Human tissue models for 21st century therapeutics

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Meilin Berkhoff | Inside Sales & Support Specialist

07MAY2026

Grow. Learn. Discover.

MIMETAS global operations

EU

Oegstgeest, The Netherlands

- MIMETAS' headquarters
- R&D Hub & training facility
- Phenotypic Screening Center
- Commercial Ops
- OrganoReady production

Enschede, The Netherlands

- OrganoPlate Production
- Logistics

USA

Gaithersburg, MD, United States

- R&D projects
- Training
- Commercial Ops
- OrganoReady production

ASIA

Tokyo, Japan

- Training
- Commercial Ops
- Distribution

Drug discovery needs better models to cure complex diseases

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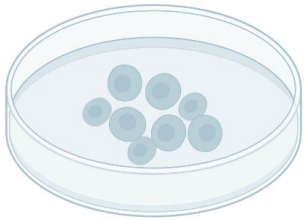

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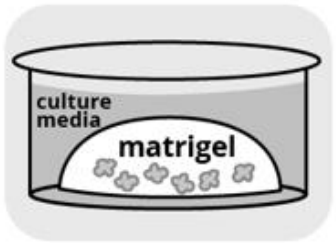
For several severe diseases such as cancer, inflammatory bowel disease and kidney disease..

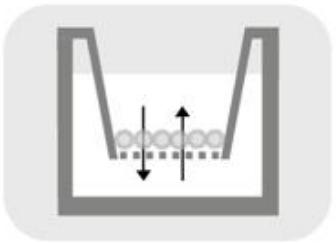
..simple cell cultures and animal models are insufficient..

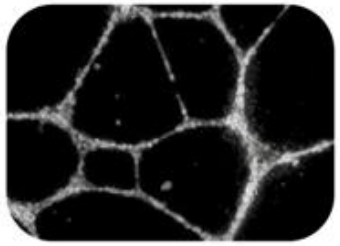
..which leads to >90% failure rates in clinical trials, and missed drugs

Traditional cell culture and limitations

Classic







Standard labware

- ✗ Complex imaging & quantification
- ✗ Low throughput
- ✗ Struggles with applications

Transwell® platform

- ✗ Filter membranes interfering readout
- ✗ Complex handling & automation
- ✗ Limited imaging

Current assays

- ✗ Short-lived
- ✗ Complex imaging & quantification
- ✗ Missing key angio-genic features

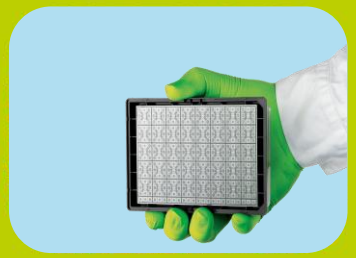
Xenografting

- ✗ Expensive
- ✗ Throughput
- ✗ Limited availability
- ✗ Ethical pressure

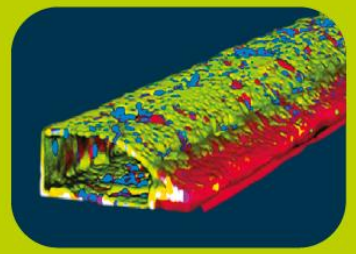
One platform for all tissue culture

- Membrane-free
- Perfused cultures
- Throughput & Compatibility
- Excellent imaging

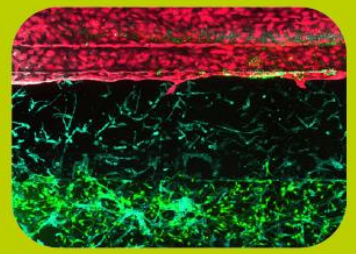
OrganoPlate®



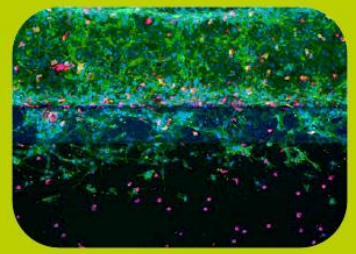
3D



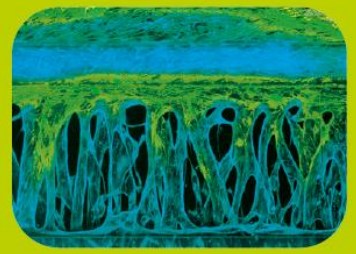
Permeability/ transport



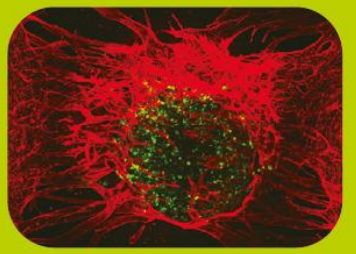
Cell-cell interactions



Migration/ invasion

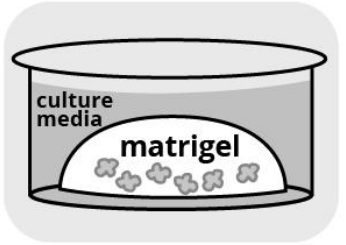


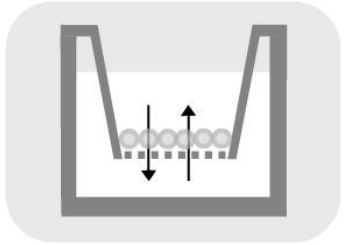
Angiogenesis

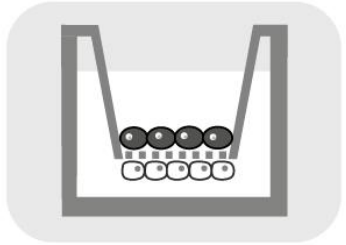


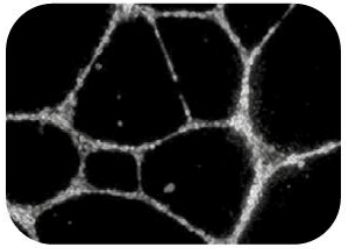
Vascularization

Classic

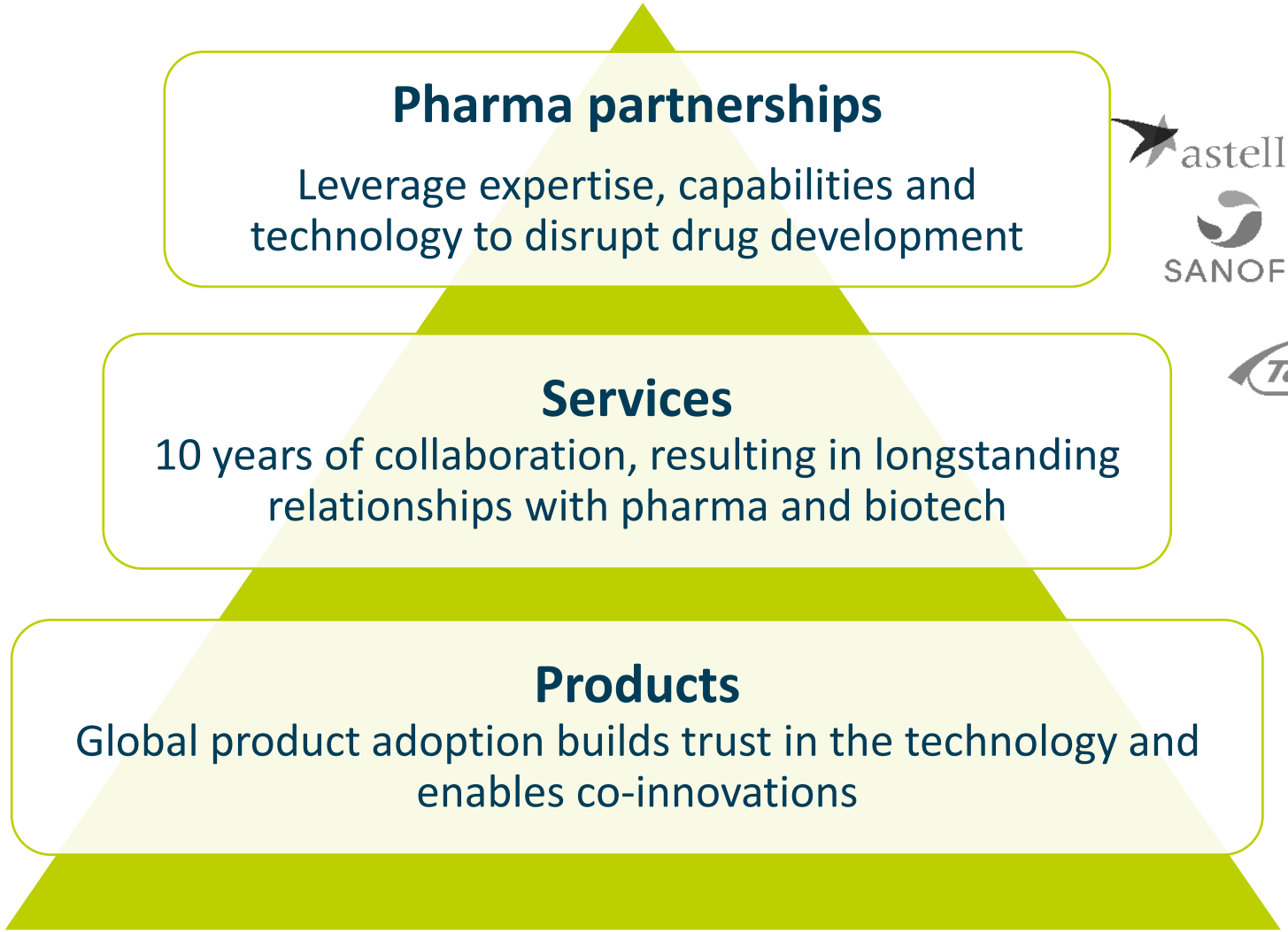






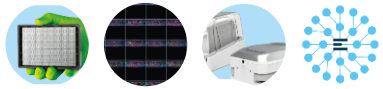


MIMETAS' business models

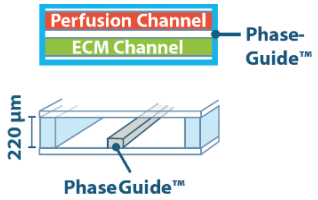


astellas · NOVARTIS · Alnylam PHARMACEUTICALS · SANOFI · VERTEX · Celgene · Genmab · Takeda · Roche · abbvie · SERVIER · Pfizer · Biogen · AsahiKASEI · UCB · MERCK · Lundbeck · novo nordisk · gsk · Galápagos · BAYER · Boehringer Ingelheim · teva

