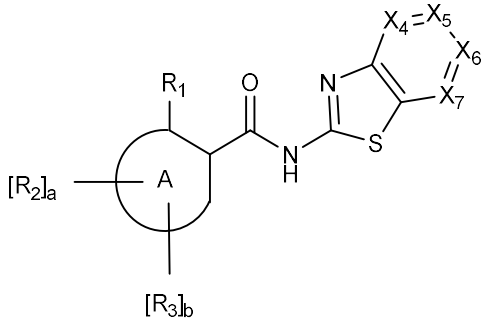
CLAIMS

1. A compound, or a pharmaceutically acceptable salt thereof, having the structural formula (I) shown below:



(I)

wherein:

ring A is selected from the group consisting of phenyl and a 5- to 10-membered heteroaryl;

R_1 is selected from the group consisting of phenyl, 5- to 6- membered heteroaryl, 5- to 6-membered heterocyclyl, 6- to 10-membered bicyclic heterocyclyl, 6- to 10-membered bridged heterocyclyl, and 6- to 12-membered spiroheterocyclyl, wherein:

(i) R_1 is optionally substituted with one or more R_{100} substituents; or two R_{100} substituents on adjacent ring atoms in R_1 may be linked to form a fused (3-6C)cycloalkyl ring; or

(ii) when R_1 is 5- to 6- membered heterocyclyl, 6- to 10-membered bicyclic heterocyclyl, 6- to 10-membered bridged heterocyclyl, and 6- to 12-membered spiroheterocyclyl, it is optionally substituted by oxo;

wherein R_{100} is selected from the group consisting of halo, (1-4C)alkyl, (1-4C)haloalkyl, (1-4C)haloalkoxy, (3-6C)cycloalkyl, (3-6C)cycloalkyloxy, -Q_{100}-OH, -Q_{100}-O-(1-4C)alkyl, -C(O)-(1-4C)alkyl and -Q_{100}-cyano; wherein Q_{100} is a bond or (1-4C)alkylene;

integers a and b are each independently 0 or 1;

R_2 and R_3, when present, are each independently selected from the group consisting of halo, cyano, -O^-, (1-4C)alkyl, (1-4C)alkoxy, (1-4C)haloalkyl, (1-4C)hydroxyalkyl, (1-4C)haloalkoxy, -Q_1-O-(1-4C)alkyl, -C(O)OH, -Q_1-C(O)-NH_2, -Q_1-C(O)-NHMe and -Q_1-C(O)-NMe_2, wherein Q_1 is a bond or (1-4C)alkylene;

X_4 is selected from CR_{x4} or N;

X_5 is selected from CR_{x5} or N;

X_6 is selected from CR_{x6} or N;

X_7 is selected from CR_{x7} or N;

R_{x4} is hydrogen, fluoro, chloro, methyl or a group of the formula:

-Y-Q

wherein:

Y is -O-, -O-CH_2-, -S-, -NH-, -CH_2- or -CH_2-CH_2-;

Q is selected from hydrogen (1-6C)alkyl, -C(O)-NH_2, -C(O)-NHMe, -C(O)-NMe_2, (3-8C)cycloalkyl, phenyl, heteroaryl, 4-to 7- membered heterocyclyl, 6- to 10-membered bicyclic heterocyclyl, 6- to 10-membered bridged heterocyclyl, and 6- to 12-membered spiroheterocyclyl, each of which is optionally substituted by one or more R_{100} substituents and a (3-8C)cycloalkyl, 4-to 7- membered heterocyclyl, 6- to 10-membered bicyclic heterocyclyl, 6- to 10-membered bridged heterocyclyl, and 6- to 12-membered spiroheterocyclyl is optionally substituted by oxo;

R_{x5} or R_{x6} are selected from:

hydrogen, halo, cyano, nitro, or a group of the formula:

$-L_1-Y_1-L_2-Q_1$

wherein:

L_1 is absent or (1-2C)alkylene;
Y_1 is absent or -O-, -S-, -SO-, -SO_2-, -S(O)(=NR_{y1})-, -N(R_{y1})-, -C(O)-, -C(O)O-, -OC(O)-, -C(O)N(R_{y1})-, -N(R_{y1})C(O)-, -S(O)$_2$N(R_{y1})-, -N(R_{y1})SO_2- or -N(R_{y1a})C(O)-N(R_{y1})-, wherein R_{y1} and R_{y1a} are selected from hydrogen or (1-2C)alkyl;
L_2 is absent or (1-2C)alkylene; and
Q_1 is hydrogen, (1-6C)alkyl, (2-6C)alkenyl, (2-6C)alkynyl, (3-8C)cycloalkyl, phenyl, 5- to 6- membered heteroaryl, 4-to 7- membered heterocyclyl, 6- to 10-membered bicyclic heterocyclyl, 6- to 10-membered bridged heterocyclyl, and 6- to 12-membered spiroheterocyclyl,
wherein:

(i) when Q_1 is (1-6C)alkyl, (2-6C)alkenyl or (2-6C)alkynyl, it is optionally further substituted by one or more substituent groups independently

selected from oxo, halo, cyano, or by one or more group(s) of the formula:

$$-Y_2-Q_2$$

wherein:

Y_2 is absent or selected from or -O-, -S-, -SO-, $-SO_2-$, $-N(R_{y2})-$, -C(O)-, -C(O)O-, -OC(O)-, $-C(O)N(R_{y2})-$, $-N(R_{y2})C(O)-$, $-S(O)_2N(R_{y2})-$, or $-N(R_{y2})SO_2-$, wherein R_{y2} is selected from hydrogen or (1-2C)alkyl;

Q_2 is selected from:

hydrogen;

a (1-4C)alkyl which is optionally substituted by one or more substituents selected from halo, hydroxy, cyano, amino or (1-4C)alkoxy; or

a 4 to 7-membered heterocyclic ring which is optionally substituted by one or more substituents selected from halo, hydroxy, cyano, amino, (1-4C)alkyl or (1-4C)alkoxy;

(ii) when Q_1 is (3-8C)cycloalkyl, 4-to 7- membered heterocyclyl, 6- to 10-membered bicyclic heterocyclyl, 6- to 10-membered bridged heterocyclyl, and 6- to 12-membered spiroheterocyclyl, it is optionally further substituted by one or more substituent groups independently selected from oxo, halo, cyano, or by one or more group(s) of the formula:

$$-Y_3-Q_3$$

wherein:

Y_3 is absent or selected from or -O-, -S-, -SO-, $-SO_2-$, $-N(R_{y2})-$, -C(O)-, -C(O)O-, -OC(O)-, $-C(O)N(R_{y3})-$, $-N(R_{y3})C(O)-$, $-S(O)_2N(R_{y3})-$, or $-N(R_{y3})SO_2-$, wherein R_{y3} is selected from hydrogen or (1-2C)alkyl;

Q_3 is selected from:

hydrogen;

a (1-4C)alkyl which is optionally substituted by one or more substituents selected from halo, hydroxy, cyano, amino or (1-4C)alkoxy; or

a 4 to 7-membered heterocyclic ring which is optionally substituted by one or more substituents selected from halo, hydroxy, cyano, amino, (1-4C)alkyl or (1-4C)alkoxy;

(iii) when Q_1 is phenyl or 5- to 6- membered heteroaryl, it is optionally further substituted by one or more substituent groups independently selected from halo, cyano, or by one or more group(s) of the formula -Y_3-Q_3 defined above;

R_{x7} is selected from hydrogen, fluoro, chloro, hydroxy, NH_2, methyl, or CF_3;

or R_{x4} and R_{x5}, R_{x5} and R_{x6} or R_{x6} and R_{x7} are linked such that, together with the carbon atoms to which they are attached, they form a fused (5-6C)cycloalkyl, phenyl, 5- or 6-membered heteroaryl or 5- or 6-membered heterocyclic ring, each of which is optionally substituted by fluoro, chloro, methyl or hydroxy;

with the proviso that:

(i) when X_5 is CR_{x5} and R_{x5} is a group of the formula -L_1-Y_1-L_2-Q_1 then X_6 is selected from N, C-H, C-F, C-CN, C-Cl or C-Me; and

(ii) when X_6 is CR_{x6} and R_{x6} is a group of the formula -L_1-Y_1-L_2-Q_1 then X_5 is selected from N, C-H, C-F, C-Cn, C-Cl or C-Me.

2. A compound according to claim 1, or a pharmaceutically acceptable salt thereof, wherein:

(i) when X_5 is CR_{x5} and R_{x5} is cyano or a group of the formula -L_1-Y_1-L_2-Q_1 then:

X_4 is selected from N, C-H, C-F, C-Cl or C-Me;

X_6 is selected from N, C-H, C-F, C-CN, C-Cl or C-Me;

X_7 is selected from N, C-H, C-F, C-Cl or C-Me; and

(ii) when X_6 is CR_{x6} and R_{x6} is cyano or a group of the formula -L_1-Y_1-L_2-Q_1 then:

X_4 is selected from N, C-H, C-F, C-Cl or C-Me;

X_5 is selected from N, C-H, C-F, C-Cl or C-Me;

X_7 is selected from N, C-H, C-F, C-Cl or C-Me.

3. A compound according to claim 1 or claim 2, or a pharmaceutically acceptable salt thereof, wherein ring A is selected from phenyl or 5-, 6-, 9- or 10-membered heteroaryl.

