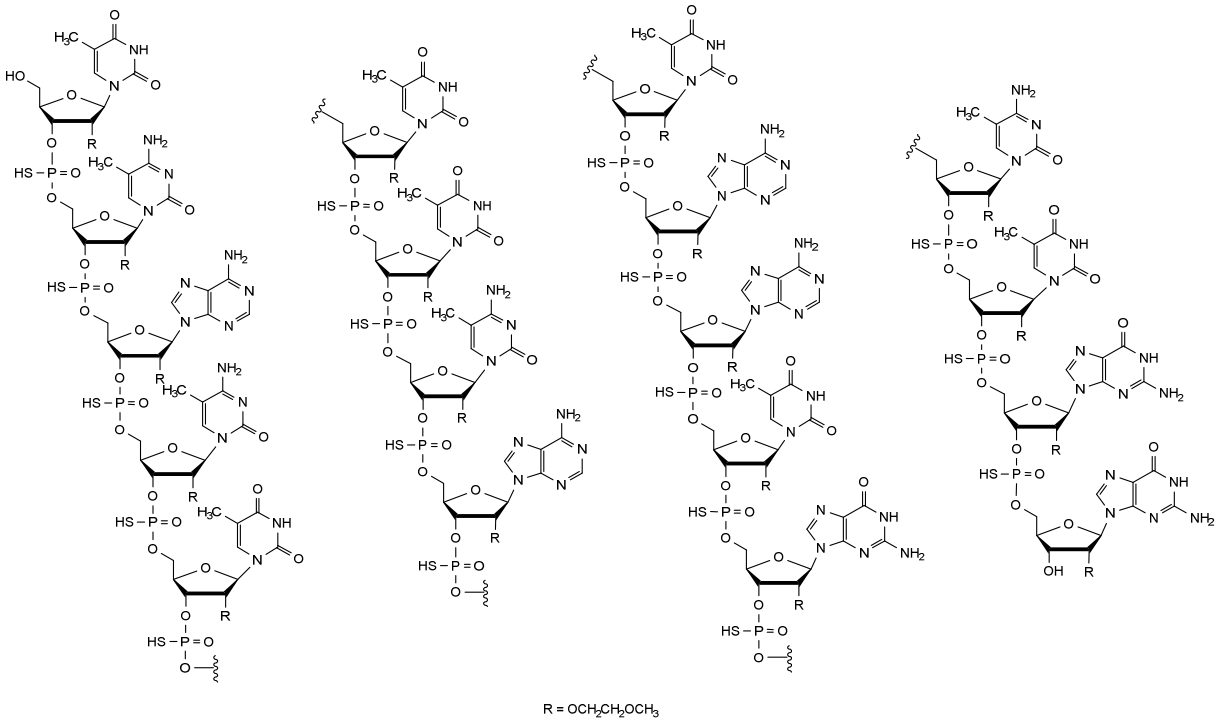
~~WHAT IS~~ CLAIM~~ED IS~~:

1. Use of an antisense compound having the following structure ~~A method for treating spinal muscular atrophy (SMA) in a human subject in need thereof, the method comprising administering to the human subject at least two loading doses of an antisense compound having the following structure:~~



R = $OCH_2CH_2OCH_3$

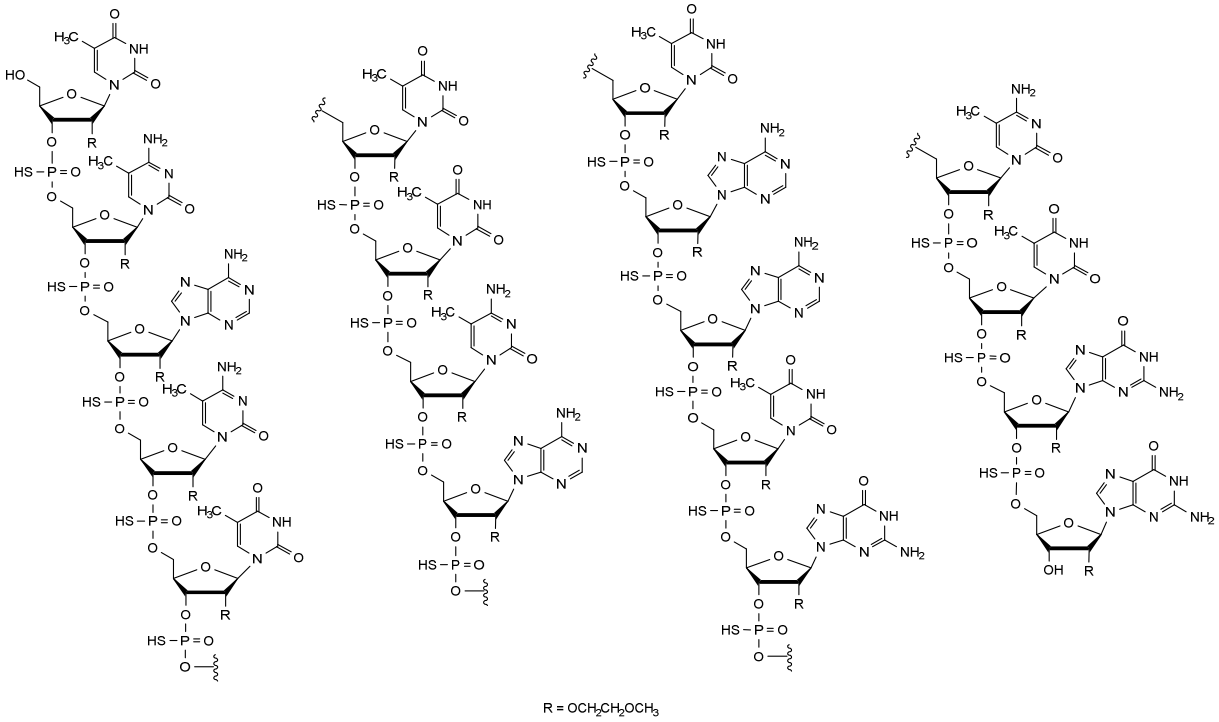
or a salt thereof, in the manufacture of a medicament for treating spinal muscular atrophy (SMA) in a human subject in need thereof, wherein the medicament is to be administered to the human subject in at least two loading doses

