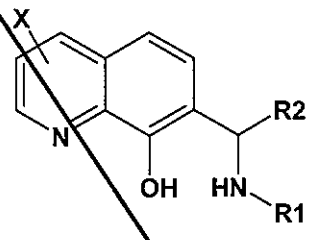
CLAIMS

Claim 1. A compound having a formula of:



Formula (2)

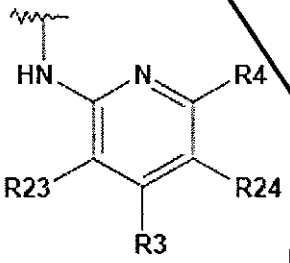
or a stereoisomer or pharmaceutically acceptable salt thereof;

wherein,

X is selected from the group consisting of: hydrogen, 2-Methyl, 5-Chloro, 5-Nitro, and 6-Hydroxyl;

R^1 is selected from the group consisting of:

(i) a 2-Pyridyl ring of Formula (3)



Formula (3)

wherein

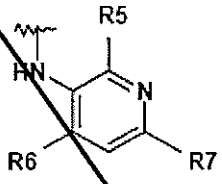
R^{23} is selected from the group consisting of hydrogen; fluoro; chloro; trifluoromethyl; methyl; ethyl; and methoxy;

R^3 is selected from the group consisting of hydrogen; fluoro; chloro; methyl; ethyl; methoxy; a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; a C-2 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms; and alkoxy -OR^{10} where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-2 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom;

R^{24} is selected from the group consisting of: hydrogen; fluoro; chloro; and trifluoromethyl; and

R^4 is selected from the group consisting of hydrogen; methyl; a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; a C-2 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms; and alkoxy $-OR^{10}$ where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-2 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom;

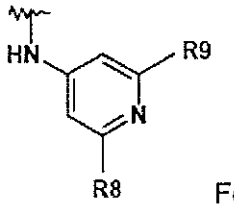
(ii) a 3-Pyridyl ring of Formula (4)



Formula(4)

wherein R^5, R^6 , and R^7 are independently selected from the group consisting of: hydrogen, a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; a C-2 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; Aryl comprising a phenyl or heteroaryl containing from 1 to 4 N, O, or S atoms; and alkoxy $-OR^{10}$ where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-2 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; and

(iii) a 4-Pyridyl ring of Formula (5)



Formula (5)

wherein R^8 and R^9 are independently selected from the group consisting of: a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; a C-2 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl containing from 1 to 4 N, O, or S atoms; and alkoxy $-OR^{10}$ where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-2 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom;

(iv) a phenyl ring substituted with one or more groups selected from a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; a C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl containing from 1 to 4 N, O, or S atoms; alkoxy $-OR^{10}$ where R^{10} is a

straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; trifluoromethyl; trifluoromethoxy; difluoromethoxy; 3, 4-methylenedioxy; 2, 3-methylenedioxy; nitro; and halogen; and

(v) an unsubstituted heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms;

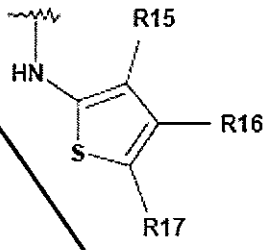
(vi) a substituted heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms substituted with one or more groups selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms; and alkoxy $-OR^{10}$ where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; and

R^2 is selected from the group consisting of:

(i) an unsubstituted phenyl ring or a phenyl ring substituted at the 2-, 3-, 4-, 5- or 6-position with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-2 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms; alkoxy $-OR^{10}$ where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-2 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; 2,3-methylenedioxy; 3,4-methylenedioxy; dialkylamino having formula $-NR_{13}R_{14}$ wherein R_{13} and R_{14} are independently selected from hydrogen or a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; trifluoromethyl; trifluoromethoxy; difluoromethoxy; 3, 4-methylenedioxy; 2, 3-methylenedioxy; nitro; and halogen;

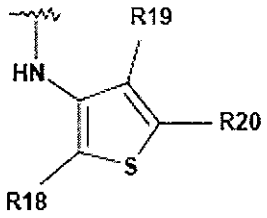
wherein if R^1 is a 3-Pyridyl ring of Formula (4) where each of R^5, R^6 , and R^7 are hydrogen, and R^2 is a phenyl ring, the phenyl ring is substituted with one or more groups independently selected from the group consisting of: a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-2 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; a heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms; alkoxy $-OR^{10}$ where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-2 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; 2,3-methylenedioxy; 3,4-methylenedioxy; dialkylamino having formula $-NR_{13}R_{14}$ wherein R_{13} and R_{14} are independently selected from hydrogen or a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; trifluoromethoxy; difluoromethoxy; 3, 4-methylenedioxy; 2, 3-methylenedioxy; and nitro;

(ii) a 2-thiophene ring of Formula (8) wherein R^{15}, R^{16}, and R^{17} are independently selected from the group consisting of: hydrogen; straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; alkoxy -OR^{10} where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; dialkylamino; trifluoromethyl; difluoromethyl; trifluoromethoxy; and halogen



Formula (8);

(iii) a 3-thiophene ring of Formula (9) wherein R^{18}, R^{19}, and R^{20} are independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; alkoxy -OR^{10} where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; dialkylamino; trifluoromethyl; difluoromethyl; trifluoromethoxy; and halogen



Formula (9);

(iv) a 2-Pyridyl ring substituted at 4- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-2 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom;

(v) an unsubstituted 3-Pyridyl ring or a 3-Pyridyl ring substituted at the 2-, 4- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-2 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; and

(vi) an unsubstituted 4-Pyridyl ring or a 4-Pyridyl ring substituted at the 2- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing

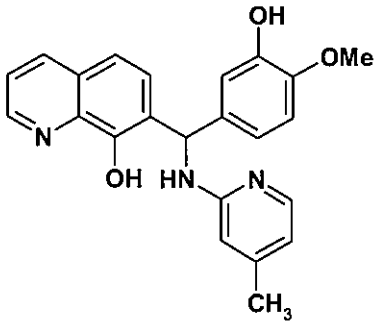
unsaturation and C-2 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom;

wherein if each of R^3, R^4, R^{23}, and R^{24} is hydrogen, then R^2 is a substituted pyridyl ring or a phenyl substituted with straight chain or branched C-3 to C-4 lower alkyl optionally containing unsaturation; C-2 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms; alkoxy $-OR^{10}$ where R^{10} is a straight chain or branched C-3 to C-4 lower alkyl optionally containing unsaturation or a C-2 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; 2,3-methylenedioxy; 3,4-methylenedioxy; dialkylamino having formula $-NR_{13}R_{14}$ wherein R_{13} and R_{14} are independently selected from hydrogen or a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; trifluoromethoxy; difluoromethoxy; 3, 4-methylenedioxy; 2, 3-methylenedioxy; or nitro;

wherein if one of R^3, R^4, R^{23}, or R^{24} is methyl and the other three of R^3, R^4, R^{23}, or R^{24} are hydrogen, then R^2 is a substituted pyridyl ring or a phenyl substituted with straight chain or branched C-3 to C-4 lower alkyl optionally containing unsaturation; C-2 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms; 2,3-methylenedioxy; 3,4-methylenedioxy; dialkylamino having formula $-NR_{13}R_{14}$ wherein R_{13} and R_{14} are independently selected from hydrogen or a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; trifluoromethyl; trifluoromethoxy; difluoromethoxy; 3,4-methylenedioxy; or 2,3-methylenedioxy; or

a stereoisomer or pharmaceutically acceptable salt thereof; and

Formula (2) excludes the compound of Formula (1):

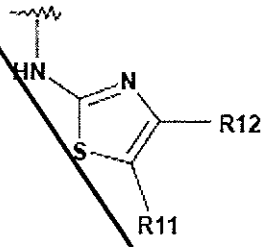


Formula (1).

Claim 2. The compound of claim 1 wherein R^1 of Formula (2) is selected from the group consisting of:

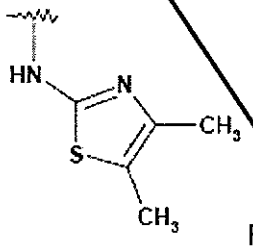
(i) an 2-(1,3-thiazoyl) of Formula (6), wherein R11 and R12 are independently selected from the group consisting of: hydrogen; straight chain or branched C-1 to C-4 lower

alkyl optionally containing unsaturation; C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; alkoxy -OR^{10} where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; dialkylamino; trifluoromethyl; difluoromethyl; trifluoromethoxy; and halogen,



Formula (6); and

(ii) a 2-(4,5-Dimethyl-1,3-thiazoyl) of Formula (7)



Formula (7).

Claim 3. The compound of claim 1 wherein R^1 is a 2-pyridyl ring of Formula (3) and:

R^{24} is chloro; or

R^{23} is methyl.

Claim 4. The compound of claim 1 wherein R^1 is a 2-pyridyl ring of Formula (3) and:

R^4 is hydrogen, R^{24} is fluoro, R^3 is hydrogen, and R^{23} is fluoro;

R^4 is methyl, R^{24} is chloro, R^3 is hydrogen, and R^{23} is fluoro;

R^4 is hydrogen, R^{24} is chloro, R^3 is ethyl, and R^{23} is fluoro;

R^4 is hydrogen, R^{24} is fluoro, R^3 is methyl, and R^{23} is fluoro;

R^4 is hydrogen, R^{24} is chloro, R^3 is hydrogen, and R^{23} is ethyl;

R^4 is methyl, R^{24} is chloro, R^3 is hydrogen, and R^{23} is chloro;

R^4 is hydrogen, R^{24} is chloro, R^3 is methyl, and R^{23} is fluoro;

R^4 is hydrogen, R^{24} is trifluoromethyl, R^3 is hydrogen, and R^{23} is hydrogen;

R^4 is hydrogen, R^{24} is chloro, R^3 is hydrogen, and R^{23} is methyl;

R^4 is hydrogen, R^{24} is chloro, R^3 is hydrogen, and R^{23} is chloro;

R^4 is hydrogen, R^{24} is chloro, R^3 is methyl, and R^{23} is hydrogen; or

R^4 is hydrogen, R^{24} is chloro, R^3 is chloro, and R^{23} is hydrogen.

