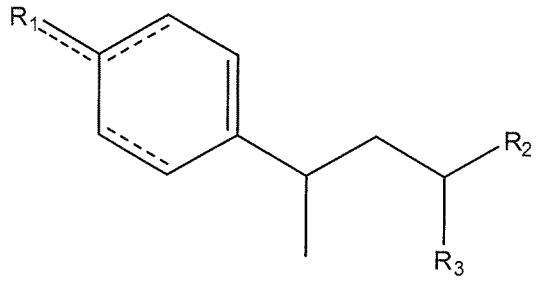
What is claimed:

1. A compound comprising formula I-0



I-0

or pharmaceutically acceptable salt thereof, wherein:

-------- is selected from a single bond and a double bond;

R_1 is selected from CH_3, CH_2, F, Cl, Br, CF_3, O-alkyl, and OCF_3;

R_2 is selected from $CH_2C(CH_3)_2OH$ and $CH=C(CH_3)$; and

R_3 is selected from OH and $NHCH_2CH(CH_3)_2$.

~~2. The compound of claim 1, wherein R_1 is selected from CH_3 and CH_2.~~

~~3.~~2. The compound of claim 1 selected from:

2-methyl-6-p-tolylhept-2-en-4-ol;

2-methyl-6-(4-methylcyclohexa-1,3-dienyl)hept-2-en-4-ol;

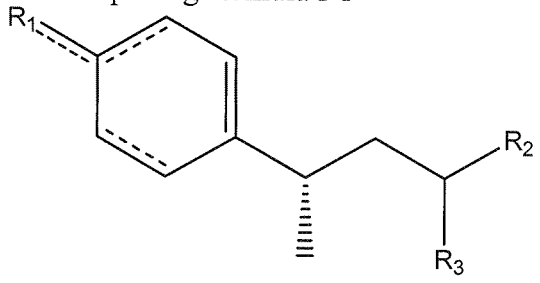
2-methyl-6-p-tolylheptane-2,4-diol;

N-isobutyl-2-methyl-6-(p-tolyl)hept-2-en-4-amine;

4-(isobutylamino)-2-methyl-6-p-tolylheptan-2-ol;

4-(isobutylamino)-2-methyl-6-(4-methylcyclohexa-1,3-dienyl)heptan-2-ol and pharmaceutically acceptable salts thereof.

~~4.~~3. A compound comprising formula I-1



I-1

or pharmaceutically acceptable salt thereof, wherein:

-------- is selected from a single bond and a double bond;

R_1 is selected from CH_3, CH_2, F, Cl, Br, CF_3, O-alkyl, and OCF_3;

R_2 is selected from $CH_2C(CH_3)_2OH$ and $CH=C(CH_3)$; and

R_3 is selected from OH and $NHCH_2CH(CH_3)_2$.

~~5. The compound of claim 4, wherein R_1 is selected from CH_3 and CH_2.~~

6.4. The compound of claim ~~4~~ 3 selected from:

(6S)-2-methyl-6-p-tolylhept-2-en-4-ol;

(6S)-2-methyl-6-(4-methylcyclohexa-1,3-dienyl)hept-2-en-4-ol;

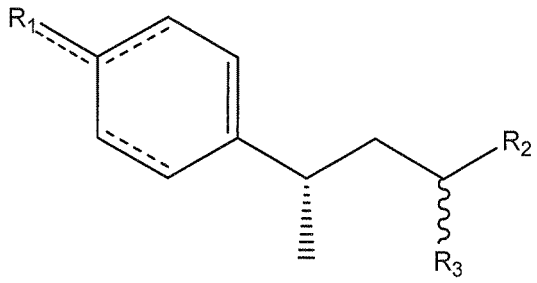
(6S)-2-methyl-6-p-tolylheptane-2,4-diol;

(6S)-N-isobutyl-2-methyl-6-(p-tolyl)hept-2-en-4-amine;

(6S)-4-(isobutylamino)-2-methyl-6-p-tolylheptan-2-ol;

(6S)-4-(isobutylamino)-2-methyl-6-(4-methylcyclohexa-1,3-dienyl)heptan-2-ol and pharmaceutically acceptable salts thereof.

