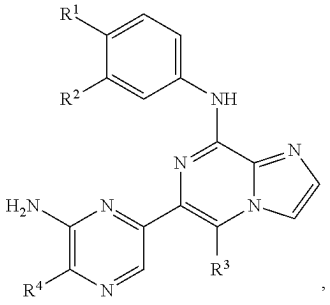
CLAIMS

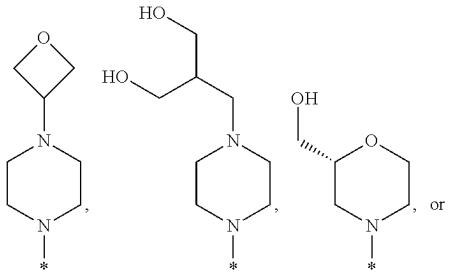
1. A compound for use in the manufacture of a medicament for inhibiting activity of a spleen tyrosine kinase in a subject in need thereof, said compound having the structure of Formula I:

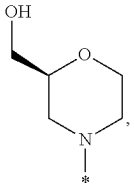
Formula I



or a pharmaceutically acceptable salt, pharmaceutically acceptable co-crystal, pharmaceutically acceptable ester, stereoisomer, mixture of stereoisomers, or tautomer thereof, wherein:

R^1 is:





wherein * indicates the carbon atom of the indicated phenyl ring of Formula I to which R^1 is attached;

R^2 is H or 2-hydroxyethoxy;

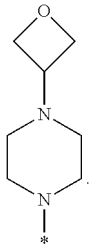
R^3 is H or methyl; and

R^4 is H or methyl.

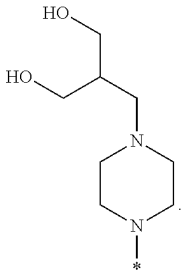
2. The use according to claim 1, wherein the compound, or a pharmaceutically acceptable salt thereof, is a mesylate salt or co-crystal.

3. The use according to claim 1, wherein the compound, or a pharmaceutically acceptable salt thereof, is a succinate salt or co-crystal.

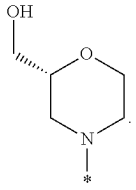
4. The use according to any one of claims 1 to 3, wherein, in the compound of Formula I, or a pharmaceutically acceptable salt, pharmaceutically acceptable co-crystal, pharmaceutically acceptable ester, stereoisomer, mixture of stereoisomers, or tautomer thereof, R^1 is



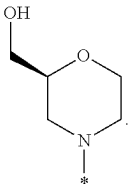
5. The use according to any one of claims 1 to 3, wherein, in the compound of Formula I, or a pharmaceutically acceptable salt, pharmaceutically acceptable co-crystal, pharmaceutically acceptable ester, stereoisomer, mixture of stereoisomers, or tautomer thereof, R^1 is



6. The use according to any one of claims 1 to 3, wherein, in the compound of Formula I, or a pharmaceutically acceptable salt, pharmaceutically acceptable co-crystal, pharmaceutically acceptable ester, stereoisomer, mixture of stereoisomers, or tautomer thereof, R^1 is



7. The use according to any one of claims 1 to 3, wherein, in the compound of Formula I, or a pharmaceutically acceptable salt, pharmaceutically acceptable co-crystal, pharmaceutically acceptable ester, stereoisomer, mixture of stereoisomers, or tautomer thereof, R^1 is



8. The use according to any one of claims 1 to 7, wherein, in the compound of Formula I, or a pharmaceutically acceptable salt, pharmaceutically acceptable co-crystal, pharmaceutically acceptable ester, stereoisomer, mixture of stereoisomers, or tautomer thereof, R^2 is 2-hydroxyethoxy.

9. The use according to any one of claims 1 to 7, wherein, in the compound of Formula I, or a pharmaceutically acceptable salt, pharmaceutically acceptable co-crystal, pharmaceutically acceptable ester, stereoisomer, mixture of stereoisomers, or tautomer thereof, R^2 is H.