~~wherein the method comprises administering to the human subject~~ by intrathecal injection, wherein ~~:~~

(i) the ~~a~~ first loading dose of the ~~antisense compound or the salt thereof~~ medicament ~~that~~ is to be equivalent to about 50 mg of the antisense compound; and

(ii) the ~~a~~ second loading dose of the ~~antisense compound or the salt thereof~~ medicament ~~that~~ is to be equivalent to about 50 mg of the antisense compound, which is to be administered about 10 to 20 days after administration of the first loading dose.

2. ~~A method~~Use of an antisense compound having the following structure: ~~for increasing levels of survival motor neuron-2 (SMN2) messenger ribonucleic acid (mRNA) containing exon 7 in a human subject having mutations in chromosome 5q that are associated with SMN protein deficiency, the method comprising administering to the human subject at least two loading doses of an antisense compound having the following structure:~~



or a salt thereof, in the manufacture of a medicament for increasing levels of survival motor neuron-2 (SMN2) messenger ribonucleic acid (mRNA) containing exon 7 in a human subject having mutations in chromosome 5q that are associated with SMN protein deficiency, wherein the medicament is to be administered to the human subject in at least two loading doses

~~wherein the method comprises administering to the human subject~~ by intrathecal injection:

(i) ~~a~~ the first loading dose of the ~~antisense compound or the salt thereof~~ medicament being ~~that is~~ equivalent to about 50 mg of the antisense compound; and

(ii) ~~a~~ the second loading dose of the ~~antisense compound or the salt thereof~~ medicament~~that is~~ being equivalent to about 50 mg of the antisense compound, which is to be administered about 10 to 20 days after administration of the first loading dose.

3. The ~~method~~ use of claim 1 or claim 2, wherein at least one further ~~comprising administering to the human subject by~~ intrathecal injection is to be administered in the form ~~at least one~~of a maintenance dose, wherein the at least one maintenance dose is equivalent to about 28 mg of the antisense compound.

4. The ~~method~~ use of claim 1 or claim 2, wherein ~~the method~~ further ~~comprises administering to the human subject by~~ intrathecal injection maintenance doses of the ~~antisense compound or the salt thereof~~medicament are to be administered, beginning about 4 months after administration of the second loading dose and continuing once about every 4 months thereafter, wherein each maintenance dose is equivalent to about 28 mg of the antisense compound.

5. The ~~method~~ use of claim 4, wherein the second loading dose is to be administered about 14 days after administration of the first loading dose.

6. The ~~method~~ use of claim 1 or claim 2, wherein ~~the method~~ further ~~comprises administering to the human subject by~~ intrathecal injections are to be administered, whereby:

(iii) a third loading dose of the ~~antisense compound or the salt thereof~~ medicament that is equivalent to about 50 mg of the antisense compound, is to be administered about 10 to 20 days after administration of the second loading dose; and

(iv) maintenance doses of the ~~antisense compound or the salt thereof~~medicament, beginning about 4 months after administration of the third loading dose and continuing once about every 4 months thereafter, are to be administered, wherein each maintenance dose is equivalent to about 28 mg of the antisense compound.

7. The ~~method~~ use of claim 6, wherein the second loading dose is to be administered about 14 days after administration of the first loading dose and the third loading dose is to be administered about 14 days after administration of the second loading dose.

8. The ~~method~~ use of claim 1 or claim 2, wherein ~~the method~~ further ~~comprises administering to the human subject by~~ intrathecal injections are to be administered whereby:

(iii) a third loading dose of the ~~antisense compound or the salt thereof~~ medicament that is equivalent to about 50 mg of the antisense compound, is to be administered about 10 to 20 days after administration of the second loading dose;

