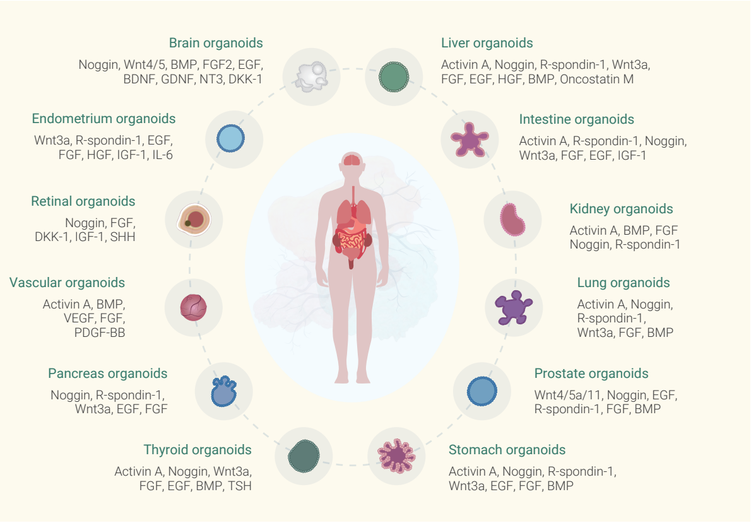
Proteins for Organoid Culture



Organoid Related Products

01 Inhibitors/ Agonists

Product Name	Cat. No.	Function
Gastrin	HY-P1097	A hormone with mitogenic effect on gastric cells. Used in stomach organoids culture
Laduviglusib	HY-10182	A selective GSK3 inhibitor that can be used for the generation of organoid
Y-27632	HY-10583	A ROCK inhibitor; used to increase the proliferation and reduce apoptosis of progenitor cells
A 83-01	HY-10432	An inhibitor of TGF-β type I receptor ALK5, the Activin/Nodal receptor ALK4 and ALK7
SB-431542	HY-10431	A selective TGF-β type I Receptor inhibitor; the addition of SB431542 in the culture medium prevents spontaneous differentiation of mouse embryonic stem cells

02 Recombinant Proteins

Proteins Category	Function	Product Name	Cat. No.
Wnt	An essential niche component for maintaining the proliferation of Lgr5-positive stem cells in various organoids, such as the intestinal, gastric, pancreatic and liver organoids	Human Wnt3a Surrogate Human Wnt3a	HY-P70453C HY-P70453A
EGF	A growth factor for epithelial tissues; binding to EGF receptors, induces hyperplasic changes. Used for the generation of intestinal, liver, thyroid, and brain organoids	Human EGF Mouse EGF	HY-P7109 HY-P70590
Noggin	An inhibitor of bone morphogenetic proteins that modulates cellular differentiation, proliferation, and apoptosis	Human Noggin Mouse Noggin	HY-P7051A HY-P7086
R-spondin	The ligand of Lgr5 and a niche factor that is required for the self-renewal of stem cells and activates Wnt signaling. An essential additive of the organoid culture system	Human R-spondin-1 Mouse R-spondin-1	HY-P7114 HY-P76012
FGF	FGFs play crucial roles in a wide variety of cellular functions, including cell proliferation, survival, metabolism, morphogenesis, and differentiation, as well as in tissue repair and regeneration. In a 3D extracellular matrix, FGF-2, FGF-7, FGF-9, and FGF-10 promote lung organoid formation	Human FGF-4 Human FGF-7 Human FGF-9 Human FGF-10 Human FGF-19 Human FGF-basic/ FGF-2	HY-P7014 HY-P7047A HY-P7177 HY-P70695 HY-P7172 HY-P7004
BMP	BMPs play crucial roles in embryogenesis and development, and also in maintenance of adult tissue homeostasis. BMP-2 and BMP-4 are widely used in in vitro generation of hepatic cells from iPSCs and ESCs	Human BMP-4 Human BMP-7 Human/Mouse/ Rat BMP-2	HY-P7007 HY-P7008 HY-P7006
VEGF	VEGF-A is required during embryogenesis to regulate the proliferation, migration, and survival of endothelial cells. It is used in the generation of vascular organoids	Human VEGF-A Mouse VEGF-A	HY-P7420 HY-P7312
PDGF	PDGF-BB induces vascular smooth muscle cells (VSMC) specification and cell differentiation in the vascular	Mouse PDGF-BB	HY-P70699
HGF	A known hepatocyte mitogen that can be used for the liver organoid culture	Human HGF	HY-P7121
Activin A	A cytokine with multiple roles in development and homeostasis. In the case of intestinal organoids, it activates TGF-β signaling in PSCs to trigger endodermal differentiation	Human/Mouse/ Rat Activin A	HY-P70311
DKK	A canonical WNT inhibitor that can induce retinal progenitors for self-organization	Human DKK-1	HY-P7155A
IGF-I	IGF-I/IGF-1 coordinate proliferation, differentiation, and maturation of neuroepithelial precursor cells. IGF-1 facilitates the generation of retinal organoids that display the typical laminated structure and photoreceptor maturation	Human IGF-I/IGF-1 Mouse IGF-I/IGF-1	HY-P7018 HY-P7070