Claim 5. The compound of claim 1, wherein R^1 is a 2-pyridyl ring of Formula (3) and:

R^{24} is chloro and R^3 is chloro or methyl or R^{23} is chloro or methyl;

R^{24} is chloro, R^3 is hydrogen, and R^{23} is methyl;

R^{24} is chloro, R^3 is methyl, and R^{23} is fluoro;

R^{24} is chloro, R^3 is chloro, and R^{23} is hydrogen;

R^{24} is chloro, R^3 is hydrogen, and R^{23} is chloro.

Claim 6. The compound of claim 1 wherein R^2 is selected from the group consisting of:

a phenyl ring substituted at the 2- and 4-positions;

4-trifluoromethylphenyl;

2-fluoro,4-trifluoromethylphenyl; and

2,4-dichlorophenyl.

Claim 7. The compound of claim 1 wherein R^2 is selected from the group consisting of: 4-chlorophenyl; 2-fluoro,4-trifluoromethylphenyl; 3-fluoro,4-chlorophenyl; 2-fluoro,4-chlorophenyl; 2,3-dichlorophenyl; 2,3,5-trichlorophenyl; 2,4-dichlorophenyl; 3,4-dichlorophenyl; and 3,5-dichlorophenyl.

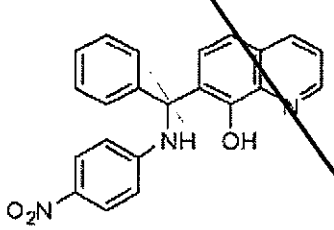
Claim 8. The compound of claim 1 wherein R^2 is selected from the group consisting:

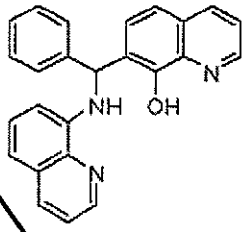
a phenyl ring substituted at the 4 position with chloro and substituted at the 2- or 3- position with chloro or fluoro;

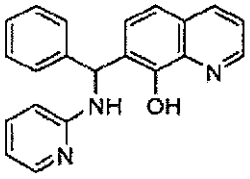
2,4-dichlorophenyl; and

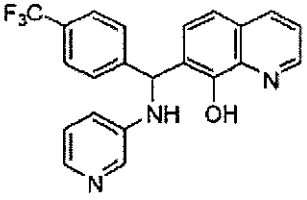
2-chloro,4-fluorophenyl.

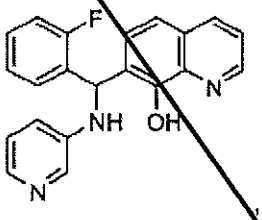
Claim 9. The compound of claim 1 wherein Formula (2) is not one or more of the following compounds:

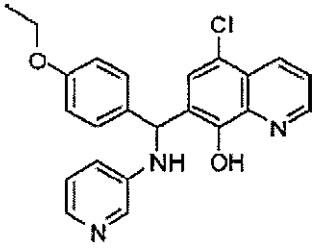


,


,


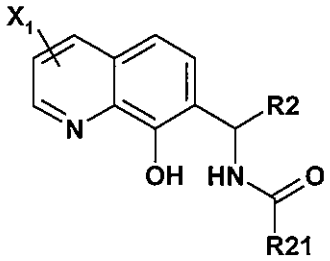
,


,


, and


.

Claim 10. A compound having a formula of:



Formula (10) (1505-like Type B)

or a stereoisomer or pharmaceutically acceptable salt thereof;

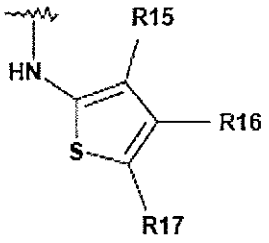
wherein,

X^1 is selected from the group consisting of: hydrogen, 2-Methyl, 5-Chloro, 5-Nitro, and 6-Hydroxyl;

R^2 is selected from the group consisting of:

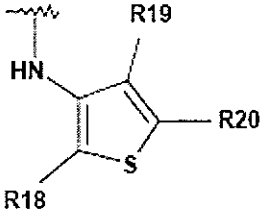
(i) an unsubstituted phenyl ring or a phenyl ring substituted at the 2-, 3-, 4-, 5- or 6-position with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms; alkoxy -OR^{10} where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; 2,3-methylenedioxy; 3,4-methylenedioxy; dialkylamino having formula -$NR_{13}R_{14}$ wherein R_{13} and R_{14} are independently selected from hydrogen; straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; trifluoromethyl; trifluoromethoxy; difluoromethoxy; 3, 4-methylenedioxy; 2, 3-methylenedioxy; nitro; and halogen;

(ii) a 2-thiophene ring of Formula (8) wherein R^{15}, R^{16}, and R^{17} are independently selected from the group consisting of: hydrogen; straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; alkoxy -OR^{10} where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; dialkylamino; trifluoromethyl; difluoromethyl; trifluoromethoxy; and halogen



Formula (8);

(iii) a 3-thiophene ring of Formula (9) wherein R^{18}, R^{19}, and R^{20} are independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; alkoxy -OR^{10} where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; dialkylamino; trifluoromethyl; difluoromethyl; trifluoromethoxy; and halogen



Formula (9);

(iv) an unsubstituted 2-Pyridyl ring or a 2-Pyridyl ring substituted at 4- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom;

(v) an unsubstituted 3-Pyridyl ring or a 3-Pyridyl ring substituted at the 2-, 4- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; and

(vi) an unsubstituted 4-Pyridyl ring or a 4-Pyridyl ring substituted at the 2- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; and

R^{21} is selected from the group consisting of:

(i) straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation;

(ii) C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom;

(iii) an unsubstituted phenyl ring or a phenyl ring substituted at the 2-, 3-, 4-, 5- or 6-position with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms; alkoxy -OR^{10} where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; 2,3-methylenedioxy; 3,4-methylenedioxy; dialkylamino having formula -$NR_{13}R_{14}$ wherein R_{13} and R_{14} are independently selected from hydrogen; straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; trifluoromethyl; trifluoromethoxy; difluoromethoxy; 3, 4-methylenedioxy; 2, 3-methylenedioxy; nitro; and halogen;

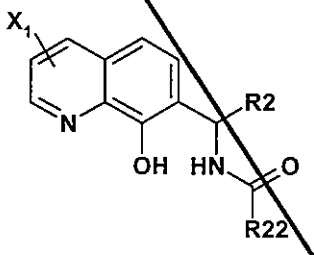
(iv) an unsubstituted 2-Pyridyl ring or a 2-Pyridyl ring substituted at 4- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom;

(v) an unsubstituted 3-Pyridyl ring or a 3-Pyridyl ring substituted at the 2-, 4- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; and

(vi) an unsubstituted 4-Pyridyl ring or a 4-Pyridyl ring substituted at the 2- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; and

(vii) a heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms.

Claim 11. A compound having a formula of:



Formula (11) (1505-like Type C)

or a stereoisomer or pharmaceutically acceptable salt thereof;

wherein,

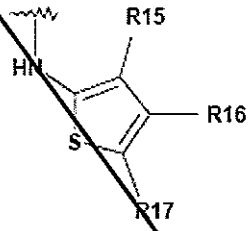
X^1 is selected from the group consisting of: hydrogen, 2-Methyl, 5-Chloro, 5-Nitro, and 6-Hydroxyl;

R^2 is selected from the group consisting of:

(i) an unsubstituted phenyl ring or a phenyl ring substituted at the 2-, 3-, 4-, 5- or 6-position with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms; alkoxy -OR^{10} where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; 2,3-methylenedioxy; 3,4-methylenedioxy; dialkylamino having formula -$NR_{13}R_{14}$ wherein R_{13} and R_{14} are independently selected from hydrogen; straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; trifluoromethyl; trifluoromethoxy; difluoromethoxy; 3, 4-methylenedioxy; 2, 3-methylenedioxy; nitro; and halogen;

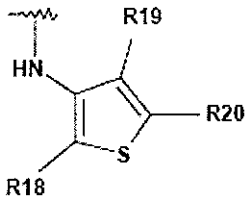
(ii) a 2-thiophene ring of Formula (8) wherein R^{15}, R^{16}, and R^{17} are independently selected from the group consisting of: hydrogen; straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; alkoxy -OR^{10} where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-1 to C-6 cycloalkyl optionally containing

unsaturation or one oxygen or nitrogen atom; dialkylamino; trifluoromethyl; difluoromethyl; trifluoromethoxy; and halogen



Formula (8);

(iii) a 3-thiophene ring of Formula (9) wherein R^{18}, R^{19}, and R^{20} are independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; alkoxy $-OR^{10}$ where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; dialkylamino; trifluoromethyl; difluoromethyl; trifluoromethoxy; and halogen



Formula (9);

(iv) an unsubstituted 2-Pyridyl ring or a 2-Pyridyl ring substituted at 4- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom;

(v) an unsubstituted 3-Pyridyl ring or a 3-Pyridyl ring substituted at the 2-, 4- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; and

(vi) an unsubstituted 4-Pyridyl ring or a 4-Pyridyl ring substituted at the 2- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom;

R^{22} is a C-1 to C-6 lower alkyl optionally substituted at C-1 or C-2 with at least one group selected from the group consisting of:

(i) an unsubstituted phenyl ring and

(ii) a phenyl ring substituted at the 2-, 3-, 4-, 5- or 6-position with one or more groups independently selected from the group consisting of: (a) straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; (b) C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; (c) aryl comprising a phenyl or heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms; (d) alkoxy $-OR^{10}$ where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-1 to C-6 cycloalkyl optionally containing unsaturation or one oxygen or nitrogen atom; (e) 2,3-methylenedioxy; (f) 3,4-methylenedioxy; (g) dialkylamino having formula $-NR_{13}R_{14}$ wherein R_{13} and R_{14} are independently selected from hydrogen and straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; (h) trifluoromethyl; (i) trifluoromethoxy; (j) difluoromethoxy; (k) 3, 4-methylenedioxy; (l) 2, 3-methylenedioxy; (m) nitro; and (n) halogen.

