CLAIMS:

1. A method of increasing osteoblastic function in a subject, the method comprising systemically administering to the subject a population of stem cells and/or progeny thereof and/or soluble factors derived therefrom.

2. The method of claim 1 wherein the stem cells are multipotential cells.

3. The method of claim 2 wherein the multipotential cells are STRO-1^{+} cells.

4. The method of claim 2 wherein the multipotential cells are STRO-1^{bright} cells.

5. The method of any one of claims 1 to 4 wherein the stem cells stimulate production of osteocalcin by osteoblasts in the subject.

6. The method of any one of claims 1 to 5 wherein the subject is suffering from a disorder associated with low osteoblast levels or activity.

7. The method of claim 6 wherein the disorder is a metabolic bone disorder or male infertility.

8. The method of claim 7 wherein the metabolic bone disorder is selected from the group consisting of osteomalacia, osteoporosis, osteopetrosis, Paget's disease and X-linked hypophosphatemic rickets, renal failure-associated osteodystrophy, marble bone disease, osteitis fibrosa cystica and glucocorticoid-induced bone loss.

9. The method of claim 6, wherein the subject suffers from osteoporosis and the method prevents or reduces the risk of a fracture.

10. The method of any one of claims 1 to 8, wherein the subject suffers from a bone fracture.

11. The method of claim 10, wherein the method accelerates healing of the bone fracture and/or prevents delayed union of the bone fracture and/or prevents non-union of the bone fracture.

12. The method of any one of claims 1 to 11 wherein administration of the population of stem cells and/or progeny thereof and/or soluble factors derived therefrom results in an increase in plasma osteocalcin levels in the subject.

13. The method of claim 12 wherein administration of the population of stem cells and/or progeny thereof and/or soluble factors derived therefrom results in at least a five-fold increase in plasma osteocalcin levels within 2 weeks of administration.

14. The method of claim 12 wherein administration of the population of stem cells and/or progeny thereof and/or soluble factors derived therefrom results in at least a ten-fold increase in plasma osteocalcin levels within 2 weeks of administration.

15. The method of claim 12 wherein administration of the population of stem cells and/or progeny thereof and/or soluble factors derived therefrom results in at least a twenty-fold increase in plasma osteocalcin levels within 2 weeks of administration.

16. The method of any one of claims 1 to 15 wherein administration of the population of stem cells and/or progeny thereof and/or soluble factors derived therefrom results in an increase in plasma alkaline phosphatase levels in the subject.

17. The method of claim 16 wherein administration of the population of stem cells and/or progeny thereof and/or soluble factors derived therefrom results in at least a five percent increase in plasma alkaline phosphatase levels within 6 weeks of administration compared to the level of plasma alkaline phosphatase prior to administration.

18. The method of claim 16 wherein administration of the population of stem cells and/or progeny thereof and/or soluble factors derived therefrom results in at least a ten percent increase in plasma alkaline phosphatase levels within 6 weeks of administration compared to the level of plasma alkaline phosphatase prior to administration.

19. The method of any one of claims 1 to 18, wherein the population of stem cells and/or the progeny and/or the soluble factors are administered to the subject a plurality of times.

20. The method of claim 19, wherein the population and/or the progeny and/or the soluble factors are administered once every twelve or more weeks.

21. The method of any one of claims 1 to 20, comprising administering between 0.1 x 10^6 to 5 x 10^6 STRO-1^+ multipotential cells and/or progeny thereof per kg.

22. The method of any one of claims 1 to 21, comprising administering between 0.3 x 10^6 to 2 x 10^6 multipotential STRO-1^+ cells and/or progeny thereof per kg.

23. The method of any one of claims 1 to 22 comprising administering a low dose of multipotential STRO-1^+ cells and/or progeny thereof.

24. The method of claim 23, wherein the low dose of STRO-1^+ cells and/or progeny thereof comprises between 0.1 x 10^5 and 0.5 x 10^6 STRO-1^+ cells and/or progeny thereof per kg.

25. The method of claim 23, wherein the low dose of STRO-1^+ cells and/or progeny thereof comprises about 0.3 x 10^6 STRO-1^+ cells and/or progeny thereof per kg.

26. The method of any one of claims 1 to 25, wherein the population of stem cells and/or progeny cells are autogeneic or allogeneic and/or the soluble factors can be derived from autogeneic or allogeneic cells.

27. The method of any one of claims 1 to 26, wherein the population of multipotential cells and/or progeny cells have been culture expanded prior to administration and/or prior to obtaining the soluble factors.