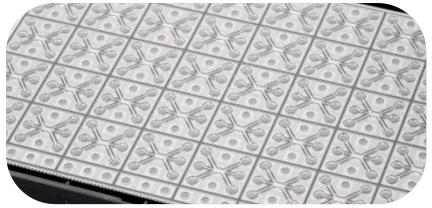
OrganoPlate® family

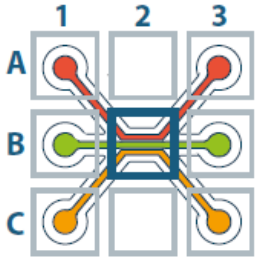


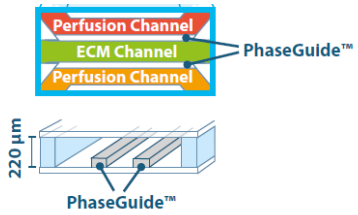
OrganoPlate® 2-lane 96



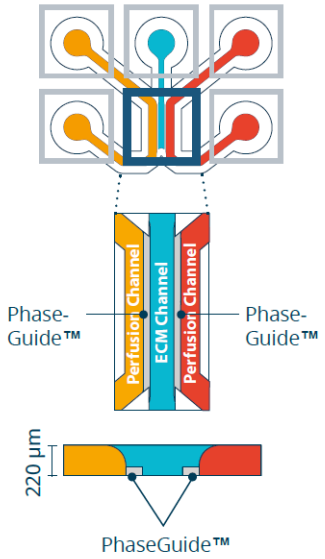
OrganoPlate® 3-lane 40



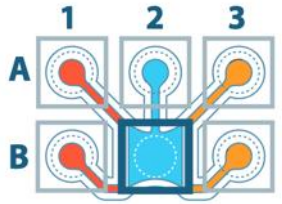


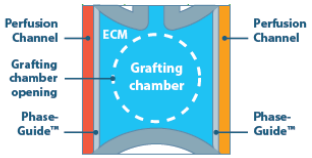


OrganoPlate® 3-lane 64



OrganoPlate® Graft






1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
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3-LANE 64
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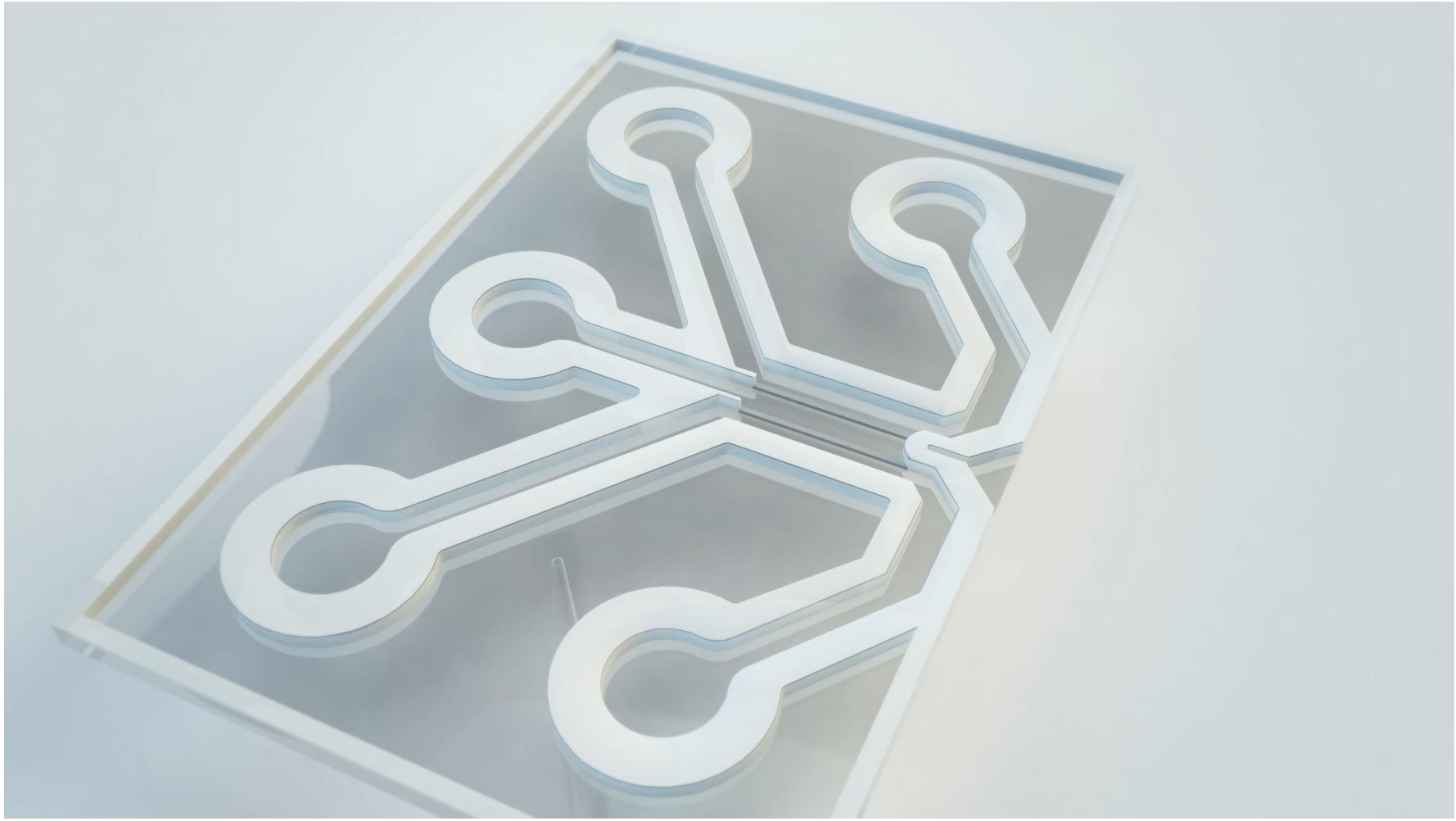
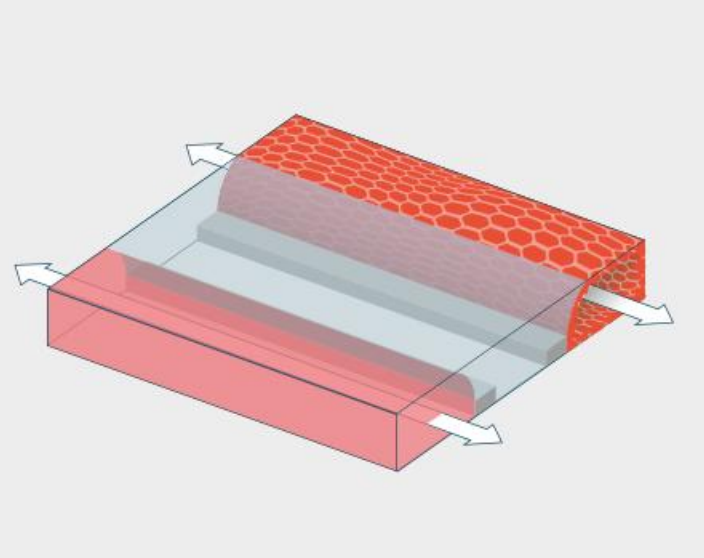