Claim 12. The compound of any one of claims 1-11 that inhibits EGFR activity comprising:

six or more of functional groups F(I)1, F(I)2, F(I)3, F(I)4, F(I)5, F(I)6, F(I)7, F(I)8, and F(I)9 of a Scheme I 1505-like pharmacophore;

wherein

functional group F(I)1 donates an H-bond or forms a salt bridge to a carboxylate side chain of receptor Asp553 of SEQ ID NO: 1 and has coordinates of r = 56.363, θ (theta) = 94.368, and Φ (phi) = -17.752 and a spherical radius of about 1.2Å;

functional group F(I)2 donates an H-bond to backbone carbonyl of receptor Thr570 of SEQ ID NO: 1 and has coordinates of r = 53.290, θ (theta) = 101.494, and Φ (phi) = -23.244 and a spherical radius of about 1.0Å;

functional group F(I)3 forms a hydrophobic contact with a side chain of receptor Val568, an imidazole side chain of receptor His566, and an imidazolidine ring of receptor Pro552 of SEQ ID NO: 1 and has coordinates of r = 53.726, θ (theta) = 97.830, and Φ (phi) = -18.378 and a spherical radius of about 1.7Å;

functional group F(I)4 donates an H-bond or forms a salt bridge to the side chain carboxylate of receptor Asp563 of SEQ ID NO: 1 and has coordinates of r = 56.103, θ (theta) = 99.536, and Φ (phi) = -21.080 and a spherical radius of about 1.2Å;

functional group F(I)5 forms a hydrophobic contact with an imidazoline ring of receptor Pro572 and a side chain of Met253 of SEQ ID NO: 1 and has coordinates of r = 53.647, θ (theta) = 103.844, and Φ (phi) = -20.990 and a spherical radius of about 1.4Å;

functional group F(I)6 donates an H-bond to a backbone carbonyl of receptor Cys571 of SEQ ID NO: 1 and has coordinates of r = 51.088, θ (theta) = 104.241, and Φ (phi) = -25.552 and a spherical radius of about 1.2Å;

functional group F(I)7 donates an H-bond to a backbone carbonyl of receptor Cys571 of SEQ ID NO: 1 and has coordinates of r = 52.340, θ (theta) = 103.980, and Φ (phi) = -27.461 and a spherical radius of about 1.5Å;

functional group F(I)8 accepts an H-bond from receptor backbone NH of Ala573 of SEQ ID NO: 1 and has coordinates of r = 51.383, θ (theta) = 106.455, and Φ (phi) = -24.319 and a spherical radius of about 1.2Å;

functional group F(I)9 accepts an H-bond from receptor backbone NH of Ala573 of SEQ ID NO: 1 and has coordinates of r = 52.861, θ (theta) = 107.692, and Φ (phi) = -25.447 and a spherical radius of about 1.5Å; and

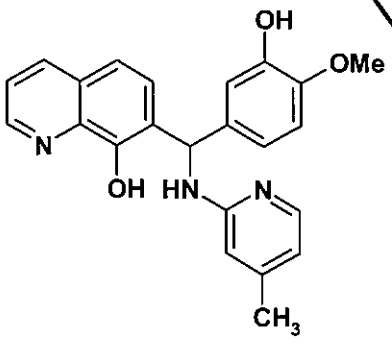
the compound substantially maintains a non-extended tether inactive configuration of EGFR or substantially prevents stabilization of an extended tether active configuration of EGFR.

Claim 13. A composition for use in the treatment of a proliferative disease, disorder, or condition, the composition comprising:

a compound selected from:

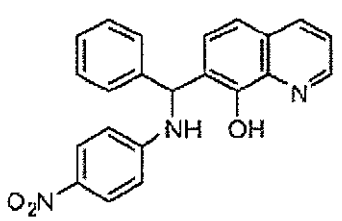
(i) a compound of any one of claims 1-12;

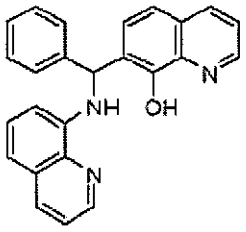
(ii) a compound of Formula (1):

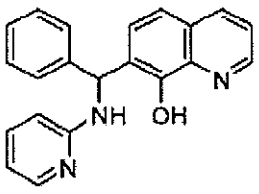


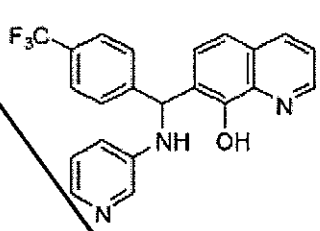
AD4-1505, Formula (1);

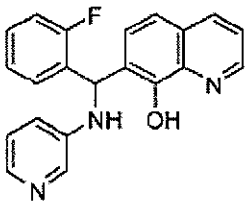
(iii) a compound selected from the group consisting of:

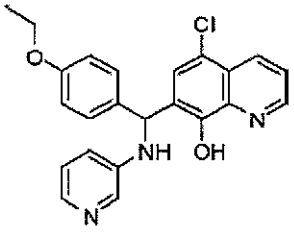








, 

, and 

; or

(iv) a stereoisomer or pharmaceutically acceptable salt of (i), (ii), or (iii); and

optionally, a pharmaceutically acceptable carrier or excipient.

Claim 14. The composition according to claim 13, wherein the proliferative disease, disorder, or condition is selected from the group consisting of: cancer; a blood vessel proliferative disorder; a fibrotic disorder; a mesangial cell proliferative disorder; psoriasis; actinic keratoses; seborrheic keratoses; warts; keloid scars; eczema; and hyperproliferative diseases caused by a viral infection.

Claim 15. A method for identifying an epidermal growth factor receptor (EGFR) inhibitor comprising:

providing a pharmacophore comprising Scheme I as input to a 3-dimensional database;

comparing a three dimensional structure of a candidate compound to the three dimensional structure of the pharmacophore;

selecting a candidate compound with a three dimensional structure that substantially aligns with six or more functional groups of Scheme I (ADS-1505-like);

wherein,

similarity between the three-dimensional structure of the candidate compound and the three-dimensional structure of the pharmacophore is indicative of an ability of the candidate compound to inhibit EGFR by substantially maintaining a tethered inactive configuration of EGFR or substantially preventing stabilization of the untethered active configuration of EGFR; and

Scheme I (ADS-1505-like) comprises functional groups F(I)1, F(I)2, F(I)3, F(I)4, F(I)5, F(I)6, F(I)7, F(I)8, and F(I)9; wherein

functional group F(I)1 donates an H-bond or forms a salt bridge to a carboxylate side chain of receptor Asp553 of SEQ ID NO: 1 and has coordinates of r = 56.363, θ (theta) = 94.368, and Φ (phi) = -17.752 and a spherical radius of about 1.2Å;

functional group F(I)2 donates an H-bond to backbone carbonyl of receptor Thr570 of SEQ ID NO: 1 and has coordinates of r = 53.290, θ (theta) = 101.494, and Φ (phi) = -23.244 and a spherical radius of about 1.0Å;

functional group F(I)3 forms a hydrophobic contact with a side chain of receptor Val568, an imidazole side chain of receptor His566, and an imidazolidine ring of receptor Pro552 of SEQ ID NO: 1 and has coordinates of r = 53.726, θ (theta) = 97.830, and Φ (phi) = -18.378 and a spherical radius of about 1.7Å;

functional group F(I)4 donates an H-bond or forms a salt bridge to the side chain carboxylate of receptor Asp563 of SEQ ID NO: 1 and has coordinates of r = 56.103, θ (theta) = 99.536, and Φ (phi) = -21.080 and a spherical radius of about 1.2Å;

functional group F(I)5 forms a hydrophobic contact with an imidazoline ring of receptor Pro572 and a side chain of Met253 of SEQ ID NO: 1 and has

coordinates of r = 53.647, θ (theta) = 103.844, and Φ (phi) = -20.990 and a spherical radius of about 1.4Å;

functional group F(I)6 donates an H-bond to a backbone carbonyl of receptor Cys571 of SEQ ID NO: 1 and has coordinates of r = 51.088, θ (theta) = 104.241, and Φ (phi) = -25.552 and a spherical radius of about 1.2Å;

functional group F(I)7 donates an H-bond to a backbone carbonyl of receptor Cys571 of SEQ ID NO: 1 and has coordinates of r = 52.340, θ (theta) = 103.980, and Φ (phi) = -27.461 and a spherical radius of about 1.5Å;

functional group F(I)8 accepts an H-bond from receptor backbone NH of Ala573 of SEQ ID NO: 1 and has coordinates of r = 51.383, θ (theta) = 106.455, and Φ (phi) = -24.319 and a spherical radius of about 1.2Å; and

functional group F(I)9 accepts an H-bond from receptor backbone NH of Ala573 of SEQ ID NO: 1 and has coordinates of r = 52.861, θ (theta) = 107.692, and Φ (phi) = -25.447 and a spherical radius of about 1.5Å.

Claim 16. A method for forming a compound of claim 1, comprising:

combining an amino pyridine intermediate compound, an aldehyde intermediate compound, and a hydroxyquinoline intermediate compound in ethanol under conditions sufficient to form a compound of claim 1;

wherein,

the amino pyridine intermediate compound comprises R^2-CHO, where R^2 is as defined in claim 1;

the aldehyde intermediate compound comprises R^1-NH_2, where R^1 is as defined in claim 1; and

the hydroxyquinoline intermediate compound comprises 8-hydroxyquinoline, optionally substituted with X, where X is as defined in claim 1.

Claim 17. The composition according to claim 13, wherein the aminopyridine intermediate compound is selected from the group consisting of 2-Amino-3-methoxy-5-chloropyridine; 2-Amino-4,5-dichloropyridine; 2-Amino-5-chloro-6-methylpyridine; 2-Amino-5-chloro-3-methylpyridine; 2-Amino-3,5-dichloro-4-methylpyridine; 2-Amino-3,5-dichloro-4,6-dimethylpyridine; 2-Amino-3-fluoro-4-methyl-5-chloropyridine; 2-Amino-3-ethyl-5-chloropyridine; 2-Amino-3-fluoro-4-ethyl-5-chloropyridine; and 2-Amino-4-methyl-3,5-difluoropyridine, or an aminopyridine compound formed according to claim 18.

