][mU][fC][mU][fC][mA][mA][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]-3' (SEQ ID NO: 1621), and wherein the antisense strand comprises the sequence and all of the modifications of 5'-[MePhosphonate-4O-mUs][fUs][fU][fG][fA][mG][fA][mA][mA][fU][mG][mU][mC][fA][mU][fG][mA][mC][fU][mGs][mGs][mG]-3' (SEQ ID NO: 1656), wherein mC, mA, mG, mU = 2'-OMe ribonucleosides; fA, fC, fG, fU = 2'-F ribonucleosides; s = phosphorothioate, and wherein ademA-GalNAc =

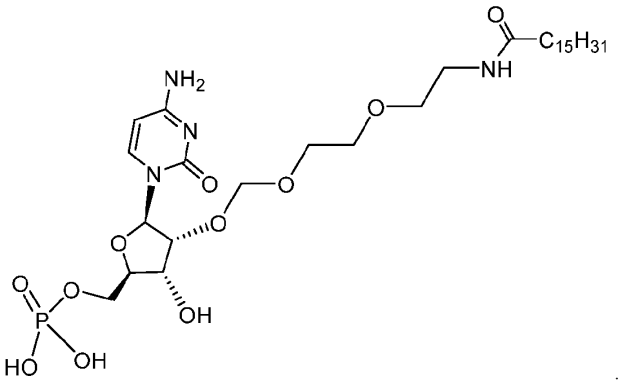


[0032] In some aspects, the sense strand comprises the sequence and all of the modifications of 5′-[mAs][mG][fU][mU][fG][mU][mU][fA][mG][fU][mG][fA][fU][mU][fU][mG][fC][mU][mA][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]-3’ (SEQ ID NO: 1640), and wherein the antisense strand comprises the sequence and all of the modifications of 5′-[MePhosphonate-4O-mUs][fUs][fA][fG][fC][mA][fA][mA][mU][fC][mA][mC][mU][fA][mA][fC][mA][mA][fC][mUs][mGs][mG]-3′ (SEQ ID NO: 1675), wherein mC, mA, mG, mU = 2'-OMe ribonucleosides; fA, fC, fG, fU = 2'-F ribonucleosides; s = phosphorothioate, and wherein ademA-GalNAc =



In some aspects, the sense strand comprises the sequence and all of the modifications of 5′-[ademCs-C_{16}][mA][fG][mU][fC][mA][mU][fG][mA][fC][mA][fU][fU][mU][fC][mU][fC][mAs]

[mAs][mA]-3' (SEQ ID NO: 1682), and wherein the antisense strand comprises the sequence and all of the modifications of 5'-[MePhosphonate-4O-mUs][fUs][fU][fG][fA][mG][fA][mA][mA][fU][mG][mU][mC][fA][mU][fG][mA][mC][fU][mGs][mGs][mG]-3' (SEQ ID NO: 1656), wherein mC, mA, mG, mU = 2'-OMe ribonucleosides; fA, fC, fG, fU = 2'-F ribonucleosides; s = phosphorothioate, and [ademCs-C_{16}]=



[0033] In some aspects, the disclosure provides a pharmaceutical composition comprising a RNAi oligonucleotide described herein, and a pharmaceutically acceptable carrier, delivery agent or excipient.

[0034] In other aspects, the disclosure provides a method for treating a subject having a disease, disorder, or condition associated with *SNCA* gene expression, the method comprising administering to the subject a therapeutically effective amount of a RNAi oligonucleotide described herein, or pharmaceutical composition thereof, thereby treating the subject.

[0035] In further aspects, the disclosure provides a method of delivering an oligonucleotide to a subject, the method comprising administering a pharmaceutical composition described herein to the subject.

[0036] In yet further aspects, the disclosure provides, a method for reducing *SNCA* gene expression in a cell, a population of cells or a subject, the method comprising the step of:

i. contacting the cell or the population of cells with a RNAi oligonucleotide or pharmaceutical composition described herein; or

ii. administering to the subject a RNAi oligonucleotide or pharmaceutical composition described herein.

[0037] In some aspects, reducing *SNCA* gene expression comprises reducing an amount or level of SNCA mRNA, an amount or level of SNCA protein, or both. In some aspects, the subject has a disease, disorder, or condition associated with *SNCA* gene expression. In some aspects, the disease, disorder, or condition associated with *SNCA* expression is multiple system atrophy, dementia with Lewy bodies, or Parkinson disease.

[0038] In any of the foregoing or related aspects, a RNAi oligonucleotide or pharmaceutical composition described herein *SNCA* gene expression is reduced in tissue of one or more regions of the CNS, wherein the tissue is associated with Parkinson disease. In some aspects, the tissue associated with Parkinson disease is selected from: putamen, midbrain tegmentum, substantia nigra, pons, and medulla. In some aspects, *SNCA* gene expression is reduced in tissue of one or more regions of the CNS, wherein the tissue is associated with multiple system atrophy. In some aspects, tissue associated with multiple system atrophy is selected from: caudate nuclease, putamen, midbrain tegmentum, substantia nigra, pons, cerebellar cortex, cerebellar white matter, medulla, cervical spinal cord, thoracic spinal cord, and lumbar spinal cord. In some aspects, *SNCA* gene expression is reduced in one or more regions of the CNS selected from: cervical spinal cord, thoracic spinal cord, lumbar spinal cord, frontal cortex, temporal cortex, cerebellum, midbrain, occipital cortex, parietal cortex, hippocampus, caudate nucleus, thalamus, brainstem, motor cortex, globus pallidus, midbrain tegmentum, substantia nigra, pons, cerebellar white matter, and cerebellar dentate nucleus. In some aspects, *SNCA* gene expression is reduced in one or more regions of the CNS selected from: cervical spinal cord, thoracic spinal cord, lumbar spinal cord, frontal cortex, temporal cortex, cerebellum, midbrain, occipital cortex, parietal cortex, hippocampus, caudate nucleus, thalamus, brainstem, motor cortex, globus pallidus, midbrain tegmentum, substantia nigra, pons, cerebellar white matter, cerebellar dentate nucleus, L1 dorsal root ganglion (DRG), L2 DRG, L3 DRG, L4 DRG, L5 DRG, L6 DRG, putamen, midbrain tegmentum, substantia nigra, pons, medulla, cerebellar cortex, and cerebellar white matter.

[0039] In any of the foregoing or related aspects, the RNAi oligonucleotide, or pharmaceutical composition, is administered in combination with a second composition or therapeutic agent.

[0040] In other aspects, the disclosure provides use of a RNAi oligonucleotide or pharmaceutical composition described herein, in the manufacture of a medicament for the treatment of a disease, disorder, or condition associated with *SNCA* gene expression.

[0041] In further aspects, the disclosure provides a RNAi oligonucleotide or pharmaceutical composition described herein for use, or adaptable for use, in the treatment of a disease, disorder, or condition associated with *SNCA* expression.

[0042] In some aspects, the disclosure provides a kit comprising an RNAi oligonucleotide described herein, an optional pharmaceutically acceptable carrier, and a package insert comprising instructions for administration to a subject having a disease, disorder or condition associated with *SNCA* expression.

[0043] In any of the foregoing or related aspects, the disease, disorder, or condition associated with *SNCA* gene expression is multiple system atrophy, dementia with Lewy bodies, and Parkinson disease.

BRIEF DESCRIPTION OF THE FIGURES

[0044] **FIGs. 1A** and **1B** provide graphs depicting the percent (%) of human *SNCA* mRNA remaining in the liver of mice exogenously expressing human *SNCA* (hydrodynamic injection model) after treatment with GalNAc-conjugated SNCA-targeting oligonucleotides. CD-1 mice were dosed subcutaneously with 3 mg/kg of the indicated GalNAc-conjugated SNCA-targeting oligonucleotide formulated in PBS. Three days post-dose mice were hydrodynamically injected (HDI) with a DNA plasmid encoding human *SNCA*. The level of human SNCA mRNA was determined from livers collected 24 hours later. Hs-Mf = construct is human and monkey *SNCA* specific. Hs-Mf-Mm = construct is human, monkey, and mouse *SNCA* specific. SNCA-291 was used as a benchmark control.

[0045] **FIGs. 2A** and **2B** provide graphs depicting the dose response of GalNAc-conjugated *SNCA* oligonucleotides selected based on inhibitory efficacy shown in **FIGs. 1A-1B**. The percent (%) of *SNCA* mRNA remaining in liver tissue was measured in CD-1 HDI mice as described in **FIGs. 1A-1B.** Following injection with 0.3mg/kg, 1.0mg/kg, or 3mg/kg of the indicated GalNAc-conjugated *SNCA* oligonucleotide, percent (%) mRNA remaining was determined in two cohorts,

FIG. 2A and **FIG. 2B**. Hs-Mf = construct is human and monkey *SNCA* specific. Hs-Mf-Mm= construct is human, monkey, and mouse *SNCA* specific.

[0046] **FIGs. 3A-3S** provide graphs depicting the percent (%) of non-human primate (NHP; Mf) SNCA mRNA remaining in the CNS of NHPs after treatment with GalNAc-conjugated SNCA-targeting oligonucleotides. NHPs were dosed by intra cisterna magna (i.c.m) injection with 50 mg of the indicated GalNAc-conjugated SNCA-targeting oligonucleotide formulated in artificial cerebrospinal fluid (aCSF) on study days 0 and 7. The level of SNCA mRNA was determined relative to the percent (%) of SNCA mRNA remaining in aCSF treated animals. Central nervous tissues measured included frontal cortex (**FIG. 3A**), caudate nucleus (**FIG. 3B**), hippocampus (**FIG. 3C**), mid brain (**FIG. 3D**), **parietal** cortex (**FIG. 3E**), occipital cortex (**FIG. 3F**), thalamus (**FIG. 3G**), temporal cortex (**FIG. 3H**), cerebellum (**FIG. 3I**), brainstem (**FIG. 3J**), cervical spinal cord (**FIG. 3K**), thoracic spinal cord (**FIG. 3L**), lumbar spinal cord (**FIG. 3M**), L1 dorsal root ganglion (DRG) (**FIG. 3N**), L2 DRG (**FIG. 3O**), L3 DRG (**FIG. 3P**), L4 DRG (**FIG. 3Q**), L5 DRG (**FIG. 3R**), and L6 DRG (**FIG. 3S**). GaLXC = GalNAc-conjugated SNCA-targeting oligonucleotide.

[0047] **FIGs. 4A-4B** provide graphs depicting the percent (%) of non-human primate (NHP; Mf) SNCA mRNA remaining (**FIG. 4A**) and concentration of oligonucleotide (**FIG. 4B**) in NHP CNS tissue associated with Parkinson's disease. NHPs were intrathecally administered aCSF or SNCA-B15 conjugated to a C_{16} lipid. Tissue was collected and analyzed 28 days after administration of the oligonucleotide.

[0048] **FIGs. 5A-5B** provide graphs depicting the percent (%) of non-human primate (NHP; Mf) SNCA mRNA remaining (**FIG. 5A**) and concentration of oligonucleotide (**FIG. 5B**) in NHP CNS tissue associated with Multiple Systems Atrophy. NHPs were intrathecally administered aCSF or SNCA-B15 conjugated to a C_{16} lipid. Tissue was collected and analyzed 28 days after administration of the oligonucleotide.

DETAILED DESCRIPTION

[0049] According to some aspects, the disclosure provides oligonucleotides that reduce *SNCA* gene expression in the CNS. In some embodiments, the oligonucleotides provided herein are

designed to treat diseases associated with SNCA expression in the CNS. In other embodiments, the disclosure provides methods of treating a disease associated with SNCA expression by reducing *SNCA* gene expression in cells (*e.g.*, cells of the CNS).

Oligonucleotide Inhibitors of *SNCA* Expression

[0050] The disclosure provides, *inter alia,* oligonucleotides that inhibit *SNCA* gene expression (*e.g.*, RNAi oligonucleotides). In some embodiments, an oligonucleotide that inhibits *SNCA* gene expression is targeted to a SNCA mRNA.

SNCA Target Sequences

[0051] In some embodiments, an oligonucleotide herein (*e.g.,* a RNAi oligonucleotide) is targeted to a target sequence comprising a SNCA mRNA. In some embodiments, the oligonucleotide described herein is targeted to a target sequence within a SNCA mRNA sequence.

[0052] In some embodiments, the oligonucleotide described herein corresponds to a target sequence within a *SNCA* mRNA sequence. In some embodiments, the oligonucleotide, or a portion, fragment, or strand thereof (*e.g.*, an antisense strand or a guide strand of a ds RNAi oligonucleotide) binds or anneals to a target sequence comprising SNCA mRNA, thereby inhibiting *SNCA* gene expression.

[0053] In some embodiments, the oligonucleotide is targeted to a *SNCA* target sequence for the purpose of inhibiting *SNCA* gene expression *in vivo*. In some embodiments, the amount or extent of inhibition of *SNCA* gene expression by an oligonucleotide targeted to a *SNCA* target sequence correlates with the potency of the oligonucleotide. In some embodiments, the amount or extent of inhibition of *SNCA* gene expression by an oligonucleotide targeted to a *SNCA* target sequence correlates with the amount or extent of therapeutic benefit in a subject or patient having a disease, disorder, or condition associated with *SNCA* gene expression treated with the oligonucleotide.

[0054] Through examination of the nucleotide sequence of mRNAs encoding SNCA, including mRNAs of multiple different species (*e.g.*, human, cynomolgus monkey, and mouse; *see*, *e.g.*, Example 1) and as a result of *in vitro* and *in vivo* testing (*see*, *e.g.*, Examples 2-5), it has been discovered that certain nucleotide sequences of SNCA mRNA are more amenable than others to

oligonucleotide-based inhibition and are thus useful as target sequences for the oligonucleotides herein. In some embodiments, a sense strand of an oligonucleotide (*e.g.*, a RNAi oligonucleotide) described herein comprises a *SNCA* target sequence. In some embodiments, a portion or region of the sense strand of a ds oligonucleotide described herein comprises a *SNCA* target sequence. In some embodiments, the *SNCA* target sequence comprises, or consists of, a nucleotide sequence of any one of SEQ ID NOs: 1683-2066. In some embodiments, the *SNCA* target sequence comprises, or consists of, a nucleotide sequence of any one of SEQ ID Nos: 1781, 1782, 1796, 1798, 1802, 1808, 1814, 1817, 1713, 1718, 1726, 1830, 1839, 1742, 1846, 1852, 1865, 1784, 1804, 1721, 1822, 1840, 1735, 1847, 1855, 1864, 1901, 1902, 1938, 1947, 1955, 1964, 1973, and 1978. In some embodiments, the *SNCA* target sequence comprises, or consists of, a nucleotide sequence of any one of SEQ ID Nos: 1798, 1817, 1718, 1846, 1852, 1865, 1804, 1721, 1847, 1855, 1864, and 1955. In some embodiments, a *SNCA* target sequence comprises, or consists of, a nucleotide sequence of any one of SEQ ID NOs: 1865, 1721, 1847, 1846, and 1955. In some embodiments, the *SNCA* target sequence comprises the nucleotide sequence set forth in SEQ ID NO: 1865. In some embodiments, the *SNCA* target sequence comprises the nucleotide sequence set forth in SEQ ID NO: 1721. In some embodiments, the *SNCA* target sequence comprises the nucleotide sequence set forth in SEQ ID NO: 1847. In some embodiments, the *SNCA* target sequence comprises the nucleotide sequence set forth in SEQ ID NO: 1846. In some embodiments, the *SNCA* target sequence comprises the nucleotide sequence set forth in SEQ ID NO: 1955.

SNCA-Targeting Sequences

[0055] In some embodiments, an oligonucleotide herein has a region of complementarity to *SNCA* mRNA (*e.g.*, within a target sequence of *SNCA* mRNA) for purposes of targeting the mRNA in cells and inhibiting its expression. In some embodiments, the oligonucleotide comprises a *SNCA* targeting sequence (*e.g.*, an antisense strand or a guide strand of a ds oligonucleotide) having a region of complementarity that binds or anneals to the *SNCA* target sequence by complementary (Watson-Crick) base pairing. The targeting sequence or region of complementarity is generally of suitable length and base content to enable binding or annealing of the oligonucleotide (or a strand thereof) to a SNCA mRNA for purposes of inhibiting its expression. In some embodiments, the

targeting sequence or region of complementarity is at least about 12, at least about 13, at least about 14, at least about 15, at least about 16, at least about 17, at least about 18, at least about 19, at least about 20, at least about 21, at least about 22, at least about 23, at least about 24, at least about 25, at least about 26, at least about 27, at least about 28, at least about 29, or at least about 30 nucleotides in length. In some embodiments, the targeting sequence or region of complementarity is at least 12, at least 13, at least 14, at least 15, at least 16, at least 17, at least 18, at least 19, or at least 20 nucleotides. In some embodiments, the targeting sequence or region of complementarity is about 12 to about 30 (*e.g.*, 12 to 30, 12 to 22, 15 to 25, 17 to 21, 18 to 27, 19 to 27, or 15 to 30) nucleotides in length. In some embodiments, the targeting sequence or region of complementarity is about 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, or 30 nucleotides in length. In some embodiments, the targeting sequence or region of complementarity is 18 nucleotides in length. In some embodiments, the targeting sequence or region of complementarity is 19 nucleotides in length. In some embodiments, the targeting sequence or region of complementarity is 20 nucleotides in length. In some embodiments, the targeting sequence or region of complementarity is 21 nucleotides in length. In some embodiments, the targeting sequence or region of complementarity is 22 nucleotides in length. In some embodiments, the targeting sequence or region of complementarity is 23 nucleotides in length. In some embodiments, the targeting sequence or region of complementarity is 24 nucleotides in length. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity complementary to a sequence of any one of SEQ ID NOs: 1683-2066, and the targeting sequence or region of complementarity is 18 nucleotides in length. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity complementary to a sequence of any one of SEQ ID NOs: 1683-2066, and the targeting sequence or region of complementarity is 19 nucleotides in length. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity complementary to a sequence of any one of SEQ ID NOs: 1-384, and the targeting sequence or region of complementarity is 20 nucleotides in length. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity complementary to a sequence of any one of SEQ ID NOs: 1-384, and the targeting sequence or region of complementarity is 21 nucleotides in length. In some embodiments,

the oligonucleotide comprises a targeting sequence or region of complementarity complementary to a sequence of any one of SEQ ID NOs: 1-384, and the targeting sequence or region of complementarity is 22 nucleotides in length. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity complementary to a sequence of any one of SEQ ID NOs: 1-384, and the targeting sequence or region of complementarity is 23 nucleotides in length. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity complementary to a sequence of any one of SEQ ID NOs: 1-384 and the targeting sequence or region of complementarity is 24 nucleotides in length.

[0056] In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementarity (*e.g.*, an antisense strand or a guide strand of a ds oligonucleotide) that is fully complementary to a *SNCA* target sequence. In some embodiments, the targeting sequence or region of complementarity is partially complementary to a *SNCA* target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is fully complementary to a sequence of any one of SEQ ID NOs: 1683-2066. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is partially complementary to a sequence of any one of SEQ ID NOs: 1683-2066. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is fully complementary to a sequence of any one of SEQ ID NOs: 1781, 1782, 1796, 1798, 1802, 1808, 1814, 1817, 1713, 1718, 1726, 1830, 1839, 1742, 1846, 1852, 1865, 1784, 1804, 1721, 1822, 1840, 1735, 1847, 1855, 1864, 1901, 1902, 1938, 1947, 1955, 1964, 1973, and 1978. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is partially complementary to a sequence of any one of SEQ ID NOs: 1781, 1782, 1796, 1798, 1802, 1808, 1814, 1817, 1713, 1718, 1726, 1830, 1839, 1742, 1846, 1852, 1865, 1784, 1804, 1721, 1822, 1840, 1735, 1847, 1855, 1864, 1901, 1902, 1938, 1947, 1955, 1964, 1973, and 1978. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is fully complementary to a sequence of any one of SEQ ID NOs: 1798, 1817, 1718, 1846, 1852, 1865, 1804, 1721, 1847, 1855, 1864, and 1955. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is partially complementary to a sequence of any one of SEQ ID NOs: 1798, 1817, 1718, 1846, 1852, 1865,

1804, 1721, 1847, 1855, 1864, and 1955. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is fully complementary to a sequence of any one of SEQ ID NOs: 1865, 1721, 1847, 1846, and 1955. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is partially complementary to a sequence of any one of SEQ ID NOs: 1865, 1721, 1847, 1846, and 1955. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is fully complementary to the sequence set forth in SEQ ID NO: 1865. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is fully complementary to the sequence set forth in SEQ ID NO: 1721. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is fully complementary to the sequence set forth in SEQ ID NO: 1847. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is fully complementary to the sequence set forth in SEQ ID NO: 1846. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is fully complementary to the sequence set forth in SEQ ID NO: 1955. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is partially complementary to a sequence of any one of SEQ ID NOs: 1865. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is partially complementary to the sequence of SEQ ID NO: 1721. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is partially complementary to the sequence of SEQ ID NO: 1847. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is partially complementary to the sequence of SEQ ID NO: 1846. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is partially complementary to the sequence of SEQ ID NO: 1955.

[0057] In some embodiments, the oligonucleotide herein comprises a targeting sequence or region of complementarity that is complementary to a contiguous sequence of nucleotides comprising a SNCA mRNA, wherein the contiguous sequence of nucleotides is about 12 to about 30 nucleotides in length (*e.g.*, 12 to 30, 12 to 28, 12 to 26, 12 to 24, 12 to 20, 12 to 18, 12 to 16,

14 to 22, 16 to 20, 18 to 20, or 18 to 19 nucleotides in length). In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is complementary to a contiguous sequence of nucleotides comprising a SNCA mRNA, wherein the contiguous sequence of nucleotides is 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, or 20 nucleotides in length. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is complementary to a contiguous sequence of nucleotides comprising a SNCA mRNA, wherein the contiguous sequence of nucleotides is 19 nucleotides in length. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity that is complementary to a contiguous sequence of nucleotides comprising a SNCA mRNA, wherein the contiguous sequence of nucleotides is 20 nucleotides in length.

[0058] In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementarity that is complementary to a contiguous sequence of nucleotides of any one of SEQ ID NOs: 1683-2066, optionally wherein the contiguous sequence of nucleotides is 19 nucleotides in length. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementarity that is complementary to a contiguous sequence of nucleotides of any one of SEQ ID NOs: 1781, 1782, 1796, 1798, 1802, 1808, 1814, 1817, 1713, 1718, 1726, 1830, 1839, 1742, 1846, 1852, 1865, 1784, 1804, 1721, 1822, 1840, 1735, 1847, 1855, 1864, 1901, 1902, 1938, 1947, 1955, 1964, 1973, and 1978, optionally wherein the contiguous sequence of nucleotides is 19 nucleotides in length. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementarity that is complementary to a contiguous sequence of nucleotides of any one of SEQ ID NOs: 1798, 1817, 1718, 1846, 1852, 1865, 1804, 1721, 1847, 1855, 1864, and 1955, optionally wherein the contiguous sequence of nucleotides is 19 nucleotides in length. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementarity that is complementary to a contiguous sequence of nucleotides of SEQ ID NO: 1865, 1721, 1847, 1846, and 1955, optionally wherein the contiguous sequence of nucleotides is 19 nucleotides in length.

[0059] In some embodiments, the targeting sequence or region of complementarity of the oligonucleotide (*e.g.*, a RNAi oligonucleotide) is complementary to contiguous nucleotides of a sequence as set forth in any one of SEQ ID NOs: 1683-2066 and spans the entire length of an

antisense strand. In some embodiments, the targeting sequence or region of complementarity of the oligonucleotide is complementary to contiguous nucleotides of a sequence as set forth in any one of SEQ ID NOs: 1683-2066 and spans a portion of the entire length of an antisense strand. In some embodiments, the oligonucleotide comprises a region of complementarity (*e.g.*, on an antisense strand of a ds oligonucleotide) that is at least partially (*e.g.*, fully) complementary to a contiguous stretch of nucleotides spanning nucleotides 1-20 of a sequence as set forth in any one of SEQ ID NOs: 1683-2066. In some embodiments, the targeting sequence or region of complementarity of the oligonucleotide is complementary to contiguous nucleotides of a sequence as set forth in any one of SEQ ID NOs: 1-384 and spans the entire length of an antisense strand. In some embodiments, the region of complementarity of the oligonucleotide is complementary to contiguous nucleotides of a sequence as set forth in any one of SEQ ID NOs: 1-384 and spans a portion of the entire length of an antisense strand. In some embodiments, the oligonucleotide comprises a region of complementarity (*e.g.*, on an antisense strand of a ds oligonucleotide) that is at least partially (*e.g.*, fully) complementary to a contiguous stretch of nucleotides spanning nucleotides 1 to 19 of a sequence as set forth in any one of SEQ ID NOs: 1-384.

[0060] In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity having one or more base pair (bp) mismatches with the corresponding *SNCA* target sequence. In some embodiments, the targeting sequence or region of complementarity may have up to about 1, up to about 2, up to about 3, up to about 4, up to about 5, *etc.* mismatches with the corresponding *SNCA* target sequence provided that the ability of the targeting sequence or region of complementarity to bind or anneal to the SNCA mRNA under appropriate hybridization conditions and/or the ability of the oligonucleotide to inhibit *SNCA* gene expression is maintained. Alternatively, in some embodiments, the targeting sequence or region of complementarity comprises no more than 1, no more than 2, no more than 3, no more than 4, or no more than 5 mismatches with the corresponding *SNCA* target sequence provided that the ability of the targeting sequence or region of complementarity to bind or anneal to the SNCA mRNA under appropriate hybridization conditions and/or the ability of the oligonucleotide to inhibit *SNCA* gene expression is maintained. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity having 1 mismatch with the corresponding target sequence. In some

embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity having 2 mismatches with the corresponding target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity having 3 mismatches with the corresponding target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity having 4 mismatches with the corresponding target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity having 5 mismatches with the corresponding target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity more than one mismatch (*e.g.*, 2, 3, 4, 5, or more mismatches) with the corresponding target sequence, wherein at least 2 (*e.g.*, all) of the mismatches are positioned consecutively (*e.g.*, 2, 3, 4, 5, or more mismatches in a row), or wherein the mismatches are interspersed in any position throughout the targeting sequence or region of complementarity. In some embodiments, the oligonucleotide comprises a targeting sequence or region of complementarity more than one mismatch (*e.g.*, 2, 3, 4, 5, or more mismatches) with the corresponding target sequence, wherein at least 2 (*e.g.*, all) of the mismatches are positioned consecutively (*e.g.*, 2, 3, 4, 5, or more mismatches in a row), or wherein at least one or more non-mismatched base pair is located between the mismatches, or a combination thereof.

[0061] In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of any one of SEQ ID NOs: 1683-2066, wherein the targeting sequence or region of complementarity may have up to about 1, up to about 2, up to about 3, up to about 4, up to about 5, *etc.* mismatches with the corresponding *SNCA* target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of any one of SEQ ID NOs: 1683-2066, wherein the targeting sequence or region of complementarity may have no more than 1, no more than 2, no more than 3, no more than 4, or no more than 5 mismatches with the corresponding *SNCA* target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of any one of SEQ ID NOs: 1781, 1782, 1796, 1798, 1802, 1808, 1814, 1817, 1713, 1718, 1726, 1830, 1839, 1742, 1846, 1852, 1865, 1784,

1804, 1721, 1822, 1840, 1735, 1847, 1855, 1864, 1901, 1902, 1938, 1947, 1955, 1964, 1973, and 1978, wherein the targeting sequence or region of complementarity may have up to about 1, up to about 2, up to about 3, up to about 4, up to about 5, *etc.* mismatches with the corresponding *SNCA* target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of any one of SEQ ID NOs: 1781, 1782, 1796, 1798, 1802, 1808, 1814, 1817, 1713, 1718, 1726, 1830, 1839, 1742, 1846, 1852, 1865, 1784, 1804, 1721, 1822, 1840, 1735, 1847, 1855, 1864, 1901, 1902, 1938, 1947, 1955, 1964, 1973, and 1978, wherein the targeting sequence or region of complementarity may have no more than 1, no more than 2, no more than 3, no more than 4, or no more than 5 mismatches with the corresponding *SNCA* target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of any one of SEQ ID NOs: 1798, 1817, 1718, 1846, 1852, 1865, 1804, 1721, 1847, 1855, 1864, and 1955, wherein the targeting sequence or region of complementarity may have up to about 1, up to about 2, up to about 3, up to about 4, up to about 5, *etc.* mismatches with the corresponding *SNCA* target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of any one of SEQ ID NOs: 1798, 1817, 1718, 1846, 1852, 1865, 1804, 1721, 1847, 1855, 1864, and 1955, wherein the targeting sequence or region of complementarity may have no more than 1, no more than 2, no more than 3, no more than 4, or no more than 5 mismatches with the corresponding *SNCA* target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of any one of SEQ ID NOs: 1865, 1721, 1847, 1846, and 1955, wherein the targeting sequence or region of complementarity may have up to about 1, up to about 2, up to about 3, up to about 4, up to about 5, *etc.* mismatches with the corresponding *SNCA* target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of any one of SEQ ID NOs: 1865, 1721, 1847, 1846, and 1955, wherein the targeting sequence or region of complementarity may have no more than 1, no more than 2, no more than 3, no more than 4, or no more than 5 mismatches with

the corresponding *SNCA* target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of SEQ ID NO: 1865, wherein the targeting sequence or region of complementarity may have up to about 1, up to about 2, up to about 3, up to about 4, up to about 5, *etc.* mismatches with the corresponding *SNCA* target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of SEQ ID NO: 1865, wherein the targeting sequence or region of complementarity may have no more than 1, no more than 2, no more than 3, no more than 4, or no more than 5 mismatches with the corresponding *SNCA* target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of SEQ ID NO: 1721, wherein the targeting sequence or region of complementarity may have up to about 1, up to about 2, up to about 3, up to about 4, up to about 5, *etc.* mismatches with the corresponding *SNCA* target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of SEQ ID NO: 1721, wherein the targeting sequence or region of complementarity may have no more than 1, no more than 2, no more than 3, no more than 4, or no more than 5 mismatches with the corresponding *SNCA* target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of SEQ ID NO: 1847, wherein the targeting sequence or region of complementarity may have up to about 1, up to about 2, up to about 3, up to about 4, up to about 5, *etc.* mismatches with the corresponding *SNCA* target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of SEQ ID NO: 1847, wherein the targeting sequence or region of complementarity may have no more than 1, no more than 2, no more than 3, no more than 4, or no more than 5 mismatches with the corresponding *SNCA* target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of SEQ ID NO: 1846, wherein the targeting sequence or region of complementarity may have up to about 1, up to about 2, up to about

3, up to about 4, up to about 5, *etc.* mismatches with the corresponding *SNCA* target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of SEQ ID NO: 1846, wherein the targeting sequence or region of complementarity may have no more than 1, no more than 2, no more than 3, no more than 4, or no more than 5 mismatches with the corresponding *SNCA* target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of SEQ ID NO: 1955, wherein the targeting sequence or region of complementarity may have up to about 1, up to about 2, up to about 3, up to about 4, up to about 5, *etc.* mismatches with the corresponding *SNCA* target sequence. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of SEQ ID NO: 1955, wherein the targeting sequence or region of complementarity may have no more than 1, no more than 2, no more than 3, no more than 4, or no more than 5 mismatches with the corresponding *SNCA* target sequence.

Types of Oligonucleotides

[0062] A variety of oligonucleotide types and/or structures are useful for targeting SNCA mRNA in the methods herein including, but not limited to, RNAi oligonucleotides, antisense oligonucleotides, miRNAs, *etc.* Any of the oligonucleotide types described herein or elsewhere are contemplated for use as a framework to incorporate a SNCA mRNA targeting sequence herein for the purposes of inhibiting *SNCA* gene expression.

[0063] In some embodiments, the oligonucleotides herein inhibit *SNCA* gene expression by engaging with RNA interference (RNAi) pathways upstream or downstream of Dicer involvement (*e.g.*, a RNAi oligonucleotide). For example, RNAi oligonucleotides have been developed with each strand having sizes of about 19 to about 25 nucleotides with at least one 3′ overhang of about 1 to about 5 nucleotides (*see*, *e.g.*, US Patent No. 8,372,968). Longer oligonucleotides also have been developed that are processed by Dicer to generate active RNAi products (*see*, *e.g.*, US Patent No. 8,883,996). Further work produced extended ds oligonucleotides where at least one end of at least one strand is extended beyond a duplex targeting region, including structures where one of

the strands includes a thermodynamically stabilizing tetraloop structure (*see*, *e.g.*, US Patent Nos. 8,513,207 and 8,927,705, as well as Intl. Patent Application Publication No. WO 2010/033225). Such structures may include single-stranded (ss) extensions (on one or both sides of the molecule) as well as ds extensions.

[0064] In some embodiments, the oligonucleotides engage with the RNAi pathway downstream of the involvement of Dicer (*e.g.*, Dicer cleavage). In some embodiments, the oligonucleotide has an overhang (*e.g.*, of 1, 2, or 3 nucleotides in length) in the 3′ end of the sense strand. In some embodiments, the oligonucleotide (*e.g.*, siRNA) comprises a 21-nucleotide antisense strand that is antisense to a target mRNA (*e.g.*, SNCA mRNA) and a complementary passenger sense strand, in which both strands anneal to form a 19-bp duplex and 2 nucleotide overhangs at either or both 3′ ends. Longer oligonucleotide designs also are contemplated including oligonucleotides having a antisense strand of 23 nucleotides and a passenger strand of 21 nucleotides, where there is a blunt end on the right side of the molecule (3′ end of sense strand/5′ end of antisense strand) and a two nucleotide 3′ antisense strand overhang on the left side of the molecule (5′ end of the sense strand/3′ end of the antisense strand). In such molecules, there is a 21-bp duplex region. *See*, *e.g.*, US Patent Nos. 9,012,138; 9,012,621 and 9,193,753.

[0065] In some embodiments, the oligonucleotide herein comprises sense and antisense strands that are both in the range of about 17 to about 36 (*e.g.*, 17 to 26, 20 to 25, or 21-23) nucleotides in length. In some embodiments, the oligonucleotide comprises an antisense strand of 19-30 nucleotides in length and a sense strand of 19-50 nucleotides in length, wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3’ terminus of the antisense strand. In some embodiments, the oligonucleotide comprises sense and antisense strands that are both in the range of about 19 to about 22 nucleotides in length. In some embodiments, the sense and antisense strands are of equal length. In some embodiments, the oligonucleotide comprises sense and antisense strands, such that there is a 3′ overhang on either the sense strand or the antisense strand, or both the sense and antisense strand. In some embodiments, for oligonucleotides that have sense and antisense strands that are both in the range of about 21-23 nucleotides in length, a 3′ overhang on the sense, antisense, or both strands is 1 or 2 nucleotides in length. In some embodiments, the oligonucleotide has an

antisense strand of 22 nucleotides and a sense strand of 20 nucleotides, where there is a blunt end on the right side of the molecule (3′ end of sense strand/5′ end of antisense strand) and a 2 nucleotide 3′ antisense strand overhang on the left side of the molecule (5′ end of the sense strand/3′ end of the antisense strand). In such molecules, there is a 20-bp duplex region.

[0066] Other oligonucleotide designs for use with the compositions and methods herein include: 16-mer siRNAs (*see*, *e.g.*, NUCLEIC ACIDS IN CHEMISTRY AND BIOLOGY, Blackburn (ed.), Royal Society of Chemistry, 2006), shRNAs (*e.g.*, having 19 bp or shorter stems; *see*, *e.g.*, Moore *et al.* (2010) METHODS MOL. BIOL. 629:141-58), blunt siRNAs (*e.g.*, of 19 bps in length; *see*, *e.g.*, Kraynack & Baker (2006) *RNA* 12:163-76), asymmetrical siRNAs (aiRNA; *see*, *e.g.*, Sun *et al.* (2008) *Nat. Biotechnol.* 26:1379-82), asymmetric shorter-duplex siRNA (*see*, *e.g.*, Chang *et al.* (2009) *Mol. Ther.* 17:725-732), fork siRNAs (*see*, *e.g.*, Hohjoh (2004) *FEBS Lett.* 557:193-98), single-stranded siRNAs (Elsner (2012) *Nat. Biotechnol.* 30:1063), dumbbell-shaped circular siRNAs (*see*, *e.g.*, Abe *et al.* (2007) *J. Am. Chem. Soc.* 129:15108-09), and small internally segmented interfering RNA (siRNA; *see*, *e.g.*, Bramsen *et al.* (2007) *Nucleic Acids Res.* 35:5886-97). Further non-limiting examples of an oligonucleotide designs that may be used in some embodiments to reduce or inhibit *SNCA* gene expression are microRNA (miRNA), short hairpin RNA (shRNA) and short siRNA (*see*, *e.g.*, Hamilton *et al.* (2002) *EMBO J.* 21:4671-79; *see also*, US Patent Application Publication No. 2009/0099115).

[0067] Still, in some embodiments, an oligonucleotide for reducing or inhibiting *SNCA* gene expression herein is ss. Such structures may include but are not limited to ss RNAi molecules. Recent efforts have demonstrated the activity of ss RNAi molecules (*see*, *e.g.*, Matsui *et al.* (2016) *Mol. Ther.* 24:946-955). However, in some embodiments, the oligonucleotide is an antisense oligonucleotide (ASO). An antisense oligonucleotide is a ss oligonucleotide that has a nucleobase sequence and that, when written or depicted in the 5′ to 3′ direction, comprises the reverse complement of a targeted segment of a particular nucleic acid and is suitably modified (*e.g.*, as a gapmer) so as to induce RNaseH-mediated cleavage of its target RNA in cells or (*e.g.*, as a mixmer) so as to inhibit translation of the target mRNA in cells. ASOs for use herein may be modified in any suitable manner known in the art including, for example, as shown in US Patent No. 9,567,587 (including, *e.g.*, length, sugar moieties of the nucleobase (pyrimidine, purine), and alterations of

the heterocyclic portion of the nucleobase). Further, ASOs have been used for decades to reduce expression of specific target genes (*see*, *e.g.*, Bennett *et al.* (2017) *Annu. Rev. Pharmacol.* 57:81-105).

[0068] In some embodiments, the antisense oligonucleotide (ASO) shares a region of complementarity with SNCA mRNA. In some embodiments, the ASO targets various areas of the human *SNCA* identified as NM_000345.3. In some embodiments, the ASO is about 15 to about 50 nucleotides in length. In some embodiments, the ASO is 15-25 nucleotides in length. In some embodiments, the ASO is 22 nucleotides in length. In some embodiments, the ASO is complementary to any one of SEQ ID NOs: 1683-2066. In some embodiments, the ASO is at least 15 contiguous nucleotides in length. In some embodiments, the ASO is at least 19 contiguous nucleotides in length. In some embodiments, the ASO is at least 20 contiguous nucleotides in length. In some embodiments, the ASO differs by 1, 2, or 3 nucleotides from the target sequence.

Double-Stranded RNAi Oligonucleotides

[0069] In some aspects, the disclosure provides ds RNAi oligonucleotides for targeting SNCA mRNA and inhibiting *SNCA* gene expression (*e.g.*, *via* the RNAi pathway) comprising a sense strand (also referred to herein as a passenger strand) and an antisense strand (also referred to herein as a guide strand). In some embodiments, the sense strand and antisense strand are separate strands and are not covalently linked. In some embodiments, the sense strand and the antisense strand are covalently linked. In some embodiments, the sense strand and the antisense strand form a duplex region, wherein the sense strand and the antisense strand, or a portion thereof, binds with one another in a complementary fashion (*e.g.*, by Watson-Crick base pairing).

[0070] In some embodiments, the sense strand has a first region (R1) and a second region (R2), wherein R2 comprises a first subregion (S1), a loop (L) such as a tetraloop (tetraL) or triloop (triL), and a second subregion (S2), wherein L is located between S1 and S2, and wherein S1 and S2 form a second duplex (D2). D2 may have various lengths. In some embodiments, D2 is about 1 to about 6 bp in length. In some embodiments, D2 is 2-6, 3-6, 4-6, 5-6, 1-5, 2-5, 3-5, or 4-5 bp in length. In some embodiments, D2 is 1, 2, 3, 4, 5, or 6 bp in length. In some embodiments, D2 is 6 bp in length.

[0071] In some embodiments, R1 of the sense strand and the antisense strand form a first duplex (D1). In some embodiments, D1 is at least about 15 (*e.g.*, at least 15, at least 16, at least 17, at least 18, at least 19, at least 20, or at least 21) nucleotides in length. In some embodiments, D1 is in the range of about 12 to about 30 nucleotides in length (*e.g.*, 12 to 30, 12 to 27, 15 to 22, 18 to 22, 18 to 25, 18 to 27, 18 to 30 or 21 to 30 nucleotides in length). In some embodiments, D1 is at least 12 nucleotides in length (*e.g.*, at least 12, at least 15, at least 20, at least 25, or at least 30 nucleotides in length). In some embodiments, D1 is 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, or 30 nucleotides in length. In some embodiments, D1 is 19 nucleotides in length. In some embodiments, D1 is 20 nucleotides in length. In some embodiments, D1 comprising the sense strand and the antisense strand does not span the entire length of the sense strand and/or the antisense strand. In some embodiments, D1 comprising the sense strand and the antisense strand spans the entire length of either the sense strand or the antisense strand or both. In certain embodiments, D1 comprising the sense strand and the antisense strand spans the entire length of both the sense strand and the antisense strand.

[0072] In some embodiments, the sense strand is 36 nucleotides in length and positions are numbered 1-36 from 5' to 3'. In some embodiments, the antisense strand is 22 nucleotides in length and positions are numbered 1-22 from 5' to 3'. In some embodiments, position numbers described herein adhere to this numbering format.

[0073] In some embodiments, the oligonucleotide comprises a sense strand having a sequence of any one of SEQ ID NOs: 1-384 and an antisense strand comprising a complementary sequence of any one of SEQ ID NOs: 385-768. In some embodiments, the oligonucleotide comprises a sense strand having a sequence of SEQ ID NOs: 1683-2066 and an antisense strand comprising a complementary sequence of any one of SEQ ID NOs: 2067-2450.

[0074] In some embodiments, the oligonucleotide comprises a sense strand having a sequence of any one of SEQ ID NOs: 1537-1571 and an antisense strand comprising a complementary sequence of any one of SEQ ID NOs: 1572-1606. In some embodiments, the oligonucleotide comprises a sense strand having a sequence of any one of SEQ ID NOs: 1537-1571 and 1681 and an antisense strand comprising a complementary sequence of any one of SEQ ID NOs: 1572-1606.

[0075] In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand comprising nucleotide sequences selected from:

a) SEQ ID NOs: 1537 and 1572, respectively;

b) SEQ ID NOs: 1538 and 1573, respectively;

c) SEQ ID NOs: 1539 and 1574, respectively;

d) SEQ ID NOs: 1540 and 1575, respectively;

e) SEQ ID NOs: 1541 and 1576, respectively;

f) SEQ ID NOs: 1542 and 1577, respectively;

g) SEQ ID NOs: 1543 and 1578, respectively;

h) SEQ ID NOs: 1544 and 1579, respectively;

i) SEQ ID NOs: 1545 and 1580, respectively;

j) SEQ ID NOs: 1546 and 1581, respectively;

k) SEQ ID NOs: 1547 and 1582, respectively;

l) SEQ ID NOs: 1548 and 1583, respectively;

m) SEQ ID NOs: 1549 and 1584, respectively;

n) SEQ ID NOs: 1550 and 1585, respectively;

o) SEQ ID NOs: 1551 and 1586, respectively;

p) SEQ ID NOs: 1552 and 1587, respectively;

q) SEQ ID NOs: 1553 and 1588, respectively;

r) SEQ ID NOs: 1554 and 1589, respectively;

s) SEQ ID NOs: 1555 and 1590, respectively;

t) SEQ ID NOs: 1556 and 1591, respectively;

u) SEQ ID NOs: 1557 and 1592, respectively;

v) SEQ ID NOs: 1558 and 1593, respectively;

w) SEQ ID NOs: 1559 and 1594, respectively;

x) SEQ ID NOs: 1560 and 1595, respectively;

y) SEQ ID NOs: 1561 and 1596, respectively;

z) SEQ ID NOs: 1562 and 1597, respectively;

aa) SEQ ID NOs: 1563 and 1598, respectively;

bb) SEQ ID NOs: 1564 and 1599, respectively;

cc) SEQ ID NOs: 1565 and 1600, respectively;

dd) SEQ ID NOs: 1566 and 1601, respectively;

ee) SEQ ID NOs: 1567 and 1602, respectively;

ff) SEQ ID NOs: 1568 and 1603, respectively;

gg) SEQ ID NOs: 1569 and 1604, respectively;

hh) SEQ ID NOs: 1570 and 1605, respectively;

ii) SEQ ID NOs: 1571 and 1606, respectively; and

jj) SEQ ID NOs: 1681 and 1586, respectively.

[0076] In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand comprising nucleotide sequences selected from:

a) SEQ ID NOs: 1540 and 1575, respectively;

b) SEQ ID NOs: 1544 and 1579, respectively;

c) SEQ ID NOs: 1546 and 1581, respectively;

d) SEQ ID NOs: 1551and 1586, respectively;

e) SEQ ID NOs: 1552 and 1587, respectively;

f) SEQ ID NOs: 1553 and 1588, respectively;

g) SEQ ID NOs: 1558 and 1594, respectively;

h) SEQ ID NOs: 1560 and 1595, respectively;

i) SEQ ID NOs: 1564 and 1599, respectively;

j) SEQ ID NOs: 1565 and 1600, respectively;

k) SEQ ID NOs: 1566 and 1601, respectively;

l) SEQ ID NOs: 1570 and 1605, respectively; and

m) SEQ ID NOs: 1681 and 1586, respectively.

[0077] In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand comprising nucleotide sequences selected from:

a) SEQ ID NOs: 1553 and 1588, respectively;

b) SEQ ID NOs: 1560 and 1595, respectively;

c) SEQ ID NOs: 1564 and 1599, respectively;

d) SEQ ID NOs: 1551 and 1586, respectively;

e) SEQ ID NOs: 1570 and 1605, respectively; and

f) SEQ ID NOs: 1681 and 1586, respectively.

[0078] In some embodiments, the sense strand comprises the sequence of SEQ ID NO: 1553 and the antisense strand comprises the sequence of SEQ ID NO: 1588. In some embodiments, the sense strand comprises the sequence of SEQ ID NO: 1560 and the antisense strand comprises the sequence of SEQ ID NO: 1595. In some embodiments, the sense strand comprises the sequence of SEQ ID NO: 1564 and the antisense strand comprises the sequence of SEQ ID NO: 1599. In some embodiments, the sense strand comprises the sequence of SEQ ID NO: 1551 and the antisense strand comprises the sequence of SEQ ID NO: 1586. In some embodiments, the sense strand comprises the sequence of SEQ ID NO: 1570 and the antisense strand comprises the sequence of SEQ ID NO: 1605. In some embodiments, the sense strand comprises the sequence of SEQ ID NO: 1681 and the antisense strand comprises the sequence of SEQ ID NO: 1586.

[0079] It should be appreciated that, in some embodiments, sequences presented in the Sequence Listing may be referred to in describing the structure of the oligonucleotide (*e.g.*, a RNAi oligonucleotide) or other nucleic acid. In such embodiments, the actual oligonucleotide or other nucleic acid may have one or more alternative nucleotides (*e.g.*, a RNA counterpart of a DNA nucleotide or a DNA counterpart of a RNA nucleotide) and/or one or more modified nucleotides and/or one or more modified internucleotide linkages and/or one or more other modification when compared with the specified sequence while retaining essentially same or similar complementary properties as the specified sequence.

[0080] In some embodiments, a RNAi oligonucleotide herein comprises a 25-nucleotide sense strand and a 27-nucleotide antisense strand that when acted upon by a Dicer enzyme results in an antisense strand that is incorporated into the mature RNA-induced silencing complex (RISC). In some embodiments, the 25-nucleotide sense strand comprises a sequence selected from SEQ ID NOs: 1-384. In some embodiments, the 27-nucleotide antisense strand comprises a sequence selected from SEQ ID NOs: 385-768. In some embodiments, the sense strand is longer than 27 nucleotides (*e.g.*, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, or 50 nucleotides). In some embodiments, the sense strand is longer than 25 nucleotides (*e.g.*,

26, 27, 28, 29, or 30 nucleotides). In some embodiments, the sense strand comprises a nucleotide sequence selected from SEQ ID NOs: 1683-2066, wherein the nucleotide sequence is longer than 27 nucleotides (*e.g.*, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, or 50 nucleotides). In some embodiments, the sense strand comprises a nucleotide sequence selected from SEQ ID NOs: 1683-2066, wherein the nucleotide sequence is longer than 25 nucleotides (*e.g.*, 26, 27, 28, 29, or 30 nucleotides).

[0081] In some embodiments, the oligonucleotide has one 5′ end that is thermodynamically less stable when compared to the other 5′ end. In some embodiments, an asymmetric RNAi oligonucleotide is provided that comprises a blunt end at the 3′ end of a sense strand and a 3′ overhang at the 3′ end of an antisense strand. In some embodiments, the 3′ overhang on the antisense strand is about 1 to about 8 nucleotides in length (*e.g.*, 1, 2, 3, 4, 5, 6, 7, or 8 nucleotides in length). Typically, the oligonucleotide has a two-nucleotide overhang on the 3′ end of the antisense strand. However, other overhangs are possible. In some embodiments, the overhang is a 3′ overhang comprising a length of between 1 and 6 nucleotides, optionally 1 to 5, 1 to 4, 1 to 3, 1 to 2, 2 to 6, 2 to 5, 2 to 4, 2 to 3, 3 to 6, 3 to 5, 3 to 4, 4 to 6, 4 to 5, 5 to 6 nucleotides, or 1, 2, 3, 4, 5, or 6 nucleotides. In other embodiments, the overhang is a 5′ overhang comprising a length of between 1 and 6 nucleotides, optionally 1 to 5, 1 to 4, 1 to 3, 1 to 2, 2 to 6, 2 to 5, 2 to 4, 2 to 3, 3 to 6, 3 to 5, 3 to 4, 4 to 6, 4 to 5, 5 to 6 nucleotides, or 1, 2, 3, 4, 5, or 6 nucleotides.

[0082] In some embodiments, two terminal nucleotides on the 3′ end of the antisense strand are modified. In some embodiments, the two terminal nucleotides on the 3′ end of the antisense strand are complementary with the target mRNA (*e.g.*, SNCA mRNA). In some embodiments, the two terminal nucleotides on the 3′ end of the antisense strand are not complementary with the target mRNA. In some embodiments, the two terminal nucleotides on the 3’ end of the antisense strand of the oligonucleotide are unpaired. In some embodiments, the two terminal nucleotides on the 3’ end of the antisense strand of the oligonucleotide comprise an unpaired GG. In some embodiments, the two terminal nucleotides on the 3’ end of the antisense strand of the oligonucleotide are not complementary to the target mRNA. In some embodiments, two terminal nucleotides on each 3′ end of the oligonucleotide are GG. Typically, one or both of the two terminal GG nucleotides on each 3′ end of a ds oligonucleotide are not complementary with the target mRNA. In some

embodiments, two terminal nucleotides on each 3′ end of the oligonucleotide are GG. In some embodiments, one or both of the two terminal GG nucleotides on each 3′ end of the oligonucleotide are not complementary with the target mRNA. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of any one of SEQ ID NOs: 2067-2045, wherein the two terminal nucleotides on the 3′ end of the antisense strand of the oligonucleotide comprise an unpaired GG. In some embodiments, the oligonucleotide comprises an antisense strand comprising a nucleotide sequence selected from SEQ ID NOs: 2067-2450, wherein the two terminal nucleotides on the 3′ end of the antisense strand of the oligonucleotide comprise an unpaired GG. In some embodiments, the oligonucleotide comprises a sense strand comprising a nucleotide sequence selected from SEQ ID NOs: 1683-2066 and antisense strand comprising a nucleotide sequence selected from SEQ ID NOs: 2067-2450, wherein the two terminal nucleotides on the 3′ end of the antisense strand of the oligonucleotide comprise an unpaired GG.

[0083] In some embodiments, there is one or more (*e.g.*, 1, 2, 3, 4, or 5) mismatch(es) between the sense and antisense strands comprising an oligonucleotide herein. If there is more than one mismatch between the sense and antisense strands, they may be positioned consecutively (*e.g.*, 2, 3, or more in a row) or may be interspersed throughout the region of complementarity. In some embodiments, the 3′ end of the sense strand contains one or more mismatches. In one embodiment, two mismatches are incorporated at the 3′ end of the sense strand. In some embodiments, base mismatches or destabilization of segments at the 3′ end of the sense strand of the oligonucleotide improves or increases the potency of the oligonucleotide.

[0084] In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand comprising nucleotide sequences selected from:

a) SEQ ID NOs: 1537 and 1572, respectively;

b) SEQ ID NOs: 1538 and 1573, respectively;

c) SEQ ID NOs: 1539 and 1574, respectively;

d) SEQ ID NOs: 1540 and 1575, respectively;

e) SEQ ID NOs: 1541 and 1576, respectively;

f) SEQ ID NOs: 1542 and 1577, respectively;

g) SEQ ID NOs: 1543 and 1578, respectively;
h) SEQ ID NOs: 1544 and 1579, respectively;
i) SEQ ID NOs: 1545 and 1580, respectively;
j) SEQ ID NOs: 1546 and 1581, respectively;
k) SEQ ID NOs: 1547 and 1582, respectively;
l) SEQ ID NOs: 1548 and 1583, respectively;
m) SEQ ID NOs: 1549 and 1584, respectively;
n) SEQ ID NOs: 1550 and 1585, respectively;
o) SEQ ID NOs: 1551 and 1586, respectively;
p) SEQ ID NOs: 1552 and 1587, respectively;
q) SEQ ID NOs: 1553 and 1588, respectively;
r) SEQ ID NOs: 1554 and 1589, respectively;
s) SEQ ID NOs: 1555 and 1590, respectively;
t) SEQ ID NOs: 1556 and 1591, respectively;
u) SEQ ID NOs: 1557 and 1592, respectively;
v) SEQ ID NOs: 1558 and 1593, respectively;
w) SEQ ID NOs: 1559 and 1594, respectively;
x) SEQ ID NOs: 1560 and 1595, respectively;
y) SEQ ID NOs: 1561 and 1596, respectively;
z) SEQ ID NOs: 1562 and 1597, respectively;
aa) SEQ ID NOs: 1563 and 1598, respectively;
bb) SEQ ID NOs: 1564 and 1599, respectively;
cc) SEQ ID NOs: 1565 and 1600, respectively;
dd) SEQ ID NOs: 1566 and 1601, respectively;
ee) SEQ ID NOs: 1567 and 1602, respectively;
ff) SEQ ID NOs: 1568 and 1603, respectively;
gg) SEQ ID NOs: 1569 and 1604, respectively;
hh) SEQ ID NOs: 1570 and 1605, respectively;
ii) SEQ ID NOs: 1571 and 1606, respectively; and

jj) SEQ ID NOs: 1681 and 1586, respectively,

wherein there is one or more (*e.g.*, 1, 2, 3, 4, or 5) mismatch(s) between the sense and antisense strands.

[0085] In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand comprising nucleotide sequences selected from:

a) SEQ ID NOs: 1540 and 1575, respectively;

b) SEQ ID NOs: 1544 and 1579, respectively;

c) SEQ ID NOs: 1546 and 1581, respectively;

d) SEQ ID NOs: 1551and 1586, respectively;

e) SEQ ID NOs: 1552 and 1587, respectively;

f) SEQ ID NOs: 1553 and 1588, respectively;

g) SEQ ID NOs: 1558 and 1594, respectively;

h) SEQ ID NOs: 1560 and 1595, respectively;

i) SEQ ID NOs: 1564 and 1599, respectively;

j) SEQ ID NOs: 1565 and 1600, respectively;

k) SEQ ID NOs: 1566 and 1601, respectively;

l) SEQ ID NOs: 1570 and 1605, respectively; and

m) SEQ ID NOs: 1681 and 1586, respectively,

wherein there is one or more (*e.g.*, 1, 2, 3, 4, or 5) mismatch(s) between the sense and antisense strands.

[0086] In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand comprising sequence selected from:

a) SEQ ID NOs: 1553 and 1588, respectively;

b) SEQ ID NOs: 1560 and 1595, respectively;

c) SEQ ID NOs: 1564 and 1599, respectively;

d) SEQ ID NOs: 1551 and 1586, respectively;

e) SEQ ID NOs: 1570 and 1605, respectively; and,

f) SEQ ID NOs: 1681 and 1586, respectively,

wherein there is one or more (e.g., 1, 2, 3, 4 or 5) mismatch(s) between the sense and antisense strands.

Antisense Strands

[0087] In some embodiments, an antisense strand of an oligonucleotide is referred to as a "guide strand," which engages with RISC and binds to an *Argonaute* protein such as Ago2, or engages with or binds to one or more similar factors, and directs silencing of a target gene. In some embodiments, a sense strand complementary to the antisense strand is referred to as a "passenger strand."

[0088] In some embodiments, the oligonucleotide comprises an antisense strand of up to about 50 nucleotides in length (*e.g.*, up to 50, up to 40, up to 35, up to 30, up to 27, up to 25, up to 21, up to 19, up to 17, up to 15, or up to 12 nucleotides in length). In some embodiments, the oligonucleotide comprises an antisense strand of at least about 12 nucleotides in length (*e.g.*, at least 12, at least 15, at least 19, at least 21, at least 22, at least 25, at least 27, at least 30, at least 35, or at least 38 nucleotides in length). In some embodiments, the antisense strand is in a range of about 12 to about 40 (*e.g.*, 12 to 40, 12 to 36, 12 to 32, 12 to 28, 15 to 40, 15 to 36, 15 to 32, 15 to 30, 15 to 28, 17 to 22, 17 to 25, 19 to 27, 19 to 30, 20 to 40, 22 to 40, 25 to 40, or 32 to 40) nucleotides in length. In some embodiments, the oligonucleotide comprises an antisense of 15 to 30 nucleotides in length. In some embodiments, the antisense strand of any one of the oligonucleotides disclosed herein is of 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, or 40 nucleotides in length. In some embodiments, the antisense strand is 22 nucleotides in length.

[0089] In some embodiments, the antisense strand comprises or consists of a sequence as set forth in any one of SEQ ID NOs: 1683-2066. In some embodiments, the antisense strand comprises at least about 12 (*e.g.*, at least 12, at least 13, at least 14, at least 15, at least 16, at least 17, at least 18, at least 19, at least 20, at least 21, at least 22, or at least 23) contiguous nucleotides of a sequence as set forth in any one of SEQ ID NOs: 2067-2450. In some embodiments, the antisense strand comprises or consists of a sequence as set forth in any one of SEQ ID NOs: 385-768. In some embodiments, the antisense strand comprises at least about 12 (*e.g.*, at least 12, at least 13,

at least 14, at least 15, at least 16, at least 17, at least 18, at least 19, at least 20, at least 21, at least 22, or at least 23) contiguous nucleotides of a sequence as set forth in any one of SEQ ID NOs: 385-768. In some embodiments, the antisense strand comprises or consists of a sequence as set forth in any one of SEQ ID NOs: 1572-1606. In some embodiments, the antisense strand comprises at least about 12 (*e.g.*, at least 12, at least 13, at least 14, at least 15, at least 16, at least 17, at least 18, at least 19, at least 20, at least 21, at least 22, or at least 23) contiguous nucleotides of a sequence as set forth in any one of SEQ ID NOs: 1572-1606. In some embodiments, the antisense strand comprises or consists of a sequence as set forth in any one of SEQ ID NOs: 2067-2450. In some embodiments, the antisense strand comprises at least about 12 (*e.g.*, at least 12, at least 13, at least 14, at least 15, at least 16, at least 17, at least 18, at least 19, at least 20, at least 21, at least 22, or at least 23) contiguous nucleotides of a sequence as set forth in any one of SEQ ID NOs: 2067-2450. In some embodiments, the antisense strand comprises or consists of a sequence as set forth in any one of SEQ ID NOs: 1575, 1579, 1581, 1586, 1587, 1588, 1594, 1595, 1599, 1600, 1601, 1605, and 1586. In some embodiments, the antisense strand comprises at least about 12 (*e.g.*, at least 12, at least 13, at least 14, at least 15, at least 16, at least 17, at least 18, at least 19, at least 20, at least 21, at least 22, or at least 23) contiguous nucleotides of a sequence as set forth in any one of SEQ ID NOs: 1575, 1579, 1581, 1586, 1587, 1588, 1594, 1595, 1599, 1600, 1601, 1605, and 1586. In some embodiments, the antisense strand comprises or consists of a sequence as set forth in any one of SEQ ID NOs: 1588, 1595, 1599, 1586, and 1605. In some embodiments, the antisense strand comprises at least about 12 (*e.g.*, at least 12, at least 13, at least 14, at least 15, at least 16, at least 17, at least 18, at least 19, at least 20, at least 21, at least 22, or at least 23) contiguous nucleotides of a sequence as set forth in any one of SEQ ID NOs: 1588, 1595, 1599, 1586, and 1605.

Sense Strands

[0090] In some embodiments, the oligonucleotide comprises a sense strand sequence as set forth in in any one of SEQ ID NOs: 1683-2066. In some embodiments, the sense strand comprises at least about 12 (*e.g.*, at least 13, at least 14, at least 15, at least 16, at least 17, at least 18, at least 19, at least 20, at least 21, at least 22, or at least 23) contiguous nucleotides of a sequence as set

forth in in any one of SEQ ID NOs: 1683-2066. In some embodiments, the sense strand comprises a sequence a set forth in any one of SEQ ID NOs: 1-384. In some embodiments, the sense strand comprises at least about 12 (*e.g.*, at least 13, at least 14, at least 15, at least 16, at least 17, at least 18, at least 19, at least 20, at least 21, at least 22, or at least 23) contiguous nucleotides of a sequence as set forth in in any one of SEQ ID NOs: 1-384. In some embodiments, the sense strand comprises a sequence as set forth in any one of SEQ ID NOs: 1537-1571. In some embodiments, the sense strand comprises a sequence as set forth in any one of SEQ ID NOs: 1537-1571 and 1681. In some embodiments, the sense strand is SEQ ID NO: 1681. In some embodiments, the sense strand comprises at least about 12 (*e.g.*, at least 13, at least 14, at least 15, at least 16, at least 17, at least 18, at least 19, at least 20, at least 21, at least 22, or at least 23) contiguous nucleotides of a sequence as set forth in any one of SEQ ID NOs: 1537-1571. In some embodiments, the sense strand comprises a sequence as set forth in any one of SEQ ID NOs: 1781, 1782, 1796, 1798, 1802, 1808, 1814, 1817, 1713, 1718, 1726, 1830, 1839, 1742, 1846, 1852, 1865, 1784, 1804, 1721, 1822, 1840, 1735, 1847, 1855, 1864, 1901, 1902, 1938, 1947, 1955, 1964, 1973, and 1978. In some embodiments, the sense strand comprises at least about 12 (*e.g.*, at least 13, at least 14, at least 15, at least 16, at least 17, at least 18, at least 19, at least 20, at least 21, at least 22, or at least 23) contiguous nucleotides of a sequence as set forth in any one of SEQ ID NOs: 1781, 1782, 1796, 1798, 1802, 1808, 1814, 1817, 1713, 1718, 1726, 1830, 1839, 1742, 1846, 1852, 1865, 1784, 1804, 1721, 1822, 1840, 1735, 1847, 1855, 1864, 1901, 1902, 1938, 1947, 1955, 1964, 1973, and 1978. In some embodiments, the sense strand comprises a sequence as set forth in any one of SEQ ID NOs: 1540, 1544, 1546, 1551, 1552, 1553, 1558, 1560, 1564, 1565, 1566, and 1570. In some embodiments, the sense strand comprises at least about 12 (*e.g.*, at least 13, at least 14, at least 15, at least 16, at least 17, at least 18, at least 19, at least 20, at least 21, at least 22 or at least 23) contiguous nucleotides of a sequence as set forth in any one of SEQ ID NOs: 1540, 1544, 1546, 1551, 1552, 1553, 1558, 1560, 1564, 1565, 1566, and 1570. In some embodiments, the sense strand comprises a sequence as set forth in any one of SEQ ID NOs: 1553, 1560, 1564, 1551, and 1570. In some embodiments, the sense strand that comprises at least about 12 (*e.g.*, at least 13, at least 14, at least 15, at least 16, at least 17, at least 18, at least 19, at least 20, at least 21, at least 22, or

at least 23) contiguous nucleotides of a sequence as set forth in any one of SEQ ID NOs: 1553, 1560, 1564, 1551, and 1570.

[0091] In some embodiments, the oligonucleotide comprises a sense strand sequence as set forth in any one of SEQ ID NOs: 1540, 1544, 1546, 1551, 1552, 1553, 1558, 1560, 1564, 1565, 1566, 1570, and 1681. In some embodiments, the sense strand comprises at least about 12 (*e.g.*, at least 13, at least 14, at least 15, at least 16, at least 17, at least 18, at least 19, at least 20, at least 21, at least 22, or at least 23) contiguous nucleotides of a sequence as set forth in any one of SEQ ID NOs: 1540, 1544, 1546, 1551, 1552, 1553, 1558, 1560, 1564, 1565, 1566, 1570, and 1681. In some embodiments, the sense strand comprises a sequence as set forth in any one of SEQ ID NOs: 1553, 1560, 1564, 1551, 1570, and 1681. In some embodiments, the sense strand comprises at least about 12 (*e.g.*, at least 13, at least 14, at least 15, at least 16, at least 17, at least 18, at least 19, at least 20, at least 21, at least 22, or at least 23) contiguous nucleotides of a sequence as set forth in any one of SEQ ID NOs: 1553, 1560, 1564, 1551, 1570, and 1681.

[0092] In some embodiments, the sense strand comprises up to about 50 nucleotides in length (*e.g.*, up to 50, up to 40, up to 36, up to 30, up to 27, up to 25, up to 21, up to 19, up to 17, or up to 12 nucleotides in length). In some embodiments, the sense strand comprises at least about 12 nucleotides in length (*e.g.*, at least 12, at least 15, at least 19, at least 21, at least 25, at least 27, at least 30, at least 36, or at least 38 nucleotides in length). In some embodiments, the sense strand is in a range of about 12 to about 50 (*e.g.*, 12 to 50, 12 to 40, 12 to 36, 12 to 32, 12 to 28, 15 to 40, 15 to 36, 15 to 32, 15 to 28, 17 to 21, 17 to 25, 19 to 27, 19 to 30, 20 to 40, 22 to 40, 25 to 40, or 32 to 40) nucleotides in length. In some embodiments, the sense strand comprises 15 to 50 nucleotides in length. In some embodiments, the sense strand comprises 18 to 36 nucleotides in length. In some embodiments, the sense strand comprises 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, or 50 nucleotides in length. In some embodiments, the sense strand is 36 nucleotides in length.

[0093] In some embodiments, the sense strand comprises a stem-loop structure at its 3′ end. In some embodiments, the stem-loop is formed by intrastrand base pairing. In some embodiments, the sense strand comprises a stem-loop structure at its 5′ end. In some embodiments, the stem of the stem-loop comprises a duplex of 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, or 14 nucleotides in length.

In some embodiments, the stem of the stem-loop comprises a duplex of 2 nucleotides in length. In some embodiments, the stem of the stem-loop comprises a duplex of 3 nucleotides in length. In some embodiments, the stem of the stem-loop comprises a duplex of 4 nucleotides in length. In some embodiments, the stem of the stem-loop comprises a duplex of 5 nucleotides in length. In some embodiments, the stem of the stem-loop comprises a duplex of 6 nucleotides in length. In some embodiments, the stem of the stem-loop comprises a duplex of 7 nucleotides in length. In some embodiments, the stem of the stem-loop comprises a duplex of 8 nucleotides in length. In some embodiments, the stem of the stem-loop comprises a duplex of 9 nucleotides in length. In some embodiments, the stem of the stem-loop comprises a duplex of 10 nucleotides in length. In some embodiments, the stem of the stem-loop comprises a duplex of 11 nucleotides in length. In some embodiments, the stem of the stem-loop comprises a duplex of 12 nucleotides in length. In some embodiments, the stem of the stem-loop comprises a duplex of 13 nucleotides in length. In some embodiments, the stem of the stem-loop comprises a duplex of 14 nucleotides in length.

[0094] In some embodiments, a stem-loop provides the oligonucleotide protection against degradation (*e.g.*, enzymatic degradation), facilitates or improves targeting and/or delivery to a target cell, tissue, or organ (*e.g.*, the liver or brain), or both. For example, in some embodiments, the loop of the stem-loop provides nucleotides comprising one or more modifications that facilitate, improve, or increase targeting to a target mRNA (*e.g.*, a SNCA mRNA), inhibition of target gene expression (*e.g.*, *SNCA* gene expression), and/or delivery to a target cell, tissue, or organ (*e.g.*, the CNS), or a combination thereof. In some embodiments, the stem-loop itself or modification(s) to the stem-loop do not substantially affect the inherent gene expression inhibition activity of the oligonucleotide, but facilitates, improves, or increases stability (*e.g.*, provides protection against degradation) and/or delivery of the oligonucleotide to a target cell, tissue, or organ (*e.g.*, the CNS). In certain embodiments, the oligonucleotide comprises a sense strand comprising (*e.g.*, at its 3′ end) a stem-loop set forth as: S1-L-S2, in which S1 is complementary to S2, and in which L forms a single-stranded loop between S1 and S2 of up to about 10 nucleotides in length (*e.g.*, 3, 4, 5, 6, 7, 8, 9, or 10 nucleotides in length). In some embodiments, the loop (L) is 3 nucleotides in length (*e.g.*, triloop or triL). In some embodiments, the loop (L) is 4 nucleotides in length (*e.g.*, tetraloop or tetraL). In some embodiments, the loop (L) is 5 nucleotides in length

(*e.g.*, pentaloop or pentaL). In some embodiments, the loop (L) is 6 nucleotides in length (*e.g.*, hexaloop or hexaL). In some embodiments, the loop (L) is 7 nucleotides in length (*e.g.*, heptaloop or heptaL). In some embodiments, the loop (L) is 8 nucleotides in length (*e.g.*, octaloop or octaL). In some embodiments, the loop (L) is 9 nucleotides in length (*e.g.*, nonaloop or nonaL). In some embodiments, the loop (L) is 10 nucleotides in length (*e.g.*, decaloop or decaL).

[0095] In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of any one of SEQ ID NOs: 1683-2066, and the oligonucleotide comprises a sense strand comprising (*e.g.*, at its 3′ end) a stem-loop set forth as: S1-L-S2, in which S1 is complementary to S2, and in which L forms a ss loop between S1 and S2 of up to about 10 nucleotides in length (*e.g.*, 3, 4, 5, 6, 7, 8, 9, or 10 nucleotides in length). In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of any one of SEQ ID NOs: 1683-2066, and the oligonucleotide comprises a sense strand comprising (*e.g.*, at its 3′ end) a stem-loop set forth as: S1-L-S2, in which S1 is complementary to S2, and in which L forms a ss loop between S1 and S2 of 4 nucleotides in length. In some embodiments, a loop (L) of a stem-loop having the structure S1-L-S2 as described above is a tetraL as described in US Patent No. 10,131,912, incorporated herein by reference (*e.g.*, within a nicked tetraloop structure). In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of any one of SEQ ID NOs: 1683-2066 and a tetraL. In some embodiments, the tetraloop comprises the sequence 5'-GAAA-3'. In some embodiments, the stem loop comprises the sequence 5'-GCAGCCGAAAGGCUGC-3' (SEQ ID NO: 1680).

[0096] In other embodiments, the loop (L) is a triL. In some embodiments, the oligonucleotide comprises a targeting sequence or a region of complementary that is complementary to a contiguous sequence of nucleotides of any one of SEQ ID NOs: 1683-2066 and a triL. In some embodiments, the triL comprises ribonucleotides, deoxyribonucleotides, modified nucleotides, delivery ligands, and combinations thereof.

Duplex Length

[0097] In some embodiments, a duplex formed between the sense and antisense strands is at least about 12 (*e.g.,* at least 15, at least 16, at least 17, at least 18, at least 19, at least 20, or at least 21) nucleotides in length. In some embodiments, the duplex is in the range of about 12 to about 30 nucleotides in length (*e.g.*, 12 to 30, 12 to 27, 12 to 22, 15 to 25, 18 to 30, 18 to 22, 18 to 25, 18 to 27, 18 to 30, 19 to 30, or 21 to 30 nucleotides in length). In some embodiments, the duplex is 12, 13, 14, 15, 16, 17, 18, 19, 29, 21, 22, 23, 24, 25, 26, 27, 28, 29, or 30 nucleotides in length. In some embodiments, the duplex is 12 nucleotides in length. In some embodiments, the duplex is 13 nucleotides in length. In some embodiments, the duplex is 14 nucleotides in length. In some embodiments, the duplex is 15 nucleotides in length. In some embodiments, the duplex is 16 nucleotides in length. In some embodiments, the duplex is 17 nucleotides in length. In some embodiments, the duplex is 18 nucleotides in length. In some embodiments, the duplex is 19 nucleotides in length. In some embodiments, the duplex is 20 nucleotides in length. In some embodiments, the duplex is 21 nucleotides in length. In some embodiments, the duplex is 22 nucleotides in length. In some embodiments, the duplex is 23 nucleotides in length. In some embodiments, the duplex formed is 24 nucleotides in length. In some embodiments, the duplex is 25 nucleotides in length. In some embodiments, the duplex is 26 nucleotides in length. In some embodiments, the duplex is 27 nucleotides in length. In some embodiments, the duplex is 28 nucleotides in length. In some embodiments, the duplex is 29 nucleotides in length. In some embodiments, the duplex is 30 nucleotides in length. In some embodiments, the duplex does not span the entire length of the sense strand and/or the antisense strand. In some embodiments, the duplex spans the entire length of either the sense or antisense strands. In some embodiments, the duplex spans the entire length of both the sense strand and the antisense strand.

[0098] In some embodiments, the sense and antisense strands comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1537 and 1572, respectively;

b) SEQ ID NOs: 1538 and 1573, respectively;

c) SEQ ID NOs: 1539 and 1574, respectively;

d) SEQ ID NOs: 1540 and 1575, respectively;

e) SEQ ID NOs: 1541 and 1576, respectively;

f) SEQ ID NOs: 1542 and 1577, respectively;
g) SEQ ID NOs: 1543 and 1578, respectively;
h) SEQ ID NOs: 1544 and 1579, respectively;
i) SEQ ID NOs: 1545 and 1580, respectively;
j) SEQ ID NOs: 1546 and 1581, respectively;
k) SEQ ID NOs: 1547 and 1582, respectively;
l) SEQ ID NOs: 1548 and 1583, respectively;
m) SEQ ID NOs: 1549 and 1584, respectively;
n) SEQ ID NOs: 1550 and 1585, respectively;
o) SEQ ID NOs: 1551 and 1586, respectively;
p) SEQ ID NOs: 1552 and 1587, respectively;
q) SEQ ID NOs: 1553 and 1588, respectively;
r) SEQ ID NOs: 1554 and 1589, respectively;
s) SEQ ID NOs: 1555 and 1590, respectively;
t) SEQ ID NOs: 1556 and 1591, respectively;
u) SEQ ID NOs: 1557 and 1592, respectively;
v) SEQ ID NOs: 1558 and 1593, respectively;
w) SEQ ID NOs: 1559 and 1594, respectively;
x) SEQ ID NOs: 1560 and 1595, respectively;
y) SEQ ID NOs: 1561 and 1596, respectively;
z) SEQ ID NOs: 1562 and 1597, respectively;
aa) SEQ ID NOs: 1563 and 1598, respectively;
bb) SEQ ID NOs: 1564 and 1599, respectively;
cc) SEQ lD NOs: 1565 and 1600, respectively;
dd) SEQ ID NOs: 1566 and 1601, respectively;
ee) SEQ ID NOs: 1567 and 1602, respectively;
ff) SEQ ID NOs: 1568 and 1603, respectively;
gg) SEQ ID NOs: 1569 and 1604, respectively;
hh) SEQ ID NOs: 1570 and 1605, respectively;

ii) SEQ ID NOs: 1571 and 1606, respectively; and

jj) SEQ ID NOs: 1681 and 1586, respectively,

wherein a duplex formed between the sense and antisense strands is in the range of about 12 to about 30 nucleotides in length (*e.g.*, 12 to 30, 12 to 27, 12 to 22, 15 to 25, 18 to 30, 18 to 22, 18 to 25, 18 to 27, 18 to 30, 19 to 30, or 21 to 30 nucleotides in length).

[0099] In some embodiments, the sense and antisense strands comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1540 and 1575, respectively;

b) SEQ ID NOs: 1544 and 1579, respectively;

c) SEQ ID NOs: 1546 and 1581, respectively;

d) SEQ ID NOs: 1551and 1586, respectively;

e) SEQ ID NOs: 1552 and 1587, respectively;

f) SEQ ID NOs: 1553 and 1588, respectively;

g) SEQ ID NOs: 1558 and 1594, respectively;

h) SEQ ID NOs: 1560 and 1595, respectively;

i) SEQ ID NOs: 1564 and 1599, respectively;

j) SEQ ID NOs: 1565 and 1600, respectively;

k) SEQ ID NOs: 1566 and 1601, respectively;

l) SEQ ID NOs: 1570 and 1605, respectively; and

m) SEQ ID NOs: 1681 and 1586, respectively,

wherein a duplex formed between the sense and antisense strands is in the range of about 12 to about 30 nucleotides in length (*e.g.*, 12 to 30, 12 to 27, 12 to 22, 15 to 25, 18 to 30, 18 to 22, 18 to 25, 18 to 27, 18 to 30, 19 to 30, or 21 to 30 nucleotides in length).

[0100] In some embodiments, the sense and antisense strands comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1553 and 1588, respectively;

b) SEQ ID NOs: 1560 and 1595, respectively;

c) SEQ ID NOs: 1564 and 1599, respectively;

d) SEQ ID NOs: 1551 and 1586, respectively;

e) SEQ ID NOs: 1570 and 1605, respectively; and,

f) SEQ ID NOs: 1681 and 1586, respectively,

wherein a duplex formed between the sense and antisense strands is in the range of about 12 to about 30 nucleotides in length (*e.g.*, 12 to 30, 12 to 27, 12 to 22, 15 to 25, 18 to 30, 18 to 22, 18 to 25, 18 to 27, 18 to 30, 19 to 30, or 21 to 30 nucleotides in length).

Oligonucleotide Termini

[0101] In some embodiments, the oligonucleotide (*e.g.*, a RNAi oligonucleotide) comprises a sense strand and an antisense strand, wherein the termini of either or both strands comprise a blunt end. In some embodiments, the oligonucleotide comprises sense and antisense strands that are separate strands that form an asymmetric duplex region having an overhang at the 3' terminus of the antisense strand. In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand, wherein the termini of either or both strands comprise an overhang comprising one or more nucleotides. In some embodiments, the one or more nucleotides comprising the overhang are unpaired nucleotides. In some embodiments, the oligonucleotide herein comprises a sense strand and an antisense strand, wherein the 3' termini of the sense strand and the 5' termini of the antisense strand comprise a blunt end. In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand, wherein the 5' termini of the sense strand and the 3' termini of the antisense strand comprise a blunt end.

[0102] In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand, wherein a 3' terminus of either or both strands comprises a 3' overhang comprising one or more nucleotides. In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand, wherein the sense strand comprises a 3' overhang comprising one or more nucleotides. In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand, wherein the antisense strand comprises a 3' overhang comprising one or more nucleotides. In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand, wherein both the sense strand and the antisense strand comprise a 3' overhang comprising one or more nucleotides.

[0103] In some embodiments, the 3' overhang is about 1 to about 20 nucleotides in length (*e.g.*, about 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, or about 20 nucleotides in length). In some embodiments, the 3' overhang is about 1 to 19, 1 to 18, 1 to 17, 1 to 16, 1 to 15, 1 to 14, 1 to 13, 1 to 12, 1 to 11, 1 to 10, 1 to 9, 1 to 8, 1 to 7, 1 to 6, 1 to 5, 1 to 4, 1 to 3, or 1 to 2 nucleotides in length. In some embodiments, the 3' overhang is 1 nucleotide in length. In some embodiments, the 3' overhang is 2 nucleotides in length. In some embodiments, the 3' overhang is 3 nucleotides in length. In some embodiments, the 3'-overhang is 4 nucleotides in length. In some embodiments, the 3' overhang is 5 nucleotides in length. In some embodiments, the 3' overhang is 6 nucleotides in length. In some embodiments, the 3' overhang is 7 nucleotides in length. In some embodiments, the 3' overhang is 8 nucleotides in length. In some embodiments, the 3' overhang is 9 nucleotides in length. In some embodiments, the 3' overhang is 10 nucleotides in length. In some embodiments, the 3' overhang is 11 nucleotides in length. In some embodiments, the 3' overhang is 12 nucleotides in length. In some embodiments, the 3' overhang is 13 nucleotides in length. In some embodiments, the 3' overhang is 14 nucleotides in length. In some embodiments, the 3' overhang is 15 nucleotides in length. In some embodiments, the 3' overhang is 16 nucleotides in length. In some embodiments, the 3' overhang is 17 nucleotides in length. In some embodiments, the 3' overhang is 18 nucleotides in length. In some embodiments, the 3' overhang is 19 nucleotides in length. In some embodiments, the 3' overhang is 20 nucleotides in length.

[0104] In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand, wherein the sense and antisense strands comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1537 and 1572, respectively;

b) SEQ ID NOs: 1538 and 1573, respectively;

c) SEQ ID NOs: 1539 and 1574, respectively;

d) SEQ ID NOs: 1540 and 1575, respectively;

e) SEQ ID NOs: 1541 and 1576, respectively;

f) SEQ ID NOs: 1542 and 1577, respectively;

g) SEQ ID NOs: 1543 and 1578, respectively;

h) SEQ ID NOs: 1544 and 1579, respectively;
i) SEQ ID NOs: 1545 and 1580, respectively;
j) SEQ ID NOs: 1546 and 1581, respectively;
k) SEQ ID NOs: 1547 and 1582, respectively;
l) SEQ ID NOs: 1548 and 1583, respectively;
m) SEQ ID NOs: 1549 and 1584, respectively;
n) SEQ ID NOs: 1550 and 1585, respectively;
o) SEQ ID NOs: 1551 and 1586, respectively;
p) SEQ ID NOs: 1552 and 1587, respectively;
q) SEQ ID NOs: 1553 and 1588, respectively;
r) SEQ ID NOs: 1554 and 1589, respectively;
s) SEQ ID NOs: 1555 and 1590, respectively;
t) SEQ ID NOs: 1556 and 1591, respectively;
u) SEQ ID NOs: 1557 and 1592, respectively;
v) SEQ ID NOs: 1558 and 1593, respectively;
w) SEQ ID NOs: 1559 and 1594, respectively;
x) SEQ ID NOs: 1560 and 1595, respectively;
y) SEQ ID NOs: 1561 and 1596, respectively;
z) SEQ ID NOs: 1562 and 1597, respectively;
aa) SEQ ID NOs: 1563 and 1598, respectively;
bb) SEQ ID NOs: 1564 and 1599, respectively;
cc) SEQ ID NOs: 1565 and 1600, respectively;
dd) SEQ ID NOs: 1566 and 1601, respectively;
ee) SEQ lD NOs: 1567 and 1602, respectively;
ff) SEQ ID NOs: 1568 and 1603, respectively;
gg) SEQ ID NOs: 1569 and 1604, respectively;
hh) SEQ ID NOs: 1570 and 1605, respectively;
ii) SEQ ID NOs: 1571 and 1606, respectively; and
jj) SEQ ID NOs: 1681 and 1586, respectively,

wherein the antisense strand comprises a 3' overhang about 1 to about 20 nucleotides in length (*e.g.*, about 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, or about 20 nucleotides in length), optionally wherein the 3' overhang is 2 nucleotides in length.

