WHAT IS CLAIMED IS:

1. A method for stimulating growth factor production by human umbilical cord blood cells, said method comprising:

culturing said cells in a medium comprising a lithium salt,

wherein said growth factor is selected from the group consisting of a cell survival factor, an anti-differentiation factor, and combinations thereof, and

wherein said cell survival factor is selected from the group consisting of a neurotrophin, a cytokine, epidermal growth factor (EGF), platelet-derived growth factor (PDGF), fibroblast growth factor (FGF), insulin-like growth factor (IGF), and combinations thereof.

2. The method of claim 1, wherein said cell survival factor is a neurotrophin selected from the group consisting of neurotrophin-3 (NT-3), neurotrophin-4 (NT-4), brain-derived neurotrophic factor (BDNF), glial-derived neurotrophic factor (GDNF), ciliary neurotrophic factor (CNTF), nerve growth factor (NGF), and combinations thereof.

3. The method of claim 1, wherein said growth factor is an anti-differentiation factor, wherein said anti-differentiation factor is leukemia inhibitory factor (LIF).

4. The method of claim 1, wherein said lithium salt is selected from the group consisting of lithium chloride, lithium carbonate, and lithium sulfate.

5. The method of claim 1, wherein said lithium salt is lithium chloride.

6. The method of claim 1, wherein said lithium salt is present in said medium at a concentration of from about 0.5 to about 5 mM.

7. The method of claim 1, wherein said lithium salt is present in said medium at a concentration of about 3 mM.

8. The method of claim 1, wherein growth factor production by said cells promotes the expansion of said cells.

9. The method of claim 8, wherein said lithium salt is selected from the group consisting of lithium chloride, lithium carbonate, and lithium sulfate.

10. The method of claim 8, wherein said lithium salt is lithium chloride.

11. The method of claim 8, wherein said lithium salt is present in said medium at a concentration of from about 0.5 to about 5 mM.

12. The method of claim 8, wherein said lithium salt is present in said medium at a concentration of about 3 mM.

13. Human umbilical cord blood cells cultured in a medium comprising a lithium salt for use in the treatment of a spinal cord injury, a traumatic brain injury, a stroke, Parkinson's disease, Alzheimer's disease, burns, heart disease, diabetes, osteoarthritis, rheumatoid arthritis, leukemia, lymphoma, anemia, multiple myeloma, an inherited blood disorder, a disease resulting in an immunodeficiency, or bone marrow cell loss from chemotherapy or radiation therapy for cancer,

wherein said lithium salt stimulates growth factor production by said cells,

wherein said growth factor is selected from the group consisting of a cell survival factor, an anti-differentiation factor, and combinations thereof, and

wherein said cell survival factor is selected from the group consisting of a neurotrophin, a cytokine, epidermal growth factor (EGF), platelet-derived growth factor (PDGF), fibroblast growth factor (FGF), insulin-like growth factor (IGF), and combinations thereof. 14. The use of claim 13, further comprising use of a lithium salt.

15. The use of claim 14, wherein said lithium salt is lithium chloride.

16. The use of claim 14, wherein said lithium salt is used at a dose of from about 1 mg/kg to about 150 mg/kg.

17. The method of claim 14, wherein said lithium salt is used at a dose of about 10 mg/kg.

18. The use of claim 13, wherein said cell survival factor is a neurotrophin selected from the group consisting of neurotrophin-3 (NT-3), neurotrophin-4 (NT-4), brain-derived neurotrophic factor (BDNF), glial-derived neurotrophic factor (GDNF), ciliary neurotrophic factor (CNTF), nerve growth factor (NGF), and combinations thereof.

19. The use of claim 13, wherein said growth factor is an anti-differentiation factor, wherein said anti-differentiation factor is leukemia inhibitory factor (LIF).

20. A lithium salt for reducing rejection of transplanted human umbilical cord blood cells in a subject.

21. The lithium salt of claim 20, wherein said subject is a human.

22. The lithium salt of claim 20, wherein said subject has been diagnosed with a spinal cord injury.

23. The lithium salt of claim 20, wherein said lithium salt is selected from the group consisting of lithium chloride, lithium carbonate, and lithium sulfate.

24. The lithium salt of claim 20, wherein said lithium salt is lithium chloride.

25. The lithium salt of claim 20, wherein said lithium salt is used at a dose of from about 1 mg/kg to about 150 mg/kg.

26. The lithium salt of claim 20, wherein said lithium salt is used at a dose of about 10 mg/kg.

WHAT IS CLAIMED IS:

1. An *in vitro* method for maintaining human umbilical cord blood stem cells under conditions that promote their proliferation, said method comprising:

culturing said cells in a medium comprising a lithium salt.

2. The method of claim 1, wherein production of a growth factor selected from the group consisting of a cell survival factor, an anti-differentiation factor, and combinations thereof is stimulated in the cells.

3. The method of claim 2, wherein said growth factor is a cell survival factor selected from the group consisting of a neurotrophin, a cytokine, epidermal growth factor (EGF), platelet-derived growth factor (PDGF), fibroblast growth factor (FGF), insulin-like growth factor (IGF), and combinations thereof.

4. The method of claim 3, wherein said cell survival factor is a neurotrophin selected from the group consisting of neurotrophin-3 (NT-3), neurotrophin-4 (NT-4), brain-derived neurotrophic factor (BDNF), glial-derived neurotrophic factor (GDNF), ciliary neurotrophic factor (CNTF), nerve growth factor (NGF), and combinations thereof.

5. The method of claim 2, wherein said growth factor is an anti-differentiation factor, wherein said anti-differentiation factor is leukemia inhibitory factor (LIF).

6. The method of claim 1, wherein said lithium salt is selected from the group consisting of lithium chloride, lithium carbonate, and lithium sulfate.

7. The method of claim 1, wherein said lithium salt is lithium chloride.

8. The method of claim 1, wherein said lithium salt is present in said medium at a concentration of from about 0.5 to about 5 mM.

9. The method of claim 1, wherein said lithium salt is present in said medium at a concentration of about 3 mM.

10. The method of claim 1, wherein the human umbilical cord blood stem cells are selected from the group consisting of mesenchymal stem cells, hematopoietic stem cells, progenitor cells, and combinations thereof.