Claim 18. The method of claim 16, wherein the aminopyridine intermediate compound is formed by a method comprising:

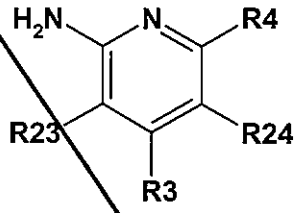
(i) combining a substituted or unsubtituted 2-aminopyridine and N-chlorosuccinimide in a solvent comprising ethylacetate or dimethylformamide under conditions sufficient to form a 2-amino-5-chloropyridine derivative; or

(ii) combining acetic anhydride in glacial acetic acid and a 2-aminopyridine substituted at 3-position and 5-position with fluoro, chloro, or bromo to form a corresponding acetamide derivative; combining the acetamide derivative and diisopropyl amine and butyllithium in tetrahydrofuran at about -70 °C to deprotonate the acetamide derivative; combining the deprotonated acetamide derivative and a lower alkyl halide to alkylate the 4-position of the acetamide derivative; combining the alkylated acetamide derivative and a concentrated hydrochloric acid in a methanol solvent at about 50 °C to remove the acetamide group and form a 2-amino-3,5-dihalo-4-alkylaminopridine.

Claim 19. The method of claim 18, wherein

(i) the 2-aminopyridine of reaction (i) comprises Formula (12), wherein R^{23}, R^3, and R^4 are as defined in claim 1 and R^{24} is hydrogen; and the 2-amino-5-chloropyridine derivative comprises Formula (12), wherein R^{23}, R^3, and R^4 are the same as for the 2-aminopyridine and R^{24} is chloro; or

(ii) the substituted 2-aminopyridine comprises Formula (12), wherein R^{23} is fluoro, chloro, or bromo; R^3 is hydrogen; R^4 is as defined in claim 1; and R^{24} is fluoro, chloro, or bromo;



Formula (12).

Claim 20. The method of claim 18, wherein the amino pyridine compound selected from the group consisting of:

2-Amino-3-fluoro-4-methyl-5-chloropyridine;

2-Amino-3-ethyl-5-chloropyridine;

2-Amino-3-fluoro-4-ethyl-5-chloropyridine; and

2-Amino-4-methyl-3,5-difluoropyridine.

21. The compound of claim 1, wherein R^1 is a 2-Pyridyl ring of Formula (3) and at least one of R^3, R^{23}, or R^{24} is fluoro or chloro.

22. The compound of claim 1, wherein R^1 is a 2-Pyridyl ring of Formula (3) and at least two of R^3, R^{23}, or R^{24} is fluoro or chloro.

23. The compound of claim 22, wherein R^1 is a 2-Pyridyl ring of Formula (3) and at least one of R^{23} or R^{24} is fluoro or chloro.

24. The compound of claim 22, wherein R^{24} is chloro.

25. The compound of claim 1, wherein R^1 is a 2-Pyridyl ring of Formula (3) and one of R^3, R^4, R^{23}, or R^{24} is methyl or ethyl and at least one of R^3, R^4, R^{23}, or R^{24} is halogen.

26. The compound of claim 25, wherein R^{24} is chloro and R^3, R^4, or R^{23} is methyl or ethyl.

27. The compound of claim 1, wherein R^1 is a 2-Pyridyl ring of Formula (3) and none of R^3, R^4, R^{23}, or R^{24} is methyl.

28, The compound of claim 1, wherein R^1 is a 3-Pyridyl ring of Formula (4), each of R^5, R^6 , and R^7 are hydrogen, and R^2 is a 2,4-dimethyl substituted phenyl ring.

29. The compound of claim 1, wherein R^1 is a 3-Pyridyl ring of Formula (4) and at least one of R^5, R^6 , or R^7 is not hydrogen.

30. The compound of claim 1, wherein R^2 is

a 2-chloro substituted phenyl ring;

a 2,3-dichloro substituted phenyl ring;

a 2,4-dichloro substituted phenyl ring;

a 2,5-dichloro substituted phenyl ring;

a 3,4-dichloro substituted phenyl ring;

a 2-chlor, 4-fluoro substituted phenyl ring;

a 4-trifluoromethyl substituted phenyl ring;

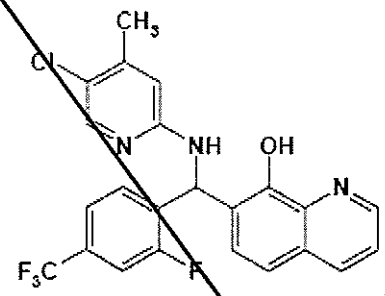
a 2-fluoro, 4-trifluoromethyl substituted phenyl ring;

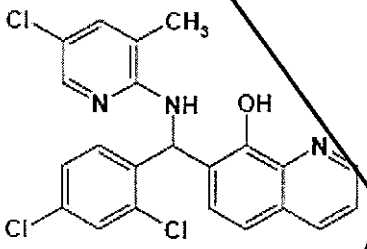
a 2,4-dimethyl substituted phenyl ring; or

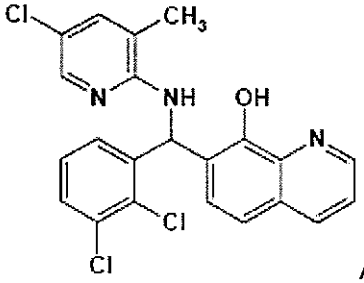
a 2,3,4-trimethoxy substituted phenyl ring.

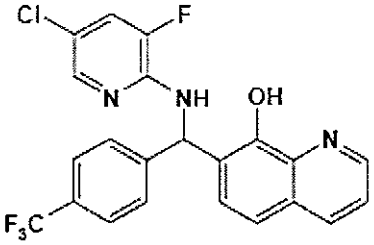
31. The compound of claim 1, wherein X is hydrogen.

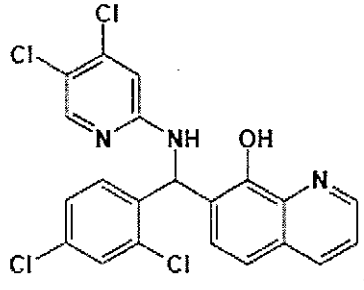
32. The compound of claim 1, selected from the group consisting of:

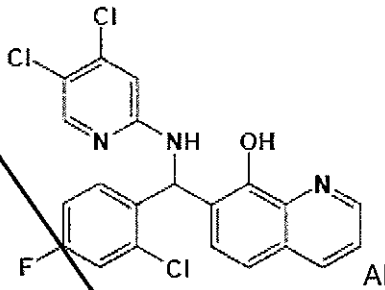

AD4-13129;


AD4-13130;

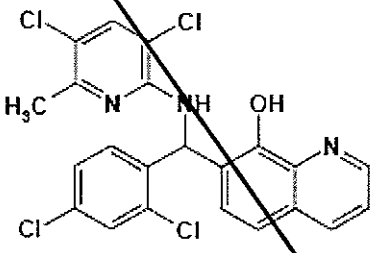

AD4-13147;


AD4-13162;

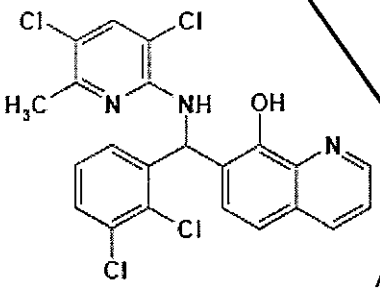

AD4-13178;



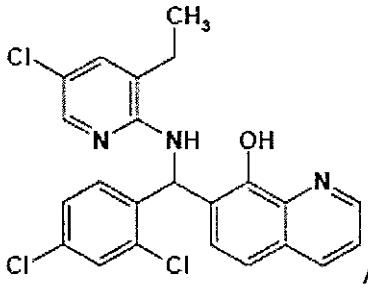
AD4-13185;



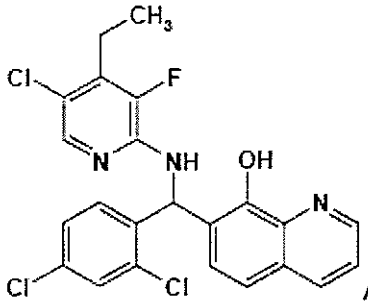
AD4-13206;



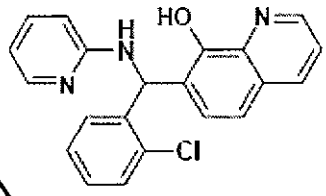
AD4-13211;



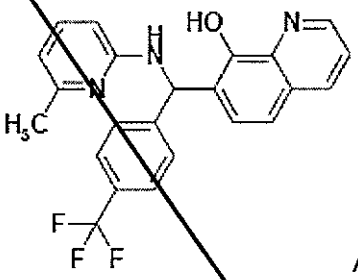
AD4-13217;



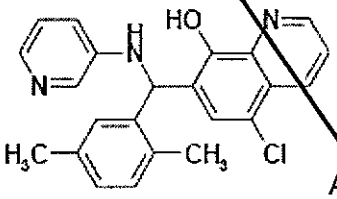
AD4-13218;



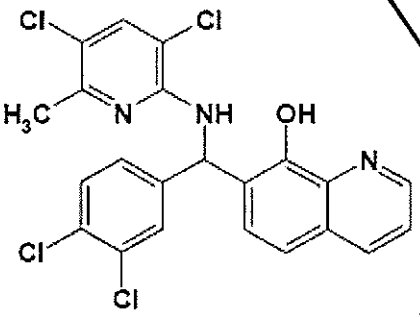
AD4-10482;



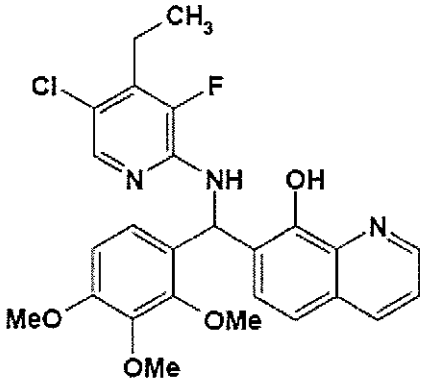
AD4-10628;



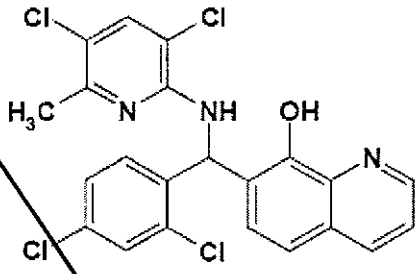
AD4-10944;



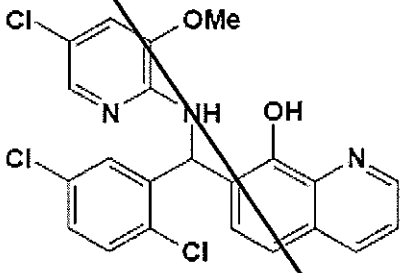
AD4-13202;



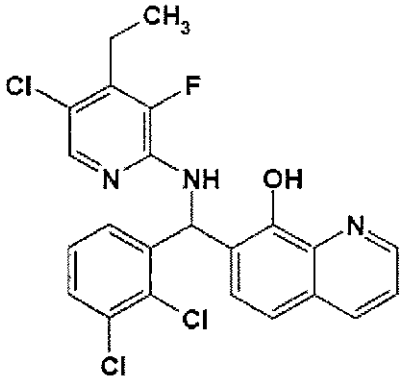
AD4-13219;



AD4-13220;



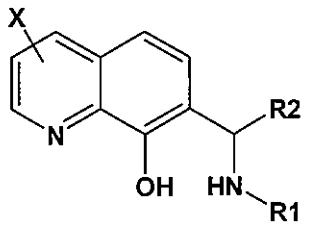
AD4-13221; and



AD4-13222.