[0105] In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand, wherein the sense and antisense strands comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1540 and 1575, respectively;

b) SEQ ID NOs: 1544 and 1579, respectively;

c) SEQ ID NOs: 1546 and 1581, respectively;

d) SEQ ID NOs: 1551and 1586, respectively;

e) SEQ ID NOs: 1552 and 1587, respectively;

f) SEQ ID NOs: 1553 and 1588, respectively;

g) SEQ ID NOs: 1558 and 1594, respectively;

h) SEQ ID NOs: 1560 and 1595, respectively;

i) SEQ ID NOs: 1564 and 1599, respectively;

j) SEQ ID NOs: 1565 and 1600, respectively;

k) SEQ ID NOs: 1566 and 1601, respectively;

l) SEQ ID NOs: 1570 and 1605, respectively; and

m) SEQ ID NOs: 1681 and 1586, respectively,

and wherein the antisense strand comprises a 3'-overhang about 1 to about 20 nucleotides in length (*e.g.*, about 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, or about 20 nucleotides in length), optionally wherein the 3' overhang is 2 nucleotides in length.

[0106] In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand, wherein the sense and antisense strands comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1553 and 1588, respectively;

b) SEQ ID NOs: 1560 and 1595, respectively;

c) SEQ ID NOs: 1564 and 1599, respectively;

d) SEQ ID NOs: 1551 and 1586, respectively;

e) SEQ ID NOs: 1570 and 1605, respectively; and

f) SEQ ID NOs: 1681 and 1586, respectively,

wherein the antisense strand comprises a 3' overhang about 1 to about 20 nucleotides in length (*e.g.*, about 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, or about 20 nucleotides in length), optionally wherein the 3' overhang is 2 nucleotides in length.

[0107] In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand, wherein the sense strand comprises a 5' overhang comprising one or more nucleotides.

[0108] In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand, wherein the sense and antisense strands comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1540 and 1575, respectively;

b) SEQ ID NOs: 1544 and 1579, respectively;

c) SEQ ID NOs: 1546 and 1581, respectively;

d) SEQ ID NOs: 1551and 1586, respectively;

e) SEQ ID NOs: 1552 and 1587, respectively;

f) SEQ ID NOs: 1553 and 1588, respectively;

g) SEQ ID NOs: 1558 and 1594, respectively;

h) SEQ ID NOs: 1560 and 1595, respectively;

i) SEQ ID NOs: 1564 and 1599, respectively;

j) SEQ ID NOs: 1565 and 1600, respectively;

k) SEQ ID NOs: 1566 and 1601, respectively;

l) SEQ ID NOs: 1570 and 1605, respectively; and

m) SEQ ID NOs: 1681 and 1586, respectively,

wherein the antisense strand comprises a 5' overhang about 1 to about 20 nucleotides in length (*e.g.*, about 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, or about 20 nucleotides in length), optionally wherein the 5' overhang is 2 nucleotides in length.

[0109] In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand, wherein the sense and antisense strands comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1553 and 1588, respectively;

b) SEQ ID NOs: 1560 and 1595, respectively;

c) SEQ ID NOs: 1564 and 1599, respectively;

d) SEQ ID NOs: 1551 and 1586, respectively;

e) SEQ ID NOs: 1570 and 1605, respectively; and

f) SEQ ID NOs: 1681 and 1586, respectively,

wherein the antisense strand comprises a 5' overhang about 1 to about 20 nucleotides in length (*e.g.*, about 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, or about 20 nucleotides in length), optionally wherein the 5' overhang is 2 nucleotides in length.

[0110] In some embodiments, one or more (*e.g.*, 2, 3, 4, 5, or more) nucleotides comprising the 3' terminus or 5' terminus of the sense and/or antisense strand are modified. For example, in some embodiments, one or two terminal nucleotides of the 3' terminus of the antisense strand are modified. In some embodiments, the last nucleotide at the 3' terminus of the antisense strand is modified (*e.g.*, comprises a 2' modification, *e.g.*, a 2'-O-methoxyethyl). In some embodiments, the last one or two terminal nucleotides at the 3' terminus of an antisense strand are complementary with the target. In some embodiments, the last one or two nucleotides at the 3' terminus of the antisense strand are not complementary with the target.

[0111] In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand, wherein the 3' terminus of the sense strand comprises a stem-loop described herein, and the 3' terminus of the antisense strand comprises a 3' overhang. In some embodiments, the oligonucleotide comprises a sense strand and an antisense strand that form a nicked tetraL structure, wherein the 3' terminus of the sense strand comprises a stem-loop, wherein the loop (L) is a tetraL described herein, and wherein the 3' terminus of the antisense strand comprises a 3' overhang described herein. In some embodiments, the 3' overhang is 2 nucleotides in length. In some embodiments, the 2 nucleotides comprising the 3' overhang both comprise guanine (G) nucleobases. Typically, one or both of the nucleotides comprising the 3' overhang of the antisense strand are not complementary with the target mRNA.

Oligonucleotide Modifications

[0112] In some embodiments, an oligonucleotide comprises a modification. Oligonucleotides (*e.g.*, a RNAi oligonucleotide) may be modified in various ways to improve or control specificity, stability, delivery, bioavailability, resistance from nuclease degradation, immunogenicity, base-pairing properties, RNA distribution and cellular uptake, and other features relevant to therapeutic research use.

[0113] In some embodiments, the modification is a modified sugar. In some embodiments, the modification is a 5'-terminal phosphate group. In some embodiments, the modification is a modified internucleoside linkage. In some embodiments, the modification is a modified base. In some embodiments, the modification is a reversible modification. In some embodiments, the oligonucleotide can comprise any one of the modifications described herein or any combination thereof. For example, in some embodiments, the oligonucleotide comprises at least one modified sugar, a 5' terminal phosphate group, at least one modified internucleoside linkage, at least one modified base, and at least one reversible modification.

[0114] In some embodiments, the oligonucleotide comprises at least one modified sugar, a 5' terminal phosphate group, at least one modified internucleotide linkage, and at least one modified base. In some embodiments, the sense and antisense strands of the oligonucleotide comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1537 and 1572, respectively;
b) SEQ ID NOs: 1538 and 1573, respectively;
c) SEQ ID NOs: 1539 and 1574, respectively;
d) SEQ ID NOs: 1540 and 1575, respectively;
e) SEQ ID NOs: 1541 and 1576, respectively;
f) SEQ ID NOs: 1542 and 1577, respectively;
g) SEQ ID NOs: 1543 and 1578, respectively;
h) SEQ ID NOs: 1544 and 1579, respectively;
i) SEQ ID NOs: 1545 and 1580, respectively;
j) SEQ ID NOs: 1546 and 1581, respectively;
k) SEQ ID NOs: 1547 and 1582, respectively;
l) SEQ ID NOs: 1548 and 1583, respectively;

m) SEQ ID NOs: 1549 and 1584, respectively;
n) SEQ ID NOs: 1550 and 1585, respectively;
o) SEQ ID NOs: 1551 and 1586, respectively;
p) SEQ ID NOs: 1552 and 1587, respectively;
q) SEQ ID NOs: 1553 and 1588, respectively;
r) SEQ ID NOs: 1554 and 1589, respectively;
s) SEQ ID NOs: 1555 and 1590, respectively;
t) SEQ ID NOs: 1556 and 1591, respectively;
u) SEQ ID NOs: 1557 and 1592, respectively;
v) SEQ ID NOs: 1558 and 1593, respectively;
w) SEQ ID NOs: 1559 and 1594, respectively;
x) SEQ ID NOs: 1560 and 1595, respectively;
y) SEQ ID NOs: 1561 and 1596, respectively;
z) SEQ ID NOs: 1562 and 1597, respectively;
aa) SEQ ID NOs: 1563 and 1598, respectively;
bb) SEQ ID NOs: 1564 and 1599, respectively;
cc) SEQ ID NOs: 1565 and 1600, respectively;
dd) SEQ ID NOs: 1566 and 1601, respectively;
ee) SEQ ID NOs: 1567 and 1602, respectively;
ff) SEQ ID NOs: 1568 and 1603, respectively;
gg) SEQ ID NOs: 1569 and 1604, respectively;
hh) SEQ ID NOs: 1570 and 1605, respectively;
ii) SEQ ID NOs: 1571 and 1606, respectively; and
jj) SEQ ID NOs: 1681 and 1586, respectively,

wherein the oligonucleotide comprises at least one modified sugar, a 5' terminal phosphate group, at least one modified internucleotide linkage, and at least one modified base.

[0115] In some embodiments, the sense and antisense strands comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1540 and 1575, respectively;

b) SEQ ID NOs: 1544 and 1579, respectively;

c) SEQ ID NOs: 1546 and 1581, respectively;

d) SEQ ID NOs: 1551and 1586, respectively;

e) SEQ ID NOs: 1552 and 1587, respectively;

f) SEQ ID NOs: 1553 and 1588, respectively;

g) SEQ ID NOs: 1558 and 1594, respectively;

h) SEQ ID NOs: 1560 and 1595, respectively;

i) SEQ ID NOs: 1564 and 1599, respectively;

j) SEQ ID NOs: 1565 and 1600, respectively;

k) SEQ ID NOs: 1566 and 1601, respectively;

l) SEQ ID NOs: 1570 and 1605, respectively; and

m) SEQ ID NOs: 1681 and 1586, respectively,

wherein the oligonucleotide comprises at least one modified sugar, a 5' terminal phosphate group, at least one modified internucleotide linkage, and at least one modified base.

[0116] In some embodiments, the sense and antisense strands comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1553 and 1588, respectively;

b) SEQ ID NOs: 1560 and 1595, respectively;

c) SEQ ID NOs: 1564 and 1599, respectively;

d) SEQ ID NOs: 1551 and 1586, respectively;

e) SEQ ID NOs: 1570 and 1605, respectively; and

f) SEQ ID NOs: 1681 and 1586, respectively,

wherein the oligonucleotide comprises at least one modified sugar, a 5' terminal phosphate group, at least one modified internucleotide linkage, and at least one modified base.

[0117] The number of modifications on the oligonucleotide and the position of those nucleotide modifications may influence the properties of the oligonucleotide. For example, the oligonucleotide may be delivered *in vivo* by encompassing them in a lipid nanoparticle (LNP) or similar carrier. However, when the oligonucleotide is not protected by an LNP or similar carrier, it may be advantageous for at least some of the nucleotides to be modified. Accordingly, in some

embodiments, all or substantially all of the nucleotides of the oligonucleotide are modified. In some embodiments, more than half of the nucleotides are modified. In some embodiments, less than half of the nucleotides are modified. In some embodiments, the sugar moiety of all nucleotides comprising the oligonucleotide is modified at the 2' position. The modifications may be reversible or irreversible. In some embodiments, the oligonucleotide has a number and type of modified nucleotides sufficient to cause the desired characteristics (*e.g.*, protection from enzymatic degradation, capacity to target a desired cell after *in vivo* administration, and/or thermodynamic stability).

Sugar Modifications

[0118] In some embodiments, the oligonucleotide comprises a modified sugar. In some embodiments, the modified sugar (also referred herein to a sugar analog) includes a modified deoxyribose or ribose moiety in which, for example, one or more modifications occur at the 2′, 3′, 4′ and/or 5′ carbon position of the sugar. In some embodiments, the modified sugar may also include non-natural alternative carbon structures such as those present in locked nucleic acids ("LNA"; *see*, *e.g.*, Koshkin *et al.* (1998) *Tetrahedon* 54:3607-30), unlocked nucleic acids ("UNA"; see, *e.g.*, Snead *et al.* (2013) *Mol. Ther-Nucl. Acids* 2:e103) and bridged nucleic acids ("BNA"; *see*, *e.g.*, Imanishi & Obika (2002) *Chem Commun. (Camb)* 21:1653-59).

[0119] In some embodiments, a nucleotide modification in the sugar comprises a 2′-modification. In some embodiments, the 2′-modification may be 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, 2′-F, 2′-aminoethyl (EA), 2′-OMe, 2′-O-methoxyethyl (2′-MOE), 2′-O-[2-(methylamino)-2-oxoethyl] (2′-O-NMA) or 2′-deoxy-2′-fluoro-β-d-arabinonucleic acid (2′-FANA). In some embodiments, the modification is 2′-F, 2′-OMe or 2′-MOE. In some embodiments, the modified sugar comprises a modification of the sugar ring, which may comprise modification of one or more carbons of the sugar ring. For example, a modification of a sugar of a nucleotide may comprise a 2′-oxygen of a sugar is linked to a 1′-carbon or 4′-carbon of the sugar, or a 2′-oxygen is linked to the 1′-carbon or 4′-carbon *via* an ethylene or methylene bridge. In some embodiments, the modified nucleotide has an acyclic sugar that lacks a 2′-carbon to 3′-carbon

bond. In some embodiments, the modified nucleotide has a thiol group (*e.g.*, in the 4′ position of the sugar).

[0120] In some embodiments, the oligonucleotide comprises at least about 1 modified nucleotide (*e.g.*, at least 1, at least 5, at least 10, at least 15, at least 20, at least 25, at least 30, at least 35, at least 40, at least 45, at least 50, at least 55, at least 60, or more). In some embodiments, the sense strand of the oligonucleotide comprises at least about 1 modified nucleotide (*e.g.*, at least 1, at least 5, at least 10, at least 15, at least 20, at least 25, at least 30, at least 35, or more). In some embodiments, the antisense strand of the oligonucleotide comprises at least about 1 modified nucleotide (*e.g.*, at least 1, at least 5, at least 10, at least 15, at least 20, or more).

[0121] In some embodiments, all the nucleotides of the sense strand are modified. In some embodiments, all the nucleotides of the antisense strand are modified. In some embodiments, all the nucleotides (*i.e.*, both the sense strand and the antisense strand) are modified. In some embodiments, the modified nucleotide comprises a 2′-modification (*e.g.*, a 2′-F or 2′-OMe, 2′-MOE, and 2′-deoxy-2′-fluoro-β-d-arabinonucleic acid). In some embodiments, the modified nucleotide comprises a 2′-modification (*e.g.*, a 2′-F or 2′-OMe)

[0122] In some embodiments, the disclosure provides oligonucleotides having different modification patterns. In some embodiments, the oligonucleotides comprise a sense strand sequence having a modification pattern as set forth in the Examples and Sequence Listing and an antisense strand having a modification pattern as set forth in the Examples and Sequence Listing.

[0123] In some embodiments, the oligonucleotide comprises an antisense strand having nucleotides that are modified with 2′-F. In other embodiments, the oligonucleotide comprises an antisense strand having nucleotides that are modified with 2′-F and 2′-OMe. In some embodiments, the oligonucleotide comprises a sense strand having nucleotides that are modified with 2′-F. In other embodiments, the oligonucleotide comprises a sense strand having nucleotides that are modified with 2′-F and 2′-OMe.

[0124] In some embodiments, the oligonucleotide comprises a sense strand with about 10% to about 15%, or 10%, 11%, 12%, 13%, 14%, or 15% of the nucleotides of the sense strand comprising a 2’-F modification. In some embodiments, the oligonucleotide comprises a sense strand with about 18% to about 23%, or 18%, 19%, 20%, 21%, 22%, or 23% of the nucleotides

comprising a 2'-F modification. In some embodiments, the oligonucleotide comprises a sense strand with about 38% to about 43%, or 38%, 39%, 40%, 41%, 42%, or 43% of the nucleotides comprising a 2'-F modification. In some embodiments, about 11% of the nucleotides of the sense strand comprise a 2-F modification. In some embodiments, about 22% of the nucleotides of the sense strand comprise a 2-F modification. In some embodiments, about 40% of the nucleotides of the sense strand comprise a 2-F modification.

[0125] In some embodiments, the oligonucleotide comprises an antisense strand with about 25% to about 35%, or 25%, 26%, 27%, 28%, 29%, 30%, 31%, 32%, 33%, 34%, or 35% of the nucleotides comprising a 2'-F modification. In some embodiments, about 32% of the nucleotides of the antisense strand comprise a 2'-F modification. In some embodiments, the oligonucleotide has about 15% to about 25%, or 15%, 16%, 17%, 18%, 19%, 20%, 21%, 22%, 23%, 24%, or 25% of the nucleotides comprising a 2'-F modification. In some embodiments, the oligonucleotide has about 35% to about 45%, or 35%, 36%, 37%, 38%, 39%, 40%, 41%, 42%, 43%, 44%, or 45% of the nucleotides comprising a 2'-F modification. In some embodiments, about 19% of the nucleotides comprise a 2'-F modification. In some embodiments, about 29% of the nucleotides comprise a 2'-F modification. In some embodiments, about 40% of the nucleotides comprise a 2'-F modification.

[0126] In some embodiments, one or more of positions 8, 9, 10, or 11 of a 36-nucleotide sense strand are modified with a 2′-F group. In some embodiments, one or more of positions 8, 9, 10, or 11 of a sense strand comprising a stem-loop are modified with a 2'-F group. In some embodiments, the sugar moiety at each of nucleotides at positions 1-7 and 12-20 of a 36-nucleotide sense strand is modified with a 2′-OMe. In some embodiments, the sugar moiety at each of nucleotides at positions 1-7 and 12-20 of a sense strand comprising a stem-loop is modified with a 2'-OMe. In some embodiments, the sugar moiety at each of nucleotides at positions 1-7 and 12-36 in the sense strand is modified with a 2′-OMe.

[0127] In some embodiments, one or more of positions 3, 5, 8, 10, 12, 13, 15, and 17 of the sense strand are modified with a 2′-F group.

[0128] In some embodiments, the antisense strand has 3 nucleotides that are modified at the 2′-position of the sugar moiety with a 2′-F. In some embodiments, the sugar moiety at positions 2, 5,

and 14 and optionally up to 3 of the nucleotides at positions 1, 3, 7 and 10 of the antisense strand are modified with a 2′-F. In some embodiments, the sugar moiety at positions 2, 5, and 14 and optionally up to 3 of the nucleotides at positions 3, 4, 7 and 10 of the antisense strand are modified with a 2′-F. In other embodiments, the sugar moiety at each of the positions at positions 2, 5, and 14 of the antisense strand is modified with the 2′-F. In other embodiments, the sugar moiety at each of the positions at positions 1, 2, 5, and 14 of the antisense strand is modified with the 2′-F. In other embodiments, the sugar moiety at each of the positions at positions 2, 4, 5, and 14 of the antisense strand is modified with the 2′-F. In still other embodiments, the sugar moiety at each of the positions at positions 1, 2, 3, 5, 7, and 14 of the antisense strand is modified with the 2′-F. In other embodiments, the sugar moiety at each of the positions at positions 2, 3, 4, 5, 7, and 14 of the antisense strand is modified with the 2′-F. In yet another embodiment, the sugar moiety at each of the positions at positions 1, 2, 3, 5, 10, and 14 of the antisense strand is modified with the 2′-F. In other embodiments, the sugar moiety at each of the positions at positions 2, 3, 4, 5, 10, and 14 of the antisense strand is modified with the 2′-F. In another embodiment, the sugar moiety at each of the positions at positions 2, 3, 5, 7, 10, and 14 of the antisense strand is modified with the 2′-F. In other embodiments, the sugar moiety at each of the positions at positions 2, 3, 4, 5, 7, 10, and 14 of an antisense strand duplexed with a 36-nucleotide sense strand is modified with the 2′-F. In some embodiments, the sugar moiety at each of the positions at positions 2, 3, 4, 5, 7, 10, and 14 of the antisense strand duplexed with a sense strand comprising a stem-loop is modified with the 2’-F.

[0129] In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety at positions 2 and 14 modified with 2′-F. In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety at positions 2, 5, and 14 modified with 2′-F. In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety at positions 1, 2, 5, and 14 modified with 2′-F. In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety at positions 2, 4, 5, and 14 modified with 2′-F. In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety at positions 1, 2, 3, 5, 7, and 14 modified with 2′-F. In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety at positions 2, 3, 4, 5, 7,

and 14 modified with 2′-F. In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety at positions 1, 2, 3, 5, 10, and 14 modified with 2′-F. In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety at positions 2, 3, 4, 5, 10, and 14 modified with 2′-F. In some embodiments, the oligonucleotide comprises a 36-nucleotide sense strand and an antisense strand, wherein the antisense strand comprises a sugar moiety at positions 2, 3, 4, 5, 7, 10, and 14 modified with 2′-F. In some embodiments, the oligonucleotide comprises a sense strand comprising a stem-loop and an antisense strand, wherein the antisense strand comprises a sugar moiety at positions 2, 3, 4, 5, 7, 10, and 14 modified with 2'-F. In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety at positions 2, 3, 4, 5, 7, 10, 14, 16, and 19 modified with 2′-F.

[0130] In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety of each of the nucleotides at positions 2, 5, and 14 modified with 2′-F and the sugar moiety of each of the remaining nucleotides of the antisense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA.

[0131] In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety of each of the nucleotides at positions 1, 2, 5, and 14 modified with 2′-F and the sugar moiety of each of the remaining nucleotides of the antisense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA.

[0132] In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety of each of the nucleotides at positions 2, 4, 5, and 14 modified with 2′-F and the sugar moiety of each of the remaining nucleotides of the antisense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA.

[0133] In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety of each of the nucleotides at positions 1, 2, 3, 5, 7, and 14 modified with 2′-F and the sugar moiety of each of the remaining nucleotides of the antisense strand modified with a

modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA.

[0134] In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety of each of the nucleotides at positions 2, 3, 4, 5, 7, and 14 modified with 2′-F and the sugar moiety of each of the remaining nucleotides of the antisense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA.

[0135] In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety of each of the nucleotides at positions 1, 2, 3, 5, 10, and 14 modified with 2′-F and the sugar moiety of each of the remaining nucleotides of the antisense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA.

[0136] In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety of each of the nucleotides at positions 2, 3, 4, 5, 10, and 14 modified with 2′-F and the sugar moiety of each of the remaining nucleotides of the antisense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA.

[0137] In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety of each of the nucleotides at positions 2, 3, 5, 7, 10, and 14 modified with 2′-F and the sugar moiety of each of the remaining nucleotides of the antisense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA.

[0138] In some embodiments, the oligonucleotide comprises a 36-nucleotide sense strand and an antisense strand, wherein the antisense strand comprises a sugar moiety at positions 2, 3, 4, 5, 7, 10, and 14 modified with 2′-F and the sugar moiety of each of the remaining nucleotides of the antisense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA. In some embodiments, the oligonucleotide comprises a sense strand comprising a stem-loop and an antisense strand, wherein the antisense strand comprises a sugar moiety at positions 2, 3, 4, 5,

7, 10, and 14 modified with 2′-F and the sugar moiety of each of the remaining nucleotides of the antisense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA.

[0139] In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety of each of the nucleotides at positions 2, 3, 4, 5, 7, 10, 14, 16, and 19 modified with 2′-F and the sugar moiety of each of the remaining nucleotides of the antisense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA.

[0140] In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety at position 1, position 2, position 3, position 4, position 5, position 6, position 7, position 8, position 9, position 10, position 11, position 12, position 13, position 14, position 15, position 16, position 17, position 18, position 19, position 20, position 21, or position 22 modified with 2′-F.

[0141] In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety at position 1, position 2, position 3, position 4, position 5, position 6, position 7, position 8, position 9, position 10, position 11, position 12, position 13, position 14, position 15, position 16, position 17, position 18, position 19, position 20, position 21, or position 22 modified with 2′-OMe.

[0142] In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety at position 1, position 2, position 3, position 4, position 5, position 6, position 7, position 8, position 9, position 10, position 11, position 12, position 13, position 14, position 15, position 16, position 17, position 18, position 19, position 20, position 21, or position 22 modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA.

[0143] In some embodiments, the oligonucleotide comprises a 36-nucleotide sense strand having the sugar moiety at positions 8-11 modified with 2′-F. In some embodiments, the oligonucleotide comprises a sense strand comprising a stem-loop and the sugar moiety at positions 8-11 modified with 2’-F. In some embodiments, the oligonucleotide comprises a 36-nucleotide sense strand having the sugar moiety at positions 1-7 and 12-17 or 12-20 modified with 2’-OMe. In some

embodiments, the oligonucleotide comprises a sense strand comprising a stem-loop and the sugar moiety at positions 1-7 and 12-17 or 12-20 modified with 2'-OMe. In some embodiments, the oligonucleotide comprises a 36-nucleotide sense strand having the sugar moiety at positions 1-7 and 12-17, 12-20 or 12-22 modified with 2'-OMe. In some embodiments, the oligonucleotide comprises a sense strand comprising a stem-loop and the sugar moiety at positions 1-7 and 12-17, 12-20 or 12-22 modified with 2'-OMe. In some embodiments, the oligonucleotide comprises a 36-nucleotide sense strand having the sugar moiety of each of the nucleotides at positions 1-7 and 12-17 or 12-20 of the sense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA. In some embodiments, the oligonucleotide comprises a sense strand comprising a stem-loop and having the sugar moiety of each of the nucleotides at positions 1-7 and 12-17 or 12-20 of the sense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA. In some embodiments, the oligonucleotide comprises a 36-nucleotde sense strand having the sugar moiety of each of the nucleotides at positions 1-7 and 12-17, 12-20 or 12-22 of the sense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA. In some embodiments, the oligonucleotide comprises a sense strand comprising a stem-loop and the sugar moiety of each of the nucleotides at positions 1-7 and 12-17, 12-20 or 12-22 of the sense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA.

[0144] In some embodiments, the oligonucleotide comprises a sense strand having the sugar moiety at positions 3, 5, 8, 10, 12, 13, 15, and 17 modified with 2′-F. In some embodiments, the oligonucleotide comprises a sense strand having the sugar moiety at positions 1, 2, 4, 6, 7, 9, 11, 14, 16, and 18-20 modified with 2'-OMe. In some embodiments, the oligonucleotide comprises a sense strand having the sugar moiety of each of the nucleotides at positions 1, 2, 4, 6, 7, 9, 11, 14, 16, and 18-20 of the sense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA. In some embodiments, the oligonucleotide comprises a sense strand having the sugar

moiety of each of the nucleotides at positions 1-7 and 12-17, 12-20 or 12-22 of the sense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA.

[0145] In some embodiments, the oligonucleotide comprises a sense strand having the sugar moiety at position 1, position 2, position 3, position 4, position 5, position 6, position 7, position 8, position 9, position 10, position 11, position 12, position 13, position 14, position 15, position 16, position 17, position 18, position 19, position 20, position 21, position 22, position 23, position 24, position 25, position 26, position 27, position 28, position 29, position 30, position 31, position 32, position 33, position 34, position 35, or position 36 modified with 2′-F.

[0146] In some embodiments, the oligonucleotide comprises a sense strand having the sugar moiety at position 1, position 2, position 3, position 4, position 5, position 6, position 7, position 8, position 9, position 10, position 11, position 12, position 13, position 14, position 15, position 16, position 17, position 18, position 19, position 20, position 21, position 22, position 23, position 24, position 25, position 26, position 27, position 28, position 29, position 30, position 31, position 32, position 33, position 34, position 35, or position 36 modified with 2′-OMe.

[0147] In some embodiments, the oligonucleotide comprises a sense strand having the sugar moiety at position 1, position 2, position 3, position 4, position 5, position 6, position 7, position 8, position 9, position 10, position 11, position 12, position 13, position 14, position 15, position 16, position 17, position 18, position 19, position 20, position 21, position 22, position 23, position 24, position 25, position 26, position 27, position 28, position 29, position 30, position 31, position 32, position 33, position 34, position 35, or position 36 modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA.

[0148] In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety of each of the nucleotides at positions 2, 3, 4, 5, 7, 10, and 14 of the antisense strand modified with 2′-F and the sugar moiety of each of the remaining nucleotides of the antisense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA; and a sense strand having the sugar moiety at each of the nucleotides at positions 8-11 of the sense strand

modified with 2'-F and the sugar moiety of each of the remaining nucleotides of the sense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA. In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety of each of the nucleotides at positions 2, 3, 4, 5, 7, 10, and 14 of the antisense strand modified with 2′-F and the sugar moiety of each of the remaining nucleotides of the antisense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA; and a sense strand having and stem-loop and the sugar moiety at each of the nucleotides at positions 8-11 of the sense strand modified with 2'-F and the sugar moiety of each of the remaining nucleotides of the sense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA.

[0149] In some embodiments, the oligonucleotide comprises an antisense strand having the sugar moiety of each of the nucleotides at positions 2, 3, 4, 5, 7, 10, 14, 16, and 19 of the antisense strand modified with 2′-F and the sugar moiety of each of the remaining nucleotides of the antisense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA; and a sense strand having the sugar moiety at each of the nucleotides at positions 3, 5, 8, 10, 12, 13, 15, and 17 of the sense strand modified with 2'-F and the sugar moiety of each of the remaining nucleotides of the sense strand modified with a modification selected from the group consisting of 2′-O-propargyl, 2′-O-propylamin, 2′-amino, 2′-ethyl, EA, 2′-OMe, 2′-MOE, 2′-O-NMA, and 2′-FANA.

[0150] In some embodiments, the sense and antisense strands of an oligonucleotide comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1537 and 1572, respectively;

b) SEQ ID NOs: 1538 and 1573, respectively;

c) SEQ ID NOs: 1539 and 1574, respectively;

d) SEQ ID NOs: 1540 and 1575, respectively;

e) SEQ ID NOs: 1541 and 1576, respectively;

f) SEQ ID NOs: 1542 and 1577, respectively;
g) SEQ ID NOs: 1543 and 1578, respectively;
h) SEQ ID NOs: 1544 and 1579, respectively;
i) SEQ ID NOs: 1545 and 1580, respectively;
j) SEQ ID NOs: 1546 and 1581, respectively;
k) SEQ ID NOs: 1547 and 1582, respectively;
l) SEQ ID NOs: 1548 and 1583, respectively;
m) SEQ ID NOs: 1549 and 1584, respectively;
n) SEQ ID NOs: 1550 and 1585, respectively;
o) SEQ ID NOs: 1551 and 1586, respectively;
p) SEQ ID NOs: 1552 and 1587, respectively;
q) SEQ ID NOs: 1553 and 1588, respectively;
r) SEQ ID NOs: 1554 and 1589, respectively;
s) SEQ ID NOs: 1555 and 1590, respectively;
t) SEQ ID NOs: 1556 and 1591, respectively;
u) SEQ ID NOs: 1557 and 1592, respectively;
v) SEQ ID NOs: 1558 and 1593, respectively;
w) SEQ ID NOs: 1559 and 1594, respectively;
x) SEQ ID NOs: 1560 and 1595, respectively;
y) SEQ ID NOs: 1561 and 1596, respectively;
z) SEQ ID NOs: 1562 and 1597, respectively;
aa) SEQ ID NOs: 1563 and 1598, respectively;
bb) SEQ ID NOs: 1564 and 1599, respectively;
cc) SEQ lD NOs: 1565 and 1600, respectively;
dd) SEQ ID NOs: 1566 and 1601, respectively;
ee) SEQ ID NOs: 1567 and 1602, respectively;
ff) SEQ ID NOs: 1568 and 1603, respectively;
gg) SEQ ID NOs: 1569 and 1604, respectively;
hh) SEQ ID NOs: 1570 and 1605, respectively;

ii) SEQ ID NOs: 1571 and 1606, respectively; and

jj) SEQ ID NOs: 1681 and 1586, respectively,

wherein one or more of positions 3, 5, 8, 10, 12, 13, 15, or 17 of the sense strand are modified with a 2′-F group.

[0151] In some embodiments, the sense and antisense strands of the oligonucleotide comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1540 and 1575, respectively;

b) SEQ ID NOs: 1544 and 1579, respectively;

c) SEQ ID NOs: 1546 and 1581, respectively;

d) SEQ ID NOs: 1551and 1586, respectively;

e) SEQ ID NOs: 1552 and 1587, respectively;

f) SEQ ID NOs: 1553 and 1588, respectively;

g) SEQ ID NOs: 1558 and 1594, respectively;

h) SEQ ID NOs: 1560 and 1595, respectively;

i) SEQ ID NOs: 1564 and 1599, respectively;

j) SEQ ID NOs: 1565 and 1600, respectively;

k) SEQ ID NOs: 1566 and 1601, respectively;

l) SEQ ID NOs: 1570 and 1605, respectively; and

m) SEQ ID NOs: 1681 and 1586, respectively,

wherein one or more of positions 3, 5, 8, 10, 12, 13, 15, or 17 of the sense strand are modified with a 2′-F group.

[0152] In some embodiments, the sense and antisense strands of the oligonucleotide comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1553 and 1588, respectively;

b) SEQ ID NOs: 1560 and 1595, respectively;

c) SEQ ID NOs: 1564 and 1599, respectively;

d) SEQ ID NOs: 1551 and 1586, respectively;

e) SEQ ID NOs: 1570 and 1605, respectively; and

f) SEQ ID NOs: 1681 and 1586, respectively,

wherein one or more of positions 3, 5, 8, 10, 12, 13, 15, or 17 of the sense strand are modified with a 2′-F group.

5'-Terminal Phosphate

[0153] In some embodiments, an oligonucleotide described herein (*e.g.*, an RNAi oligonucleotide) comprises a sense strand and an antisense strand, wherein the antisense strand comprises a 5' terminal phosphate. In some embodiments, 5′ terminal phosphate groups enhance the interaction with Ago2. However, oligonucleotides comprising a 5′ phosphate group may be susceptible to degradation *via* phosphatases or other enzymes, which can limit their bioavailability *in vivo*. In some embodiments, oligonucleotides include analogs of 5′ phosphates that are resistant to such degradation. In some embodiments, the phosphate analog is oxymethyl phosphonate, vinyl phosphonate or malonyl phosphonate, or a combination thereof. In certain embodiments, the 5′ end of an oligonucleotide strand is attached to chemical moiety that mimics the electrostatic and steric properties of a natural 5′ phosphate group ("phosphate mimic").

[0154] In some embodiments, the oligonucleotide has a phosphate analog at a 4′-carbon position of the sugar (referred to as a "4′-phosphate analog"). *See*, *e.g.*, Intl. Patent Application Publication No. WO 2018/045317. In some embodiments, the oligonucleotide comprises a 4′-phosphate analog at a 5′ terminal nucleotide. In some embodiments, the phosphate analog is an oxymethyl phosphonate, in which the oxygen atom of the oxymethyl group is bound to the sugar moiety (*e.g.*, at its 4′-carbon) or analog thereof. In other embodiments, the 4′-phosphate analog is a thiomethylphosphonate or an aminomethylphosphonate, in which the sulfur atom of the thiomethyl group or the nitrogen atom of the amino methyl group is bound to the 4′-carbon of the sugar moiety or analog thereof. In certain embodiments, the 4′-phosphate analog is an oxymethyl phosphonate. In some embodiments, the oxymethyl phosphonate is represented by the formula $–O–CH_2–PO(OH)_2$,$–O–CH_2–PO(OR)_2$, or -O-CH2-POOH(R), in which R is independently selected from H, CH_3, an alkyl group, CH_2CH_2CN, $CH_2OCOC(CH_3)_3$, $CH_2OCH_2CH_2Si(CH_3)_3$ or a protecting group. In certain embodiments, the alkyl group is CH_2CH_3. More typically, R is independently selected from H, CH_3, or CH_2CH_3. In some embodiment, R is CH_3. In some embodiments, the 4'-phosphate analog is 4'-oxymethylphosphonate. In some embodiments, the modified nucleotide

having the 4'-phosphonate analog is a uridine. In some embodiments, the modified nucleotide is 4'-O-monomethylphosphonate-2'-O-methyl uridine.

[0155] In some embodiments, the sense and antisense strands of the oligonucleotide comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1537 and 1572, respectively;

b) SEQ ID NOs: 1538 and 1573, respectively;

c) SEQ ID NOs: 1539 and 1574, respectively;

d) SEQ ID NOs: 1540 and 1575, respectively;

e) SEQ ID NOs: 1541 and 1576, respectively;

f) SEQ ID NOs: 1542 and 1577, respectively;

g) SEQ ID NOs: 1543 and 1578, respectively;

h) SEQ ID NOs: 1544 and 1579, respectively;

i) SEQ ID NOs: 1545 and 1580, respectively;

j) SEQ ID NOs: 1546 and 1581, respectively;

k) SEQ ID NOs: 1547 and 1582, respectively;

l) SEQ ID NOs: 1548 and 1583, respectively;

m) SEQ ID NOs: 1549 and 1584, respectively;

n) SEQ ID NOs: 1550 and 1585, respectively;

o) SEQ ID NOs: 1551 and 1586, respectively;

p) SEQ ID NOs: 1552 and 1587, respectively;

q) SEQ ID NOs: 1553 and 1588, respectively;

r) SEQ ID NOs: 1554 and 1589, respectively;

s) SEQ ID NOs: 1555 and 1590, respectively;

t) SEQ ID NOs: 1556 and 1591, respectively;

u) SEQ ID NOs: 1557 and 1592, respectively;

v) SEQ ID NOs: 1558 and 1593, respectively;

w) SEQ ID NOs: 1559 and 1594, respectively;

x) SEQ ID NOs: 1560 and 1595, respectively;

y) SEQ ID NOs: 1561 and 1596, respectively;

z) SEQ ID NOs: 1562 and 1597, respectively;

aa) SEQ ID NOs: 1563 and 1598, respectively;

bb) SEQ ID NOs: 1564 and 1599, respectively;

cc) SEQ ID NOs: 1565 and 1600, respectively;

dd) SEQ ID NOs: 1566 and 1601, respectively;

ee) SEQ ID NOs: 1567 and 1602, respectively;

ff) SEQ ID NOs: 1568 and 1603, respectively;

gg) SEQ ID NOs: 1569 and 1604, respectively;

hh) SEQ ID NOs: 1570 and 1605, respectively;

ii) SEQ ID NOs: 1571 and 1606, respectively; and

jj) SEQ ID NOs: 1681 and 1586, respectively,

wherein the oligonucleotide comprises a 5'-terminal phosphate, optionally a 5'-terminal phosphate analog.

[0156] In some embodiments, the sense and antisense strands of an oligonucleotide comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1540 and 1575, respectively;

b) SEQ ID NOs: 1544 and 1579, respectively;

c) SEQ ID NOs: 1546 and 1581, respectively;

d) SEQ ID NOs: 1551and 1586, respectively;

e) SEQ ID NOs: 1552 and 1587, respectively;

f) SEQ ID NOs: 1553 and 1588, respectively;

g) SEQ ID NOs: 1558 and 1594, respectively;

h) SEQ ID NOs: 1560 and 1595, respectively;

i) SEQ ID NOs: 1564 and 1599, respectively;

j) SEQ ID NOs: 1565 and 1600, respectively;

k) SEQ ID NOs: 1566 and 1601, respectively;

l) SEQ ID NOs: 1570 and 1605, respectively; and

m) SEQ ID NOs: 1681 and 1586, respectively,

wherein the oligonucleotide comprises a 5'-terminal phosphate, optionally a 5'-terminal phosphate analog.

[0157] In some embodiments, the sense and antisense strands of the oligonucleotide comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1553 and 1588, respectively;

b) SEQ ID NOs: 1560 and 1595, respectively;

c) SEQ ID NOs: 1564 and 1599, respectively;

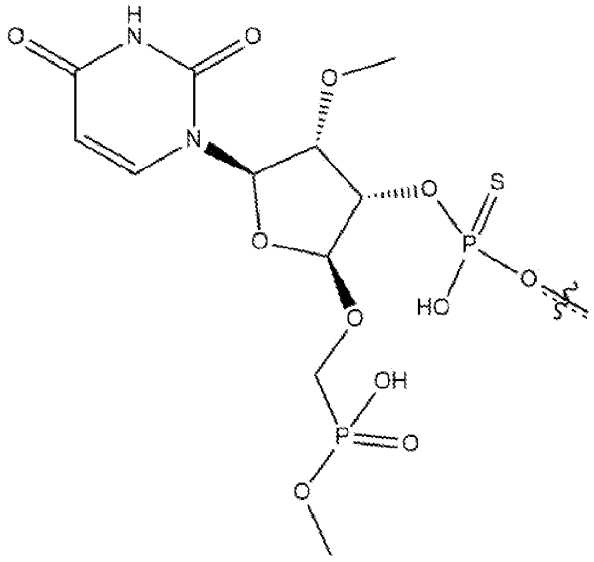
d) SEQ ID NOs: 1551 and 1586, respectively;

e) SEQ ID NOs: 1570 and 1605, respectively; and

f) SEQ ID NOs: 1681 and 1586, respectively,

wherein the oligonucleotide comprises a 5'-terminal phosphate, optionally a 5'-terminal phosphate analog.

[0158] In some embodiments, the oligonucleotide comprises an antisense strand comprising a 4′-phosphate analog at the 5′ terminal nucleotide, wherein 5' terminal nucleotide comprises the following structure:



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4'-O-monomethylphosphonate-2'-O-methyl uridine phosphorothioate [MePhosphonate-4O-mUs].

Modified Internucleotide Linkage

[0159] In some embodiments, an oligonucleotide (*e.g.*, a RNAi oligonucleotide) comprises a modified internucleotide linkage. In some embodiments, phosphate modifications or substitutions result in an oligonucleotide that comprises at least about 1 (*e.g.*, at least 1, at least 2, at least 3, at least 4, or at least 5) modified internucleotide linkage. In some embodiments, the oligonucleotide comprises about 1 to about 10 (*e.g.*, 1 to 10, 2 to 8, 4 to 6, 3 to 10, 5 to 10, 1 to 5, 1 to 3 or 1 to 2) modified internucleotide linkages. In some embodiments, the oligonucleotide comprises 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 modified internucleotide linkages.

[0160] A modified internucleotide linkage may be a phosphorodithioate linkage, a phosphorothioate linkage, a phosphotriester linkage, a thionoalkylphosphonate linkage, a thionalkylphosphotriester linkage, a phosphoramidite linkage, a phosphonate linkage, or a boranophosphate linkage. In some embodiments, at least one modified internucleotide linkage is a phosphorothioate linkage.

[0161] In some embodiments, the oligonucleotide has a phosphorothioate linkage between one or more of positions 1 and 2 of the sense strand, positions 1 and 2 of the antisense strand, positions 2 and 3 of the antisense strand, positions 3 and 4 of the antisense strand, positions 20 and 21 of the antisense strand, and positions 21 and 22 of the antisense strand. In some embodiments, the oligonucleotide has a phosphorothioate linkage between each of positions 1 and 2 of the sense strand, positions 1 and 2 of the antisense strand, positions 2 and 3 of the antisense strand, positions 20 and 21 of the antisense strand, and positions 21 and 22 of the antisense strand. In some embodiments, the oligonucleotide has a phosphorothioate linkage between each of (i) positions 1 and 2 of the sense strand; and (ii) positions 1 and 2, positions 2 and 3, positions 3 and 4, positions 20 and 21, and positions 21 and 22 of the antisense strand.

[0162] In some embodiments, the sense and antisense strands of the oligonucleotide comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1537 and 1572, respectively;

b) SEQ ID NOs: 1538 and 1573, respectively;
c) SEQ ID NOs: 1539 and 1574, respectively;
d) SEQ ID NOs: 1540 and 1575, respectively;
e) SEQ ID NOs: 1541 and 1576, respectively;
f) SEQ ID NOs: 1542 and 1577, respectively;
g) SEQ ID NOs: 1543 and 1578, respectively;
h) SEQ ID NOs: 1544 and 1579, respectively;
i) SEQ ID NOs: 1545 and 1580, respectively;
j) SEQ ID NOs: 1546 and 1581, respectively;
k) SEQ ID NOs: 1547 and 1582, respectively;
l) SEQ ID NOs: 1548 and 1583, respectively;
m) SEQ ID NOs: 1549 and 1584, respectively;
n) SEQ ID NOs: 1550 and 1585, respectively;
o) SEQ ID NOs: 1551 and 1586, respectively;
p) SEQ ID NOs: 1552 and 1587, respectively;
q) SEQ ID NOs: 1553 and 1588, respectively;
r) SEQ ID NOs: 1554 and 1589, respectively;
s) SEQ ID NOs: 1555 and 1590, respectively;
t) SEQ ID NOs: 1556 and 1591, respectively;
u) SEQ ID NOs: 1557 and 1592, respectively;
v) SEQ ID NOs: 1558 and 1593, respectively;
w) SEQ ID NOs: 1559 and 1594, respectively;
x) SEQ ID NOs: 1560 and 1595, respectively;
y) SEQ ID NOs: 1561 and 1596, respectively;
z) SEQ ID NOs: 1562 and 1597, respectively;
aa) SEQ ID NOs: 1563 and 1598, respectively;
bb) SEQ ID NOs: 1564 and 1599, respectively;
cc) SEQ ID NOs: 1565 and 1600, respectively;
dd) SEQ ID NOs: 1566 and 1601, respectively;

ee) SEQ ID NOs: 1567 and 1602, respectively;

ff) SEQ ID NOs: 1568 and 1603, respectively;

gg) SEQ ID NOs: 1569 and 1604, respectively;

hh) SEQ ID NOs: 1570 and 1605, respectively;

ii) SEQ ID NOs: 1571 and 1606, respectively; and

jj) SEQ ID NOs: 1681 and 1586, respectively,

wherein the oligonucleotide comprises a modified internucleotide linkage.

[0163] In some embodiments, the sense and antisense strands of the oligonucleotide comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1540 and 1575, respectively;

b) SEQ ID NOs: 1544 and 1579, respectively;

c) SEQ ID NOs: 1546 and 1581, respectively;

d) SEQ ID NOs: 1551and 1586, respectively;

e) SEQ ID NOs: 1552 and 1587, respectively;

f) SEQ ID NOs: 1553 and 1588, respectively;

g) SEQ ID NOs: 1558 and 1594, respectively;

h) SEQ ID NOs: 1560 and 1595, respectively;

i) SEQ ID NOs: 1564 and 1599, respectively;

j) SEQ ID NOs: 1565 and 1600, respectively;

k) SEQ ID NOs: 1566 and 1601, respectively;

l) SEQ ID NOs: 1570 and 1605, respectively; and

m) SEQ ID NOs: 1681 and 1586, respectively,

wherein the oligonucleotide comprises a modified internucleotide linkage.

[0164] In some embodiments, the sense and antisense strands of the oligonucleotide comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1553 and 1588, respectively;

b) SEQ ID NOs: 1560 and 1595, respectively;

c) SEQ ID NOs: 1564 and 1599, respectively;

d) SEQ ID NOs: 1551 and 1586, respectively;

e) SEQ ID NOs: 1570 and 1605, respectively; and

f) SEQ ID NOs: 1681 and 1586, respectively,

wherein the oligonucleotide comprises a modified internucleotide linkage.

Base Modifications

[0165] In some embodiments, an oligonucleotide herein (*e.g.*, a RNAi oligonucleotide) has one or more modified nucleobases. In some embodiments, modified nucleobases (also referred to herein as base analogs) are linked at the 1′ position of a nucleotide sugar moiety. In certain embodiments, a modified nucleobase is a nitrogenous base. In certain embodiments, a modified nucleobase does not contain nitrogen atom. *See*, *e.g.*, US Patent Application Publication No. 2008/0274462. In some embodiments, a modified nucleotide comprises a universal base. In some embodiments, a modified nucleotide does not contain a nucleobase (abasic).

[0166] In some embodiments, the sense and antisense strands of the oligonucleotide comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1537 and 1572, respectively;

b) SEQ ID NOs: 1538 and 1573, respectively;

c) SEQ ID NOs: 1539 and 1574, respectively;

d) SEQ ID NOs: 1540 and 1575, respectively;

e) SEQ ID NOs: 1541 and 1576, respectively;

f) SEQ ID NOs: 1542 and 1577, respectively;

g) SEQ ID NOs: 1543 and 1578, respectively;

h) SEQ ID NOs: 1544 and 1579, respectively;

i) SEQ ID NOs: 1545 and 1580, respectively;

j) SEQ ID NOs: 1546 and 1581, respectively;

k) SEQ ID NOs: 1547 and 1582, respectively;

l) SEQ ID NOs: 1548 and 1583, respectively;

m) SEQ ID NOs: 1549 and 1584, respectively;

n) SEQ ID NOs: 1550 and 1585, respectively;

o) SEQ ID NOs: 1551 and 1586, respectively;

p) SEQ ID NOs: 1552 and 1587, respectively;

q) SEQ ID NOs: 1553 and 1588, respectively;

r) SEQ ID NOs: 1554 and 1589, respectively;

s) SEQ ID NOs: 1555 and 1590, respectively;

t) SEQ ID NOs: 1556 and 1591, respectively;

u) SEQ ID NOs: 1557 and 1592, respectively;

v) SEQ ID NOs: 1558 and 1593, respectively;

w) SEQ ID NOs: 1559 and 1594, respectively;

x) SEQ ID NOs: 1560 and 1595, respectively;

y) SEQ ID NOs: 1561 and 1596, respectively;

z) SEQ ID NOs: 1562 and 1597, respectively;

aa) SEQ ID NOs: 1563 and 1598, respectively;

bb) SEQ ID NOs: 1564 and 1599, respectively;

cc) SEQ ID NOs: 1565 and 1600, respectively;

dd) SEQ ID NOs: 1566 and 1601, respectively;

ee) SEQ ID NOs: 1567 and 1602, respectively;

ff) SEQ ID NOs: 1568 and 1603, respectively;

gg) SEQ ID NOs: 1569 and 1604, respectively;

hh) SEQ ID NOs: 1570 and 1605, respectively;

ii) SEQ ID NOs: 1571 and 1606, respectively; and

jj) SEQ ID NOs: 1681 and 1586, respectively,

wherein the oligonucleotide comprises one or more modified nucleobases.

[0167] In some embodiments, the sense and antisense strands of an oligonucleotide comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1540 and 1575, respectively;

b) SEQ ID NOs: 1544 and 1579, respectively;

c) SEQ ID NOs: 1546 and 1581, respectively;

d) SEQ ID NOs: 1551and 1586, respectively;

e) SEQ ID NOs: 1552 and 1587, respectively;

f) SEQ ID NOs: 1553 and 1588, respectively;

g) SEQ ID NOs: 1558 and 1594, respectively;

h) SEQ ID NOs: 1560 and 1595, respectively;

i) SEQ ID NOs: 1564 and 1599, respectively;

j) SEQ ID NOs: 1565 and 1600, respectively;

k) SEQ ID NOs: 1566 and 1601, respectively;

l) SEQ ID NOs: 1570 and 1605, respectively; and

m) SEQ ID NOs: 1681 and 1586, respectively,

wherein the oligonucleotide comprises one or more modified nucleobases.

[0168] In some embodiments, the sense and antisense strands of an oligonucleotide comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1553 and 1588, respectively;

b) SEQ ID NOs: 1560 and 1595, respectively;

c) SEQ ID NOs: 1564 and 1599, respectively;

d) SEQ ID NOs: 1551 and 1586, respectively;

e) SEQ ID NOs: 1570 and 1605, respectively; and

f) SEQ ID NOs: 1681 and 1586, respectively,

wherein the oligonucleotide comprises one or more modified nucleobases.

[0169] In some embodiments, a universal base is a heterocyclic moiety located at the 1′ position of a nucleotide sugar moiety in a modified nucleotide, or the equivalent position in a nucleotide sugar moiety substitution, that, when present in a duplex, can be positioned opposite more than one type of base without substantially altering structure of the duplex. In some embodiments, compared to a reference ss nucleic acid (*e.g.*, oligonucleotide) that is fully complementary to a target nucleic acid, a ss nucleic acid containing a universal base forms a duplex with the target nucleic acid that has a lower T_m than a duplex formed with the complementary nucleic acid. In some embodiments, when compared to a reference ss nucleic acid in which the universal base has been replaced with a base to generate a single mismatch, the ss nucleic acid containing the universal base forms a duplex with the target nucleic acid that has a higher T_m than a duplex formed with the nucleic acid comprising the mismatched base.

[0170] Non-limiting examples of universal-binding nucleotides include, but are not limited to, inosine, 1-β-D-ribofuranosyl-5-nitroindole and/or 1-β-D-ribofuranosyl-3-nitropyrrole (*see*, US Patent Application Publication No. 2007/0254362; Van Aerschot *et al.* (1995) *Nucleic Acids Res.* 23:4363-4370; Loakes *et al.* (1995) *Nucleic Acids Res.* 23:2361-66; and Loakes & Brown (1994) *Nucleic Acids Res.* 22:4039-43).

Targeting Ligands

[0171] In some embodiments, it is desirable to target the oligonucleotide (*e.g.*, a RNAi oligonucleotide) to one or more cells or one or more organs. Such a strategy can help to avoid undesirable effects in other organs or avoid undue loss of the oligonucleotide to cells, tissue, or organs that would not benefit from the oligonucleotide. Accordingly, in some embodiments, the oligonucleotide is modified to facilitate targeting and/or delivery to a particular tissue, cell, or organ (*e.g.*, to facilitate delivery of the oligonucleotide to the CNS). In some embodiments, the oligonucleotide comprises at least one nucleotide (*e.g.*, 1, 2, 3, 4, 5, 6 or more nucleotides) conjugated to one or more targeting ligand(s). In some embodiments, the sense and antisense strands of the oligonucleotide comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1537 and 1572, respectively;
b) SEQ ID NOs: 1538 and 1573, respectively;
c) SEQ ID NOs: 1539 and 1574, respectively;
d) SEQ ID NOs: 1540 and 1575, respectively;
e) SEQ ID NOs: 1541 and 1576, respectively;
f) SEQ ID NOs: 1542 and 1577, respectively;
g) SEQ ID NOs: 1543 and 1578, respectively;
h) SEQ ID NOs: 1544 and 1579, respectively;
i) SEQ ID NOs: 1545 and 1580, respectively;
j) SEQ ID NOs: 1546 and 1581, respectively;
k) SEQ ID NOs: 1547 and 1582, respectively;
l) SEQ ID NOs: 1548 and 1583, respectively;

m) SEQ ID NOs: 1549 and 1584, respectively;
n) SEQ ID NOs: 1550 and 1585, respectively;
o) SEQ ID NOs: 1551 and 1586, respectively;
p) SEQ ID NOs: 1552 and 1587, respectively;
q) SEQ ID NOs: 1553 and 1588, respectively;
r) SEQ ID NOs: 1554 and 1589, respectively;
s) SEQ ID NOs: 1555 and 1590, respectively;
t) SEQ ID NOs: 1556 and 1591, respectively;
u) SEQ ID NOs: 1557 and 1592, respectively;
v) SEQ ID NOs: 1558 and 1593, respectively;
w) SEQ ID NOs: 1559 and 1594, respectively;
x) SEQ ID NOs: 1560 and 1595, respectively;
y) SEQ ID NOs: 1561 and 1596, respectively;
z) SEQ ID NOs: 1562 and 1597, respectively;
aa) SEQ ID NOs: 1563 and 1598, respectively;
bb) SEQ ID NOs: 1564 and 1599, respectively;
cc) SEQ ID NOs: 1565 and 1600, respectively;
dd) SEQ ID NOs: 1566 and 1601, respectively;
ee) SEQ ID NOs: 1567 and 1602, respectively;
ff) SEQ ID NOs: 1568 and 1603, respectively;
gg) SEQ ID NOs: 1569 and 1604, respectively;
hh) SEQ ID NOs: 1570 and 1605, respectively;
ii) SEQ ID NOs: 1571 and 1606, respectively; and
jj) SEQ ID NOs: 1681 and 1586, respectively,

wherein the oligonucleotide comprises a targeting ligand conjugated to at least one nucleotide.

[0172] In some embodiments, the oligonucleotide comprises at least one nucleotide (*e.g.*, 1, 2, 3, 4, 5, 6 or more nucleotides) conjugated to one or more targeting ligand(s). In some embodiments, the sense and antisense strands of the oligonucleotide comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1540 and 1575, respectively;

b) SEQ ID NOs: 1544 and 1579, respectively;

c) SEQ ID NOs: 1546 and 1581, respectively;

d) SEQ ID NOs: 1551and 1586, respectively;

e) SEQ ID NOs: 1552 and 1587, respectively;

f) SEQ ID NOs: 1553 and 1588, respectively;

g) SEQ ID NOs: 1558 and 1594, respectively;

h) SEQ ID NOs: 1560 and 1595, respectively;

i) SEQ ID NOs: 1564 and 1599, respectively;

j) SEQ ID NOs: 1565 and 1600, respectively;

k) SEQ ID NOs: 1566 and 1601, respectively;

l) SEQ ID NOs: 1570 and 1605, respectively; and

m) SEQ ID NOs: 1681 and 1586, respectively,

wherein the oligonucleotide comprises a targeting ligand conjugated to at least one nucleotide.

[0173] In some embodiments, the oligonucleotide comprises at least one nucleotide (*e.g.*, 1, 2, 3, 4, 5, 6 or more nucleotides) conjugated to one or more targeting ligand(s). In some embodiments, the sense and antisense strands of the oligonucleotide comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1553 and 1588, respectively;

b) SEQ ID NOs: 1560 and 1595, respectively;

c) SEQ ID NOs: 1564 and 1599, respectively;

d) SEQ ID NOs: 1551 and 1586, respectively;

e) SEQ ID NOs: 1570 and 1605, respectively; and,

f) SEQ ID NOs: 1681 and 1586, respectively,

wherein the oligonucleotide comprises a targeting ligand conjugated to at least one nucleotide.

[0174] In some embodiments, the targeting ligand comprises a carbohydrate, amino sugar, cholesterol, peptide, polypeptide, or protein or part of a protein (*e.g.*, an antibody or antibody fragment). In some embodiments, the targeting ligand is an aptamer. For example, a targeting ligand may be a RGD peptide that is used to target tumor vasculature or glioma cells, CREKA

peptide to target tumor vasculature or stoma, transferring, lactoferrin, or an aptamer to target transferrin receptors expressed on CNS vasculature, or an anti-EGFR antibody to target EGFR on glioma cells. In certain embodiments, the targeting ligand is one or more GalNAc moieties. In some embodiments, the targeting ligand is one or more lipid moieties.

[0175] In some embodiments, 1 or more (*e.g.*, 1, 2, 3, 4, 5, or 6) nucleotides of the oligonucleotide are each conjugated to a separate targeting ligand. In some embodiments, 2 to 4 nucleotides of the oligonucleotide are each conjugated to a separate targeting ligand. In some embodiments, targeting ligands are conjugated to 2 to 4 nucleotides at either ends of the sense or antisense strand (*e.g.*, targeting ligands are conjugated to a 2 to 4 nucleotide overhang or extension on the 5′ or 3′ end of the sense or antisense strand) such that the targeting ligands resemble bristles of a toothbrush, and the oligonucleotide resembles a toothbrush. For example, the oligonucleotide may comprise a stem-loop at either the 5′ or 3′ end of the sense strand and 1, 2, 3, or 4 nucleotides of the loop of the stem may be individually conjugated to a targeting ligand. In some embodiments, the oligonucleotide comprises a stem-loop at the 3′ end of the sense strand, wherein the loop of the stem-loop comprises a triL or a tetraL, and wherein the 3 or 4 nucleotides comprising the triL or tetraL, respectfully, are individually conjugated to a targeting ligand. In some embodiments, the oligonucleotide comprises a blunt end at its 3’ end and one or more targeting ligands conjugated to at least one nucleotide. In some embodiments, the oligonucleotide comprises a blunt end at its 3’ end and one or more targeting ligands conjugated to the 5’ terminal nucleotide of the sense strand.

GalNAc Conjugation

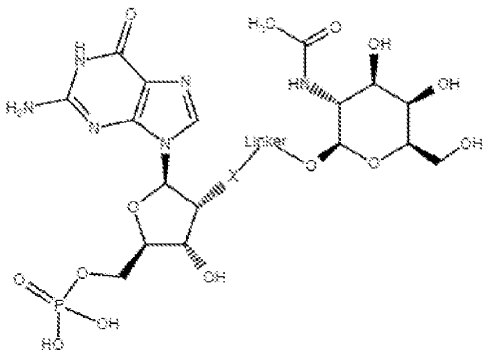
[0176] GalNAc is a high affinity ligand for the ASGPR, which is primarily expressed on the sinusoidal surface of hepatocyte cells and has a major role in binding, internalizing and subsequent clearing circulating glycoproteins that contain terminal galactose or GalNAc residues (asialoglycoproteins). Conjugation (either indirect or direct) of GalNAc moieties to an oligonucleotide herein *(e.g.*, a RNAi oligonucleotide) can be used to target the oligonucleotide to the ASGPR expressed on cells. In some embodiments, the oligonucleotide is conjugated to at least one or more GalNAc moieties, wherein the GalNAc moieties target the oligonucleotide to an

ASGPR expressed on human liver cells (*e.g.*, human hepatocytes). In some embodiments, the GalNAc moiety targets the oligonucleotide to the liver.

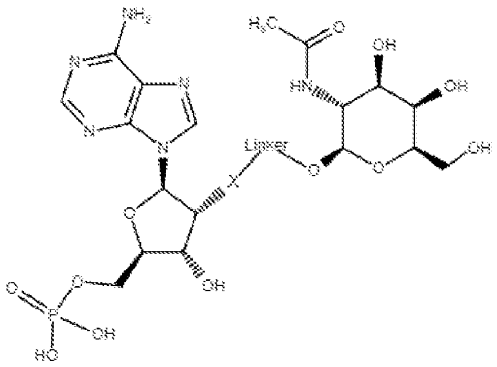
[0177] In some embodiments, the oligonucleotide is conjugated directly or indirectly to a monovalent GalNAc. In some embodiments, the oligonucleotide is conjugated directly or indirectly to more than one monovalent GalNAc (*i.e.*, is conjugated to 2, 3, or 4 monovalent GalNAc moieties, and is typically conjugated to 3 or 4 monovalent GalNAc moieties). In some embodiments, the oligonucleotide is conjugated to one or more bivalent GalNAc, trivalent GalNAc, or tetravalent GalNAc moieties. In some embodiments, the bivalent, trivalent, or tetravalent GalNAc moiety is conjugated to the oligonucleotide *via* a branched linker. In some embodiments, the monovalent GalNAc moiety is conjugated to a first nucleotide and the bivalent, trivalent, or tetravalent GalNAc moiety is conjugated to a second nucleotide *via* a branched linker.

[0178] In some embodiments, 1 or more (*e.g.*, 1, 2, 3, 4, 5, or 6) nucleotides of the oligonucleotide are each conjugated to a GalNAc moiety. In some embodiments, 2 to 4 nucleotides of a tetraL are each conjugated to a separate GalNAc. In some embodiments, 1 to 3 nucleotides of a triL are each conjugated to a separate GalNAc. In some embodiments, targeting ligands are conjugated to 2 to 4 nucleotides at either ends of the sense or antisense strand (*e.g.*, ligands are conjugated to a 2 to 4 nucleotide overhang or extension on the 5′ or 3′ end of the sense or antisense strand) such that the GalNAc moieties resemble bristles of a toothbrush, and the oligonucleotide resembles a toothbrush. In some embodiments, GalNAc moieties are conjugated to a nucleotide of the sense strand. For example, 4 GalNAc moieties can be conjugated to nucleotides in the tetraL of the sense strand where each GalNAc moiety is conjugated to 1 nucleotide.

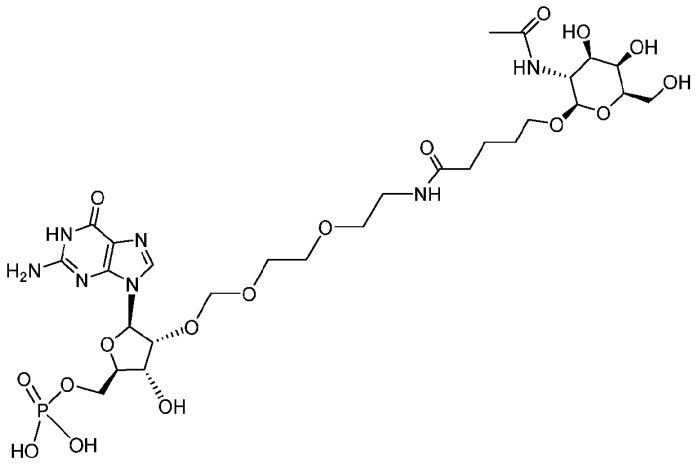
[0179] In some embodiments, the oligonucleotide comprises a tetraL, wherein the tetraL is any combination of adenine (A) and guanine (G) nucleotides. In some embodiments, the tetraL comprises a monovalent GalNAc moiety attached to any one or more guanine (G) nucleotides of the tetraloop *via* any linker described herein, as depicted below (X=heteroatom):



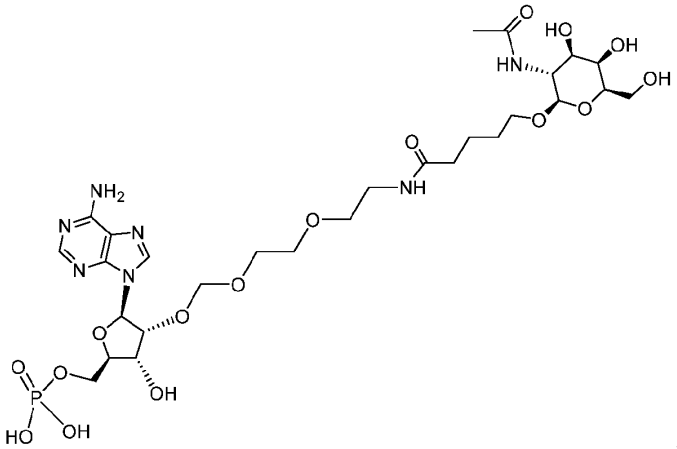
[0180] In some embodiments, the tetraL has a monovalent GalNAc attached to any one or more adenine nucleotides of the tetraL *via* any linker described herein, as depicted below (X=heteroatom):



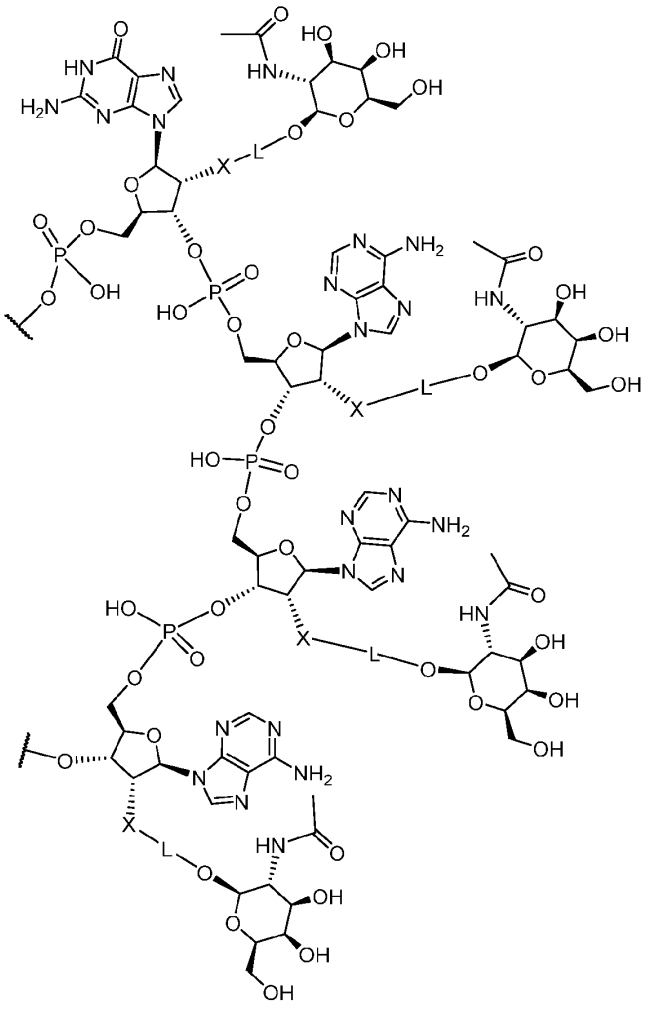
[0181] In some embodiments, the oligonucleotide comprises a monovalent GalNAc attached to a guanine (G) nucleotide referred to as [ademG-GalNAc] or 2′-aminodiethoxymethanol-Guanine-GalNAc, as depicted below:



[0182] In some embodiments, the oligonucleotide comprises a monovalent GalNAc attached to an adenine (A) nucleotide, referred to as [ademA-GalNAc] or 2′-aminodiethoxymethanol-Adenine-GalNAc, as depicted below:

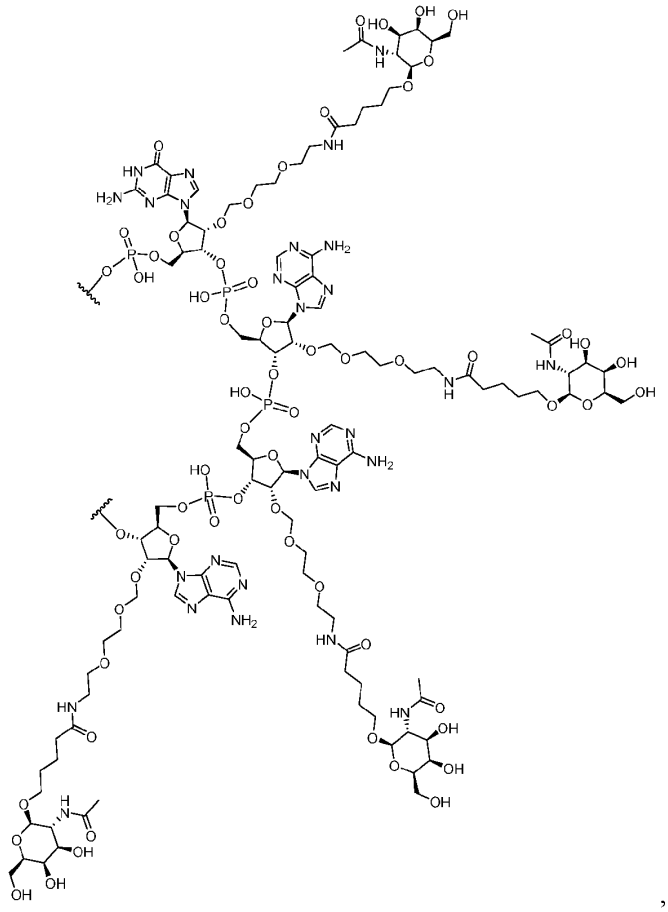


[0183] An example of such conjugation is shown below for a loop comprising from 5′ to 3′ the nucleotide sequence GAAA (L = linker, X = heteroatom) stem attachment points are shown. Such a loop may be present, for example, at positions 27-30 of the sense strand of any one of the sense strands listed in **Tables 4** and **5**. In the chemical formula,  is used to describe an attachment point to the oligonucleotide strand.

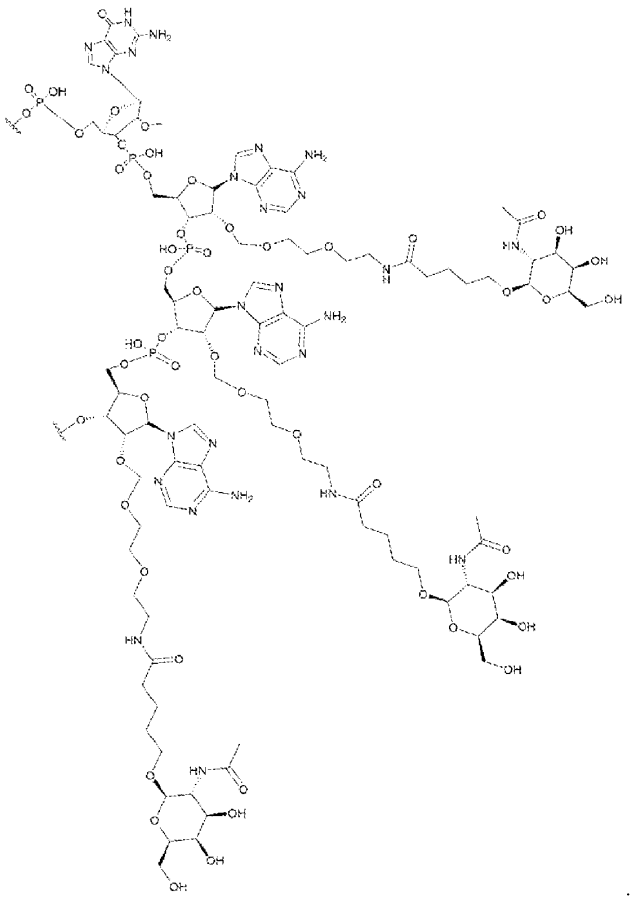


[0184] Appropriate methods or chemistry (*e.g.*, click chemistry) can be used to link the targeting ligand to a nucleotide. In some embodiments, the targeting ligand is conjugated to a nucleotide using a click linker. In some embodiments, an acetal-based linker is used to conjugate a targeting ligand to a nucleotide of any one of the oligonucleotides described herein. Acetal-based linkers are disclosed, for example, in Intl. Patent Application Publication No. WO 2016/100401. In some embodiments, the linker is a labile linker. However, in other embodiments, the linker is stable. Examples are shown below for a loop comprising from 5′ to 3′ the nucleotides GAAA, in which GalNAc moieties are attached to 3 or 4 nucleotides of the loop using an acetal linker. Such a loop

may be present, for example, at positions 27-30 of the any one of the sense strands listed in **Tables 4** and **5** In the chemical formula,  is an attachment point to the oligonucleotide strand:



, or



[0185] As mentioned, various appropriate methods or chemistry synthetic techniques (*e.g.*, click chemistry) can be used to link the targeting ligand to a nucleotide. In some embodiments, the targeting ligand is conjugated to a nucleotide using a click linker. In some embodiments, an acetal-based linker is used to conjugate the targeting ligand to a nucleotide of any one of the oligonucleotides described herein. Acetal-based linkers are disclosed, for example, in Intl. Patent Application Publication No. WO 2016/100401. In some embodiments, the linker is a labile linker. However, in other embodiments, the linker is a stable linker.

[0186] In some embodiments, a duplex extension (*e.g.*, of up to 3, 4, 5, or 6 bp in length) is provided between the targeting ligand (*e.g.*, a GalNAc moiety) and the oligonucleotide. In some embodiments, the oligonucleotide does not have a GalNAc conjugated thereto.

[0187] In some embodiments, the sense and antisense strands of an oligonucleotide comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1537 and 1572, respectively;

b) SEQ ID NOs: 1538 and 1573, respectively;

c) SEQ ID NOs: 1539 and 1574, respectively;

d) SEQ ID NOs: 1540 and 1575, respectively;

e) SEQ ID NOs: 1541 and 1576, respectively;

f) SEQ ID NOs: 1542 and 1577, respectively;

g) SEQ ID NOs: 1543 and 1578, respectively;

h) SEQ ID NOs: 1544 and 1579, respectively;

i) SEQ ID NOs: 1545 and 1580, respectively;

j) SEQ ID NOs: 1546 and 1581, respectively;

k) SEQ ID NOs: 1547 and 1582, respectively;

l) SEQ ID NOs: 1548 and 1583, respectively;

m) SEQ ID NOs: 1549 and 1584, respectively;

n) SEQ ID NOs: 1550 and 1585, respectively;

o) SEQ ID NOs: 1551 and 1586, respectively;

p) SEQ ID NOs: 1552 and 1587, respectively;

q) SEQ ID NOs: 1553 and 1588, respectively;

r) SEQ ID NOs: 1554 and 1589, respectively;

s) SEQ ID NOs: 1555 and 1590, respectively;

t) SEQ ID NOs: 1556 and 1591, respectively;

u) SEQ ID NOs: 1557 and 1592, respectively;

v) SEQ ID NOs: 1558 and 1593, respectively;

w) SEQ ID NOs: 1559 and 1594, respectively;

x) SEQ ID NOs: 1560 and 1595, respectively;

y) SEQ ID NOs: 1561 and 1596, respectively;

z) SEQ ID NOs: 1562 and 1597, respectively;

aa) SEQ ID NOs: 1563 and 1598, respectively;

bb) SEQ ID NOs: 1564 and 1599, respectively;

cc) SEQ ID NOs: 1565 and 1600, respectively;

dd) SEQ ID NOs: 1566 and 1601, respectively;

ee) SEQ ID NOs: 1567 and 1602, respectively;

ff) SEQ ID NOs: 1568 and 1603, respectively;

gg) SEQ ID NOs: 1569 and 1604, respectively;

hh) SEQ ID NOs: 1570 and 1605, respectively;

ii) SEQ ID NOs: 1571 and 1606, respectively; and

jj) SEQ ID NOs: 1681 and 1586, respectively,

wherein the oligonucleotide comprises at least one GalNAc moiety conjugated to a nucleotide.

[0188] In some embodiments, the sense and antisense strands of an oligonucleotide comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1540 and 1575, respectively;

b) SEQ ID NOs: 1544 and 1579, respectively;

c) SEQ ID NOs: 1546 and 1581, respectively;

d) SEQ ID NOs: 1551and 1586, respectively;

e) SEQ ID NOs: 1552 and 1587, respectively;

f) SEQ ID NOs: 1553 and 1588, respectively;

g) SEQ ID NOs: 1558 and 1594, respectively;

h) SEQ ID NOs: 1560 and 1595, respectively;

i) SEQ ID NOs: 1564 and 1599, respectively;

j) SEQ ID NOs: 1565 and 1600, respectively;

k) SEQ ID NOs: 1566 and 1601, respectively;

l) SEQ ID NOs: 1570 and 1605, respectively; and

m) SEQ ID NOs: 1681 and 1586, respectively,

wherein the oligonucleotide comprises at least one GalNAc moiety conjugated to a nucleotide.

[0189] In some embodiments, the sense and antisense strands of an oligonucleotide comprise nucleotides sequences selected from the group consisting of:

a) SEQ ID NOs: 1553 and 1588, respectively;

b) SEQ ID NOs: 1560 and 1595, respectively;

c) SEQ ID NOs: 1564 and 1599, respectively;

d) SEQ ID NOs: 1551 and 1586, respectively;

e) SEQ ID NOs: 1570 and 1605, respectively; and

f) SEQ ID NOs: 1681 and 1586, respectively,

wherein the oligonucleotide comprises at least one GalNAc moiety conjugated to a nucleotide.

Lipid Conjugation

[0190] In some embodiments, one or more lipid moieties are conjugated to a 5' terminal nucleotide of a sense strand. In some embodiments, one or more lipid moieties are conjugated to an adenine nucleotide. In some embodiments, one or more lipid moieties are conjugated to a guanine nucleotide. In some embodiments, one or more lipid moieties are conjugated toa cytosine nucleotide. In some embodiments, one or more lipid moieties are conjugated to a thymine (T) nucleotide. In some embodiments, one or more lipid moieties are conjugated to a uracil (U) nucleotide.

[0191] In some embodiments, the lipid moiety is a hydrocarbon chain. In some embodiments, the hydrocarbon chain is saturated. In other embodiments, the hydrocarbon chain is unsaturated. In some embodiments, the hydrocarbon chain is branched. In other embodiments, the hydrocarbon chain is straight. In some embodiments, the lipid moiety is a C_8-C_{30} hydrocarbon chain. In certain embodiments, the lipid moiety is a C_8:0, C_{10}:0, C_{11}:0, C_{12}:0, C_{14}:0, C_{16}:0, C_{17}:0, C_{18}:0, C_{18}:1, C_{18}:2, C_{22}:5, C_{22}:0, C_{24}:0, C_{26}:0, C_{22}:6, C_{24}:1, diacyl C_{16}:0 or diacyl C_{18}:1. In some embodiments, the lipid moiety is a C_{16} hydrocarbon chain. In some embodiments, the C_{16} hydrocarbon chain is represented as:  .

[0192] In some embodiments, the sense strand is 20-22 nucleotides in length, and a lipid moiety is conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the sense strand is 20-22 nucleotides in length, and a hydrocarbon chain is conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the sense strand is 20-22 nucleotides in length, and a C_{14}-C_{22} hydrocarbon chain is conjugated to the 5' terminal nucleotide of the sense

strand. In some embodiments, the sense strand is 20-22 nucleotides in length and a C_{16} hydrocarbon chain is conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the sense strand is 20 nucleotides in length, and a lipid moiety is conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the sense strand is 20 nucleotides in length, and a hydrocarbon chain is conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the sense strand is 20 nucleotides in length, and a C_{14}-C_{22} hydrocarbon chain is conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the sense strand is 20 nucleotides in length ,and a C_{16} hydrocarbon chain is conjugated to the 5' terminal nucleotide of the sense strand.

[0193] In some embodiments, the oligonucleotide comprises (i) a sense strand of 20-22 nucleotides in length; (ii) an antisense strand comprising a 3' overhang sequence of one or more nucleotides in length; (iii) a blunt end comprising the 3' end of the sense strand; and (iv) a lipid moiety conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the oligonucleotide comprises (i) a sense strand of 20-22 nucleotides in length; (ii) an antisense strand comprising a 3' overhang sequence of one or more nucleotides in length; (iii) a blunt end comprising the 3' end of the sense strand; and (iv) a hydrocarbon chain conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the oligonucleotide comprises (i) a sense strand of 20-22 nucleotides in length; (ii) an antisense strand comprising a 3' overhang sequence of one or more nucleotides in length; (iii) a blunt end comprising the 3' end of the sense strand; and (iv) a C_{14}-C_{22} hydrocarbon chain conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the oligonucleotide comprises (i) a sense strand of 20-22 nucleotides in length; (ii) an antisense strand comprising a 3' overhang sequence of one or more nucleotides in length; (iii) a blunt end comprising the 3' end of the sense strand; and (iv) a C_{16} hydrocarbon chain conjugated to the 5' terminal nucleotide of the sense strand.

[0194] In some embodiments, the oligonucleotide comprises (i) a sense strand of 20 nucleotides in length; (ii) an antisense strand of 22 nucleotides in length comprising a 3' overhang sequence of two nucleotides in length; (iii) a blunt end comprising the 3' end of the sense strand; and (iv) a lipid moiety conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the oligonucleotide comprises (i) a sense strand of 20 nucleotides in length; (ii) an antisense strand

of 22 nucleotides in length comprising a 3' overhang sequence of two nucleotides in length; (iii) a blunt end comprising the 3' end of the sense strand; and (iv) a hydrocarbon chain conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the oligonucleotide comprises (i) a sense strand of 20 nucleotides in length; (ii) an antisense strand of 22 nucleotides in length comprising a 3' overhang sequence of 2 nucleotides in length; (iii) a blunt end comprising the 3' end of the sense strand; and (iv) a C_{14}-C_{22} hydrocarbon chain conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the oligonucleotide comprises (i) a sense strand of 20 nucleotides in length; (ii) an antisense strand of 22 nucleotides in length comprising a 3' overhang sequence of 2 nucleotides in length; (iii) a blunt end comprising the 3' end of the sense strand; and (iv) a C_{16} hydrocarbon chain conjugated to the 5' terminal nucleotide of the sense strand.

[0195] In some embodiments, the oligonucleotide comprises (i) an antisense strand of 19-30 nucleotides comprising a region of complementarity to a SNCA mRNA target sequence selected from SEQ ID NOs: 1781, 1782, 1796, 1798, 1802, 1808, 1814, 1817, 1713, 1718, 1726, 1830, 1839, 1742, 1846, 1852, 1865, 1784, 1804, 1721, 1822, 1840, 1735, 1847, 1855, 1864, 1901, 1902, 1938, 1947, 1955, 1964, 1973, and 1978; (ii) a sense strand of 19-25 nucleotides that forms a duplex region with the antisense strand; and (iii) a lipid moiety conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the oligonucleotide comprises (i) an antisense strand of 19-30 nucleotides comprising a region of complementarity to a SNCA mRNA target sequence selected from SEQ ID NOs: 1798, 1817, 1718, 1846, 1852, 1865, 1804, 1721, 1847, 1855, 1864, and 1955; (ii) a sense strand of 19-25 nucleotides that forms a duplex region with the antisense strand; and (iii) a lipid moiety conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the oligonucleotide comprises (i) an antisense strand of 19-30 nucleotides comprising a region of complementarity to a SNCA mRNA target sequence selected from SEQ ID NOs: 1865, 1721, 1847, 1846, and 1955; (ii) a sense strand of 19-25 nucleotides that forms a duplex region with the antisense strand; and (iii) a lipid moiety conjugated to the 5' terminal nucleotide of the sense strand.

