

Claims

[Claim 1]

A method for developing a secondary organ by using a non-human animal in which organ formation is inhibited, comprising the step of:

(1) raising a newborn or a fetus of the non-human animal in which organ formation is inhibited by complementing at least a part of the function of the organ whose formation is inhibited.

[Claim 2]

The method according to claim 1, wherein the secondary organ develops in such a manner that at least a part of the function complemented by the raising is impaired.

[Claim 3]

The method according to claim 1 or 2, wherein the secondary organ is an organ lacking a specific functional cell.

[Claim 4]

The method according to claim 3, wherein the functional cell is a β cell.

[Claim 5]

The method according to any one of claims 1 to 4, wherein organ formation is inhibited by genetic modification of the non-human animal in step (1).

[Claim 6]

The method according to any one of claims 1 to 5, wherein the organ whose formation is inhibited is a pancreas and complementation of the function of the pancreas whose formation is inhibited is performed by administering at least insulin and a digestive enzyme.

[Claim 7]

The method according to claim 5, wherein the genetic modification is overexpressing a Hes1 gene under the control of a Pdx1 promoter in the non-human animal.

[Claim 8]

The method according to any one of claims 1 to 7, wherein the non-human animal is a pig.

[Claim 9]

A non-human animal obtained by raising a newborn or a fetus of a non-human animal in which organ formation is inhibited, wherein the non-human animal has a secondary organ lacking a specific functional cell.

[Claim 10]

The non-human animal according to claim 9, wherein the organ is a pancreas and the functional cell is a β cell.

[Claim 11]

The non-human animal according to claim 10, wherein the newborn or the fetus of the non-human animal is that in which organ formation is inhibited by overexpressing a Hes1 gene under the control of a Pdx1 promoter.

[Claim 12]

The non-human animal according to any one of claims 9 to 11, wherein the non-human animal is a pig.

[Claim 13]

A secondary organ developed by raising a newborn or a fetus of a non-human animal in which organ formation is inhibited, wherein the secondary organ lacks a specific functional cell.

[Claim 14]

The secondary organ according to claim 13, wherein the organ is a pancreas and the functional cell is a β cell.

[Claim 15]

The secondary organ according to claim 14, wherein the newborn or the fetus of the non-human animal is that in which organ formation is inhibited by overexpressing a Hes1 gene under the control of a Pdx1 promoter.

[Claim 16]

The secondary organ according to any one of claims 13 to 15, wherein the non-human animal is a pig.

[Claim 17]

The secondary organ according to any one of claims 13 to 16, wherein a transplanted cell established itself in the secondary organ.

[Claim 18]

A method for producing a cell within the body of a non-human animal, comprising the step of raising the non-human animal according to claim 1 or 2.

[Claim 19]

A method for establishment and growth of a progenitor cell of a specific functional cell or a pluripotent stem cell, or a functional cell derived therefrom, comprising transplanting the progenitor cell or the pluripotent stem cell into an organ-like tissue, wherein the organ-like tissue is formed by a newborn or a fetus of a genetically modified pig and lacks a functional cell derived from the pig, wherein the organ is pancreas or kidney.

[Claim 20]

The method according to claim 19, wherein the progenitor cell of functional cell or the pluripotent stem cell is a human-derived cell.

[Claim 21]

A material in which a progenitor cell of a specific functional cell or a pluripotent stem cell, or a functional cell derived therefrom is established and grown, the material lacking a functional cell derived from the pig and comprising organ-like tissue formed by a newborn or a fetus of a genetically modified pig, wherein the progenitor cell or the pluripotent stem cell is transplanted into the organ-like tissue, wherein the organ is pancreas or kidney.

[Claim 22]

The material according to claim 21, wherein the progenitor cell of functional cell or the pluripotent stem cell is a human-derived cell.