CLAIMS

1. A method for selecting cardiomyocytes derived from embryonic stem cells, wherein the cardiomyocytes are selected by the following steps of:

inducing differentiation of embryonic stem cells to form embryoid bodies comprising undifferentiated mesoblast cells;

then preparing a cell mixture comprising programmed cardiomyocytes by culturing the embryoid bodies in the culture medium under a low-serum-supplemented condition and a mildly-acidic pH condition; and

continuing the culture of the cell mixture in the same culture medium to obtain the cardiomyocytes.

2. The method for selecting cardiomyocytes according to Claim 1, wherein the low-serum-supplemented condition is serum-free condition, or a condition where, when the concentration of serum or a serum components supplemented to the culture medium used in the process for obtaining undifferentiated mesoblast cells is considered as 100%, the concentration of serum or serum components is reduced to 0%-10%.

3. The method for selecting cardiomyocytes according to Claim 1, wherein the mildly-acidic pH condition is a condition of pH6.5.

CLAIMS

[1] A method for selecting cardiomyocytes from a cell mixture containing cardiomyocytes and non-cardiomyocytes derived from stem cells having similar characteristics to those of embryonic stem cells, wherein the stem cells exclude embryonic stem cells, adult stem cells, or fetuses, wherein said cell mixture is cultured in the culture medium under the following conditions:

(i) a low-glucose-supplemented condition; and

(ii) one or more conditions selected from the group consisting of a low calcium condition, a low-nutritional condition, a lactic acid-supplemented condition, an aspartic acid/glutamic acid-supplemented condition,and a pyruvic acid-supplemented condition.

[2] The method for selecting cardiomyocytes according to Claim 1, further comprising a step of eliminating dead cells adhered to the cardiomyocytes using collagenase.

[3] The method for selecting cardiomyocytes according to Claim 2, wherein the dead cells are eliminated based on the fact that the specific gravity of the dead cells is higher than that of the cardiomyocytes.

[4] The method for selecting cardiomyocytes according to any one of Claims 1-3, wherein the condition (ii) of the culture medium is a lactic acid-supplemented condition.

[5] The method for selecting cardiomyocytes according to any one of Claims 1-3, wherein the condition (ii) of the culture medium is an aspartic acid/glutamic acid-supplemented condition.

[6] The method for selecting cardiomyocytes according to any one of Claims 1-3, wherein the condition (ii) of the culture medium is a pyruvic acid-supplemented condition.

[7] The method for selecting cardiomyocytes according to Claim 1, wherein the cell mixture is prepared by the following steps of:

inducing differentiation of embryonic stem cells;

forming embryoid bodies comprising programmed cardiomyocytes (undifferentiated mesoblast cells) ;

preparing the cell mixture by culturing the embryoid bodies in the culture medium under a low-serum-supplemented condition and/or a mildly-acidic pH condition.

[8] A method for selecting cardiomyocytes derived from stem cells having similar characteristics to those of embryonic stem cells, wherein the stem cells exclude embryonic stem cells, wherein the cardiomyocytes are selected by the following steps of:

inducing differentiation of embryonic stem cells to form embryoid bodies comprising undifferentiated mesoblast cells;

then preparing a cell mixture comprising programmed cardiomyocytes by culturing the embryoid bodies in the culture medium under a low-serum-supplemented condition and a mildly-acidic pH condition; and

continuing the culture of the cell mixture in the same culture medium to obtain the cardiomyocytes.

[9] The method for selecting cardiomyocytes according to any one of Claims 1-6, wherein the low-glucose-supplemented condition is a sugar-free condition or a condition where sugar content is decreased less than 1% as compared to the sugar condition of the culture medium used for differentiation induction.

[10] The method for selecting cardiomyocytes according to any one of Claims 1-6, wherein the low calcium condition is a condition where the calcium concentration in the culture medium ranges between 0.3-1.3 mM.

[11] The method for selecting cardiomyocytes according to any one of Claims 1-6, wherein the low-nutritional condition is a condition where, when using a culture medium selected from the group consisting of RPMI culture medium, DMEM culture medium, MEM culture medium, F12 culture medium, and α-MEM culture medium as a culture medium, the contents of each nutritional components included in the culture medium are reduced to 10% or less as compared with the contents of each nutritional components originally included in these culture medium.

[12] The method for selecting cardiomyocytes according to any one of Claims 1-6, wherein the lactic acid-supplemented condition is a condition where 0.1-5 mM of lactic acid is supplemented to the culture medium.

[13] The method for selecting cardiomyocytes according to any one of Claims 1-6, wherein the aspartic acid/glutamic acid-supplemented condition is a condition where 20-100 mg/L of aspartic acid and 20-100 mg/L of glutamic acid are supplemented to the culture medium.

[14] The method for selecting cardiomyocytes according to any one of Claims 1-6, wherein the pyruvic acid-supplemented condition is a condition where 0.5-5 mM of pyruvic acid is supplemented to the culture medium.

[15] The method for selecting cardiomyocytes according to Claim 8, wherein the low-serum-supplemented condition is serum-free condition, or a condition where, when the concentration of serum or a serum components supplemented to the culture medium used in the process for obtaining undifferentiated mesoblast cells is considered as 100%, the concentration of serum or serum components is reduced to 0%-10%.

[16] The method for selecting cardiomyocytes according to Claim 8, wherein the mildly-acidic pH condition is a condition of pH6.5.