Oxidative stress

[005] Oxidative stress is caused by an imbalance between the production of reactive oxygen species and a biological system's ability to readily detoxify the reactive intermediates or easily repair the resulting damage. Although reactive oxygen species can be beneficial, as they are used in cell signaling and by the immune system they are also involved in many diseases. Therefore, a need still exists for compounds which can help maintain a proper balance in levels of reactive oxygen species in order to prevent damage to the cell or its components that may be caused by toxic effects of such reactive species.

[006] The present invention addresses these needs for new treatment methods, compounds, and pharmaceutical compositions.

[007] Indeed, it was unknown prior to the present invention that substituted aromatic compounds as defined herein may be therapeutically effective agents for the prevention and/or treatment of (i) blood disorders, (ii) renal disorders, nephropathy, and/or a renal disorder complication; (iii) an inflammatory-related disease; and/or (iv) oxidative stress related disorder.

[008] Additional features of the invention will be apparent from review of the disclosure, figures and description of the invention below.

BRIEF SUMMARY OF THE INVENTION

[009] The present ~~invention~~disclosure relates to compounds, compositions and treatment regimens for the prevention and/or treatment of various diseases and conditions in subjects.

[0010] Particular ~~aspects~~embodiments of the ~~invention~~disclosure relates to the use of compounds according to any of Formula I, Formula II, Formula IIA, Formula IIB, Formula III, Formula IV, Formula IVA, Formula IVB, Formula V, Formula VA as defined herein, and pharmaceutically acceptable salts thereof. The salt may be selected from the group consisting of sodium, potassium, calcium and magnesium. Preferably, the compound is the sodium salt of Compound I or the sodium salt of compound XI. Specific examples of compounds according to the invention are represented in **Table 2**.

[0011] One particular ~~aspect~~embodiment of the ~~invention~~disclosure concerns the use of a compound represented by any of the formulas as defined herein for use in preventing and/or

treating (i) blood disorders (e.g. anemia, neutropenia) (ii) renal disorders and/or renal disorder complications; (iii) inflammatory-related diseases (e.g. autoimmune disease); and (iv) oxidative stress.

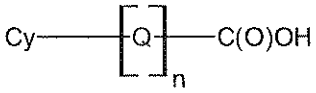
[0012] Another related ~~aspect~~embodiment of the ~~invention~~disclosure concerns the use of a compound represented by any of the formulas as defined herein for the manufacture of a medications and pharmaceutical compositions. One particular example is a nephroprotective composition comprising a compound represented by any of the formulas as defined herein, and a pharmaceutically acceptable carrier.

[0013] The ~~invention~~disclosure also relates to compounds according to any of Formula I, Formula II, Formula IIA, Formula IIB, Formula III, Formula IV, Formula IVA, Formula IVB, Formula V, Formula VA as defined herein, and a pharmaceutically acceptable salts thereof, for use in preventing and/or treating (i) blood disorders (ii) renal disorders and/or renal disorder complications; (iii) inflammatory-related diseases; and/or (iv) oxidative stress.

[0014] The ~~invention~~disclosure further relates to methods of preventing and/or treating various diseases and conditions including, but not limited (i) blood disorders (e.g. anemia, neutropenia) (ii) renal disorders and/or renal disorder complications; (iii) inflammatory-related diseases (e.g. autoimmune disease); and/or (iv) oxidative stress. The method comprises administering to a human patient in need thereof a pharmacologically effective amount of a compound represented by any of the formulas as defined herein.

[0015] The ~~invention~~disclosure further relates to compounds according to any of Formula I, Formula II, Formula IIA, Formula IIB, Formula III, Formula IV, Formula IVA, Formula IVB, Formula V, Formula VA as defined herein, and pharmaceutically acceptable salts thereof, as prophylactically effective and/or therapeutically effective agents against various diseases and conditions in subjects.

[0015a] In one aspect, there is provided a compound represented by Formula I:



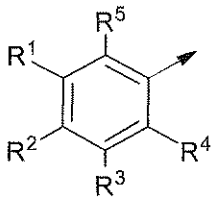
I

or a pharmaceutically acceptable salt thereof,

wherein:

n is 1;

Q is selected from the group consisting of: linear or branched C_1, C_3, or C_4 alkyl optionally substituted with one R^a substituent, linear C_2 alkyl optionally substituted with one R^a substituent, and branched C_2 alkyl substituted with R^a;

Cy is 

wherein

R^1 is linear or branched C_5-C_6 alkyl or C_5-C_6 alkenyl;

R^2 is H, halogen or OR^b;
R^3 is H, halogen or OR^b;
R^4 is H, halogen or OR^b;
R^5 is H or OR^b;
R^a is OR^b; and
R^b is H;

for use in preventing and/or treating a condition selected from the group consisting of (i) blood disorders (ii) renal disorders, nephropathies, and/or renal disorder complications; (iii) inflammatory-related diseases; and (iv) oxidative stress related disorders.

[0015b] In another aspect, there is provided the use of a compound as defined above, in the manufacture of a medication for preventing and/or treating a condition in a subject wherein said condition is (i) a blood disorder (ii) a renal disorder, a nephropathy, or a renal disorder complication; (iii) an inflammatory-related disease; or (iv) an oxidative stress related disorder.

[0015c] In another aspect, there is provided a pharmaceutical composition comprising the compound as defined above, for use in preventing and/or treating a condition, wherein said condition is (i) a blood disorder (ii) a renal disorder, a nephropathy, or a renal disorder complication; (iii) a inflammatory-related disease; or (iv) an oxidative stress related disorder.

[0015d] In another aspect, there is provided the use of a pharmaceutical composition as defined above in the manufacture of a medicament for preventing and/or treating a blood disorder in a subject in need thereof.

[0015e] In another aspect, there is provided the use of a pharmaceutical composition as defined above in the manufacture of a medicament for preventing and/or treating a renal disorder and/or a renal disorder complication in a subject in need thereof.

[0015f] In another aspect, there is provided the use of a pharmaceutical composition as defined above in the manufacture of a medicament for improving kidney function in a human subject in need thereof.

[0015g] In another aspect, there is provided the use of a pharmaceutical composition as defined above in the manufacture of a medicament for preventing and/or treating an inflammatory-related disease in a subject in need thereof.

[0015h] In another aspect, there is provided the use of a pharmaceutical composition as defined above in the manufacture of a medicament for nephroprotection against toxic effects arising from a treatment with a chemotherapeutic agent in a subject, wherein said medicament is to be administered to the subject before and/or following treatment with the chemotherapeutic agent.

[0015i] In another aspect, there is provided the use of a pharmaceutical composition as defined above in the manufacture of a medicament for preventing and/or treating an oxidative stress related disorder in a subject in need thereof.

[0016] Further aspects of the invention will be apparent to a person skilled in the art from the following description, and claims and generalizations therein.

BRIEF DESCRIPTION OF THE FIGURES

[0017] In order that the invention may be readily understood, embodiments of the invention are illustrated by way of examples in the accompanying drawings.