

	HP	FBP1	CFB
	HGB	F12	C3
	HAMP	ETFDH	APOC3
	HAAO	DEFB1	ALDOB
	G0S2	CTSO	ABCC3
	FTCD	CLDN2	ABCA6
	FGGY	CFI	
	FBP1	CFH	
	F12	CFB	
	ETFDH	C3	
	ENTPD8	APOC3	
	DHRS1	ANG	
	DEFB1	ALDOB	
	CTSO	ALDH3A2	
	CLDN2	ACAT1	
	CFI	ABCC3	
	CFH	ABCA6	
	CFB		
	CES2		
	C3		
	APOC3		
	ANG		
	ALDOB		
	ALDH3A2		
	ALAS1		
	ACOX1		
	ACAT1		
	ABCC3		
	ABCA6		

[0074]

2. Calculation of gene expression levels of hepatocytes derived from an adult

The values used in the section of "1. Selection of values of the plurality of functions"

CLAIMS

1. A tissue structure obtained by co-culturing a hepatic endoderm cell derived from an embryonic stem cell or derived from an induced pluripotent stem cell with a vascular endothelial cell and a mesenchymal stem cell using a culture chamber having a culture surface which is a cell non-adhesive surface, wherein a hepatic endoderm cell: a vascular endothelial cell: and a mesenchymal stem cell are co-cultured at a ratio of 10:5-10:1-2, and the cells are seeded at a density of 20 to 2000 cells per microchamber,

wherein a value obtained by assay of a plurality of functions using a Pearson product-moment correlation coefficient is closer to a value of a cell or biological tissue sampled from an adult than a value of a cell or biological tissue sampled from a fetus,

the tissue structure has a spheroid shape and a diameter of the spheroid is in a range from 50 μ m to 2 mm, the plurality of functions are a gene expression level of a gene selected from 61 genes in which the Variation Factors in Table 2-1 and Table 2-2 disclosed in the specification are x2, and

the 61 genes contains 49 genes in which the Variation Factors in Table 2-1 and Table 2-2 disclosed in the specification are x10.

2. The tissue structure according to Claim 1, wherein the gene expression level is a value obtained by an analysis using a DNA chip on which all gene segments are immobilized.

3. The tissue structure according to Claim 1 or 2, wherein the plurality of functions are functions specific to a liver.

4. A method of preparing a tissue structure, comprising:
preparing a cultured form by co-culturing a hepatic endoderm cell derived from an embryonic stem cell or derived from an induced pluripotent stem cell with a vascular endothelial cell and a mesenchymal stem cell using a culture chamber having a culture surface which is a cell non-adhesive surface, wherein a hepatic endoderm cell: a vascular endothelial cell: and a mesenchymal stem cell are co-cultured at a ratio of 10:5-10:1-2, and the cells are seeded at a density of 20 to 2000 cells per microchamber;

performing an assay of a plurality of functions of the cultured form by using a Pearson product-moment correlation coefficient; and

picking, as a tissue structure, a cultured form in which a value obtained by the assay is closer to a value of a cell or biological tissue sampled from an adult than a value of a cell or biological tissue sampled from a fetus, wherein

the co-culturing is performed using a microchamber having an equivalent diameter in a range from 20 μ m to 2.5 mm and a depth in a range from 20 μ m to 1000 μ m,

the microchamber is formed of a bottom portion and an opening,

the opening is defined by a wall that surrounds an area from a boundary between the opening and the bottom portion to an end of the opening, the wall having a taper angle in a range from 1 to 20 degrees,

the bottom portion has one of a hemispherical shape and a truncated cone shape,

the plurality of functions are a gene expression level of a gene selected from 61 genes in which the Variation Factors in Table 2-1 and Table 2-2 disclosed in the specification are x2, and

the 61 genes contains 49 genes in which the Variation Factors in Table 2-1 and Table 2-2 disclosed in the specification are x10.

5. The method of preparing a tissue structure according to Claim 4, wherein the gene expression levels are analyzed using a DNA chip on which all gene segments are immobilized.

6. The method of preparing a tissue structure according to Claim 4 or 5, wherein the co-culture step comprises the steps of: forming an aggregate; forming an organ bud; and further culturing the organ bud for maturation.

7. The method of preparing a tissue structure according to Claim 6, wherein in the steps of forming an aggregate, forming an organ bud, and further culturing the organ bud for maturation, cells are combined to form an aggregate.

8. The method of preparing a tissue structure according to Claim 6 or 7, wherein in the steps of forming an aggregate, forming an organ bud, and further culturing the organ bud for maturation, cells are combined to form a cluster having a spheroid shape.

9. The method of preparing a tissue structure according to Claim 8, wherein a spheroid formed by the cells has a diameter in a range from 50 μm to 2 mm.

10. The method of preparing a tissue structure according to any one of Claims 4 to 9, wherein the hepatic endoderm cell is a cell derived from an induced pluripotent stem cell.

11. The method of preparing a tissue structure according to any one of Claims 4 to 10, wherein the plurality of functions are functions specific to a liver.

12. The method of preparing a tissue structure according to any one of Claims 4 to 11,
wherein the culture surface of the culture chamber is coated with a polymer selected from the
group consisting of a phospholipid, a phospholipid-polymer complex, poly(2-hydroxyethyl
5 methacrylate) (PHEMA), polyvinyl alcohol, agarose, chitosan, polyethyleneglycol, and albumin,
or a combination thereof, the culture surface being a surface in contact with cells.