CLAIMS

1. A compound having a formula of:



Formula (2)

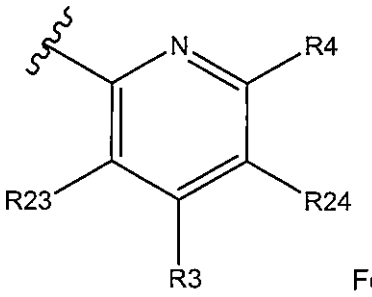
or a stereoisomer or pharmaceutically acceptable salt thereof;

wherein,

X is selected from the group consisting of: hydrogen, 2-Methyl, 5-Chloro, 5-Nitro, and 6-Hydroxyl;

R^1 is selected from the group consisting of:

(i) a 2-Pyridyl ring of Formula (3)



Formula (3)

wherein

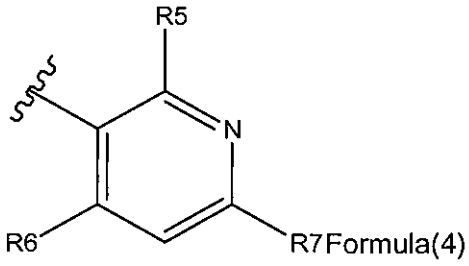
R^{23} is selected from the group consisting of hydrogen; fluoro; chloro; trifluoromethyl; methyl; ethyl; and methoxy;

R^3 is selected from the group consisting of hydrogen; fluoro; chloro; methyl; ethyl; methoxy; a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; a C-3 to C-7cycloalkyl optionally containing unsaturation wherein one carbon may be replaced with one oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms; and alkoxy having the formula of $-OR^{10}$ where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-3 to C-7 cycloalkyl optionally containing unsaturation wherein one carbon may be replaced with one oxygen or nitrogen atom;

R^{24} is selected from the group consisting of: hydrogen; fluoro; chloro; and trifluoromethyl; and

R^4 is selected from the group consisting of hydrogen; methyl; a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; a C-3 to C-7 cycloalkyl optionally containing unsaturation wherein one carbon may be replaced with one oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms; and alkoxy -OR^{10} where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-3 to C-7 cycloalkyl optionally containing unsaturation wherein one carbon may be replaced with one oxygen or nitrogen atom;

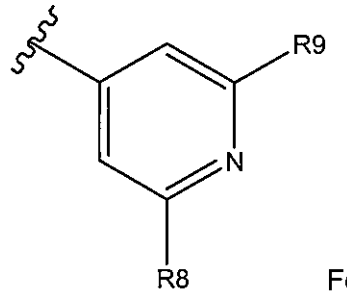
(ii) a 3-Pyridyl ring of Formula (4)



Formula(4)

wherein R^5, R^6 , and R^7 are independently selected from the group consisting of: hydrogen, a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; a C-3 to C-7 cycloalkyl optionally containing unsaturation wherein one carbon may be replaced with one oxygen or nitrogen atom; Aryl comprising a phenyl or heteroaryl containing from 1 to 4 N, O, or S atoms; and alkoxy having the formula -OR^{10} where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-3 to C-7 cycloalkyl optionally containing unsaturation wherein one carbon may be replaced with one oxygen or nitrogen atom; and

(iii) a 4-Pyridyl ring of Formula (5)



Formula (5)

wherein R^8 and R^9 are independently selected from the group consisting of: a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; a C-3 to C-7 cycloalkyl optionally containing unsaturation wherein one carbon may

be replaced with one oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl containing from 1 to 4 N, O, or S atoms; and alkoxy having the formula $-OR^{10}$ where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-3 to C-7 cycloalkyl optionally containing unsaturation wherein one carbon may be replaced with one oxygen or nitrogen atom; and

R^2 is selected from the group consisting of:

(i) a substituted phenyl ring

(a) substituted at the 2-, 3-, 4-, 5- or 6-position with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-3 to C-7 cycloalkyl optionally containing unsaturation wherein one carbon may be replaced with one oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms; alkoxy having the formula $-OR^{10}$ where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-3 to C-7 cycloalkyl optionally containing unsaturation wherein one carbon may be replaced with one oxygen or nitrogen atom; dialkylamino having formula $-NR_{13}R_{14}$ wherein R_{13} and R_{14} are independently selected from hydrogen or a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; trifluoromethoxy; difluoromethoxy; 3,4-methylenedioxy; and 2,3-methylenedioxy;

(b) substituted at the 2- and 4- position with two halogens or a halogen and a trifluoromethyl;

(c) substituted at the 2-, 3-, 4-, or 5-position with a halogen and a trifluoromethyl;

(d) substituted at the 4-position with a chloro and at the 2- or 3-position with chloro or fluoro;

(e) substituted at the 2- and 3-position with chloro;

(f) substituted at the 2-, 3-, and 5-position with chloro;

(g) substituted at the 3- and 5-position with chloro; or

(h) substituted at the 2- and 5-position with chloro;

wherein if R^1 is a 3-Pyridyl ring of Formula (4) where each of R^5, R^6 , and R^7 are hydrogen, and R^2 is a substituted phenyl ring, the phenyl ring is substituted with one or more groups independently selected from the group consisting of: a straight chain or branched C-2 to C-4 lower alkyl optionally containing unsaturation; C-3 to C-7 cycloalkyl optionally containing unsaturation wherein one carbon may be replaced with one oxygen or nitrogen atom; a heteroaryl five or six

membered ring containing from 1 to 4 N, O, or S atoms; alkoxy having the formula of -OR^{10} where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-3 to C-7 cycloalkyl optionally containing unsaturation wherein one carbon may be replaced with one oxygen or nitrogen atom;dialkylamino having formula -$NR_{13}R_{14}$ wherein R_{13} and R_{14} are independently selected from hydrogen or a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; trifluoromethoxy; difluoromethoxy; 3,4-methylenedioxy;and 2,3-methylenedioxy;

(ii) a 2-Pyridyl ring substituted at 4- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-3 to C-7 cycloalkyl optionally containing unsaturation wherein one carbon may be replaced with one oxygen or nitrogen atom;

(iii) an unsubstituted 3-Pyridyl ring or a 3-Pyridyl ring substituted at the 2-, 4- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-3 to C-7 cycloalkyl optionally containing unsaturation wherein one carbon may be replaced with one oxygen or nitrogen atom; and

(iv) an unsubstituted 4-Pyridyl ring or a 4-Pyridyl ring substituted at the 2- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-3 to C-7 cycloalkyl optionally containing unsaturation wherein one carbon may be replaced with one oxygen or nitrogen atom;

wherein if each of R^3, R^4, R^{23}, and R^{24} is hydrogen, then R^2 is a substituted pyridyl ring or a phenyl substituted with straight chain or branched C-3 to C-4 lower alkyl optionally containing unsaturation; C-3 to C-7 cycloalkyl optionally containing unsaturation wherein one carbon may be replaced with one oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms; alkoxy having the formula -OR^{10} where R^{10} is a straight chain or branched C-3 to C-4 lower alkyl optionally containing unsaturation or a C-3 to C-7 cycloalkyl optionally containing unsaturation wherein one carbon may be replaced with one oxygen or nitrogen atom;; dialkylamino having formula -$NR_{13}R_{14}$ wherein R_{13} and R_{14} are independently selected from hydrogen or a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; trifluoromethoxy; difluoromethoxy; 3,4-methylenedioxy; or 2,3-methylenedioxy;

wherein if one of R^3, R^4, R^{23}, or R^{24} is methyl and the other three of R^3, R^4, R^{23}, or R^{24} are hydrogen, then R^2 is a substituted pyridyl ring or a phenyl substituted with straight chain or branched C-3 to C-4 lower alkyl optionally containing unsaturation; C-3 to C-7 cycloalkyl optionally containing unsaturation wherein one carbon may be replaced with one oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl five or six membered ring

containing from 1 to 4 N, O, or S atoms; dialkylamino having formula $-NR_{13}R_{14}$ wherein R_{13} and R_{14} are independently selected from hydrogen or a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; trifluoromethyl; trifluoromethoxy; difluoromethoxy; 3,4-methylenedioxy; or 2,3-methylenedioxy; or

a stereoisomer or pharmaceutically acceptable salt thereof.

2. The compound of claim 1 wherein R^1 is a 2-pyridyl ring of Formula (3) and:

R^{24} is chloro; or

R^{23} is methyl.

3. The compound of claim 1 wherein R^1 is a 2-pyridyl ring of Formula (3) and:

R^4 is hydrogen, R^{24} is fluoro, R^3 is hydrogen, and R^{23} is fluoro;

R^4 is methyl, R^{24} is chloro, R^3 is hydrogen, and R^{23} is fluoro;

R^4 is hydrogen, R^{24} is chloro, R^3 is ethyl, and R^{23} is fluoro;

R^4 is hydrogen, R^{24} is fluoro, R^3 is methyl, and R^{23} is fluoro;

R^4 is hydrogen, R^{24} is chloro, R^3 is hydrogen, and R^{23} is ethyl;

R^4 is methyl, R^{24} is chloro, R^3 is hydrogen, and R^{23} is chloro;

R^4 is hydrogen, R^{24} is chloro, R^3 is methyl, and R^{23} is fluoro;

R^4 is hydrogen, R^{24} is trifluoromethyl, R^3 is hydrogen, and R^{23} is hydrogen;

R^4 is hydrogen, R^{24} is chloro, R^3 is hydrogen, and R^{23} is methyl;

R^4 is hydrogen, R^{24} is chloro, R^3 is hydrogen, and R^{23} is chloro;

R^4 is hydrogen, R^{24} is chloro, R^3 is methyl, and R^{23} is hydrogen; or

R^4 is hydrogen, R^{24} is chloro, R^3 is chloro, and R^{23} is hydrogen.