4. A compound according to any one of the preceding claims, or a pharmaceutically acceptable salt thereof, wherein ring A is selected from:

(i) phenyl, pyridinyl, pyridazinyl, pyrimidinyl, imidazolyl, pyrazolyl, triazolyl, imidazo[l,2-a]pyridinyl, [l,2,3]triazolo[l,5- a]pyridinyl, imidazo[l,5-a]pyridinyl, pyrrolo[2,3-b]pyridinyl, pyrrolo[3,2-b]pyridinyl, pyrazolo[l,5-a]pyridinyl, [l,2,4]triazolo[l,5-a]pyridinyl, 1,6-naphthyridinyl, or 1,7- naphthyridinyl;

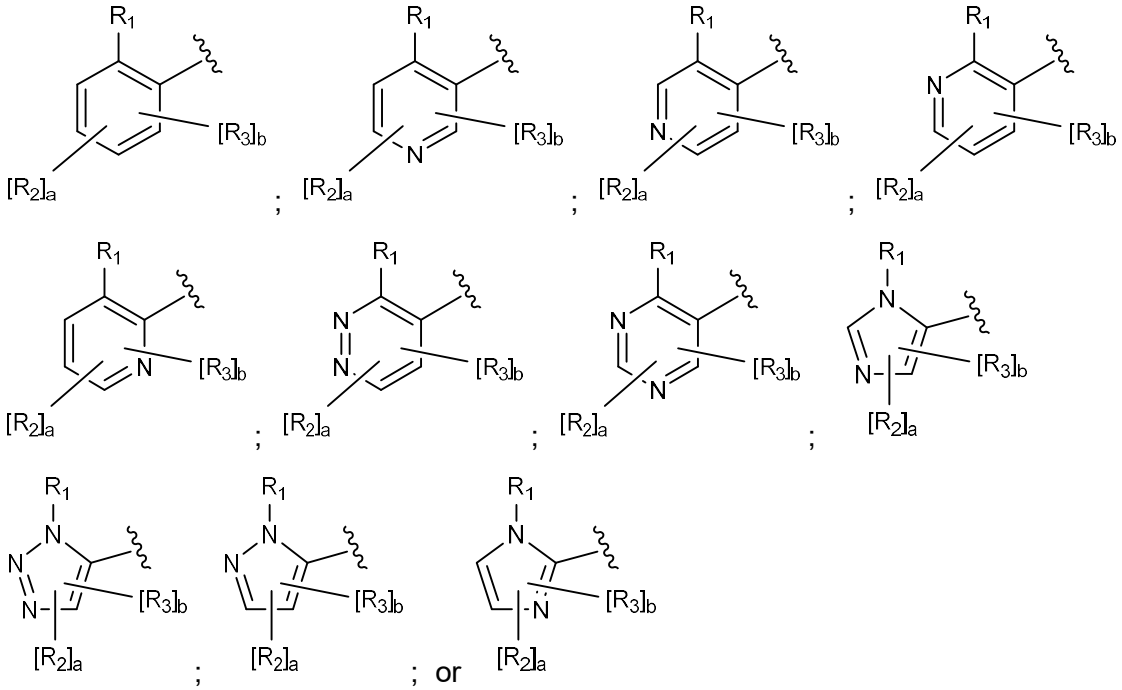
(ii) phenyl, pyridinyl, pyrimidinyl, and imidazo[l,2-a]pyridinyl, 1,2,3-triazole, pyrazolyl, isoxazolyl, imidazo [1,5 -a]pyridinyl;

(iii) phenyl, pyridinyl, pyrimidinyl, and imidazo[l,2-a]pyridinyl;

(iv) phenyl or pyridyl;

(v) pyridyl.

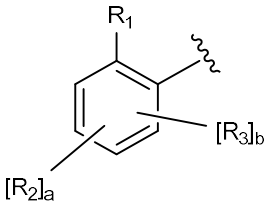
5. A compound according to any one of the preceding claims, or a pharmaceutically acceptable salt thereof, wherein ring A is selected from:

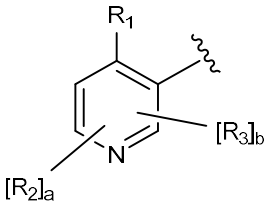


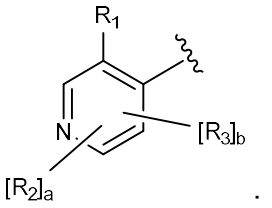
; or

wherein ~~~ denotes the point of attachment to the amide group of formula I; and R_1, R_2, R_3, a and b are as defined in claim 1.

6. A compound according to any one of the preceding claims, or a pharmaceutically acceptable salt thereof, wherein ring A is selected from:



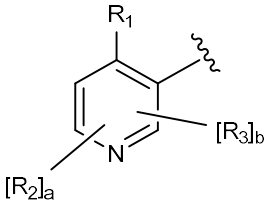
; 

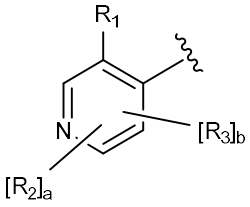
; or 

;

wherein ~~~ denotes the point of attachment to the amide group of formula I; and R_1, R_2, R_3, a and b are each as defined herein.

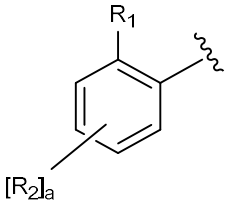
7. A compound according to any one of the preceding claims, or a pharmaceutically acceptable salt thereof, wherein ring A is selected from:

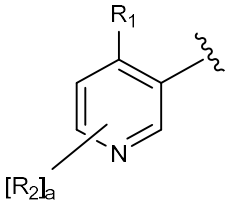


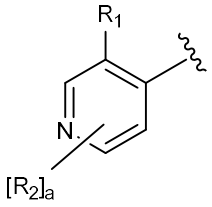
; or 

; wherein ~~~ denotes the point of attachment to the amide group of formula I; and R_1, R_2, R_3, a and b are as defined in claim 1.

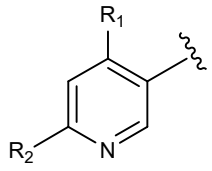
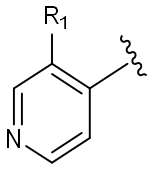
8. A compound according to any one of the preceding claims, or a pharmaceutically acceptable salt thereof, wherein ring A is selected from:

(i) 

; 

; or 

; or

(ii)  ; or  ;

wherein ~~~ denotes the point of attachment to the amide group of formula I; and R_1, R_2, R_3, a and b are as defined in claim 1.

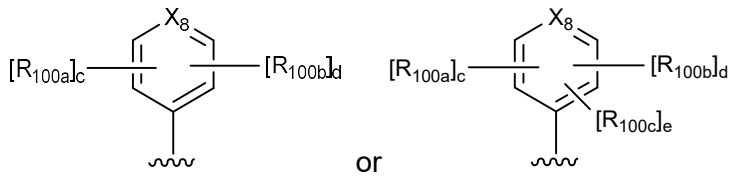
9. A compound according to any one of the preceding claims, or a pharmaceutically acceptable salt thereof, wherein R_1 is selected from one of the following options:

(i) phenyl or a 5- to 6- membered heteroaryl, each of which is optionally substituted with one or more R_{100} substituents as defined in claim 1; or two R_{100} substituents on adjacent ring atoms in R_1 may be linked to form a fused (3-6C)cycloalkyl ring; or

(ii) phenyl or a 6- membered heteroaryl, each of which is optionally substituted with one or more R_{100} substituents as defined in claim 1; or two R_{100} substituents on adjacent ring atoms in R_1 may be linked to form a fused (3-6C)cycloalkyl ring.

10. A compound according to any one of the preceding claims, or a pharmaceutically acceptable salt thereof, wherein R_1 is selected from one of the following options:

(i) a group of the formula



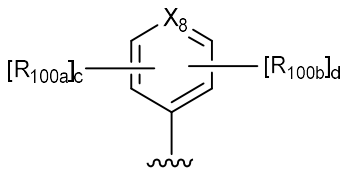
wherein:

~~~ denotes the point of attachment to ring A of formula I;

X_8 is CH or N;

R_{100a}, R_{100b} and R_{100c} are substituent groups R_{100} as defined in claim 1; and integers c, d and e are 0, 1 or 2;

(ii) a group of the formula:
~~~



wherein:

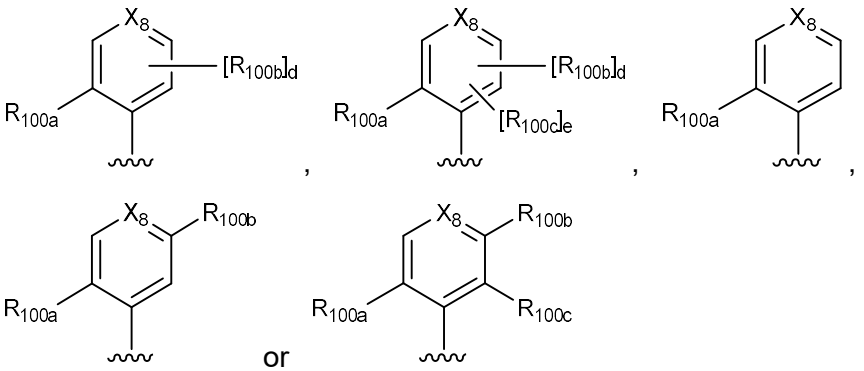
denotes the point of attachment to ring A of formula I;

X_8 is CH or N;

R_{100a} and R_{100b} are both substituent groups R_{100} as defined in claim 1; and

integers c and d are 0, 1 or 2;

(iii) a group of the formula:



wherein:

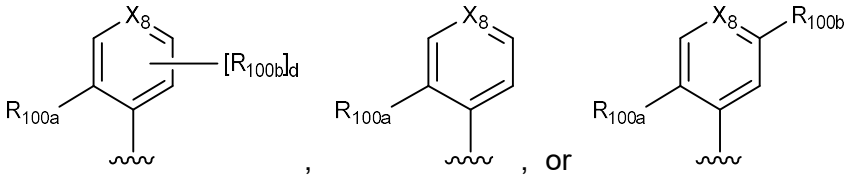
denotes the point of attachment to ring A of formula I;

X_8 is CH or N;

R_{100a}, R_{100b} and R_{100c} are substituent groups R_{100} as defined in claim 1; and

integers d and e are 0 or 1;

(iv) a group of the formula:



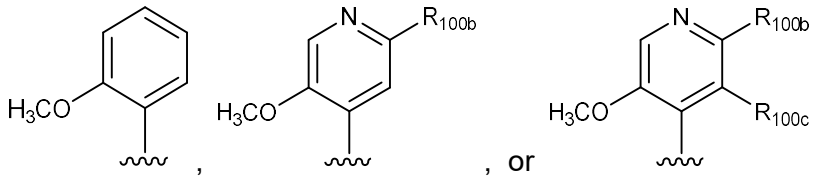
wherein:

denotes the point of attachment to ring A of formula I;

X_8 is CH or N;

R_{100a} and R_{100b} are both substituent groups R_{100} as defined in claim 1; and integer d is 0 or 1;

(v) a group of the formula:



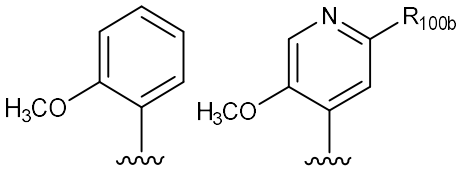
wherein:

denotes the point of attachment to ring A of formula I;

R_{100b} is methyl, fluoro or chloro;

R_{100c} is fluoro or chloro, especially fluoro;

(vi) a group of the formula:

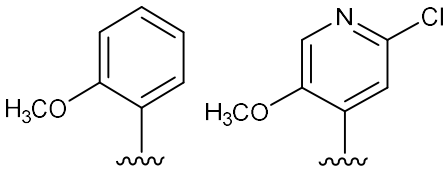


wherein:

denotes the point of attachment to ring A of formula I;

R_{100b} is fluoro or chloro; or

(vii) a group of the formula:



wherein:

denotes the point of attachment to ring A of formula I.

11. A compound according to any one of the preceding claims, or a pharmaceutically acceptable salt thereof, wherein R_{100} is selected from one of the following options:

(i) halo, (1-3C)alkyl, (1-3C)haloalkyl, (1-3C)haloalkoxy, (3-6C)cycloalkyl, (3-6C)cycloalkyloxy, -Q_{100}-OH, -Q_{100}-O-(1-3C)alkyl, -C(O)-(1-3C)alkyl and -Q_{100}-cyano; wherein Q_{100} is a bond or (1-3C)alkylene;

(ii) halo, (1-2C)alkyl, (1-2C)haloalkyl, (1-2C)haloalkoxy, (3-6C)cycloalkyl, (3-6C)cycloalkyloxy, -Q_{100}-OH, -Q_{100}-O-(1-2C)alkyl, -C(O)-(1-2C)alkyl and -Q_{100}-cyano; wherein Q_{100} is a bond or (1-2C)alkylene;

(iii) halo, (1-2C)alkyl, (1-2C)fluoroalkyl, (1-2C)fluorooalkoxy, (3-6C)cycloalkyl, (3-6C)cycloalkyloxy, -Q_{100}-OH, -Q_{100}-O-(1-2C)alkyl, -C(O)-(1-2C)alkyl and -Q_{100}-cyano; wherein Q_{100} is a bond or (1-2C)alkylene;

(iv) halo, (1-2C)alkyl, (1-2C)fluoroalkyl, -Q-OH, -Q_{100}-O-(1-2C)alkyl, -C(O)-(1-2C)alkyl and -Q_{100}-cyano; wherein Q_{100} is a bond or (1-2C)alkylene;

(v) halo, (1-2C)alkyl, (1-2C)fluoroalkyl, -Q-OH and -Q-O-(1-2C)alkyl; wherein Q is a bond or (1-2C)alkylene;

(vi) fluoro, chloro, (1-2C)alkyl, (1-2C)fluoroalkyl, -Q_{100}-OH and -Q_{100}-O-(1-2C)alkyl; wherein Q_{100} is a bond or (1-2C)alkylene; or

(vii) fluoro, chloro, methyl, (1-2C)fluoromethyl and -Q_{100}-O-(1-2C)alkyl; wherein Q_{100} is a bond or methylene.

12. A compound according to any one of the preceding claims, or a pharmaceutically acceptable salt thereof, wherein:

(i) integer a is 0 or 1 and integer b is 0;

(ii) integer a is 0 and integer b is 0;

(iii) integer a is 1 and integer b is 0.

13. A compound according to any one of the preceding claims, or a pharmaceutically acceptable salt thereof, wherein R_2 and R_3, when present, are each independently selected from:

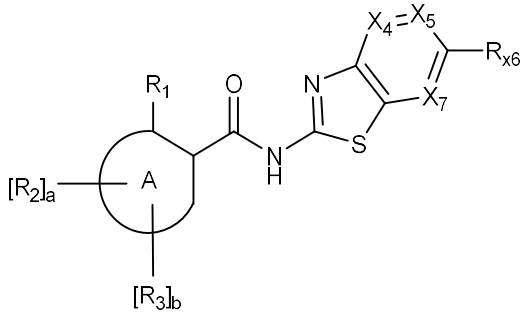
(i) the group consisting of fluoro, chloro, (1-2C)alkyl, (1-2C)alkoxy, (1-2C)haloalkyl, (1-2C)hydroxyalkyl, (1-2C)haloalkoxy, -Q_1-O-(1-2C)alkyl and -C(O)OH, wherein Q_1 is a bond or (1-2C)alkylene;

(ii) the group consisting of fluoro, chloro, (1-2C)alkyl, (1-2C)alkoxy or (1-2C)haloalkyl;

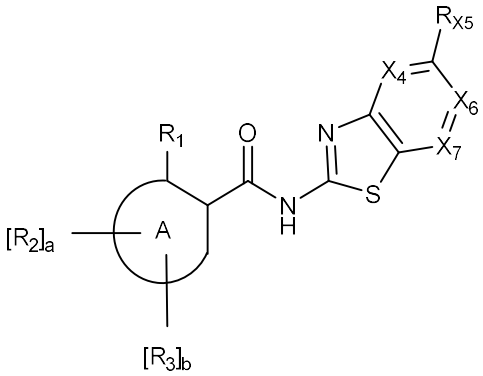
(iii) the group consisting of fluoro, (1-2C)alkyl or (1-2C)alkoxy; or

(iv) methyl.

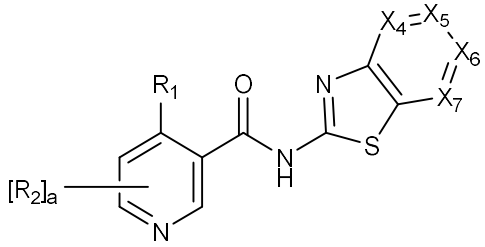
14. A compound, or a pharmaceutically acceptable salt thereof, having one of the following formulae Ia to Iac shown below:



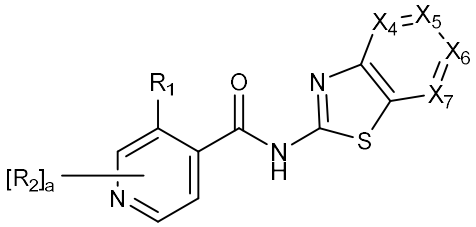
Ia



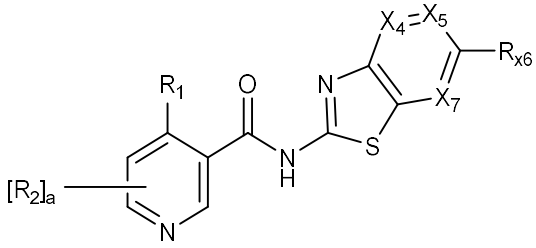
Ib



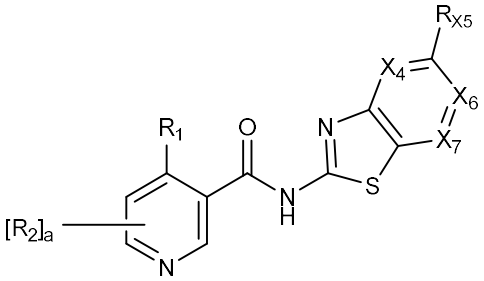
Ic



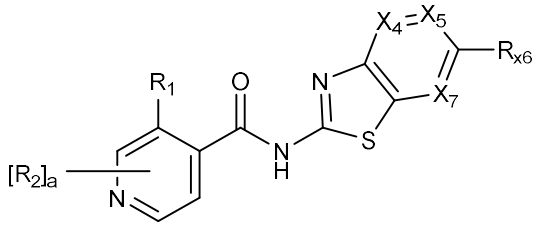
Id



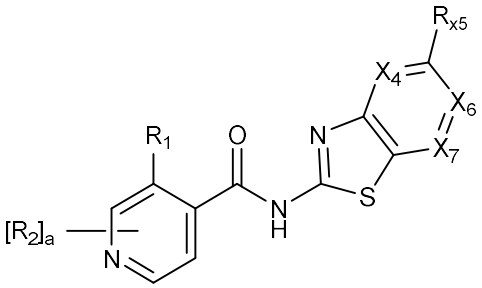
Ie



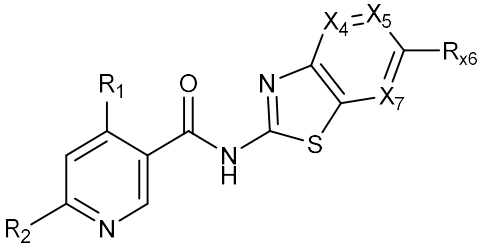
If



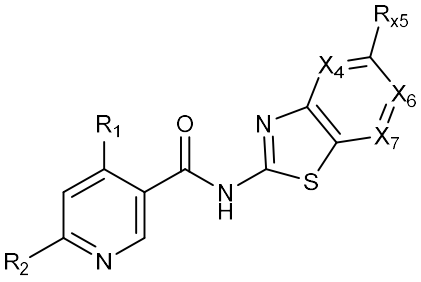
Ig



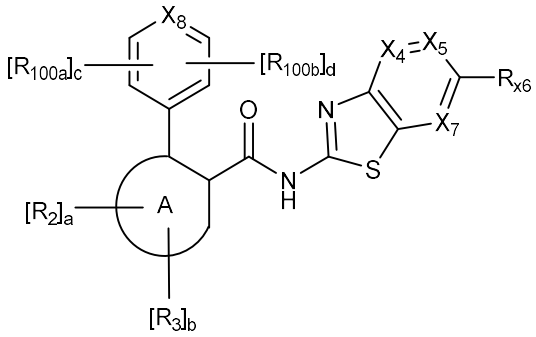
Ih



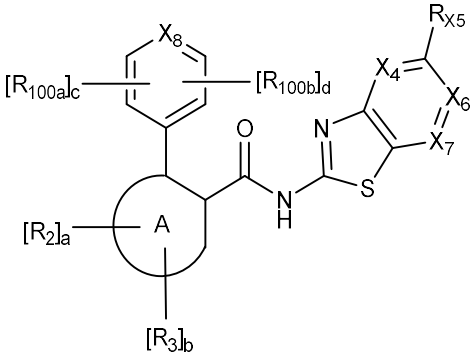
Ii



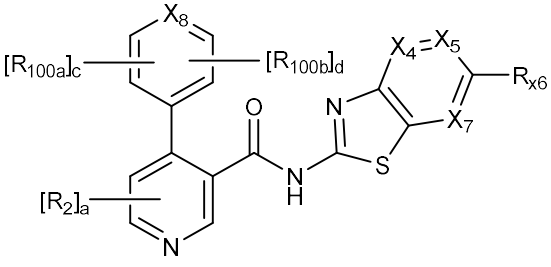
Ij



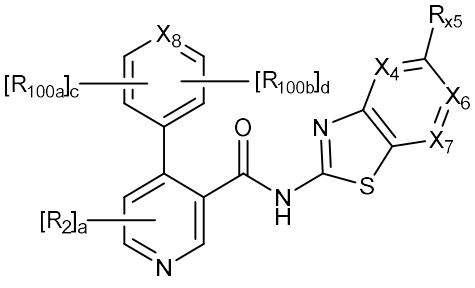
Ik



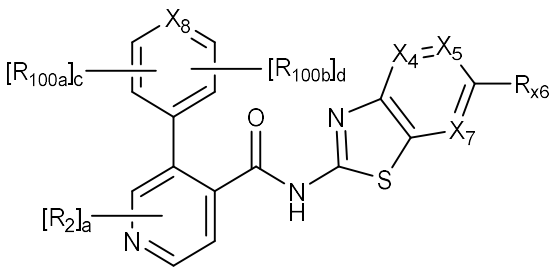
Im



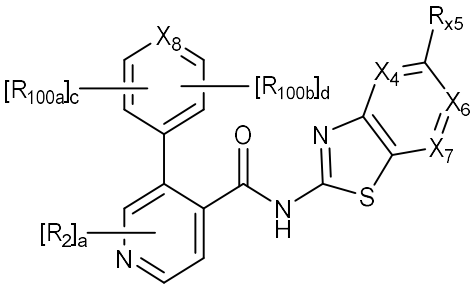
In



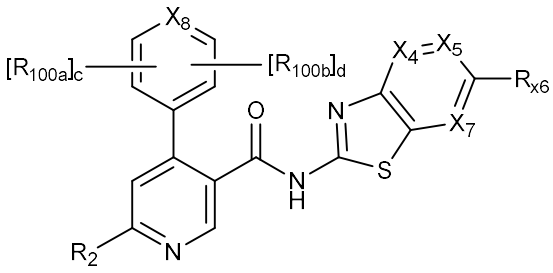
Io



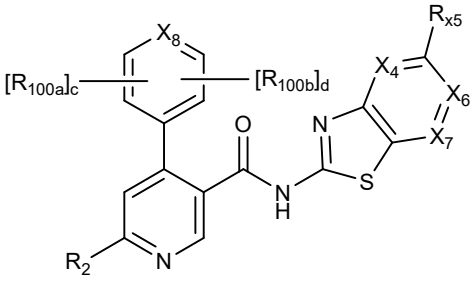
Ip



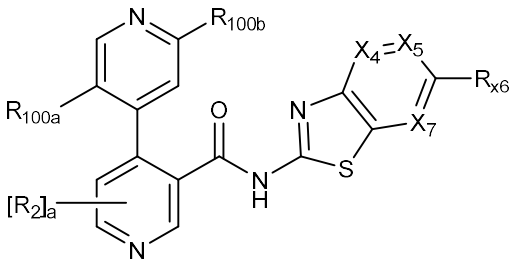
Iq



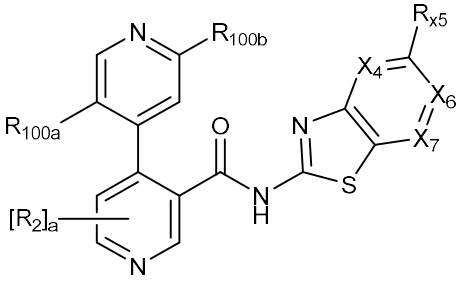
Ir



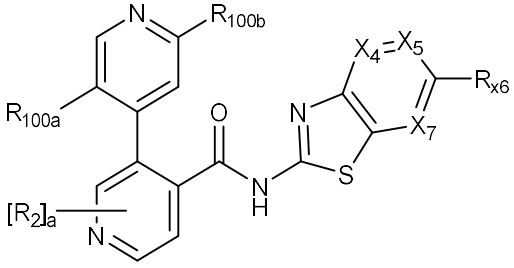
Is



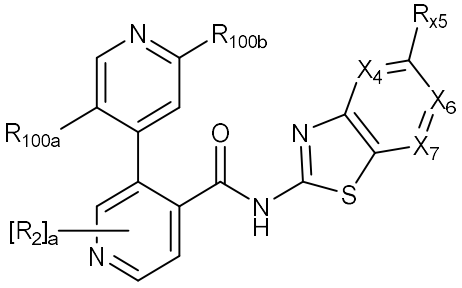
It



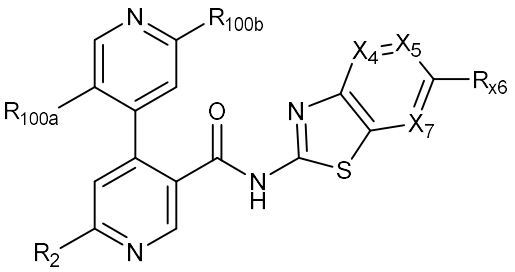
Iu



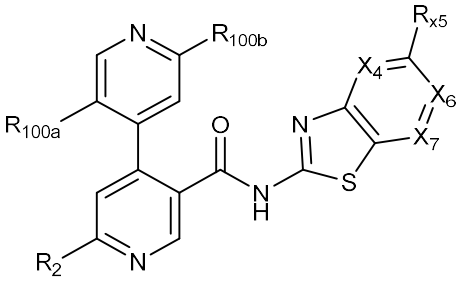
Iv



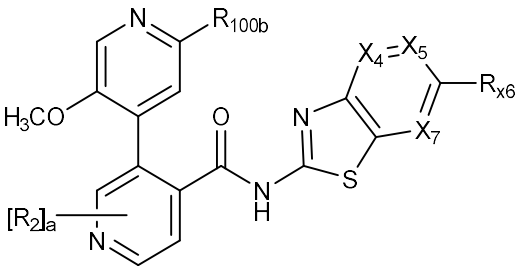
Iw



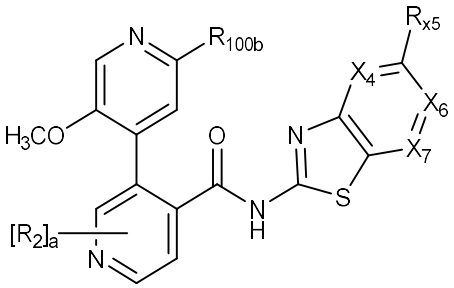
Ix



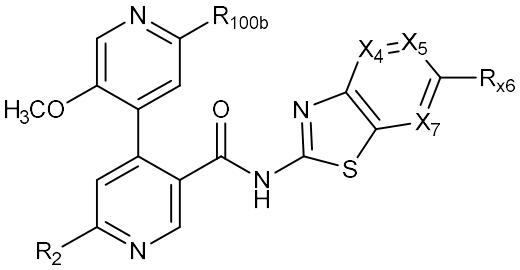
Iy



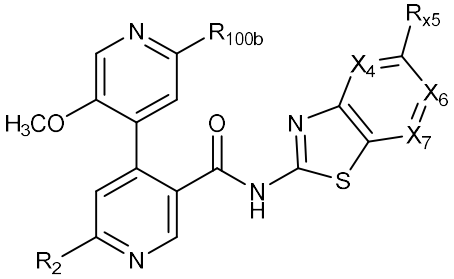
Iz



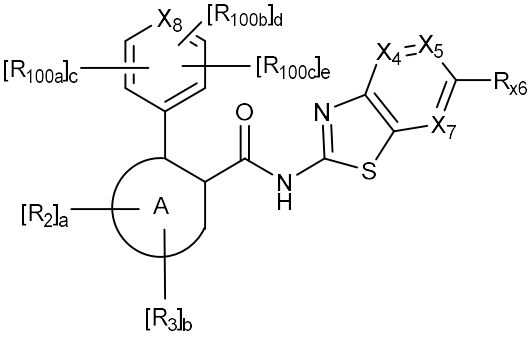
Iaa



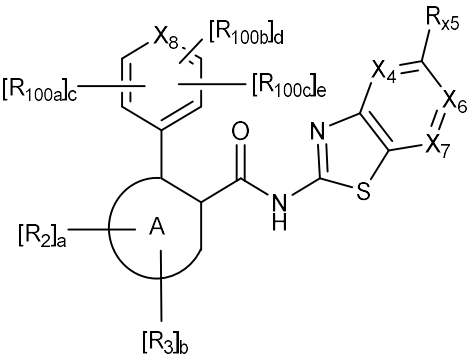
Iab



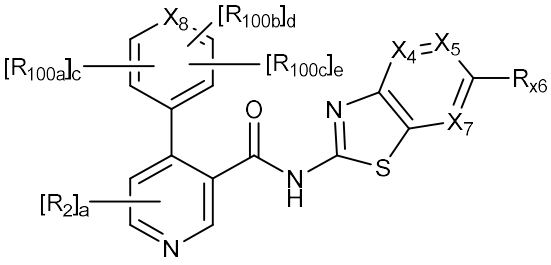
Iac



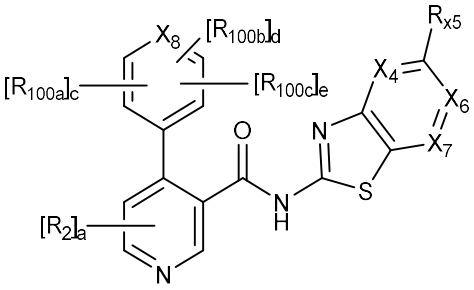
Iad



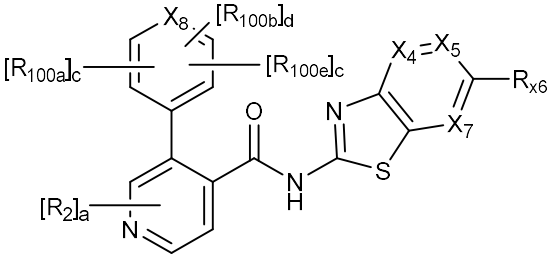
Iae



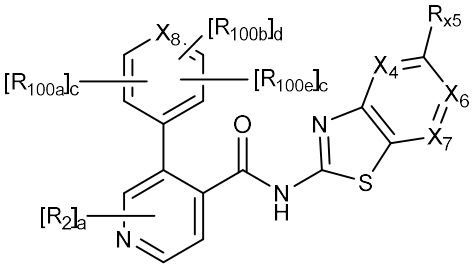
Iaf



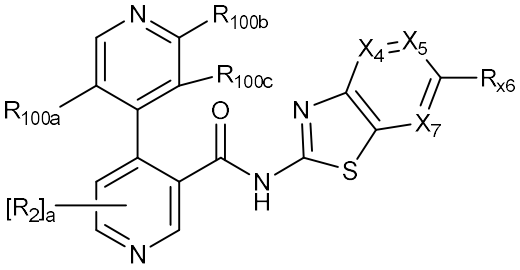
Iag



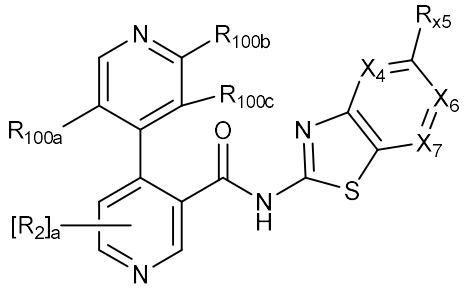
Iah



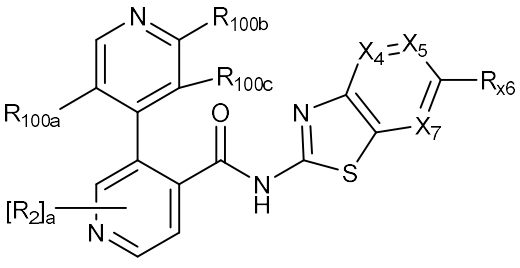
Iai



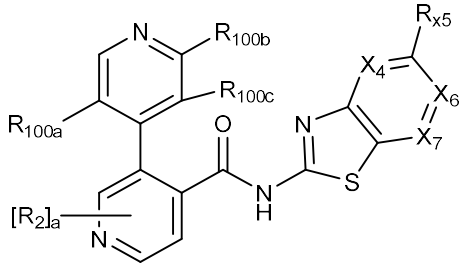
Iaj



Iak



Ial



Iam

wherein:

ring A, R_1, integer a, integer b, R_2, R_3, X_4, X_5, X_6, X_7, R_{x5} and R_{x6} are as defined in any one of claims 1 to 13 or 15 to 21;

X_8 is CH or N;

R_{100a}, R_{100b} and R_{100c} are both R_{100} as defined in claim 1; and

Integers c, d and e are 0 or 1.

15. A compound according to any one of the preceding claims, or a pharmaceutically acceptable salt thereof, wherein X_4, X_5, X_6 and X_7 are selected for one of the following options:

(i) X_4 is selected from CR_{x4} or N;
X_5 is selected from CR_{x5} or N;
X_6 is selected from CR_{x6};
X_7 is selected from CR_{x7} or N;

(ii) X_4 is selected from CR_{x4};
X_5 is selected from CR_{x5} or N;
X_6 is selected from CR_{x6};
X_7 is selected from CR_{x7} or N;

(iii) X_4 is selected from CR_{x4};
X_5 is selected from CR_{x5} or N;
X_6 is selected from CR_{x6};
X_7 is selected from CH or N;

(iv) X_4 is selected from CH;
X_5 is selected from CR_{x5} or N;
X_6 is selected from CR_{x6};