[0196] In some embodiments, the oligonucleotide comprises (i) an antisense strand of 19-30 nucleotides comprising a region of complementarity to a SNCA mRNA target sequence selected

from SEQ ID NOs: 1781, 1782, 1796, 1798, 1802, 1808, 1814, 1817, 1713, 1718, 1726, 1830, 1839, 1742, 1846, 1852, 1865, 1784, 1804, 1721, 1822, 1840, 1735, 1847, 1855, 1864, 1901, 1902, 1938, 1947, 1955, 1964, 1973, and 1978; (ii) a sense strand of 19-25 nucleotides that forms a duplex region with the antisense strand; and (iii) a hydrocarbon chain conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the oligonucleotide comprises (i) an antisense strand of 19-30 nucleotides comprising a region of complementarity to a SNCA mRNA target sequence selected from SEQ ID NOs: 1798, 1817, 1718, 1846, 1852, 1865, 1804, 1721, 1847, 1855, 1864, and 1955; (ii) a sense strand of 19-25 nucleotides that forms a duplex region with the antisense strand; and (iii) a hydrocarbon chain conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the oligonucleotide comprises (i) an antisense strand of 19-30 nucleotides comprising a region of complementarity to a SNCA mRNA target sequence selected from SEQ ID NOs: 1865, 1721, 1847, 1846, and 1955; (ii) a sense strand of 19-25 nucleotides that forms a duplex region with the antisense strand; and (iii) a hydrocarbon chain conjugated to the 5' terminal nucleotide of the sense strand.

[0197] In some embodiments, the oligonucleotide comprises (i) an antisense strand of 19-30 nucleotides comprising a region of complementarity to a SNCA mRNA target sequence selected from SEQ ID NOs: 1781, 1782, 1796, 1798, 1802, 1808, 1814, 1817, 1713, 1718, 1726, 1830, 1839, 1742, 1846, 1852, 1865, 1784, 1804, 1721, 1822, 1840, 1735, 1847, 1855, 1864, 1901, 1902, 1938, 1947, 1955, 1964, 1973, and 1978; (ii) a sense strand of 19-25 nucleotides that forms a duplex region with the antisense strand; and (iii) a C_{14}-C_{22} hydrocarbon chain conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the oligonucleotide comprises (i) an antisense strand of 19-30 nucleotides comprising a region of complementarity to a SNCA mRNA target sequence selected from SEQ ID NOs: 1798, 1817, 1718, 1846, 1852, 1865, 1804, 1721, 1847, 1855, 1864, and 1955; (ii) a sense strand of 19-25 nucleotides that forms a duplex region with the antisense strand; and (iii) a C_{14}-C_{22} hydrocarbon chain conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the oligonucleotide comprises (i) an antisense strand of 19-30 nucleotides comprising a region of complementarity to a SNCA mRNA target sequence selected from SEQ ID NOs: 1865, 1721, 1847, 1846, and 1955; (ii) a sense strand

of 19-25 nucleotides that forms a duplex region with the antisense strand; and (iii) a C_{14}-C_{22} hydrocarbon chain conjugated to the 5' terminal nucleotide of the sense strand.

[0198] In some embodiments, the oligonucleotide comprises (i) an antisense strand of 19-30 nucleotides comprising a region of complementarity to a SNCA mRNA target sequence selected from SEQ ID NOs:1781, 1782, 1796, 1798, 1802, 1808, 1814, 1817, 1713, 1718, 1726, 1830, 1839, 1742, 1846, 1852, 1865, 1784, 1804, 1721, 1822, 1840, 1735, 1847, 1855, 1864, 1901, 1902, 1938, 1947, 1955, 1964, 1973, and 1978; (ii) a sense strand of 19-25 nucleotides that forms a duplex region with the antisense strand; and (iii) a C_{16} hydrocarbon chain conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the oligonucleotide comprises (i) an antisense strand of 19-30 nucleotides comprising a region of complementarity to a SNCA mRNA target sequence selected from SEQ ID NOs: 1798, 1817, 1718, 1846, 1852, 1865, 1804, 1721, 1847, 1855, 1864, and 1955; (ii) a sense strand of 19-25 nucleotides that forms a duplex region with the antisense strand; and (iii) a C_{16} hydrocarbon chain conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the oligonucleotide comprises (i) an antisense strand of 19-30 nucleotides comprising a region of complementarity to a SNCA mRNA target sequence selected from SEQ ID NOs: 1865, 1721, 1847, 1846, and 1955; (ii) a sense strand of 19-25 nucleotides that forms a duplex region with the antisense strand; and (iii) a C_{16} hydrocarbon chain conjugated to the 5' terminal nucleotide of the sense strand.

[0199] In some embodiments, the oligonucleotide comprises a sense strand comprising the nucleotide sequence of SEQ ID NO: 1681 and an antisense strand comprising the nucleotide sequence of SEQ ID NO: 1586, wherein the sense strand comprises a lipid moiety conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the oligonucleotide comprises a sense strand comprising the nucleotide sequence of SEQ ID NO: 1681 and an antisense strand comprising the nucleotide sequence of SEQ ID NO: 1586, wherein the sense strand comprises a hydrocarbon chain conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the oligonucleotide comprises a sense strand comprising the nucleotide sequence of SEQ ID NO: 1681 and an antisense strand comprising the nucleotide sequence of SEQ ID NO: 1586, wherein the sense strand comprises a C_{14}-C_{22} hydrocarbon chain conjugated to the 5' terminal nucleotide of the sense strand. In some embodiments, the oligonucleotide comprises a

sense strand comprising the nucleotide sequence of SEQ ID NO: 1681 and an antisense strand comprising the nucleotide sequence of SEQ ID NO: 1586, wherein the sense strand comprises a C_{16} hydrocarbon chain conjugated to the 5' terminal nucleotide of the sense strand.

Exemplary SNCA-Targeting RNAi Oligonucleotides

[0200] In some embodiments, the *SNCA*-targeting RNAi oligonucleotide for reducing *SNCA* gene expression comprise a sense strand and an antisense strand, wherein all nucleotides comprising the sense strand and the antisense strand are modified, wherein the antisense strand comprises a region of complementarity to a SNCA mRNA target sequence of any one of SEQ ID NOs: 1683-2066, and wherein the region of complementarity is at least 15 contiguous nucleotides in length. In some embodiments, the 5' terminal nucleotide of the antisense strand comprises 4'-O-monomethylphosphonate-2'-O-methyluridine [MePhosphonate-4O-mU], as described herein. In some embodiments, the 5' terminal nucleotide of the antisense strand comprises a phosphorothioate linkage. In some embodiments, the antisense strand and the sense strand comprise one or more 2′-F and 2′-OMe modified nucleotides and at least one phosphorothioate linkage. In some embodiments, the antisense strand comprises 4 phosphorothioate linkages and the sense strand comprises 1 phosphorothioate linkage. In some embodiments, the antisense strand comprises 5 phosphorothioate linkages and the sense strand comprises 1 phosphorothioate linkage.

[0201] In some embodiments, the oligonucleotide comprises a sense strand having a sequence of any one of SEQ ID NOs: 1683-2066 and an antisense strand comprising a complementary sequence selected from any one of SEQ ID NOs: 2067-2450.

[0202] In some embodiments, the oligonucleotide comprises a sense strand having a sequence of any one of SEQ ID NOs: 1-384 and an antisense strand comprising a complementary sequence selected from any one of SEQ ID NOs: 385-768.

[0203] In some embodiments, the oligonucleotide comprises a sense strand having a sequence of any one of SEQ ID NOs: 1537-1571 and an antisense strand comprising a complementary sequence selected from any one of SEQ ID NOs: 1572-1606.

[0204] In some embodiments, the oligonucleotide comprises a sense strand having a sequence of any one of SEQ ID NOs: 1537-1571 and 1681 and an antisense strand comprising a complementary sequence selected from any one of SEQ ID NOs: 1572-1606.

[0205] In some embodiments, the oligonucleotide consists a sense strand having a sequence of any one of SEQ ID NOs: 1537-1571 and an antisense strand comprising a complementary sequence selected from any one of SEQ ID NOs: 1572-1606.

[0206] In some embodiments, the oligonucleotide consists a sense strand having a sequence of any one of SEQ ID NOs: 1537-1571 and 1681 and an antisense strand comprising a complementary sequence selected from any one of SEQ ID NOs: 1572-1606.

[0207] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises:

a sense strand of 36 nucleotides comprising a 2′-F modified nucleotide at positions 3, 5, 8, 10, 12, 13, 15, and 17; a 2′-OMe modified nucleotide at positions 1, 2, 4, 6, 7, 9, 11, 14, 16, 18-27, and 31-36; a GalNAc-conjugated nucleotide at position 28, 29, and 30; and a phosphorothioate linkage between positions 1 and 2; and

an antisense strand of 22 nucleotides comprising a 2′-F modified nucleotide at positions 2, 3, 4, 5, 7, 10, 14, 16, and 19; a 2′-OMe at positions 1, 6, 8, 9, 11, 12, 13, 15, 17, 18, and 20-22; a phosphorothioate linkage between positions 1 and 2, positions 2 and 3, positions 20 and 21, and positions 21 and 22; and a 5’ terminal nucleotide at position 1 comprising a 4’-phosphate analog, optionally wherein the 5’ terminal nucleotide comprises 4’-O-monomethylphosphonate-2’-O-methyluridine [MePhosphonate-4O-mU]; wherein positions 1-20 of the antisense strand form a duplex region with positions 1-20 of the sense strand, wherein positions 21-36 of the sense strand form a stem-loop, wherein positions 27-30 form the loop of the stem-loop, optionally wherein positions 27-30 comprise a tetraL, wherein positions 21 and 22 of the antisense strand comprise an overhang, and wherein the sense strand and antisense strands comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1537 and 1572, respectively;

b) SEQ ID NOs: 1538 and 1573, respectively;

c) SEQ ID NOs: 1539 and 1574, respectively;

d) SEQ ID NOs: 1540 and 1575, respectively;
e) SEQ ID NOs: 1541 and 1576, respectively;
f) SEQ ID NOs: 1542 and 1577, respectively;
g) SEQ ID NOs: 1543 and 1578, respectively;
h) SEQ ID NOs: 1544 and 1579, respectively;
i) SEQ ID NOs: 1545 and 1580, respectively;
j) SEQ ID NOs: 1546 and 1581, respectively;
k) SEQ ID NOs: 1547 and 1582, respectively;
l) SEQ ID NOs: 1548 and 1583, respectively;
m) SEQ ID NOs: 1549 and 1584, respectively;
n) SEQ ID NOs: 1550 and 1585, respectively;
o) SEQ ID NOs: 1551 and 1586, respectively;
p) SEQ ID NOs: 1552 and 1587, respectively;
q) SEQ ID NOs: 1553 and 1588, respectively;
r) SEQ ID NOs: 1554 and 1589, respectively;
s) SEQ ID NOs: 1555 and 1590, respectively;
t) SEQ ID NOs: 1556 and 1591, respectively;
u) SEQ ID NOs: 1557 and 1592, respectively;
v) SEQ ID NOs: 1558 and 1593, respectively;
w) SEQ ID NOs: 1559 and 1594, respectively;
x) SEQ ID NOs: 1560 and 1595, respectively;
y) SEQ ID NOs: 1561 and 1596, respectively;
z) SEQ ID NOs: 1562 and 1597, respectively;
aa) SEQ lD NOs: 1563 and 1598, respectively;
bb) SEQ ID NOs: 1564 and 1599, respectively;
cc) SEQ ID NOs: 1565 and 1600, respectively;
dd) SEQ ID NOs: 1566 and 1601, respectively;
ee) SEQ ID NOs: 1567 and 1602, respectively;
ff) SEQ ID NOs: 1568 and 1603, respectively;

gg) SEQ ID NOs: 1569 and 1604, respectively;

hh) SEQ ID NOs: 1570 and 1605, respectively; and

ii) SEQ ID NOs: 1571 and 1606, respectively.

[0208] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises:

a sense strand of 36 nucleotides comprising a 2'-F modified nucleotide at positions 3, 5, 8, 10, 12, 13, 15, and 17; a 2'-OMe modified nucleotide at positions 1, 2, 4, 6, 7, 9, 11, 14, 16, 18-27, and 31-36; a GalNAc-conjugated nucleotide at position 28, 29, and 30; and a phosphorothioate linkage between positions 1 and 2; and

an antisense strand of 22 nucleotides comprising a 2'-F modified nucleotide at positions 2, 3, 4, 5, 7, 10, 14, 16, and 19; a 2'-OMe at positions 1, 6, 8, 9, 11, 12, 13, 15, 17, 18, and 20-22; a phosphorothioate linkage between positions 1 and 2, positions 2 and 3, positions 20 and 21, and positions 21 and 22; and a 5' terminal nucleotide at position 1 comprising a 4'-phosphate analog, optionally wherein the 5' terminal nucleotide comprises 4'-O-monomethylphosphonate-2'-O-methyluridine [MePhosphonate-4O-mU]; wherein positions 1-20 of the antisense strand form a duplex region with positions 1-20 of the sense strand, wherein positions 21-36 of the sense strand form a stem-loop, wherein positions 27-30 form the loop of the stem-loop, optionally wherein positions 27-30 comprise a tetraL, wherein positions 21 and 22 of the antisense strand comprise an overhang, and wherein the sense strand and antisense strands comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1540 and 1575, respectively;

b) SEQ ID NOs: 1544 and 1579, respectively;

c) SEQ ID NOs: 1546 and 1581, respectively;

d) SEQ ID NOs: 1551and 1586, respectively;

e) SEQ ID NOs: 1552 and 1587, respectively;

f) SEQ ID NOs: 1553 and 1588, respectively;

g) SEQ ID NOs: 1558 and 1594, respectively;

h) SEQ ID NOs: 1560 and 1595, respectively;

i) SEQ ID NOs: 1564 and 1599, respectively;

j) SEQ ID NOs: 1565 and 1600, respectively;

k) SEQ ID NOs: 1566 and 1601, respectively; and

l) SEQ ID NOs: 1570 and 1605, respectively.

[0209] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises:

a sense strand of 36 nucleotides comprising a 2′-F modified nucleotide at positions 3, 5, 8, 10, 12, 13, 15, and 17; a 2′-OMe modified nucleotide at positions 1, 2, 4, 6, 7, 9, 11, 14, 16, 18-27, and 31-36; a GalNAc-conjugated nucleotide at position 28, 29 and 30; and a phosphorothioate linkage between positions 1 and 2; and

an antisense strand of 22 nucleotides comprising a 2′-F modified nucleotide at positions 2, 3, 4, 5, 7, 10, 14, 16, and 19; a 2′-OMe at positions 1, 6, 8, 9, 11, 12, 13, 15, 17, 18, and 20-22; a phosphorothioate linkage between positions 1 and 2, positions 2 and 3, positions 20 and 21, and positions 21 and 22; and a 5’ terminal nucleotide at position 1 comprising a 4’-phosphate analog, optionally wherein the 5’-terminal nucleotide comprises 4’-O-monomethylphosphonate-2’-O-methyluridine [MePhosphonate-4O-mU]; wherein positions 1-20 of the antisense strand form a duplex region with positions 1-20 of the sense strand, wherein positions 21-36 of the sense strand form a stem-loop, wherein positions 27-30 form the loop of the stem-loop, optionally wherein positions 27-30 comprise a tetraL, wherein positions 21 and 22 of the antisense strand comprise an overhang, and wherein the sense strand and antisense strands comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1553 and 1588, respectively;

b) SEQ ID NOs: 1560 and 1595, respectively;

c) SEQ ID NOs: 1564 and 1599, respectively;

d) SEQ ID NOs: 1551 and 1586, respectively; and

e) SEQ ID NOs: 1570 and 1605, respectively.

[0210] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises:

a sense strand of 20 nucleotides comprising a 2′-F modified nucleotide at positions 3, 5, 8, 10, 12, 13, 15, and 17; a 2′-OMe modified nucleotide at positions 2, 4, 6, 7, 9, 11, 14, 16, and

18-20; a C_{16} hydrocarbon chain conjugated to a nucleotide at position 1; and a phosphorothioate linkage between positions 1 and 2, between positions 18 and 19, and between positions 19 and 20; and

an antisense strand of 22 nucleotides comprising a 2′-F modified nucleotide at positions 2, 3, 4, 5, 7, 10, 14, 16, and 19; a 2′-OMe at positions 1, 6, 8, 9, 11, 12, 13, 15, 17, 18, and 20-22; a phosphorothioate linkage between positions 1 and 2, positions 2 and 3, positions 20 and 21, and positions 21 and 22; and a 5' terminal nucleotide at position 1 comprising a 4'-phosphate analog, optionally wherein the 5' terminal nucleotide comprises 4'-O-monomethylphosphonate-2'-O-methyluridine [MePhosphonate-4O-mU]; wherein positions 1-20 of the antisense strand form a duplex region with positions 1-20 of the sense strand, wherein positions 21 and 22 of the antisense strand comprise an overhang, and wherein the sense strand and antisense strands comprise nucleotide sequences of SEQ ID NOs: 1681 and 1586, respectively.

[0211] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises a sense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1553 and an antisense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1588. In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises a sense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1560 and an antisense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1595. In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises a sense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1564 and an antisense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1599. In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression comprises a sense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1551 and an antisense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1586. In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises a sense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1570 and an antisense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1605. In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises a sense strand comprising the nucleotide sequence as set forth in

SEQ ID NO: 1681 and an antisense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1586.

[0212] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1865; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand, wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0213] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1721; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand, wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0214] In some embodiments, the oligonucleotide is for reducing *SNCA* expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1847; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand, wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0215] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1846; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense

strand, wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0216] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1955; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand, wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0217] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1865; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand and a stem-loop at the 3' terminus, wherein the stem-loop is set forth as S1-L-S2, wherein S1 is complementary to S2, and wherein L forms a loop between S1 and S2 of 3 to 5 nucleotides in length, wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0218] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1721; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand and a stem-loop at the 3' terminus, wherein the stem-loop is set forth as S1-L-S2, wherein S1 is complementary to S2, and wherein L forms a loop between S1 and S2 of 3 to 5 nucleotides in length, wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0219] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand

comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1847; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand and a stem-loop at the 3' terminus, wherein the stem-loop is set forth as S1-L-S2, wherein S1 is complementary to S2, and wherein L forms a loop between S1 and S2 of 3 to 5 nucleotides in length, wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0220] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1846; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand and a stem-loop at the 3' terminus, wherein the stem-loop is set forth as S1-L-S2, wherein S1 is complementary to S2, and wherein L forms a loop between S1 and S2 of 3 to 5 nucleotides in length, wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0221] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1955; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand and a stem-loop at the 3' terminus, wherein the stem-loop is set forth as S1-L-S2, wherein S1 is complementary to S2, and wherein L forms a loop between S1 and S2 of 3 to 5 nucleotides in length, wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0222] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1846; and (ii) a sense

strand of 19-25 nucleotides in length comprising a region of complementarity to the antisense strand, wherein the oligonucleotide comprises a blunt end comprising the 3' end of the sense strand, and wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0223] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1865; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand, wherein the region of complementarity to the antisense strand is set forth in SEQ ID NO: 2249, and wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0224] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1721; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand, wherein the region of complementarity to the antisense strand is set forth in SEQ ID NO: 2105, and wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0225] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1847; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand, wherein the region of complementarity to the antisense strand is set forth in SEQ ID NO: 2231, and wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0226] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1846; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand, wherein the region of complementarity to the antisense strand is set forth in SEQ ID NO: 2230, and wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0227] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1955; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand, wherein the region of complementarity to the antisense strand is set forth in SEQ ID NO: 2339, and wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0228] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a *SNCA* mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1865; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand and a stem-loop at the 3' terminus, wherein the region of complementarity to the antisense strand is set forth in SEQ ID NO: 2249, wherein the stem-loop is set forth as S1-L-S2, wherein S1 is complementary to S2, and wherein L forms a loop between S1 and S2 of 3 to 5 nucleotides in length, wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0229] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target

sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1721; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand and a stem-loop at the 3' terminus, wherein the region of complementarity to the antisense strand is set forth in SEQ ID NO: 2105, wherein the stem-loop is set forth as S1-L-S2, wherein S1 is complementary to S2, and wherein L forms a loop between S1 and S2 of 3 to 5 nucleotides in length, wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0230] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1847; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand and a stem-loop at the 3' terminus, wherein the region of complementarity to the antisense strand is set forth in SEQ ID NO: 2231, wherein the stem-loop is set forth as S1-L-S2, wherein S1 is complementary to S2, and wherein L forms a loop between S1 and S2 of 3 to 5 nucleotides in length, wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0231] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1846; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand and a stem-loop at the 3' terminus, wherein the region of complementarity to the antisense strand is set forth in SEQ ID NO: 2230, wherein the stem-loop is set forth as S1-L-S2, wherein S1 is complementary to S2, and wherein L forms a loop between S1 and S2 of 3 to 5 nucleotides in length, wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0232] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand

comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1955; and (ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand and a stem-loop at the 3' terminus, wherein the region of complementarity to the antisense strand is set forth in SEQ ID NO: 2339, wherein the stem-loop is set forth as S1-L-S2, wherein S1 is complementary to S2, and wherein L forms a loop between S1 and S2 of 3 to 5 nucleotides in length, wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0233] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises (i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is set forth in SEQ ID NO: 1846; and (ii) a sense strand of 19-25 nucleotides in length comprising a region of complementarity to the antisense strand, wherein the region of complementarity to the antisense strand is set forth in SEQ ID NO: 2230, wherein the oligonucleotide comprises a blunt end comprising the 3' end of the sense strand, and wherein the antisense and sense strands are separate strands that form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

[0234] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises a sense strand and an antisense strand according to:

Sense Strand: 5'-mX-*S*-mX-fX-mX-fX-mX-mX-fX-mX-fX-mX-fX-fX-mX-fX-mX-fX-mX-mX-mX-mX-mX-mX-mX-mX-mX-mX-[ademX-GalNAc][ademX-GalNAc][ademX-GalNAc]-mX-mX-mX-mX-mX-mX-3'; hybridized to:

Antisense Strand: 5'-[MePhosphonate-4O-mX]-*S*-fX-*S*-fX-fX-fX-mX-fX-mX-mX-fX-mX-mX-mX-fX-mX-fX-mX-mX-fX-mX-*S*-mX-*S*-mX-3';

wherein mX = 2'-OMe modified nucleotide, fX = 2'-F modified nucleotide, -*S*- = phosphorothioate linkage, - = phosphodiester linkage, [MePhosphonate-4O-mX] = 4'-O-monomethylphosphonate-2'-O-methyl modified nucleotide, and ademX-GalNAc = GalNAc attached to a nucleotide.

[0235] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises a sense strand and an antisense strand according to:

Sense Strand: 5'-[AdemX-L]-*S*-mX-fX-mX-fX-mX-mX-fX-mX-fX-mX-fX-fX-mX-fX-mX-fX-mX-*S*-mX-*S*-mX-3'; hybridized to:

Antisense Strand: 5'-[MePhosphonate-4O-mX]-*S*-fX-*S*-fX-fX-fX-mX-fX-mX-mX-fX-mX-mX-mX-fX-mX-fX-mX-mX-fX-mX-*S*-mX-*S*-mX-3';

wherein mX = 2'-OMe modified nucleotide, fX = 2'-F modified nucleotide, -*S*- = phosphorothioate linkage, - = phosphodiester linkage, [MePhosphonate-4O-mX] = 4'-O-monomethylphosphonate-2'-O-methyl modified nucleotide, and ademX-L = lipid moiety attached to a nucleotide.

[0236] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises a sense strand and an antisense strand according to:

Sense Strand: 5'-[AdemX-C_{16}]-*S*-mX-fX-mX-fX-mX-mX-fX-mX-fX-mX-fX-fX-mX-fX-mX-fX-mX-*S*-mX-*S*-mX-3'; hybridized to:

Antisense Strand: 5'-[MePhosphonate-4O-mX]-*S*-fX-*S*-fX-fX-fX-mX-fX-mX-mX-fX-mX-mX-mX-fX-mX-fX-mX-mX-fX-mX-*S*-mX-*S*-mX-3';

wherein mX = 2'-OMe modified nucleotide, fX = 2'-F modified nucleotide, -*S*- = phosphorothioate linkage, - = phosphodiester linkage, [MePhosphonate-4O-mX] = 4'-O-monomethylphosphonate-2'-O-methyl modified nucleotide, and ademX-C_{16} = C_{16} hydrocarbon chain attached to a nucleotide.

[0237] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises a sense strand and an antisense strand comprising nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1607 and 1642, respectively;

b) SEQ ID NOs: 1608 and 1643, respectively;

c) SEQ ID NOs: 1609 and 1644, respectively;

d) SEQ ID NOs: 1610 and 1645, respectively;

e) SEQ ID NOs: 1611 and 1646, respectively;

f) SEQ ID NOs: 1612 and 1647, respectively;

g) SEQ ID NOs: 1613 and 1648, respectively;
h) SEQ ID NOs: 1614 and 1649, respectively;
i) SEQ ID NOs: 1615 and 1650, respectively;
j) SEQ ID NOs: 1616 and 1651, respectively;
k) SEQ ID NOs: 1617 and 1652, respectively;
l) SEQ ID NOs: 1618 and 1653, respectively;
m) SEQ ID NOs: 1619 and 1654, respectively;
n) SEQ ID NOs: 1620 and 1655, respectively;
o) SEQ ID NOs: 1621 and 1656, respectively;
p) SEQ ID NOs: 1622 and 1657, respectively;
q) SEQ ID NOs: 1623 and 1658, respectively;
r) SEQ ID NOs: 1624 and 1659, respectively;
s) SEQ ID NOs: 1625 and 1660, respectively;
t) SEQ ID NOs: 1626 and 1661, respectively;
u) SEQ ID NOs: 1627 and 1662, respectively;
v) SEQ ID NOs: 1628 and 1663, respectively;
w) SEQ ID NOs: 1629 and 1664, respectively;
x) SEQ ID NOs: 1630 and 1665, respectively;
y) SEQ ID NOs: 1631 and 1666, respectively;
z) SEQ ID NOs: 1632 and 1667, respectively;
aa) SEQ ID NOs: 1633 and 1668, respectively;
bb) SEQ ID NOs: 1634 and 1669, respectively;
cc) SEQ ID NOs: 1635 and 1670, respectively;
dd) SEQ ID NOs: 1636 and 1671, respectively;
ee) SEQ ID NOs: 1637 and 1672, respectively;
ff) SEQ ID NOs: 1638 and 1673, respectively;
gg) SEQ ID NOs: 1639 and 1674, respectively;
hh) SEQ ID NOs: 1640 and 1675, respectively;
ii) SEQ ID NOs: 1641 and 1676, respectively; and

jj) SEQ ID NOs: 1682 and 1656, respectively.

[0238] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises a sense strand and an antisense strand comprising nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1610 and 1645, respectively;

b) SEQ ID NOs: 1614 and 1649, respectively;

c) SEQ ID NOs: 1616 and 1651, respectively;

d) SEQ ID NOs: 1621 and 1656, respectively;

e) SEQ ID NOs: 1622 and 1657, respectively;

f) SEQ ID NOs: 1623 and 1658, respectively;

g) SEQ ID NOs: 1629 and 1664, respectively;

h) SEQ ID NOs: 1630 and 1665, respectively;

i) SEQ ID NOs: 1634 and 1669, respectively;

j) SEQ ID NOs: 1635 and 1670, respectively;

k) SEQ ID NOs: 1636 and 1671, respectively;

l) SEQ ID NOs: 1640 and 1675, respectively; and

m) SEQ ID NOs: 1682 and 1656, respectively.

[0239] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises a sense strand and an antisense strand comprising nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1623 and 1658, respectively;

b) SEQ ID NOs: 1630 and 1665, respectively;

c) SEQ ID NOs: 1634 and 1669, respectively;

d) SEQ ID NOs: 1621 and 1656, respectively;

e) SEQ ID NOs: 1640 and 1675, respectively; and,

f) SEQ ID NOs: 1682 and 1656, respectively.

[0240] In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises a sense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1623 and an antisense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1658. In some

embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises a sense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1630 and an antisense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1665. In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises a sense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1634 and an antisense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1669. In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises a sense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1621 and an antisense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1656. In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises a sense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1640 and an antisense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1675. In some embodiments, the oligonucleotide is for reducing *SNCA* gene expression and comprises a sense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1682 and an antisense strand comprising the nucleotide sequence as set forth in SEQ ID NO: 1656.

Formulations

[0241] Various formulations have been developed to facilitate oligonucleotide use. For example, oligonucleotides (*e.g.*, RNAi oligonucleotides) can be delivered to a subject or a cellular environment using a formulation that minimizes degradation, facilitates delivery and/or uptake, or provides another beneficial property to the oligonucleotide in the formulation. In some embodiments, the formulation is a composition comprising oligonucleotides that reduce *SNCA* gene expression. Such a composition can be suitably formulated such that when administered to a subject, either into the immediate environment of a target cell or systemically, a sufficient portion of the oligonucleotides enter the cell to reduce *SNCA* gene expression. Any variety of suitable oligonucleotide formulations can be used to deliver oligonucleotides for the reduction of *SNCA* gene expression. In some embodiments, the oligonucleotides are formulated in buffer solutions such as phosphate buffered saline solutions, liposomes, micellar structures, and capsids. In other

embodiments, the oligonucleotides are formulated in buffer solutions such as phosphate buffered saline solutions.

[0242] Formulations of oligonucleotides with cationic lipids can be used to facilitate transfection of the oligonucleotides into cells. For example, cationic lipids, such as lipofectin, cationic glycerol derivatives, and polycationic molecules (*e.g.*, polylysine) can be used. Suitable lipids include Oligofectamine, Lipofectamine (Life Technologies), NC388 (Ribozyme Pharmaceuticals, Inc.; Boulder, CO), or FuGene 6 (Roche), all of which can be used according to the manufacturer's instructions. In some embodiments, the oligonucleotide is not formulated with a component to facilitate transfection into cells.

[0243] Accordingly, in some embodiments, the formulation comprises a lipid nanoparticle. In some embodiments, the lipid nanoparticle comprises a liposome, a lipid, a lipid complex, a microsphere, a microparticle, a nanosphere or a nanoparticle, or may be otherwise formulated for administration to the cells, tissues, organs, or body of a subject in need thereof (*see*, *e.g.*, Remington: THE SCIENCE AND PRACTICE OF PHARMACY, 22nd ed, Pharmaceutical Press, 2013).

[0244] In some embodiments, the formulation comprises an excipient, which confers to a composition improved stability, improved absorption, improved solubility, and/or therapeutic enhancement of the active ingredient. In some embodiments, the excipient is a buffering agent (*e.g.*, sodium citrate, sodium phosphate, a tris base, or sodium hydroxide) or a vehicle (*e.g.*, a buffered solution, petrolatum, dimethyl sulfoxide, or mineral oil). In some embodiments, the oligonucleotide is lyophilized for extending its shelf-life and then made into a solution before use (*e.g.*, administration to a subject). Accordingly, the excipient may be a lyoprotectant (*e.g.*, mannitol, lactose, polyethylene glycol, or polyvinylpyrrolidone) or a collapse temperature modifier (*e.g.*, dextran, Ficoll™ or gelatin).

[0245] In some embodiments, the formulation is a pharmaceutical composition compatible with its intended route of administration. Examples of routes of administration include, but are not limited to, parenteral (*e.g.*, intravenous, intramuscular, intraperitoneal, intradermal, subcutaneous), oral (*e.g.*, inhalation), transdermal (*e.g.*, topical), transmucosal, and rectal administration.

[0246] In some embodiments, the formulation is formulated for administration into the CNS. In some embodiments, the formulation is formulated for administration into the cerebral spinal fluid.

In some embodiments, the formulation is formulated for administration to the spinal cord. In some embodiments, the formulation is formulated for intrathecal administration. In some embodiments, the formulation is formulated for administration to the brain. In some embodiments, the formulation is formulated for intracerebroventricular administration. In some embodiments, the formulation is formulated for the brain stem. In some embodiments, the formulation is formulated for intracisternal magna administration.

[0247] Pharmaceutical compositions suitable for injectable use include sterile aqueous solutions (where water soluble) or dispersions and sterile powders for the extemporaneous preparation of sterile injectable solutions or dispersion. For intravenous administration, suitable carriers include physiological saline, bacteriostatic water, Cremophor EL™ (BASF; Parsippany, NJ), or phosphate buffered saline (PBS). The carrier can be a solvent or dispersion medium containing, for example, water, ethanol, polyol (*e.g.*, glycerol, propylene glycol, and liquid polyethylene glycol, and the like), and suitable mixtures thereof. In many cases, it will be preferable to include isotonic agents, for example, sugars, polyalcohols such as mannitol, sorbitol, sodium chloride in the composition. Sterile injectable solutions can be prepared by incorporating the oligonucleotides in a required amount in a selected solvent with one or a combination of ingredients enumerated above, as required, followed by filtered sterilization.

[0248] In some embodiments, the formulation may contain at least about 0.1% of the oligonucleotide or more, although the percentage of the active ingredient(s) may be between about 1% to about 80% or more of the weight or volume of the total composition. Factors such as solubility, bioavailability, biological half-life, route of administration, product shelf life, as well as other pharmacological considerations will be contemplated by one skilled in the art of preparing such pharmaceutical formulations, and as such, a variety of dosages and treatment regimens may be desirable.

Methods of Use

Reducing SNCA Expression

[0249] In some embodiments, methods of contacting or delivering to a cell or population of cells comprise administering an effective amount of an oligonucleotide (*e.g.*, a RNAi oligonucleotide)

to reduce *SNCA* gene expression. In some embodiments, a reduction of *SNCA* gene expression is determined by measuring a reduction in the amount or level of SNCA mRNA, SNCA protein, SNCA activity in a cell, or a combination thereof. The methods include those described herein and known to one of ordinary skill in the art.

[0250] In some embodiments, methods of reducing *SNCA* gene expression in the CNS comprise administering an effective amount of an oligonucleotide (*e.g.*, a RNAi oligonucleotide) to reduce *SNCA* gene expression. In some embodiments, the CNS comprises the brain and spinal cord. In some embodiments, *SNCA* gene expression is reduced in at least one region of the brain, which includes, but is not limited to, the cervical spinal cord, thoracic spinal cord, lumbar spinal cord, frontal cortex, temporal cortex, cerebellum, midbrain, occipital cortex, parietal cortex, hippocampus, caudate nucleus, thalamus, and brainstem. In some embodiments, *SNCA* gene expression is reduced in at least one region of the spinal cord, which includes, but is not limited to, the cervical spinal cord, thoracic spinal cord, and lumbar spinal cord. In some embodiments, *SNCA* gene expression is reduced in at least one region of the brain and at least one region of the spinal cord. In some embodiments, *SNCA* gene expression is reduced in at least one of the cervical spinal cord, thoracic spinal cord, lumbar spinal cord, frontal cortex, temporal cortex, cerebellum, midbrain, occipital cortex, parietal cortex, hippocampus, caudate nucleus, thalamus, brainstem, motor cortex, globus pallidus, midbrain tegmentum, substantia nigra, pons, cerebellar white matter, and cerebellar dentate nucleus. In some embodiments, *SNCA* gene expression is reduced in at least one of the lumbar spinal cord, thoracic spinal cord, and cervical spinal cord. In some embodiments, *SNCA* gene expression is reduced in tissue of the brain and/or spinal cord associated with Parkinson's disease. In some embodiments, tissue associated with Parkinson's disease includes, but is not limited to, putamen, midbrain tegmentum, substantia nigra, pons, and medulla. In some embodiments, *SNCA* gene expression is reduced in tissue of the brain and/or spinal cord associated with multiple systems atrophy. In some embodiments, tissue associated with Parkinson's disease includes, but is not limited to, caudate nucleus, putamen, midbrain tegmentum, substantia nigra, pons, cerebellar cortex, cerebellar white matter, medulla, cervical spinal cord, thoracic spinal cord, and lumbar spinal cord.

[0251] In some embodiments, *SNCA* gene expression is reduced for about 1 week to about 12 weeks after administration of an oligonucleotide or a formulation including the same. In some embodiments, *SNCA* gene expression is reduced for 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or 12 weeks after administration of the oligonucleotide or the formulation. In some embodiments, *SNCA* gene expression is reduced for about 1 month to about 4 months after administration of the oligonucleotide or the formulation. In some embodiments, *SNCA* gene expression is reduced for about 1 month to about 6 months after administration of the oligonucleotide or the formulation. In some embodiments, *SNCA* gene expression is reduced for 1, 2, 3, or 4 months after administration of the oligonucleotide or the formulation. In some embodiments, *SNCA* gene expression is reduced for 1, 2, 3 4, 5, or 6 months after administration of the oligonucleotide or the formulation. In some embodiments, *SNCA* gene expression is reduced for about 7days to about 91 days after administration of the oligonucleotide or the formulation. In some embodiments, *SNCA* gene expression is reduced for 7, 14, 21, 28, 35, 42, 49, 56, 63, 70, 77, 84, or 91 days after administration of the oligonucleotide or the formulation.

[0252] In some embodiments, *SNCA* gene expression is reduced in at least one region of the brain and/or at least one region of the spinal cord for about 1 to about 12 weeks after administration of the oligonucleotide or the formulation. In some embodiments, *SNCA* gene expression is reduced in at least one region of the brain and/or at least one region of the spinal cord for 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or 12 weeks after administration of the oligonucleotide or the formulation. In some embodiments, *SNCA* gene expression is reduced in at least one region of the brain and/or at least one region of the spinal cord for about 1 month to about 4 months after administration of the oligonucleotide or the formulation. In some embodiments, *SNCA* gene expression is reduced in at least one region of the brain and/or at least one region of the spinal cord for about 1 month to about 6 months after administration of the oligonucleotide or the formulation. In some embodiments, *SNCA* gene expression is reduced in at least one region of the brain and/or at least one region of the spinal cord for 1, 2, 3, or 4 months after administration of the oligonucleotide or the formulation. In some embodiments, *SNCA* gene expression is reduced in at least one region of the brain and/or at least one region of the spinal cord for 1, 2, 3 4, 5, or 6 months after administration of the oligonucleotide or the formulation. In some embodiments, *SNCA* gene expression is reduced

in at least one region of the brain and/or at least one region of the spinal cord for about 7 days to about 91 days after administration of the oligonucleotide or the formulation. In some embodiments, *SNCA* gene expression is reduced in at least one region of the brain and/or at least one region of the spinal cord for 7, 14, 21, 28, 35, 42, 49, 56, 63, 70, 77, 84, or 91 days after administration of the oligonucleotide or the formulation.

[0253] The methods herein are useful in any appropriate cell type. In some embodiments, the cell type is any cell that expresses SNCA mRNA (*e.g.*, oligodendrocyte). In some embodiments, the cell type is a primary cell obtained from a subject. In some embodiments, the primary cell has undergone a limited number of passages such that the cell substantially maintains is natural phenotypic properties. In some embodiments, a cell to which the oligonucleotide is delivered is *ex vivo* or *in vitro* (*i.e.*, can be delivered to a cell in culture or to an organism in which the cell resides).

[0254] In some embodiments, the oligonucleotide is delivered to a cell or population of cells using a nucleic acid delivery method known in the art including, but not limited to, injection of a solution or pharmaceutical composition containing the oligonucleotide (*i.e.*, a formulation), bombardment by particles covered by the oligonucleotide, exposing the cell or population of cells to a solution containing the oligonucleotide, or electroporation of cell membranes in the presence of the oligonucleotide. Other methods known in the art for delivering oligonucleotides to cells may be used, such as lipid-mediated carrier transport, chemical-mediated transport, and cationic liposome transfection such as calcium phosphate, and others.

[0255] In some embodiments, reduction of *SNCA* gene expression is determined by an assay or technique that evaluates one or more molecules, properties or characteristics of a cell or population of cells associated with *SNCA* gene expression, or by an assay or technique that evaluates molecules that are directly indicative of *SNCA* gene expression in a cell or population of cells (*e.g.*, *SNCA* mRNA or SNCA protein). In some embodiments, the extent to which the oligonucleotide reduces *SNCA* gene expression is evaluated by comparing *SNCA* gene expression in a cell or population of cells contacted with the oligonucleotide to a control cell or population of cells (*e.g.*, a cell or population of cells not contacted with the oligonucleotide or contacted with a control oligonucleotide). In some embodiments, a control amount or level of *SNCA* gene expression in a control cell or population of cells is predetermined, such that the control amount or level need not

be measured in every instance the assay or technique is performed. The predetermined level or value can take a variety of forms. In some embodiments, a predetermined level or value can be single cut-off value, such as a median or mean.

[0256] In some embodiments, contacting or delivering the oligonucleotide to a cell or a population of cells results in a reduction in *SNCA* gene expression. In some embodiments, the reduction in *SNCA* gene expression is relative to a control amount or level of *SNCA* gene expression in cell or population of cells not contacted with the oligonucleotide or contacted with a control oligonucleotide. In some embodiments, the reduction in *SNCA* gene expression is about 1% or lower, about 5% or lower, about 10% or lower, about 15% or lower, about 20% or lower, about 25% or lower, about 30% or lower, about 35% or lower, about 40% or lower, about 45% or lower, about 50% or lower, about 55% or lower, about 60% or lower, about 70% or lower, about 80% or lower, or about 90% or lower relative to a control amount or level of *SNCA* gene expression. In some embodiments, the control amount or level of *SNCA* gene expression is an amount or level of SNCA mRNA and/or SNCA protein and/or SNCA activity/function in a cell or population of cells that has not been contacted with the oligonucleotide. In some embodiments, the effect of delivery of the oligonucleotide to a cell or population of cells according to a method herein is assessed after any finite period or amount of time (*e.g.*, minutes, hours, days, weeks, months). For example, in some embodiments, *SNCA* gene expression is determined in a cell or population of cells at least about 4 hours, about 8 hours, about 12 hours, about 18 hours, about 24 hours; or at least about 1 day, about 2 days, about 3 days, about 4 days, about 5 days, about 6 days, about 7 days, about 8 days, about 9 days, about 10 days, about 11 days, about 12 days, about 13 days, about 14 days, about 21 days, about 28 days, about 35 days, about 42 days, about 49 days, about 56 days, about 63 days, about 70 days, about 77 days, or about 84 days, or more after contacting or delivering the oligonucleotide to the cell or population of cells. In some embodiments, *SNCA* gene expression is determined in a cell or population of cells at least about 1 month, about 2 months, about 3 months, about 4 months, about 5 months, or about 6 months, or more after contacting or delivering the oligonucleotide to the cell or population of cells.

[0257] In some embodiments, the oligonucleotide is delivered in the form of a transgene that is engineered to express in a cell the oligonucleotide or strands comprising the oligonucleotide (*e.g.*,

its sense and antisense strands). In some embodiments, the oligonucleotide is delivered using a transgene engineered to express any oligonucleotide. Transgenes may be delivered using viral vectors (*e.g.*, adenovirus, retrovirus, vaccinia virus, poxvirus, adeno-associated virus, or herpes simplex virus) or non-viral vectors (*e.g.*, plasmids or synthetic mRNAs). In some embodiments, transgenes can be injected directly to a subject.

Treatment Methods

[0258] Oligonucleotides (*e.g.,* RNAi oligonucleotides) also are provided for use, or adaptable for use, to treat a subject (*e.g.*, a human having a disease, disorder, or condition associated with *SNCA* expression) that would benefit from reducing *SNCA* gene expression. In some aspects, the disclosure provides oligonucleotides for use, or adapted for use, to treat a subject having a disease, disorder or condition associated with expression of *SNCA*. Oligonucleotides also are provided for use, or adaptable for use, in the manufacture of a medicament or formulation/pharmaceutical composition for treating a disease, disorder, or condition associated with *SNCA* gene expression. In some embodiments, the oligonucleotides for use, or adaptable for use, target SNCA mRNA and reduce *SNCA* gene expression (*e.g.*, *via* the RNAi pathway). In some embodiments, the oligonucleotides for use, or adaptable for use, target SNCA mRNA and reduce the amount or level of SNCA mRNA, SNCA protein and/or SNCA activity/function.

[0259] In addition, in some embodiments of the methods herein, a subject having a disease, disorder, or condition associated with *SNCA* expression or is predisposed to the same is selected for treatment with the oligonucleotide or the formulation. In some embodiments, the method comprises selecting an individual having a marker (*e.g.*, a biomarker) for a disease, disorder, or condition associated with *SNCA* gene expression, or predisposed to the same, such as, but not limited to, SNCA mRNA, SNCA protein, SNCA activity/function, or a combination thereof. Likewise, and as detailed below, some embodiments of the methods include steps such as measuring or obtaining a baseline value for a marker of *SNCA* gene expression, and then comparing such obtained value to one or more other baseline values or values obtained after the subject is administered the oligonucleotide to assess the effectiveness of treatment.

[0260] Methods of treating a subject having, suspected of having, or at risk of developing a

disease, disorder, or condition associated with *SNCA* gene expression with the oligonucleotide or formulation are provided herein. In some aspects, methods of treating or attenuating the onset or progression of a disease, disorder, or condition associated with *SNCA* gene expression using the oligonucleotide or formulation are provided herein. In other aspects, methods to achieve one or more therapeutic benefits in a subject having a disease, disorder, or condition associated with *SNCA* gene expression using the oligonucleotide or formulation are provided herein. In some embodiments, the subject is treated by administering a therapeutically effective amount of any one or more of the oligonucleotides provided herein. In some embodiments, treatment comprises reducing *SNCA* gene expression. In some embodiments, the subject is treated therapeutically. In other embodiments, the subject is treated prophylactically.

[0261] In some embodiments of the methods herein, the oligonucleotide, or a pharmaceutical composition comprising the oligonucleotide, is administered to a subject having a disease, disorder, or condition associated with *SNCA* expression such that *SNCA* gene expression is reduced in the subject, thereby treating the subject. In some embodiments, an amount or level of *SNCA* mRNA is reduced in the subject. In some embodiments, an amount or level of SNCA protein is reduced in the subject. In other embodiments, an amount or level of SNCA activity/function is reduced in the subject.

[0262] In some embodiments, the oligonucleotide or pharmaceutical composition/formulation comprising the oligonucleotide, is administered to a subject having a disease, disorder, or condition associated with *SNCA* gene expression such that *SNCA* expression is reduced in the subject by at least about 30%, about 35%, about 40%, about 45%, about 50%, about 55%, about 60%, about 65%, about 70%, about 75%, about 80%, about 85%, about 90%, about 95%, about 99%, or greater than 99% when compared to *SNCA* expression prior to administration of the oligonucleotide or pharmaceutical composition. In some embodiments of the methods herein, the oligonucleotide or the pharmaceutical composition is administered to a subject having a disease, disorder, or condition associated with *SNCA* gene expression such that *SNCA* expression is reduced in the subject by at least about 30%, about 35%, about 40%, about 45%, about 50%, about 55%, about 60%, about 65%, about 70%, about 75%, about 80%, about 85%, about 90%, about 95%, about 99%, or greater than 99% for about 1 week to about 12 weeks, about 1 month to about 6 months,

or about 7 days to about 91 days when compared to *SNCA* expression prior to administration of the oligonucleotide or pharmaceutical composition. In some embodiments, *SNCA* expression is reduced in the subject by at least about 30%, about 35%, about 40%, about 45%, about 50%, about 55%, about 60%, about 65%, about 70%, about 75%, about 80%, about 85%, about 90%, about 95%, about 99%, or greater than 99% when compared to *SNCA* expression in a subject (*e.g.*, a reference or control subject) not receiving the oligonucleotide or pharmaceutical composition or receiving a control oligonucleotide, pharmaceutical composition, or treatment. In some embodiments, *SNCA* expression is reduced in the subject by at least about 30%, about 35%, about 40%, about 45%, about 50%, about 55%, about 60%, about 65%, about 70%, about 75%, about 80%, about 85%, about 90%, about 95%, about 99%, or greater than 99% for about 1 week to about 12 weeks, about 1 month to about 6 months, or about 7 days to about 91 days when compared to *SNCA* expression in a subject (*e.g.*, a reference or control subject) not receiving the oligonucleotide or pharmaceutical composition or receiving a control oligonucleotide, pharmaceutical composition or treatment.

[0263] In some embodiments of the methods herein, the oligonucleotide or the pharmaceutical composition is administered to a subject having a disease, disorder, or condition associated with *SNCA* gene expression such that an amount or level of SNCA mRNA is reduced in the subject by at least about 30%, about 35%, about 40%, about 45%, about 50%, about 55%, about 60%, about 65%, about 70%, about 75%, about 80%, about 85%, about 90%, about 95%, about 99%, or greater than 99% when compared to the amount or level of SNCA mRNA prior to administration of the oligonucleotide or pharmaceutical composition. In some embodiments of the methods herein, the oligonucleotide or the pharmaceutical composition is administered to a subject having a disease, disorder, or condition associated with *SNCA* gene expression such that an amount or level of SNCA mRNA is reduced in the subject by at least about 30%, about 35%, about 40%, about 45%, about 50%, about 55%, about 60%, about 65%, about 70%, about 75%, about 80%, about 85%, about 90%, about 95%, about 99%, or greater than 99% for about 1 week to about 12 weeks, about 1 month to about 6 months, or about 7 days to about 91 days when compared to the amount or level of SNCA mRNA prior to administration of the oligonucleotide or pharmaceutical composition. In some embodiments, an amount or level of SNCA mRNA is reduced in the subject by at least about

30%, about 35%, about 40%, about 45%, about 50%, about 55%, about 60%, about 65%, about 70%, about 75%, about 80%, about 85%, about 90%, about 95%, about 99%, or greater than 99% when compared to an amount or level of SNCA mRNA in a subject (*e.g.*, a reference or control subject) not receiving the oligonucleotide or pharmaceutical composition or receiving a control oligonucleotide, pharmaceutical composition, or treatment. In some embodiments, an amount or level of SNCA mRNA is reduced in the subject by at least about 30%, about 35%, about 40%, about 45%, about 50%, about 55%, about 60%, about 65%, about 70%, about 75%, about 80%, about 85%, about 90%, about 95%, about 99%, or greater than 99% for about 1 week to about 12 weeks, about 1 month to about 6 months, or about 7 days to about 91 days when compared to an amount or level of SNCA mRNA in a subject (*e.g.*, a reference or control subject) not receiving the oligonucleotide or pharmaceutical composition or receiving a control oligonucleotide, pharmaceutical composition, or treatment.

[0264] In some embodiments of the methods herein, the oligonucleotide or the pharmaceutical composition is administered to a subject having a disease, disorder, or condition associated with *SNCA* gene expression such that an amount or level of SNCA protein is reduced in the subject by at least about 30%, about 35%, about 40%, about 45%, about 50%, about 55%, about 60%, about 65%, about 70%, about 75%, about 80%, about 85%, about 90%, about 95%, about 99%, or greater than 99% when compared to the amount or level of SNCA protein prior to administration of the oligonucleotide or pharmaceutical composition. In some embodiments of the methods herein, the oligonucleotide or the pharmaceutical composition is administered to a subject having a disease, disorder, or condition associated with *SNCA* gene expression such that an amount or level of SNCA protein is reduced in the subject by at least about 30%, about 35%, about 40%, about 45%, about 50%, about 55%, about 60%, about 65%, about 70%, about 75%, about 80%, about 85%, about 90%, about 95%, about 99%, or greater than 99% for about 1 week to about 12 weeks, about 1 month to about 6 months, or about 7 days to about 91 days when compared to the amount or level of SNCA protein prior to administration of the oligonucleotide or pharmaceutical composition. In some embodiments, an amount or level of SNCA protein is reduced in the subject by at least about 30%, about 35%, about 40%, about 45%, about 50%, about 55%, about 60%, about 65%, about 70%, about 75%, about 80%, about 85%, about 90%, about 95%, about 99%, or greater than 99%

when compared to an amount or level of SNCA protein in a subject (*e.g.*, a reference or control subject) not receiving the oligonucleotide or pharmaceutical composition or receiving a control oligonucleotide, pharmaceutical composition, or treatment. In some embodiments, an amount or level of SNCA protein is reduced in the subject by at least about 30%, about 35%, about 40%, about 45%, about 50%, about 55%, about 60%, about 65%, about 70%, about 75%, about 80%, about 85%, about 90%, about 95%, about 99%, or greater than 99% for about 1 week to about 12 weeks, about 1 month to about 6 months, or about 7 days to about 91 days when compared to an amount or level of SNCA protein in a subject (*e.g.*, a reference or control subject) not receiving the oligonucleotide or pharmaceutical composition or receiving a control oligonucleotide, pharmaceutical composition, or treatment.

[0265] In some embodiments of the methods herein, the oligonucleotide or the pharmaceutical composition is administered to a subject having a disease, disorder, or condition associated with *SNCA* gene expression such that an amount or level of SNCA activity/function is reduced in the subject by at least about 30%, about 35%, about 40%, about 45%, about 50%, about 55%, about 60%, about 65%, about 70%, about 75%, about 80%, about 85%, about 90%, about 95%, about 99%, or greater than 99% when compared to the amount or level of SNCA activity/function prior to administration of the oligonucleotide or pharmaceutical composition. In some embodiments of the methods herein, the oligonucleotide or the pharmaceutical composition is administered to a subject having a disease, disorder, or condition associated with *SNCA* gene expression such that an amount or level of SNCA activity/function is reduced in the subject by at least about 30%, about 35%, about 40%, about 45%, about 50%, about 55%, about 60%, about 65%, about 70%, about 75%, about 80%, about 85%, about 90%, about 95%, about 99% ,or greater than 99% for about 1 week to about 12 weeks, about 1 month to about 6 months, or about 7 days to about 91 days when compared to the amount or level of SNCA activity/function prior to administration of the oligonucleotide or pharmaceutical composition. In some embodiments, an amount or level of SNCA activity/function is reduced in the subject by at least about 30%, about 35%, about 40%, about 45%, about 50%, about 55%, about 60%, about 65%, about 70%, about 75%, about 80%, about 85%, about 90%, about 95%, about 99%, or greater than 99% when compared to an amount or level of SNCA activity/function in a subject (*e.g.*, a reference or control subject) not receiving

the oligonucleotide or pharmaceutical composition or receiving a control oligonucleotide, pharmaceutical composition or treatment. In some embodiments, an amount or level of SNCA activity/function is reduced in the subject by at least about 30%, about 35%, about 40%, about 45%, about 50%, about 55%, about 60%, about 65%, about 70%, about 75%, about 80%, about 85%, about 90%, about 95%, about 99%, or greater than 99% for about 1 week to about 12 weeks, about 1 month to about 6 months, or about 7 days to about 91 days when compared to an amount or level of SNCA activity/function in a subject (*e.g.*, a reference or control subject) not receiving the oligonucleotide or pharmaceutical composition or receiving a control oligonucleotide, pharmaceutical composition, or treatment.

[0266] Suitable methods for determining *SNCA* gene expression such as *SNCA* expression, an amount or level of SNCA mRNA, an amount or level of SNCA protein, and/or an amount or level of SNCA activity/function in the subject, or in a sample from the subject, are known in the art. Further, the Examples set forth herein illustrate exemplary methods for determining *SNCA* gene expression.

[0267] In some embodiments, *SNCA* gene expression such as *SNCA* expression, an amount or level of *SNCA* mRNA, an amount or level of SNCA protein, an amount or level of SNCA activity/function, or any combination thereof, is reduced in a cell (*e.g.*, an oligodendrocyte), a population or a group of cells (*e.g.*, an organoid), an organ (*e.g.*, frontal cortex), blood or a fraction thereof (*e.g.*, plasma), a tissue (*e.g.*, brain tissue), a sample (*e.g.*, a brain biopsy sample), or any other biological material obtained or isolated from the subject. In some embodiments, *SNCA* expression, an amount or level of *SNCA* mRNA, an amount or level of SNCA protein, an amount or level of SNCA activity/function, or any combination thereof, is reduced in more than one type of cell (*e.g.*, an oligodendrocyte and one or more other type(s) of cell), more than one groups of cells, more than one organ (*e.g.*, brain and one or more other organ(s)), more than one fraction of blood (*e.g.*, plasma and one or more other blood fraction(s)), more than one type of tissue (*e.g.*, brain tissue and one or more other type(s) of tissue), more than one type of sample (*e.g.*, a brain biopsy sample and one or more other type(s) of biopsy sample) obtained or isolated from the subject. In some embodiments, *SNCA* expression, an amount or level of *SNCA* mRNA, an amount or level of SNCA protein, an amount or level of SNCA activity/function, or any combination

thereof is reduced in one or more of the cervical spinal cord, thoracic spinal cord, lumbar spinal cord, frontal cortex, temporal cortex, cerebellum, midbrain, occipital cortex, parietal cortex, hippocampus, caudate nucleus, thalamus, brainstem, motor cortex, globus pallidus, midbrain tegmentum, substantia nigra, pons, cerebellar white matter, and cerebellar dentate nucleus. In some embodiments, *SNCA* expression, an amount or level of *SNCA* mRNA, an amount or level of SNCA protein, an amount or level of SNCA activity/function, or any combination thereof is reduced in tissue of the brain and/or spinal cord associated with Parkinson's disease. In some embodiments, tissue associated with Parkinson's disease includes, but is not limited to, putamen, midbrain tegmentum, substantia nigra, pons, and medulla. In some embodiments, *SNCA* expression, an amount or level of *SNCA* mRNA, an amount or level of SNCA protein, an amount or level of SNCA activity/function, or any combination thereof is reduced in tissue of the brain and/or spinal cord associated with multiple system atrophy. In some embodiments, tissue associated with multiple system atrophy includes, but is not limited to caudate nucleus, putamen, midbrain tegmentum, substantia nigra, pons, cerebellar cortex, cerebellar white matter, medulla, cervical spinal cord, thoracic spinal cord, and lumbar spinal cord.

[0268] Examples of a disease, disorder or condition associated with *SNCA* gene expression include, multiple system atrophy, dementia with Lewy bodies, and Parkinson disease.

[0269] Because of their high specificity, the oligonucleotide herein specifically targets SNCA mRNA of target genes of cells, tissue(s), or organ(s) (*e.g.*, brain). In preventing disease, the target gene may be one which is required for initiation or maintenance of the disease or which has been identified as being associated with a higher risk of contracting the disease. In treating disease, the oligonucleotide can be brought into contact with the cells, tissue(s), or organ(s) (*e.g.*, brain) exhibiting or responsible for mediating the disease. For example, an oligonucleotide substantially identical to all or part of a wild-type (*i.e.*, native) or mutated gene associated with a disease, disorder, or condition associated with *SNCA* gene expression may be brought into contact with or introduced into a cell or tissue type of interest such as an oligodendrocyte or other brain cell.

[0270] In some embodiments, *SNCA* may be from any mammal, such as a human and may be silenced according to the method described herein.

[0271] The methods herein typically involve administering to a subject a therapeutically

effective amount of the oligonucleotide, that is, an amount capable of producing a desirable therapeutic result. A therapeutically acceptable amount may be an amount that can therapeutically treat a disease, disorder, or condition. The appropriate amount/dosage for any one subject will depend on certain factors, including the subject's size, body surface area, age, the particular composition to be administered, the active ingredient(s) in the composition, time and route of administration, general health, and other drugs being administered concurrently.

[0272] In some embodiments, the subject is administered any one of the oligonucleotides or compositions herein either enterally (*e.g.*, orally, by gastric feeding tube, by duodenal feeding tube, *via* gastrostomy or rectally), parenterally (*e.g.*, subcutaneous injection, intravenous injection or infusion, intra-arterial injection or infusion, intraosseous infusion, intramuscular injection, intracerebral injection, intracerebroventricular injection, intrathecal), topically (*e.g.*, epicutaneous, inhalational, *via* eye drops, or through a mucous membrane), or by direct injection into a target organ (*e.g.*, the brain of a subject). Typically, the oligonucleotide or composition is administered intravenously or subcutaneously. In some embodiments, the oligonucleotide or composition is administered to the cerebral spinal fluid. In some embodiments, the oligonucleotide or composition is administered intrathecally. In some embodiments, the oligonucleotide or composition is administered intracerebroventricularly. In some embodiments, the oligonucleotide or composition is administered by intracisternal magna injection.

[0273] As a non-limiting set of examples, the oligonucleotide would typically be administered quarterly (once every three months), bi-monthly (once every two months), monthly, or weekly. For example, the oligonucleotide may be administered every week or at intervals of two, or three weeks. Alternatively, the oligonucleotide may be administered daily. In some embodiments, a subject is administered one or more loading doses of the oligonucleotide followed by one or more maintenance doses of the oligonucleotide.

[0274] In some embodiments, the subject to be treated is a human or non-human primate or other mammalian subject. Other exemplary subjects include domesticated animals such as dogs and cats; livestock such as horses, cattle, pigs, sheep, goats, and chickens; and animals such as mice, rats, guinea pigs, and hamsters.

Kits

[0275] In some embodiments, a kit is provided comprising an oligonucleotide described herein (*e.g.*, a RNAi oligonucleotide), and instructions for its use. In some embodiments, the kit comprises the oligonucleotide, and a package insert containing instructions for use of the kit and/or any component thereof. In some embodiments, the kit comprises, in a suitable container, the oligonucleotide, one or more controls, and various buffers, reagents, enzymes, and other standard ingredients well known in the art. In some embodiments, the container comprises at least one vial, well, test tube, flask, bottle, syringe, or other container means, into which the oligonucleotide is placed, and in some instances, suitably aliquoted. In some embodiments where an additional component is provided, the kit contains additional containers into which this component is placed. The kits can also include a means for containing the oligonucleotide and any other reagent in close confinement for commercial sale. Such containers may include injection or blow-molded plastic containers into which the desired vials are retained. Containers and/or kits can include labeling with instructions for use and/or warnings.

[0276] In some embodiments, the kit comprises the oligonucleotide and a pharmaceutically acceptable carrier, or the pharmaceutical composition, and instructions for treating or delaying progression of a disease, disorder, or condition associated with *SNCA* gene expression in a subject in need thereof.

[0277] In some embodiments, the kit comprises the oligonucleotide and a pharmaceutically acceptable carrier, or the pharmaceutical composition, and instructions for administering the oligonucleotide or pharmaceutical composition to the cerebral spinal fluid to reduce *SNCA* gene expression in at least one region of the brain and/or at least one region of the spinal cord in a subject in need thereof.

Definitions

[0278] As used herein, "approximately" or "about," as applied to one or more values of interest, refers to a value that is similar to a stated reference value. In certain embodiments, "about" refers to a range of values that fall within 25%, 20%, 19%, 18%, 17%, 16%, 15%, 14%, 13%, 12%, 11%, 10%, 9%, 8%, 7%, 6%, 5%, 4%, 3%, 2%, 1%, or less in either direction (greater than or less than)

of the stated reference value unless otherwise stated or otherwise evident from the context (except where such number would exceed 100% of a possible value).

[0279] As used herein, "administer," "administering," "administration" and the like refer to providing a substance (*e.g.*, an oligonucleotide) to a subject in a manner that is pharmacologically useful (*e.g.*, to treat a disease, disorder, or condition in the subject).

[0280] As used herein, "asialoglycoprotein receptor" or "ASGPR" refers to a bipartite C-type lectin formed by a major 48 kDa subunit (ASGPR-1) and minor 40 kDa subunit (ASGPR-2). ASGPR is primarily expressed on the sinusoidal surface of hepatocyte cells and has a major role in binding, internalizing, and subsequent clearing of circulating glycoproteins that contain terminal galactose or GalNAc residues (asialoglycoproteins).

[0281] As used herein, "attenuate," "attenuating," "attenuation" and the like refer to reducing or effectively halting. As a non-limiting example, one or more of the treatments herein may reduce or effectively halt the onset or progression of a disease, disorder, or condition associated with *SNCA* gene expression in a subject. This attenuation may be exemplified by, for example, a decrease in one or more aspects (*e.g.*, symptoms, tissue characteristics, and cellular, inflammatory, or immunological activity, *etc.*) of a disease associated with *SNCA* gene expression, no detectable progression (worsening) of one or more aspects of the disease, disorder, or condition, or no detectable aspects of the disease in a subject when they might otherwise be expected.

[0282] As used herein, "complementary" refers to a structural relationship between two nucleotides (*e.g.*, on two opposing nucleic acids or on opposing regions of a single nucleic acid strand) that permits the two nucleotides to form base pairs with one another. For example, a purine nucleotide of one nucleic acid that is complementary to a pyrimidine nucleotide of an opposing nucleic acid may base pair together by forming hydrogen bonds with one another. In some embodiments, complementary nucleotides can base pair in the Watson-Crick manner or in any other manner that allows for the formation of stable duplexes. In some embodiments, two nucleic acids may have regions of multiple nucleotides that are complementary with each other to form regions of complementarity, as described herein.

[0283] As used herein, "deoxyribonucleotide" refers to a nucleotide having a hydrogen in place of a hydroxyl at the 2′ position of its pentose sugar when compared with a ribonucleotide. A

modified deoxyribonucleotide is a deoxyribonucleotide having one or more modifications or substitutions of atoms other than at the 2′ position, including modifications or substitutions in or of the sugar, phosphate group or base.

[0284] As used herein, "double-stranded oligonucleotide" or "ds oligonucleotide" refers to an oligonucleotide that is substantially in a duplex form. In some embodiments, the complementary base-pairing of duplex region(s) of a ds oligonucleotide is formed between antiparallel sequences of nucleotides of covalently separate nucleic acid strands. In some embodiments, complementary base-pairing of duplex region(s) of a ds oligonucleotide is formed between antiparallel sequences of nucleotides of nucleic acid strands that are covalently linked. In some embodiments, complementary base-pairing of duplex region(s) of a ds oligonucleotide is formed from single nucleic acid strand that is folded (*e.g.*, *via* a hairpin) to provide complementary antiparallel sequences of nucleotides that base pair together. In some embodiments, a ds oligonucleotide comprises two covalently separate nucleic acid strands that are fully duplexed with one another. However, in other embodiments, a ds oligonucleotide comprises two covalently separate nucleic acid strands that are partially duplexed (*e.g.*, having overhangs at one or both ends). In some embodiments, a ds oligonucleotide comprises antiparallel sequence of nucleotides that are partially complementary, and thus, may have one or more mismatches, which may include internal mismatches or end mismatches.

[0285] As used herein, "duplex," in reference to nucleic acids (*e.g.*, oligonucleotides), refers to a structure formed through complementary base pairing of two antiparallel sequences of nucleotides.

[0286] As used herein, "excipient" refers to a non-therapeutic agent that may be included in a composition, for example, to provide or contribute to a desired consistency or stabilizing effect.

[0287] As used herein, "labile linker" refers to a linker that can be cleaved (*e.g.*, by acidic pH). A "fairly stable linker" refers to a linker that cannot be cleaved.

[0288] As used herein, "loop" refers to a unpaired region of a nucleic acid (*e.g.*, oligonucleotide) that is flanked by two antiparallel regions of the nucleic acid that are sufficiently complementary to one another, such that under appropriate hybridization conditions (*e.g.*, in a phosphate buffer,

in a cells), the two antiparallel regions, which flank the unpaired region, hybridize to form a duplex (referred to as a "stem").

[0289] As used herein, "modified internucleotide linkage" refers to an internucleotide linkage having one or more chemical modifications when compared with a reference internucleotide linkage comprising a phosphodiester bond. In some embodiments, a modified nucleotide is a non-naturally occurring linkage. Typically, a modified internucleotide linkage confers one or more desirable properties to a nucleic acid in which the modified internucleotide linkage is present. For example, a modified nucleotide may improve thermal stability, resistance to degradation, nuclease resistance, solubility, bioavailability, bioactivity, reduced immunogenicity, *etc*.

[0290] As used herein, "modified nucleotide" refers to a nucleotide having one or more chemical modifications when compared with a corresponding reference nucleotide selected from: adenine ribonucleotide, guanine ribonucleotide, cytosine ribonucleotide, uracil ribonucleotide, adenine deoxyribonucleotide, guanine deoxyribonucleotide, cytosine deoxyribonucleotide, and thymidine deoxyribonucleotide. In some embodiments, a modified nucleotide is a non-naturally occurring nucleotide. In some embodiments, a modified nucleotide has one or more chemical modification in its sugar, nucleobase, and/or phosphate group. In some embodiments, a modified nucleotide has one or more chemical moieties conjugated to a corresponding reference nucleotide. Typically, a modified nucleotide confers one or more desirable properties to a nucleic acid in which the modified nucleotide is present. For example, a modified nucleotide may improve thermal stability, resistance to degradation, nuclease resistance, solubility, bioavailability, bioactivity, reduced immunogenicity, *etc*.

[0291] As used herein, "nicked tetraloop structure" or "nicked tetraL structure" refers to a structure of an oligonucleotide (*e.g.*, a RNAi oligonucleotide) that is characterized by separate sense (passenger) and antisense (guide) strands, in which the sense strand has a region of complementarity with the antisense strand, and in which at least one of the strands, generally the sense strand, has a tetraL configured to stabilize an adjacent stem region formed within the at least one strand.

[0292] As used herein, "oligonucleotide" refers to a short nucleic acid (*e.g.*, less than about 100 nucleotides in length). An oligonucleotide may be ss or ds. An oligonucleotide may or may not

have duplex regions. As a set of non-limiting examples, an oligonucleotide may be, but is not limited to, a small interfering RNA (siRNA), microRNA (miRNA), short hairpin RNA (shRNA), dicer substrate interfering RNA (dsiRNA), antisense oligonucleotide (ASO), short siRNA, or ss siRNA. In some embodiments, the oligonucleotide is a ds oligonucleotide and is an RNAi oligonucleotide.

[0293] As used herein, "overhang" refers to terminal non-base pairing nucleotide(s) resulting from one strand or region extending beyond the terminus of a complementary strand with which the one strand or region forms a duplex. In some embodiments, an overhang comprises one or more unpaired nucleotides extending from a duplex region at the 5′ terminus or 3′ terminus of a ds oligonucleotide. In certain embodiments, the overhang is a 3′ or 5′ overhang on the antisense strand or sense strand of a ds oligonucleotides.

[0294] As used herein, "phosphate analog" refers to a chemical moiety that mimics the electrostatic and/or steric properties of a phosphate group. In some embodiments, a phosphate analog is positioned at the 5′ terminal nucleotide of an oligonucleotide in place of a 5′-phosphate, which is often susceptible to enzymatic removal. In some embodiments, a 5′ phosphate analog contains a phosphatase-resistant linkage Examples of phosphate analogs include, but are not limited to, 5′ phosphonates, such as 5′ methylenephosphonate (5′-MP) and 5′-(E)-vinylphosphonate (5′-VP). In some embodiments, an oligonucleotide has a phosphate analog at a 4′-carbon position of the sugar (referred to as a "4′-phosphate analog") at a 5′-terminal nucleotide. An example of a 4′-phosphate analog is oxymethylphosphonate, in which the oxygen atom of the oxymethyl group is bound to the sugar moiety (*e.g.*, at its 4′-carbon) or analog thereof. *See*, *e.g.*, US Provisional Patent Application Nos. 62/383,207 (filed on 2 September 2016) and 62/393,401 (filed on 12 September 2016). Other modifications have been developed for the 5′ end of oligonucleotides (*see*, *e.g.*, Intl. Patent Application No. WO 2011/133871; US Patent No. 8,927,513; and Prakash *et al.* (2015) *Nucleic Acids Res.* 43:2993-3011).

[0295] As used herein, "SNCA" refers to Synyclein Alpha. SNCA is found abundantly in the brain, and inhibits phospholipase D2. It functions in resynaptic signaling and membrane trafficking. The mRNA encoding wild-type human SNCA is set forth in SEQ ID NO: 1677. The

mRNA encoding mouse SNCA is set forth in SEQ ID NO: 1678. The mRNA encoding monkey SNCA is set forth in SEQ ID NO: 1679.

[0296] As used herein, "reduced expression" of a gene (*e.g.*, *SNCA*) refers to a decrease in the amount or level of RNA transcript (*e.g.*, SNCA mRNA) or protein encoded by the gene and/or a decrease in the amount or level of activity/function of the gene and/or protein in a cell, a population of cells, a sample, or a subject, when compared to an appropriate reference (*e.g.*, a reference cell, population of cells, sample, or subject). For example, the act of contacting a cell with an oligonucleotide (*e.g.*, an oligonucleotide such as a RNAi oligonucleotide comprising an antisense strand having a nucleotide sequence that is complementary to a nucleotide sequence comprising SNCA mRNA) may result in a decrease in the amount or level of SNCA mRNA, SNCA protein and/or SNCA activity/function (*e.g.*, *via* inactivation and/or degradation of SNCA mRNA by the RNAi pathway) when compared to a cell that is not treated with the oligonucleotide. Similarly, and as used herein, "reducing expression" refers to an act that results in reduced expression of a gene (*e.g.*, *SNCA*).

[0297] As used herein, "reduction of *SNCA* gene expression" refers to a decrease in the amount or level of SNCA mRNA, SNCA protein and/or SNCA activity/function in a cell, a population of cells, a sample, or a subject when compared to an appropriate reference (*e.g.*, a reference cell, population of cells, sample, or subject).

[0298] As used herein, "region of complementarity" refers to a sequence of nucleotides of a nucleic acid (*e.g.*, a ds oligonucleotide) that is sufficiently complementary to an antiparallel sequence of nucleotides to permit hybridization between the two sequences of nucleotides under appropriate hybridization conditions (*e.g.*, in a phosphate buffer, in a cell, *etc.*). In some embodiments, the oligonucleotide comprises a targeting sequence having a region of complementary to a mRNA target sequence.

[0299] As used herein, "ribonucleotide" refers to a nucleotide having a ribose as its pentose sugar, which contains a hydroxyl group at its 2′ position. A "modified ribonucleotide" refers to a ribonucleotide having one or more modifications or substitutions of atoms other than at the 2′ position, including modifications or substitutions in or of the ribose, phosphate group, or base.

[0300] As used herein, "RNAi oligonucleotide" refers to either (a) a ds oligonucleotide having a sense strand and an antisense strand in which the antisense strand or part of the antisense strand is used by the *Argonaute* 2 (Ago2) endonuclease in the cleavage of a target mRNA (*e.g.*, SNCA mRNA) or (b) a ss oligonucleotide having a single antisense strand, where that antisense strand (or part of that antisense strand) is used by the Ago2 endonuclease in the cleavage of a target mRNA (*e.g.*, SNCA mRNA).

[0301] As used herein, "strand" refers to a single, contiguous sequence of nucleotides linked together through internucleotide linkages (*e.g.*, phosphodiester linkages or phosphorothioate linkages). In some embodiments, a strand has two free ends (*e.g.*, a 5′ end and a 3′ end).

[0302] As used herein, "subject" means any mammal, including mice, rabbits, and humans. In one embodiment, the subject is a human or NHP. Moreover, "individual" or "patient" may be used interchangeably with "subject."

[0303] As used herein, "synthetic" refers to a nucleic acid or other molecule that is artificially synthesized (*e.g.*, using a machine such as, for example, a solid-state nucleic acid synthesizer) or that is otherwise not derived from a natural source (*e.g.*, a cell or organism) that normally produces the molecule.

[0304] As used herein, "targeting ligand" refers to a molecule (*e.g.*, a carbohydrate, amino sugar, cholesterol, or polypeptide) that selectively binds to a cognate molecule (*e.g.*, a receptor) of a tissue or cell of interest and that is conjugatable to another substance for purposes of targeting the other substance to the tissue or cell of interest. For example, in some embodiments, a targeting ligand may be conjugated to an oligonucleotide for purposes of targeting the oligonucleotide to a specific tissue or cell of interest. In some embodiments, a targeting ligand selectively binds to a cell surface receptor. Accordingly, in some embodiments, a targeting ligand when conjugated to an oligonucleotide facilitates delivery of the oligonucleotide into a particular cell through selective binding to a receptor expressed on the surface of the cell and endosomal internalization by the cell of the complex comprising the oligonucleotide, targeting ligand, and receptor. In some embodiments, a targeting ligand is conjugated to an oligonucleotide *via* a linker that is cleaved following or during cellular internalization such that the oligonucleotide is released from the targeting ligand in the cell.

[0305] As used herein, "tetraloop" or "tetraL" refers to a loop that increases stability of an adjacent duplex formed by hybridization of flanking sequences of nucleotides. The increase in stability is detectable as an increase in melting temperature (T_m) of an adjacent stem duplex that is higher than the T_m of the adjacent stem duplex expected, on average, from a set of loops of comparable length consisting of randomly selected sequences of nucleotides. For example, a tetraL can confer a T_m of at least about 50°C, at least about 55°C, at least about 56°C, at least about 58°C, at least about 60°C, at least about 65°C, or at least about 75°C in 10 mM $NaHPO_4$ to a hairpin comprising a duplex of at least 2 base pairs (bp) in length. In some embodiments, a tetraL may stabilize a bp in an adjacent stem duplex by stacking interactions. In addition, interactions among the nucleotides in a tetraL include, but are not limited to, non-Watson-Crick base pairing, stacking interactions, hydrogen bonding, and contact interactions (Cheong *et al.* (1990) *Nature* 346:680-682; and Heus & Pardi (1991) *Science* 253:191-94). In some embodiments, a tetraL comprises or consists of 3 to 6 nucleotides and is typically 4 to 5 nucleotides. In certain embodiments, a tetraL comprises or consists of 3, 4, 5, or 6 nucleotides, which may or may not be modified (*e.g.*, which may or may not be conjugated to a targeting moiety). In certain embodiments, a tetraL comprises or consists of 3, 4, 5, or 6 nucleotides, which may or may not be modified (*e.g.*, which may or may not be conjugated to a targeting ligand). In one embodiment, a tetraL consists of 4 nucleotides. Any nucleotide may be used in the tetraL and standard IUPAC-IUB symbols for such nucleotides may be used as described in Cornish-Bowden (1985) *Nucleic Acids Res.* 13:3021-30. For example, the letter "N" may be used to mean that any base may be in that position, the letter "R" may be used to show that A (adenine) or G (guanine) may be in that position, and "B" may be used to show that C (cytosine), G (guanine), T (thymine) or U (uracil) may be in that position. Examples of tetraloops include the UNCG family of tetraloops (*e.g.*, UUCG), the GNRA family of tetraloops (*e.g.*, GAAA), and the CUUG tetraloop (Woese *et al.* (1990) *Proc. Natl. Acad. Sci. USA* 87:8467-71; and Antao *et al.* (1991) *Nucleic Acids Res.* 19:5901-05). Examples of DNA tetraloops include the d(GNNA) family of tetraloops (*e.g.*, d(GTTA), the d(GNRA)) family of tetraloops, the d(GNAB) family of tetraloops, the d(CNNG) family of tetraloops, and the d(TNCG) family of tetraloops (*e.g.*, d(TTCG)). *See*, *e.g.*, Nakano *et al.* (2002) *Biochem.* 41:4281-92; Shinji *et al.*

(2000) *Nippon Kagakkai Koen Yokoshu* 78:731. In some embodiments, the tetraL is contained within a nicked tetraL structure.

[0306] As used herein, "treat" or "treating" refers to the act of providing care to a subject in need thereof, for example, by administering a therapeutic agent (*e.g.*, an oligonucleotide herein such as a RNAi oligonucletoide) to the subject, for purposes of improving the health and/or well-being of the subject with respect to an existing condition (*e.g.*, a disease, disorder) or to prevent or decrease the likelihood of the occurrence of a condition. In some embodiments, treatment involves reducing the frequency or severity of at least one sign, symptom, or contributing factor of a condition (*e.g.*, disease, disorder) experienced by the subject.

EXAMPLES

Example 1: Preparation of RNAi Oligonucleotides

Oligonucleotide Synthesis and Purification

[0307] The oligonucleotides (*i.e.*, RNAi oligonucleotides) described in the foregoing Examples are chemically synthesized using methods described herein. Generally, RNAi oligonucleotides are synthesized using solid phase oligonucleotide synthesis methods as described for 19-23mer siRNAs (*see*, *e.g.*, Scaringe *et al.* (1990) *Nucleic Acids Res.* 18:5433-5441 and Usman *et al.* (1987) *J. Am. Chem. Soc.* 109:7845-45; *see also*, US Patent Nos. 5,804,683; 5,831,071; 5,998,203; 6,008,400; 6,111,086; 6,117,657; 6,353,098; 6,362,323; 6,437,117 and 6,469,158) in addition to using known phosphoramidite synthesis (*see*, *e.g.*, Hughes & Ellington (2017) *Cold Spring Harb Perspect Biol.* 9(1):a023812; Beaucage & Caruthers (1981) *Tetrahedron Lett.* 22:1859-62). dsRNAi oligonucleotides with a 19mer core sequence were formatted into constructs having a 25mer sense strand and a 27mer antisense strand to allow for processing by the RNAi machinery. The 19mer core sequence is complementary to a region in the SNCA mRNA.

[0308] Individual RNA strands were synthesized and HPLC purified according to standard methods (Integrated DNA Technologies; Coralville, IA). For example, RNA oligonucleotides were synthesized using solid phase phosphoramidite chemistry, deprotected, and desalted on NAP-5 columns (Amersham Pharmacia Biotech; Piscataway, NJ) using standard techniques (Damha & Olgivie (1993) *Methods Mol. Biol.* 20:81-114; Wincott *et al.* (1995) *Nucleic Acids Res.* 23:2677-

84). The oligomers were purified using ion-exchange high performance liquid chromatography (IE-HPLC) on an Amersham Source 15Q column (1.0 cm×25 cm; Amersham Pharmacia Biotech) using a 15 min step-linear gradient. The gradient varied from 90:10 Buffers A:B to 52:48 Buffers A:B, where Buffer A is 100 mM Tris pH 8.5 and Buffer B is 100 mM Tris pH 8.5, 1 M NaCl. Samples were monitored at 260 nm, and peaks corresponding to the full-length oligonucleotide species were collected, pooled, desalted on NAP-5 columns, and lyophilized.

[0309] The purity of each oligomer was determined by capillary electrophoresis (CE) on a Beckman PACE 5000 (Beckman Coulter, Inc.; Fullerton, CA). The CE capillaries have a 100 μm inner diameter and contain ssDNA 100R Gel (Beckman-Coulter). Typically, about 0.6 nmole of oligonucleotide was injected into a capillary, run in an electric field of 444 V/cm, and detected by UV absorbance at 260 nm. Denaturing Tris-Borate-7 M-urea running buffer was purchased from Beckman-Coulter. Oligoribonucleotides were obtained that were at least 90% pure as assessed by CE for use in experiments described below. Compound identity was verified by matrix-assisted laser desorption ionization time-of-flight (MALDI-TOF) mass spectroscopy on a Voyager DE™ Biospectometry Work Station (Applied Biosystems; Foster City, CA) following the manufacturer's recommended protocol. Relative molecular masses of all oligomers were obtained, often within 0.2% of expected molecular mass.

Preparation of Duplexes

[0310] ss RNA oligomers were resuspended (*e.g.*, at 100 μM concentration) in duplex buffer consisting of 100 mM potassium acetate, 30 mM HEPES, pH 7.5. Complementary sense and antisense strands were mixed in equal molar amounts to yield a final solution of, for example, 50 μM duplex. Samples were heated to 100°C for 5 min in RNA buffer (IDT) and were allowed to cool to room temperature before use. The RNAi oligonucleotides were stored at −20° C. ss RNA oligomers were stored lyophilized or in nuclease-free water at −80° C.

Example 2: Generation of *SNCA*-Targeting RNAi Oligonucleotides

[0311] *SNCA* encodes SNCA, a neuronal protein that inhibits phospholipase D2. SNCA participates in the regulation of synaptic vesicle trafficking and neurotransmitter release. Abnormal expression of SNCA can lead to various diseases of the brain, including but not limited to Parkinson disease and multiple system atrophy. Oligonucleotides capable of inhibiting SNCA mRNA expression were identified and generated.