4. The compound of claim 1, wherein R^1 is a 2-pyridyl ring of Formula (3) and:

R^{24} is chloro and R^3 is chloro or methyl or R^{23} is chloro or methyl;

R^{24} is chloro, R^3 is hydrogen, and R^{23} is methyl;

R^{24} is chloro, R^3 is methyl, and R^{23} is fluoro;

R^{24} is chloro, R^3 is chloro, and R^{23} is hydrogen;

R^{24} is chloro, R^3 is hydrogen, and R^{23} is chloro.

5. The compound of claim 1 wherein R^2 is selected from the group consisting of:

a phenyl ring substituted at the 2- and 4-positions;

2-fluoro,4-trifluoromethylphenyl; and

2,4-dichlorophenyl.

6. The compound of claim 1 wherein R^2 is selected from the group consisting of: 2-fluoro,4-trifluoromethylphenyl; 3-fluoro,4-chlorophenyl; 2-fluoro,4-chlorophenyl; 2,3-dichlorophenyl; 2,3,5-trichlorophenyl; 2,4-dichlorophenyl; 3,4-dichlorophenyl; and 3,5-dichlorophenyl.

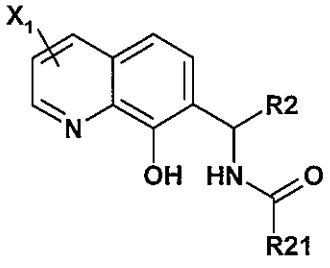
7. The compound of claim 1 wherein R^2 is selected from the group consisting of:

a phenyl ring substituted at the 4 position with chloro and substituted at the 2- or 3- position with chloro or fluoro;

2,4-dichlorophenyl; and

2-chloro,4-fluorophenyl.

8. A compound having a formula of:



Formula (10) (1505-like Type B)

or a stereoisomer or pharmaceutically acceptable salt thereof;

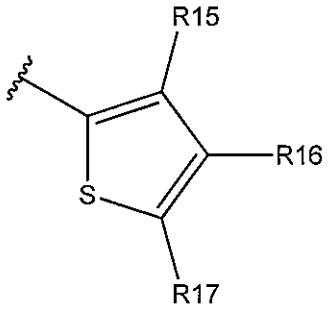
wherein,

X^1 is selected from the group consisting of: hydrogen, 2-Methyl, 5-Chloro, 5-Nitro, and 6-Hydroxyl;

R^2 is selected from the group consisting of:

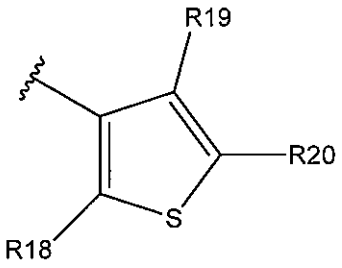
(i) an unsubstituted phenyl ring or a phenyl ring substituted at the 2-, 3-, 4-, 5- or 6-position with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms; alkoxy $-OR^{10}$ where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; 2,3-methylenedioxy; 3,4-methylenedioxy; dialkylamino having formula $-NR_{13}R_{14}$ wherein R_{13} and R_{14} are independently selected from hydrogen; straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; trifluoromethyl; trifluoromethoxy; difluoromethoxy; 3,4-methylenedioxy; 2,3-methylenedioxy; nitro; and halogen;

(ii) a 2-thiophene ring of Formula (8) wherein R^{15}, R^{16}, and R^{17} are independently selected from the group consisting of: hydrogen; straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; alkoxy $-OR^{10}$ where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; dialkylamino; trifluoromethyl; difluoromethyl; trifluoromethoxy; and halogen



Formula (8);

(iii) a 3-thiophene ring of Formula (9) wherein R^{18}, $R^{19,}$ and R^{20} are independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; alkoxy -OR^{10} where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; dialkylamino; trifluoromethyl; difluoromethyl; trifluoromethoxy; and halogen



Formula (9);

(iv) an unsubstituted 2-Pyridyl ring or a 2-Pyridyl ring substituted at 4- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom;

(v) an unsubstituted 3-Pyridyl ring or a 3-Pyridyl ring substituted at the 2-, 4- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; and

(vi) an unsubstituted 4-Pyridyl ring or a 4-Pyridyl ring substituted at the 2- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; and

R^{21} is selected from the group consisting of:

(i) straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation;

(ii) C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen nitrogen atom;

(iii) an unsubstituted phenyl ring or a phenyl ring substituted at the 2-, 3-, 4-, 5- or 6-position with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms; alkoxy $-OR^{10}$ where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; 2,3-methylenedioxy; 3,4-methylenedioxy; dialkylamino having formula $-NR_{13}R_{14}$ wherein R_{13} and R_{14} are independently selected from hydrogen; straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; trifluoromethyl; trifluoromethoxy; difluoromethoxy; 3,4-methylenedioxy; 2,3-methylenedioxy; nitro; and halogen;

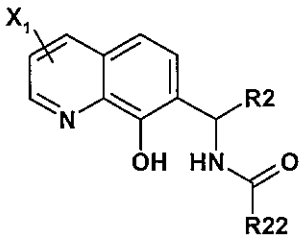
(iv) an unsubstituted 2-Pyridyl ring or a 2-Pyridyl ring substituted at 4- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom;

(v) an unsubstituted 3-Pyridyl ring or a 3-Pyridyl ring substituted at the 2-, 4- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; and

(vi) an unsubstituted 4-Pyridyl ring or a 4-Pyridyl ring substituted at the 2- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; and

(vii) a heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms.

9. A compound having a formula of:



Formula (11) (1505-like Type C)

or a stereoisomer or pharmaceutically acceptable salt thereof;

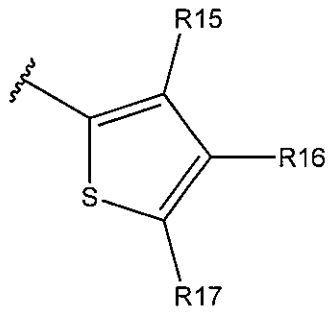
wherein,

X^1 is selected from the group consisting of: hydrogen, 2-Methyl, 5-Chloro, 5-Nitro, and 6-Hydroxyl;

R^2 is selected from the group consisting of:

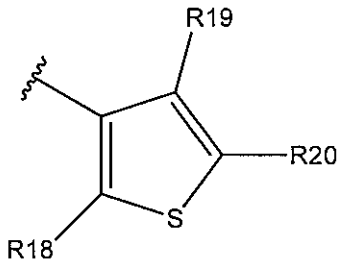
(i) an unsubstituted phenyl ring or a phenyl ring substituted at the 2-, 3-, 4-, 5- or 6-position with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; aryl comprising a phenyl or heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms; alkoxy $-OR^{10}$ where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; 2,3-methylenedioxy; 3,4-methylenedioxy; dialkylamino having formula $-NR_{13}R_{14}$ wherein R_{13} and R_{14} are independently selected from hydrogen; straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; trifluoromethyl; trifluoromethoxy; difluoromethoxy; 3,4-methylenedioxy; 2,3-methylenedioxy; nitro; and halogen;

(ii) a 2-thiophene ring of Formula (8) wherein R^{15}, R^{16}, and R^{17} are independently selected from the group consisting of: hydrogen; straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; alkoxy $-OR^{10}$ where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; dialkylamino; trifluoromethyl; difluoromethyl; trifluoromethoxy; and halogen



Formula (8);

(iii) a 3-thiophene ring of Formula (9) wherein R^{18}, R^{19}, and R^{20} are independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; alkoxy -OR^{10} where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; dialkylamino; trifluoromethyl; difluoromethyl; trifluoromethoxy; and halogen



Formula (9);

(iv) an unsubstituted 2-Pyridyl ring or a 2-Pyridyl ring substituted at 4- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom;

(v) an unsubstituted 3-Pyridyl ring or a 3-Pyridyl ring substituted at the 2-, 4- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; and

(vi) an unsubstituted 4-Pyridyl ring or a 4-Pyridyl ring substituted at the 2- or 6-position of the pyridine ring with one or more groups independently selected from the group consisting of: straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation and C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom;

R^{22} is a C-1 to C-6 lower alkyl optionally substituted at C-1 or C-2 with at least one group selected from the group consisting of:

(i) an unsubstituted phenyl ring and

(ii) a phenyl ring substituted at the 2-, 3-, 4-, 5- or 6-position with one or more groups independently selected from the group consisting of: (a) straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; (b) C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; (c) aryl comprising a phenyl or heteroaryl five or six membered ring containing from 1 to 4 N, O, or S atoms; (d) alkoxy $-OR^{10}$ where R^{10} is a straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation or a C-3 to C-7 cycloalkyl optionally containing unsaturation in which one carbon may be replaced with oxygen or nitrogen atom; (e) 2,3-methylenedioxy; (f) 3,4-methylenedioxy; (g) dialkylamino having formula $-NR_{13}R_{14}$ wherein R_{13} and R_{14} are independently selected from hydrogen and straight chain or branched C-1 to C-4 lower alkyl optionally containing unsaturation; (h) trifluoromethyl; (i) trifluoromethoxy; (j) difluoromethoxy; (k) 3,4-methylenedioxy; (l) 2,3-methylenedioxy; (m) nitro; and (n) halogen.

