Microbiology Cell Biology Biotechnology Process Control

I&L Biosystems

Protein Fluidics
Pu•MA System 3D

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The Pu•MA System 3D streamlines your workflow to automate assays with minimal user handling. The open platform allows you to program complex protocols and increases the reproducibility of your results. The system is touchscreen driven with an intuitive interface. The Pu•MA System and flowchips use valveless fluidic switching (VLFS) to precisely control fluid movement in the flowchip. The system can fit inside any standard cell culture incubator and maintains the 3D cell models under physiological conditions while the assay steps are in progress, which reduces stress and damage to the cells.

Small in size
- Fits in incubator and cold room

One touch easy-to-use organoid assay system
- Maintain physiological conditions
- Control flow & stress environment

Accommodate different organoid types
- Free-forming, semi-solid support (Matrigel grown)
- Size ranging from up to 1 mm

Automated assay steps
- Media/compound exchange, sampling, staining
- Avoid damage or loss of organoids

Disposable flowchips
- No cross contamination

Flowchip

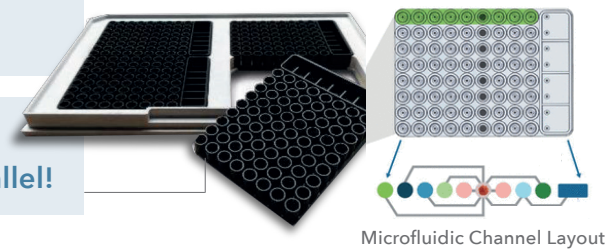
The flowchip has sample chambers connected to multiple reservoirs to enable media and buffer exchange, supernatant sampling, and in situ lysing. A key aspect to the flowchip is a protective chamber that holds 3D cell models and allows reagent exchanges without disrupting the structures.

4 flowchips per run

384 well plate format

Pro sample up to 7 different solutions addable

8 samples per chip
= 32 samples in parallel!

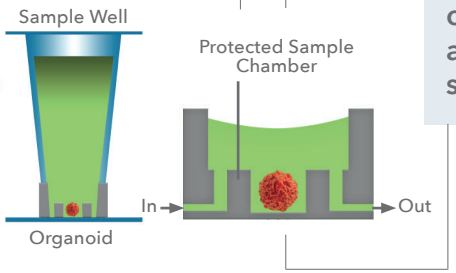


Small volume 10 - 20 µl

Reduced disturbing or disrupting during Reagent exchange

Easy positioning

Thin clear bottom is compatible with imaging and standard plate reader systems



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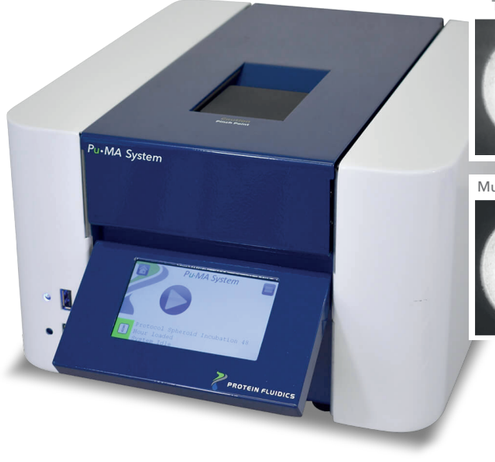
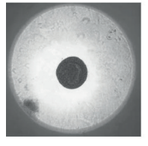


Automated assay workflow

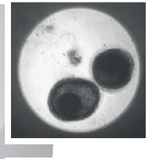
Transfer organoids to the flowchips, add media and reagents, place the flowchips plate into the system, select the assay protocol and press play. Preloaded protocols allow easy handling of the device and execute all fluid transfers and incubation step. It is compatible with multi-modal down stream analysis.

Sample positioning

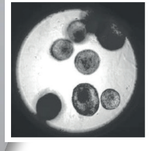
Single Organoid



Two Organoids

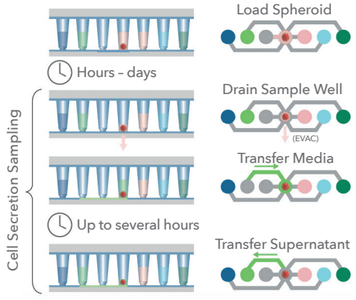


Multiple Organoids



- Transfer direct into protected chamber possible
- Positioning with or without matrigel
- Single or multiple organoid transfer
- Positioning with magnetic coating
- Visual inspection of sample

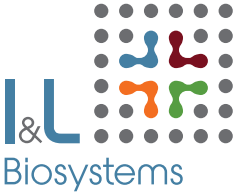
Automated protocols



- Versatile protocol design
- Automated medium collection and reagent exchange
- 3D model remain in protected chamber
- Reagent exchange up to 95% without drying cells
- No direct fluid flow over cells
- Reduction of pipetting steps

Example for applications

	Precise organoid location	High sensitivity for secreted analytes	>95% fluid transfer reproducibility	Single Organoid profiling capability	Reduced reagent volume	More data points from Single organoids
Organoid cultivation	●			●		●
Co culture	●	●	●	●	●	●
Functional assay		●	●	●	●	●
Metabolomic analysis		●	●	●		●
Drug/Toxicity testing			●	●	●	●
Immuno-flourescence	●				●	
Antibody staining	●			●	●	●



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