Identification of SNCA mRNA Target Sequences

To generate *SNCA*-targeting RNAi oligonucleotides, a computer-based algorithm was used to computationally identify SNCA mRNA target sequences suitable for assaying inhibition of *SNCA* expression by the RNAi pathway. The algorithm provided RNAi oligonucleotide antisense strand sequences each having a region of complementarity to a suitable SNCA mRNA target sequence of human (Hs) or murine (Mm) mRNA (*e.g.*, SEQ ID NOs: 1677 and 1678, respectively; **Table 1).** Due to sequence conservation across species, some of the SNCA mRNA target sequences identified for human SNCA mRNA are homologous to the corresponding SNCA mRNA target sequence of murine (mM) SNCA mRNA (SEQ ID NO: 1678; **Table 1**; *i.e.*, double-common) and/or monkey (Mf) SNCA mRNA (SEQ ID NO: 1679; **Table 1**; *i.e.*, triple-common). *SNCA*-targeting RNAi oligonucleotides comprising a region of complementarity to homologous SNCA mRNA target sequences with nucleotide sequence similarity are predicted to have the ability to target homologous SNCA mRNAs (*e.g.*, human SNCA and monkey SNCA mRNAs).

[0312] Table 1: Exemplary Human SNCA, Monkey SNCA, and Mouse SNCA mRNA Sequences.

Species	GenBank Ref Seq #	SEQ ID NO
Human (Hs)	NM_00345.3	1677
Mouse (Mm)	NM_001042451.2	1678
Cynomolgus monkey (Mf)	XM_005555420.2	1679

[0313] RNAi oligonucleotides (formatted as DsiRNA oligonucleotides) were generated as described in **Example 1** for evaluation *in vitro*. Each DsiRNA was generated with the same

modification pattern, and each with a unique guide strand having a region of complementarity to a *SNCA* target sequence identified by the algorithm. Modifications for the sense and anti- sense DsiRNA included the following (*X*- any nucleotide; *m*- 2'-OMe modified nucleotide; *r*- ribosyl modified nucleotide):

Sense Strand:

5' rXmXrXmXrXrXrXrXrXrXrXrXmXrXmXrXrXrXrXrXrXXX 3'

Anti-sense Strand:

3' mXmXmXrXmXrXrXrXrXrXrXrXrXmXrXmXrXrXrXrXrXrXmXmXmXmX 5'

In Vitro Cell-Based Assays

[0314] The ability of each of the modified DsiRNA in **Table 2** to reduce SNCA mRNA was measured using *in vitro* cell-based assays. Briefly, human Huh7 cells (hepatocyte cell line) expressing endogenous human *SNCA* were transfected with each of the DsiRNAs listed in **Table 2** at 0.5 nM (Phase 1) or select DsiRNAs at 0.5 nM, 0.1 nM, and 0.02 nM (Phase 2) in separate wells of a multi-well cell-culture plate. Cells were maintained for 24 hours following transfection with the modified DsiRNA, and then the amount of remaining SNCA mRNA from the transfected cells was determined using a TAQMAN®-based qPCR assay using the following primers: Forward: AGG GTG TTC TCT ATG TAG GCT (SEQ ID NO: 2451); Reverse: ACT GCT CCT CCA ACA TTT GTC (SEQ ID NO: 2452); Probe: TGCTCTTTG/ZEN/GTCTTCTCAGCCACTG (SEQ ID NO:2453). Primer pairs were assayed for % remaining mRNA as shown in **Table 2.** DsiRNAs resulting in less than or equal to 13% SNCA mRNA remaining in DsiRNA-transfected cells when compared to mock-transfected cells were considered DsiRNA "hits". The Huh7 cell-based assay evaluating the ability of the DsiRNAs listed in **Table 2** to inhibit *SNCA* gene expression identified several candidate DsiRNAs.

[0315] Taken together, these results show that DsiRNAs designed to target human SNCA mRNA inhibit *SNCA* gene expression in cells, as determined by a reduced amount of SNCA mRNA in DsiRNA-transfected cells relative to control cells. These results demonstrate that the nucleotide sequences comprising the DsiRNA are useful for generating RNAi oligonucleotides to inhibit *SNCA* gene expression. Further, these results demonstrate that multiple SNCA mRNA

target sequences are suitable for the RNAi-mediated inhibition of *SNCA* gene expression.

[0316] Table 2: *In Vitro* Screening Results.

			0.5 nM (Phase 1)		0.5 nM (Phase 2)		0.1 nM (Phase 2)		0.02 nM (Phase 2)	
Construct	**Sense strand SEQ ID NO**	**Anti-sense strand SEQ ID NO**	**% remaining**	**SEM**	**% remaining**	**SEM**	**% remaining**	**SEM**	**% remaining**	**SEM**
SNCA-259	1	385	21.028	7.767						
SNCA-260	2	386	10.924	7.093	37.112	5.627	28.096	8.714	79.81	7.104
SNCA-261	3	387	35.842	15.053						
SNCA-262	4	388	17.541	8.957						
SNCA-263	5	389	17.382	10.863						
SNCA-264	6	390	36.491	18.92						
SNCA-285	7	391	49.492	26.24						
SNCA-288	8	392	49.592	19.43						
SNCA-289	9	393	8.115	3.208	43.444	7.701	27.964	8.808	81.547	10.004
SNCA-290	10	394	38.872	10.445						
SNCA-292	11	395	29.695	7.526						
SNCA-293	12	396	9.825	4.634	22.757	4.4	36.61	7.78	58.649	13.758
SNCA-294	13	397	13.107	4.749	37.536	4.852	30.59	3.325	52.451	6.372
SNCA-295	14	398	33.409	9.494						
SNCA-296	15	399	16.99	5.748						

SNCA-297	16	400	40.332	10.053						
SNCA-407	17	401	18.159	2.562						
SNCA-408	18	402	11.591	3.87	33.765	3.647	25.106	5.023	67.476	8.155
SNCA-409	19	403	38.371	7.67						
SNCA-410	20	404	18.726	11.196						
SNCA-411	21	405	17.893	4.02						
SNCA-412	22	406	11.516	4.359	47.246	6.569	27.393	6.544	37.152	4.036
SNCA-413	23	407	14.504	5.535						
SNCA-414	24	408	27.844	7.473						
SNCA-415	25	409	20.554	12.528						
SNCA-416	26	410	19.024	3.911						
SNCA-417	27	411	12.153	2.561	35.679	5.906	23.925	5.503	52.532	11.956
SNCA-418	28	412	22.664	11.484						
SNCA-419	29	413	9.869	6.642	39.642	5.514	33.021	6.914	41.898	4.856
SNCA-420	30	414	12.122	4.44	27.797	3.652	26.587	8.315	47.288	8.683
SNCA-421	31	415	6.679	2.43	30.227	6.532	27.521	4.281	55.495	17.603
SNCA-422	32	416	16.366	6.3						
SNCA-423	33	417	34.694	8.893						
SNCA-424	34	418	12.914	4.06	35.198	5.089	30.672	4.529	61.593	7.128
SNCA-425	35	419	15.225	4.866						
SNCA-426	36	420	5.898	1.512	23.623	3.415	28.853	6.675	51.599	5.31

SNCA-427	37	421	9.735	8.3	31.398	5.755	23.728	3.694	45.858	4.865
SNCA-428	38	422	11.137	6.328	44.865	6.327	26.163	2.559	45.181	4.085
SNCA-429	39	423	9.884	4.575	21.653	4.026	26.259	5.864	40.966	7.277
SNCA-430	40	424	27.457	3.782						
SNCA-431	41	425	8.998	2.605	48.481	6.857	25.432	4.515	58.303	9.736
SNCA-432	42	426	38.792	19.736						
SNCA-433	43	427	53.456	19.289						
SNCA-434	44	428	7.412	3.571	49.317	10.869	36.72	9.856	86.058	21.28
SNCA-435	45	429	21.354	3.191						
SNCA-436	46	430	44.513	14.609						
SNCA-437	47	431	23.269	8.142						
SNCA-725	48	432	10.817	4.527	41.874	6.214	34.836	8.734	72.722	9.305
SNCA-726	49	433	18.369	7.153						
SNCA-727	50	434	11.69	1.534	41.632	4.62	34.945	7.453	74.069	5.139
SNCA-728	51	435	31.135	7.334						
SNCA-729	52	436	16.565	3.422						
SNCA-730	53	437	11.618	2.771	34.963	7.849	17.192	3.216	34.475	2.241
SNCA-731	54	438	11.056	4.648	35.328	4.627	40.424	5.885	67.647	15.711
SNCA-732	55	439	75.461	17.42						
SNCA-733	56	440	14.148	2.791						
SNCA-734	57	441	11.7	4.222	35.111	5.164	27.312	6.438	45.112	8.846

SNCA-735	58	442	18.872	2.553						
SNCA-736	59	443	58.586	17.766						
SNCA-737	60	444	6.272	1.395	39.086	9.636	34.317	6.674	73.497	6.148
SNCA-738	61	445	11.747	2.406	54.583	10.289	38.467	3.934	74.344	5.756
SNCA-739	62	446	10.99	3.496	18.361	4.756	39.08	3.562	54.152	8.21
SNCA-740	63	447	69.35	19.817						
SNCA-741	64	448	8.737	4.305	19.377	4.552	66.725	5.334	79.724	9.112
SNCA-742	65	449	8.433	3.552	33.441	4.868	30.56	7.944	70.617	4.772
SNCA-790	66	450	16.941	4.739						
SNCA-791	67	451	20.25	4.265						
SNCA-792	68	452	16.986	3.945						
SNCA-938	69	453	22.982	7.151						
SNCA-939	70	454	29.625	8.316						
SNCA-940	71	455	77.834	23.621						
SNCA-941	72	456	16.428	5.414						
SNCA-942	73	457	16.912	4.906						
SNCA-943	74	458	24.415	5.263						
SNCA-944	75	459	20.981	5.464						
SNCA-945	76	460	20.003	5.712						
SNCA-946	77	461	20.9	2.949						
SNCA-947	78	462	18.256	4.331						

SNCA-948	79	463	17.407	3.425						
SNCA-949	80	464	26.9	7.839						
SNCA-950	81	465	15.38	4.999						
SNCA-951	82	466	10.579	2.195	25.725	5.871	29.644	8.857	66.912	13.379
SNCA-952	83	467	12.643	5.775	36.383	5.003	32.949	5.078	46.625	9.677
SNCA-953	84	468	20.445	6.132						
SNCA-954	85	469	19.377	6.269						
SNCA-1081	86	470	16.369	9.735						
SNCA-1082	87	471	42.726	19.415						
SNCA-1083	88	472	18.413	5.398						
SNCA-1084	89	473	26.872	8.226						
SNCA-1085	90	474	32.544	11.55						
SNCA-1188	91	475	34.434	8.376						
SNCA-1189	92	476	33.597	10.639						
SNCA-1190	93	477	36.212	5.277						
SNCA-1191	94	478	54.982	16.216						
SNCA-1192	95	479	36.96	6.856						
SNCA-1193	96	480	52.029	24.55						
SNCA-225	97	481	14.347	3.229						
SNCA-226	98	482	19.268	7.984						
SNCA-227	99	483	4.787	1.383	41.587	8.038	35.936	6.086	42.385	9.759

SNCA-228	100	484	6.165	2.191	28.468	3.963	40.682	11.345	66.497	15.786
SNCA-229	101	485	9.606	4.668	24.686	4.171	41.949	4.391	74.199	20.715
SNCA-230	102	486	10.137	1.818	13.832	3.756	25.986	5.879	39.103	7.664
SNCA-231	103	487	9.529	3.888	32.71	4.003	35.013	9.465	55.227	5.636
SNCA-232	104	488	17.066	7.008						
SNCA-233	105	489	20.06	7.991						
SNCA-234	106	490	21.677	5.799						
SNCA-235	107	491	26.294	10.298						
SNCA-236	108	492	19.996	9.8						
SNCA-237	109	493	7.984	10.599	22.528	4.807	40.783	7.847	65.34	12.841
SNCA-238	110	494	11.813	4.894	16.115	3.206	29.219	8.812	74.975	10.255
SNCA-239	111	495	11.508	7.719	33.154	3.975	47.627	7.067	67.706	17.831
SNCA-240	112	496	13.53	4.889						
SNCA-241	113	497	19.899	6.874						
SNCA-242	114	498	5.83	5.69	29.958	7.055	32.098	8.11	63.262	14.749
SNCA-243	115	499	15.544	3.721						
SNCA-244	116	500	4.34	2.369	21.584	4.329	24.849	8.061	81.412	11.388
SNCA-245	117	501	18.764	6.481						
SNCA-246	118	502	23.857	4.59						
SNCA-247	119	503	15.174	9.291						
SNCA-248	120	504	5.441	1.321	20.623	2.402	44.023	7.469	77.315	11.73

SNCA-249	121	505	14.374	7.944						
SNCA-250	122	506	8.485	2.956	14.209	3.152	22.153	5.705	35.813	8.053
SNCA-251	123	507	9.309	2.574	21.192	5.49	39.388	9.439	54.495	9.357
SNCA-252	124	508	16.638	3.288						
SNCA-253	125	509	13.298	2.511						
SNCA-254	126	510	5.654	2.676	20.119	2.655	21.843	4.688	53.619	7.441
SNCA-256	127	511	28.53	6.232						
SNCA-330	128	512	11.724	4.488	20.966	3.786	21.548	4.295	58.124	11.871
SNCA-335	129	513	37.001	26.374						
SNCA-337	130	514	15.67	7.738						
SNCA-341	131	515	23.437	9.387						
SNCA-342	132	516	6.432	2.063	22.627	4.443	27.249	7.378	51.84	11.789
SNCA-344	133	517	10.679	5.402	23.343	3.606	33.233	4.542	67.616	8.864
SNCA-345	134	518	38.719	11.091						
SNCA-351	135	519	4.932	4.037	23.27	4.284	27.573	4.187	66.702	7.826
SNCA-353	136	520	8.895	2.611	26.016	5.32	32.58	6.87	51.731	8.723
SNCA-355	137	521	11.07	6.637	26.4	2.109	24.228	4.719	45.598	6.927
SNCA-638	138	522	10.32	3.591	30.861	4.875	43.199	7.525	55.085	9.655
SNCA-641	139	523	14.388	9.708						
SNCA-642	140	524	9.499	4.637	18.555	3.579	28.094	4.526	48.625	7.33
SNCA-647	141	525	19.686	8.814						

SNCA-648	142	526	16.775	6.624						
SNCA-650	143	527	17.623	3.844						
SNCA-652	144	528	19.589	4.808						
SNCA-653	145	529	19.395	7.726						
SNCA-654	146	530	16.734	8.572						
SNCA-656	147	531	12.377	6.682	41.918	10.66	48.746	8.211	57.445	10.006
SNCA-657	148	532	7.019	2.637	46.196	7.494	36.925	6.859	30.886	5.127
SNCA-659	149	533	21.058	12.569						
SNCA-660	150	534	16.745	7.314						
SNCA-661	151	535	45.235	11.77						
SNCA-662	152	536	80.539	22.395						
SNCA-663	153	537	21.728	11.526						
SNCA-668	154	538	14.729	3.379						
SNCA-669	155	539	13.525	4.882						
SNCA-672	156	540	19.661	7.793						
SNCA-675	157	541	6.27	2.424	33.096	6.913	23.4	3.202	39.723	8.089
SNCA-676	158	542	11.339	4.109	19.649	4.311	25.257	3.504	52.186	9.605
SNCA-689	159	543	17.236	4.674						
SNCA-724	160	544	15.301	3.793						
SNCA-744	161	545	25.371	12.622						
SNCA-745	162	546	22.027	7.134						

SNCA-746	163	547	16.917	3.299						
SNCA-751	164	548	7.046	4.365	21.584	4.247	24.528	5.148	55.641	7.8
SNCA-752	165	549	8.962	4.066	14.127	2.79	21.293	4.657	26.359	5.246
SNCA-753	166	550	13.116	4.566	32.4	4.996	32.551	9.586	46.198	9.593
SNCA-754	167	551	10.092	6.201	21.078	4.407	37.065	4.481	41.618	8.725
SNCA-755	168	552	10.167	3.77	34.641	5.11	33.916	6.369	42.694	4.827
SNCA-756	169	553	12.669	10.7	24.246	5.182	49.091	10.258	58.13	5.742
SNCA-757	170	554	7.776	3.982	21.017	3.596	27.818	4.273	42.151	7.169
SNCA-758	171	555	46.122	14.665						
SNCA-759	172	556	88.569	15.714						
SNCA-760	173	557	11.23	4.522	22.47	3.604	21.289	4.481	41.864	3.488
SNCA-761	174	558	14.274	5.024						
SNCA-762	175	559	13.223	6.405						
SNCA-789	176	560	36.561	7.308						
SNCA-795	177	561	17.339	4.453						
SNCA-796	178	562	14.282	8.129						
SNCA-797	179	563	17.559	5.909						
SNCA-798	180	564	20.326	9.797						
SNCA-799	181	565	9.776	3.404	25.468	6.855	35.649	5.913	73.684	11.933
SNCA-800	182	566	12.828	3.795	21.022	4.795	21.187	2.88	27.413	4.036
SNCA-801	183	567	6.113	5.646	26.92	8.222	31.387	6.463	49.773	5.712

SNCA-802	184	568	11.053	2.081	20.612	4.001	29.139	5.267	40.539	4.129
SNCA-803	185	569	22.76	12.542						
SNCA-804	186	570	20.403	7.537						
SNCA-805	187	571	46.87	15.777						
SNCA-809	188	572	14.108	5.477						
SNCA-839	189	573	9.329	3.564	27.873	1.985	35.244	6.038	50.308	10.075
SNCA-844	190	574	74.626	46.046						
SNCA-845	191	575	18.69	6.059						
SNCA-846	192	576	10.317	5.491	26.901	3.102	41.337	6.44	48.667	8.691
SNCA-847	193	577	19.063	7.07						
SNCA-848	194	578	9.428	3.56	36.383	5.379	41.782	8.026	48.692	6.434
SNCA-849	195	579	14.389	3.715						
SNCA-850	196	580	13.739	4.862						
SNCA-851	197	581	10.463	4.253	35.979	7.852	41.306	8.024	62.016	23.237
SNCA-852	198	582	11.316	3.697	27.846	5.738	37.543	5.499	50.286	13.342
SNCA-853	199	583	15.994	4.1						
SNCA-854	200	584	9.202	2.258	30.711	6.059	25.599	4.353	55.565	15.174
SNCA-855	201	585	20.573	10.841						
SNCA-856	202	586	14.776	8.048						
SNCA-857	203	587	15.183	2.258						
SNCA-858	204	588	25.315	5.923						

SNCA-859	205	589	13.239	4.322						
SNCA-860	206	590	14.615	5.194						
SNCA-861	207	591	21.488	4.128						
SNCA-863	208	592	18.045	3.597						
SNCA-864	209	593	17.14	4.532						
SNCA-865	210	594	46.184	11.994						
SNCA-867	211	595	23.013	4.494						
SNCA-868	212	596	13.434	5.696						
SNCA-875	213	597	40.79	10.131						
SNCA-881	214	598	16.108	4.34						
SNCA-883	215	599	20.237	4.316						
SNCA-889	216	600	23.853	6.207						
SNCA-890	217	601	22.243	9.121						
SNCA-891	218	602	9.251	2.909	27.694	4.477	31.71	11.159	57.055	14.154
SNCA-892	219	603	7.919	3.423	27.469	3.712	22.038	5.285	39.552	7.131
SNCA-893	220	604	10.274	3.153	27.735	3.133	20.78	2.389	43.233	11.771
SNCA-894	221	605	12.18	2.415	29.449	2.382	27.927	4.718	37.986	6.528
SNCA-895	222	606	11.2	5.219	57.268	8.688	22.85	2.979	58.137	13.395
SNCA-897	223	607	12.904	3.536	29.601	6.084	18.668	3.682	42.864	12.918
SNCA-898	224	608	19.485	6.082						
SNCA-900	225	609	20.537	7.854						

SNCA-901	226	610	11.492	3.831	38.196	7.236	30.775	6.084	30.583	8.291
SNCA-956	227	611	13.887	3.36						
SNCA-957	228	612	15.814	5.095						
SNCA-958	229	613	23.912	4.441						
SNCA-959	230	614	14.942	4.781						
SNCA-961	231	615	16.496	7.433						
SNCA-962	232	616	21.007	6.266						
SNCA-963	233	617	39.092	2.915						
SNCA-964	234	618	16.443	7.239						
SNCA-965	235	619	24.775	8.528						
SNCA-966	236	620	12.893	5.171	38.54	5.561	25.903	7.249	44.895	9.781
SNCA-967	237	621	14.291	3.583						
SNCA-968	238	622	20.484	7.418						
SNCA-969	239	623	30.042	9.705						
SNCA-970	240	624	30.704	9.914						
SNCA-971	241	625	16.061	3.327						
SNCA-972	242	626	29.952	6.161						
SNCA-973	243	627	22.638	6.961						
SNCA-974	244	628	13.472	2.265						
SNCA-975	245	629	16.262	4.2						
SNCA-976	246	630	12.646	2.818	51.087	4.763	37.57	14.498	35.082	7.703

SNCA-977	247	631	14.825	3.605						
SNCA-978	248	632	14.93	3.02						
SNCA-979	249	633	22.697	4.896						
SNCA-980	250	634	25.151	4.841						
SNCA-981	251	635	13.233	4.093						
SNCA-982	252	636	16.88	7.685						
SNCA-983	253	637	15.526	2.246						
SNCA-984	254	638	13.162	3.1						
SNCA-985	255	639	17.685	6.097						
SNCA-986	256	640	7.535	3.549	30.867	3.607	23.927	2.952	38.751	5.435
SNCA-987	257	641	26.054	7.963						
SNCA-988	258	642	23.731	5.057						
SNCA-989	259	643	13.036	2.572	34.841	8.76	22.808	3.446	35.423	6.812
SNCA-990	260	644	18.701	4.706						
SNCA-991	261	645	20.048	6.431						
SNCA-992	262	646	13.682	1.71						
SNCA-993	263	647	19.584	8.343						
SNCA-994	264	648	20.247	6.365						
SNCA-995	265	649	11.503	5.112	39.827	5.279	18.776	2.896	33.235	8.303
SNCA-996	266	650	15.688	7.789						
SNCA-997	267	651	28.605	9.062						

SNCA-998	268	652	14.155	5.759						
SNCA-999	269	653	19.154	5.565						
SNCA-1000	270	654	18.472	10.619						
SNCA-1001	271	655	21.593	5.895						
SNCA-1002	272	656	17.202	4.5						
SNCA-1003	273	657	10.605	4.275	30.587	4.495	19.739	2.385	18.628	3.478
SNCA-1004	274	658	14.493	6.762						
SNCA-1005	275	659	21.933	9.807						
SNCA-1028	276	660	27.057	10.347						
SNCA-1029	277	661	29.887	8.996						
SNCA-1030	278	662	18.273	6.134						
SNCA-1031	279	663	62.219	21.153						
SNCA-1032	280	664	35.366	5.832						
SNCA-1033	281	665	22.3	6.342						
SNCA-1034	282	666	7.062	2.479	28.972	6.428	16.802	2.512	42.248	8.076
SNCA-1035	283	667	16.393	6.443						
SNCA-1036	284	668	18.334	5.834						
SNCA-1037	285	669	25.424	6.451						
SNCA-1038	286	670	18.831	4.653						
SNCA-1039	287	671	24.154	7.567						
SNCA-1040	288	672	36.947	11.492						

SNCA-1041	289	673	13.823	6.008						
SNCA-1042	290	674	11.095	2.118	31.324	2.939	26.757	5.437	41.648	14.447
SNCA-1043	291	675	7.35	2.454	38.997	5.081	22.643	3.492	40.713	7.375
SNCA-1044	292	676	17.706	4.577						
SNCA-1045	293	677	16.292	2.168						
SNCA-1046	294	678	15.658	7.503						
SNCA-1047	295	679	15.639	3.306						
SNCA-1048	296	680	9.349	5.031	30.899	2.779	21.882	3.428	24.603	5.441
SNCA-1049	297	681	23.163	9.595						
SNCA-1050	298	682	19.115	5.282						
SNCA-1051	299	683	27.655	7.553						
SNCA-1052	300	684	21.243	8.076						
SNCA-1053	301	685	15.077	4.191						
SNCA-1054	302	686	18.869	9.119						
SNCA-1055	303	687	26.89	15.696						
SNCA-1056	304	688	12.264	6.595	44.451	8.867	36.043	9.631	58.354	12.915
SNCA-1057	305	689	20.41	6.387						
SNCA-1058	306	690	10.734	3.309	35.627	5.971	26.914	3.053	40.089	7.169
SNCA-1078	307	691	13.259	4.184						
SNCA-1079	308	692	15.297	4.701						
SNCA-1080	309	693	12.222	5.155	36.869	6.201	25.214	2.551	39.187	9.278

SNCA-1086	310	694	37.084	4.125						
SNCA-1087	311	695	35.676	6.696						
SNCA-1088	312	696	27.322	15.476						
SNCA-1089	313	697	68.397	25.077						
SNCA-1090	314	698	36.399	10.994						
SNCA-1091	315	699	37.696	6.729						
SNCA-1092	316	700	44.046	10.96						
SNCA-1093	317	701	31.816	8.953						
SNCA-1116	318	702	73.504	28.254						
SNCA-1117	319	703	25.707	8.623						
SNCA-1119	320	704	21.994	3.997						
SNCA-1120	321	705	18.984	6.632						
SNCA-1121	322	706	25.181	10.677						
SNCA-1122	323	707	8.715	4.101	58.375	28.834	24.834	2.818	48.721	14.78
SNCA-1123	324	708	10.026	4.496	36.377	4.91	27.322	6.134	44.703	8.901
SNCA-1124	325	709	27.046	12.269						
SNCA-1125	326	710	29.562	9.796						
SNCA-1126	327	711	17.413	9.769						
SNCA-1127	328	712	17.312	7.13						
SNCA-1128	329	713	25.66	5.656						
SNCA-1129	330	714	12.245	7.949	32.214	4.276	31.044	4.133	57.233	8.853

SNCA-1130	331	715	34.35	15.109						
SNCA-1131	332	716	28.425	8.875						
SNCA-1132	333	717	18.938	7.034						
SNCA-1133	334	718	19.037	6.871						
SNCA-1194	335	719	51.074	16.21						
SNCA-1195	336	720	66.934	20.682						
SNCA-1196	337	721	20.218	6.253						
SNCA-1197	338	722	21.898	9.87						
SNCA-1198	339	723	20.282	3.906						
SNCA-1199	340	724	21.535	5.1						
SNCA-1200	341	725	19.277	3.967						
SNCA-1201	342	726	18.381	8.987						
SNCA-1202	343	727	21.481	4.71						
SNCA-1203	344	728	31.249	3.839						
SNCA-1204	345	729	26.626	4.995						
SNCA-1205	346	730	22.175	3.4						
SNCA-1206	347	731	27.216	6.526						
SNCA-1207	348	732	18.742	6.75						
SNCA-1208	349	733	15.897	4.168						
SNCA-1250	350	734	61.901	10.051						
SNCA-1252	351	735	17.747	3.922						

SNCA-1253	352	736	64.716	19.519						
SNCA-1254	353	737	56.022	16.549						
SNCA-1255	354	738	52.129	15.261						
SNCA-1256	355	739	42.31	13.171						
SNCA-1257	356	740	40.958	14.053						
SNCA-1258	357	741	50.463	11.568						
SNCA-1259	358	742	45.852	5.684						
SNCA-1260	359	743	44.782	7.958						
SNCA-1261	360	744	50.171	24.931						
SNCA-1262	361	745	65.255	14.437						
SNCA-1263	362	746	73.142	16.725						
SNCA-1264	363	747	58.931	8.389						
SNCA-1265	364	748	57.598	12.06						
SNCA-1266	365	749	55.266	14.495						
SNCA-1267	366	750	56.807	29.36						
SNCA-1351	367	751	74.116	27.182						
SNCA-1365	368	752	112.666	17.184						
SNCA-1372	369	753	56.007	23.106						
SNCA-1373	370	754	162.449	57.315						
SNCA-1374	371	755	66.819	32.556						
SNCA-1375	372	756	50.369	5.421						

SNCA-1376	373	757	78.47	14.83						
SNCA-1377	374	758	66.513	14.808						
SNCA-1379	375	759	181.273	49.399						
SNCA-1380	376	760	144.261	36.281						
SNCA-1381	377	761	142.144	37.588						
SNCA-1382	378	762	167.898	45.832						
SNCA-1383	379	763	76.222	15.027						
SNCA-1384	380	764	69.315	30.999						
SNCA-1385	381	765	84.66	18.066						
SNCA-1388	382	766	64.157	29.244						
SNCA-1428	383	767	85.836	14.2						
SNCA-1429	384	768	240.2	76.094						

Example 3: GalNAc-Conjugated *SNCA*-Targeting RNAi Oligonucleotides Inhibit Human SNCA mRNA Expression *In Vivo*

[0317] The *in vitro* screening assays in **Example 2** validated the ability of *SNCA*-targeting RNAi oligonucleotides to knock-down target SNCA mRNA. To further evaluate the ability of *SNCA*-targeting RNAi oligonucleotides to inhibit SNCA mRNA expression, GalNAc-conjugated *SNCA*-targeting RNAi oligonucleotides were generated to confirm knockdown *in vivo*.

[0318] Specifically, a subset of the DsiRNAs identified in **Example 2** were used to generate corresponding ds RNAi oligonucleotides comprising a nicked tetraL GalNAc-conjugated structure (referred to herein as "GalNAc-conjugated *SNCA* oligonucleotides" or "GalNAc-*SNCA* oligonucleotides") having a 36-mer passenger strand and a 22-mer guide strand (**Tables 4** and **5**). Further, the nucleotide sequences comprising the sense strand and the antisense strand have a distinct pattern of modified nucleotides and phosphorothioate linkages. Three of the nucleotides

comprising the tetraL were each conjugated to a GalNAc moiety (CAS#14131-60-3). The modification patterns are illustrated below:

Sense Strand: 5'-mX-*S*-mX-fX-mX-fX-mX-mX-fX-mX-fX-mX-fX-fX-mX-fX-mX-fX-mX-mX-mX-mX-mX-mX-mX-mX-mX-mX-[ademX-GalNAc][ademX-GalNAc][ademX-GalNAc]-mX-mX-mX-mX-mX-mX-3'

hybridized to:

Antisense Strand: 5'-MePhosphonate-4O-mX-*S*-fX-*S*-fX-fX-fX-mX-fX-mX-mX-fX-mX-mX-mX-fX-mX-fX-mX-mX-fX-mX-*S*-mX-*S*-mX-3' (Modification key: **Table 3**).

Or, represented as:

Sense Strand: 5'-[mXs][mX][fX][mX][fX][mX][mX][fX][mX][fX][mX][fX][fX][mX][fX][mX][fX][mX][mX][mX][mX][mX][mX][mX][mX][mX][mX][ademX-GalNAc][ademX-GalNAc][ademX-GalNAc][mX][mX][mX][mX][mX][mX]-3'

hybridized to:

Antisense Strand: 5'-[MePhosphonate-4O-mXs][fXs][fX][fX][fX][mX][fX][mX][mX][fX][mX][mX][mX][fX][mX][fX][mX][mX][fX][mXs][mXs][mX]-3' (Modification key: **Table 3**).

[0319] Table 3: Key for Modification Patterns.

Symbol	Modification/linkage
Key 1	
mX	2'-OMe modified nucleotide
fX	2'-F modified nucleotide
-*S*-	phosphorothioate linkage
-	phosphodiester linkage
[MePhosphonate-4O-mX]	4'-O-monomethylphosphonate-2'-O-methyl modified nucleotide
ademX-GalNAc	GalNAc attached to a nucleotide
ademX-C_{16}	C_{16} hydrocarbon chain attached to a nucleotide
Key 2	
[mXs]	2'-OMe modified nucleotide with a phosphorothioate linkage to the neighboring nucleotide
[fXs]	2'-F modified nucleotide with a phosphorothioate linkage to the neighboring nucleotide
[mX]	2'-OMe modified nucleotide with phosphodiester linkages to neighboring nucleotides

[fX]	2'-F modified nucleotide with phosphodiester linkages to neighboring nucleotides
[ademXs-C_{16}]	C_{16} hydrocarbon chain attached to a nucleotide with phosphodiester linkages to neighboring nucleotides

[0320] The GalNAc-conjugated *SNCA*-targeting oligonucleotides were used in a hydrodynamic injection (HDI) mouse model to confirm the ability of the RNAi oligonucleotides to knockdown *SNCA* gene expression *in vivo*. The GalNAc-conjugated *SNCA*-targeting oligonucleotides listed in **Tables 4** and **5** were evaluated in mice engineered to transiently express human SNCA mRNA in hepatocytes of the mouse liver. Briefly, 6-8-week-old female CD-1 mice were subcutaneously administered the indicated GalNAc-conjugated *SNCA*-targeting oligonucleotides at a dose of 3 mg/kg formulated in PBS. A control group of mice (n = 5) were administered only PBS. Three days later (72 hours), the mice were HDI with a DNA plasmid encoding the full human *SNCA* (SEQ ID NO: 1677) (10 μg) under control of a ubiquitous cytomegalovirus (CMV) promoter sequence. One day after introduction of the DNA plasmid, liver samples from HDI mice were collected. Total RNA derived from these HDI mice were subjected to qRT-PCR analysis to determine human SNCA mRNA levels as described in **Example 2**. The values were normalized for transfection efficiency using the NeoR gene included on the DNA plasmid. Benchmark control SNCA-291 was used to confirm successful knock-down.

[0321] **Table 4:** GalNAc-Conjugated Human *SNCA* RNAi Oligonucleotides for HDI screen.

RNAi Oligonucleotide	**SEQ ID NO (Sense)**	**SEQ ID NO (Antisense)**	**SEQ ID NO (Sense)**	**SEQ ID NO (Antisense)**
	Unmodified		**Modified**	
SNCA-227	1537	1572	1607	1642
SNCA-228	1538	1573	1608	1643
SNCA-242	1539	1574	1609	1644
SNCA-244	1540	1575	1610	1645
SNCA-248	1541	1576	1611	1646
SNCA-254	1542	1577	1612	1647
SNCA-342	1543	1578	1613	1648
SNCA-351	1544	1579	1614	1649
SNCA-421	1545	1580	1615	1650
SNCA-426	1546	1581	1616	1651
SNCA-434	1547	1582	1617	1652
SNCA-657	1548	1583	1618	1653

SNCA-675	1549	1584	1619	1654
SNCA-737	1550	1585	1620	1655
SNCA-751	1551	1586	1621	1656
SNCA-757	1552	1587	1622	1657
SNCA-801	1553	1588	1623	1658
SNCA-291	1554	1589	1624	1659

[0322] **Table 5:** GalNAc-Conjugated Human *SNCA* RNAi Oligonucleotides for HDI screen.

RNAi Oligonucleotide	**SEQ ID NO (Sense)**	**SEQ ID NO (Antisense)**	**SEQ ID NO (Sense)**	**SEQ ID NO (Antisense)**
	Unmodified		**Modified**	
SNCA-230	1558	1593	1628	1663
SNCA-250	1559	1594	1629	1664
SNCA-429	1560	1595	1630	1665
SNCA-642	1561	1596	1631	1666
SNCA-676	1562	1597	1632	1667
SNCA-730	1563	1598	1633	1668
SNCA-752	1564	1599	1634	1669
SNCA-760	1565	1600	1635	1670
SNCA-800	1566	1601	1636	1671
SNCA-892	1567	1602	1637	1672
SNCA-893	1568	1603	1638	1673
SNCA-986	1555	1590	1625	1660
SNCA-995	1569	1604	1639	1674
SNCA-1003	1570	1605	1640	1675
SNCA-1034	1556	1591	1626	1661
SNCA-1043	1557	1592	1627	1662
SNCA-1048	1571	1606	1641	1676
SNCA-291	1554	1589	1624	1659

[0323] The results in **FIGs. 1A** and **1B** demonstrate that GalNAc-conjugated *SNCA* oligonucleotides (as shown in **Tables 4** and **5**, respectively) designed to target human SNCA mRNA successfully inhibited human SNCA mRNA expression in HDI mice, as determined by a reduction in the amount of human SNCA mRNA expression in liver samples from HDI mice treated with GalNAc-conjugated *SNCA* oligonucleotides relative to control HDI mice treated with only PBS.

Example 4: GalNAc-Conjugated *SNCA* RNAi Oligonucleotides Inhibit Human *SNCA* Gene

Expression in A Dose-Dependent Manner

[0324] To further evaluate the ability of GalNAc-conjugated *SNCA* RNAi oligonucleotides to inhibit *SNCA* expression a dose response study was carried out. Specifically, in separate treatment groups, selected GalNAc-conjugated *SNCA* RNAi oligonucleotides (**Tables 6** and **7**) were formulated in PBS and administered to CD-1 mice at doses of 0.3 mg/kg, 1 mg/kg, or 3 mg/kg subcutaneously. As described in **Example 3**, a human *SNCA* DNA expression plasmid was administered to the mice 3 days post-oligonucleotide dosing, and livers were collected 24 hours later for qRT-PCR analysis. As shown in **FIGs. 2A** and **2B**, all of the GalNAc-conjugated *SNCA* RNAi oligonucleotides tested inhibited human *SNCA* gene expression in a dose-dependent manner. Potent GalNAc-conjugated *SNCA* oligonucleotides (*i.e.*, SNCA-244, SNCA-429, SNCA-751, SNCA-752, SNCA-800, SNCA-801, and SNCA1003) reduced SNCA mRNA by about 50% or more at 1 mg/kg and even further at 3 mg/kg. Select constructs were chosen for further studies in non-human primates.

[0325] **Table 6:** GalNAc-Conjugated Human *SNCA* RNAi Oligonucleotides for Dose Screen.

RNAi Oligonucleotide	**SEQ ID NO (Sense)**	**SEQ ID NO (Antisense)**	**SEQ ID NO (Sense)**	**SEQ ID NO (Antisense)**
	Unmodified		**Modified**	
SNCA-244	1540	1575	1610	1645
SNCA-351	1544	1579	1614	1649
SNCA-426	1546	1581	1616	1651
SNCA-751	1551	1586	1621	1656
SNCA-757	1552	1587	1622	1657
SNCA-801	1553	1588	1623	1658

[0326] **Table 7:** GalNAc-Conjugated Human *SNCA* RNAi Oligonucleotides for Dose Screen.

RNAi Oligonucleotide	**SEQ ID NO (Sense)**	**SEQ ID NO (Antisense)**	**SEQ ID NO (Sense)**	**SEQ ID NO (Antisense)**
	Unmodified		**Modified**	
SNCA-250	1558	1594	1629	1664
SNCA-429	1560	1595	1630	1665
SNCA-752	1564	1599	1634	1669
SNCA-760	1565	1600	1635	1670
SNCA-800	1566	1601	1636	1671
SNCA-1003	1570	1605	1640	1675

Example 5: RNAi Oligonucleotide Inhibition of *SNCA* Gene Expression in NHP CNS

[0327] Effective GalNAc-conjugated *SNCA*-targeting oligonucleotides identified in the HDI mouse studies were assayed for inhibition in NHPs. Specifically, GalNAc-conjugated *SNCA*-targeting oligonucleotides listed in **Table 8** were evaluated in non-naïve cynomolgus monkeys (*Macaca fascicularis*). Each cohort contained 2 male and 2 female subjects. The GalNAc-conjugated *SNCA*-targeting oligonucleotides were administered at a dose of 50 mg in 1.6 mL of artificial cerebrospinal fluid (aCSF) on study days 0 and 7 *via intra cisterna magna* (i.c.m.) injection.

[0328] **Table 8.** GalNAc-Conjugated *SNCA* RNAi Oligonucleotides for NHP Study.

RNAi Oligonucleotide	SEQ ID NO (Sense)	SEQ ID NO (Antisense)	SEQ ID NO (Sense)	SEQ ID NO (Antisense)
	Unmodified		Modified	
SNCA-0801	1553	1588	1623	1658
SNCA-0429	1560	1595	1630	1665
SNCA-0752	1564	1599	1634	1669
SNCA-0751	1551	1586	1621	1656
SNCA-1003	1570	1605	1640	1675

[0329] On study day 14, CNS tissue was collected and subjected to qRT-PCR analysis to measure SNCA mRNA in oligonucleotide-treated monkeys relative to those treated with a comparable volume of aCSF. To normalize the data, the measurements were made relative to 2 reference genes, RPL23 and GAPDH (the geometric mean between the two was used as the set point for on target KD). The following SYBR assays purchased from Integrated DNA Technologies were used to evaluate gene expressions: Forward: ACAGTGG CTGAGAAGACCAA (SEQ ID NO: 2454), Reverse: CTCCCTCCACTGTCTTCTGG (SEQ ID NO: 2455); and Probe: ACCCGTCACCACCGCTCCTCC (SEQ ID NO: 2456).

[0330] As shown in **FIGs. 3A-3S** (Day 14), treating NHPs with the GalNAc-conjugated *SNCA*-targeting oligonucleotides inhibited *SNCA* gene expression in several regions of the CNS, as determined by a reduced amount of SNCA mRNA in brain samples from oligonucleotide-treated NHPs relative to NHPs treated with aCSF. Several GalNAc-conjugated *SNCA*-targeting oligonucleotides reduced *SNCA* gene expression throughout the CNS. SNCA-801 and SNCA-751 were particularly potent and reduced SNCA mRNA by at least 50% in the frontal cortex,

hippocampus, parietal cortex, occipital cortex, temporal cortex, brain stem, cervical spinal cord, thoracic spinal cord, and lumbar spinal cord. These results demonstrate that treating NHPs with the GalNAc-conjugated *SNCA*-targeting oligonucleotides reduces the amount of SNCA mRNA in the CNS.

Example 6: Lipid-Conjugated RNAi Oligonucleotide Targeting *SNCA* Reduces Gene Expression in NHP CNS

[0331] To further investigate the efficacy of oligonucleotides targeting *SNCA*, a lipid-conjugated oligonucleotide was assessed in NHP. Specifically, SNCA-0751 was selected based on the above studies, and the sense strand was formatted as a 20mer sense strand with a lipid conjugated to the 5' terminal nucleotide. This construct is referred to as SNCA-B15, having a 20mer sense strand and 22mer antisense strand (SEQ ID NOs: 1682 and 1656, respectively). The chemical modification pattern of the lipid-conjugated oligonucleotide is provided below:

Sense Strand: 5'-[ademX-C_{16}]-*S*-mX-fX-mX-fX-mX-mX-fX-mX-fX-mX-fX-fX-mX-fX-mX-fX-mX-*S*-mX-*S*-mX-3'

hybridized to:

Antisense Strand: 5'-[MePhosphonate-4O-mX]-*S*-fX-*S*-fX-fX-fX-mX-fX-mX-mX-fX-mX-mX-mX-fX-mX-fX-mX-mX-fX-mX-*S*-mX-*S*-mX 3' (Modification key: **Table 3**).

Or, represented as:

Sense Strand: 5'-[ademXs-C_{16}][mX][fX][mX][fX][mX][mX][fX][mX][fX][mX][fX][fX][mX][fX][mX][fX][mXs][mXs][mX]-3'

hybridized to:

Antisense Strand: 5'-[MePhosphonate-4O-mXs][fXs][fX][fX][fX][mX][fX][mX][mX][fX][mX][mX][mX][fX][mX][fX][mX][mX][fX][mXs][mXs][mX]-3' (Modification key: **Table 3**).

Lipid Conjugation

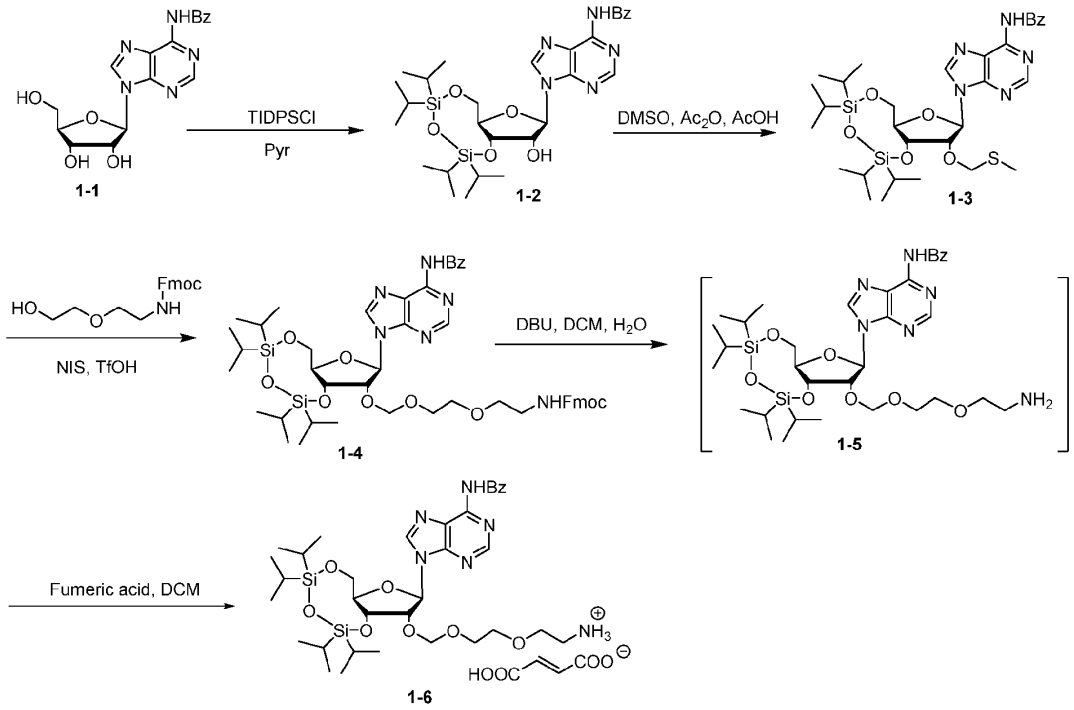
[0332] Lipid-conjugated blunt-ended oligonucleotides were synthesized using a standard procedure known in the literature for oligo synthesis on a synthesizer using amidite chemistry (*see*, Matteucci & Caruthers (1981) *Tetrahedron Lett.* 21:719-22[1]; Beaucage & Caruthers (1981) *Tetrahedron Lett.* 22:1859-62[2]).

[1]Matteucci MD, Caruthers MH. The synthesis of oligodeoxypyrimidines on a polymer support. *Tetrahedron Lett.* 1980;21(8):719–722.

[2]Beaucage SL, Caruthers MH. Deoxynucleoside phosphoramidites-A new class of key intermediates for deoxypolynucleotides. *Tetrahedron Lett.* 1981;22(20):1859–1862

[0333] Conjugation of a lipid moiety to the *SNCA*-targeting oligonucleotide was carried out using phosphoramidite synthesis as shown below:

[0334] *Synthesis of 2-(2-((((6aR,8R,9R,9aR)-8-(6-benzamido-9H-purin-9-yl)-2,2,4,4-tetraisopropyltetrahydro-6H-furo[3,2-f][1,3,5,2,4]trioxadisilocin-9-yl)oxy)methoxy)ethoxy) ethan-1-ammonium formate (1-6)*



[0335] A solution of compound **1-1** (25.00 g, 67.38 mmol) in 20 mL of DMF was treated with pyridine (11 mL, 134.67 mmol) and tetraisopropyldisiloxane dichloride (22.63 mL, 70.75 mmol) at 10 °C. The resulting mixture was stirred at 25 °C for 3 hr and quenched with 20% citric acid (50 mL). The aqueous layer was extracted with EtOAc (3X50 mL), and the combined organic layers were concentrated *in vacuo*. The crude residue was recrystallized from a mixture of MTBE and n-heptane (1:15, 320 mL) to afford compound **1-2** (37.20 g, 90%) as a white oily solid.

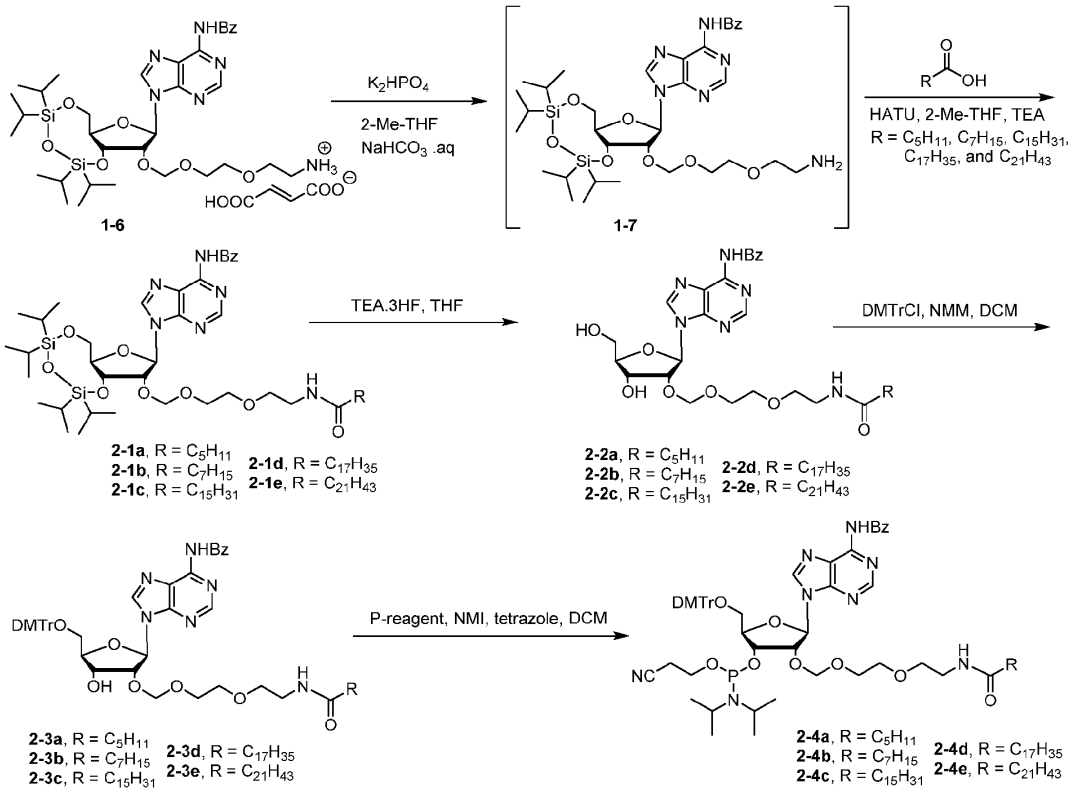
[0336] A solution of compound **1-2** (37.00 g, 60.33 mmol) in 20 mL of DMSO was treated with AcOH (20 mL, 317.20 mmol) and Ac_2O (15 mL, 156.68 mmol). The mixture was stirred at 25 °C for 15 hr. The reaction was diluted with EtOAc (100 mL) and quenched with sat. K_2CO_3 (50 mL). The aqueous layer was extracted with EtOAc (3X50 mL). The combined organic layers were concentrated and recrystallized with ACN (30 mL) to afford compound **1-3** (15.65 g, 38.4%) as a white solid.

[0337] A solution of compound **1-3** (20.00 g, 29.72 mmol) in 120 mL of DCM was treated with Fmoc-amino-ethoxy ethanol (11.67 g, 35.66 mmol) at 25 °C. The mixture was stirred to afford a clear solution and then treated with 4Å molecular sieves (20.0 g), *N*-iodosuccinimide (8.02 g, 35.66 mmol), and TfOH (5.25 mL, 59.44 mmol). The mixture was stirred at 30 °C until the HPLC analysis indicated >95% consumption of compound **1-3**. The reaction was quenched with TEA (6 mL) and filtered. The filtrate was diluted with EtOAc, washed with sat. $NaHCO_3$ (2X100 mL), sat. Na_2SO_3 (2X100 mL), and water (2X100 mL) and concentrated *in vacuo* to afford crude compound **1-4** (26.34 g, 93.9%) as a yellow solid, which was used directly for the next step without further purification.

[0338] A solution of compound **1-4** (26.34 g, 27.62 mmol) in a mixture of DCM/water (10:7, 170 mL) was treated with DBU (7.00 mL, 45.08 mmol) at 5 °C. The mixture was stirred at 5-25 °C for 1 hr. The organic layer was then separated, washed with water (100 mL), and diluted with DCM (130 mL). The solution was treated with fumaric acid (7.05 g, 60.76 mmol) and 4Å molecular sieves (26.34 g) in 4 portions. The mixture was stirred for 1 hr, concentrated, and recrystallized from a mixture of MTBE and DCM (5:1) to afford compound **1-6** (14.74 g, 62.9%) as a white solid: ^{1}H NMR (400 MHz, d_6-DMSO) 8.73 (s, 1H), 8.58 (s, 1H), 8.15-8.02 (m, 2H),

7.65-7.60 (m, 1H), 7.59-7.51 (m, 2H), 6.52 (s, 2H), 6.15(s, 1H), 5.08-4.90 (m, 3H), 4.83-4.78 (m, 1H), 4.15-3.90 (m, 3H), 3.79-3.65 (m, 2H), 2.98-2.85 (m, 6H), 1.20-0.95 (m, 28H).

[0339] *Synthesis of (2R,3R,4R,5R)-5-(6-benzamido-9H-purin-9-yl)-2-((bis(4-methoxyphenyl)(phenyl)methoxy)methyl)-4-((2-(2-[lipid]-amidoethoxy)ethoxy)methoxy) tetrahydrofuran-3-yl (2-cyanoethyl) diisopropylphosphoramidite (2-4a to 2-4e)*



[0340] A solution of compound **1-6** (50.00 g, 59.01 mmol) in 150 mL of 2-methyltetrahydrofuran was washed with ice cold aqueous K_2HPO_4 (6%, 100 mL) and brine (20%, 2X100 mL). The organic layer was separated and treated with hexanoic acid (10.33 mL, 82.61 mmol), HATU (33.66 g, 88.52 mmol), and DMAP (10.81 g, 147.52 mmol) at 0 °C. The resulting mixture was warmed to 25 °C and stirred for 1 hr. The solution was washed with water (2X100 mL), brine (100 mL), and concentrated *in vacuo* to afford a crude residue. Flash chromatography on silica gel (1:1 hexanes/acetone) gave compound **2-1a** (34.95 g, 71.5%) as a white solid.

[0341] A mixture of compound **2-1a** (34.95 g, 42.19 mmol) and TEA (9.28 mL, 126.58 mmol) in 80 mL of THF was treated with triethylamine trihydrofluoride (20.61 mL, 126.58 mmol) dropwise at 10 °C. The mixture was warmed to 25 °C and stirred for 2 hr. The reaction was concentrated, dissolved in DCM (100 mL), and washed with sat. $NaHCO_3$ (5X20 mL) and brine (50 mL). The organic layer was concentrated *in vacuo* to afford crude compound **2-2a** (24.72 g, 99%), which was used directly for the next step without further purification.

[0342] A solution of compound **2-2a** (24.72 g, 42.18 mmol) in 50 mL of DCM was treated with *N*-methylmorpholine (18.54 mL, 168.67 mmol) and DMTr-Cl (15.69 g, 46.38 mmol). The mixture was stirred at 25 °C for 2 hr and quenched with sat. $NaHCO_3$ (50 mL). The organic layer was separated, washed with water, and concentrated to afford a slurry crude. Flash chromatography on silica gel (1:1 hexanes/acetone) gave compound **2-3a** (30.05 g, 33.8 mmol, 79.9%) as a white solid.

[0343] A solution of compound **2-3a** (25.00 g, 28.17 mmol) in 50 mL of DCM was treated with *N*-methylmorpholine (3.10 mL, 28.17 mmol) and tetrazole (0.67 mL, 14.09 mmol) under nitrogen atmosphere. Bis(diisopropylamino) chlorophosphine (9.02 g, 33.80 mmol) was added to the solution dropwise and the resulting mixture was stirred at 25 °C for 4 hr. The reaction was quenched with water (15 mL), and the aqueous layer was extracted with DCM (3X50 mL). The combined organic layers were washed with sat. $NaHCO_3$ (50 mL), concentrated to afford a crude solid that was recrystallized from a mixture of DCM/MTBE/n-hexane (1:4:40) to afford compound **2-4a** (25.52 g, 83.4%) as a white solid: ^{1}H NMR (400 MHz, d_6-DMSO) 11.25 (s, 1H), 8.65-8.60 (m, 2 H), 8.09-8.02 (m, 2H), 7.71 (s, 1H), 7.67-7.60 (m, 1H), 7.59-7.51 (m, 2H), 7.38-7.34 (m, 2H), 7.30-7.25 (m, 7H), 6.85-6.79 (m, 4H), 6.23-6.20 (m, 1H), 5.23-5.14 (m, 1H), 4. 80-4.69 (m, 3H), 4.33-4.23 (m, 2H), 3.90-3.78 (m, 1H), 3.75 (s, 6H), 3.74-3.52 (m, 3H), 3.50-3.20 (m, 6H), 3.14-3.09 (m, 2H), 3.09 (s, 1H), 2.82-2.80 (m, 1H), 2.65-2.60 (m, 1H), 2.05-1.96 (m, 2H), 1.50-1.39 (m, 2H), 1.31-1.10 (m, 14H), 1.08-1.05 (m, 2 H), 0.85-0.79 (m, 3H); ^{31}P NMR (162 MHz, d_6-DMSO) 149.43, 149.18.

[0344] Compound **2-4b, 2-4c, 2-4d,** and **2-4e** were prepared using similar procedures described above for compound **2-4a**. Compound **2-4b** was obtained (25.50 g, 85.4%) as a white solid: ^{1}H NMR (400 MHz, d_6-DMSO) 11.23 (s, 1H), 8.65-8.60 (m, 2 H), 8.05-8.02 (m, 2H), 7.73-7.70 (m, 1H), 7.67-7.60 (m, 1H), 7.59-7.51 (m, 2H), 7.38-7.34 (m, 2H), 7.30-7.25 (m, 7H), 6.89-6.80 (m,

4H), 6.21-6.15 (m, 1H), 5.23-5.17 (m, 1H), 4. 80-4.69 (m, 3H), 4.40-4.21 (m, 2H), 3.91-3.80 (m, 1H), 3.74 (s, 6H), 3.74-3.52 (m, 3H), 3.50-3.20 (m, 6H), 3.14-3.09 (m, 2H), 3.09 (s, 1H), 2.83-2.79 (m, 1H), 2.68-2.62 (m, 1H), 2.05-1.97 (m, 2H), 1.50-1.38 (m, 2H), 1.31-1.10 (m, 18H), 1.08-1.05 (m, 2H), 0.85-0.78 (m, 3H); ^{31}P NMR (162 MHz, d_6-DMSO) 149.43, 149.19.

[0345] Compound **2-4c** was obtained (36.60 g, 66.3%) as an off-white solid: ^{1}H NMR (400 MHz, d_6-DMSO) 11.22 (s, 1H), 8.64-8.59 (m, 2H), 8.05-8.00 (m, 2H), 7.73-7.70 (m, 1H), 7.67-7.60 (m, 1H), 7.59-7.51 (m, 2H), 7.38-7.34 (m, 2H), 7.30-7.25 (m, 7H), 6.89-6.80 (m, 4H), 6.21-6.15 (m, 1H), 5.25-5.17 (m, 1H), 4.80-4.69 (m, 3H), 4.40-4.21 (m, 2H), 3.91-3.80 (m, 1H), 3.74 (s, 6H), 3.74-3.50 (m, 3H), 3.50-3.20 (m, 6H), 3.14-3.09 (m, 2H), 3.09 (s, 1H), 2.83-2.79 (m, 1H), 2.68-2.62 (m, 1H), 2.05-1.99 (m, 2H), 1.50-1.38 (m, 2H), 1.33-1.12 (m, 38H), 1.08-1.05 (m, 2 H), 0.86-0.80 (m, 3H); ^{31}P NMR (162 MHz, d_6-DMSO) 149.42, 149.17.

[0346] Compound **2-4d** was obtained (26.60 g, 72.9%) as an off-white solid: ^{1}H NMR (400 MHz, d_6-DMSO) 11.22 (s, 1H), 8.64-8.59 (m, 2H), 8.05-8.00 (m, 2H), 7.73-7.70 (m, 1H), 7.67-7.60 (m, 1H), 7.59-7.51 (m, 2H), 7.38-7.33 (m, 2H), 7.30-7.25 (m, 7H), 6.89-6.80 (m, 4H), 6.21-6.15 (m, 1H), 5.22-5.17 (m, 1H), 4.80-4.69 (m, 3H), 4.40-4.21 (m, 2H), 3.91-3.80 (m, 1H), 3.74 (s, 6H), 3.74-3.52 (m, 3H), 3.50-3.20 (m, 6H), 3.14-3.09 (m, 2H), 3.09 (s, 1H), 2.83-2.79 (m, 1H), 2.68-2.62 (m, 1H), 2.05-1.99 (m, 2H), 1.50-1.38 (m, 2H), 1.35-1.08 (m, 38H), 1.08-1.05 (m, 2 H), 0.85-0.79 (m, 3H); ^{31}P NMR (162 MHz, d_6-DMSO) 149.47, 149.22.

[0347] Compound **2-4e** was obtained (38.10 g, 54.0%) as a white solid: ^{1}H NMR (400 MHz, d_6-DMSO) 11.21 (s, 1H), 8.64-8.59 (m, 2H), 8.05-8.00 (m, 2H), 7.73-7.70 (m, 1H), 7.67-7.60 (m, 1H), 7.59-7.51 (m, 2H), 7.38-7.34 (m, 2H), 7.30-7.25 (m, 7H), 6.89-6.80 (m, 4H), 6.21-6.15 (m, 1H), 5.23-5.17 (m, 1H), 4.80-4.69 (m, 3H), 4.40-4.21 (m, 2H), 3.91-3.80 (m, 1H), 3.73 (s, 6H), 3.74-3.52 (m, 3H), 3.47-3.22 (m, 6H), 3.14-3.09 (m, 2H), 3.09 (s, 1H), 2.83-2.79 (m, 1H), 2.68-2.62 (m, 1H), 2.05-1.99 (m, 2H), 1.50-1.38 (m, 2H), 1.35-1.06 (m, 46H), 1.08-1.06 (m, 2 H), 0.85-0.77 (m, 3H); ^{31}P NMR (162 MHz, d_6-DMSO) 149.41, 149.15.

NHP study

[0348] NHPs (n=4) were intrathecally administered 37.5 mg lipid-conjugated SNCA-B15 *via* lumbar infusion at L1 (*see* **Table 9**). aCSF was used as a control.

[0349] **Table 9.** Lipid-Conjugated *SNCA*-Targeting RNAi Oligonucleotide for NHP Study

RNAi Oligonucleotide	Conjugate	SEQ ID NO (Sense)	SEQ ID NO (Antisense)	SEQ ID NO (Sense)	SEQ ID NO (Antisense)
		Unmodified		Modified	
SNCA-B15	C_{16}	1681	1586	1682	1656

[0350] 28 days after administration, CNS tissue was collected to determine the concentration of the oligonucleotide and the *SCNA* gene expression level. Parkinson's Disease (PD) is a movement disorder characterized by tremors, slowness of movement, stiff muscles, unsteady walk, and/or loss of balance, whereas Multiple Systems Atrophy (MSA) is a rare disorder affecting autonomic functions such as blood pressure, breathing and bladder control, and motor function. Accordingly, CNS tissues associated with PD or MSA were analyzed separately.

[0351] As shown in **FIG. 4A**, *SNCA* gene expression was reduced in tissues associated with AD, including the putamen, midbrain tegmentum, substantia nigra, pons, and medulla, with the lipid-conjugated SNCA-B15. *SNCA* gene expression was determined as described in the above Examples. **FIG. 4B** shows concentration of lipid-conjugated SNCA-B15 in the tissues after 28 days. These results indicate lipid-conjugated *SNCA*-targeting oligonucleotides have enhanced potency across tissues associated with PD.

[0352] Likewise, and as shown in **FIG. 5A**, *SNCA* gene expression was reduced in tissues associated with MSA, including the putamen, midbrain tegmentum, substantia nigra, pons, cerebellar white matter, medulla, cervical spinal cord, thoracic spinal cord, and lumbar spinal cord with lipid-conjugated SNCA- B15. *SNCA* gene expression was determined as described in the above Examples. **FIG. 5B** shows the concentration of lipid-conjugated SNCA-B15 in the tissues after 28 days. These results indicate lipid-conjugated *SNCA*-targeting oligonucleotides have enhanced potency across tissues associated with MSA.

SEQUENCE LISTING

[0353] The following nucleic and/or amino acid sequences are referred to in the disclosure and are provided below for reference.

Construct	Description	Sequence	SEQ ID NO
SNCA-259	25mer sense strand	UUCAUGAAAGGACUUUCAAAGGCCA	1
SNCA-260	25mer sense strand	UCAUGAAAGGACUUUCAAAAGCCAA	2
SNCA-261	25mer sense strand	CAUGAAAGGACUUUCAAAGACCAAG	3
SNCA-262	25mer sense strand	AUGAAAGGACUUUCAAAGGACAAGG	4
SNCA-263	25mer sense strand	UGAAAGGACUUUCAAAGGCAAAGGA	5
SNCA-264	25mer sense strand	GAAAGGACUUUCAAAGGCCAAGGAG	6
SNCA-285	25mer sense strand	GGAGGGAGUUGUGGCUGCUACUGAG	7
SNCA-288	25mer sense strand	GGGAGUUGUGGCUGCUGCUAAGAAA	8
SNCA-289	25mer sense strand	GGAGUUGUGGCUGCUGCUGAGAAAA	9
SNCA-290	25mer sense strand	GAGUUGUGGCUGCUGCUGAAAAAAC	10
SNCA-292	25mer sense strand	GUUGUGGCUGCUGCUGAGAAAACCA	11
SNCA-293	25mer sense strand	UUGUGGCUGCUGCUGAGAAAACCAA	12
SNCA-294	25mer sense strand	UGUGGCUGCUGCUGAGAAAACCAAA	13
SNCA-295	25mer sense strand	GUGGCUGCUGCUGAGAAAAACAAAC	14
SNCA-296	25mer sense strand	UGGCUGCUGCUGAGAAAACAAAACA	15
SNCA-297	25mer sense strand	GGCUGCUGCUGAGAAAACCAAACAG	16
SNCA-407	25mer sense strand	CAACAGUGGCUGAGAAGACAAAAGA	17
SNCA-408	25mer sense strand	AACAGUGGCUGAGAAGACCAAAGAG	18
SNCA-409	25mer sense strand	ACAGUGGCUGAGAAGACCAAAGAGC	19
SNCA-410	25mer sense strand	CAGUGGCUGAGAAGACCAAAGAGCA	20
SNCA-411	25mer sense strand	AGUGGCUGAGAAGACCAAAAAGCAA	21
SNCA-412	25mer sense strand	GUGGCUGAGAAGACCAAAGAGCAAG	22
SNCA-413	25mer sense strand	UGGCUGAGAAGACCAAAGAACAAGT	23
SNCA-414	25mer sense strand	GGCUGAGAAGACCAAAGAGAAAGTG	24
SNCA-415	25mer sense strand	GCUGAGAAGACCAAAGAGCAAGUGA	25
SNCA-416	25mer sense strand	CUGAGAAGACCAAAGAGCAAGUGAC	26
SNCA-417	25mer sense strand	UGAGAAGACCAAAGAGCAAAUGACA	27
SNCA-418	25mer sense strand	GAGAAGACCAAAGAGCAAGAGACAA	28
SNCA-419	25mer sense strand	AGAAGACCAAAGAGCAAGUAACAAA	29
SNCA-420	25mer sense strand	GAAGACCAAAGAGCAAGUGACAAAT	30
SNCA-421	25mer sense strand	AAGACCAAAGAGCAAGUGAAAAATG	31
SNCA-422	25mer sense strand	AGACCAAAGAGCAAGUGACAAAUGT	32
SNCA-423	25mer sense strand	GACCAAAGAGCAAGUGACAAAUGTT	33
SNCA-424	25mer sense strand	ACCAAAGAGCAAGUGACAAAUGUTG	34
SNCA-425	25mer sense strand	CCAAAGAGCAAGUGACAAAAGUUGG	35
SNCA-426	25mer sense strand	CAAAGAGCAAGUGACAAAUAUUGGA	36

SNCA-427	25mer sense strand	AAAGAGCAAGUGACAAAUGAUGGAG	37
SNCA-428	25mer sense strand	AAGAGCAAGUGACAAAUGUAGGAGG	38
SNCA-429	25mer sense strand	AGAGCAAGUGACAAAUGUUAGAGGA	39
SNCA-430	25mer sense strand	GAGCAAGUGACAAAUGUUGAAGGAG	40
SNCA-431	25mer sense strand	AGCAAGUGACAAAUGUUGGAGGAGC	41
SNCA-432	25mer sense strand	GCAAGUGACAAAUGUUGGAAGAGCA	42
SNCA-433	25mer sense strand	CAAGUGACAAAUGUUGGAGAAGCAG	43
SNCA-434	25mer sense strand	AAGUGACAAAUGUUGGAGGAGCAGT	44
SNCA-435	25mer sense strand	AGUGACAAAUGUUGGAGGAACAGTG	45
SNCA-436	25mer sense strand	GUGACAAAUGUUGGAGGAGAAGUGG	46
SNCA-437	25mer sense strand	UGACAAAUGUUGGAGGAGCAGUGGT	47
SNCA-725	25mer sense strand	GUACAAGUGCUCAGUUCCAAUGUGC	48
SNCA-726	25mer sense strand	UACAAGUGCUCAGUUCCAAAGUGCC	49
SNCA-727	25mer sense strand	ACAAGUGCUCAGUUCCAAUAUGCCC	50
SNCA-728	25mer sense strand	CAAGUGCUCAGUUCCAAUGAGCCCA	51
SNCA-729	25mer sense strand	AAGUGCUCAGUUCCAAUGUACCCAG	52
SNCA-730	25mer sense strand	AGUGCUCAGUUCCAAUGUGACCAGT	53
SNCA-731	25mer sense strand	GUGCUCAGUUCCAAUGUGCACAGTC	54
SNCA-732	25mer sense strand	UGCUCAGUUCCAAUGUGCCAAGUCA	55
SNCA-733	25mer sense strand	GCUCAGUUCCAAUGUGCCCAGUCAT	56
SNCA-734	25mer sense strand	CUCAGUUCCAAUGUGCCCAAUCATG	57
SNCA-735	25mer sense strand	UCAGUUCCAAUGUGCCCAGACAUGA	58
SNCA-736	25mer sense strand	CAGUUCCAAUGUGCCCAGUAAUGAC	59
SNCA-737	25mer sense strand	AGUUCCAAUGUGCCCAGUCAUGACA	60
SNCA-738	25mer sense strand	GUUCCAAUGUGCCCAGUCAAGACAT	61
SNCA-739	25mer sense strand	UUCCAAUGUGCCCAGUCAUAACATT	62
SNCA-740	25mer sense strand	UCCAAUGUGCCCAGUCAUGACAUTT	63
SNCA-741	25mer sense strand	CCAAUGUGCCCAGUCAUGAAAUUTC	64
SNCA-742	25mer sense strand	CAAUGUGCCCAGUCAUGACAUUUCT	65
SNCA-790	25mer sense strand	AAGUCUUCCAUCAGCAGUGAUUGAA	66
SNCA-791	25mer sense strand	AGUCUUCCAUCAGCAGUGAAUGAAG	67
SNCA-792	25mer sense strand	GUCUUCCAUCAGCAGUGAUAGAAGT	68
SNCA-938	25mer sense strand	AAAACACCUAAGUGACUACAACUTA	69
SNCA-939	25mer sense strand	AAACACCUAAGUGACUACCACUUAT	70
SNCA-940	25mer sense strand	AACACCUAAGUGACUACCAAUUATT	71
SNCA-941	25mer sense strand	ACACCUAAGUGACUACCACAUAUTT	72
SNCA-942	25mer sense strand	CACCUAAGUGACUACCACUAAUUTC	73
SNCA-943	25mer sense strand	ACCUAAGUGACUACCACUUAUUUCT	74
SNCA-944	25mer sense strand	CCUAAGUGACUACCACUUAAUUCTA	75
SNCA-945	25mer sense strand	CUAAGUGACUACCACUUAUAUCUAA	76
SNCA-946	25mer sense strand	UAAGUGACUACCACUUAUUACUAAA	77
SNCA-947	25mer sense strand	AAGUGACUACCACUUAUUUAUAAAT	78

SNCA-948	25mer sense strand	AGUGACUACCACUUAUUUCAAAATC	79
SNCA-949	25mer sense strand	GUGACUACCACUUAUUUCUAAAUCC	80
SNCA-950	25mer sense strand	UGACUACCACUUAUUUCUAAAUCCT	81
SNCA-951	25mer sense strand	GACUACCACUUAUUUCUAAAUCCTC	82
SNCA-952	25mer sense strand	ACUACCACUUAUUUCUAAAACCUCA	83
SNCA-953	25mer sense strand	CUACCACUUAUUUCUAAAUACUCAC	84
SNCA-954	25mer sense strand	UACCACUUAUUUCUAAAUCAUCACT	85
SNCA-1081	25mer sense strand	UUGUGAAAUUUGUUAAUAUAUAUAA	86
SNCA-1082	25mer sense strand	UGUGAAAUUUGUUAAUAUAAAUAAT	87
SNCA-1083	25mer sense strand	GUGAAAUUUGUUAAUAUAUAUAATA	88
SNCA-1084	25mer sense strand	UGAAAUUUGUUAAUAUAUAAAAUAC	89
SNCA-1085	25mer sense strand	GAAAUUUGUUAAUAUAUAUAAUACT	90
SNCA-1188	25mer sense strand	ACUUGUGUUUGUAUAUAAAAGGUGA	91
SNCA-1189	25mer sense strand	CUUGUGUUUGUAUAUAAAUAGUGAG	92
SNCA-1190	25mer sense strand	UUGUGUUUGUAUAUAAAUGAUGAGA	93
SNCA-1191	25mer sense strand	UGUGUUUGUAUAUAAAUGGAGAGAA	94
SNCA-1192	25mer sense strand	GUGUUUGUAUAUAAAUGGUAAGAAT	95
SNCA-1193	25mer sense strand	UGUUUGUAUAUAAAUGGUGAGAATT	96
SNCA-225	25mer sense strand	UGUGGUGUAAAGGAAUUCAAUAGCC	97
SNCA-226	25mer sense strand	GUGGUGUAAAGGAAUUCAUAAGCCA	98
SNCA-227	25mer sense strand	UGGUGUAAAGGAAUUCAUUAGCCAT	99
SNCA-228	25mer sense strand	GGUGUAAAGGAAUUCAUUAACCATG	100
SNCA-229	25mer sense strand	GUGUAAAGGAAUUCAUUAGACAUGG	101
SNCA-230	25mer sense strand	UGUAAAGGAAUUCAUUAGCAAUGGA	102
SNCA-231	25mer sense strand	GUAAAGGAAUUCAUUAGCCAUGGAT	103
SNCA-232	25mer sense strand	UAAAGGAAUUCAUUAGCCAAGGATG	104
SNCA-233	25mer sense strand	AAAGGAAUUCAUUAGCCAUAGAUGT	105
SNCA-234	25mer sense strand	AAGGAAUUCAUUAGCCAUGAAUGTA	106
SNCA-235	25mer sense strand	AGGAAUUCAUUAGCCAUGGAUGUAT	107
SNCA-236	25mer sense strand	GGAAUUCAUUAGCCAUGGAAGUATT	108
SNCA-237	25mer sense strand	GAAUUCAUUAGCCAUGGAUAUAUTC	109

SNCA-238	25mer sense strand	AAUUCAUUAGCCAUGGAUGAAUUCA	110
SNCA-239	25mer sense strand	AUUCAUUAGCCAUGGAUGUAUUCAT	111
SNCA-240	25mer sense strand	UUCAUUAGCCAUGGAUGUAAUCATG	112
SNCA-241	25mer sense strand	UCAUUAGCCAUGGAUGUAUACAUGA	113
SNCA-242	25mer sense strand	CAUUAGCCAUGGAUGUAUUAAUGAA	114
SNCA-243	25mer sense strand	AUUAGCCAUGGAUGUAUUCAUGAAA	115
SNCA-244	25mer sense strand	UUAGCCAUGGAUGUAUUCAAGAAAG	116
SNCA-245	25mer sense strand	UAGCCAUGGAUGUAUUCAUAAAAGG	117
SNCA-246	25mer sense strand	AGCCAUGGAUGUAUUCAUGAAAGGA	118
SNCA-247	25mer sense strand	GCCAUGGAUGUAUUCAUGAAAGGAC	119
SNCA-248	25mer sense strand	CCAUGGAUGUAUUCAUGAAAGGACT	120
SNCA-249	25mer sense strand	CAUGGAUGUAUUCAUGAAAAGACTT	121
SNCA-250	25mer sense strand	AUGGAUGUAUUCAUGAAAGAACUTT	122
SNCA-251	25mer sense strand	UGGAUGUAUUCAUGAAAGGACUUTC	123
SNCA-252	25mer sense strand	GGAUGUAUUCAUGAAAGGAAUUUCA	124
SNCA-253	25mer sense strand	GAUGUAUUCAUGAAAGGACAUUCAA	125
SNCA-254	25mer sense strand	AUGUAUUCAUGAAAGGACUAUCAAA	126
SNCA-256	25mer sense strand	GUAUUCAUGAAAGGACUUUAAAAGG	127
SNCA-330	25mer sense strand	AGAAGCAGCAGGAAAGACAAAAGAG	128
SNCA-335	25mer sense strand	CAGCAGGAAAGACAAAAGAAGGUGT	129
SNCA-337	25mer sense strand	GCAGGAAAGACAAAAGAGGAUGUTC	130
SNCA-341	25mer sense strand	GAAAGACAAAAGAGGGUGUACUCTA	131
SNCA-342	25mer sense strand	AAAGACAAAAGAGGGUGUUAUCUAT	132
SNCA-344	25mer sense strand	AGACAAAAGAGGGUGUUCUAUAUGT	133
SNCA-345	25mer sense strand	GACAAAAGAGGGUGUUCUCAAUGTA	134
SNCA-351	25mer sense strand	AGAGGGUGUUCUCUAUGUAAGCUCC	135
SNCA-353	25mer sense strand	AGGGUGUUCUCUAUGUAGGAUCCAA	136
SNCA-355	25mer sense strand	GGUGUUCUCUAUGUAGGCUACAAAA	137
SNCA-638	25mer sense strand	AGGAAGGGUAUCAAGACUAAGAACC	138
SNCA-641	25mer sense strand	AAGGGUAUCAAGACUACGAACCUGA	139
SNCA-642	25mer sense strand	AGGGUAUCAAGACUACGAAACUGAA	140
SNCA-647	25mer sense strand	AUCAAGACUACGAACCUGAAGCCTA	141
SNCA-648	25mer sense strand	UCAAGACUACGAACCUGAAACCUAA	142
SNCA-650	25mer sense strand	AAGACUACGAACCUGAAGCAUAAGA	143
SNCA-652	25mer sense strand	GACUACGAACCUGAAGCCUAAGAAA	144
SNCA-653	25mer sense strand	ACUACGAACCUGAAGCCUAAGAAAT	145
SNCA-654	25mer sense strand	CUACGAACCUGAAGCCUAAAAAATA	146
SNCA-656	25mer sense strand	ACGAACCUGAAGCCUAAGAAAUATC	147
SNCA-657	25mer sense strand	CGAACCUGAAGCCUAAGAAAUAUCT	148
SNCA-659	25mer sense strand	AACCUGAAGCCUAAGAAAUAUCUTT	149
SNCA-660	25mer sense strand	ACCUGAAGCCUAAGAAAUAACUUTG	150
SNCA-661	25mer sense strand	CCUGAAGCCUAAGAAAUAUAUUUGC	151

SNCA-662	25mer sense strand	CUGAAGCCUAAGAAAUAUCAUUGCT	152
SNCA-663	25mer sense strand	UGAAGCCUAAGAAAUAUCUAUGCTC	153
SNCA-668	25mer sense strand	CCUAAGAAAUAUCUUUGCUACCAGT	154
SNCA-669	25mer sense strand	CUAAGAAAUAUCUUUGCUCACAGTT	155
SNCA-672	25mer sense strand	AGAAAUAUCUUUGCUCCCAAUUUCT	156
SNCA-675	25mer sense strand	AAUAUCUUUGCUCCCAGUUACUUGA	157
SNCA-676	25mer sense strand	AUAUCUUUGCUCCCAGUUUAUUGAG	158
SNCA-689	25mer sense strand	CAGUUUCUUGAGAUCUGCUAACAGA	159
SNCA-724	25mer sense strand	UGUACAAGUGCUCAGUUCCAAUGTG	160
SNCA-744	25mer sense strand	AUGUGCCCAGUCAUGACAUAUCUCA	161
SNCA-745	25mer sense strand	UGUGCCCAGUCAUGACAUUACUCAA	162
SNCA-746	25mer sense strand	GUGCCCAGUCAUGACAUUUAUCAAA	163
SNCA-751	25mer sense strand	CAGUCAUGACAUUUCUCAAAGUUTT	164
SNCA-752	25mer sense strand	AGUCAUGACAUUUCUCAAAAUUUTT	165
SNCA-753	25mer sense strand	GUCAUGACAUUUCUCAAAGAUUUTA	166
SNCA-754	25mer sense strand	UCAUGACAUUUCUCAAAGUAUUUAC	167
SNCA-755	25mer sense strand	CAUGACAUUUCUCAAAGUUAUUACA	168
SNCA-756	25mer sense strand	AUGACAUUUCUCAAAGUUUAUACAG	169
SNCA-757	25mer sense strand	UGACAUUUCUCAAAGUUUUAACAGT	170
SNCA-758	25mer sense strand	GACAUUUCUCAAAGUUUUUACAGTG	171
SNCA-759	25mer sense strand	ACAUUUCUCAAAGUUUUUAAAGUGT	172
SNCA-760	25mer sense strand	CAUUUCUCAAAGUUUUUACAGUGTA	173
SNCA-761	25mer sense strand	AUUUCUCAAAGUUUUUACAAUGUAT	174
SNCA-762	25mer sense strand	UUUCUCAAAGUUUUUACAGAGUATC	175
SNCA-789	25mer sense strand	GAAGUCUUCCAUCAGCAGUAAUUGA	176
SNCA-795	25mer sense strand	UUCCAUCAGCAGUGAUUGAAGUATC	177
SNCA-796	25mer sense strand	UCCAUCAGCAGUGAUUGAAAUAUCT	178
SNCA-797	25mer sense strand	CCAUCAGCAGUGAUUGAAGAAUCTG	179
SNCA-798	25mer sense strand	CAUCAGCAGUGAUUGAAGUAUCUGT	180
SNCA-799	25mer sense strand	AUCAGCAGUGAUUGAAGUAACUGTA	181
SNCA-800	25mer sense strand	UCAGCAGUGAUUGAAGUAUAUGUAC	182
SNCA-801	25mer sense strand	CAGCAGUGAUUGAAGUAUCAGUACC	183
SNCA-802	25mer sense strand	AGCAGUGAUUGAAGUAUCUAUACCT	184
SNCA-803	25mer sense strand	GCAGUGAUUGAAGUAUCUGAACCTG	185
SNCA-804	25mer sense strand	CAGUGAUUGAAGUAUCUGUACCUGC	186
SNCA-805	25mer sense strand	AGUGAUUGAAGUAUCUGUAACUGCC	187
SNCA-809	25mer sense strand	AUUGAAGUAUCUGUACCUGACCCCA	188
SNCA-839	25mer sense strand	CAUUUCGGUGCUUCCCUUUAACUGA	189
SNCA-844	25mer sense strand	CGGUGCUUCCCUUUCACUGAAGUGA	190
SNCA-845	25mer sense strand	GGUGCUUCCCUUUCACUGAAGUGAA	191
SNCA-846	25mer sense strand	GUGCUUCCCUUUCACUGAAAUGAAT	192
SNCA-847	25mer sense strand	UGCUUCCCUUUCACUGAAGAGAATA	193

