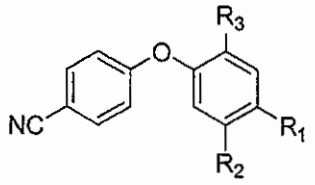
CLAIMS

I/we claim:

1. A compound which is represented by Formula I



I

wherein $R_1$, $R_2$, and $R_3$ are independently hydrogen, halo, hydroxyl, optionally substituted alkoxyl, optionally substituted thioalkoxy, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted heterocycloalkyl, optionally substituted aryl, optionally substituted aralkyl, optionally substituted heteroaryl, optionally substituted heteroarakyl, $-(C)_mNHC(X)NH(C)_nR_a-$, $-(C)_pNHC(X)R_b-$, $-(C)_qNHS(O)_2R_c$, $-(C)_r(X)NHR_d-$, or $-(C)_sNH(C)_tR_e$;

wherein $R_a$, $R_b$, $R_c$, $R_d$ and $R_e$ are independently hydrogen, halo, hydroxyl, optionally substituted alkoxyl, optionally substituted thioalkoxy, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substitutedcycloalkyl, optionally substituted heterocycloalkyl, optionally substitutedaryl, optionally substituted aralkyl, optionally substituted heteroaryl, optionally substituted heteroarakyl;

X=O or S; and

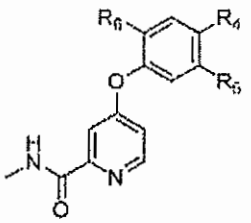
m, n, p, q, r, s, t=0, 1, or 2.

2. The compound of claim 1, wherein $R_1$, $R_2$, and $R_3$ are independently hydrogen, optionally substituted lower alkyl, $-(C)_mNHC(X)NH(C)_n R_a-$, $-(C)_pNHC(X)R_b-$, $-(C)_qNHS(O)_2R_c$, or $-(C)_sNH(C)_tR_e$.

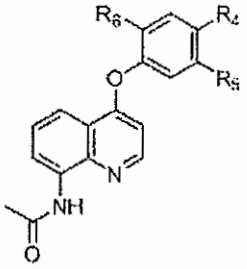
3. The compound of claim 1 or 2, wherein $R_a$, $R_b$, $R_c$, $R_d$ and $R_e$ are independently phenyl or naphthyl, optionally substituted with 1 to 3 groups selected from the group consisting of halo, optionally substituted lower alkyl (such as halo-substituted lower alkyl, e.g. trifluoromethyl), optionally substituted alkoxyl (e.g. such as halo-substituted lower alkoxyl, e.g. trifluoromethyl) and optionally substituted aryloxy (e.g. cyano-substituted phenoxy).

4. The compound of claim 1, which is one of the compounds SC-1, SC-48, SC-49, SC-54, SC-55, SC-56, SC-58, SC-43, SC-44, SC-45, SC-50, SC-51, SC-52, SC-59, SC-60 and SC-40.

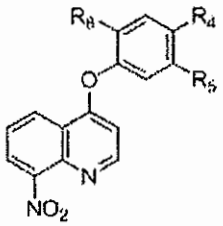
5. A compound which is represented by Formula II(a), II(b) or II(c)



II(a)



II(b)



II(c)

wherein $R_4$, $R_6$ and $R_6$ are independently hydrogen, halo, hydroxyl, optionally substituted alkoxyl, optionally substituted thioalkoxy, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted heterocycloalkyl, optionally substituted aryl, optionally substituted aralkyl, optionally substituted heteroaryl, optionally substituted heteroarakyl, $-(C)_mNHC(X)NH(C)_n R_a-$, $-(C)_pNHC(X)R_b-$, $-(C)_qNHS(O)_2R_c$, $-(C)_r(X)NHR_d-$, or $-(C)_sNH(C)_tR_e$;

wherein $R_a$, $R_b$, $R_c$, $R_d$ and $R_e$ are independently hydrogen, halo, hydroxyl, optionally substituted alkoxyl, optionally substituted thioalkoxy, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substitutedcycloalkyl, optionally substituted heterocycloalkyl, optionally substituted aryl, optionally substituted aralkyl, optionally substituted heteroaryl, optionally substituted heteroarakyl;

X=O or S; and

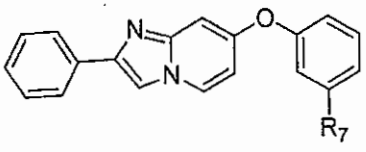
m, n, p, q, r, s, t=0, 1, or 2.

6. The compound of claim 5, wherein $R_4$, $R_5$ and $R_6$ are independently hydrogen, optionally substituted lower alkyl, $-(C)_mNHC(X)NH(C)_n R_a-$, $-(C)_pNHC(X)R_b-$, $-(C)_qNHS(O)_2R_c$, or $-(C)_sNH(C)_tR_e$.

