Claims

1. A culture method for a proliferation of a pluripotent stem cell while maintaining an undifferentiated state, comprising a step of cultivating the pluripotent stem cell in a medium added with at least one selected from the group consisting of ethanolamine, ethanolamine analogs and pharmaceutically acceptable salts thereof, and substantially free of β-mercaptoethanol or containing β-mercaptoethanol at a concentration of not more than 9 μM.

2. The method according to claim 1, wherein the concentration of at least one selected from the group consisting of ethanolamine, ethanolamine analogs and pharmaceutically acceptable salts thereof in the medium is 1 μM - 1000 μM.

3. The method according to claim 1, wherein the concentration of at least one selected from the group consisting of ethanolamine, ethanolamine analogs and pharmaceutically acceptable salts thereof in the medium is 5 μM - 200 μM.

4. The method according to any one of claims 1 to 3, wherein the ethanolamine analog is a compound represented by the following formula

$X-CH_2-CH_2-O-Y$

wherein

X is $R^1-N(R^2)-$ [R^1 and R^2 are the same or different and each is a hydrogen atom or an amino-protecting group] or $R^3-CH=N-$ [R^3-CH is H-CH or a Shiff base type amino-protecting group]; and

Y is $-P(=O)(OH)-O-R^4$ [R^4 is $-CH_2-CH(O-R^5)-CH_2-O-R^6$ (R^5 and R^6 are the same or different and each is an acyl group having 2 - 30 carbon atoms or a hydrogen atom) or a hydrogen atom], a hydrogen atom or a hydroxy-protecting group.

5. The method according to claim 4, wherein R^1 and R^2 are the

same or different and each is a hydrogen atom, a halogen atom, a hydroxy group, an aryl group, an acyl group having 2 - 30 carbon atoms, an alkyl group having 1 - 6 carbon atoms, an alkoxyl group having 1 - 6 carbon atoms, a hydroxyalkyl group having 1 - 6 carbon atoms, a haloalkyl group having 1 - 6 carbon atoms, a haloalkoxyl group having 1 - 6 carbon atoms or a halohydroxyalkyl group having 1 - 6 carbon atoms, and R^3 is a hydrogen atom, a halogen atom, a hydroxy group, an aryl group, an acyl group having 2 - 30 carbon atoms, an alkyl group having 1 - 6 carbon atoms, an alkoxyl group having 1 - 6 carbon atoms, a hydroxyalkyl group having 1 - 6 carbon atoms, a haloalkyl group having 1 - 6 carbon atoms, a haloalkoxyl group having 1 - 6 carbon atoms or a halohydroxyalkyl group having 1 - 6 carbon atoms.

6. The method according to any one of claims 1 to 3, wherein the ethanolamine analog is one or plural selected from the group consisting of phosphoethanolamine, monomethylethanolamine, dimethylethanolamine, N-acylphosphatidylethanolamine, phosphatidylethanolamine, and lysophosphatidylethanolamine.

7. The method according to any one of claims 1 to 6, wherein the medium is further added with albumin.

8. The method according to claim 7, wherein the concentration of the albumin in the medium is 0.1 g/l - 20 g/l.

9. The method according to claim 7, wherein the concentration of the albumin in the medium is 1 g/l - 8 g/l.

10. The method according to any one of claims 7 to 9, wherein the albumin is obtained from plasma of an animal (including human) or by gene recombination technology.

11. The method according to any one of claims 7 to 10, wherein

the amount of fatty acid carried by the albumin in the medium is not more than 9 mg/g.

12. The method according to any one of claims 7 to 10, wherein the amount of fatty acid carried by the albumin in the medium is not more than 2.2 mg/g.

13. The method according to any one of claims 1 to 12, wherein the medium is further added with sulfated saccharide and/or a pharmaceutically acceptable salt thereof.

14. The method according to claim 13, wherein the concentration of the sulfated saccharide and/or a pharmaceutically acceptable salt thereof in the medium is 1 - 1000 ng/ml.

15. The method according to claim 13 or 14, wherein the sulfated saccharide or a pharmaceutically acceptable salt thereof is dextran sulfate Na having an average molecular weight of 2,500 - 7,500.

16. A culture method for a proliferation of a pluripotent stem cell while maintaining an undifferentiated state, comprising a step of cultivating the pluripotent stem cell in a medium added with at least one selected from the group consisting of ethanolamine, ethanolamine analogs and pharmaceutically acceptable salts thereof, and added with sulfated saccharide and/or a pharmaceutically acceptable salt thereof.

