WE CLAIM:

1. A method for recovering viable cells from frozen umbilical cord tissue, comprising the steps of:

1) obtaining cryogenically stored cord tissue, wherein the cord tissue has been prepared by a method comprising the steps of

a) obtaining umbilical cord tissue comprising viable cells,

b) combining the umbilical cord tissue with a cryopreserving solution comprising serum-containing cell culturing medium and a cryopreservant, and

c) subjecting the combination to a cooling process in which the combination is refrigerated as a liquid for a period and at a temperature permitting the cryopreservant to penetrate the tissue,

d) freezing the cooled combination, to provide frozen tissue, and optionally then

e) storing the frozen tissue under cryogenic conditions;

2) thawing the frozen cord tissue;

3) treating the thawed cord tissue to displace the cyropreservant with water; and

4) recovering viable cells from the cord tissue so treated.

2. A method for preserving the viability of cells present in umbilical cord tissue, comprising the steps of

a) obtaining umbilical cord tissue comprising viable cells,

b) combining the umbilical cord tissue with a cryopreserving solution comprising serum-containing cell culturing medium and a cryopreservant;

c) subjecting the combination to a cooling process in which the combination is refrigerated as a liquid for a period and at a temperature permitting the cryopreservant to penetrate the tissue,

d) freezing the cooled combination, and optionally, then

e) storing the frozen combination under cryogenic conditions.

3. The method according to claim 1 or claim 2, wherein the cryopreservant is DMSO.

4. The method according to claim 1 or 2, wherein the cell culturing medium is fetal bovine serum.

5. The method according to claim 1 or claim 2, wherein the cryopreserving solution comprises, by volume, from 5-25% DMSO, and from 75-95% fetal bovine serum.

6. The method according to claim 5, wherein the cryopreserving solution is 10% DMSO, and 90% fetal bovine serum.

7. The method according to any one of claims 1-6, wherein the umbilical cord tissue is umbilical cord vessel, or segment thereof, bearing perivascular Wharton's jelly comprising progenitor cells.

8. The method according to claim 7, wherein the umbilical cord tissue is human umbilical cord tissue.

9. The method according to claim 7 or claim 8, wherein the umbilical cord tissue is essentially free from blood.

10. The method according to any preceding claim, wherein the cooling process is performed at about 4C for a period of at least 20 minutes.

11. The method according to any preceding claim, wherein the freezing process is conducted at about -70C.

12. The method according to any preceding claim, wherein the cryogenic storage is conducted at about -196C.

13. The method according to any one of claims 1 and 3-12, wherein the thawing process is performed at about 37C.

14. The method according to any one of claims 1 and 3-13, wherein the thawed cord is treated by immersion in water or buffer at about 4C.

15. A method according to any one of claims 1 and 3-14, wherein the viable cells recovered from the stored cord are human umbilical cord perivascular cells.

16. A method according to claim 15, wherein the viable cells are recovered by digestion of the Wharton's jelly.

17. Umbilical cord tissue, in a cryopreserved state and comprising progenitor cells that are recoverable in a viable state, whenever prepared by the method according to any one of claims 2-14.

18. Umbilical cord tissue according to claim 17, in the form of a tissue bank comprising a plurality of containers each comprising a sample of said cord tissue, and a catalog referencing the contents of each container.

19. Umbilical cord tissue according to any claim 17 or claim 18, wherein the umbilical cord tissue is cord vessel, or a segment thereof, bearing perivascular Wharton's jelly comprising progenitor cells.

20. A method for recovering viable HUCPVCs from frozen umbilical cord tissue, comprising the steps of:

1) obtaining cryogenically stored cord tissue, wherein the cord tissue is fresh, isolated human umbilical cord vessel, or a segment thereof, bearing associated perivascular Wharton's jelly, and has been prepared by a method comprising the steps of

a) obtaining said umbilical cord tissue,

b) combining the umbilical cord tissue with a cryopreserving solution comprising serum-containing cell culturing medium and DMSO,

c) subjecting the combination to a cooling process in which the combination is refrigerated as a liquid for a period and at a temperature permitting the DMSO to penetrate the tissue,

d) freezing the cooled combination, and

e) storing the frozen combination under cryogenic conditions for a period of time; and then

2) thawing the stored cord tissue;

3) treating the thawed cord tissue to displace the DMSO with water; and

4) digesting the Wharton's jelly associated with the stored vessels to release viable HUCPVCs.

