CLAIMS

1. A method of improving iPS cell establishment efficiency, comprising contacting the following (1) and (2):
(1) one or more substances selected from the group consisting of members of the GLIS family and nucleic acids that encode the same,
(2) one or more substances selected from the group consisting of members of the Klf family and nucleic acids that encode the same,
with a somatic cell.

2. The method according to claim 1, wherein the substances (1) above include GLIS family zinc finger 1 (GLIS1) or a nucleic acid that encodes the GLIS1.

3. The method according to claim 1 or 2, wherein the substances (2) above include Klf4 or a nucleic acid that encodes the Klf4.

4. An iPS cell establishment efficiency improver comprising the following (1) and (2):
(1) one or more substances selected from the group consisting of members of the GLIS family and nucleic acids that encode the same,
(2) one or more substances selected from the group consisting of members of the Klf family and nucleic acids that encode the same.

5. The improver according to claim 4, wherein the substances (1) above include GLIS1 or a nucleic acid that encodes the GLIS1.

6. The improver according to claim 4 or 5, wherein the substances (2) above include Klf4 or a nucleic acid that

encodes the Klf4.

7. A method of producing an iPS cell, comprising contacting the following (1), (2) and (3):

(1) one or more substances selected from the group consisting of members of the GLIS family and nucleic acids that encode the same,

(2) one or more substances selected from the group consisting of members of the Klf family and nucleic acids that encode the same,

(3) a nuclear reprogramming substance capable of inducing an iPS cell from a somatic cell by being combined with the substances (1) and (2) above,

with a somatic cell.

8. The method according to claim 7, wherein the substances (1) above include GLIS1 or a nucleic acid that encodes the GLIS1.

9. The method according to claim 7 or 8, wherein the substances (2) above include Klf4 or a nucleic acid that encodes the Klf4.

10. The method according to any one of claims 7 to 9, wherein the nuclear reprogramming substance (3) above is selected from the group consisting of members of the Oct family, members of the Sox family, members of the Myc family, members of the Lin28 family, Nanog, and nucleic acids that encode the same.

11. The method according to any one of claims 7 to 9, wherein the nuclear reprogramming substance (3) above includes Oct3/4 or a nucleic acid that encodes the same.

12. The method according to claim 11, wherein the nuclear reprogramming substance (3) above includes Oct3/4 and Sox2 or nucleic acids that encode the same.

13. The method according to claim 11, wherein the nuclear reprogramming substance (3) above includes Oct3/4, Sox2 and c-Myc or nucleic acids that encode the same.

14. An agent for iPS cell induction from a somatic cell, comprising the following (1), (2) and (3):
(1) one or more substances selected from the group consisting of members of the GLIS family and nucleic acids that encode the same,
(2) one or more substances selected from the group consisting of members of the Klf family and nucleic acids that encode the same,
(3) a nuclear reprogramming substance capable of inducing an iPS cell from a somatic cell by being combined with the substances (1) and (2) above.

15. The agent according to claim 14, wherein the substances (1) above include GLIS1 or a nucleic acid that encodes the GLIS1.

16. The agent according to claim 14 or 15, wherein the substances (2) above include Klf4 or a nucleic acid that encodes the Klf4.

17. The agent according to any one of claims 14 to 16, wherein the nuclear reprogramming substance (3) above is selected from the group consisting of members of the Oct family, members of the Sox family, members of the Myc family, members of the Lin28 family, Nanog, and nucleic acids that encode the same.

18. The agent according to any one of claims 14 to 16, wherein the nuclear reprogramming substance (3) above includes Oct3/4 or a nucleic acid that encodes the same.

19. The agent according to claim 18, wherein the nuclear reprogramming substance (3) above includes Oct3/4 and Sox2 or nucleic acids that encode the same.

20. The agent according to claim 18, wherein the nuclear reprogramming substance (3) above includes Oct3/4, Sox2 and c-Myc or nucleic acids that encode the same.

