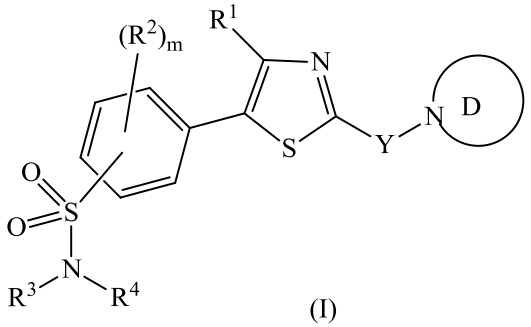
CLAIMS

1. A compound of formula I, ~~its tautomeric forms, its stereoisomers and its pharmaceutically acceptable salts,~~ a tautomeric form, a stereoisomer, or a pharmaceutically acceptable salt thereof,



(I)

wherein, in the compound of formula I,

ring D is substituted- or unsubstituted-5 to 12 membered heterocycle optionally containing 1 to 3 additional heteroatom(s)/group(s) selected from $–S(O)_n$-, $-NR^5$-, and -O-;

ring D may be substituted on ring carbons with 1 to 6 substituent(s) independently selected from halogen, nitro, cyano, oxo, substituted- or unsubstituted-alkyl, perhaloalkyl, substituted- or unsubstituted-cycloalkyl, substituted- or unsubstituted-aryl, substituted- or unsubstituted-heteroaryl, substituted- or unsubstituted-heterocyclyl, $R^{6b}O$-, $R^6N(H)C(=O)$-, $R^{6a}C(=O)N(H)$-, $R^6N(R^7)$-, and $R^6N(H)C(=O)N(H)$-;

Y is a bond, $–CH_2$-, or -C(=O)-;

R^1 is selected from substituted- or unsubstituted-aryl, substituted- or unsubstituted-heteroaryl, substituted- or unsubstituted-cycloalkyl, and substituted- or unsubstituted-heterocyclyl;

R^2 is independently selected at each occurrence from halogen, nitro, cyano, substituted- or unsubstituted-alkyl, perhaloalkyl, substituted- or

unsubstituted-cycloalkyl, substituted- or unsubstituted-heterocyclyl, $R^{6b}O$-, and $R^{6a}C(=O)$-, or

two R^2 groups and the carbon atoms to which they are attached together form a 5- to 6-membered cyclic system which optionally contains 1 to 3 heteroatom(s) selected from –N-, -S-, and -O-, ~~the~~ said 5- to 6-membered ~~ring~~ cyclic system may be substituted with 1 to 3 substituent(s) independently selected from oxo, halogen, cyano, and alkyl;

R^3 and R^4 are independently selected from hydrogen, $R^{6a}C(=O)$-, substituted- or unsubstituted-alkyl, substituted- or unsubstituted-cycloalkyl, and substituted- or unsubstituted-heterocyclyl; or

R^3 and R^4 together with the nitrogen atom to which they are attached form a 3- to 10-membered heterocyclic ring system containing one to three heteroatom(s) selected from –S-, -N-, and -O-, ~~the~~ said 3- to 10-membered heterocyclic ring system may be substituted with 1 to 3 substituent(s) independently selected from oxo, halogen, alkyl, OR^{6b}, and $R^6N(H)$-;

R^5 is selected from hydrogen, substituted- or unsubstituted-alkyl, substituted- or unsubstituted-cycloalkyl, substituted- or unsubstituted-aryl, substituted- or unsubstituted-heterocyclyl, $R^{6a}C(=O)$-, and $R^6N(R^7)C(=O)$-;

R^6 and R^7 are each independently selected from hydrogen, substituted- or unsubstituted-alkyl, substituted- or unsubstituted-cycloalkyl, and substituted- or unsubstituted-heterocyclyl;

R^{6a} is selected from substituted- or unsubstituted-alkyl, perhaloalkyl, substituted- or unsubstituted-cycloalkyl, and substituted- or unsubstituted-heterocyclyl;

when the heteroaryl group is substituted, it is substituted with 1 to 3 substituents selected independently from halogen, nitro, cyano, hydroxy, substituted- or unsubstituted-alkyl, perhaloalkyl, substituted- or unsubstituted-cycloalkyl, substituted- or unsubstituted-heterocycle, (alkyl)O-, (perhaloalkyl)O-, (alkyl)N(alkyl)-, (alkyl)N(H)-, H_2N-, (alkyl)$S(O_2)$-, (perhaloalkyl)$S(O_2)$-, (alkyl)C(=O)N(alkyl)-, (alkyl)C(=O)N(H)-, (alkyl)N(alkyl)C(=O)-, (alkyl)N(H)C(=O)-, $H_2NC(=O)$-, (alkyl)N(alkyl)$S(O_2)$-, (alkyl)N(H)$S(O_2)$-, and $H_2NS(O_2)$-;

when the heterocyclic group is substituted, it can be substituted either on a ring carbon atom or on a ring hetero atom, and when ~~it~~ the heterocyclic group is substituted on a ring carbon atom, it is substituted with 1-3 substituents selected independently from halogen, nitro, cyano, oxo, substituted- or unsubstituted-alkyl, perhaloalkyl, substituted- or unsubstituted-cycloalkyl, substituted- or unsubstituted-aryl, substituted- or unsubstituted-heteroaryl, substituted- or unsubstituted-heterocyclyl, $R^{8b}O$-, $R^{8c}OC(=O)$-, $R^{8c}C(=O)O$-, $R^{8d}N(H)C(=O)$-, $R^{8d}N(alkyl)C(=O)$-, $R^{8c}C(=O)N(H)$-, $R^{8d}N(H)$-, $R^{8d}N(alkyl)$-, $R^{8d}N(H)C(=O)N(H)$-, and $R^{8d}N(alkyl)C(=O)N(H)$-; when the ~~'heterocyclic'~~ heterocyclic group is substituted on a ring nitrogen, it is substituted with a substituent selected from substituted- or unsubstituted-alkyl, substituted- or unsubstituted-cycloalkyl, substituted- or unsubstituted-aryl, substituted- or unsubstituted-heteroaryl, $R^{8a}S(O_2)$-, $R^{8a}C(=O)$-, $R^{8a}OC(=O)$-, $R^8N(H)C(=O)$-, and $R^8N(alkyl)C(=O)$-;

