Claims

1. A system for the production of mature dendritic cells comprising: a) a first isolated cell population comprising human pluripotent stem cells in a cell culture medium comprising granulocyte-macrophage colony stimulating factor (GM-CSF) and bone morphogenic protein 4 (BMP-4); and b) a second isolated cell population comprising mature dendritic cells which are the in vitro progeny of a portion of the first isolated cell population, wherein the system is stromal cell and interleukin 3 (IL-3) free.

2. The system of claim 1, wherein at least 5% of the mature dendritic cells express one or more markers chosen from CD86 and CD83.

3. The system of claim 2, wherein the mature dendritic cells expressing one or more markers chosen from CD86 and CD83 further express one or more of the following MHCII and CCR7.

4. The system of claim 1, wherein the human pluripotent stem cells are human embryonic stem cells.

5. The system of claim 1, wherein the system is serum free.

6. The system of claim 1, wherein the cell culture medium comprising GM-CSF and BMP-4 further comprises one or more factors selected from vascular endothelial growth factor (VEGF), stem cell factor (SCF), and interleukin 4 (IL-4).

7. A cell culture, comprising: a) a first cell population comprising human pluripotent stem cells in a cell culture medium comprising granulocyte-macrophage colony stimulating factor (GM-CSF) and bone morphogenic protein 4 (BMP-4) and b) a second cell population comprising dendritic cells which are the in vitro differentiated progeny of a portion of the first cell population, wherein the cell culture is stromal cell and interleukin 3 (IL-3) free.

8. The cell culture of claim 7, wherein the human pluripotent stem cells are human embryonic stem cells.

9. The cell culture of claim 7, wherein the cell culture is serum free.

10. The cell culture of claim 7, wherein the cell culture medium comprising GM-CSF and BMP-4 further comprises one or more factors selected from vascular endothelial growth factor (VEGF), stem cell factor (SCF), and interleukin 4 (IL-4).

11. A first and a second population of cells, comprising: a) a first cell population comprising human pluripotent stem cells in a cell culture medium comprising granulocyte-macrophage colony stimulating factor (GM-CSF) and bone morphogenic protein 4 (BMP-4) and b) a second cell population comprising dendritic cells which are the in vitro progeny of a portion of the first cell population, wherein the first and the second population of cells are stromal cell and interleukin 3 (IL-3) free.

12. The first and the second population of cells of claim 11, wherein the human pluripotent stem cells in the first cell population are human embryonic stem cells.

13. The first and the second population of cells of claim 11, wherein the first and the second populations are cultured in a serum free medium.

14. The first and the second population of cells of claim 11, wherein the cell culture medium comprising GM-CSF and BMP-4 further comprises one or more factors selected from vascular endothelial growth factor (VEGF), stem cell factor (SCF), and interleukin 4 (IL-4).