CLAIMS

The invention claimed is:

1. A method of reducing the number of extraneous phenotypic cells in a mixed population of cells comprising a) contacting the mixed population of cells with one or more ligands that specifically bind to the extraneous phenotypic cells; and b) separating the ligand bound extraneous phenotypic cells from the rest of the mixed population of cells thereby reducing the number of extraneous phenotypic cells from a mixed population of cells, wherein the mixed population of cells comprises the in vitro differentiated progeny of pPS cells including the extraneous phenotypic cells.

2. The method of claim 1, wherein the extraneous phenotypic cell is an epithelial cell.

3. The method of claim 2, wherein the epithelial cell expresses a cytokeratin.

4. The method of claim 2, wherein the epithelial cell expresses EpCAM.

5. The method of claim 4, wherein one or more of the cells expressing EpCAM also expresses TRA-1-60.

6. The method of claim 1, wherein the ligand is an antibody.

7. The method of claim 6, wherein the antibody binds specifically to EpCAM.

8. The method of claim 1, wherein the ligand is bound to a solid support.

9. The method of claim 8, wherein the solid support is a bead.

10. The method of claim 9, wherein the bead is a magnetic bead.

11. The method of claim 1, wherein separating the ligand bound extraneous phenotypic cells from the rest of the mixed population of cells is performed by applying an external force to the mixed population of cells.

12. The method of claim 11, wherein the external force is provided by a magnetic field.

13. The method of claim 1, wherein the mixed population of cells comprises a targeted phenotype.

14. The method of claim 13, wherein the targeted phenotype is chosen from an oligodendrocyte, a cardiomyocyte, an islet cell, a hematopoietic cell, a hepatocyte, an osteoblast and a chondrocyte.

15. The method of claim 14 wherein the targeted phenotype is an oligodendrocyte.

16. The method of claim 14, wherein the targeted phenotype is a cardiomyocyte.

17. A method of reducing the number of extraneous phenotypic cells in a mixed population of cells comprising a) contacting the mixed population of cells with one or more ligands that specifically bind to one or more markers expressed by an epithelial cell; and b) separating the ligand bound cells of a) from the rest of the mixed population of cells thereby reducing the number of extraneous phenotypic cells from a mixed population of cells, wherein the mixed population of cells comprises the in vitro differentiated progeny of pPS cells including the extraneous phenotypic cells.

18. A method of reducing the number of extraneous phenotypic cells in a mixed population of cells comprising a) contacting the mixed population of cells with one or more ligands that specifically bind epithelial cells and contacting the mixed population of cells with one or more ligands that specifically bind to undifferentiated pPS cells; and b) separating the ligand bound cells from the rest of the mixed population of cells thereby reducing the number of extraneous

phenotypic cells from a mixed population of cells, wherein the mixed population of cells comprises the in vitro differentiated progeny of pPS cells.

CLAIMS

1. A method of reducing the number of extraneous phenotypic cells in a mixed population of cells comprising a) contacting the mixed population of cells with one or more ligands that specifically bind to the extraneous phenotypic cells; and b) separating the ligand bound extraneous phenotypic cells from the rest of the mixed population of cells thereby reducing the number of extraneous phenotypic cells from a mixed population of cells, wherein the mixed population of cells comprises the in vitro differentiated progeny of pPS cells including the extraneous phenotypic cells and wherein the ligand is an antibody that binds specifically to EpCAM and the mixed population of cells comprises a targeted phenotype and the targeted phenotype is an oligodendrocyte.

2. The method of claim **1**, wherein the extraneous phenotypic cell is an epithelial cell.

3. The method of claim **2**, wherein the epithelial cell expresses a cytokeratin.

4. The method of claim **1**, wherein the ligand is bound to a solid support.

5. The method of claim **4**, wherein the solid support is a bead.

6. The method of claim **5**, wherein the bead is a magnetic bead.

7. The method of claim **1**, wherein separating the ligand bound extraneous phenotypic cells from the rest of the mixed population of cells is performed by applying an external force to the mixed population of cells.

8. The method of claim **7**, wherein the external force is provided by a magnetic field.