

MIMETAS

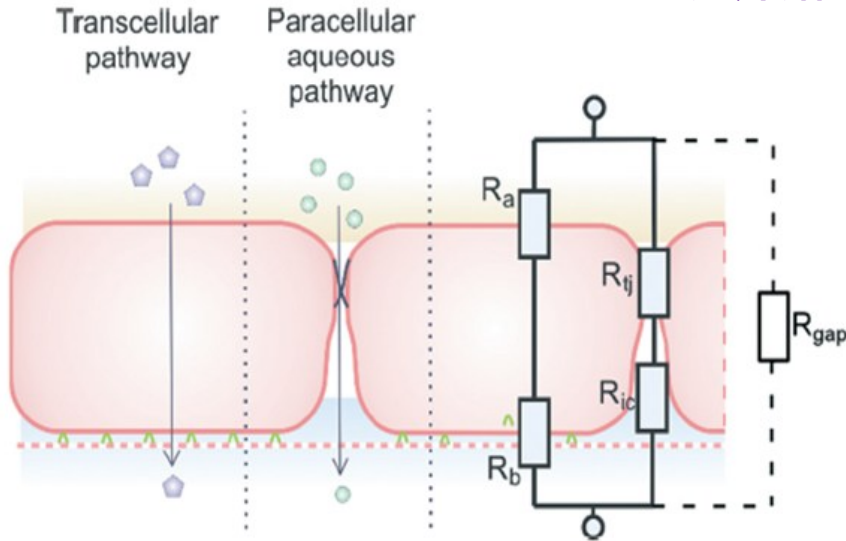


Mimetas.

Grow. Learn. Discover. 1

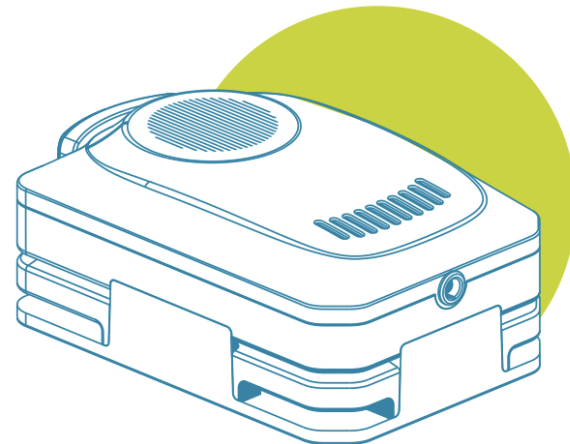


◆ 介紹



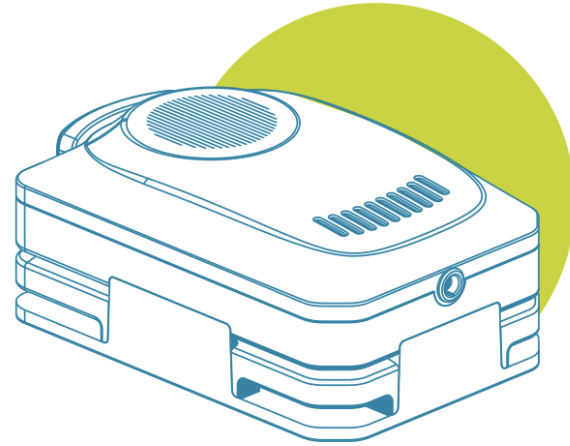
Transepithelial/endothelial electrical resistance (TEER) :

跨上皮/內皮電阻，是一種測定體外組織屏障完整性的方法，這些上皮細胞和內皮細胞層在不同組織之間提供屏障，選擇性地運輸分子穿過屏障，因為是非入侵檢測所以實用性高，成為確認**裝置上組織屏障建構完整性**的絕佳方法。



OrganoTEER®

High-throughput automated TEER measurement platform

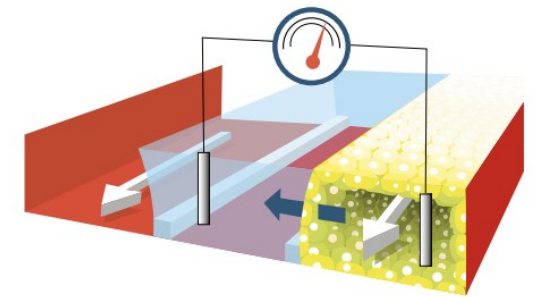
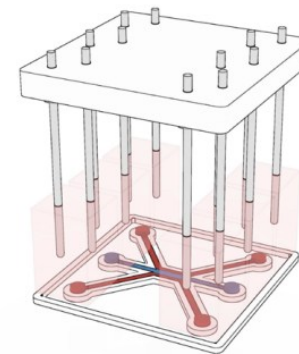


OrganoPlate®
3-lane 40

OrganoPlate®
3-lane 64

◆ 特色

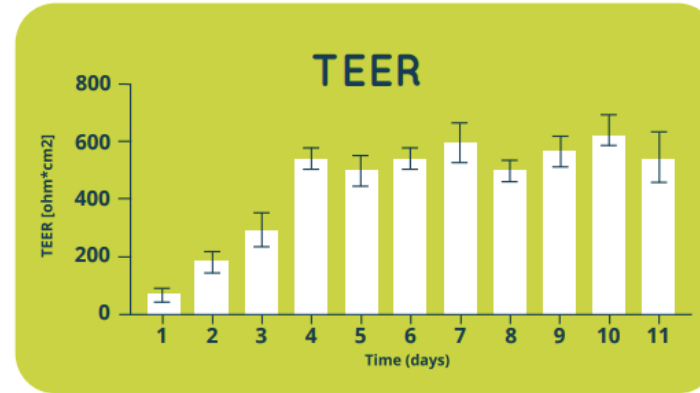
- ✓ 一分鐘內一次測量 40/64 個sample
- ✓ 流動條件下評估屏障功能，不受裝置結構的干擾
- ✓ 保持細胞完好無損
- ✓ 可長期延時檢測
- ✓ 可應用於腸道、血腦屏障、腎臟等多種體外內皮和上皮屏障model
- ✓ 設備和軟體系統直觀，易於維護。



TEER 測量概念: 透過在細胞單層兩側放置的電極上施加電流並以測量出的電壓計算屏障的電阻。

OrganoTEER®

High-throughput automated TEER measurement platform



Barrier Integrity (BI) Assay

No cells Leak - tight tubule Leaking tubule

Choose the right method for your needs

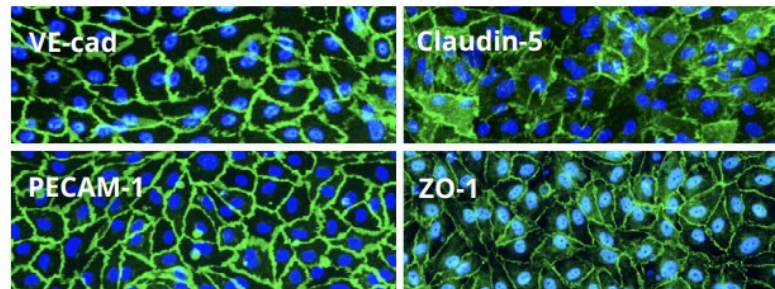
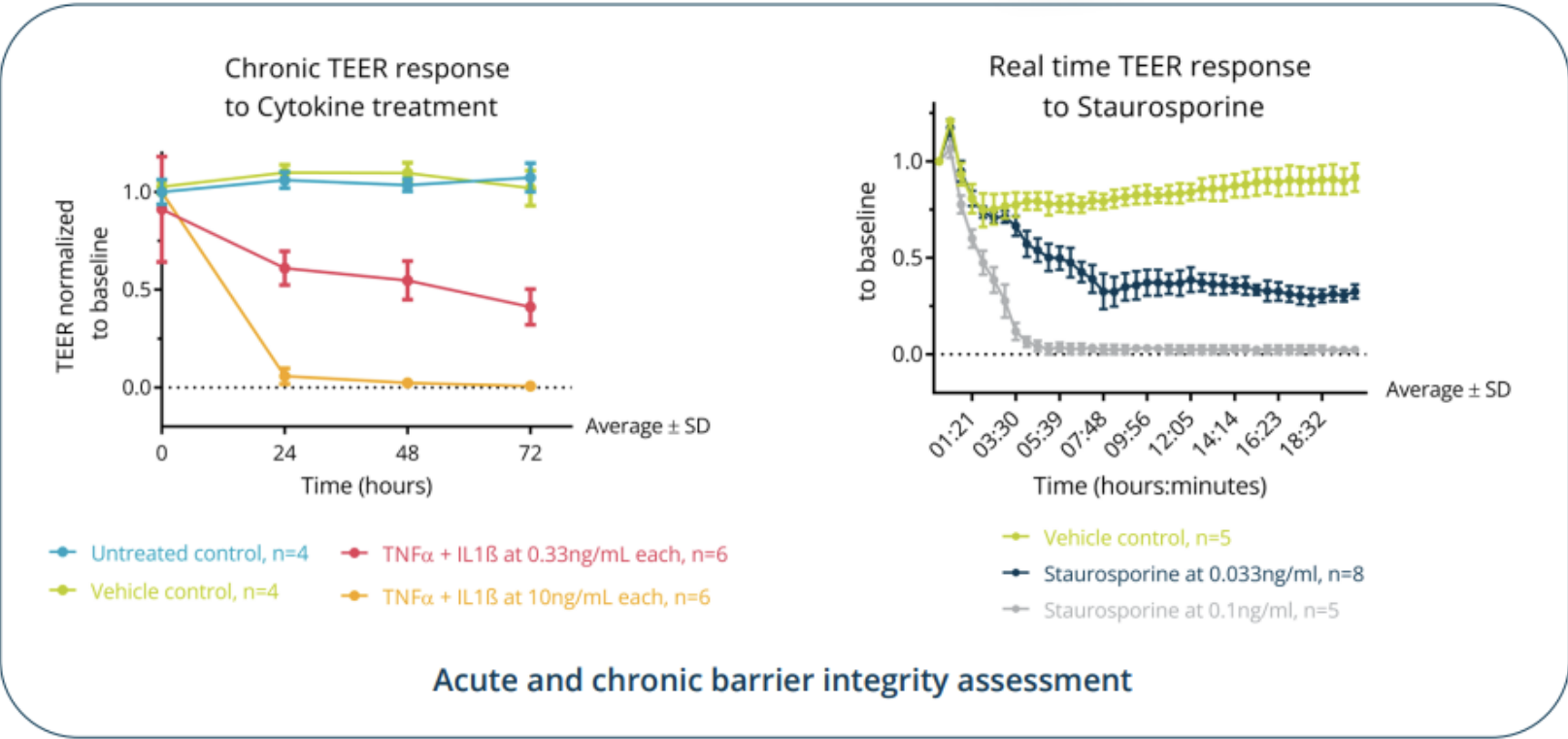
Your experimental needs:

