3. SUMMARY

[0007] ~~In a first aspect, the present invention refers to the use of a Platelet Factor-4 (PF-4) interacting heparinoid in the manufacture of a medicament for treating cancer in a subject, wherein the medicament is adjunctively administered with a myelosuppressive treatment regimen and wherein the PF-4 interacting heparinoid is substantially non-anticoagulating. In a second aspect, the present invention refers to the use of a Platelet Factor-4 (PF-4) interacting heparinoid in the preparation of a medicament for use in preventing or treating radiation-induced thrombocytopenia in a subject, wherein the subject is exposed to ionizing radiation and wherein the PF4-interating heparinoid is substantially non-anticoagulating. In a third aspect, the present invention refers to the use of a Platelet Factor-4 (PF-4) interacting heparinoid in the preparation of a medicament for treating thrombocytopenia in a subject, wherein the PF4-interacting heparinoid is substantially non-anticoagulating.~~ In a ~~fourth~~ first aspect, the present invention refers to the use of a Platelet Factor-4 (PF-4) interacting heparinoid in the preparation of a medicament for treating neutropenia in a subject, wherein the PF-4 interacting heparinoid is substantially non-anticoagulating and wherein the neutropenia results from an anti-neoplastic myelosuppressive treatment regimen. In one example, methods are described for attenuating a myelosuppressive side effect of a patient treatment regimen. The methods comprise adjunctively administering to the patient a therapeutically effective amount of a platelet factor 4-interacting heparinoid (hereinafter "PF4-interacting heparinoid"). As disclosed herein, a myelosuppressive side effect is the occurrence of thrombocytopenia and/or neutropenia, and a patient treatment regimen having a myelosuppressive side effect is a treatment regimen that induces, as a side effect, one or both of thrombocytopenia and neutropenia. In various examples, this provides uses of a PF4-interacting heparinoid, e.g., ODSH, in the attenuation of a myelosuppressive side effect of a patient treatment regimen.

[0008] Numerous patient treatment regimens have myelosuppressive side effects, including antineoplastic treatment regimens, such as chemotherapy and radiation therapy, antibody therapy, including treatment regimens used to treat cancer and/or auto-immune diseases, and transplant procedures, such as bone marrow or stem cell transplant. In certain examples, the patient treatment regimen comprises chemotherapy and/or radiation therapy and/or antibody therapy. In one

What is claimed is:

1. Use of a Platelet Factor-4 (PF-4) interacting heparinoid in the preparation of a medicament for treating neutropenia in a subject, wherein the PF-4 interacting heparinoid is substantially non-anticoagulating and wherein the neutropenia results from an anti-neoplastic myelosuppressive treatment regimen.

2. The use according to claim 1, wherein the anti-neoplastic myelosuppressive treatment regimen comprises administration of one or more chemotherapeutic agents.

3. The use according to claim 2, wherein the one or more chemotherapeutic agents comprises gemcitabine and/or nab-paclitaxel.

4. The use according to claim 2, wherein the one or more chemotherapeutic agents comprises cytarabine and/or anthracycline.

5. The use according to any of the preceding claims, wherein the anti-neoplastic myelosuppressive treatment regimen comprises or further comprises radiation therapy.

6. The use according to any of the preceding claims, wherein the subject is a human.

7. The use according to any of the preceding claims, wherein the PF4-interacting heparinoid is substantially desulfated at the 2-O position and/or the 3-O position.

8. The use according to claim 7, wherein the PF4-interacting heparinoid is substantially desulfated at each of the 2-O and 3-O positions.

9. The use according to claim 7 or claim 8, wherein the PF4-interacting heparinoid is at least 85%, 90%, or 95% desulfated at the 2-O position.

10. The use according to claim 7 or claim 8, wherein the PF4-interacting heparinoid is at least 85%, 90%, or 95% desulfated at the 3-O position.

11. The use according to claim 8, wherein the PF4 interacting heparinoid is at least 85%, 90%, or 95% desulfated at each of the 2-O and 3-O positions.

12. The use according to any of the preceding claims, wherein the PF4-interacting heparinoid has an average molecular weight of about 8 kDa to about 15 kDa, about 11 kDa to about 14 kDa, or about 11 kDa to about 13 kDa.

13. The use according to claim 12, wherein the PF4-interacting heparinoid is a heparinoid that is substantially desulfated at 2-0 and 3-0 positions (ODSH).

14. The use according to any of the preceding claims, wherein the medicament is for subcutaneous administration.

15. The use according to any of the preceding claims, wherein the medicament is for administration intravenously.

16. The use according to claim-15, wherein the medicament is for administration as one or more bolus injections.

17. The use according to claim 16, wherein the one or more bolus injections are administered at a dose of about 1 mg/kg to about 25 mg/kg, about 1 mg/kg to about 10 mg/kg, about 1 mg/kg to about 5 mg/kg, or about 2 mg/kg to about 4 mg/kg.

