High throughput Organs-on-a-Plate assay for research and drug screening

Introduction

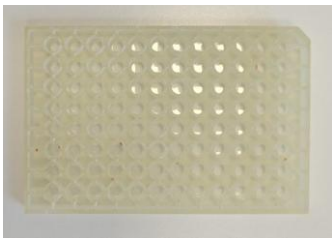
The pharmaceutical industry spends **nearly $300 billion annually** on drug R&D, yet **>90% of drug candidates fail** in clinical trials—and failures frequently trace back to the **first step**: traditional **static culture in multi-well plates** cannot replicate the **dynamic physiological microenvironment**. **Organ-on-a-chip** platforms better emulate ***in vivo* conditions**, but most remain **complex and costly—impractical to scale** for robotic **High Throughput Screening (HTS)** or **High Content Screening (HCS)** drug development platforms.

Solution

We have developed a **minimalistic "Organs-on-a-plate" platform** that embeds **programmable mechanical stimulation** in standard **96- and 384-well plates**, compatible with **automated liquid handling, robotic workflows, and HTS** across **cardiac, pulmonary, musculoskeletal, skin, and tumor microenvironments**.

ORGANS-ON-A-PLATE HTS AND HCS ASSAY

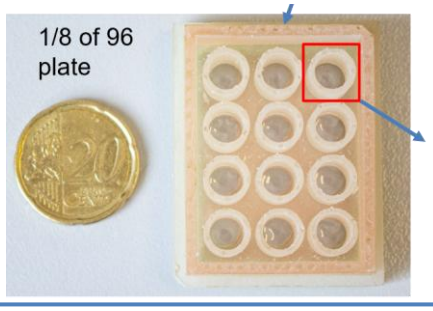
Our **innovative membrane- and vacuum-driven design** creates a **flat stretching substrate** without additional components, enabling **high-resolution imaging** during dynamic mechanical stimulation.



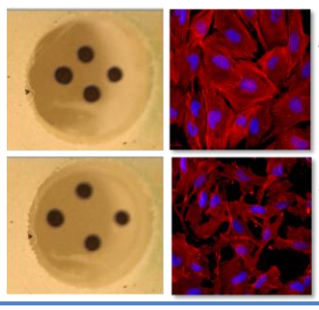
96 well Organs-on-a-plate

Assay Highlights:

- ✓ Dynamic control of mechanical stimulus to **mimic physiological microenvironment**
- ✓ Applicable to both **2D cell culture and 3D models** such as organoids and spheroids
- ✓ **Uniaxial and bi-axial stretch modes** with flexible, **high-precision amplitude control**
- ✓ Integration of additional components such as **air-liquid interface for lung-chip**
- ✓ Low cost and effortless integration into **standard 24-, 96-, or 384-well plates**



Fibroblasts before and after cyclic stretching



Application

This high-throughput, high-content assay embeds **mechanobiology** directly into standard screening formats, offering a practical strategy for incorporating dynamic mechanical cues into early-stage drug discovery. It is particularly relevant for **oncology and fibrosis**, while broadly applicable to **cardiovascular, musculoskeletal, and neurodegenerative disease models**. By improving physiological relevance without sacrificing throughput, it opens the door to more predictive screening across a wide range of disease areas.

Opportunity

To fully realize this technology's potential in research and drug screening, we are seeking **commercial partners** to bring it to the **emerging market**, and we remain **open to scientific collaborations** that expand its applications across disease models. We believe this platform can help drive a new era of predictive, mechanobiology-informed drug discovery.

References and Acknowledgement

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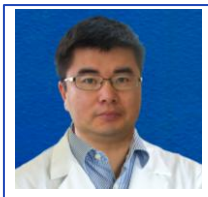

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