X_7 is selected from CH or N;

(v) X_4 is selected from CH;
X_5 is selected from CH or N;
X_6 is selected from CR_{x6};
X_7 is selected from CH or N;

(vi) X_4 is selected from CH;
X_5 is selected from CH;
X_6 is selected from CR_{x6};
X_7 is selected from CH or N;

(vii) X_4 is selected from CH;
X_5 is selected from CH or N;

X_6 is selected from CR_{x6};

X_7 is selected from CH;

(viii) X_4 is selected from CH;

X_5 is selected from CH;

X_6 is selected from CR_{x6};

X_7 is selected from CH;

(ix) X_4 is selected from CH;

X_5 is selected from N;

X_6 is selected from CR_{x6};

X_7 is selected from CH;

(x) X_4 is selected from CH;

X_5 is selected from CH;

X_6 is selected from CR_{x6};

X_7 is selected from N;

(xi) X_4 is selected from CH;

X_5 is selected from N;

X_6 is selected from CR_{x6};

X_7 is selected from N;

(xii) X_4 is selected from CH or N;

X_5 is selected from CR_{x5};

X_6 is selected from CH or N;

X_7 is selected from CH or N;

(xiii) X_4 is selected from CH;

X_5 is selected from CR_{x5};

X_6 is selected from CH;

X_7 is selected from CH;

(xiv) X_4 is selected from CH;

X_5 is selected from CR_{x5};

X_6 is selected from N;

X_7 is selected from CH;

(xv) X_4 is selected from CH;

X_5 is selected from CR_{x5};

X_6 is selected from CH;

X_7 is selected from N;

(xvi) X_4 is selected from N;

X_5 is selected from CR_{x5};

X_6 is selected from CH;

X_7 is selected from CH;

(xvii) X_4 is selected from N;

X_5 is selected from CR_{x5};

X_6 is selected from N;

X_7 is selected from CH.

16. A compound according to claim 14, or a pharmaceutically acceptable salt thereof, wherein X_4, X_5, X_6 and X_7 are selected for one of the following options:

(i) X_4 is selected from CH;

X_5 is selected from CH or N;

X_6 is selected from CR_{x6};

X_7 is selected from CH or N;

(ii) X_4 is selected from CH;

X_5 is selected from CH;

X_6 is selected from CR_{x6};

X_7 is selected from CH or N;

(iii) X_4 is selected from CH;

X_5 is selected from CH or N;

X_6 is selected from CR_{x6};

X_7 is selected from CH;

(iv) X_4 is selected from CH;

X_5 is selected from CH;

X_6 is selected from CR_{x6};

X_7 is selected from CH;

(v) X_4 is selected from CH;

X_5 is selected from N;

X_6 is selected from CR_{x6};

X_7 is selected from CH;

(vi) X_4 is selected from CH;

X_5 is selected from CH;

X_6 is selected from CR_{x6};

X_7 is selected from N;

(vii) X_4 is selected from CH;

X_5 is selected from N;

X_6 is selected from CR_{x6};

X_7 is selected from N;

(viii) X_4 is selected from CH;

X_5 is selected from CR_{x5};

X_6 is selected from CH;

X_7 is selected from CH.

