CLAIMS

1. A method of promoting stem cell proliferation *in-vitro*, the method comprising:

culturing a population of mesenchymal lineage precursor cells or mesenchymal stem cells in a fetal bovine serum free cell culture medium comprising platelet derived growth factor (PDGF), epidermal growth factor (EGF) and fibroblast growth factor 2 (FGF2), in which the level of PDGF is between 3 ng/ml and 120 ng/ml, the level of EGF is between 0.08 ng/ml and 7 ng/ml and the level of FGF2 is between 2 pg/ml and 2 ng/ml.

2. A fetal bovine serum free cell culture medium for promoting mesenchymal lineage precursor cells or mesenchymal stem cells *in-vitro* comprising:

a basal medium;

platelet derived growth factor (PDGF);

epidermal growth factor (EGF);

fibroblast growth factor 2 (FGF2);

in which the level of PDGF is between 3 ng/ml and 120 ng/ml, the level of EGF is between 0.08 ng/ml and 7 ng/ml, and the level of FGF2 is between 2 pg/ml and 2 ng/ml.

3. A method according to Claim 1 or a culture medium according to Claim 2, in which the level of FGF2 is between 2 pg/ml and 40 pg/ml.

4. A method according to Claim 1 or a culture medium according to Claim 2, in which the level of FGF2 is 20 pg/ml.

5. A method according to Claim 1 or a culture medium according to Claim 2, in which the level of FGF2 is between 0.3 ng/ml and 1.5 ng/ml.

6. A method according to Claim 1 or a culture medium according to Claim 2, in which the level of FGF2 is 1 ng/ml.

7. A method or culture medium according to any preceding claim, in which the PDGF is PDGF-BB.

8. A method or culture medium according to Claim 7, in which the level of PDGF-BB is between 9.0 ng/ml and 60 ng/ml.

9. A method or culture medium according to Claim 8, in which the level of PDGF-BB is at least 30 ng/ml.

10. A method or culture medium according to Claim 7, in which the level of PDGF-BB is at least 10 ng/ml.

11. A method or culture medium according to any preceding claim, in which the level of EGF is at least 5 ng/ml.

12. A method or culture medium according to any preceding claim, in which the level of EGF is between 0.4 ng/ml and 1.6 ng/ml.

13. A method or culture medium according to any preceding claim, in which the level of EGF is at least 0.8 ng/ml.

14. A method or culture medium according to any preceding claim, in which the cell culture medium comprises alpha-minimal essential medium or fetal bovine serum free expansion medium.

15. A method or culture medium according to any preceding claim, in which the cell culture medium maintains the mesenchymal lineage precursor cells or mesenchymal stem cells in an undifferentiated state.

16. A method or culture medium according to any preceding claim, in which the number of mesenchymal lineage precursor cells or mesenchymal stem cells in culture is increased or accelerated over a period of time.

17. A method or culture medium according to Claim 16, in which increased or accelerated cell numbers between day 0 and day 7 indicates that cell proliferation has been promoted.

18. A method or culture medium according to any preceding claim, in which the number of mesenchymal lineage precursor cells or mesenchymal stem cells is increased relative to a culture medium that does not comprise PDGF, EGF, and FGF2.

19. A method or culture medium according to any preceding claim, in which the stem cells are mesenchymal stem cells.