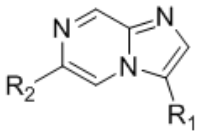
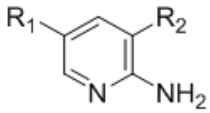
CLAIMS

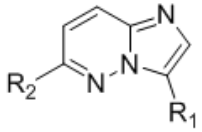
1. A compound capable of inhibiting Fyn kinase, wherein said compound is represented by a structure selected from the group consisting of Formula II, Formula I, Formula III, Formula IV, Formula V, and Formula VI, and all their pharmaceutically acceptable salts and solvates:



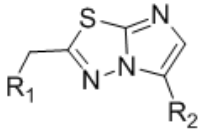
(II),



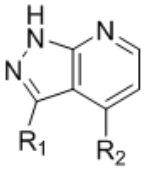
(I),



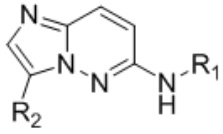
(III),



(IV),



(V),



(VI),

wherein R_1 is selected from the group consisting of H, alkyl, alkenyl, alkylene, alkynyl, aryl, arylalkyl, alkylaryl, arylalkenyl, cycloalkyl, cycloalkylalkyl, cycloalkenyl, cycloalkenylalkyl, heteroaryl, heteroarylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclenyl, wherein each of the alkyl, alkenyl, alkylene, alkynyl, alkynylalkyl, aryl, arylalkyl, alkylaryl, arylalkenyl, cycloalkyl, cycloalkylalkyl, cycloalkenyl, cycloalkenylalkyl, heterocyclic moieties can be substituted with one or more moieties which can be the same or different, each moiety being independently selected from the group consisting of acyl, alcohol, alkyl, aryl, aroyl, alkoxy, aryloxy, arylalkyloxy, alkylthio, arylthio, aralkylthio, alkoxycarbonyl, aryloxycarbonyl, aralkoxycarbonyl, alkylsulfonyl, arylsulfonyl, cyano, hydroxyalkyl, amide, amine, thiol, thiophene, pyrrole, furan, alkylsulfate, arylsulfate, alkylphosphate and arylphosphate,

wherein R_2 is selected from the group consisting of H, alkyl, alkenyl, alkylene, alkynyl, aryl, arylalkyl, alkylaryl, arylalkenyl, cycloalkyl, cycloalkylalkyl, cycloalkenyl, cycloalkenylalkyl, heteroaryl, heteroarylalkyl, heterocyclyl, heterocyclylalkyl, heterocyclenyl, wherein each of the alkyl, alkenyl, alkylene, alkynyl, alkynylalkyl, aryl, arylalkyl, alkylaryl, arylalkenyl, cycloalkyl,

cycloalkylalkyl, cycloalkenyl, cycloalkenylalkyl, heterocyclic moieties can be substituted with one or more moieties which can be the same or different, each moiety being independently selected from the group consisting of acyl, alcohol, alkyl, aryl, aroyl, alkoxy, aryloxy, arylalkyloxy, alkylthio, arylthio, aralkylthio, alkoxycarbonyl, aryloxycarbonyl, aralkoxycarbonyl, alkylsulfonyl, arylsulfonyl, cyano, hydroxyalkyl, amide, amine, thiol, thiophene, pyrrole, furan, alkylsulfate, arylsulfate, alkylphosphate and arylphosphate.

2. A compound according to claim 1, wherein said compound is selected from Table 3, preferably wherein said compound is selected from Table 4.

