CLAIMS

1. A method of identifying human otic progenitor cells in a mixed population of cells comprising determining if a cell has at least two cell surface markers selected from SSEA1, GD3, TRA-2-49, SSEA4, GD2 and CD141.

2. The method according to claim 1, wherein the cell markers SSEA1, GD3, TRA-2- 49, SSEA4, and GD2 are positive cell markers.

3. The method according to claim 1 or claim 2, wherein the cell marker CD141 is a negative cell marker.

4. The method according to claim 2 or 3, wherein at least two positive cell markers are used in combination to identify human otic progenitors.

5. The method according to claim 2 or 3, wherein at least three, four or five positive cell markers are used in combination to identify human otic progenitors.

6. The method according to any preceding claim, wherein a positive cell marker, or at least two positive cell markers are used in combination with the negative cell marker CD141.

7. The method according to any preceding claim, wherein the mixed population of cells is provided from, or during, an in vitro pluripotent stem cell differentiation protocol, such as human embryonic stem cells (hESCs) or induced-pluripotent stem cells (iPSCs); or
wherein the mixed population of cells is provided from, or during, dedifferentiating, trans-differentiating or direct reprogramming procedures into human otic cell lineages; or
wherein the mixed population of cells is provided from tissue, such as developing foetal inner ear tissue, or cochlear or vestibular samples obtained from surgical interventions from adult inner ears.

8. The method according to any preceding claim, wherein the mixed population of cells is contacted with one or more binding members arranged to bind to the cell markers.

9. The method according to claim 8, wherein binding member comprises an antibody, antibody fragment, or a mimetic thereof.

10. The method according to any preceding claim, comprising a detection step, wherein the cell markers are detected as present or not present on a cell or group of cells.

11. The method according to any of claims 8 to 10, wherein the binding member is labeled for identification

12. The method according to claim 11, wherein the label comprises a fluorophore.

13. The method according to any of claims 10 to 12, wherein detection comprises the use of FACS and/or the use of MACS.

14. A method of identifying human otic progenitor cells in a mixed population of cells using at least two cell surface markers selected from SSEA1, GD3, TRA-2-49, SSEA4, GD2 and CD141, the method comprising:

- providing binding members specific for at least two different cell markers;
- contacting the mixed population of cells with the binding members; and
- detecting the binding or non-binding of the binding members to cells in the mixed population of cells.

15. The method according to claim 14, wherein the method further comprises the determination that a cell is a human otic progenitor cell if:

a) binding members arranged to bind to the positive cell markers bind to at least two different positive cell markers on the cell; or

b) a binding member arranged to bind one of the positive cell markers binds to at least one of the positive cell markers on the cell, and a binding marker arranged to bind to the negative cell marker CD141 does not bind to the cell.

16. The method according to claim 14, wherein the method further comprises the determination that a cell is a human otic progenitor cell if

a) binding members arranged to bind to the positive cell markers bind to at least three different positive cell markers on the cell; or

b) binding members arranged to bind at least two different positive cell markers bind to the at least two different positive cell markers on the cell, and a binding marker arranged to bind to the negative cell marker CD141 does not bind to the cell.

17. A method of enriching human otic progenitor cells from a mixed population of cells, the method comprising:

- identifying the human otic progenitor cells in accordance with the method of any of claims 1 to 16; and
- sorting the cells such that human otic progenitor cells are isolated from non- otic progenitor cells, such that the human otic progenitor cells are enriched in the population.

18. The method according to claim 17, wherein the sorting comprises FACS and/or comprises MACS.

19. A method of producing a population of human otic progenitor cells, the method comprising:
- differentiating non-otic progenitor cells into human otic progenitor cells, whereby some non-otic progenitor cells may remain in the population to form a mixed population of cells; and
- enriching the human otic progenitor cells from the mixed population of cells in accordance with the method of claims 17 or 18.

20. A kit comprising at least two different binding members, wherein the binding members specifically bind to different cell markers selected from SSEA1, GD3, TRA-2-49, SSEA4, GD2 and CD141, wherein at least one binding member binds to GD3, TRA-2-49, GD2 or CD141.

21. The kit according to claim 20, wherein the kit comprises at least three different binding members, wherein the binding members specifically bind to different cell markers selected from SSEA1, GD3, TRA-2-49, SSEA4, GD2 and CD141.

22. The kit according to claim 20 or 21, wherein the kit comprises a panel of binding members, wherein the panel of binding members comprises a binding member specific for each of the cell markers of SSEA1, GD3, TRA-2-49, SSEA4, GD2 and CD141.

23. The kit according to any of claims 20 to 22, wherein the binding members are antibodies, and optionally wherein the antibodies are labeled.

24. Use of CD141 as a negative cell marker to identify human non-otic progenitor cells in a mixed population of cells.