Claims:

1. An anti-PODXL antibody that contains the amino acid sequences i), ii) and iii), and the amino acid sequences iv), v) and vi):
i) SASSSVNYMY (SEQ ID NO: 2)
ii) DTSNLAS (SEQ ID NO: 3)
iii) QQWSSYPYT (SEQ ID NO: 4)
iv) NYWMN (SEQ ID NO: 5)
v) EIRLKSNNYATHYAESVKG (SEQ ID NO: 6)
vi) ERA (SEQ ID NO: 7).

2. A method of identifying an undifferentiated human embryonic stem cell in a sample which may contain such cells, the method comprising:
(a) adding an antibody according to claim 1 to said cell or cells,
(b) detecting binding of the antibody to said cell or cells, and
(c) identifying the cell or cells within the sample that express podocalyxin-like protein (PODXL) on their surface on the basis of the antibody binding to said cell or cells.

3. A method of removing an undifferentiated human embryonic stem cell from a sample containing such cells, the method comprising:
(a) adding an antibody according to claim 1 to said cell or cells,
(b) detecting binding of the antibody to said cell or cells, and
(c) removing from the sample the cell or cells that express PODXL on their surface on the basis of the antibody binding to said cell or cells.

4. A method of destroying an undifferentiated human embryonic stem cell in a sample containing such cells, the method comprising:
(a) adding an antibody according to claim 1 to said cell or cells, and
(b) destroying the cell or cells in the sample that express PODXL on their surface by virtue of being bound to the antibody.

5. A method according to claims 2, 3 or 4 wherein the sample is a sample from a human embryo or is human embryonic tissue.

6. A method according to claims 2, 3 or 4 wherein the sample is a sample of cells cultivated in vitro.

7. A method according to claim 3 or 4 wherein the sample is a sample in which undifferentiated human embryonic stem cells have been encouraged to differentiate into particular cell lineages, and the sample contains differentiated cells derived from undifferentiated human embryonic stem cells.

8. A method according to claim 2 or 3 wherein the antibody is immobilized to a solid support.

9. A method according to claim 2 or 3 wherein the antibody is detectably labelled or is capable of detection.

10. A method according to claim 9 wherein the label facilitates detection of the cells.

11. A method according to claim 4 wherein the antibody further comprises a cytotoxic moiety.

12. A method of making a pharmaceutical composition containing differentiated cells but which is depleted of undifferentiated human embryonic stem cells, the method comprising removing an undifferentiated human embryonic stem cell from a sample containing such cells by the method of claim 3 and incorporating the cells depleted of undifferentiated human embryonic stem cells into a pharmaceutical composition.

13. An antibody according to claim 1 comprising a light chain variable region comprising the amino acid sequence of SEQ ID NO: 8.

14. An antibody according to claim 1 comprising a heavy chain variable region comprising the amino acid sequence of SEQ ID NO: 10.

15. An antibody according to claim 1 comprising:

a light chain variable region incorporating the following CDRs:

CDR1: SASSSVNYMY (SEQ ID NO: 2)

CDR2: DTSNLAS (SEQ ID NO: 3)

CDR3: QQWSSYPYT (SEQ ID NO: 4); and

at least one heavy chain variable region incorporating the following CDRs:

CDR1: NYWMN (SEQ ID NO: 5),

CDR2: EIRLKSNNYATHYAESVKG (SEQ ID NO: 6),

CDR3: ERA (SEQ ID NO: 7).

16. An antibody according to claim 1 comprising a light chain variable region comprising the amino acid sequence of SEQ ID NO: 8 and a heavy chain variable region comprising the amino acid sequence of SEQ ID NO: 10.

CLAIMS

1. A method of identifying an undifferentiated human embryonic stem cell in a sample which may contain such cells, the method comprising identifying the cell or cells within the sample that express podocalyxin-like protein (PODXL) on their surface.

2. A method of isolating an undifferentiated human embryonic stem cell from a sample containing such cells, the method comprising isolating the cell or cells within the sample that express PODXL on their surface.

3. A method of removing an undifferentiated human embryonic stem cell from a sample containing such cells, the method comprising removing from the sample the cell or cells that express PODXL on their surface.

4. A method of destroying an undifferentiated human embryonic stem cell in a sample containing such cells, the method comprising destroying the cell or cells in the sample that express PODXL on their surface.

5. A method according to any one of Claims 1 to 4 wherein the sample is a sample from a human embryo or is human embryonic tissue.

6. A method according to Claims 1 to 4 wherein the sample is a sample of cells cultivated *in vitro*.

7. A method according to Claim 3 or 4 wherein the sample is a sample in which undifferentiated human embryonic stem cells have been encouraged to differentiate into particular cell lineages, and the sample contains differentiated cells derived from undifferentiated human embryonic stem cells.

8. A method according to any one of Claims 1 to 3 wherein the sample is contacted with a binding moiety which moiety binds to PODXL and the said

human embryonic stem cell is identified in or isolated from or removed from the sample by virtue of being bound by to the binding moiety.

9. A method according to Claim 8 wherein the binding moiety is an antibody.

10. A method according to Claim 8 or 9 wherein the binding moiety is immobilised to a solid support.

11. A method according to Claim 8 or 9 wherein the binding moiety is detectably labelled or is capable of detection.

12. A method according to Claim 11 wherein the label facilitates detection of the cells.

13. A method according to Claim 4 wherein the said undifferentiated human embryonic stem cell is destroyed by virtue of being bound to a binding moiety which binds to PODXL.

