

STARTER Kit: A Multi-Organ Multitool Driven by TOP

Educational Workshop and Hands-on Training

MPS WORLD SUMMIT 2025, BRUSSELS

Challenges in the MPS Market

Users can't take advantage of parts from multiple ecosystems



Suppliers can only sell to their own ecosystems

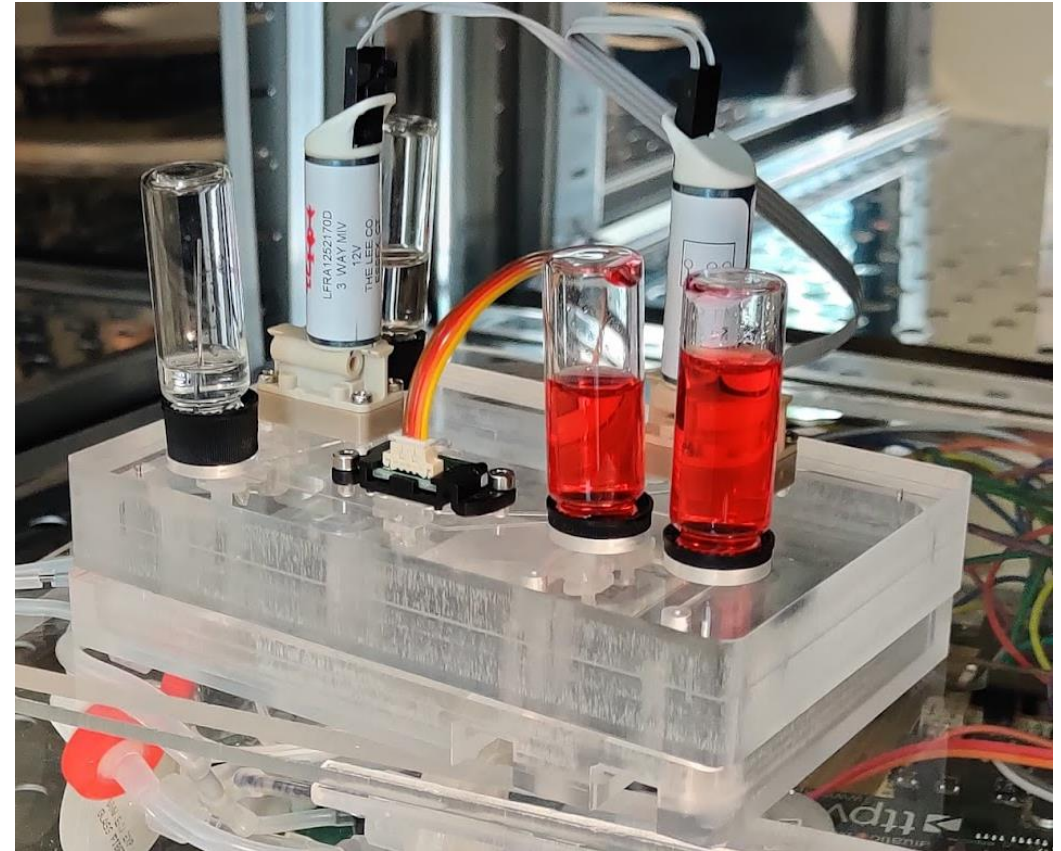


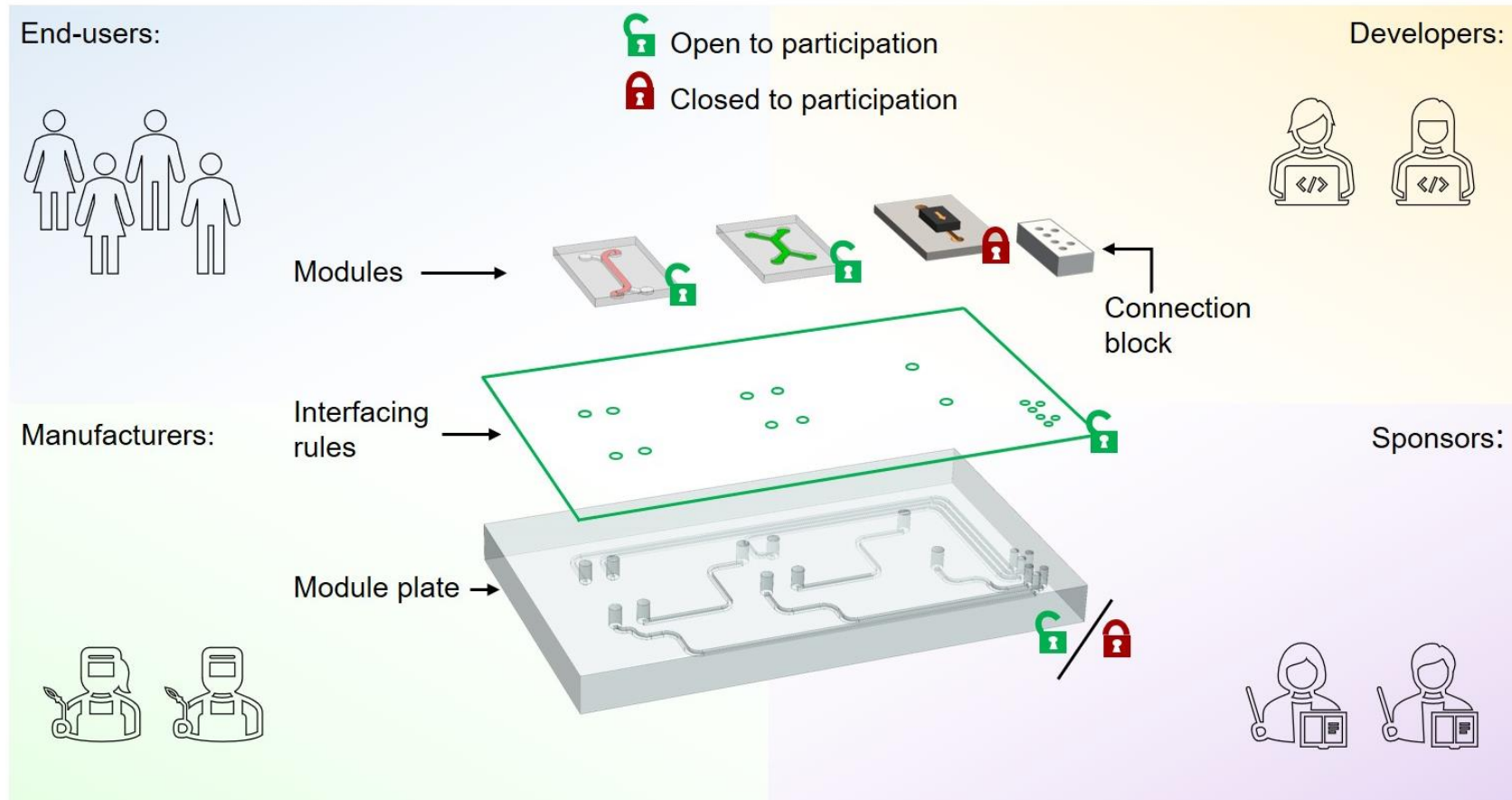