18. The use according to any of the preceding claims, wherein the medicament is for administration concurrently, sequentially, and/or separately with the myelosuppressive treatment regimen.

19. The use according to any of the preceding claims, wherein the subject has been diagnosed with cancer.

20. The use according to claim 20, wherein the cancer is acute myelogenous leukemia (AML) and the anti-neoplastic myelosuppressive treatment regimen is a regimen suitable for treating the acute myelogenous leukemia (AML).

What is claimed is:

1. Use of a Platelet Factor-4 (PF-4) interacting heparinoid in the manufacture of a medicament for treating cancer in a subject, wherein the medicament is adjunctively administered with a myelosuppressive treatment regimen and wherein the PF-4 interacting heparinoid is substantially non-anticoagulating.

2. The use according to claim 1, wherein the myelosuppressive treatment regimen induces thrombocytopenia and/or neutropenia.

3. The use according to claim 1 or 2, wherein the myelosuppressive treatment regimen comprises an antineoplastic treatment regimen.

4. The use according to claim 3, wherein the antineoplastic treatment regimen comprises one or more chemotherapeutic agents.

5. The use according to claim 4, wherein the one or more chemotherapeutic agents comprises gemcitabine and/or nab-paclitaxel.

6. The use according to claim 3, wherein the antineoplastic treatment regimen comprises radiation therapy.

7. The use according to any of claims 1 to 6, wherein the cancer is pancreatic cancer, ovarian cancer, uterine cancer, breast cancer, metastatic breast cancer, recurrent breast cancer, head and neck cancer, bladder cancer, urothelial cancer, lung cancer, colorectal cancer, gastric cancer, esophageal cancer, lymphoma, liver cancer, melanoma, prostate cancer, osteosarcoma, leukemia, acute myelogenous leukemia or pediatric acute lymphoblastic leukemia.

8. The use according to claim 7, wherein the cancer is acute myelogenous leukemia (AML) and the myelosuppressive treatment regimen is a regimen suitable for treating the acute myelogenous leukemia (AML).

9. The use according to claim 8, wherein the myelosuppressive treatment regimen comprises cytarabine and/or anthracycline.

10. The use of any of claims 1 to 9, wherein the subject is a human.

11. The use according to any of claims 1 to 10, wherein the PF4-interacting heparinoid is substantially desulfated at the 2-O position and/or the 3-O position.

12. The use according to claim 11, wherein the PF4-interacting heparinoid is at least 85%, 90%, or 95% desulfated at the 2-O position.

13. The use according to claim 11, wherein the PF4-interacting heparinoid is at least 85%, 90%, or 95% desulfated at the 3-O position.

14. The use according to any of claims 1 to 10, wherein the PF4-interacting heparinoid is substantially desulfated at each of the 2-O and 3-O positions.

15. The use according to claim 14, wherein the PF4 interacting heparinoid is at least 85%, 90%, or 95% desulfated at each of the 2-O and 3-O positions.

16. The use according to any of claims 1 to 15, wherein the PF4-interacting heparinoid has an average molecular weight of about 8 kDa to about 15 kDa, about 11 kDa to about 14 kDa, or about 11 kDa to about 13 kDa.

17. The use according to any of claims 1 to 16, wherein the PF4-interacting heparinoid is ODSH.

18. The use according to any of claims 1 to17, wherein the medicament is for administration parenterally or subcutaneously.

19. The use according to claim 18, wherein the medicament is for administration intravenously.

20. The use according to claim 18 or 19, wherein the medicament is for administration as one or more bolus injections.

21. The use according to claim 20, wherein the one or more bolus injections are administered at a dose of about 1 mg/kg to about 25 mg/kg, about 1 mg/kg to about 10 mg/kg, about 1 mg/kg to about 5 mg/kg, or about 2 mg/kg to about 4 mg/kg.

22. The use according to any of claims 1 to 21, wherein the medicament is for administration concurrently, sequentially, and/or separately with the myelosuppressive treatment regimen.

23. The use according to claim 22, wherein the medicament is for administration sequentially before, and/or after the myelosuppressive treatment regimen, or for administration separately before and/or after the myelosuppressive treatment regimen.

24. Use of a Platelet Factor-4 (PF-4) interacting heparinoid in the preparation of a medicament for use in preventing or treating radiation-induced thrombocytopenia in a subject, wherein the subject is exposed to ionizing radiation and wherein the PF4-interating heparinoid is substantially non-anticoagulating.

25. The use according to claim 24, wherein the ionizing radiation is part of a patient treatment regimen or is not part of a patient treatment regimen.

26. Use of a Platelet Factor-4 (PF-4) interacting heparinoid in the preparation of a medicament for treating thrombocytopenia in a subject, wherein the PF4-interacting heparinoid is substantially non-anticoagulating.

27. Use of a Platelet Factor-4 (PF-4) interacting heparinoid in the preparation of a medicament for treating neutropenia in a subject, wherein the PF-4 interacting heparinoid is substantially non-anticoagulating.