03 Basement Membrane Matrix

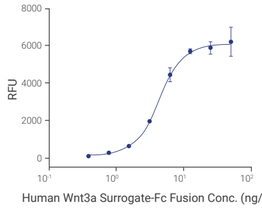
Cat. No.	Product Name	Application
HY-K6001	Basement Membrane Matrix (Phenol Red)	In vitro angiogenesis, tumor cell migration or invasion
HY-K6002	Basement Membrane Matrix	In vitro angiogenesis, tumor cell migration or invasion
HY-K6003	Basement Membrane Matrix GFR (Phenol Red)	Organoid culture, in vitro angiogenesis
HY-K6004	Basement Membrane Matrix GFR	Organoid culture, in vitro angiogenesis
HY-K6005	Basement Membrane Matrix HC (Phenol Red)	Transplantation/induction of tumorigenic models such as PDX, CDX
HY-K6006	Basement Membrane Matrix IPSC-qualified	Stem cell expansion and differentiation
HY-K6007	Basement Membrane Matrix for Organoid Culture	Organoid culture

04 Organoid Culture Kits

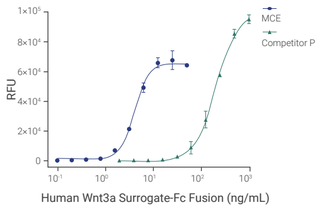
	Cat. No.	Product Name	Cat. No.	Product Name
Tumor Organoid Medium	HY-K6101	Human Breast Cancer Organoid Kit	HY-K6107	Human Cervical Cancer Organoid Kit
	HY-K6102	Human Lung Adenocarcinoma Organoid Kit	HY-K6108	Human Esophageal Cancer Organoid Kit
	HY-K6103	Human Small Cell Lung Cancer Organoid Kit	HY-K6109	Human Endometrial Cancer Organoid Kit
	HY-K6104	Human Colorectal Cancer Organoid Kit	HY-K6110	Human Pancreatic Cancer Organoid Kit
	HY-K6105	Human Gastric Cancer Organoid Kit	HY-K6111	Human Head and Neck Squamous Cell Carcinoma Organoid Kit
	HY-K6106	Human Cholangiocarcinoma Organoid Kit		
Normal Tissue Organoid Culture Medium	HY-K6112	Human Colonic Organoid Kit	HY-K6117	Human Liver Ductal Organoid (expansion) Kit
	HY-K6113	Human Intestinal Organoid Kit	HY-K6118	Mouse Liver Ductal Organoid (expansion) Kit
	HY-K6114	Human Gastric Epithelial Organoid Kit	HY-K6119	Mouse Intestinal Organoid Kit
	HY-K6115	Human Pancreatic Organoid Kit	HY-K6120	Mouse Colonic Organoid Kit
	HY-K6116	Human Kidney Tubular Organoid Kit		

Experiment validation

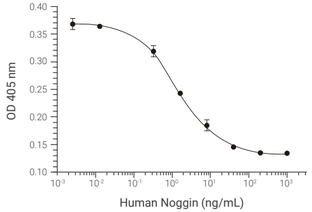
- Measured by its ability to induce Topflash reporter activity in HEK293T human embryonic kidney cells. The ED_{50} for this effect is 5.2 ng/mL.



