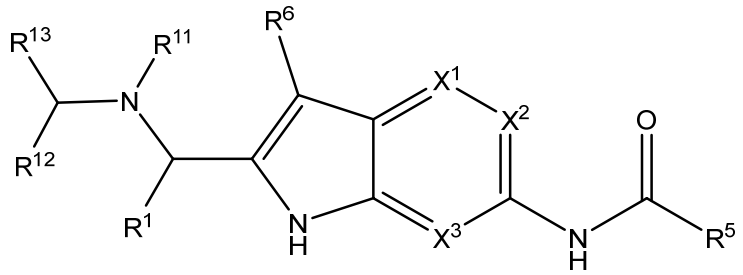
CLAIMS

1. A compound of formula Ia



Ia

wherein:

$X^1$, $X^2$, and $X^3$ are independently chosen from N and $CR^4$, with the provisos that

(1) no more than two of $X^1$, $X^2$, and $X^3$ are N; and

(2) when $X^1$ and/or $X^2$ are $CR^4$, then $X^3$ is not N;

$R^1$ is chosen from: H, $(C_{1-6})$alkyl, aryl$(C_{1-6})$alkyl, $(C_{3-12})$cycloalkyl$(C_{1-6})$alkyl, heterocyclyl, heterocyclyl$(C_{1-6})$alkyl, $(C_{1-6})$alkylamino$(C_{1-6})$alkyl, heterocyclylamino$(C_{1-6})$alkyl, heterocyclyl$(C_{1-6})$alkylamino$(C_{1-6})$alkyl, $(C_{3-12})$cycloalkylamino$(C_{1-6})$alkyl, $(C_{3-12})$cycloalkyl$(C_{1-6})$alkylamino$(C_{1-6})$alkyl, arylamino$(C_{1-6})$alkyl, and aryl$(C_{1-6})$alkylamino$(C_{1-6})$alkyl;

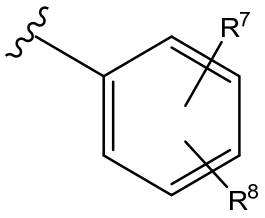
$R^4$ is chosen from H, $CH_3$, and Cl;

$R^5$ is chosen from 5- or 6- member carbocycle or heterocycle; bicyclic 5:6 carbocycle or heterocycle and bicyclic 6:6 carbocycle or heterocycle, not attached at a nitrogen of said heterocycle, wherein said carbocycle or heterocycle may be optionally substituted with one or more groups chosen from $(C_{1-8})$hydrocarbyl, $(C_{1-10})$oxaalkyl, halogen, $(C_{1-6})$haloalkyl, $-SO_2(C_{1-6})$alkyl, $-SO_2NH(C_{0-3}H_{1-7})$, $-CONH(C_{0-3}H_{1-7})$, $-SO_2NH(C_{1-6})$oxaalkyl, -CN, $CH_2CN$, $CH_2NH_2$, $-NH_2$, $NR^{14}$ where $R^{14}$ is independently chosen from hydrogen, $(C_{1-6})$fluoroalkyl, and $(C_{1-3})$oxaalkyl, $-CH_2OH$, benzyloxy, $-C(=NH)-NH_2$, -A-Het and additionally, when $R^5$ is a 5- or 6-member heterocycle, bicyclic 5:6 heterocycle, quinoline, isoquinolin, quinazolin, or benzo[*b*][1,4]oxazine, =O; wherein A is chosen from direct bond, $-(C_{1-6})$alkyl-, $-(C_{1-10})$oxaalkyl-, $-CO(C_{1-6})$alkyl-, $-SO_2(C_{1-6})$alkyl-, $-SO_2NH(C_{1-6})$alkyl-, and $-CONH(C_{1-6})$alkyl-; and Het is

heterocyclyl optionally substituted with ($C_{1-6}$)hydrocarbyl, ($C_{1-10}$)oxaalkyl, ($C_{1-10}$)oxaalkyl(C=O)-, hydroxy, =O, or halogen and

with the provisos that

(1) when all of $X^1$, $X^2$, and $X^3$ are carbon and $R^5$ is optionally substituted phenyl, then

$R^5$ is  ; and

(2) $R^5$ is not a 1,3-disubstituted pyrazole or 5-oxaalkylindazole

$R^6$ is selected from: H, Me, F, and Cl;

$R^7$ is hydrogen or halogen; and

$R^8$ is chosen from ($C_{1-10}$)oxaalkyl, heterocyclyl, and heterocyclyl($C_{1-10}$)oxaalkyl

$R^{11}$, $R^{12}$ and $R^{13}$ are chosen from the following three groups:

(a) $R^{11}$ is H or $CH_3$;

$R^{12}$ is chosen from H, ($C_1$-$C_6$)hydrocarbyl, hydroxy($C_1$-$C_6$)hydrocarbyl, and 5- or 6-membered monocyclic heterocyclyl, wherein said heterocycle may be optionally substituted with ($C_1$-$C_6$)hydrocarbyl, hydroxyl, or hydroxy($C_1$-$C_6$)hydrocarbyl; and

$R^{13}$ is hydrogen or methyl; or

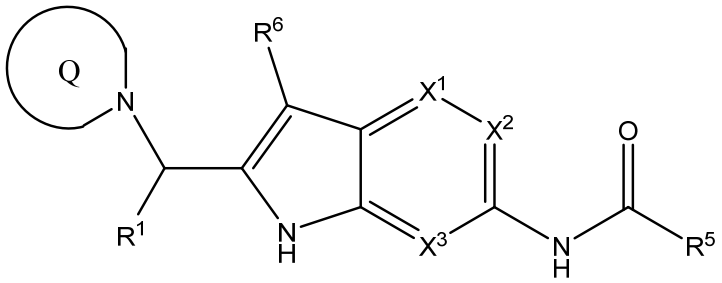
(b) $R^{11}$ and $R^{12}$ taken together form an optionally substituted nitrogenous heterocycle attached via nitrogen, said nitrogenous heterocycle chosen from (a) a monocyclic aliphatic nitrogenous heterocycle, (b) a 5:5 or 5:6 bicyclic aliphatic nitrogenous heterocycle, (c) a spirobicyclic aliphatic nitrogenous heterocycle, and (d) an 8-azabicyclo[3.2.1]octane, wherein said optional substituents are independently chosen from ($C_{1-10}$)hydrocarbyl, halo($C_{1-10}$)hydrocarbyl, halo($C_{1-10}$)hydrocarbyloxy, -($C_{1-10}$)oxaalkyl, COOH, -$SO_2$($C_{1-6}$)alkyl, =O, =S, =NH, and additionally, when $R^{11}$ and $R^{12}$ taken together for a spirobicyclic aliphatic nitrogenous heterocycle, halogen; and

$R^{13}$ is chosen from H, ($C_{1-10}$)hydrocarbyl, halo($C_{1-10}$)hydrocarbyl, halo($C_{1-10}$)hydrocarbyloxy, -($C_{1-10}$)oxaalkyl, -$SO_2$($C_{1-6}$)alkyl, =O, =S, and =NH; or

(c) $R^{11}$ is H; and

$R^{12}$ and $R^{13}$ taken together form a 3- to 7- membered aliphatic carbocycle, wherein said carbocycle may be optionally substituted with ($C_1$-$C_6$)hydrocarbyl, hydroxyl, or hydroxy($C_1$-$C_6$)hydrocarbyl.

2. A compound according to claim 1 of formula Ib




Ib

wherein $R^{11}$ and $R^{12}$ taken together form an optionally substituted nitrogenous heterocycle, Q, chosen from (a) a monocyclic aliphatic nitrogenous heterocycle, (b) a 5:5 or 5:6 bicyclic aliphatic nitrogenous heterocycle, (c) a spirobicyclic aliphatic nitrogenous heterocycle, and (d) an 8-azabicyclo[3.2.1]octane, wherein said optional substituents are independently chosen from ($C_{1-10}$)hydrocarbyl, halo($C_{1-10}$)hydrocarbyl, halo($C_{1-10}$)hydrocarbyloxy, -($C_{1-10}$)oxaalkyl, COOH, -$SO_2$($C_{1-6}$)alkyl, =O, =S, =NH, and additionally, when $R^{11}$ and $R^{12}$ taken together for a spirobicyclic aliphatic nitrogenous heterocycle, halogen;

$R^1$ is chosen from: H, ($C_{1-6}$)alkyl, aryl($C_{1-6}$)alkyl, ($C_{3-12}$)cycloalkyl($C_{1-6}$)alkyl, heterocyclyl, heterocyclyl($C_{1-6}$)alkyl, ($C_{1-6}$)alkylamino($C_{1-6}$)alkyl, heterocyclylamino($C_{1-6}$)alkyl, heterocyclyl($C_{1-6}$)alkylamino($C_{1-6}$)alkyl, ($C_{3-12}$)cycloalkylamino($C_{1-6}$)alkyl, ($C_{3-12}$)cycloalkyl($C_{1-6}$)alkylamino($C_{1-6}$)alkyl, arylamino($C_{1-6}$)alkyl, and aryl($C_{1-6}$)alkylamino($C_{1-6}$)alkyl.