R^8 is selected from hydrogen, alkyl, cycloalkyl, aryl, heteroaryl, and heterocyclyl;

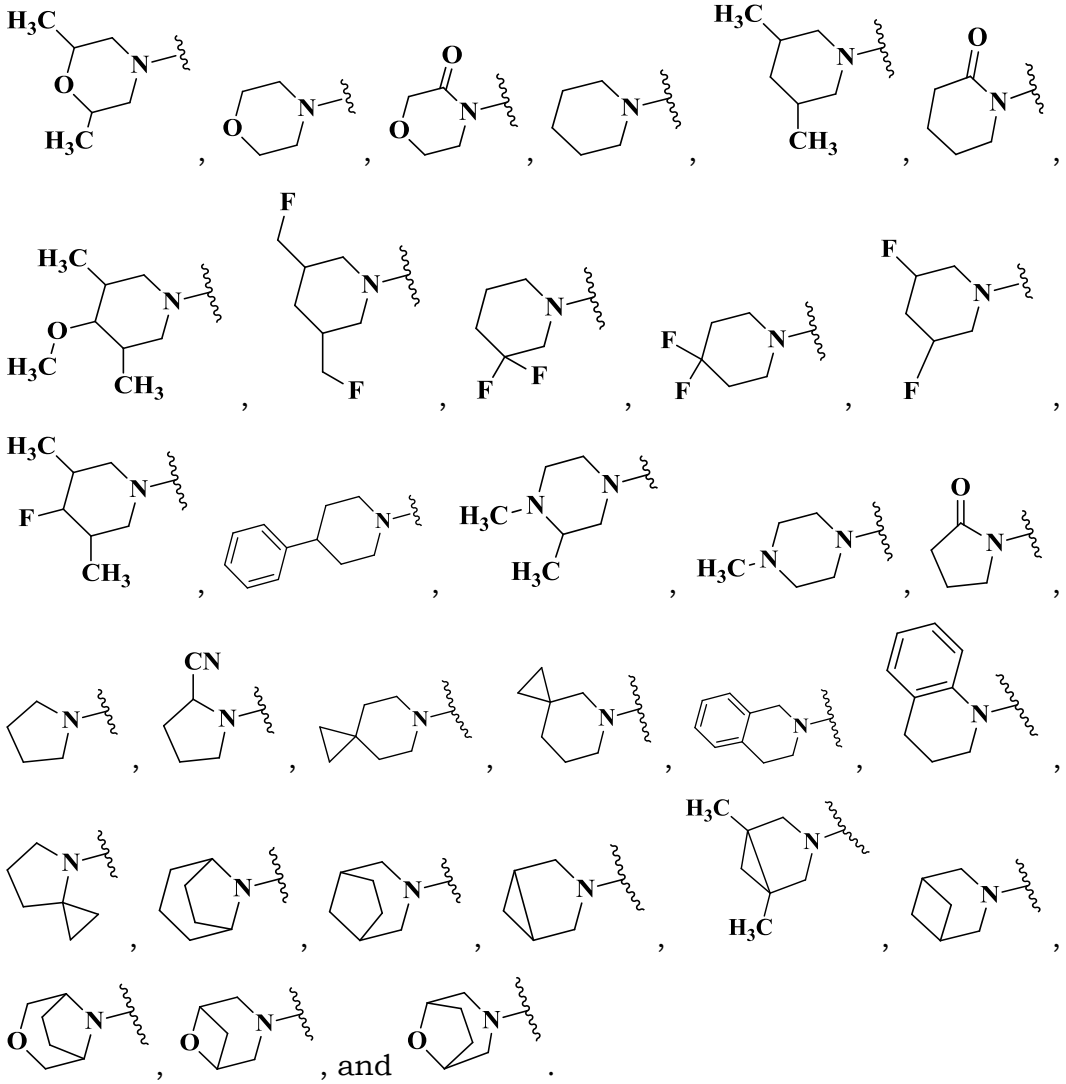
R^{8a} is selected from alkyl, perhaloalkyl, cycloalkyl, aryl, heteroaryl, and heterocyclyl;

R^{8b} is selected from hydrogen, alkyl, perhaloalkyl, cycloalkyl, aryl, heteroaryl, and heterocyclyl;

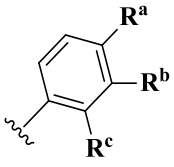
R^{8c} is selected from alkyl, perhaloalkyl, and cycloalkyl; and

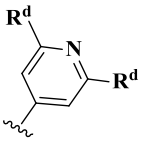
R^{8d} is selected from hydrogen, alkyl, and cycloalkyl.

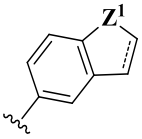
2. The compound of formula I, ~~its tautomeric forms, its stereoisomers, and its pharmaceutically acceptable salts,~~ a tautomeric form, a stereoisomer, or a pharmaceutically acceptable salt thereof, as claimed in claim 1, wherein ring D is selected from

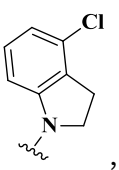
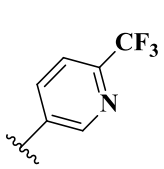
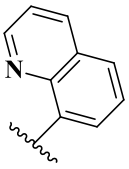
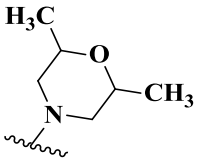


3. The compound of formula I, ~~its tautomeric forms, its stereoisomers, and its pharmaceutically acceptable salts~~ a tautomeric form, a stereoisomer, or a pharmaceutically acceptable salt thereof, as claimed in claim 1 ~~or 2~~, wherein R^1 is selected from

a)  , wherein R^a is selected from halogen, cyano, cyclopropyl, methyl, trifluoromethyl, ~~dimethyl amine~~ dimethylamino, $H_3CS(O_2)$-, $H_2NC(=O)$-, $H_3CC(=O)N(H)$-, and $(CH_3)_2NC(=O)$-; R^b is selected from hydrogen, halogen, cyclopropyl, and methyl; and R^c is selected from hydrogen and halogen;

b)  , wherein R^d is independently selected at each occurrence from hydrogen and methyl;

c)  , wherein, Z^1 is selected from $–CH_2$-, -N(H)-, $-N(CH_3)$-, and -$N(COCH_3)$-; "-----" is either a single bond or a double bond; and

d) cyclopropyl,  ,  ,  , or  .