Endothelial tubule in 3-lane chip

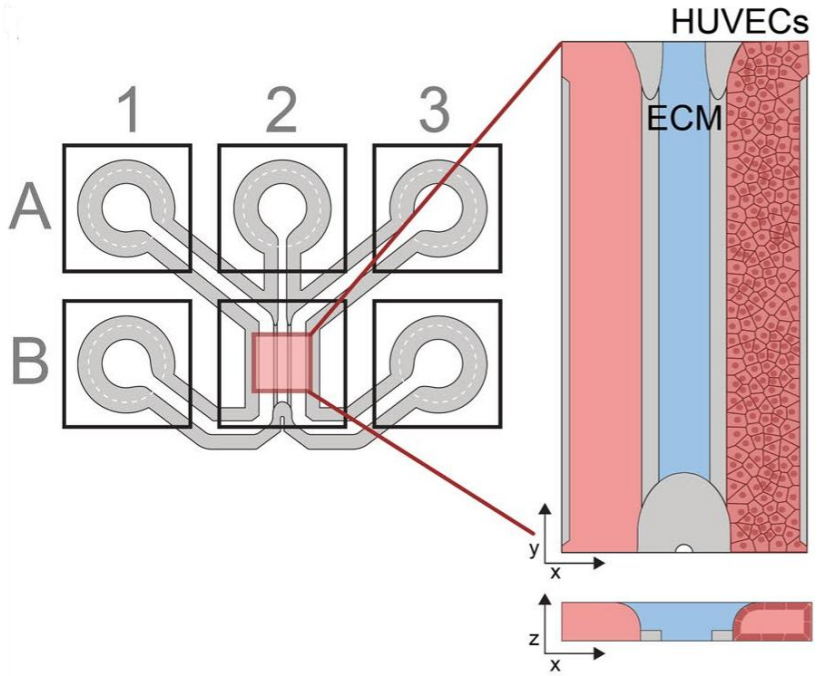


Membrane-free

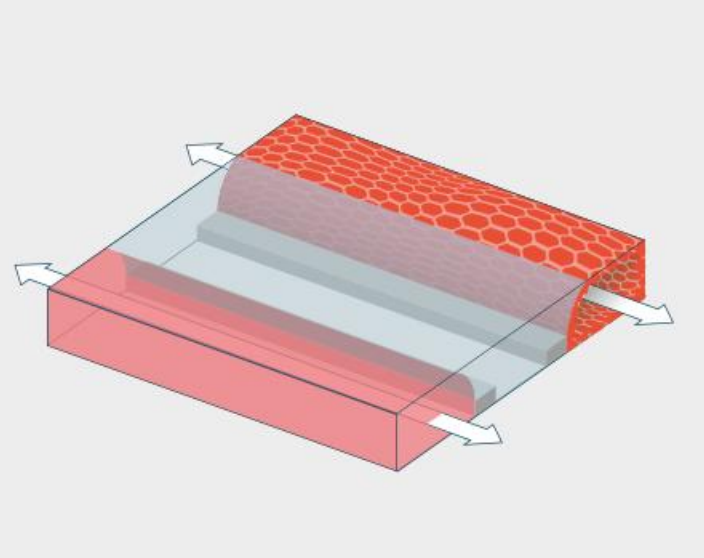
Easy apical/basolateral access

Imaging capabilities

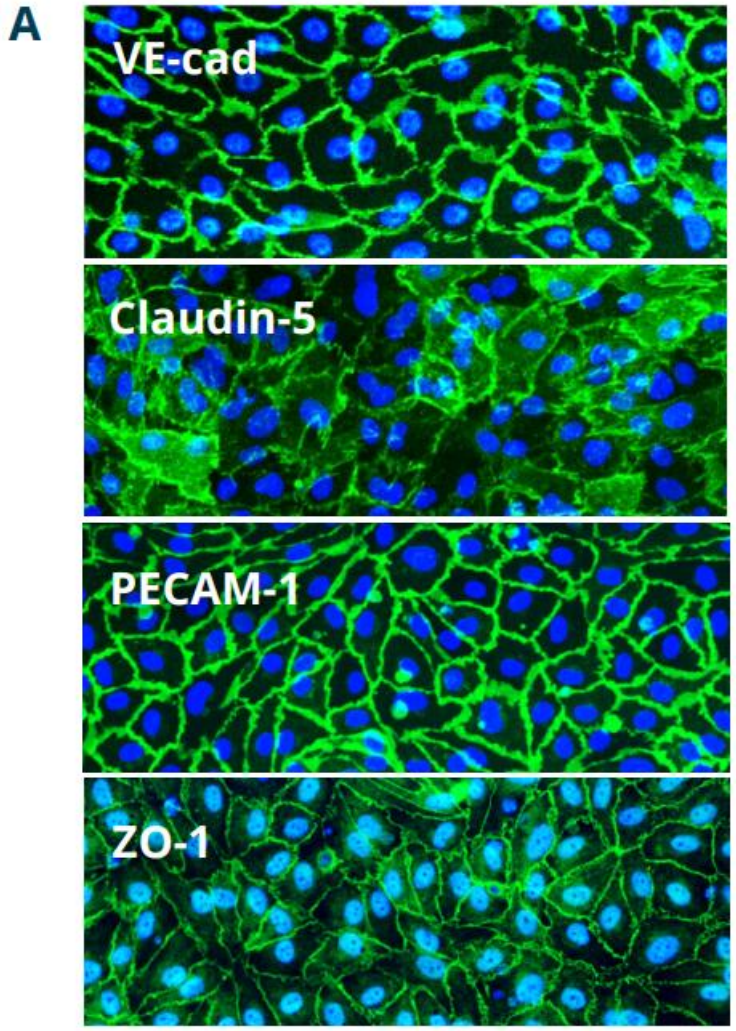
High throughput

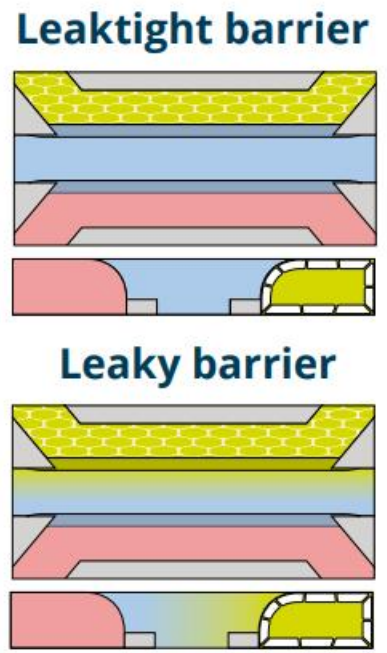


Endothelial tubule in 3-lane chip

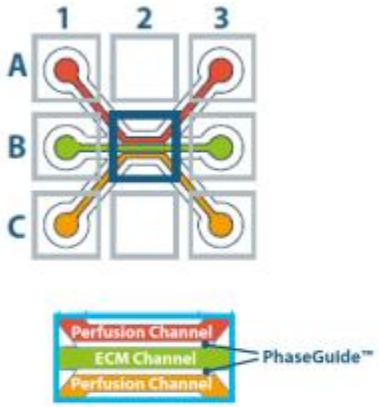


- **Marker expression**
- **Barrier integrity**
- **Cell viability**

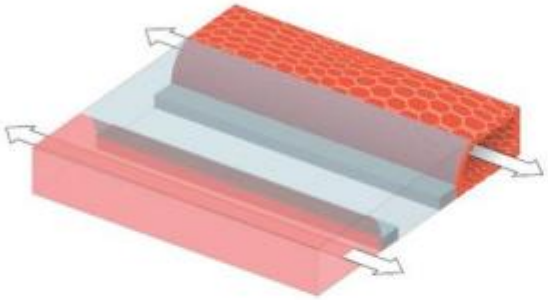




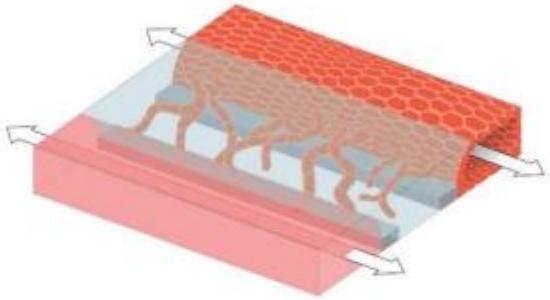
Build organ-on-a-chip models your way



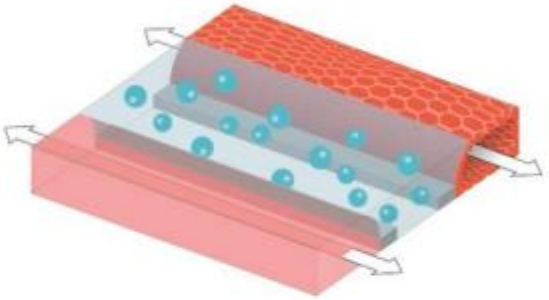
Perfused tubule

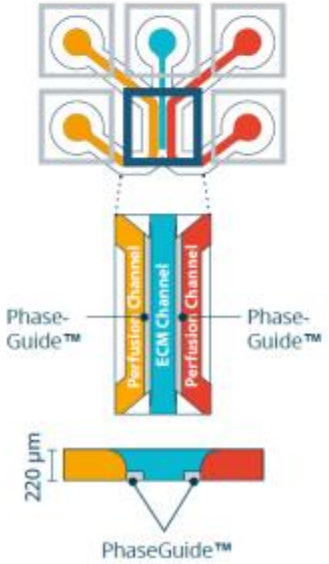


Angiogenesis

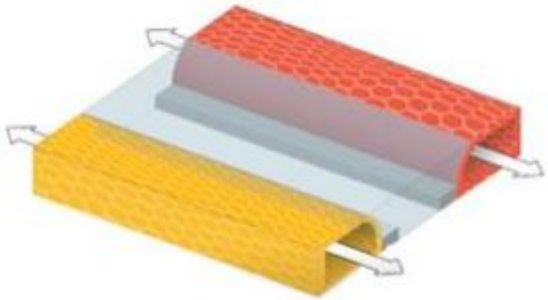


Tube + in-gel culture

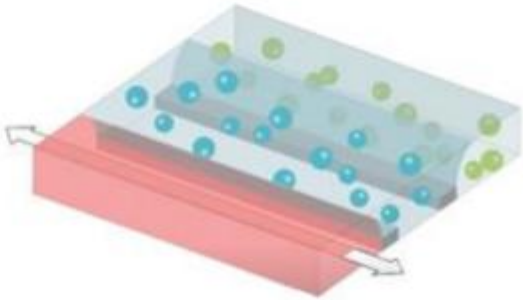




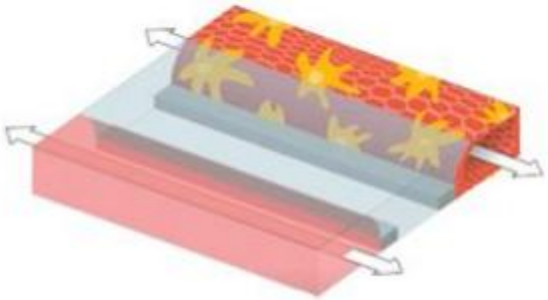
Double tube culture



In-gel + in-gel culture



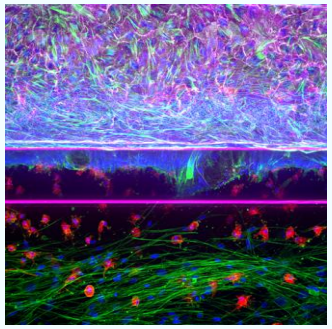
Tube-in-tube culture



Expertise across multiple organs

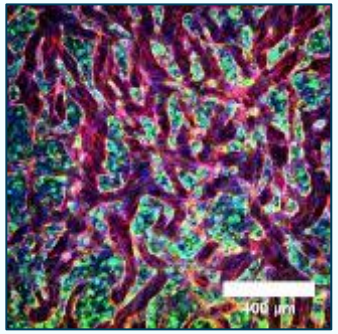
Organ Modelling Capabilities

Gut



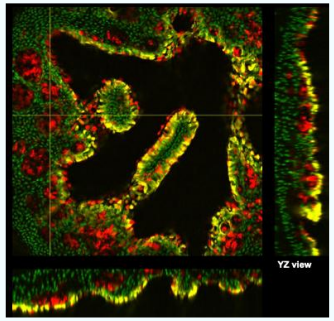
- *Adult stem cell derived organoids*
- *Co-culture with stroma and vasculature*
- *Tissue resident macrophages*

