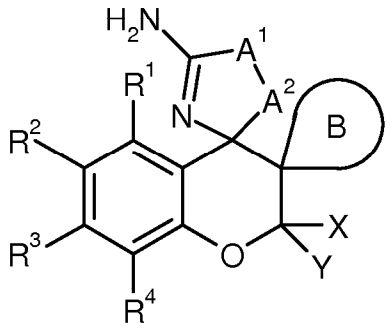
CLAIMS

1. A compound of the formula (I) or a salt thereof:



(I)

wherein

$A^1$ is O;

$A^2$ is -C($R^{A21}R^{A22}$)-; and

$R^{A21}$ and $R^{A22}$ are H;

B is

an oxygen-containing monocyclic saturated hetero ring group or

cycloalkyl, wherein said cycloalkyl is unsubstituted or substituted with halogen;

X is lower alkyl;

Y is lower alkyl;

$R^1$ and $R^4$ are H;

$R^3$ is H or halogen; and

$R^2$ is -N(H)-C(O)-(hetero ring group), wherein said hetero ring group is unsubstituted or substituted with one or more substituents selected from the group consisting of

halogen,

lower alkyl which is unsubstituted or substituted with halogen,

-CN, and

-O-(lower alkyl).

2. The compound, or a salt thereof, of claim 1, wherein

$R^2$ is selected from the group consisting of

-N(H)-C(O)-(pyridyl), wherein said pyridyl is unsubstituted or substituted with one or more substituents selected from the group consisting of
halogen,
lower alkyl, and
-CN,
-N(H)-C(O)-(pyrazinyl), wherein said pyrazinyl is unsubstituted or substituted with
-O-(lower alkyl) or
lower alkyl which is unsubstituted or substituted with halogen, and
-N(H)-C(O)-(pyrimidinyl), wherein said pyrimidinyl is unsubstituted or substituted with halogen.

3. The compound, or a salt thereof, of claim 2, wherein
B is an oxygen-containing monocyclic saturated hetero ring group.

4 The compound, or a salt thereof, of claim 3, wherein
B is oxetanyl;
X is methyl; and
Y is methyl.

5. The compound, or a salt thereof, of claim 4, wherein
$R^3$ is H; and
$R^2$ is -N(H)-C(O)-(pyridyl), wherein said pyridyl is unsubstituted or substituted with halogen.

6. The compound, or a salt thereof, of claim 2, wherein
B is cycloalkyl, wherein said cycloalkyl is unsubstituted or substituted with halogen.

7. The compound, or a salt thereof, of claim 6, wherein
B is cyclopropyl;
X is methyl; and
Y is methyl.

8. The compound, or a salt thereof, of claim 7, wherein

$R^3$ is H; and

$R^2$ is -N(H)-C(O)-(pyrazinyl), wherein said pyrazinyl is unsubstituted or substituted with

-O-(lower alkyl) or

lower alkyl which is unsubstituted or substituted with halogen.

9. The compound, or a salt thereof, of claim 1, which is selected from the group consisting of

N-(2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3''-oxetan]-6'-yl)-5-chloropyridine-2-carboxamide,

N-(2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3''-oxetan]-6'-yl)-5-fluoropyridine-2-carboxamide,

N-(2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3''-oxetan]-6'-yl)-5-chloro-3-fluoropyridine-2-carboxamide,

N-(2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3''-oxetan]-6'-yl)-5-bromopyrimidine-2-carboxamide,

N-(2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3''-oxetan]-6'-yl)-5-chloro-3-methylpyridine-2-carboxamide,

N-(2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3''-oxetan]-6'-yl)-5-cyanopyridine-2-carboxamide,

N-(2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3''-oxetan]-6'-yl)-5-methoxypyrazine-2-carboxamide,

N-[(4S)-2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3''-oxetan]-6'-yl]-5-chloropyridine-2-carboxamide,

N-[(4'R)-2''-amino-2',2'-dimethyldispiro[cyclopropane-1,3'-chromene-4',4''-[1,3]oxazol]-6'-yl]-5-methoxypyrazine-2-carboxamide,

N-[(4'R)-2''-amino-2',2'-dimethyldispiro[cyclopropane-1,3'-chromene-4',4''-[1,3]oxazol]-6'-yl]-5-(difluoromethyl)pyrazine-2-carboxamide,

N-[(4S)-2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3''-oxetan]-6'-yl]-5-methoxypyrazine-2-carboxamide,

N-[(4S)-2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3"-oxetan]-6'-yl]-5-bromopyridine-2-carboxamide,
N-[(4'R)-2"-amino-2',2'-dimethyldispiro[cyclopropane-1,3'-chromene-4',4"-[1,3]oxazol]-6'-yl]-5-chloropyridine-2-carboxamide, and
N-[(4'R)-2"-amino-2',2'-dimethyldispiro[cyclopropane-1,3'-chromene-4',4"-[1,3]oxazol]-6'-yl]-5-fluoropyridine-2-carboxamide.