10. The compound of any one of claims 1-9 that inhibits EGFR activity comprising:

six or more of functional groups F(I)1, F(I)2, F(I)3, F(I)4, F(I)5, F(I)6, F(I)7, F(I)8, and F(I)9 of a Scheme I 1505-like pharmacophore;

wherein

functional group F(I)1 donates an H-bond or forms a salt bridge to a carboxylate side chain of receptor Asp553 of SEQ ID NO: 1 and has coordinates of r = 56.363, θ (theta) = 94.368, and Φ (phi) = -17.752 and a spherical radius of about 1.2Å;

functional group F(I)2 donates an H-bond to backbone carbonyl of receptor Thr570 of SEQ ID NO: 1 and has coordinates of r = 53.290, θ (theta) = 101.494, and Φ (phi) = -23.244 and a spherical radius of about 1.0Å;

functional group F(I)3 forms a hydrophobic contact with a side chain of receptor Val568, an imidazole side chain of receptor His566, and an imidazolidine ring of receptor Pro552 of SEQ ID NO: 1 and has coordinates of r = 53.726, θ (theta) = 97.830, and Φ (phi) = -18.378 and a spherical radius of about 1.7Å;

functional group F(I)4 donates an H-bond or forms a salt bridge to the side chain carboxylate of receptor Asp563 of SEQ ID NO: 1 and has coordinates of r = 56.103, θ (theta) = 99.536, and Φ (phi) = -21.080 and a spherical radius of about 1.2Å;

functional group F(I)5 forms a hydrophobic contact with an imidazoline ring of receptor Pro572 and a side chain of Met253 of SEQ ID NO: 1 and has coordinates of r = 53.647, θ (theta) = 103.844, and Φ (phi) = -20.990 and a spherical radius of about 1.4Å;

functional group F(I)6 donates an H-bond to a backbone carbonyl of receptor Cys571 of SEQ ID NO: 1 and has coordinates of r = 51.088, θ (theta) = 104.241, and Φ (phi) = -25.552 and a spherical radius of about 1.2Å;

functional group F(I)7 donates an H-bond to a backbone carbonyl of receptor Cys571 of SEQ ID NO: 1 and has coordinates of r = 52.340, θ (theta) = 103.980, and Φ (phi) = -27.461 and a spherical radius of about 1.5Å;

functional group F(I)8 accepts an H-bond from receptor backbone NH of Ala573 of SEQ ID NO: 1 and has coordinates of r = 51.383, θ (theta) = 106.455, and Φ (phi) = -24.319 and a spherical radius of about 1.2Å;

functional group F(I)9 accepts an H-bond from receptor backbone NH of Ala573 of SEQ ID NO: 1 and has coordinates of r = 52.861, θ (theta) = 107.692, and Φ (phi) = -25.447 and a spherical radius of about 1.5Å; and

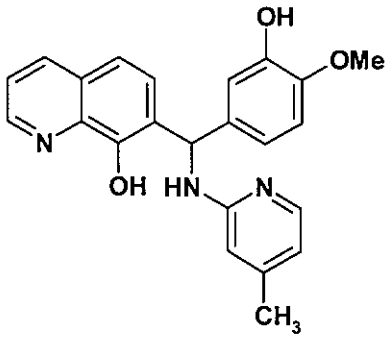
the compound substantially maintains a non-extended tether inactive configuration of EGFR or substantially prevents stabilization of an extended tether active configuration of EGFR.

11. A pharmaceutical composition for use in the treatment of a proliferative disease, disorder, or condition, the composition comprising:

a compound selected from:

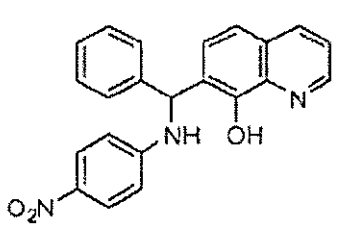
(i) a compound of any one of claims 1-10;

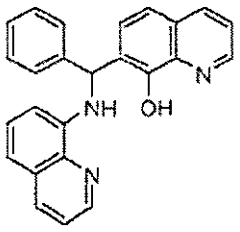
(ii) a compound of Formula (1):

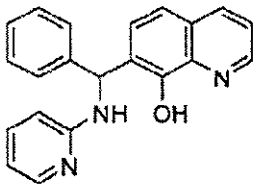


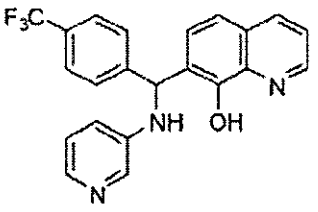
AD4-1505, Formula (1);

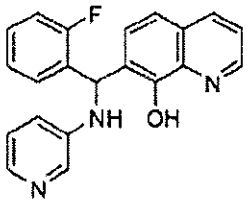
(iii) a compound selected from the group consisting of:

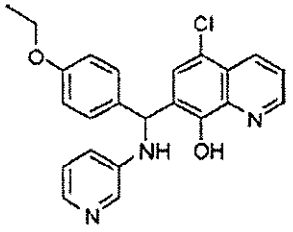


,


,


,


,


, and


; or

(iv) a stereoisomer or pharmaceutically acceptable salt of (i), (ii), or (iii); and

optionally, a pharmaceutically acceptable carrier or excipient.

12. The composition according to claim 11, wherein the proliferative disease, disorder, or condition is selected from the group consisting of: cancer; a blood vessel proliferative disorder; a fibrotic disorder; a mesangial cell proliferative disorder; psoriasis; actinic keratoses; seborrheic keratoses; warts; keloid scars; eczema; and hyperproliferative diseases caused by a viral infection.

13. A method for identifying an epidermal growth factor receptor (EGFR) inhibitor comprising:

providing a pharmacophore comprising Scheme I as input to a 3-dimensional database;

comparing a three dimensional structure of a candidate compound to the three dimensional structure of the pharmacophore;

selecting a candidate compound with a three dimensional structure that substantially aligns with six or more functional groups of Scheme I (AD4-1505-like);

wherein,

similarity between the three-dimensional structure of the candidate compound and the three-dimensional structure of the pharmacophore is indicative of an ability of the candidate compound to inhibit EGFR by substantially maintaining a tethered inactive configuration of

EGFR or substantially preventing stabilization of the untethered active configuration of EGFR; and

Scheme I (AD4-1505-like) comprises functional groups F(I)1, F(I)2, F(I)3, F(I)4, F(I)5, F(I)6, F(I)7, F(I)8, and F(I)9; wherein

functional group F(I)1 donates an H-bond or forms a salt bridge to a carboxylate side chain of receptor Asp553 of SEQ ID NO: 1 and has coordinates of r = 56.363, θ (theta) = 94.368, and Φ (phi) = -17.752 and a spherical radius of about 1.2Å;

functional group F(I)2 donates an H-bond to backbone carbonyl of receptor Thr570 of SEQ ID NO: 1 and has coordinates of r = 53.290, θ (theta) = 101.494, and Φ (phi) = -23.244 and a spherical radius of about 1.0Å;

functional group F(I)3 forms a hydrophobic contact with a side chain of receptor Val568, an imidazole side chain of receptor His566, and an imidazolidine ring of receptor Pro552 of SEQ ID NO: 1 and has coordinates of r = 53.726, θ (theta) = 97.830, and Φ (phi) = -18.378 and a spherical radius of about 1.7Å;

functional group F(I)4 donates an H-bond or forms a salt bridge to the side chain carboxylate of receptor Asp563 of SEQ ID NO: 1 and has coordinates of r = 56.103, θ (theta) = 99.536, and Φ (phi) = -21.080 and a spherical radius of about 1.2Å;

functional group F(I)5 forms a hydrophobic contact with an imidazoline ring of receptor Pro572 and a side chain of Met253 of SEQ ID NO: 1 and has

coordinates of r = 53.647, θ (theta) = 103.844, and Φ (phi) = -20.990 and a spherical radius of about 1.4Å;

functional group F(I)6 donates an H-bond to a backbone carbonyl of receptor Cys571 of SEQ ID NO: 1 and has coordinates of r = 51.088, θ (theta) = 104.241, and Φ (phi) = -25.552 and a spherical radius of about 1.2Å;

functional group F(I)7 donates an H-bond to a backbone carbonyl of receptor Cys571 of SEQ ID NO: 1 and has coordinates of r = 52.340, θ (theta) = 103.980, and Φ (phi) = -27.461 and a spherical radius of about 1.5Å;

functional group F(I)8 accepts an H-bond from receptor backbone NH of Ala573 of SEQ ID NO: 1 and has coordinates of r = 51.383, θ (theta) = 106.455, and Φ (phi) = -24.319 and a spherical radius of about 1.2Å; and

functional group F(I)9 accepts an H-bond from receptor backbone NH of Ala573 of SEQ ID NO: 1 and has coordinates of r = 52.861, θ (theta) = 107.692, and Φ (phi) = -25.447 and a spherical radius of about 1.5Å.

14. A method for forming a compound of claim 1, comprising:

combining an amino pyridine intermediate compound, an aldehyde intermediate compound, and a hydroxyquinoline intermediate compound in ethanol under conditions sufficient to form a compound of claim 1;

wherein,

the amino pyridine intermediate compound comprises R^2-NH_2, where R^2 is as defined in claim 1;

the aldehyde intermediate compound comprises R^1-CHO, where R^1 is as defined in claim 1; and

the hydroxyquinoline intermediate compound comprises 8-hydroxyquinoline, optionally substituted with X, where X is as defined in claim 1.

15. The method according to claim 14, wherein the aminopyridine intermediate compound is selected from the group consisting of 2-Amino-3-methoxy-5-chloropyridine; 2-Amino-4,5-dichloropyridine; 2-Amino-5-chloro-6-methylpyridine; 2-Amino-5-chloro-3-methylpyridine; 2-Amino-3,5-dichloro-4-methylpyridine; 2-Amino-3,5-dichloro-4,6-dimethylpyridine; 2-Amino-3-fluoro-4-methyl-5-chloropyridine; 2-Amino-3-ethyl-5-chloropyridine; 2-Amino-3-fluoro-4-ethyl-5-chloropyridine; and 2-Amino-4-methyl-3,5-difluoropyridine.

16. The method of claim 14, wherein the aminopyridine intermediate compound is formed by a method comprising:

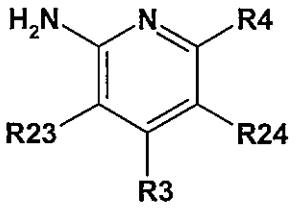
(i) combining a substituted or unsubtituted 2-aminopyridine and N-chlorosuccinimide in a solvent comprising ethylacetate or dimethylformamide under conditions sufficient to form a 2-amino-5-chloropyridine derivative; or

(ii) combining acetic anhydride in glacial acetic acid and a 2-aminopyridine substituted at 3-position and 5-position with fluoro, chloro, or bromo to form a corresponding acetamide derivative; combining the acetamide derivative and diisopropyl amine and butyllithium in tetrahydrofuran at about -70 °C to deprotonate the acetamide derivative; combining the deprotonated acetamide derivative and a lower alkyl halide to alkylate the 4-position of the acetamide derivative; combining the alkylated acetamide derivative and a concentrated hydrochloric acid in a methanol solvent at about 50 °C to remove the acetamide group and form a 2-amino-3,5-dihalo-4-alkylaminopridine.