Liver



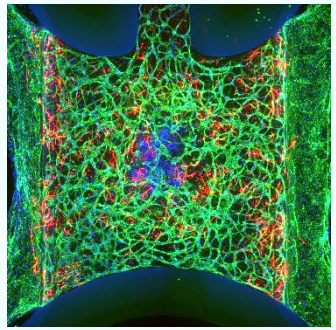
- *Primary hepatocytes*
- *Perfusable LSEC vascular plexus*
- *Stellate cells*
- *Perfused and resident immune cells*

Lung



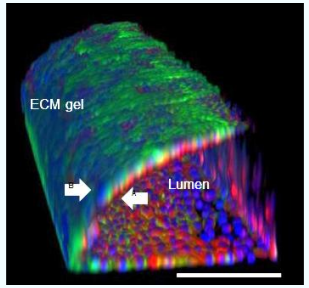
- *Air lifted epithelium*
- *Perfused vasculature*
- *Fibroblasts*
- *Immune cell perfusion*

Nervous system



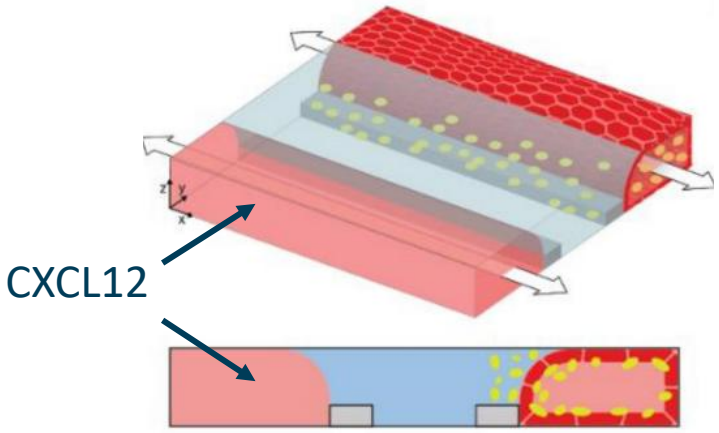
- *iPSC neurons*
- *Axonal outgrowth*
- *Astrocytes and microglia*
- *Perfused brain endothelium*
- *Inflammation*

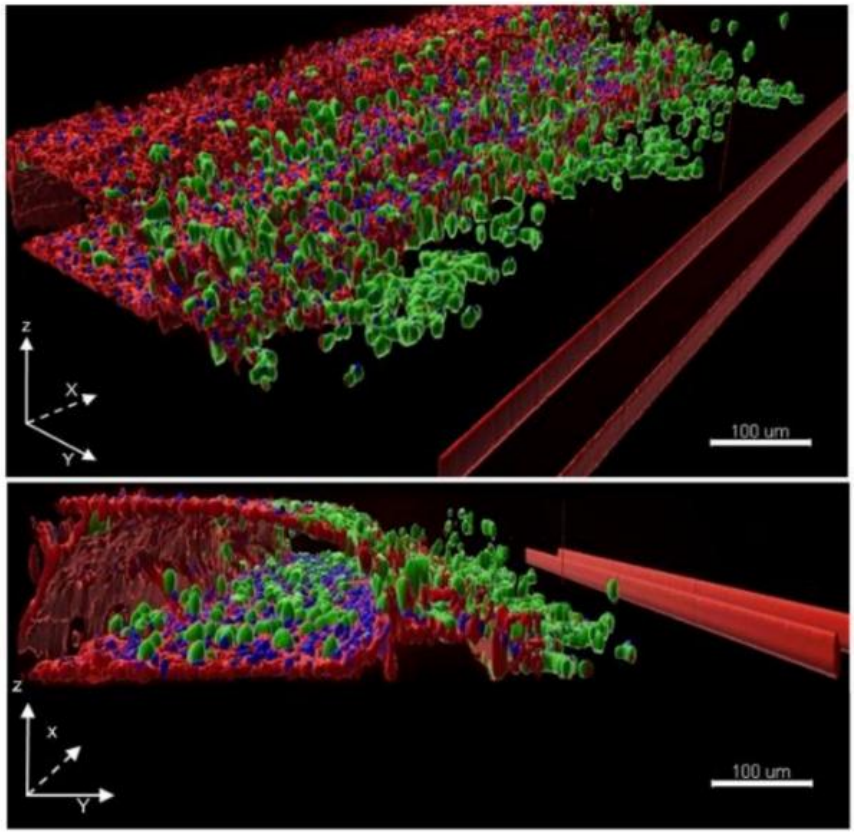
Kidney



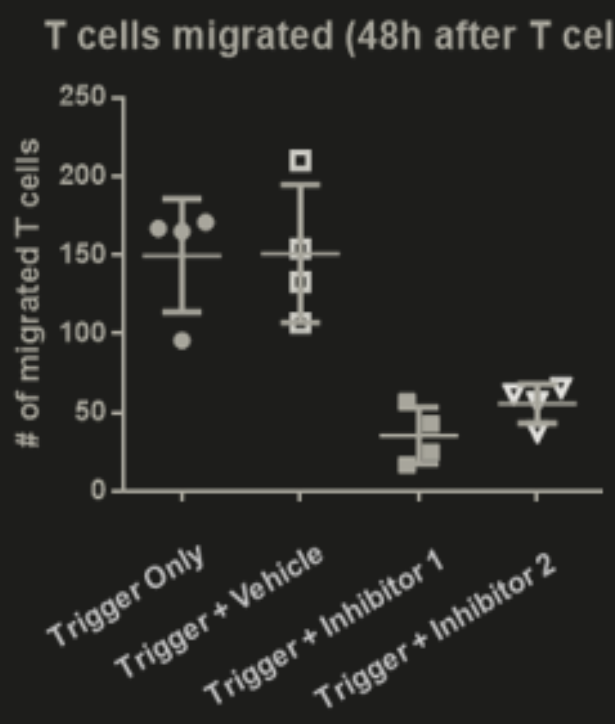
- *Adult stem cell derived tubuloids*
- *Proximal and distal phenotype*
- *Co-culture with vasculature and immune cells*
- *Glomerulus from primary isolated material*
- *Podocytes and glomerular endothelium*

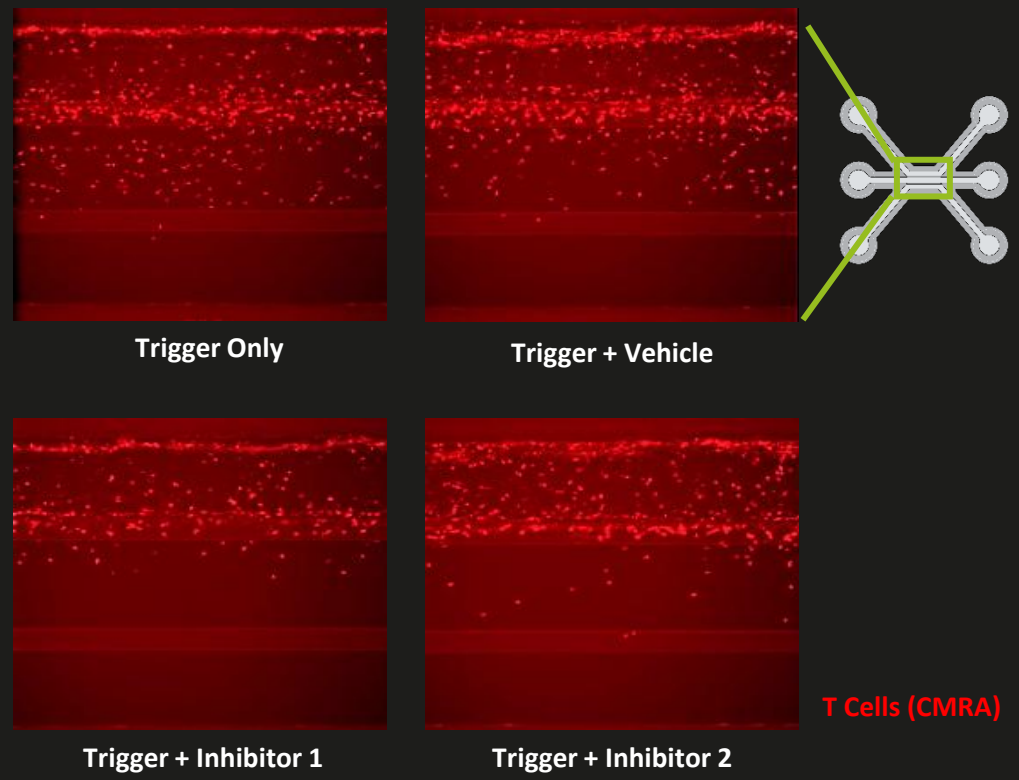
Adding complexity: T cell extravasation





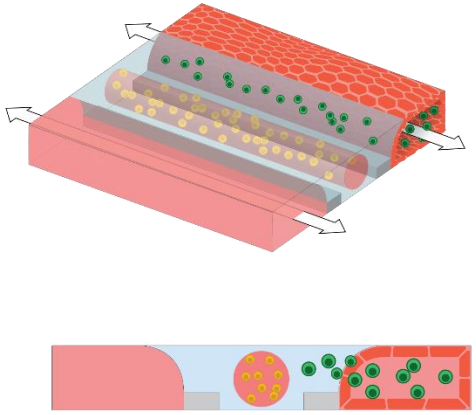
Adding complexity: T cell extravasation

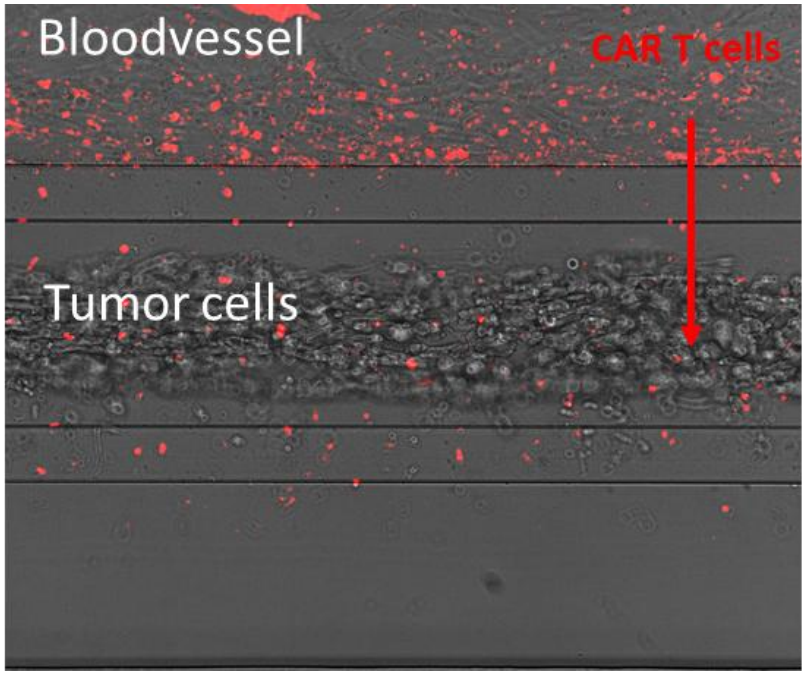


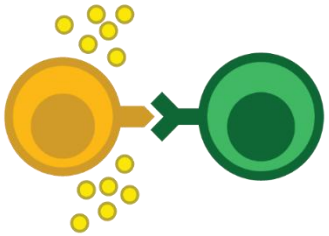


This immune cell recruitment assay in the OrganoPlate® 3-lane 40 demonstrates a clear assay window between untreated conditions and chips treated with migration inhibitors.