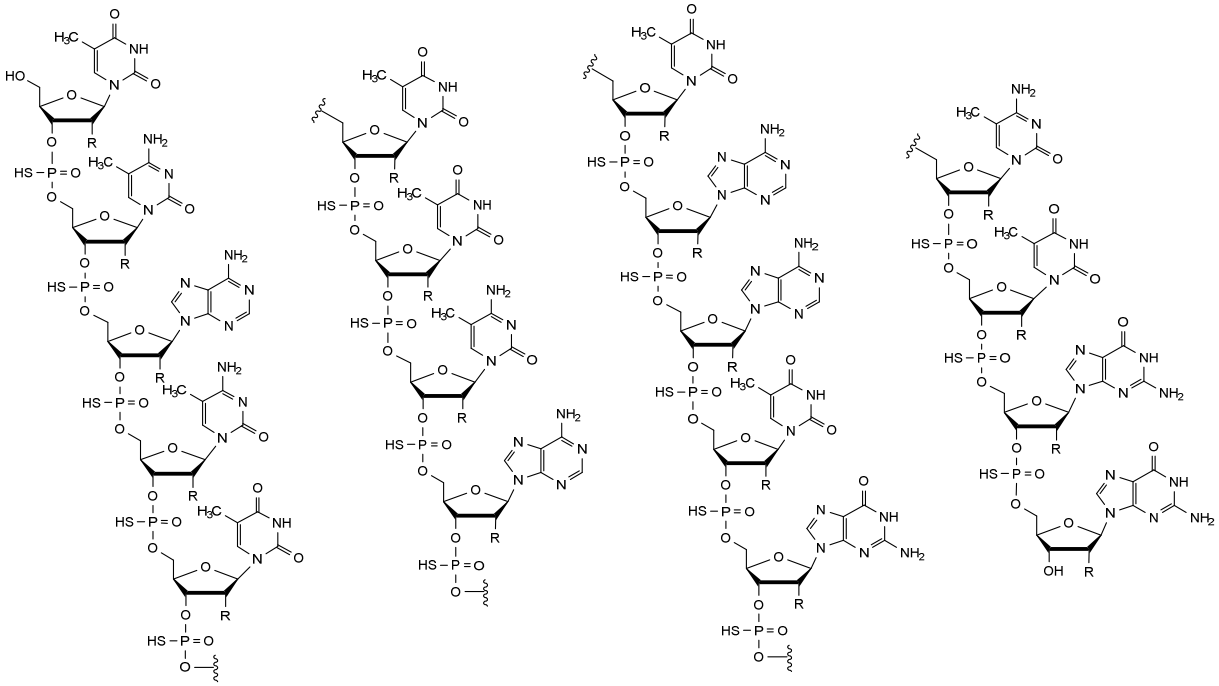
(iv) a fourth loading dose of ~~the antisense compound or the salt thereof~~ the medicament that is equivalent to about 50 mg of the antisense compound, is to be administered about 10 to 20 days after administration of the third loading dose; and

(v) maintenance doses of the ~~antisense compound or the salt thereof~~medicament, beginning about 4 months after administration of the fourth loading dose and continuing once about every 4 months thereafter, are to be administered wherein each maintenance dose is equivalent to about 28 mg of the antisense compound.

9. The ~~method~~ use of claim 8, wherein the second loading dose is to be administered about 14 days after administration of the first loading dose, the third loading dose is to be administered about 14 days after administration of the second loading dose, and the fourth loading dose is to be administered about 14 days after administration of the third loading dose.

10. Use of subject an antisense compound having the following structure:

~~A method for treating spinal muscular atrophy (SMA) in a human subject in need thereof, the method comprising administering to the human subject an antisense compound having the following structure:~~



or a salt thereof, in the manufacture of a medicament for treating spinal muscular atrophy (SMA) in a human subject in need thereof, whereby the medicament is to be administered to the human subject when

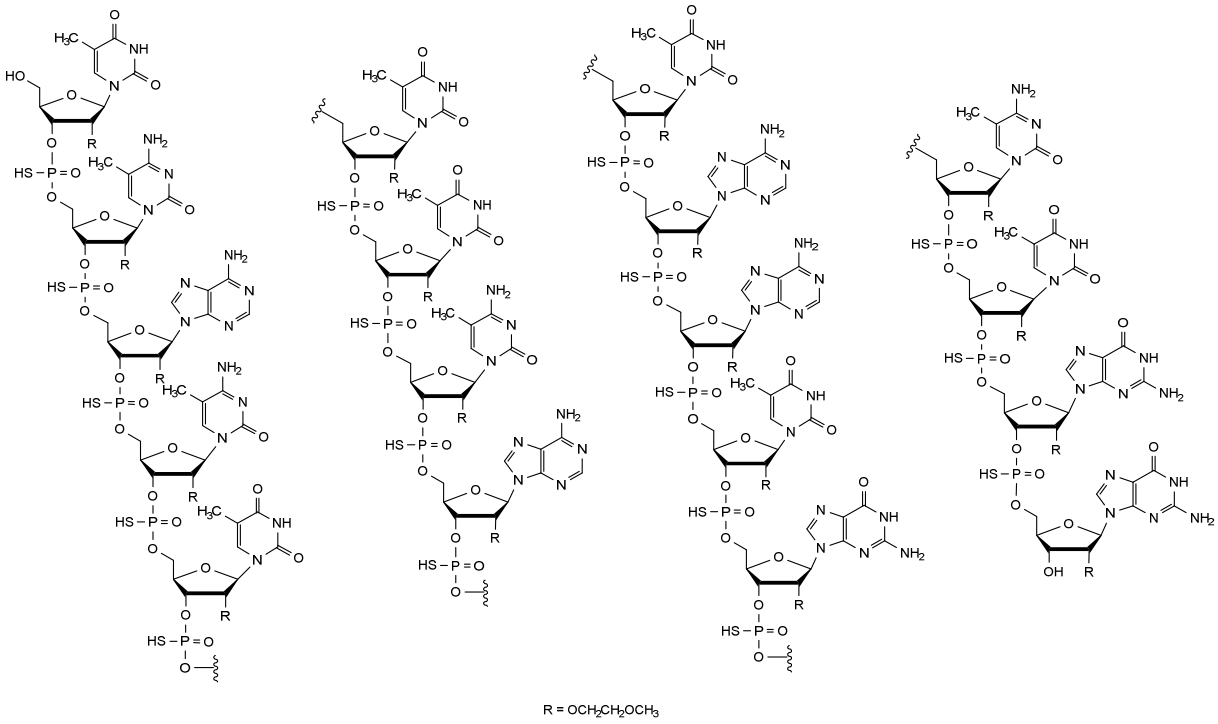
~~wherein~~ the human subject had~~was~~ previously been administered one or more doses of the ~~antisense compound or the salt thereof~~medicament, and wherein the one or more previously administered doses ~~were~~ had been equivalent to about 12 mg of the antisense compound, and whereby ~~wherein~~ the medicament is to be administered ~~method comprises administering~~ to the human subject by intrathecal injection through:

(i) a loading dose of the ~~antisense compound or the salt thereof~~ medicament that is equivalent to about 50 mg of the antisense compound, which is to be administered about 4 months after administration of the last previously administered dose equivalent to about 12 mg of the antisense compound; and

(ii) maintenance doses of the ~~antisense compound or the salt thereof~~medicament, beginning about 4 months after administration of the loading dose and continuing once about every 4 months thereafter, wherein each maintenance dose is equivalent to about 28 mg of the antisense compound.