7.5. A compound comprising formula I-2



I-2

or pharmaceutically acceptable salt thereof, wherein:

-------- is selected from a single bond and a double bond;

R_1 is selected from CH_3, CH_2, F, Cl, Br, CF_3, O-alkyl, and OCF_3;

R_2 is selected from $CH_2C(CH_3)_2OH$ and $CH=C(CH_3)$; and

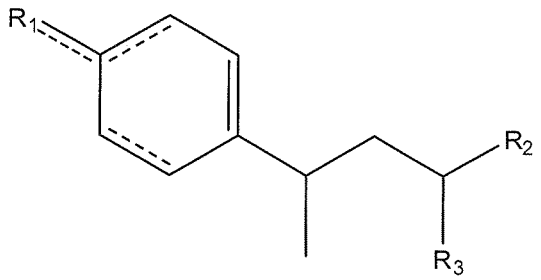
R_3 is selected from OH and $NHCH_2CH(CH_3)_2$.

9.6. The compound of claim 75, selected from:

(4S,6S)-N-isobutyl-2-methyl-6-p-tolylhept-2-en-4-amine;

(4R,6S)-N-isobutyl-2-methyl-6-p-tolylhept-2-en-4-amine and pharmaceutically acceptable salts thereof.

10.7. A pharmaceutical composition comprising a therapeutically effective amount of a compound of formula I-0



I-0

wherein:

-------- is selected from a single bond and a double bond;

R_1 is selected from CH_3, CH_2, F, Cl, Br, CF_3, O-alkyl, and OCF_3;

R_2 is selected from $CH_2C(CH_3)_2OH$ and $CH=C(CH_3)$ and

R_3 is selected from OH and $NHCH_2CH(CH_3)_2$ or a pharmaceutically acceptable salt thereof; and a pharmaceutically acceptable carrier.

~~11. The pharmaceutical composition of claim 10, wherein R_1 is selected from CH_3 and CH_2.~~

12.8. The pharmaceutical composition of claim 107, wherein the compound is selected from:

2-methyl-6-p-tolylhept-2-en-4-ol;

2-methyl-6-(4-methylcyclohexa-1,3-dienyl)hept-2-en-4-ol;

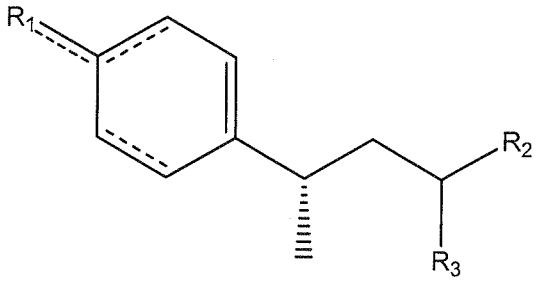
2-methyl-6-p-tolylheptane-2,4-diol;

N-isobutyl-2-methyl-6-(p-tolyl)hept-2-en-4-amine;

4-(isobutylamino)-2-methyl-6-p-tolylheptan-2-ol;

4-(isobutylamino)-2-methyl-6-(4-methylcyclohexa-1,3-dienyl)heptan-2-ol and pharmaceutically acceptable salts thereof.

13.9. A pharmaceutical composition comprising a therapeutically effective amount of a compound of formula I-1



I-1

wherein:

-------- is selected from a single bond and a double bond;

R_1 is selected from CH_3, CH_2, F, Cl, Br, CF_3, O-alkyl, and OCF_3;

R_2 is selected from CH2C(CH3)$_2$OH and CH=C(CH_3); and

R_3 is selected from OH and NH CH2 CH(CH3)$_2$ or a pharmaceutically acceptable salt thereof; and a pharmaceutically acceptable carrier.

~~14. The pharmaceutical composition of claim 13, wherein R_1 is selected from CH_3 and CH_2.~~

~~15.~~10. The pharmaceutical composition of claim ~~13~~9, wherein the compound is selected from:

(6S)-2-methyl-6-p-tolylhept-2-en-4-ol;

(6S)-2-methyl-6-(4-methylcyclohexa-1,3-dienyl)hept-2-en-4-ol;

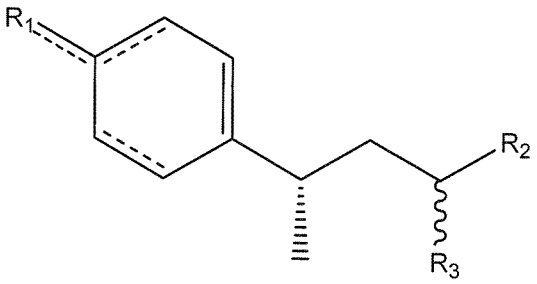
(6S)-2-methyl-6-p-tolylheptane-2,4-diol;

(6S)-N-isobutyl-2-methyl-6-(p-tolyl)hept-2-en-4-amine;

(6S)-4-(isobutylamino)-2-methyl-6-p-tolylheptan-2-ol;

(6S)-4-(isobutylamino)-2-methyl-6-(4-methylcyclohexa-1,3-dienyl)heptan-2-ol and pharmaceutically acceptable salts thereof.

