CLAIMS

WE CLAIM:

1. A method of reprogramming primate somatic cells, the method comprising the steps of:

exposing a plurality of potency-determining factors to ~~the~~ primate somatic cells obtained from a post-natal individual under conditions sufficient to reprogram the cells, wherein the potency-determining factors comprise Oct4, Sox2, and at least one of Lin28 and Nanog; and

culturing the exposed cells to obtain pluripotent reprogrammed cells, wherein the reprogrammed cells are substantially genetically identical to the post-natal individual.

~~2. The method of Claim 1, wherein the primate somatic cells are obtained from a post-natal individual.~~

~~3. The method of Claim 2, wherein the reprogrammed cells are substantially genetically identical to the post-natal individual.~~

42. The method of Claim 1, wherein the primate somatic cells are obtained by *in vitro* differentiation of a stem cell.

~~5~~3. The method of Claim 1, wherein the exposing step includes the step of introducing a vector encoding one or more potency-determining factors into the primate somatic cells.

~~6~~4. The method of Claim ~~5~~3, wherein the vector is a viral-based vector.

~~7~~5. The method of Claim ~~6~~4, wherein the viral-based vector is a retroviral vector.

~~8~~6. The method of Claim ~~7~~5, wherein the retroviral vector is a lentiviral vector.

~~9~~7. The method of Claim 1, wherein the potency-determining factors are introduced to the somatic cells as a reprogramming sequence in which a nucleic acid sequence encoding the potency-determining factor is operably linked to a heterologous promoter.

~~10~~8. The method of Claim 1, wherein the reprogrammed cells (i) express a cell marker selected from the group consisting of Oct-4, SSEA3, SSEA4, Tra-1-60 and Tra-1-81; (ii) exhibit morphology characteristic of pluripotent cells; and (iii) form teratomas when introduced into an immunocompromised animal.

~~11~~9. An enriched population of primate pluripotent cells produced according to a method comprising the step of: introducing a plurality of potency-determining factors into primate somatic cells obtained from a post-natal individual under conditions sufficient to express the potency-determining factors, thereby reprogramming the somatic cells to produce euploid primate pluripotent cells, wherein the potency-determining factors comprise Oct4, Sox2, and at least one of Lin28 and Nanog, and wherein the reprogrammed cells are substantially genetically identical to the post-natal individual.

~~12~~10. The enriched population of cells as claimed in Claim ~~11~~9, wherein the primate pluripotent cells (i) express a cell surface marker selected from the group consisting of Oct-4, SSEA3, SSEA4, Tra-1-60 and Tra-1-81; (ii) exhibit morphology characteristic of pluripotent cells; and (iii) form teratomas when introduced into an immunocompromised animal.

~~13~~11. The enriched population of cells as claimed in Claim ~~11~~9, wherein the primate pluripotent cells account for at least 60% of the population.

~~14~~12. The enriched population of cells as claimed in Claim ~~11~~9, wherein the primate pluripotent cells account for at least 80% of the population.

~~15~~13. The enriched population of cells as claimed in Claim ~~11~~9, wherein the primate pluripotent cells account for at least 95% of the population.

~~16~~14. A method reprogramming primate somatic cells, the method comprising the steps of:

exposing a plurality of potency-determining factors to the primate somatic cells obtained from a post-natal individual under conditions sufficient to reprogram the cells, wherein the potency-determining factors comprise Oct4, Sox2 and at least one of Lin28 and Nanog ~~and do not comprise c-Myc and Klf4~~; and

culturing the exposed cells to obtain pluripotent reprogrammed cells, wherein the reprogrammed cells are substantially genetically identical to the post-natal individual.

~~17. The method of Claim 16, wherein the primate somatic cells are obtained form a post-natal individual.~~

~~18. The method of Claim 17, wherein the reprogrammed cells are substantially genetically identical to the post-natal individual.~~

~~19~~15. The method of Claim ~~16~~14, wherein the primate somatic cells are obtained by in vitro differentiation of a stem cell.

~~20~~16. The method of Claim ~~16~~14, wherein the exposing step includes the step of introducing a vector encoding one or more potency-determining factors into the primate somatic cells.

~~21~~17. The method of Claim ~~20~~16, wherein the vector is a viral-based vector.

~~22~~18. The method of Claim ~~21~~17, wherein the viral-based vector is a retroviral vector.

~~23~~19. The method of Claim ~~22~~18, wherein the retroviral vector is a lentiviral vector.

~~24~~20. The method of Claim ~~16~~14, wherein the potency-determining factors are introduced to the somatic cells as a reprogramming sequence in which a nucleic acid sequence encoding the potency-determining factor is operably linked to a heterologous promoter.

~~25~~21. The method of Claim ~~16~~14, wherein the potency-determining factors comprise Oct-4, Sox2, Nanog and Lin28.

~~26~~22. The method of Claim ~~16~~14, wherein the reprogrammed cells (i) express a cell marker selected from the group consisting of Oct-4, SSEA3, SSEA4, Tra-1-60 and Tra-1-81; (ii) exhibit morphology characteristic of pluripotent cells; and (iii) form teratomas when introduced into an immunocompromised animal.

~~27~~23. An enriched population of primate pluripotent cells produced according to a method comprising the step of: introducing a plurality of potency-determining factors into primate somatic cells under conditions sufficient to express the potency-determining factors, thereby reprogramming the somatic cells to produce euploid primate pluripotent cells, wherein the potency-determining factors comprise Oct4, Sox2, and at least one of Lin28 and Nanog ~~and do not comprise c-Myc or Klf4~~.

~~28~~24. The enriched population of cells as claimed in Claim ~~27~~23, wherein the primate pluripotent cells (i) express a cell surface marker selected from the group consisting of Oct-4, SSEA3, SSEA4, Tra-1-60 and Tra-1-81; (ii) exhibit morphology characteristic of pluripotent cells; and (iii) form teratomas when introduced into an immunocompromised animal.

~~29~~25. The enriched population of cells as claimed in Claim ~~27~~23, wherein the potency-determining factors are Oct-4, Sox2, Nanog and Lin28.

~~30~~26. The enriched population of cells as claimed in Claim ~~27~~23, wherein the primate pluripotent cells account for at least 60% of the population.

~~31~~27. The enriched population of cells as claimed in Claim ~~27~~23, wherein the primate pluripotent cells account for at least 80% of the population.

~~32~~28. The enriched population of cells as claimed in Claim ~~15~~23, wherein the primate pluripotent cells account for at least 95% of the population.