There is a need for **‘open’** platforms to facilitate and speed up development of next-generation organ-on-chip systems

What is the Translational OoC Platform (TOP)?



Aisen Vivas



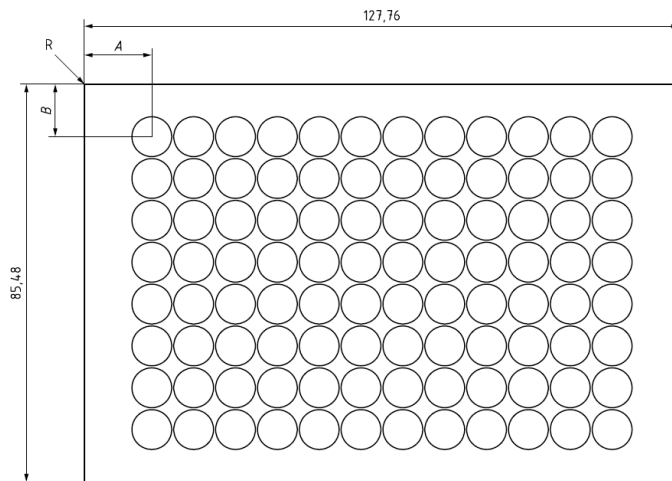


TOP is an open platform

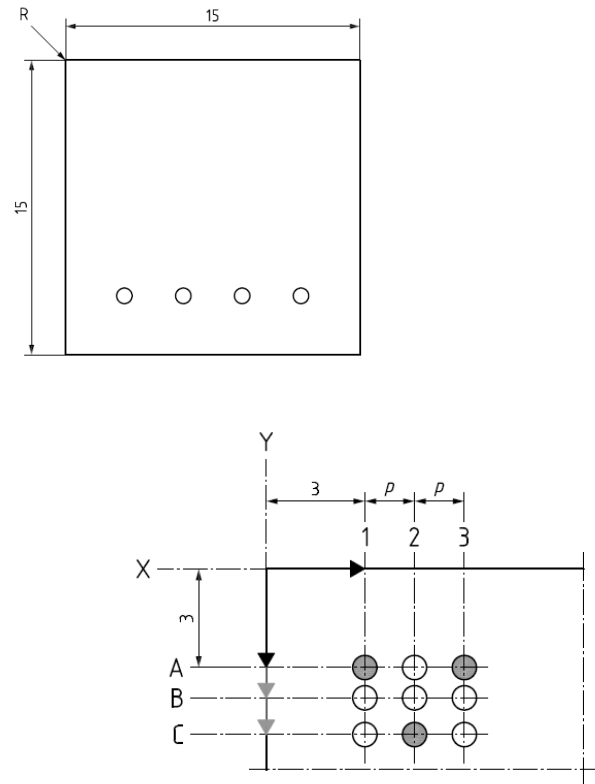
'Open' means open to participation. It does not always mean 'free', or 'public domain'.