~~16.~~11. A pharmaceutical composition comprising a therapeutically effective amount of a compound of formula I-2



I-2

wherein:

-------- is selected from a single bond and a double bond;

R_1 is selected from CH_3, CH_2, F, Cl, Br, CF_3, O-alkyl, and OCF_3;

R_2 is selected from $CH_2C(CH_3)_2OH$ and $CH=C(CH_3)$; and

R_3 is selected from OH and $NHCH_2CH(CH_3)_2$ or a pharmaceutically acceptable salt thereof; and a pharmaceutically acceptable carrier.

~~17. The pharmaceutical composition of claim 16, wherein R_1 is selected from CH_3 and CH_2.~~

~~18.~~12. The pharmaceutical composition of claim ~~16~~11, wherein the compound is selected from:

(4S,6S)-N-isobutyl-2-methyl-6-p-tolylhept-2-en-4-amine;

(4R,6S)-N-isobutyl-2-methyl-6-p-tolylhept-2-en-4-amine and pharmaceutically acceptable salts thereof.

~~19.~~13. A pharmaceutical composition comprising a mixture of a therapeutically effective amount of 4-(isobutylamino)-2-methyl-6-p-tolylheptan-2-ol and a therapeutically effective amount of 4-(isobutylamino)-2-methyl-6-(4-methylcyclohexa-1,3-dienyl)heptan-2-ol or pharmaceutically acceptable salts thereof, and a pharmaceutically acceptable carrier.

~~20.~~14. A pharmaceutical composition comprising a mixture of a therapeutically effective amount of (6S)-4-(isobutylamino)-2-methyl-6-p-tolylheptan-2-ol and a therapeutically effective amount of (6S)-4-(isobutylamino)-2-methyl-6-(4-methylcyclohexa-1,3-dienyl)heptan-2-ol or pharmaceutically acceptable salts thereof, and a pharmaceutically acceptable carrier.

~~21. A method of forming a compound or pharmaceutically acceptable salt thereof, the method comprising:~~

~~(a) reacting a turmeric oil with 4-isobutylamine under reactive amination condition to produce a crude product, wherein the ratio of the turmeric oil to 4-isobutylamine about 3.4 :1 by weight; and~~

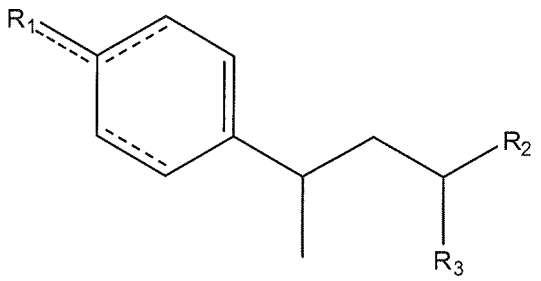
~~(b) isolating a composition comprising at least 80%, 85%, 90%, or 95% by weight of a compound or a pharmaceutically acceptable salt thereof;~~

~~wherein the compound has an analytical mass spectrum peak of $[M+H^+]$ at about 274.~~

~~22. The method of claim 21, wherein the ^1H NMR (400 MHz, $CDCl_3$) spectrum of the compound comprises the peaks at about the following chemical shifts: δ 9.08, 7.09, 7.05, 5.26, 3.74, 2.84, 2.56, 2.28, 2.11-2.07, 1.73, 1.57, 1.17, 0.91, 0.89.~~

~~23. The method of claim 21, wherein the ^{1}H NMR (400 MHz, $CDCl_3$) spectrum of the compound comprises the peaks at about the following chemical shifts: δ 9.19-9.17, 7.11, 5.30, 3.40, 2.78, 2.64-2.48, 2.33, 1.30, 1.19, 1.04, 0.97.~~

~~24.~~15. ~~A method for treating cognitive decline and/or Alzheimer's disease in a patient comprising administrating to the patient a therapeutically effective amount~~Use of a compound of formula I-0



I-0

in the manufacture of a medicament for treating cognitive decline and/or Alzheimer's disease in a patient, wherein:

-------- is selected from a single bond and a double bond;

R_1 is selected from CH_3, CH_2, F, Cl, Br, CF_3, O-alkyl, and OCF_3;

R_2 is selected from CH2C(CH3)$_2$OH and CH=C(CH_3); and

R_3 is selected from OH and NH CH2 CH(CH3)$_2$ or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

~~25. The method of claim 24, wherein R_1 is selected from CH_3 and CH_2.~~

~~26.~~16. The ~~method~~ use of claim ~~24~~15, wherein the compound is selected from:

2-methyl-6-p-tolylhept-2-en-4-ol;

2-methyl-6-(4-methylcyclohexa-1,3-dienyl)hept-2-en-4-ol;

2-methyl-6-p-tolylheptane-2,4-diol;

N-isobutyl-2-methyl-6-(p-tolyl)hept-2-en-4-amine;

4-(isobutylamino)-2-methyl-6-p-tolylheptan-2-ol; and

4-(isobutylamino)-2-methyl-6-(4-methylcyclohexa-1,3-dienyl)heptan-2-ol and pharmaceutically acceptable salts thereof.

~~27. The method of claim 24, wherein one or more symptoms of cognitive decline selected from the group consisting of memory loss, confusion, impaired judgment, personality changes, disorientation, and loss of language skills is treated.~~

~~28. The method of claim 24, wherein treating comprises one or more of:~~

~~(i) restoration of long-term potentiation;~~

~~(ii) inhibition, treatment, and/or abatement of neurodegeneration;~~

~~(iii) inhibition, treatment, and/or abatement of general amyloidosis;~~

~~(iv) inhibition, treatment, and/or abatement of one or more of amyloid production, amyloid assembly, amyloid aggregation, amyloid oligomer binding, and amyloid deposition; and~~

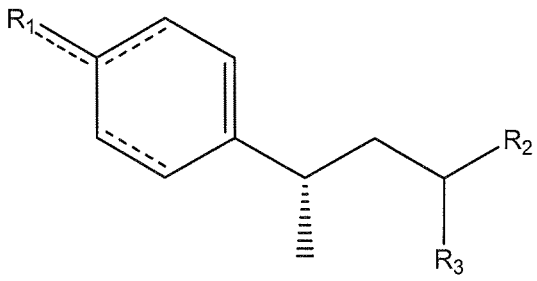
~~(v) inhibition, treatment, and/or abatement of the activity/effect of one or more of Abeta oligomers on a neuron cell.~~

~~29. The method of claim 24, wherein treating comprises one or more of inhibition of amyloid production, inhibition of amyloid assembly, inhibition of the activity of one or more of Abeta oligomers on a neuron cell, inhibition of amyloid aggregation, inhibition of amyloid binding, and inhibition of amyloid deposition.~~

~~30. The method of claim 24, wherein treating comprises inhibition of the activity of one or more of Abeta oligomers on a neuron cell, inhibition of amyloid aggregation, inhibition of amyloid binding, and inhibition of amyloid deposition.~~

~~31. The method of claim 24, wherein said compound is in a pharmaceutical composition comprising a pharmaceutically acceptable excipient.~~

~~32.~~17. ~~A method for treating cognitive decline and/or Alzheimer's disease in a patient comprising administrating to the patient a therapeutically effective amount~~Use of a compound of formula I-1



I-1

in the manufacture of a medicament for treating cognitive decline and/or Alzheimer's disease in a patient, wherein:

-------- is selected from a single bond and a double bond;

R_1 is selected from CH_3, CH_2, F, Cl, Br, CF_3, O-alkyl, and OCF_3;

R_2 is selected from $CH2C(CH3)_2OH$ and $CH=C(CH_3)$; and

R_3 is selected from OH and NH CH2 $CH(CH3)_2$ or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

~~33. The method of claim 32, wherein R_1 is selected from CH_3 and CH_2.~~

~~34.~~18. The ~~method~~ use of claim ~~32~~17, wherein the compound is selected from:

(6S)-2-methyl-6-p-tolylhept-2-en-4-ol;

(6S)-2-methyl-6-(4-methylcyclohexa-1,3-dienyl)hept-2-en-4-ol;

(6S)-2-methyl-6-p-tolylheptane-2,4-diol;

(6S)-N-isobutyl-2-methyl-6-(p-tolyl)hept-2-en-4-amine;

(6S)-4-(isobutylamino)-2-methyl-6-p-tolylheptan-2-ol; and

(6S)-4-(isobutylamino)-2-methyl-6-(4-methylcyclohexa-1,3-dienyl)heptan-2-ol and pharmaceutically acceptable salts thereof.