7. The compound of claim 5 or 6, wherein $R_a$, $R_b$, $R_c$, $R_d$ and $R_e$ are independently phenyl or naphthyl, optionally substituted with 1 to 3 groups selected from the group consisting of halo, optionally substituted lower alkyl (such as halo-substituted lower alkyl, e.g. trifluoromethyl), optionally substituted alkoxyl (e.g. such as halo-substituted lower alkoxyl, e.g. trifluoromethyl) and optionally substituted aryloxy (e.g. cyano-substituted phenoxy).

8. The compound of claim 5, which is one of the compounds SC-31, SC-32, SC-33, SC-34 and SC-35.

9. A compound which is represented by Formula III



III

wherein $R_7$ is hydrogen, halo, hydroxyl, optionally substituted alkoxyl, optionally substituted thioalkoxy, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted cycloalkyl, optionally substituted heterocycloalkyl, optionally substituted aryl, optionally substituted aralkyl, optionally substituted heteroaryl, optionally substituted heteroarakyl, $-(C)_mNHC(X)NH(C)_n R_a-$, $-(C)_pNHC(X)R_b-$, $-(C)_qNHS(O)_2R_c$, $-(C)_r(X)NHR_d-$, or $-(C)_sNH(C)_tR_e$;

wherein $R_a$, $R_b$, $R_c$, $R_d$ and $R_e$ are independently hydrogen, halo, hydroxyl, optionally substituted alkoxyl, optionally substituted thioalkoxy, optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substitutedcycloalkyl, optionally substituted heterocycloalkyl, optionally substituted aryl, optionally substituted aralkyl, optionally substituted heteroaryl, optionally substituted heteroarakyl;

X=O or S; and

m, n, p, q, r, s, t=0, 1, or 2.

10. The compound of claim 9, wherein $R_7$ is independently hydrogen, optionally substituted lower alkyl, $-(C)_mNHC(X)NH(C)_n R_a-$, $-(C)_pNHC(X)R_b-$, $-(C)_qNHS(O)_2R_c$, or $-(C)_sNH(C)_tR_e$.

11. The compound of claim 9 or 10, wherein $R_a$, $R_b$, $R_c$, $R_d$ and $R_e$ are independently phenyl or naphthyl, optionally substituted with 1 to 3 groups selected from the group consisting of halo, optionally substituted lower alkyl (such as halo-substituted lower alkyl, e.g. trifluoromethyl), optionally substituted alkoxyl (e.g. such as halo-substituted lower alkoxyl, e.g. trifluoromethyl) and optionally substituted aryloxy (e.g. cyano-substituted phenoxy).

12. The compound of claim 9, which is one of the compounds SC-36, SC-37and SC-38.

13. A pharmaceutical composition comprising a compound as defined in any of claim 1 to 11 and a pharmacological acceptable carrier.

14. A pharmaceutical composition for increasing Src homology-2 containing protein tyrosine phosphatase-1 (SHP-1) expression in a cell, comprising a compound as defined in any of claim 1 to 11 and a pharmacological acceptable carrier.

15. A pharmaceutical composition for treating a disease or condition characterized by decreased Src homology-2 containing protein tyrosine phosphatase-1 (SHP-1), comprising a compound as defined in any of claim 1 to 11 and a pharmacological acceptable carrier.

16. A method for increasing Src homology-2 containing protein tyrosine phosphatase-1 (SHP-1) expression in a cell, comprising contacting the cell with an effective amount of a compound as defined in any of claim 1 to 11 or a pharmaceutical composition of claim 13.

17. A method for treating a disease or condition characterized by decreased Src homology-2 containing protein tyrosine phosphatase-1 (SHP-1) expression in a subject in need thereof, comprising administering to the subject an effective amount of a compound as defined in any of claim 1 to 11 or a pharmaceutical composition of claim 13.

18. The method of claim 16, wherein the disease or condition characterized by decreased SHP-1 expression is cancer and osteoporosis.

19. The method of claim18, wherein the cancer is hepatocellular carcinoma (e.g. hepatocellular carcinoma, leukemia, lung cancer, breast cancer, renal cancer, thyroid cancer colon, head and neck cancer.

20. Use of a compound as defined in any of claim 1 to 11 for manufacture of a medicament for treating a disease or condition characterized by decreased Src homology-2 containing protein tyrosine phosphatase-1 (SHP-1) expression.

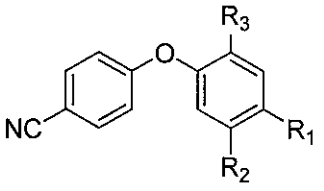
21. Use of claim 20, wherein the disease or condition characterized by decreased SHP-1 expression is cancer and osteoporosis.