17. The method according to claim 16, wherein the concentration of the sulfated saccharide and/or a pharmaceutically acceptable salt thereof in the medium is 1 - 1000 ng/ml.

18. The method according to claim 16 or 17, wherein the sulfated saccharide or a pharmaceutically acceptable salt thereof is dextran sulfate Na having an average molecular

weight of 2,500 - 7,500.

19. The method according to any one of claims 16 to 18, wherein the medium is further added with albumin.

20. The method according to claim 19, wherein the concentration of the albumin in the medium is 0.1 g/l - 20 g/l.

21. The method according to claim 19, wherein the concentration of the albumin in the medium is 1 g/l - 8 g/l.

22. The method according to any one of claims 19 to 21, wherein the albumin is obtained from plasma of an animal (including human) or by gene recombination technology.

23. The method according to any one of claims 1 to 22, wherein the culture is performed in the absence of a feeder cell.

24. The method according to claim 23, wherein the culture is performed by using an extracellular matrix or an active fragment thereof, or an artificial product mimicking the function thereof.

25. The method according to claim 23, wherein the culture is performed by using laminin 511 or an active fragment thereof or matrigel.

26. The method according to any one of claims 1 to 25, wherein the culture is performed by single cell-seeding.

27. The method according to any one of claims 1 to 26, wherein the culture is performed under serum-free conditions.

28. The method according to any one of claims 1 to 27, wherein the medium is substantially free of a component derived from an

animal other than human.

29. The method according to any one of claims 1 to 28, wherein the pluripotent stem cell is an embryonic stem cell (ES cell) or induced pluripotent stem cell (iPS cell).

30. The method according to any one of claims 1 to 29, wherein the pluripotent stem cell is derived from primates.

31. The method according to any one of claims 1 to 30, wherein the pluripotent stem cell is human iPS cell.

32. A preservation stabilizing method for a medium for a proliferation of a pluripotent stem cell, comprising adding at least one selected from the group consisting of ethanolamine, ethanolamine analogs and pharmaceutically acceptable salts thereof, and adding sulfated saccharide and/or a pharmaceutically acceptable salt thereof.

33. The method according to claim 32, wherein the final concentration of the sulfated saccharide and/or a pharmaceutically acceptable salt thereof in use is 1 - 1000 ng/ml.

34. The method according to claim 32 or 33, further comprising adding albumin.

35. The method according to claim 34, wherein the final concentration of the albumin in use is 0.1 g/l - 20 g/l.

36. The method according to claim 34, wherein the final concentration of the albumin in use is 1 g/l - 8 g/l.

37. The method according to any one of claims 34 to 36, wherein the albumin is obtained from plasma of an animal (including

human) or by gene recombination technology.

38. The method according to any one of claims 34 to 37, wherein the amount of fatty acid carried by the albumin is not more than 9 mg/g.

39. The method according to any one of claims 34 to 37, wherein the amount of fatty acid carried by the albumin is not more than 2.2 mg/g.

40. The method according to any one of claims 32 to 39, wherein the medium is substantially free of β-mercaptoethanol or contains β-mercaptoethanol at a final concentration of not more than 9 μM.

41. The method according to any one of claims 32 to 40, wherein the medium is for a proliferation of a pluripotent stem cell while maintaining an undifferentiated state.

42. A medium additive for a proliferation of a pluripotent stem cell while maintaining an undifferentiated state, comprising at least one selected from the group consisting of ethanolamine, ethanolamine analogs and pharmaceutically acceptable salts thereof, and substantially free of β-mercaptoethanol or containing β-mercaptoethanol at a concentration of not more than 9 μM when in use.

43. The medium additive according to claim 42, wherein the ethanolamine analog is a compound represented by the following formula

$X-CH_2-CH_2-O-Y$

wherein

X is $R^1-N(R^2)-$ [R^1 and R^2 are the same or different and each is a hydrogen atom or an amino-protecting group] or $R^3-CH=N-$ [R^3-CH is H-CH or a Shiff base type amino-protecting group]; and

Y is $-P(=O)(OH)-O-R^4$ [R^4 is $-CH_2-CH(O-R^5)-CH_2-O-R^6$ (R^5 and R^6 are the same or different and each is an acyl group having 2 - 30 carbon atoms or a hydrogen atom) or a hydrogen atom], a hydrogen atom or a hydroxy-protecting group.