10. The compound, or a salt thereof, of claim 1, which is selected from the group consisting of
N-[(4S)-2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3"-oxetan]-6'-yl]-5-chloropyridine-2-carboxamide,
N-[(4'R)-2"-amino-2',2'-dimethyldispiro[cyclopropane-1,3'-chromene-4',4"-[1,3]oxazol]-6'-yl]-5-methoxypyrazine-2-carboxamide, and
N-[(4'R)-2"-amino-2',2'-dimethyldispiro[cyclopropane-1,3'-chromene-4',4"-[1,3]oxazol]-6'-yl]-5-(difluoromethyl)pyrazine-2-carboxamide.

11. A hydrate of
N-[(4S)-2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3"-oxetan]-6'-yl]-5-chloropyridine-2-carboxamide.

12. A pharmaceutical composition comprising a compound, or a salt thereof, according to claim 1 and a pharmaceutically acceptable carrier.

13. A pharmaceutical composition for preventing or treating MCI (Mild cognitive impairment) or Alzheimer's disease, comprising a compound, or a salt thereof, according to claim 1.

14. Use of a compound, or a salt thereof, according to claim 1 for the preparation of a pharmaceutical composition for preventing or treating MCI (Mild cognitive impairment) or Alzheimer's disease.

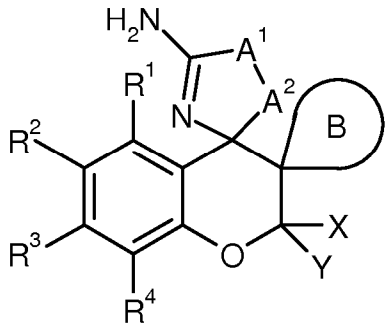
15. Use of a compound, or a salt thereof, according to claim 1 for preventing or treating MCI (Mild cognitive impairment) or Alzheimer's disease.

16. A method for preventing or treating MCI (Mild cognitive impairment) or Alzheimer's disease, comprising administering to a subject in need thereof an effective amount of the compound or a salt thereof according to claim 1.

17. A compound, or a salt thereof, according to claim 1 for use in the prevention or treatment of MCI (Mild cognitive impairment) or Alzheimer's disease.

CLAIMS

1. A compound of the formula (I) or a salt thereof:



(I)

wherein

$A^1$ is O;

$A^2$ is -C($R^{A21}R^{A22}$)-; and

$R^{A21}$ and $R^{A22}$ are H;

B is

an oxygen-containing monocyclic saturated hetero ring group or

cycloalkyl, wherein said cycloalkyl is unsubstituted or substituted with halogen;

X is lower alkyl;

Y is lower alkyl;

$R^1$ and $R^4$ are H;

$R^3$ is H or halogen; and

$R^2$ is -N(H)-C(O)-(hetero ring group), wherein said hetero ring group is unsubstituted or substituted with one or more substituents selected from the group consisting of

halogen,

lower alkyl which is unsubstituted or substituted with halogen,

-CN, and

-O-(lower alkyl).

2. The compound, or a salt thereof, of claim 1, wherein

$R^2$ is selected from the group consisting of

-N(H)-C(O)-(pyridyl), wherein said pyridyl is unsubstituted or substituted with one or more substituents selected from the group consisting of
halogen,
lower alkyl, and
-CN,
-N(H)-C(O)-(pyrazinyl), wherein said pyrazinyl is unsubstituted or substituted with
-O-(lower alkyl) or
lower alkyl which is unsubstituted or substituted with halogen, and
-N(H)-C(O)-(pyrimidinyl), wherein said pyrimidinyl is unsubstituted or substituted with halogen.

3. The compound, or a salt thereof, of claim 2, wherein
B is an oxygen-containing monocyclic saturated hetero ring group.