3. A compound according to claim 2, wherein said compound is selected from the group consisting of N-(2-hydroxyethyl)-4-[3-(4-hydroxyphenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, 3-[3-(4-hydroxyphenyl)imidazo[1,2-a]pyrazin-6-yl]-N,N-dimethyl-benzamide, 4-[6-[4-(4-isopropylpiperazin-1-yl)phenyl]imidazo[1,2-a]pyrazin-3-yl]phenol, 4-[6-(1-benzylpyrazol-4-yl)imidazo[1,2-a]pyrazin-3-yl]phenol, 4-[3-(2-thienyl)imidazo[1,2-a]pyrazin-6-yl]phenol, 3,6-bis(2-thienyl)imidazo[1,2-a]pyrazine, N-(2-hydroxyethyl)-3-[3-(4-hydroxyphenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, N-cyclopropyl-4-[3-(4-hydroxyphenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, 4-[6-[4-(4-methylpiperazin-1-yl)phenyl]imidazo[1,2-a]pyrazin-3-yl]phenol, 4-[6-(6-amino-3-pyridyl)imidazo[1,2-a]pyrazin-3-yl]phenol, 5-[3-(2-thienyl)imidazo[1,2-a]pyrazin-6-yl]pyridin-2-amine, 4-[3-(3-acetylphenyl)imidazo[1,2-a]pyrazin-6-yl]-N-(2-dimethylaminoethyl)benzamide, N-(2-dimethylaminoethyl)-4-[3-(2-thienyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, 4-[3-(3,5-dimethoxyphenyl)imidazo[1,2-a]pyrazin-6-yl]-N-[3-(dimethylamino)propyl]benzamide, N-(2-dimethylaminoethyl)-4-[3-(4-pyridyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, 4-[6-[2-(dimethylamino)phenyl]imidazo[1,2-a]pyrazin-3-yl]-2-methoxy-phenol, N-(2-hydroxyethyl)-3-[3-(4-hydroxy-3-methoxy-phenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, 2-methoxy-4-[6-(3-pyridyl)imidazo[1,2-a]pyrazin-3-yl]phenol, 4-[6-(2-chlorophenyl)imidazo[1,2-a]pyrazin-3-yl]-2-methoxy-phenol, 4-[6-(3-ethoxyphenyl)imidazo[1,2-a]pyrazin-3-yl]-2-methoxy-phenol, N-(2-dimethylaminoethyl)-4-[3-(4-hydroxy-3-methoxy-phenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, 4-[6-(6-amino-3-pyridyl)imidazo[1,2-a]pyrazin-3-yl]-2-methoxy-phenol, 2-methoxy-4-[6-[6-(4-methylpiperazin-1-yl)-3-pyridyl]imidazo[1,2-a]pyrazin-3-yl]phenol, 2-methoxy-4-[6-(1-methylpyrazol-4-yl)imidazo[1,2-a]pyrazin-3-yl]phenol, N-[3-[3-(3,4,5-trimethoxyphenyl)imidazo[1,2-a]pyrazin-6-yl]phenyl]methanesulfonamide, N-[3-