14. A method according to Claim 13 wherein the binding moiety is an antibody.

15. A method according to Claim 14 wherein the binding moiety further comprises a cytotoxic moiety.

16. Use of a moiety which binds PODXL for identifying an undifferentiated human embryonic stem cell in a sample containing such cells.

17. Use of a moiety which binds PODXL for isolating an undifferentiated human embryonic stem cell from a sample which containing such cells.

18. Use of a moiety which binds to PODXL for removing an undifferentiated human embryonic stem cell from a sample which containing such cells.

19. Use of a moiety which binds to PODXL for destroying undifferentiated human embryonic stem cells in a sample which containing such cells.

20. Use according to any of Claims 16 to 19 wherein the binding moiety is an antibody.

21. A moiety which binds to PODXL further comprising a detectable label.

22. A moiety which binds to PODXL further comprising a cytotoxic moiety.

23. A moiety according to Claim 21 or 22 which is an antibody.

24. A kit of parts comprising a moiety which binds PODXL and a further agent that detects another human embryonic stem cell marker.

25. A kit of parts according to Claim 24 wherein the other human embryonic stem cell marker is any of Oct 4, SSEA-4, Tra-1-60, Tra-1-81 and GCTM-2.

26. A kit of parts according to Claim 25 wherein the other human embryonic stem cell marker further includes any of mAb 5, mAb 8, mAb 14, mAb 63, mAb 84, mAb 85, mAb 95, mAb 375, mAb 432 and mAb 529.

27. An undifferentiated human embryonic stem cell isolated by the method of Claim 2.

28. An isolated undifferentiated human embryonic stem cell which expresses PODXL on its surface.

29. A composition containing differentiated cells but which is depleted in undifferentiated human embryonic stem cells obtained by the method of Claim 7.

30. A composition containing cells differentiated from undifferentiated human embryonic stem cells which composition contains substantially no undifferentiated human embryonic stem cells which express PODXL on their surface.

31. A method of treating a patient in need of cell therapy, the method comprising administering to the patient a cell according to Claim 27 or 28 or a composition according to Claim 29 or 30.

32. Use of a cell according to Claim 27 or 28 or a composition according to Claim 29 or 30 in the manufacture of a medicament for treating a patient in need of cell therapy.

33. A method of making a pharmaceutical composition of undifferentiated human embryonic stem cells, the method comprising carrying out the method of Claim 2 or providing cells according to Claim 28 and incorporating the cells so isolated into a pharmaceutical composition.

34. A method of making a pharmaceutical composition containing differentiated cells but which is depleted of undifferentiated human embryonic stem cells, the method comprising carrying out the method of Claim 7, or providing a composition according to Claim 29, and incorporating said composition of cells into a pharmaceutical composition.

35. An anti-PODXL antibody that contains the amino acid sequences *i*) to *iii*), or the amino acid sequences *iv*) to *vi*), or preferably the amino acid sequences *i*) to *vi*):

i) SASSSVNYMY (SEQ ID NO: 2)

ii) DTSNLAS (SEQ ID NO: 3)

iii) QQWSSYPYT (SEQ ID NO: 4)

iv) NYWMN (SEQ ID NO: 5)

v) EIRLKSNNYATHYAESVKG (SEQ ID NO: 6)

vi) ERA (SEQ ID NO: 7)

or a variant thereof in which one or two or three amino acids in one or more of the sequences (i) to (vi) are replaced with another amino acid.

36. An antibody according to Claim 35 having at least one light chain variable region incorporating the following CDRs:

CDR1: SASSSVNYMY (SEQ ID NO: 2)

CDR2: DTSNLAS (SEQ ID NO: 3)

CDR3: QQWSSYPYT (SEQ ID NO: 4)

37. An antibody according to Claim 36 having at least one light chain variable region comprising the amino acid sequence set out in Figure 11 (SEQ ID NO: 8).

38. An antibody according to Claim 35 having at least one heavy chain variable region incorporating the following CDRs:

CDR1: NYWMN (SEQ ID NO: 5)

CDR2: EIRLKSNNYATHYAESVKG (SEQ ID NO: 6)

CDR3: ERA (SEQ ID NO: 7)

or a variant thereof in which one or two or three amino acids in one or more of the sequences (i) to (vi) are replaced with another amino acid.

39. An antibody according to Claim 38 having at least one heavy chain variable region comprising the amino acid sequence as set out in Figure 12 (SEQ ID NO: 10).

40. An antibody according to Claim 35 having at least one light chain variable region according to Claim 36 or 37 and at least one heavy chain variable region according to Claim 38 or 39.

41. An antibody that selectively binds to the PODXL epitope bound by an antibody having at least one light chain variable region according to Claim 37 and at least one heavy chain variable region according to Claim 39.

42. A polynucleotide encoding an antibody according to any of Claims 35 to 41, or a molecule containing V_H or V_L chain contained therein.

43. A host cell containing a polynucleotide according to Claim 42.

44. A method according to any one of Claims 9 or 14 or a use according to Claim 20 or according to Claim 23 wherein the antibody is an antibody of any one of Claims 35 to 41.