SUMMARY OF THE INVENTION

[0006] In one aspect, the present invention refers to the use of a heparinoid in the manufacture of a medicament for treating or preventing radiation-induced gastrointestinal damage in a subject resulting from whole-body radiation wherein the heparinoid is to be administered to the subject prior to exposure to whole-body radiation, following exposure to whole-body radiation, or combinations thereof. In one example, methods of treating or preventing radiation damage in a subject exposed to whole-body radiation are presented, comprising administering to a subject exposed to whole-body radiation a therapeutically or prophylactically effective amount of a low-anticoagulant heparinoid. In another example, methods are presented for extending the life of a subject exposed to whole-body radiation, comprising administering to a subject exposed to whole-body radiation a therapeutically or prophylactically effective amount of a low-anticoagulant heparinoid.

[0007] In certain examples, the low-anticoagulant heparinoid disclosed herein has an average molecular weight of about 8kDa to about 15kDa. The low-anticoagulant heparinoid may be desulfated or substantially desulfated at the 2-O position or the 3-O position. In certain examples, the low-anticoagulant heparinoid is desulfated or substantially desulfated at both the 2-O position and the 3-O position. In particular examples, the low-anticoagulant heparinoid is ODSH, which is described in greater detail herein below.

[0008] The low-anticoagulant heparinoid may be administered parenterally. In particular examples, the low-anticoagulant heparinoid is administered intravenously and/or subcutaneously.

[0009] The low-anticoagulant heparinoid may be administered prior to, and/or during, and/or following exposure to whole-body radiation. In certain examples, the subject is administered the low-anticoagulant heparinoid following exposure to whole-body radiation, such as within 60 hours after exposure to whole-body radiation. The subject may be administered the low-anticoagulant heparinoid immediately following, or about 2 hours or more after exposure to whole-body radiation.

We claim:

1. Use of a heparinoid at least 85% desulfated at the 2-O position or 3-O position in the manufacture of a medicament for treating or preventing radiation-induced gastrointestinal damage in a subject resulting from whole-body radiation, wherein the heparinoid is to be administered to the subject prior to exposure to whole-body radiation, following exposure to whole-body radiation, or combinations thereof.

2. The use of claim 1, wherein unit dosage form of the medicament comprises 1 mg to 1 g of the heparinoid.

3. The use of claim 1, wherein the heparinoid has an average molecular weight of 8 kDa to 15 kDa.

4. The use of claim 1, wherein the heparinoid is at least 85% desulfated at the 2-O and 3-O positions.

5. The use of claim 1, wherein the heparinoid is to be administered parenterally.

6. The use of claim 5, wherein the heparinoid is to be administered intravenously or subcutaneously.

7. The use of claim 1, wherein the subject is to be administered the heparinoid following exposure to whole-body radiation.

8. The use of claim 7, wherein the subject is to be administered the heparinoid within about 60 hours after exposure to whole-body radiation.

9. The use of claim 7, wherein the subject is to be administered the heparinoid about 2 hours or more after exposure to whole-body radiation.

10. The use of claim 1, wherein the subject is to be administered the heparinoid prior to exposure to whole-body radiation.

11. The use of claim 1, wherein the subject is exposed to whole-body radiation at a dose rate of about 0.1 Gy/min or greater.

12. The use of claim 11, wherein the subject is exposed to whole-body radiation at a dose rate of about 0.5 Gy/min or greater.

13. The use of claim 11, wherein the irradiation of the subject occurs over a time period of about 2 hours or less.

14. The use of claim 13, wherein the irradiation of the subject occurs over a time period of about 1 hour or less.

15. The use of claim 1, wherein a therapeutically or prophylactically effective amount of the heparinoid is to be administered to a subject exposed to whole-body radiation, wherein the amount is effective to treat or prevent radiation-induced gastrointestinal damage.

16. The use of claim 1, wherein the heparinoid is to be administered in one or more doses.

17. The use of claim 16, wherein the one or more doses are independently selected from 1 mg/kg to 40 mg/kg.

18. The use of claim 17, wherein the one or more doses are independently selected from 10 mg/kg to 30 mg/kg.

19. The use of claim 1, wherein the subject exposed to whole-body radiation has acute radiation syndrome.

20. The use of claim 1, further comprising one or more additional treatments.

21. The use of claim 20, wherein the one or more additional treatments are selected from a blood transfusion, antibiotics which are to be administered and a bone marrow transplant.

22. The use of claim 1, wherein the heparinoid is at least 85% desulfated at the 2-O position.

23. The use of claim 22, wherein the heparinoid is at least 90% desulfated at the 2-O position.

24. The use of claim 23, wherein the heparinoid is at least 95% desulfated at the 2-O position.

25. The use of claim 1, wherein the heparinoid is at least 85% desulfated at the 3-O position.

26. The use of claim 25, wherein the heparinoid is at least 90% desulfated at the 3-O position.

27. The use of claim 26, wherein the heparinoid is at least 95% desulfated at the 3-O position.

28. The use of claim 6, wherein the heparinoid is at least 90% desulfated at the 2-O and 3-O positions.

29. The use of claim 28, wherein the heparinoid is at least 95% desulfated at the 2-O and 3-O positions.