17. A compound according to claim 14, or a pharmaceutically acceptable salt thereof, wherein X_4, X_5, X_6 and X_7 are selected for one of the following options:

(i) X_4 is selected from CH;

X_5 is selected from CH;

X_6 is selected from CR_{x6};

X_7 is selected from CH;

(ii) X_4 is selected from CH;

X_5 is selected from N;

X_6 is selected from CR_{x6};

X_7 is selected from CH;

(iii) X_4 is selected from CH;

X_5 is selected from CH;

X_6 is selected from CR_{x6};

X_7 is selected from N;

(iv) X_4 is selected from CH;

X_5 is selected from N;

X_6 is selected from CR_{x6};

X_7 is selected from N;

(v) X_4 is selected from CH;

X_5 is selected from CR_{x5};

X_6 is selected from CH;

X_7 is selected from CH.

18. A compound according to any one of the preceding claims, or a pharmaceutically acceptable salt thereof, wherein R_{x4} is selected from one of the following options:

(i) hydrogen, fluoro, chloro, methyl or a group of the formula:

-Y-Q

wherein:

Y is -O-, -S-, -NH- or -CH_2-;

Q is selected from hydrogen (1-4C)alkyl, (3-6C)cycloalkyl, phenyl, 5- or 6-membered heteroaryl, 4-to 7-membered heterocyclyl, each of which is optionally substituted by one or more R_{100} substituents and a (3-8C)cycloalkyl and 4-to 7-membered heterocyclyl is optionally substituted by oxo;

(ii) hydrogen, fluoro, methyl or a group of the formula:

-Y-Q

wherein:

Y is -O-, -S-, -NH- or -CH_2-;

Q is selected from hydrogen, (1-4C)alkyl, (3-6C)cycloalkyl, phenyl, 5- or 6-membered heteroaryl, 4-to 7-membered heterocyclyl;

(iii) hydrogen, fluoro, chloro or methyl; or

(iv) hydrogen.

19. A compound according to any one of the preceding claims, or a pharmaceutically acceptable salt thereof, wherein R_{x5} or R_{x6} are selected from hydrogen, halo, cyano, nitro or a group of the formula:

$-L_1-Y_1-L_2-Q_1$

wherein:

L_1 is absent or (1-2C)alkylene;

Y_1 is absent or -O-, -S-, -SO-, -SO_2-, -S(O)(=NR_{y1})-, -N(R_{y1})-, -C(O)-, -C(O)O-, -OC(O)-, -C(O)N(R_{y1})-, -N(R_{y1})C(O)-, -$S(O)_2$N(R_{y1})-, -N(R_{y1})SO_2- or -N(R_{y1a})C(O)-N(R_{y1})-, wherein R_{y1} and R_{y1a} are selected from hydrogen or (1-2C)alkyl;

L_2 is absent or (1-2C)alkylene; and

Q_1 is hydrogen, (1-6C)alkyl, (3-8C)cycloalkyl, phenyl, 5- to 6- membered heteroaryl, 4-to 7- membered heterocyclyl, 6- to 10-membered bicyclic heterocyclyl, 6- to 10-membered bridged heterocyclyl, and 6- to 12-membered spiroheterocyclyl,

wherein:

(i) when Q_1 is (1-6C)alkyl, it is optionally further substituted by one or more substituent groups independently selected from oxo, halo, cyano, or by one or more group(s) of the formula:

$$-Y_2-Q_2$$

wherein:

Y_2 is absent or selected from or -O-, $-SO_2-$, $-N(R_{y2})-$, -C(O)-, $-C(O)N(R_{y2})-$, $-N(R_{y2})C(O)-$, $-S(O)_2N(R_{y2})-$, or $-N(R_{y2})SO_2-$, wherein R_{y2} is selected from hydrogen or methyl;

Q_2 is selected from:

hydrogen;

a (1-4C)alkyl which is optionally substituted by one or more substituents selected from halo, hydroxy, cyano, amino or (1-4C)alkoxy; or

a 4 to 7-membered heterocyclic ring which is optionally substituted by one or more substituents selected from halo, hydroxy, cyano, amino, (1-4C)alkyl or (1-4C)alkoxy;

(ii) when Q_1 is (3-8C)cycloalkyl, 4-to 7- membered heterocyclyl, 6- to 10-membered bicyclic heterocyclyl, 6- to 10-membered bridged heterocyclyl, and 6- to 12-membered spiroheterocyclyl, it is optionally further substituted by one or more substituent groups independently selected from oxo, halo, cyano, or by one or more group(s) of the formula:

$$-Y_3-Q_3$$

wherein:

Y_3 is absent or selected from or -O-, $-SO_2-$, $-N(R_{y3})-$, -C(O)-, $-C(O)N(R_{y3})-$, $-N(R_{y3})C(O)-$, $-S(O)_2N(R_{y3})-$, or $-N(R_{y3})SO_2-$, wherein R_{y3} is selected from hydrogen or methyl;

Q_3 is selected from:

hydrogen;

a (1-4C)alkyl which is optionally substituted by one or more substituents selected from halo, hydroxy, cyano, amino or (1-4C)alkoxy; or

a 4 to 7-membered heterocyclic ring which is optionally substituted by one or more substituents selected from halo, hydroxy, cyano, amino, (1-4C)alkyl or (1-4C)alkoxy;

(iii) when Q_1 is phenyl or 5- to 6- membered heteroaryl, it is optionally further substituted by one or more substituent groups independently selected from halo, cyano, or by one or more group(s) of the formula -Y_3-Q_3 defined above.

20. A compound according any one of the preceding claims, or a pharmaceutically acceptable salt thereof, wherein R_{x5} or R_{x6} are selected from hydrogen, halo, cyano, nitro or a group of the formula:

$$-L_1\text{-}Y_1\text{-}L_2\text{-}Q_1$$

wherein:

L_1 is absent or methylene;

Y_1 is absent or -O-, -SO_2-, -S(O)(=NR_{y1})-, -N(R_{y1})-, -C(O)N(R_{y1})-, -N(R_{y1})C(O)-, -$S(O)_2$N(R_{y1})-, or -N(R_{y1})SO_2-, wherein R_{y1} and R_{y1a} are selected from hydrogen or (1-2C)alkyl;

L_2 is absent or methylene; and

Q_1 is hydrogen, (1-4C)alkyl, (3-4C)cycloalkyl, phenyl, 5- to 6- membered heteroaryl, 4-to 7- membered heterocyclyl, 6- to 10-membered bicyclic heterocyclyl, 6- to 10-membered bridged heterocyclyl, and 6- to 12-membered spiroheterocyclyl,

wherein:

(i) when Q_1 is (1-4C)alkyl, it is optionally further substituted by one or more substituent groups independently selected from halo, cyano, or by one or more group(s) of the formula:

$$-Y_2\text{-}Q_2$$

wherein:

Y_2 is absent or selected from or -O-, -SO_2-, -N(R_{y2})-, -C(O)-, -C(O)N(R_{y2})-, or -N(R_{y2})C(O)-, -$S(O)_2$N(R_{y2})-, or -N(R_{y2})SO_2-, wherein R_{y2} is selected from hydrogen or methyl;

Q_2 is selected from:

hydrogen;

a (1-4C)alkyl optionally substituted by one or more halo;
or
a 4 to 7-membered heterocyclic ring;

(ii) when Q_1 is (3-6C)cycloalkyl, 4-to 7- membered heterocyclyl, 6- to 10-membered bicyclic heterocyclyl, 6- to 10-membered bridged heterocyclyl, and 6- to 12-membered spiroheterocyclyl, it is optionally further substituted by one or more substituent groups independently selected from oxo, halo, cyano, or by one or more group(s) of the formula:

$$-Y_3-Q_3$$

wherein:

Y_3 is absent or selected from or -O-, $-SO_2-$, $-N(R_{y3})-$, -C(O)-, $-C(O)N(R_{y3})-$, $-N(R_{y3})C(O)-$, $-S(O)_2N(R_{y3})-$, or $-N(R_{y3})SO_2-$, wherein R_{y3} is selected from hydrogen or methyl;

Q_3 is selected from:

hydrogen;
a (1-4C)alkyl optionally substituted by one or more halo;
or
a 4 to 7-membered heterocyclic ring;

(iii) when Q_1 is phenyl or 5- to 6- membered heteroaryl, it is optionally further substituted by one or more substituent groups independently selected from halo, cyano, or by one or more group(s) of the formula $-Y_3-Q_3$ defined above.

21. A compound according any one of the preceding claims, or a pharmaceutically acceptable salt thereof, wherein R_{x7} is selected from one of the following options:

(i) hydrogen, fluoro, chloro or methyl; or

(ii) hydrogen.

22. A compound according any one of claims 14 to 21, or a pharmaceutically acceptable salt thereof, wherein:

(i) X_8 is N;
R_{100a} and R_{100b} are both R_{100} as defined in claim 1 or claim 11; and
integers c and d are 0 or 1;

(ii) X_8 is CH;

R_{100a} and R_{100b} are both R_{100} as defined in claim 1 or claim 11; and
integers c and d are 0 or 1;

(iii) X_8 is N;
R_{100a} and R_{100b} are both R_{100} as defined in claim 11; and
integers c and d are 0 or 1;

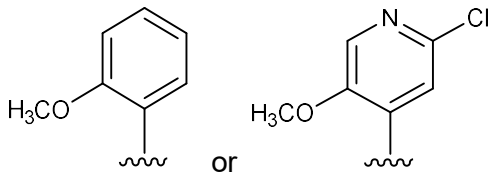
(iv) X_8 is CH;
R_{100a} and R_{100b} are both R_{100} as defined in claim 11; and
integers c and d are 0 or 1.