- Assess integrity of barrier tissues
- Fast and label-free evaluation
- Long term time lapse measurements
- Detect subtle permeability changes*
- Observe leakage of compounds of various molecular weights
- Visualize the nature of barrier leakage

OrganoTEER®	BI assay
✓	✓
✓	—
✓	—
✓	—
—	✓
—	✓

OrganoTEER®

High-throughput automated TEER measurement platform



Endothelial and junctional markers expressed: VE-cad, PECAM-1, Claudin-5, ZO-1, ICAM-1
 Influx and efflux transporters expressed: GLUT-1, P-gp, BCRP1, MRP-1, and TfRC

◆ 發表 [paper link](#)

frontiers | Frontiers in Toxicology

TYPE Original Research
PUBLISHED 13 June 2024
DOI 10.3389/tox.2024.1395670

Optimisation of an *in vitro* human cardiovascular model on-a-chip for toxicological assessment of nicotine delivery products

Fiona Chapman^{1*}, Luuk de Haan^{2†}, Linda Gijzen², Wouter Strijker², Edgar Trelles Sticken³, Sarah Jean Pour³, Roman Wieczorek³, Florian Haberstroh³, Sandra Otte³, Thomas Nahde³, Liam Simms¹ and Matthew Stevenson¹

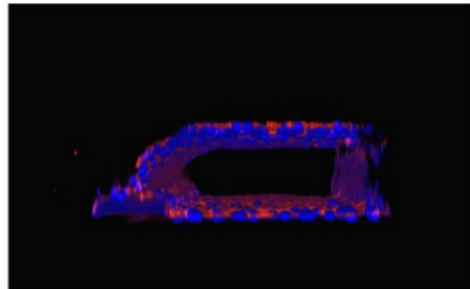
OrganoPlate[®]



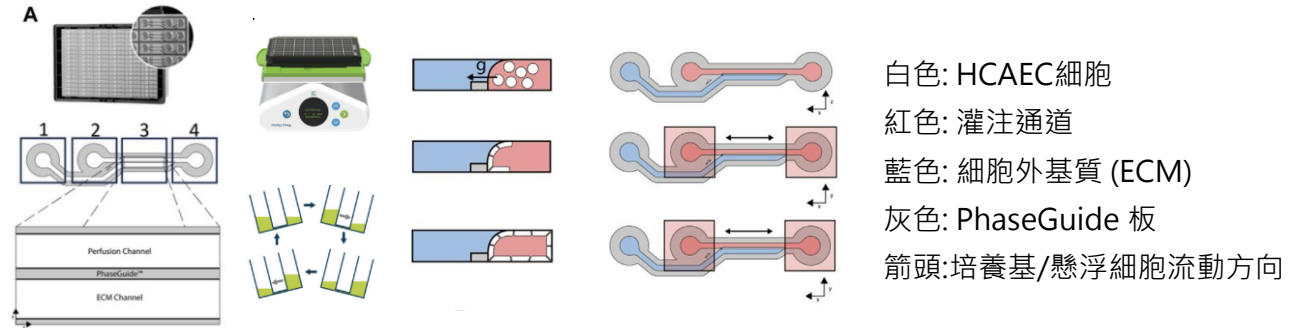
OrganoFlow[®]

2-lane 96

CD31 染色HCAEC血管3D影像

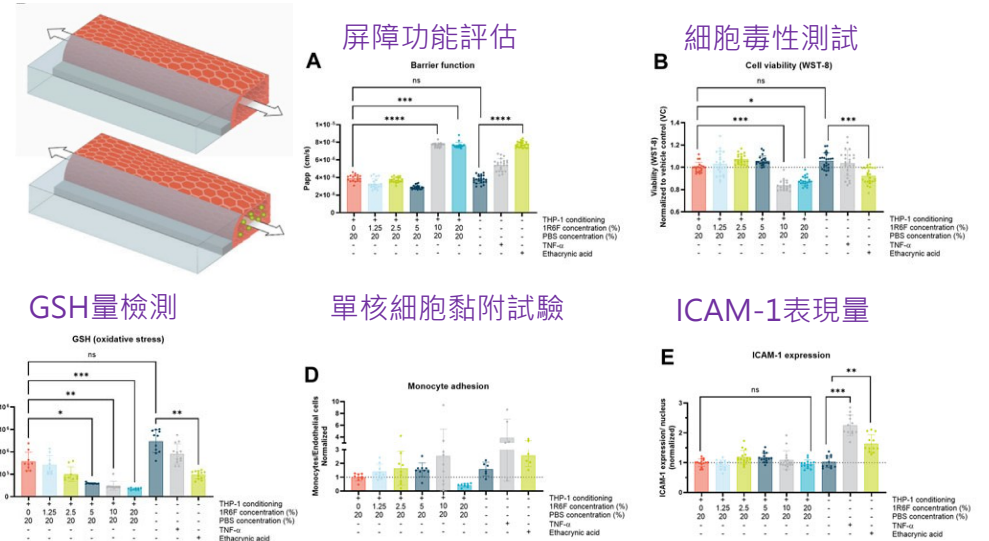


人類冠狀動脈內皮細胞 (HCAEC) 微流控培養



人類HCAEC細胞血管模型中THP-1細胞的遷移

紅色: HCAEC細胞血管
藍色: 細胞外基質 (ECM)
綠色圓圈: THP-1細胞



◆ 發表 [paper link](#)

Check for updates

REGULAR ARTICLE

blood VTH
vessels, thrombosis & hemostasis

A multicellular vessel-on-a-chip model reveals context-dependent roles for platelets in inflammation and inflammatory hemostasis

Rebecca B. Riddle,¹ Karin Jennbacken,² Kenny M. Hansson,² and Matthew T. Harper¹

¹Department of Pharmacology, University of Cambridge, Cambridge, United Kingdom; and ²Research and Early Development, Cardiovascular, Renal and Metabolism, R&D BioPharmaceuticals, AstraZeneca, Gothenburg, Sweden

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+ 2-lane 96

OrganoFlow®

Model Development

A 3D *in vitro* model was constructed in a commercially available platform, consisting of an endothelial vessel adjacent to a polymerised extracellular matrix (ECM). The vessel is perfusable with platelets, red blood cells, and neutrophils.

Key Results

Resting Vessel

↓ FITC-dextran leak

Platelets support resting endothelial barrier function

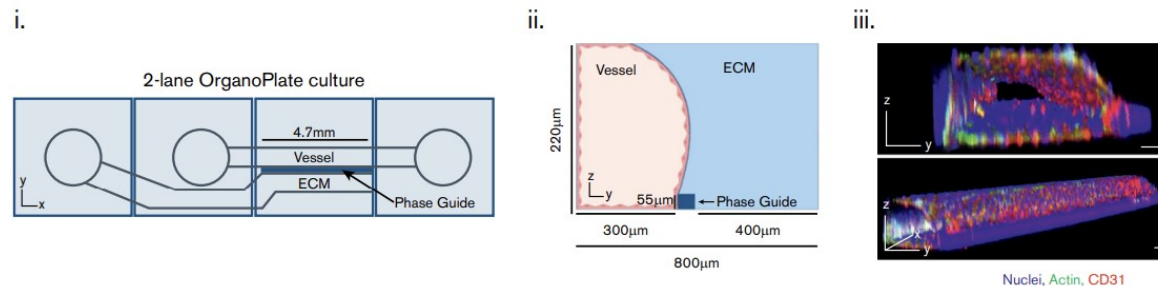
Inflamed Vessel

↑ FITC-dextran leak

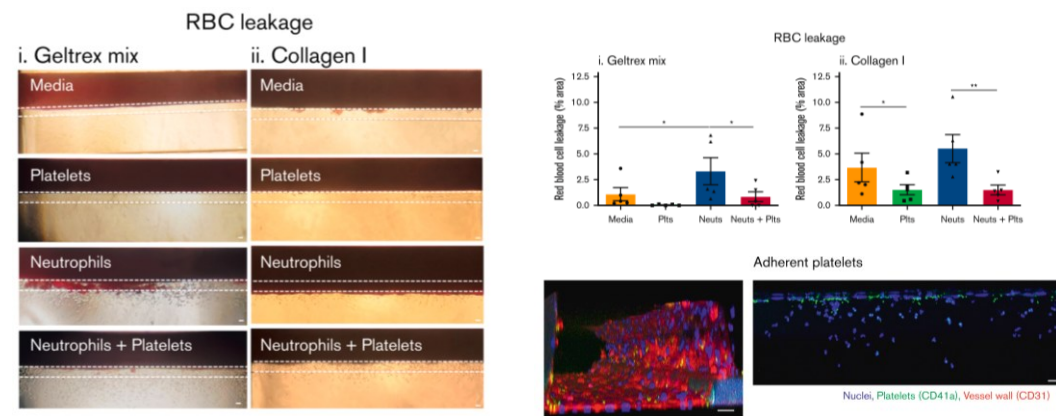
Platelets enhance endothelial permeability and neutrophil transmigration, while preventing red blood cell leakage (bleeding)

