Claims

1. Use of umbilical cord tissue-derived cells in the manufacture of a medicament for reducing the production of one or more pro-inflammatory mediators involved in the pathology of a lung disease, disorder, and/or injury in a patient having the lung disease, disorder, and/or injury, wherein the cells are obtainable from human umbilical cord tissue free of blood, are capable of self-renewal and expansion in culture, lack the production of CD117 or CD45, and do not express hTERT or telomerase.

2. The use of claim 1, wherein the one or more pro-inflammatory mediators is selected from the group consisting of TNF-α, RANTES, MCP-1, IL-1β and combinations thereof.

3. The use of claim 1, wherein the one or more pro-inflammatory mediators are involved in the progress of the lung disease, disorder, and/or injury.

4. The use of claim 1, wherein the lung disease, disorder, and/or injury is selected from the group consisting of a chronic obstructive pulmonary disease (COPD), pulmonary fibrosis, acute lung injury (ALI), and acute respiratory distress syndrome (ARDS).

5. The use of claim 4, wherein the lung disease, disorder, and/or injury is a chronic obstructive pulmonary disease.

6. The use of claim 5, wherein the chronic obstructive pulmonary disease is chronic bronchitis or emphysema.

7. The use of claim 1, wherein the use further comprises at least one other cell type and/or at least one other agent.

8. The use of claim 7, wherein the other cell type is a lung tissue cell selected from lung progenitor cell, vascular smooth muscle cell, vascular smooth muscle progenitor cell, pericyte, vascular endothelial cell, vascular endothelium progenitor cell, or other multipotent or pluripotent stem cell.

9. The use of claim 7, wherein the agent is an antithrombogenic agent, an anti-

inflammatory agent, an immunosuppressive agent, an immunomodulatory agent, a pro-angiogenic agent, or an antiapoptotic agent.

10. The use of claim 1, wherein the use inhibits the production of the one or more pro-inflammatory mediators.

11. The use of claim 1, wherein the umbilical cord tissue-derived cells are formulated for administration by injection, infusion, a device implanted in the patient, or by implantation of a matrix or scaffold containing the cells.

12. The use of claim 1, wherein the cells exert a trophic effect on the lung tissue, vascular smooth muscle, or vascular endothelium of the patient.

13. The use of claim 1, wherein the cells lack production of CD117 and CD45.

14. The use of claims 1 or 15, wherein the cells do not express hTERT and telomerase.

15. The use of claim 1, wherein the umbilical cord tissue-derived cells further comprise one or more of the following characteristics:

(a) express CD10, CD13, CD44, CD73, and CD90;

(b) do not express CD31 or CD34;

(c) express, relative to a human fibroblast, mesenchymal stem cell, or iliac crest bone marrow cell, increased levels of interleukin 8 or reticulon 1; and

(d) have the potential to differentiate into cells of at least a lung tissue.

16. Use of umbilical cord tissue-derived cells in the manufacture of a medicament for reducing the production of one or more pro-inflammatory mediators of a chronic obstructive pulmonary disease in a patient having the chronic obstructive pulmonary disease, wherein the cells are obtainable from human umbilical cord tissue free of blood, are capable of self-renewal and expansion in culture, lack the production of CD117 and CD45, and do not express hTERT or telomerase.

17. The use of claim 16, wherein the chronic obstructive pulmonary disease is emphysema.

18. The use of claim 16, wherein the chronic obstructive pulmonary disease is chronic bronchitis.

19. The use of claim 16, wherein the one or more pro-inflammatory mediators is selected from the group consisting of TNF-α, RANTES, MCP-1, IL-1β and combinations thereof.

20. The use of claim 16, wherein the umbilical cord tissue-derived cells further comprise one or more of the following characteristics:

(a) express CD10, CD13, CD44, CD73, and CD90;

(b) do not express CD31 or CD34;

(c) express, relative to a human fibroblast, mesenchymal stem cell, or iliac crest bone marrow cell, increased levels of interleukin 8 or reticulon 1; and

(d) have the potential to differentiate into cells of at least a lung tissue.

21. Use of umbilical cord tissue-derived cells in the manufacture of a medicament inhibiting the production of one or more pro-inflammatory mediators of chronic obstructive pulmonary disease in a patient having the chronic obstructive pulmonary disease, wherein the cells are isolated from human umbilical cord tissue substantially free of blood, are capable of self-renewal and expansion in culture, lack the production of CD117 and CD45, and do not express hTERT or telomerase.

