3D Human Pancreatic Microvascular

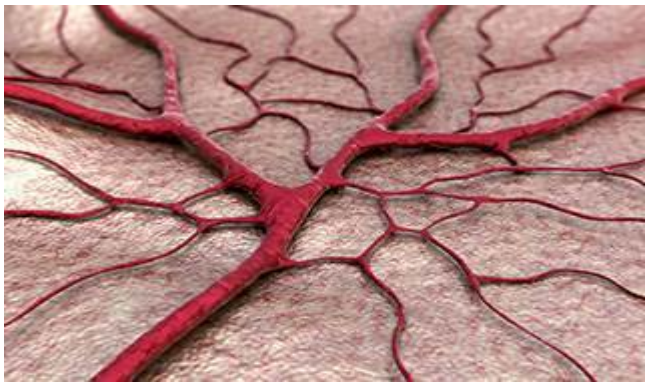
Product Name	3D Human Pancreatic Microvascular
Catalog Number	EP007
Product Format	6 , 12, and 24 well
Storage	37° C

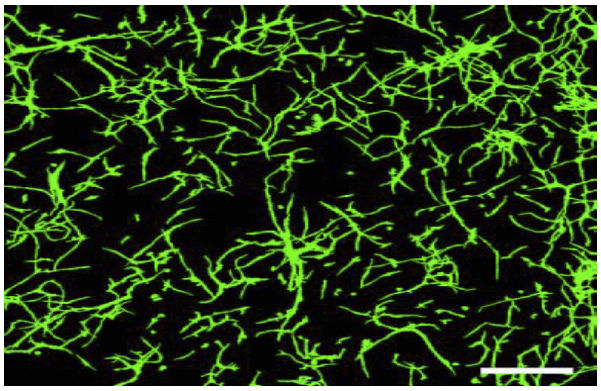
GENERAL INFORMATION

Human pancreas development starts between 26 and 35 days post conception with the emergence of dorsal and ventral buds from the foregut epithelium. At 6 weeks of gestation (equivalent to 4 weeks post conception) the two buds fuse and become a single organ formed by stratified epithelium embedded in mesenchyme. The stratified epithelium will give rise to both the exocrine and endocrine compartments of the definitive pancreas.

One important physiological regulator of development and normal function of the endocrine cells of the pancreas is the microcirculation through specialized sinusoidal capillaries that irrigate the islets of Langerhans. The endothelial cells of these capillaries are highly fenestrated to facilitate the exchange of signals. The dense network ensures that each endocrine cell (glucagon-producing α-cell, insulin-producing β-cell, somatostatin-producing δ-cell, ghrelin-producing ϵ-cell and pancreatic polypeptide-producing PP-cell) is in close proximity to the circulation. It makes up a considerable part of the islets and it is responsible for critical communication via blood signals between the endocrine and exocrine pancreas and also between the different cell types that populate the islets. After transplantation of islets to the pancreas, angiogenesis is key to restoring proper function

Our 3D Human Pancreatic Microvascular Endothelial Angiogenesis model is construct using GFP- Tagged human pancreatic microvascular endothelial cells are co-cultured with RFP- Tagged human Supporting cells. GFP positive lymphatic capillary like tubule formation can be monitored in real time under fluorescence microscope throughout the whole process of the experiment.





Advantages:

1) Cells used in the 3D model are all human cells; results obtained are more relevant to human situations rather than those data from animal models, i.e. CAM et al.
2) The whole angiogenesis process can be monitored (from cell inoculation to the end of experiment), therefore, more crucial information can be acquired at multiple time points from a single experiment.
3) No need to perform post-experimental staining for endothelial markers, this is particularly important, if those markers are changed in experimental conditions involved in the studies.

The 3D Human Pancreatic Microvascular Endothelial Angiogenesis contains all of the materials necessary to perform multiple angiogenesis assays in 6, 12, or 24 well formats. The 3D model is designed that the testing materials, i.e. compounds, conditioned media, or tissue explants, can be added into the system at any time, ranging from the onset of vasculogenesis to advanced angiogenesis. The resulting effect on tubule formation (tubular length, number of branches et al) can be monitored throughout the whole process under inverted fluorescence microscope.

Reagents and Materials Provided:

(1) 1 x vial of mixture of Human Pancreatic Microvascular Endothelial Angiogenesis ECs and RFP-tagged supporting cells (-80°C or liquid N2)
(2) 1 x 24-well Alpha Coat Solution coated plate (Room temperature, for 2 months)
(3) 1 x 500ml of Endo-Growth Medium (4°C)

Protocols: Day 1

1. Pre warm Endo-Growth Medium to 37ºC in a water bath
2. Accurately pipette 24ml Endo-Growth Medium into a 50ml Falcon tube;
3. Rapidly thaw the vial of cryopreserved cells in a 37ºC water bath;
4. Transfer all cells gently into 24ml pre warmed Endo-growth medium;
5. Mix well the cells gently using a serological pipette;
6. Add 1.0ml of cell suspension to each well of the pre coated 24-well plate.
7. Make sure the cells are evenly dispersed in the wells.
8. Place the plate in an incubator (37ºC, 5% CO2 and humidified).

Day 2

9. Take the plate from the incubator and examine cells under inverted fluorescence microscopy (GFP Human Pancreatic Microvascular Endothelial Angiogenesis should sparsely and evenly distributed among RFP positive human supporting cells).
10. Wash the cells one with 2 ml of PBS
11. Add 2.0ml of fresh Endo-Growth medium (control) or Experimental media (Endo-Growth medium, plus pro- or anti-angiogenic regents according to customer's needs).
12. Place the plate back into the incubator. Day 4, 6, 8, 10, 12, and 14……
13. Replace the medium every 2 days until the end of the experiments.