4. The compound of formula I, ~~its tautomeric forms, its stereoisomers, and its pharmaceutically acceptable salts~~ a tautomeric form, a stereoisomer, or a pharmaceutically acceptable salt thereof, as claimed in ~~any one of claims 1-3~~ claim 1, wherein R^2 is selected from substituted- or unsubstituted-alkyl, halogen, and perhaloalkyl; or two R^2 groups and the carbon atoms to which they are attached together form a substituted- or unsubstituted-5 to 6 membered carbocycle.

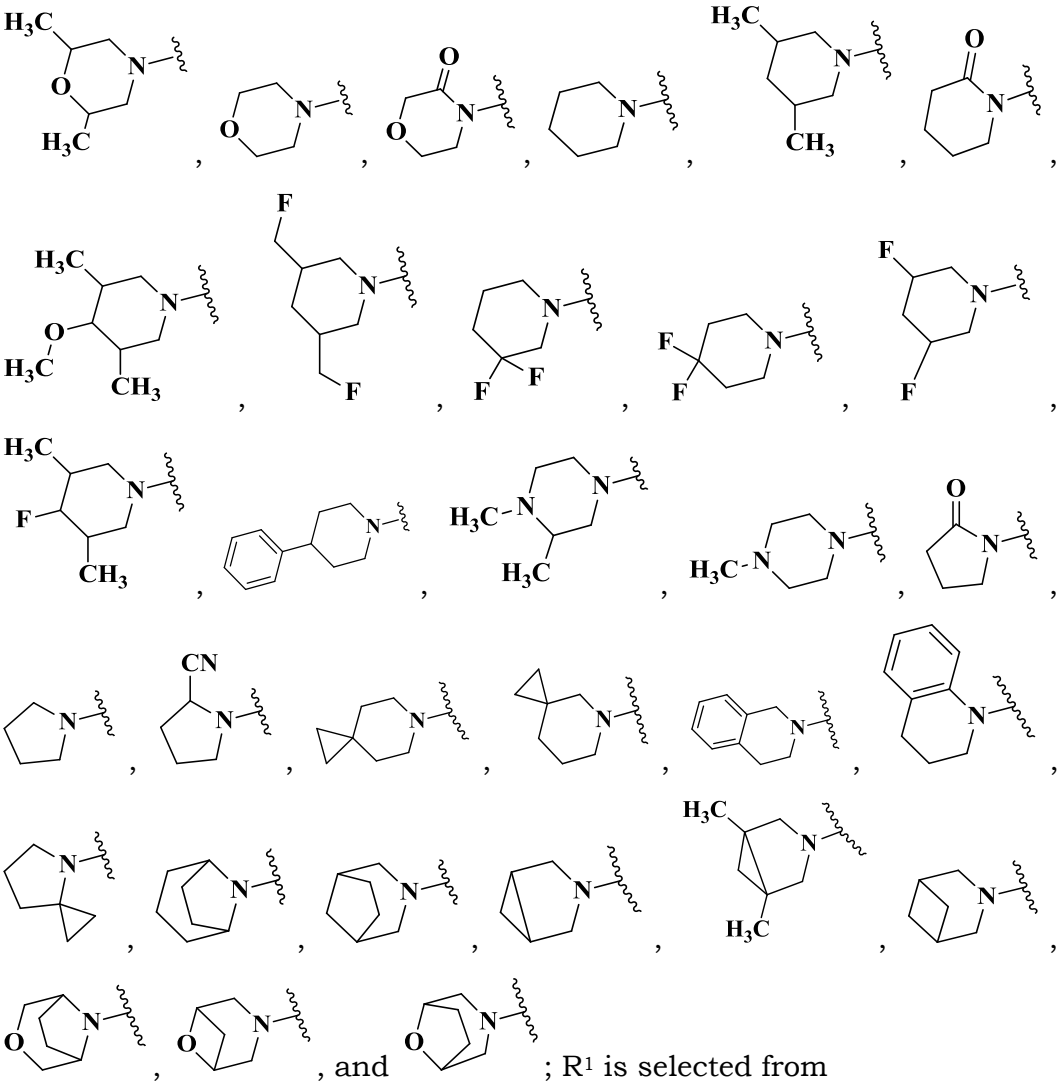
5. The compound of formula I, ~~its tautomeric forms, its stereoisomers, and its pharmaceutically acceptable salts~~ a tautomeric form, a stereoisomer, or a pharmaceutically acceptable salt thereof, as claimed in ~~any one of claims 1-4~~ claim 1, wherein R^2 is selected from methyl, fluoro, and trifluoromethyl; or two R^2 groups and two adjacent carbon atoms to which they are attached together form~~ing~~ a six membered carbocycle.

6. The compound of formula I, ~~its tautomeric forms, its stereoisomers, and its pharmaceutically acceptable salts~~ a tautomeric form, a stereoisomer, or a pharmaceutically acceptable salt thereof, as claimed in ~~any one of claims 1-5~~ claim 1, wherein m is selected from 0, 1, and 2.

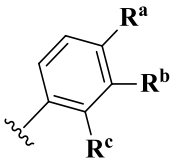
7. The compound of formula I, ~~its tautomeric forms, its stereoisomers, and its pharmaceutically acceptable salts~~ a tautomeric form, a stereoisomer, or a pharmaceutically acceptable salt thereof, as claimed in ~~any one of claims 1-6~~ claim 1, wherein R^3 and R^4 are selected independently from hydrogen, substituted- or unsubstituted-alkyl, and $R^{6a}C(=O)$-; or R^3, R^4 and the nitrogen to which they are attached together form~~ing~~ a 3- to 10-membered heterocycle.