22. The use of claim 21, wherein the one or more pro-inflammatory mediators is selected from the group consisting of TNF-α, RANTES, MCP-1, IL-1β and combinations thereof.

23. The use of claim 21, wherein the chronic obstructive pulmonary disease is emphysema.

24. The use of claim 21, wherein the chronic obstructive pulmonary disease is chronic bronchitis.

25. The use of claim 21, wherein the use comprises administration of the cells at the sites of the chronic obstructive pulmonary disease.

26. The use of claim 21, wherein the one or more pro-inflammatory mediators is selected from the group consisting of TNF-α, RANTES, MCP-1, IL-1β and combinations thereof.

27. The use of claim 21, wherein the umbilical cord tissue-derived cells further comprise one or more of the following characteristics:

(a) express CD10, CD13, CD44, CD73, and CD90;

(b) do not express CD31 or CD34;

(c) express, relative to a human fibroblast, mesenchymal stem cell, or iliac crest bone marrow cell, increased levels of interleukin 8 or reticulon 1, and

(d) have the potential to differentiate into cells of at least a lung tissue.

28. A pharmaceutical composition for reducing the production of one or more pro-inflammatory mediators involved in the pathology of a lung disease, disorder, and/or injury comprising umbilical cord tissue-derived cells, wherein the cells are obtainable from human umbilical cord tissue free of blood, are capable of self-renewal and expansion in culture, lack the production of CD117 and CD45, and do not express hTERT or telomerase.

29. The pharmaceutical composition of claim 28, wherein the lung disease is a chronic obstructive pulmonary disease.

30. A kit for reducing the production of one or more pro-inflammatory mediators involved in the pathology of a lung disease, disorder, and/or injury comprising a pharmaceutically acceptable carrier and umbilical cord tissue-derived cells, wherein the cells are obtainable from human umbilical cord tissue free of blood, are capable of self-renewal and expansion in culture, lack the production of CD117 and CD45, and do not express hTERT or telomerase.

31. The kit of claim 30, wherein the lung disease is a chronic obstructive pulmonary disease.

Claims

1. Use of umbilical cord tissue-derived cells in the manufacture of a medicament for reducing the production of one or more pro-inflammatory mediators involved in the pathology of a lung disease, disorder, and/or injury in a patient having the lung disease, disorder, and/or injury, wherein the lung disease, disorder, and/or injury is selected from the group consisting of chronic bronchitis, emphysema, pulmonary fibrosis, acute lung injury (ALI), and acute respiratory distress syndrome (ARDS), and wherein the cells are obtainable from human umbilical cord tissue free of blood, are capable of self-renewal and expansion in culture, lack the production of CD117 or CD45, and do not express hTERT or telomerase.

2. The use of claim 1, wherein the one or more pro-inflammatory mediators is selected from the group consisting of TNF-α, RANTES, MCP-1, IL-13 and combinations thereof.

3. The use of claim 1, wherein the one or more pro-inflammatory mediators are involved in the progress of the lung disease, disorder, and/or injury.

4. The use of claim 1, wherein the lung disease, disorder, and/or injury is emphysema.

5. The use of claim 4, wherein the lung disease, disorder, and/or injury is chronic bronchitis.

6. The use of claim 1, wherein the use further comprises at least one other cell type and/or at least one other agent.

7. The use of claim 6, wherein the other cell type is a lung tissue cell selected from lung progenitor cell, vascular smooth muscle cell, vascular smooth muscle progenitor cell, pericyte, vascular endothelial cell, vascular endothelium progenitor cell, or other multipotent or pluripotent stem cell.

8. The use of claim 6, wherein the agent is an antithrombogenic agent, an anti-inflammatory agent, an immunosuppressive agent, an immunomodulatory agent, a pro-angiogenic agent, or an antiapoptotic agent.

9. The use of claim 1, wherein the use inhibits the production of the one or more pro-inflammatory mediators.

10. The use of claim 1, wherein the umbilical cord tissue-derived cells are formulated for administration by injection, infusion, a device implanted in the patient, or by implantation of a matrix or scaffold containing the cells.

11. The use of claim 1, wherein the cells exert atrophic effect on the lung tissue, vascular smooth muscle, or vascular endothelium of the patient.