44. The medium additive according to claim 43, wherein R^1 and R^2 are the same or different and each is a hydrogen atom, a halogen atom, a hydroxy group, an aryl group, an acyl group having 2 - 30 carbon atoms, an alkyl group having 1 - 6 carbon atoms, an alkoxyl group having 1 - 6 carbon atoms, a hydroxyalkyl group having 1 - 6 carbon atoms, a haloalkyl group having 1 - 6 carbon atoms, a haloalkoxyl group having 1 - 6 carbon atoms or a halohydroxyalkyl group having 1 - 6 carbon atoms, and
R^3 is a hydrogen atom, a halogen atom, a hydroxy group, an aryl group, an acyl group having 2 - 30 carbon atoms, an alkyl group having 1 - 6 carbon atoms, an alkoxyl group having 1 - 6 carbon atoms, a hydroxyalkyl group having 1 - 6 carbon atoms, a haloalkyl group having 1 - 6 carbon atoms, a haloalkoxyl group having 1 - 6 carbon atoms or a halohydroxyalkyl group having 1 - 6 carbon atoms.

45. The medium additive according to any one of claims 42 to 44, wherein the ethanolamine analog is one or plural selected from the group consisting of phosphoethanolamine, monomethylethanolamine, dimethylethanolamine, N-acylphosphatidylethanolamine, phosphatidylethanolamine, and lysophosphatidylethanolamine.

46. The medium additive according to any one of claims 42 to 45, further comprising albumin.

47. The medium additive according to claim 46, wherein the final concentration of the albumin in use is 0.1 g/l - 20 g/l.

48. The medium additive according to claim 46, wherein the final concentration of the albumin in use is 1 g/l - 8 g/l.

49. The medium additive according to any one of claims 46 to 48, wherein the amount of fatty acid carried by the albumin is not more than 9 mg/g.

50. The medium additive according to any one of claims 46 to 48, wherein the amount of fatty acid carried by the albumin is not more than 2.2 mg/g.

51. The medium additive according to any one of claims 46 to 50, wherein the albumin is obtained from plasma of an animal (including human) or by gene recombination technology.

52. The medium additive according to any one of claims 42 to 51, further comprising sulfated saccharide and/or a pharmaceutically acceptable salt thereof.

53. The medium additive according to claim 52, wherein the final concentration of the sulfated saccharide and/or a pharmaceutically acceptable salt thereof in use is 1 - 1000 ng/ml.

54. The medium additive according to claim 52 or 53, wherein the sulfated saccharide is at least one selected from the group consisting of sulfated monosaccharide, sulfated disaccharide, sulfated polysaccharide, sulfated sugar alcohol and sulfated cyclitol.

55. The medium additive according to any one of claims 52 to 54, wherein the aforementioned sulfated saccharide or a pharmaceutically acceptable salt thereof is at least one selected from the group consisting of dextran sulfate Na, cellulose SO_3Na, xanthan gum SO_3Na, fucoidan, alginate SO_3Na,

inulin SO_3Na, maltoheptaose SO_3Na, stachyose SO_3Na, maltotriose SO_3Na, multitol SO_3Na, sucrose8SO_3K, glucose SO_3Na, myo-6 inositol SO_3K, α-cyclodextrin SO_3Na, mannitol SO_3Na, xylitol SO_3Na and erythritol SO_3Na.

56. The medium additive according to claim 55, wherein the aforementioned sulfated saccharide or a pharmaceutically acceptable salt thereof is at least one selected from the group consisting of dextran sulfate Na, fucoidan, maltoheptaose SO_3Na, maltotriose SO_3Na, multitol SO_3Na and sucrose8SO_3K.

57. The medium additive according to any one of claims 52 to 56, wherein the aforementioned sulfated saccharide or a pharmaceutically acceptable salt thereof is dextran sulfate Na having an average molecular weight of 2,500 - 7,500.

58. The medium additive according to any one of claims 42 to 57, wherein the proliferation of a pluripotent stem cell while maintaining an undifferentiated state is performed under the conditions without using a feeder cell.

59. The medium additive according to claim 58, wherein the conditions without using a feeder cell do not include use of a feeder cell but include use of an extracellular matrix or an active fragment thereof, or an artificial product mimicking the function thereof.