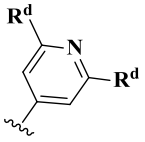
8. The compound of formula I, ~~its tautomeric forms, its stereoisomers, and its pharmaceutically acceptable salts~~ a tautomeric form, a stereoisomer, or a pharmaceutically acceptable salt thereof, as claimed in ~~any one of claims 1-7~~ claim 1, wherein R^3 and R^4 are selected independently from hydrogen, methyl, and acetyl; or R^3, R^4 and the nitrogen to which they are attached together form~~ing piperidine~~ a piperidinyl ring.

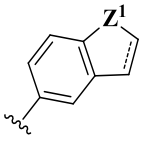
9. The compound of formula I, ~~its tautomeric forms, its stereoisomers, and its pharmaceutically acceptable salts~~ a tautomeric form, a stereoisomer, or a pharmaceutically acceptable salt thereof, as claimed in ~~any one of the claims 1-8~~ claim 1, wherein ring D is selected from

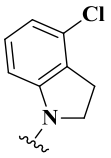
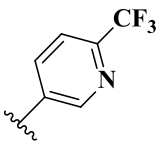
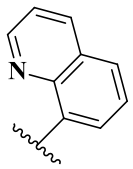
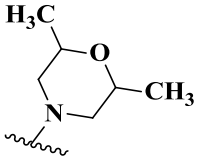


; R^1 is selected from

a)  , wherein R^a is selected from halogen, cyano, cyclopropyl, methyl, trifluoromethyl, ~~dimethyl amine~~ dimethylamino, $H_3CS(O_2)$-, $H_2NC(=O)$-, $H_3CC(=O)N(H)$-, and $(CH_3)_2NC(=O)$-; R^b is selected from hydrogen, halogen, cyclopropyl, and methyl; R^c is selected from hydrogen, and halogen;

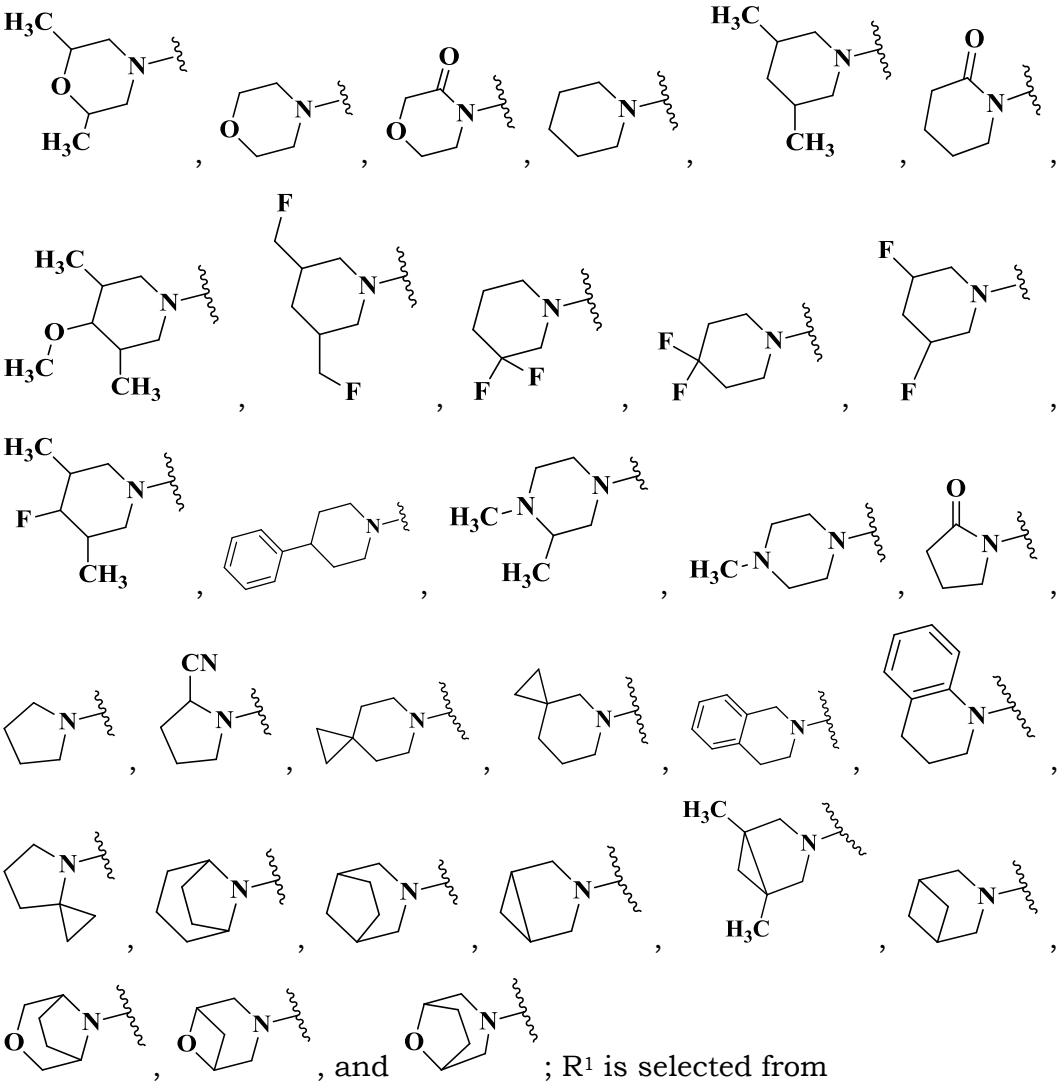
b)  , wherein R^d is independently selected at each occurrence from hydrogen and methyl;

c)  , wherein, Z^1 is selected from $–CH_2$-, -N(H)-, -N(CH_3)-, and -N($COCH_3$)-; "-----" is either a single bond or a double bond; and

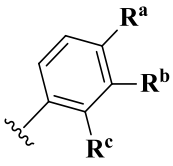
d) ~~Cyclopropyl~~ cyclopropyl,  ,  ,  , or  ;

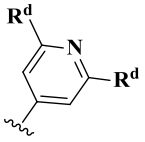
R^2 is selected from substituted- or unsubstituted-alkyl, halogen, and perhaloalkyl; or two R^2 groups and the carbon atoms to which they are attached together form a substituted- or unsubstituted-5 to 6 membered carbocycle; m is selected from 0, 1 and 2; and R^3 and R^4 are ~~particularly~~ selected from hydrogen, substituted- or unsubstituted-alkyl, and $R^{6a}C(=O)$-; or R^3, R^4 and the nitrogen to which they are attached together form~~ing~~ a 3- to 10-membered heterocycle.