22. Use of claim 21, wherein the cancer is hepatocellular carcinoma (e.g. hepatocellular carcinoma, leukemia, lung cancer, breast cancer, renal cancer, thyroid cancer colon, head and neck cancer.

CLAIMS

What is claimed is:

1. A compound which is represented by Formula I



I

wherein $R_1$ and $R_3$ are independently hydrogen, halo, hydroxyl, alkoxyl, thioalkoxy, alkyl, alkenyl, alkynyl, cycloalkyl, heterocycloalkyl, aryl, aralkyl, or heteroarakyl;

wherein $R_2$ is independently $-(C)_mNHC(X)NH(C)_nR_a-$, $-(C)_pNHC(X)R_b-$, $-(C)_qNHS(O)_2R_c$, $-(C)_r(X)NHR_d-$,or $-(C)_sNH(C)_tR_e$; wherein $R_a$, $R_b$, $R_c$, $R_d$ and $R_e$ are independently hydrogen, halo, hydroxyl, alkoxyl, thioalkoxy, alkyl, alkenyl, alkynyl, cycloalkyl, heterocycloalkyl, aryl, aralkyl, or heteroarakyl;

X=O or S; and

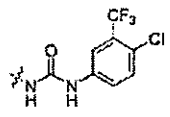
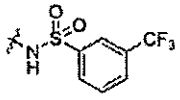
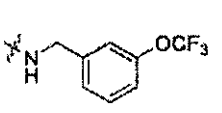
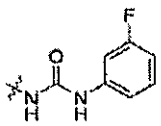
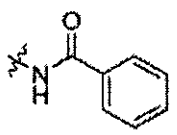
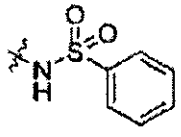
m, n, p, q, r, s, t=0, 1, or 2.

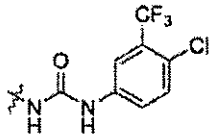
2. The compound of claim 1, wherein $R_1$ and $R_3$ are independently hydrogen or lower alkyl.

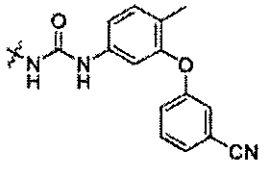
3. The compound of claim 1 or 2, wherein $R_a$, $R_b$, $R_c$, $R_d$ and $R_e$ are independently phenyl or naphthyl, with 1 to 3 groups selected from the group consisting of halo, lower alkyl (such as halo-substituted lower alkyl, e.g. trifluoromethyl), alkoxyl (e.g. such as halo-substituted lower alkoxyl, e.g. trifluoromethyl) and aryloxy (e.g. cyano-substituted phenoxy).

4. The compound of claim 1,

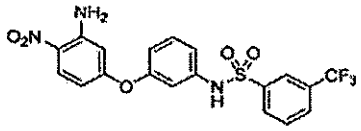
wherein (i) $R_1$ and $R_3$ are independently hydrogen; and

$R_2$ is , , , ,  or  ; or

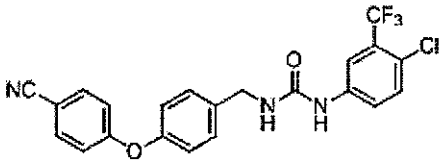
(ii) $R_1$ is independently hydrogen; $R_3$ is methyl; and $R_2$ is  or



5. A compound which is represented by



6. A compound which is represented by



7. A pharmaceutical composition comprising a compound as defined in any of claim 1 to 6 and a pharmacological acceptable carrier.

8. A pharmaceutical composition for increasing Src homology-2 containing protein tyrosine phosphatase-1 (SHP-1) expression in a cell, comprising a compound as defined in any of claim 1 to 6 and a pharmacological acceptable carrier.

9. A pharmaceutical composition for treating a disease or condition characterized by decreased Src homology-2 containing protein tyrosine phosphatase-1 (SHP-1), comprising a compound as defined in any of claim 1 to 6 and a pharmacological acceptable carrier.

10. A method for increasing Src homology-2 containing protein tyrosine phosphatase-1 (SHP-1) expression in a cell *in vitro*, comprising contacting the cell with an effective amount of a compound as defined in any of claim 1 to 6 or a pharmaceutical composition of claim 7.

11. Use of a compound as defined in any of claim 1 to 6 for manufacture of a medicament for treating a disease or condition characterized by decreased Src homology-2 containing protein

tyrosine phosphatase-1 (SHP-1) expression, wherein the disease or condition characterized by decreased SHP-1 expression is cancer and osteoporosis.

12. Use of claim 11, wherein the cancer is hepatocellular carcinoma (e.g. hepatocellular carcinoma, leukemia, lung cancer, breast cancer, renal cancer, thyroid cancer colon, head and neck cancer.