CAR-T migration and tumor cytotoxicity



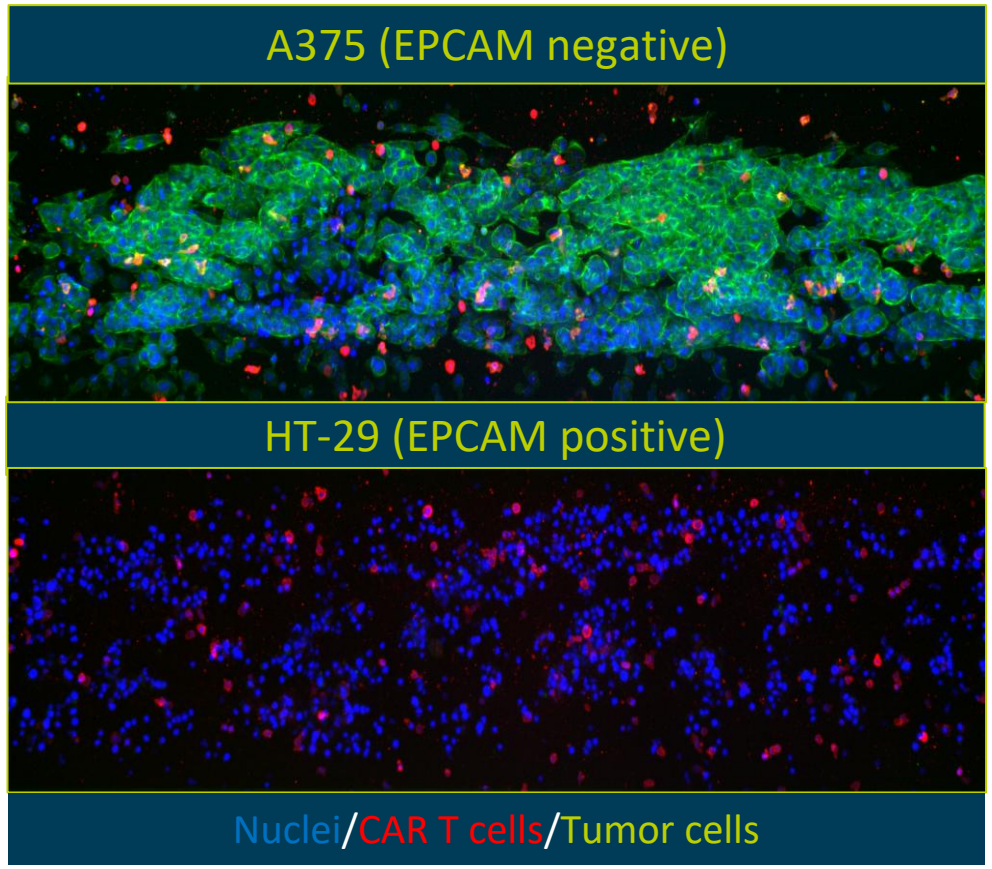


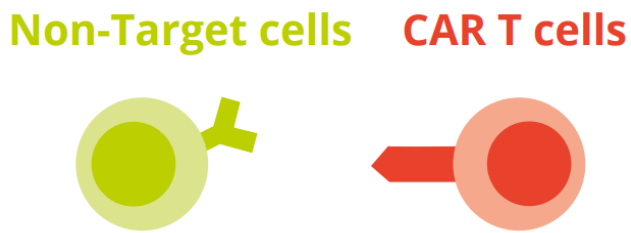


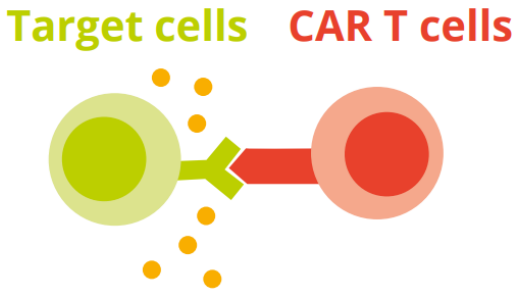
Tumor – w/wo target expressed and TME

CAR-T cells

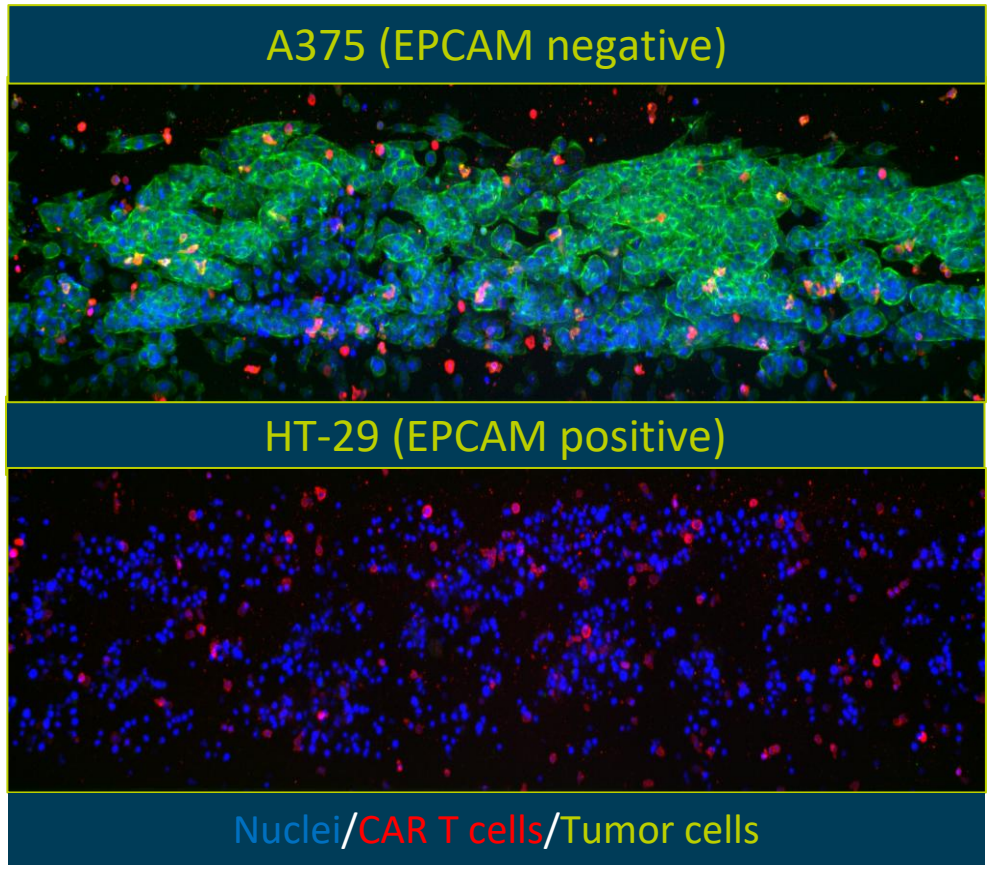
CAR-T migration and tumor cytotoxicity

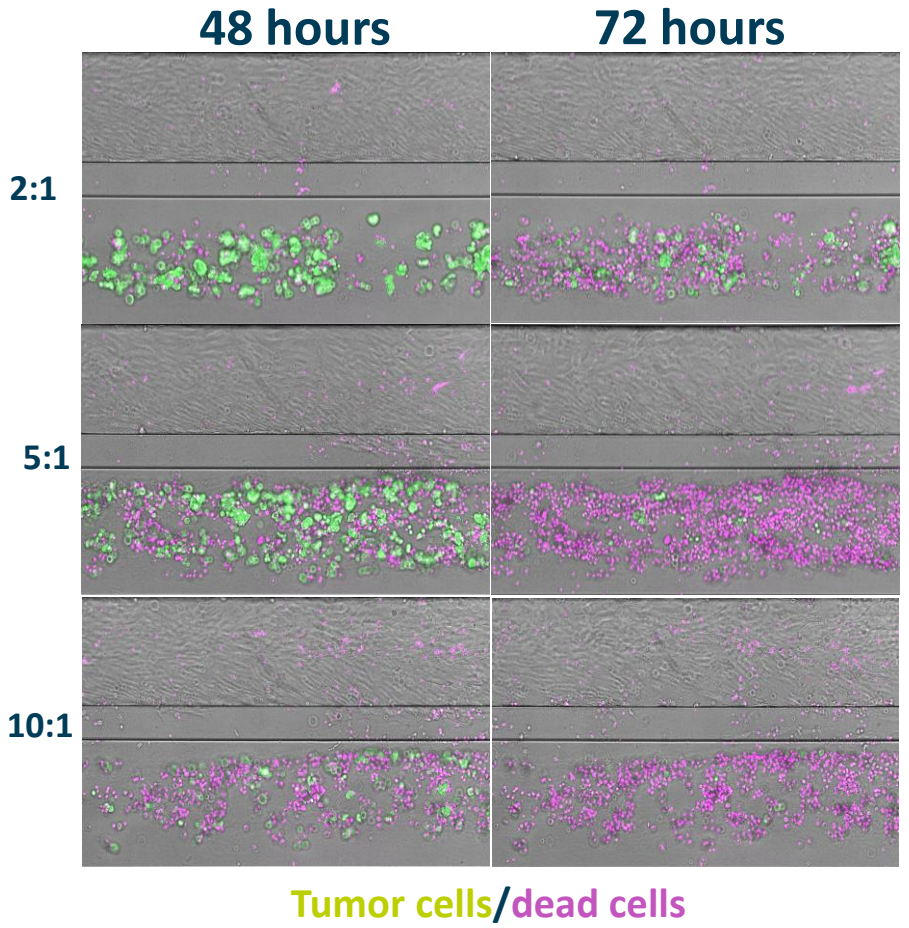






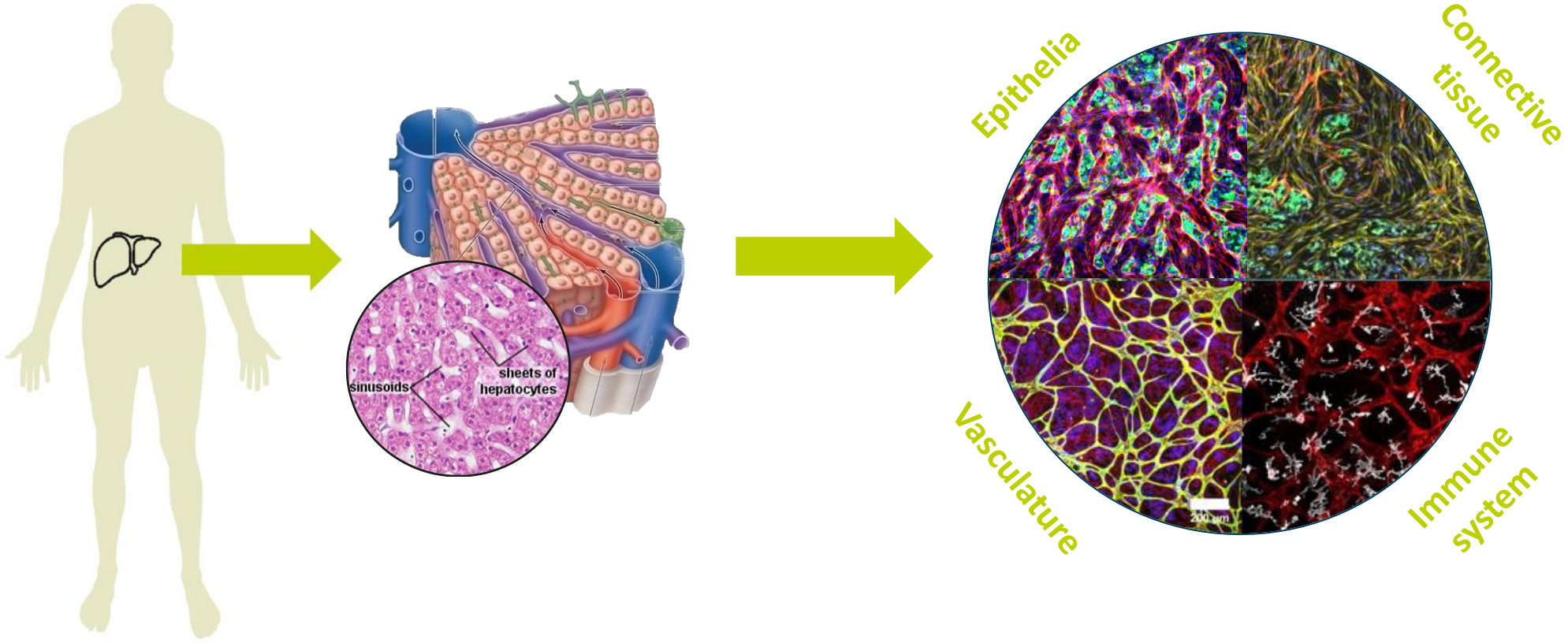
CAR-T migration and tumor cytotoxicity





Models that Capture Human Physiology

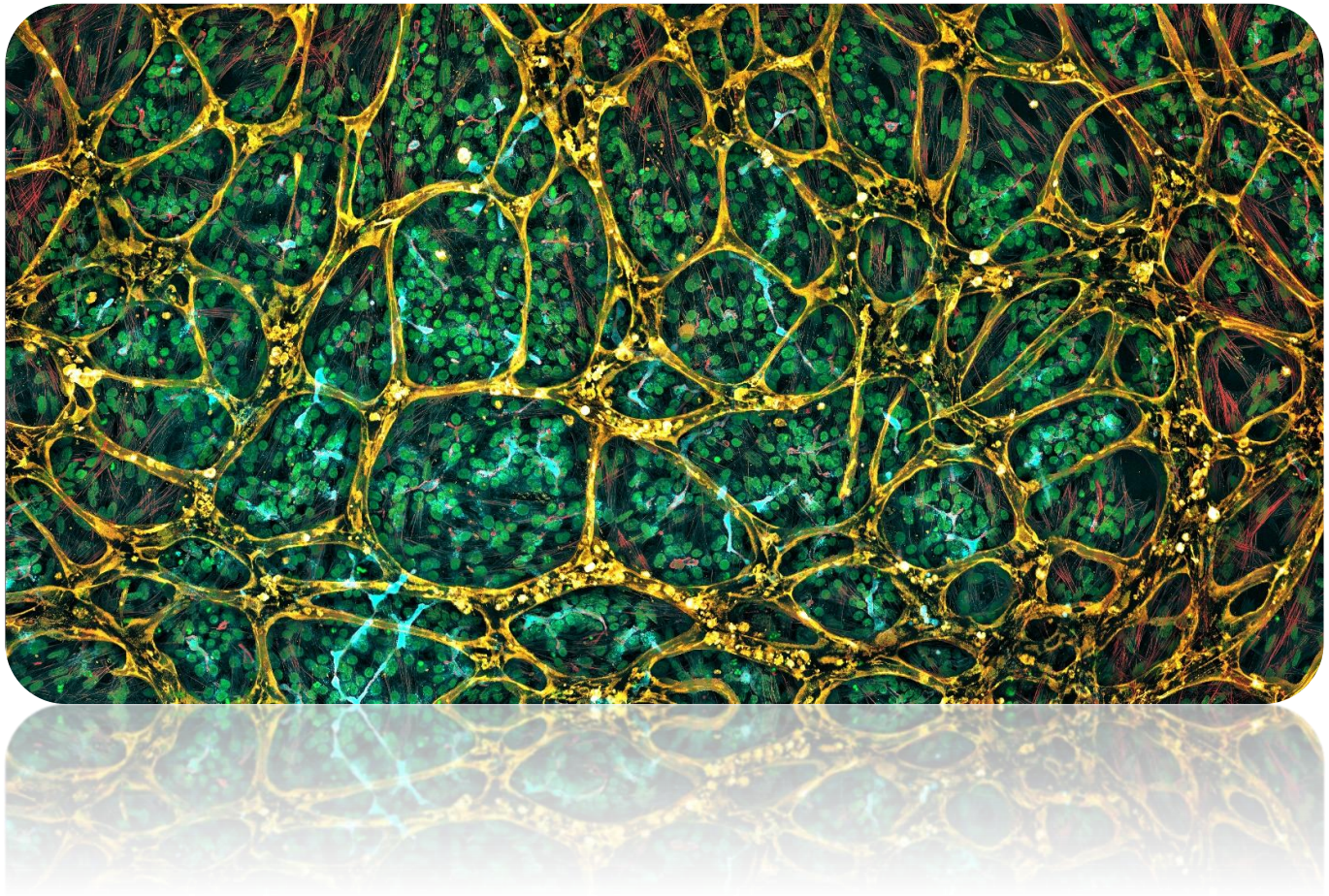
Human-relevant Biology



MIMETAS provides **human-relevant disease models** that enable development of **more effective and safer therapies** by replicating patient disease processes

Ticking the final box in human disease models

- **Human** ✓
- **Comprehensive** ✓
- **Membrane free** ✓
- **Vascularized** ✓
- **Scalable** ✓
- **Physiological flow**



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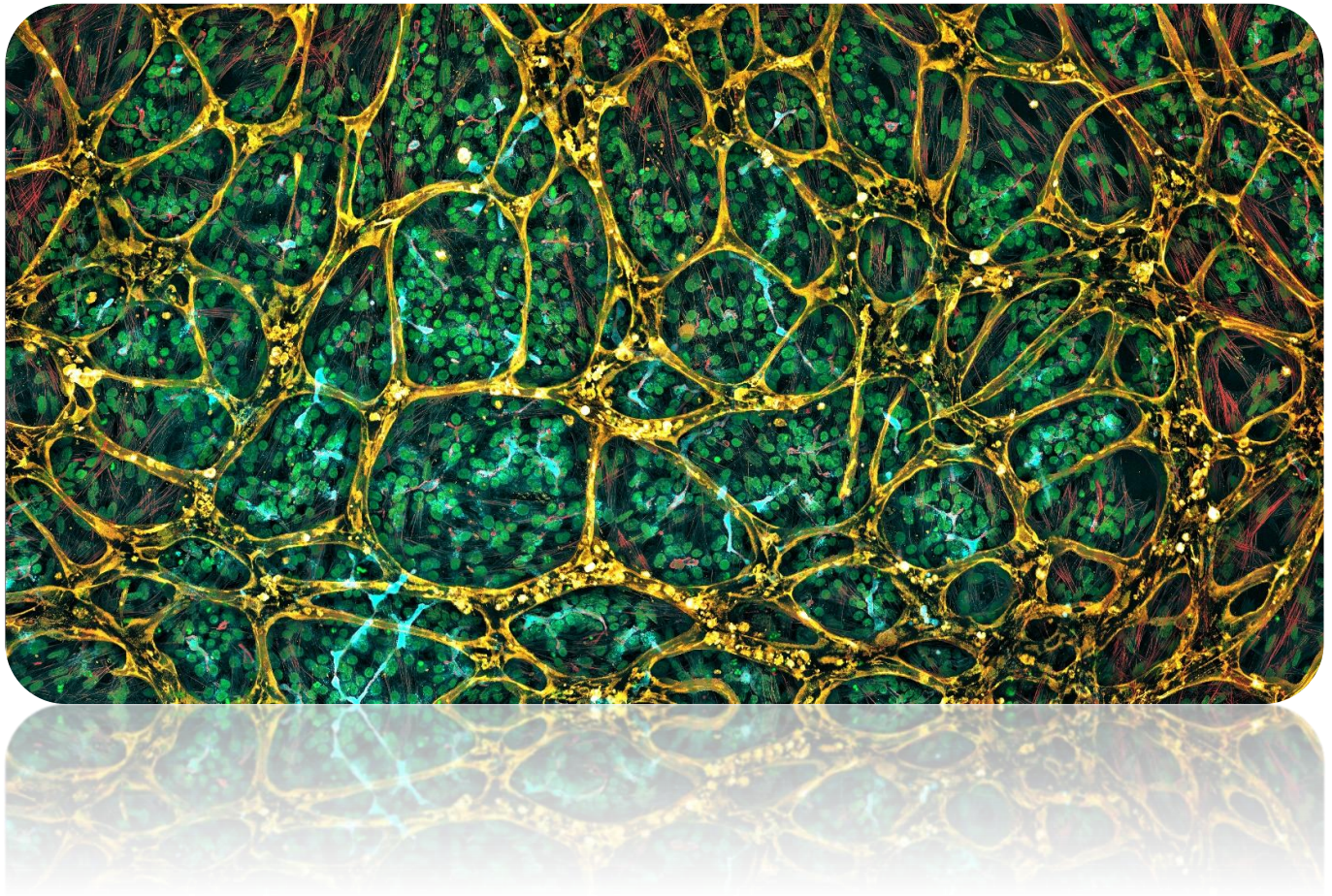
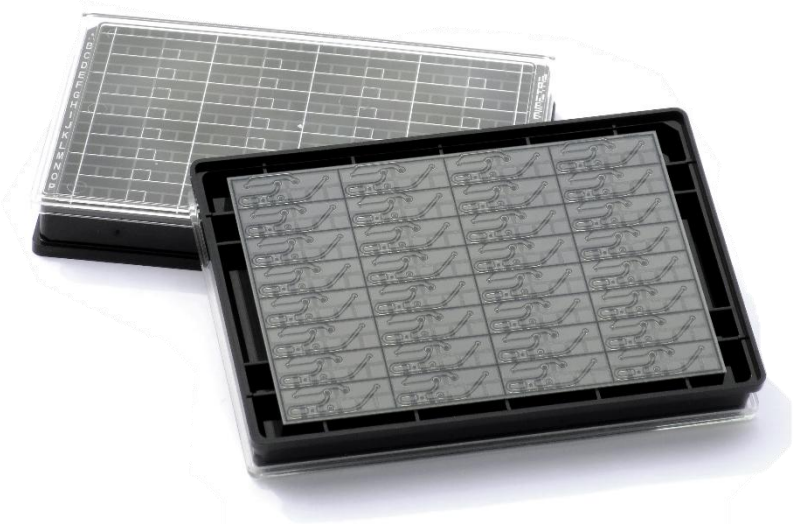
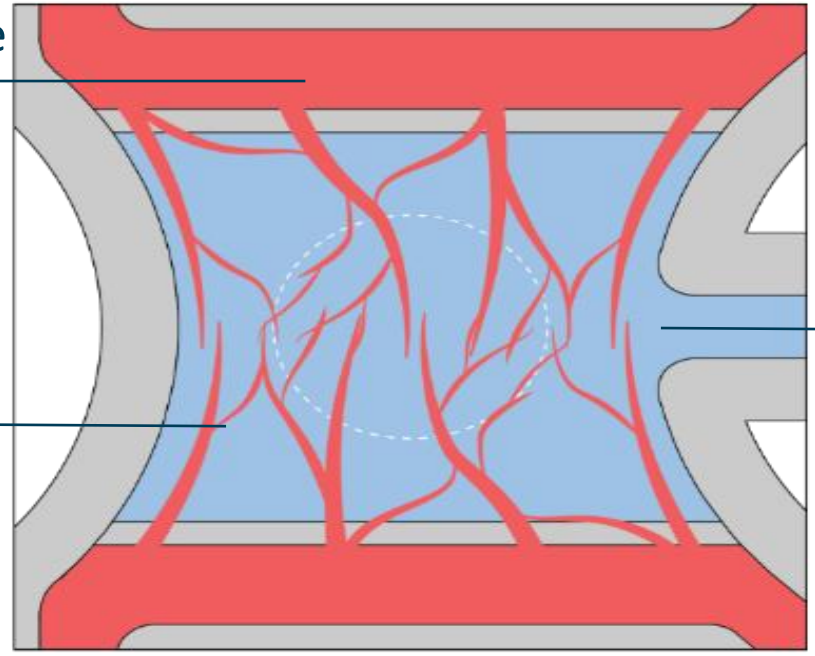