ISO 22916:2022 – Microfluidic Devices - Interoperability requirements for dimensions, connections, and initial device classification

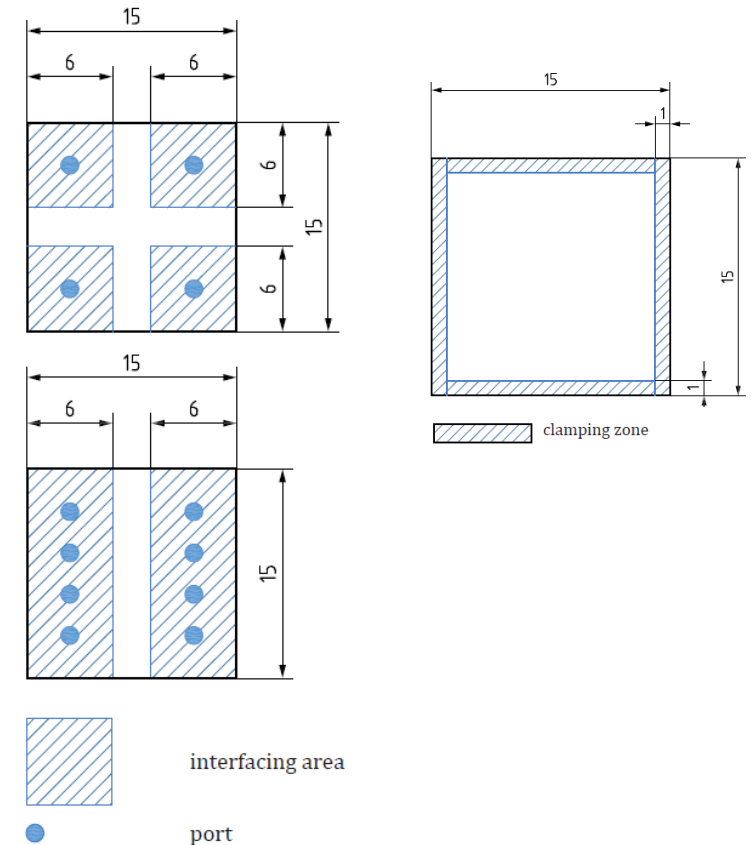
Well-plate Total Footprint



Defined MFBB Dimensions



Specific Interconnect Criteria

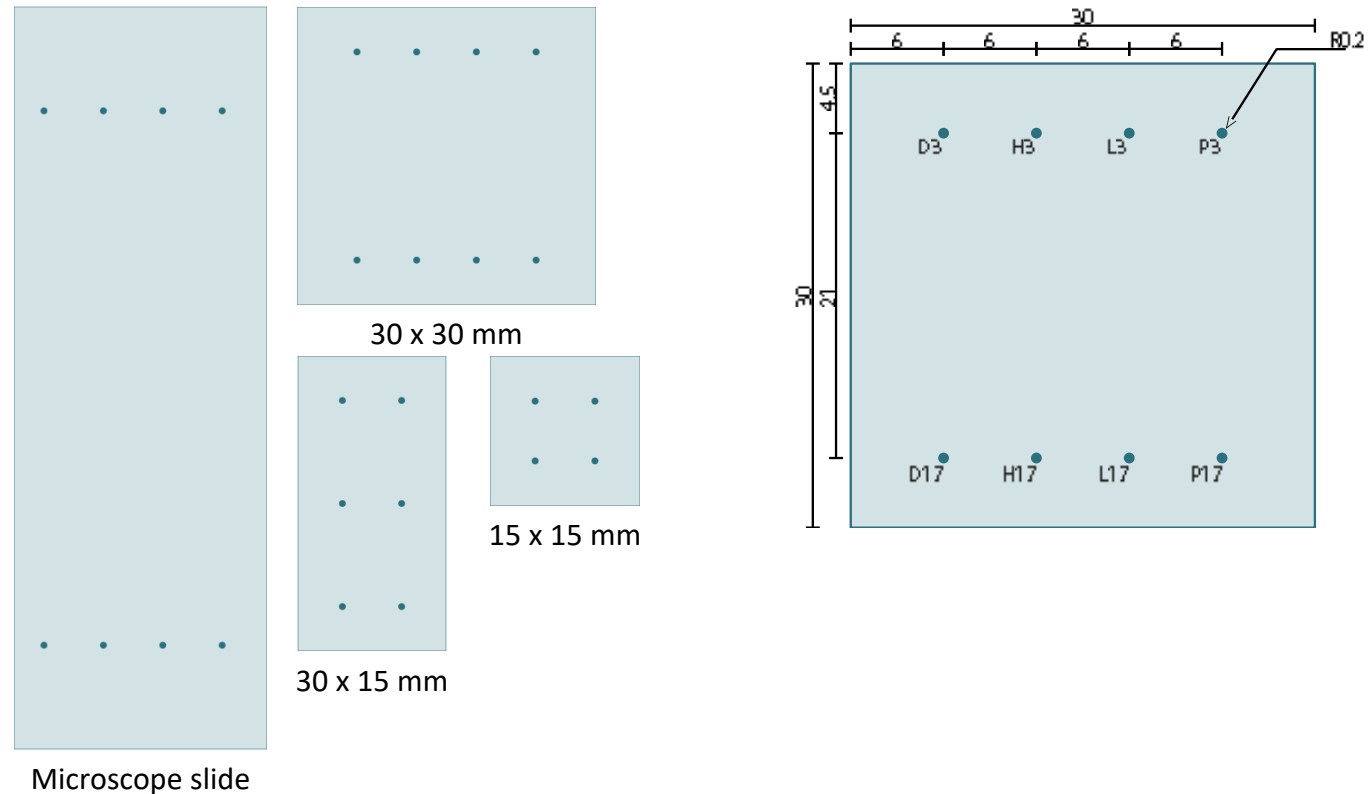


Standards: TOP as an Open Tech Platform



Eric Safai

TOP Design Rule Port Layouts



The Starter Kit: A Multi-Organ Multitool