11. Use of an antisense compound having the following structure:

~~A method for increasing levels of survival motor neuron-2 (SMN2) messenger ribonucleic acid (mRNA) containing exon 7 in a human subject having mutations in chromosome 5q that are associated with SMN protein deficiency, the method comprising administering to the human subject an antisense compound having the following structure:~~



or a salt thereof, in the manufacture of a medicament for increasing levels of survival motor neuron-2 (SMN2) messenger ribonucleic acid (mRNA) containing exon 7 in a human subject having mutations in chromosome 5q that are associated with SMN protein deficiency, whereby the medicament is to be administered to the human subject when

~~wherein~~ the human subject had~~was~~ previously been administered one or more doses of the ~~antisense compound or the salt thereof~~medicament, and wherein the one or more previously administered doses were equivalent to about 12 mg of the antisense compound, and whereby~~wherein~~ the medicament is to be ~~method comprises~~ administer~~ed~~ing to the human subject by intrathecal injection through:

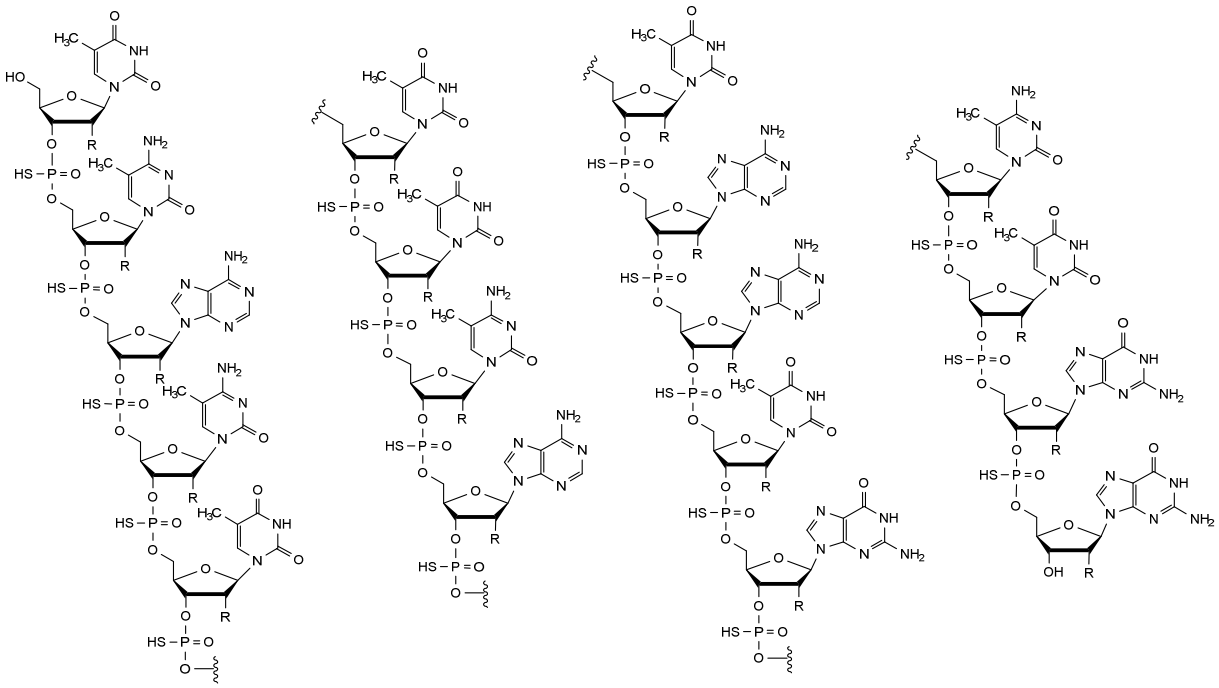
(i) a loading dose of the ~~antisense compound or the salt thereof~~ medicament that is equivalent to about 50 mg of the antisense compound, which is to be administered about 4

months after administration of the last previously administered dose equivalent to about 12 mg of the antisense compound; and

(ii) maintenance doses of the ~~antisense compound or the salt thereof~~medicament, beginning about 4 months after administration of the loading dose and continuing once about every 4 months thereafter, wherein each maintenance dose is equivalent to about 28 mg of the antisense compound.