● Endothelial vessel ● Neutrophil ■ ECM
● Platelet ● Red blood cell ■ FITC-dextran

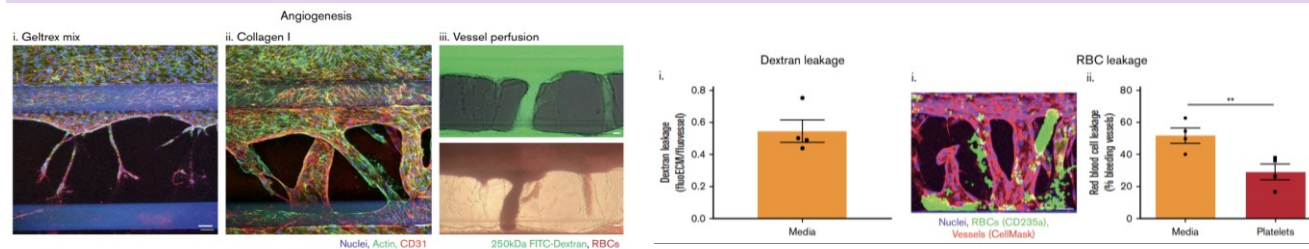
原代人類臍靜脈內皮細胞 (HUVEC) 建立血管發炎模型



血小板保持血管生成血管的完整性



血小板可防止紅血球在發炎血管中滲漏



◆ 發表 [paper link](#)

International Journal of
Molecular Sciences

Article

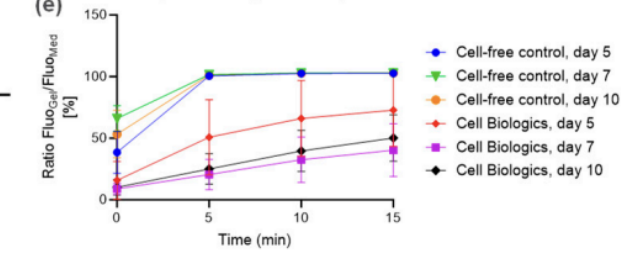
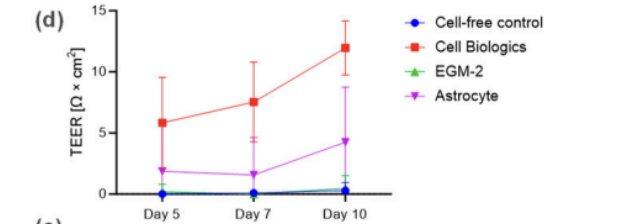
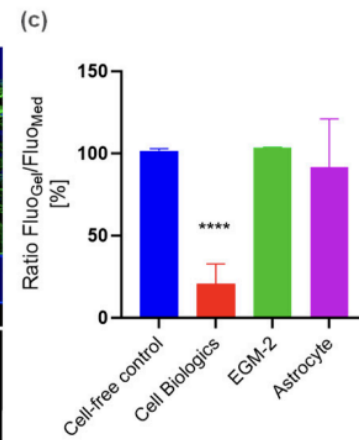
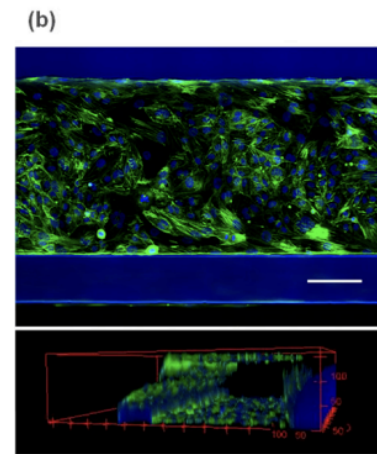
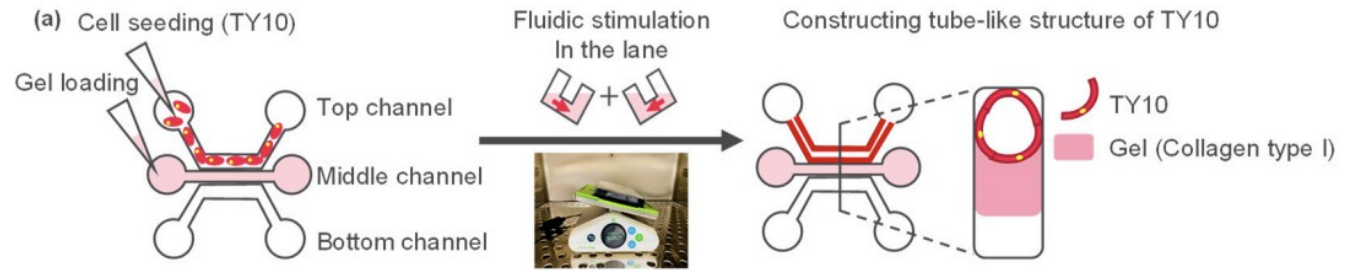
Modeling of Blood–Brain Barrier (BBB) Dysfunction and Immune Cell Migration Using Human BBB-on-a-Chip for Drug Discovery Research

Masato Ohbuchi ^{1,*}, Mayu Shibuta ¹, Kazuhiro Tetsuka ¹, Haruna Sasaki-Iwaoka ¹, Masayo Oishi ¹, Fumitaka Shimizu ² and Yasuhisa Nagasaka ¹

OrganoPlate® + OrganoFlow®

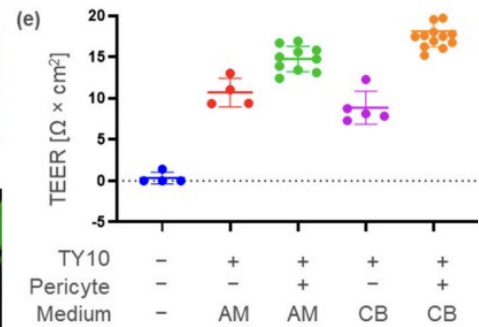
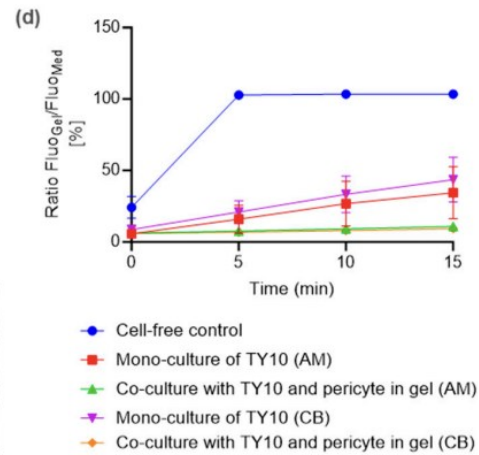
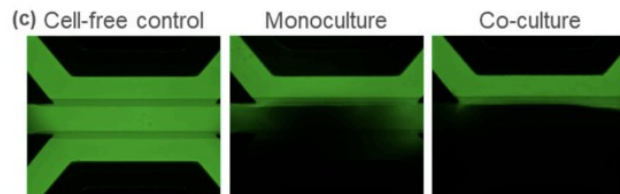
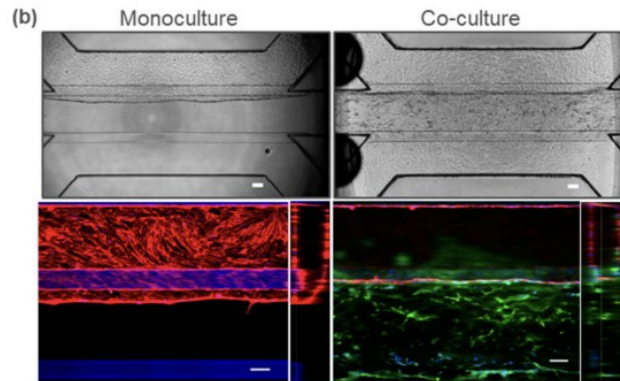
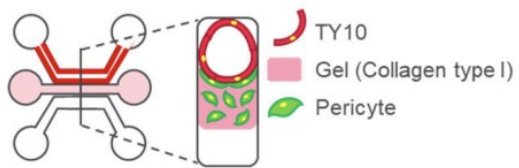
3-lane 40

人類腦內皮細胞微流控培養 (TY10)