Eric Safai

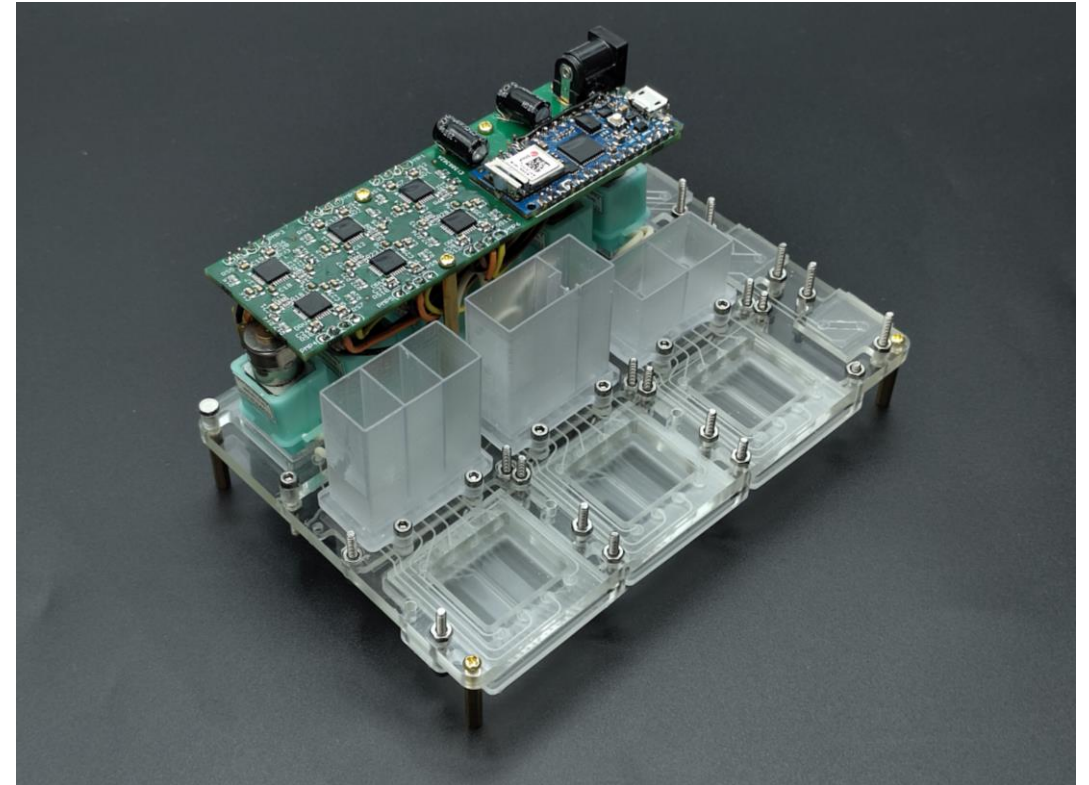


Aniruddha Paul

All-in-one and Reconfigurable

Features

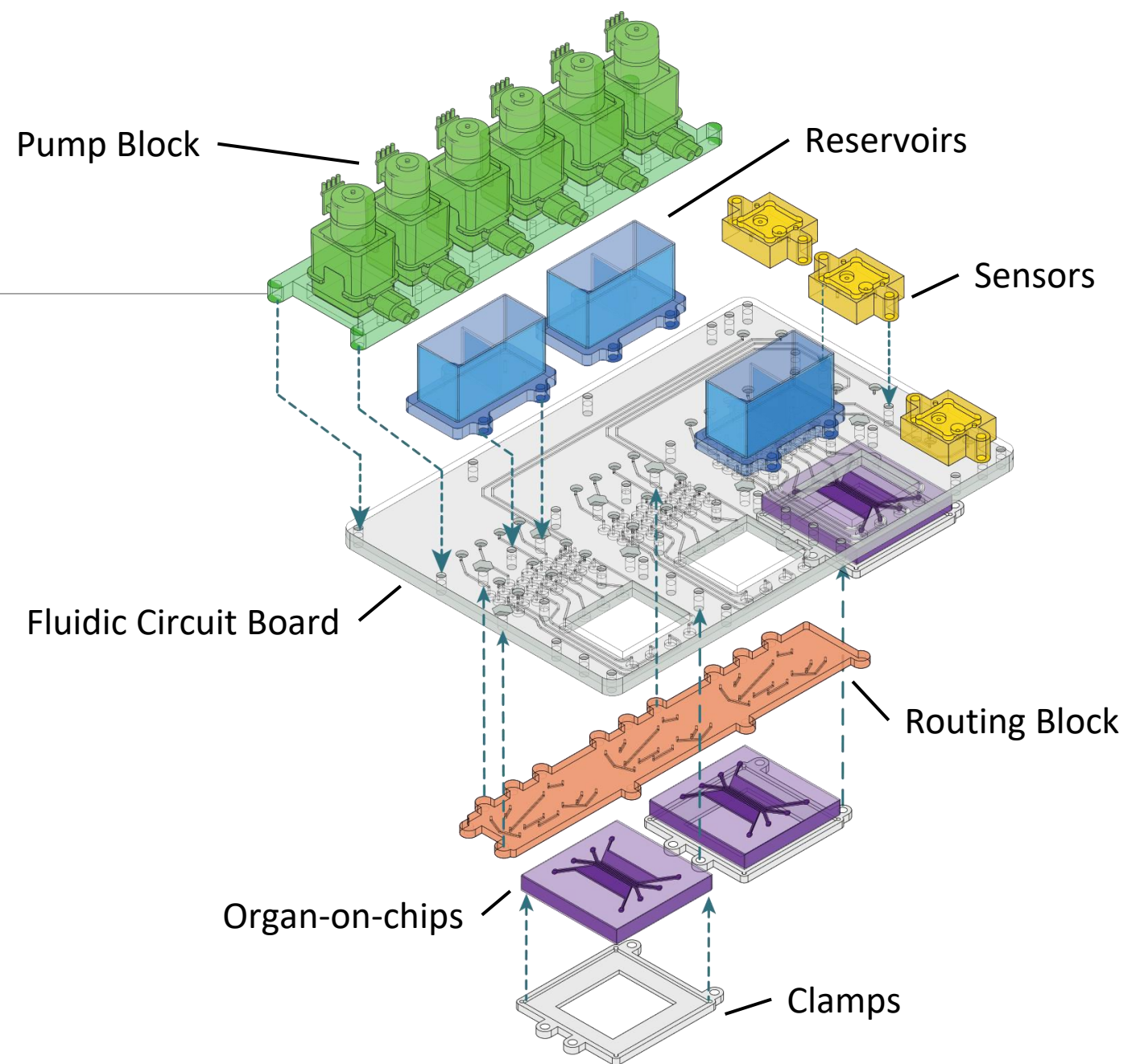
- Compatible with Single or Multi-Organ workflows
 - Hot-Swappable OoC's
 - Bring your own chip! (PDMS, Plastic, Glass)
- In-Incubator Perfusion
 - Simple Interface to the Outside world
- Microscope Compatible
- Sensor Integration
- Easy to Sample Supernatant



