

What is claimed is:

1. A method of producing induced pluripotent stem cells (iPSCs) comprising:
 - (a) contacting an isolated population of cells with an activation culture; wherein the activation culture comprises IL-15 and zoledronic acid;
 - 5 (b) culturing the isolated population of cells in the activation culture to enrich and/or activate $\gamma\delta$ T cells in the isolated population of cells;
 - (c) transducing the $\gamma\delta$ T cells with a viral vector encoding one or more reprogramming factors; and
 - (d) culturing the transduced $\gamma\delta$ T cells under conditions suitable for reprogramming
- 10 mammalian somatic cells to a pluripotent state.
2. The method of claim 1, wherein the activation culture further comprises IL-2.
3. The method of claim 1 or 2, wherein the viral vector is a Sendai virus (SeV) vector.
- 15 4. The method of any one of claims 1- 3, wherein the method further comprises obtaining the isolated population of cells from a subject.
5. The method of any one of claims 1- 4, wherein the isolated population of cells are
- 20 peripheral blood mononuclear cells (PBMCs).
6. The method of any one of claims 1-5, wherein the isolated population of cells are terminally differentiated cells.
- 25 7. The method of any one of claims 1-6, wherein the isolated population of cells are mammal cells.
8. The method of claim 7, wherein the isolated population of cells are human cells.
- 30 9. The method of any one of claims 1-8, wherein the isolated population of cells are cultured in the activation culture for at most 13 days, at most 10 days, at most 9 days, at most 8

days, at most 7 days, at most 6 days, at most 5 days, at most 4 days, at most 3 days, at most 2 days, or at most 1 day.

10. The method of claim 9, wherein the isolated population of cells are cultured in the activation culture for at most 3 days.

11. The method of claim 9, wherein the isolated population of cells are cultured in the activation culture for 3 days.

12. The method of any one of claims 1-11, wherein after being cultured in the activation culture the isolated population of cells comprise less than 90%, less than 80%, less than 70%, less than 60%, less than 50%, less than 45%, less than 40%, less than 35%, or less than 30% $\gamma\delta$ T cells.

13. The method of claim 12, wherein after being cultured in the activation culture the isolated population of cells comprise less than 35% $\gamma\delta$ T cells.

14. The method of any one of claims 1-13, further comprises enriching the $\gamma\delta$ T cells in the isolated population of cells after step (b).

15. The method of claim 14, wherein the $\gamma\delta$ T cells are enriched by cell-cell clump enrichment.

16. The method of any one of claims 1-15, wherein at least part of the $\gamma\delta$ T cells are activated to $V\gamma 9^+$ $\gamma\delta$ T cells in step (b).

17. The method of any one of claims 1-15, wherein at least part of the $\gamma\delta$ T cells are activated to $V\gamma 9\delta 2^+$ $\gamma\delta$ T cells in step (b).

18. The method of any one of claims 1-17, wherein the one or more reprogramming factors are selected from a group consisting of OCT3/4, SOX2, KLF4, LIN28, and c-Myc.

19. The method of any one of claims 1-18, wherein in step (d) the transduced $\gamma\delta$ T cells are cultured in the presence of one or more feeder layers.
- 5 20. The method of claim 19, wherein in step (d) the transduced $\gamma\delta$ T cells are cultured in the presence of a mono layer of feeder layer.
21. The method of claim 19 or 20, wherein the feeder layer comprises mouse embryonic fibroblasts (MEFs).
- 10 22. The method of any one of claims 1-21, further comprising isolating and/or purifying the produced iPSCs.
23. The method of claim 22, further comprising administering the isolated iPSCs to a subject.
- 15 24. The method of any one of claims 1-22, further comprising differentiating the iPSCs *ex vivo* to cells of a desired cell type.
25. The method of claim 24, further comprising administering the differentiated cell to a subject.
- 20 26. The method of any one of claims 1-25, wherein the produced iPSCs are negative for a Sendai virus (SeV) vector.
- 25 27. The method of any one of claims 1-26, wherein the produced iPSCs are derived from $\gamma\delta$ T cells.
28. The method of any one of claims 1-26, wherein the produced iPSCs have rearrangement genes of TRG and TRD gene loci; and wherein optionally the produced iPSCs have V γ 9 and
- 30 V δ 2 gene arrangements.

29. The method of any one of claims 1-26, wherein the produced iPSCs are not derived from $\alpha\beta$ T cells.
30. The method of any one of claims 1-26, wherein the produced iPSCs do not produce
5 polymerase chain reaction (PCR) products from TCRA and TCRB gene loci.
31. The method of any one of claims 1-30, wherein the produced iPSCs are genomically stable with no loss of a chromosome.
- 10 32. The method of claim 31, wherein the genomic stability of the produced iPSCs is determined by Karyotyping analysis.
33. The method of any one of claims 1-32, wherein the produced iPSCs can grow in feeder free medium after adoption.
- 15 34. An induced pluripotent stem cell (iPSC) produced according to the method of any one of claims 1-33.
35. A pharmaceutical composition comprising the iPSC of claim 34 and a pharmaceutically
20 acceptable excipient.
36. A differentiated cell produced according to the method of claim 24.
37. A pharmaceutical composition comprising the differentiated cell of claim 36 and a
25 pharmaceutically acceptable excipient.
38. A method of treating a subject in need thereof comprising:
(i) obtaining a population of cells comprising peripheral blood mononuclear cells (PBMCs) from a subject;
30 (ii) reprogramming $\gamma\delta$ T cells in the population of cells to produce iPSCs according to the method of any one of claims 1-33; and

(iii) administering the produced iPSCs, or a pharmaceutical composition comprising the produced iPSCs to the subject, optionally after differentiating the iPSCs into one or more desired types of cells.

5 39. The method of claim 38, wherein the subject is a human.

40. The method of claim 38 or 39, wherein the subject has a hyperproliferative disorder or a cancer of hematopoietic system.

10 41. An isolated population of induced pluripotent stem cells (iPSCs), wherein the isolated population of iPSCs comprise pluripotent cells, wherein the pluripotent cells express one or more reprogramming factors, and/or wherein the pluripotent cells comprise a nucleotide sequence encoding rearrangement of TRG and TRD genes, and wherein optionally the iPSCs have V γ 9 and V δ 2 gene arrangements.

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42. A method of producing induced pluripotent stem cells (iPSCs) comprising:

(a) a step for performing a function of enriching and/or activating $\gamma\delta$ T cells in the isolated population of cells; and

20 (b) a step for performing a function of reprogramming the $\gamma\delta$ T cells to a pluripotent state.

43. An induced pluripotent stem cell (iPSC) produced according to the method of claim 42.

25 44. An isolated population of induced pluripotent stem cells (iPSCs) comprising pluripotent cells, wherein the pluripotent cells comprise a means for expressing one or more reprogramming factors, and/or wherein the pluripotent cells comprise a means for encoding rearrangement of TRG and TRD genes.