60. The medium additive according to claim 58, wherein the conditions without using a feeder cell do not include use of a feeder cell but include use of laminin 511 or an active fragment thereof or matrigel.

61. The medium additive according to any one of claims 42 to 60, wherein the proliferation of a pluripotent stem cell while maintaining an undifferentiated state is performed by single

cell-seeding.

62. The medium additive according to any one of claims 42 to 61, wherein the proliferation of a pluripotent stem cell while maintaining an undifferentiated state is performed under serum-free conditions.

63. The medium additive according to any one of claims 42 to 62, comprising substantially free of a component derived from an animal other than human.

64. The medium additive according to any one of claims 42 to 63, wherein the pluripotent stem cell is an embryonic stem cell (ES cell) or induced pluripotent stem cell (iPS cell).

65. The medium additive according to any one of claims 42 to 64, wherein the pluripotent stem cell is derived from primates.

66. The medium additive according to any one of claims 42 to 65, wherein the pluripotent stem cell is human iPS cell.

67. A medium for proliferation of a pluripotent stem cell while maintaining an undifferentiated state, which comprises the medium additive according to any one of claims 42 to 66.

68. A culture method for a proliferation of an induced pluripotent stem cell (iPS cell) while maintaining an undifferentiated state, comprising a step of cultivating the induced pluripotent stem cell (iPS cell) in a medium added with at least one selected from the group consisting of ethanolamine, ethanolamine analogs and pharmaceutically acceptable salts thereof.

69. The method according to claim 68, wherein the concentration of at least one selected from the group consisting of

ethanolamine, ethanolamine analogs and pharmaceutically acceptable salts thereof in the medium is 1 μM - 1000 μM.

70. The method according to claim 68, wherein the concentration of at least one selected from the group consisting of ethanolamine, ethanolamine analogs and pharmaceutically acceptable salts thereof in the medium is 5 μM - 200 μM.

71. The method according to any one of claims 68 to 70, wherein the ethanolamine analog is a compound represented by the following formula

$X-CH_2-CH_2-O-Y$

wherein

X is $R^1-N(R^2)-$ [R^1 and R^2 are the same or different and each is a hydrogen atom or an amino-protecting group] or $R^3-CH=N-$ [R^3-CH is H-CH or a Shiff base type amino-protecting group]; and

Y is $-P(=O)(OH)-O-R^4$ [R^4 is $-CH_2-CH(O-R^5)-CH_2-O-R^6$ (R^5 and R^6 are the same or different and each is an acyl group having 2 - 30 carbon atoms or a hydrogen atom) or a hydrogen atom], a hydrogen atom or a hydroxy-protecting group.

72. The method according to claim 71, wherein R^1 and R^2 are the same or different and each is a hydrogen atom, a halogen atom, a hydroxy group, an aryl group, an acyl group having 2 - 30 carbon atoms, an alkyl group having 1 - 6 carbon atoms, an alkoxyl group having 1 - 6 carbon atoms, a hydroxyalkyl group having 1 - 6 carbon atoms, a haloalkyl group having 1 - 6 carbon atoms, a haloalkoxyl group having 1 - 6 carbon atoms or a halohydroxyalkyl group having 1 - 6 carbon atoms, and R^3 is a hydrogen atom, a halogen atom, a hydroxy group, an aryl group, an acyl group having 2 - 30 carbon atoms, an alkyl group having 1 - 6 carbon atoms, an alkoxyl group having 1 - 6 carbon atoms, a hydroxyalkyl group having 1 - 6 carbon atoms, a haloalkyl group having 1 - 6 carbon atoms, a haloalkoxyl group having 1 - 6 carbon atoms or a halohydroxyalkyl group having 1

- 6 carbon atoms.

73. The method according to any one of claims 68 to 72, wherein the ethanolamine analog is one or plural selected from the group consisting of phosphoethanolamine, monomethylethanolamine, dimethylethanolamine, N-acylphosphatidylethanolamine, phosphatidylethanolamine, and lysophosphatidylethanolamine.

74. The method according to any one of claims 68 to 73, wherein the medium is further added with albumin.

75. The method according to claim 74, wherein the concentration of the albumin in the medium is 0.1 g/l - 20 g/l.

76. The method according to claim 74, wherein the concentration of the albumin in the medium is 1 g/l - 8 g/l.

77. The method according to any one of claims 74 to 76, wherein the albumin is obtained from plasma of an animal (including human) or by gene recombination technology.