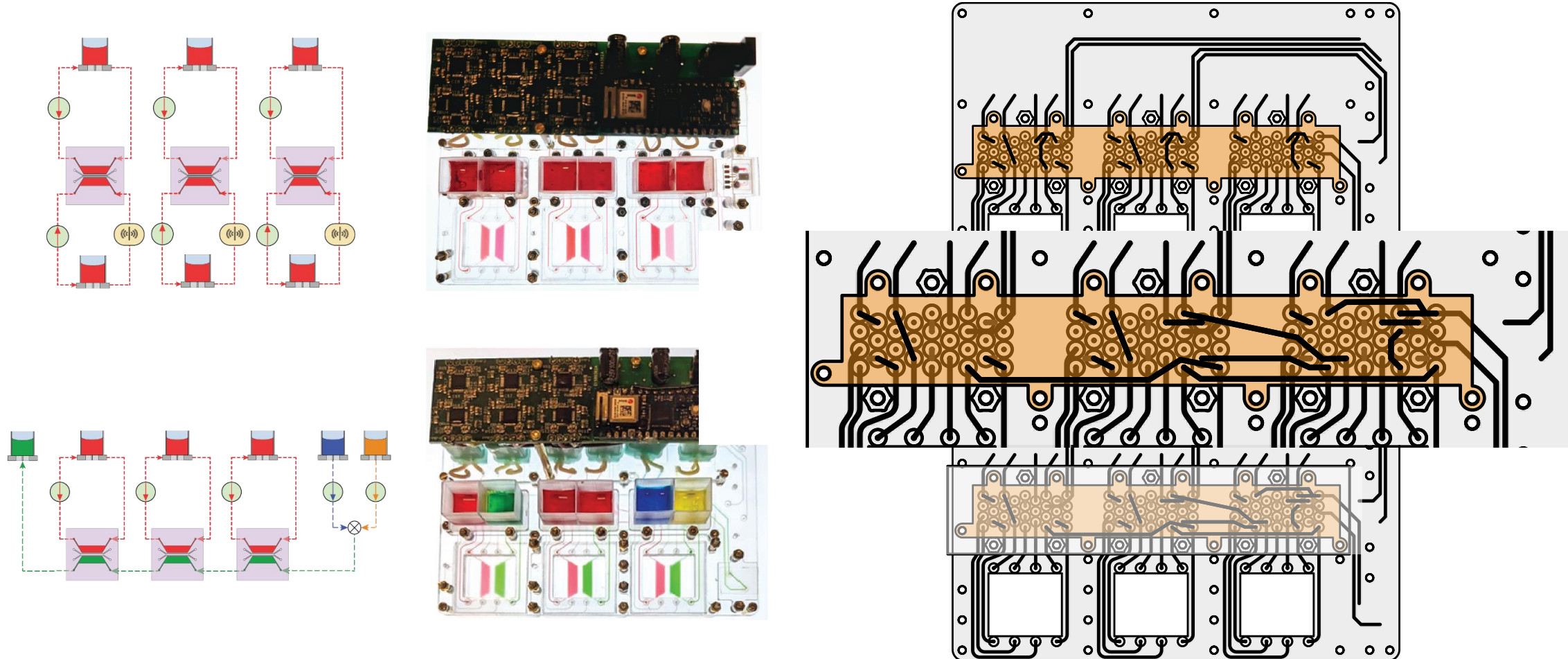
TOP-STARTER

Microfluidic Building Blocks (MFBBs)

- Pumping Block
 - 6 peristaltic pumps
- Reservoir Blocks
 - 3D-printed
 - Commercial reagent tanks
- Routing Block
 - Determines experimental design
- Sensor Blocks