~~35. The method of claim 32, wherein one or more symptoms of cognitive decline selected from the group consisting of memory loss, confusion, impaired judgment, personality changes, disorientation, and loss of language skills is treated.~~

~~36. The method of claim 32, wherein treating comprises one or more of:~~

~~(i) restoration of long term potentiation;~~

~~(ii) inhibition, treatment, and/or abatement of neurodegeneration;~~

~~(iii) inhibition, treatment, and/or abatement of general amyloidosis;~~

~~(iv) inhibition, treatment, and/or abatement of one or more of amyloid production, amyloid assembly, amyloid aggregation, amyloid oligomer binding, and amyloid deposition; and~~

~~(v) inhibition, treatment, and/or abatement of the activity/effect of one or more of Abeta oligomers on a neuron cell.~~

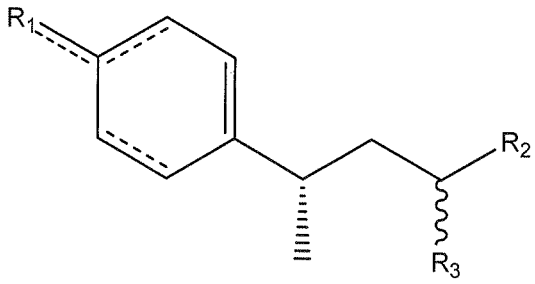
~~37. The method of claim 32, wherein treating comprises one or more of inhibition of amyloid production, inhibition of amyloid assembly, inhibition of the activity of one or more of Abeta~~

~~oligomers on a neuron cell, inhibition of amyloid aggregation, inhibition of amyloid binding, and inhibition of amyloid deposition.~~

~~38. The method of claim 32, wherein treating comprises inhibition of the activity of one or more of Abeta oligomers on a neuron cell, inhibition of amyloid aggregation, inhibition of amyloid binding, and inhibition of amyloid deposition.~~

~~39. The method of claim 32, wherein said compound is in a pharmaceutical composition comprising a pharmaceutically acceptable excipient.~~

~~40.~~19. ~~A method for treating cognitive decline and/or Alzheimer's disease in a patient comprising administrating to the patient a therapeutically effective amount~~Use of a compound of formula I-2



I-2

or pharmaceutically acceptable salt thereof in the manufacture of a medicament for treating cognitive decline and/or Alzheimer's disease in a patient, wherein:

-------- is selected from a single bond and a double bond;

R_1 is selected from CH_3, CH_2, F, Cl, Br, CF_3, O-alkyl, and OCF_3;

R_2 is selected from $CH_2C(CH_3)_2OH$ and $CH{=}C(CH_3)$; and

R_3 is selected from OH and $NHCH_2CH(CH_3)_2$.

~~41. The method of claim 40, wherein R_1 is selected from CH_3 and CH_2.~~

~~42.~~20. The ~~method~~ use of claim ~~40~~19, wherein the compound is selected from:

(4S,6S)-N-isobutyl-2-methyl-6-p-tolylhept-2-en-4-amine;

(4S,6S)-N-isobutyl-2-methyl-6-p-tolylhept-2-en-4-amine and pharmaceutically acceptable salts thereof.

~~43. The method of claim 40, wherein one or more symptoms of cognitive decline selected from the group consisting of memory loss, confusion, impaired judgment, personality changes, disorientation, and loss of language skills is treated.~~

~~44. The method of claim 40, wherein treating comprises one or more of:~~

~~(i) restoration of long term potentiation;~~

~~(ii) inhibition, treatment, and/or abatement of neurodegeneration;~~

~~(iii) inhibition, treatment, and/or abatement of general amyloidosis;~~

~~(iv) inhibition, treatment, and/or abatement of one or more of amyloid production, amyloid assembly, amyloid aggregation, amyloid oligomer binding, and amyloid deposition; and~~

~~(v) inhibition, treatment, and/or abatement of the activity/effect of one or more of Abeta oligomers on a neuron cell.~~

~~45. The method of claim 40, wherein treating comprises one or more of inhibition of amyloid production, inhibition of amyloid assembly, inhibition of the activity of one or more of Abeta oligomers on a neuron cell, inhibition of amyloid aggregation, inhibition of amyloid binding, and inhibition of amyloid deposition.~~

