SPECIFICATION

ANIMAL CELL GROWTH PROMOTER, MEDIUM FOR CULTURING ANIMAL CELLS, AND DEVICE FOR CULTURING ANIMAL CELLS

Cross reference to related application

[0001]

This application claims priority to Japanese Patent Application No. 2018-210910, filed November 8, 2018, which is incorporated herein by reference.

Technical field

[0002]

The present invention relates to animal cell growth promoters, media for culturing animal cells, and devices for culturing animal cells.

Background art

[0003]

In the culture of animal cells, sera-containing culture media supplemented with a fetal bovine serum or with hormones or growth factors in place of the sera as a factor with activity for maintaining cell growth.

[0004]

Besides those factors, JP-A-2013-247927 discloses that rice bran extracts have growth-promoting effects on cultured animal cells. JP-A-2011-182736 discloses that media supplemented with hydrolyzed β-conglycinin concentrate enhance cell growth rate when animal cells are cultured in the media. Furthermore, JP-A-7-188292 discloses that glycoproteins in the supernatant from cultures of human-derived fibroblasts promote human vascular endothelial and liver parenchymal cell growth. In addition, JP-A-5-301893 discloses that a protein in the conditioned madia obtained by culturing human-derived glioma cell lines has a growth-promoting effect on glial cells and fibroblasts.

Summary of the invention

Problem to be solved by the invention

[0005]

An object of the present disclosure is to provide novel animal cell growth promoters, media for culturing animal cells, and devices for culturing animal cells.

Means for solving the problem

[0006]

An example of the present disclosure is an animal cell growth promoter including, as an active ingredient, a culture supernatant of an embryonic membrane from an avian or reptilian egg. The egg may comprise a chicken egg. The animal cell growth promoter may be the one for a muscle cell, a visceral cell, or a neural cell. The animal cell growth promoter may be the one for a liver cell, a pancreas cell, or an oviduct cell.

[0006a]

In one aspect, the present disclosure refers to an animal cell growth promoter comprising, as an active ingredient, a culture supernatant of an embryonic membrane derived from an avian or reptilian fertilized egg.

[0007]

Another example of the present disclosure is a cell culture medium containing any one of the cell growth promoters described above.

[0007a]

In another aspect, the present disclosure refers to a cell culture medium comprising the animal cell growth promoter as disclosed herein.

[0008]

Another example of the present disclosure is a device for culturing animal cells including: a first culture vessel for culturing cells derived from an embryonic membrane of an avian or reptile egg; a second culture vessel for culturing animal cells to be grown; a first flow path for flowing a culture medium from the first culture vessel to the second culture vessel; a second flow path for flowing a culture medium from the second culture vessel to the first culture vessel; and a medium-flow-rate control unit for circulating a culture medium in the order of the first culture vessel, the first flow path, the second culture vessel, and the second flow path, and controlling the flow of the culture medium in the first flow path and the second flow path depending on a condition of the animal cells and/or a condition of the culture medium. The device may include a culture medium introduction path for introducing a fresh culture medium to the circulating culture medium; and a culture medium discharge path for discharging a used culture medium, from the circulating culture medium, the medium-flow-rate control unit controlling the introduction of a fresh culture medium via the culture medium introduction path and the discharge of the used culture medium, via the culture medium discharge path depending on a condition of the animal cells and/or a condition of the culture medium.

[0008a]

In another aspect, the present disclosure refers to a device for culturing animal cells comprising: a first culture vessel for culturing cells derived from an embryonic membrane of an avian or reptile egg; a second culture vessel for culturing animal cells to be grown; a first flow path for flowing a culture medium from the first culture vessel to the second culture vessel; a second flow path

for flowing a culture medium from the second culture vessel to the first culture vessel; and a medium-flow-rate control unit for circulating a culture medium in the order of the first culture vessel, the first flow path, the second culture vessel, and the second flow path, and controlling the flow of the culture medium in the first flow path and the second flow path depending on a condition of the animal cells and/or a condition of the culture medium.

Brief description of the drawings

[0009]

Fig. 1 is a schematic diagram of a device for growing cells according to an embodiment of the present invention;

Fig. 2 shows photographs of observations showing that growth of the cells derived from the tissues shown in the figure (stomach, skeletal muscle, heart, gallbladder, intestine, brain, bursa of Fabricius, and bone) is promoted when a culture supernatant of chicken egg chorioallantoic membranes is added to the medium in an embodiment of the present invention;

Fig. 3 shows graphs quantitatively representing the results in Fig. 1 for cells derived from the liver, pancreas, and oviduct in an embodiment of the present invention; and

Fig. 4 shows graphs showing that growth of the cells derived from the tissues shown in the figure (stomach, muscle, heart, liver, intestine, brain, bursa of Fabricius, and bone)is promoted when