Vasculature model in OrganoPlate® Graft 32 UF



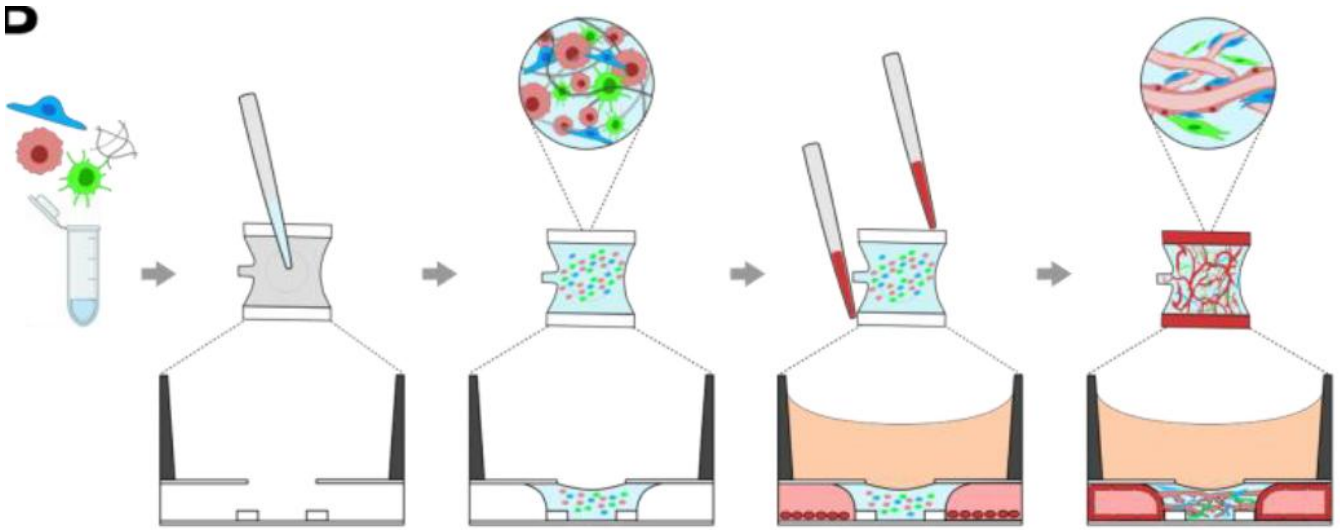
HUVEC:
Supporting tubule

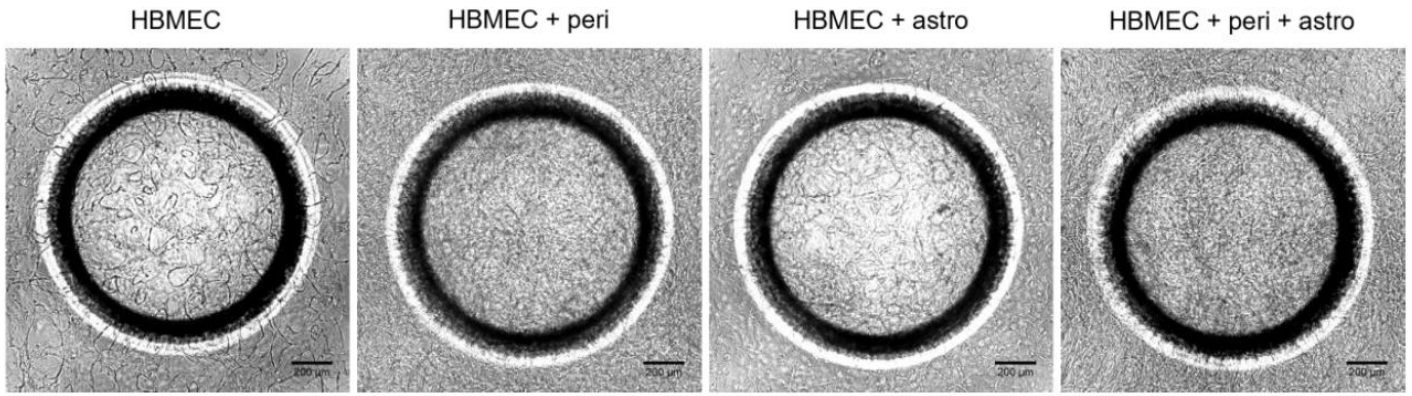
HUVEC + NHLF:
Vascular bed



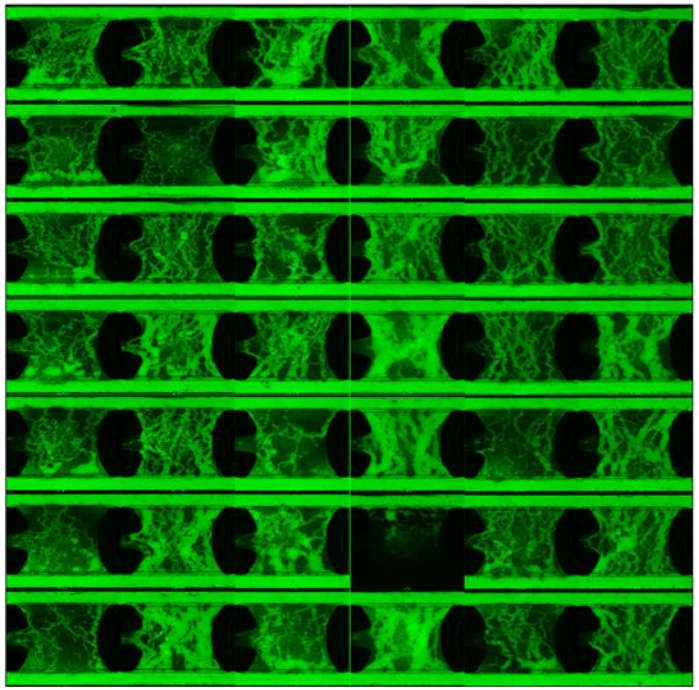
Fibrin Gel

Improving microvasculature: Blood Brain Barrier





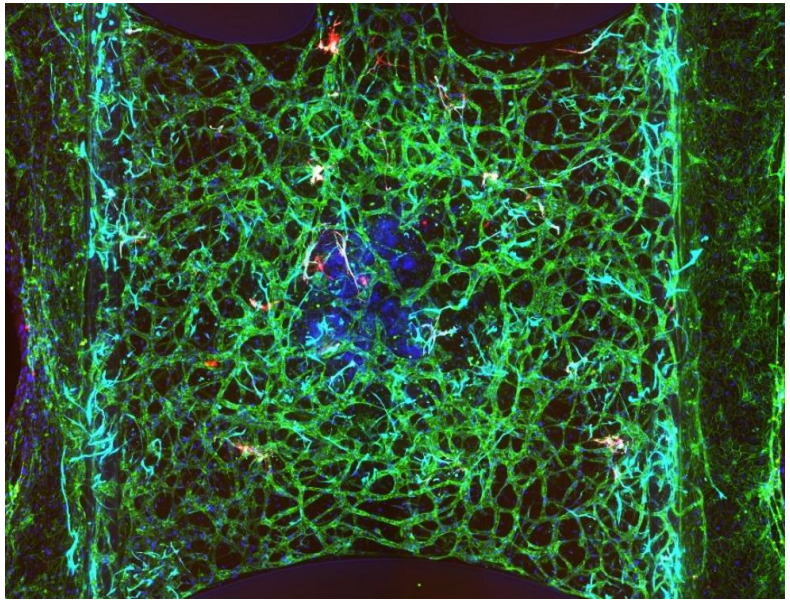
Vascular bed formation

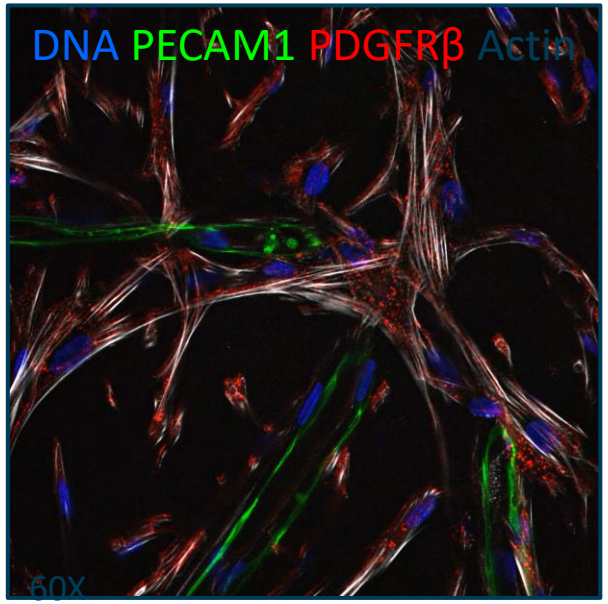


Perfusable microvasculature supported by pericytes and astrocytes

Neurovascular Unit in the OrganoPlate®

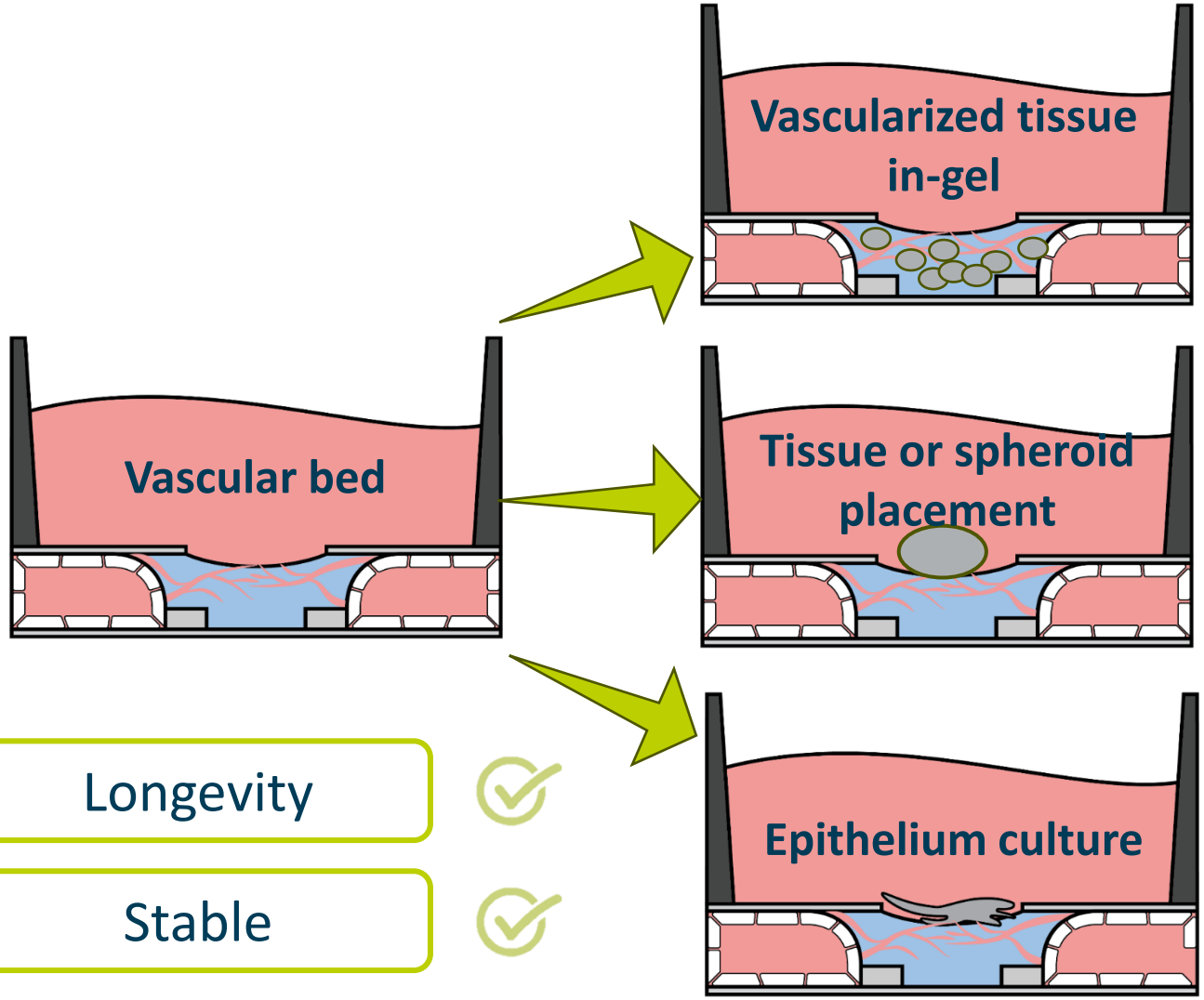
NVU-on-a-chip



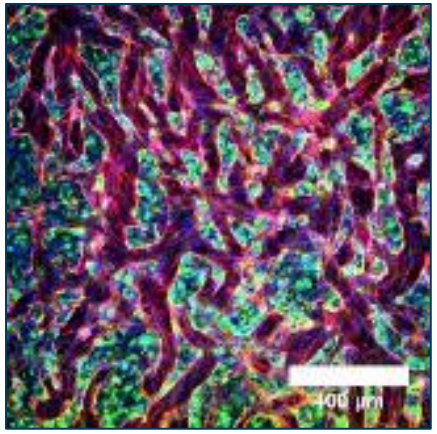


