

CLAIMS

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 is (1) umbilical cord blood vessel that has been excised from umbilical cord and bearing perivascular Wharton's jelly that comprises viable progenitor cells, (2) a segment of said blood vessel, or (3) Wharton's jelly obtained from said vessel, and 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;
 - 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 cryopreservant 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 progenitor cells, wherein said umbilical cord tissue is (1) umbilical cord blood vessel that has been excised from umbilical cord and bearing perivascular Wharton's jelly that comprises said progenitor cells, (2) a segment of said blood vessel or (3) Wharton's jelly obtained from said vessel;
 - 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 cryopreserving solution comprises, by volume, from 5-25% DMSO, and from 75-95% fetal bovine serum.
 4. The method according to claim 3, wherein the cryopreserving solution is 10% DMSO, and 90% fetal bovine serum.
 5. The method according to claim 1 or 2, wherein the umbilical cord tissue is human umbilical cord tissue.
 6. The method according to any preceding claim, wherein the umbilical cord tissue is essentially free from blood.
 7. The method according to any preceding claim, wherein the cooling process is performed for at least 10 minutes.
 8. The method according to any preceding claim, wherein the cooling process is performed at about 4 °C for a period of at least 20 minutes.
 9. The method according to any preceding claim, wherein the method of preparing the cryogenically stored cord tissue or the method of preserving the viability of cells present in umbilical cord tissue further comprises immersing the umbilical cord tissue in fresh cryopreserving solution between steps c) and d).
 10. The method according to any one of claims 1 and 3-9, wherein the thawed cord is treated by immersion in water or buffer at about 4 °C .

11. A method according to any one of claims 1 and 3-9, wherein the viable cells recovered from the stored cord are human umbilical cord perivascular cells.
12. A method according to claim 11, wherein the viable cells are recovered by digestion of the Wharton's jelly.
13. 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 2-12.
14. A tissue bank comprising a plurality of containers each comprising a sample of umbilical cord tissue according to claim 13, and a catalog referencing the contents of each container.
15. Umbilical cord tissue according to claim 13 or a tissue bank according to claim 14, wherein the umbilical cord tissue is cord vessel, or a segment thereof, bearing perivascular Wharton's jelly comprising progenitor cells.
16. The method of claim 1, wherein the viable cells are HUCPVCs, and wherein the frozen umbilical cord tissue is (1) fresh, isolated human umbilical cord vessel that has been excised from umbilical cord, and bearing associated perivascular Wharton's jelly, (2) a segment of said blood vessel, or (3) Wharton's jelly obtained from said vessel, 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 further wherein the method comprise the steps of:
 - 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.