10. The use according to any one of claims 1 to 9, wherein, in the compound of Formula I, or a pharmaceutically acceptable salt, pharmaceutically acceptable co-crystal, pharmaceutically acceptable ester, stereoisomer, mixture of stereoisomers, or tautomer thereof, R^3 is methyl.

11. The use according to any one of claims 1 to 9, wherein, in the compound of Formula I, or a pharmaceutically acceptable salt, pharmaceutically acceptable co-crystal, pharmaceutically acceptable ester, stereoisomer, mixture of stereoisomers, or tautomer thereof, R^3 is H.

12. The use according to any one of claims 1 to 11, wherein in the compound of Formula I, or a pharmaceutically acceptable salt, pharmaceutically acceptable co-crystal, pharmaceutically acceptable ester, stereoisomer, mixture of stereoisomers, or tautomer thereof, R^4 is methyl.

13. The use according to any one of claims 1 to 11, wherein, in the compound of Formula I, or a pharmaceutically acceptable salt, pharmaceutically acceptable co-crystal,

pharmaceutically acceptable ester, stereoisomer, mixture of stereoisomers, or tautomer thereof, R^4 is H.

14. The use according to any one of claims 1 to 3, wherein, in the compound of Formula I, or a pharmaceutically acceptable salt, pharmaceutically acceptable co-crystal, pharmaceutically acceptable ester, stereoisomer, mixture of stereoisomers, or tautomer thereof, R^2 is H, R^3 is methyl, and R^4 is H.

15. The use according to any one of claims 1 to 3, wherein, in the compound of Formula I, or a pharmaceutically acceptable salt, pharmaceutically acceptable co-crystal, pharmaceutically acceptable ester, stereoisomer, mixture of stereoisomers, or tautomer thereof, R^2 is H, R^3 is H, and R^4 is methyl.

16. The use according to any one of claims 1 to 3, wherein, in the compound of Formula I, or a pharmaceutically acceptable salt, pharmaceutically acceptable co-crystal, pharmaceutically acceptable ester, stereoisomer, mixture of stereoisomers, or tautomer thereof, R^2, R^3, and R^4 are H.

17. The use according to any one of claims 1 to 3, wherein, in the compound of Formula I, or a pharmaceutically acceptable salt, pharmaceutically acceptable co-crystal, pharmaceutically acceptable ester, stereoisomer, mixture of stereoisomers, or tautomer thereof, R^2 is 2-hydroxyethoxy, R^3 is methyl, and R^4 is H.

18. The use according to any one of claims 1 to 3, wherein, in the compound of Formula I, or a pharmaceutically acceptable salt, pharmaceutically acceptable co-crystal, pharmaceutically acceptable ester, stereoisomer, mixture of stereoisomers, or tautomer thereof, R^2 is 2-hydroxyethoxy, R^3 is H, and R^4 is methyl.

19. The use according to any one of claims 1 to 3, wherein the compound of Formula I is selected from:

2-(5-((6-(6-amino-5-methylpyrazin-2-yl)imidazo[1,2-a]pyrazin-8-yl)amino)-2-(4-(oxetan-3-yl)piperazin-1-yl)phenoxy)ethanol;

6-(6-aminopyrazin-2-yl)-N-(4-(4-(oxetan-3-yl)piperazin-1-yl)phenyl)imidazo[1,2-a]pyrazin-8-amine;

2-((4-(4-((6-(6-aminopyrazin-2-yl)imidazo[1,2-a]pyrazin-8-yl)amino)phenyl)piperazin-1-yl)methyl)propane-1,3-diol;

2-(5-((6-(6-aminopyrazin-2-yl)imidazo[1,2-a]pyrazin-8-yl)amino)-2-(4-(oxetan-3-yl)piperazin-1-yl)phenoxy)ethanol;

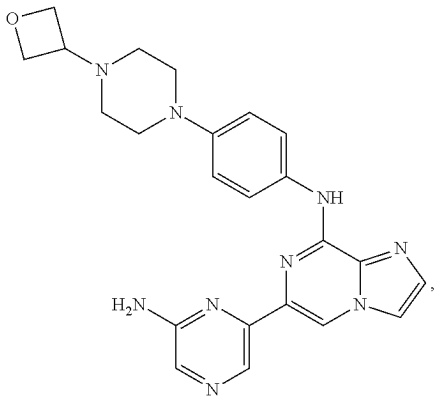
(R)-(4-(4-((6-(6-aminopyrazin-2-yl)imidazo[1,2-a]pyrazin-8-yl)amino)phenyl)morpholin-2-yl)methanol;