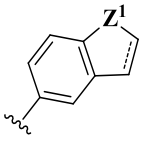
10. The compound of formula I, ~~its tautomeric forms, its stereoisomers, and its pharmaceutically acceptable salts~~ a tautomeric form, a stereoisomer, or a pharmaceutically acceptable salt thereof, as claimed in ~~any one of the claims 1-9~~ claim 1, wherein ring D is selected from

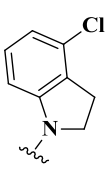
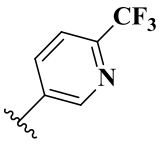
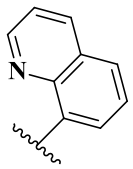
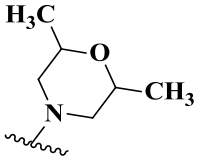


; R^1 is selected from

a) , wherein R^a is selected from halogen, cyano, cyclopropyl, methyl, trifluoromethyl, ~~dimethyl amine~~ dimethylamino, $H_3CS(O_2)$-, $H_2NC(=O)$-, $H_3CC(=O)N(H)$-, and $(CH_3)_2NC(=O)$-; R^b is selected from hydrogen, halogen, cyclopropyl, and methyl; R^c is selected from hydrogen and halogen;

b)  , wherein R^d is independently selected at each occurrence from hydrogen and methyl;

c)  , wherein, Z^1 is selected from $–CH_2$-, -N(H)-, -N(CH_3)-, and -N($COCH_3$)-; "-----" is either a single bond or a double bond; and

d) ~~Cyclopropyl~~ cyclopropyl,  ,  ,  , or  ;

R^2 is selected from methyl, fluoro, and trifluoromethyl; or two R^2 groups and two adjacent carbon atoms to which they are attached together form~~ing~~ a six membered carbocycle; m is selected from 0, 1, and 2; and R^3 and R^4 are selected independently from hydrogen, methyl, and acetyl; or R^3, R^4 and the nitrogen to which they are attached together form~~ing~~ ~~piperidine~~ a piperidinyl ring.

11. The compound of formula I, ~~its tautomeric forms, its stereoisomers, and its pharmaceutically acceptable salts~~ a tautomeric form, a stereoisomer, or a pharmaceutically acceptable salt thereof, as claimed in ~~any one of the claims 1-10~~ claim 1, wherein the compound is selected from:

(cis) 4-(4-(4-chlorophenyl)-2-(2,6-dimethylmorpholino)thiazol-5-yl)benzenesulfonamide;

4-(4-(4-chlorophenyl)-2-morpholinothiazol-5-yl)benzenesulfonamide;

4-(4-(4-chlorophenyl)-2-(4-methylpiperazin-1-yl)thiazol-5-yl)benzenesulfonamide;

4-(4-(4-chlorophenyl)-2-(piperidin-1-yl)thiazol-5-yl)benzenesulfonamide;

4-(2-(3-azabicyclo[3.1.0]hexan-3-ylmethyl)-4-(4-chlorophenyl)thiazol-5-yl)benzenesulfonamide;

4-(4-(4-chlorophenyl)-2-((2-oxopyrrolidin-1-yl)methyl)thiazol-5-yl)benzenesulfonamide;

4-(4-(4-chlorophenyl)-2-((2-oxopyrrolidin-1-yl)methyl)thiazol-5-yl)-3-fluorobenzenesulfonamide;

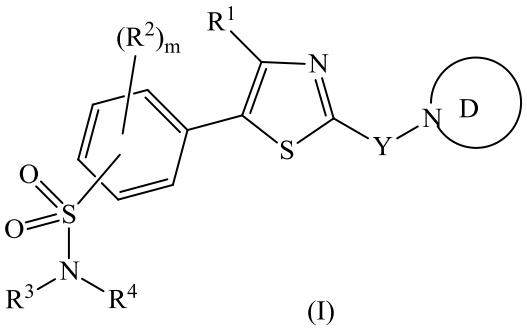
4-(4-(4-chlorophenyl)-2-((2-oxopiperidin-1-yl)methyl)thiazol-5-yl)benzenesulfonamide; and

4-(4-(4-chlorophenyl)-2-(4-phenylpiperidin-1-yl)thiazol-5-yl)benzenesulfonamide.

12. A pharmaceutical composition comprising a compound of ~~any one claim 1-11~~ claim 1, a tautomeric form, a stereoisomer or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

~~**13.** A method of preventing or treating a disease or its symptoms or a disorder mediated partially or completely by nicotinic acetylcholine receptors, said method comprising administering to a subject having or susceptible to said disease or its symptoms or disorder with a therapeutically effective amount of a compound of any one of claims 1-11.~~

~~14~~13. A method of treating a disease or disorder or condition mediated partially or completely by nicotinic acetylcholine receptors in a subject in need thereof, comprising administering to the subject a therapeutically effective amount of a compound of formula I, ~~its tautomeric forms, its stereoisomers, and its pharmaceutically acceptable salts~~ a tautomeric form, a stereoisomer, or a pharmaceutically acceptable salt thereof,