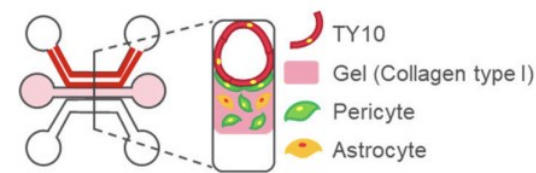
模擬BBB屏障晶片 (TY10、pericyte)

(a) Co-culture with TY10s and pericytes

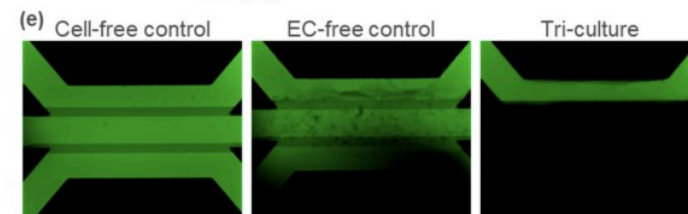
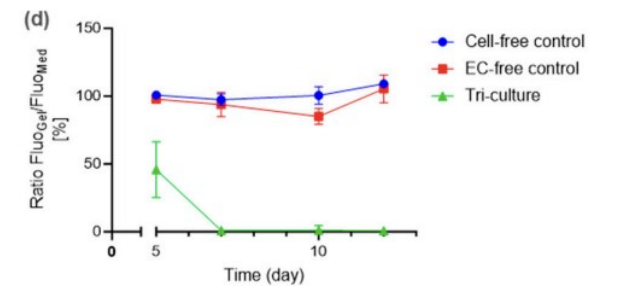
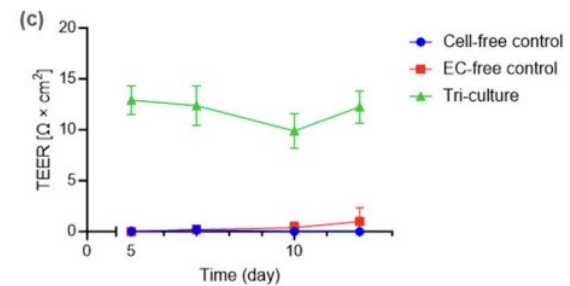
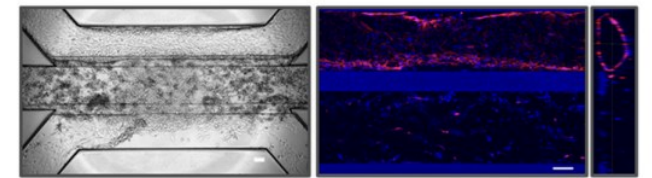


模擬BBB屏障晶片 (TY10、pericyte) 進行Astrocyte細胞遷移檢測

(a) Co-culture with TY10s, pericytes and astrocytes



(b)



◆ 發表 [paper link](#)

nature communications

Article <https://doi.org/10.1038/s41467-023-39038-8>

The contribution of inflammatory astrocytes to BBB impairments in a brain-chip model of Parkinson's disease

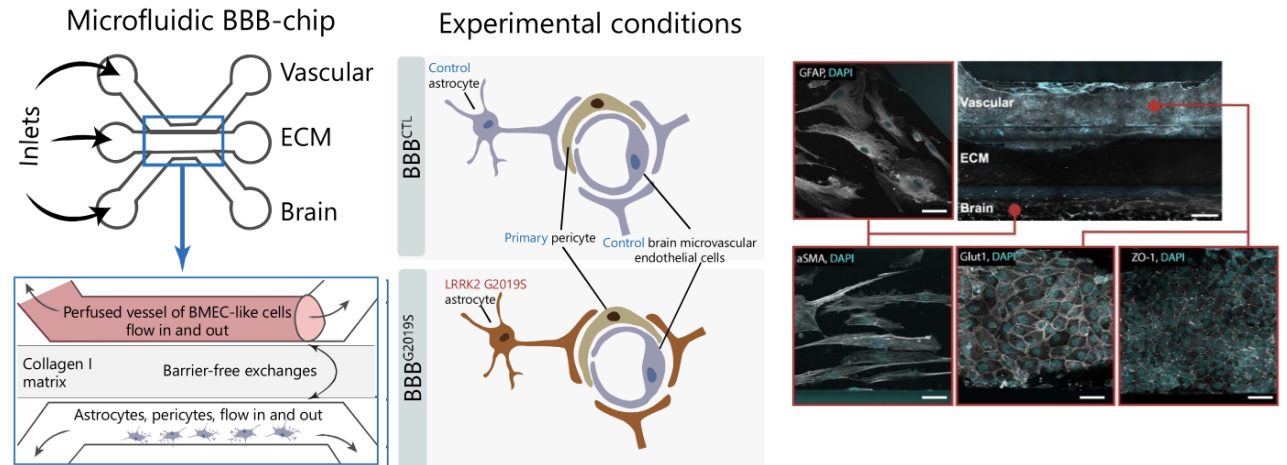
Received: 23 October 2021
Accepted: 26 May 2023

A. de Rus Jacquet^{1,2,3,10} ✉, M. Alpaugh^{1,2,4,10}, H. L. Denis^{1,2}, J. L. Tancredi^{3,5}, M. Boutin¹, J. Decaestecker⁶, C. Beauparlant⁶, L. Herrmann⁶, M. Saint-Pierre¹, M. Parent^{2,7}, A. Droit⁶, S. Breton^{8,9} & F. Cicchetti^{1,2} ✉

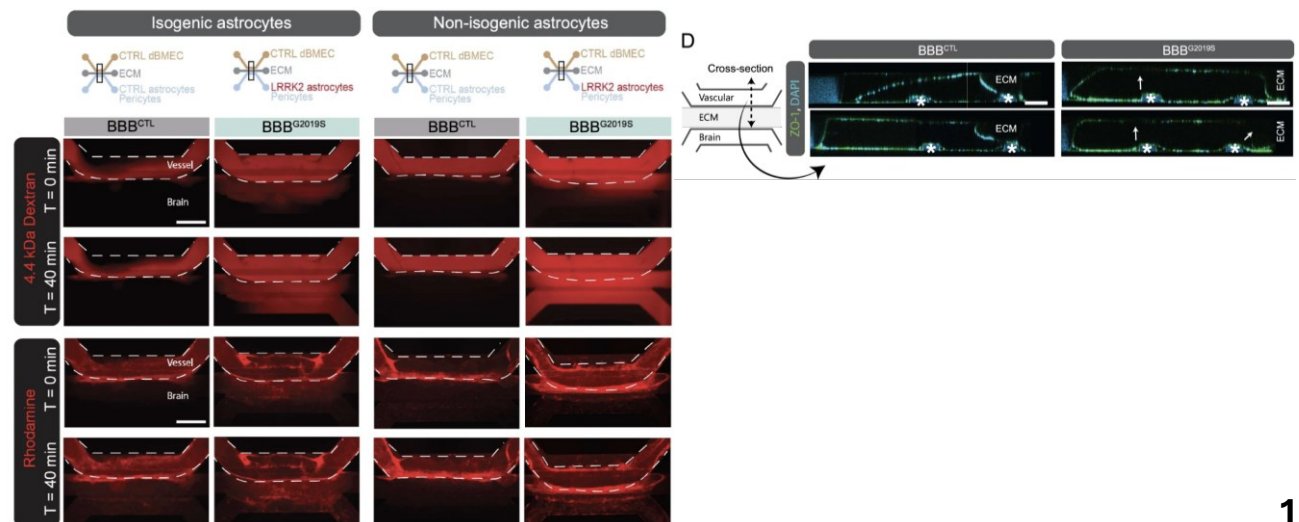
OrganoPlate[®] + OrganoFlow[®]

3-lane 40

使用 iPSC 和微流體技術建立 BBB 人體模型



具有 LRRK2 G2019S 突變的星狀細胞無法形成功能性 BBB 模型



◆ 發表 [paper link](#)

iScience **CellPress**
OPEN ACCESS

Article
Development of a human iPSC-derived placental barrier-on-chip model

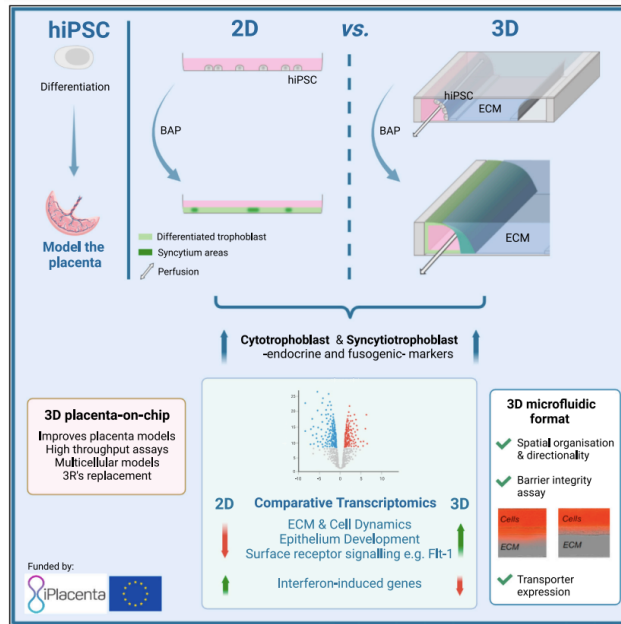
Agathe Lermant,¹ Gwenaëlle Rabussier,² Henriëtte L. Lanz,² Lindsay Davidson,³ Iain M. Porter,⁴ and Colin E. Murdoch^{1,5,*}