23. A compound according to any one of claims 1-22, or a pharmaceutically acceptable salt thereof, wherein X_4, X_5, X_6 and X_7 are selected from one of the following options:

(i) X_4 is selected from CH;
X_5 is selected from N;
X_6 is selected from CR_{x6}; and
X_7 is selected from N; or

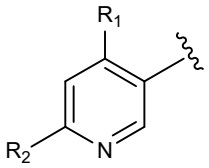
(ii) X_4 is selected from CH;
X_5 is selected from N;
X_6 is selected from CR_{x6}; and
X_7 is selected from CH.

24. A compound according to claim 23, or a pharmaceutically acceptable salt thereof, wherein R_1 is selected from a group of the formula:



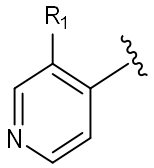
wherein ~~~ denotes the point of attachment to ring A of formula I.

25. A compound according to claim 23 or 24, or a pharmaceutically acceptable salt thereof, wherein ring A is selected from:



;

or



;

wherein ~~~ denotes the point of attachment to the amide group of formula I; and R_1 and R_2 are as defined in claim 1.

26. A compound selected from any one of the following, or a pharmaceutically acceptable salt thereof:

N-(6-chloro-1,3-benzothiazol-2-yl)-4-(2-chloro-5-methoxy-4-pyridyl)-6-methyl-pyridine-3-carboxamide;

2'-chloro-N-(6-methanesulfonyl-1,3-benzothiazol-2-yl)-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-(6-cyano-1,3-benzothiazol-2-yl)-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-(6-iodo-1,3-benzothiazol-2-yl)-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

N-(6-bromo-1,3-benzothiazol-2-yl)-2'-chloro-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-{5-chloro-[1,3]thiazolo[5,4-d]pyrimidin-2-yl}-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-{5-chloro-[1,3]thiazolo[5,4-b]pyridin-2-yl}-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

3-(2-methoxyphenyl)-N-{[1,3]thiazolo[5,4-d]pyrimidin-2-yl}pyridine-4-carboxamide;

N-(6-bromo-1,3-benzothiazol-2-yl)-3-(2-methoxyphenyl)pyridine-4-carboxamide;

3-(2-methoxyphenyl)-N-{[1,3]thiazolo[4,5-c]pyridin-2-yl}pyridine-4-carboxamide;

3-(2-methoxyphenyl)-N-{[1,3]thiazolo[4,5-b]pyridin-2-yl}pyridine-4-carboxamide;

3-(2-methoxyphenyl)-N-[5-(trifluoromethyl)-1,3-benzothiazol-2-yl]pyridine-4-carboxamide;

N-(5-chloro-1,3-benzothiazol-2-yl)-3-(2-methoxyphenyl)pyridine-4-carboxamide;

3-(2-methoxyphenyl)-N-{[1,3]thiazolo[5,4-b]pyridin-2-yl}pyridine-4-carboxamide;

N-(1,3-benzothiazol-2-yl)-3-(2-methoxyphenyl)pyridine-4-carboxamide;

N-(5-cyano-1,3-benzothiazol-2-yl)-3-(2-methoxyphenyl)pyridine-4-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[6-(morpholin-4-yl)-1,3-benzothiazol-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-(6-nitro-1,3-benzothiazol-2-yl)-[4,4'-bipyridine]-3-carboxamide;

4-(2-chloro-5-methoxy-4-pyridyl)-N-[5-[(3R)-3-hydroxypyrrolidin-1-yl]thiazolo[5,4-d]pyrimidin-2-yl]-6-methyl-pyridine-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[5-(piperidin-1-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-[5-(4,4-difluoropiperidin-1-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[5-(morpholin-4-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-{5-[(3S)-3-hydroxypyrrolidin-1-yl]-[1,3]thiazolo[5,4-d]pyrimidin-2-yl}-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[5-(pyrrolidin-1-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-[5-(3,3-difluoropyrrolidin-1-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-{5-[(3R)-3-hydroxypyrrolidin-1-yl]-[1,3]thiazolo[5,4-d]pyrimidin-2-yl}-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-[5-(1,1-dioxo-1λ⁶-thiomorpholin-4-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[5-(4-methylpiperazin-1-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-(5-{2-oxa-6-azaspiro[3.3]heptan-6-yl}-[1,3]thiazolo[5,4-d]pyrimidin-2-yl)-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-N-{5-[(2-methoxyethyl)amino]-[1,3]thiazolo[5,4-d]pyrimidin-2-yl}-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-[5-(3-hydroxyazetidin-1-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-N-[5-(3-methoxypyrrolidin-1-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-[5-(4-hydroxypiperidin-1-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-{5-[(1S,4S)-2-oxa-5-azabicyclo[2.2.1]heptan-5-yl]-[1,3]thiazolo[5,4-d]pyrimidin-2-yl}-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-[5-(3-cyanopiperidin-1-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

N-(6-amino-1,3-benzothiazol-2-yl)-4-(2-chloro-5-methoxy-4-pyridyl)-6-methyl-pyridine-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[6-(2-oxopiperidin-1-yl)-1,3-benzothiazol-2-yl]-[4,4'-bipyridine]-3-carboxamide;

4-(2-chloro-5-methoxy-4-pyridyl)-N-[5-(3,6-dihydro-2H-pyran-5-yl)thiazolo[5,4-b]pyridin-2-yl]-6-methyl-pyridine-3-carboxamide;
4-(2-chloro-5-methoxy-4-pyridyl)-N-[6-(5-chloro-2-pyridyl)-1,3-benzothiazol-2-yl]-6-methyl-pyridine-3-carboxamide;
N-[6-(5-chloropyridin-2-yl)-1,3-benzothiazol-2-yl]-3-(2-methoxyphenyl)pyridine-4-carboxamide;

2'-chloro-N-[6-(3-hydroxyoxolan-3-yl)-1,3-benzothiazol-2-yl]-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-(6-methanesulfonamido-1,3-benzothiazol-2-yl)-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-{[1,3]thiazolo[5,4-d]pyrimidin-2-yl}-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[6-(methylsulfanyl)-1,3-benzothiazol-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-{[1,3]thiazolo[5,4-c]pyridin-2-yl}-[4,4'-bipyridine]-3-carboxamide;

N-[5-(4-acetylpiperazin-1-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-2'-chloro-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-{5-[(2-hydroxyethyl)amino]-[1,3]thiazolo[5,4-d]pyrimidin-2-yl}-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-N-[5-(3-methoxyazetidin-1-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-{5-[(4-hydroxycyclohexyl)amino]-[1,3]thiazolo[5,4-d]pyrimidin-2-yl}-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

rac-2'-chloro-N-(5-{[(1R,3S)-3-hydroxycyclopentyl]amino}-[1,3]thiazolo[5,4-d]pyrimidin-2-yl)-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-{5-[(3R)-3-methylmorpholin-4-yl]-[1,3]thiazolo[5,4-d]pyrimidin-2-yl}-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-{5-[(3S)-3-methylmorpholin-4-yl]-[1,3]thiazolo[5,4-d]pyrimidin-2-yl}-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-{5-[(propan-2-yl)amino]-[1,3]thiazolo[5,4-d]pyrimidin-2-yl}-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-(5-{2-oxa-7-azaspiro[3.5]nonan-7-yl}-[1,3]thiazolo[5,4-d]pyrimidin-2-yl)-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-(5-{3,8-diazabicyclo[3.2.1]octan-3-yl}-[1,3]thiazolo[5,4-d]pyrimidin-2-yl)-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[5-(piperazin-1-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[6-(2-oxopyrrolidin-1-yl)-1,3-benzothiazol-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[6-(3-oxomorpholin-4-yl)-1,3-benzothiazol-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[6-(3-methyl-2-oxoimidazolidin-1-yl)-1,3-benzothiazol-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[6-(2-oxo-1,3-oxazolidin-3-yl)-1,3-benzothiazol-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[6-(2-oxoimidazolidin-1-yl)-1,3-benzothiazol-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[6-(2-oxopiperidin-1-yl)-[1,3]thiazolo[4,5-c]pyridin-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-{[1,3]thiazolo[4,5-c]pyridin-2-yl}-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-{6-chloro-[1,3]thiazolo[5,4-c]pyridin-2-yl}-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-{6-chloro-[1,3]thiazolo[4,5-c]pyridin-2-yl}-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[6-(morpholin-4-yl)-[1,3]thiazolo[4,5-c]pyridin-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-[6-(dimethylsulfamoyl)-1,3-benzothiazol-2-yl]-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[6-(morpholin-4-yl)-[1,3]thiazolo[4,5-b]pyridin-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-[6-(4-hydroxypiperidin-1-yl)-[1,3]thiazolo[4,5-c]pyridin-2-yl]-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

