

Claims

1. A method for inducing stem cells, comprising
transfecting a plurality of reprogramming factors into somatic cells floating-cultured in a gel medium; and
inducing stem cells from the somatic cells floating-cultured in the gel medium.
2. The method for inducing stem cells according to claim 1, wherein the gel medium is not stirred.
3. The method for inducing stem cells according to claim 1 or 2, wherein the gel medium is gelled with deacetylated gellan gum.
4. The method for inducing stem cells according to any one of claims 1 to 3, wherein the gel medium is free from a growth factor.
5. The method for inducing stem cells according to any one of claims 1 to 3, wherein the gel medium contains a growth factor at a concentration of 40% by weight or lower.
6. The method for inducing stem cells according to any one of claims 1 to 3, wherein the gel medium is free from bFGF.
7. The method for inducing stem cells according to any one of claims 1 to 6, wherein the gel medium comprises a human ES/iPS culture medium.
8. A floating culture method for stem cells, comprising floating-culturing stem cells in a gel medium without a growth factor, wherein somatic cells floating-cultured in the gel medium were transfected with a plurality of reprogramming factors and floating-cultured in the gel medium to induce the stem cells.
9. A floating culture method for stem cells, comprising floating-culturing stem cells in a gel medium with a growth factor at a concentration of 40% by weight or lower, wherein somatic cells floating-cultured in the gel medium were transfected with a plurality of reprogramming factors and floating-cultured in the gel medium to induce the stem cells.
10. A floating culture method for stem cells, comprising floating-culturing stem cells in a gel medium without bFGF, wherein somatic cells floating-cultured in the gel medium were transfected with a plurality of reprogramming factors and floating-cultured in the gel medium to induce the

stem cells.

11. A floating culture method for stem cells, comprising floating-culturing stem cells in a gel medium with bFGF at a concentration of 40 $\mu\text{g/L}$ or lower, wherein somatic cells floating-cultured in the gel medium were transfected with a plurality of reprogramming factors and floating-cultured in the gel medium to induce the stem cells.

12. The floating culture method for stem cells according to any one of claims 8 to 11, wherein the gel medium is not stirred.

13. The floating culture method for stem cells according to any one of claims 8 to 12, wherein the gel medium is gelled with deacetylated gellan gum.

14. The floating culture method for stem cells according to any one of claims 8 to 13, wherein the gel medium contains a ROCK inhibitor.

15. The floating culture method for stem cells according to any one of claims 8 to 12, wherein the concentration of the stem cells in the gel medium is 0.1×10^5 cells/mL or higher.

16. The floating culture method for stem cells according to any one of claims 8 to 13, further comprising, before the floating culture of the stem cells, dissociating the stem cells into single cells, and placing the stem cells dissociated into single cells in the gel medium.

17. The floating culture method for stem cells according to claim 16, wherein in the floating culture, the single cells form colonies while maintaining their clonality.

18. The floating culture method for stem cells according to any one of claims 11 to 15, further comprising, before the floating culture, hanging drop-culturing the stem cells using a grating plate to form colonies, and placing the formed colonies in the gel medium.

19. The floating culture method for stem cells according to any one of claims 8 to 18, wherein the stem cells proliferate while maintaining their undifferentiated states.

20. The floating culture method for stem cells according to any one of

claims 8 to 19, wherein the gel medium comprises a human ES/iPS culture medium.

21. A floating culture method for stem cells comprising:
transfecting a plurality of reprogramming factors into somatic cells floating-cultured in a gel medium;
inducing stem cells from the somatic cells floating-cultured in the gel medium;
placing stem cells and the gel medium in a dialysis membrane;
placing the dialysis membrane in a container;
placing a gel medium in the container; and
floating-culturing the stem cells in the gel medium in the dialysis membrane.

22. The floating culture method for stem cells according to claim 21, wherein a molecular weight cutoff of the dialysis membrane is 0.1 kDa or larger.

23. The floating culture method for stem cells according to claim 21 or 22, wherein the dialysis membrane is made of at least one member selected from cellulose ester, cellulose ester derivatives, regenerated cellulose, and cellulose acetate.