OrganoPlate®

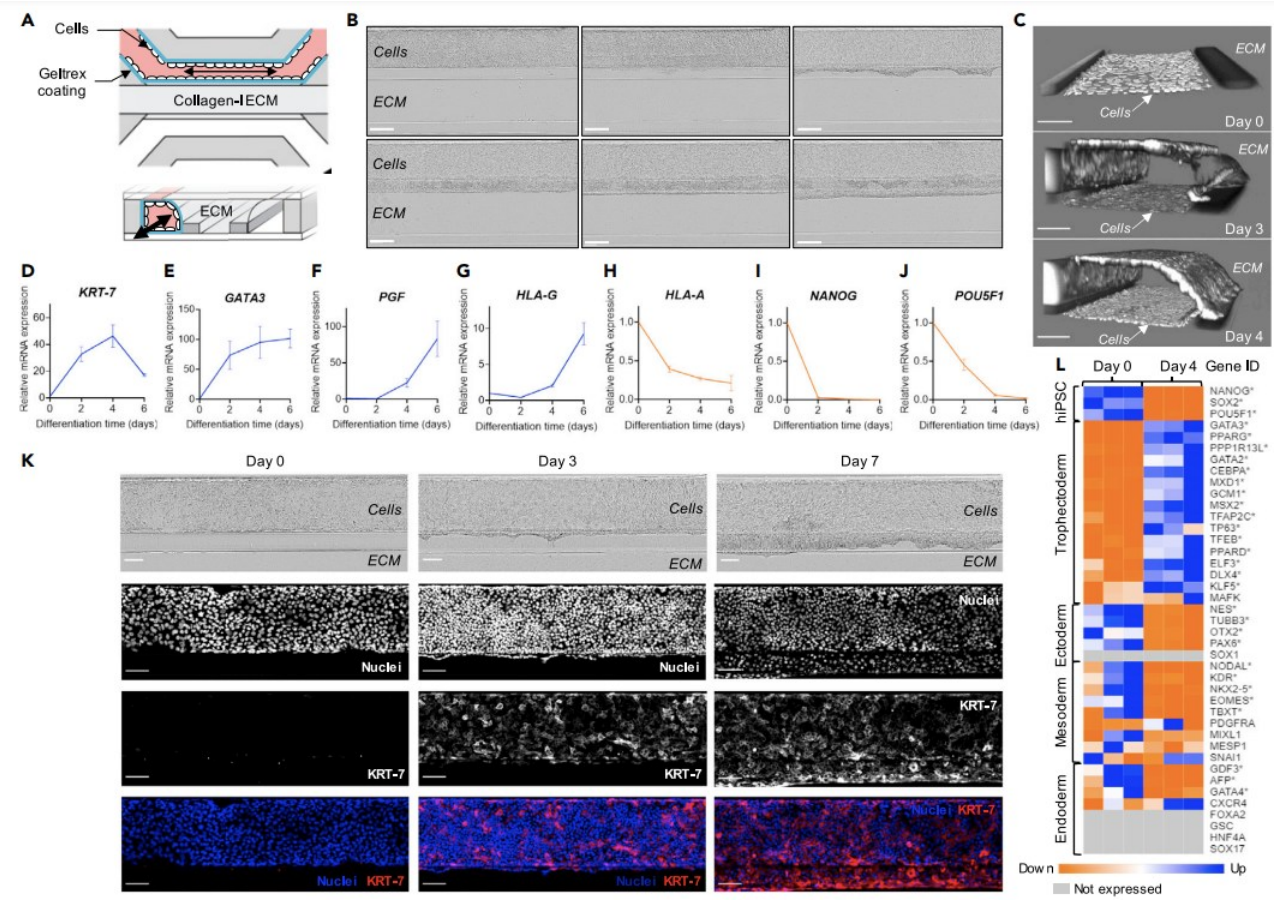
+

3-lane 40

OrganoFlow®



ChiPS4 分化成滋養層細胞模擬管狀結構胎盤屏障模型



◆ 發表 [paper link](#)

Acta Biomaterialia 164 (2023) 363–376

Contents lists available at ScienceDirect

Acta Biomaterialia

journal homepage: www.elsevier.com/locate/actbio

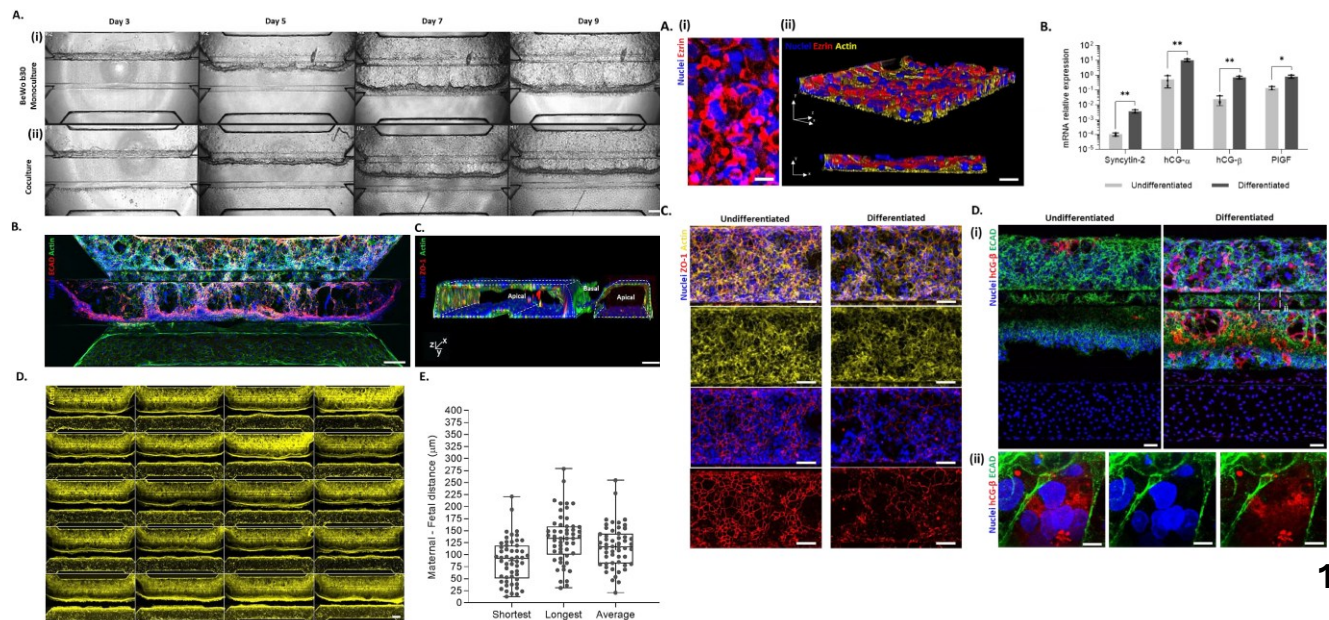
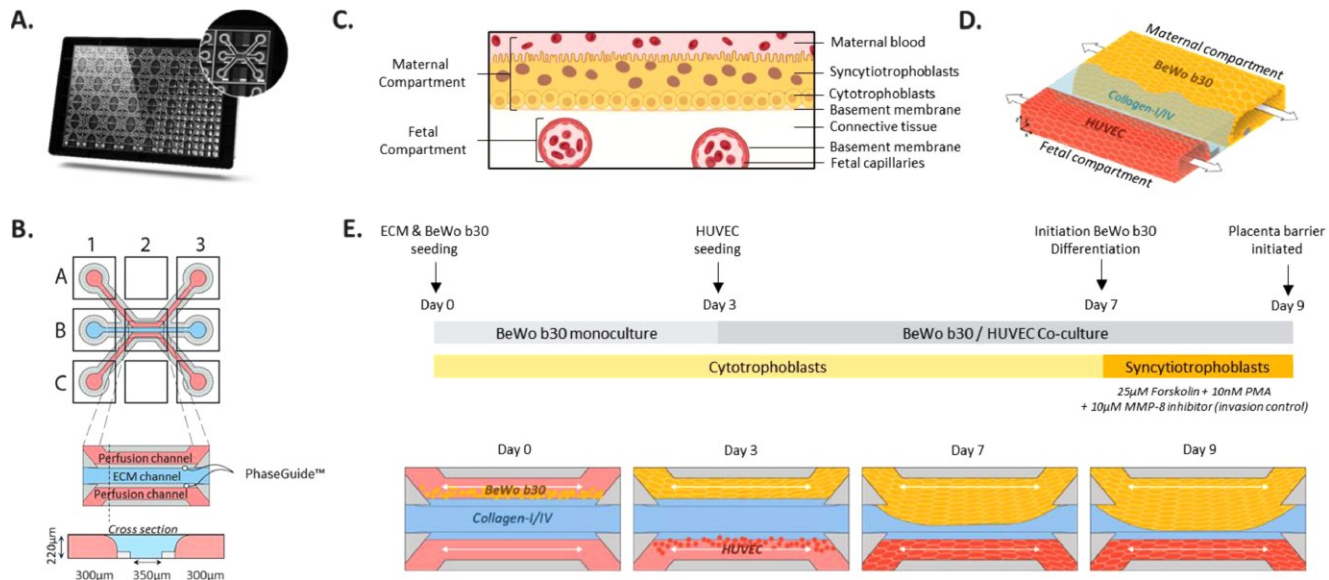
Full length article

Healthy and diseased placental barrier on-a-chip models suitable for standardized studies