 - In-line sensing
- Organs-on-chips
 - Bring your own!
 - TDR compliant



Flexible Architecture



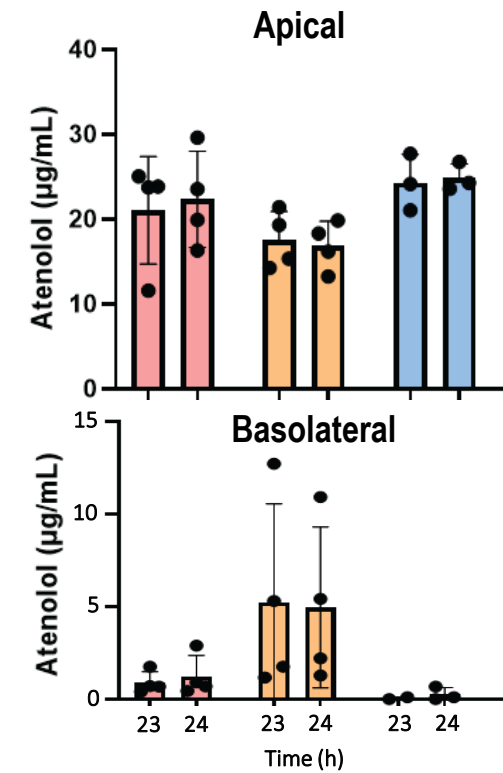
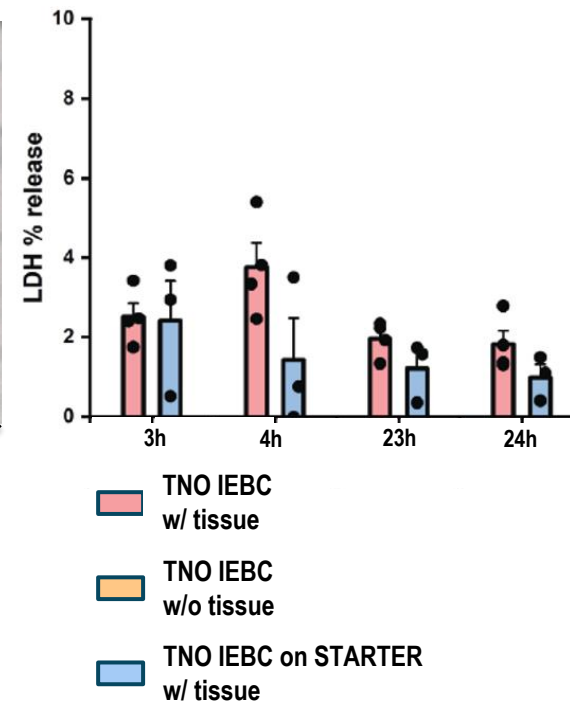
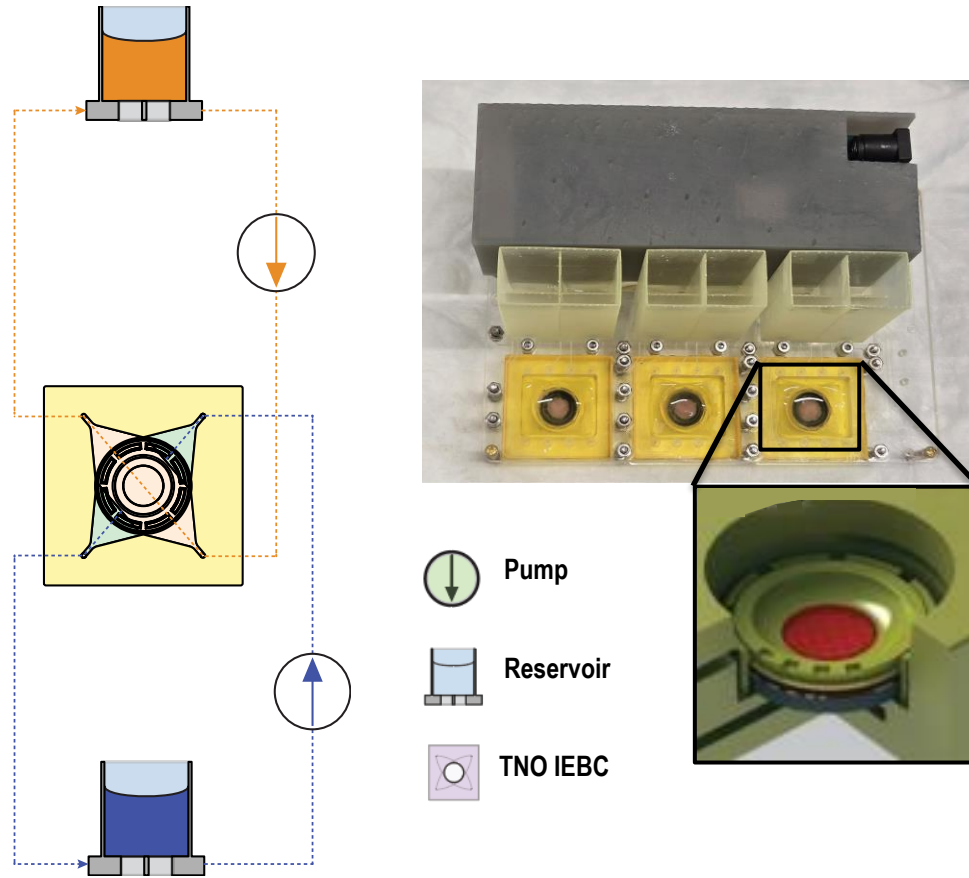
Ex vivo: intestinal explant barrier chips