24. The floating culture method for stem cells according to any one of claims 21 to 23, wherein the gel medium is supplemented with a ROCK inhibitor.

25. The floating culture method for stem cells according to any one of claims 21 to 24, wherein the gel medium is not stirred.

26. The floating culture method for stem cells according to any one of claims 21 to 25, wherein the gel medium is a medium gelled with deacetylated gellan gum.

27. The floating culture method for stem cells according to any one of claims 21 to 26, wherein the gel medium is free from a growth factor.

28. The floating culture method for stem cells according to any one of claims 21 to 26, wherein the gel medium contains a growth factor at a concentration of 40% by weight or lower.

29. The floating culture method for stem cells according to any one of claims 21 to 26, wherein the gel medium is free from bFGF.

30. The floating culture method for stem cells according to any one of claims 21 to 29, wherein the concentration of the stem cells in the gel medium is 0.1×10^5 cells/mL or higher.

31. The floating culture method for stem cells according to any one of claims 21 to 30, further comprising, before the floating culture, dissociating the stem cells into single cells, and placing the stem cells dissociated into single cells in the gel medium.

32. The floating culture method for stem cells according to claim 31, wherein in the floating culture, the single cells form colonies while maintaining their clonality.

33. The floating culture method for stem cells according to any one of claims 21 to 32, further comprising, before the floating culture, hanging drop-culturing the stem cells using a grating plate to form colonies, and placing the formed colonies in the gel medium.

34. The floating culture method for stem cells according to any one of claims 21 to 33, wherein the stem cells proliferate while maintaining their undifferentiated states.

35. The floating culture method for stem cells according to any one of claims 21 to 34, further comprising replacing the gel medium in the container with a fresh gel medium.

36. The floating culture method for stem cells according to any one of claims 21 to 35, further comprising supplementing the gel medium in the container with a fresh gel medium.

37. The floating culture method for stem cells according to any one of claims 21 to 36, wherein the gel medium in the dialysis membrane is not replaced.

38. The floating culture method for stem cells according to any one of claims 21 to 37, wherein the gel medium comprises a human ES/iPS culture medium.

39. A method for inducing stem cells by floating, comprising:
placing somatic cells and a gel medium in a dialysis membrane;
placing the dialysis membrane in a container;

placing a gel medium in the container;
transfecting a plurality of reprogramming factors into the somatic cells floating in the gel medium; and
inducing stem cells from the somatic cells floating in the gel medium in the dialysis membrane.

40. The method for inducing stem cells by floating according to claim 39, wherein a molecular weight cutoff of the dialysis membrane is 0.1 kDa or larger.

41. The method for inducing stem cells by floating according to claim 39 or 40, wherein the dialysis membrane is made of at least one member selected from cellulose ester, cellulose ester derivatives, regenerated cellulose, and cellulose acetate.

42. The method for inducing stem cells by floating according to any one of claims 39 to 41, wherein the gel medium is not stirred.

43. The method for inducing stem cells by floating according to any one of claims 39 to 42, wherein the gel medium is gelled with deacetylated gellan gum.

44. The method for inducing stem cells by floating according to any one of claims 39 to 43, wherein the gel medium is free from a growth factor.

45. The method for inducing stem cells by floating according to any one of claims 39 to 44, wherein the gel medium is free from bFGF.

46. The method for inducing stem cells by floating according to any one of claims 39 to 45, further comprising, before the floating culture, dissociating the somatic cells into single cells, and placing the somatic cells dissociated into single cells in the gel medium.

47. The method for inducing stem cells by floating according to claim 46, wherein in the floating culture, the single cells form colonies while maintaining their clonality.

48. The method for inducing stem cells by floating according to any one of claims 39 to 47, further comprising replacing the gel medium in the container with a fresh gel medium.

49. The method for inducing stem cells by floating according to any one of claims 39 to 48, further comprising supplementing the gel medium in the

container with a fresh gel medium.

50. The method for inducing stem cells by floating according to any one of claims 39 to 49, wherein the gel medium in the dialysis membrane tube is not replaced.

51. The method for inducing stem cells by floating according to any one of claims 39 to 50, wherein the gel medium comprises a human ES/iPS culture medium.