SNCA-848	25mer sense strand	GCUUCCCUUUCACUGAAGUAAAUAC	194
SNCA-849	25mer sense strand	CUUCCCUUUCACUGAAGUGAAUACA	195
SNCA-850	25mer sense strand	UUCCCUUUCACUGAAGUGAAUACAT	196
SNCA-851	25mer sense strand	UCCCUUUCACUGAAGUGAAAACATG	197
SNCA-852	25mer sense strand	CCCUUUCACUGAAGUGAAUACAUGG	198
SNCA-853	25mer sense strand	CCUUUCACUGAAGUGAAUAAAUGGT	199
SNCA-854	25mer sense strand	CUUUCACUGAAGUGAAUACAUGGTA	200
SNCA-855	25mer sense strand	UUUCACUGAAGUGAAUACAAGGUAG	201
SNCA-856	25mer sense strand	UUCACUGAAGUGAAUACAUAGUAGC	202
SNCA-857	25mer sense strand	UCACUGAAGUGAAUACAUGAUAGCA	203
SNCA-858	25mer sense strand	CACUGAAGUGAAUACAUGGAAGCAG	204
SNCA-859	25mer sense strand	ACUGAAGUGAAUACAUGGUAGCAGG	205
SNCA-860	25mer sense strand	CUGAAGUGAAUACAUGGUAACAGGG	206
SNCA-861	25mer sense strand	UGAAGUGAAUACAUGGUAGAAGGGT	207
SNCA-863	25mer sense strand	AAGUGAAUACAUGGUAGCAAGGUCT	208
SNCA-864	25mer sense strand	AGUGAAUACAUGGUAGCAGAGUCTT	209
SNCA-865	25mer sense strand	GUGAAUACAUGGUAGCAGGAUCUTT	210
SNCA-867	25mer sense strand	GAAUACAUGGUAGCAGGGUAUUUGT	211
SNCA-868	25mer sense strand	AAUACAUGGUAGCAGGGUCAUUGTG	212
SNCA-875	25mer sense strand	GGUAGCAGGGUCUUUGUGUACUGTG	213
SNCA-881	25mer sense strand	AGGGUCUUUGUGUGCUGUGAAUUTT	214
SNCA-883	25mer sense strand	GGUCUUUGUGUGCUGUGGAAUUUGT	215
SNCA-889	25mer sense strand	UGUGUGCUGUGGAUUUUGUAGCUTC	216
SNCA-890	25mer sense strand	GUGUGCUGUGGAUUUUGUGACUUCA	217
SNCA-891	25mer sense strand	UGUGCUGUGGAUUUUGUGGAUUCAA	218
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SNCA-894	25mer sense strand	GCUGUGGAUUUUGUGGCUUAAAUCT	221
SNCA-895	25mer sense strand	CUGUGGAUUUUGUGGCUUCAAUCTA	222
SNCA-897	25mer sense strand	GUGGAUUUUGUGGCUUCAAACUACG	223
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SNCA-900	25mer sense strand	GAUUUUGUGGCUUCAAUCUACGATG	225
SNCA-901	25mer sense strand	AUUUUGUGGCUUCAAUCUAAGAUGT	226
SNCA-956	25mer sense strand	CCACUUAUUUCUAAAUCCUAACUAT	227
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SNCA-958	25mer sense strand	ACUUAUUUCUAAAUCCUCAAUAUTT	229
SNCA-959	25mer sense strand	CUUAUUUCUAAAUCCUCACAAUUTT	230
SNCA-961	25mer sense strand	UAUUUCUAAAUCCUCACUAAUUUTT	231
SNCA-962	25mer sense strand	AUUUCUAAAUCCUCACUAUAUUUTT	232
SNCA-963	25mer sense strand	UUUCUAAAUCCUCACUAUUAUUUTG	233
SNCA-964	25mer sense strand	UUCUAAAUCCUCACUAUUUAUUUGT	234
SNCA-965	25mer sense strand	UCUAAAUCCUCACUAUUUUAUUGTT	235

SNCA-966	25mer sense strand	CUAAAUCCUCACUAUUUUUAUGUTG	236
SNCA-967	25mer sense strand	UAAAUCCUCACUAUUUUUUAGUUGC	237
SNCA-968	25mer sense strand	AAAUCCUCACUAUUUUUUUAUUGCT	238
SNCA-969	25mer sense strand	AAUCCUCACUAUUUUUUUGAUGCTG	239
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SNCA-973	25mer sense strand	CUCACUAUUUUUUUGUUGCAGUUGT	243
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SNCA-975	25mer sense strand	CACUAUUUUUUUGUUGCUGAUGUTC	245
SNCA-976	25mer sense strand	ACUAUUUUUUUGUUGCUGUAGUUCA	246
SNCA-977	25mer sense strand	CUAUUUUUUUGUUGCUGUUAUUCAG	247
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SNCA-979	25mer sense strand	AUUUUUUUGUUGCUGUUGUACAGAA	249
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SNCA-981	25mer sense strand	UUUUUUGUUGCUGUUGUUCAGAAGT	251
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SNCA-983	25mer sense strand	UUUUGUUGCUGUUGUUCAGAAGUTG	253
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SNCA-986	25mer sense strand	UGUUGCUGUUGUUCAGAAGAUGUTA	256
SNCA-987	25mer sense strand	GUUGCUGUUGUUCAGAAGUAGUUAG	257
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SNCA-989	25mer sense strand	UGCUGUUGUUCAGAAGUUGAUAGTG	259
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SNCA-993	25mer sense strand	GUUGUUCAGAAGUUGUUAGAGAUTT	263
SNCA-994	25mer sense strand	UUGUUCAGAAGUUGUUAGUAAUUTG	264
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SNCA-999	25mer sense strand	CAGAAGUUGUUAGUGAUUUACUATC	269
SNCA-1000	25mer sense strand	AGAAGUUGUUAGUGAUUUGAUAUCA	270
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SNCA-1002	25mer sense strand	AAGUUGUUAGUGAUUUGCUAUCATA	272
SNCA-1003	25mer sense strand	AGUUGUUAGUGAUUUGCUAACAUAT	273

SNCA-1004	25mer sense strand	GUUGUUAGUGAUUUGCUAUAAUATA	274
SNCA-1005	25mer sense strand	UUGUUAGUGAUUUGCUAUCAUAUAT	275
SNCA-1028	25mer sense strand	AUUAUAAGAUUUUUAGGUGACUUTT	276
SNCA-1029	25mer sense strand	UUAUAAGAUUUUUAGGUGUAUUUTA	277
SNCA-1030	25mer sense strand	UAUAAGAUUUUUAGGUGUCAUUUAA	278
SNCA-1031	25mer sense strand	AUAAGAUUUUUAGGUGUCUAUUAAT	279
SNCA-1032	25mer sense strand	UAAGAUUUUUAGGUGUCUUAUAATG	280
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SNCA-1040	25mer sense strand	UUAGGUGUCUUUUAAUGAUACUGTC	288
SNCA-1041	25mer sense strand	UAGGUGUCUUUUAAUGAUAAUGUCT	289
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SNCA-1046	25mer sense strand	GUCUUUUAAUGAUACUGUCAAAGAA	294

SNCA-1047	25mer sense strand	UCUUUUAAUGAUACUGUCUAAGAAT	295
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SNCA-1049	25mer sense strand	UUUUAAUGAUACUGUCUAAAAAUAA	297
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SNCA-1092	25mer sense strand	GUUAAUAUAUAUAAUACUUAAAAAT	316
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SNCA-1121	25mer sense strand	GAGCAUGAAACUAUGCACCAAUAAA	322
SNCA-1122	25mer sense strand	AGCAUGAAACUAUGCACCUAUAAAT	323
SNCA-1123	25mer sense strand	GCAUGAAACUAUGCACCUAAAAATA	324
SNCA-1124	25mer sense strand	CAUGAAACUAUGCACCUAUAAAUAC	325
SNCA-1125	25mer sense strand	AUGAAACUAUGCACCUAUAAAUACT	326
SNCA-1126	25mer sense strand	UGAAACUAUGCACCUAUAAAUACTA	327
SNCA-1127	25mer sense strand	GAAACUAUGCACCUAUAAAAACUAA	328
SNCA-1128	25mer sense strand	AAACUAUGCACCUAUAAAUACUAAA	329
SNCA-1129	25mer sense strand	AACUAUGCACCUAUAAAUAAUAAAT	330
SNCA-1130	25mer sense strand	ACUAUGCACCUAUAAAUACAAAATA	331
SNCA-1131	25mer sense strand	CUAUGCACCUAUAAAUACUAAAUAT	332
SNCA-1132	25mer sense strand	UAUGCACCUAUAAAUACUAAAUATG	333
SNCA-1133	25mer sense strand	AUGCACCUAUAAAUACUAAAUAUGA	334
SNCA-1194	25mer sense strand	GUUUGUAUAUAAAUGGUGAAAAUTA	335
SNCA-1195	25mer sense strand	UUUGUAUAUAAAUGGUGAGAAUUAA	336

SNCA-1196	25mer sense strand	UUGUAUAUAAAUGGUGAGAAUUAAA	337
SNCA-1197	25mer sense strand	UGUAUAUAAAUGGUGAGAAAUAAAA	338
SNCA-1198	25mer sense strand	GUAUAUAAAUGGUGAGAAUAAAAAT	339
SNCA-1199	25mer sense strand	UAUAUAAAUGGUGAGAAUUAAAATA	340
SNCA-1200	25mer sense strand	AUAUAAAUGGUGAGAAUUAAAAUAA	341
SNCA-1201	25mer sense strand	UAUAAAUGGUGAGAAUUAAAAUAAA	342
SNCA-1202	25mer sense strand	AUAAAUGGUGAGAAUUAAAAUAAAA	343
SNCA-1203	25mer sense strand	UAAAUGGUGAGAAUUAAAAAAAAAC	344
SNCA-1204	25mer sense strand	AAAUGGUGAGAAUUAAAAUAAAACG	345
SNCA-1205	25mer sense strand	AAUGGUGAGAAUUAAAAUAAAACGT	346
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SNCA-1207	25mer sense strand	UGGUGAGAAUUAAAAUAAAACGUTA	348
SNCA-1208	25mer sense strand	GGUGAGAAUUAAAAUAAAAAGUUAT	349
SNCA-1250	25mer sense strand	UUAUUUUUAUCCCAUCUCAAUUUAA	350
SNCA-1252	25mer sense strand	AUUUUUAUCCCAUCUCACUAUAATA	351
SNCA-1253	25mer sense strand	UUUUUAUCCCAUCUCACUUAAAUAA	352
SNCA-1254	25mer sense strand	UUUUAUCCCAUCUCACUUUAAUAAT	353
SNCA-1255	25mer sense strand	UUUAUCCCAUCUCACUUUAAUAATA	354
SNCA-1256	25mer sense strand	UUAUCCCAUCUCACUUUAAAAAUAA	355
SNCA-1257	25mer sense strand	UAUCCCAUCUCACUUUAAUAAUAAA	356
SNCA-1258	25mer sense strand	AUCCCAUCUCACUUUAAUAAUAAAA	357

SNCA-1259	25mer sense strand	UCCCAUCUCACUUUAAUAAAAAAAA	358
SNCA-1260	25mer sense strand	CCCAUCUCACUUUAAUAAUAAAAAT	359
SNCA-1261	25mer sense strand	CCAUCUCACUUUAAUAAUAAAAATC	360
SNCA-1262	25mer sense strand	CAUCUCACUUUAAUAAUAAAAAUCA	361
SNCA-1263	25mer sense strand	AUCUCACUUUAAUAAUAAAAAUCAT	362
SNCA-1264	25mer sense strand	UCUCACUUUAAUAAUAAAAAUCATG	363
SNCA-1265	25mer sense strand	CUCACUUUAAUAAUAAAAAACAUGC	364
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SNCA-1267	25mer sense strand	CACUUUAAUAAUAAAAAUCAUGCTT	366
SNCA-1351	25mer sense strand	AUUUGAAGAAGGAGGAAUUAUAGAA	367
SNCA-1365	25mer sense strand	GAAUUUUAGAAGAGGUAGAAAAAAT	368
SNCA-1372	25mer sense strand	AGAAGAGGUAGAGAAAAUGAAACAT	369
SNCA-1373	25mer sense strand	GAAGAGGUAGAGAAAAUGGAACATT	370
SNCA-1374	25mer sense strand	AAGAGGUAGAGAAAAUGGAACAUTA	371
SNCA-1375	25mer sense strand	AGAGGUAGAGAAAAUGGAAAAUUAA	372
SNCA-1376	25mer sense strand	GAGGUAGAGAAAAUGGAACAUUAAC	373
SNCA-1377	25mer sense strand	AGGUAGAGAAAAUGGAACAAUAACC	374
SNCA-1379	25mer sense strand	GUAGAGAAAAUGGAACAUUAACCCT	375
SNCA-1380	25mer sense strand	UAGAGAAAAUGGAACAUUAACCCTA	376
SNCA-1381	25mer sense strand	AGAGAAAAUGGAACAUUAAACCUAC	377
SNCA-1382	25mer sense strand	GAGAAAAUGGAACAUUAACACUACA	378

SNCA-1383	25mer sense strand	AGAAAAUGGAACAUUAACCAUACAC	379
SNCA-1384	25mer sense strand	GAAAAUGGAACAUUAACCCAACACT	380
SNCA-1385	25mer sense strand	AAAAUGGAACAUUAACCCUACACTC	381
SNCA-1388	25mer sense strand	AUGGAACAUUAACCCUACAAUCGGA	382
SNCA-1428	25mer sense strand	ACUGCCAGAAGUGUGUUUUAGUATG	383
SNCA-1429	25mer sense strand	CUGCCAGAAGUGUGUUUUGAUAUGC	384
SNCA-259	27mer antisense strand	UGGCCUUUGAAAGUCCUUUCAUGAAUA	385
SNCA-260	27mer antisense strand	UUGGCUUUUGAAAGUCCUUUCAUGAAU	386
SNCA-261	27mer antisense strand	CUUGGUCUUUGAAAGUCCUUUCAUGAA	387
SNCA-262	27mer antisense strand	CCUUGUCCUUUGAAAGUCCUUUCAUGA	388
SNCA-263	27mer antisense strand	UCCUUUGCCUUUGAAAGUCCUUUCAUG	389
SNCA-264	27mer antisense strand	CUCCUUGGCCUUUGAAAGUCCUUUCAU	390
SNCA-285	27mer antisense strand	CUCAGUAGCAGCCACAACUCCCUCCUU	391
SNCA-288	27mer antisense strand	UUUCUUAGCAGCAGCCACAACUCCCUC	392
SNCA-289	27mer antisense strand	UUUUCUCAGCAGCAGCCACAACUCCCU	393
SNCA-290	27mer antisense strand	GUUUUUUCAGCAGCAGCCACAACUCCC	394
SNCA-292	27mer antisense strand	UGGUUUUCUCAGCAGCAGCCACAACUC	395
SNCA-293	27mer antisense strand	UUGGUUUUCUCAGCAGCAGCCACAACU	396
SNCA-294	27mer antisense strand	UUUGGUUUUCUCAGCAGCAGCCACAAC	397
SNCA-295	27mer antisense strand	GUUUGUUUUUCUCAGCAGCAGCCACAA	398
SNCA-296	27mer antisense strand	UGUUUUGUUUUCUCAGCAGCAGCCACA	399

SNCA-297	27mer antisense strand	CUGUUUGGUUUUCUCAGCAGCAGCCAC	400
SNCA-407	27mer antisense strand	UCUUUUGUCUUCUCAGCCACUGUUGCC	401
SNCA-408	27mer antisense strand	CUCUUUGGUCUUCUCAGCCACUGUUGC	402
SNCA-409	27mer antisense strand	GCUCUUUGGUCUUCUCAGCCACUGUUG	403
SNCA-410	27mer antisense strand	UGCUCUUUGGUCUUCUCAGCCACUGUU	404
SNCA-411	27mer antisense strand	UUGCUUUUUGGUCUUCUCAGCCACUGU	405
SNCA-412	27mer antisense strand	CUUGCUCUUUGGUCUUCUCAGCCACUG	406
SNCA-413	27mer antisense strand	ACUUGUUCUUUGGUCUUCUCAGCCACU	407
SNCA-414	27mer antisense strand	CACUUUCUCUUUGGUCUUCUCAGCCAC	408
SNCA-415	27mer antisense strand	UCACUUGCUCUUUGGUCUUCUCAGCCA	409
SNCA-416	27mer antisense strand	GUCACUUGCUCUUUGGUCUUCUCAGCC	410
SNCA-417	27mer antisense strand	UGUCAUUUGCUCUUUGGUCUUCUCAGC	411
SNCA-418	27mer antisense strand	UUGUCUCUUGCUCUUUGGUCUUCUCAG	412
SNCA-419	27mer antisense strand	UUUGUUACUUGCUCUUUGGUCUUCUCA	413
SNCA-420	27mer antisense strand	AUUUGUCACUUGCUCUUUGGUCUUCUC	414
SNCA-421	27mer antisense strand	CAUUUUUCACUUGCUCUUUGGUCUUCU	415
SNCA-422	27mer antisense strand	ACAUUUGUCACUUGCUCUUUGGUCUUC	416
SNCA-423	27mer antisense strand	AACAUUUGUCACUUGCUCUUUGGUCUU	417
SNCA-424	27mer antisense strand	CAACAUUUGUCACUUGCUCUUUGGUCU	418
SNCA-425	27mer antisense strand	CCAACUUUUGUCACUUGCUCUUUGGUC	419
SNCA-426	27mer antisense strand	UCCAAUAUUUGUCACUUGCUCUUUGGU	420

SNCA-427	27mer antisense strand	CUCCAUCAUUUGUCACUUGCUCUUUG	421
SNCA-428	27mer antisense strand	CCUCCUACAUUUGUCACUUGCUCUUU G	422
SNCA-429	27mer antisense strand	UCCUCUAACAUUUGUCACUUGCUCUU U	423
SNCA-430	27mer antisense strand	CUCCUUCAACAUUUGUCACUUGCUCU U	424
SNCA-431	27mer antisense strand	GCUCCUCCAACAUUUGUCACUUGCUCU	425
SNCA-432	27mer antisense strand	UGCUCUUCCAACAUUUGUCACUUGCU C	426
SNCA-433	27mer antisense strand	CUGCUUCUCCAACAUUUGUCACUUGC U	427
SNCA-434	27mer antisense strand	ACUGCUCCUCCAACAUUUGUCACUUGC	428
SNCA-435	27mer antisense strand	CACUGUUCCUCCAACAUUUGUCACUU G	429
SNCA-436	27mer antisense strand	CCACUUCUCCUCCAACAUUUGUCACUU	430
SNCA-437	27mer antisense strand	ACCACUGCUCCUCCAACAUUUGUCACU	431
SNCA-725	27mer antisense strand	GCACAUUGGAACUGAGCACUUGUACA G	432
SNCA-726	27mer antisense strand	GGCACUUUGGAACUGAGCACUUGUAC A	433
SNCA-727	27mer antisense strand	GGGCAUAUUGGAACUGAGCACUUGUA C	434
SNCA-728	27mer antisense strand	UGGGCUCAUUGGAACUGAGCACUUGU A	435
SNCA-729	27mer antisense strand	CUGGGUACAUUGGAACUGAGCACUUG U	436
SNCA-730	27mer antisense strand	ACUGGUCACAUUGGAACUGAGCACUU G	437
SNCA-731	27mer antisense strand	GACUGUGCACAUUGGAACUGAGCACU U	438
SNCA-732	27mer antisense strand	UGACUUGGCACAUUGGAACUGAGCAC U	439
SNCA-733	27mer antisense strand	AUGACUGGGCACAUUGGAACUGAGCA C	440
SNCA-734	27mer antisense strand	CAUGAUUGGGCACAUUGGAACUGAGC A	441

SNCA-735	27mer antisense strand	UCAUGUCUGGGCACAUUGGAACUGAGC	442
SNCA-736	27mer antisense strand	GUCAUUACUGGGCACAUUGGAACUGAG	443
SNCA-737	27mer antisense strand	UGUCAUGACUGGGCACAUUGGAACUGA	444
SNCA-738	27mer antisense strand	AUGUCUUGACUGGGCACAUUGGAACUG	445
SNCA-739	27mer antisense strand	AAUGUUAUGACUGGGCACAUUGGAACU	446
SNCA-740	27mer antisense strand	AAAUGUCAUGACUGGGCACAUUGGAAC	447
SNCA-741	27mer antisense strand	GAAAUUUCAUGACUGGGCACAUUGGAA	448
SNCA-742	27mer antisense strand	AGAAAUGUCAUGACUGGGCACAUUGGA	449
SNCA-790	27mer antisense strand	UUCAAUCACUGCUGAUGGAAGACUUCG	450
SNCA-791	27mer antisense strand	CUUCAUUCACUGCUGAUGGAAGACUUC	451
SNCA-792	27mer antisense strand	ACUUCUAUCACUGCUGAUGGAAGACUU	452
SNCA-938	27mer antisense strand	UAAGUUGUAGUCACUUAGGUGUUUUUA	453
SNCA-939	27mer antisense strand	AUAAGUGGUAGUCACUUAGGUGUUUUU	454
SNCA-940	27mer antisense strand	AAUAAUUGGUAGUCACUUAGGUGUUUU	455
SNCA-941	27mer antisense strand	AAAUAUGUGGUAGUCACUUAGGUGUUU	456
SNCA-942	27mer antisense strand	GAAAUUAGUGGUAGUCACUUAGGUGUU	457
SNCA-943	27mer antisense strand	AGAAAUAAGUGGUAGUCACUUAGGUGU	458
SNCA-944	27mer antisense strand	UAGAAUUAAGUGGUAGUCACUUAGGUG	459
SNCA-945	27mer antisense strand	UUAGAUAUAAGUGGUAGUCACUUAGGU	460
SNCA-946	27mer antisense strand	UUUAGUAAUAAGUGGUAGUCACUUAGG	461
SNCA-947	27mer antisense strand	AUUUAUAAAUAAGUGGUAGUCACUUAG	462

SNCA-948	27mer antisense strand	GAUUUUGAAAUAAGUGGUAGUCACUU A	463
SNCA-949	27mer antisense strand	GGAUUUAGAAAUAAGUGGUAGUCACU U	464
SNCA-950	27mer antisense strand	AGGAUUUAGAAAUAAGUGGUAGUCAC U	465
SNCA-951	27mer antisense strand	GAGGAUUUAGAAAUAAGUGGUAGUCA C	466
SNCA-952	27mer antisense strand	UGAGGUUUUAGAAAUAAGUGGUAGUC A	467
SNCA-953	27mer antisense strand	GUGAGUAUUUAGAAAUAAGUGGUAGU C	468
SNCA-954	27mer antisense strand	AGUGAUGAUUUAGAAAUAAGUGGUAG U	469
SNCA-1081	27mer antisense strand	UUAUAUAUAUUAACAAAUUUCACAAU A	470
SNCA-1082	27mer antisense strand	AUUAUUUAUAUUAACAAAUUUCACAA U	471
SNCA-1083	27mer antisense strand	UAUUAUAUAUAUUAACAAAUUUCACA A	472
SNCA-1084	27mer antisense strand	GUAUUUUAUAUAUUAACAAAUUUCAC A	473
SNCA-1085	27mer antisense strand	AGUAUUAUAUAUAUUAACAAAUUUCA C	474
SNCA-1188	27mer antisense strand	UCACCUUUUAUAUACAAACACAAGUG A	475
SNCA-1189	27mer antisense strand	CUCACUAUUUAUAUACAAACACAAGU G	476
SNCA-1190	27mer antisense strand	UCUCAUCAUUUAUAUACAAACACAAG U	477
SNCA-1191	27mer antisense strand	UUCUCUCCAUUUAUAUACAAACACAA G	478
SNCA-1192	27mer antisense strand	AUUCUUACCAUUUAUAUACAAACACA A	479
SNCA-1193	27mer antisense strand	AAUUCUCACCAUUUAUAUACAAACAC A	480
SNCA-225	27mer antisense strand	GGCUAUUGAAUUCCUUUACACCACAC U	481
SNCA-226	27mer antisense strand	UGGCUUAUGAAUUCCUUUACACCACA C	482
SNCA-227	27mer antisense strand	AUGGCUAAUGAAUUCCUUUACACCAC A	483

SNCA-228	27mer antisense strand	CAUGGUUAAUGAAUUCCUUUACACCA C	484
SNCA-229	27mer antisense strand	CCAUGUCUAAUGAAUUCCUUUACACC A	485
SNCA-230	27mer antisense strand	UCCAUUGCUAAUGAAUUCCUUUACAC C	486
SNCA-231	27mer antisense strand	AUCCAUGGCUAAUGAAUUCCUUUACA C	487
SNCA-232	27mer antisense strand	CAUCCUUGGCUAAUGAAUUCCUUUAC A	488
SNCA-233	27mer antisense strand	ACAUCUAUGGCUAAUGAAUUCCUUUA C	489
SNCA-234	27mer antisense strand	UACAUUCAUGGCUAAUGAAUUCCUUU A	490
SNCA-235	27mer antisense strand	AUACAUCCAUGGCUAAUGAAUUCCUU U	491
SNCA-236	27mer antisense strand	AAUACUUCCAUGGCUAAUGAAUUCCU U	492
SNCA-237	27mer antisense strand	GAAUAUAUCCAUGGCUAAUGAAUUCC U	493
SNCA-238	27mer antisense strand	UGAAUUCAUCCAUGGCUAAUGAAUUC C	494
SNCA-239	27mer antisense strand	AUGAAUACAUCCAUGGCUAAUGAAUU C	495
SNCA-240	27mer antisense strand	CAUGAUUACAUCCAUGGCUAAUGAAU U	496
SNCA-241	27mer antisense strand	UCAUGUAUACAUCCAUGGCUAAUGAA U	497
SNCA-242	27mer antisense strand	UUCAUUAAUACAUCCAUGGCUAAUGA A	498
SNCA-243	27mer antisense strand	UUUCAUGAAUACAUCCAUGGCUAAUG A	499
SNCA-244	27mer antisense strand	CUUUCUUGAAUACAUCCAUGGCUAAU G	500
SNCA-245	27mer antisense strand	CCUUUUAUGAAUACAUCCAUGGCUAA U	501
SNCA-246	27mer antisense strand	UCCUUUCAUGAAUACAUCCAUGGCUA A	502
SNCA-247	27mer antisense strand	GUCCUUUCAUGAAUACAUCCAUGGCU A	503
SNCA-248	27mer antisense strand	AGUCCUUUCAUGAAUACAUCCAUGGC U	504

SNCA-249	27mer antisense strand	AAGUCUUUUCAUGAAUACAUCCAUGG C	505
SNCA-250	27mer antisense strand	AAAGUUCUUUCAUGAAUACAUCCAUG G	506
SNCA-251	27mer antisense strand	GAAAGUCCUUUCAUGAAUACAUCCAU G	507
SNCA-252	27mer antisense strand	UGAAAUUCCUUUCAUGAAUACAUCCA U	508
SNCA-253	27mer antisense strand	UUGAAUGUCCUUUCAUGAAUACAUCC A	509
SNCA-254	27mer antisense strand	UUUGAUAGUCCUUUCAUGAAUACAUC C	510
SNCA-256	27mer antisense strand	CCUUUUAAAGUCCUUUCAUGAAUACA U	511
SNCA-330	27mer antisense strand	CUCUUUUGUCUUUCCUGCUGCUUCUG C	512
SNCA-335	27mer antisense strand	ACACCUUCUUUUGUCUUUCCUGCUGC U	513
SNCA-337	27mer antisense strand	GAACAUCCUCUUUUGUCUUUCCUGCU G	514
SNCA-341	27mer antisense strand	UAGAGUACACCCUCUUUUGUCUUUCC U	515
SNCA-342	27mer antisense strand	AUAGAUAACACCCUCUUUUGUCUUUC C	516
SNCA-344	27mer antisense strand	ACAUAUAGAACACCCUCUUUUGUCUU U	517
SNCA-345	27mer antisense strand	UACAUUGAGAACACCCUCUUUUGUCU U	518
SNCA-351	27mer antisense strand	GGAGCUUACAUAGAGAACACCCUCUU U	519
SNCA-353	27mer antisense strand	UUGGAUCCUACAUAGAGAACACCCUC U	520
SNCA-355	27mer antisense strand	UUUUGUAGCCUACAUAGAGAACACCC U	521
SNCA-638	27mer antisense strand	GGUUCUUAGUCUUGAUACCCUUCCUC A	522
SNCA-641	27mer antisense strand	UCAGGUUCGUAGUCUUGAUACCCUUC C	523
SNCA-642	27mer antisense strand	UUCAGUUUCGUAGUCUUGAUACCCUU C	524
SNCA-647	27mer antisense strand	UAGGCUUCAGGUUCGUAGUCUUGAUA C	525

SNCA-648	27mer antisense strand	UUAGGUUUCAGGUUCGUAGUCUUGAUA	526
SNCA-650	27mer antisense strand	UCUUAUGCUUCAGGUUCGUAGUCUUGA	527
SNCA-652	27mer antisense strand	UUUCUUAGGCUUCAGGUUCGUAGUCUU	528
SNCA-653	27mer antisense strand	AUUUCUUAGGCUUCAGGUUCGUAGUCU	529
SNCA-654	27mer antisense strand	UAUUUUUUAGGCUUCAGGUUCGUAGUC	530
SNCA-656	27mer antisense strand	GAUAUUUCUUAGGCUUCAGGUUCGUAG	531
SNCA-657	27mer antisense strand	AGAUAUUUCUUAGGCUUCAGGUUCGUA	532
SNCA-659	27mer antisense strand	AAAGAUAUUUCUUAGGCUUCAGGUUCG	533
SNCA-660	27mer antisense strand	CAAAGUUAUUUCUUAGGCUUCAGGUUC	534
SNCA-661	27mer antisense strand	GCAAAUAUAUUUCUUAGGCUUCAGGUU	535
SNCA-662	27mer antisense strand	AGCAAUGAUAUUUCUUAGGCUUCAGGU	536
SNCA-663	27mer antisense strand	GAGCAUAGAUAUUUCUUAGGCUUCAGG	537
SNCA-668	27mer antisense strand	ACUGGUAGCAAAGAUAUUUCUUAGGCU	538
SNCA-669	27mer antisense strand	AACUGUGAGCAAAGAUAUUUCUUAGGC	539
SNCA-672	27mer antisense strand	AGAAAUUGGGAGCAAAGAUAUUUCUUA	540
SNCA-675	27mer antisense strand	UCAAGUAACUGGGAGCAAAGAUAUUUC	541
SNCA-676	27mer antisense strand	CUCAAUAAACUGGGAGCAAAGAUAUUU	542
SNCA-689	27mer antisense strand	UCUGUUAGCAGAUCUCAAGAAACUGGG	543
SNCA-724	27mer antisense strand	CACAUUGGAACUGAGCACUUGUACAGG	544
SNCA-744	27mer antisense strand	UGAGAUAUGUCAUGACUGGGCACAUUG	545
SNCA-745	27mer antisense strand	UUGAGUAAUGUCAUGACUGGGCACAUU	546

SNCA-746	27mer antisense strand	UUUGAUAAAUGUCAUGACUGGGCACAU	547
SNCA-751	27mer antisense strand	AAAACUUUGAGAAAUGUCAUGACUGGG	548
SNCA-752	27mer antisense strand	AAAAAUUUUGAGAAAUGUCAUGACUGG	549
SNCA-753	27mer antisense strand	UAAAAUCUUUGAGAAAUGUCAUGACUG	550
SNCA-754	27mer antisense strand	GUAAAUACUUUGAGAAAUGUCAUGACU	551
SNCA-755	27mer antisense strand	UGUAAUAACUUUGAGAAAUGUCAUGAC	552
SNCA-756	27mer antisense strand	CUGUAUAAACUUUGAGAAAUGUCAUGA	553
SNCA-757	27mer antisense strand	ACUGUUAAAACUUUGAGAAAUGUCAUG	554
SNCA-758	27mer antisense strand	CACUGUAAAAACUUUGAGAAAUGUCAU	555
SNCA-759	27mer antisense strand	ACACUUUAAAAACUUUGAGAAAUGUCA	556
SNCA-760	27mer antisense strand	UACACUGUAAAAACUUUGAGAAAUGUC	557
SNCA-761	27mer antisense strand	AUACAUUGUAAAAACUUUGAGAAAUGU	558
SNCA-762	27mer antisense strand	GAUACUCUGUAAAAACUUUGAGAAAUG	559
SNCA-789	27mer antisense strand	UCAAUUACUGCUGAUGGAAGACUUCGA	560
SNCA-795	27mer antisense strand	GAUACUUCAAUCACUGCUGAUGGAAGA	561
SNCA-796	27mer antisense strand	AGAUAUUUCAAUCACUGCUGAUGGAAG	562
SNCA-797	27mer antisense strand	CAGAUUCUUCAAUCACUGCUGAUGGAA	563
SNCA-798	27mer antisense strand	ACAGAUACUUCAAUCACUGCUGAUGGA	564
SNCA-799	27mer antisense strand	UACAGUUACUUCAAUCACUGCUGAUGG	565
SNCA-800	27mer antisense strand	GUACAUAUACUUCAAUCACUGCUGAUG	566
SNCA-801	27mer antisense strand	GGUACUGAUACUUCAAUCACUGCUGAU	567

SNCA-802	27mer antisense strand	AGGUAUAGAUACUUCAAUCACUGCUG A	568
SNCA-803	27mer antisense strand	CAGGUUCAGAUACUUCAAUCACUGCU G	569
SNCA-804	27mer antisense strand	GCAGGUACAGAUACUUCAAUCACUGC U	570
SNCA-805	27mer antisense strand	GGCAGUUACAGAUACUUCAAUCACUG C	571
SNCA-809	27mer antisense strand	UGGGGUCAGGUACAGAUACUUCAAUC A	572
SNCA-839	27mer antisense strand	UCAGUUAAAGGGAAGCACCGAAAUGC U	573
SNCA-844	27mer antisense strand	UCACUUCAGUGAAAGGGAAGCACCGA A	574
SNCA-845	27mer antisense strand	UUCACUUCAGUGAAAGGGAAGCACCG A	575
SNCA-846	27mer antisense strand	AUUCAUUUCAGUGAAAGGGAAGCACC G	576
SNCA-847	27mer antisense strand	UAUUCUCUUCAGUGAAAGGGAAGCAC C	577
SNCA-848	27mer antisense strand	GUAUUUACUUCAGUGAAAGGGAAGCA C	578
SNCA-849	27mer antisense strand	UGUAUUCACUUCAGUGAAAGGGAAGC A	579
SNCA-850	27mer antisense strand	AUGUAUUCACUUCAGUGAAAGGGAAG C	580
SNCA-851	27mer antisense strand	CAUGUUUUCACUUCAGUGAAAGGGAA G	581
SNCA-852	27mer antisense strand	CCAUGUAUUCACUUCAGUGAAAGGGA A	582
SNCA-853	27mer antisense strand	ACCAUUUAUUCACUUCAGUGAAAGGG A	583
SNCA-854	27mer antisense strand	UACCAUGUAUUCACUUCAGUGAAAGG G	584
SNCA-855	27mer antisense strand	CUACCUUGUAUUCACUUCAGUGAAAG G	585
SNCA-856	27mer antisense strand	GCUACUAUGUAUUCACUUCAGUGAAA G	586
SNCA-857	27mer antisense strand	UGCUAUCAUGUAUUCACUUCAGUGAA A	587
SNCA-858	27mer antisense strand	CUGCUUCCAUGUAUUCACUUCAGUGA A	588

SNCA-859	27mer antisense strand	CCUGCUACCAUGUAUUCACUUCAGUG A	589
SNCA-860	27mer antisense strand	CCCUGUUACCAUGUAUUCACUUCAGU G	590
SNCA-861	27mer antisense strand	ACCCUUCUACCAUGUAUUCACUUCAG U	591
SNCA-863	27mer antisense strand	AGACCUUGCUACCAUGUAUUCACUUC A	592
SNCA-864	27mer antisense strand	AAGACUCUGCUACCAUGUAUUCACUU C	593
SNCA-865	27mer antisense strand	AAAGAUCCUGCUACCAUGUAUUCACU U	594
SNCA-867	27mer antisense strand	ACAAAUACCCUGCUACCAUGUAUUCA C	595
SNCA-868	27mer antisense strand	CACAAUGACCCUGCUACCAUGUAUUC A	596
SNCA-875	27mer antisense strand	CACAGUACACAAAGACCCUGCUACCAU	597
SNCA-881	27mer antisense strand	AAAAUUCACAGCACACAAAGACCCUG C	598
SNCA-883	27mer antisense strand	ACAAAUUCCACAGCACACAAAGACCCU	599
SNCA-889	27mer antisense strand	GAAGCUACAAAAUCCACAGCACACAA A	600
SNCA-890	27mer antisense strand	UGAAGUCACAAAAUCCACAGCACACA A	601
SNCA-891	27mer antisense strand	UUGAAUCCACAAAAUCCACAGCACAC A	602
SNCA-892	27mer antisense strand	AUUGAUGCCACAAAAUCCACAGCACA C	603
SNCA-893	27mer antisense strand	GAUUGUAGCCACAAAAUCCACAGCAC A	604
SNCA-894	27mer antisense strand	AGAUUUAAGCCACAAAAUCCACAGCA C	605
SNCA-895	27mer antisense strand	UAGAUUGAAGCCACAAAAUCCACAGC A	606
SNCA-897	27mer antisense strand	CGUAGUUUGAAGCCACAAAAUCCACA G	607
SNCA-898	27mer antisense strand	UCGUAUAUUGAAGCCACAAAAUCCAC A	608
SNCA-900	27mer antisense strand	CAUCGUAGAUUGAAGCCACAAAAUCC A	609

SNCA-901	27mer antisense strand	ACAUCUUAGAUUGAAGCCACAAAAUCC	610
SNCA-956	27mer antisense strand	AUAGUUAGGAUUUAGAAAUAAGUGGUA	611
SNCA-957	27mer antisense strand	AAUAGUGAGGAUUUAGAAAUAAGUGGU	612
SNCA-958	27mer antisense strand	AAAUAUUGAGGAUUUAGAAAUAAGUGG	613
SNCA-959	27mer antisense strand	AAAAUUGUGAGGAUUUAGAAAUAAGUG	614
SNCA-961	27mer antisense strand	AAAAAUUAGUGAGGAUUUAGAAAUAAG	615
SNCA-962	27mer antisense strand	AAAAAUAUAGUGAGGAUUUAGAAAUAA	616
SNCA-963	27mer antisense strand	CAAAAUAAUAGUGAGGAUUUAGAAAUA	617
SNCA-964	27mer antisense strand	ACAAAUAAAUAGUGAGGAUUUAGAAAU	618
SNCA-965	27mer antisense strand	AACAAUAAAAUAGUGAGGAUUUAGAAA	619
SNCA-966	27mer antisense strand	CAACAUAAAAAUAGUGAGGAUUUAGAA	620
SNCA-967	27mer antisense strand	GCAACUAAAAAAUAGUGAGGAUUUAGA	621
SNCA-968	27mer antisense strand	AGCAAUAAAAAAAUAGUGAGGAUUUAG	622
SNCA-969	27mer antisense strand	CAGCAUCAAAAAAAUAGUGAGGAUUUA	623
SNCA-970	27mer antisense strand	ACAGCUACAAAAAAAUAGUGAGGAUUU	624
SNCA-971	27mer antisense strand	AACAGUAACAAAAAAAUAGUGAGGAUU	625
SNCA-972	27mer antisense strand	CAACAUCAACAAAAAAAUAGUGAGGAU	626
SNCA-973	27mer antisense strand	ACAACUGCAACAAAAAAAUAGUGAGGA	627
SNCA-974	27mer antisense strand	AACAAUAGCAACAAAAAAAUAGUGAGG	628
SNCA-975	27mer antisense strand	GAACAUCAGCAACAAAAAAAUAGUGAG	629
SNCA-976	27mer antisense strand	UGAACUACAGCAACAAAAAAAUAGUGA	630

SNCA-977	27mer antisense strand	CUGAAUAACAGCAACAAAAAAAUAGUG	631
SNCA-978	27mer antisense strand	UCUGAUCAACAGCAACAAAAAAAUAGU	632
SNCA-979	27mer antisense strand	UUCUGUACAACAGCAACAAAAAAAUAG	633
SNCA-980	27mer antisense strand	CUUCUUAACAACAGCAACAAAAAAAU	634
SNCA-981	27mer antisense strand	ACUUCUGAACAACAGCAACAAAAAAU	635
SNCA-982	27mer antisense strand	AACUUUUGAACAACAGCAACAAAAAA	636
SNCA-983	27mer antisense strand	CAACUUCUGAACAACAGCAACAAAAA	637
SNCA-984	27mer antisense strand	ACAACUUCUGAACAACAGCAACAAAA	638
SNCA-985	27mer antisense strand	AACAAUUUCUGAACAACAGCAACAAA	639
SNCA-986	27mer antisense strand	UAACAUCUUCUGAACAACAGCAACAA	640
SNCA-987	27mer antisense strand	CUAACUACUUCUGAACAACAGCAACA	641
SNCA-988	27mer antisense strand	ACUAAUAACUUCUGAACAACAGCAAC	642
SNCA-989	27mer antisense strand	CACUAUCAACUUCUGAACAACAGCAAC	643
SNCA-990	27mer antisense strand	UCACUUACAACUUCUGAACAACAGCAA	644
SNCA-991	27mer antisense strand	AUCACUAACAACUUCUGAACAACAGCA	645
SNCA-992	27mer antisense strand	AAUCAUUAACAACUUCUGAACAACAGC	646
SNCA-993	27mer antisense strand	AAAUCUCUAACAACUUCUGAACAACAG	647
SNCA-994	27mer antisense strand	CAAAUUACUAACAACUUCUGAACAAC	648
SNCA-995	27mer antisense strand	GCAAAUCACUAACAACUUCUGAACAAC	649
SNCA-996	27mer antisense strand	AGCAAUUCACUAACAACUUCUGAACAA	650
SNCA-997	27mer antisense strand	UAGCAUAUCACUAACAACUUCUGAACA	651

SNCA-998	27mer antisense strand	AUAGCUAAUCACUAACAACUUCUGAAC	652
SNCA-999	27mer antisense strand	GAUAGUAAAUCACUAACAACUUCUGAA	653
SNCA-1000	27mer antisense strand	UGAUAUCAAAUCACUAACAACUUCUGA	654
SNCA-1001	27mer antisense strand	AUGAUUGCAAAUCACUAACAACUUCUG	655
SNCA-1002	27mer antisense strand	UAUGAUAGCAAAUCACUAACAACUUCU	656
SNCA-1003	27mer antisense strand	AUAUGUUAGCAAAUCACUAACAACUUC	657
SNCA-1004	27mer antisense strand	UAUAUUAUAGCAAAUCACUAACAACUU	658
SNCA-1005	27mer antisense strand	AUAUAUGAUAGCAAAUCACUAACAACU	659
SNCA-1028	27mer antisense strand	AAAAGUCACCUAAAAAUCUUAUAAUAU	660
SNCA-1029	27mer antisense strand	UAAAAUACACCUAAAAAUCUUAUAAUA	661
SNCA-1030	27mer antisense strand	UUAAAUGACACCUAAAAAUCUUAUAAU	662
SNCA-1031	27mer antisense strand	AUUAAUAGACACCUAAAAAUCUUAUAA	663
SNCA-1032	27mer antisense strand	CAUUAUAAGACACCUAAAAAUCUUAUA	664
SNCA-1033	27mer antisense strand	UCAUUUAAAGACACCUAAAAAUCUUAU	665
SNCA-1034	27mer antisense strand	AUCAUUAAAAGACACCUAAAAAUCUUA	666
SNCA-1035	27mer antisense strand	UAUCAUUAAAAGACACCUAAAAAUCUU	667
SNCA-1036	27mer antisense strand	GUAUCUUUAAAAGACACCUAAAAAUCU	668
SNCA-1037	27mer antisense strand	AGUAUUAUUAAAAGACACCUAAAAAUC	669
SNCA-1038	27mer antisense strand	CAGUAUCAUUAAAAGACACCUAAAAAU	670
SNCA-1039	27mer antisense strand	ACAGUUUCAUUAAAAGACACCUAAAAA	671
SNCA-1040	27mer antisense strand	GACAGUAUCAUUAAAAGACACCUAAAA	672

SNCA-1041	27mer antisense strand	AGACAUUAUCAUUAAAAGACACCUAAA	673
SNCA-1042	27mer antisense strand	UAGACUGUAUCAUUAAAAGACACCUAA	674
SNCA-1043	27mer antisense strand	UUAGAUAGUAUCAUUAAAAGACACCUA	675
SNCA-1044	27mer antisense strand	CUUAGUCAGUAUCAUUAAAAGACACCU	676
SNCA-1045	27mer antisense strand	UCUUAUACAGUAUCAUUAAAAGACACC	677
SNCA-1046	27mer antisense strand	UUCUUUGACAGUAUCAUUAAAAGACAC	678
SNCA-1047	27mer antisense strand	AUUCUUAGACAGUAUCAUUAAAAGACA	679
SNCA-1048	27mer antisense strand	UAUUCUUAGACAGUAUCAUUAAAAGAC	680
SNCA-1049	27mer antisense strand	UUAUUUUUAGACAGUAUCAUUAAAAGA	681
SNCA-1050	27mer antisense strand	AUUAUUCUUAGACAGUAUCAUUAAAAG	682
SNCA-1051	27mer antisense strand	CAUUAUUCUUAGACAGUAUCAUUAAAA	683
SNCA-1052	27mer antisense strand	UCAUUUUUCUUAGACAGUAUCAUUAAA	684
SNCA-1053	27mer antisense strand	GUCAUUAUUCUUAGACAGUAUCAUUAA	685
SNCA-1054	27mer antisense strand	CGUCAUUAUUCUUAGACAGUAUCAUUA	686
SNCA-1055	27mer antisense strand	ACGUCUUUAUUCUUAGACAGUAUCAUU	687
SNCA-1056	27mer antisense strand	UACGUUAUUAUUCUUAGACAGUAUCAU	688
SNCA-1057	27mer antisense strand	AUACGUCAUUAUUCUUAGACAGUAUCA	689
SNCA-1058	27mer antisense strand	AAUACUUCAUUAUUCUUAGACAGUAUC	690
SNCA-1078	27mer antisense strand	UAUAUUUUAACAAAUUUCACAAUACGU	691
SNCA-1079	27mer antisense strand	AUAUAUAUUAACAAAUUUCACAAUACG	692
SNCA-1080	27mer antisense strand	UAUAUUUAUUAACAAAUUUCACAAUAC	693

SNCA-1086	27mer antisense strand	AAGUAUUAUAUAUAUUAACAAAUUUCA	694
SNCA-1087	27mer antisense strand	UAAGUUUUAUAUAUAUUAACAAAUUUC	695
SNCA-1088	27mer antisense strand	UUAAGUAUUAUAUAUAUUAACAAAUUU	696
SNCA-1089	27mer antisense strand	UUUAAUUAUUAUAUAUAUUAACAAAUU	697
SNCA-1090	27mer antisense strand	UUUUAUGUAUUAUAUAUAUUAACAAAU	698
SNCA-1091	27mer antisense strand	UUUUUUAGUAUUAUAUAUAUUAACAAA	699
SNCA-1092	27mer antisense strand	AUUUUUAAGUAUUAUAUAUAUUAACAA	700
SNCA-1093	27mer antisense strand	UAUUUUUAAGUAUUAUAUAUAUUAACA	701
SNCA-1116	27mer antisense strand	AGGUGUAUAGUUUCAUGCUCACAUAUU	702
SNCA-1117	27mer antisense strand	UAGGUUCAUAGUUUCAUGCUCACAUAU	703
SNCA-1119	27mer antisense strand	UAUAGUUGCAUAGUUUCAUGCUCACAU	704
SNCA-1120	27mer antisense strand	UUAUAUGUGCAUAGUUUCAUGCUCACA	705
SNCA-1121	27mer antisense strand	UUUAUUGGUGCAUAGUUUCAUGCUCAC	706
SNCA-1122	27mer antisense strand	AUUUAUAGGUGCAUAGUUUCAUGCUCA	707
SNCA-1123	27mer antisense strand	UAUUUUUAGGUGCAUAGUUUCAUGCUC	708
SNCA-1124	27mer antisense strand	GUAUUUAUAGGUGCAUAGUUUCAUGCU	709
SNCA-1125	27mer antisense strand	AGUAUUUAUAGGUGCAUAGUUUCAUGC	710
SNCA-1126	27mer antisense strand	UAGUAUUUAUAGGUGCAUAGUUUCAUG	711
SNCA-1127	27mer antisense strand	UUAGUUUUUAUAGGUGCAUAGUUUCAU	712
SNCA-1128	27mer antisense strand	UUUAGUAUUUAUAGGUGCAUAGUUUCA	713
SNCA-1129	27mer antisense strand	AUUUAUUAUUUAUAGGUGCAUAGUUUC	714

SNCA-1130	27mer antisense strand	UAUUUUGUAUUUAUAGGUGCAUAGUU	715
SNCA-1131	27mer antisense strand	AUAUUUAGUAUUUAUAGGUGCAUAGU	716
SNCA-1132	27mer antisense strand	CAUAUUUAGUAUUUAUAGGUGCAUAG	717
SNCA-1133	27mer antisense strand	UCAUAUUUAGUAUUUAUAGGUGCAUA	718
SNCA-1194	27mer antisense strand	UAAUUUUCACCAUUUAUAUACAAACA	719
SNCA-1195	27mer antisense strand	UUAAUUCUCACCAUUUAUAUACAAAC	720
SNCA-1196	27mer antisense strand	UUUAAUUCUCACCAUUUAUAUACAAA	721
SNCA-1197	27mer antisense strand	UUUUAUUUCUCACCAUUUAUAUACAA	722
SNCA-1198	27mer antisense strand	AUUUUUAUUCUCACCAUUUAUAUACA	723
SNCA-1199	27mer antisense strand	UAUUUUAAUUCUCACCAUUUAUAUAC	724
SNCA-1200	27mer antisense strand	UUAUUUUAAUUCUCACCAUUUAUAUA	725
SNCA-1201	27mer antisense strand	UUUAUUUUAAUUCUCACCAUUUAUAU	726
SNCA-1202	27mer antisense strand	UUUUAUUUUAAUUCUCACCAUUUAUA	727
SNCA-1203	27mer antisense strand	GUUUUUUUUUAAUUCUCACCAUUUAU	728
SNCA-1204	27mer antisense strand	CGUUUUAUUUUAAUUCUCACCAUUUA	729
SNCA-1205	27mer antisense strand	ACGUUUUAUUUUAAUUCUCACCAUUU	730
SNCA-1206	27mer antisense strand	AACGUUUUAUUUUAAUUCUCACCAUU	731
SNCA-1207	27mer antisense strand	UAACGUUUUAUUUUAAUUCUCACCAU	732
SNCA-1208	27mer antisense strand	AUAACUUUUUAUUUUAAUUCUCACCA	733
SNCA-1250	27mer antisense strand	UUAAAUUGAGAUGGGAUAAAAAUAAA	734
SNCA-1252	27mer antisense strand	UAUUAUAGUGAGAUGGGAUAAAAAUA	735

SNCA-1253	27mer antisense strand	UUAUUUAAGUGAGAUGGGAUAAAAAUA	736
SNCA-1254	27mer antisense strand	AUUAUUAAAGUGAGAUGGGAUAAAAAU	737
SNCA-1255	27mer antisense strand	UAUUAUUAAAGUGAGAUGGGAUAAAAA	738
SNCA-1256	27mer antisense strand	UUAUUUUUAAAGUGAGAUGGGAUAAAA	739
SNCA-1257	27mer antisense strand	UUUAUUAUUAAAGUGAGAUGGGAUAAA	740
SNCA-1258	27mer antisense strand	UUUUAUUAUUAAAGUGAGAUGGGAUAA	741
SNCA-1259	27mer antisense strand	UUUUUUUUAUUAAAGUGAGAUGGGAUA	742
SNCA-1260	27mer antisense strand	AUUUUUAUUAUUAAAGUGAGAUGGGAU	743
SNCA-1261	27mer antisense strand	GAUUUUUAUUAUUAAAGUGAGAUGGGA	744
SNCA-1262	27mer antisense strand	UGAUUUUUAUUAUUAAAGUGAGAUGGG	745
SNCA-1263	27mer antisense strand	AUGAUUUUUAUUAUUAAAGUGAGAUGG	746
SNCA-1264	27mer antisense strand	CAUGAUUUUUAUUAUUAAAGUGAGAUG	747
SNCA-1265	27mer antisense strand	GCAUGUUUUUUAUUAUUAAAGUGAGAU	748
SNCA-1266	27mer antisense strand	AGCAUUAUUUUUAUUAUUAAAGUGAGA	749
SNCA-1267	27mer antisense strand	AAGCAUGAUUUUUAUUAUUAAAGUGAG	750
SNCA-1351	27mer antisense strand	UUCUAUAAUUCCUCCUUCUUCAAAUGG	751
SNCA-1365	27mer antisense strand	AUUUUUUCUACCUCUUCUAAAAUUCCU	752
SNCA-1372	27mer antisense strand	AUGUUUCAUUUUCUCUACCUCUUCUAA	753
SNCA-1373	27mer antisense strand	AAUGUUCCAUUUUCUCUACCUCUUCUA	754
SNCA-1374	27mer antisense strand	UAAUGUUCCAUUUUCUCUACCUCUUCU	755
SNCA-1375	27mer antisense strand	UUAAUUUUCCAUUUUCUCUACCUCUUC	756

SNCA-1376	27mer antisense strand	GUUAAUGUUCCAUUUUCUCUACCUCU	757
SNCA-1377	27mer antisense strand	GGUUAUUGUUCCAUUUUCUCUACCUC U	758
SNCA-1379	27mer antisense strand	AGGGUUAAUGUUCCAUUUUCUCUACC U	759
SNCA-1380	27mer antisense strand	UAGGGUUAAUGUUCCAUUUUCUCUAC C	760
SNCA-1381	27mer antisense strand	GUAGGUUUAAUGUUCCAUUUUCUCUA C	761
SNCA-1382	27mer antisense strand	UGUAGUGUUAAUGUUCCAUUUUCUCU A	762
SNCA-1383	27mer antisense strand	GUGUAUGGUUAAUGUUCCAUUUUCUC U	763
SNCA-1384	27mer antisense strand	AGUGUUGGGUUAAUGUUCCAUUUUCU C	764
SNCA-1385	27mer antisense strand	GAGUGUAGGGUUAAUGUUCCAUUUUC U	765
SNCA-1388	27mer antisense strand	UCCGAUUGUAGGGUUAAUGUUCCAUU U	766
SNCA-1428	27mer antisense strand	CAUACUAAAACACACUUCUGGCAGUG U	767
SNCA-1429	27mer antisense strand	GCAUAUCAAAACACACUUCUGGCAGU G	768
SNCA-259	Modified 25mer sense strand	rUmUrCmArUrGrArArArGrGrArCmUrUmUr CrArArArGrGrCCA	769
SNCA-260	Modified 25mer sense strand	rUmCrAmUrGrArArArGrGrArCrUmUrUmCr ArArArArGrCrCAA	770
SNCA-261	Modified 25mer sense strand	rCmArUmGrArArArGrGrArCrUrUmUrCmAr ArArGrArCrCrAAG	771
SNCA-262	Modified 25mer sense strand	rAmUrGmArArArGrGrArCrUrUrUmCrAmAr ArGrGrArCrArAGG	772
SNCA-263	Modified 25mer sense strand	rUmGrAmArArGrGrArCrUrUrUrCmArAmAr GrGrCrArArArGGA	773
SNCA-264	Modified 25mer sense strand	rGmArAmArGrGrArCrUrUrUrCrAmArAmGr GrCrCrArArGrGAG	774
SNCA-285	Modified 25mer sense strand	rGmGrAmGrGrGrArGrUrUrGrUrGmGrCmUr GrCrUrArCrUrGAG	775
SNCA-288	Modified 25mer sense strand	rGmGrGmArGrUrUrGrUrGrGrCrUmGrCmUr GrCrUrArArGrAAA	776
SNCA-289	Modified 25mer sense strand	rGmGrAmGrUrUrGrUrGrGrCrUrGmCrUmGr CrUrGrArGrArAAA	777

SNCA-290	Modified 25mer sense strand	rGmArGmUrUrGrUrGrGrCrUrGrCmUrGmCrUrGrArArArArAAC	778
SNCA-292	Modified 25mer sense strand	rGmUrUmGrUrGrGrCrUrGrCrUrGmCrUmGrArGrArArArArCCA	779
SNCA-293	Modified 25mer sense strand	rUmUrGmUrGrGrCrUrGrCrUrGrCmUrGmArGrArArArArCrCAA	780
SNCA-294	Modified 25mer sense strand	rUmGrUmGrGrCrUrGrCrUrGrCrUmGrAmGrArArArArCrCrAAA	781
SNCA-295	Modified 25mer sense strand	rGmUrGmGrCrUrGrCrUrGrCrUrGmArGmArArArArArCrArAAC	782
SNCA-296	Modified 25mer sense strand	rUmGrGmCrUrGrCrUrGrCrUrGrAmGrAmArArArCrArArArACA	783
SNCA-297	Modified 25mer sense strand	rGmGrCmUrGrCrUrGrCrUrGrArGmArAmArArCrCrArArArCAG	784
SNCA-407	Modified 25mer sense strand	rCmArAmCrArGrUrGrGrCrUrGrAmGrAmArGrArCrArArArAGA	785
SNCA-408	Modified 25mer sense strand	rAmArCmArGrUrGrGrCrUrGrArGmArAmGrArCrCrArArArGAG	786
SNCA-409	Modified 25mer sense strand	rAmCrAmGrUrGrGrCrUrGrArGrAmArGmArCrCrArArArGrAGC	787
SNCA-410	Modified 25mer sense strand	rCmArGmUrGrGrCrUrGrArGrArAmGrAmCrCrArArArGrArGCA	788
SNCA-411	Modified 25mer sense strand	rAmGrUmGrGrCrUrGrArGrArArGmArCmCrArArArArArGrCAA	789
SNCA-412	Modified 25mer sense strand	rGmUrGmGrCrUrGrArGrArArArGrAmCrCmArArArGrArGrCrAAG	790
SNCA-413	Modified 25mer sense strand	rUmGrGmCrUrGrArGrArArArGrArCmCrAmArArGrArArCrArAGT	791
SNCA-414	Modified 25mer sense strand	rGmGrCmUrGrArGrArArArGrArCrCmArAmArGrArGrArArArGTG	792
SNCA-415	Modified 25mer sense strand	rGmCrUmGrArGrArArArGrArCrCrAmArAmGrArGrCrArArGrUGA	793
SNCA-416	Modified 25mer sense strand	rCmUrGmArGrArArArGrArCrCrArAmArGmArGrCrArArGrUrGAC	794
SNCA-417	Modified 25mer sense strand	rUmGrAmGrArArGrArCrCrArArArAmGrAmGrCrArArArUrGrACA	795
SNCA-418	Modified 25mer sense strand	rGmArGmArArGrArCrCrArArArArGmArGmCrArArGrArGrArCAA	796
SNCA-419	Modified 25mer sense strand	rAmGrAmArGrArCrCrArArArArGrAmGrCmArArGrUrArArCrAAA	797
SNCA-420	Modified 25mer sense strand	rGmArAmGrArCrCrArArArArGrArGmCrAmArGrUrGrArCrArAAT	798

SNCA-421	Modified 25mer sense strand	rAmArGmArCrCrArArArGrArGrCmArAmGrUrGrArArArArATG	799
SNCA-422	Modified 25mer sense strand	rAmGrAmCrCrArArArGrArGrCrAmArGmUrGrArCrArArArUGT	800
SNCA-423	Modified 25mer sense strand	rGmArCmCrArArArGrArGrCrArAmGrUmGrArCrArArArUrGTT	801
SNCA-424	Modified 25mer sense strand	rAmCrCmArArArGrArGrCrArArGmUrGmArCrArArArUrGrUTG	802
SNCA-425	Modified 25mer sense strand	rCmCrAmArArGrArGrCrArArGrUmGrAmCrArArArArGrUrUGG	803
SNCA-426	Modified 25mer sense strand	rCmArAmArGrArGrCrArArGrUrGmArCmArArArUrArUrUrGGA	804
SNCA-427	Modified 25mer sense strand	rAmArAmGrArGrCrArArGrUrGrAmCrAmArArUrGrArUrGrGAG	805
SNCA-428	Modified 25mer sense strand	rAmArGmArGrCrArArGrUrGrArCmArAmArUrGrUrArGrGrAGG	806
SNCA-429	Modified 25mer sense strand	rAmGrAmGrCrArArGrUrGrArCrAmArAmUrGrUrUrArGrArGGA	807
SNCA-430	Modified 25mer sense strand	rGmArGmCrArArGrUrGrArCrArAmArUmGrUrUrGrArArGrGAG	808
SNCA-431	Modified 25mer sense strand	rAmGrCmArArGrUrGrArCrArArAmUrGmUrUrGrGrArGrGrAGC	809
SNCA-432	Modified 25mer sense strand	rGmCrAmArGrUrGrArCrArArArUmGrUmUrGrGrArArGrArGCA	810
SNCA-433	Modified 25mer sense strand	rCmArAmGrUrGrArCrArArArUrGmUrUmGrGrArGrArArGrCAG	811
SNCA-434	Modified 25mer sense strand	rAmArGmUrGrArCrArArArUrGrUmUrGmGrArGrGrArGrCrAGT	812
SNCA-435	Modified 25mer sense strand	rAmGrUmGrArCrArArArUrGrUrUmGrGmArGrGrArArCrArGTG	813
SNCA-436	Modified 25mer sense strand	rGmUrGmArCrArArArUrGrUrUrGmGrAmGrGrArGrArArGrUGG	814
SNCA-437	Modified 25mer sense strand	rUmGrAmCrArArArUrGrUrUrGrGmArGmGrArGrCrArGrUrGGT	815
SNCA-725	Modified 25mer sense strand	rGmUrAmCrArArGrUrGrCrUrCrAmGrUmUrCrCrArArUrGrUGC	816
SNCA-726	Modified 25mer sense strand	rUmArCmArArGrUrGrCrUrCrArGmUrUmCrCrArArArGrUrGCC	817
SNCA-727	Modified 25mer sense strand	rAmCrAmArGrUrGrCrUrCrArGrUmUrCmCrArArUrArUrGrCCC	818
SNCA-728	Modified 25mer sense strand	rCmArAmGrUrGrCrUrCrArGrUrUmCrCmArArUrGrArGrCrCCA	819

SNCA-729	Modified 25mer sense strand	rAmArGmUrGrCrUrCrArGrUrUrCmCrAmArUrGrUrArCrCrCAG	820
SNCA-730	Modified 25mer sense strand	rAmGrUmGrCrUrCrArGrUrUrCrCmArAmUrGrUrGrArCrCrAGT	821
SNCA-731	Modified 25mer sense strand	rGmUrGmCrUrCrArGrUrUrCrCrAmArUmGrUrGrCrArCrArGTC	822
SNCA-732	Modified 25mer sense strand	rUmGrCmUrCrArGrUrUrCrCrArAmUrGmUrGrCrCrArArGrUCA	823
SNCA-733	Modified 25mer sense strand	rGmCrUmCrArGrUrUrCrCrArArUmGrUmGrCrCrCrArGrUrCAT	824
SNCA-734	Modified 25mer sense strand	rCmUrCmArGrUrUrCrCrArArUrGmUrGmCrCrCrArArUrCrATG	825
SNCA-735	Modified 25mer sense strand	rUmCrAmGrUrUrCrCrArArUrGrUmGrCmCrCrArGrArCrArUGA	826
SNCA-736	Modified 25mer sense strand	rCmArGmUrUrCrCrArArUrGrUrGmCrCmCrArGrUrArArUrGAC	827
SNCA-737	Modified 25mer sense strand	rAmGrUmUrCrCrArArUrGrUrGrCmCrCmArGrUrCrArUrGrACA	828
SNCA-738	Modified 25mer sense strand	rGmUrUmCrCrArArUrGrUrGrCrCmCrAmGrUrCrArArGrArCAT	829
SNCA-739	Modified 25mer sense strand	rUmUrCmCrArArUrGrUrGrCrCrCmArGmUrCrArUrArArCrATT	830
SNCA-740	Modified 25mer sense strand	rUmCrCmArArUrGrUrGrCrCrCrAmGrUmCrArUrGrArCrArUTT	831
SNCA-741	Modified 25mer sense strand	rCmCrAmArUrGrUrGrCrCrCrArGmUrCmArUrGrArArArUrUTC	832
SNCA-742	Modified 25mer sense strand	rCmArAmUrGrUrGrCrCrCrArGrUmCrAmUrGrArCrArUrUrUCT	833
SNCA-790	Modified 25mer sense strand	rAmArGmUrCrUrUrCrCrArUrCrAmGrCmArGrUrGrArUrUrGAA	834
SNCA-791	Modified 25mer sense strand	rAmGrUmCrUrUrCrCrArUrCrArGmCrAmGrUrGrArArUrGrAAG	835
SNCA-792	Modified 25mer sense strand	rGmUrCmUrUrCrCrArUrCrArGrCmArGmUrGrArUrArGrArAGT	836
SNCA-938	Modified 25mer sense strand	rAmArAmArCrArCrCrUrArArGrUmGrAmCrUrArCrArArCrUTA	837
SNCA-939	Modified 25mer sense strand	rAmArAmCrArCrCrUrArArGrUrGmArCmUrArCrCrArCrUrUAT	838
SNCA-940	Modified 25mer sense strand	rAmArCmArCrCrUrArArGrUrGrAmCrUmArCrCrArArUrUrATT	839
SNCA-941	Modified 25mer sense strand	rAmCrAmCrCrUrArArGrUrGrArCmUrAmCrCrArCrArUrArUTT	840

SNCA-942	Modified 25mer sense strand	rCmArCmCrUrArArGrUrGrArCrUmArCmCrArCrUrArArUrUTC	841
SNCA-943	Modified 25mer sense strand	rAmCrCmUrArArGrUrGrArCrUrAmCrCmArCrUrUrArUrUrUCT	842
SNCA-944	Modified 25mer sense strand	rCmCrUmArArGrUrGrArCrUrArCmCrAmCrUrUrArArUrUrCTA	843
SNCA-945	Modified 25mer sense strand	rCmUrAmArGrUrGrArCrUrArCrCmArCmUrUrArUrArUrCrUAA	844
SNCA-946	Modified 25mer sense strand	rUmArAmGrUrGrArCrUrArCrCrAmCrUmUrArUrUrArCrUrAAA	845
SNCA-947	Modified 25mer sense strand	rAmArGmUrGrArCrUrArCrCrArCmUrUmArUrUrUrArUrArAAT	846
SNCA-948	Modified 25mer sense strand	rAmGrUmGrArCrUrArCrCrArCrUmUrAmUrUrUrCrArArArATC	847
SNCA-949	Modified 25mer sense strand	rGmUrGmArCrUrArCrCrArCrUrUmArUmUrUrCrUrArArArUCC	848
SNCA-950	Modified 25mer sense strand	rUmGrAmCrUrArCrCrArCrUrUrAmUrUmUrCrUrArArArUrCCT	849
SNCA-951	Modified 25mer sense strand	rGmArCmUrArCrCrArCrUrUrArUmUrUmCrUrArArArUrCrCTC	850
SNCA-952	Modified 25mer sense strand	rAmCrUmArCrCrArCrUrUrArUrUmUrCmUrArArArArCrCrUCA	851
SNCA-953	Modified 25mer sense strand	rCmUrAmCrCrArCrUrUrArUrUrUmCrUmArArArUrArCrUrCAC	852
SNCA-954	Modified 25mer sense strand	rUmArCmCrArCrUrUrArUrUrUrCmUrAmArArUrCrArUrCrACT	853
SNCA-1081	Modified 25mer sense strand	rUmUrGmUrGrArArArUrUrUrGrUmUrAmArUrArUrArUrArUAA	854
SNCA-1082	Modified 25mer sense strand	rUmGrUmGrArArArUrUrUrGrUrUmArAmUrArUrArArArUrAAT	855
SNCA-1083	Modified 25mer sense strand	rGmUrGmArArArUrUrUrGrUrUrAmArUmArUrArUrArUrArATA	856
SNCA-1084	Modified 25mer sense strand	rUmGrAmArArUrUrUrGrUrUrArAmUrAmUrArUrArArArArUAC	857
SNCA-1085	Modified 25mer sense strand	rGmArAmArUrUrUrGrUrUrArArUmArUmArUrArUrArArUrACT	858
SNCA-1188	Modified 25mer sense strand	rAmCrUmUrGrUrGrUrUrUrGrUrAmUrAmUrArArArArGrGrUGA	859
SNCA-1189	Modified 25mer sense strand	rCmUrUmGrUrGrUrUrUrGrUrArUmArUmArArArUrArGrUrGAG	860
SNCA-1190	Modified 25mer sense strand	rUmUrGmUrGrUrUrUrGrUrArUrAmUrAmArArUrGrArUrGrAGA	861

SNCA-1191	Modified 25mer sense strand	rUmGrUmGrUrUrUrGrUrArUrArUmArAmArUrGrGrArGrArGAA	862
SNCA-1192	Modified 25mer sense strand	rGmUrGmUrUrUrGrUrArUrArUrAmArAmUrGrGrUrArArGrAAT	863
SNCA-1193	Modified 25mer sense strand	rUmGrUmUrUrGrUrArUrArUrArAmArUmGrGrUrGrArGrArATT	864
SNCA-225	Modified 25mer sense strand	rUmGrUmGrGrUrGrUrArArArGrGmArAmUrUrCrArArUrArGCC	865
SNCA-226	Modified 25mer sense strand	rGmUrGmGrUrGrUrArArArGrGrAmArUmUrCrArUrArArGrCCA	866
SNCA-227	Modified 25mer sense strand	rUmGrGmUrGrUrArArArGrGrArAmUrUmCrArUrUrArGrCrCAT	867
SNCA-228	Modified 25mer sense strand	rGmGrUmGrUrArArArGrGrArArUmUrCmArUrUrArArCrCrATG	868
SNCA-229	Modified 25mer sense strand	rGmUrGmUrArArArGrGrArArUrUmCrAmUrUrArGrArCrArUGG	869
SNCA-230	Modified 25mer sense strand	rUmGrUmArArArGrGrArArUrUrCmArUmUrArGrCrArArUrGGA	870
SNCA-231	Modified 25mer sense strand	rGmUrAmArArGrGrArArUrUrCrAmUrUmArGrCrCrArUrGrGAT	871
SNCA-232	Modified 25mer sense strand	rUmArAmArGrGrArArUrUrCrArUmUrAmGrCrCrArArGrGrATG	872
SNCA-233	Modified 25mer sense strand	rAmArAmGrGrArArUrUrCrArUrUmArGmCrCrArUrArGrArUGT	873
SNCA-234	Modified 25mer sense strand	rAmArGmGrArArUrUrCrArUrUrAmGrCmCrArUrGrArArUrGTA	874
SNCA-235	Modified 25mer sense strand	rAmGrGmArArUrUrCrArUrUrArGmCrCmArUrGrGrArUrGrUAT	875
SNCA-236	Modified 25mer sense strand	rGmGrAmArUrUrCrArUrUrArGrCmCrAmUrGrGrArArGrUrATT	876
SNCA-237	Modified 25mer sense strand	rGmArAmUrUrCrArUrUrArGrCrCmArUmGrGrArUrArUrArUTC	877
SNCA-238	Modified 25mer sense strand	rAmArUmUrCrArUrUrArGrCrCrAmUrGmGrArUrGrArArUrUCA	878
SNCA-239	Modified 25mer sense strand	rAmUrUmCrArUrUrArGrCrCrArUmGrGmArUrGrUrArUrUrCAT	879
SNCA-240	Modified 25mer sense strand	rUmUrCmArUrUrArGrCrCrArUrGmGrAmUrGrUrArArUrCrATG	880
SNCA-241	Modified 25mer sense strand	rUmCrAmUrUrArGrCrCrArUrGrGmArUmGrUrArUrArCrArUGA	881
SNCA-242	Modified 25mer sense strand	rCmArUmUrArGrCrCrArUrGrGrAmUrGmUrArUrUrArArUrGAA	882

SNCA-243	Modified 25mer sense strand	rAmUrUmArGrCrCrArUrGrGrArUmGrUmArUrUrCrArUrGrAAA	883
SNCA-244	Modified 25mer sense strand	rUmUrAmGrCrCrArUrGrGrArUrGmUrAmUrUrCrArArGrArAAG	884
SNCA-245	Modified 25mer sense strand	rUmArGmCrCrArUrGrGrArUrGrUmArUmUrCrArUrArArArAGG	885
SNCA-246	Modified 25mer sense strand	rAmGrCmCrArUrGrGrArUrGrUrAmUrUmCrArUrGrArArArGGA	886
SNCA-247	Modified 25mer sense strand	rGmCrCmArUrGrGrArUrGrUrArUmUrCmArUrGrArArArGrGAC	887
SNCA-248	Modified 25mer sense strand	rCmCrAmUrGrGrArUrGrUrArUrUmCrAmUrGrArArArGrGrACT	888
SNCA-249	Modified 25mer sense strand	rCmArUmGrGrArUrGrUrArUrUrCmArUmGrArArArArGrArCTT	889
SNCA-250	Modified 25mer sense strand	rAmUrGmGrArUrGrUrArUrUrCrAmUrGmArArArGrArArCrUTT	890
SNCA-251	Modified 25mer sense strand	rUmGrGmArUrGrUrArUrUrCrArUmGrAmArArGrGrArCrUrUTC	891
SNCA-252	Modified 25mer sense strand	rGmGrAmUrGrUrArUrUrCrArUrGmArAmArGrGrArArUrUrUCA	892
SNCA-253	Modified 25mer sense strand	rGmArUmGrUrArUrUrCrArUrGrAmArAmGrGrArCrArUrUrCAA	893
SNCA-254	Modified 25mer sense strand	rAmUrGmUrArUrUrCrArUrGrArAmArGmGrArCrUrArUrCrAAA	894
SNCA-256	Modified 25mer sense strand	rGmUrAmUrUrCrArUrGrArArArGmGrAmCrUrUrUrArArArAGG	895
SNCA-330	Modified 25mer sense strand	rAmGrAmArGrCrArGrCrArGrGrAmArAmGrArCrArArArArGAG	896
SNCA-335	Modified 25mer sense strand	rCmArGmCrArGrGrArArArGrArCmArAmArArGrArArGrGrUGT	897
SNCA-337	Modified 25mer sense strand	rGmCrAmGrGrArArArGrArCrArAmArAmGrArGrGrArUrGrUTC	898
SNCA-341	Modified 25mer sense strand	rGmArAmArGrArCrArArArArGrAmGrGmGrUrGrUrArCrUrCTA	899
SNCA-342	Modified 25mer sense strand	rAmArAmGrArCrArArArArGrArGmGrGmUrGrUrUrArUrCrUAT	900
SNCA-344	Modified 25mer sense strand	rAmGrAmCrArArArArGrArGrGrGmUrGmUrUrCrUrArUrArUGT	901
SNCA-345	Modified 25mer sense strand	rGmArCmArArArArGrArGrGrGrUmGrUmUrCrUrCrArArUrGTA	902
SNCA-351	Modified 25mer sense strand	rAmGrAmGrGrGrUrGrUrUrCrUrCmUrAmUrGrUrArArGrCrUCC	903

SNCA-353	Modified 25mer sense strand	rAmGrGmGrUrGrUrUrCrUrCrUrAmUrGmUrArGrGrArUrCrCAA	904
SNCA-355	Modified 25mer sense strand	rGmGrUmGrUrUrCrUrCrUrArUrGmUrAmGrGrCrUrArCrArAAA	905
SNCA-638	Modified 25mer sense strand	rAmGrGmArArGrGrGrUrArUrCrAmArGmArCrUrArArGrArACC	906
SNCA-641	Modified 25mer sense strand	rAmArGmGrGrUrArUrCrArArGrAmCrUmArCrGrArArCrCrUGA	907
SNCA-642	Modified 25mer sense strand	rAmGrGmGrUrArUrCrArArGrArCmUrAmCrGrArArArCrUrGAA	908
SNCA-647	Modified 25mer sense strand	rAmUrCmArArGrArCrUrArCrGrAmArCmCrUrGrArArGrCrCTA	909
SNCA-648	Modified 25mer sense strand	rUmCrAmArGrArCrUrArCrGrArAmCrCmUrGrArArArCrCrUAA	910
SNCA-650	Modified 25mer sense strand	rAmArGmArCrUrArCrGrArArCrCmUrGmArArGrCrArUrArAGA	911
SNCA-652	Modified 25mer sense strand	rGmArCmUrArCrGrArArCrCrUrGmArAmGrCrCrUrArArGrAAA	912
SNCA-653	Modified 25mer sense strand	rAmCrUmArCrGrArArCrCrUrGrAmArGmCrCrUrArArGrArAAT	913
SNCA-654	Modified 25mer sense strand	rCmUrAmCrGrArArCrCrUrGrArAmGrCmCrUrArArArArArATA	914
SNCA-656	Modified 25mer sense strand	rAmCrGmArArCrCrUrGrArArGrCmCrUmArArGrArArArUrATC	915
SNCA-657	Modified 25mer sense strand	rCmGrAmArCrCrUrGrArArGrCrCmUrAmArGrArArArUrArUCT	916
SNCA-659	Modified 25mer sense strand	rAmArCmCrUrGrArArGrCrCrUrAmArGmArArArUrArUrCrUTT	917
SNCA-660	Modified 25mer sense strand	rAmCrCmUrGrArArGrCrCrUrArAmGrAmArArUrArArCrUrUTG	918
SNCA-661	Modified 25mer sense strand	rCmCrUmGrArArGrCrCrUrArArGmArAmArUrArUrArUrUrUGC	919
SNCA-662	Modified 25mer sense strand	rCmUrGmArArGrCrCrUrArArGrAmArAmUrArUrCrArUrUrGCT	920
SNCA-663	Modified 25mer sense strand	rUmGrAmArGrCrCrUrArArGrArAmArUmArUrCrUrArUrGrCTC	921
SNCA-668	Modified 25mer sense strand	rCmCrUmArArGrArArArUrArUrCmUrUmUrGrCrUrArCrCrAGT	922
SNCA-669	Modified 25mer sense strand	rCmUrAmArGrArArArUrArUrCrUmUrUmGrCrUrCrArCrArGTT	923
SNCA-672	Modified 25mer sense strand	rAmGrAmArArUrArUrCrUrUrUrGmCrUmCrCrCrArArUrUrUCT	924

SNCA-675	Modified 25mer sense strand	rAmArUmArUrCrUrUrUrGrCrUrCmCrCmArGrUrUrArCrUrUGA	925
SNCA-676	Modified 25mer sense strand	rAmUrAmUrCrUrUrUrGrCrUrCrCmCrAmGrUrUrUrArUrUrGAG	926
SNCA-689	Modified 25mer sense strand	rCmArGmUrUrUrCrUrUrGrArGrAmUrCmUrGrCrUrArArCrAGA	927
SNCA-724	Modified 25mer sense strand	rUmGrUmArCrArArGrUrGrCrUrCmArGmUrUrCrCrArArUrGTG	928
SNCA-744	Modified 25mer sense strand	rAmUrGmUrGrCrCrCrArGrUrCrAmUrGmArCrArUrArUrCrUCA	929
SNCA-745	Modified 25mer sense strand	rUmGrUmGrCrCrCrArGrUrCrArUmGrAmCrArUrUrArCrUrCAA	930
SNCA-746	Modified 25mer sense strand	rGmUrGmCrCrCrArGrUrCrArUrGmArCmArUrUrUrArUrCrAAA	931
SNCA-751	Modified 25mer sense strand	rCmArGmUrCrArUrGrArCrArUrUmUrCmUrCrArArArGrUrUTT	932
SNCA-752	Modified 25mer sense strand	rAmGrUmCrArUrGrArCrArUrUrUmCrUmCrArArArArUrUrUTT	933
SNCA-753	Modified 25mer sense strand	rGmUrCmArUrGrArCrArUrUrUrCmUrCmArArArGrArUrUrUTA	934
SNCA-754	Modified 25mer sense strand	rUmCrAmUrGrArCrArUrUrUrCrUmCrAmArArGrUrArUrUrUAC	935
SNCA-755	Modified 25mer sense strand	rCmArUmGrArCrArUrUrUrCrUrCmArAmArGrUrUrArUrUrACA	936
SNCA-756	Modified 25mer sense strand	rAmUrGmArCrArUrUrUrCrUrCrAmArAmGrUrUrUrArUrArCAG	937
SNCA-757	Modified 25mer sense strand	rUmGrAmCrArUrUrUrCrUrCrArAmArGmUrUrUrUrArArCrAGT	938
SNCA-758	Modified 25mer sense strand	rGmArCmArUrUrUrCrUrCrArArAmGrUmUrUrUrUrArCrArGTG	939
SNCA-759	Modified 25mer sense strand	rAmCrAmUrUrUrCrUrCrArArArGmUrUmUrUrUrArArArGrUGT	940
SNCA-760	Modified 25mer sense strand	rCmArUmUrUrCrUrCrArArArGrUmUrUmUrUrArCrArGrUrGTA	941
SNCA-761	Modified 25mer sense strand	rAmUrUmUrCrUrCrArArArGrUrUmUrUmUrArCrArArUrGrUAT	942
SNCA-762	Modified 25mer sense strand	rUmUrUmCrUrCrArArArGrUrUrUmUrUmArCrArGrArGrUrATC	943
SNCA-789	Modified 25mer sense strand	rGmArAmGrUrCrUrUrCrCrArUrCmArGmCrArGrUrArArUrUGA	944
SNCA-795	Modified 25mer sense strand	rUmUrCmCrArUrCrArGrCrArGrUmGrAmUrUrGrArArGrUrATC	945

SNCA-796	Modified 25mer sense strand	rUmCrCmArUrCrArGrCrArGrUrGmArUmUrGrArArArUrArUCT	946
SNCA-797	Modified 25mer sense strand	rCmCrAmUrCrArGrCrArGrUrGrAmUrUmGrArArGrArArUrCTG	947
SNCA-798	Modified 25mer sense strand	rCmArUmCrArGrCrArGrUrGrArUmUrGmArArGrUrArUrCrUGT	948
SNCA-799	Modified 25mer sense strand	rAmUrCmArGrCrArGrUrGrArUrUmGrAmArGrUrArArCrUrGTA	949
SNCA-800	Modified 25mer sense strand	rUmCrAmGrCrArGrUrGrArUrUrGmArAmGrUrArUrArUrGrUAC	950
SNCA-801	Modified 25mer sense strand	rCmArGmCrArGrUrGrArUrUrGrAmArGmUrArUrCrArGrUrACC	951
SNCA-802	Modified 25mer sense strand	rAmGrCmArGrUrGrArUrUrGrArAmGrUmArUrCrUrArUrArCCT	952
SNCA-803	Modified 25mer sense strand	rGmCrAmGrUrGrArUrUrGrArArGmUrAmUrCrUrGrArArCrCTG	953
SNCA-804	Modified 25mer sense strand	rCmArGmUrGrArUrUrGrArArGrUmArUmCrUrGrUrArCrCrUGC	954
SNCA-805	Modified 25mer sense strand	rAmGrUmGrArUrUrGrArArGrUrAmUrCmUrGrUrArArCrUrGCC	955
SNCA-809	Modified 25mer sense strand	rAmUrUmGrArArGrUrArUrCrUrGmUrAmCrCrUrGrArCrCrCCA	956
SNCA-839	Modified 25mer sense strand	rCmArUmUrUrCrGrGrUrGrCrUrUmCrCmCrUrUrUrArArCrUGA	957
SNCA-844	Modified 25mer sense strand	rCmGrGmUrGrCrUrUrCrCrCrUrUmUrCmArCrUrGrArArGrUGA	958
SNCA-845	Modified 25mer sense strand	rGmGrUmGrCrUrUrCrCrCrUrUrUmCrAmCrUrGrArArGrUrGAA	959
SNCA-846	Modified 25mer sense strand	rGmUrGmCrUrUrCrCrCrUrUrUrCmArCmUrGrArArArUrGrAAT	960
SNCA-847	Modified 25mer sense strand	rUmGrCmUrUrCrCrCrUrUrUrCrAmCrUmGrArArGrArGrArATA	961
SNCA-848	Modified 25mer sense strand	rGmCrUmUrCrCrCrUrUrUrCrArCmUrGmArArGrUrArArArUAC	962
SNCA-849	Modified 25mer sense strand	rCmUrUmCrCrCrUrUrUrCrArCrUmGrAmArGrUrGrArArUrACA	963
SNCA-850	Modified 25mer sense strand	rUmUrCmCrCrUrUrUrCrArCrUrGmArAmGrUrGrArArUrArCAT	964
SNCA-851	Modified 25mer sense strand	rUmCrCmCrUrUrUrCrArCrUrGrAmArGmUrGrArArArArCrATG	965
SNCA-852	Modified 25mer sense strand	rCmCrCmUrUrUrCrArCrUrGrArAmGrUmGrArArUrArCrArUGG	966