Gwenaëlle Rabussier^{a,b}, Ivan Bünter^a, Josse Bouwhuis^a, Camilla Soragni^{a,b}, Torben van Zijp^a, Chee Ping Ng^a, Karel Domansky^a, Leon J. de Windt^b, Paul Vulto^a, Colin E. Murdoch^c, Kristin M. Bircsak^a, Henriëtte L. Lanz^{a,*}

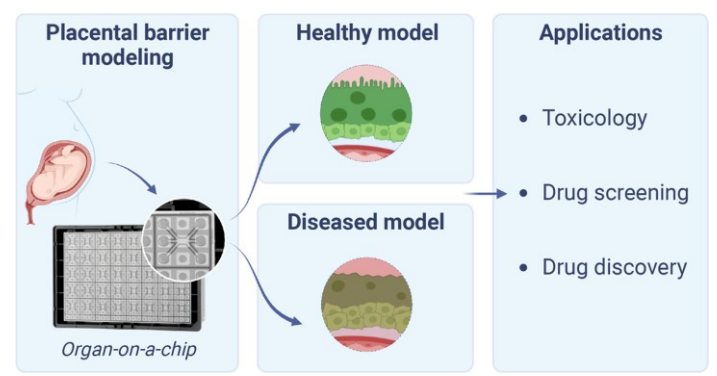
^aMIMETAS BV, Oegstgeest, 2342 DH, the Netherlands
^bDepartment of Cardiology, Maastricht University, Maastricht, 6226 ER, the Netherlands
^cSystems Medicine, School of Medicine, University of Dundee, Dundee, DD1 9SY, Scotland, UK

原代人類臍靜脈內皮細胞 (HUVEC)及人類絨毛膜癌細胞株BeWo b30建立胎盤屏障模型



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3-lane 40



使用從人類誘導多能幹細胞分化的滋養層的胎盤晶片模型

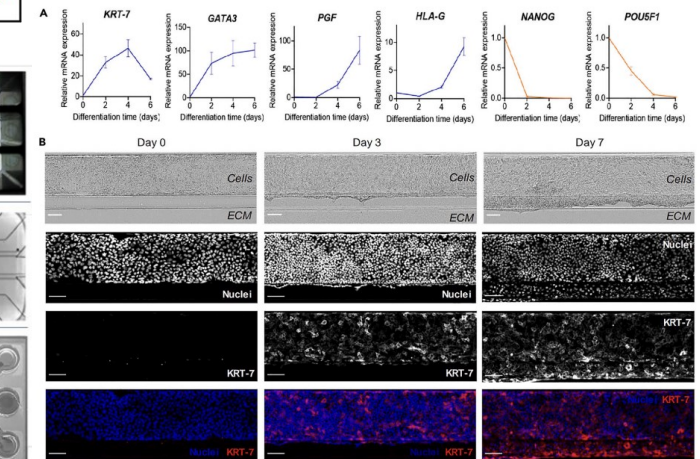
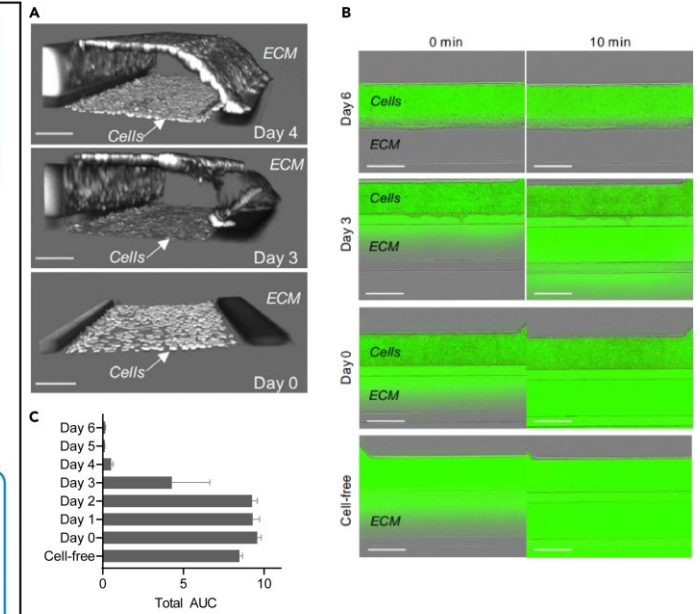
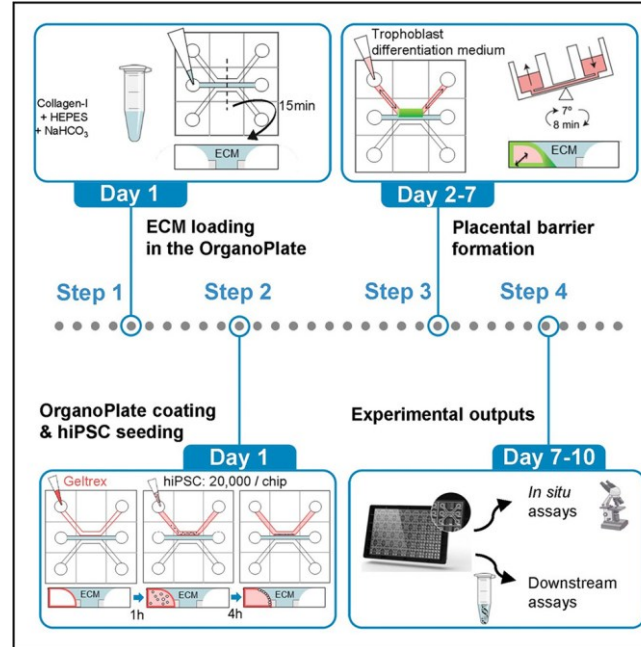
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STAR Protocols CellPress OPEN ACCESS

Protocol
Protocol for a placenta-on-a-chip model using trophoblasts differentiated from human induced pluripotent stem cells

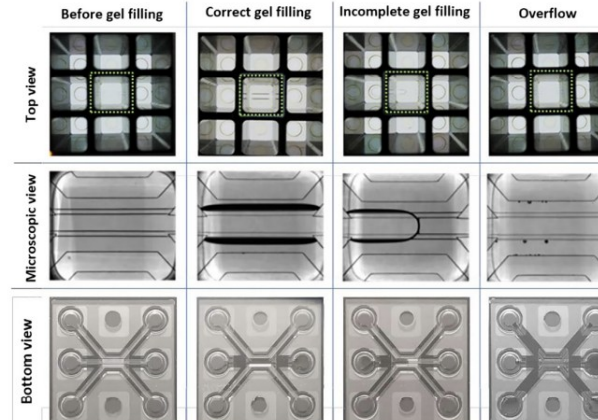
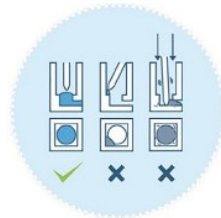
Agathe Lermant,^{1,4} Gwenaëlle Rabussier,² Lindsey Davidson,³ Henriëtte L. Lanz,² and Colin E. Murdoch^{1,4,5,*}

¹Systems Medicine, School of Medicine, University of Dundee, DD1 9SY Dundee, UK
²MIMETAS, 2342 DH, Oegstgeest, the Netherlands
³Human Pluripotent Stem Cell Facility, School of Life Sciences, University of Dundee, Dundee, UK
⁴Technical contact
⁵Lead contact
 *Correspondence: c.z.murdoch@dundee.ac.uk
<https://doi.org/10.1016/j.xpro.2024.102879>



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3-lane 40



◆ 發表 [paper link](#)

SLAS TECHNOLOGY: Translating Life Sciences Innovation
Volume 25, Issue 6, December 2020, Pages 585-597
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<https://doi.org/10.1177/2472630320924999>



Original Research

An Intestine-on-a-Chip Model of Plug-and-Play Modularity to Study Inflammatory Processes

Linda Gijzen^{1,*}, Diego Marescotti^{2,*}, Elisa Raineri¹, Arnaud Nicolas¹, Henriette L. Lanz¹, Diego Guerra², Remko van Vught¹, Jos Joore¹, Paul Vulto¹, Manuel C. Peitsch², Julia Hoeng², Giuseppe Lo Sasso², and Dorota Kurek¹