Eric Safai



Aniruddha Paul



Showcases with STARTER



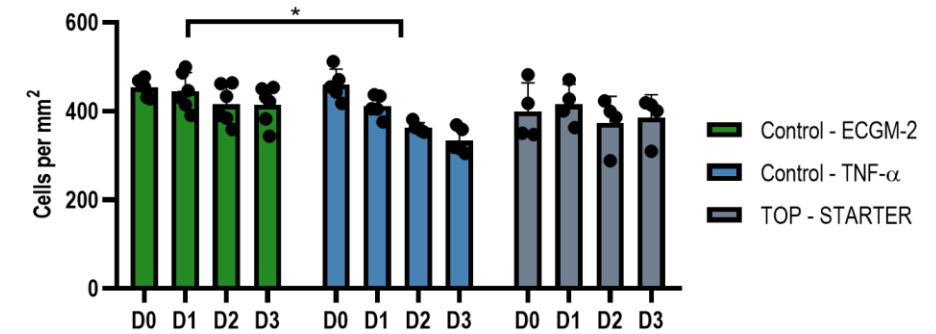
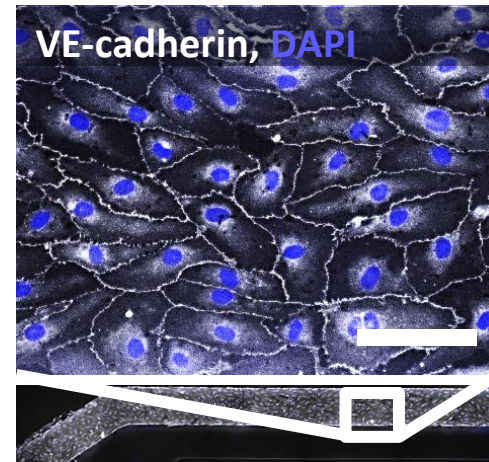
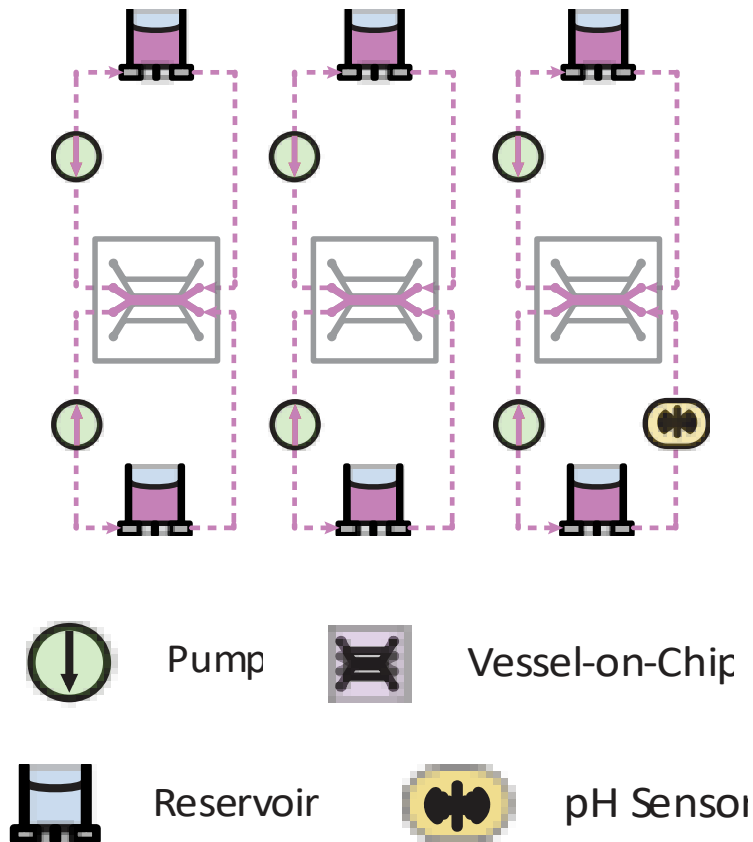
Laura de Heus