~~46. The method of claim 40, wherein treating comprises inhibition of the activity of one or more of Abeta oligomers on a neuron cell, inhibition of amyloid aggregation, inhibition of amyloid binding, and inhibition of amyloid deposition.~~

~~47. The method of claim 40, wherein said compound is in a pharmaceutical composition comprising a pharmaceutically acceptable excipient.~~

~~48.~~21. ~~A method for treating cognitive decline and/or Alzheimer's disease in a patient comprising administrating to the patient~~Use of a pharmaceutical composition comprising a mixture of a therapeutically effective amount of 4-(isobutylamino)-2-methyl-6-p-tolylheptan-2-ol and a therapeutically effective amount of 4-(isobutylamino)-2-methyl-6-(4-methylcyclohexa-1,3-dienyl)heptan-2-ol or pharmaceutically acceptable salts thereof in the manufacture of a medicament for treating cognitive decline and/or Alzheimer's disease in a patient,.

~~49. The method of claim 48, wherein one or more symptoms of cognitive decline selected from the group consisting of memory loss, confusion, impaired judgment, personality changes, disorientation, and loss of language skills is treated.~~

~~50. The method of claim 48, wherein treating comprises one or more of:~~

~~(i) restoration of long term potentiation;~~

~~(ii) inhibition, treatment, and/or abatement of neurodegeneration;~~

~~(iii) inhibition, treatment, and/or abatement of general amyloidosis;~~

~~(iv) inhibition, treatment, and/or abatement of one or more of amyloid production, amyloid assembly, amyloid aggregation, amyloid oligomer binding, and amyloid deposition; and~~

~~(v) inhibition, treatment, and/or abatement of the activity/effect of one or more of Abeta oligomers on a neuron cell.~~

~~51. The method of claim 48, wherein treating comprises one or more of inhibition of amyloid production, inhibition of amyloid assembly, inhibition of the activity of one or more of Abeta oligomers on a neuron cell, inhibition of amyloid aggregation, inhibition of amyloid binding, and inhibition of amyloid deposition.~~

~~52. The method of claim 48, wherein treating comprises inhibition of the activity of one or more of Abeta oligomers on a neuron cell, inhibition of amyloid aggregation, inhibition of amyloid binding, and inhibition of amyloid deposition.~~

~~53. The method of claim 48, wherein said compound is in a pharmaceutical composition comprising a pharmaceutically acceptable excipient.~~

~~54.~~22. ~~A method for treating cognitive decline and/or Alzheimer's disease in a patient comprising administrating to the patient~~Use of a pharmaceutical composition comprising a mixture of a therapeutically effective amount of (6S)-4-(isobutylamino)-2-methyl-6-p-tolylheptan-2-ol and a therapeutically effective amount of (6S)-4-(isobutylamino)-2-methyl-6-(4-methylcyclohexa-1,3-dienyl)heptan-2-ol or pharmaceutically acceptable salts thereof in the manufacture of a medicament for treating cognitive decline and/or Alzheimer's disease in a patient.

~~55. The method of claim 54, wherein one or more symptoms of cognitive decline selected from the group consisting of memory loss, confusion, impaired judgment, personality changes, disorientation, and loss of language skills is treated.~~

~~56. The method of claim 54, wherein treating comprises one or more of:~~

~~(i) restoration of long term potentiation;~~

~~(ii) inhibition, treatment, and/or abatement of neurodegeneration;~~

~~(iii) inhibition, treatment, and/or abatement of general amyloidosis;~~

~~(iv) inhibition, treatment, and/or abatement of one or more of amyloid production, amyloid assembly, amyloid aggregation, amyloid oligomer binding, and amyloid deposition; and~~

~~(v) inhibition, treatment, and/or abatement of the activity/effect of one or more of Abeta oligomers on a neuron cell.~~

57. The method of claim 54, wherein treating comprises one or more of inhibition of amyloid production, inhibition of amyloid assembly, inhibition of the activity of one or more of Abeta oligomers on a neuron cell, inhibition of amyloid aggregation, inhibition of amyloid binding, and inhibition of amyloid deposition.

58. The method of claim 54, wherein treating comprises inhibition of the activity of one or more of Abeta oligomers on a neuron cell, inhibition of amyloid aggregation, inhibition of amyloid binding, and inhibition of amyloid deposition.

59. The method of claim 54, wherein said compound is in a pharmaceutical composition comprising a pharmaceutically acceptable excipient.