[0005] The present disclosure provides a composition for promoting the proliferation of pluripotent stem cells and a method for promoting the proliferation of pluripotent stem cells.

Summary

[0005a] In one aspect, the present invention refers to a method for promoting proliferation of pluripotent stem cells, comprising: seeding pluripotent stem cells in a single-cell state or a dispersed state; and culturing the pluripotent stem cells in a culture medium to which hemagglutinin or modified hemagglutinin has been added. In another aspect, the present invention refers to a method for promoting proliferation of pluripotent stem cells, comprising: adding hemagglutinin or modified hemagglutinin to a culture medium for suspension culture of a cell aggregate of pluripotent stem cells; and culturing the pluripotent stem cells without dividing the cell aggregate into small aggregates. In yet another aspect, the present invention refers to a method for culturing pluripotent stem cells; comprising: performing the method as disclosed herein.

Means for Solving Problem

[0006] In one aspect, the present disclosure relates to a composition for promoting the proliferation of pluripotent stem cells. The composition contains hemagglutinin or modified hemagglutinin as an active ingredient.

[0007] In another aspect, the present disclosure relates to a method for promoting the proliferation of pluripotent stem cells. The method includes culturing pluripotent stem cells in a culture medium to which the proliferation promoting composition of the present disclosure has been added.

[0008] In yet another aspect, the present disclosure relates to a method for culturing pluripotent stem cells. The method includes performing the proliferation promoting method of the present disclosure.

Effects of the Invention

[0009] In one or more embodiments, the present disclosure has the effect of being able to promote the proliferation of pluripotent stem cells while maintaining their undifferentiated state.

Brief Description of Drawings

[0010] [FIG. 1] FIG. 1 shows the results of observing the proliferation promoting effect of hemagglutinin (HA) in clonal cell culture derived from single cells of human iPS cells.

[FIG. 2] FIG. 2 is a schematic view of the experimental scheme in Examples.

[FIG. 3] FIG. 3 is a diagram plotting the culture time and the cell density in suspension culture of cell aggregates of human iPS cells.

[FIG. 4] FIG. 4 shows the results of the micrographs of the effect of hemagglutinin (HA) in suspension culture of cell aggregates of human iPS cells.

[FIG. 5] FIG. 5 shows an example of a graph that confirmed the effect of the addition of HA on the number of cells in a cell aggregate (○: without the addition of

CLAIMS

[1] A method for promoting proliferation of pluripotent stem cells, comprising:
seeding pluripotent stem cells in a single-cell state or a dispersed state; and
culturing the pluripotent stem cells in a culture medium to which hemagglutinin or modified hemagglutinin has been added.

[2] The method according to claim 1, comprising:
adding hemagglutinin or modified hemagglutinin to the culture medium before a colony of the pluripotent stem cells is formed.

[3] A method for promoting proliferation of pluripotent stem cells, comprising:
adding hemagglutinin or modified hemagglutinin to a culture medium for suspension culture of a cell aggregate of pluripotent stem cells; and
culturing the pluripotent stem cells without dividing the cell aggregate into small aggregates.

[4] The method according to claim 1 or 2, comprising:
preparing the pluripotent stem cells in a single-cell state or a dispersed state by dispersing a cell aggregate of the pluripotent stem cells into at least one of single cell and cell population with a cell dispersion treatment.

[5] The method according to claim 1 or 2, wherein the culturing is performed by monolayer culture or suspension culture.

[6] The method according to claim 3, wherein the culturing of pluripotent stem cells is performed by using a bioreactor.

[7] The method according to any one of claims 1 to 6, wherein the hemagglutinin is hemagglutinin of *Clostridium botulinum*.

[8] The method according to any one of claims 1 to 7, wherein the hemagglutinin is a complex composed of hemagglutinin subcomponents HA2 (HA17) and HA3

(HA70) of the neurotoxin complex of *Clostridium botulinum*, or a complex composed of hemagglutinin subcomponents HA1 (HA33), HA2 (HA17), and HA3 (HA70) of the neurotoxin complex of *Clostridium botulinum*.

[9] The method according to claim 8, wherein the subcomponent HA3 (HA70) is of *Clostridium botulinum* type A or *Clostridium botulinum* type B.

[10] The method according to any one of claims 1 to 9, wherein the concentration of the hemagglutinin or modified hemagglutinin in the culture medium is 5 nM or more and 200 nM or less.

[11] A method for culturing pluripotent stem cells; comprising:
performing the method according to any one of claims 1 to 10.