HBMEC/pericyte co-cultures for modeling BBB/NVU

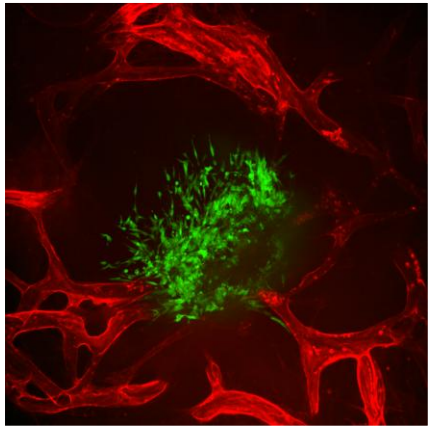
OrganoPlate Graft 32 UF: Applications



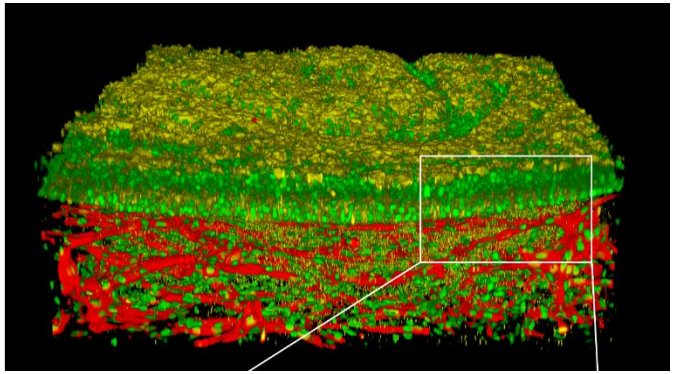
- Longevity
- Stable
- Reproducible



Liver
Brain

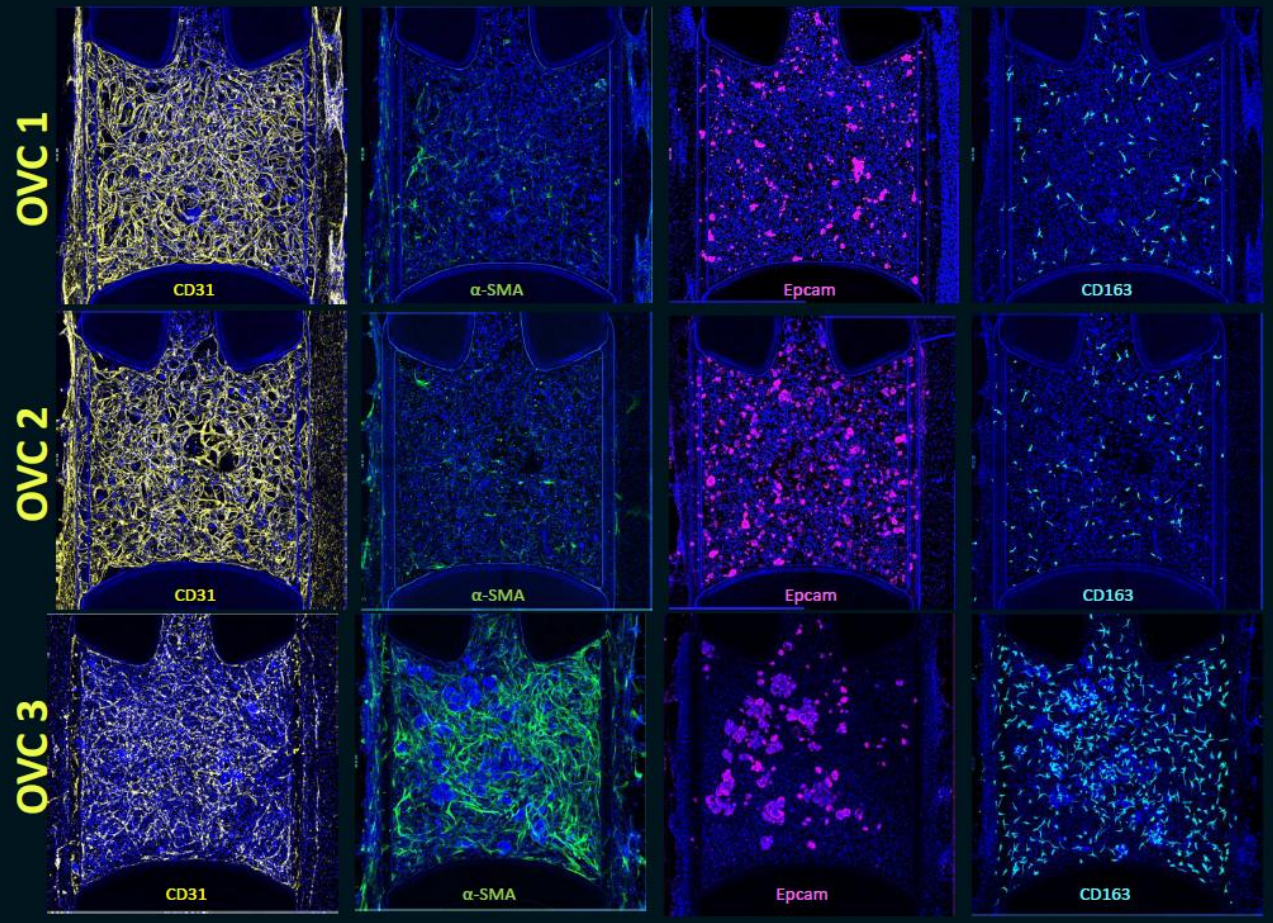


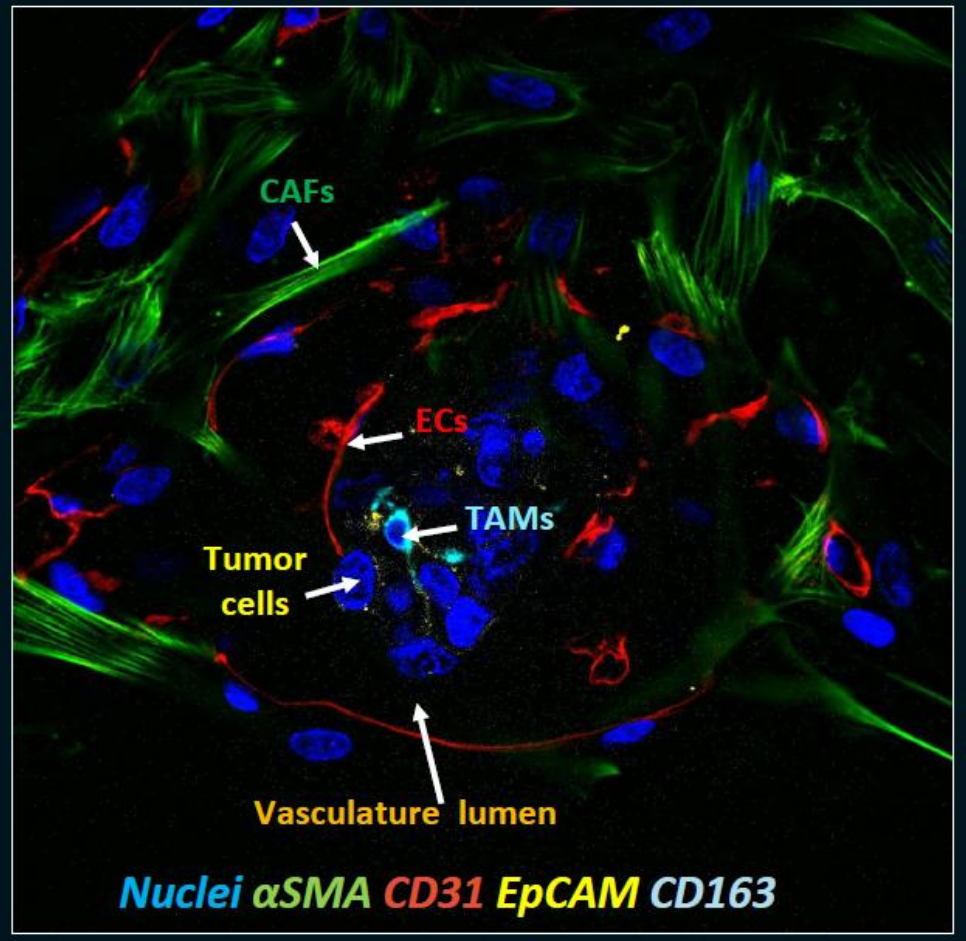
Tumor
Organoid



Gut
Lung
Skin

Development of organotypic patient-derived ovarian cancer model for therapy testing





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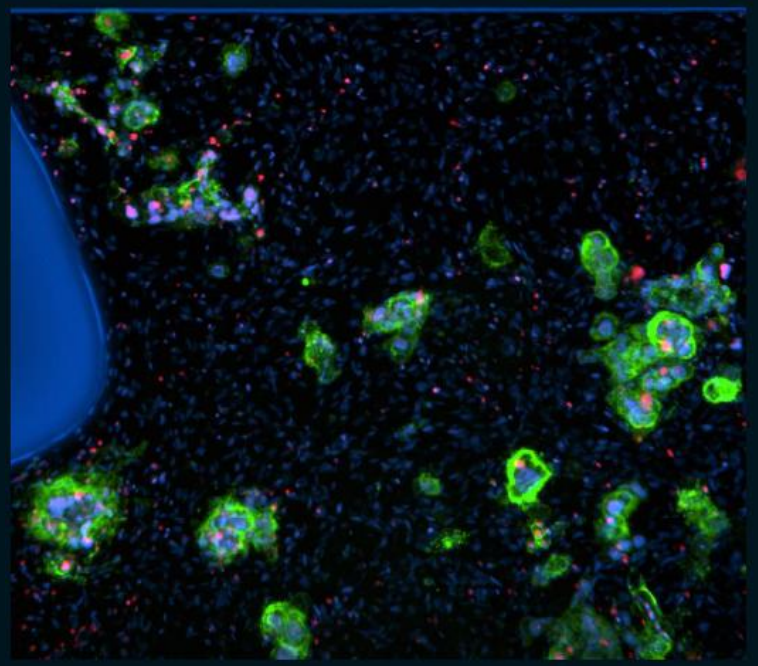
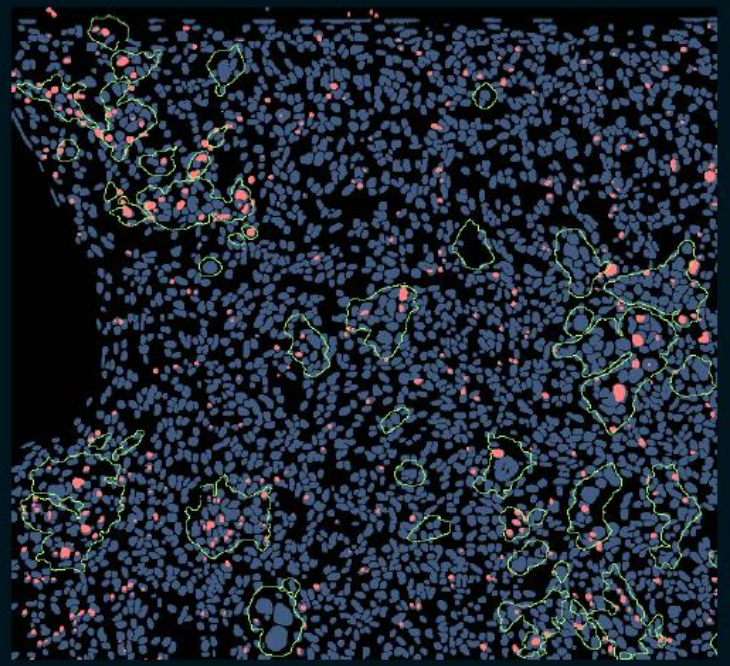
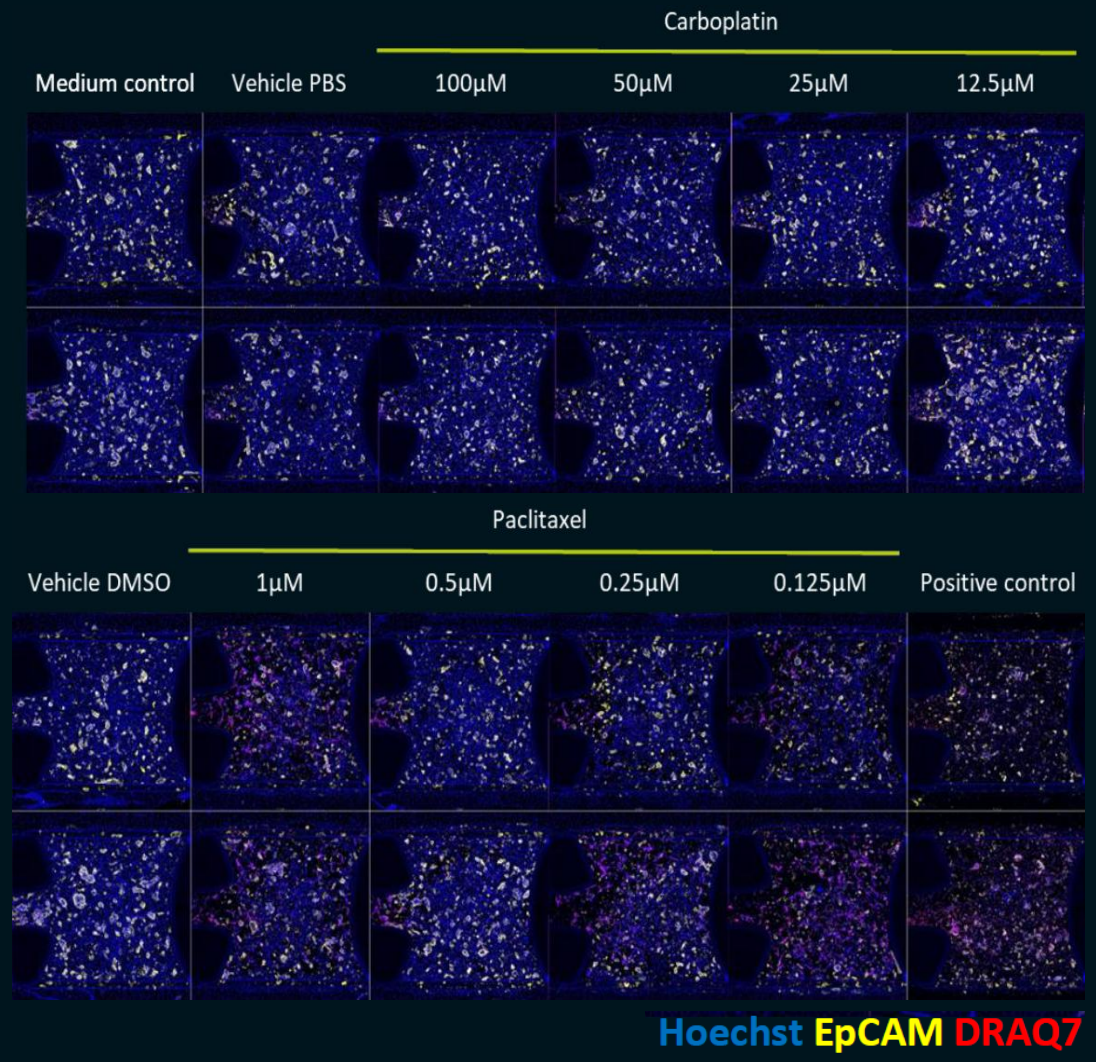