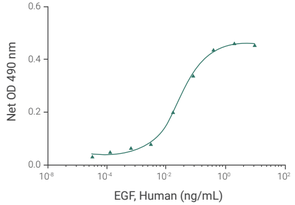
- The ED_{50} of human Wnt3a Surrogate from MCE's each Lot is lower than of Competitor P.



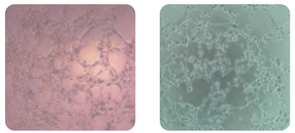
- The IC_{50} is 1.523 ng/mL, as measured by its ability to inhibit BMP-4-induced alkaline phosphatase production by ATDC5 mouse chondrogenic cells.



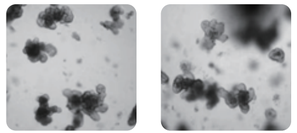
- The ED_{50} is <0.2 ng/mL as measured by murine BALB/c 3T3 cells.



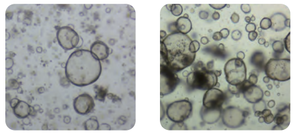
HY-K6001 Basement Membrane Matrix (Phenol Red) (Left)
HY-K6002 Basement Membrane Matrix (Right)
Angiogenesis in HUVEC cells 4 h



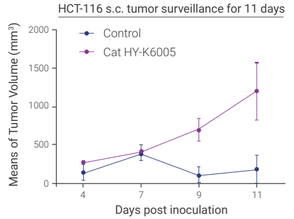
HY-K6004 Basement Membrane Matrix GFR (Left)
HY-K6007 Basement Membrane Matrix for Organoid Culture (Right)
Culture of mouse intestinal organoid Day 6



HY-K6004 Basement Membrane Matrix GFR (Left)
HY-K6007 Basement Membrane Matrix for Organoid Culture (Right)
Culture of human gastric cancer organoid Day 9



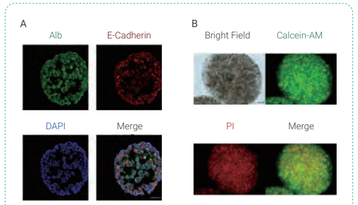
HY-K6005 Basement Membrane Matrix HC (Phenol Red)
Subcutaneous tumor formation in 4-5 week old BALB/c-nu mice Day 11



Example — Generation of Reproducible Kidney Organoids

Experimental Details

Droplet-engineered organoids (DEOs) were derived from mouse liver tissues and human liver tumors. The organoids were cultured in the corresponding culture medium.
For mouse liver DEOs: Basal medium DMEM/F12 supplemented with 20% FBS (HY-T1000), 1% Penicillin-Streptomycin, Noggin (HY-P7086), R-spondin 1 (HY-P76012), EGF, SB431542 (HY-10431), CHIR99021, FGF4 (HY-P72649), FGF-basic (HY-P7066), Y-27632, etc.
For human liver tumor DEOs: basal medium DMEM/F12 supplemented with 20% FBS, 1% Penicillin-Streptomycin, Noggin (HY-P70558), R-spondin 1 (HY-P72784), EGF, FGF-basic (HY-P7004), Y-27632, etc.



MCE Products Cited in **Haoran Zhao, et al. Fundamental Research.** [m5GeSdc;June 8, 2022;12:37]

References:

[1] **Exp Hematol Oncol.** 2018 Dec 5;7:30. [2] **Nat Rev Mol Cell Biol.** 2020 Oct;21(10):571-584. [3] **Development.** 2020 Dec 24;147(24):dev189746.
[4] **Haoran Zhao, et al. Fundamental Research.** [m5GeSdc;June 8, 2022;12:37]

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