12. The use of claim 1, wherein the cells lack production of CD117 and CD45.

13. The use of claims 1 or 12, wherein the cells do not express hTERT and telomerase.

14. The use of claim 1, wherein the umbilical cord tissue-derived cells further comprise one or more of the following characteristics:

(a) express CD10, CD13, CD44, CD73, and CD90;

(b) do not express CD31 or CD34;

(c) express, relative to a human fibroblast, mesenchymal stem cell, or iliac crest bone marrow cell, increased levels of interleukin 8 or reticulon 1; and

(d) have the potential to differentiate into cells of at least a lung tissue.

15. Use of umbilical cord tissue-derived cells in the manufacture of a medicament for reducing the production of one or more of TNF-α, RANTES, IL-1β in a patient having emphysema, chronic bronchitis pulmonary fibrosis, acute lung injury (ALI), or acute respiratory distress syndrome (ARDS), wherein the cells are obtainable from human umbilical cord tissue free of blood, are capable of self-renewal and expansion in culture, lack the production of CD117 and CD45, and do not express hTERT or telomerase.

16. The use of claim 15, wherein the patient has emphysema.

17. The use of claim 15, wherein the patient has chronic bronchitis.

18. The use of claim 15, wherein the patient has acute lung injury (ALI).

19. The use of claim 15, wherein the patient has acute respiratory distress syndrome (ARDS).

20. The use of claim 15, wherein the umbilical cord tissue-derived cells further comprise one or more of the following characteristics:

(a) express CD10, CD13, CD44, CD73, and CD90;

(b) do not express CD31 or CD34;

(c) express, relative to a human fibroblast, mesenchymal stem cell, or iliac crest bone marrow cell, increased levels of interleukin 8 or reticulon 1; and

(d) have the potential to differentiate into cells of at least a lung tissue.

21. Use of umbilical cord tissue-derived cells in the manufacture of a medicament inhibiting the production of one or more pro-inflammatory mediators of chronic obstructive pulmonary disease in a patient having the chronic obstructive pulmonary disease, wherein the chronic obstructive pulmonary disease is emphysema or chronic bronchitis, and wherein the cells are obtainable from human umbilical cord tissue free of blood, are capable of self-renewal and expansion in culture, lack the production of CD117 and CD45, and do not express hTERT or telomerase.

22. The use of claim 21, wherein the one or more pro-inflammatory mediators is selected from the group consisting of TNF-α, RANTES, MCP-1, IL-13 and combinations thereof.

23. The use of claim 21, wherein the chronic obstructive pulmonary disease is emphysema.

24. The use of claim 21, wherein the chronic obstructive pulmonary disease is chronic bronchitis.

25. The use of claim 21, wherein the use comprises administration of the cells at the sites of the chronic obstructive pulmonary disease.

26. The use of claim 21, wherein the one or more pro-inflammatory mediators is selected from the group consisting of TNF-α, RANTES, MCP-1, IL-10 and combinations thereof.

27. The use of claim 21, wherein the umbilical cord tissue-derived cells further comprise one or more of the following characteristics:

(a) express CD10, CD13, CD44, CD73, and CD90;

(b) do not express CD31 or CD34;

(c) express, relative to a human fibroblast, mesenchymal stem cell, or iliac crest bone marrow cell, increased levels of interleukin 8 or reticulon 1; and

(d) have the potential to differentiate into cells of at least a lung tissue.

28. A pharmaceutical composition for reducing the production of one or more pro-inflammatory mediators involved in the pathology of a lung disease, disorder, and/or injury comprising umbilical cord tissue-derived cells, wherein the cells are obtainable from human umbilical cord tissue free of blood, are capable of self-renewal and expansion in culture, lack the production of CD117 and CD45, and do not express hTERT or telomerase.

29. The pharmaceutical composition of claim 28, wherein the lung disease is a chronic obstructive pulmonary disease.

30. A kit for reducing the production of one or more pro-inflammatory mediators involved in the pathology of a lung disease, disorder, and/or injury comprising a pharmaceutically acceptable carrier and umbilical cord tissue-derived cells, wherein the cells are obtainable from human umbilical cord tissue free of blood, are capable of self-renewal and expansion in culture, lack the production of CD117 and CD45, and do not express hTERT or telomerase.

31. The kit of claim 30, wherein the lung disease is a chronic obstructive pulmonary disease.