21. An iPS cell comprising the following (1) and (2):
(1) one or more nucleic acids selected from the group consisting of exogenous nucleic acids that encode members of the GLIS family,
(2) one or more nucleic acids selected from the group consisting of exogenous nucleic acids that encode members of the Klf family.

22. The iPS cell according to claim 21, wherein the exogenous nucleic acids are integrated in a genome.

23. A method of producing a somatic cell, comprising treating the iPS cell according to claim 21 or 22 to induce it to differentiate into a somatic cell.

24. A method of producing a somatic cell, comprising the following (1) and (2):
(1) the step of producing an iPS cell by the method according to any one of claims 7 to 13, and
(2) the step of treating the iPS cell obtained through the step (1) above to induce it to differentiate into a somatic cell.

25. A use of the following (1) and (2) to improve the efficiency of establishment of iPS cells:
(1) one or more substances selected from the group consisting of members of the GLIS family and nucleic acids that encode

the same,

(2) one or more substances selected from the group consisting of members of the Klf family and nucleic acids that encode the same.

26. A use of one or more substances selected from the group consisting of members of the GLIS family and nucleic acids that encode the same to improve the efficiency of establishment of iPS cells, wherein the substances, along with one or more substances selected from the group consisting of members of the Klf family and nucleic acids that encode the same, are contacted with a somatic cell.

27. A use of the following (1), (2) and (3) to produce an iPS cell:

(1) one or more substances selected from the group consisting of members of the GLIS family and nucleic acids that encode the same,

(2) one or more substances selected from the group consisting of members of the Klf family and nucleic acids that encode the same,

(3) a nuclear reprogramming substance capable of inducing an iPS cell from a somatic cell by being combined with the substances (1) and (2) above.

28. A use of the following (1) and (2) to produce an iPS cell:

(1) one or more substances selected from the group consisting of members of the GLIS family and nucleic acids that encode the same,

(2) one or more substances selected from the group consisting of members of the Klf family and nucleic acids that encode the same, wherein the factors, along with a nuclear reprogramming substance capable of inducing an iPS cell from a somatic cell by being combined with the substances (1) and (2) above, are contacted with a somatic cell.

29. A use of (1) one or more substances selected from the group consisting of members of the GLIS family and nucleic acids that encode the same to produce an iPS cell, wherein the substances, along with (2) one or more substances selected from the group consisting of members of the Klf family and nucleic acids that encode the same, and a nuclear reprogramming substance capable of inducing an iPS cell from a somatic cell by being combined with the substances (1) and (2) above, are contacted with a somatic cell.

30. A use of the iPS cell according to claim 21 or 22 in producing a somatic cell.

31. The iPS cell according to claim 21 or 22, wherein the iPS cell serves as a source of cell in producing a somatic cell.

CLAIMS

1. A method of producing an iPS cell, comprising culturing a somatic cell transfected with nucleic acids that

encode the following (1), (2), (3), and (4):

(1) GLIS1,

(2) Oct3/4,

(3) a member of the Klf family selected from the group consisting of Klf1, Klf2, Klf4, and Klf5,

(4) a member of the Sox family selected from the group consisting of Sox1, Sox2, Sox3, Sox15, and Sox17,

thereby producing an iPS cell.

2. The method according to claim 1, wherein the member of the Klf family is Klf4.

3. The method according to claim 1, wherein the somatic cell has been transfected with a further nucleic acid that encodes a reprogramming substance selected from the group consisting of a member of the Myc family, a member of the Lin28 family, and Nanog,

wherein the member of the Myc family is selected from the group consisting of c-Myc, L-Myc and N-Myc, and

wherein the member of the Lin28 family is selected from the group consisting of Lin28 and Lin28b.

4. The method according to claim 1, wherein the member of the Sox family is Sox2.

5. The method according to claim 1, wherein the member of the Myc family is c-Myc.

6. A method of producing a somatic cell, comprising the following (1) and (2):

(1) the step of producing an iPS cell by the method according to claim 1, and

(2) the step of treating the iPS cell obtained through the step

(1) above to induce it to differentiate into a somatic cell.