3. A compound according to claim 1 wherein

$R^{11}$ is H or $CH_3$;

$R^{12}$ is chosen from H, ($C_1$-$C_6$)hydrocarbyl, hydroxy($C_1$-$C_6$)hydrocarbyl, and 5- or 6-membered monocyclic heterocyclyl, wherein said heterocycle may be optionally substituted with ($C_1$-$C_6$)hydrocarbyl, hydroxyl, or hydroxy($C_1$-$C_6$)hydrocarbyl; and

$R^{13}$ is hydrogen or methyl.

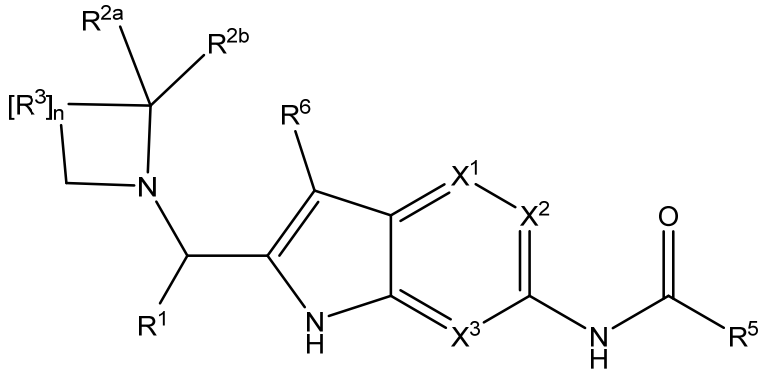
4. A compound of claim 1 wherein $R^5$ is chosen from bicyclic 5:6 carbocycle or heterocycle and bicyclic 6:6 carbocycle or heterocycle, not attached at a nitrogen of said heterocycle, wherein said carbocycle or heterocycle may be optionally substituted with a group chosen from $(C_{1-6})$alkyl, $(C_{1-6})$alkoxy, halogen, $(C_{1-6})$haloalkyl, $CH_2CN$, $CH_2NH_2$, $-NH_2$, $NR^{14}$ where $R^{14}$ is independently chosen from hydrogen, $(C_{1-6})$fluoroalkyl, and $(C_{1-3})$oxaalkyl, $-CH_2OH$, and -A-Het, and additionally, when $R^5$ is a 5- or 6- member heterocycle, bicyclic 5:6 heterocycle, quinoline, isoquinolin, quinazolin, or benzo[*b*][1,4]oxazine, =O; wherein A is chosen from direct bond, $-(C_{1-6})$alkyl-, $-(C_{1-10})$oxaalkyl-, $-CO(C_{1-6})$alkyl-, $-SO_2(C_{1-6})$alkyl-, $-SO_2NH(C_{1-6})$alkyl-, and $-CONH(C_{1-6})$alkyl-; and Het is heterocyclyl optionally substituted with $(C_{1-6})$hydrocarbyl, $(C_{1-10})$oxaalkyl, $(C_{1-10})$oxaalkyl(C=O)-, hydroxy, =O, or halogen.

5. A compound of claim 1 wherein $R^5$ is chosen from bicyclic 5:6 carbocycle or heterocycle and bicyclic 6:6 carbocycle or heterocycle wherein said carbocycle or heterocycle may be optionally substituted with a group chosen from $(C_{1-6})$alkyl, $(C_{1-6})$alkoxy, halogen, and $(C_{1-6})$haloalkyl.

6. A compound according to claim 2 wherein Q is a monocyclic aliphatic nitrogenous heterocycle optionally substituted with one or more groups chosen from $(C_{1-10})$hydrocarbyl, halo$(C_{1-10})$hydrocarbyl, halo$(C_{1-10})$hydrocarbyloxy, $-(C_{1-10})$oxaalkyl, COOH, $-SO_2(C_{1-6})$alkyl, =O, =S, and =NH.

7. A compound according to claim 6 wherein Q is a monocyclic aliphatic nitrogenous heterocycle optionally substituted with one or more groups chosen from methyl and =O.