SNCA-853	Modified 25mer sense strand	rCmCrUmUrUrCrArCrUrGrArArGmUrGmAr ArUrArArArUrGGT	967
SNCA-854	Modified 25mer sense strand	rCmUrUmUrCrArCrUrGrArArGrUmGrAmAr UrArCrArUrGrGTA	968
SNCA-855	Modified 25mer sense strand	rUmUrUmCrArCrUrGrArArGrUrGmArAmUr ArCrArArGrGrUAG	969
SNCA-856	Modified 25mer sense strand	rUmUrCmArCrUrGrArArGrUrGrAmArUmAr CrArUrArGrUrAGC	970
SNCA-857	Modified 25mer sense strand	rUmCrAmCrUrGrArArGrUrGrArAmUrAmCr ArUrGrArUrArGCA	971
SNCA-858	Modified 25mer sense strand	rCmArCmUrGrArArGrUrGrArArUmArCmAr UrGrGrArArGrCAG	972
SNCA-859	Modified 25mer sense strand	rAmCrUmGrArArGrUrGrArArUrAmCrAmUr GrGrUrArGrCrAGG	973
SNCA-860	Modified 25mer sense strand	rCmUrGmArArGrUrGrArArUrArCmArUmGr GrUrArArCrArGGG	974
SNCA-861	Modified 25mer sense strand	rUmGrAmArGrUrGrArArUrArCrAmUrGmGr UrArGrArArGrGGT	975
SNCA-863	Modified 25mer sense strand	rAmArGmUrGrArArUrArCrArUrGmGrUmAr GrCrArArGrGrUCT	976
SNCA-864	Modified 25mer sense strand	rAmGrUmGrArArUrArCrArUrGrGmUrAmGr CrArGrArGrUrCTT	977
SNCA-865	Modified 25mer sense strand	rGmUrGmArArUrArCrArUrGrGrUmArGmCr ArGrGrArUrCrUTT	978
SNCA-867	Modified 25mer sense strand	rGmArAmUrArCrArUrGrGrUrArGmCrAmGr GrGrUrArUrUrUGT	979
SNCA-868	Modified 25mer sense strand	rAmArUmArCrArUrGrGrUrArGrCmArGmGr GrUrCrArUrUrGTG	980
SNCA-875	Modified 25mer sense strand	rGmGrUmArGrCrArGrGrGrUrCrUmUrUmGr UrGrUrArCrUrGTG	981
SNCA-881	Modified 25mer sense strand	rAmGrGmGrUrCrUrUrUrGrUrGrUmGrCmUr GrUrGrArArUrUTT	982
SNCA-883	Modified 25mer sense strand	rGmGrUmCrUrUrUrGrUrGrUrGrCmUrGmUr GrGrArArUrUrUGT	983
SNCA-889	Modified 25mer sense strand	rUmGrUmGrUrGrCrUrGrUrGrGrAmUrUmUr UrGrUrArGrCrUTC	984
SNCA-890	Modified 25mer sense strand	rGmUrGmUrGrCrUrGrUrGrGrArUmUrUmUr GrUrGrArCrUrUCA	985
SNCA-891	Modified 25mer sense strand	rUmGrUmGrCrUrGrUrGrGrArUrUmUrUmGr UrGrGrArUrUrCAA	986
SNCA-892	Modified 25mer sense strand	rGmUrGmCrUrGrUrGrGrArUrUrUmUrGmUr GrGrCrArUrCrAAT	987

SNCA-893	Modified 25mer sense strand	rUmGrCmUrGrUrGrGrArUrUrUrUmGrUmGr GrCrUrArCrArATC	988
SNCA-894	Modified 25mer sense strand	rGmCrUmGrUrGrGrArUrUrUrUrGmUrGmGr CrUrUrArArArUCT	989
SNCA-895	Modified 25mer sense strand	rCmUrGmUrGrGrArUrUrUrUrGrUmGrGmCr UrUrCrArArUrCTA	990
SNCA-897	Modified 25mer sense strand	rGmUrGmGrArUrUrUrUrGrUrGrGmCrUmUr CrArArArCrUrACG	991
SNCA-898	Modified 25mer sense strand	rUmGrGmArUrUrUrUrGrUrGrGrCmUrUmCr ArArUrArUrArCGA	992
SNCA-900	Modified 25mer sense strand	rGmArUmUrUrUrGrUrGrGrCrUrUmCrAmAr UrCrUrArCrGrATG	993
SNCA-901	Modified 25mer sense strand	rAmUrUmUrUrGrUrGrGrCrUrUrCmArAmUr CrUrArArGrArUGT	994
SNCA-956	Modified 25mer sense strand	rCmCrAmCrUrUrArUrUrUrCrUrAmArAmUr CrCrUrArArCrUAT	995
SNCA-957	Modified 25mer sense strand	rCmArCmUrUrArUrUrUrCrUrArAmArUmCr CrUrCrArCrUrATT	996
SNCA-958	Modified 25mer sense strand	rAmCrUmUrArUrUrUrCrUrArArAmUrCmCr UrCrArArUrArUTT	997
SNCA-959	Modified 25mer sense strand	rCmUrUmArUrUrUrCrUrArArArUmCrCmUr CrArCrArArUrUTT	998
SNCA-961	Modified 25mer sense strand	rUmArUmUrUrCrUrArArArUrCrCmUrCmAr CrUrArArUrUrUTT	999
SNCA-962	Modified 25mer sense strand	rAmUrUmUrCrUrArArArUrCrCrUmCrAmCr UrArUrArUrUrUTT	1000
SNCA-963	Modified 25mer sense strand	rUmUrUmCrUrArArArUrCrCrUrCmArCmUr ArUrUrArUrUrUTG	1001
SNCA-964	Modified 25mer sense strand	rUmUrCmUrArArArUrCrCrUrCrAmCrUmAr UrUrUrArUrUrUGT	1002
SNCA-965	Modified 25mer sense strand	rUmCrUmArArArUrCrCrUrCrArCmUrAmUr UrUrUrArUrUrGTT	1003
SNCA-966	Modified 25mer sense strand	rCmUrAmArArUrCrCrUrCrArCrUmArUmUr UrUrUrArUrGrUTG	1004
SNCA-967	Modified 25mer sense strand	rUmArAmArUrCrCrUrCrArCrUrAmUrUmUr UrUrUrArGrUrUGC	1005
SNCA-968	Modified 25mer sense strand	rAmArAmUrCrCrUrCrArCrUrArUmUrUmUr UrUrUrArUrUrGCT	1006
SNCA-969	Modified 25mer sense strand	rAmArUmCrCrUrCrArCrUrArUrUmUrUmUr UrUrGrArUrGrCTG	1007
SNCA-970	Modified 25mer sense strand	rAmUrCmCrUrCrArCrUrArUrUrUmUrUmUr UrGrUrArGrCrUGT	1008

SNCA-971	Modified 25mer sense strand	rUmCrCmUrCrArCrUrArUrUrUrUmUrUmUrGrUrUrArCrUrGTT	1009
SNCA-972	Modified 25mer sense strand	rCmCrUmCrArCrUrArUrUrUrUrUmUrUmGrUrUrGrArUrGrUTG	1010
SNCA-973	Modified 25mer sense strand	rCmUrCmArCrUrArUrUrUrUrUrUmUrGmUrUrGrCrArGrUrUGT	1011
SNCA-974	Modified 25mer sense strand	rUmCrAmCrUrArUrUrUrUrUrUrUmGrUmUrGrCrUrArUrUrGTT	1012
SNCA-975	Modified 25mer sense strand	rCmArCmUrArUrUrUrUrUrUrUrGmUrUmGrCrUrGrArUrGrUTC	1013
SNCA-976	Modified 25mer sense strand	rAmCrUmArUrUrUrUrUrUrUrGrUmUrGmCrUrGrUrArGrUrUCA	1014
SNCA-977	Modified 25mer sense strand	rCmUrAmUrUrUrUrUrUrUrGrUrUmGrCmUrGrUrUrArUrUrCAG	1015
SNCA-978	Modified 25mer sense strand	rUmArUmUrUrUrUrUrUrGrUrUrGmCrUmGrUrUrGrArUrCrAGA	1016
SNCA-979	Modified 25mer sense strand	rAmUrUmUrUrUrUrUrGrUrUrGrCmUrGmUrUrGrUrArCrArGAA	1017
SNCA-980	Modified 25mer sense strand	rUmUrUmUrUrUrUrGrUrUrGrCrUmGrUmUrGrUrUrArArGrAAG	1018
SNCA-981	Modified 25mer sense strand	rUmUrUmUrUrUrGrUrUrGrCrUrGmUrUmGrUrUrCrArGrArAGT	1019
SNCA-982	Modified 25mer sense strand	rUmUrUmUrUrGrUrUrGrCrUrGrUmUrGmUrUrCrArArArArGTT	1020
SNCA-983	Modified 25mer sense strand	rUmUrUmUrGrUrUrGrCrUrGrUrUmGrUmUrCrArGrArArGrUTG	1021
SNCA-984	Modified 25mer sense strand	rUmUrUmGrUrUrGrCrUrGrUrUrGmUrUmCrArGrArArGrUrUGT	1022
SNCA-985	Modified 25mer sense strand	rUmUrGmUrUrGrCrUrGrUrUrGrUmUrCmArGrArArArUrUrGTT	1023
SNCA-986	Modified 25mer sense strand	rUmGrUmUrGrCrUrGrUrUrGrUrUmCrAmGrArArGrArUrGrUTA	1024
SNCA-987	Modified 25mer sense strand	rGmUrUmGrCrUrGrUrUrGrUrUrCmArGmArArGrUrArGrUrUAG	1025
SNCA-988	Modified 25mer sense strand	rUmUrGmCrUrGrUrUrGrUrUrCrAmGrAmArGrUrUrArUrUrAGT	1026
SNCA-989	Modified 25mer sense strand	rUmGrCmUrGrUrUrGrUrUrCrArGmArAmGrUrUrGrArUrArGTG	1027
SNCA-990	Modified 25mer sense strand	rGmCrUmGrUrUrGrUrUrCrArGrAmArGmUrUrGrUrArArGrUGA	1028
SNCA-991	Modified 25mer sense strand	rCmUrGmUrUrGrUrUrCrArGrArAmGrUmUrGrUrUrArGrUrGAT	1029

SNCA-992	Modified 25mer sense strand	rUmGrUmUrGrUrUrCrArGrArArGmUrUmGrUrUrArArUrGrATT	1030
SNCA-993	Modified 25mer sense strand	rGmUrUmGrUrUrCrArGrArArGrUmUrGmUrUrArGrArGrArUTT	1031
SNCA-994	Modified 25mer sense strand	rUmUrGmUrUrCrArGrArArGrUrUmGrUmUrArGrUrArArUrUTG	1032
SNCA-995	Modified 25mer sense strand	rUmGrUmUrCrArGrArArGrUrUrGmUrUmArGrUrGrArUrUrUGC	1033
SNCA-996	Modified 25mer sense strand	rGmUrUmCrArGrArArGrUrUrGrUmUrAmGrUrGrArArUrUrGCT	1034
SNCA-997	Modified 25mer sense strand	rUmUrCmArGrArArGrUrUrGrUrUmArGmUrGrArUrArUrGrCTA	1035
SNCA-998	Modified 25mer sense strand	rUmCrAmGrArArGrUrUrGrUrUrAmGrUmGrArUrUrArGrCrUAT	1036
SNCA-999	Modified 25mer sense strand	rCmArGmArArGrUrUrGrUrUrArGmUrGmArUrUrUrArCrUrATC	1037
SNCA-1000	Modified 25mer sense strand	rAmGrAmArGrUrUrGrUrUrArGrUmGrAmUrUrUrGrArUrArUCA	1038
SNCA-1001	Modified 25mer sense strand	rGmArAmGrUrUrGrUrUrArGrUrGmArUmUrUrGrCrArArUrCAT	1039
SNCA-1002	Modified 25mer sense strand	rAmArGmUrUrGrUrUrArGrUrGrAmUrUmUrGrCrUrArUrCrATA	1040
SNCA-1003	Modified 25mer sense strand	rAmGrUmUrGrUrUrArGrUrGrArUmUrUmGrCrUrArArCrArUAT	1041
SNCA-1004	Modified 25mer sense strand	rGmUrUmGrUrUrArGrUrGrArUrUmUrGmCrUrArUrArArUrATA	1042
SNCA-1005	Modified 25mer sense strand	rUmUrGmUrUrArGrUrGrArUrUrUmGrCmUrArUrCrArUrArUAT	1043
SNCA-1028	Modified 25mer sense strand	rAmUrUmArUrArArGrArUrUrUrUmUrAmGrGrUrGrArCrUrUTT	1044
SNCA-1029	Modified 25mer sense strand	rUmUrAmUrArArGrArUrUrUrUrUmArGmGrUrGrUrArUrUrUTA	1045
SNCA-1030	Modified 25mer sense strand	rUmArUmArArGrArUrUrUrUrUrAmGrGmUrGrUrCrArUrUrUAA	1046
SNCA-1031	Modified 25mer sense strand	rAmUrAmArGrArUrUrUrUrUrArGmGrUmGrUrCrUrArUrUrAAT	1047
SNCA-1032	Modified 25mer sense strand	rUmArAmGrArUrUrUrUrUrArGrGmUrGmUrCrUrUrArUrArATG	1048
SNCA-1033	Modified 25mer sense strand	rAmArGmArUrUrUrUrUrArGrGrUmGrUmCrUrUrUrArArArUGA	1049
SNCA-1034	Modified 25mer sense strand	rAmGrAmUrUrUrUrUrArGrGrUrGmUrCmUrUrUrUrArArUrGAT	1050

SNCA-1035	Modified 25mer sense strand	rGmArUmUrUrUrUrArGrGrUrGrUmCrUmUrUrUrArArUrGrATA	1051
SNCA-1036	Modified 25mer sense strand	rAmUrUmUrUrUrArGrGrUrGrUrCmUrUmUrUrArArArGrArUAC	1052
SNCA-1037	Modified 25mer sense strand	rUmUrUmUrUrArGrGrUrGrUrCrUmUrUmUrArArUrArArUrACT	1053
SNCA-1038	Modified 25mer sense strand	rUmUrUmUrArGrGrUrGrUrCrUrUmUrUmArArUrGrArUrArCTG	1054
SNCA-1039	Modified 25mer sense strand	rUmUrUmArGrGrUrGrUrCrUrUrUmUrAmArUrGrArArArCrUGT	1055
SNCA-1040	Modified 25mer sense strand	rUmUrAmGrGrUrGrUrCrUrUrUrUmArAmUrGrArUrArCrUrGTC	1056
SNCA-1041	Modified 25mer sense strand	rUmArGmGrUrGrUrCrUrUrUrUrAmArUmGrArUrArArUrGrUCT	1057
SNCA-1042	Modified 25mer sense strand	rAmGrGmUrGrUrCrUrUrUrUrArAmUrGmArUrArCrArGrUrCTA	1058
SNCA-1043	Modified 25mer sense strand	rGmGrUmGrUrCrUrUrUrUrArArUmGrAmUrArCrUrArUrCrUAA	1059
SNCA-1044	Modified 25mer sense strand	rGmUrGmUrCrUrUrUrUrArArUrGmArUmArCrUrGrArCrUrAAG	1060
SNCA-1045	Modified 25mer sense strand	rUmGrUmCrUrUrUrUrArArUrGrAmUrAmCrUrGrUrArUrArAGA	1061
SNCA-1046	Modified 25mer sense strand	rGmUrCmUrUrUrUrArArUrGrArUmArCmUrGrUrCrArArArGAA	1062
SNCA-1047	Modified 25mer sense strand	rUmCrUmUrUrUrArArUrGrArUrAmCrUmGrUrCrUrArArGrAAT	1063
SNCA-1048	Modified 25mer sense strand	rCmUrUmUrUrArArUrGrArUrArCmUrGmUrCrUrArArGrArATA	1064
SNCA-1049	Modified 25mer sense strand	rUmUrUmUrArArUrGrArUrArCrUmGrUmCrUrArArArArArUAA	1065
SNCA-1050	Modified 25mer sense strand	rUmUrUmArArUrGrArUrArCrUrGmUrCmUrArArGrArArUrAAT	1066
SNCA-1051	Modified 25mer sense strand	rUmUrAmArUrGrArUrArCrUrGrUmCrUmArArGrArArUrArATG	1067
SNCA-1052	Modified 25mer sense strand	rUmArAmUrGrArUrArCrUrGrUrCmUrAmArGrArArArArArUGA	1068
SNCA-1053	Modified 25mer sense strand	rAmArUmGrArUrArCrUrGrUrCrUmArAmGrArArUrArArUrGAC	1069
SNCA-1054	Modified 25mer sense strand	rAmUrGmArUrArCrUrGrUrCrUrAmArGmArArUrArArUrGrACG	1070
SNCA-1055	Modified 25mer sense strand	rUmGrAmUrArCrUrGrUrCrUrArAmGrAmArUrArArArGrArCGT	1071

SNCA-1056	Modified 25mer sense strand	rGmArUmArCrUrGrUrCrUrArArGmArAmUrArArUrArArCrGTA	1072
SNCA-1057	Modified 25mer sense strand	rAmUrAmCrUrGrUrCrUrArArGrAmArUmArArUrGrArCrGrUAT	1073
SNCA-1058	Modified 25mer sense strand	rUmArCmUrGrUrCrUrArArGrArAmUrAmArUrGrArArGrUrATT	1074
SNCA-1078	Modified 25mer sense strand	rGmUrAmUrUrGrUrGrArArArUrUmUrGmUrUrArArArArUrATA	1075
SNCA-1079	Modified 25mer sense strand	rUmArUmUrGrUrGrArArArUrUrUmGrUmUrArArUrArUrArUAT	1076
SNCA-1080	Modified 25mer sense strand	rAmUrUmGrUrGrArArArUrUrUrGmUrUmArArUrArArArUrATA	1077
SNCA-1086	Modified 25mer sense strand	rAmArAmUrUrUrGrUrUrArArUrAmUrAmUrArUrArArUrArCTT	1078
SNCA-1087	Modified 25mer sense strand	rAmArUmUrUrGrUrUrArArUrArUmArUmArUrArArArArCrUTA	1079
SNCA-1088	Modified 25mer sense strand	rAmUrUmUrGrUrUrArArUrArUrAmUrAmUrArArUrArCrUrUAA	1080
SNCA-1089	Modified 25mer sense strand	rUmUrUmGrUrUrArArUrArUrArUmArUmArArUrArArUrUrAAA	1081
SNCA-1090	Modified 25mer sense strand	rUmUrGmUrUrArArUrArUrArUrAmUrAmArUrArCrArUrArAAA	1082
SNCA-1091	Modified 25mer sense strand	rUmGrUmUrArArUrArUrArUrArUmArAmUrArCrUrArArArAAA	1083
SNCA-1092	Modified 25mer sense strand	rGmUrUmArArUrArUrArUrArUrAmArUmArCrUrUrArArArAAT	1084
SNCA-1093	Modified 25mer sense strand	rUmUrAmArUrArUrArUrArUrArAmUrAmCrUrUrArArArArATA	1085
SNCA-1116	Modified 25mer sense strand	rUmArUmGrUrGrArGrCrArUrGrAmArAmCrUrArUrArCrArCCT	1086
SNCA-1117	Modified 25mer sense strand	rAmUrGmUrGrArGrCrArUrGrArAmArCmUrArUrGrArArCrCTA	1087
SNCA-1119	Modified 25mer sense strand	rGmUrGmArGrCrArUrGrArArArCmUrAmUrGrCrArArCrUrATA	1088
SNCA-1120	Modified 25mer sense strand	rUmGrAmGrCrArUrGrArArArCrUmArUmGrCrArCrArUrArUAA	1089
SNCA-1121	Modified 25mer sense strand	rGmArGmCrArUrGrArArArCrUrAmUrGmCrArCrCrArArUrAAA	1090
SNCA-1122	Modified 25mer sense strand	rAmGrCmArUrGrArArArCrUrArUmGrCmArCrCrUrArUrArAAT	1091
SNCA-1123	Modified 25mer sense strand	rGmCrAmUrGrArArArCrUrArUrGmCrAmCrCrUrArArArArATA	1092

SNCA-1124	Modified 25mer sense strand	rCmArUmGrArArArCrUrArUrGrCmArCmCrUrArUrArArArUAC	1093
SNCA-1125	Modified 25mer sense strand	rAmUrGmArArArCrUrArUrGrCrAmCrCmUrArUrArArArUrACT	1094
SNCA-1126	Modified 25mer sense strand	rUmGrAmArArCrUrArUrGrCrArCmCrUmArUrArArArUrArCTA	1095
SNCA-1127	Modified 25mer sense strand	rGmArAmArCrUrArUrGrCrArCrCmUrAmUrArArArArArCrUAA	1096
SNCA-1128	Modified 25mer sense strand	rAmArAmCrUrArUrGrCrArCrCrUmArUmArArArUrArCrUrAAA	1097
SNCA-1129	Modified 25mer sense strand	rAmArCmUrArUrGrCrArCrCrUrAmUrAmArArUrArArUrArAAT	1098
SNCA-1130	Modified 25mer sense strand	rAmCrUmArUrGrCrArCrCrUrArUmArAmArUrArCrArArArATA	1099
SNCA-1131	Modified 25mer sense strand	rCmUrAmUrGrCrArCrCrUrArUrAmArAmUrArCrUrArArArUAT	1100
SNCA-1132	Modified 25mer sense strand	rUmArUmGrCrArCrCrUrArUrArAmArUmArCrUrArArArUrATG	1101
SNCA-1133	Modified 25mer sense strand	rAmUrGmCrArCrCrUrArUrArArAmUrAmCrUrArArArUrArUGA	1102
SNCA-1194	Modified 25mer sense strand	rGmUrUmUrGrUrArUrArUrArArAmUrGmGrUrGrArArArArUTA	1103
SNCA-1195	Modified 25mer sense strand	rUmUrUmGrUrArUrArUrArArArArUmGrGmUrGrArGrArArUrUAA	1104
SNCA-1196	Modified 25mer sense strand	rUmUrGmUrArUrArUrArArArArUrGmGrUmGrArGrArArArUrUrAAA	1105
SNCA-1197	Modified 25mer sense strand	rUmGrUmArUrArUrArArArArUrGrGmUrGmArGrArArArUrArAAA	1106
SNCA-1198	Modified 25mer sense strand	rGmUrAmUrArUrArArArArUrGrGrUmGrAmGrArArUrArArArAAT	1107
SNCA-1199	Modified 25mer sense strand	rUmArUmArUrArArArArUrGrGrUrGmArGmArArUrUrArArArATA	1108
SNCA-1200	Modified 25mer sense strand	rAmUrAmUrArArArArUrGrGrUrGrAmGrAmArUrUrArArArArUAA	1109
SNCA-1201	Modified 25mer sense strand	rUmArUmArArArArUrGrGrUrGrArGmArAmUrUrArArArArUrAAA	1110
SNCA-1202	Modified 25mer sense strand	rAmUrAmArArArUrGrGrUrGrArGrAmArUmUrArArArArUrArAAA	1111
SNCA-1203	Modified 25mer sense strand	rUmArAmArUrGrGrUrGrArGrArAmUrUmArArArArArArArAAC	1112
SNCA-1204	Modified 25mer sense strand	rAmArAmUrGrGrUrGrArGrArArUmUrAmArArArUrArArArACG	1113

SNCA-1205	Modified 25mer sense strand	rAmArUmGrGrUrGrArGrArArUrUmArAmArArUrArArArArCGT	1114
SNCA-1206	Modified 25mer sense strand	rAmUrGmGrUrGrArGrArArUrUrAmArAmArUrArArArArCrGTT	1115
SNCA-1207	Modified 25mer sense strand	rUmGrGmUrGrArGrArArUrUrArAmArAmUrArArArArCrGrUTA	1116
SNCA-1208	Modified 25mer sense strand	rGmGrUmGrArGrArArUrUrArArArAmArUmArArArArArGrUrUAT	1117
SNCA-1250	Modified 25mer sense strand	rUmUrAmUrUrUrUrUrArUrCrCrCmArUmCrUrCrArArUrUrUAA	1118
SNCA-1252	Modified 25mer sense strand	rAmUrUmUrUrUrArUrCrCrCrArUmCrUmCrArCrUrArUrArATA	1119
SNCA-1253	Modified 25mer sense strand	rUmUrUmUrUrArUrCrCrCrArUrCmUrCmArCrUrUrArArArUAA	1120
SNCA-1254	Modified 25mer sense strand	rUmUrUmUrArUrCrCrCrArUrCrUmCrAmCrUrUrUrArArUrAAT	1121
SNCA-1255	Modified 25mer sense strand	rUmUrUmArUrCrCrCrArUrCrUrCmArCmUrUrUrArArUrArATA	1122
SNCA-1256	Modified 25mer sense strand	rUmUrAmUrCrCrCrArUrCrUrCrAmCrUmUrUrArArArArArUAA	1123
SNCA-1257	Modified 25mer sense strand	rUmArUmCrCrCrArUrCrUrCrArCmUrUmUrArArUrArArUrAAA	1124
SNCA-1258	Modified 25mer sense strand	rAmUrCmCrCrArUrCrUrCrArCrUmUrUmArArUrArArUrArAAA	1125
SNCA-1259	Modified 25mer sense strand	rUmCrCmCrArUrCrUrCrArCrUrUmUrAmArUrArArArArArAAA	1126
SNCA-1260	Modified 25mer sense strand	rCmCrCmArUrCrUrCrArCrUrUrUmArAmUrArArUrArArArAAT	1127
SNCA-1261	Modified 25mer sense strand	rCmCrAmUrCrUrCrArCrUrUrUrAmArUmArArUrArArArArATC	1128
SNCA-1262	Modified 25mer sense strand	rCmArUmCrUrCrArCrUrUrUrArAmUrAmArUrArArArArArUCA	1129
SNCA-1263	Modified 25mer sense strand	rAmUrCmUrCrArCrUrUrUrArArUmArAmUrArArArArArUrCAT	1130
SNCA-1264	Modified 25mer sense strand	rUmCrUmCrArCrUrUrUrArArUrAmArUmArArArArArUrCrATG	1131
SNCA-1265	Modified 25mer sense strand	rCmUrCmArCrUrUrUrArArUrArAmUrAmArArArArArCrArUGC	1132
SNCA-1266	Modified 25mer sense strand	rUmCrAmCrUrUrUrArArUrArArUmArAmArArArUrArArUrGCT	1133
SNCA-1267	Modified 25mer sense strand	rCmArCmUrUrUrArArUrArArUrAmArAmArArUrCrArUrGrCTT	1134

SNCA-1351	Modified 25mer sense strand	rAmUrUmUrGrArArGrArArGrGrAmGrGmArArUrUrArUrArGAA	1135
SNCA-1365	Modified 25mer sense strand	rGmArAmUrUrUrUrArGrArArGrAmGrGmUrArGrArArArArAAT	1136
SNCA-1372	Modified 25mer sense strand	rAmGrAmArGrArGrGrUrArGrArGmArAmArArUrGrArArArCAT	1137
SNCA-1373	Modified 25mer sense strand	rGmArAmGrArGrGrUrArGrArGrAmArAmArUrGrGrArArCrATT	1138
SNCA-1374	Modified 25mer sense strand	rAmArGmArGrGrUrArGrArGrArAmArAmUrGrGrArArCrArUTA	1139
SNCA-1375	Modified 25mer sense strand	rAmGrAmGrGrUrArGrArGrArArAmArUmGrGrArArArArUrUAA	1140
SNCA-1376	Modified 25mer sense strand	rGmArGmGrUrArGrArGrArArArAmUrGmGrArArCrArUrUrAAC	1141
SNCA-1377	Modified 25mer sense strand	rAmGrGmUrArGrArGrArArArArUmGrGmArArCrArArUrArACC	1142
SNCA-1379	Modified 25mer sense strand	rGmUrAmGrArGrArArArArUrGrGmArAmCrArUrUrArArCrCCT	1143
SNCA-1380	Modified 25mer sense strand	rUmArGmArGrArArArArUrGrGrAmArCmArUrUrArArCrCrCTA	1144
SNCA-1381	Modified 25mer sense strand	rAmGrAmGrArArArArUrGrGrArAmCrAmUrUrArArArCrCrUAC	1145
SNCA-1382	Modified 25mer sense strand	rGmArGmArArArArUrGrGrArArCmArUmUrArArCrArCrUrACA	1146
SNCA-1383	Modified 25mer sense strand	rAmGrAmArArArUrGrGrArArCrAmUrUmArArCrCrArUrArCAC	1147
SNCA-1384	Modified 25mer sense strand	rGmArAmArArUrGrGrArArCrArUmUrAmArCrCrCrArArCrACT	1148
SNCA-1385	Modified 25mer sense strand	rAmArAmArUrGrGrArArCrArUrUmArAmCrCrCrUrArCrArCTC	1149
SNCA-1388	Modified 25mer sense strand	rAmUrGmGrArArCrArUrUrArArCmCrCmUrArCrArArUrCrGGA	1150
SNCA-1428	Modified 25mer sense strand	rAmCrUmGrCrCrArGrArArGrUrGmUrGmUrUrUrUrArGrUrATG	1151
SNCA-1429	Modified 25mer sense strand	rCmUrGmCrCrArGrArArGrUrGrUmGrUmUrUrUrGrArUrArUGC	1152
SNCA-259	Modified 27mer antisense strand	mUmGmGmCrCrUrUrUrUrGrAmArAmGrUrCrCrUrUrUrCrArUmGrAmAmUmA	1153
SNCA-260	Modified 27mer antisense strand	mUmUmGmGrCrUrUrUrUrUrGmArAmArGrUrCrCrUrUrUrCrAmUrGmAmAmU	1154
SNCA-261	Modified 27mer antisense strand	mCmUmUmGrGrUrCrUrUrUmGrAmArArGrUrCrCrUrUrUrCmArUmGmAmA	1155

SNCA-262	Modified 27mer antisense strand	mCmCmUmUrGrUrCrCrUrUmUrGmArArAr GrUrCrCrUrUrUmCrAmUmGmA	1156
SNCA-263	Modified 27mer antisense strand	mUmCmCmUrUrUrGrCrCrUmUrUmGrArAr ArGrUrCrCrUrUmUrCmAmUmG	1157
SNCA-264	Modified 27mer antisense strand	mCmUmCmCrUrUrGrGrCrCmUrUmUrGrAr ArArGrUrCrCrUmUrUmCmAmU	1158
SNCA-285	Modified 27mer antisense strand	mCmUmCmArGrUrArGrCrAmGrCmCrArCr ArArCrUrCrCrCmUrCmCmUmU	1159
SNCA-288	Modified 27mer antisense strand	mUmUmUmCrUrUrArGrCrAmGrCmArGrCr CrArCrArArCrUmCrCmCmUmC	1160
SNCA-289	Modified 27mer antisense strand	mUmUmUmUrCrUrCrArGrCmArGmCrArGr CrCrArCrArArCmUrCmCmCmU	1161
SNCA-290	Modified 27mer antisense strand	mGmUmUmUrUrUrUrCrArGmCrAmGrCrAr GrCrCrArCrArAmCrUmCmCmC	1162
SNCA-292	Modified 27mer antisense strand	mUmGmGmUrUrUrUrCrUrCmArGmCrArGr CrArGrCrCrArCmArAmCmUmC	1163
SNCA-293	Modified 27mer antisense strand	mUmUmGmGrUrUrUrUrCrUmCrAmGrCrAr GrCrArGrCrCrAmCrAmAmCmU	1164
SNCA-294	Modified 27mer antisense strand	mUmUmUmGrGrUrUrUrUrCmUrCmArGrCr ArGrCrArGrCrCmArCmAmAmC	1165
SNCA-295	Modified 27mer antisense strand	mGmUmUmUrGrUrUrUrUrUmCrUmCrArGr CrArGrCrArGrCmCrAmCmAmA	1166
SNCA-296	Modified 27mer antisense strand	mUmGmUmUrUrUrGrUrUrUmUrCmUrCrAr GrCrArGrCrArGmCrCmAmCmA	1167
SNCA-297	Modified 27mer antisense strand	mCmUmGmUrUrUrGrGrUrUmUrUmCrUrCr ArGrCrArGrCrAmGrCmCmAmC	1168
SNCA-407	Modified 27mer antisense strand	mUmCmUmUrUrUrGrUrCrUmUrCmUrCrAr GrCrCrArCrUrGmUrUmGmCmC	1169
SNCA-408	Modified 27mer antisense strand	mCmUmCmUrUrUrGrGrUrCmUrUmCrUrCr ArGrCrCrArCrUmGrUmUmGmC	1170
SNCA-409	Modified 27mer antisense strand	mGmCmUmCrUrUrUrGrGrUmCrUmUrCrUr CrArGrCrCrArCmUrGmUmUmG	1171
SNCA-410	Modified 27mer antisense strand	mUmGmCmUrCrUrUrUrGrGmUrCmUrUrCr UrCrArGrCrCrAmCrUmGmUmU	1172
SNCA-411	Modified 27mer antisense strand	mUmUmGmCrUrUrUrUrUrGmGrUmCrUrUr CrUrCrArGrCrCmArCmUmGmU	1173
SNCA-412	Modified 27mer antisense strand	mCmUmUmGrCrUrCrUrUrUmGrGmUrCrUr UrCrUrCrArGrCmCrAmCmUmG	1174
SNCA-413	Modified 27mer antisense strand	mAmCmUmUrGrUrUrCrUrUmUrGmGrUrCr UrUrCrUrCrArGmCrCmAmCmU	1175
SNCA-414	Modified 27mer antisense strand	mCmAmCmUrUrUrCrUrCrUmUrUmGrGrUr CrUrUrCrUrCrAmGrCmCmAmC	1176

SNCA-415	Modified 27mer antisense strand	mUmCmAmCrUrUrGrCrUrCmUrUmUrGrGr UrCrUrUrCrUrCmArGmCmCmA	1177
SNCA-416	Modified 27mer antisense strand	mGmUmCmArCrUrUrGrCrUmCrUmUrUrGr GrUrCrUrUrCrUmCrAmGmCmC	1178
SNCA-417	Modified 27mer antisense strand	mUmGmUmCrArUrUrUrGrCmUrCmUrUrUr GrGrUrCrUrUrCmUrCmAmGmC	1179
SNCA-418	Modified 27mer antisense strand	mUmUmGmUrCrUrCrUrUrGmCrUmCrUrUr UrGrGrUrCrUrUmCrUmCmAmG	1180
SNCA-419	Modified 27mer antisense strand	mUmUmUmGrUrUrArCrUrUmGrCmUrCrUr UrUrGrGrUrCrUmUrCmUmCmA	1181
SNCA-420	Modified 27mer antisense strand	mAmUmUmUrGrUrCrArCrUmUrGmCrUrCr UrUrUrGrGrUrCmUrUmCmUmC	1182
SNCA-421	Modified 27mer antisense strand	mCmAmUmUrUrUrUrCrArCmUrUmGrCrUr CrUrUrUrGrGrUmCrUmUmCmU	1183
SNCA-422	Modified 27mer antisense strand	mAmCmAmUrUrUrGrUrCrAmCrUmUrGrCr UrCrUrUrUrGrGmUrCmUmUmC	1184
SNCA-423	Modified 27mer antisense strand	mAmAmCmArUrUrUrGrUrCmArCmUrUrGr CrUrCrUrUrUrGmGrUmCmUmU	1185
SNCA-424	Modified 27mer antisense strand	mCmAmAmCrArUrUrUrGrUmCrAmCrUrUr GrCrUrCrUrUrUmGrGmUmCmU	1186
SNCA-425	Modified 27mer antisense strand	mCmCmAmArCrUrUrUrUrGmUrCmArCrUr UrGrCrUrCrUrUmUrGmGmUmC	1187
SNCA-426	Modified 27mer antisense strand	mUmCmCmArArUrArUrUrUmGrUmCrArCr UrUrGrCrUrCrUmUrUmGmGmU	1188
SNCA-427	Modified 27mer antisense strand	mCmUmCmCrArUrCrArUrUmUrGmUrCrAr CrUrUrGrCrUrCmUrUmUmGmG	1189
SNCA-428	Modified 27mer antisense strand	mCmCmUmCrCrUrArCrArUmUrUmGrUrCr ArCrUrUrGrCrUmCrUmUmUmG	1190
SNCA-429	Modified 27mer antisense strand	mUmCmCmUrCrUrArArCrAmUrUmUrGrUr CrArCrUrUrGrCmUrCmUmUmU	1191
SNCA-430	Modified 27mer antisense strand	mCmUmCmCrUrUrCrArArCmArUmUrUrGr UrCrArCrUrUrGmCrUmCmUmU	1192
SNCA-431	Modified 27mer antisense strand	mGmCmUmCrCrUrCrCrArAmCrAmUrUrUr GrUrCrArCrUrUmGrCmUmCmU	1193
SNCA-432	Modified 27mer antisense strand	mUmGmCmUrCrUrUrCrCrAmArCmArUrUr UrGrUrCrArCrUmUrGmCmUmC	1194
SNCA-433	Modified 27mer antisense strand	mCmUmGmCrUrUrCrUrCrCmArAmCrArUr UrUrGrUrCrArCmUrUmGmCmU	1195
SNCA-434	Modified 27mer antisense strand	mAmCmUmGrCrUrCrCrUrCmCrAmArCrAr UrUrUrGrUrCrAmCrUmUmGmC	1196
SNCA-435	Modified 27mer antisense strand	mCmAmCmUrGrUrUrCrCrUmCrCmArArCr ArUrUrUrGrUrCmArCmUmUmG	1197

SNCA-436	Modified 27mer antisense strand	mCmCmAmCrUrUrCrUrCrCmUrCmCrArAr CrArUrUrUrGrUmCrAmCmUmU	1198
SNCA-437	Modified 27mer antisense strand	mAmCmCmArCrUrGrCrUrCmCrUmCrCrAr ArCrArUrUrUrGmUrCmAmCmU	1199
SNCA-725	Modified 27mer antisense strand	mGmCmAmCrArUrUrGrGrAmArCmUrGrAr GrCrArCrUrUrGmUrAmCmAmG	1200
SNCA-726	Modified 27mer antisense strand	mGmGmCmArCrUrUrUrGrGmArAmCrUrGr ArGrCrArCrUrUmGrUmAmCmA	1201
SNCA-727	Modified 27mer antisense strand	mGmGmGmCrArUrArUrUrGmGrAmArCrUr GrArGrCrArCrUmUrGmUmAmC	1202
SNCA-728	Modified 27mer antisense strand	mUmGmGmGrCrUrCrArUrUmGrGmArArCr UrGrArGrCrArCmUrUmGmUmA	1203
SNCA-729	Modified 27mer antisense strand	mCmUmGmGrGrUrArCrArUmUrGmGrArAr CrUrGrArGrCrAmCrUmUmGmU	1204
SNCA-730	Modified 27mer antisense strand	mAmCmUmGrGrUrCrArCrAmUrUmGrGrAr ArCrUrGrArGrCmArCmUmUmG	1205
SNCA-731	Modified 27mer antisense strand	mGmAmCmUrGrUrGrCrArCmArUmUrGrGr ArArCrUrGrArGmCrAmCmUmU	1206
SNCA-732	Modified 27mer antisense strand	mUmGmAmCrUrUrGrGrCrAmCrAmUrUrGr GrArArCrUrGrAmGrCmAmCmU	1207
SNCA-733	Modified 27mer antisense strand	mAmUmGmArCrUrGrGrGrCmArCmArUrUr GrGrArArCrUrGmArGmCmAmC	1208
SNCA-734	Modified 27mer antisense strand	mCmAmUmGrArUrUrGrGrGmCrAmCrArUr UrGrGrArArCrUmGrAmGmCmA	1209
SNCA-735	Modified 27mer antisense strand	mUmCmAmUrGrUrCrUrGrGmGrCmArCrAr UrUrGrGrArArCmUrGmAmGmC	1210
SNCA-736	Modified 27mer antisense strand	mGmUmCmArUrUrArCrUrGmGrGmCrArCr ArUrUrGrGrArAmCrUmGmAmG	1211
SNCA-737	Modified 27mer antisense strand	mUmGmUmCrArUrGrArCrUmGrGmGrCrAr CrArUrUrGrGrAmArCmUmGmA	1212
SNCA-738	Modified 27mer antisense strand	mAmUmGmUrCrUrUrGrArCmUrGmGrGrCr ArCrArUrUrGrGmArAmCmUmG	1213
SNCA-739	Modified 27mer antisense strand	mAmAmUmGrUrUrArUrGrAmCrUmGrGrGr CrArCrArUrUrGmGrAmAmCmU	1214
SNCA-740	Modified 27mer antisense strand	mAmAmAmUrGrUrCrArUrGmArCmUrGrGr GrCrArCrArUrUmGrGmAmAmC	1215
SNCA-741	Modified 27mer antisense strand	mGmAmAmArUrUrUrCrArUmGrAmCrUrGr GrGrCrArCrArUmUrGmGmAmA	1216
SNCA-742	Modified 27mer antisense strand	mAmGmAmArArUrGrUrCrAmUrGmArCrUr GrGrGrCrArCrAmUrUmGmGmA	1217
SNCA-790	Modified 27mer antisense strand	mUmUmCmArArUrCrArCrUmGrCmUrGrAr UrGrGrArArGrAmCrUmUmCmG	1218

SNCA-791	Modified 27mer antisense strand	mCmUmUmCrArUrUrCrArCmUrGmCrUrGr ArUrGrGrArArGmArCmUmUmC	1219
SNCA-792	Modified 27mer antisense strand	mAmCmUmUrCrUrArUrCrAmCrUmGrCrUr GrArUrGrGrArAmGrAmCmUmU	1220
SNCA-938	Modified 27mer antisense strand	mUmAmAmGrUrUrGrUrArGmUrCmArCrUr UrArGrGrUrGrUmUrUmUmUmA	1221
SNCA-939	Modified 27mer antisense strand	mAmUmAmArGrUrGrGrUrAmGrUmCrArCr UrUrArGrGrUrGmUrUmUmUmU	1222
SNCA-940	Modified 27mer antisense strand	mAmAmUmArArUrUrGrGrUmArGmUrCrAr CrUrUrArGrGrUmGrUmUmUmU	1223
SNCA-941	Modified 27mer antisense strand	mAmAmAmUrArUrGrUrGrGmUrAmGrUrCr ArCrUrUrArGrGmUrGmUmUmU	1224
SNCA-942	Modified 27mer antisense strand	mGmAmAmArUrUrArGrUrGmGrUmArGrUr CrArCrUrUrArGmGrUmGmUmU	1225
SNCA-943	Modified 27mer antisense strand	mAmGmAmArArUrArArGrUmGrGmUrArGr UrCrArCrUrUrAmGrGmUmGmU	1226
SNCA-944	Modified 27mer antisense strand	mUmAmGmArArUrUrArArGmUrGmGrUrAr GrUrCrArCrUrUmArGmGmUmG	1227
SNCA-945	Modified 27mer antisense strand	mUmUmAmGrArUrArUrArArAmGrUmGrGrUr ArGrUrCrArCrUmUrAmGmGmU	1228
SNCA-946	Modified 27mer antisense strand	mUmUmUmArGrUrArArUrUrAmArGmUrGrGr UrArGrUrCrArCmUrUmAmGmG	1229
SNCA-947	Modified 27mer antisense strand	mAmUmUmUrArUrArArArArUmArAmGrUrGr GrUrArGrUrCrAmCrUmUmAmG	1230
SNCA-948	Modified 27mer antisense strand	mGmAmUmUrUrUrGrArArAmUrAmArGrUr GrGrUrArGrUrCmArCmUmUmA	1231
SNCA-949	Modified 27mer antisense strand	mGmGmAmUrUrUrArGrArAmArUmArArGr UrGrGrUrArGrUmCrAmCmUmU	1232
SNCA-950	Modified 27mer antisense strand	mAmGmGmArUrUrUrArGrGrAmArAmUrArAr GrUrGrGrUrArGmUrCmAmCmU	1233
SNCA-951	Modified 27mer antisense strand	mGmAmGmGrArUrUrUrUrArGmArAmArUrAr ArGrUrGrGrUrAmGrUmCmAmC	1234
SNCA-952	Modified 27mer antisense strand	mUmGmAmGrGrUrUrUrUrUrAmGrAmArArUr ArArGrUrGrGrUmArGmUmCmA	1235
SNCA-953	Modified 27mer antisense strand	mGmUmGmArGrUrArUrUrUrUmArGmArArAr UrArArGrUrGrGmUrAmGmUmC	1236
SNCA-954	Modified 27mer antisense strand	mAmGmUmGrArUrGrArUrUmUrAmGrArArAr ArUrArArGrUrGmGrUmAmGmU	1237
SNCA-1081	Modified 27mer antisense strand	mUmUmAmUrArUrArUrArUrUmUrAmArCrAr ArArUrUrUrCrAmCrAmAmUmA	1238
SNCA-1082	Modified 27mer antisense strand	mAmUmUmArUrUrUrArUrArUmUrUmArArCr ArArArUrUrUrCmArCmAmAmU	1239

SNCA-1083	Modified 27mer antisense strand	mUmAmUmUrArUrArUrArUmArUmUrArArCrArArArUrUrUmCrAmCmAmA	1240
SNCA-1084	Modified 27mer antisense strand	mGmUmAmUrUrUrUrArUrAmUrAmUrUrArArCrArArArUrUmUrCmAmCmA	1241
SNCA-1085	Modified 27mer antisense strand	mAmGmUmArUrUrArUrArUrUmArUmArUrUrArArCrArArArUmUrUmCmAmC	1242
SNCA-1188	Modified 27mer antisense strand	mUmCmAmCrCrUrUrUrUrAmUrAmUrArCrArArArCrArCrAmArGmUmGmA	1243
SNCA-1189	Modified 27mer antisense strand	mCmUmCmArCrUrArUrUrUmArUmArUrArCrArArArCrArCmArAmGmUmG	1244
SNCA-1190	Modified 27mer antisense strand	mUmCmUmCrArUrCrArUrUmUrAmUrArUrArCrArArArCrArCmCrAmAmGmU	1245
SNCA-1191	Modified 27mer antisense strand	mUmUmCmUrCrUrCrCrArUmUrUmArUrArUrArCrArArArCmArCmAmAmG	1246
SNCA-1192	Modified 27mer antisense strand	mAmUmUmCrUrUrArCrCrAmUrUmUrArUrArUrArCrArArAmCrAmCmAmA	1247
SNCA-1193	Modified 27mer antisense strand	mAmAmUmUrCrUrCrArCrCmArUmUrUrArUrArUrArCrArArAmArCmAmCmA	1248
SNCA-225	Modified 27mer antisense strand	mGmGmCmUrArUrUrGrArAmUrUmCrCrUrUrUrArCrArCrCmArCmAmCmU	1249
SNCA-226	Modified 27mer antisense strand	mUmGmGmCrUrUrArUrGrAmArUmUrCrCrUrUrUrArCrArCmCrAmCmAmC	1250
SNCA-227	Modified 27mer antisense strand	mAmUmGmGrCrUrArArUrGmArAmUrUrCrCrUrUrUrArCrAmCrCmAmCmA	1251
SNCA-228	Modified 27mer antisense strand	mCmAmUmGrGrUrUrArArUmGrAmArUrUrCrCrUrUrUrArCmArCmCmAmC	1252
SNCA-229	Modified 27mer antisense strand	mCmCmAmUrGrUrCrUrArAmUrGmArArUrUrCrCrUrUrUrAmCrAmCmCmA	1253
SNCA-230	Modified 27mer antisense strand	mUmCmCmArUrUrGrCrUrAmArUmGrArArUrUrCrCrUrUrUmArCmAmCmC	1254
SNCA-231	Modified 27mer antisense strand	mAmUmCmCrArUrGrGrCrUmArAmUrGrArArUrUrCrCrUrUmUrAmCmAmC	1255
SNCA-232	Modified 27mer antisense strand	mCmAmUmCrCrUrUrGrGrCmUrAmArUrGrArArUrUrCrCrUmUrUmAmCmA	1256
SNCA-233	Modified 27mer antisense strand	mAmCmAmUrCrUrArUrGrGmCrUmArArUrGrArArUrUrCrCmUrUmUmAmC	1257
SNCA-234	Modified 27mer antisense strand	mUmAmCmArUrUrCrArUrGmGrCmUrArArUrGrArArUrUrCmCrUmUmUmA	1258
SNCA-235	Modified 27mer antisense strand	mAmUmAmCrArUrCrCrArUmGrGmCrUrArArUrGrArArUrUmCrCmUmUmU	1259
SNCA-236	Modified 27mer antisense strand	mAmAmUmArCrUrUrCrCrAmUrGmGrCrUrArArUrGrArArUmUrCmCmUmU	1260

SNCA-237	Modified 27mer antisense strand	mGmAmAmUrArUrArUrCrCmArUmGrGrCr UrArArUrGrArAmUrUmCmCmU	1261
SNCA-238	Modified 27mer antisense strand	mUmGmAmArUrUrCrArUrCmCrAmUrGrGr CrUrArArUrGrAmArUmUmCmC	1262
SNCA-239	Modified 27mer antisense strand	mAmUmGmArArUrArCrArUmCrCmArUrGr GrCrUrArArUrGmArAmUmUmC	1263
SNCA-240	Modified 27mer antisense strand	mCmAmUmGrArUrUrArCrAmUrCmCrArUr GrGrCrUrArArUmGrAmAmUmU	1264
SNCA-241	Modified 27mer antisense strand	mUmCmAmUrGrUrArUrArCmArUmCrCrAr UrGrGrCrUrArAmUrGmAmAmU	1265
SNCA-242	Modified 27mer antisense strand	mUmUmCmArUrUrArArUrAmCrAmUrCrCr ArUrGrGrCrUrAmArUmGmAmA	1266
SNCA-243	Modified 27mer antisense strand	mUmUmUmCrArUrGrArArUmArCmArUrCr CrArUrGrGrCrUmArAmUmGmA	1267
SNCA-244	Modified 27mer antisense strand	mCmUmUmUrCrUrUrGrArAmUrAmCrArUr CrCrArUrGrGrCmUrAmAmUmG	1268
SNCA-245	Modified 27mer antisense strand	mCmCmUmUrUrUrArUrGrAmArUmArCrAr UrCrCrArUrGrGmCrUmAmAmU	1269
SNCA-246	Modified 27mer antisense strand	mUmCmCmUrUrUrCrArUrGmArAmUrArCr ArUrCrCrArUrGmGrCmUmAmA	1270
SNCA-247	Modified 27mer antisense strand	mGmUmCmCrUrUrUrCrArUmGrAmArUrAr CrArUrCrCrArUmGrGmCmUmA	1271
SNCA-248	Modified 27mer antisense strand	mAmGmUmCrCrUrUrUrCrAmUrGmArArUr ArCrArUrCrCrAmUrGmGmCmU	1272
SNCA-249	Modified 27mer antisense strand	mAmAmGmUrCrUrUrUrUrCmArUmGrArAr UrArCrArUrCrCmArUmGmGmC	1273
SNCA-250	Modified 27mer antisense strand	mAmAmAmGrUrUrCrUrUrUmCrAmUrGrAr ArUrArCrArUrCmCrAmUmGmG	1274
SNCA-251	Modified 27mer antisense strand	mGmAmAmArGrUrCrCrUrUmUrCmArUrGr ArArUrArCrArUmCrCmAmUmG	1275
SNCA-252	Modified 27mer antisense strand	mUmGmAmArArUrUrCrCrUmUrUmCrArUr GrArArUrArCrAmUrCmCmAmU	1276
SNCA-253	Modified 27mer antisense strand	mUmUmGmArArUrGrUrCrCmUrUmUrCrAr UrGrArArUrArCmArUmCmCmA	1277
SNCA-254	Modified 27mer antisense strand	mUmUmUmGrArUrArGrUrCmCrUmUrUrCr ArUrGrArArUrAmCrAmUmCmC	1278
SNCA-256	Modified 27mer antisense strand	mCmCmUmUrUrUrArArArGmUrCmCrUrUr UrCrArUrGrArAmUrAmCmAmU	1279
SNCA-330	Modified 27mer antisense strand	mCmUmCmUrUrUrUrGrUrCmUrUmUrCrCr UrGrCrUrGrCrUmUrCmUmGmC	1280
SNCA-335	Modified 27mer antisense strand	mAmCmAmCrCrUrUrCrUrUmUrUmGrUrCr UrUrUrCrCrUrGmCrUmGmCmU	1281

SNCA-337	Modified 27mer antisense strand	mGmAmAmCrArUrCrCrUrCmUrUmUrUrGr UrCrUrUrUrCrCmUrGmCmUmG	1282
SNCA-341	Modified 27mer antisense strand	mUmAmGmArGrUrArCrArCmCrCmUrCrUr UrUrUrGrUrCrUmUrUmCmCmU	1283
SNCA-342	Modified 27mer antisense strand	mAmUmAmGrArUrArArCrAmCrCmCrUrCr UrUrUrUrGrUrCmUrUmUmCmC	1284
SNCA-344	Modified 27mer antisense strand	mAmCmAmUrArUrArGrArAmCrAmCrCrCr UrCrUrUrUrUrGmUrCmUmUmU	1285
SNCA-345	Modified 27mer antisense strand	mUmAmCmArUrUrGrArGrAmArCmArCrCr CrUrCrUrUrUrUmGrUmCmUmU	1286
SNCA-351	Modified 27mer antisense strand	mGmGmAmGrCrUrUrArCrAmUrAmGrArGr ArArCrArCrCrCmUrCmUmUmU	1287
SNCA-353	Modified 27mer antisense strand	mUmUmGmGrArUrCrCrUrAmCrAmUrArGr ArGrArArCrArCmCrCmUmCmU	1288
SNCA-355	Modified 27mer antisense strand	mUmUmUmUrGrUrArGrCrCmUrAmCrArUr ArGrArGrArArCmArCmCmCmU	1289
SNCA-638	Modified 27mer antisense strand	mGmGmUmUrCrUrUrArGrUmCrUmUrGrAr UrArCrCrCrUrUmCrCmUmCmA	1290
SNCA-641	Modified 27mer antisense strand	mUmCmAmGrGrUrUrCrGrUmArGmUrCrUr UrGrArUrArCrCmCrUmUmCmC	1291
SNCA-642	Modified 27mer antisense strand	mUmUmCmArGrUrUrUrCrGmUrAmGrUrCr UrUrGrArUrArCmCrCmUmUmC	1292
SNCA-647	Modified 27mer antisense strand	mUmAmGmGrCrUrUrCrArGmGrUmUrCrGr UrArGrUrCrUrUmGrAmUmAmC	1293
SNCA-648	Modified 27mer antisense strand	mUmUmAmGrGrUrUrUrCrAmGrGmUrUrCr GrUrArGrUrCrUmUrGmAmUmA	1294
SNCA-650	Modified 27mer antisense strand	mUmCmUmUrArUrGrCrUrUmCrAmGrGrUr UrCrGrUrArGrUmCrUmUmGmA	1295
SNCA-652	Modified 27mer antisense strand	mUmUmUmCrUrUrArGrGrCmUrUmCrArGr GrUrUrCrGrUrAmGrUmCmUmU	1296
SNCA-653	Modified 27mer antisense strand	mAmUmUmUrCrUrUrArGrGmCrUmUrCrAr GrGrUrUrCrGrUmArGmUmCmU	1297
SNCA-654	Modified 27mer antisense strand	mUmAmUmUrUrUrUrUrArGmGrCmUrUrCr ArGrGrUrUrCrGmUrAmGmUmC	1298
SNCA-656	Modified 27mer antisense strand	mGmAmUmArUrUrUrCrUrUmArGmGrCrUr UrCrArGrGrUrUmCrGmUmAmG	1299
SNCA-657	Modified 27mer antisense strand	mAmGmAmUrArUrUrUrCrUmUrAmGrGrCr UrUrCrArGrGrUmUrCmGmUmA	1300
SNCA-659	Modified 27mer antisense strand	mAmAmAmGrArUrArUrUrUmCrUmUrArGr GrCrUrUrCrArGmGrUmUmCmG	1301
SNCA-660	Modified 27mer antisense strand	mCmAmAmArGrUrUrArUrUmUrCmUrUrAr GrGrCrUrUrCrAmGrGmUmUmC	1302

SNCA-661	Modified 27mer antisense strand	mGmCmAmArArUrArUrArUmUrUmCrUrUr ArGrGrCrUrUrCmArGmGmUmU	1303
SNCA-662	Modified 27mer antisense strand	mAmGmCmArArUrGrArUrAmUrUmUrCrUr UrArGrGrCrUrUmCrAmGmGmU	1304
SNCA-663	Modified 27mer antisense strand	mGmAmGmCrArUrArGrArUmArUmUrUrCr UrUrArGrGrCrUmUrCmAmGmG	1305
SNCA-668	Modified 27mer antisense strand	mAmCmUmGrGrUrArGrCrAmArAmGrArUr ArUrUrUrCrUrUmArGmGmCmU	1306
SNCA-669	Modified 27mer antisense strand	mAmAmCmUrGrUrGrArGrCmArAmArGrAr UrArUrUrUrCrUmUrAmGmGmC	1307
SNCA-672	Modified 27mer antisense strand	mAmGmAmArArUrUrGrGrGmArGmCrArAr ArGrArUrArUrUmUrCmUmUmA	1308
SNCA-675	Modified 27mer antisense strand	mUmCmAmArGrUrArArCrUmGrGmGrArGr CrArArArGrArUmArUmUmUmC	1309
SNCA-676	Modified 27mer antisense strand	mCmUmCmArArUrArArArCmUrGmGrGrAr GrCrArArArGrAmUrAmUmUmU	1310
SNCA-689	Modified 27mer antisense strand	mUmCmUmGrUrUrArGrCrAmGrAmUrCrUr CrArArGrArArArAmCrUmGmGmG	1311
SNCA-724	Modified 27mer antisense strand	mCmAmCmArUrUrGrGrArAmCrUmGrArGr CrArCrUrUrGrUmArCmAmGmG	1312
SNCA-744	Modified 27mer antisense strand	mUmGmAmGrArUrArUrGrUmCrAmUrGrAr CrUrGrGrGrCrAmCrAmUmUmG	1313
SNCA-745	Modified 27mer antisense strand	mUmUmGmArGrUrArArUrGmUrCmArUrGr ArCrUrGrGrGrCmArCmAmUmU	1314
SNCA-746	Modified 27mer antisense strand	mUmUmUmGrArUrArArArUmGrUmCrArUr GrArCrUrGrGrGmCrAmCmAmU	1315
SNCA-751	Modified 27mer antisense strand	mAmAmAmArCrUrUrUrGrAmGrAmArArUr GrUrCrArUrGrAmCrUmGmGmG	1316
SNCA-752	Modified 27mer antisense strand	mAmAmAmArArUrUrUrUrGmArGmArArAr UrGrUrCrArUrGmArCmUmGmG	1317
SNCA-753	Modified 27mer antisense strand	mUmAmAmArArUrCrUrUrUmGrAmGrArAr ArUrGrUrCrArUmGrAmCmUmG	1318
SNCA-754	Modified 27mer antisense strand	mGmUmAmArArUrArCrUrUmUrGmArGrAr ArArUrGrUrCrAmUrGmAmCmU	1319
SNCA-755	Modified 27mer antisense strand	mUmGmUmArArUrArArCrUmUrUmGrArGr ArArArUrGrUrCmArUmGmAmC	1320
SNCA-756	Modified 27mer antisense strand	mCmUmGmUrArUrArArArCmUrUmUrGrAr GrArArArUrGrUmCrAmUmGmA	1321
SNCA-757	Modified 27mer antisense strand	mAmCmUmGrUrUrArArArAmCrUmUrUrGr ArGrArArArUrGmUrCmAmUmG	1322
SNCA-758	Modified 27mer antisense strand	mCmAmCmUrGrUrArArArAmArCmUrUrUr GrArGrArArArUmGrUmCmAmU	1323

SNCA-759	Modified 27mer antisense strand	mAmCmAmCrUrUrUrArArAmArAmCrUrUr UrGrArGrArArAmUrGmUmCmA	1324
SNCA-760	Modified 27mer antisense strand	mUmAmCmArCrUrGrUrArAmArAmArCrUr UrUrGrArGrArAmArUmGmUmC	1325
SNCA-761	Modified 27mer antisense strand	mAmUmAmCrArUrUrGrUrAmArAmArArCr UrUrUrGrArGrAmArAmUmGmU	1326
SNCA-762	Modified 27mer antisense strand	mGmAmUmArCrUrCrUrGrUmArAmArArAr CrUrUrUrGrArGmArAmAmUmG	1327
SNCA-789	Modified 27mer antisense strand	mUmCmAmArUrUrArCrUrGmCrUmGrArUr GrGrArArGrArCmUrUmCmGmA	1328
SNCA-795	Modified 27mer antisense strand	mGmAmUmArCrUrUrCrArAmUrCmArCrUr GrCrUrGrArUrGmGrAmAmGmA	1329
SNCA-796	Modified 27mer antisense strand	mAmGmAmUrArUrUrUrCrAmArUmCrArCr UrGrCrUrGrArUmGrGmAmAmG	1330
SNCA-797	Modified 27mer antisense strand	mCmAmGmArUrUrCrUrUrCmArAmUrCrAr CrUrGrCrUrGrAmUrGmGmAmA	1331
SNCA-798	Modified 27mer antisense strand	mAmCmAmGrArUrArCrUrUmCrAmArUrCr ArCrUrGrCrUrGmArUmGmGmA	1332
SNCA-799	Modified 27mer antisense strand	mUmAmCmArGrUrUrArCrUmUrCmArArUr CrArCrUrGrCrUmGrAmUmGmG	1333
SNCA-800	Modified 27mer antisense strand	mGmUmAmCrArUrArUrArCmUrUmCrArAr UrCrArCrUrGrCmUrGmAmUmG	1334
SNCA-801	Modified 27mer antisense strand	mGmGmUmArCrUrGrArUrAmCrUmUrCrAr ArUrCrArCrUrGmCrUmGmAmU	1335
SNCA-802	Modified 27mer antisense strand	mAmGmGmUrArUrArGrArUmArCmUrUrCr ArArUrCrArCrUmGrCmUmGmA	1336
SNCA-803	Modified 27mer antisense strand	mCmAmGmGrUrUrCrArGrAmUrAmCrUrUr CrArArUrCrArCmUrGmCmUmG	1337
SNCA-804	Modified 27mer antisense strand	mGmCmAmGrGrUrArCrArGmArUmArCrUr UrCrArArUrCrAmCrUmGmCmU	1338
SNCA-805	Modified 27mer antisense strand	mGmGmCmArGrUrUrArCrAmGrAmUrArCr UrUrCrArArUrCmArCmUmGmC	1339
SNCA-809	Modified 27mer antisense strand	mUmGmGmGrGrUrCrArGrGmUrAmCrArGr ArUrArCrUrUrCmArAmUmCmA	1340
SNCA-839	Modified 27mer antisense strand	mUmCmAmGrUrUrArArArArGmGrGmArArGr CrArCrCrGrArAmArUmGmCmU	1341
SNCA-844	Modified 27mer antisense strand	mUmCmAmCrUrUrCrArGrUmGrAmArArGr GrGrArArGrCrAmCrCmGmAmA	1342
SNCA-845	Modified 27mer antisense strand	mUmUmCmArCrUrUrCrArGmUrGmArArAr GrGrGrArArGrCmArCmCmGmA	1343
SNCA-846	Modified 27mer antisense strand	mAmUmUmCrArUrUrUrCrAmGrUmGrArAr ArGrGrGrArArGmCrAmCmCmG	1344

SNCA-847	Modified 27mer antisense strand	mUmAmUmUrCrUrCrUrUrCmArGmUrGrAr ArArGrGrGrArAmGrCmAmCmC	1345
SNCA-848	Modified 27mer antisense strand	mGmUmAmUrUrUrArCrUrUmCrAmGrUrGr ArArArGrGrGrAmArGmCmAmC	1346
SNCA-849	Modified 27mer antisense strand	mUmGmUmArUrUrCrArCrUmUrCmArGrUr GrArArArGrGrGmArAmGmCmA	1347
SNCA-850	Modified 27mer antisense strand	mAmUmGmUrArUrUrCrArCmUrUmCrArGr UrGrArArArGrGmGrAmAmGmC	1348
SNCA-851	Modified 27mer antisense strand	mCmAmUmGrUrUrUrUrCrAmCrUmUrCrAr GrUrGrArArArGmGrGmAmAmG	1349
SNCA-852	Modified 27mer antisense strand	mCmCmAmUrGrUrArUrUrCmArCmUrUrCr ArGrUrGrArArAmGrGmGmAmA	1350
SNCA-853	Modified 27mer antisense strand	mAmCmCmArUrUrUrArUrUmCrAmCrUrUr CrArGrUrGrArAmArGmGmGmA	1351
SNCA-854	Modified 27mer antisense strand	mUmAmCmCrArUrGrUrArUmUrCmArCrUr UrCrArGrUrGrAmArAmGmGmG	1352
SNCA-855	Modified 27mer antisense strand	mCmUmAmCrCrUrUrGrUrAmUrUmCrArCr UrUrCrArGrUrGmArAmAmGmG	1353
SNCA-856	Modified 27mer antisense strand	mGmCmUmArCrUrArUrGrUmArUmUrCrAr CrUrUrCrArGrUmGrAmAmAmG	1354
SNCA-857	Modified 27mer antisense strand	mUmGmCmUrArUrCrArUrGmUrAmUrUrCr ArCrUrUrCrArGmUrGmAmAmA	1355
SNCA-858	Modified 27mer antisense strand	mCmUmGmCrUrUrCrCrArUmGrUmArUrUr CrArCrUrUrCrAmGrUmGmAmA	1356
SNCA-859	Modified 27mer antisense strand	mCmCmUmGrCrUrArCrCrAmUrGmUrArUr UrCrArCrUrUrCmArGmUmGmA	1357
SNCA-860	Modified 27mer antisense strand	mCmCmCmUrGrUrUrArCrCmArUmGrUrAr UrUrCrArCrUrUmCrAmGmUmG	1358
SNCA-861	Modified 27mer antisense strand	mAmCmCmCrUrUrCrUrArCmCrAmUrGrUr ArUrUrCrArCrUmUrCmAmGmU	1359
SNCA-863	Modified 27mer antisense strand	mAmGmAmCrCrUrUrGrCrUmArCmCrArUr GrUrArUrUrCrAmCrUmUmCmA	1360
SNCA-864	Modified 27mer antisense strand	mAmAmGmArCrUrCrUrGrCmUrAmCrCrAr UrGrUrArUrUrCmArCmUmUmC	1361
SNCA-865	Modified 27mer antisense strand	mAmAmAmGrArUrCrCrUrGmCrUmArCrCr ArUrGrUrArUrUmCrAmCmUmU	1362
SNCA-867	Modified 27mer antisense strand	mAmCmAmArArUrArCrCrCmUrGmCrUrAr CrCrArUrGrUrAmUrUmCmAmC	1363
SNCA-868	Modified 27mer antisense strand	mCmAmCmArArUrGrArCrCmCrUmGrCrUr ArCrCrArUrGrUmArUmUmCmA	1364
SNCA-875	Modified 27mer antisense strand	mCmAmCmArGrUrArCrArCmArAmArGrAr CrCrCrUrGrCrUmArCmCmAmU	1365

SNCA-881	Modified 27mer antisense strand	mAmAmAmArUrUrCrArCrAmGrCmArCrAr CrArArArGrArCmCrCmUmGmC	1366
SNCA-883	Modified 27mer antisense strand	mAmCmAmArArUrUrCrCrAmCrAmGrCrAr CrArCrArArArGmArCmCmCmU	1367
SNCA-889	Modified 27mer antisense strand	mGmAmAmGrCrUrArCrArArAmArAmUrCrCr ArCrArGrCrArCmArCmAmAmA	1368
SNCA-890	Modified 27mer antisense strand	mUmGmAmArGrUrCrArCrAmArAmArUrCr CrArCrArGrCrAmCrAmCmAmA	1369
SNCA-891	Modified 27mer antisense strand	mUmUmGmArArUrCrCrArCmArAmArArUr CrCrArCrArGrCmArCmAmCmA	1370
SNCA-892	Modified 27mer antisense strand	mAmUmUmGrArUrGrCrCrAmCrAmArArAr UrCrCrArCrArGmCrAmCmAmC	1371
SNCA-893	Modified 27mer antisense strand	mGmAmUmUrGrUrArGrCrCmArCmArArAr ArUrCrCrArCrAmGrCmAmCmA	1372
SNCA-894	Modified 27mer antisense strand	mAmGmAmUrUrUrArArGrCmCrAmCrArAr ArArUrCrCrArCmArGmCmAmC	1373
SNCA-895	Modified 27mer antisense strand	mUmAmGmArUrUrGrArArGmCrCmArCrAr ArArArUrCrCrAmCrAmGmCmA	1374
SNCA-897	Modified 27mer antisense strand	mCmGmUmArGrUrUrUrGrAmArGmCrCrAr CrArArArArUrCmCrAmCmAmG	1375
SNCA-898	Modified 27mer antisense strand	mUmCmGmUrArUrArUrUrGmArAmGrCrCr ArCrArArArArUmCrCmAmCmA	1376
SNCA-900	Modified 27mer antisense strand	mCmAmUmCrGrUrArGrArUmUrGmArArGr CrCrArCrArArAmArUmCmCmA	1377
SNCA-901	Modified 27mer antisense strand	mAmCmAmUrCrUrUrArGrAmUrUmGrArAr GrCrCrArCrArAmArAmUmCmC	1378
SNCA-956	Modified 27mer antisense strand	mAmUmAmGrUrUrArGrGrAmUrUmUrArGr ArArArUrArArGmUrGmGmUmA	1379
SNCA-957	Modified 27mer antisense strand	mAmAmUmArGrUrGrArGrGmArUmUrUrAr GrArArArUrArAmGrUmGmGmU	1380
SNCA-958	Modified 27mer antisense strand	mAmAmAmUrArUrUrGrArGmGrAmUrUrUr ArGrArArArUrAmArGmUmGmG	1381
SNCA-959	Modified 27mer antisense strand	mAmAmAmArUrUrGrUrGrAmGrGmArUrUr UrArGrArArArUmArAmGmUmG	1382
SNCA-961	Modified 27mer antisense strand	mAmAmAmArArUrUrArGrUmGrAmGrGrAr UrUrUrArGrArAmArUmAmAmG	1383
SNCA-962	Modified 27mer antisense strand	mAmAmAmArArUrArUrArGmUrGmArGrGr ArUrUrUrArGrAmArAmUmAmA	1384
SNCA-963	Modified 27mer antisense strand	mCmAmAmArArUrArArUrAmGrUmGrArGr GrArUrUrUrArGmArAmAmUmA	1385
SNCA-964	Modified 27mer antisense strand	mAmCmAmArArUrArArArUmArGmUrGrAr GrGrArUrUrUrAmGrAmAmAmU	1386

SNCA-965	Modified 27mer antisense strand	mAmAmCmArArUrArArArAmUrAmGrUrGr ArGrGrArUrUrUmArGmAmAmA	1387
SNCA-966	Modified 27mer antisense strand	mCmAmAmCrArUrArArArArAmArUmArGrUr GrArGrGrArUrUmUrAmGmAmA	1388
SNCA-967	Modified 27mer antisense strand	mGmCmAmArCrUrArArArArAmArAmUrArGr UrGrArGrGrArUmUrUmAmGmA	1389
SNCA-968	Modified 27mer antisense strand	mAmGmCmArArUrArArArArAmArAmArUrAr GrUrGrArGrGrAmUrUmUmAmG	1390
SNCA-969	Modified 27mer antisense strand	mCmAmGmCrArUrCrArArAmArAmArArUr ArGrUrGrArGrGmArUmUmUmA	1391
SNCA-970	Modified 27mer antisense strand	mAmCmAmGrCrUrArCrArAmArAmArArAr UrArGrUrGrArGmGrAmUmUmU	1392
SNCA-971	Modified 27mer antisense strand	mAmAmCmArGrUrArArCrAmArAmArArAr ArUrArGrUrGrAmGrGmAmUmU	1393
SNCA-972	Modified 27mer antisense strand	mCmAmAmCrArUrCrArArCmArAmArArAr ArArUrArGrUrGmArGmGmAmU	1394
SNCA-973	Modified 27mer antisense strand	mAmCmAmArCrUrGrCrArAmCrAmArArAr ArArArUrArGrUmGrAmGmGmA	1395
SNCA-974	Modified 27mer antisense strand	mAmAmCmArArUrArGrCrAmArCmArArAr ArArArArUrArGmUrGmAmGmG	1396
SNCA-975	Modified 27mer antisense strand	mGmAmAmCrArUrCrArGrCmArAmCrArAr ArArArArArUrAmGrUmGmAmG	1397
SNCA-976	Modified 27mer antisense strand	mUmGmAmArCrUrArCrArGmCrAmArCrAr ArArArArArArUmArGmUmGmA	1398
SNCA-977	Modified 27mer antisense strand	mCmUmGmArArUrArArCrAmGrCmArArCr ArArArArArArAmUrAmGmUmG	1399
SNCA-978	Modified 27mer antisense strand	mUmCmUmGrArUrCrArArCmArGmCrArAr CrArArArArArAmArUmAmGmU	1400
SNCA-979	Modified 27mer antisense strand	mUmUmCmUrGrUrArCrArAmCrAmGrCrAr ArCrArArArArAmArAmUmAmG	1401
SNCA-980	Modified 27mer antisense strand	mCmUmUmCrUrUrArArCrAmArCmArGrCr ArArCrArArArAmArAmAmUmA	1402
SNCA-981	Modified 27mer antisense strand	mAmCmUmUrCrUrGrArArCmArAmCrArGr CrArArCrArArAmArAmAmAmU	1403
SNCA-982	Modified 27mer antisense strand	mAmAmCmUrUrUrUrGrArAmCrAmArCrAr GrCrArArCrArAmArAmAmAmA	1404
SNCA-983	Modified 27mer antisense strand	mCmAmAmCrUrUrCrUrGrAmArCmArArCr ArGrCrArArCrAmArAmAmAmA	1405
SNCA-984	Modified 27mer antisense strand	mAmCmAmArCrUrUrCrUrGmArAmCrArAr CrArGrCrArArCmArAmAmAmA	1406
SNCA-985	Modified 27mer antisense strand	mAmAmCmArArUrUrUrCrUmGrAmArCrAr ArCrArGrCrArAmCrAmAmAmA	1407

SNCA-986	Modified 27mer antisense strand	mUmAmAmCrArUrCrUrUrCmUrGmArArCr ArArCrArGrCrAmArCmAmAmA	1408
SNCA-987	Modified 27mer antisense strand	mCmUmAmArCrUrArCrUrUmCrUmGrArAr CrArArCrArGrCmArAmCmAmA	1409
SNCA-988	Modified 27mer antisense strand	mAmCmUmArArUrArArCrUmUrCmUrGrAr ArCrArArCrArGmCrAmAmCmA	1410
SNCA-989	Modified 27mer antisense strand	mCmAmCmUrArUrCrArArCmUrUmCrUrGr ArArCrArArCrAmGrCmAmAmC	1411
SNCA-990	Modified 27mer antisense strand	mUmCmAmCrUrUrArCrArAmCrUmUrCrUr GrArArCrArArCmArGmCmAmA	1412
SNCA-991	Modified 27mer antisense strand	mAmUmCmArCrUrArArCrAmArCmUrUrCr UrGrArArCrArAmCrAmGmCmA	1413
SNCA-992	Modified 27mer antisense strand	mAmAmUmCrArUrUrArArCmArAmCrUrUr CrUrGrArArCrAmArCmAmGmC	1414
SNCA-993	Modified 27mer antisense strand	mAmAmAmUrCrUrCrUrArAmCrAmArCrUr UrCrUrGrArArCmArAmCmAmG	1415
SNCA-994	Modified 27mer antisense strand	mCmAmAmArUrUrArCrUrAmArCmArArCr UrUrCrUrGrArArAmCrAmAmCmA	1416
SNCA-995	Modified 27mer antisense strand	mGmCmAmArArUrCrArCrUmArAmCrArAr CrUrUrCrUrGrAmArCmAmAmC	1417
SNCA-996	Modified 27mer antisense strand	mAmGmCmArArUrUrCrArCmUrAmArCrAr ArCrUrUrCrUrGmArAmCmAmA	1418
SNCA-997	Modified 27mer antisense strand	mUmAmGmCrArUrArUrCrAmCrUmArArCr ArArCrUrUrCrUmGrAmAmCmA	1419
SNCA-998	Modified 27mer antisense strand	mAmUmAmGrCrUrArArUrCmArCmUrArAr CrArArCrUrUrCmUrGmAmAmC	1420
SNCA-999	Modified 27mer antisense strand	mGmAmUmArGrUrArArArUmCrAmCrUrAr ArCrArArCrUrUmCrUmGmAmA	1421
SNCA-1000	Modified 27mer antisense strand	mUmGmAmUrArUrCrArArAmUrCmArCrUr ArArCrArArCrUmUrCmUmGmA	1422
SNCA-1001	Modified 27mer antisense strand	mAmUmGmArUrUrGrCrArAmArUmCrArCr UrArArCrArArCmUrUmCmUmG	1423
SNCA-1002	Modified 27mer antisense strand	mUmAmUmGrArUrArGrCrAmArAmUrCrAr CrUrArArCrArAmCrUmUmCmU	1424
SNCA-1003	Modified 27mer antisense strand	mAmUmAmUrGrUrUrArGrCmArAmArUrCr ArCrUrArArCrAmArCmUmUmC	1425
SNCA-1004	Modified 27mer antisense strand	mUmAmUmArUrUrArUrArGmCrAmArArUr CrArCrUrArArCmArAmCmUmU	1426
SNCA-1005	Modified 27mer antisense strand	mAmUmAmUrArUrGrArUrAmGrCmArArAr UrCrArCrUrArAmCrAmAmCmU	1427
SNCA-1028	Modified 27mer antisense strand	mAmAmAmArGrUrCrArCrCmUrAmArArAr ArUrCrUrUrArUmArAmUmAmU	1428

SNCA-1029	Modified 27mer antisense strand	mUmAmAmArArUrArCrArCmCrUmArArArArUrCrUrUrAmUrAmAmUmA	1429
SNCA-1030	Modified 27mer antisense strand	mUmUmAmArArUrGrArCrAmCrCmUrArArArArArUrCrUrUmArUmAmAmU	1430
SNCA-1031	Modified 27mer antisense strand	mAmUmUmArArUrArGrArCmArCmCrUrArArArArArUrCrUmUrAmUmAmA	1431
SNCA-1032	Modified 27mer antisense strand	mCmAmUmUrArUrArArArGrAmCrAmCrCrUrArArArArArUrCmUrUmAmUmA	1432
SNCA-1033	Modified 27mer antisense strand	mUmCmAmUrUrUrArArArArGmArCmArCrCrUrArArArArArUmCrUmUmAmU	1433
SNCA-1034	Modified 27mer antisense strand	mAmUmCmArUrUrArArArArAmGrAmCrArCrCrUrArArArArArAmUrCmUmUmA	1434
SNCA-1035	Modified 27mer antisense strand	mUmAmUmCrArUrUrUrArArArAmArGmArCrArCrCrUrArArArAmArUmCmUmU	1435
SNCA-1036	Modified 27mer antisense strand	mGmUmAmUrCrUrUrUrUrArArAmArAmGrArCrArCrCrUrArArArAmArAmUmCmU	1436
SNCA-1037	Modified 27mer antisense strand	mAmGmUmArUrUrUrArUrUrArArAmArAmArGrArCrArCrCrUrArArArAmArAmAmUmC	1437
SNCA-1038	Modified 27mer antisense strand	mCmAmGmUrArUrCrArUrUmArArAmArAmArArGrArCrArCrCrUrArArArAmArAmAmU	1438
SNCA-1039	Modified 27mer antisense strand	mAmCmAmGrUrUrUrCrArUmUrArAmArArArGrArCrArCrCrUmArArAmAmAmA	1439
SNCA-1040	Modified 27mer antisense strand	mGmAmCmArGrUrArUrCrArAmUrUmArArArArArGrArCrArCrCmUrAmAmAmA	1440
SNCA-1041	Modified 27mer antisense strand	mAmGmAmCrArUrUrUrArUrCmArUmUrArArArArArGrArCrArCmCrUmAmAmA	1441
SNCA-1042	Modified 27mer antisense strand	mUmAmGmArCrUrGrUrUrArUmCrArUmUrUrArArArArGrArCrArCmCrCmUmAmA	1442
SNCA-1043	Modified 27mer antisense strand	mUmUmAmGrArUrArGrUrArUmUrCmArUrUrArArArArArGrArCmArCmCmUmA	1443
SNCA-1044	Modified 27mer antisense strand	mCmUmUmArGrUrCrArGrUmArUmCrArUrUrUrArArArArArGrArCmArCmCmU	1444
SNCA-1045	Modified 27mer antisense strand	mUmCmUmUrArUrArCrArGmUrArUmUrCrArUrUrArArArArArGmArCmArCmC	1445
SNCA-1046	Modified 27mer antisense strand	mUmUmCmUrUrUrGrArCrArCmGrUmArUrCrArUrUrArArArArArAmGrArCmArCmC	1446
SNCA-1047	Modified 27mer antisense strand	mAmUmUmCrUrUrArGrGrArCmArGmUrArUrCrArUrUrArArArArArAmArGmArCmA	1447
SNCA-1048	Modified 27mer antisense strand	mUmAmUmUrCrUrUrArGrArAmCrArAmGrUrArUrCrArArUrArArArArAmArGmGmAmC	1448
SNCA-1049	Modified 27mer antisense strand	mUmUmAmUrUrUrUrUrArGmArCmArGrUrArUrCrArUrUrArArArArAmGmA	1449

