CLAIMS:

1. A method of preparing breastmilk stem cell(s) (BSC) or a spheroid comprising or consisting of BSC, comprising the steps of:

a) separating cells from non-cellular portions of breastmilk obtained from a subject, wherein said cells comprise a mixture of cells;

b) growing the mixture of cells in suspension culture that reduces adherence to plates to form one or more spheroid; and

c) harvesting said one or more spheroids, wherein said one or more spheroids comprise or consist of said BSC.

2. The method of claim 1 wherein the step of growing said mixture of cells comprises the proliferation of a cell.

3. The method of claim 1 or claim 2 wherein the step of growing said mixture of cells comprises selective proliferation of said BSC.

4. The method of any one of the preceding claims wherein said at least one spheroid is harvested after growing in suspension culture for up to 12-14 days.

5. The method of any one of the preceding claims wherein said at least one spheroid is harvested after growing in suspension culture for 9 days.

6. The method of any one of the preceding claims, further comprising the step of passaging said at least one spheroid in suspension culture after step (b) and before step (c).

7. The method of claim 6 wherein said passaging comprises dissociating said at least one spheroid.

8. The method of any one of the preceding claims wherein said at least one spheroid is grown in a low-binding cell culture vessel.

9. The method of any one of the preceding claims wherein said at least one spheroid is grown in a feeder-free culture.

10. The method of any one of the preceding claims wherein the step of growing said mixture of cells in suspension culture comprises growing said cells in the presence of any one or more of the following, or combinations thereof: growth factors, insulin, transferrin, selenium, nicotinamide, dexamethasone, fetal bovine serum or non-essential amino acids (NNEA).

11. The method of claim 10, wherein said growth factors are selected from epidermal growth factor and fibroblast growth factor.

12. The method of any one of the preceding claims wherein said BSC is a pluripotent stem cell.

13. The method of any one of the preceding claims wherein the breastmilk is human breastmilk and wherein said BSC is a human pluripotent stem cell.

14. The method of claim 13 wherein said human BSC (hBSC) expresses Oct4, Sox2, Nanog and/or Klf4.

15. The method of claim 13 wherein said human BSC (hBSC) expresses Oct4, Sox2, Nanog, SSEA4 and TRA-1-60/81.

16. A method of preparing breastmilk stem cell(s) (BSC) or a spheroid comprising or consisting of BSC, comprising the steps of:

a) separating cells from non-cellular portions of breastmilk obtained from a subject after initiation of feeding, wherein said cells comprise a mixture of cells;

b) growing the mixture of cells in suspension culture that reduces adherence to plates to form one or more spheroid; and

c) harvesting said one or more spheroids, wherein said one or more spheroids comprise or consist of said BSC.

17. The method of claim 16 wherein said breastmilk is collected after or at the end of said feeding.

18. The method of claim 17 wherein said breastmilk is collected from about 0 minutes to about one hour after said feeding.

19. The method of claim 17 or claim 18 wherein the breastmilk is collected about 25-30 minutes after said feeding.

20. The method of any one of the preceding claims further comprising the step of differentiating said BSC.

21. The method of claim 20 wherein said BSC is differentiated to become a myoepithelial cell, a luminal cell, a lactocyte, a neural cell, a stromal cell, an osteoblast, a chondrocyte, an adipocyte, a cardiomyocyte, a hepatocyte, or a beta islet cell.

22. Use of one or more spheroids comprising or consisting of breastmilk stem cell(s) (BSC), in the preparation of a medicament for cell ~~treatment~~therapy in a patient, wherein said one or more spheroids are prepared by:

a) separating cells from non-cellular portions of breastmilk obtained from a subject, wherein said cells comprise a mixture of cells;

b) growing the mixture of cells in suspension culture that reduces adherence to plates to form said one or more spheroids; and

c) harvesting said one or more spheroids.

23. The use of claim 22, wherein the cells of said one or more spheroids are autologous to the patient.

24. The use of claim 22, wherein the patient is an infant and the cell is obtained from the breastmilk of the infant's mother.

