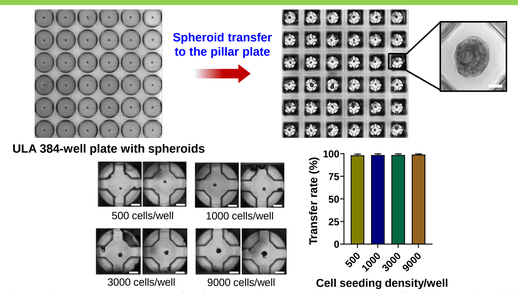
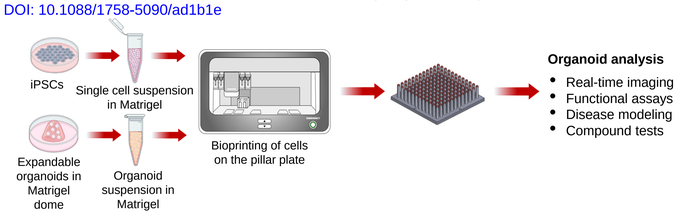
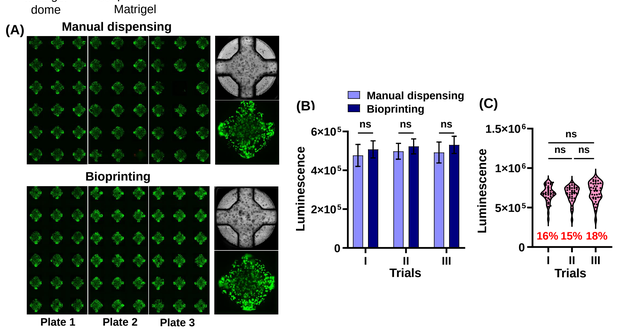
Bioprinting® Laboratories

Fast and simple cell/spheroid loading on the pillar plate

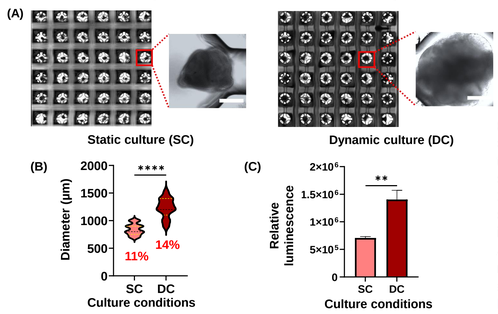


Robust spheroid transfer from the ultralow attachment (ULA) 384-well plate to the 36PillarPlate.
DOI: 10.1088/1758-5090/ad1b1e



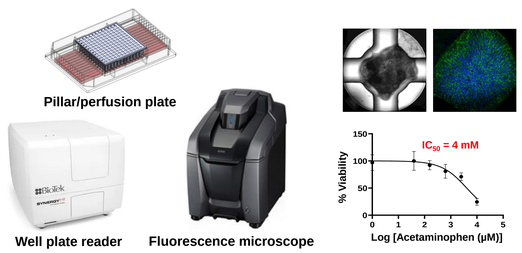


(A) Viability of iPSCs in Matrigel after manual dispensing with a pipette and bioprinting with a 3D bioprinter measured with calcein AM and ethidium homodimer-1 staining. **(B)** Comparison of cell viability between bioprinted and manually dispensed iPSCs in Matrigel on the pillar plate by an ATP-based luminescence assay. The data were shown as mean ± SEM. n = 36 per trial. **(C)** Viability of bioprinted foregut cells in Matrigel on the pillar plate by the ATP-based luminescence assay. n = 36 per trial. DOI: 10.1039/D4LC00149D



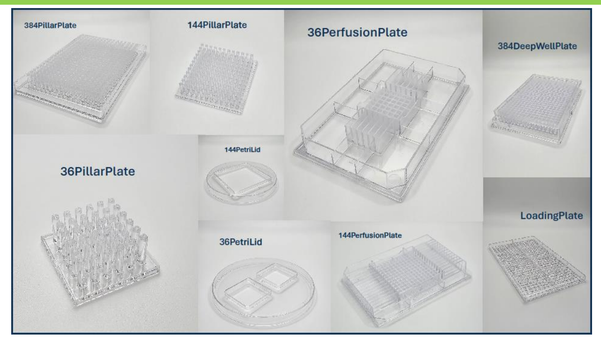
(A) Representative images of day 31 cerebral organoids cultured in a static condition using the 36PillarPlate/384DeepWellPlate and a dynamic condition using the 36PillarPlate/36PerfusionPlate. Scale bars: 350 μm. **(B)** The diameter of day 31 cerebral organoids cultured in static (SC) and dynamic (DC) conditions. **(C)** ATP levels in day 31 cerebral organoids measured with CellTiter-Glo 3D cell viability assay kit.
DOI: doi.org/10.1101/2024.03.11.584506

Compatible with common lab equipment



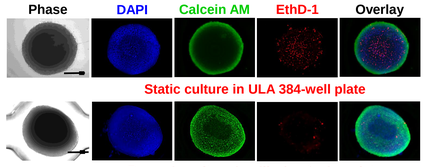
The pillar and perfusion plates built on the footprint of traditional 384-well plates are compatible with common lab equipment such as microtiter well plate readers and fluorescence microscopes. Thus, there is no need to purchase additional equipment to operate the pillar/perfusion plates.
DOI: doi.org/10.1002/adhm.202302502

