CLAIMS:

1. A method for increasing cortical activation or reducing infarct volume following a cerebral infarction, the method comprising systemic administration of a therapeutically effective amount of a human cell population enriched for mesenchymal lineage precursor or stem cells (MLPSCs) to a human subject in need thereof.

2. The method according to claim 1, wherein the cerebral infarction is an ischemic cerebral infarction.

3. The method according to claim 2, wherein the cerebral infarction was caused by hypoxic ischemic encephalopathy (HIE).

4. The method according to claim 1, wherein the cerebral infarction is a hemorrhagic cerebral infarction.

5. The method according to any one of claims 1 to 4, wherein the cerebral infarction is in motor cortex.

6. The method according to any one of claims 1 to 5, wherein the affected volume is reduced following the administration.

7. The method according to any one of claims 1 to 6, wherein the cortical activation is increased following the administration.

8. The method according to any one of claims 1 to 7, wherein the cortical activation is increased within the volume of the infarct.

9. The method according to any one of claims 1 to 8, wherein motor function is improved in the human subject following the administration.

10. The method according to any one of claims 1 to 9, wherein the increase in cortical activation is in response to contralateral tactile stimulation.

11. The method according to any one of claims 1 to 10, wherein the systemic administration is performed at about 24 hours or less following the cerebral infarction.

12. The method according to any one of claims 1 to 10, wherein the systemic administration is performed at about 12 hours or less following the cerebral infarction.

13. The method according to any one of claims 1 to 12, wherein the MLPSCs are STRO-1^+ MPCs.

14. The method according to claim 13, wherein the STRO-1^+ MPCs are STRO-1^{bright} MPCs.

15. The method according to any one of claims 1 to 14, wherein the STRO-1^+ MPCs are tissue non-specific alkaline phosphatase $(TNAP)^+$ or $CD146^+$.

16. The method according to any one of claims 1 to 12, wherein the MLPSCs are mesenchymal stem cells.

17. The method according to any one of claims 1 to 16, wherein the human cell population is an allogeneic human cell population.

18. The method according to any one of claims 1 to 16, wherein the human cell population is an autogeneic human cell population.

19. The method according to any one of claims 1 to 18, comprising administering about 2 x 10^6 cells/cm^3 of affected cortex to about 2 x 10^7 cells/cm^3 of affected cortex.

20. The method according to any one of claims 1 to 18, comprising administering 0.1 x 10^6 cells/kg body weight to 5 x 10^6 cells/kg body weight.

21. The method according to any one of claims 1 to 20, wherein the human cell population was culture expanded prior to the administration.

22. The method according to any one of claims 1 to 21, wherein the human cell population was derived from bone marrow, dental pulp, adipose, or pluripotent stem cells.

23. The method according to any one of claims 1 to 21, wherein the human cell population was not derived from dental pulp or adipose.

24. The method according to any one of claims 1 to 23, wherein the human cell population is a genetically modified human cell population.

25. The method according to any one of claims 1 to 24, wherein the systemic administration is intra-arterial administration or intravenous administration.

26. The method according to claim 25, wherein the systemic administration is intra-arterial administration.

27. The method according to any one of claims 1 to 26, further comprising administering a thrombolytic agent.

28. The method according to any one of claims 1 to 26, wherein the subject is not administered a thrombolytic agent before or after administration of the human cell population.

29. The method according to any one of claims 1 to 28, further comprising administering mannitol.

30. The method according to claim 29, further comprising administering temozolomide.

31. The method according to any one of claims 1 to 30, further comprising administering an anti-inflammatory agent.

32. The method according to any one of claims 1 to 31, wherein the human cell population is administered a plurality of times.

33. The method according to any one of claims 1 to 32, wherein the human cell population is administered once every four or more weeks.

34. The method according to any one of claims 1 to 31, wherein the human cell population is administered a single time.

35. The method according to any one of claims 1 to 34, wherein at least a portion of the cells in the human cell population is labelled for *in vivo* detection.

36. The method according to claim 35, further comprising tracking the location of the labelled cells in the subject following the administration.

37. The method according to any one of claims 1 to 36, further comprising determining changes in infarct volume and/or activity within the infarct volume following the administration.

CLAIMS

1. Use of a therapeutically effective amount of an allogeneic human cell population enriched for STRO-1$^+$ mesenchymal precursor cells (MPCs) in the manufacture of a medicament for increasing cortical activation following a cerebral infarction in a human subject, in which the medicament is formulated for systemic administration, and in which the human cell population was derived from bone marrow.

2. The method according to Claim 1, in which the cerebral infarction is an ischemic cerebral infarction.

3. Use according to Claim 2, in which the cerebral infarction was caused by hypoxic ischemic encephalopathy (HIE).

4. Use according to Claim 1, in which the cerebral infarction is a hemorrhagic cerebral infarction.

5. Use according to any preceding claim, in which the cerebral infarction is in motor cortex.

6. Use according to any preceding claim, in which motor function is improved in the human subject following the administration.

7. Use according to any preceding claim, in which the increase in cortical activation is in response to contralateral tactile stimulation.

8. Use according to any preceding claim, in which the systemic administration is performed at 24 hours or less following the cerebral infarction.

9. Use according to any preceding claim, in which the systemic administration is performed at 12 hours or less following the cerebral infarction.

10. Use according to any preceding claim, in which the STRO-1$^+$ MPCs are STRO-1^{bright} MPCs.

11. Use according to any of Claims 1 to 9, in which the STRO-1$^+$ MPCs are tissue non-specific alkaline phosphatase (TNAP)$^+$ or CD146$^+$.

12. Use according to any preceding claim, in which 2 x 10^6 cells/cm^3 of affected cortex to 2 x 10^7 cells/cm^3 of affected cortex are to be administered.

13. Use according to any of Claims 1 to 11, in which 0.1 x 10^6 cells/kg body weight to 5 x 10^6 cells/kg body weight are to be administered.

14. Use according to any preceding claim, in which the human cell population was culture expanded prior to the administration.

15. Use according to any preceding claim, in which the human cell population is a genetically modified human cell population.

16. Use according to any preceding claim, in which the systemic administration is intra-arterial administration or intravenous administration.

17. Use according to Claim 16, in which the systemic administration is intra-arterial administration.

18. Use according to any preceding claim, in which the medicament is for use in combination with a thrombolytic agent for increasing cortical activation.

19. Use according to any of Claims 1 to 17, in which the subject was not administered a thrombolytic agent before or after administration of the human cell population.

20. Use according to any preceding claim, in which the medicament is for use in combination with mannitol for increasing cortical activation.

21. Use according to Claim 20, in which the medicament is for use in further combination with temozolomide.

22. Use according to any preceding claim, in which the medicament is for use in combination with an anti-inflammatory agent.

23. Use according to any preceding claim, in which the human cell population is administered a plurality of times.

24. Use according to any preceding claim, in which the human cell population is to be administered once every four or more weeks.

25. Use according to any of Claims 1 to 22, in which the medicament is to be administered a single time.

26. Use according to any preceding claim, in which at least a portion of the cells in the human cell population is labelled for *in vivo* detection.

27. Use according to any preceding claim, in which, following administration of the medicament, changes in infarct activity within the infarct volume are determined.

FIGURE 9