We Claim:

1. A method for detecting an endothelial progenitor cell (EPC) comprising determining the level of expression of a nucleic acid or protein set forth in Table 1, or a nucleic acid or a protein having at least about 70% identity thereto, in, on or secreted from a cell, wherein an increased level of expression of a nucleic acid or protein set forth in Table 1 or a nucleic acid or protein having at least about 70% identity thereto compared to another cell type is indicative of an EPC.

2. A method according to claim 1, wherein the nucleic acid or protein is expressed in, on or secreted from EPCs at a level at least 1.5 fold greater or 2 fold greater or 3 fold greater or 4 fold greater or 5 fold greater than in, on or secreted by human umbilical cord vascular endothelial cells (HUVECs).

3. A method according to claim 2, wherein the nucleic acid or protein is expressed in, on or secreted by non-adherent $CD133^+$ EPCs at a level at least 1.5 fold greater or 2 fold greater or 3 fold greater or 4 fold greater or 5 fold greater than in, on or secreted by HUVECs.

4. A method for detecting an endothelial progenitor cell (EPC) comprising determining the level of expression of a protein that is a cell adhesion molecule or a nucleic acid encoding the protein as set forth in Table 2, or a nucleic acid or protein having at least about 70% identity thereto, in, on or secreted from a cell, wherein an increased level of expression of a nucleic acid or protein set forth in Table 2 or a nucleic acid or protein having at least about 70% identity thereto compared to another cell type is indicative of an EPC.

5. A method for detecting an endothelial progenitor cell (EPC) comprising determining the level of expression of a transporter protein or a nucleic acid encoding the protein as set forth in Table 3, or a nucleic acid or protein having at least about 70% identity thereto, in, on or secreted from a cell, wherein an increased level of expression of a nucleic acid or protein set forth in Table 3 or a nucleic acid or protein having at least about 70% identity thereto compared to another cell type is indicative of an EPC.

6. A method for detecting an endothelial progenitor cell (EPC) comprising determining the level of expression of a growth factor protein or a nucleic acid encoding the protein as set forth in Table 4, or a nucleic acid or protein having at least

about 70% identity thereto, in, on or secreted from a cell, wherein an increased level of expression of a nucleic acid or protein set forth in Table 4 or a nucleic acid or protein having at least about 70% identity thereto compared to another cell type is indicative of an EPC.

7. A method for detecting an endothelial progenitor cell (EPC) comprising determining the level of expression of a receptor protein or a nucleic acid encoding the protein as set forth in Table 5, or a nucleic acid or protein having at least about 70% identity thereto, in, on or secreted from a cell, wherein an increased level of expression of a nucleic acid or protein set forth in Table 5 or a nucleic acid or protein having at least about 70% identity thereto compared to another cell type is indicative of an EPC.

8. A method for detecting an endothelial progenitor cell (EPC) comprising determining the level of expression of an enzyme protein or a nucleic acid encoding the protein as set forth in Table 6, or a nucleic acid or protein having at least about 70% identity thereto, in, on or secreted from a cell, wherein an increased level of expression of a nucleic acid or protein set forth in Table 6 or a nucleic acid or protein having at least about 70% identity thereto compared to another cell type is indicative of an EPC.

9. A method according to any one of claims 1 to 8, wherein the protein is selected from the group consisting of DSG2, EMR2, EMB, ADCY7, SLC39A8, TM7SF3, NKG7, NCSTN, SIRBP1, EVI5, LOXL4, INSRR, PKD2L1, DPP6, LRRC33 and SCL1A5 or the nucleic acid encodes one of the foregoing proteins.

10. A method according to any one of claims 1 to 9, wherein the protein is a cell surface protein in or on an EPC.

11. A method for isolating an endothelial progenitor cell (EPC), the method comprising detecting an EPC by performing the method according to any one of claims 1 to 10 and isolating the detected EPC.

12. A method for isolating a population of cells enriched for endothelial progenitor cells (EPCs), the method comprising contacting a population of cells comprising EPCs with a compound that binds to a protein set forth in Table 1 or a protein having at least about 70% identity thereto for a time and under conditions sufficient for the compound to bind to a cell and isolating cells to which the compound is bound.