CLAIMS

1. A method for recovering viable progenitor cells from cryogenically frozen umbilical cord tissue, comprising the steps of:

i) thawing the cord tissue, wherein the cord tissue is an umbilical cord blood vessel, or a segment thereof, bearing perivascular Wharton's jelly comprising said progenitor cells and a cryopreserving solution comprising a serum-containing medium and a cryopreservant, and wherein, prior to cryogenic freezing, the cord tissue is contacted with said cryopreserving solution bv the step consisting of immersing said cord tissue in said cryopreserving solution to allow passive permeation about the exterior of said cord tissue with said cryopreserving solution,

ii) displacing the cryopreservant with an aqueous liquid; and

iii) recovering said viable progenitor cells from the cord tissue so treated.

2. The method of claim 1, wherein the cryopreservant is dimethyl sulfoxide (DMSO).

3. The method of claim 1, wherein the medium comprises fetal bovine serum or human serum.

4. The method of claim 1, wherein the cryopreserving solution comprises, by volume, 1-25% DMSO and 75-99% of said medium.

5. The method of claim 4, wherein the cryopreserving solution comprises 10% DMSO and 90% of said medium.

6. The method of claim 1, wherein the umbilical cord tissue is human umbilical cord tissue.

7. The method of claim 1, wherein the umbilical cord tissue is essentially free from blood.

8. The method of claim 1, wherein the thawing process is performed at about 37°C.

9. The method of claim 1, wherein the thawed cord is treated by immersion in water or buffer at about 4°C.

10. The method of claim 1, wherein the viable cells recovered from the stored cord tissue are human umbilical cord perivascular cells.

11. The method of claim 10, wherein the viable cells are recovered by digestion of the Wharton's jelly.

12. The method of claim 1, wherein, after contacting of said cord tissue with said cryopreserving solution and prior to said cryogenic freezing, the cord tissue is subjected to a cooling process in which the cord tissue is refrigerated in the cryopreserving solution in liquid form for a period of time and at a temperature permitting the cryopreservant to penetrate exterior portions of the cord tissue, and freezing the cooled cord tissue to produce the frozen umbilical cord tissue.

13. The method of claim 12 further comprising storing the frozen umbilical cord tissue under cryogenic conditions.

14. The method of claim 13, wherein the cryogenic storage is conducted at about -196°C.

15. The method of claim 12, wherein the refrigerating is performed at about 4°C for a period of at least 20 minutes.

16. The method of claim 12, wherein the freezing is conducted at about -70°C.

17. The method of claim 1, wherein the aqueous liquid is water or buffered saline.

18. A method for recovering viable human umbilical cord perivascular cells (HUCPVCs) from cryogenically frozen umbilical cord tissue, comprising the steps of:

i) thawing the cord tissue, wherein the cord tissue is a human umbilical cord blood vessel, or segment thereof, bearing viable cells within associated perivascular Wharton's jelly comprising progenitor cells and a cryopreserving solution comprising a serum-containing medium and dimethyl sulfoxide (DMSO), and wherein, prior to cryogenic freezing, the cord tissue is contacted with said cryopreserving solution by the step consisting of immersing said cord tissue in said cryopreserving solution to allow passive permeation about the exterior of said cord tissue with said cryopreserving solution;

ii) displacing the DMSO with an aqueous liquid; and

iii) digesting the Wharton's jelly associated with the cord tissue to release said viable HUCPVCs from the cord tissue.

19. The method of claim 18, wherein the umbilical cord tissue was freshly obtained post-partum tissue when frozen.

20. The method of claim 18, wherein, after contacting of said cord tissue with said cryopreserving solution and prior to said cryogenic freezing, said cord tissue is subjected to a cooling process in which the cord tissue is refrigerated in the cryopreserving solution in liquid form for a period of time and at a temperature permitting the DMSO to penetrate exterior portions of the cord tissue, and freezing the cooled cord tissue under cryogenic conditions, and wherein, prior said thawing, said cord tissue is stored under said cryogenic conditions for a period of time.