Unique Features of Our Products

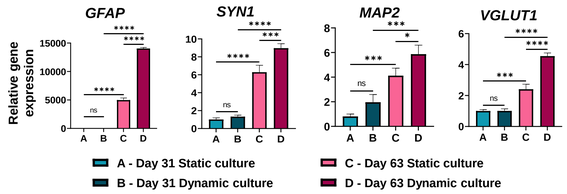


- **Extremely fast and simple cell/spheroid loading by microarray 3D bioprinting and manual stamping for organoid culture**
- **Reducing cell death and enhancing organoid maturity by rapid diffusion of nutrients and oxygen**
- ***In situ* organoid testing and imaging**
- **Scale-up organoid production with small medium volume**
- **User-friendly operation without using pumps and tubes**
- **Compatible with existing microscopes and well plate readers**

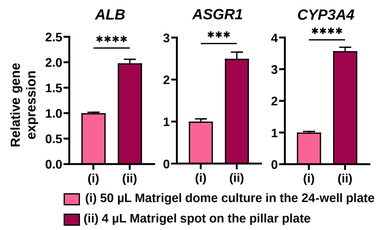
Reduced cell death and enhanced organoid maturity by rapid diffusion of nutrients and oxygen



Reduced cell death in the core of Hep3B cell spheroids (necrotic core) achieved by dynamic culture in the pillar/perfusion plate. Representative images of Hep3B cell spheroids cultured for 7 days in static and dynamic conditions and stained with calcein AM and ethidium homodimer-1 (EthD-1) to assess cell death in the core. Scale bars: 350 μm. DOI: doi.org/10.1021/acsbiomaterials.4c00179

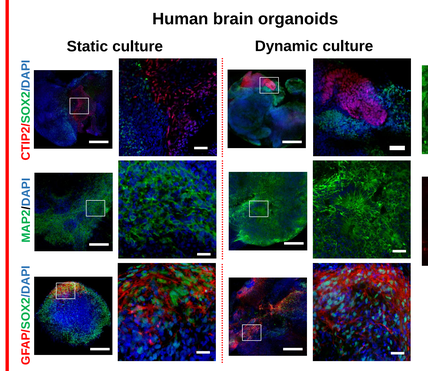


Enhanced maturity of human brain organoids achieved by dynamic culture in the pillar/perfusion plate demonstrated by the increased expression of *GFAP* astrocyte marker, *SYN1* synaptic marker, *MAP2* mature neuronal marker, and *VGLUT1* excitatory neuronal marker as compared to static culture in the pillar/deep well plate. DOI: doi.org/10.1101/2024.03.11.584506

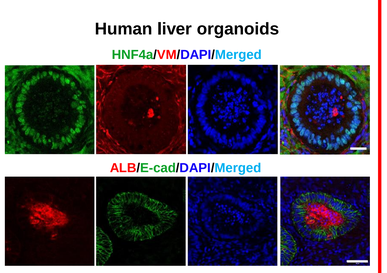


Enhanced maturity of human liver organoids achieved by static culture in the pillar/deep well plates demonstrated by the increased expression of *ALB* albumin marker, *ASGR1* hepatocytes marker , and *CYP3A4* cytochrome P450 3A4 marker as compared to static culture in the 24-well plate.
DOI: 10.1039/D4LC00149D

In situ organoid testing and imaging

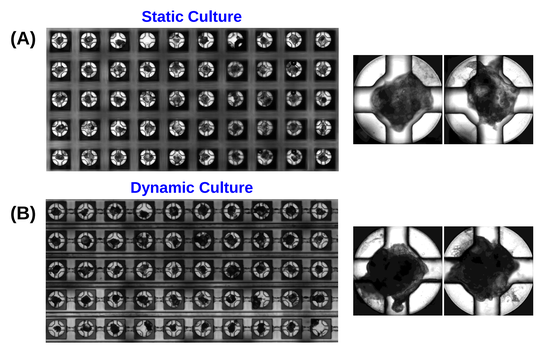


Immunofluorescence staining of cerebral organoids on the pillar plate cultured in static (left panel) and dynamic (right panel) conditions. Scale bars: 200 μm and 50 μm (magnified).
DOI: doi.org/10.1101/2024.03.11.584506

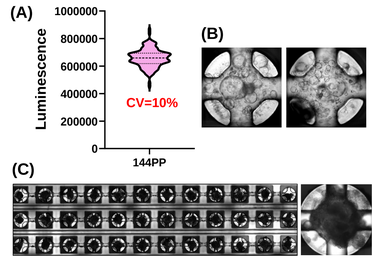


Immunofluorescence staining of day 25 HLOs generated on the pillar plate. Scale bars: 50 μm.
DOI: 10.1039/D4LC00149D

Scale-up organoid production with small medium volume

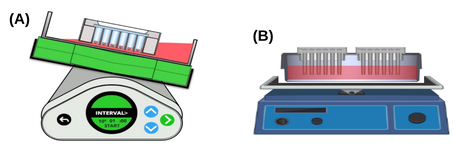


(A) Stitched (left) and representative (right) images of day 20 differentiated HLOs from expandable HLOs cultured in a static condition using the 144PillarPlate and the 384DeepWellPlate. **(B)** Stitched (left) and representative (right) images of day 20 Diff-HLOs cultured in a dynamic condition using the 144PillarPlate and the 144PerfusionPlate. DOI: doi.org/10.1101/2024.03.25.586638



(A) Uniform printing of dissociated liver organoids on the 144PillarPlate measured by using ATP-based cell viability assay kit. **(B)** Representative images of expandable liver organoids cultured on the 144PillarPlate. **(C)** Stitched (left) and representative (right) images of mature liver organoids in the 144PillarPlate/144PerfusionPlate for 20 days. DOI: doi.org/10.1101/2024.03.25.586638

User-friendly operation without using pumps and tubes



(A) Dynamic organoid culture in the pillar/perfusion plate performed without using pumps and tubes. Bidirectional flow can be generated by changing the tilting angle of the digital rocker. **(B)** Dynamic organoid culture on the pillar plate coupled with a petri dish on an orbital shaker.