SNCA-1050	Modified 27mer antisense strand	mAmUmUmArUrUrCrUrUrAmGrAmCrArGrUrArUrCrArUrUmArAmAmAmG	1450
SNCA-1051	Modified 27mer antisense strand	mCmAmUmUrArUrUrCrUrUmArGmArCrArGrUrArUrCrArUmUrAmAmAmA	1451
SNCA-1052	Modified 27mer antisense strand	mUmCmAmUrUrUrUrUrCrUmUrAmGrArCrArGrUrArUrCrAmUrUmAmAmA	1452
SNCA-1053	Modified 27mer antisense strand	mGmUmCmArUrUrArUrUrCmUrUmArGrArCrArGrUrArUrCmArUmUmAmA	1453
SNCA-1054	Modified 27mer antisense strand	mCmGmUmCrArUrUrArUrUmCrUmUrArGrArCrArGrUrArUmCrAmUmUmA	1454
SNCA-1055	Modified 27mer antisense strand	mAmCmGmUrCrUrUrUrArUmUrCmUrUrArGrArCrArGrUrAmUrCmAmUmU	1455
SNCA-1056	Modified 27mer antisense strand	mUmAmCmGrUrUrArUrUrAmUrUmCrUrUrArGrArCrArGrUmArUmCmAmU	1456
SNCA-1057	Modified 27mer antisense strand	mAmUmAmCrGrUrCrArUrUmArUmUrCrUrUrArGrArCrArGmUrAmUmCmA	1457
SNCA-1058	Modified 27mer antisense strand	mAmAmUmArCrUrUrCrArUmUrAmUrUrCrUrUrArGrArCrAmGrUmAmUmC	1458
SNCA-1078	Modified 27mer antisense strand	mUmAmUmArUrUrUrUrArAmCrAmArArUrUrUrCrArCrArAmUrAmCmGmU	1459
SNCA-1079	Modified 27mer antisense strand	mAmUmAmUrArUrArUrUrAmArCmArArArUrUrUrCrArCrAmArUmAmCmG	1460
SNCA-1080	Modified 27mer antisense strand	mUmAmUmArUrUrUrArUrUmArAmCrArArArUrUrUrCrArCmArAmUmAmC	1461
SNCA-1086	Modified 27mer antisense strand	mAmAmGmUrArUrUrArUrArUmUrAmUrArUrUrArArCrArArArAmUrUmUmCmA	1462
SNCA-1087	Modified 27mer antisense strand	mUmAmAmGrUrUrUrUrArUmArUmArUrArUrUrArCrArAmArUmUmUmC	1463
SNCA-1088	Modified 27mer antisense strand	mUmUmAmArGrUrArUrUrArUmUrAmUrArUrArUrUrArArCrAmArAmUmUmU	1464
SNCA-1089	Modified 27mer antisense strand	mUmUmUmArArUrUrArUrUmArUmArUrArUrArUrUrArArCmArAmAmUmU	1465
SNCA-1090	Modified 27mer antisense strand	mUmUmUmUrArUrGrUrArUmUrAmUrArUrArUrArUrUrArArCrAmAmAmU	1466
SNCA-1091	Modified 27mer antisense strand	mUmUmUmUrUrUrArGrUrAmUrUmArUrArUrArUrUrUrAmArCmAmAmA	1467
SNCA-1092	Modified 27mer antisense strand	mAmUmUmUrUrUrArArGrUmArUmUrArUrArUrArUrUmArAmCmAmA	1468
SNCA-1093	Modified 27mer antisense strand	mUmAmUmUrUrUrUrArArGmUrAmUrUrArUrArUrArUmUrAmAmCmA	1469
SNCA-1116	Modified 27mer antisense strand	mAmGmGmUrGrUrArUrArGmUrUmUrCrArUrGrCrUrCrArCmArUmAmUmU	1470

SNCA-1117	Modified 27mer antisense strand	mUmAmGmGrUrUrCrArUrAmGrUmUrUrCrArUrGrCrUrCrAmCrAmUmAmU	1471
SNCA-1119	Modified 27mer antisense strand	mUmAmUmArGrUrUrGrCrAmUrAmGrUrUrUrCrArUrGrCrUmCrAmCmAmU	1472
SNCA-1120	Modified 27mer antisense strand	mUmUmAmUrArUrGrUrGrCmArUmArGrUrUrUrCrArUrGrCmUrCmAmCmA	1473
SNCA-1121	Modified 27mer antisense strand	mUmUmUmArUrUrGrGrUrGmCrAmUrArGrUrUrUrCrArUrGmCrUmCmAmC	1474
SNCA-1122	Modified 27mer antisense strand	mAmUmUmUrArUrArGrGrUmGrCmArUrArGrUrUrUrCrArUmGrCmUmCmA	1475
SNCA-1123	Modified 27mer antisense strand	mUmAmUmUrUrUrUrArGrGmUrGmCrArUrArGrUrUrUrCrAmUrGmCmUmC	1476
SNCA-1124	Modified 27mer antisense strand	mGmUmAmUrUrUrArUrArGmGrUmGrCrArUrArGrUrUrUrCmArUmGmCmU	1477
SNCA-1125	Modified 27mer antisense strand	mAmGmUmArUrUrUrArUrAmGrGmUrGrCrArUrArGrUrUrUmCrAmUmGmC	1478
SNCA-1126	Modified 27mer antisense strand	mUmAmGmUrArUrUrUrUrArUmArGmGrUrGrCrArUrArGrUrUmUrCmAmUmG	1479
SNCA-1127	Modified 27mer antisense strand	mUmUmAmGrUrUrUrUrUrAmUrAmGrGrUrGrCrArUrArGrUmUrUmCmAmU	1480
SNCA-1128	Modified 27mer antisense strand	mUmUmUmArGrUrArUrUrUmArUmArGrGrUrGrCrArUrArGmUrUmUmCmA	1481
SNCA-1129	Modified 27mer antisense strand	mAmUmUmUrArUrUrArUrUmUrAmUrArGrGrUrGrCrArUrAmGrUmUmUmC	1482
SNCA-1130	Modified 27mer antisense strand	mUmAmUmUrUrUrGrUrArUmUrUmArUrArGrGrUrGrCrArUmArGmUmUmU	1483
SNCA-1131	Modified 27mer antisense strand	mAmUmAmUrUrUrArGrUrAmUrUmUrArUrArGrGrUrGrCrAmUrAmGmUmU	1484
SNCA-1132	Modified 27mer antisense strand	mCmAmUmArUrUrUrArGrUmArUmUrUrArUrArGrGrUrGrCmArUmAmGmU	1485
SNCA-1133	Modified 27mer antisense strand	mUmCmAmUrArUrUrUrUrArGmUrAmUrUrUrArUrArGrGrUrGmCrAmUmAmG	1486
SNCA-1194	Modified 27mer antisense strand	mUmAmAmUrUrUrUrCrArCmCrAmUrUrUrArUrArUrArCrAmArAmCmAmC	1487
SNCA-1195	Modified 27mer antisense strand	mUmUmAmArUrUrCrUrCrAmCrCmArUrUrUrArUrArUrArCmArAmAmCmA	1488
SNCA-1196	Modified 27mer antisense strand	mUmUmUmArArUrUrCrUrCmArCmCrArUrUrUrArUrArUrAmCrAmAmAmC	1489
SNCA-1197	Modified 27mer antisense strand	mUmUmUmUrArUrUrUrCrUmCrAmCrCrArUrUrUrArUrArUmArCmAmAmA	1490
SNCA-1198	Modified 27mer antisense strand	mAmUmUmUrUrUrArUrUrCmUrCmArCrCrArUrUrUrArUrAmUrAmCmAmA	1491

SNCA-1199	Modified 27mer antisense strand	mUmAmUmUrUrUrArArUrUmCrUmCrArCrCrArUrUrUrArUmArUmAmCmA	1492
SNCA-1200	Modified 27mer antisense strand	mUmUmAmUrUrUrUrArArUmUrCmUrCrArCrCrArUrUrUrAmUrAmUmAmC	1493
SNCA-1201	Modified 27mer antisense strand	mUmUmUmArUrUrUrUrArAmUrUmCrUrCrArCrCrArUrUrUmArUmAmUmA	1494
SNCA-1202	Modified 27mer antisense strand	mUmUmUmUrArUrUrUrUrAmArUmUrCrUrCrArCrCrArUrUmUrAmUmAmU	1495
SNCA-1203	Modified 27mer antisense strand	mGmUmUmUrUrUrUrUrUrUmArAmUrUrCrUrCrArCrCrArUmUrUmAmUmA	1496
SNCA-1204	Modified 27mer antisense strand	mCmGmUmUrUrUrArUrUrUmUrAmArUrUrCrUrCrArCrCrAmUrUmUmAmU	1497
SNCA-1205	Modified 27mer antisense strand	mAmCmGmUrUrUrUrArUrUmUrUmArArUrUrCrUrCrArCrCmArUmUmUmA	1498
SNCA-1206	Modified 27mer antisense strand	mAmAmCmGrUrUrUrUrArUmUrUmUrArArUrUrCrUrCrArCmCrAmUmUmU	1499
SNCA-1207	Modified 27mer antisense strand	mUmAmAmCrGrUrUrUrUrAmUrUmUrUrArArUrUrCrUrCrAmCrCmAmUmU	1500
SNCA-1208	Modified 27mer antisense strand	mAmUmAmArCrUrUrUrUrUmArUmUrUrUrArArUrUrCrUrCmArCmCmAmU	1501
SNCA-1250	Modified 27mer antisense strand	mUmUmAmArArUrUrGrArGmArUmGrGrGrArUrArArArArAmUrAmAmAmA	1502
SNCA-1252	Modified 27mer antisense strand	mUmAmUmUrArUrArGrUrGmArGmArUrGrGrGrArUrArArAmArAmUmAmA	1503
SNCA-1253	Modified 27mer antisense strand	mUmUmAmUrUrUrArArGrUmGrAmGrArUrGrGrGrArUrArAmArAmAmUmA	1504
SNCA-1254	Modified 27mer antisense strand	mAmUmUmArUrUrArArArGmUrGmArGrArUrGrGrGrArUrAmArAmAmAmU	1505
SNCA-1255	Modified 27mer antisense strand	mUmAmUmUrArUrUrArArAmGrUmGrArGrArUrGrGrGrArUmArAmAmAmA	1506
SNCA-1256	Modified 27mer antisense strand	mUmUmAmUrUrUrUrUrArAmArGmUrGrArGrArUrGrGrGrAmUrAmAmAmA	1507
SNCA-1257	Modified 27mer antisense strand	mUmUmUmArUrUrArUrUrAmArAmGrUrGrArGrArUrGrGrGmArUmAmAmA	1508
SNCA-1258	Modified 27mer antisense strand	mUmUmUmUrArUrUrArUrUmArAmArGrUrGrArGrArUrGrGmGrAmUmAmA	1509
SNCA-1259	Modified 27mer antisense strand	mUmUmUmUrUrUrUrUrArUmUrAmArArGrUrGrArGrArUrGmGrGmAmUmA	1510
SNCA-1260	Modified 27mer antisense strand	mAmUmUmUrUrUrArUrUrAmUrUmArArArGrUrGrArGrArUmGrGmGmAmU	1511
SNCA-1261	Modified 27mer antisense strand	mGmAmUmUrUrUrUrArUrUmArUmUrArArArGrUrGrArGrArAmUrGmGmGmA	1512

SNCA-1262	Modified 27mer antisense strand	mUmGmAmUrUrUrUrUrArUmUrAmUrUrArArArGrUrGrArGmArUmGmGmG	1513
SNCA-1263	Modified 27mer antisense strand	mAmUmGmArUrUrUrUrUrAmUrUmArUrUrArArArGrUrGrAmGrAmUmGmG	1514
SNCA-1264	Modified 27mer antisense strand	mCmAmUmGrArUrUrUrUrUmArUmUrArUrUrArArArGrUrGmArGmAmUmG	1515
SNCA-1265	Modified 27mer antisense strand	mGmCmAmUrGrUrUrUrUrUmUrAmUrUrArUrUrArArArGrUmGrAmGmAmU	1516
SNCA-1266	Modified 27mer antisense strand	mAmGmCmArUrUrArUrUrUmUrUmArUrUrArUrUrArArArGmUrGmAmGmA	1517
SNCA-1267	Modified 27mer antisense strand	mAmAmGmCrArUrGrArUrUmUrUmUrArUrUrArUrUrArArArAmGrUmGmAmG	1518
SNCA-1351	Modified 27mer antisense strand	mUmUmCmUrArUrArArUrUmCrCmUrCrCrUrUrCrUrUrCrAmArAmUmGmG	1519
SNCA-1365	Modified 27mer antisense strand	mAmUmUmUrUrUrUrCrUrAmCrCmUrCrUrUrCrUrArArArAmUrUmCmCmU	1520
SNCA-1372	Modified 27mer antisense strand	mAmUmGmUrUrUrCrArUrUmUrUmCrUrCrUrArCrCrUrCrUmUrCmUmAmA	1521
SNCA-1373	Modified 27mer antisense strand	mAmAmUmGrUrUrCrCrArUmUrUmUrCrUrCrUrArCrCrUrCmUrUmCmUmA	1522
SNCA-1374	Modified 27mer antisense strand	mUmAmAmUrGrUrUrCrCrAmUrUmUrUrCrUrCrUrArCrCrUmCrUmUmCmU	1523
SNCA-1375	Modified 27mer antisense strand	mUmUmAmArUrUrUrUrCrCmArUmUrUrUrCrUrCrUrArCrCmUrCmUmUmC	1524
SNCA-1376	Modified 27mer antisense strand	mGmUmUmArArUrGrUrUrCmCrAmUrUrUrUrCrUrCrUrArCmCrUmCmUmU	1525
SNCA-1377	Modified 27mer antisense strand	mGmGmUmUrArUrUrGrUrUmCrCmArUrUrUrUrCrUrCrUrArAmCrCmUmCmU	1526
SNCA-1379	Modified 27mer antisense strand	mAmGmGmGrUrUrArArArUrGmUrUmCrCrArUrUrUrUrCrUrCmUrAmCmCmU	1527
SNCA-1380	Modified 27mer antisense strand	mUmAmGmGrGrUrUrUrArArArUmGrUmUrCrCrArUrUrUrUrCrUmCrUmAmCmC	1528
SNCA-1381	Modified 27mer antisense strand	mGmUmAmGrGrUrUrUrUrArAmUrGmUrUrCrCrArUrUrUrUrCmUrCmUmAmC	1529
SNCA-1382	Modified 27mer antisense strand	mUmGmUmArGrUrGrUrUrUrAmArUmGrUrUrCrCrArUrUrUrUmCrUmCmUmA	1530
SNCA-1383	Modified 27mer antisense strand	mGmUmGmUrArUrGrGrUrUmArAmUrGrUrUrCrCrArUrUrUmUrCmUmCmU	1531
SNCA-1384	Modified 27mer antisense strand	mAmGmUmGrUrUrGrGrGrUmUrAmArUrGrUrUrCrCrArUrUmUrUmCmUmC	1532
SNCA-1385	Modified 27mer antisense strand	mGmAmGmUrGrUrArGrGrGmUrUmArArUrGrUrUrCrCrArUmUrUmUmCmU	1533

SNCA-1388	Modified 27mer antisense strand	mUmCmCmGrArUrUrGrUrAmGrGmGrUrUrArArUrGrUrUrCmCrAmUmUmU	1534
SNCA-1428	Modified 27mer antisense strand	mCmAmUmArCrUrArArArArAmCrAmCrArCrUrUrCrUrGrGrCmArGmUmGmU	1535
SNCA-1429	Modified 27mer antisense strand	mGmCmAmUrArUrCrArArAmArCmArCrArCrUrUrCrUrGrGmCrAmGmUmG	1536
SNCA-0227	36mer sense strand	UGGUGUAAAGGAAUUCAUUAGCAGCCGAAAGGCUGC	1537
SNCA-0228	36mer sense strand	GGUGUAAAGGAAUUCAUUAAGCAGCCGAAAGGCUGC	1538
SNCA-0242	36mer sense strand	CAUUAGCCAUGGAUGUAUUAGCAGCCGAAAGGCUGC	1539
SNCA-0244	36mer sense strand	UUAGCCAUGGAUGUAUUCAAGCAGCCGAAAGGCUGC	1540
SNCA-0248	36mer sense strand	CCAUGGAUGUAUUCAUGAAAGCAGCCGAAAGGCUGC	1541
SNCA-0254	36mer sense strand	AUGUAUUCAUGAAAGGACUAGCAGCCGAAAGGCUGC	1542
SNCA-0342	36mer sense strand	AAAGACAAAAGAGGGUGUUAGCAGCCGAAAGGCUGC	1543
SNCA-0351	36mer sense strand	AGAGGGUGUUCUCUAUGUAAGCAGCCGAAAGGCUGC	1544
SNCA-0421	36mer sense strand	AAGACCAAAGAGCAAGUGAAGCAGCCGAAAGGCUGC	1545
SNCA-0426	36mer sense strand	CAAAGAGCAAGUGACAAAUAGCAGCCGAAAGGCUGC	1546
SNCA-0434	36mer sense strand	AAGUGACAAAUGUUGGAGGAGCAGCCGAAAGGCUGC	1547
SNCA-0657	36mer sense strand	CGAACCUGAAGCCUAAGAAAGCAGCCGAAAGGCUGC	1548
SNCA-0675	36mer sense strand	AAUAUCUUUGCUCCCAGUUAGCAGCCGAAAGGCUGC	1549
SNCA-0737	36mer sense strand	AGUUCCAAUGUGCCCAGUCAGCAGCCGAAAGGCUGC	1550
SNCA-0751	36mer sense strand	CAGUCAUGACAUUUCUCAAAGCAGCCGAAAGGCUGC	1551
SNCA-0757	36mer sense strand	UGACAUUUCUCAAAGUUUUAGCAGCCGAAAGGCUGC	1552
SNCA-0801	36mer sense strand	CAGCAGUGAUUGAAGUAUCAGCAGCCGAAAGGCUGC	1553
SNCA-0291	36mer sense strand	GAUGUAUUCAUGAAAGGACAGCAGCCGAAAGGCUGC	1554

SNCA-0986	36mer sense strand	UGUUGCUGUUGUUCAGAAGAGCAGCCGAAAGGCUGC	1555
SNCA-1034	36mer sense strand	AGAUUUUUAGGUGUCUUUUAGCAGCCGAAAGGCUGC	1556
SNCA-1043	36mer sense strand	GGUGUCUUUUAAUGAUACUAGCAGCCGAAAGGCUGC	1557
SNCA-0230	36mer sense strand	UGUAAAGGAAUUCAUUAGCAGCAGCCGAAAGGCUGC	1558
SNCA-0250	36mer sense strand	AUGGAUGUAUUCAUGAAAGAGCAGCCGAAAGGCUGC	1559
SNCA-0429	36mer sense strand	AGAGCAAGUGACAAAUGUUAGCAGCCGAAAGGCUGC	1560
SNCA-0642	36mer sense strand	AGGGUAUCAAGACUACGAAAGCAGCCGAAAGGCUGC	1561
SNCA-0676	36mer sense strand	AUAUCUUUGCUCCCAGUUUAGCAGCCGAAAGGCUGC	1562
SNCA-0730	36mer sense strand	AGUGCUCAGUUCCAAUGUGAGCAGCCGAAAGGCUGC	1563
SNCA-0752	36mer sense strand	AGUCAUGACAUUUCUCAAAAGCAGCCGAAAGGCUGC	1564
SNCA-0760	36mer sense strand	CAUUUCUCAAAGUUUUUACAGCAGCCGAAAGGCUGC	1565
SNCA-0800	36mer sense strand	UCAGCAGUGAUUGAAGUAUAGCAGCCGAAAGGCUGC	1566
SNCA-0892	36mer sense strand	GUGCUGUGGAUUUUGUGGCAGCAGCCGAAAGGCUGC	1567
SNCA-0893	36mer sense strand	UGCUGUGGAUUUUGUGGCUAGCAGCCGAAAGGCUGC	1568
SNCA-0995	36mer sense strand	UGUUCAGAAGUUGUUAGUGAGCAGCCGAAAGGCUGC	1569
SNCA-1003	36mer sense strand	AGUUGUUAGUGAUUUGCUAAGCAGCCGAAAGGCUGC	1570
SNCA-1048	36mer sense strand	CUUUUAAUGAUACUGUCUAAGCAGCCGAAAGGCUGC	1571
SNCA-0227	22mer antisense strand	UAAUGAAUUCCUUUACACCAGG	1572
SNCA-0228	22mer antisense strand	UUAAUGAAUUCCUUUACACCGG	1573
SNCA-0242	22mer antisense strand	UAAUACAUCCAUGGCUAAUGGG	1574
SNCA-0244	22mer antisense strand	UUGAAUACAUCCAUGGCUAAGG	1575

SNCA-0248	22mer antisense strand	UUUCAUGAAUACAUCCAUGGGG	1576
SNCA-0254	22mer antisense strand	UAGUCCUUUCAUGAAUACAUGG	1577
SNCA-0342	22mer antisense strand	UAACACCCUCUUUUGUCUUUGG	1578
SNCA-0351	22mer antisense strand	UUACAUAGAGAACACCCUCUGG	1579
SNCA-0421	22mer antisense strand	UUCACUUGCUCUUUGGUCUUGG	1580
SNCA-0426	22mer antisense strand	UAUUUGUCACUUGCUCUUUGGG	1581
SNCA-0434	22mer antisense strand	UCCUCCAACAUUUGUCACUUGG	1582
SNCA-0657	22mer antisense strand	UUUCUUAGGCUUCAGGUUCGGG	1583
SNCA-0675	22mer antisense strand	UAACUGGGAGCAAAGAUAUUGG	1584
SNCA-0737	22mer antisense strand	UGACUGGGCACAUUGGAACUGG	1585
SNCA-0751	22mer antisense strand	UUUGAGAAAUGUCAUGACUGGG	1586
SNCA-0757	22mer antisense strand	UAAAACUUUGAGAAAUGUCAGG	1587
SNCA-0801	22mer antisense strand	UGAUACUUCAAUCACUGCUGGG	1588
SNCA-0291	22mer antisense strand	UGUCCUUUCAUGAAUACAUCGG	1589
SNCA-0986	22mer antisense strand	UCUUCUGAACAACAGCAACAGG	1590
SNCA-1034	22mer antisense strand	UAAAAGACACCUAAAAAUCUGG	1591
SNCA-1043	22mer antisense strand	UAGUAUCAUUAAAAGACACCGG	1592
SNCA-0230	22mer antisense strand	UGCUAAUGAAUUCCUUUACAGG	1593
SNCA-0250	22mer antisense strand	UCUUUCAUGAAUACAUCCAUGG	1594
SNCA-0429	22mer antisense strand	UAACAUUUGUCACUUGCUCUGG	1595
SNCA-0642	22mer antisense strand	UUUCGUAGUCUUGAUACCCUGG	1596

SNCA-0676	22mer antisense strand	UAAACUGGGAGCAAAGAUAUGG	1597
SNCA-0730	22mer antisense strand	UCACAUUGGAACUGAGCACUGG	1598
SNCA-0752	22mer antisense strand	UUUUGAGAAAUGUCAUGACUGG	1599
SNCA-0760	22mer antisense strand	UGUAAAAACUUUGAGAAAUGGG	1600
SNCA-0800	22mer antisense strand	UAUACUUCAAUCACUGCUGAGG	1601
SNCA-0892	22mer antisense strand	UGCCACAAAAUCCACAGCACGG	1602
SNCA-0893	22mer antisense strand	UAGCCACAAAAUCCACAGCAGG	1603
SNCA-0995	22mer antisense strand	UCACUAACAACUUCUGAACAGG	1604
SNCA-1003	22mer antisense strand	UUAGCAAAUCACUAACAACUGG	1605
SNCA-1048	22mer antisense strand	UUAGACAGUAUCAUUAAAAGGG	1606
SNCA-0227	Modified 36mer sense strand	[mUs][mG][fG][mU][fG][mU][mA][fA][mA][fG][mG][fA][fA][mU][fU][mC][fA][mU][mU][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1607
SNCA-0228	Modified 36mer sense strand	[mGs][mG][fU][mG][fU][mA][mA][fA][mG][fG][mA][fA][fU][mU][fC][mA][fU][mU][mA][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1608
SNCA-0242	Modified 36mer sense strand	[mCs][mA][fU][mU][fA][mG][mC][fC][mA][fU][mG][fG][fA][mU][fG][mU][fA][mU][mU][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1609
SNCA-0244	Modified 36mer sense strand	[mUs][mU][fA][mG][fC][mC][mA][fU][mG][fG][mA][fU][fG][mU][fA][mU][fU][mC][mA][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1610
SNCA-0248	Modified 36mer sense strand	[mCs][mC][fA][mU][fG][mG][mA][fU][mG][fU][mA][fU][fU][mC][fA][mU][fG][mA][mA][mA][mG][mC][mA][mG][mC][mC][mG][ad	1611

		emA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	
SNCA-0254	Modified 36mer sense strand	[mAs][mU][fG][mU][fA][mU][mU][fC][mA][fU][mG][fA][fA][mA][fG][mG][fA][mC][mU][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1612
SNCA-0342	Modified 36mer sense strand	[mAs][mA][fA][mG][fA][mC][mA][fA][mA][fA][mG][fA][fG][mG][fG][mU][fG][mU][mU][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1613
SNCA-0351	Modified 36mer sense strand	[mAs][mG][fA][mG][fG][mG][mU][fG][mU][fU][mC][fU][fC][mU][fA][mU][fG][mU][mA][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1614
SNCA-0421	Modified 36mer sense strand	[mAs][mA][fG][mA][fC][mC][mA][fA][mA][fG][mA][fG][fC][mA][fA][mG][fU][mG][mA][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1615
SNCA-0426	Modified 36mer sense strand	[mCs][mA][fA][mA][fG][mA][mG][fC][mA][fA][mG][fU][fG][mA][fC][mA][fA][mA][mU][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1616
SNCA-0434	Modified 36mer sense strand	[mAs][mA][fG][mU][fG][mA][mC][fA][mA][fA][mU][fG][fU][mU][fG][mG][fA][mG][mG][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1617
SNCA-0657	Modified 36mer sense strand	[mCs][mG][fA][mA][fC][mC][mU][fG][mA][fA][mG][fC][fC][mU][fA][mA][fG][mA][mA][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1618
SNCA-0675	Modified 36mer sense strand	[mAs][mA][fU][mA][fU][mC][mU][fU][mU][fG][mC][fU][fC][mC][fC][mA][fG][mU][mU][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1619

SNCA-0737	Modified 36mer sense strand	[mAs][mG][fU][mU][fC][mC][mA][fA][mU][fG][mU][fG][fC][mC][fC][mA][fG][mU][mC][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1620
SNCA-0751	Modified 36mer sense strand	[mCs][mA][fG][mU][fC][mA][mU][fG][mA][fC][mA][fU][fU][mU][fC][mU][fC][mA][mA][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1621
SNCA-0757	Modified 36mer sense strand	[mUs][mG][fA][mC][fA][mU][mU][fU][mC][fU][mC][fA][fA][mA][fG][mU][fU][mU][mU][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1622
SNCA-0801	Modified 36mer sense strand	[mCs][mA][fG][mC][fA][mG][mU][fG][mA][fU][mU][fG][fA][mA][fG][mU][fA][mU][mC][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1623
SNCA-0291	Modified 36mer sense strand	[mGs][mA][mU][mG][mU][mA][mU][fU][fC][fA][fU][mG][mA][mA][mA][mG][mG][mA][mC][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1624
SNCA-0986	Modified 36mer sense strand	[mUs][mG][fU][mU][fG][mC][mU][fG][mU][fU][mG][fU][fU][mC][fA][mG][fA][mA][mG][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1625
SNCA-1034	Modified 36mer sense strand	[mAs][mG][fA][mU][fU][mU][mU][fU][mA][fG][mG][fU][fG][mU][fC][mU][fU][mU][mU][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1626
SNCA-1043	Modified 36mer sense strand	[mGs][mG][fU][mG][fU][mC][mU][fU][mU][fU][mA][fA][fU][mG][fA][mU][fA][mC][mU][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1627
SNCA-0230	Modified 36mer sense strand	[mUs][mG][fU][mA][fA][mA][mG][fG][mA][fA][mU][fU][fC][mA][fU][mU][fA][mG][mC][mA][mG][mC][mA][mG][mC][mC][mG][ad	1628

		emA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	
SNCA-0250	Modified 36mer sense strand	[mAs][mU][fG][mG][fA][mU][mG][fU][mA][fU][mU][fC][fA][mU][fG][mA][fA][mA][mG][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1629
SNCA-0429	Modified 36mer sense strand	[mAs][mG][fA][mG][fC][mA][mA][fG][mU][fG][mA][fC][fA][mA][fA][mU][fG][mU][mU][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1630
SNCA-0642	Modified 36mer sense strand	[mAs][mG][fG][mG][fU][mA][mU][fC][mA][fA][mG][fA][fC][mU][fA][mC][fG][mA][mA][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1631
SNCA-0676	Modified 36mer sense strand	[mAs][mU][fA][mU][fC][mU][mU][fU][mG][fC][mU][fC][fC][mC][fA][mG][fU][mU][mU][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1632
SNCA-0730	Modified 36mer sense strand	[mAs][mG][fU][mG][fC][mU][mC][fA][mG][fU][mU][fC][fC][mA][fA][mU][fG][mU][mG][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1633
SNCA-0752	Modified 36mer sense strand	[mAs][mG][fU][mC][fA][mU][mG][fA][mC][fA][mU][fU][fU][mC][fU][mC][fA][mA][mA][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1634
SNCA-0760	Modified 36mer sense strand	[mCs][mA][fU][mU][fU][mC][mU][fC][mA][fA][mA][fG][fU][mU][fU][mU][fU][mA][mC][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1635
SNCA-0800	Modified 36mer sense strand	[mUs][mC][fA][mG][fC][mA][mG][fU][mG][fA][mU][fU][fG][mA][fA][mG][fU][mA][mU][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1636

SNCA-0892	Modified 36mer sense strand	[mGs][mU][fG][mC][fU][mG][mU][fG][mG][fA][mU][fU][fU][mU][fG][mU][fG][mG][mC][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1637
SNCA-0893	Modified 36mer sense strand	[mUs][mG][fC][mU][fG][mU][mG][fG][mA][fU][mU][fU][fU][mG][fU][mG][fG][mC][mU][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1638
SNCA-0995	Modified 36mer sense strand	[mUs][mG][fU][mU][fC][mA][mG][fA][mA][fG][mU][fU][fG][mU][fU][mA][fG][mU][mG][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1639
SNCA-1003	Modified 36mer sense strand	[mAs][mG][fU][mU][fG][mU][mU][fA][mG][fU][mG][fA][fU][mU][fU][mG][fC][mU][mA][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1640
SNCA-1048	Modified 36mer sense strand	[mCs][mU][fU][mU][fU][mA][mA][fU][mG][fA][mU][fA][fC][mU][fG][mU][fC][mU][mA][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]	1641
SNCA-0227	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fAs][fA][fU][fG][mA][fA][mU][mU][fC][mC][mU][mU][fU][mA][fC][mA][mC][fC][mAs][mGs][mG]	1642
SNCA-0228	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fUs][fA][fA][fU][mG][fA][mA][mU][fU][mC][mC][mU][fU][mU][fA][mC][mA][fC][mCs][mGs][mG]	1643
SNCA-0242	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fAs][fA][fU][fA][mC][fA][mU][mC][fC][mA][mU][mG][fG][mC][fU][mA][mA][fU][mGs][mGs][mG]	1644
SNCA-0244	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fUs][fG][fA][fA][mU][fA][mC][mA][fU][mC][mC][mA][fU][mG][fG][mC][mU][fA][mAs][mGs][mG]	1645
SNCA-0248	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fUs][fU][fC][fA][mU][fG][mA][mA][f	1646

		U][mA][mC][mA][fU][mC][fC][mA][mU][fG][mGs][mGs][mG]	
SNCA-0254	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fAs][fG][fU][fC][mC][fU][mU][mU][fC][mA][mU][mG][fA][mA][fU][mA][mC][fA][mUs][mGs][mG]	1647
SNCA-0342	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fAs][fA][fC][fA][mC][fC][mC][mU][fC][mU][mU][mU][fU][mG][fU][mC][mU][fU][mUs][mGs][mG]	1648
SNCA-0351	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fUs][fA][fC][fA][mU][fA][mG][mA][fG][mA][mA][mC][fA][mC][fC][mC][mU][fC][mUs][mGs][mG]	1649
SNCA-0421	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fUs][fC][fA][fC][mU][fU][mG][mC][fU][mC][mU][mU][fU][mG][fG][mU][mC][fU][mUs][mGs][mG]	1650
SNCA-0426	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fAs][fU][fU][fU][mG][fU][mC][mA][fC][mU][mU][mG][fC][mU][fC][mU][mU][fU][mGs][mGs][mG]	1651
SNCA-0434	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fCs][fC][fU][fC][mC][fA][mA][mC][fA][mU][mU][mU][fG][mU][fC][mA][mC][fU][mUs][mGs][mG]	1652
SNCA-0657	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fUs][fU][fC][fU][mU][fA][mG][mG][fC][mU][mU][mC][fA][mG][fG][mU][mU][fC][mGs][mGs][mG]	1653
SNCA-0675	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fAs][fA][fC][fU][mG][fG][mG][mA][fG][mC][mA][mA][fA][mG][fA][mU][mA][fU][mUs][mGs][mG]	1654
SNCA-0737	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fGs][fA][fC][fU][mG][fG][mG][mC][fA][mC][mA][mU][fU][mG][fG][mA][mA][fC][mUs][mGs][mG]	1655
SNCA-0751	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fUs][fU][fG][fA][mG][fA][mA][mA][fU][mG][mU][mC][fA][mU][fG][mA][mC][fU][mGs][mGs][mG]	1656

SNCA-0757	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fAs][fA][fA][fA][mC][fU][mU][mU][fG][mA][mG][mA][fA][mA][fU][mG][mU][fC][mAs][mGs][mG]	1657
SNCA-0801	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fGs][fA][fU][fA][mC][fU][mU][mC][fA][mA][mU][mC][fA][mC][fU][mG][mC][fU][mGs][mGs][mG]	1658
SNCA-0291	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fGs][fUs][fC][fC][mU][fU][mU][mC][fA][mU][mG][mA][fA][mU][mA][mC][mA][mU][mCs][mGs][mG]	1659
SNCA-0986	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fCs][fU][fU][fC][mU][fG][mA][mA][fC][mA][mA][mC][fA][mG][fC][mA][mA][fC][mAs][mGs][mG]	1660
SNCA-1034	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fAs][fA][fA][fA][mG][fA][mC][mA][fC][mC][mU][mA][fA][mA][fA][mA][mU][fC][mUs][mGs][mG]	1661
SNCA-1043	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fAs][fG][fU][fA][mU][fC][mA][mU][fU][mA][mA][mA][fA][mG][fA][mC][mA][fC][mCs][mGs][mG]	1662
SNCA-0230	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fGs][fC][fU][fA][mA][fU][mG][mA][fA][mU][mU][mC][fC][mU][fU][mU][mA][fC][mAs][mGs][mG]	1663
SNCA-0250	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fCs][fU][fU][fU][mC][fA][mU][mG][fA][mA][mU][mA][fC][mA][fU][mC][mC][fA][mUs][mGs][mG]	1664
SNCA-0429	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fAs][fA][fC][fA][mU][fU][mU][mG][fU][mC][mA][mC][fU][mU][fG][mC][mU][fC][mUs][mGs][mG]	1665
SNCA-0642	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fUs][fU][fC][fG][mU][fA][mG][mU][fC][mU][mU][mG][fA][mU][fA][mC][mC][fC][mUs][mGs][mG]	1666
SNCA-0676	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fAs][fA][fA][fC][mU][fG][mG][mG][f	1667

		A][mG][mC][mA][fA][mA][fG][mA][mU][fA][mUs][mGs][mG]	
SNCA-0730	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fCs][fA][fC][fA][mU][fU][mG][mG][fA][mA][mC][mU][fG][mA][fG][mC][mA][fC][mUs][mGs][mG]	1668
SNCA-0752	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fUs][fU][fU][fG][mA][fG][mA][mA][fA][mU][mG][mU][fC][mA][fU][mG][mA][fC][mUs][mGs][mG]	1669
SNCA-0760	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fGs][fU][fA][fA][mA][fA][mA][mC][fU][mU][mU][mG][fA][mG][fA][mA][mA][fU][mGs][mGs][mG]	1670
SNCA-0800	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fAs][fU][fA][fC][mU][fU][mC][mA][fA][mU][mC][mA][fC][mU][fG][mC][mU][fG][mAs][mGs][mG]	1671
SNCA-0892	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fGs][fC][fC][fA][mC][fA][mA][mA][fA][mU][mC][mC][fA][mC][fA][mG][mC][fA][mCs][mGs][mG]	1672
SNCA-0893	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fAs][fG][fC][fC][mA][fC][mA][mA][fA][mA][mU][mC][fC][mA][fC][mA][mG][fC][mAs][mGs][mG]	1673
SNCA-0995	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fCs][fA][fC][fU][mA][fA][mC][mA][fA][mC][mU][mU][fC][mU][fG][mA][mA][fC][mAs][mGs][mG]	1674
SNCA-1003	Modified 22mer antisense strand	[MePhosphonate-4O-mUs][fUs][fA][fG][fC][mA][fA][mA][mU][fC][mA][mC][mU][fA][mA][fC][mA][mA][fC][mUs][mGs][mG]	1675
SNCA-1048	Modified 22 mer antisense strand	[MePhosphonate-4O-mUs][fUs][fA][fG][fA][mC][fA][mG][mU][fA][mU][mC][mA][fU][mU][fA][mA][mA][fA][mGs][mGs][mG]	1676
Human SNCA mRNA sequence	NM_000345.3	AGGAGAAGGAGAAGGAGGAGGACTAG GAGGAGGAGGACGGCGACGACCAGAA GGGGCCCAAGAGAGGGGGCGAGCGAC CGAGCGCCGCGACGCGGAAGTGAGGTG CGTGCGGGCTGCAGCGCAGACCCCGGC	1677

		CCGGCCCCTCCGAGAGCGTCCTGGGCG CTCCCTCACGCCTTGCCTTCAAGCCTTC TGCCTTTCCACCCTCGTGAGCGGAGAA CTGGGAGTGGCCATTCGACGACAGTGT GGTGTAAAGGAATTCATTAGCCATGGA TGTATTCATGAAAGGACTTTCAAAGGC CAAGGAGGGAGTTGTGGCTGCTGCTGA GAAAACCAAACAGGGTGTGGCAGAAG CAGCAGGAAAGACAAAAGAGGGTGTTC TCTATGTAGGCTCCAAAACCAAGGAGG GAGTGGTGCATGGTGTGGCAACAGTGG CTGAGAAGACCAAAGAGCAAGTGACA AATGTTGGAGGAGCAGTGGTGACGGGT GTGACAGCAGTAGCCCAGAAGACAGTG GAGGGAGCAGGGAGCATTGCAGCAGCC ACTGGCTTTGTCAAAAAGGACCAGTTG GGCAAGAATGAAGAAGGAGCCCCACA GGAAGGAATTCTGGAAGATATGCCTGT GGATCCTGACAATGAGGCTTATGAAAT GCCTTCTGAGGAAGGGTATCAAGACTA CGAACCTGAAGCCTAAGAAATATCTTT GCTCCCAGTTTCTTGAGATCTGCTGACA GATGTTCCATCCTGTACAAGTGCTCAGT TCCAATGTGCCCAGTCATGACATTTCTC AAAGTTTTTACAGTGTATCTCGAAGTCT TCCATCAGCAGTGATTGAAGTATCTGTA CCTGCCCCCACTCAGCATTTCGGTGCTT CCCTTTCACTGAAGTGAATACATGGTA GCAGGGTCTTTGTGTGCTGTGGATTTTG TGGCTTCAATCTACGATGTTAAAACAA ATTAAAAACACCTAAGTGACTACCACT TATTTCTAAATCCTCACTATTTTTTTGTT GCTGTTGTTCAGAAGTTGTTAGTGATTT GCTATCATATATTATAAGATTTTTAGGT GTCTTTTAATGATACTGTCTAAGAATAA TGACGTATTGTGAAATTTGTTAATATAT ATAATACTTAAAAATATGTGAGCATGA AACTATGCACCTATAAATACTAAATAT GAAATTTTACCATTTTGCGATGTGTTTT ATTCACTTGTGTTTGTATATAAATGGTG AGAATTAAAATAAAACGTTATCTCATT GCAAAAATATTTTATTTTTATCCCATCT CACTTTAATAATAAAAATCATGCTTATA AGCAACATGAATTAAGAACTGACACAA	

		AGGACAAAAATATAAAGTTATTAATAG CCATTTGAAGAAGGAGGAATTTTAGAA GAGGTAGAGAAAATGGAACATTAACCC TACACTCGGAATTCCCTGAAGCAACAC TGCCAGAAGTGTGTTTTGGTATGCACTG GTTCCTTAAGTGGCTGTGATTAATTATT GAAAGTGGGGTGTTGAAGACCCCAACT ACTATTGTAGAGTGGTCTATTTCTCCCT TCAATCCTGTCAATGTTTGCTTTACGTA TTTTGGGGAACTGTTGTTTGATGTGTAT GTGTTTATAATTGTTATACATTTTTAAT TGAGCCTTTTATTAACATATATTGTTAT TTTTGTCTCGAAATAATTTTTTAGTTAA AATCTATTTTGTCTGATATTGGTGTGAA TGCTGTACCTTTCTGACAATAAATAATA TTCGACCATGAATAAAAAAAAAAAAAA AGTGGGTTCCCGGGAACTAAGCAGTGT AGAAGATGATTTTGACTACACCCTCCTT AGAGAGCCATAAGACACATTAGCACAT ATTAGCACATTCAAGGCTCTGAGAGAA TGTGGTTAACTTTGTTTAACTCAGCATT CCTCACTTTTTTTTTTTAATCATCAGAA ATTCTCTCTCTCTCTCTCTTTTTCTCT CGCTCTCTTTTTTTTTTTTTTTTACAGG AAATGCCTTTAAACATCGTTGGAACTA CCAGAGTCACCTTAAAGGAGATCAATT CTCTAGACTGATAAAAATTTCATGGCCT CCTTTAAATGTTGCCAAATATATGAATT CTAGGATTTTTCCTTAGGAAAGGTTTTT CTCTTTCAGGGAAGATCTATTAACTCCC CATGGGTGCTGAAAATAAACTTGATGG TGAAAAACTCTGTATAAATTAATTTAA AAATTATTTGGTTTCTCTTTTTAATTATT CTGGGGCATAGTCATTTCTAAAAGTCA CTAGTAGAAAGTATAATTTCAAGACAG AATATTCTAGACATGCTAGCAGTTTATA TGTATTCATGAGTAATGTGATATATATT GGGCGCTGGTGAGGAAGGAAGGAGGA ATGAGTGACTATAAGGATGGTTACCAT AGAAACTTCCTTTTTTACCTAATTGAAG AGAGACTACTACAGAGTGCTAAGCTGC ATGTGTCATCTTACACTAGAGAGAAAT GGTAAGTTTCTTGTTTTATTTAAGTTAT GTTTAAGCAAGGAAAGGATTTGTTATT	

		GAACAGTATATTTCAGGAAGGTTAGAA AGTGGCGGTTAGGATATATTTTAAATCT ACCTAAAGCAGCATATTTTAAAAATTT AAAAGTATTGGTATTAAATTAAGAAAT AGAGGACAGAACTAGACTGATAGCAGT GACCTAGAACAATTTGAGATTAGGAAA GTTGTGACCATGAATTTAAGGATTTATG TGGATACAAATTCTCCTTTAAAGTGTTT CTTCCCTTAATATTTATCTGACGGTAAT TTTTGAGCAGTGAATTACTTTATATATC TTAATAGTTTATTTGGGACCAAACACTT AAACAAAAAGTTCTTTAAGTCATATAA GCCTTTTCAGGAAGCTTGTCTCATATTC ACTCCCGAGACATTCACCTGCCAAGTG GCCTGAGGATCAATCCAGTCCTAGGTTT ATTTTGCAGACTTACATTCTCCCAAGTT ATTCAGCCTCATATGACTCCACGGTCGG CTTTACCAAAACAGTTCAGAGTGCACTT TGGCACACAATTGGGAACAGAACAATC TAATGTGTGGTTTGGTATTCCAAGTGGG GTCTTTTTCAGAATCTCTGCACTAGTGT GAGATGCAAACATGTTTCCTCATCTTTC TGGCTTATCCAGTATGTAGCTATTTGTG ACATAATAAATATATACATATATGAAA ATA	
Mouse SNCA mRNA sequence	NM_001042451.2	AGATACCCACAGCCCTCACGCACCGCA CCTCCAACCAACCCGTCCCCTCCCTAGG AAGAGGAGCGAAGGCACGAGGCAGGC GAGGGGCGGGGAGAGGCGCTGACAAA TCAGCTGCGGGGGCGACGTGAAGGAGC CAGGGAGCCAGAGCGCCCGGCAGCAG GCAGCAGACGGCAGGAGACCAGCAGG TGTTCCCCCTGCCCCTGCCTGCCCTTGC CTCTTTCATTGAAATTAGATTGGGGAAA ACAGGAAGAATCGGAGTTCTTCAGAAG CCTAGGGAGCCGTGTGGAGCAAAAATA CATCTTTAGCCATGGATGTGTTCATGAA AGGACTTTCAAAGGCCAAGGAGGGAGT TGTGGCTGCTGCTGAGAAAACCAAGCA GGGTGTGGCAGAGGCAGCTGGAAAGAC AAAAGAGGGAGTCCTCTATGTAGGTTC CAAAACTAAGGAAGGAGTGGTTCATGG AGTGACAACAGTGGCTGAGAAGACCAA AGAGCAAGTGACAAATGTTGGAGGAGC	1678

		AGTGGTGACTGGTGTGACAGCAGTCGC TCAGAAGACAGTGGAGGGAGCTGGGA ATATAGCTGCTGCCACTGGCTTTGTCAA GAAGGACCAGATGGGCAAGGGTGAGG AGGGGTACCCACAGGAAGGAATCCTGG AAGACATGCCTGTGGATCCTGGCAGTG AGGCTTATGAAATGCCTTCAGAGGAAG GCTACCAAGACTATGAGCCTGAAGCCT AAGAATGTCATTGCACCCAATCTCCTA AGATCTGCCGGCTGCTCTTCCATGGCGT ACAAGTGCTCAGTTCCAATGTGCCCAG TCATGACCTTTTCTCAAAGCTGTACAGT GTGTTTCAAAGTCTTCCATCAGCAGTGA TCGGCGTCCTGTACCTGCCCCTCAGCAT CCCGGTGCTCCCCTCTCACTACAGTGAA AACCTGGTAGCAGGGTCTTGTGTGCTGT GGATATTGTTGTGGCTTCACACTTAAAT TGTTAGAAGAAACTTAAAACACCTAAG TGACTACCACTTATTTCTAAATCTTCAT CGTTTTCTTTTTGTTGCTGTTCTTAAGAA GTTGTGATTTGCTCCAAGAGTTTTAGGT GTCCTGAATGACTCTTTCTGTCTAAGAA TGATGTGTTGTGAAATTTGTTAATATAT ATTTTAAAATTATGTGAGCATGAGACT ATGCACCTATAAATATTAATTTATGAAT TTTACAGTTTTGTGATGTGTTTTATTAA CTTGTGTTTGTATATAAATGGTGGAAAA TAAAATAAAATATTATCCATTGCAAAA TCAAAAAAAAAAAAAAAAAA	
Monkey SNCA mRNA sequence	XM_005555420.2	CCTTGCGCGGCCAGGCAGGCGGCTGGA ATTGGTGGTTCACCCTGCGCCCCCTGCC CCATCCCCATCCGAGATAGGGAACGAA GAGCACGCTGCAGGGAAAGCAGCGAG CGCTGGGAGGGGAGCGTGGAGAGGCG CTGACAAATCAGCGGTGGGGGCGGAGA GCCGAGGAGAAGGAGAAGGAGGAGGA CGAGGAGGAGGAGGACGGCGACGACC AGAAGGGGCCCGAGAGAGGGGGCGAG CGACCGAGCGCCGCGACGCGGGAGTGA GGTGCGTGCGGGCTGCAGCGCAGACCC CGGCCCGGCCCCTCCGAGAGCGTCCTG AGCGCTCCCTCACGCCTTCCCTTCAAAC CTTCTGCCTTTTTCTCCATCCTCGTGAG CGGAGAACTGGGAGTGGCCATTCGACG	1679

		ACAGTGTGGTGTAAAGGAATTCATTAG CCATGGATGTATTCATGAAAGGACTTTC AAAGGCCAAGGAGGGAGTTGTGGCTGC TGCTGAGAAAACCAAACAGGGTGTGGC AGAAGCAGCAGGAAAGACAAAAGAGG GTGTTCTCTATGTAGGCTCCAAAACCAA GGAGGGAGTGGTGCACGGTGTGGCAAC AGTGGCTGAGAAGACCAAAGAGCAAGT GACAAATGTTGGAGGAGCGGTGGTGAC GGGTGTGACAGCAGTAGCCCAGAAGAC AGTGGAGGGAGCAGGGAGCATTGCAGC AGCCACTGGCTTCATCAAAAAGGACCA GTTGGGCAAGAATGAAGAAGGAGCCCC ACAGGAAGGAATTCTACAAGATATGCC TGTGGATCCTGACAATGAGGCTTATGA AATGCCTTCTGAGGAAGGGTATCAAGA CTACGAACCTGAAGCCTAAGAAATATC TTTGCTCCCAGTTTCTTGAGATCTGCTG ACAGACGTTCCATCTTGTACAAGTGCTC AGTTCCAATGTGCCCAGTCATGACATTT CTCAAAGTTTTTACAGTATATTTTGAAG TCTTCCATCAGCAGTGATTGAAGTATCT GTACCTGCCCCCATTCAGCATTTCGGTG CTTCCCTTTCACTGAAGTGAATACATGG TAGCAGGGTCTTTGTGTGCTGTGGATTT TGTGGCTTCAATCTATGATGTTAAAACA ATTTAAAAACACCTAAGTGACTACCAC TTATTTCTAAATCCTCACTATTTTTTTGT TGCTGTTGTTCAGAAGTTGTTAGTGATT TGCTATCGTATATTATAAGATTTTTAGG TGTCTTTTAATGATACTGTCTAAGAATA ATGATGTATTGTGAAATTTGTTAATATA TATAATACTTAAAAGTATGTGAGCATG AAACTATGCACCTATAAATACTAACTA TGAAATTTTACCGTTTTGTGATGTGTTT TATTAACTTGTGTTTGTATATAAATGGT GAGAATTAAAATAAAATGTCGTCTCAT TGCAAACAAAAATTTATTTTTATCCCAT CTCACTTTAATAATAAAAATCTTGCTTA TAAGCAACATGCATTGAGAACTGACAC AATGGACATAAAGTTATTAATAGGCAT TTGAAGAAGGAGGAATTTTAGAAGAGG TAGAGAAAATGGAACATTAACCCTACA CTGGGAATTCCCTGAAGCAGCACTGCC	

		AGAAGTGTGTTTTGTGGTGCCTTAAGTG GCTGTGATAAAAAAAAAAAAAAGTGG GCTCCAGGGAACGAAGCAGTGTAAAAG ATGATTTTGACTACATCCTCCTTAGAGA TCCATGAGACACTTTAGCACATATTAGC ACATTCAAGGCTCTGAGACAATGTGGT TAACTTAGTTTAACTCAGCAGTCCCCAC TAAAAAAAAAAAAATCATCAAAAATTC TCTCTCTCTATTCCTTTTTCTCTCGCTCC CCTTTTTTCCAGGAAATGCCTTTAAACA CCTTTGGGAACTATCAGGATCACCTTAA AGAAGATCAGTTCTCCAGACTGATAAA AATTTCATGATCTCTTTTAAATGTTGCC AAATATATGAATTCTAGGATTTTTCCTT GGGAAAGGTTTTTCTCTTTCAGGGAAG ATCTATTAACTCCCCATGGGTGCTGAAA ATAAACTTGATGGTGAAAAATTCTATA TAAATTAATTTAAAATTTTTTTGGTTTC TCTTTTTAATTATTCTGGGGCATAGTCA TTTTTAAAAGTCACTAGTAGAAAGTAT AATTTCAAGACAGAATATTCTAGACAT GCTAGCAGTTTATATGTATTCATGAGTA ATGTGATATATATTGGGCACTGGTGAG GCAGGAAGGAGGAATGAGTGACTATAA GGATGGTTACCATAGAAACTTCCTTTTT TACCTAATTGAAAAGCGACTACTACAG AGTGCTAAGCTGCATGTGTCATCTTACA CTGGAGAGAAATGGTAAGTTTCTTGTTT TATTTAAGTTATGTTTAAGCAAGGAAA GGATTTTTTATTGAACAGTATATTTCAG GAAGGTTAGAAAATAGCTGTTAGGATA TATTTTAAATCTACCTAAAGCAGCATAT TTTAAAAAATTAGAAGTATTGGCATTA AATGAAGAAATAGAGGACAAAACTAG ACTGACAGCAATGACCCAGAACATTTT GAGATTAGTAAAGTTGTGACCATGAAT TTAGGGATTTATGTGGATACAAATTCTC CTTTAAAGTGTTTCTTCCCTTAATATTT ATCTGGTAGTTATTTATGAGCAGTGAAT TATTTTGTAGTTTATATATCTTAATAGT TTATTTGGGACCAAGCACTTAACAAAA AGTTCTATAAGTCATAGAAGCCTTTTCA GGAAGCTTGTCTCACATTCATTCCTGAG ACTTTCACCTGCCAAGTGGCCTGAGGA	

		TCAATCCGGTCCTAGGTTTATTTTGCAG ACATACATTCTCCCAAGTTATTCAGCCT CATATGACTCCACAGTGGGCTTTACCA AAACAGTTCAGAGTGCACTTTGGCACA CAATTGGGAGCAGAACAATCTAATGTG TGGTTTGGTATTCCAAGTGGGGTCTTTT TCAGAATCTCTCCACTAGTGTGAGATGC AAATATGTTTCCTCATTTTTCTGGCTCA TCCAGTATGTAGCTTTTTGTGACATAAT AAATATATACATATATGAAAATA	
Stem-Loop		GCAGCCGAAAGGCUGC	1680
SNCA-0751	20mer sense strand	CAGUCAUGACAUUUCUCAAA	1681
SNCA-0751	Modified 20mer sense strand	[ademCs-C_{16}][mA][fG][mU][fC][mA][mU] [fG][mA][fC][mA][fU][fU][mU][fC][mU] [fC][mAs][mAs][mA]	1682
SNCA-259	19mer Sense Strand	UUCAUGAAAGGACUUUCAA	1683
SNCA-260	19mer Sense Strand	UCAUGAAAGGACUUUCAAA	1684
SNCA-261	19mer Sense Strand	CAUGAAAGGACUUUCAAAG	1685
SNCA-262	19mer Sense Strand	AUGAAAGGACUUUCAAAGG	1686
SNCA-263	19mer Sense Strand	UGAAAGGACUUUCAAAGGC	1687
SNCA-264	19mer Sense Strand	GAAAGGACUUUCAAAGGCC	1688
SNCA-285	19mer Sense Strand	GGAGGGAGUUGUGGCUGCU	1689
SNCA-288	19mer Sense Strand	GGGAGUUGUGGCUGCUGCU	1690
SNCA-289	19mer Sense Strand	GGAGUUGUGGCUGCUGCUG	1691
SNCA-290	19mer Sense Strand	GAGUUGUGGCUGCUGCUGA	1692
SNCA-292	19mer Sense Strand	GUUGUGGCUGCUGCUGAGA	1693
SNCA-293	19mer Sense Strand	UUGUGGCUGCUGCUGAGAA	1694
SNCA-294	19mer Sense Strand	UGUGGCUGCUGCUGAGAAA	1695
SNCA-295	19mer Sense Strand	GUGGCUGCUGCUGAGAAAA	1696
SNCA-296	19mer Sense Strand	UGGCUGCUGCUGAGAAAAC	1697
SNCA-297	19mer Sense Strand	GGCUGCUGCUGAGAAAACC	1698
SNCA-407	19mer Sense Strand	CAACAGUGGCUGAGAAGAC	1699
SNCA-408	19mer Sense Strand	AACAGUGGCUGAGAAGACC	1700
SNCA-409	19mer Sense Strand	ACAGUGGCUGAGAAGACCA	1701
SNCA-410	19mer Sense Strand	CAGUGGCUGAGAAGACCAA	1702
SNCA-411	19mer Sense Strand	AGUGGCUGAGAAGACCAAA	1703
SNCA-412	19mer Sense Strand	GUGGCUGAGAAGACCAAAG	1704
SNCA-413	19mer Sense Strand	UGGCUGAGAAGACCAAAGA	1705
SNCA-414	19mer Sense Strand	GGCUGAGAAGACCAAAGAG	1706
SNCA-415	19mer Sense Strand	GCUGAGAAGACCAAAGAGC	1707
SNCA-416	19mer Sense Strand	CUGAGAAGACCAAAGAGCA	1708
SNCA-417	19mer Sense Strand	UGAGAAGACCAAAGAGCAA	1709

SNCA-418	19mer Sense Strand	GAGAAGACCAAAGAGCAAG	1710
SNCA-419	19mer Sense Strand	AGAAGACCAAAGAGCAAGU	1711
SNCA-420	19mer Sense Strand	GAAGACCAAAGAGCAAGUG	1712
SNCA-421	19mer Sense Strand	AAGACCAAAGAGCAAGUGA	1713
SNCA-422	19mer Sense Strand	AGACCAAAGAGCAAGUGAC	1714
SNCA-423	19mer Sense Strand	GACCAAAGAGCAAGUGACA	1715
SNCA-424	19mer Sense Strand	ACCAAAGAGCAAGUGACAA	1716
SNCA-425	19mer Sense Strand	CCAAAGAGCAAGUGACAAA	1717
SNCA-426	19mer Sense Strand	CAAAGAGCAAGUGACAAAU	1718
SNCA-427	19mer Sense Strand	AAAGAGCAAGUGACAAAUG	1719
SNCA-428	19mer Sense Strand	AAGAGCAAGUGACAAAUGU	1720
SNCA-429	19mer Sense Strand	AGAGCAAGUGACAAAUGUU	1721
SNCA-430	19mer Sense Strand	GAGCAAGUGACAAAUGUUG	1722
SNCA-431	19mer Sense Strand	AGCAAGUGACAAAUGUUGG	1723
SNCA-432	19mer Sense Strand	GCAAGUGACAAAUGUUGGA	1724
SNCA-433	19mer Sense Strand	CAAGUGACAAAUGUUGGAG	1725
SNCA-434	19mer Sense Strand	AAGUGACAAAUGUUGGAGG	1726
SNCA-435	19mer Sense Strand	AGUGACAAAUGUUGGAGGA	1727
SNCA-436	19mer Sense Strand	GUGACAAAUGUUGGAGGAG	1728
SNCA-437	19mer Sense Strand	UGACAAAUGUUGGAGGAGC	1729
SNCA-725	19mer Sense Strand	GUACAAGUGCUCAGUUCCA	1730
SNCA-726	19mer Sense Strand	UACAAGUGCUCAGUUCCAA	1731
SNCA-727	19mer Sense Strand	ACAAGUGCUCAGUUCCAAU	1732
SNCA-728	19mer Sense Strand	CAAGUGCUCAGUUCCAAUG	1733
SNCA-729	19mer Sense Strand	AAGUGCUCAGUUCCAAUGU	1734
SNCA-730	19mer Sense Strand	AGUGCUCAGUUCCAAUGUG	1735
SNCA-731	19mer Sense Strand	GUGCUCAGUUCCAAUGUGC	1736
SNCA-732	19mer Sense Strand	UGCUCAGUUCCAAUGUGCC	1737
SNCA-733	19mer Sense Strand	GCUCAGUUCCAAUGUGCCC	1738
SNCA-734	19mer Sense Strand	CUCAGUUCCAAUGUGCCCA	1739
SNCA-735	19mer Sense Strand	UCAGUUCCAAUGUGCCCAG	1740
SNCA-736	19mer Sense Strand	CAGUUCCAAUGUGCCCAGU	1741
SNCA-737	19mer Sense Strand	AGUUCCAAUGUGCCCAGUC	1742
SNCA-738	19mer Sense Strand	GUUCCAAUGUGCCCAGUCA	1743
SNCA-739	19mer Sense Strand	UUCCAAUGUGCCCAGUCAU	1744
SNCA-740	19mer Sense Strand	UCCAAUGUGCCCAGUCAUG	1745
SNCA-741	19mer Sense Strand	CCAAUGUGCCCAGUCAUGA	1746
SNCA-742	19mer Sense Strand	CAAUGUGCCCAGUCAUGAC	1747
SNCA-790	19mer Sense Strand	AAGUCUUCCAUCAGCAGUG	1748
SNCA-791	19mer Sense Strand	AGUCUUCCAUCAGCAGUGA	1749
SNCA-792	19mer Sense Strand	GUCUUCCAUCAGCAGUGAU	1750
SNCA-938	19mer Sense Strand	AAAACACCUAAGUGACUAC	1751

SNCA-939	19mer Sense Strand	AAACACCUAAGUGACUACC	1752
SNCA-940	19mer Sense Strand	AACACCUAAGUGACUACCA	1753
SNCA-941	19mer Sense Strand	ACACCUAAGUGACUACCAC	1754
SNCA-942	19mer Sense Strand	CACCUAAGUGACUACCACU	1755
SNCA-943	19mer Sense Strand	ACCUAAGUGACUACCACUU	1756
SNCA-944	19mer Sense Strand	CCUAAGUGACUACCACUUA	1757
SNCA-945	19mer Sense Strand	CUAAGUGACUACCACUUAU	1758
SNCA-946	19mer Sense Strand	UAAGUGACUACCACUUAUU	1759
SNCA-947	19mer Sense Strand	AAGUGACUACCACUUAUUU	1760
SNCA-948	19mer Sense Strand	AGUGACUACCACUUAUUUC	1761
SNCA-949	19mer Sense Strand	GUGACUACCACUUAUUUCU	1762
SNCA-950	19mer Sense Strand	UGACUACCACUUAUUUCUA	1763
SNCA-951	19mer Sense Strand	GACUACCACUUAUUUCUAA	1764
SNCA-952	19mer Sense Strand	ACUACCACUUAUUUCUAAA	1765
SNCA-953	19mer Sense Strand	CUACCACUUAUUUCUAAAU	1766
SNCA-954	19mer Sense Strand	UACCACUUAUUUCUAAAUC	1767
SNCA-1081	19mer Sense Strand	UUGUGAAAUUUGUUAAUAU	1768
SNCA-1082	19mer Sense Strand	UGUGAAAUUUGUUAAUAUA	1769
SNCA-1083	19mer Sense Strand	GUGAAAUUUGUUAAUAUAU	1770
SNCA-1084	19mer Sense Strand	UGAAAUUUGUUAAUAUAUA	1771
SNCA-1085	19mer Sense Strand	GAAAUUUGUUAAUAUAUAU	1772
SNCA-1188	19mer Sense Strand	ACUUGUGUUUGUAUAUAAA	1773
SNCA-1189	19mer Sense Strand	CUUGUGUUUGUAUAUAAAU	1774
SNCA-1190	19mer Sense Strand	UUGUGUUUGUAUAUAAAUG	1775
SNCA-1191	19mer Sense Strand	UGUGUUUGUAUAUAAAUGG	1776
SNCA-1192	19mer Sense Strand	GUGUUUGUAUAUAAAUGGU	1777
SNCA-1193	19mer Sense Strand	UGUUUGUAUAUAAAUGGUG	1778
SNCA-225	19mer Sense Strand	UGUGGUGUAAAGGAAUUCA	1779
SNCA-226	19mer Sense Strand	GUGGUGUAAAGGAAUUCAU	1780
SNCA-227	19mer Sense Strand	UGGUGUAAAGGAAUUCAUU	1781
SNCA-228	19mer Sense Strand	GGUGUAAAGGAAUUCAUUA	1782

SNCA-229	19mer Sense Strand	GUGUAAAGGAAUUCAUUAG	1783
SNCA-230	19mer Sense Strand	UGUAAAGGAAUUCAUUAGC	1784
SNCA-231	19mer Sense Strand	GUAAAGGAAUUCAUUAGCC	1785
SNCA-232	19mer Sense Strand	UAAAGGAAUUCAUUAGCCA	1786
SNCA-233	19mer Sense Strand	AAAGGAAUUCAUUAGCCAU	1787
SNCA-234	19mer Sense Strand	AAGGAAUUCAUUAGCCAUG	1788
SNCA-235	19mer Sense Strand	AGGAAUUCAUUAGCCAUGG	1789
SNCA-236	19mer Sense Strand	GGAAUUCAUUAGCCAUGGA	1790
SNCA-237	19mer Sense Strand	GAAUUCAUUAGCCAUGGAU	1791
SNCA-238	19mer Sense Strand	AAUUCAUUAGCCAUGGAUG	1792
SNCA-239	19mer Sense Strand	AUUCAUUAGCCAUGGAUGU	1793
SNCA-240	19mer Sense Strand	UUCAUUAGCCAUGGAUGUA	1794
SNCA-241	19mer Sense Strand	UCAUUAGCCAUGGAUGUAU	1795
SNCA-242	19mer Sense Strand	CAUUAGCCAUGGAUGUAUU	1796
SNCA-243	19mer Sense Strand	AUUAGCCAUGGAUGUAUUC	1797
SNCA-244	19mer Sense Strand	UUAGCCAUGGAUGUAUUCA	1798
SNCA-245	19mer Sense Strand	UAGCCAUGGAUGUAUUCAU	1799
SNCA-246	19mer Sense Strand	AGCCAUGGAUGUAUUCAUG	1800
SNCA-247	19mer Sense Strand	GCCAUGGAUGUAUUCAUGA	1801
SNCA-248	19mer Sense Strand	CCAUGGAUGUAUUCAUGAA	1802
SNCA-249	19mer Sense Strand	CAUGGAUGUAUUCAUGAAA	1803
SNCA-250	19mer Sense Strand	AUGGAUGUAUUCAUGAAAG	1804
SNCA-251	19mer Sense Strand	UGGAUGUAUUCAUGAAAGG	1805
SNCA-252	19mer Sense Strand	GGAUGUAUUCAUGAAAGGA	1806
SNCA-253	19mer Sense Strand	GAUGUAUUCAUGAAAGGAC	1807
SNCA-254	19mer Sense Strand	AUGUAUUCAUGAAAGGACU	1808
SNCA-256	19mer Sense Strand	GUAUUCAUGAAAGGACUUU	1809
SNCA-330	19mer Sense Strand	AGAAGCAGCAGGAAAGACA	1810
SNCA-335	19mer Sense Strand	CAGCAGGAAAGACAAAAGA	1811
SNCA-337	19mer Sense Strand	GCAGGAAAGACAAAAGAGG	1812
SNCA-341	19mer Sense Strand	GAAAGACAAAAGAGGGUGU	1813
SNCA-342	19mer Sense Strand	AAAGACAAAAGAGGGUGUU	1814
SNCA-344	19mer Sense Strand	AGACAAAAGAGGGUGUUCU	1815
SNCA-345	19mer Sense Strand	GACAAAAGAGGGUGUUCUC	1816
SNCA-351	19mer Sense Strand	AGAGGGUGUUCUCUAUGUA	1817
SNCA-353	19mer Sense Strand	AGGGUGUUCUCUAUGUAGG	1818
SNCA-355	19mer Sense Strand	GGUGUUCUCUAUGUAGGCU	1819
SNCA-638	19mer Sense Strand	AGGAAGGGUAUCAAGACUA	1820
SNCA-641	19mer Sense Strand	AAGGGUAUCAAGACUACGA	1821
SNCA-642	19mer Sense Strand	AGGGUAUCAAGACUACGAA	1822
SNCA-647	19mer Sense Strand	AUCAAGACUACGAACCUGA	1823
SNCA-648	19mer Sense Strand	UCAAGACUACGAACCUGAA	1824

SNCA-650	19mer Sense Strand	AAGACUACGAACCUGAAGC	1825
SNCA-652	19mer Sense Strand	GACUACGAACCUGAAGCCU	1826
SNCA-653	19mer Sense Strand	ACUACGAACCUGAAGCCUA	1827
SNCA-654	19mer Sense Strand	CUACGAACCUGAAGCCUAA	1828
SNCA-656	19mer Sense Strand	ACGAACCUGAAGCCUAAGA	1829
SNCA-657	19mer Sense Strand	CGAACCUGAAGCCUAAGAA	1830
SNCA-659	19mer Sense Strand	AACCUGAAGCCUAAGAAAU	1831
SNCA-660	19mer Sense Strand	ACCUGAAGCCUAAGAAAUA	1832
SNCA-661	19mer Sense Strand	CCUGAAGCCUAAGAAAUAU	1833
SNCA-662	19mer Sense Strand	CUGAAGCCUAAGAAAUAUC	1834
SNCA-663	19mer Sense Strand	UGAAGCCUAAGAAAUAUCU	1835
SNCA-668	19mer Sense Strand	CCUAAGAAAUAUCUUUGCU	1836
SNCA-669	19mer Sense Strand	CUAAGAAAUAUCUUUGCUC	1837
SNCA-672	19mer Sense Strand	AGAAAUAUCUUUGCUCCCA	1838
SNCA-675	19mer Sense Strand	AAUAUCUUUGCUCCCAGUU	1839
SNCA-676	19mer Sense Strand	AUAUCUUUGCUCCCAGUUU	1840
SNCA-689	19mer Sense Strand	CAGUUUCUUGAGAUCUGCU	1841
SNCA-724	19mer Sense Strand	UGUACAAGUGCUCAGUUCC	1842
SNCA-744	19mer Sense Strand	AUGUGCCCAGUCAUGACAU	1843
SNCA-745	19mer Sense Strand	UGUGCCCAGUCAUGACAUU	1844
SNCA-746	19mer Sense Strand	GUGCCCAGUCAUGACAUUU	1845
SNCA-751	19mer Sense Strand	CAGUCAUGACAUUUCUCAA	1846
SNCA-752	19mer Sense Strand	AGUCAUGACAUUUCUCAAA	1847
SNCA-753	19mer Sense Strand	GUCAUGACAUUUCUCAAAG	1848
SNCA-754	19mer Sense Strand	UCAUGACAUUUCUCAAAGU	1849
SNCA-755	19mer Sense Strand	CAUGACAUUUCUCAAAGUU	1850
SNCA-756	19mer Sense Strand	AUGACAUUUCUCAAAGUUU	1851
SNCA-757	19mer Sense Strand	UGACAUUUCUCAAAGUUUU	1852
SNCA-758	19mer Sense Strand	GACAUUUCUCAAAGUUUUU	1853
SNCA-759	19mer Sense Strand	ACAUUUCUCAAAGUUUUUA	1854
SNCA-760	19mer Sense Strand	CAUUUCUCAAAGUUUUUAC	1855
SNCA-761	19mer Sense Strand	AUUUCUCAAAGUUUUUACA	1856
SNCA-762	19mer Sense Strand	UUUCUCAAAGUUUUUACAG	1857
SNCA-789	19mer Sense Strand	GAAGUCUUCCAUCAGCAGU	1858
SNCA-795	19mer Sense Strand	UUCCAUCAGCAGUGAUUGA	1859
SNCA-796	19mer Sense Strand	UCCAUCAGCAGUGAUUGAA	1860
SNCA-797	19mer Sense Strand	CCAUCAGCAGUGAUUGAAG	1861
SNCA-798	19mer Sense Strand	CAUCAGCAGUGAUUGAAGU	1862
SNCA-799	19mer Sense Strand	AUCAGCAGUGAUUGAAGUA	1863
SNCA-800	19mer Sense Strand	UCAGCAGUGAUUGAAGUAU	1864
SNCA-801	19mer Sense Strand	CAGCAGUGAUUGAAGUAUC	1865
SNCA-802	19mer Sense Strand	AGCAGUGAUUGAAGUAUCU	1866

SNCA-803	19mer Sense Strand	GCAGUGAUUGAAGUAUCUG	1867
SNCA-804	19mer Sense Strand	CAGUGAUUGAAGUAUCUGU	1868
SNCA-805	19mer Sense Strand	AGUGAUUGAAGUAUCUGUA	1869
SNCA-809	19mer Sense Strand	AUUGAAGUAUCUGUACCUG	1870
SNCA-839	19mer Sense Strand	CAUUUCGGUGCUUCCCUUU	1871
SNCA-844	19mer Sense Strand	CGGUGCUUCCCUUUCACUG	1872
SNCA-845	19mer Sense Strand	GGUGCUUCCCUUUCACUGA	1873
SNCA-846	19mer Sense Strand	GUGCUUCCCUUUCACUGAA	1874
SNCA-847	19mer Sense Strand	UGCUUCCCUUUCACUGAAG	1875
SNCA-848	19mer Sense Strand	GCUUCCCUUUCACUGAAGU	1876
SNCA-849	19mer Sense Strand	CUUCCCUUUCACUGAAGUG	1877
SNCA-850	19mer Sense Strand	UUCCCUUUCACUGAAGUGA	1878
SNCA-851	19mer Sense Strand	UCCCUUUCACUGAAGUGAA	1879
SNCA-852	19mer Sense Strand	CCCUUUCACUGAAGUGAAU	1880
SNCA-853	19mer Sense Strand	CCUUUCACUGAAGUGAAUA	1881
SNCA-854	19mer Sense Strand	CUUUCACUGAAGUGAAUAC	1882
SNCA-855	19mer Sense Strand	UUUCACUGAAGUGAAUACA	1883
SNCA-856	19mer Sense Strand	UUCACUGAAGUGAAUACAU	1884
SNCA-857	19mer Sense Strand	UCACUGAAGUGAAUACAUG	1885
SNCA-858	19mer Sense Strand	CACUGAAGUGAAUACAUGG	1886
SNCA-859	19mer Sense Strand	ACUGAAGUGAAUACAUGGU	1887
SNCA-860	19mer Sense Strand	CUGAAGUGAAUACAUGGUA	1888
SNCA-861	19mer Sense Strand	UGAAGUGAAUACAUGGUAG	1889
SNCA-863	19mer Sense Strand	AAGUGAAUACAUGGUAGCA	1890
SNCA-864	19mer Sense Strand	AGUGAAUACAUGGUAGCAG	1891
SNCA-865	19mer Sense Strand	GUGAAUACAUGGUAGCAGG	1892
SNCA-867	19mer Sense Strand	GAAUACAUGGUAGCAGGGU	1893
SNCA-868	19mer Sense Strand	AAUACAUGGUAGCAGGGUC	1894
SNCA-875	19mer Sense Strand	GGUAGCAGGGUCUUUGUGU	1895
SNCA-881	19mer Sense Strand	AGGGUCUUUGUGUGCUGUG	1896
SNCA-883	19mer Sense Strand	GGUCUUUGUGUGCUGUGGA	1897
SNCA-889	19mer Sense Strand	UGUGUGCUGUGGAUUUUGU	1898
SNCA-890	19mer Sense Strand	GUGUGCUGUGGAUUUUGUG	1899
SNCA-891	19mer Sense Strand	UGUGCUGUGGAUUUUGUGG	1900
SNCA-892	19mer Sense Strand	GUGCUGUGGAUUUUGUGGC	1901
SNCA-893	19mer Sense Strand	UGCUGUGGAUUUUGUGGCU	1902
SNCA-894	19mer Sense Strand	GCUGUGGAUUUUGUGGCUU	1903
SNCA-895	19mer Sense Strand	CUGUGGAUUUUGUGGCUUC	1904
SNCA-897	19mer Sense Strand	GUGGAUUUUGUGGCUUCAA	1905
SNCA-898	19mer Sense Strand	UGGAUUUUGUGGCUUCAAU	1906
SNCA-900	19mer Sense Strand	GAUUUUGUGGCUUCAAUCU	1907
SNCA-901	19mer Sense Strand	AUUUUGUGGCUUCAAUCUA	1908

SNCA-956	19mer Sense Strand	CCACUUAUUUCUAAAUCCU	1909
SNCA-957	19mer Sense Strand	CACUUAUUUCUAAAUCCUC	1910
SNCA-958	19mer Sense Strand	ACUUAUUUCUAAAUCCUCA	1911
SNCA-959	19mer Sense Strand	CUUAUUUCUAAAUCCUCAC	1912
SNCA-961	19mer Sense Strand	UAUUUCUAAAUCCUCACUA	1913
SNCA-962	19mer Sense Strand	AUUUCUAAAUCCUCACUAU	1914
SNCA-963	19mer Sense Strand	UUUCUAAAUCCUCACUAUU	1915
SNCA-964	19mer Sense Strand	UUCUAAAUCCUCACUAUUU	1916
SNCA-965	19mer Sense Strand	UCUAAAUCCUCACUAUUUU	1917
SNCA-966	19mer Sense Strand	CUAAAUCCUCACUAUUUUU	1918
SNCA-967	19mer Sense Strand	UAAAUCCUCACUAUUUUUU	1919
SNCA-968	19mer Sense Strand	AAAUCCUCACUAUUUUUUU	1920
SNCA-969	19mer Sense Strand	AAUCCUCACUAUUUUUUUG	1921
SNCA-970	19mer Sense Strand	AUCCUCACUAUUUUUUUGU	1922
SNCA-971	19mer Sense Strand	UCCUCACUAUUUUUUUGUU	1923
SNCA-972	19mer Sense Strand	CCUCACUAUUUUUUUGUUG	1924
SNCA-973	19mer Sense Strand	CUCACUAUUUUUUUGUUGC	1925
SNCA-974	19mer Sense Strand	UCACUAUUUUUUUGUUGCU	1926
SNCA-975	19mer Sense Strand	CACUAUUUUUUUGUUGCUG	1927
SNCA-976	19mer Sense Strand	ACUAUUUUUUUGUUGCUGU	1928
SNCA-977	19mer Sense Strand	CUAUUUUUUUGUUGCUGUU	1929
SNCA-978	19mer Sense Strand	UAUUUUUUUGUUGCUGUUG	1930
SNCA-979	19mer Sense Strand	AUUUUUUUGUUGCUGUUGU	1931
SNCA-980	19mer Sense Strand	UUUUUUUGUUGCUGUUGUU	1932
SNCA-981	19mer Sense Strand	UUUUUUGUUGCUGUUGUUC	1933
SNCA-982	19mer Sense Strand	UUUUUGUUGCUGUUGUUCA	1934
SNCA-983	19mer Sense Strand	UUUUGUUGCUGUUGUUCAG	1935
SNCA-984	19mer Sense Strand	UUUGUUGCUGUUGUUCAGA	1936
SNCA-985	19mer Sense Strand	UUGUUGCUGUUGUUCAGAA	1937
SNCA-986	19mer Sense Strand	UGUUGCUGUUGUUCAGAAG	1938
SNCA-987	19mer Sense Strand	GUUGCUGUUGUUCAGAAGU	1939
SNCA-988	19mer Sense Strand	UUGCUGUUGUUCAGAAGUU	1940
SNCA-989	19mer Sense Strand	UGCUGUUGUUCAGAAGUUG	1941
SNCA-990	19mer Sense Strand	GCUGUUGUUCAGAAGUUGU	1942
SNCA-991	19mer Sense Strand	CUGUUGUUCAGAAGUUGUU	1943
SNCA-992	19mer Sense Strand	UGUUGUUCAGAAGUUGUUA	1944
SNCA-993	19mer Sense Strand	GUUGUUCAGAAGUUGUUAG	1945
SNCA-994	19mer Sense Strand	UUGUUCAGAAGUUGUUAGU	1946
SNCA-995	19mer Sense Strand	UGUUCAGAAGUUGUUAGUG	1947
SNCA-996	19mer Sense Strand	GUUCAGAAGUUGUUAGUGA	1948
SNCA-997	19mer Sense Strand	UUCAGAAGUUGUUAGUGAU	1949
SNCA-998	19mer Sense Strand	UCAGAAGUUGUUAGUGAUU	1950

SNCA-999	19mer Sense Strand	CAGAAGUUGUUAGUGAUUU	1951
SNCA-1000	19mer Sense Strand	AGAAGUUGUUAGUGAUUUG	1952
SNCA-1001	19mer Sense Strand	GAAGUUGUUAGUGAUUUGC	1953
SNCA-1002	19mer Sense Strand	AAGUUGUUAGUGAUUUGCU	1954
SNCA-1003	19mer Sense Strand	AGUUGUUAGUGAUUUGCUA	1955
SNCA-1004	19mer Sense Strand	GUUGUUAGUGAUUUGCUAU	1956
SNCA-1005	19mer Sense Strand	UUGUUAGUGAUUUGCUAUC	1957
SNCA-1028	19mer Sense Strand	AUUAUAAGAUUUUUAGGUG	1958
SNCA-1029	19mer Sense Strand	UUAUAAGAUUUUUAGGUGU	1959
SNCA-1030	19mer Sense Strand	UAUAAGAUUUUUAGGUGUC	1960
SNCA-1031	19mer Sense Strand	AUAAGAUUUUUAGGUGUCU	1961
SNCA-1032	19mer Sense Strand	UAAGAUUUUUAGGUGUCUU	1962
SNCA-1033	19mer Sense Strand	AAGAUUUUUAGGUGUCUUU	1963
SNCA-1034	19mer Sense Strand	AGAUUUUUAGGUGUCUUUU	1964
SNCA-1035	19mer Sense Strand	GAUUUUUAGGUGUCUUUUA	1965
SNCA-1036	19mer Sense Strand	AUUUUUAGGUGUCUUUUAA	1966
SNCA-1037	19mer Sense Strand	UUUUUAGGUGUCUUUUAAU	1967
SNCA-1038	19mer Sense Strand	UUUUAGGUGUCUUUUAAUG	1968
SNCA-1039	19mer Sense Strand	UUUAGGUGUCUUUUAAUGA	1969
SNCA-1040	19mer Sense Strand	UUAGGUGUCUUUUAAUGAU	1970
SNCA-1041	19mer Sense Strand	UAGGUGUCUUUUAAUGAUA	1971
SNCA-1042	19mer Sense Strand	AGGUGUCUUUUAAUGAUAC	1972

SNCA-1043	19mer Sense Strand	GGUGUCUUUUAAUGAUACU	1973
SNCA-1044	19mer Sense Strand	GUGUCUUUUAAUGAUACUG	1974
SNCA-1045	19mer Sense Strand	UGUCUUUUAAUGAUACUGU	1975
SNCA-1046	19mer Sense Strand	GUCUUUUAAUGAUACUGUC	1976
SNCA-1047	19mer Sense Strand	UCUUUUAAUGAUACUGUCU	1977
SNCA-1048	19mer Sense Strand	CUUUUAAUGAUACUGUCUA	1978
SNCA-1049	19mer Sense Strand	UUUUAAUGAUACUGUCUAA	1979
SNCA-1050	19mer Sense Strand	UUUAAUGAUACUGUCUAAG	1980
SNCA-1051	19mer Sense Strand	UUAAUGAUACUGUCUAAGA	1981
SNCA-1052	19mer Sense Strand	UAAUGAUACUGUCUAAGAA	1982
SNCA-1053	19mer Sense Strand	AAUGAUACUGUCUAAGAAU	1983
SNCA-1054	19mer Sense Strand	AUGAUACUGUCUAAGAAUA	1984
SNCA-1055	19mer Sense Strand	UGAUACUGUCUAAGAAUAA	1985
SNCA-1056	19mer Sense Strand	GAUACUGUCUAAGAAUAAU	1986
SNCA-1057	19mer Sense Strand	AUACUGUCUAAGAAUAAUG	1987
SNCA-1058	19mer Sense Strand	UACUGUCUAAGAAUAAUGA	1988
SNCA-1078	19mer Sense Strand	GUAUUGUGAAAUUUGUUAA	1989
SNCA-1079	19mer Sense Strand	UAUUGUGAAAUUUGUUAAU	1990
SNCA-1080	19mer Sense Strand	AUUGUGAAAUUUGUUAAUA	1991
SNCA-1086	19mer Sense Strand	AAAUUUGUUAAUAUAUAUA	1992
SNCA-1087	19mer Sense Strand	AAUUUGUUAAUAUAUAUAA	1993