(dimethylamino)propyl]-4-[3-(4-hydroxy-3-methoxy-phenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, 2-methoxy-4-[6-[6-(2-morpholinoethylamino)-3-pyridyl]imidazo[1,2-a]pyrazin-3-yl]phenol, 6-(1-methylpyrazol-4-yl)-3-(3-thienyl)imidazo[1,2-a]pyrazine, 6-phenyl-3-(3-thienyl)imidazo[1,2-a]pyrazine, [4-[3-(3-thienyl)imidazo[1,2-a]pyrazin-6-yl]phenyl]methanol, 4-[3-(4-methoxyphenyl)imidazo[1,2-a]pyrazin-6-yl]phenol, 6-(3-pyridyl)-3-(3-thienyl)imidazo[1,2-a]pyrazine, 3-(4-pyridyl)-6-(2-thienyl)imidazo[1,2-a]pyrazine, 4-[3-(3-thienyl)imidazo[1,2-a]pyrazin-6-yl]phenol, 6-(2-thienyl)-3-(3-thienyl)imidazo[1,2-a]pyrazine, N-[3-[3-(3-thienyl)imidazo[1,2-a]pyrazin-6-yl]phenyl]acetamide, N-[3-[3-(3-thienyl)imidazo[1,2-a]pyrazin-6-yl]phenyl]methanesulfonamide, 6-(2-furyl)-3-(3-thienyl)imidazo[1,2-a]pyrazine, 3-(6-phenylimidazo[1,2-a]pyrazin-3-yl)phenol, 3-[3-(3-hydroxyphenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, 4-[6-(3-pyridyl)imidazo[1,2-a]pyrazin-3-yl]phenol, [4-[3-(4-phenoxyphenyl)imidazo[1,2-a]pyrazin-6-yl]phenyl]methanol, 4-[6-(4-chlorophenyl)imidazo[1,2-a]pyrazin-3-yl]phenol, 3-[6-(2-thienyl)imidazo[1,2-a]pyrazin-3-yl]phenol, 6-(1-methylpyrazol-4-yl)-3-(4-phenoxyphenyl)imidazo[1,2-a]pyrazine, 3-[6-(2-furyl)imidazo[1,2-a]pyrazin-3-yl]phenol, 4-[6-(6-methoxy-3-pyridyl)imidazo[1,2-a]pyrazin-3-yl]phenol, 3-[6-[4-(hydroxymethyl)phenyl]imidazo[1,2-a]pyrazin-3-yl]phenol, 3-[6-(1-methylpyrazol-4-yl)imidazo[1,2-a]pyrazin-3-yl]phenol, 4-[6-(1-methylpyrazol-4-yl)imidazo[1,2-a]pyrazin-3-yl]phenol, 6-[6-(4-methylpiperazin-1-yl)-3-pyridyl]-3-(4-phenoxyphenyl)imidazo[1,2-a]pyrazine, N-(2-hydroxyethyl)-3-[3-(4-phenoxyphenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, N-(2-dimethylaminoethyl)-4-[3-(4-phenoxyphenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, N-(2-hydroxyethyl)-4-[3-(4-phenoxyphenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, 4-[3-(3-chlorophenyl)imidazo[1,2-a]pyrazin-6-yl]-N-[3-(dimethylamino)propyl]benzamide, 5-[3-(4-phenoxyphenyl)imidazo[1,2-a]pyrazin-6-yl]pyridin-2-amine, N-[3-(dimethylamino)propyl]-4-[3-(3-thienyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, 3-(4-methoxyphenyl)-6-[4-(4-methylpiperazin-1-yl)phenyl]imidazo[1,2-a]pyrazine, N-(2-hydroxyethyl)-3-[3-(3-thienyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, 6-[6-(4-methylpiperazin-1-yl)-3-pyridyl]-3-(3-thienyl)imidazo[1,2-a]pyrazine, 5-[3-(3-thienyl)imidazo[1,2-a]pyrazin-6-yl]pyridin-2-amine, 3,6-bis(3-thienyl)imidazo[1,2-a]pyrazine, N-(2-dimethylaminoethyl)-4-[3-(3-thienyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, 3-(1-methylpyrazol-4-yl)-6-(2-phenoxyphenyl)imidazo[1,2-a]pyrazine, 3-[6-[6-(4-methylpiperazin-1-yl)-3-pyridyl]imidazo[1,2-a]pyrazin-3-yl]phenol, 3-[[5-[3-(1,3-benzodioxol-5-yl)imidazo[1,2-a]pyrazin-6-yl]-2-pyridyl]oxy]-N,N-dimethyl-propan-1-amine, 3-[6-(3-ethoxyphenyl)imidazo[1,2-a]pyrazin-3-