(I)

wherein, in the compound of formula I,

ring D is substituted- or unsubstituted-5 to 12 membered heterocycle optionally containing 1 to 3 additional heteroatom(s)/group(s) selected from $–S(O)_n$-, $-NR^5$-, and -O-;

ring D may be substituted on ring carbons with 1 to 6 substituent(s) independently selected from halogen, nitro, cyano, oxo, substituted- or unsubstituted-alkyl, perhaloalkyl, substituted- or unsubstituted-cycloalkyl, substituted- or unsubstituted-aryl, substituted- or unsubstituted-heteroaryl, substituted- or unsubstituted-heterocyclyl, $R^{6b}O$-, $R^6N(H)C(=O)$-, $R^{6a}C(=O)N(H)$-, $R^6N(R^7)$-, and $R^6N(H)C(=O)N(H)$-;

Y is a bond, $–CH_2$-, or -C(=O)-;

R^1 is selected from substituted- or unsubstituted-aryl, substituted- or unsubstituted-heteroaryl, substituted- or unsubstituted-cycloalkyl, and substituted- or unsubstituted-heterocyclyl;

R^2 is independently selected at each occurrence from halogen, nitro, cyano, substituted- or unsubstituted-alkyl, perhaloalkyl, substituted- or unsubstituted-cycloalkyl, substituted- or unsubstituted-heterocyclyl, $R^{6b}O$-, and $R^{6a}C(=O)$-, or

two R^2 groups and the carbon atoms to which they are attached together form a 5- to 6-membered cyclic system which optionally contains 1 to 3

heteroatom(s) selected from –N-, -S-, and -O-, ~~the said~~ 5- to 6- membered ~~ring~~ cyclic system may be substituted with 1 to 3 substituent(s) independently selected from oxo, halogen, cyano, and alkyl;

R^3 and R^4 are independently selected from hydrogen, $R^{6a}C(=O)$-, substituted- or unsubstituted-alkyl, substituted- or unsubstituted-cycloalkyl, and substituted- or unsubstituted-heterocyclyl; or

R^3 and R^4 together with the nitrogen atom to which they are attached form a 3- to 10-membered heterocyclic ring system containing one to three heteroatom(s) selected from –S-, -N-, and -O-, the said 3- to 10-membered heterocyclic ring system may be substituted with 1 to 3 substituent(s) independently selected from oxo, halogen, alkyl, OR^{6b}, and $R^6N(H)$-;

R^5 is selected from hydrogen, substituted- or unsubstituted-alkyl, substituted- or unsubstituted-cycloalkyl, substituted- or unsubstituted-aryl, substituted- or unsubstituted-heterocyclyl, $R^{6a}C(=O)$-, and $R^6N(R^7)C(=O)$-;

R^6 and R^7 are each independently selected from hydrogen, substituted- or unsubstituted-alkyl, substituted- or unsubstituted-cycloalkyl, and substituted- or unsubstituted-heterocyclyl;

R^{6a} is selected from substituted- or unsubstituted-alkyl, perhaloalkyl, substituted- or unsubstituted-cycloalkyl, and substituted- or unsubstituted-heterocyclyl;

R^{6b} is selected from hydrogen, substituted- or unsubstituted-alkyl, perhaloalkyl, substituted- or unsubstituted-cycloalkyl, and substituted- or unsubstituted-heterocyclyl;

m is an integer selected from 0, 1, 2, and 3;

n is an integer selected from 0, 1, and 2;

when the heterocyclic group is substituted, it can be substituted either on a ring carbon atom or on a ring hetero atom, when it substituted on a ring carbon atom, it is substituted with 1-3 substituents selected independently from halogen, nitro, cyano, oxo, substituted- or unsubstituted-alkyl, perhaloalkyl, substituted- or unsubstituted-cycloalkyl, substituted- or unsubstituted-aryl, substituted- or unsubstituted-heteroaryl, substituted- or unsubstituted-heterocyclyl, $R^{8b}O$-, $R^{8c}OC(=O)$-, $R^{8c}C(=O)O$-, $R^{8d}N(H)C(=O)$-, $R^{8d}N(alkyl)C(=O)$-, $R^{8c}C(=O)N(H)$-, $R^{8d}N(H)$-, $R^{8d}N(alkyl)$-, $R^{8d}N(H)C(=O)N(H)$-, and $R^{8d}N(alkyl)C(=O)N(H)$-;

when the ~~'heterocyclic'~~ heterocyclic group is substituted on a ring nitrogen, it is substituted with a substituent selected from substituted- or unsubstituted-alkyl, substituted- or unsubstituted-cycloalkyl, substituted- or unsubstituted-aryl, substituted- or unsubstituted-heteroaryl, $R^{8a}S(O_2)$-, $R^{8a}C(=O)$-, $R^{8a}OC(=O)$-, $R^{8}N(H)C(=O)$-, and $R^{8}N(alkyl)C(=O)$-;

R^{8} is selected from hydrogen, alkyl, cycloalkyl, aryl, heteroaryl, and heterocyclyl;

R^{8a} is selected from alkyl, perhaloalkyl, cycloalkyl, aryl, heteroaryl, and heterocyclyl;

R^{8b} is selected from hydrogen, alkyl, perhaloalkyl, cycloalkyl, aryl, heteroaryl, and heterocyclyl;

R^{8c} is selected from alkyl, perhaloalkyl, and cycloalkyl; and

R^{8d} is selected from hydrogen, alkyl, and cycloalkyl.

~~15~~14. The method of claim 13 ~~or 14~~, wherein the disorder or condition or disease is selected from Alzheimer's disease, mild cognitive impairment, senile dementia, vascular dementia, dementia of Parkinson's disease, attention deficit disorder, attention deficit hyperactivity disorder, dementia associated with Lewy bodies, AIDS dementia complex, Pick's

disease, dementia associated with Down's syndrome, Huntington's disease, cognitive deficits associated with traumatic

brain injury, cognitive decline associated with stroke, poststroke neuroprotection, cognitive and sensorimotor gating deficits associated with schizophrenia, cognitive deficits associated with bipolar disorder, cognitive impairments associated with depression, acute pain, post-surgical or post-operative pain, chronic pain, inflammation, inflammatory pain, neuropathic pain, smoking cessation, need for new blood vessel growth associated with wound healing, need for new blood vessel growth associated with vascularization of skin grafts, and lack of circulation, arthritis, rheumatoid arthritis, psoriasis, Crohn's disease, ulcerative colitis, pouchitis, inflammatory bowel disease, celiac disease, periodontitis, sarcoidosis, pancreatitis, organ transplant rejection, acute immune disease associated with organ transplantation, chronic immune disease associated with organ transplantation, septic shock, toxic shock syndrome, sepsis syndrome, depression, and rheumatoid spondylitis.