12. Use of an antisense compound having the following structure:

~~A method for treating spinal muscular atrophy (SMA) in a human subject in need thereof, the method comprising administering to the human subject an antisense compound having the following structure:~~



R = $OCH_2CH_2OCH_3$

or a salt thereof, in the manufacture of a medicament for treating spinal muscular atrophy (SMA) in a human subject in need thereof, whereby the medicament is to be administered to the human subject when

~~wherein~~ the human subject ~~was~~ had previously been administered one or more doses of the ~~antisense compound or the salt thereof~~medicament, wherein the one or more previously

administered doses were equivalent to about 12 mg of the antisense compound, and whereby ~~wherein~~ the medicament is to be ~~method comprises~~ administer~~ed~~~~ing~~ to the human subject by intrathecal injection through:

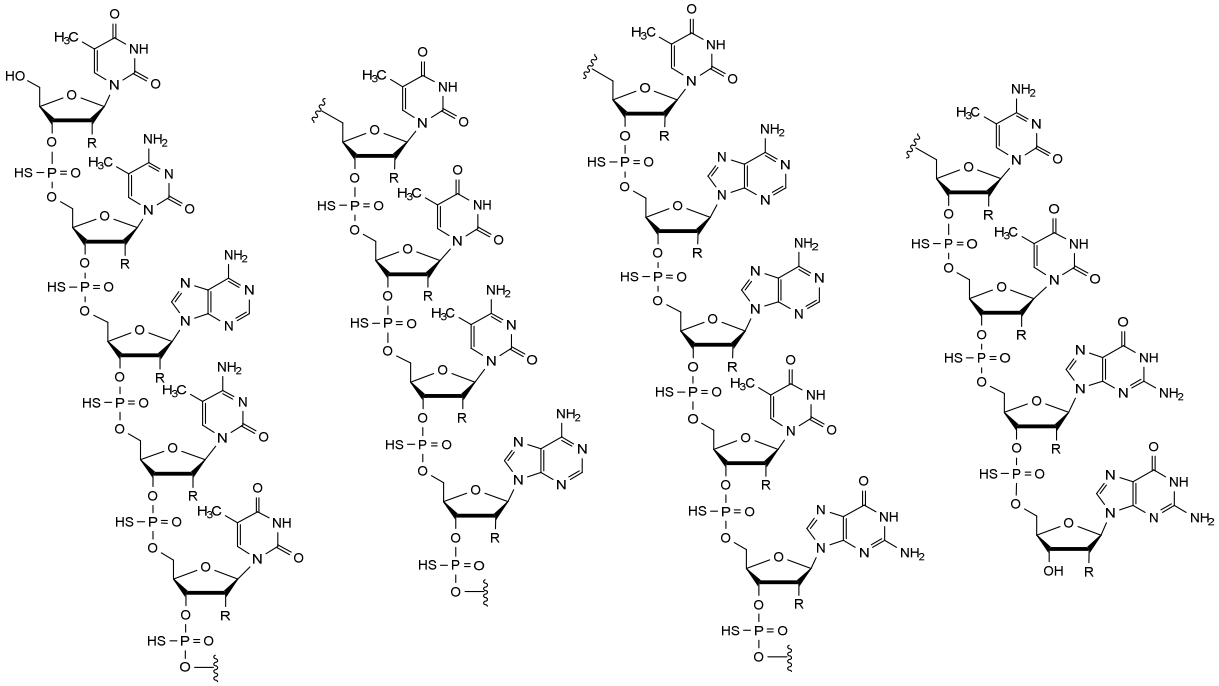
(i) a first loading dose of the ~~antisense compound or the salt thereof~~ medicament that is equivalent to about 28 mg of the antisense compound, which is to be administered about 4 months after administration of the last previously administered dose equivalent to about 12 mg of the antisense compound;

(ii) a second loading dose of the ~~antisense compound or the salt thereof~~ medicament that is equivalent to about 50 mg of the antisense compound, which is to be administered about 4 months after administration of the first loading dose; and

(iii) maintenance doses of the ~~antisense compound or the salt thereof~~medicament, beginning about 4 months after administration of the second loading dose and continuing once about every 4 months thereafter, wherein each maintenance dose is equivalent to about 28 mg of the antisense compound.

13. Use of an antisense compound having the following structure:

~~A method for increasing levels of survival motor neuron-2 (SMN2) messenger ribonucleic acid (mRNA) containing exon 7 in a human subject having mutations in chromosome 5q that are associated with SMN protein deficiency, the method comprising administering to the human subject an antisense compound having the following structure:~~



or a salt thereof, in the manufacture of a medicament for increasing levels of survival motor neuron-2 (SMN2) messenger ribonucleic acid (mRNA) containing exon 7 in a human subject having mutations in chromosome 5q that are associated with SMN protein deficiency, wherein the medicament is to be administered to the human when

~~wherein~~ the human subject had~~was~~ previously been administered one or more doses of the ~~antisense compound or the salt thereof~~medicament, wherein the one or more previously administered doses were equivalent to about 12 mg of the antisense compound, and whereby~~in~~ the medicament~~thod~~ is to be ~~comprises~~ administered~~ing~~ to the human subject by intrathecal injection through~~:~~

(i) a first loading dose of the ~~antisense compound or the salt thereof~~ medicament that is equivalent to about 28 mg of the antisense compound, which is to be administered about 4 months after administration of the last previously administered dose equivalent to about 12 mg of the antisense compound;

(ii) a second loading dose of the ~~antisense compound or the salt thereof~~ medicament that is equivalent to about 50 mg of the antisense compound, which is to be administered about 4 months after administration of the first loading dose; and

(iii) maintenance doses of the ~~antisense compound or the salt thereof~~medicament, beginning about 4 months after administration of the second loading dose and continuing once about every 4 months thereafter, wherein each maintenance dose is equivalent to about 28 mg of the antisense compound.

14. The ~~method~~ use of any one of claims 10 to 13, wherein the human subject ~~was~~ had previously been administered at least five doses of the ~~antisense compound or the salt thereof~~medicament, wherein each of the at least five previously administered doses was equivalent to about 12 mg of the antisense compound.

15. The ~~method~~ use of any one of claims 1 to 14, wherein the human subject has (i) type I SMA; (ii) type II SMA; (iii) type III SMA; or (iv) type IV SMA.

