CLAIMS

1. A mesenchymal stem cell (MSC) expressing miR-145-5p, miR-181b-5p and miR-214-3p, but not miR-127-3p or miR-299-5p.

2. The MSC of claim 1 having CD73+CD105+CD90+CD146+CD44+CD10+CD31-CD45- phenotype.

3. A method for producing a mesenchymal stem cell (MSC), the method comprising:

(a) culturing a primitive mesoderm cell in a mesenchymal-colony forming medium (M-CFM) comprising LiCl and FGF2, but excluding PDGF, under normoxic conditions for sufficient time for a mesenchymal colony to form; and

(b) culturing the mesenchymal colony of (a) adherently to produce the MSC,

wherein the MSC of (b) has superior T-cell immunosuppressive properties comprising suppression of proliferation of T helper ($CD4^+$) lymphocytes, optionally determined using an ImmunoPotency Assay, relative to an MSC produced in a M-CFM comprising LiCl, FGF2, and PDGF.

4. The method of claim 3, wherein the primitive mesodermal cell is a primitive mesodermal cell with mesenchymoangioblast (MCA) potential.

5. The method of claim 3 or claim 4, wherein the primitive mesodermal cell with MCA potential has a $^{EMH}lin^-KDR^+APLNR^+PDGFRalpha^+$ phenotype.

6. The method of any one of claims 3 to 5, wherein sufficient time for the mesenchymal colony to form is about 8 days to about 14 days, about 10 days to about 14 days, about 11 to about 13 days, or about 12 days.

7. The method of any one of claims 3 to 6, wherein the T-cell immunosuppressive properties of the MSC are determined relative to an MSC produced by a method comprising:

(a') culturing a primitive mesodermal cell under normoxic conditions for sufficient time for a mesenchymal colony to form; and

(b') culturing the mesenchymal colony of (a') adherently to produce the MSC.

8. The method of any one of claims 3 to 7, wherein the T-cell immunosuppressive properties of the MSC are determined relative to an MSC produced from a primitive mesodermal cell differentiated from a PSC in a differentiation medium comprising FGF2, BMP4, Activin A, and LiCl under hypoxic conditions for about two days.

9. The method of any one of claims 3 to 8, wherein the M-CFM comprises about 1 mM LiCl.

10. The method of any one of claims 3 to 9, wherein the M-CFM comprises about 5 ng/mL to about 100 ng/mL FGF2, or about 10 ng/mL to about 50 ng/mL FGF2, about 10 ng/mL FGF2, or about 20 ng/mL.

11. The method of any one of claims 3 to 10, wherein the M-CFM comprises about 1 mM LiCl and about 10 ng/mL FGF2, or about 1 mM LiCl and about 20 ng/mL FGF2.

12. The method of any one of claims 3 to 11, further comprising, prior to culturing the primitive mesoderm cell, differentiating a pluripotent stem cell (PSC) into a primitive mesoderm cell comprising:

culturing the PSC in a differentiation medium comprising FGF2, BMP4, Activin A, and LiCl under hypoxic conditions for about two days to form the primitive mesoderm; and

replacing the differentiation medium with the M-CFM comprising LiCl and FGF2, but excluding PDGF.

13. The method of any one of claims 3 to 12, wherein the cells are human.

14. The method of claim 12 or claim 13, wherein the PSC is an induced PSC (iPSC).

15. The method of any one of claims 12 to 14, wherein the differentiation medium comprises:

about 10 ng/mL to about 50 ng/mL FGF2, or about 50 ng/mL FGF2;

about 50 ng/mL to about 250 ng/mL BMP4, or about 50 ng/mL BMP4;

about 1 ng/mL to about 15 ng/mL Activin A, about 10 ng/mL to about 15 ng/mL Activin A, about 12.5 ng/mL Activin A, or about 1.5 ng/mL Activin A; and/or

about 1 mM to about 2 mM LiCl.

16. The method of any one of claims 12 to 15, wherein the differentiation medium comprises:

about 50 ng/mL FGF2;

about 50 ng/mL BMP4;

about 1.5 ng/mL Activin A; and

about 2 mM LiCl.

17. The method of any one of claims 3 to 16, comprising culturing on collagen IV and/or tenascin C.

18. The method of any one of claims 3 to 17, further comprising passaging the mesenchymal colony and/or MSC.

19. The method of claim 18, wherein passaging comprises:

culturing the mesenchymal colony and/or MSC for about 3 days;

culturing the mesenchymal colony and/or MSC on fibronectin and/or collagen I; and/or

1, 2, 3, 4, 5, or 6 passages.

20. An MSC produced by the method of any one of claims 3 to 19.

21. A population of MSCs, comprising the MSC of any one of claims 1, 2 or 20 or produced by the method of any one of claims 3 to 19.

22. A therapeutic composition comprising the MSC of any one of claims 1, 2 or 20 or produced by the method of any one of claims 3 to 19, or the population of MSCs of claim 21.

23. A kit comprising a container containing the MSC of any one of claims 1, 2 or 20 or produced by the method of any one of claims 3 to 19, the population of MSCs of claim 21, or the therapeutic composition of claim 22.

24. Use of the MSC of any one of claims 1, 2 or 20 or produced by the method of any one of claims 3 to 19, or the population of MSCs of claim 21 in the manufacture of a medicament for treating a condition selected from the group consisting of graft versus host disease, systemic lupus erythematosus (SLE), Crohn's disease, multiple system atrophy, multiple sclerosis, amyotrophic lateral sclerosis, stroke, cardiovascular disorders, orthopaedic disorders, rejection of transplanted solid organs, bone cysts, bone neoplasms, fractures, cartilage defects, osteoarthritis, ligament

injury, osteogenesis imperfecta, osteonecrosis, osteoporosis, aplastic anaemia, myelodysplastic syndrome, Type 1 diabetes, Type 2 diabetes, autoimmune hepatitis, liver cirrhosis, liver failure, dilated cardiomyopathy, heart failure, myocardial infarction, myocardial ischemia, ulcerative colitis, burns, epidermolysis bullosa, lupus erythematosus, rheumatoid arthritis, Sjogren's disease, systemic sclerosis, bronchopulmonary dysplasia, chronic obstructive airways disease, emphysema, pulmonary fibrosis, Alzheimer's disease, brain injury, ataxia, degenerative disc disease, Parkinson's disease, retinitis pigmentosa, Romberg's disease, spinal cord injury, muscular dystrophy, limb ischaemia, kidney injury, lupus nephritis, endometriosis, and complications of bone marrow or solid organ transplantation.