13. A method according to claim 11 or 12, additionally comprising culturing the isolated cells to increase the number of isolated EPCs and/or differentiating the isolated and/or cultured EPCs.

14. A method according to any one of claims 11 to 13, additionally comprising determining the activity of the isolated and/or cultured EPCs.

15. A method according to any one of claims 11 to 14, additionally comprising formulating the isolated EPCs and/or cells isolated therefrom with a pharmaceutically acceptable carrier or excipient to thereby produce a pharmaceutical composition.

16. A method according to any one of claims 11 to 15, additionally comprising immobilizing the isolated EPCs and/or cells derived therefrom on a solid or semi-solid matrix.

17. A composition comprising a population of cells enriched for endothelial progenitor cells (EPCs), wherein the population is isolated by performing a method according to any one of claims 11 to 16.

18. A composition comprising a population of cells enriched for endothelial progenitor cells (EPCs) expressing one or more nucleic acids or proteins set forth in Table 1.

19. A composition according to claim 17 or 18, wherein the population of cells is enriched for EPCs expressing one or more proteins selected from the group consisting of DSG2, EMR2, EMB, ADCY7, SLC39A8, TM7SF3, NKG7, NCSTN, SIRBP1, EVI5, LOXL4, INSRR, PKD2L1, DPP6, LRRC33 and SCL1A5.

20. A composition according to any one of claims 17 to 19, wherein the EPCs additionally express one or more proteins selected from the group consisting of CD133, CD117, CD34 CD144, VEGFR2 and CD31.

21. A method for diagnosing and/or prognosing an endothelial progenitor cell (EPC)-associated condition in a subject, the method comprising performing the method according to any one of claims 1 to 10 to detect an EPC in a sample from a subject

and/or performing the method of claim 14 to determine the activity of an EPC from a subject wherein detection of EPC(s) and/or EPC activity or failure to detect EPCs and/or EPC activity is diagnostic or prognostic of the EPC-associated condition.

22. A method for localising and/or detecting and/or diagnosing and/or prognosing an endothelial progenitor cell (EPC)-associated condition in a subject, the method comprising:

(i) administering to a subject a compound that binds specifically to a compound that binds to a protein set forth in Table 1 such that the compound binds to the protein, if present; and

(ii) detecting the compound bound to the protein *in vivo*, wherein detection of the bound compound localises and/or detects and/or diagnoses and/or prognoses the EPC-associated condition.

23. A method of treating or preventing a condition associated with reduced endothelial progenitor cell (EPC) numbers or activity, treating or preventing a condition associated with insufficient neovascularization and/or improving grafting and/or improving wound healing in a subject, the method comprising administering the composition according to any one of claims 17 to 20 or :

(i) isolating a population enriched for EPCs by performing the method according to any one of claims 11 to 16; and

(ii) administering the cells at (i) to the subject.

24. A method of treating or preventing a condition associated with reduced EPC numbers or activity and/or treating or preventing a condition associated with insufficient neovascularization and/or improving grafting and/or improving wound healing in a subject, the method comprising administering to a subject in need thereof a solid support or a semi-solid support having immobilized thereon a compound that binds to a protein set forth in Table 1 for a time and under conditions for the compound to bind to EPCs from the subject.

25. A method of modulating neovascularization and/or EPC numbers or activity in a subject, the method comprising administering to a subject in need thereof a compound that modulates expression and/or activity of a protein or nucleic acid set forth in Table 1, and/or administering a compound that binds to a protein set forth in Table 1 and modulates EPC activity and/or induces EPC death and/or EPC proliferation.

26. An isolated antibody or polypeptide that binds specifically to a protein set forth in Table 1 or an immunogenic fragment or epitope thereof, or a polypeptide comprising antigen binding domain of an antibody that binds specifically to a protein set forth in Table 1 or an immunogenic fragment or epitope thereof when used in a method according to any one of claims 1 to 16 or 21 to 25.

27. Use of an isolated antibody or polypeptide that binds specifically to a protein set forth in Table 1 or an immunogenic fragment or epitope thereof, or a polypeptide comprising antigen binding domain of an antibody that binds specifically to a protein set forth in Table 1 or an immunogenic fragment or epitope thereof in the manufacture of a medicament for treating, diagnosing, prognosing or preventing an EPC-associated condition.