yl]phenol, 3-(1,3-benzodioxol-5-yl)-6-[4-(4-methylpiperazin-1-yl)phenyl]imidazo[1,2-a]pyrazine, 3-[6-(3-thienyl)imidazo[1,2-a]pyrazin-3-yl]phenol, 3-[6-[4-(4-methylpiperazin-1-yl)phenyl]imidazo[1,2-a]pyrazin-3-yl]phenol, 4-[3-(4-chlorophenyl)imidazo[1,2-a]pyrazin-6-yl]-N-[3-(dimethylamino)propyl]benzamide, 4-[3-(1,3-benzodioxol-5-yl)imidazo[1,2-a]pyrazin-6-yl]-N-(2-dimethylaminoethyl)benzamide, 3-[6-(6-amino-3-pyridyl)imidazo[1,2-a]pyrazin-3-yl]phenol, N-(2-dimethylaminoethyl)-4-[3-(3-hydroxyphenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, 4-[3-(4-chlorophenyl)imidazo[1,2-a]pyrazin-6-yl]-N-(2-dimethylaminoethyl)benzamide, 3-[6-[6-(2-morpholinoethylamino)-3-pyridyl]imidazo[1,2-a]pyrazin-3-yl]phenol, N-[3-(dimethylamino)propyl]-4-[3-(3-hydroxyphenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, N-(2-hydroxyethyl)-4-[3-(3-hydroxyphenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, 4-[3-(1,3-benzodioxol-5-yl)imidazo[1,2-a]pyrazin-6-yl]-N-[3-(dimethylamino)propyl]benzamide, 6-[6-(4-methylpiperazin-1-yl)-3-pyridyl]-3-phenyl-imidazo[1,2-a]pyrazine, 3-[6-[4-(4-isopropylpiperazin-1-yl)phenyl]imidazo[1,2-a]pyrazin-3-yl]phenol, 5-[3-(1,3-benzodioxol-5-yl)imidazo[1,2-a]pyrazin-6-yl]pyridin-2-amine, 4-[6-[6-[3-(dimethylamino)propoxy]-3-pyridyl]imidazo[1,2-a]pyrazin-3-yl]phenol, 4-[6-[6-(2-morpholinoethylamino)-3-pyridyl]imidazo[1,2-a]pyrazin-3-yl]phenol, 4-[6-[6-(4-methylpiperazin-1-yl)-3-pyridyl]imidazo[1,2-a]pyrazin-3-yl]phenol, 3-[2-(cyclohexylamino)imidazo[2,1-b][1,3,4]thiadiazol-5-yl]-N,N-dimethyl-benzamide, N-[2-(dimethylamino)ethyl]-4-[3-(4-hydroxyphenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, N-[2-(dimethylamino)ethyl]-4-[3-(4-phenoxyphenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, N-[3-(dimethylamino)propyl]-4-[3-(4-phenoxyphenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, N-[2-(dimethylamino)ethyl]-4-[3-(4-hydroxy-3-methoxy-phenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide, and 4-[6-[[(1S)-1-(hydroxymethyl)-2-methyl-propyl]amino]imidazo[1,2-b]pyridazin-3-yl]-2-methoxy-phenol.

4. A compound according to claim 3, wherein said compound is N-(2-hydroxyethyl)-4-[3-(4-hydroxyphenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide.

5 A compound according to claim 3, wherein said compound is N-[3-(dimethylamino)propyl]-4-[3-(4-phenoxyphenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide.

6. A compound according to claim 3, wherein said compound is N-[2-(dimethylamino)ethyl]-4-[3-(4-phenoxyphenyl)imidazo[1,2-a]pyrazin-6-yl]benzamide.

7. Use of the compound according to any of one of claims 1 to 6, for the manufacture of a medicament inhibiting dephosphorylation of bound ATP by Fyn kinase.

8. Use of the compound according to any of one of claims 1 to 6 for the manufacture of a medicament for inhibiting activity of Fyn kinase.

9. Use of the compound according to any of one of claims 1 to 6 for the manufacture of a medicament for the treatment or prevention of a disorder associated with Fyn kinase.

10. The use according to claim 9, wherein said disorder associated with Fyn kinase is selected from the group consisting of Type I diabetes, Type II diabetes, pre-diabetes, breast cancer, prostate cancer, pancreatic cancer, esophageal cancer, gastric cancer, liver cancer, bowel cancer, melanoma, Multiple Sclerosis, Alzheimer's disease, and Parkinson's disease.

11. Use of the compound according to any of one of claims 1 to 6 for manufacture of a medicament to improve physiological functions associated with Fyn kinase.

12. Use of the compound according to claim 11, wherein said physiological function associated with Fyn kinase is selected from the group consisting general weight loss, obesity, lean muscle mass, exercise recovery, stress recovery and physical endurance.

13. The use according to claim 11, wherein said physiological function associated with Fyn kinase is selected from the group consisting of improved recovery from head trauma and improved recovery from spinal trauma.