~~16~~15. The method of claim 13 ~~or 14~~, wherein the disease or disorder or condition is selected from the group classified or diagnosed as major or minor neurocognitive disorders, or disorders arising due to neurodegeneration.

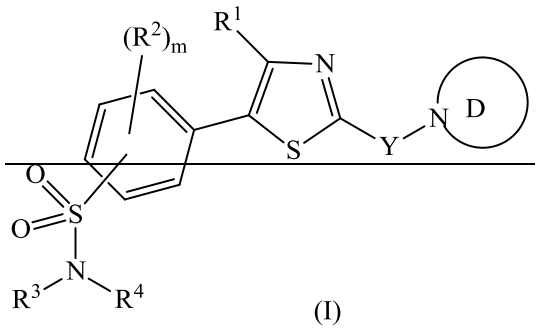
~~17~~16. The method of claim 13 ~~or 14~~, comprising administering a compound of formula I, a tautomeric form, a stereoisomer, or a pharmaceutically acceptable salt thereof, in combination with or as adjunct to medications utilized in the treatment of attention deficit hyperactivity disorders, schizophrenia, cognitive disorders such as Alzheimer's disease, Parkinson’s dementia, vascular dementia or dementia associated with Lewy bodies, or traumatic brain injury.

~~18~~17. The method of claim 13 or 14, further comprising administering a compound of formula I, a tautomeric form, a stereoisomer, or a pharmaceutically acceptable salt thereof, in combination with or as an adjunct to acetylcholinesterase inhibitors, disease modifying drugs or

biologics for neurodegenerative disorders, dopaminergic drugs, antidepressants, or a typical or an atypical antipsychotic.

~~**19.** Use of a compound of any one of claims 1-11 in preparation of a medicament for preventing or treating a disease or its symptoms or a disorder mediated partially or completely by nicotinic acetylcholine receptors.~~

~~**20.** Use of a compound of formula I, its tautomeric forms, its stereoisomers, and its pharmaceutically acceptable salts, in the preparation of a medicament for treating a disease or disorder or condition,~~



(I)

~~wherein, in the compound of formula I,~~

~~ring D is substituted or unsubstituted 5 to 12 membered heterocycle optionally containing 1 to 3 additional heteroatom(s)/group(s) selected from $-S(O)_n-$, NR^5-, and $-O-$;~~

~~ring D may be substituted on ring carbons with 1 to 6 substituent(s) independently selected from halogen, nitro, cyano, oxo, substituted or unsubstituted alkyl, perhaloalkyl, substituted or unsubstituted cycloalkyl, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, substituted or unsubstituted heterocyclyl, $R^{6b}O-$, $R^6N(H)C(=O)-$, $R^{6a}C(=O)N(H)-$, $R^6N(R^7)-$, and $R^6N(H)C(=O)N(H)-$;~~

~~Y is bond, $-CH_2-$, or $-C(=O)-$;~~

R^1 is selected from substituted- or unsubstituted-aryl, substituted- or unsubstituted-heteroaryl, substituted- or unsubstituted-cycloalkyl, substituted- or unsubstituted-heterocyclyl;

R^2 is independently selected at each occurrence from halogen, nitro, cyano, substituted- or unsubstituted-alkyl, perhaloalkyl, substituted- or unsubstituted-cycloalkyl, substituted- or unsubstituted-heterocyclyl, $R^{6b}O$-, and $R^{6a}C(=O)$-, or

two R^2 groups and the carbon atoms to which they are attached together form a 5- to 6-membered cyclic system which optionally contains 1 to 3 heteroatom(s) selected from –N-, -S-, and -O-, the said 5 to 6 membered ring system may be substituted with 1 to 3 substituent(s) independently selected from oxo, halogen, cyano, and alkyl;

R^3 and R^4 are independently selected from hydrogen, $R^{6a}C(=O)$-, substituted- or unsubstituted-alkyl, substituted- or unsubstituted-cycloalkyl, and substituted- or unsubstituted-heterocyclyl; or

R^3 and R^4 together with the nitrogen atom to which they are attached form a 3- to 10-membered heterocyclic ring system containing one to three heteroatom(s) selected from–S-, -N-, and -O-, the said 3- to 10-membered heterocyclic ring system may be substituted with 1 to 3 substituent(s) independently selected from oxo, halogen, alkyl, OR^{6b}, and $R^6N(H)$-;

R^5 is selected from hydrogen, substituted- or unsubstituted-alkyl, substituted- or unsubstituted-cycloalkyl, substituted- or unsubstituted-aryl, substituted- or unsubstituted-heterocyclyl, $R^{6a}C(=O)$-, and $R^6N(R^7)C(=O)$-;

R^6 and R^7 are each independently selected from hydrogen, substituted- or unsubstituted-alkyl, substituted- or unsubstituted-cycloalkyl, and substituted- or unsubstituted-heterocyclyl;

R^{6a} is selected from substituted- or unsubstituted-alkyl, perhaloalkyl, substituted- or unsubstituted-cycloalkyl, and substituted- or unsubstituted-heterocyclyl;