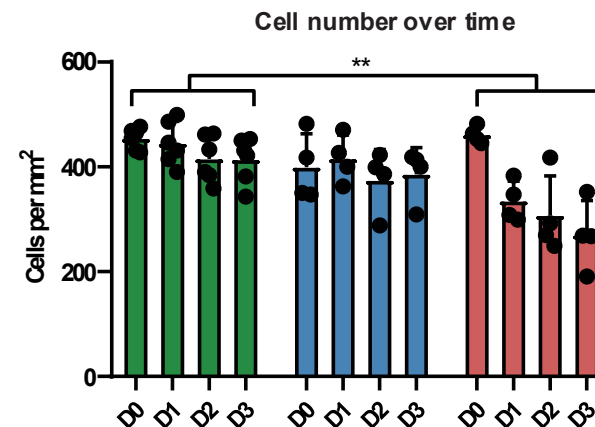
Eric Safai



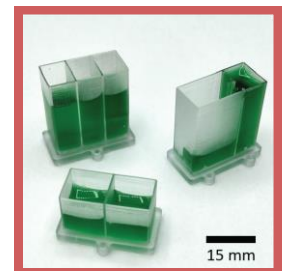
Aniruddha Paul



Scale bars
100µm



Commercial
Reservoirs



3D-printed
Reservoirs

Affiliated MPS/EUROoCS '25 Content

POSTER PRESENTATIONS

Dr.ir. Sandro Meucci – Poster 385

- "Microfluidic Development Kits: Standardized open-platform technology for the upscaling of modular MPS"

Sabine de Winter – Poster 143

- "Towards real-time multiparameter monitoring of fibrotic tissue dynamics in an organ-on-chip model"

Eric Safai – Poster 383

- "Intestinal explant barrier chips integrated on the Translational Organ-on-chip Platform (TOP)"

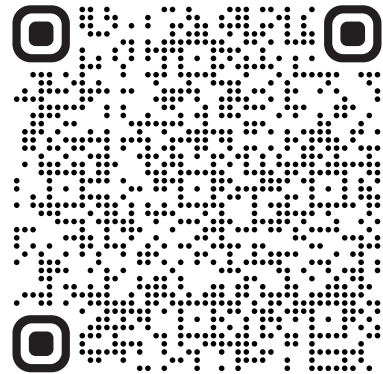
ORAL PRESENTATIONS

Prof. dr. Andries van der Meer – Session 4.1

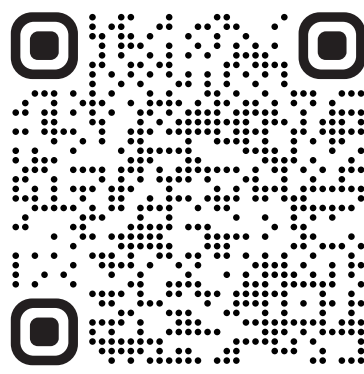
- "The roadmap of the translational organ-on-chip platform: towards advanced physiology, throughput and autonomy"

Find us Online!

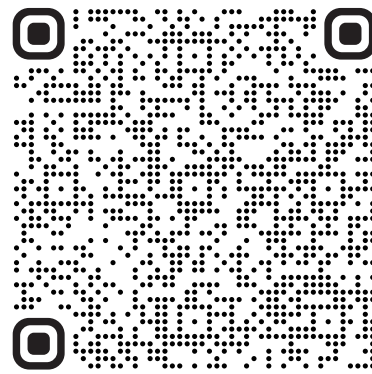
**TOP Design
Rules**



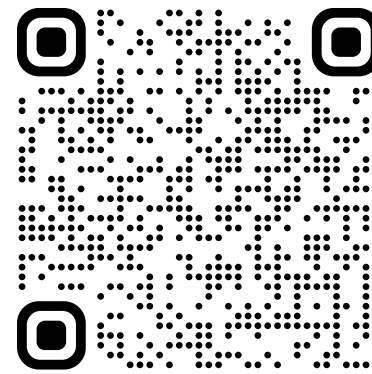
**ISO
22916:2022**



**Organ-on-Chip
Centre Twente**



**TOP-OoC
GitHub**



**STARTER
Kit Publication**



Want to include your work? Let's discuss!