4 The compound, or a salt thereof, of claim 3, wherein
B is oxetanyl;
X is methyl; and
Y is methyl.

5. The compound, or a salt thereof, of claim 4, wherein
$R^3$ is H; and
$R^2$ is -N(H)-C(O)-(pyridyl), wherein said pyridyl is unsubstituted or substituted with halogen.

6. The compound, or a salt thereof, of claim 2, wherein
B is cycloalkyl, wherein said cycloalkyl is unsubstituted or substituted with halogen.

7. The compound, or a salt thereof, of claim 6, wherein
B is cyclopropyl;
X is methyl; and
Y is methyl.

8. The compound, or a salt thereof, of claim 7, wherein

$R^3$ is H; and

$R^2$ is -N(H)-C(O)-(pyrazinyl), wherein said pyrazinyl is unsubstituted or substituted with

-O-(lower alkyl) or

lower alkyl which is unsubstituted or substituted with halogen.

9. The compound, or a salt thereof, of claim 1, which is selected from the group consisting of

N-(2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3"-oxetan]-6'-yl)-5-chloropyridine-2-carboxamide,

N-(2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3"-oxetan]-6'-yl)-5-fluoropyridine-2-carboxamide,

N-(2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3"-oxetan]-6'-yl)-5-chloro-3-fluoropyridine-2-carboxamide,

N-(2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3"-oxetan]-6'-yl)-5-bromopyrimidine-2-carboxamide,

N-(2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3"-oxetan]-6'-yl)-5-chloro-3-methylpyridine-2-carboxamide,

N-(2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3"-oxetan]-6'-yl)-5-cyanopyridine-2-carboxamide,

N-(2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3"-oxetan]-6'-yl)-5-methoxypyrazine-2-carboxamide,

N-[(4S)-2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3"-oxetan]-6'-yl]-5-chloropyridine-2-carboxamide,

N-[(4'R)-2"-amino-2',2'-dimethyldispiro[cyclopropane-1,3'-chromene-4',4"-[1,3]oxazol]-6'-yl]-5-methoxypyrazine-2-carboxamide,

N-[(4'R)-2"-amino-2',2'-dimethyldispiro[cyclopropane-1,3'-chromene-4',4"-[1,3]oxazol]-6'-yl]-5-(difluoromethyl)pyrazine-2-carboxamide,

N-[(4S)-2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3"-oxetan]-6'-yl]-5-methoxypyrazine-2-carboxamide,

N-[(4S)-2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3"-oxetan]-6'-yl]-5-bromopyridine-2-carboxamide,
N-[(4'R)-2"-amino-2',2'-dimethyldispiro[cyclopropane-1,3'-chromene-4',4"-[1,3]oxazol]-6'-yl]-5-chloropyridine-2-carboxamide, and
N-[(4'R)-2"-amino-2',2'-dimethyldispiro[cyclopropane-1,3'-chromene-4',4"-[1,3]oxazol]-6'-yl]-5-fluoropyridine-2-carboxamide.

10. The compound, or a salt thereof, of claim 1, which is selected from the group consisting of
N-[(4S)-2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3"-oxetan]-6'-yl]-5-chloropyridine-2-carboxamide,
N-[(4'R)-2"-amino-2',2'-dimethyldispiro[cyclopropane-1,3'-chromene-4',4"-[1,3]oxazol]-6'-yl]-5-methoxypyrazine-2-carboxamide, and
N-[(4'R)-2"-amino-2',2'-dimethyldispiro[cyclopropane-1,3'-chromene-4',4"-[1,3]oxazol]-6'-yl]-5-(difluoromethyl)pyrazine-2-carboxamide.

11. A hydrate of
N-[(4S)-2-amino-2',2'-dimethyldispiro[1,3-oxazole-4,4'-chromene-3',3"-oxetan]-6'-yl]-5-chloropyridine-2-carboxamide.

12. A pharmaceutical composition comprising a compound, or a salt thereof, according to claim 1 and a pharmaceutically acceptable carrier.

13. A pharmaceutical composition for preventing or treating MCI (Mild cognitive impairment) or Alzheimer's disease, comprising a compound, or a salt thereof, according to claim 1.

14. Use of a compound, or a salt thereof, according to claim 1 in the preparation of a pharmaceutical composition for preventing or treating MCI (Mild cognitive impairment) or Alzheimer's disease.