28. The method of any one of claims 1 to 27, wherein the population of multipotential cells are STRO-1^{bright}, and/or express tissue non-specific alkaline phosphatase (TNAP) and/or the progeny cells and/or soluble factors are derived from STRO-1^+ cells that are STRO-1^{bright} and/or express TNAP.

29. The method according to any one of claims 1 to 29, wherein the stem cells and/or progeny cells thereof and/or soluble factors derived therefrom are administered intravenously.

30. The method according to any one of claims 1 to 29, wherein the stem cells and/or progeny cells thereof and/or soluble factors derived therefrom are administered

in the form of a composition comprising said stem cells and/or progeny cells thereof and/or soluble factors derived therefrom and a carrier and/or excipient.

CLAIMS

1. Use of a population of cells enriched for STRO-1^{+} multipotential cells in the manufacture of a medicament for systemic administration for therapeutically increasing osteoblastic function in a subject.

2. Use according to Claim 1, in which the multipotential cells are STRO-1^{bright} cells.

3. Use according to Claim 1 or 2, in which the cells stimulate production of osteocalcin by osteoblasts in the subject.

4. Use according to Claim 1, 2 or 3, in which the subject is suffering from a disorder associated with low osteoblast levels or activity.

5. Use according to Claim 4, in which the disorder is a metabolic bone disorder or male infertility.

6. Use according to Claim 5, in which the metabolic bone disorder is selected from the group consisting of osteomalacia, osteoporosis, osteopetrosis, Paget's disease and X-linked hypophosphatemic rickets, renal failure-associated osteodystrophy, marble bone disease, osteitis fibrosa cystica and glucocorticoid-induced bone loss.

7. Use according to Claim 4, in which the subject suffers from osteoporosis and the method prevents or reduces the risk of a fracture.

8. Use according to any preceding claim, in which the subject suffers from a bone fracture.

9. Use according to Claim 8, in which the method accelerates healing of the bone fracture and/or prevents delayed union of the bone fracture and/or prevents non-union of the bone fracture.

10. Use according to any preceding claim, in which administration of the population of cells results in an increase in plasma osteocalcin levels in the subject.

11. Use according to Claim 10, in which administration of the population of cells results in at least a five-fold increase in plasma osteocalcin levels within 2 weeks of administration.

12. Use according to Claim 10, in which administration of the population of cells results in at least a ten-fold increase in plasma osteocalcin levels within 2 weeks of administration.

13. Use according to Claim 10, in which administration of the population of cells results in at least a twenty-fold increase in plasma osteocalcin levels within 2 weeks of administration.

14. Use according to any preceding claim, in which administration of the population of cells results in an increase in plasma alkaline phosphatase levels in the subject.

15. Use according to Claim 14, in which administration of the population of cells and results in at least a five percent increase in plasma alkaline phosphatase levels within 6 weeks of administration compared to the level of plasma alkaline phosphatase prior to administration.

16. Use according to Claim 15, in which administration of the population of cells results in at least a ten percent increase in plasma alkaline phosphatase levels within 6 weeks of administration compared to the level of plasma alkaline phosphatase prior to administration.

17. Use according to any preceding claim, in which the population of cells is administered to the subject a plurality of times.

18. Use according to Claim 17, in which the population of cells is administered once every twelve or more weeks.

19. Use according to any preceding claim, comprising administering between 0.1×10^6 to 5×10^6 STRO-1^+ multipotential cells per kg.

20. Use according to any preceding claim, comprising administering between 0.3×10^6 to 2×10^6 STRO-1^+ multipotential cells per kg.

21. Use according to any of Claims 1 to 18, comprising administering a low dose of STRO-1^+ multipotential cells, in which the low dose of STRO-1^+ multipotential cells comprises between 0.1×10^5 and 0.5×10^6 STRO-1^+ multipotential cells per kg or about 0.3×10^6 STRO-1^+ multipotential cells per kg.

22. Use according to any preceding claim, in which the population of cells is autogeneic or allogeneic.

23. Use according to any preceding claim, in which the population of cells has been culture expanded prior to administration.

24. Use according to any preceding claim, in which the population of cells are STRO-1^{bright} and express tissue non-specific alkaline phosphatase (TNAP).

25. Use according to any preceding claim, in which the population of cells is administered intravenously.

26. Use according to any preceding claim, in which the population of cells is administered in the form of a composition comprising the population of cells and a carrier and/or excipient.