78. The method according to any one of claims 74 to 77, wherein the amount of fatty acid carried by the albumin in the medium is not more than 9 mg/g.

79. The method according to any one of claims 74 to 77, wherein the amount of fatty acid carried by the albumin in the medium is not more than 2.2 mg/g.

80. The method according to any one of claims 68 to 79, wherein the culture is performed in the absence of a feeder cell.

81. The method according to claim 80, wherein the culture is performed by using an extracellular matrix or an active fragment thereof, or an artificial product mimicking the

function thereof.

82. The method according to claim 80, wherein the culture is performed by using laminin 511 or an active fragment thereof or matrigel.

83. The method according to any one of claims 68 to 82, wherein the culture is performed by single cell-seeding.

84. The method according to any one of claims 68 to 83, wherein the culture is performed under serum-free conditions.

85. The method according to any one of claims 68 to 84, wherein the medium is substantially free of a component derived from an animal other than human.

86. The method according to any one of claims 68 to 85, wherein the induced pluripotent stem cell is derived from primates.

87. The method according to any one of claims 68 to 86, wherein the induced pluripotent stem cell is human iPS cell.

88. A preservation stabilizing method for a medium for a proliferation of a pluripotent stem cell, comprising adding at least one selected from the group consisting of ethanolamine, ethanolamine analogs and pharmaceutically acceptable salts thereof.

89. The method according to claim 88, further comprising adding sulfated saccharide and/or a pharmaceutically acceptable salt thereof.

90. The method according to claim 89, wherein the final concentration of the sulfated saccharide and/or a pharmaceutically acceptable salt thereof in use is 1 - 1000

ng/ml.

91. The method according to any one of claims 88 to 90, further comprising adding albumin.

92. The method according to claim 91, wherein the final concentration of the albumin in use is 0.1 g/l - 20 g/l.

93. The method according to claim 91, wherein the final concentration of the albumin in use is 1 g/l - 8 g/l.

94. The method according to any one of claims 91 to 93, wherein the albumin is obtained from plasma of an animal (including human) or by gene recombination technology.

95. The method according to any one of claims 91 to 94, wherein the amount of fatty acid carried by the albumin is not more than 9 mg/g.

96. The method according to any one of claims 91 to 94, wherein the amount of fatty acid carried by the albumin is not more than 2.2 mg/g.

97. The method according to any one of claims 88 to 96, wherein the medium is substantially free of β-mercaptoethanol or contains β-mercaptoethanol at a final concentration of not more than 9 μM.

98. The method according to any one of claims 88 to 97, wherein the medium is for a proliferation of a pluripotent stem cell while maintaining an undifferentiated state.

99. A medium additive for a proliferation of a pluripotent stem cell while maintaining an undifferentiated state, comprising at least one selected from the group consisting of ethanolamine,

ethanolamine analogs and pharmaceutically acceptable salts thereof.

100. The medium additive according to claim 99, wherein the ethanolamine analog is a compound represented by the following formula

$X-CH_2-CH_2-O-Y$

wherein

X is $R^1-N(R^2)-$ [R^1 and R^2 are the same or different and each is a hydrogen atom or an amino-protecting group] or $R^3-CH=N-$ [R^3-CH is H-CH or a Shiff base type amino-protecting group]; and

Y is $-P(=O)(OH)-O-R^4$ [R^4 is $-CH_2-CH(O-R^5)-CH_2-O-R^6$ (R^5 and R^6 are the same or different and each is an acyl group having 2 - 30 carbon atoms or a hydrogen atom) or a hydrogen atom], a hydrogen atom or a hydroxy-protecting group.

101. The medium additive according to claim 100, wherein R^1 and R^2 are the same or different and each is a hydrogen atom, a halogen atom, a hydroxy group, an aryl group, an acyl group having 2 - 30 carbon atoms, an alkyl group having 1 - 6 carbon atoms, an alkoxyl group having 1 - 6 carbon atoms, a hydroxyalkyl group having 1 - 6 carbon atoms, a haloalkyl group having 1 - 6 carbon atoms, a haloalkoxyl group having 1 - 6 carbon atoms or a halohydroxyalkyl group having 1 - 6 carbon atoms, and

R^3 is a hydrogen atom, a halogen atom, a hydroxy group, an aryl group, an acyl group having 2 - 30 carbon atoms, an alkyl group having 1 - 6 carbon atoms, an alkoxyl group having 1 - 6 carbon atoms, a hydroxyalkyl group having 1 - 6 carbon atoms, a haloalkyl group having 1 - 6 carbon atoms, a haloalkoxyl group having 1 - 6 carbon atoms or a halohydroxyalkyl group having 1 - 6 carbon atoms.