SNCA-1088	19mer Sense Strand	AUUUGUUAAUAUAUAUAAU	1994
SNCA-1089	19mer Sense Strand	UUUGUUAAUAUAUAUAAUA	1995
SNCA-1090	19mer Sense Strand	UUGUUAAUAUAUAUAAUAC	1996
SNCA-1091	19mer Sense Strand	UGUUAAUAUAUAUAAUACU	1997
SNCA-1092	19mer Sense Strand	GUUAAUAUAUAUAAUACUU	1998
SNCA-1093	19mer Sense Strand	UUAAUAUAUAUAAUACUUA	1999
SNCA-1116	19mer Sense Strand	UAUGUGAGCAUGAAACUAU	2000
SNCA-1117	19mer Sense Strand	AUGUGAGCAUGAAACUAUG	2001
SNCA-1119	19mer Sense Strand	GUGAGCAUGAAACUAUGCA	2002
SNCA-1120	19mer Sense Strand	UGAGCAUGAAACUAUGCAC	2003
SNCA-1121	19mer Sense Strand	GAGCAUGAAACUAUGCACC	2004
SNCA-1122	19mer Sense Strand	AGCAUGAAACUAUGCACCU	2005
SNCA-1123	19mer Sense Strand	GCAUGAAACUAUGCACCUA	2006
SNCA-1124	19mer Sense Strand	CAUGAAACUAUGCACCUAU	2007
SNCA-1125	19mer Sense Strand	AUGAAACUAUGCACCUAUA	2008
SNCA-1126	19mer Sense Strand	UGAAACUAUGCACCUAUAA	2009
SNCA-1127	19mer Sense Strand	GAAACUAUGCACCUAUAAA	2010
SNCA-1128	19mer Sense Strand	AAACUAUGCACCUAUAAAU	2011
SNCA-1129	19mer Sense Strand	AACUAUGCACCUAUAAAUA	2012
SNCA-1130	19mer Sense Strand	ACUAUGCACCUAUAAAUAC	2013
SNCA-1131	19mer Sense Strand	CUAUGCACCUAUAAAUACU	2014

SNCA-1132	19mer Sense Strand	UAUGCACCUAUAAAUACUA	2015
SNCA-1133	19mer Sense Strand	AUGCACCUAUAAAUACUAA	2016
SNCA-1194	19mer Sense Strand	GUUUGUAUAUAAAUGGUGA	2017
SNCA-1195	19mer Sense Strand	UUUGUAUAUAAAUGGUGAG	2018
SNCA-1196	19mer Sense Strand	UUGUAUAUAAAUGGUGAGA	2019
SNCA-1197	19mer Sense Strand	UGUAUAUAAAUGGUGAGAA	2020
SNCA-1198	19mer Sense Strand	GUAUAUAAAUGGUGAGAAU	2021
SNCA-1199	19mer Sense Strand	UAUAUAAAUGGUGAGAAUU	2022
SNCA-1200	19mer Sense Strand	AUAUAAAUGGUGAGAAUUA	2023
SNCA-1201	19mer Sense Strand	UAUAAAUGGUGAGAAUUAA	2024
SNCA-1202	19mer Sense Strand	AUAAAUGGUGAGAAUUAAA	2025
SNCA-1203	19mer Sense Strand	UAAAUGGUGAGAAUUAAAA	2026
SNCA-1204	19mer Sense Strand	AAAUGGUGAGAAUUAAAAU	2027
SNCA-1205	19mer Sense Strand	AAUGGUGAGAAUUAAAAUA	2028
SNCA-1206	19mer Sense Strand	AUGGUGAGAAUUAAAAUAA	2029
SNCA-1207	19mer Sense Strand	UGGUGAGAAUUAAAAUAAA	2030
SNCA-1208	19mer Sense Strand	GGUGAGAAUUAAAAUAAAA	2031
SNCA-1250	19mer Sense Strand	UUAUUUUUAUCCCAUCUCA	2032
SNCA-1252	19mer Sense Strand	AUUUUUAUCCCAUCUCACU	2033
SNCA-1253	19mer Sense Strand	UUUUUAUCCCAUCUCACUU	2034
SNCA-1254	19mer Sense Strand	UUUUAUCCCAUCUCACUUU	2035

SNCA-1255	19mer Sense Strand	UUUAUCCCAUCUCACUUUA	2036
SNCA-1256	19mer Sense Strand	UUAUCCCAUCUCACUUUAA	2037
SNCA-1257	19mer Sense Strand	UAUCCCAUCUCACUUUAAU	2038
SNCA-1258	19mer Sense Strand	AUCCCAUCUCACUUUAAUA	2039
SNCA-1259	19mer Sense Strand	UCCCAUCUCACUUUAAUAA	2040
SNCA-1260	19mer Sense Strand	CCCAUCUCACUUUAAUAAU	2041
SNCA-1261	19mer Sense Strand	CCAUCUCACUUUAAUAAUA	2042
SNCA-1262	19mer Sense Strand	CAUCUCACUUUAAUAAUAA	2043
SNCA-1263	19mer Sense Strand	AUCUCACUUUAAUAAUAAA	2044
SNCA-1264	19mer Sense Strand	UCUCACUUUAAUAAUAAAA	2045
SNCA-1265	19mer Sense Strand	CUCACUUUAAUAAUAAAAA	2046
SNCA-1266	19mer Sense Strand	UCACUUUAAUAAUAAAAAU	2047
SNCA-1267	19mer Sense Strand	CACUUUAAUAAUAAAAAUC	2048
SNCA-1351	19mer Sense Strand	AUUUGAAGAAGGAGGAAUU	2049
SNCA-1365	19mer Sense Strand	GAAUUUUAGAAGAGGUAGA	2050
SNCA-1372	19mer Sense Strand	AGAAGAGGUAGAGAAAAUG	2051
SNCA-1373	19mer Sense Strand	GAAGAGGUAGAGAAAAUGG	2052
SNCA-1374	19mer Sense Strand	AAGAGGUAGAGAAAAUGGA	2053
SNCA-1375	19mer Sense Strand	AGAGGUAGAGAAAAUGGAA	2054
SNCA-1376	19mer Sense Strand	GAGGUAGAGAAAAUGGAAC	2055
SNCA-1377	19mer Sense Strand	AGGUAGAGAAAAUGGAACA	2056

SNCA-1379	19mer Sense Strand	GUAGAGAAAAUGGAACAUU	2057
SNCA-1380	19mer Sense Strand	UAGAGAAAAUGGAACAUUA	2058
SNCA-1381	19mer Sense Strand	AGAGAAAAUGGAACAUUAA	2059
SNCA-1382	19mer Sense Strand	GAGAAAAUGGAACAUUAAC	2060
SNCA-1383	19mer Sense Strand	AGAAAAUGGAACAUUAACC	2061
SNCA-1384	19mer Sense Strand	GAAAAUGGAACAUUAACCC	2062
SNCA-1385	19mer Sense Strand	AAAAUGGAACAUUAACCCU	2063
SNCA-1388	19mer Sense Strand	AUGGAACAUUAACCCUACA	2064
SNCA-1428	19mer Sense Strand	ACUGCCAGAAGUGUGUUUU	2065
SNCA-1429	19mer Sense Strand	CUGCCAGAAGUGUGUUUUG	2066
SNCA-259	19mer Anti-Sense Strand	UUGAAAGUCCUUUCAUGAA	2067
SNCA-260	19mer Anti-Sense Strand	UUUGAAAGUCCUUUCAUGA	2068
SNCA-261	19mer Anti-Sense Strand	CUUUGAAAGUCCUUUCAUG	2069
SNCA-262	19mer Anti-Sense Strand	CCUUUGAAAGUCCUUUCAU	2070
SNCA-263	19mer Anti-Sense Strand	GCCUUUGAAAGUCCUUUCA	2071
SNCA-264	19mer Anti-Sense Strand	GGCCUUUGAAAGUCCUUUC	2072
SNCA-285	19mer Anti-Sense Strand	AGCAGCCACAACUCCCUCC	2073
SNCA-288	19mer Anti-Sense Strand	AGCAGCAGCCACAACUCCC	2074
SNCA-289	19mer Anti-Sense Strand	CAGCAGCAGCCACAACUCC	2075
SNCA-290	19mer Anti-Sense Strand	UCAGCAGCAGCCACAACUC	2076
SNCA-292	19mer Anti-Sense Strand	UCUCAGCAGCAGCCACAAC	2077

SNCA-293	19mer Anti-Sense Strand	UUCUCAGCAGCAGCCACAA	2078
SNCA-294	19mer Anti-Sense Strand	UUUCUCAGCAGCAGCCACA	2079
SNCA-295	19mer Anti-Sense Strand	UUUUCUCAGCAGCAGCCAC	2080
SNCA-296	19mer Anti-Sense Strand	GUUUUCUCAGCAGCAGCCA	2081
SNCA-297	19mer Anti-Sense Strand	GGUUUUCUCAGCAGCAGCC	2082
SNCA-407	19mer Anti-Sense Strand	GUCUUCUCAGCCACUGUUG	2083
SNCA-408	19mer Anti-Sense Strand	GGUCUUCUCAGCCACUGUU	2084
SNCA-409	19mer Anti-Sense Strand	UGGUCUUCUCAGCCACUGU	2085
SNCA-410	19mer Anti-Sense Strand	UUGGUCUUCUCAGCCACUG	2086
SNCA-411	19mer Anti-Sense Strand	UUUGGUCUUCUCAGCCACU	2087
SNCA-412	19mer Anti-Sense Strand	CUUUGGUCUUCUCAGCCAC	2088
SNCA-413	19mer Anti-Sense Strand	UCUUUGGUCUUCUCAGCCA	2089
SNCA-414	19mer Anti-Sense Strand	CUCUUUGGUCUUCUCAGCC	2090
SNCA-415	19mer Anti-Sense Strand	GCUCUUUGGUCUUCUCAGC	2091
SNCA-416	19mer Anti-Sense Strand	UGCUCUUUGGUCUUCUCAG	2092
SNCA-417	19mer Anti-Sense Strand	UUGCUCUUUGGUCUUCUCA	2093
SNCA-418	19mer Anti-Sense Strand	CUUGCUCUUUGGUCUUCUC	2094
SNCA-419	19mer Anti-Sense Strand	ACUUGCUCUUUGGUCUUCU	2095
SNCA-420	19mer Anti-Sense Strand	CACUUGCUCUUUGGUCUUC	2096
SNCA-421	19mer Anti-Sense Strand	UCACUUGCUCUUUGGUCUU	2097
SNCA-422	19mer Anti-Sense Strand	GUCACUUGCUCUUUGGUCU	2098

SNCA-423	19mer Anti-Sense Strand	UGUCACUUGCUCUUUGGUC	2099
SNCA-424	19mer Anti-Sense Strand	UUGUCACUUGCUCUUUGGU	2100
SNCA-425	19mer Anti-Sense Strand	UUUGUCACUUGCUCUUUGG	2101
SNCA-426	19mer Anti-Sense Strand	AUUUGUCACUUGCUCUUUG	2102
SNCA-427	19mer Anti-Sense Strand	CAUUUGUCACUUGCUCUUU	2103
SNCA-428	19mer Anti-Sense Strand	ACAUUUGUCACUUGCUCUU	2104
SNCA-429	19mer Anti-Sense Strand	AACAUUUGUCACUUGCUCU	2105
SNCA-430	19mer Anti-Sense Strand	CAACAUUUGUCACUUGCUC	2106
SNCA-431	19mer Anti-Sense Strand	CCAACAUUUGUCACUUGCU	2107
SNCA-432	19mer Anti-Sense Strand	UCCAACAUUUGUCACUUGC	2108
SNCA-433	19mer Anti-Sense Strand	CUCCAACAUUUGUCACUUG	2109
SNCA-434	19mer Anti-Sense Strand	CCUCCAACAUUUGUCACUU	2110
SNCA-435	19mer Anti-Sense Strand	UCCUCCAACAUUUGUCACU	2111
SNCA-436	19mer Anti-Sense Strand	CUCCUCCAACAUUUGUCAC	2112
SNCA-437	19mer Anti-Sense Strand	GCUCCUCCAACAUUUGUCA	2113
SNCA-725	19mer Anti-Sense Strand	UGGAACUGAGCACUUGUAC	2114
SNCA-726	19mer Anti-Sense Strand	UUGGAACUGAGCACUUGUA	2115
SNCA-727	19mer Anti-Sense Strand	AUUGGAACUGAGCACUUGU	2116
SNCA-728	19mer Anti-Sense Strand	CAUUGGAACUGAGCACUUG	2117
SNCA-729	19mer Anti-Sense Strand	ACAUUGGAACUGAGCACUU	2118
SNCA-730	19mer Anti-Sense Strand	CACAUUGGAACUGAGCACU	2119

SNCA-731	19mer Anti-Sense Strand	GCACAUUGGAACUGAGCAC	2120
SNCA-732	19mer Anti-Sense Strand	GGCACAUUGGAACUGAGCA	2121
SNCA-733	19mer Anti-Sense Strand	GGGCACAUUGGAACUGAGC	2122
SNCA-734	19mer Anti-Sense Strand	UGGGCACAUUGGAACUGAG	2123
SNCA-735	19mer Anti-Sense Strand	CUGGGCACAUUGGAACUGA	2124
SNCA-736	19mer Anti-Sense Strand	ACUGGGCACAUUGGAACUG	2125
SNCA-737	19mer Anti-Sense Strand	GACUGGGCACAUUGGAACU	2126
SNCA-738	19mer Anti-Sense Strand	UGACUGGGCACAUUGGAAC	2127
SNCA-739	19mer Anti-Sense Strand	AUGACUGGGCACAUUGGAA	2128
SNCA-740	19mer Anti-Sense Strand	CAUGACUGGGCACAUUGGA	2129
SNCA-741	19mer Anti-Sense Strand	UCAUGACUGGGCACAUUGG	2130
SNCA-742	19mer Anti-Sense Strand	GUCAUGACUGGGCACAUUG	2131
SNCA-790	19mer Anti-Sense Strand	CACUGCUGAUGGAAGACUU	2132
SNCA-791	19mer Anti-Sense Strand	UCACUGCUGAUGGAAGACU	2133
SNCA-792	19mer Anti-Sense Strand	AUCACUGCUGAUGGAAGAC	2134
SNCA-938	19mer Anti-Sense Strand	GUAGUCACUUAGGUGUUUU	2135
SNCA-939	19mer Anti-Sense Strand	GGUAGUCACUUAGGUGUUU	2136
SNCA-940	19mer Anti-Sense Strand	UGGUAGUCACUUAGGUGUU	2137
SNCA-941	19mer Anti-Sense Strand	GUGGUAGUCACUUAGGUGU	2138
SNCA-942	19mer Anti-Sense Strand	AGUGGUAGUCACUUAGGUG	2139
SNCA-943	19mer Anti-Sense Strand	AAGUGGUAGUCACUUAGGU	2140

SNCA-944	19mer Anti-Sense Strand	UAAGUGGUAGUCACUUAGG	2141
SNCA-945	19mer Anti-Sense Strand	AUAAGUGGUAGUCACUUAG	2142
SNCA-946	19mer Anti-Sense Strand	AAUAAGUGGUAGUCACUUA	2143
SNCA-947	19mer Anti-Sense Strand	AAAUAAGUGGUAGUCACUU	2144
SNCA-948	19mer Anti-Sense Strand	GAAAUAAGUGGUAGUCACU	2145
SNCA-949	19mer Anti-Sense Strand	AGAAAUAAGUGGUAGUCAC	2146
SNCA-950	19mer Anti-Sense Strand	UAGAAAUAAGUGGUAGUCA	2147
SNCA-951	19mer Anti-Sense Strand	UUAGAAAUAAGUGGUAGUC	2148
SNCA-952	19mer Anti-Sense Strand	UUUAGAAAUAAGUGGUAGU	2149
SNCA-953	19mer Anti-Sense Strand	AUUUAGAAAUAAGUGGUAG	2150
SNCA-954	19mer Anti-Sense Strand	GAUUUAGAAAUAAGUGGUA	2151
SNCA-1081	19mer Anti-Sense Strand	AUAUUAACAAAUUUCACAA	2152
SNCA-1082	19mer Anti-Sense Strand	UAUAUUAACAAAUUUCACA	2153
SNCA-1083	19mer Anti-Sense Strand	AUAUAUUAACAAAUUUCAC	2154
SNCA-1084	19mer Anti-Sense Strand	UAUAUAUUAACAAAUUUCA	2155
SNCA-1085	19mer Anti-Sense Strand	AUAUAUAUUAACAAAUUUC	2156
SNCA-1188	19mer Anti-Sense Strand	UUUAUAUACAAACACAAGU	2157
SNCA-1189	19mer Anti-Sense Strand	AUUUAUAUACAAACACAAG	2158
SNCA-1190	19mer Anti-Sense Strand	CAUUUAUAUACAAACACAA	2159
SNCA-1191	19mer Anti-Sense Strand	CCAUUUAUAUACAAACACA	2160
SNCA-1192	19mer Anti-Sense Strand	ACCAUUUAUAUACAAACAC	2161

SNCA-1193	19mer Anti-Sense Strand	CACCAUUUAUAUACAAACA	2162
SNCA-225	19mer Anti-Sense Strand	UGAAUUCCUUUACACCACA	2163
SNCA-226	19mer Anti-Sense Strand	AUGAAUUCCUUUACACCAC	2164
SNCA-227	19mer Anti-Sense Strand	AAUGAAUUCCUUUACACCA	2165
SNCA-228	19mer Anti-Sense Strand	UAAUGAAUUCCUUUACACC	2166
SNCA-229	19mer Anti-Sense Strand	CUAAUGAAUUCCUUUACAC	2167
SNCA-230	19mer Anti-Sense Strand	GCUAAUGAAUUCCUUUACA	2168
SNCA-231	19mer Anti-Sense Strand	GGCUAAUGAAUUCCUUUAC	2169
SNCA-232	19mer Anti-Sense Strand	UGGCUAAUGAAUUCCUUUA	2170
SNCA-233	19mer Anti-Sense Strand	AUGGCUAAUGAAUUCCUUU	2171
SNCA-234	19mer Anti-Sense Strand	CAUGGCUAAUGAAUUCCUU	2172
SNCA-235	19mer Anti-Sense Strand	CCAUGGCUAAUGAAUUCCU	2173
SNCA-236	19mer Anti-Sense Strand	UCCAUGGCUAAUGAAUUCC	2174
SNCA-237	19mer Anti-Sense Strand	AUCCAUGGCUAAUGAAUUC	2175
SNCA-238	19mer Anti-Sense Strand	CAUCCAUGGCUAAUGAAUU	2176
SNCA-239	19mer Anti-Sense Strand	ACAUCCAUGGCUAAUGAAU	2177
SNCA-240	19mer Anti-Sense Strand	UACAUCCAUGGCUAAUGAA	2178
SNCA-241	19mer Anti-Sense Strand	AUACAUCCAUGGCUAAUGA	2179
SNCA-242	19mer Anti-Sense Strand	AAUACAUCCAUGGCUAAUG	2180
SNCA-243	19mer Anti-Sense Strand	GAAUACAUCCAUGGCUAAU	2181
SNCA-244	19mer Anti-Sense Strand	UGAAUACAUCCAUGGCUAA	2182

SNCA-245	19mer Anti-Sense Strand	AUGAAUACAUCCAUGGCUA	2183
SNCA-246	19mer Anti-Sense Strand	CAUGAAUACAUCCAUGGCU	2184
SNCA-247	19mer Anti-Sense Strand	UCAUGAAUACAUCCAUGGC	2185
SNCA-248	19mer Anti-Sense Strand	UUCAUGAAUACAUCCAUGG	2186
SNCA-249	19mer Anti-Sense Strand	UUUCAUGAAUACAUCCAUG	2187
SNCA-250	19mer Anti-Sense Strand	CUUUCAUGAAUACAUCCAU	2188
SNCA-251	19mer Anti-Sense Strand	CCUUUCAUGAAUACAUCCA	2189
SNCA-252	19mer Anti-Sense Strand	UCCUUUCAUGAAUACAUCC	2190
SNCA-253	19mer Anti-Sense Strand	GUCCUUUCAUGAAUACAUC	2191
SNCA-254	19mer Anti-Sense Strand	AGUCCUUUCAUGAAUACAU	2192
SNCA-256	19mer Anti-Sense Strand	AAAGUCCUUUCAUGAAUAC	2193
SNCA-330	19mer Anti-Sense Strand	UGUCUUUCCUGCUGCUUCU	2194
SNCA-335	19mer Anti-Sense Strand	UCUUUUGUCUUUCCUGCUG	2195
SNCA-337	19mer Anti-Sense Strand	CCUCUUUUGUCUUUCCUGC	2196
SNCA-341	19mer Anti-Sense Strand	ACACCCUCUUUUGUCUUUC	2197
SNCA-342	19mer Anti-Sense Strand	AACACCCUCUUUUGUCUUU	2198
SNCA-344	19mer Anti-Sense Strand	AGAACACCCUCUUUUGUCU	2199
SNCA-345	19mer Anti-Sense Strand	GAGAACACCCUCUUUUGUC	2200
SNCA-351	19mer Anti-Sense Strand	UACAUAGAGAACACCCUCU	2201
SNCA-353	19mer Anti-Sense Strand	CCUACAUAGAGAACACCCU	2202
SNCA-355	19mer Anti-Sense Strand	AGCCUACAUAGAGAACACC	2203

SNCA-638	19mer Anti-Sense Strand	UAGUCUUGAUACCCUUCCU	2204
SNCA-641	19mer Anti-Sense Strand	UCGUAGUCUUGAUACCCUU	2205
SNCA-642	19mer Anti-Sense Strand	UUCGUAGUCUUGAUACCCU	2206
SNCA-647	19mer Anti-Sense Strand	UCAGGUUCGUAGUCUUGAU	2207
SNCA-648	19mer Anti-Sense Strand	UUCAGGUUCGUAGUCUUGA	2208
SNCA-650	19mer Anti-Sense Strand	GCUUCAGGUUCGUAGUCUU	2209
SNCA-652	19mer Anti-Sense Strand	AGGCUUCAGGUUCGUAGUC	2210
SNCA-653	19mer Anti-Sense Strand	UAGGCUUCAGGUUCGUAGU	2211
SNCA-654	19mer Anti-Sense Strand	UUAGGCUUCAGGUUCGUAG	2212
SNCA-656	19mer Anti-Sense Strand	UCUUAGGCUUCAGGUUCGU	2213
SNCA-657	19mer Anti-Sense Strand	UUCUUAGGCUUCAGGUUCG	2214
SNCA-659	19mer Anti-Sense Strand	AUUUCUUAGGCUUCAGGUU	2215
SNCA-660	19mer Anti-Sense Strand	UAUUUCUUAGGCUUCAGGU	2216
SNCA-661	19mer Anti-Sense Strand	AUAUUUCUUAGGCUUCAGG	2217
SNCA-662	19mer Anti-Sense Strand	GAUAUUUCUUAGGCUUCAG	2218
SNCA-663	19mer Anti-Sense Strand	AGAUAUUUCUUAGGCUUCA	2219
SNCA-668	19mer Anti-Sense Strand	AGCAAAGAUAUUUCUUAGG	2220
SNCA-669	19mer Anti-Sense Strand	GAGCAAAGAUAUUUCUUAG	2221
SNCA-672	19mer Anti-Sense Strand	UGGGAGCAAAGAUAUUUCU	2222
SNCA-675	19mer Anti-Sense Strand	AACUGGGAGCAAAGAUAUU	2223
SNCA-676	19mer Anti-Sense Strand	AAACUGGGAGCAAAGAUAU	2224

SNCA-689	19mer Anti-Sense Strand	AGCAGAUCUCAAGAAACUG	2225
SNCA-724	19mer Anti-Sense Strand	GGAACUGAGCACUUGUACA	2226
SNCA-744	19mer Anti-Sense Strand	AUGUCAUGACUGGGCACAU	2227
SNCA-745	19mer Anti-Sense Strand	AAUGUCAUGACUGGGCACA	2228
SNCA-746	19mer Anti-Sense Strand	AAAUGUCAUGACUGGGCAC	2229
SNCA-751	19mer Anti-Sense Strand	UUGAGAAAUGUCAUGACUG	2230
SNCA-752	19mer Anti-Sense Strand	UUUGAGAAAUGUCAUGACU	2231
SNCA-753	19mer Anti-Sense Strand	CUUUGAGAAAUGUCAUGAC	2232
SNCA-754	19mer Anti-Sense Strand	ACUUUGAGAAAUGUCAUGA	2233
SNCA-755	19mer Anti-Sense Strand	AACUUUGAGAAAUGUCAUG	2234
SNCA-756	19mer Anti-Sense Strand	AAACUUUGAGAAAUGUCAU	2235
SNCA-757	19mer Anti-Sense Strand	AAAACUUUGAGAAAUGUCA	2236
SNCA-758	19mer Anti-Sense Strand	AAAAACUUUGAGAAAUGUC	2237
SNCA-759	19mer Anti-Sense Strand	UAAAAACUUUGAGAAAUGU	2238
SNCA-760	19mer Anti-Sense Strand	GUAAAAACUUUGAGAAAUG	2239
SNCA-761	19mer Anti-Sense Strand	UGUAAAAACUUUGAGAAAU	2240
SNCA-762	19mer Anti-Sense Strand	CUGUAAAAACUUUGAGAAA	2241
SNCA-789	19mer Anti-Sense Strand	ACUGCUGAUGGAAGACUUC	2242
SNCA-795	19mer Anti-Sense Strand	UCAAUCACUGCUGAUGGAA	2243
SNCA-796	19mer Anti-Sense Strand	UUCAAUCACUGCUGAUGGA	2244
SNCA-797	19mer Anti-Sense Strand	CUUCAAUCACUGCUGAUGG	2245

SNCA-798	19mer Anti-Sense Strand	ACUUCAAUCACUGCUGAUG	2246
SNCA-799	19mer Anti-Sense Strand	UACUUCAAUCACUGCUGAU	2247
SNCA-800	19mer Anti-Sense Strand	AUACUUCAAUCACUGCUGA	2248
SNCA-801	19mer Anti-Sense Strand	GAUACUUCAAUCACUGCUG	2249
SNCA-802	19mer Anti-Sense Strand	AGAUACUUCAAUCACUGCU	2250
SNCA-803	19mer Anti-Sense Strand	CAGAUACUUCAAUCACUGC	2251
SNCA-804	19mer Anti-Sense Strand	ACAGAUACUUCAAUCACUG	2252
SNCA-805	19mer Anti-Sense Strand	UACAGAUACUUCAAUCACU	2253
SNCA-809	19mer Anti-Sense Strand	CAGGUACAGAUACUUCAAU	2254
SNCA-839	19mer Anti-Sense Strand	AAAGGGAAGCACCGAAAUG	2255
SNCA-844	19mer Anti-Sense Strand	CAGUGAAAGGGAAGCACCG	2256
SNCA-845	19mer Anti-Sense Strand	UCAGUGAAAGGGAAGCACC	2257
SNCA-846	19mer Anti-Sense Strand	UUCAGUGAAAGGGAAGCAC	2258
SNCA-847	19mer Anti-Sense Strand	CUUCAGUGAAAGGGAAGCA	2259
SNCA-848	19mer Anti-Sense Strand	ACUUCAGUGAAAGGGAAGC	2260
SNCA-849	19mer Anti-Sense Strand	CACUUCAGUGAAAGGGAAG	2261
SNCA-850	19mer Anti-Sense Strand	UCACUUCAGUGAAAGGGAA	2262
SNCA-851	19mer Anti-Sense Strand	UUCACUUCAGUGAAAGGGA	2263
SNCA-852	19mer Anti-Sense Strand	AUUCACUUCAGUGAAAGGG	2264
SNCA-853	19mer Anti-Sense Strand	UAUUCACUUCAGUGAAAGG	2265
SNCA-854	19mer Anti-Sense Strand	GUAUUCACUUCAGUGAAAG	2266

SNCA-855	19mer Anti-Sense Strand	UGUAUUCACUUCAGUGAAA	2267
SNCA-856	19mer Anti-Sense Strand	AUGUAUUCACUUCAGUGAA	2268
SNCA-857	19mer Anti-Sense Strand	CAUGUAUUCACUUCAGUGA	2269
SNCA-858	19mer Anti-Sense Strand	CCAUGUAUUCACUUCAGUG	2270
SNCA-859	19mer Anti-Sense Strand	ACCAUGUAUUCACUUCAGU	2271
SNCA-860	19mer Anti-Sense Strand	UACCAUGUAUUCACUUCAG	2272
SNCA-861	19mer Anti-Sense Strand	CUACCAUGUAUUCACUUCA	2273
SNCA-863	19mer Anti-Sense Strand	UGCUACCAUGUAUUCACUU	2274
SNCA-864	19mer Anti-Sense Strand	CUGCUACCAUGUAUUCACU	2275
SNCA-865	19mer Anti-Sense Strand	CCUGCUACCAUGUAUUCAC	2276
SNCA-867	19mer Anti-Sense Strand	ACCCUGCUACCAUGUAUUC	2277
SNCA-868	19mer Anti-Sense Strand	GACCCUGCUACCAUGUAUU	2278
SNCA-875	19mer Anti-Sense Strand	ACACAAAGACCCUGCUACC	2279
SNCA-881	19mer Anti-Sense Strand	CACAGCACACAAAGACCCU	2280
SNCA-883	19mer Anti-Sense Strand	UCCACAGCACACAAAGACC	2281
SNCA-889	19mer Anti-Sense Strand	ACAAAAUCCACAGCACACA	2282
SNCA-890	19mer Anti-Sense Strand	CACAAAAUCCACAGCACAC	2283
SNCA-891	19mer Anti-Sense Strand	CCACAAAAUCCACAGCACA	2284
SNCA-892	19mer Anti-Sense Strand	GCCACAAAAUCCACAGCAC	2285
SNCA-893	19mer Anti-Sense Strand	AGCCACAAAAUCCACAGCA	2286
SNCA-894	19mer Anti-Sense Strand	AAGCCACAAAAUCCACAGC	2287

SNCA-895	19mer Anti-Sense Strand	GAAGCCACAAAAUCCACAG	2288
SNCA-897	19mer Anti-Sense Strand	UUGAAGCCACAAAAUCCAC	2289
SNCA-898	19mer Anti-Sense Strand	AUUGAAGCCACAAAAUCCA	2290
SNCA-900	19mer Anti-Sense Strand	AGAUUGAAGCCACAAAAUC	2291
SNCA-901	19mer Anti-Sense Strand	UAGAUUGAAGCCACAAAAU	2292
SNCA-956	19mer Anti-Sense Strand	AGGAUUUAGAAAUAAGUGG	2293
SNCA-957	19mer Anti-Sense Strand	GAGGAUUUAGAAAUAAGUG	2294
SNCA-958	19mer Anti-Sense Strand	UGAGGAUUUAGAAAUAAGU	2295
SNCA-959	19mer Anti-Sense Strand	GUGAGGAUUUAGAAAUAAG	2296
SNCA-961	19mer Anti-Sense Strand	UAGUGAGGAUUUAGAAAUA	2297
SNCA-962	19mer Anti-Sense Strand	AUAGUGAGGAUUUAGAAAU	2298
SNCA-963	19mer Anti-Sense Strand	AAUAGUGAGGAUUUAGAAA	2299
SNCA-964	19mer Anti-Sense Strand	AAAUAGUGAGGAUUUAGAA	2300
SNCA-965	19mer Anti-Sense Strand	AAAAUAGUGAGGAUUUAGA	2301
SNCA-966	19mer Anti-Sense Strand	AAAAAUAGUGAGGAUUUAG	2302
SNCA-967	19mer Anti-Sense Strand	AAAAAAUAGUGAGGAUUUA	2303
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SNCA-969	19mer Anti-Sense Strand	CAAAAAAAUAGUGAGGAUU	2305
SNCA-970	19mer Anti-Sense Strand	ACAAAAAAAUAGUGAGGAU	2306
SNCA-971	19mer Anti-Sense Strand	AACAAAAAAAUAGUGAGGA	2307
SNCA-972	19mer Anti-Sense Strand	CAACAAAAAAAUAGUGAGG	2308

SNCA-973	19mer Anti-Sense Strand	GCAACAAAAAAAUAGUGAG	2309
SNCA-974	19mer Anti-Sense Strand	AGCAACAAAAAAAUAGUGA	2310
SNCA-975	19mer Anti-Sense Strand	CAGCAACAAAAAAAUAGUG	2311
SNCA-976	19mer Anti-Sense Strand	ACAGCAACAAAAAAAUAGU	2312
SNCA-977	19mer Anti-Sense Strand	AACAGCAACAAAAAAAUAG	2313
SNCA-978	19mer Anti-Sense Strand	CAACAGCAACAAAAAAAUA	2314
SNCA-979	19mer Anti-Sense Strand	ACAACAGCAACAAAAAAAU	2315
SNCA-980	19mer Anti-Sense Strand	AACAACAGCAACAAAAAAA	2316
SNCA-981	19mer Anti-Sense Strand	GAACAACAGCAACAAAAAA	2317
SNCA-982	19mer Anti-Sense Strand	UGAACAACAGCAACAAAAA	2318
SNCA-983	19mer Anti-Sense Strand	CUGAACAACAGCAACAAAA	2319
SNCA-984	19mer Anti-Sense Strand	UCUGAACAACAGCAACAAA	2320
SNCA-985	19mer Anti-Sense Strand	UUCUGAACAACAGCAACAA	2321
SNCA-986	19mer Anti-Sense Strand	CUUCUGAACAACAGCAACA	2322
SNCA-987	19mer Anti-Sense Strand	ACUUCUGAACAACAGCAAC	2323
SNCA-988	19mer Anti-Sense Strand	AACUUCUGAACAACAGCAA	2324
SNCA-989	19mer Anti-Sense Strand	CAACUUCUGAACAACAGCA	2325
SNCA-990	19mer Anti-Sense Strand	ACAACUUCUGAACAACAGC	2326
SNCA-991	19mer Anti-Sense Strand	AACAACUUCUGAACAACAG	2327
SNCA-992	19mer Anti-Sense Strand	UAACAACUUCUGAACAACA	2328
SNCA-993	19mer Anti-Sense Strand	CUAACAACUUCUGAACAAC	2329

SNCA-994	19mer Anti-Sense Strand	ACUAACAACUUCUGAACAA	2330
SNCA-995	19mer Anti-Sense Strand	CACUAACAACUUCUGAACA	2331
SNCA-996	19mer Anti-Sense Strand	UCACUAACAACUUCUGAAC	2332
SNCA-997	19mer Anti-Sense Strand	AUCACUAACAACUUCUGAA	2333
SNCA-998	19mer Anti-Sense Strand	AAUCACUAACAACUUCUGA	2334
SNCA-999	19mer Anti-Sense Strand	AAAUCACUAACAACUUCUG	2335
SNCA-1000	19mer Anti-Sense Strand	CAAAUCACUAACAACUUCU	2336
SNCA-1001	19mer Anti-Sense Strand	GCAAAUCACUAACAACUUC	2337
SNCA-1002	19mer Anti-Sense Strand	AGCAAAUCACUAACAACUU	2338
SNCA-1003	19mer Anti-Sense Strand	UAGCAAAUCACUAACAACU	2339
SNCA-1004	19mer Anti-Sense Strand	AUAGCAAAUCACUAACAAC	2340
SNCA-1005	19mer Anti-Sense Strand	GAUAGCAAAUCACUAACAA	2341
SNCA-1028	19mer Anti-Sense Strand	CACCUAAAAAUCUUAUAAU	2342
SNCA-1029	19mer Anti-Sense Strand	ACACCUAAAAAUCUUAUAA	2343
SNCA-1030	19mer Anti-Sense Strand	GACACCUAAAAAUCUUAUA	2344
SNCA-1031	19mer Anti-Sense Strand	AGACACCUAAAAAUCUUAU	2345
SNCA-1032	19mer Anti-Sense Strand	AAGACACCUAAAAAUCUUA	2346
SNCA-1033	19mer Anti-Sense Strand	AAAGACACCUAAAAAUCUU	2347
SNCA-1034	19mer Anti-Sense Strand	AAAAGACACCUAAAAAUCU	2348
SNCA-1035	19mer Anti-Sense Strand	UAAAAGACACCUAAAAAUC	2349
SNCA-1036	19mer Anti-Sense Strand	UUAAAAGACACCUAAAAAU	2350

SNCA-1037	19mer Anti-Sense Strand	AUUAAAAGACACCUAAAAA	2351
SNCA-1038	19mer Anti-Sense Strand	CAUUAAAAGACACCUAAAA	2352
SNCA-1039	19mer Anti-Sense Strand	UCAUUAAAAGACACCUAAA	2353
SNCA-1040	19mer Anti-Sense Strand	AUCAUUAAAAGACACCUAA	2354
SNCA-1041	19mer Anti-Sense Strand	UAUCAUUAAAAGACACCUA	2355
SNCA-1042	19mer Anti-Sense Strand	GUAUCAUUAAAAGACACCU	2356
SNCA-1043	19mer Anti-Sense Strand	AGUAUCAUUAAAAGACACC	2357
SNCA-1044	19mer Anti-Sense Strand	CAGUAUCAUUAAAAGACAC	2358
SNCA-1045	19mer Anti-Sense Strand	ACAGUAUCAUUAAAAGACA	2359
SNCA-1046	19mer Anti-Sense Strand	GACAGUAUCAUUAAAAGAC	2360
SNCA-1047	19mer Anti-Sense Strand	AGACAGUAUCAUUAAAAGA	2361
SNCA-1048	19mer Anti-Sense Strand	UAGACAGUAUCAUUAAAAG	2362
SNCA-1049	19mer Anti-Sense Strand	UUAGACAGUAUCAUUAAAA	2363
SNCA-1050	19mer Anti-Sense Strand	CUUAGACAGUAUCAUUAAA	2364
SNCA-1051	19mer Anti-Sense Strand	UCUUAGACAGUAUCAUUAA	2365
SNCA-1052	19mer Anti-Sense Strand	UUCUUAGACAGUAUCAUUA	2366
SNCA-1053	19mer Anti-Sense Strand	AUUCUUAGACAGUAUCAUU	2367
SNCA-1054	19mer Anti-Sense Strand	UAUUCUUAGACAGUAUCAU	2368
SNCA-1055	19mer Anti-Sense Strand	UUAUUCUUAGACAGUAUCA	2369
SNCA-1056	19mer Anti-Sense Strand	AUUAUUCUUAGACAGUAUC	2370
SNCA-1057	19mer Anti-Sense Strand	CAUUAUUCUUAGACAGUAU	2371

SNCA-1058	19mer Anti-Sense Strand	UCAUUAUUCUUAGACAGUA	2372
SNCA-1078	19mer Anti-Sense Strand	UUAACAAAUUUCACAAUAC	2373
SNCA-1079	19mer Anti-Sense Strand	AUUAACAAAUUUCACAAUA	2374
SNCA-1080	19mer Anti-Sense Strand	UAUUAACAAAUUUCACAAU	2375
SNCA-1086	19mer Anti-Sense Strand	UAUAUAUAUUAACAAAUUU	2376
SNCA-1087	19mer Anti-Sense Strand	UUAUAUAUAUUAACAAAUU	2377
SNCA-1088	19mer Anti-Sense Strand	AUUAUAUAUAUUAACAAAU	2378
SNCA-1089	19mer Anti-Sense Strand	UAUUAUAUAUAUUAACAAA	2379
SNCA-1090	19mer Anti-Sense Strand	GUAUUAUAUAUAUUAACAA	2380
SNCA-1091	19mer Anti-Sense Strand	AGUAUUAUAUAUAUUAACA	2381
SNCA-1092	19mer Anti-Sense Strand	AAGUAUUAUAUAUAUUAAC	2382
SNCA-1093	19mer Anti-Sense Strand	UAAGUAUUAUAUAUAUUAA	2383
SNCA-1116	19mer Anti-Sense Strand	AUAGUUUCAUGCUCACAUA	2384
SNCA-1117	19mer Anti-Sense Strand	CAUAGUUUCAUGCUCACAU	2385
SNCA-1119	19mer Anti-Sense Strand	UGCAUAGUUUCAUGCUCAC	2386
SNCA-1120	19mer Anti-Sense Strand	GUGCAUAGUUUCAUGCUCA	2387
SNCA-1121	19mer Anti-Sense Strand	GGUGCAUAGUUUCAUGCUC	2388
SNCA-1122	19mer Anti-Sense Strand	AGGUGCAUAGUUUCAUGCU	2389
SNCA-1123	19mer Anti-Sense Strand	UAGGUGCAUAGUUUCAUGC	2390
SNCA-1124	19mer Anti-Sense Strand	AUAGGUGCAUAGUUUCAUG	2391
SNCA-1125	19mer Anti-Sense Strand	UAUAGGUGCAUAGUUUCAU	2392

SNCA-1126	19mer Anti-Sense Strand	UUAUAGGUGCAUAGUUUCA	2393
SNCA-1127	19mer Anti-Sense Strand	UUUAUAGGUGCAUAGUUUC	2394
SNCA-1128	19mer Anti-Sense Strand	AUUUAUAGGUGCAUAGUUU	2395
SNCA-1129	19mer Anti-Sense Strand	UAUUUAUAGGUGCAUAGUU	2396
SNCA-1130	19mer Anti-Sense Strand	GUAUUUAUAGGUGCAUAGU	2397
SNCA-1131	19mer Anti-Sense Strand	AGUAUUUAUAGGUGCAUAG	2398
SNCA-1132	19mer Anti-Sense Strand	UAGUAUUUAUAGGUGCAUA	2399
SNCA-1133	19mer Anti-Sense Strand	UUAGUAUUUAUAGGUGCAU	2400
SNCA-1194	19mer Anti-Sense Strand	UCACCAUUUAUAUACAAAC	2401
SNCA-1195	19mer Anti-Sense Strand	CUCACCAUUUAUAUACAAA	2402
SNCA-1196	19mer Anti-Sense Strand	UCUCACCAUUUAUAUACAA	2403
SNCA-1197	19mer Anti-Sense Strand	UUCUCACCAUUUAUAUACA	2404
SNCA-1198	19mer Anti-Sense Strand	AUUCUCACCAUUUAUAUAC	2405
SNCA-1199	19mer Anti-Sense Strand	AAUUCUCACCAUUUAUAUA	2406
SNCA-1200	19mer Anti-Sense Strand	UAAUUCUCACCAUUUAUAU	2407
SNCA-1201	19mer Anti-Sense Strand	UUAAUUCUCACCAUUUAUA	2408
SNCA-1202	19mer Anti-Sense Strand	UUUAAUUCUCACCAUUUAU	2409
SNCA-1203	19mer Anti-Sense Strand	UUUUAAUUCUCACCAUUUA	2410
SNCA-1204	19mer Anti-Sense Strand	AUUUUAAUUCUCACCAUUU	2411
SNCA-1205	19mer Anti-Sense Strand	UAUUUUAAUUCUCACCAUU	2412
SNCA-1206	19mer Anti-Sense Strand	UUAUUUUAAUUCUCACCAU	2413

SNCA-1207	19mer Anti-Sense Strand	UUUAUUUUAAUUCUCACCA	2414
SNCA-1208	19mer Anti-Sense Strand	UUUUAUUUUAAUUCUCACC	2415
SNCA-1250	19mer Anti-Sense Strand	UGAGAUGGGAUAAAAAUAA	2416
SNCA-1252	19mer Anti-Sense Strand	AGUGAGAUGGGAUAAAAAU	2417
SNCA-1253	19mer Anti-Sense Strand	AAGUGAGAUGGGAUAAAAA	2418
SNCA-1254	19mer Anti-Sense Strand	AAAGUGAGAUGGGAUAAAA	2419
SNCA-1255	19mer Anti-Sense Strand	UAAAGUGAGAUGGGAUAAA	2420
SNCA-1256	19mer Anti-Sense Strand	UUAAAGUGAGAUGGGAUAA	2421
SNCA-1257	19mer Anti-Sense Strand	AUUAAAGUGAGAUGGGAUA	2422
SNCA-1258	19mer Anti-Sense Strand	UAUUAAAGUGAGAUGGGAU	2423
SNCA-1259	19mer Anti-Sense Strand	UUAUUAAAGUGAGAUGGGA	2424
SNCA-1260	19mer Anti-Sense Strand	AUUAUUAAAGUGAGAUGGG	2425
SNCA-1261	19mer Anti-Sense Strand	UAUUAUUAAAGUGAGAUGG	2426
SNCA-1262	19mer Anti-Sense Strand	UUAUUAUUAAAGUGAGAUG	2427
SNCA-1263	19mer Anti-Sense Strand	UUUAUUAUUAAAGUGAGAU	2428
SNCA-1264	19mer Anti-Sense Strand	UUUUAUUAUUAAAGUGAGA	2429
SNCA-1265	19mer Anti-Sense Strand	UUUUUAUUAUUAAAGUGAG	2430
SNCA-1266	19mer Anti-Sense Strand	AUUUUUAUUAUUAAAGUGA	2431
SNCA-1267	19mer Anti-Sense Strand	GAUUUUUAUUAUUAAAGUG	2432
SNCA-1351	19mer Anti-Sense Strand	AAUUCCUCCUUCUUCAAAU	2433
SNCA-1365	19mer Anti-Sense Strand	UCUACCUCUUCUAAAAUUC	2434

SNCA-1372	19mer Anti-Sense Strand	CAUUUUCUCUACCUCUUCU	2435
SNCA-1373	19mer Anti-Sense Strand	CCAUUUUCUCUACCUCUUC	2436
SNCA-1374	19mer Anti-Sense Strand	UCCAUUUUCUCUACCUCUU	2437
SNCA-1375	19mer Anti-Sense Strand	UUCCAUUUUCUCUACCUCU	2438
SNCA-1376	19mer Anti-Sense Strand	GUUCCAUUUUCUCUACCUC	2439
SNCA-1377	19mer Anti-Sense Strand	UGUUCCAUUUUCUCUACCU	2440
SNCA-1379	19mer Anti-Sense Strand	AAUGUUCCAUUUUCUCUAC	2441
SNCA-1380	19mer Anti-Sense Strand	UAAUGUUCCAUUUUCUCUA	2442
SNCA-1381	19mer Anti-Sense Strand	UUAAUGUUCCAUUUUCUCU	2443
SNCA-1382	19mer Anti-Sense Strand	GUUAAUGUUCCAUUUUCUC	2444
SNCA-1383	19mer Anti-Sense Strand	GGUUAAUGUUCCAUUUUCU	2445
SNCA-1384	19mer Anti-Sense Strand	GGGUUAAUGUUCCAUUUUC	2446
SNCA-1385	19mer Anti-Sense Strand	AGGGUUAAUGUUCCAUUUU	2447
SNCA-1388	19mer Anti-Sense Strand	UGUAGGGUUAAUGUUCCAU	2448
SNCA-1428	19mer Anti-Sense Strand	AAAACACACUUCUGGCAGU	2449
SNCA-1429	19mer Anti-Sense Strand	CAAAACACACUUCUGGCAG	2450
Forward Primer	qPCR primer	AGGGTGTTCTCTATGTAGGCT	2451
Reverse Primer	qPCR primer	ACTGCTCCTCCAACATTTGTC	2452
Probe	qPCR probe	TGCTCTTTG/ZEN/GTCTTCTCAGCCACTG	2453
Forward Primer	SYBR Assay	ACAGTGGCTGAGAAGACCAA	2454
Reverse Primer	SYBR Assay	CTCCCTCCACTGTCTTCTGG	2455
Probe	SYBR Assay	ACCCGTCACCACCGCTCCTCC	2456

CLAIMS

The invention claimed is:

1. A RNAi oligonucleotide for reducing *SNCA* gene expression, the oligonucleotide comprising a sense strand and an antisense strand, wherein the sense strand and the antisense strand form a duplex region, wherein the antisense strand comprises a region of complementarity to a SNCA mRNA target sequence of any one of SEQ ID NOs: 1683-2066, and wherein the region of complementarity is at least 15 contiguous nucleotides in length.

2. The RNAi oligonucleotide of claim 1, wherein the sense strand is 15 to 50 nucleotides in length.

3. The RNAi oligonucleotide of claims 1 or 2, wherein the sense strand is 18 to 36 nucleotides in length.

4. The RNAi oligonucleotide of any one of claims 1 to 3, wherein the antisense strand is 15 to 30 nucleotides in length.

5. The RNAi oligonucleotide of any one of claims 1 to 4, wherein the antisense strand is 22 nucleotides in length and wherein antisense strand and the sense strand form a duplex region of at least 19 nucleotides in length, optionally at least 20 nucleotides in length.

6. The RNAi oligonucleotide of any one of claims 1 to 5, wherein the region of complementarity is at least 19 contiguous nucleotides in length.

7. The RNAi oligonucleotide of any one of claims 1 to 6, wherein the region of complementarity is at least 20 contiguous nucleotides in length.

8. A double-stranded RNAi oligonucleotide for reducing *SNCA* gene expression, the oligonucleotide comprising:

(i) an antisense strand of 19-30 nucleotides in length, wherein the antisense strand comprises a nucleotide sequence comprising a region of complementarity to a SNCA mRNA target sequence, wherein the region of complementarity is selected from SEQ ID NOs: 2067-2450, and

(ii) a sense strand of 19-50 nucleotides in length comprising a region of complementarity to the antisense strand, wherein the antisense and sense strands are separate strands which form an asymmetric duplex region having an overhang of 1-4 nucleotides at the 3' terminus of the antisense strand.

9. The RNAi oligonucleotide of any one of claims 1-8, wherein the 3' end of the sense strand comprises a stem-loop set forth as S1-L-S2, wherein S1 is complementary to S2, and wherein L forms a loop between S1 and S2 of 3-5 nucleotides in length.

10. The RNAi oligonucleotide of claim 9, wherein L is a triloop or a tetraloop.

11. The RNAi oligonucleotide of claim 10, wherein L is a tetraloop.

12. The RNAi oligonucleotide of claim 11, wherein the tetraloop comprises the sequence 5'-GAAA-3'.

13. The RNAi oligonucleotide of any one of claims 9-12, wherein the S1 and S2 are 1-10 nucleotides in length and have the same length.

14. The RNAi oligonucleotide of claim 13, wherein S1 and S2 are 1 nucleotide, 2 nucleotides, 3 nucleotides, 4 nucleotides, 5 nucleotides, 6 nucleotides, 7 nucleotides, 8 nucleotides, 9 nucleotides, or 10 nucleotides in length.

15. The RNAi oligonucleotide of claim 14, wherein S1 and S2 are 6 nucleotides in length.

16. The RNAi oligonucleotide of any one of claims 9-15, wherein the stem-loop comprises the sequence 5'-GCAGCCGAAAGGCUGC-3' (SEQ ID NO: 1680).

17. The RNAi oligonucleotide of any one of claims 1-8, wherein the oligonucleotide comprises a blunt end.

18. The RNAi oligonucleotide of claim 17, wherein the blunt end comprises the 3' end of the sense strand.

19. The RNAi oligonucleotide of any one of claims 17-18, wherein the sense strand is 20-22 nucleotides.

20. The RNAi oligonucleotide of claim 19, wherein the sense strand is 20 nucleotides.

21. The RNAi oligonucleotide of any one of claims 1 to 20, wherein the antisense strand comprises a 3' overhang sequence of one or more nucleotides in length.

22. The RNAi oligonucleotide of claim 21, wherein the overhang comprises purine nucleotides.

23. The RNAi oligonucleotide of claim 21 or 22, wherein the 3' overhang sequence is 2 nucleotides in length.

24. The RNAi oligonucleotide of claim 23, wherein the 3' overhang is selected from AA, GG, AG, and GA.

25. The RNAi oligonucleotide of claim 24, wherein the overhang is GG or AA.

26. The RNAi oligonucleotide of claim 25, wherein the overhang is GG.

27. The RNAi oligonucleotide of any one of the preceding claims, wherein the oligonucleotide comprises at least one modified nucleotide.

28. The RNAi oligonucleotide of claim 27, wherein the modified nucleotide comprises a 2′-modification.

29. The RNAi oligonucleotide of claim 28, wherein the 2′-modification is a modification selected from 2′-aminoethyl, 2′-fluoro, 2′-O-methyl, 2′-O-methoxyethyl, and 2′-deoxy-2′-fluoro-β-d-arabinonucleic acid.

30. The RNAi oligonucleotide of any one of claims 28-29, wherein the modification is a 2'-modification selected from 2'-fluoro and 2'-O-methyl.

31. The RNAi oligonucleotide of any one of claims 29-30, wherein about 18% to about 23%, or 18%, 19%, 20%, 21%, 22% or 23% of the nucleotides of the sense strand comprise the 2'-fluoro modification.

32. The RNAi oligonucleotide of any one of claims 29-30, wherein about 38% to about 43%, or 38%, 39%, 40%, 41%, 42% or 43% of the nucleotides of the sense strand comprise the 2'-fluoro modification.

33. The RNAi oligonucleotide of any one of claims 29-32, wherein about 25% to about 35%, or 25%, 26%, 27%, 28%, 29%, 30%, 31%, 32%, 33%, 34% or 35% of the nucleotides of the antisense strand comprise the 2'-fluoro modification.

34. The RNAi oligonucleotide of any one of claims 29-33, wherein about 25% to about 35%, or 25%, 26%, 27%, 28%, 29%, 30%, 31%, 32%, 33%, 34% or 35% of the nucleotides of the oligonucleotide comprise the 2'-fluoro modification.

35. The RNAi oligonucleotide of any one of claims 29-33, wherein about 35-45%, 35%, 36%, 37%, 38%, 39%, 40%, 41%, 42%, 43%, 44% or 45% of the nucleotides of the oligonucleotide comprise the 2'-fluoro modification.

36. The RNAi oligonucleotide of any one of claims 29-35, wherein the sense strand comprises 36 nucleotides with positions 1-36 from 5' to 3', wherein each of positions 3, 5, 8, 10, 12, 13, 15, and 17 comprise the 2'-fluoro modification.

37. The RNAi oligonucleotide of any one of claims 29-35, wherein the sense strand comprises 20 nucleotides with positions 1-20 from 5' to 3', wherein each of positions 3, 5, 8, 10, 12, 13, 15, and 17 comprise the 2'-fluoro modification.

38. The RNAi oligonucleotide of any one of claims 29-37, wherein the antisense strand comprises 22 nucleotides with positions 1-22 from 5' to 3', and wherein each of positions 2, 3, 4, 5, 7, 10 14, 16 and 19 comprise the 2'-fluoro modification.

39. The RNAi oligonucleotide of any one of claims 31-38, wherein the remaining nucleotides comprise the 2'-O-methyl modification.

40. The RNAi oligonucleotide of any one of the preceding claims, wherein the oligonucleotide comprises at least one modified internucleotide linkage.

41. The RNAi oligonucleotide of claim 40, wherein the at least one modified internucleotide linkage is a phosphorothioate linkage.

42. The RNAi oligonucleotide of claim 41, wherein the antisense strand comprises the phosphorothioate linkage (i) between positions 1 and 2, and between positions 2 and 3; or (ii) between positions 1 and 2, between positions 2 and 3, and between positions 3 and 4, and wherein positions are numbered 1-4 from 5' to 3'.

43. The RNAi oligonucleotide of claim 41 or 42, wherein the antisense strand is 22 nucleotides in length, and wherein the antisense strand comprises the phosphorothioate linkage between positions 20 and 21 and between positions 21 and 22, and wherein positions are numbered 1-22 from 5' to 3'.

44. The RNAi oligonucleotide of any one of claims 41-43, wherein the sense strand comprises the phosphorothioate linkage between positions 1 and 2, and wherein positions are numbered 1-2 from 5' to 3'.

45. The RNAi oligonucleotide of any one of claims 41-43, wherein the sense strand is 20 nucleotides in length, wherein the sense strand comprises the phosphorothioate linkage between positions between positions 1 and 2, between positions 18 and 19 and between positions 19 and 20, and wherein positions are numbered 1-20 from 5' to 3'.

46. The RNAi oligonucleotide of any one of the preceding claims, wherein the 4′-carbon of the sugar of the 5′-nucleotide of the antisense strand comprises a phosphate analog.

47. The RNAi oligonucleotide of claim 46, wherein the phosphate analog is oxymethyl phosphonate, vinyl phosphonate or malonyl phosphonate, optionally wherein the phosphate analog is a 4'-phosphate analog comprising 4'-oxymethylphosphonate.

48. The RNAi oligonucleotide of any one of the preceding claims, wherein at least one nucleotide of the oligonucleotide is conjugated to one or more targeting ligands.

49. The RNAi oligonucleotide of claim 48, wherein each targeting ligand comprises a carbohydrate, amino sugar, lipid, cholesterol, or polypeptide.

50. The RNAi oligonucleotide of any one of claims 9-16 and 21-49, wherein the stem-loop comprises one or more targeting ligands conjugated to one or more nucleotides of the stem-loop.

51. The RNAi oligonucleotide of claim 50, wherein the one or more targeting ligands is conjugated to one or more nucleotides of the loop (L).

52. The RNAi oligonucleotide of claim 51, wherein the loop (L) comprises 4 nucleotides numbered 1-4 from 5' to 3', wherein nucleotides at positions 2, 3, and 4 each comprise one or more targeting ligands, and wherein the targeting ligands are the same or different.

53. The RNAi oligonucleotide of claim 52, wherein each targeting ligand comprises a N-acetylgalactosamine (GalNAc) moiety.

54. The RNAi oligonucleotide of claim 53, wherein the GalNac moiety is a monovalent GalNAc moiety, a bivalent GalNAc moiety, a trivalent GalNAc moiety, or a tetravalent GalNAc moiety.

55. The RNAi oligonucleotide of any one of claims 9-16 and 21-54, wherein up to 4 nucleotides of loop (L) of the stem-loop are each conjugated to a monovalent GalNAc moiety.

56. The RNAi oligonucleotide of any one of claims 17-48, wherein the one or more targeting ligands is a lipid moiety.

57. The RNAi oligonucleotide of claim 56, wherein the lipid moiety is conjugated to the 5'terminal nucleotide of the sense strand.

58. The RNAi oligonucleotide of claim 56 or 57, wherein the lipid moiety is a hydrocarbon chain.

59. The RNAi oligonucleotide of claim 58, wherein the hydrocarbon chain is a C_8-C_{30} hydrocarbon chain.

60. The RNAi oligonucleotide of claim 58 or 59, wherein the hydrocarbon chain is a C_{16} hydrocarbon chain.

61. The RNAi oligonucleotide of claim 60, wherein the C_{16} hydrocarbon chain is represented by:  .

62. The RNAi oligonucleotide of any one of claims 56-61, wherein the lipid moiety is conjugated to the 2' carbon of the ribose ring of the 5' terminal nucleotide.

63. The RNAi oligonucleotide of any one of claims 1-62, wherein the region of complementarity is fully complementary to the SNCA mRNA target sequence at nucleotide positions 2-8 of the antisense strand, and wherein nucleotide positions are numbered 5' to 3'.

64. The RNAi oligonucleotide of any one of claims 1-62, wherein the region of complementarity is fully complementary to the *SNCA* mRNA target sequence at nucleotide positions 2-11 of the antisense strand, and wherein nucleotide positions are numbered 5' to 3'.

65. The RNAi oligonucleotide of any one of claims 1 to 64, wherein the sense strand comprises a nucleotide sequence of any one of SEQ ID NOs: 1537-1571 and 1681.

66. The RNAi oligonucleotide of any one of claims 1 to 65, wherein the antisense strand comprises a nucleotide sequence of any one of SEQ ID NOs: 1572-1606.

67. The RNAi oligonucleotide of any one of claims 1 to 66, wherein the sense strand and the antisense strand comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1537 and 1572, respectively;

b) SEQ ID NOs: 1538 and 1573, respectively;

c) SEQ ID NOs: 1539 and 1574, respectively;

d) SEQ ID NOs: 1540 and 1575, respectively;

e) SEQ ID NOs: 1541 and 1576, respectively;

f) SEQ ID NOs: 1542 and 1577, respectively;

g) SEQ ID NOs: 1543 and 1578, respectively;

h) SEQ ID NOs: 1544 and 1579, respectively;

i) SEQ ID NOs: 1545 and 1580, respectively;

j) SEQ ID NOs: 1546 and 1581, respectively;

k) SEQ ID NOs: 1547 and 1582, respectively;

l) SEQ ID NOs: 1548 and 1583, respectively;

m) SEQ ID NOs: 1549 and 1584, respectively;

n) SEQ ID NOs: 1550 and 1585, respectively;

o) SEQ ID NOs: 1551 and 1586, respectively;

p) SEQ ID NOs: 1552 and 1587, respectively;

q) SEQ ID NOs: 1553 and 1588, respectively;

r) SEQ ID NOs: 1554 and 1589, respectively;

s) SEQ ID NOs: 1555 and 1590, respectively;

t) SEQ ID NOs: 1556 and 1591, respectively;

u) SEQ ID NOs: 1557 and 1592, respectively;

v) SEQ ID NOs: 1558 and 1593, respectively;

w) SEQ ID NOs: 1559 and 1594, respectively;

x) SEQ ID NOs: 1560 and 1595, respectively;

y) SEQ ID NOs: 1561 and 1596, respectively;

z) SEQ ID NOs: 1562 and 1597, respectively;

aa) SEQ ID NOs: 1563 and 1598, respectively;
bb) SEQ ID NOs: 1564 and 1599, respectively;
cc) SEQ ID NOs: 1565 and 1600, respectively;
dd) SEQ ID NOs: 1566 and 1601, respectively;
ee) SEQ ID NOs: 1567 and 1602, respectively;
ff) SEQ ID NOs: 1568 and 1603, respectively;
gg) SEQ ID NOs: 1569 and 1604, respectively;
hh) SEQ ID NOs: 1570 and 1605, respectively;
ii) SEQ ID NOs: 1571 and 1606, respectively; and
jj) SEQ ID NOs: 1681 and 1586, respectively.

68. The RNAi oligonucleotide of any one of claims 1 to 66, wherein the sense strand and the antisense strand comprise nucleotide sequences selected from the group consisting of:
a) SEQ ID NOs: 1540 and 1575, respectively;
b) SEQ ID NOs: 1544 and 1579, respectively;
c) SEQ ID NOs: 1546 and 1581, respectively;
d) SEQ ID NOs: 1551and 1586, respectively;
e) SEQ ID NOs: 1552 and 1587, respectively;
f) SEQ ID NOs: 1553 and 1588, respectively;
g) SEQ ID NOs: 1558 and 1594, respectively;
h) SEQ ID NOs: 1560 and 1595, respectively;
i) SEQ ID NOs: 1564 and 1599, respectively;
j) SEQ ID NOs: 1565 and 1600, respectively;
k) SEQ ID NOs: 1566 and 1601, respectively;
l) SEQ ID NOs: 1570 and 1605, respectively; and
m) SEQ ID NOs: 1681 and 1586, respectively.

69. The RNAi oligonucleotide of any one of claims 1 to 66, wherein the sense strand and antisense strands comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1553 and 1588, respectively;
b) SEQ ID NOs: 1560 and 1595, respectively;
c) SEQ ID NOs: 1564 and 1599, respectively;
d) SEQ ID NOs: 1551 and 1586, respectively;
e) SEQ ID NOs: 1570 and 1605, respectively; and,
f) SEQ ID NOs: 1681 and 1586, respectively.

70. The RNAi oligonucleotide of any one of claims 1 to 66, wherein the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1553, and wherein the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1588.

71. The RNAi oligonucleotide of any one of claims 1 to 66, wherein the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1560, and wherein the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1595.

72. The RNAi oligonucleotide of any one of claims 1 to 66, wherein the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1564, and wherein the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1599.

73. The RNAi oligonucleotide of any one of claims 1 to 66, wherein the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1551, and wherein the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1586.

74. The RNAi oligonucleotide of any one of claims 1 to 66, wherein the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1570, and wherein the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1605.

75. The RNAi oligonucleotide of any one of claims 1 to 66, wherein the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1681, and wherein the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1586.

76. The RNAi oligonucleotide of any one of claims 1-64, wherein the antisense strand is 22 nucleotides in length.

77. The RNAi oligonucleotide of claim 76, wherein the antisense strand comprises a nucleotide sequence selected from SEQ ID NOs: 1588, 1595, 1599, 1586, and 1605.

78. The RNAi oligonucleotide of any one of claims 1-64 and 76-77, wherein the sense strand comprises a nucleotide sequence selected from SEQ ID NOs: 1865, 1721, 1847, 1846, and 1955.

79. The RNAi oligonucleotide of any one of claims 1-64 and 76-78, wherein the sense strand is 36 nucleotides in length.

80. The RNAi oligonucleotide of claim 79, wherein the sense strand comprises a nucleotide sequence selected from SEQ ID NOs: 1553, 1560, 1564, 1551, and 1570.

81. The RNAi oligonucleotide of any one of claims 1-64, wherein the sense strand comprises the nucleotide sequence of any one of SEQ ID NOs: 1607-1641, and 1682.

82. The RNAi oligonucleotide of any one of claims 1 to 64 and 81, wherein the antisense strand comprises a nucleotide sequence of any one of SEQ ID NOs: 1642-1676.

83. The RNAi oligonucleotide of any one of claims 1-64, wherein the sense strand and the antisense strand comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1607 and 1642, respectively;

b) SEQ ID NOs: 1608 and 1643, respectively;

c) SEQ ID NOs: 1609 and 1644, respectively;
d) SEQ ID NOs: 1610 and 1645, respectively;
e) SEQ ID NOs: 1611 and 1646, respectively;
f) SEQ ID NOs: 1612 and 1647, respectively;
g) SEQ ID NOs: 1613 and 1648, respectively;
h) SEQ ID NOs: 1614 and 1649, respectively;
i) SEQ ID NOs: 1615 and 1650, respectively;
j) SEQ ID NOs: 1616 and 1651, respectively;
k) SEQ ID NOs: 1617 and 1652, respectively;
l) SEQ ID NOs: 1618 and 1653, respectively;
m) SEQ ID NOs: 1619 and 1654, respectively;
n) SEQ ID NOs: 1620 and 1655, respectively;
o) SEQ ID NOs: 1621 and 1656, respectively;
p) SEQ ID NOs: 1622 and 1657, respectively;
q) SEQ ID NOs: 1623 and 1658, respectively;
r) SEQ ID NOs: 1624 and 1659, respectively;
s) SEQ ID NOs: 1625 and 1660, respectively;
t) SEQ ID NOs: 1626 and 1661, respectively;
u) SEQ ID NOs: 1627 and 1662, respectively;
v) SEQ ID NOs: 1628 and 1663, respectively;
w) SEQ ID NOs: 1629 and 1664, respectively;
x) SEQ ID NOs: 1630 and 1665, respectively;
y) SEQ ID NOs: 1631 and 1666, respectively;
z) SEQ ID NOs: 1632 and 1667, respectively;
aa) SEQ ID NOs: 1633 and 1668, respectively;
bb) SEQ ID NOs: 1634 and 1669, respectively;
cc) SEQ ID NOs: 1635 and 1670, respectively;
dd) SEQ ID NOs: 1636 and 1671, respectively;
ee) SEQ ID NOs: 1637 and 1672, respectively;

ff) SEQ ID NOs: 1638 and 1673, respectively;

gg) SEQ ID NOs: 1639 and 1674, respectively;

hh) SEQ ID NOs: 1640 and 1675, respectively;

ii) SEQ ID NOs: 1641 and 1676, respectively; and

jj) SEQ ID NOs: 1682 and 1656, respectively.

84. The RNAi oligonucleotide of any one of claims 1-64, wherein the sense strand and the antisense strand comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1610 and 1645, respectively;

b) SEQ ID NOs: 1614 and 1649, respectively;

c) SEQ ID NOs: 1616 and 1651, respectively;

d) SEQ ID NOs: 1621 and 1656, respectively;

e) SEQ ID NOs: 1622 and 1657, respectively;

f) SEQ ID NOs: 1623 and 1658, respectively;

g) SEQ ID NOs: 1629 and 1664, respectively;

h) SEQ ID NOs: 1630 and 1665, respectively;

i) SEQ ID NOs: 1634 and 1669, respectively;

j) SEQ ID NOs: 1635 and 1670, respectively;

k) SEQ ID NOs: 1636 and 1671, respectively;

l) SEQ ID NOs: 1640 and 1675, respectively; and

m) SEQ ID NOs: 1682 and 1656, respectively.

85. The RNAi oligonucleotide of any one of claims 1-64, wherein the sense strand and the antisense strand comprise nucleotide sequences selected from the group consisting of:

a) SEQ ID NOs: 1623 and 1658, respectively;

b) SEQ ID NOs: 1630 and 1665, respectively;

c) SEQ ID NOs: 1634 and 1669, respectively;

d) SEQ ID NOs: 1621 and 1656, respectively;

e) SEQ ID NOs: 1640 and 1675, respectively; and

f) SEQ ID NOs: 1682 and 1656, respectively.

86. The RNAi oligonucleotide of any one of claims 1 to 64, wherein the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1623, and wherein the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1658.

87. The RNAi oligonucleotide of any one of claims 1 to 64, wherein the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1630, and wherein the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1665.

88. The RNAi oligonucleotide of any one of claims 1 to 64, wherein the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1634, and wherein the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1669.

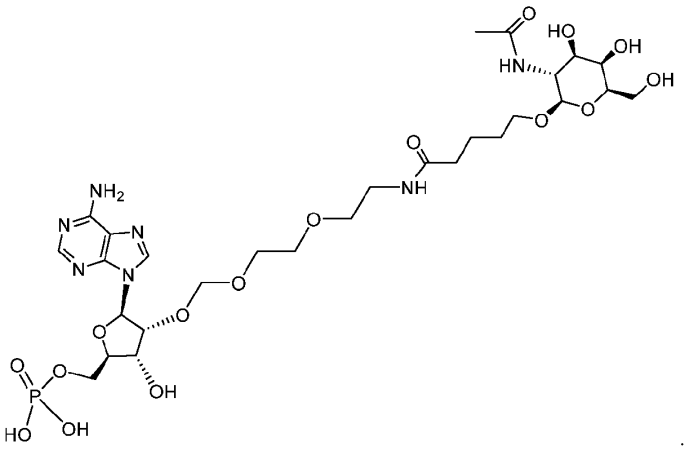
89. The RNAi oligonucleotide of any one of claims 1 to 64, wherein the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1621, and wherein the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1656.

90. The RNAi oligonucleotide of any one of claims 1 to 64, wherein the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1640, and wherein the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1676.

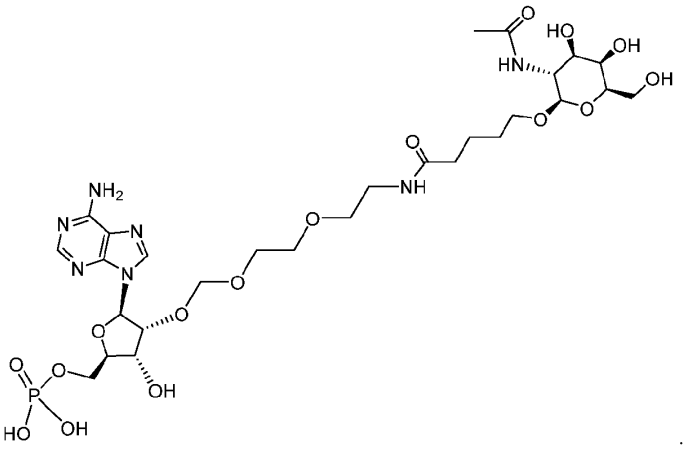
91. The RNAi oligonucleotide of any one of claims 1 to 64, wherein the sense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1682, and wherein the antisense strand comprises the nucleotide sequence as set forth in SEQ ID NO: 1656.

92. The RNAi oligonucleotide of claim 1, wherein the sense strand comprises the sequence 5′-[mCs][mA][fG][mC][fA][mG][mU][fG][mA][fU][mU] [fG][fA][mA][fG][mU][fA][mU][mC][mA][mG][mC][mA][mG][mC][mC][mG][ademA-

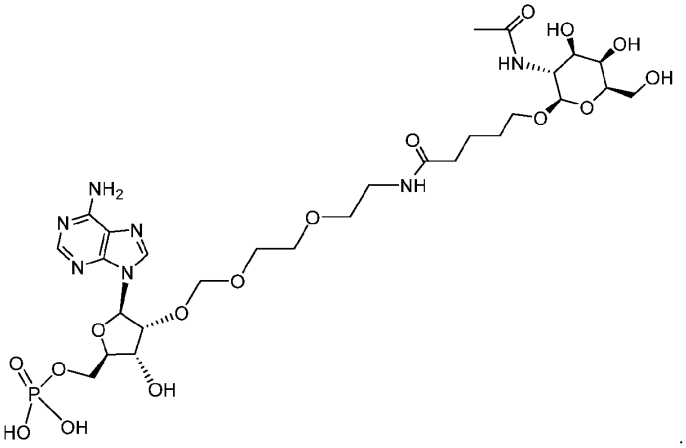
GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]-3' (SEQ ID NO: 1623), wherein the antisense strand comprises the sequence 5'-[MePhosphonate-4O-mUs][fGs][fA][fU][fA][mC][fU][mU][mC][fA][mA][mU][mC][fA] [mC][fU][mG][mC][fU][mGs][mGs][mG]-3' (SEQ ID NO: 1658), and wherein mC, mA, mG, mU = 2'-OMe ribonucleosides; fA, fC, fG, fU = 2'-F ribonucleosides; s = phosphorothioate, and wherein ademA-GalNAc =



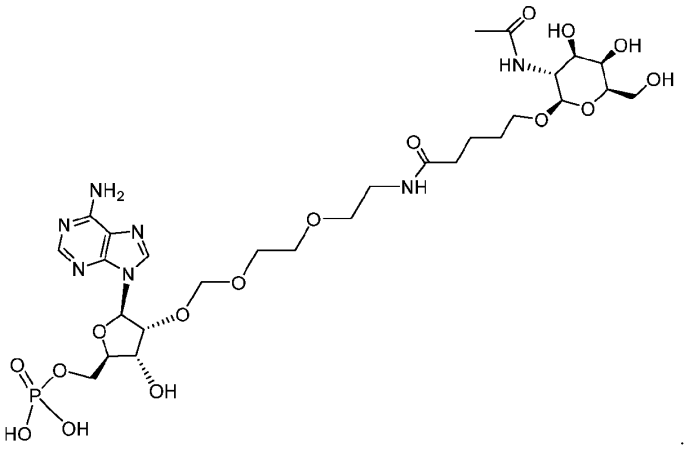
93. The RNAi oligonucleotide of claim 1, wherein the sense strand comprises the sequence 5'-[mAs][mG][fA][mG][fC][mA][mA][fG][mU][fG][mA][fC][fA][mA][fA][mU][fG][mU][mU] [mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]-3' (SEQ ID NO: 1630), wherein the antisense strand comprises the sequence 5'-[MePhosphonate-4O-mUs][fAs][fA][fC][fA][mU][fU][mU][mG] [fU][mC][mA][mC][fU][mU][fG][mC][mU][fC][mUs][mGs][mG]-3' (SEQ ID NO: 1665), and wherein mC, mA, mG, mU = 2'-OMe ribonucleosides; fA, fC, fG, fU = 2'-F ribonucleosides; s = phosphorothioate, and wherein ademA-GalNAc =



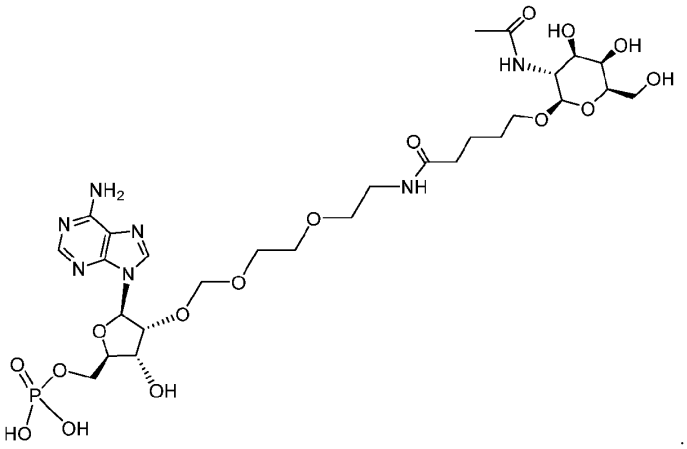
94. The RNAi oligonucleotide of claim 1, wherein the sense strand comprises the sequence 5′-[mAs][mG][fU][mC][fA][mU][mG][fA][mC][fA][mU][fU][fU][mC][fU][mC][fA][mA][mA][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]-3’ (SEQ ID NO: 1634), wherein the antisense strand comprises the sequence 5′-[MePhosphonate-4O-mUs][fUs][fU][fU][fG][mA][fG][mA][mA][fA][mU][mG][mU][fC][mA][fU][mG][mA][fC][mUs][mGs][mG]-3′ (SEQ ID NO: 1669), and wherein mC, mA, mG, mU = 2'-OMe ribonucleosides; fA, fC, fG, fU = 2'-F ribonucleosides; s = phosphorothioate, and wherein ademA-GalNAc =



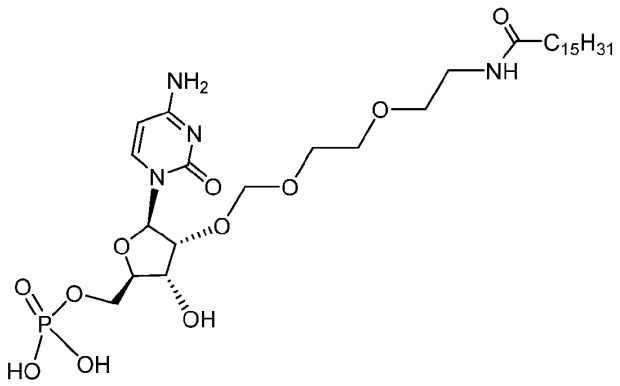
95. The RNAi oligonucleotide of claim 1, wherein the sense strand comprises the sequence 5′-[mCs][mA][fG][mU][fC][mA][mU][fG][mA][fC][mA][fU][fU][mU][fC][mU][fC][mA][mA][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]- 3’ (SEQ ID NO: 1621), wherein the antisense strand comprises the sequence 5′-[MePhosphonate-4O-mUs][fUs][fU][fG][fA][mG][fA][mA][mA][fU][mG][mU][mC][fA][mU][fG][mA][mC][fU][mGs][mGs][mG]-3′ (SEQ ID NO: 1656), and wherein mC, mA, mG, mU = 2'-OMe ribonucleosides; fA, fC, fG, fU = 2'-F ribonucleosides; s = phosphorothioate, and wherein ademA-GalNAc =



96. The RNAi oligonucleotide of claim 1, wherein the sense strand comprises the sequence 5′-[mAs][mG][fU][mU][fG][mU][mU][fA][mG][fU][mG][fA][fU][mU][fU][mG][fC][mU][mA][mA][mG][mC][mA][mG][mC][mC][mG][ademA-GalNAc][ademA-GalNAc][ademA-GalNAc][mG][mG][mC][mU][mG][mC]-3’ (SEQ ID NO: 1640), wherein the antisense strand comprises the sequence 5′-[MePhosphonate-4O-mUs][fUs][fA][fG][fC][mA][fA][mA][mU][fC][mA][mC][mU][fA][mA][fC][mA][mA][fC][mUs][mGs][mG]-3′ (SEQ ID NO: 1675), and wherein mC, mA, mG, mU = 2'-OMe ribonucleosides; fA, fC, fG, fU = 2'-F ribonucleosides; s = phosphorothioate, and wherein ademA-GalNAc =



97. The RNAi oligonucleotide of claim 1, wherein the sense strand comprises the sequence 5′-[ademCs-C_{16}][mA][fG][mU][fC][mA][mU][fG][mA][fC][mA][fU][fU][mU][fC][mU] [fC][mAs][mAs][mA]-3’ (SEQ ID NO: 1682), wherein the antisense strand comprises the sequence 5′-[MePhosphonate-4O-mUs][fUs][fU][fG][fA][mG][fA][mA][mA][fU][mG][mU] [mC][fA][mU][fG][mA][mC][fU][mGs][mGs][mG]-3′ (SEQ ID NO: 1656), and wherein mC, mA, mG, mU = 2'-OMe ribonucleosides; fA, fC, fG, fU = 2'-F ribonucleosides; s = phosphorothioate, and [ademCs-C_{16}]=



98. A pharmaceutical composition comprising the RNAi oligonucleotide of any one of claims 1 to 97, and a pharmaceutically acceptable carrier, delivery agent, or excipient.

99. A method for treating a subject having a disease, disorder, or condition associated with *SNCA* gene expression, the method comprising administering to the subject a therapeutically effective amount of the RNAi oligonucleotide of any one of claim 1-97, or pharmaceutical composition of claim 98, thereby treating the subject.

100. A method of delivering an oligonucleotide to a subject, the method comprising administering to the subject the pharmaceutical composition of claim 98.

101. A method for reducing *SNCA* gene expression in a cell, a population of cells, or a subject, the method comprising the steps of:

i. contacting the cell or the population of cells with the RNAi oligonucleotide of any one of claims 1 to 97, or the pharmaceutical composition of claim 98; or

ii. administering to the subject the RNAi oligonucleotide of any one of claims 1 to 97, or the pharmaceutical composition of claim 98.

102. The method of claim 101, wherein reducing *SNCA* gene expression comprises reducing an amount or level of SNCA mRNA, an amount or level of SNCA protein, a SNCA activity/function, or a combination thereof.

103. The method of claim 101 or 102, wherein the subject has a disease, disorder, or condition associated with *SNCA* gene expression.

104. The method of claim 99 or 103, wherein the disease, disorder, or condition associated with *SNCA* gene expression is multiple system atrophy, dementia with Lewy bodies, or Parkinson disease.

105. The method of any one of claims 99-104, wherein *SNCA* gene expression is reduced in tissue of one or more regions of the central nervous system (CNS), and wherein the tissue is associated with Parkinson disease.

106. The method of claim 105, wherein tissue associated with Parkinson disease is selected from: putamen, midbrain tegmentum, substantia nigra, pons, and medulla.

107. The method of any one of claims 99-104, wherein *SNCA* gene expression is reduced in tissue of one or more regions of the central nervous system (CNS), and wherein the tissue is associated with multiple system atrophy.

108. The method of claim 107, wherein tissue associated with multiple system atrophy is selected from: caudate nucleus, putamen, midbrain tegmentum, substantia nigra, pons, cerebellar cortex, cerebellar white matter, medulla, cervical spinal cord, thoracic spinal cord, and lumbar spinal cord.

109. The method of any one of claims 99-104, wherein *SNCA* gene expression is reduced in one or more regions of the central nervous system (CNS) selected from: cervical spinal cord, thoracic spinal cord, lumbar spinal cord, frontal cortex, temporal cortex, cerebellum, midbrain, occipital cortex, parietal cortex, hippocampus, caudate nucleus, thalamus, brainstem, motor cortex, globus pallidus, midbrain tegmentum, substantia nigra, pons, cerebellar white matter, and cerebellar dentate nucleus.

110. The method of any one of claims 99-109, wherein the RNAi oligonucleotide, or pharmaceutical composition, is administered in combination with a second composition or therapeutic agent.

111. Use of the RNAi oligonucleotide of any one of claims 1 to 97, or the pharmaceutical composition of claim 98, in the manufacture of a medicament for the treatment of a disease, disorder, or condition associated with *SNCA* gene expression.

112. The RNAi oligonucleotide of any one of claims 1 to 97, or the pharmaceutical composition of claim 98, for use, or adaptable for use, in the treatment of a disease, disorder, or condition associated with *SNCA* gene expression.

113. A kit comprising the RNAi oligonucleotide of any one of claims 1 to 97, an optional pharmaceutically acceptable carrier, and a package insert comprising instructions for administration to a subject having a disease, disorder, or condition associated with *SNCA* gene expression.

114. The use of claim 111, the RNAi oligonucleotide or pharmaceutical composition for use, or adaptable for use, of claim 112, or the kit of claim 113, wherein the disease, disorder, or condition associated with *SNCA* gene expression is multiple system atrophy, dementia with Lewy bodies, and Parkinson disease.