R^{6b} is selected from hydrogen, substituted- or unsubstituted-alkyl, perhaloalkyl, substituted- or unsubstituted-cycloalkyl, and substituted- or unsubstituted-heterocyclyl;

m is an integer selected from 0, 1, 2, and 3;

n is an integer selected from 0, 1, and 2;

when the alkyl group is a substituted alkyl group, the alkyl group is substituted with 1 to 4 substituents selected independently from oxo, halogen, nitro, cyano, perhaloalkyl, substituted- or unsubstituted-cycloalkyl, substituted- or unsubstituted-aryl, substituted- or unsubstituted-heteroaryl, substituted- or unsubstituted-heterocyclyl, $R^{8b}O$-, $R^{8a}S(O_2)$-, $R^{8a}OC(=O)$-, $R^{8a}C(=O)O$-, $R^{8}N(H)C(=O)$-, $R^{8}N(alkyl)C(=O)$-, $R^{8a}C(=O)N(H)$-, $R^{8}N(H)$-, $R^{8}N(alkyl)$-, $R^{8}N(H)C(=O)N(H)$-, and $R^{8}N(alkyl)C(=O)N(H)$-;

when the cycloalkyl and the carbocyclic groups are substituted, each of them is substituted with 1 to 3 substituents selected independently from oxo, halogen, nitro, cyano, substituted- or unsubstituted-alkyl, perhaloalkyl, substituted- or unsubstituted-aryl, substituted- or unsubstituted-heteroaryl, substituted- or unsubstituted-heterocyclyl, $R^{8b}O$-, $R^{8c}S(O_2)$-, $R^{8c}C(=O)$-, $R^{8c}OC(=O)$-, $R^{8c}C(=O)O$-, $R^{8d}N(H)C(=O)$-, $R^{8d}N(alkyl)C(=O)$-, $R^{8c}C(=O)N(H)$-, $R^{8d}N(H)$-, $R^{8d}N(alkyl)$-, $R^{8d}N(H)C(=O)N(H)$-, and $R^{8d}N(alkyl)C(=O)N(H)$-;

when the aryl group is substituted, it is substituted with 1 to 3 substituents selected independently from halogen, nitro, cyano, hydroxy, substituted- or unsubstituted-alkyl, perhaloalkyl, substituted- or unsubstituted-cycloalkyl, substituted- or unsubstituted-heterocycle, (alkyl)O-, (perhaloalkyl)O-, (alkyl)N(alkyl)-, (alkyl)N(H)-, H_2N-, (alkyl)$S(O_2)$-, (perhaloalkyl)$S(O_2)$-, (alkyl)C(=O)N(alkyl)-, (alkyl)C(=O)N(H)-,

(alkyl)N(alkyl)C(=O)-, (alkyl)N(H)C(=O)-, $H_2NC(=O)$-, (alkyl)N(alkyl)$S(O_2)$-, (alkyl)N(H)$S(O_2)$-, and $H_2NS(O_2)$-;

when the heteroaryl group is substituted, it is substituted with 1 to 3 substituents selected independently from halogen, nitro, cyano, hydroxy, substituted- or unsubstituted-alkyl, perhaloalkyl, substituted- or unsubstituted-cycloalkyl, substituted- or unsubstituted-heterocycle, (alkyl)O-, (perhaloalkyl)O-, (alkyl)N(alkyl)-, (alkyl)N(H)-, H_2N-, (alkyl)$S(O_2)$-, (perhaloalkyl)$S(O_2)$-, (alkyl)C(=O)N(alkyl)-, (alkyl)C(=O)N(H)-, (alkyl)N(alkyl)C(=O)-, (alkyl)N(H)C(=O)-, $H_2NC(=O)$-, (alkyl)N(alkyl)$S(O_2)$-, (alkyl)N(H)$S(O_2)$-, and $H_2NS(O_2)$-;

when the heterocyclic group is substituted, it can be substituted either on a ring carbon atom or on a ring hetero atom, when it substituted on a ring carbon atom, it is substituted with 1-3 substituents selected independently from halogen, nitro, cyano, oxo, substituted- or unsubstituted-alkyl, perhaloalkyl, substituted- or unsubstituted-cycloalkyl, substituted- or unsubstituted-aryl, substituted- or unsubstituted-heteroaryl, substituted- or unsubstituted-heterocyclyl, $R^{8b}O$-, $R^{8c}OC(=O)$-, $R^{8c}C(=O)O$-, $R^{8d}N(H)C(=O)$-, $R^{8d}N(alkyl)C(=O)$-, $R^{8c}C(=O)N(H)$-, $R^{8d}N(H)$-, $R^{8d}N(alkyl)$-, $R^{8d}N(H)C(=O)N(H)$-, and $R^{8d}N(alkyl)C(=O)N(H)$-; when the 'heterocyclic' group is substituted on a ring nitrogen, it is substituted with a substituent selected from substituted- or unsubstituted-alkyl, substituted- or unsubstituted-cycloalkyl, substituted- or unsubstituted-aryl, substituted- or unsubstituted-heteroaryl, $R^{8a}S(O_2)$-, $R^{8a}C(=O)$-, $R^{8a}OC(=O)$-, $R^{8}N(H)C(=O)$-, and $R^{8}N(alkyl)C(=O)$-;

R^8 is selected from hydrogen, alkyl, cycloalkyl, aryl, heteroaryl, and heterocyclyl;

R^{8a} is selected from alkyl, perhaloalkyl, cycloalkyl, aryl, heteroaryl, and heterocyclyl;

R^{8b} is selected from hydrogen, alkyl, perhaloalkyl, cycloalkyl, aryl, heteroaryl, and heterocyclyl;

R^{8c} is selected from alkyl, perhaloalkyl, and cycloalkyl;

R^{8d} is selected from hydrogen, alkyl, and cycloalkyl.

21. The use as claimed in claim 16 or 17 wherein the disease or disorder or condition is selected from the group classified or diagnosed as major or minor neurocognitive disorders, or disorders arising due to neurodegeneration.

22. The use as claimed in claim 19 or 20, which is in combination with or as adjunct to medications utilized in the treatment of attention deficit hyperactivity disorders, schizophrenia, cognitive disorders, Alzheimer's disease, Parkinson's dementia, vascular dementia or dementia associated with Lewy bodies, and traumatic brain injury.

23. The use as claimed in claim 19 or 20, which is in combination with or as an adjunct to acetylcholinesterase inhibitors, disease modifying drugs or biologics for neurodegenerative disorders, dopaminergic drugs, antidepressants, or a typical or atypical antipsychotic.