25. Use of one or more spheroids comprising or consisting of breastmilk stem cell(s) (BSC) in the manufacture of a medicament for treating milk production deficiency in a lactating female , wherein said one or more spheroids are prepared by:

a) separating cells from non-cellular portions of breastmilk obtained from a subject, wherein said cells comprise a mixture of cells;

b) growing the mixture of cells in suspension culture that reduces adherence to plates to form said one or more spheroids; and

c) harvesting said one or more spheroids.

26. The ~~method~~ use of claim 25, wherein the cell is autologous to the lactating female.

27. Use of one or more spheroids comprising or consisting of breastmilk stem cell(s) (BSC) in the manufacture of a medicament for treating a disease condition in a patient selected from the group consisting of: cardiovascular diseases; diabetes; inborn errors in metabolism; cancer; neurological diseases; chronic diseases; liver diseases; fatal infant diseases; and any ~~organ/tissue~~ diseases for which administration of said one or more spheroids is beneficial, and wherein said one or more spheroids are prepared by:

a) separating cells from non-cellular portions of breastmilk obtained from a subject, wherein said cells comprise a mixture of cells;

b) growing the mixture of cells in suspension culture that reduces adherence to plates to form said one or more spheroids; and

c) harvesting said one or more spheroids.

28. The use of claim 27, wherein the cell is autologous to the patient.

29. The ~~method~~ use of claim 27, wherein the patient is an infant and the cell is obtained from the breastmilk of the infant's mother.

CLAIMS:

1. A method of preparing breastmilk stem cell(s) (BSC) or a spheroid comprising or consisting of BSC, comprising the steps of:

a) separating cells from non-cellular portions of breastmilk obtained from a subject, wherein said cells comprise a mixture of cells;

b) growing the mixture of cells in suspension culture to form one or more spheroid; and

c) harvesting said one or more spheroids, wherein said one or more spheroids comprise or consist of said BSC.

2. The method of claim 1 wherein the step of growing said mixture of cells comprises the proliferation of a cell.

3. The method of claim 1 or claim 2 wherein the step of growing said mixture of cells comprises selective proliferation of said BSC.

4. The method of any one of the preceding claims wherein said at least one spheroid is harvested after growing in suspension culture for up to 12-14 days.

5. The method of any one of the preceding claims wherein said at least one spheroid is harvested after growing in suspension culture for 9 days.

6. The method of any one of the preceding claims, further comprising the step of passaging said at least one spheroid in suspension culture after step (b) and before step (c).

7. The method of claim 6 wherein said passaging comprises dissociating said at least one spheroid.

8. The method of any one of the preceding claims wherein said at least one spheroid is grown in a low-binding cell culture vessel.

9. The method of any one of the preceding claims wherein said at least one spheroid is grown in a feeder-free culture.

10. The method of any one of the preceding claims wherein the step of growing said mixture of cells in suspension culture comprises growing said cells in the presence of any one or more of the following, or combinations thereof: growth factors, insulin, transferrin, selenium, nicotinamide, dexamethasone, fetal bovine serum or non-essential amino acids (NNEA).

11. The method of claim 10, wherein said growth factors are selected from epidermal growth factor and fibroblast growth factor.

12. The method of any one of the preceding claims wherein said BSC is a pluripotent stem cell.

13. The method of any one of the preceding claims wherein the breastmilk is human breastmilk and wherein said BSC is a human pluripotent stem cell.

14. The method of claim 13 wherein said human BSC (hBSC) expresses Oct4, Sox2, Nanog and/or Klf4.

15. The method of claim 13 wherein said human BSC (hBSC) expresses Oct4, Sox2, Nanog, SSEA4 and TRA-1-60/81.

16. A method of preparing breastmilk stem cell(s) (BSC) or a spheroid comprising or consisting of BSC, comprising the steps of:

a) separating cells from non-cellular portions of breastmilk obtained from a subject after initiation of feeding, wherein said cells comprise a mixture of cells;

b) growing the mixture of cells in suspension culture to form one or more spheroid; and

c) harvesting said one or more spheroids, wherein said one or more spheroids comprise or consist of said BSC.