102. The medium additive according to any one of claims 99 to 101, wherein the ethanolamine analog is one or plural selected

from the group consisting of phosphoethanolamine, monomethylethanolamine, dimethylethanolamine, N-acylphosphatidylethanolamine, phosphatidylethanolamine, and lysophosphatidylethanolamine.

103. The medium additive according to any one of claims 99 to 102, further comprising albumin.

104. The medium additive according to claim 103, wherein the albumin is obtained from plasma of an animal (including human) or by gene recombination technology.

105. The medium additive according to any one of claims 99 to 104, further comprising sulfated saccharide and/or a pharmaceutically acceptable salt thereof.

106. The medium additive according to claim 105, wherein the final concentration of the sulfated saccharide and/or a pharmaceutically acceptable salt thereof in use is 1 - 1000 ng/ml.

107. The medium additive according to claim 105 or 106, wherein the sulfated saccharide is at least one selected from the group consisting of sulfated monosaccharide, sulfated disaccharide, sulfated polysaccharide, sulfated sugar alcohol and sulfated cyclitol.

108. The medium additive according to any one of claims 105 to 107, wherein the aforementioned sulfated saccharide or a pharmaceutically acceptable salt thereof is at least one selected from the group consisting of dextran sulfate Na, cellulose SO_3Na, xanthan gum SO_3Na, fucoidan, alginate SO_3Na, inulin SO_3Na, Maltoheptaose SO_3Na, stachyose SO_3Na, maltotriose SO_3Na, multitol SO_3Na, sucrose8SO_3K, glucose SO_3Na, myo-6 inositol SO_3K, α-cyclodextrin SO_3Na, mannitol SO_3Na, xylitol

SO_3Na and erythritol SO_3Na.

109. The medium additive according to claim 108, wherein the aforementioned sulfated saccharide or a pharmaceutically acceptable salt thereof is at least one selected from the group consisting of dextran sulfate Na, fucoidan, Maltoheptaose SO_3Na, maltotriose SO_3Na, multitol SO_3Na and sucrose8SO_3K.

110. The medium additive according to any one of claims 105 to 109, wherein the aforementioned sulfated saccharide or a pharmaceutically acceptable salt thereof is dextran sulfate Na having an average molecular weight of 2,500 - 7,500.

111. The medium additive according to any one of claims 99 to 110, wherein the proliferation of a pluripotent stem cell while maintaining an undifferentiated state is performed under the conditions without using a feeder cell.

112. The medium additive according to claim 111, wherein the conditions without using a feeder cell do not include use of a feeder cell but include use of an extracellular matrix or an active fragment thereof, or an artificial product mimicking the function thereof.

113. The medium additive according to claim 111, wherein the conditions without using a feeder cell do not include use of a feeder cell but include use of laminin 511 or an active fragment thereof or matrigel.

114. The medium additive according to any one of claims 99 to 113, wherein the proliferation of a pluripotent stem cell while maintaining an undifferentiated state is performed by single cell-seeding.

115. The medium additive according to any one of claims 99 to

114, wherein the proliferation of a pluripotent stem cell while maintaining an undifferentiated state is performed under serum-free conditions.

116. The medium additive according to any one of claims 99 to 115, comprising substantially free of a component derived from an animal other than human.

117. The medium additive according to any one of claims 99 to 116, wherein the pluripotent stem cell is an embryonic stem cell (ES cell) or induced pluripotent stem cell (iPS cell).

118. The medium additive according to any one of claims 99 to 117, wherein the pluripotent stem cell is derived from primates.

119. The medium additive according to any one of claims 99 to 118, wherein the pluripotent stem cell is human iPS cell.

120. A medium for proliferation of a pluripotent stem cell while maintaining an undifferentiated state, which comprises the medium additive according to any one of claims 99 to 119.