8. A compound according to claim 1 of formula I



I

wherein:

$X^1$, $X^2$, and $X^3$ are independently chosen from N and $CR^4$, with the proviso that no more than two of $X^1$, $X^2$, and $X^3$ are N;

n is 1, 2 or 3;

$R^1$ is chosen from: H, $(C_{1-6})$alkyl, aryl$(C_{1-6})$alkyl, $(C_{3-12})$cycloalkyl$(C_{1-6})$alkyl, heterocyclyl, heterocyclyl$(C_{1-6})$alkyl, $(C_{1-6})$alkylamino$(C_{1-6})$alkyl, heterocyclylamino$(C_{1-6})$alkyl, heterocyclyl$(C_{1-6})$alkylamino$(C_{1-6})$alkyl, $(C_{3-12})$cycloalkylamino$(C_{1-6})$alkyl, $(C_{3-12})$cycloalkyl$(C_{1-6})$alkylamino$(C_{1-6})$alkyl, arylamino$(C_{1-6})$alkyl, and aryl$(C_{1-6})$alkylamino$(C_{1-6})$alkyl;

$R^{2a}$ and $R^{2b}$ are independently chosen from H and $(C_{1-6})$alkyl, or taken together, $R^{2a}$ and $R^{2b}$ form a spiro 4, 5, or 6 member carbocycle or heterocycle;

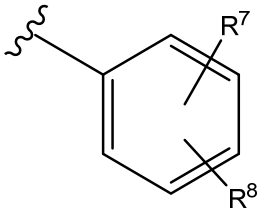
$R^3$ is chosen independently in each occurrence from CHCOOH, $NR^{10}$, O, and $CR^{10a}R^{10b}$;

$R^{10}$, $R^{10a}$ and $R^{10b}$ are independently chosen from H and $(C_{1-6})$alkyl, or taken together, $R^{10a}$ and $R^{10b}$ form a spiro 4, 5, or 6 member carbocycle or heterocycle; or

taken together, $R^{2a}$ and $R^{10a}$ form a fused 4, 5, or 6-member carbocycle or heterocycle;

$R^4$ is chosen from H, $CH_3$, F and Cl;

$R^5$ is chosen from 5- or 6- member carbocycle or heterocycle; bicyclic 5-6 carbocycle or heterocycle and bicyclic 6-6 carbocycle or heterocycle, wherein said carbocycle or heterocycle may be optionally substituted with one or more groups chosen from $(C_{1-6})$hydrocarbyl, $(C_{1-6})$alkoxy, halogen, $(C_{1-6})$haloalkyl, $-SO_2(C_{1-6})$alkyl, $-SO_2NH(C_{0-3}H_{1-7})$, $-CONH(C_{0-3}H_{1-7})$, -CN, $-NH_2$, $-CH_2OH$, benzyloxy, and heterocyclyl optionally substituted with $(C_{1-6})$hydrocarbyl, $(C_{1-6})$alkoxy, hydroxy, =O, or halogen

with the proviso that when all of $X^1$, $X^2$, and $X^3$ are carbon and $R^5$ is optionally substituted phenyl, then $R^5$ is  ;

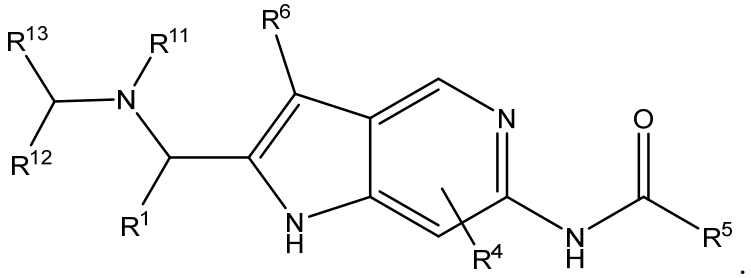
$R^6$ is selected from: H, Me, F, and Cl;

$R^7$ is hydrogen or halogen; and

$R^8$ is heterocyclyl.

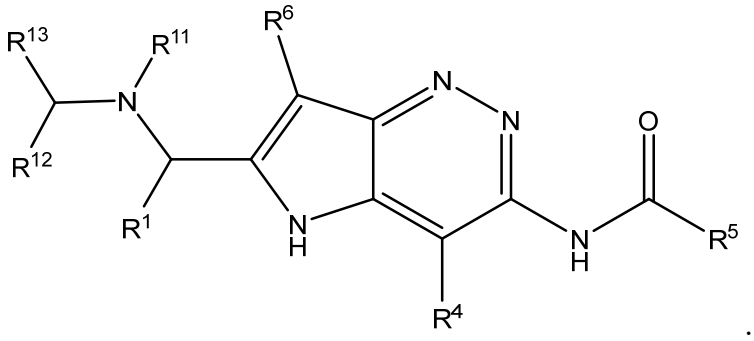
9. A compound according to any one of claims 1 to 8 wherein one of $X^1$, $X^2$ or $X^3$ is N and the other two instances of X are C.

10. A pyrrolo[3,2-c]pyridine according to claim 5 of formula



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11. A pyrrolo[3,2-c]pyridazine according to claim 1 of formula



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