17. The method of claim 16 wherein said breastmilk is collected after or at the end of said feeding.

18. The method of claim 17 wherein said breastmilk is collected from 0 minutes to one hour after said feeding.

19. The method of claim 17 or claim 18 wherein the breastmilk is collected 25-30 minutes after said feeding.

20. The method of any one of the preceding claims further comprising the step of differentiating said BSC.

21. The method of claim 20 wherein said BSC is differentiated to become a myoepithelial cell, a luminal cell, a lactocyte, a neural cell, a stromal cell, an osteoblast, a chondrocyte, an adipocyte, a cardiomyocyte, a hepatocyte, or a beta islet cell.

22. Use of one or more spheroids comprising or consisting of breastmilk stem cell(s) (BSC), in the preparation of a medicament for cell treatment, wherein said one or more spheroids are prepared by:

a) separating cells from non-cellular portions of breastmilk obtained from a subject, wherein said cells comprise a mixture of cells;

b) growing the mixture of cells in suspension culture to form said one or more spheroids; and

c) harvesting said one or more spheroids.

23. The use of claim 22, wherein the cells of said one or more spheroids are autologous to the patient.

24. The use of claim 22, wherein the patient is an infant and the cell is obtained from the breastmilk of the infant’s mother.

25. Use of one or more spheroids comprising or consisting of breastmilk stem cell(s) (BSC) in the manufacture of a medicament for treating milk production deficiency in a lactating female , wherein said one or more spheroids are prepared by:

a) separating cells from non-cellular portions of breastmilk obtained from a subject, wherein said cells comprise a mixture of cells;

b) growing the mixture of cells in suspension culture to form said one or more spheroids; and

c) harvesting said one or more spheroids.

26. The method of claim 25, wherein the cell is autologous to the lactating female.

27. Use of one or more spheroids comprising or consisting of breastmilk stem cell(s) (BSC) in the manufacture of a medicament for treating a disease condition selected from the group consisting of: cardiovascular diseases; diabetes; inborn errors in metabolism; cancer; neurological diseases; chronic diseases; liver diseases; fatal infant diseases; and any organ/tissue diseases for which administration of said one or more spheroids is beneficial, and wherein said one or more spheroids are prepared by:

a) separating cells from non-cellular portions of breastmilk obtained from a subject, wherein said cells comprise a mixture of cells;

b) growing the mixture of cells in suspension culture to form said one or more spheroids; and

c) harvesting said one or more spheroids.

28. The use of claim 27, wherein the cell is autologous to the patient.

29. The method of claim 27, wherein the patient is an infant and the cell is obtained from the breastmilk of the infant’s mother.

CLAIMS:

1. A method of preparing breastmilk stem cell(s) (BSC) or a spheroid comprising or consisting of BSC, comprising the steps of:

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2. The method of claim 1 wherein the step of growing said mixture of cells comprises the proliferation of a cell.

3. The method of claim 1 or claim 2 wherein the step of growing said mixture of cells comprises selective proliferation of said BSC.

4. The method of any one of the preceding claims wherein said at least one spheroid is harvested after growing in suspension culture for up to 12-14 days.

5. The method of any one of the preceding claims wherein said at least one spheroid is harvested after growing in suspension culture for 9 days.

6. The method of any one of the preceding claims, further comprising the step of passaging said at least one spheroid in suspension culture after step (b) and before step (c).

7. The method of claim 6 wherein said passaging comprises dissociating said at least one spheroid.

8. The method of any one of the preceding claims wherein said at least one spheroid is grown in a low-binding cell culture vessel.

9. The method of any one of the preceding claims wherein said at least one spheroid is grown in a feeder-free culture.

10. The method of any one of the preceding claims wherein the step of growing said mixture of cells in suspension culture comprises growing said cells in the presence of any one or more of the following, or combinations thereof: growth factors, insulin, transferrin, selenium, nicotinamide, dexamethasone, fetal bovine serum or non-essential amino acids (NNEA).