Claims

1. A culture medium for a proliferation of a pluripotent stem cell while maintaining an undifferentiated state, wherein the medium comprised an albumin, at least one selected from the group consisting of ethanolamine, ethanolamine analogs and pharmaceutically acceptable salts thereof, and substantially free of β-mercaptoethanol or containing β-mercaptoethanol at a concentration of not more than 9 μM and wherein the concentration of said at least one selected from the group consisting of ethanolamine, ethanolamine analogs and pharmaceutically acceptable salts thereof in the the medium is 11 μM - 200 μM.

2. The culture medium according to claim 1, which is substantially free of β-mercaptoethanol.

3. The culture medium according to claim 1, wherein the amount of fatty acid carried by the albumin in the medium is not more than 9 mg/g.

4. The culture medium according to claim 1, wherein the amount of fatty acid carried by the albumin in the medium is not more than 2.2 mg/g.

5. The culture medium according to claim 1, which is further added with sulfated saccharide and/or a pharmaceutically acceptable salt thereof.

6. A culture method for a proliferation of a pluripotent stem cell while maintaining an undifferentiated state, comprising a step of cultivating the pluripotent stem cell in a medium which comprises an albumin, at least one selected from the group consisting of ethanolamine, ethanolamine analogs and

pharmaceutically acceptable salts thereof, and substantially free of β-mercaptoethanol or containing β-mercaptoethanol at a concentration of not more than 9 μM, and wherein the concentration of said at least one selected from the group consisting of ethanolamine, ethanolamine analogs and pharmaceutically acceptable salts thereof in the medium is 11 μM - 200 μM.

7. The method according to claim 6, wherein the medium is substantially free of β-mercaptoethanol.

8. The method according to claim 6 or 7, wherein the amount of fatty acid carried by the albumin in the medium is not more than 9 mg/g.

9. The method according to claim 6 or 7, wherein the amount of fatty acid carried by the albumin in the medium is not more than 2.2 mg/g.

10. The method according to any one of claims 6 to 9, wherein the medium is further added with sulfated saccharide and/or a pharmaceutically acceptable salt thereof.

11. The method according to any one of claims 6 to 10, wherein the culture is performed in the absence of a feeder cell.

12. The method according to any one of claims 6 to 11, wherein the culture is performed by using an extracellular matrix or an active fragment thereof, or an artificial product mimicking the function thereof.

13. The method according to any one of claims 6 to 12, wherein the culture is performed by single cell-seeding.

14. The method according to any one of claims 6 to 13, wherein the pluripotent stem cell is an embryonic stem cell (ES cell) or induced pluripotent stem cell (iPS cell).

15. A medium additive for a proliferation of a pluripotent stem cell while maintaining an undifferentiated state, comprising an albumin, at least one selected from the group consisting of ethanolamine, ethanolamine analogs and pharmaceutically acceptable salts thereof, and substantially free of β-mercaptoethanol or containing β-mercaptoethanol at a concentration of not more than 9 μM when in use, and wherein the concentration of said at least one selected from the group consisting of ethanolamine, ethanolamine analogs and pharmaceutically acceptable salts thereof in the medium is 11 μM - 200 μM.

16. The method additive according to claim 15, which is substantially free of β-mercaptoethanol.

17. The medium additive according to claim 15 or 16, wherein the amount of fatty acid carried by the albumin is not more than 9 mg/g.

18. The medium additive according to claim 15 or 16, wherein the amount of fatty acid carried by the albumin is not more than 2.2 mg/g.

19. The medium additive according to any one of claims 15 to 18, further comprising sulfated saccharide and/or a pharmaceutically acceptable salt thereof.

20. A preservation stabilizing method for a medium for a proliferation of a pluripotent stem cell, comprising adding an albumin, adding at least one selected from the group consisting

of ethanolamine, ethanolamine analogs and pharmaceutically acceptable salts thereof, and adding sulfated saccharide and/or a pharmaceutically acceptable salt thereof, wherein the concentration of said at least one selected from the group consisting of ethanolamine, ethanolamine analogs and pharmaceutically acceptable salts thereof in the medium is 11 μM - 200 μM, and wherein the medium is substantially free of β-mercaptoethanol or containing β-mercaptoethanol at a concentration of not more than 9 μM.

21. The method according to claim 20, wherein the medium is substantially free of β-mercaptoethanol.

22. The method according to claim 20 or 21, wherein the amount of fatty acid carried by the albumin is not more than 9 mg/g.

23. The method according to claim 20 or 21, wherein the amount of fatty acid carried by the albumin is not more than 2.2 mg/g.