28. The method of any one of claims 21 or 25 or the use of claim 27, wherein the condition is selected from the group consisting of cardiovascular disease, diabetes or melanoma.

29. The method of claim 23 or 24, wherein the condition is cardiovascular disease or diabetes.

CLAIMS

1. An *ex vivo* method for detecting a non-adherent endothelial progenitor cell (EPC) comprising determining the level of expression of a nucleic acid encoding Dsg2 or of a Dsg2 protein, or a nucleic acid or a protein having at least about 70% identity thereto, in, on or secreted from a cell, in which an increased level of expression of the nucleic acid or protein thereto compared to another cell type is indicative of an EPC.

2. A method according to Claim 1, in which the nucleic acid or protein is expressed in, on or secreted from EPCs at a level at least 1.5 fold greater or 2 fold greater or 3 fold greater or 4 fold greater or 5 fold greater than in, on or secreted by human umbilical cord vascular endothelial cells (HUVECs).

3. A method according to Claim 2, in which the nucleic acid or protein is expressed in, on or secreted by non-adherent $CD133^+$ EPCs at a level at least 1.5 fold greater or 2 fold greater or 3 fold greater or 4 fold greater or 5 fold greater than in, on or secreted by HUVECs.

4. An *ex vivo* method for isolating an endothelial progenitor cell (EPC), the method comprising detecting an EPC by performing the method according to any preceding claim and isolating the detected EPC.

5. An *ex vivo* method for isolating a population of cells enriched for non-adherent endothelial progenitor cells (EPCs), the method comprising contacting a population of cells comprising EPCs with a compound that binds to a Dsg2 protein or a protein having at least about 70% identity thereto for a time and under conditions sufficient for the compound to bind to a cell and isolating cells to which the compound is bound.

6. A method according to Claim 4 or 5, additionally comprising culturing the isolated cells to increase the number of isolated EPCs and/or differentiating the isolated and/or cultured EPCs.

7. A method according to any of Claims 4 to 6, additionally comprising determining the activity of the isolated and/or cultured EPCs.

8. A method according to any of Claims 4 to 7, additionally comprising formulating the isolated EPCs and/or cells isolated therefrom with a pharmaceutically acceptable carrier or excipient to thereby produce a pharmaceutical composition.

9. A method according to any of Claims 4 to 8, additionally comprising immobilizing the isolated EPCs and/or cells derived therefrom on a solid or semi-solid matrix.

10. A composition comprising a population of cells enriched for non-adherent endothelial progenitor cells (EPCs), in which the population is isolated by performing a method according to any of Claims 4 to 9.

11. A composition comprising a population of cells enriched for non-adherent endothelial progenitor cells (EPCs) expressing Dsg2 encoding nucleic acid or Dsg2 protein.

12. A composition according to Claim 10 or 11, in which the EPCs additionally express one or more proteins selected from the group consisting of CD133, CD117, CD34 CD144, VEGFR2 and CD31.

13. An *ex vivo* method for diagnosing and/or prognosing an endothelial progenitor cell (EPC)-associated condition in a subject, the method comprising performing the method according to any one of Claims 1 to 3 to detect an EPC in a sample from a subject and/or performing the method of Claim 7 to determine the activity of an EPC from a subject in which detection of EPC(s) and/or EPC activity or failure to detect EPCs and/or EPC activity is diagnostic or prognostic of the EPC-associated condition.

14. Use of the population enriched for non-adherent EPCs by performing the method according to any of Claims 4 to 9 in the manufacture of a medicament for treating or preventing a condition associated with reduced endothelial progenitor cell (EPC) numbers or activity, treating or preventing a condition associated with insufficient neovascularization and/or improving grafting and/or improving wound healing in a subject.

15. Use of a solid support or a semi-solid support having immobilized thereon a compound that binds to Dsg2 for a time and under conditions for the compound to bind to non-adherent EPCs from the subject in the manufacture of a medicament for treating or preventing a condition associated with reduced EPC numbers or activity and/or treating or preventing a condition associated with insufficient neovascularization and/or improving grafting and/or improving wound healing in a subject.

16. A use according to Claim 14 or 15, in which the condition is cardiovascular disease or diabetes.