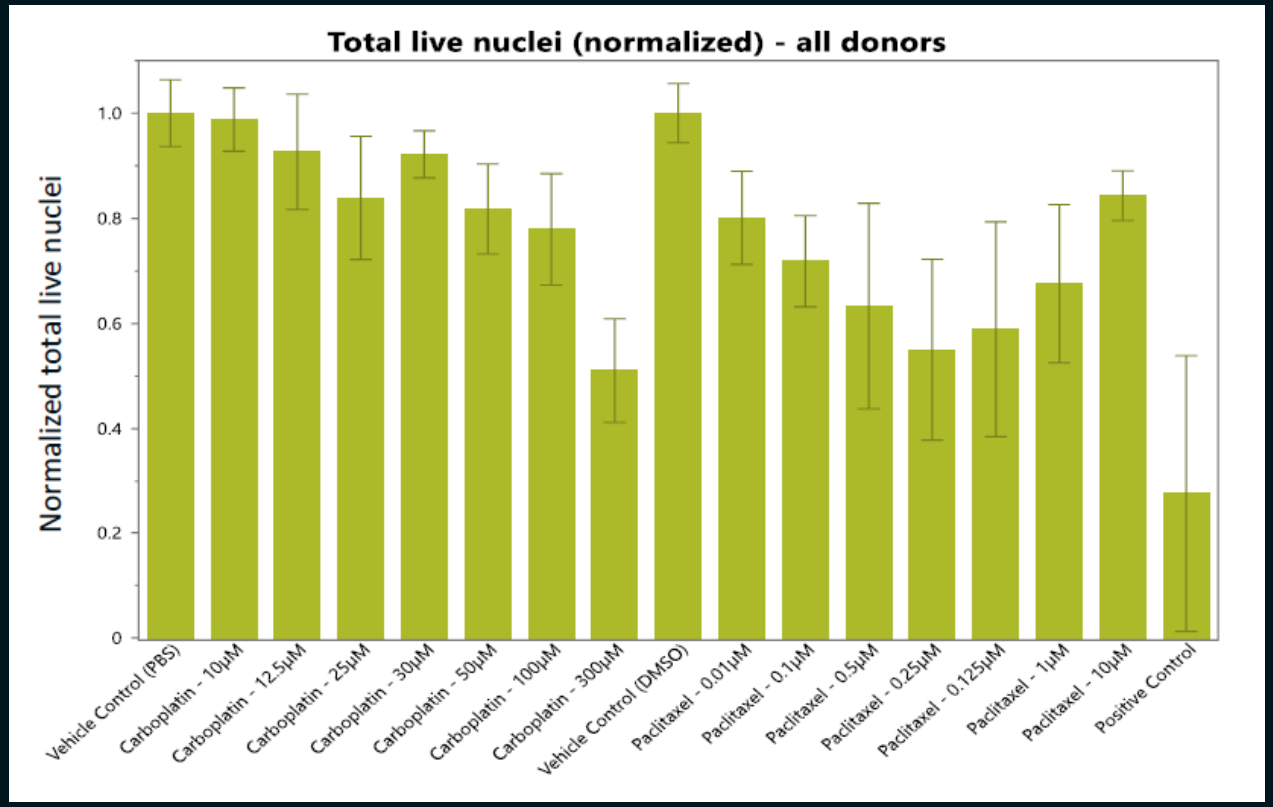
Hoechst EpCAM DRAQ7



Nuclei Tumor cluster Dead cell

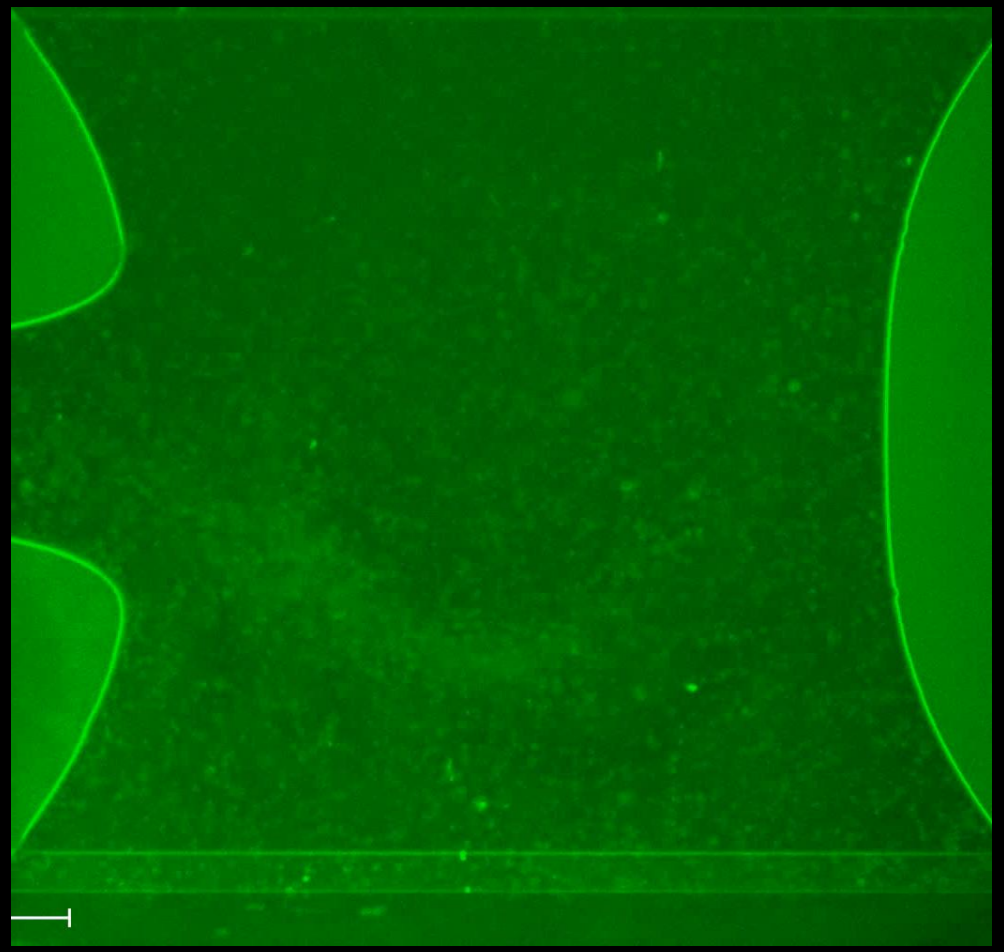
Development of organotypic patient-derived ovarian cancer model for therapy testing





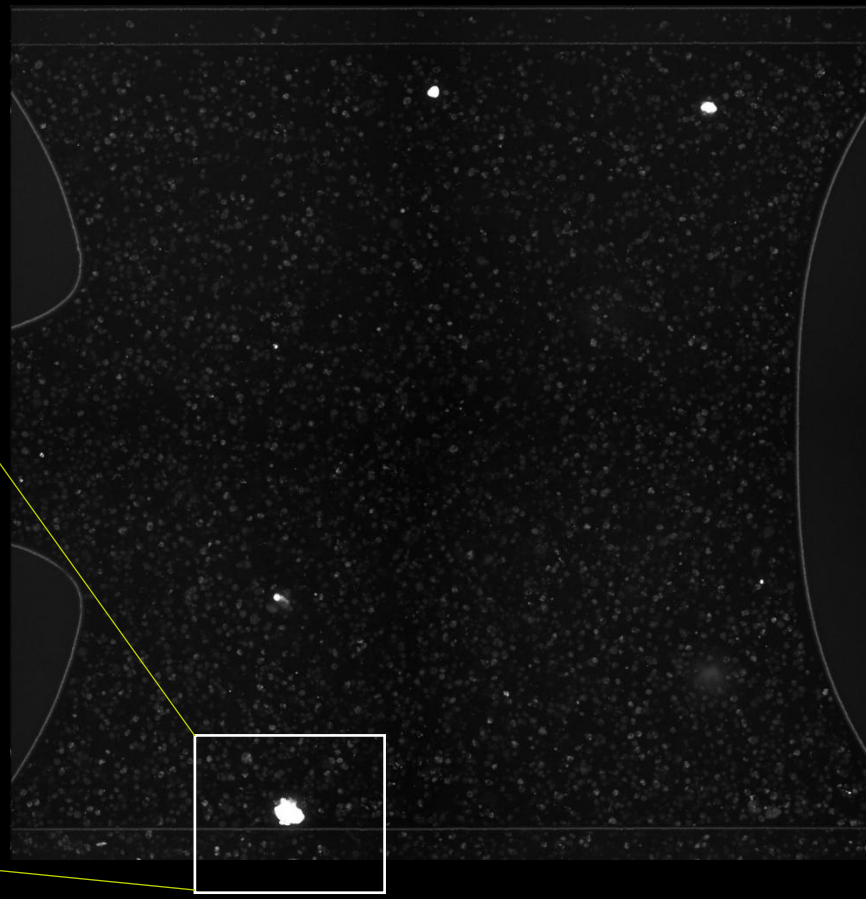
Cancer cell perfusion

GFP-Expressing HCT116 colorectal cancer cell lines added to the perfusion lanes of a uniflow sprouts with liver model (primary hepatocytes + bulk NPC) 6 days after seeding



GFP-Expressing HCT116 colorectal cancer cell lines added to the perfusion lanes of a uniflow sprouts with liver model (primary hepatocytes + bulk NPC) 6 days after seeding

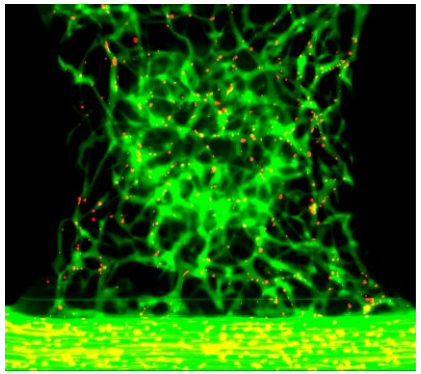
D5 after tumor addition



Why MIMETAS?

1

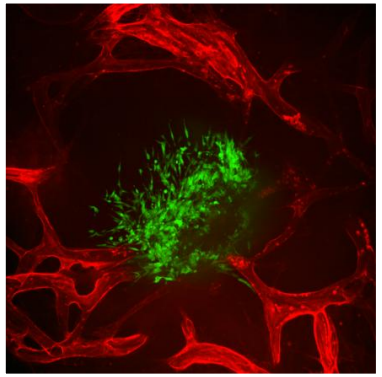
Perfused Vasculature



Perfused blood vessels and epithelial tubules

2

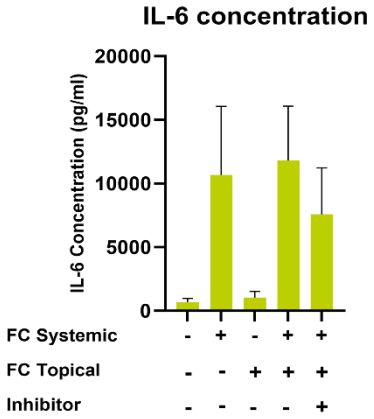
Comprehensive



Real tissues comprised of the crucial cell types

3

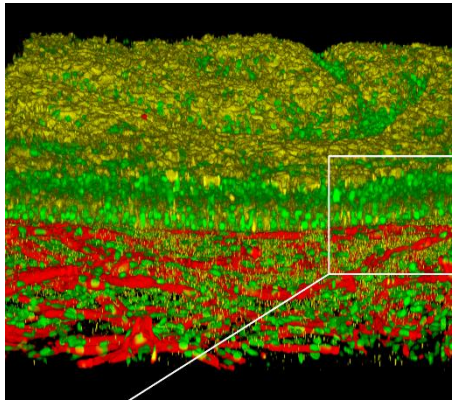
Quantification



Quantitative data from robust cultures

4

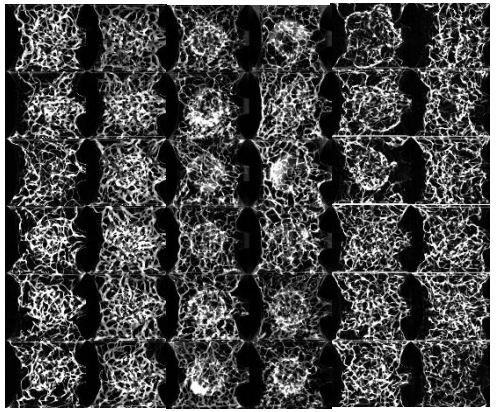
No Artificial Membranes



Cells can migrate, interact and self-organize

5

Unmatched Throughput



Reproducible and high throughput

Key Differentiators From
Other Organoid solutions

MIMETAS

Key Differentiators From
Other Organ-on-a-Chip Solutions

Growing importance of New Approach Methodologies

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FDA NEWS RELEASE

FDA Announces Plan to Phase Out Animal Testing Requirement for Monoclonal Antibodies and Other Drugs

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Organ-on-Chip Call

The Top Sector Life Sciences & Health (LSH) invites companies and research organisations to participate in the Organ-on-Chip Call 2025. Through this call, Top Sector LSH aims to further strengthen the Dutch innovation ecosystem in the field of Organ-on-Chip (OoC) technology and promote its future implementation, all with a view to enhancing the Netherlands' economic earning capacity and generating societal impact. In 2025, Top Sector LSH will make €4.000.000 in public-private partnership (PPP) funding available for this call.

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Regulatory acceptance of new approach methodologies (NAMs) to reduce animal use testing

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Driven by: cea, cnrs, Inserm

Funded by: France 2030

Operated by: anr agence nationale de la recherche

The exploratory research program Organs and organoids on chips (PEPR MED-OOC) aims to deploy a new generation of biological models in France through the development of organs and organoids on chips (O&OoC). The State has entrusted its management to the CEA, the CNRS and Inserm, and the scientific direction to Xavier Gidrol (CEA), Anne-Marie Gué (CNRS), and Jean Rosenbaum (Inserm). MED-OOC is funded by France 2030 over 6 years and has a budget of €48.4 million operated by the National Research Agency (ANR).

Questions?

Meet us at company market!

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Grow. Learn. Discover.