It is to be understood that if any prior art publication is referred to herein, such reference does not constitute an admission that the publication forms a part of the common general knowledge in the art in Australia or any other country.

SUMMARY

A first example provides a method for treating AAD/ asthma in a subject, the method comprising administering a mesenchymoangioblast mesenchymal stem cell (MCA-MSC) to the subject, wherein the MCA-MSC expresses miR-145-5p, miR-181b-5p, and miR-214-3p, but not miR-127-3p and miR-299-5p.

The first aspect provides use of a mesenchymoangioblast mesenchymal stem cell (MCA-MSC) in the manufacture of a medicament for treating AAD/ asthma in a subject, wherein the MCA-MSC expresses miR-145-5p, miR-181b-5p, and miR-214-3p, but not miR-127-3p and miR-299-5p, wherein the MCA-MSC has a $CD73^{+}CD105^{+}CD90^{+}CD146^{+}CD44^{+}CD10^{+}CD31^{-}CD45^{-}$ phenotype, and wherein the MCA-MSC is made by a method comprising:(a)culturing a primitive mesoderm cell with a mesenchymoangioblast (MCA) potential that has a $^{EMH}lin^{-}KDR^{+}APLNR^{+}PDGFRalpha^{+}$ phenotype 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 MCA-MSC.

A further alternative or additional example of the first example provides a mesenchymoangioblast mesenchymal stem cell (MCA-MSC) for use in a method of treating AAD/ asthma in a subject, wherein the MCA-MSC expresses miR-145-5p, miR-181b-5p, and miR-214-3p, but not miR-127-3p and miR-299-5p.

In one example, the MCA-MSC has a $CD73^{+}CD105^{+}CD90^{+}CD146^{+}CD44^{+}CD10^{+}CD31^{-}CD45^{-}$ phenotype.

In one example the MCA-MSC is made by a 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 MCA-MSC.

In one example, the MCA-MSC is administered intravenously or intranasally. In one example, the MCA-MSC is administered intranasally.

In one example, treating comprises administering about $1x10^{6}$ to about $1x10^{9}$ MCA-MSCs to the subject.

In one example, the subject is mammalian. In one example, the subject is human.

CLAIMS

1. Use of a mesenchymoangioblast mesenchymal stem cell (MCA-MSC) in the manufacture of a medicament for treating allergic airways disease (AAD)/ asthma in a subject, wherein the MCA-MSC expresses miR-145-5p, miR-181b-5p, and miR-214-3p, but not miR-127-3p and miR-299-5p, wherein the MCA-MSC has a $CD73^{+}CD105^{+}CD90^{+}CD146^{+}CD44^{+}CD10^{+}CD31^{-}CD45^{-}$ phenotype, and wherein the MCA-MSC is made by a method comprising:

(a) culturing a primitive mesoderm cell with a mesenchymoangioblast (MCA) potential that has a $^{EMH}lin^{-}KDR^{+}APLNR^{+}PDGFRalpha^{+}$ phenotype 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 MCA-MSC.

2. The use of claim 1, wherein the MCA-MSC is to be administered intravenously or intranasally.

3. The use of claim 1 or 2, wherein the MCA-MSC is to be administered intranasally.

4. The use of any one of claims 1 to 3, wherein treating comprises that 10^{6} MCA-MSCs/kg to $2x10^{8}$ MCA-MSCs/kg, about 10^{6} MCA-MSCs/kg, about $5x10^{6}$ MCA-MSCs/kg, or about 10^{7} MCA-MSCs/kg are to be administered to the subject.

5. The use of any one of claims 1 to 4, wherein treating comprises that $1x10^{6}$ to $1x10^{9}$ MCA-MSCs, 10^{6} to $2x10^{8}$ MCA-MSCs, about 10^{8} MCA-MSCs, about $5x10^{8}$ MCA-MSCs, or about 10^{9} MCA-MSCs are to be administered to the subject.

6. The use of any one of claims 1 to 5, wherein the subject is mammalian.

7. The use of any one of claims 1 to 6, wherein the subject is human.

8. The use of any one of claims 1 to 7, wherein the subject has previously been administered a corticosteroid or a β-agonist for treating asthma.

9. The use of any one of claims 1 to 7, wherein the subject has not previously been administered a corticosteroid or a β-agonist for treating asthma.

10. The use of any one of claims 1 to 9, wherein the subject has severe asthma or severe-refractory asthma.

11. The use of any one of claims 1 to 10, wherein treating AAD/ asthma comprises:

(a) decreasing airway inflammation, airway remodelling, airway fibrosis, lung fibrosis, goblet cell metaplasia, epithelial thickening, airway transforming growth factor (TGF)-β1 level, subepithelial myofibroblast density, subepithelial collagen concentration, or total lung collagen concentration; or

(b) increasing lung MMP activity; or

(c) any combination of any one or more feature of (a) or any combination of any one or more feature of (a) and (b).

12. The use of any one of claims 1 to 11, wherein the subject is not to be administered a corticosteroid or a β-agonist.

13. The use of any one of claims 1 to 12, wherein the subject is to be administered the MCA-MSCs before, during or after development of AAD/ asthma.