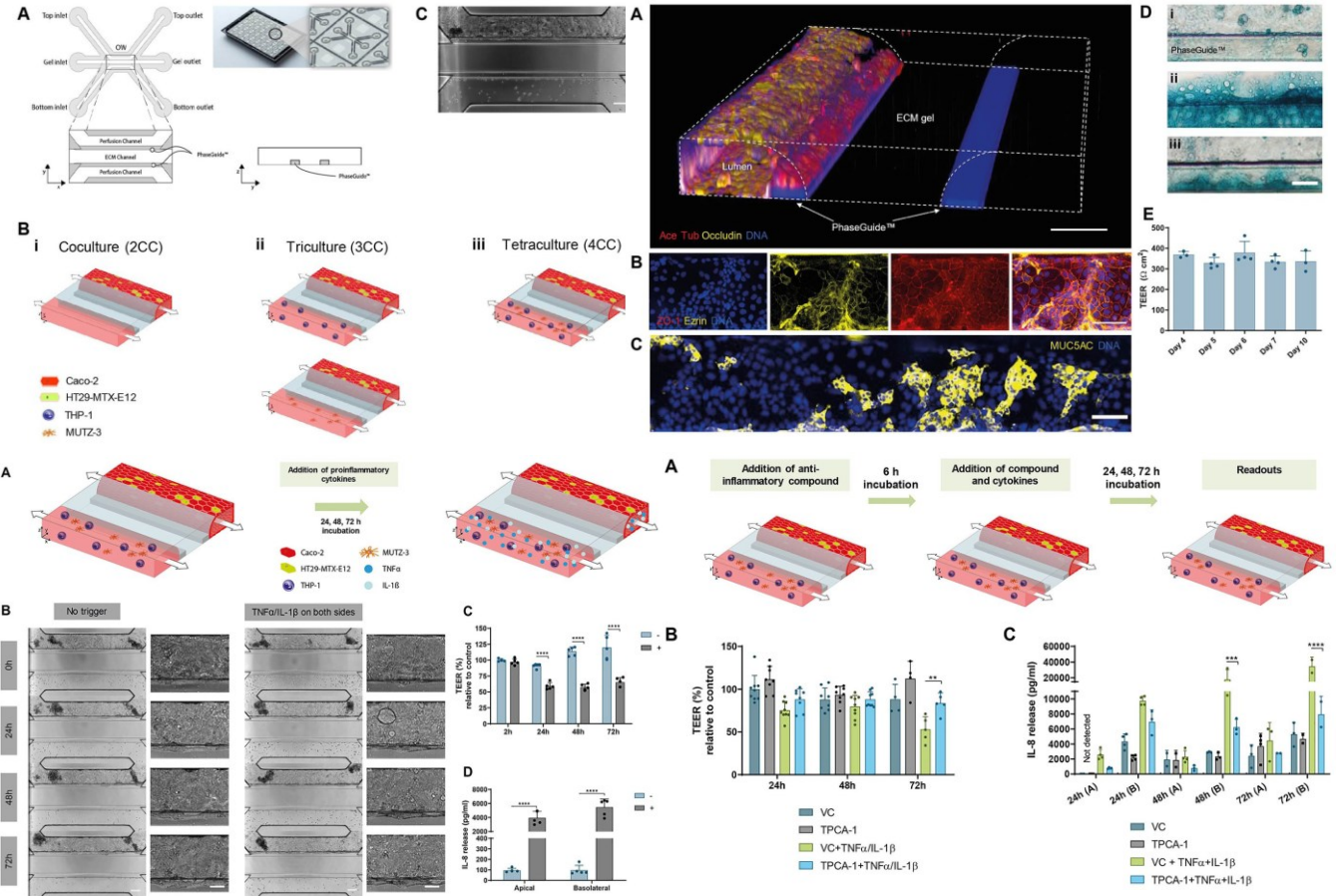
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3-lane 40

OrganoFlow®

OrganoTEER®

開發研究發炎的腸道模型



◆ 發表 [paper link](#)

Angiogenesis (2024) 27:37–49
<https://doi.org/10.1007/s10456-023-09888-3>

ORIGINAL PAPER



Phenotypic screening in Organ-on-a-Chip systems: a 1537 kinase inhibitor library screen on a 3D angiogenesis assay

Camilla Soragni^{1,2} · Karla Queiroz¹ · Chee Ping Ng¹ · Arthur Stok¹ · Thomas Olivier¹ · Dora Tzagkaraki¹ · Jeroen Heijmans¹ · Johnny Suijker¹ · Sander P. M. de Ruiter¹ · Aleksandra Olczyk¹ · Marleen Bokkers¹ · Frederik Schavemaker¹ · Sebastian J. Trietsch¹ · Henriëtte L. Lanz¹ · Paul Vulto¹ · Jos Joore¹

Received: 27 February 2023 / Accepted: 13 July 2023 / Published online: 26 July 2023
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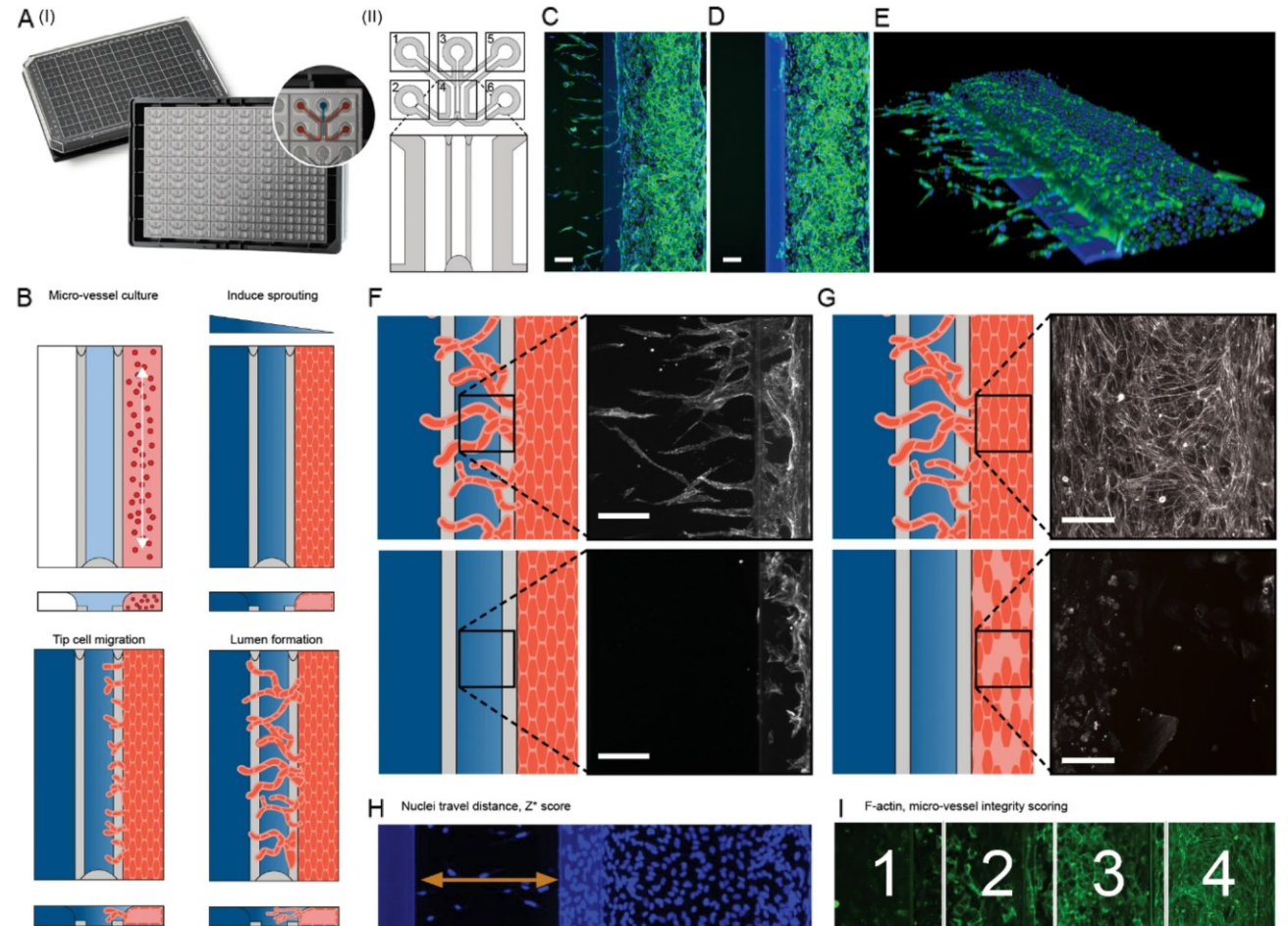
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OrganoFlow[®]

3-lane 64

原代人類臍靜脈內皮細胞 (HUVEC) 建立血管新生篩藥模型



◆ 發表 [paper link](#)