11. The method of claim 10, wherein said growth factors are selected from epidermal growth factor and fibroblast growth factor.

12. The method of any one of the preceding claims wherein said BSC is a pluripotent stem cell.

13. The method of any one of the preceding claims wherein the breastmilk is human breastmilk and wherein said BSC is a human pluripotent stem cell.

14. The method of claim 13 wherein said human BSC (hBSC) expresses Oct4, Sox2, Nanog and/or Klf4.

15. The method of claim 13 wherein said human BSC (hBSC) expresses Oct4, Sox2, Nanog, SSEA4 and TRA-1-60/81.

16. A method of preparing breastmilk stem cell(s) (BSC) or a spheroid comprising or consisting of BSC, comprising the steps of:

a) separating cells from non-cellular portions of breastmilk obtained from a subject after initiation of feeding, wherein said cells comprise a mixture of cells;

b) growing the mixture of cells in suspension culture that reduces adherence to plates to form one or more spheroid; and

c) harvesting said one or more spheroids, wherein said one or more spheroids comprise or consist of said BSC.

17. The method of claim 16 wherein said breastmilk is collected after or at the end of said feeding.

18. The method of claim 17 wherein said breastmilk is collected from about 0 minutes to about one hour after said feeding.

19. The method of claim 17 or claim 18 wherein the breastmilk is collected about 25-30 minutes after said feeding.

20. The method of any one of the preceding claims further comprising the step of differentiating said BSC.

21. The method of claim 20 wherein said BSC is differentiated to become a myoepithelial cell, a luminal cell, a lactocyte, a neural cell, a stromal cell, an osteoblast, a chondrocyte, an adipocyte, a cardiomyocyte, a hepatocyte, or a beta islet cell.

22. Use of one or more spheroids comprising or consisting of breastmilk stem cell(s) (BSC), in the preparation of a medicament for cell therapy in a patient, wherein said one or more spheroids are prepared by:

a) separating cells from non-cellular portions of breastmilk obtained from a subject, wherein said cells comprise a mixture of cells;

b) growing the mixture of cells in suspension culture that reduces adherence to plates to form said one or more spheroids; and

c) harvesting said one or more spheroids.

23. The use of claim 22, wherein the cells of said one or more spheroids are autologous to the patient.

24. The use of claim 22, wherein the patient is an infant and the cell is obtained from the breastmilk of the infant’s mother.

25. Use of one or more spheroids comprising or consisting of breastmilk stem cell(s) (BSC) in the manufacture of a medicament for treating milk production deficiency in a lactating female , wherein said one or more spheroids are prepared by:

a) separating cells from non-cellular portions of breastmilk obtained from a subject, wherein said cells comprise a mixture of cells;

b) growing the mixture of cells in suspension culture that reduces adherence to plates to form said one or more spheroids; and

c) harvesting said one or more spheroids.

26. The use of claim 25, wherein the cell is autologous to the lactating female.

27. Use of one or more spheroids comprising or consisting of breastmilk stem cell(s) (BSC) in the manufacture of a medicament for treating a disease condition in a patient selected from the group consisting of: cardiovascular diseases; diabetes; inborn errors in metabolism; cancer; neurological diseases; chronic diseases; liver diseases; fatal infant diseases; and any diseases for which administration of said one or more spheroids is beneficial, and wherein said one or more spheroids are prepared by:

a) separating cells from non-cellular portions of breastmilk obtained from a subject, wherein said cells comprise a mixture of cells;

b) growing the mixture of cells in suspension culture that reduces adherence to plates to form said one or more spheroids; and

c) harvesting said one or more spheroids.

28. The use of claim 27, wherein the cell is autologous to the patient.

29. The use of claim 27, wherein the patient is an infant and the cell is obtained from the breastmilk of the infant’s mother.