16. The ~~method~~ use of any one of claims 1 to 14, wherein the human subject is presymptomatic for SMA.

17. The ~~method~~ use of any one of claims 1 to 16, wherein the human subject is to be administered the ~~antisense compound or the salt thereof~~medicament using a spinal anesthesia needle.

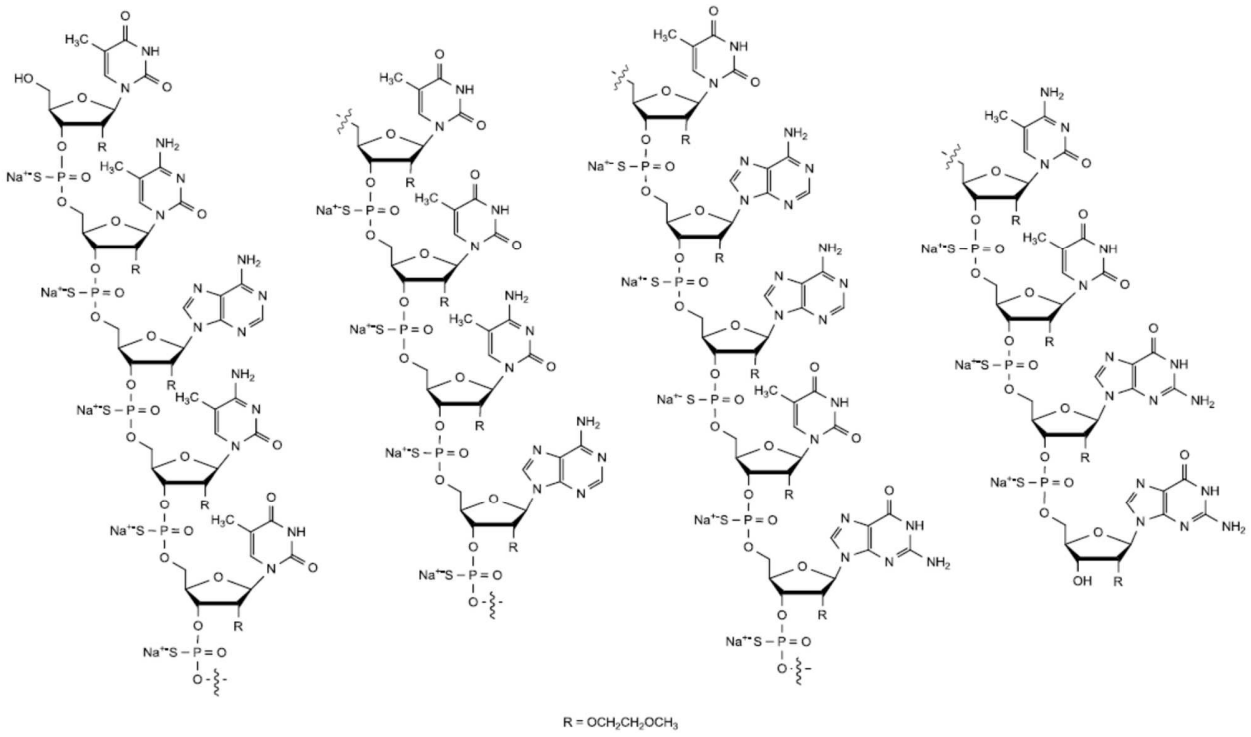
18. The ~~method~~ use of any one of claims 1 to 17, wherein the ~~antisense compound or the salt thereof~~medicament is to be administered in an injection volume of 5.0 mL

19. The ~~method~~ use of claim 18, wherein the ~~antisense compound or the salt thereof~~medicament is dissolved in phosphate buffered saline (PBS).

20. The ~~method~~ use of claim 18, wherein the ~~antisense compound or the salt thereof~~medicament is dissolved in artificial cerebrospinal fluid (aCSF).

21. The ~~method~~ use of any one of claims 1 to 20, wherein the salt of the antisense compound is a sodium salt.

22. The ~~method~~ use of any one of claims 1 to 20, wherein the salt of the antisense compound has the following structure:



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23. The ~~method~~ use of any one of claims 1 to 22, wherein ~~the method comprises detecting~~ a neurofilament level in the human subject before and/or after initiation of treatment is detected.

24. The ~~method~~ use of claim 23, ~~comprising~~whereby:

~~measuring~~ a first neurofilament level in a first biological sample obtained from the human subject before initiation of treatment is to be measured;

~~administering~~ the ~~antisense compound or salt thereof~~medicament is to be administered to the human subject according to any one of the preceding claims; and

~~measuring~~ at least one subsequent neurofilament level in a second biological sample

obtained from the human subject after administering all loading doses and at least one maintenance dose of the ~~antisense compound or salt thereof~~medicmanet is to be measured.

25. The ~~method~~ use of claim 23, ~~comprising~~whereby:

~~measuring~~ a first neurofilament level in a first biological sample obtained from the human subject before initiation of treatment is to be measured;

~~administering~~ a first loading dose of the ~~antisense compound or salt thereof~~medicament is to be administered to the human subject according to any one of the preceding claims; and

~~measuring~~ at least one subsequent neurofilament level in a biological sample obtained from the human subject after administering said first loading dose of the ~~antisense compound or salt thereof~~medicament is to be measured.

26. The ~~method~~ use of claim 23, ~~comprising~~whereby:

~~measuring~~ a first neurofilament level in a first biological sample obtained from the human subject before initiation of treatment is to be measured;

~~administering~~ a first loading dose and a second loading dose of the ~~antisense compound or salt thereof~~medicament is to be administered to the human subject according to any one of the preceding claims; and

~~measuring~~ at least one subsequent neurofilament level in a biological sample obtained from the human subject after administering said first loading dose and said second loading dose of the ~~antisense compound or salt thereof~~medicament is to be measured.