6-(6-aminopyrazin-2-yl)-5-methyl-N-(4-(4-(oxetan-3-yl)piperazin-1-yl)phenyl)imidazo[1,2-a]pyrazin-8-amine; and

6-(6-amino-5-methylpyrazin-2-yl)-N-(4-(4-(oxetan-3-yl)piperazin-1-yl)phenyl)imidazo[1,2-a]pyrazin-8-amine;

or a pharmaceutically acceptable salt, pharmaceutically acceptable co-crystal, pharmaceutically acceptable ester, stereoisomer, mixture of stereoisomers, or tautomer thereof.

20. The use according to any one of claims 1 to 3, wherein the compound of Formula I has the structure:



or a pharmaceutically acceptable salt, pharmaceutically acceptable co-crystal, pharmaceutically acceptable ester, stereoisomer, mixture of stereoisomers, or tautomer thereof.

21. The use according to any one of claims 1 to 20, wherein the spleen tyrosine kinase mediates a disease or condition selected from an inflammatory disorder, an allergic disorder, an autoimmune disease, and a cancer.

24. The use according to claim 21, wherein the disease or condition is selected from systemic lupus erythematosus, myestenia gravis, Goodpasture's syndrome, glomerulonephritis, hemorrhage, pulmonary hemorrhage, atherosclerosis, rheumatoid arthritis, psoriatic arthritis,

monoarticular arthritis, osteoarthritis, gouty arthritis, spondylitis, Behçet's disease, autoimmune thyroiditis, Reynaud's syndrome, acute disseminated encephalomyelitis, chronic idiopathic thrombocytopenic purpura, multiple sclerosis, Sjögren's syndrome, autoimmune hemolytic anemia, tissue graft rejection, hyperacute rejection of transplanted organs, allograft rejection, graft-versus-host disease, disease involving leukocyte diapedesis, a disease state due to leukocyte dyscrasia and metastasis, granulocyte transfusion-associated syndromes, cytokine-induced toxicity, scleroderma, vasculitis, asthma, psoriasis, chronic inflammatory bowel disease, ulcerative colitis, Crohn's disease, necrotizing enterocolitis, irritable bowel syndrome, dermatomyositis, Addison's disease, Parkinson's disease, Alzheimer's disease, diabetes, type I diabetes mellitus, sepsis, septic shock, endotoxic shock, gram negative sepsis, gram positive sepsis, toxic shock syndrome, multiple organ injury syndrome secondary to septicemia, trauma, hypovolemic shock, allergic conjunctivitis, vernal conjunctivitis, thyroid-associated ophthalmopathy, eosinophilic granuloma, eczema, chronic bronchitis, acute respiratory distress syndrome, allergic rhinitis, coryza, hay fever, bronchial asthma, silicosis, pulmonary sarcoidosis, pleurisy, alveolitis, emphysema, pneumonia, bacterial pneumonia, bronchiectasis, pulmonary oxygen toxicity, reperfusion injury of the myocardium, reperfusion injury of the brain, reperfusion injury of the extremities, thermal injury, cystic fibrosis, keloid formation or scar tissue formation, fever and myalgias due to infection, brain or spinal cord injury due to minor trauma, acute hypersensitivity, delayed hypersensitivity, urticaria, food allergies, skin sunburn, inflammatory pelvic disease, urethritis, uveitis, sinusitis, pneumonitis, encephalitis, meningitis, myocarditis, nephritis, osteomyelitis, myositis, hepatitis, alcoholic hepatitis, gastritis, enteritis, contact dermatitis, atopic dermatitis, gingivitis, appendicitis, pancreatitis, cholocystitis, polycythemia vera, essential thrombocythemia, or polycystic kidney disease.