frontiers | Frontiers in Oncology

TYPE Original Research
 PUBLISHED 04 January 2024
 DOI 10.3389/fonc.2023.1269376

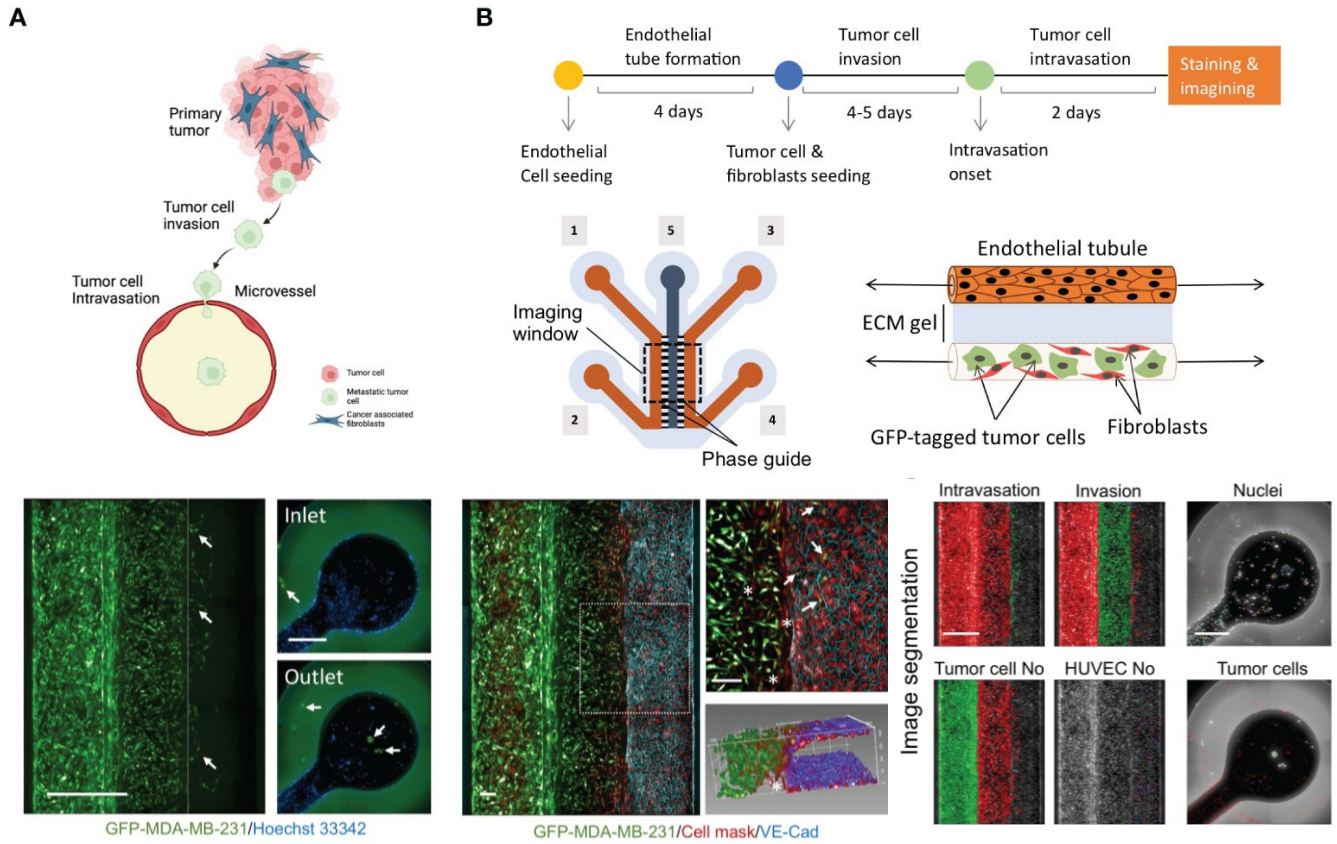
Development of a cancer metastasis-on-chip assay for high throughput drug screening

Lutfiye Yildiz Ozer, Hend Salah Fayed, Johan Ericsson and Ayman Al Haj Zen*

College of Health and Life Sciences, Hamad bin Khalifa University, Doha, Qatar

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 3-lane 64

開發用於藥物篩選的癌症轉移模型



◆ 發表 [paper link](#)

Angiogenesis (2022) 25:455–470
<https://doi.org/10.1007/s10456-022-09842-9>

ORIGINAL PAPER



In vitro grafting of hepatic spheroids and organoids on a microfluidic vascular bed

Flavio Bonanini¹ · Dorota Kurek¹ · Sara Previdi¹ · Arnaud Nicolas¹ · Delilah Hendriks² · Sander de Ruiter¹ · Marine Meyer¹ · María Clapés Cabrer¹ · Roelof Dinkelberg¹ · Silvia Bonilla García¹ · Bart Kramer¹ · Thomas Olivier¹ · Huili Hu² · Carmen López-Iglesias³ · Frederik Schavemaker¹ · Erik Walinga¹ · Devanjali Dutta² · Karla Queiroz¹ · Karel Domansky¹ · Bob Ronden¹ · Jos Joore¹ · Henriette L. Lanz¹ · Peter J. Peters³ · Sebastiaan J. Trietsch¹ · Hans Clevers² · Paul Vulto¹

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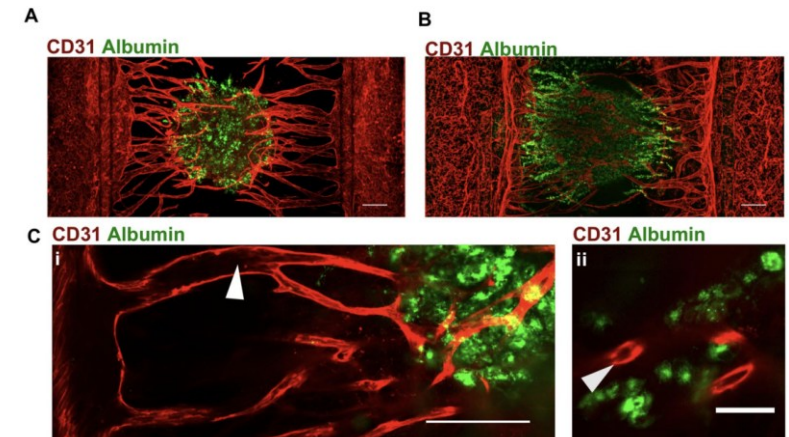
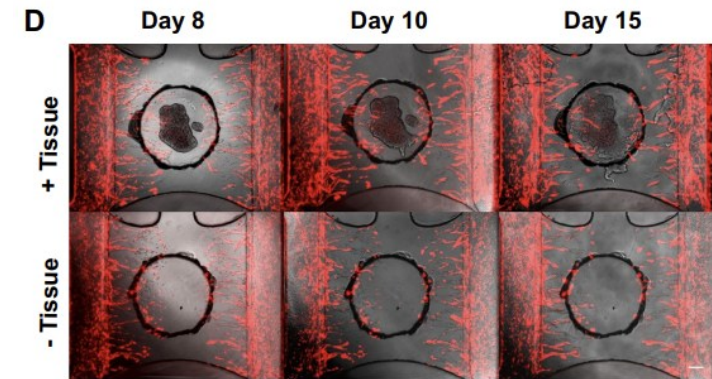
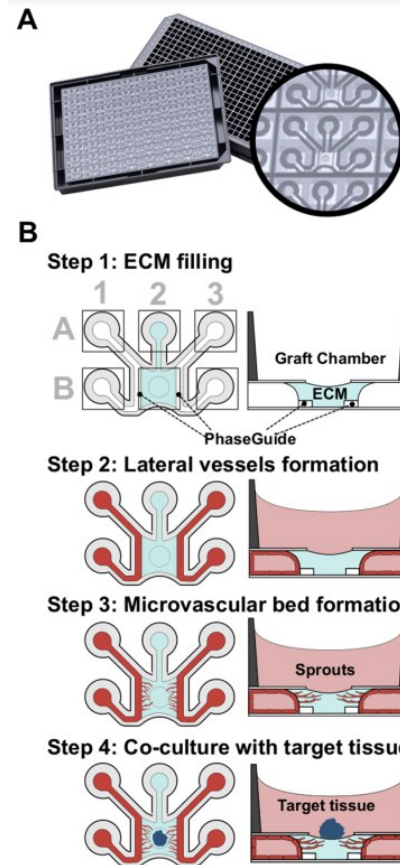
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OrganoFlow[®]

Graft

開發肝癌球體血管新生模型



◆ FAQ [原廠FAQ](#) 

Should I use an OrganoPlate® 2-lane or a 3-lane?

The main difference between the OrganoPlate® 2-lane or 3-lane is the extra channel in the 3-lane. This allows for more culture options such as: creating a gradient, having two types of ECM besides each other, having basal access to a tube, etc. This makes the OrganoPlate® 3-lane a necessary option for doing e.g. transport assays. The OrganoPlate® 2-lane however, is more fit for high-throughput screenings as it has 96 tissue culture chips per plate instead of the 40 tissue culture chips that the OrganoPlate® 3-lane provides.

What are the recommended storage conditions for the OrganoPlate?

We recommend to store the OrganoPlate at 4°C upon arrival. The optimal performance, for ECM filling, can be achieved when the OrganoPlate is used within 12 months.

Which ECMs / gels work in the OrganoPlate®?

The OrganoPlate® is compatible with a range of ECM gels that can transition from a liquid to a solid-state. These gels include, but are not limited to collagen-I, Matrigel®, Matrigel®-growth factor reduced BME, and HyStem gels.

◆ FAQ

Is the OrganoPlate suitable for imaging?

Yes, the OrganoPlate is excellent for imaging purposes. The bottom of the plate is made of high optical quality 150 μm glass coverslip-thickness glass, allowing unparalleled optical read-outs. The OrganoPlate's microtiter plate footprint makes it compatible with standard laboratory imaging systems.

What types of imaging can I do on the OrganoPlate?

The OrganoPlate is compatible with regular (time-lapse) phase contrast and fluorescent imaging as well as confocal imaging. The OrganoPlate is not compatible with electron microscopy.

Can I perform an immunostaining?

[protocol](#) 

◆ FAQ

Can I isolate RNA and DNA from OrganoPlate cultures?

Yes, you can successfully isolate high-quality RNA or DNA from the OrganoPlate using traditional Trizol[®] extraction or column-based isolation kits. Depending on the nature of your culture and the amount of RNA or DNA needed, pooling the contents of several chips may be necessary to obtain sufficient material. To give you an estimate: from an endothelial tube in one chip of an OrganoPlate[®] 3-lane , we typically collect 50 nanograms of RNA.

Can I sample from the OrganoPlate?

Yes, samples can be easily collected by taking the medium from the chip. This medium can be used to analyze the contents by various assays and read-outs, such as ELISA and mass spectrometry. In the OrganoPlate[®] 3-lane, you have access to both the apical and basal sides of the chip.

Can I isolate live cells from the OrganoPlate?

Yes, if you want to remove cells from the chips (for i.e. flow cytometry applications) you can. For instance, by trypsinizing your cells.