27. The ~~method~~ use of any one of claims 24-26, wherein the subsequent neurofilament level is reduced by at least 50% compared to the first neurofilament level.

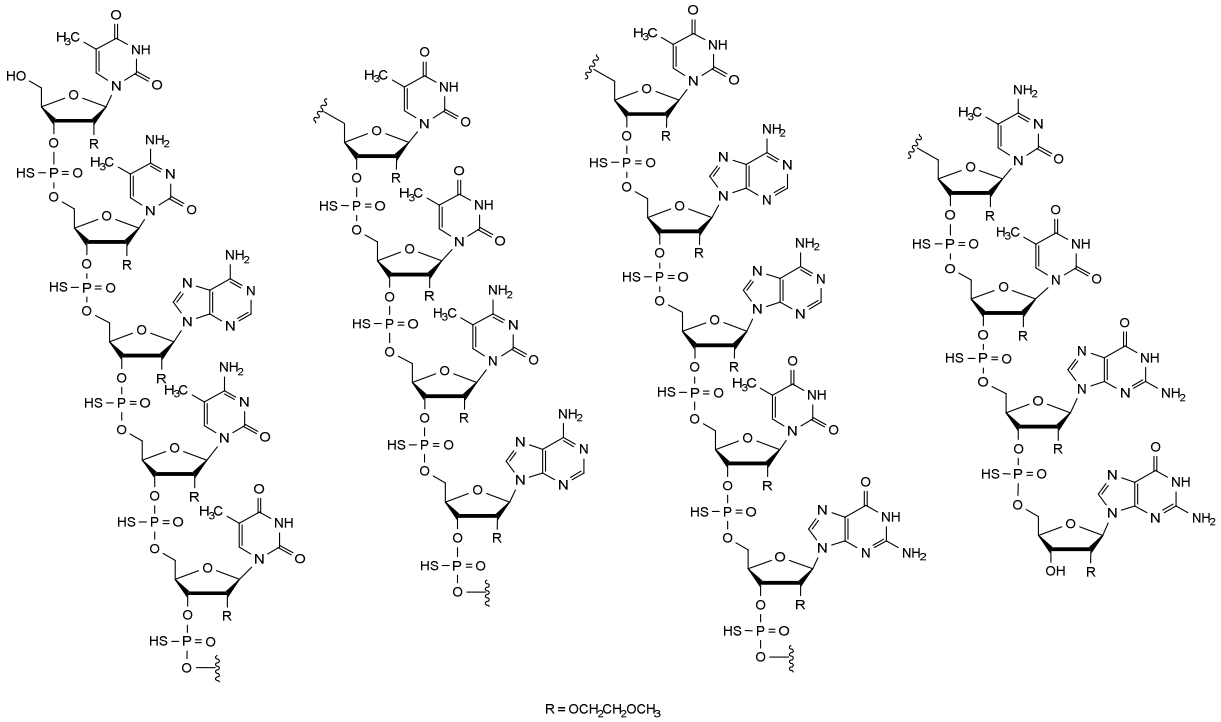
28. The ~~method~~ use of any one of claims 25-26, wherein the subsequent neurofilament level is equal to or higher than the first neurofilament level and ~~the method~~ wherein further ~~comprises administering further~~ doses of the medicament are to be administered ~~antisense compound or salt~~

~~thereof~~ to the human subject.

29. The ~~method~~ use of any one of claims 23 to 28, wherein the neurofilament is a neurofilament heavy chain (NF-H), medium/intermediate chain (NF-M), or light chain (NF-L).

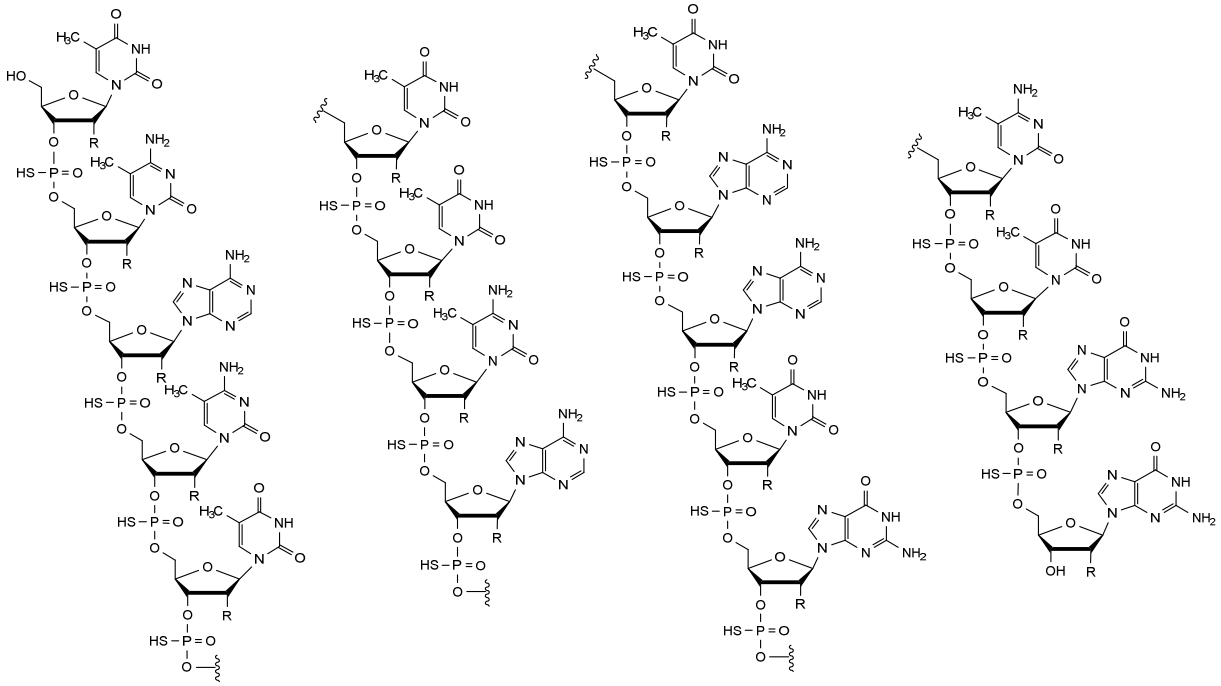
30. The ~~method~~ use of claims 23 to 29, wherein the first and second biological samples are blood, serum, plasma, or cerebrospinal fluid.