N-(1,3-benzothiazol-2-yl)-2'-chloro-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[6-(2-oxopiperidin-1-yl)-[1,3]thiazolo[4,5-b]pyridin-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-[6-(4-hydroxypiperidin-1-yl)-[1,3]thiazolo[4,5-b]pyridin-2-yl]-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[5-(morpholin-4-yl)-[1,3]thiazolo[5,4-b]pyridin-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[5-(2-oxopiperidin-1-yl)-[1,3]thiazolo[5,4-b]pyridin-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-[5-(4-hydroxypiperidin-1-yl)-[1,3]thiazolo[5,4-b]pyridin-2-yl]-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-N-{5-methoxy-[1,3]thiazolo[5,4-d]pyrimidin-2-yl}-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-(5-{2-oxa-6-azaspiro[3.4]octan-6-yl}-[1,3]thiazolo[5,4-d]pyrimidin-2-yl)-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-{5-[(2-hydroxy-2-methylpropyl)amino]-[1,3]thiazolo[5,4-d]pyrimidin-2-yl}-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-{5-[(2-methylpropyl)amino]-[1,3]thiazolo[5,4-d]pyrimidin-2-yl}-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-[5-(cyclobutylamino)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-N-[5-(4-methoxypiperidin-1-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-(5-{6-hydroxy-2-azaspiro[3.3]heptan-2-yl}-[1,3]thiazolo[5,4-d]pyrimidin-2-yl)-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-(5-{6-oxa-2-azaspiro[3.4]octan-2-yl}-[1,3]thiazolo[5,4-d]pyrimidin-2-yl)-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-{6-[imino(methyl)oxo-λ⁶-sulfanyl]-1,3-benzothiazol-2-yl}-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-[6-(1,1-dioxo-1λ⁶,2-thiazolidin-2-yl)-1,3-benzothiazol-2-yl]-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-{6-[(4R)-4-hydroxy-2-oxopiperidin-1-yl]-1,3-benzothiazol-2-yl}-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[6-(4-methyl-2-oxopiperazin-1-yl)-1,3-benzothiazol-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-[5-(3,6-dihydro-2H-pyran-4-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

N-[5-(4-hydroxypiperidin-1-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-5'-methoxy-6-methyl-2'-(trifluoromethyl)-[4,4'-bipyridine]-3-carboxamide;

N-[5-(4-hydroxypiperidin-1-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-5'-methoxy-6-methyl-2'-(trifluoromethyl)-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[5-(trifluoromethyl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-{5-methyl-[1,3]thiazolo[5,4-d]pyrimidin-2-yl}-[4,4'-bipyridine]-3-carboxamide;

5'-methoxy-2',6-dimethyl-N-[5-(morpholin-4-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-fluoro-5'-methoxy-6-methyl-N-[5-(morpholin-4-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[5-(2-oxopiperidin-1-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-(5-{[(2R)-2-hydroxypropyl]amino}-[1,3]thiazolo[5,4-d]pyrimidin-2-yl)-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;
2'-chloro-N-(5-{[(2S)-2-hydroxypropyl]amino}-[1,3]thiazolo[5,4-d]pyrimidin-2-yl)-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;
2'-chloro-5'-methoxy-N-[5-(3-methoxy-3-methylazetidin-1-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-6-methyl-[4,4'-bipyridine]-3-carboxamide;
N-(4-bromo-1,3-benzothiazol-2-yl)-2'-chloro-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;
2'-chloro-N-{4-[2-(dimethylcarbamoyl)ethyl]-1,3-benzothiazol-2-yl}-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;
2'-chloro-N-[5-(cyanomethoxy)-1,3-benzothiazol-2-yl]-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-{5-[difluoro(methylcarbamoyl)methoxy]-1,3-benzothiazol-2-yl}-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

N-(5-bromo-1,3-benzothiazol-2-yl)-2'-chloro-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-{5-[(dimethylcarbamoyl)difluoromethoxy]-1,3-benzothiazol-2-yl}-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[5-(methylcarbamoyl)-1,3-benzothiazol-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-N-(5-methoxy-1,3-benzothiazol-2-yl)-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-N-{5-[(2-methoxyethyl)carbamoyl]-1,3-benzothiazol-2-yl}-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-{7-[(dimethylcarbamoyl)methoxy]-[1,3]thiazolo[5,4-d]pyrimidin-2-yl}-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

N-{5-[(1-acetylpiperidin-4-yl)methoxy]-1,3-benzothiazol-2-yl}-2'-chloro-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-{5-[(dimethylcarbamoyl)methoxy]-1,3-benzothiazol-2-yl}-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-{5-[2-(morpholin-4-yl)ethoxy]-1,3-benzothiazol-2-yl}-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-[5-(propan-2-yloxy)-1,3-benzothiazol-2-yl]-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-{5-[(1,1-dioxo-1-λ6-thietan-3-yl)methoxy]-1,3-benzothiazol-2-yl}-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-(5-ethoxy-1,3-benzothiazol-2-yl)-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-6-methyl-N-{5-[2-(trifluoromethoxy)ethoxy]-1,3-benzothiazol-2-yl}-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-5'-methoxy-N-[6-(3-methoxyazetidin-1-yl)-[1,3]thiazolo[4,5-c]pyridin-2-yl]-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-{6-[(2-hydroxy-2-methylpropyl)amino]-[1,3]thiazolo[4,5-c]pyridin-2-yl}-5'-methoxy-6-methyl-[4,4'-bipyridine]-3 carboxamide;

2'-chloro-5'-methoxy-N-[6-(3-methoxy-3-methylazetidin-1-yl)-[1,3]thiazolo[4,5-c]pyridin-2-yl]-6-methyl-[4,4'-bipyridine]-3-carboxamide;

6-[(dimethylcarbamoyl)methyl]-5'-methoxy-N-{[1,3]thiazolo[5,4d]pyrimidin-2-yl}-2'-(trifluoromethyl)-[4,4'-bipyridine]-3-carboxamide;
N-[5-(4-hydroxypiperidin-1-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-5'-methoxy-2',6-dimethyl-[4,4'-bipyridine]-3-carboxamide;
2'-chloro-5'-methoxy-6-methyl-N-[5-(2-oxopiperidin-1-yl)-[1,3]thiazolo[5,4-b]pyridin-2-yl]-[4,4'-bipyridine]-3-carboxamide;

5-[(2-{2'-chloro-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-amido}-[1,3]thiazolo[4,5-c]pyridin-6-yl)amino]pentanoic acid;

5-[(2-{2'-chloro-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-amido}-[1,3]thiazolo[5,4-b]pyridin-5-yl)amino]pentanoic acid;

2'-chloro-5'-methoxy-6-methyl-N-{5-[(2H-1,2,3,4-tetrazol-5-yl)methoxy]-1,3-benzothiazol-2-yl}-[4,4'-bipyridine]-3-carboxamide;

2'-chloro-N-(5-hydroxy-1,3-benzothiazol-2-yl)-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

2-[(2-{2'-chloro-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-amido}-1,3-benzothiazol-5-yl)oxy]ethyl acetate;

2'-chloro-N-[5-(2-hydroxyethoxy)-1,3-benzothiazol-2-yl]-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

5-(4-hydroxypiperidin-1-yl)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl 2'-chloro-5'-methoxy-1-methyl-6-oxo-1,6-dihydro-[3,4'-bipyridine]-4-carboxylate;

2'-chloro-N-[7-(cyanomethoxy)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;

N-[7-(carbamoylmethoxy)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-2'-chloro-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;
2'-chloro-5'-methoxy-6-methyl-N-[6-(morpholin-3-yl)-1,3-benzothiazol-2-yl]-[4,4'-bipyridine]-3-carboxamide;
2'-chloro-N-[5-(4-hydroxypiperidin-1-yl)-7-methyl-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide;
2'-chloro-N-[5-(2-hydroxy-2-methylpropoxy)-[1,3]thiazolo[5,4-d]pyrimidin-2-yl]-5'-methoxy-6-methyl-[4,4'-bipyridine]-3-carboxamide,

or a pharmaceutically acceptable salt thereof.

27. A pharmaceutical composition comprising a compound according to any one of claims 1 to 26, or a pharmaceutically acceptable salt thereof, and at least one pharmaceutically acceptable excipient.

28. A compound according to any one of claims 1 to 26, or a pharmaceutically acceptable salt thereof, or a pharmaceutical composition according to claim 27, for use in:

(i) therapy;
(ii) the treatment of a disease characterized by overexpression of Polθ;
(iii) the treatment of cancer;
(iv) the treatment of a homologous recombinant (HR) deficient cancer;
(v) the treatment of cancer characterized by a reduction or absence of BRCA gene expression, the absence of the BRCA gene, or a reduced function of BRCA protein; and/or
(vi) the treatment of lymphoma, rhabdoid tumor, multiple myeloma, uterine cancer, gastric cancer, peripheral nervous system cancer, rhabdomyosarcoma, bone cancer, colorectal cancer, mesothelioma, breast cancer, ovarian cancer, lung cancer, fibroblast cancer, central nervous system cancer, urinary tract cancer, upper aerodigestive cancer, leukemia, kidney cancer, skin cancer, esophageal cancer, and pancreatic cancer.

29. Use of a compound according to any one of claims 1 to 26, or a pharmaceutically acceptable salt thereof, or a pharmaceutical composition according to claim 27 in the manufacture of a medicament for:

(i) treating a disease characterized by overexpression of Polθ;

(ii) treating cancer;

(iii) treating a homologous recombinant (HR) deficient cancer;

(iv) treating cancer characterized by a reduction or absence of BRCA gene expression, the absence of the BRCA gene, or a reduced function of BRCA protein; and/or

(v) treating lymphoma, rhabdoid tumor, multiple myeloma, uterine cancer, gastric cancer, peripheral nervous system cancer, rhabdomyosarcoma, bone cancer, colorectal cancer, mesothelioma, breast cancer, ovarian cancer, lung cancer, fibroblast cancer, central nervous system cancer, urinary tract cancer, upper aerodigestive cancer, leukemia, kidney cancer, skin cancer, esophageal cancer, and pancreatic cancer;

wherein a therapeutically effective amount of the compound, or the pharmaceutically acceptable salt thereof, or the pharmaceutical composition is to be administered to patient in need of such treatment.