17. The method of claim 16, wherein

(i) the 2-aminopyridine of reaction (i) comprises Formula (12), wherein R^{23}, R^3, and R^4 are as defined in claim 1 and R^{24} is hydrogen; and the 2-amino-5-chloropyridine derivative comprises Formula (12), wherein R^{23}, R^3, and R^4 are the same as for the 2-aminopyridine and R^{24} is chloro; or

(ii) the substituted 2-aminopyridine comprises Formula (12), wherein R^{23} is fluoro, chloro, or bromo; R^3 is hydrogen; R^4 is as defined in claim 1; and R^{24} is fluoro, chloro, or bromo;



Formula (12).

18. The method of claim 16, wherein the amino pyridine compound selected from the group consisting of:

2-Amino-3-fluoro-4-methyl-5-chloropyridine;

2-Amino-3-ethyl-5-chloropyridine;

2-Amino-3-fluoro-4-ethyl-5-chloropyridine; and

2-Amino-4-methyl-3,5-difluoropyridine.

19. The compound of claim 1, wherein R^1 is a 2-Pyridyl ring of Formula (3) and at least one of R^3, R^{23}, or R^{24} is fluoro or chloro.

20. The compound of claim 1, wherein R^1 is a 2-Pyridyl ring of Formula (3) and at least two of R^3, R^{23}, or R^{24} is fluoro or chloro.

21. The compound of claim 18, wherein R^1 is a 2-Pyridyl ring of Formula (3) and at least one of R^{23} or R^{24} is fluoro or chloro.

22. The compound of claim 20, wherein R^{24} is chloro.

23. The compound of claim 1, wherein R^1 is a 2-Pyridyl ring of Formula (3) and one of R^3, R^4, R^{23}, or R^{24} is methyl or ethyl and at least one of R^3, R^4, R^{23}, or R^{24} is halogen.

24. The compound of claim 23, wherein R^{24} is chloro and R^3, R^4, or R^{23} is methyl or ethyl,

25. The compound of claim 1, wherein R^1 is a 2-Pyridyl ring of Formula (3) and none of R^3, R^4, R^{23}, or R^{24} is methyl.

26, The compound of claim 1, wherein R^1 is a 3-Pyridyl ring of Formula (4), each of R^5, R^6 , and R^7 are hydrogen, and R^2 is a 2,4-dimethyl substituted phenyl ring.

27. The compound of claim 1, wherein R^1 is a 3-Pyridyl ring of Formula (4) and at least one of R^5, R^6 , or R^7 is not hydrogen.

28. The compound of claim 1, wherein R^2 is

a 2,3-dichloro substituted phenyl ring;

a 2,4-dichloro substituted phenyl ring;

a 2,5-dichloro substituted phenyl ring;

a 3,4-dichloro substituted phenyl ring;

a 2-chlor, 4-fluoro substituted phenyl ring;

a 4-trifluoromethyl substituted phenyl ring;

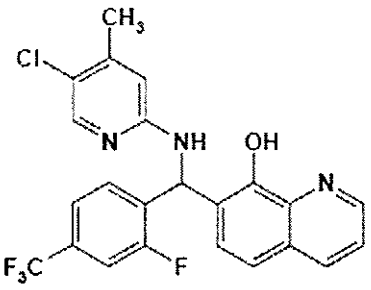
a 2-fluoro, 4-trifluoromethyl substituted phenyl ring;

a 2,4-dimethyl substituted phenyl ring; or

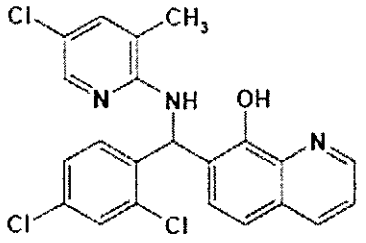
a 2,3,4-trimethoxy substituted phenyl ring.

29. The compound of claim 1, wherein X is hydrogen.

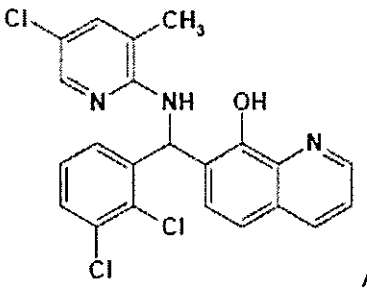
30. The compound of claim 1, selected from the group consisting of:



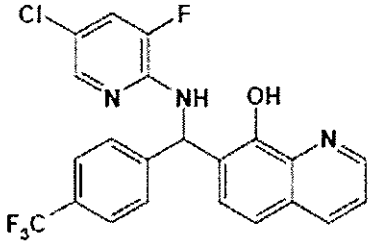
AD4-13129;



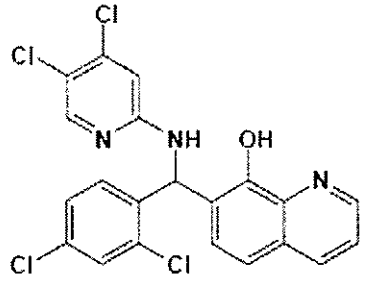
AD4-13130;



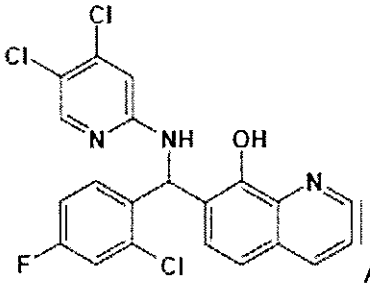
AD4-13147;



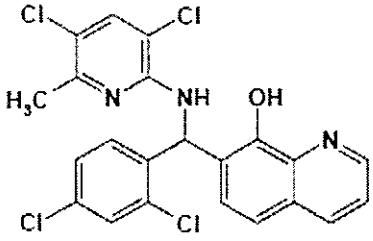
AD4-13162;



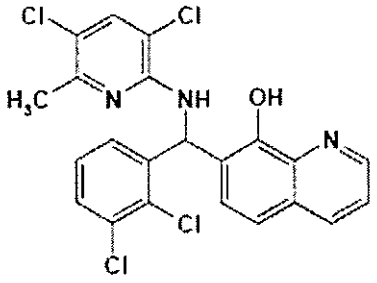
AD4-13178;



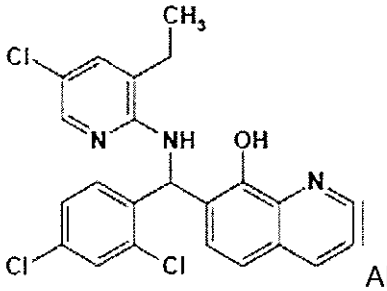
AD4-13185;



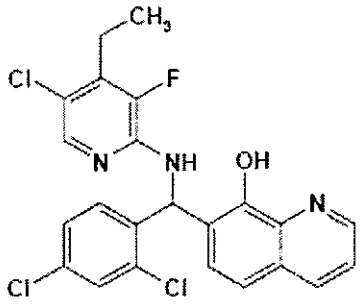
AD4-13206;



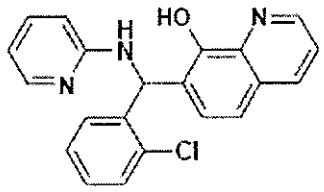
AD4-13211;



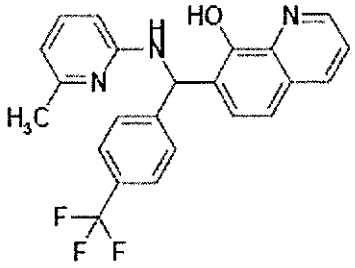
AD4-13217;



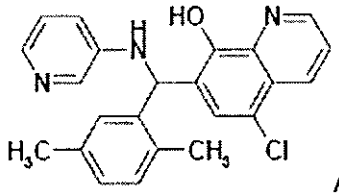
AD4-13218;



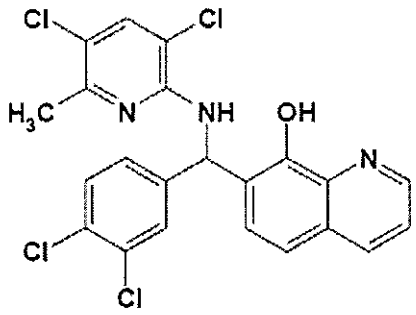
AD4-10482;



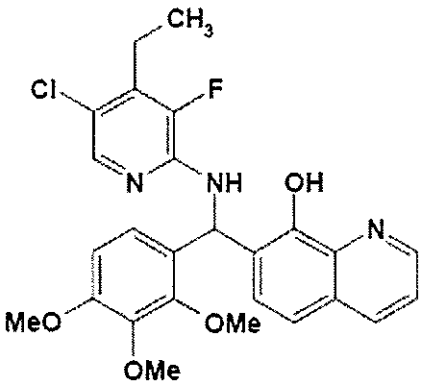
AD4-10628;



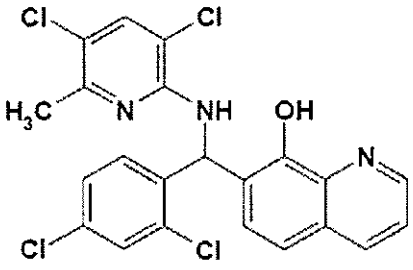
AD4-10944;



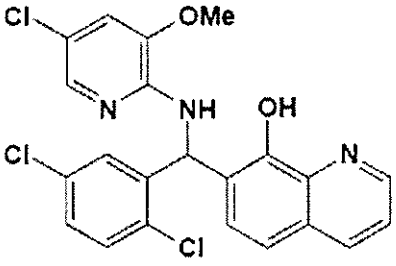
AD4-13202;



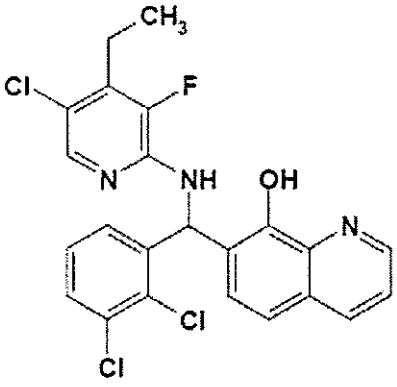
AD4-13219;



AD4-13220;



AD4-13221; and



AD4-13222.