23. The use according to claim 21, wherein the disease or condition is selected from systemic lupus erythematosus, myestenia gravis, rheumatoid arthritis, acute disseminated encephalomyelitis, idiopathic thrombocytopenic purpura, multiple sclerosis, Sjögren's syndrome, psoriasis, autoimmune hemolytic anemia, asthma, ulcerative colitis, Crohn's disease, irritable bowel disease, or chronic obstructive pulmonary disease.

24. The use according to claim 21, wherein the disease or condition is selected from asthma, rheumatoid arthritis, multiple sclerosis, chronic obstructive pulmonary disease, or systemic lupus erythematosus.

25. The use according to claim 21, wherein the disease or condition is a cancer selected from a hematologic malignancy and a solid tumor.

26. The use according to claim 25, wherein the disease or condition is selected from small lymphocytic lymphoma, non-Hodgkin's lymphoma, indolent non-Hodgkin's lymphoma, refractory indolent non-Hodgkin's lymphoma, mantle cell lymphoma, follicular lymphoma, lymphoplasmacytic lymphoma, marginal zone lymphoma, immunoblastic large cell lymphoma, lymphoblastic lymphoma, splenic marginal zone B-cell lymphoma with villous lymphocytes, splenic marginal zone B-cell lymphoma without villous lymphocytes, nodal marginal zone lymphoma with monocytoid B-cells, nodal marginal zone lymphoma without monocytoid B-cells, extranodal marginal zone B-cell lymphoma of mucosa-associated lymphoid tissue type, cutaneous T-cell lymphoma, extranodal T-cell lymphoma, anaplastic large cell lymphoma, angioimmunoblastic T-cell lymphoma, mycosis fungoides, B-cell lymphoma, diffuse large B-cell lymphoma, mediastinal large B-cell lymphoma, intravascular large B-cell lymphoma, primary effusion lymphoma, small non-cleaved cell lymphoma, Burkitt's lymphoma, multiple myeloma, plasmacytoma, acute lymphocytic leukemia, T-cell acute lymphoblastic leukemia, B-cell acute lymphoblastic leukemia, B-cell prolymphocytic leukemia, acute myeloid leukemia, chronic lymphocytic leukemia, juvenile myelomonocytic leukemia, minimal residual disease, hairy cell leukemia, primary myelofibrosis, secondary myelofibrosis, chronic myeloid leukemia, myelodysplastic syndrome, myeloproliferative disease, or Waldestrom's macroglobulinemia.

27. The use according to claim 25, wherein the disease or condition is a solid tumor, wherein the solid tumor is from a cancer selected from pancreatic cancer, urological cancer, bladder cancer, colorectal cancer, colon cancer, breast cancer, prostate cancer, renal cancer, hepatocellular cancer, thyroid cancer, gall bladder cancer, small-cell lung cancer, non-small cell lung cancer, ovarian cancer, cervical cancer, gastric cancer, endometrial cancer, esophageal cancer, head and neck cancer, melanoma, neuroendocrine cancer, central nervous system cancer, glioma, anaplastic oligodendroglioma, adult glioblastoma multiforme, adult anaplastic astrocytoma, bone cancer, soft tissue sarcoma, retinoblastomas, neuroblastomas, peritoneal effusions, malignant pleural effusions, mesotheliomas, Wilms' tumors, trophoblastic neoplasms, hemangiopericytomas, Kaposi's sarcomas, myxoid carcinoma, round cell carcinoma, squamous cell carcinomas, esophageal squamous cell carcinomas, oral carcinomas, cancers of the adrenal cortex, and adrenocorticotropic hormone-producing tumors.

28. The use according to claim 25, wherein the hematologic malignancy is selected from lymphoma, multiple myeloma, and leukemia.

29. The use according to claim 28, wherein the leukemia is selected from acute lymphocytic leukemia, T-cell acute lymphoblastic leukemia, B-cell acute lymphoblastic leukemia, B-cell prolymphocytic leukemia, acute myeloid leukemia, chronic lymphocytic leukemia, juvenile myelomonocytic leukemia, or hairy cell leukemia.

30. The use according to claim 29, wherein the leukemia is acute myeloid leukemia.