31. A kit comprising a pharmaceutical composition comprising an antisense compound having the following structure:



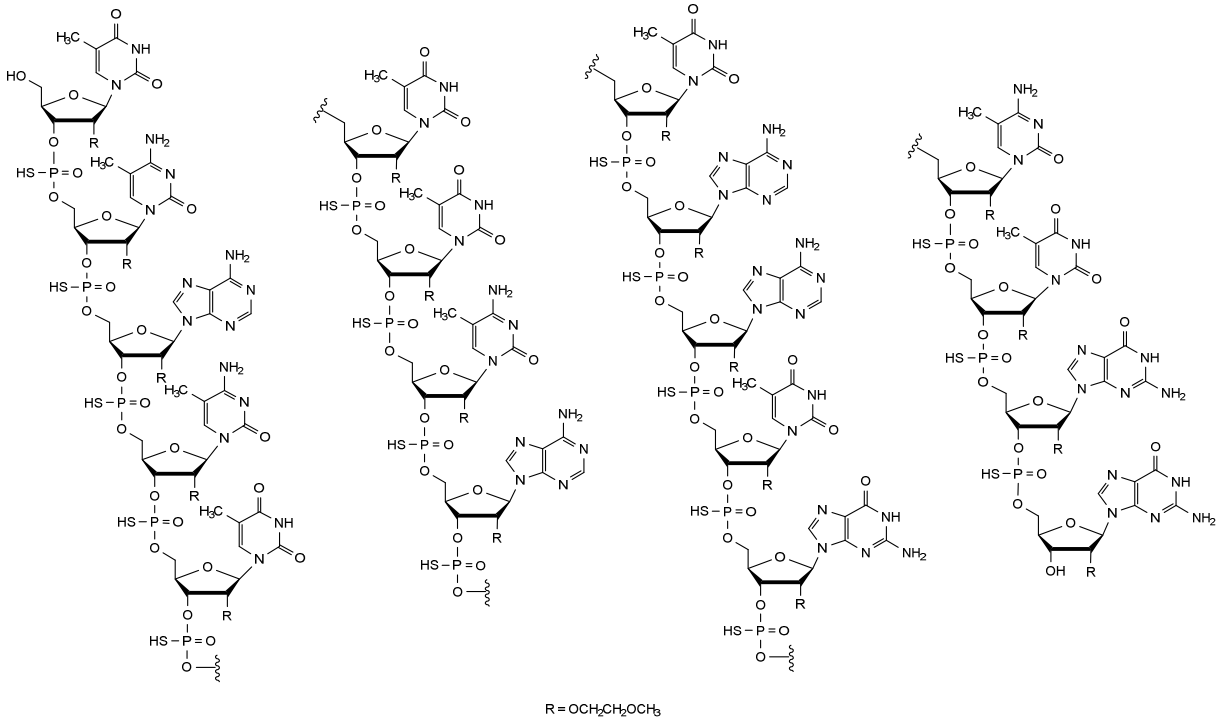
or a salt thereof, wherein the pharmaceutical composition comprises about 28 mg of the antisense compound or salt thereof.

32. A kit comprising a pharmaceutical composition comprising an antisense compound having the following structure:



or a salt thereof, wherein the pharmaceutical composition comprises about 50 mg of the antisense compound or salt thereof.

33. A kit comprising a first pharmaceutical composition and a second pharmaceutical composition each of which comprises an antisense compound having the following structure:



or a salt thereof, wherein the first pharmaceutical composition comprises about 28 mg of the antisense compound or salt thereof, and wherein the second pharmaceutical composition comprises about 50 mg of the antisense compound or salt thereof.

34. The kit of any one of claims 31 to 33, wherein the pharmaceutical composition comprises phosphate buffered saline (PBS).

35. The kit of any one of claims 31 to 33, wherein the pharmaceutical composition comprises artificial cerebrospinal fluid (aCSF).

36. The kit of any one of claims 31 to 35, wherein the antisense compound or salt thereof is at a concentration of 10 mg/mL.

37. The kit of any one of claims 31 to 35, wherein the antisense compound or salt thereof is at a concentration of 5.6 mg/mL.

38. The kit of any one of claims 31 to 37, wherein the pharmaceutical composition is formulated for intrathecal administration.

39. The kit of any one of claims 31 to 37, wherein the pharmaceutical composition is formulated for intrathecal bolus injection.

40. The kit of any one of claims 31 to 39, wherein the pharmaceutical composition comprises a salt of the antisense compound.

41. The kit of claim 40, wherein the salt is sodium.

42. The kit of any one of claims 31 to 41, wherein the kit comprises a single-dose vial containing 5 mL of the pharmaceutical composition.

43. The kit of any one of claims 31 to 42, further comprising a syringe for injection and/or instructions for use.