

Combining Human Organoids and Organ-on-a-Chip Technology to Model Intestinal Region-Specific Functionality

Gauri Kulkarni^{*1}, Athanasia Apostolou^{*1}, Lorna Ewart¹, Carolina Lucchesi¹, Magdalena Kasendra^{2,3}

¹Emulate Inc. Boston ²Center for Stem Cell and Organoid Medicine, Cincinnati Children's Hospital Medical Center ³Division of Pediatric General and Thoracic Surgery, Cincinnati Children's Hospital Medical Center

* These authors contributed equally

Corresponding Authors

Carolina Lucchesi

carolina.lucchesi@emulatebio.com

Magdalena Kasendra

magdalena.kasendra@cchmc.org

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Materials

Name	Company	Catalog Number	Comments
small intestine Human Intestinal Microvascular Endothelial Cells	AlphaBioRegen	ALHE15	0.5 cells M/ml ; cryopreserved
colon Human Intestinal Microvascular Endothelial Cells	AlphaBioRegen	ALHE16	0.5 cells M/ml ; cryopreserved
Biopsy-derived Human Duodenal Organoids	John Hopkin's University	-	The organoids were provided by Professor Mark Donowitz (Institutional Review Board Number: NA_00038329).
Biopsy-derived Human Colonic Organoids	John Hopkin's University	-	The organoids were provided by Professor Mark Donowitz (Institutional Review Board Number: NA_00038329).
Zoë CM-1™ Culture Module	Emulate Inc.	-	Culture module
Orb-HM1™ Hub Module	Emulate Inc.	-	5% CO2, vacuum stretch, and power supply
Chip-S1™ Stretchable Chip	Emulate Inc.	-	Organ-Chip
Pod™ Portable Modules	Emulate Inc.	-	Portable module
UV Light Box	Emulate Inc.	-	-
Chip Cradle	Emulate Inc.	-	1 per square culture dish
Steriflip®-HV Filters	EMD Millipore	SE1M003M00	0.45 µm PVDF filter
Square Cell Culture Dish (120 x 120 mm)	VWR	82051-068	-
Handheld vacuum aspirator	Corning	4930	-
Aspirating pipettes	Corning / Falcon	357558	2 mL, polystyrene, individually wrapped
Aspirating tips	-	-	Sterile (autoclaved)
Serological pipettes	-	-	2 mL, 5 mL, 10 mL, and 25 mL low endotoxin, sterile

Pipette			P20, P200, P1000 and standard multichannel
Pipette tips			P20, P200, and P1000.
Conical tubes (Protein LoBind® Tubes)	Eppendorf	0030122216; 0030122240	15 mL, 50 mL tubes
Eppendorf Tubes® lo-bind	Eppendorf	022431081	1.5 mL tubes
96 wells black walled plate	-	-	for epithelial permeability analysis
Microscope (with camera)	-	-	For bright-field imaging
Water bath (or beads)	-	-	Set to 37°C
Vacuum set-up	-	-	Minimum pressure: -70 kPa
Cell scrapers	Biotium	220033	
T75 flasks	BD Falcon	353136	Cell culture flask
Emulate Reagent-1 (ER-1)	Emulate Inc.	-	Chip coating solution
Emulate Reagent-2 (ER-2)	Emulate Inc.	-	Chip coating solution
Dulbecco's PBS (DPBS)	Corning	21-031-CV	1X
Cell Culture Grade Water	Corning	MT25055CV	
Trypan blue	Sigma	93595	For cell counting
TrypLE Express	ThermoFisher Scientific	12604013	Organoids dissociation and endothelium cells detachment solution
Advanced DMEM/F12	ThermoFisher Scientific	12634028	Medium
IntestiCult™ Organoid Growth Medium (Human)	Stem Cell technologies	06010	Organoid Growth Medium
Endothelial Cell Growth Medium MV 2	Promocell	C-22121	Endothelial medium
Fetal bovine serum (FBS)	Sigma	F4135	Serum
Primocin™	InvivoGen	ANT-PM-1	antimicrobial agent
Attachment Factor™	Cell Systems	4Z0-210	coating solution for flask
Matrigel - Growth Factor Reduced	Corning	356231	Solubilized basement membrane matrix
Collagen IV	Sigma	C5533	ECM component
Fibronectin	Corning	356008	ECM component
Y-27632	Stem Cell technologies	72304	organoid media supplement
CHIR99021	Reprocell	04-0004-10	organoid media supplement
Cell Recovery Solution	Corning	354253	Basement membrane matrix dissociation solution
Bovine Serum Albumin (BSA)	Sigma	A9576	30%, Sterile
Cell Culture Grade Water	Corning	MT25055CV	Sterile, Water
DMSO	Sigma	D2650	solvent
3KDa Dextran Cascade Blue	Invitrogen	D7132	10 mg powder
Rifampicin (RIF)	Sigma	Cat# R3501	CYP inducer
Testosterone hydrate	Sigma	T1500	CYP substrate
1,25-dihydroxy Vitamin D3 (VD3)	Sigma	Cat# D1530	CYP inducer
Acetonitrile with 0.1% (v/v) Formic acid	Sigma	159002	LCMS stop solution
IFN γ	Peprtech	300-02	
4% Paraformaldehyde (PFA)	EMS	157-4	Fixative
Triton-X 100	Sigma	T8787	
Normal Donkey Serum (NDS)	Sigma	566460	
anti-Occludin	ThermoFisher Scientific	33-1500	tight junctions marker

anti-Claudin 4	ThermoFisher Scientific	36-4800	tight junctions marker
anti-E-cadherin	Abcam	ab1416	epithelial adherens junctions marker
anti-VE-cadherin	Abcam	ab33168	endothelial adherent junctions marker
anti- Zonula Occludens 1 (ZO-1)	Thermo Fischer	339194	tight junctions marker
DAPI	ThermoFisher Scientific	62248	nuclear stain
2-mercaptoethanol	Sigma	M6250	
PureLink RNA Mini Kit	Invitrogen	12183020	RNA lysis, isolation and purification kit
SuperScript™ IV VIL0™ Master Mix	Invitrogen	11756050	reverse transcriptase kit
TaqMan™ Fast Advanced Master Mix	Applied Biosystems	4444557	qPCR reagent
QuantStudio™ 5 Real-Time PCR System	Applied Biosystems	A28573	Real-time PCR cyclers
18S primer	ThermoFisher Scientific	Hs99999901_s1	Eukaryotic 18S rRNA
CYP3A4 primer	ThermoFisher Scientific	Hs00604506_m1	Cytochrome family 3 subfamily A member 4
Pierce™ Coomassie Plus (Bradford) Assay Kit	ThermoFisher Scientific	23236	Protein quantification kit
MSD Tris lysis buffer	Meso Scale Diagnostics	R60TX-3	Protein lysis buffer
Cleaved/Total Caspase-3 Whole Cell Lysate Kit	Meso Scale Diagnostics	K15140D	Caspase 3 detection kit
V-PLEX Vascular Injury Panel 2 Human Kit	Meso Scale Diagnostics	K15198D	
V-PLEX Human Proinflammatory Panel II (4-Plex)	Meso Scale Diagnostics	K15053D	
Zeiss LSM 880	Zeiss	-	Confocal microscope
Zeiss LD plan-Neofluar 20x/0.40 Korr M27	Zeiss	-	20X long-distance objective lenses
Zeiss AXIOvert.A1	Zeiss	-	Brightfield microscope
Zeiss LD A-Plan 10X/0.25 Ph1	Zeiss	-	10X objective lenses