
Supplementary information

**Engineering transplantable jejunal
mucosal grafts using patient-derived
organoids from children with intestinal
failure**

In the format provided by the
authors and unedited

Supplementary information

List of Supplementary Tables:

Supplementary Table 1. Clinical demographics information on human materials (Separate Excel file).

Supplementary Table 2. 377 total proteins detected in Colon and SI ECM scaffolds using Mass Spectrometry (Separate Excel file).

Supplementary Table 3. 11 total proteins detected in either Colon or SI ECM scaffolds (Separate Excel file).

Supplementary Table 4. qRT-PCR primer sequences.

Supplementary Table 5. Antibodies and dilutions for immunofluorescence and immunohistochemistry.

Supplementary Table 6. SBF SEM imaging parameters.

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Supplementary Video:

Supplementary Video 1. 3D reconstruction video of the graft transplanted under kidney capsule (Separate Mov file).

Supplementary Table 4. qRT-PCR primer sequences.

Primer name	Forward	Reverse
human β -ACTIN	TTCTACAATGAGCTGCGTGTG	GGGGTGTTGAAGGTCTCAA
human CYBRD1	GCTATTTGTTACAGCTTCTTTCAGG	CAGGATCTCTCAGGGAAAAAATC
human SLC40A1	GATGCTGTGGATCCTTGGCCG	CCACATCCGATCTCCCCAAGTAGA
human SI	CATACCATTTGATACACAGGTC	GCAGGGTCCAAGATGATGAC
human LCT	TCAGGGCGGAAACTCTCTGTTGTC	CGACCGTGTCTTGGGCAAGC
human SLC10A2	GGCGACATGGACCTGAGCGTCAGC	CGAGAGAAACCAGAGATGTACCTATG
human OSTB	GGGGCTAAGGGGTCTAAGG	CAGGGCAAGGATGGAATGA
human OLFM4	CTTTCCAAAGTGAGGGAATATGTC	GATGTCAATTCCGACAGTTAGG
human LGR5	CAGTGCAGTGTTACCTTCC	AGTGCCAGAACTGCTATGGT
human LYZ	CATTGTTCTGGGGCTTGTCC	TCATTACACCAGTAGCGGCT
human MUC2	CAACAACCTCCGAAGCTGTG	CAAATGTTTCTCGGTCACC
human ALPI	TCATCATGAGGGTGTGGCTT	TGTAGGCTTTGCTGTCCTGA
human CHGA	GAAGAAGGCCCCACTGTAGT	AGTGCTCCTGTTCTCCCTTC

Supplementary Table 5. Antibodies and dilutions for immunofluorescence, immunohistochemistry and immunoblotting.

Antibody	Host	Supplier	Cat. Number	Dilution
Beta-actin	mouse	Sigma Aldrich	A3854	1:25000
CD31	mouse	Abcam	ab9498	1:200
ChgA	goat	Santa Cruz	sc-393941	1:500
Collagen-1 (human)	goat	Abcam	ab34710	1:200
Collagen-1 (porcine)	mouse	Abcam	ab6308	1:50
Collagen-4 (porcine)	rabbit	Novabio	NB120-6586	1:200
Defensin- α 5	mouse	Abcam	ab90802	1:50
E-cadherin	rabbit	Cell signalling	#3195	1:400
Fibronectin (human)	rabbit	Abcam	ab23750	1:200
Fibronectin (porcine)	mouse	Santa Cruz	sc-59826	1:50
FSP1	mouse	Abcam	ab11333	1:750
GLP2R	rabbit	Abcam	ab188595	1:500
hNucleoli	mouse	Abcam	ab190710	1:200
KI67	rabbit	Abcam	ab16667	1:250
Laminin- α 5 (human)	mouse	Abcam	ab210957	1:200
Laminin (porcine)	rabbit	Abcam	ab11575	1:250
LGR5	rabbit	Miltenyi Biotec,	#130-104-945	1:100
Lysozyme	rabbit	Dako	a0099	1:500
NA ⁺ K ⁺ ATPase	rabbit	Abcam	ab198367	1:100
OLFM4	rabbit	Cell signalling	#14369	1:200
PanCytokeratin	rabbit	Invitrogen	18-0059	1:100
PCNA	mouse	Abcam	ab29	1:1000
Phalloidin-568		Life technology	A12379	1:500
α SMA	rabbit	Abcam	ab5694	1:100
SOX9	rabbit	Millipore	AB5535	1:1000
Sucrase Isomaltase	mouse	Santa Cruz	sc-393424	1:100
Thrombospondin 4	mouse	Santa Cruz	sc-28293	1:50
UEA-1 (Rhodamine conjugated)		Vector Laboratories	RL-1062	1:200
Villin	mouse	Santa Cruz	sc-58897	1:50
Vimentin	mouse	Abcam	ab20346	1:1000
ZO-1	goat	Abcam	ab190085	1:200
Alexa fluor anti-mouse 568	Goat	Invitrogen	A1104	1:1000
Alexa fluor anti-rabbit 488	Goat	Invitrogen	A11008	1:1000
Alexa fluor anti-goat 594	Donkey	Invitrogen	A11058	1:1000
HRP secondary	mouse	GE Healthcare	NXA931V	1:5000
HRP secondary	rabbit		NA934V	1:5000
ABC-HRP secondary (IHC)	mouse	Vector Laboratories	BA-2001	1:1000
ABC-HRP secondary (IHC)	rabbit	Vector Laboratories	BA-1000	1:1000
ABC kit		Vector Laboratories	PK-6100	

Supplementary Table 6. SBF SEM imaging parameters.

Parameters	Fig. 3e and Fig. S3e
Vacuum (Pa)	7
Voltage (kV)	1.8
Aperture (mm)	30
Pixel dwell time (ms)	1
Pixel dimensions	8192 x 8192
Lateral pixel size (nm)	7
Slice thickness (nm)	50
Slices	400
Volume (x,y,z mm)	57.344 x 57.344 x 20

Supplementary Table 7. SEM montage imaging parameters.

Parameters	Fig. 4m i	Fig. 4m ii & iii
Voltage (kV)	5	5
Spot size	3	3.5
Pixel dwell time (ms)	60	60
Pixel dimensions	3072 x 2048	3072 x 2048
Lateral pixel size (nm)	20.67	20.67
Number of tiles (x,y)	13 x 25 (total 325)	20 x 6 (total 120)
Area of one tile (x,y mm)	63.5 x 42.33	63.5 x 42.33
Area of montage (x,y mm)	825.5 x 1058.25	1270 x 253.98