Transforming How Organoids are Grown and Isolated

The Next Generation of 3D Cell Culture

In standard culture methodologies, many organoids are grown in domes of extracellular matrix. These cultures require multifocal imaging, have overlapping structures, viability inconsistencies, and are phenotypically and morpholocically heterogenous. Single organoids from the bulk culture are also difficult to retrieve intact.

The CellRaft Technology with 3D capabilities offers a solution with a fully automated imaging, analysis, and isolation workflow for organoid culture.

- Grow and maintain hundreds of organoids
- Maintain a complete record of growth over multiple time points
- Perform on-array phenotypic assessment
- Fully automate isolation of individual viable, intact organoids of interest
- Generate customized 96-well plates for organoid-based assays such as clonal propagation, drug or toxicity screening, or target discovery

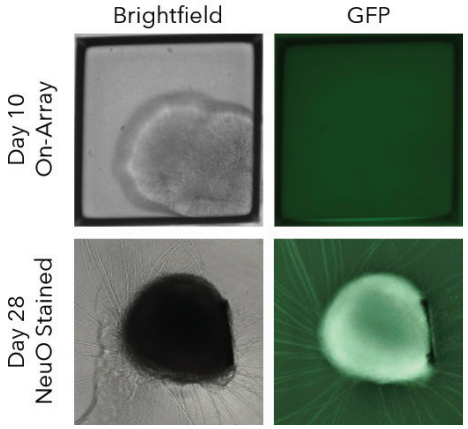


Figure 1. Cerebral Organoids with Live Neuronal Outgrowth. Organoids were grown on the CellRaft Array and then isolated on day 10.

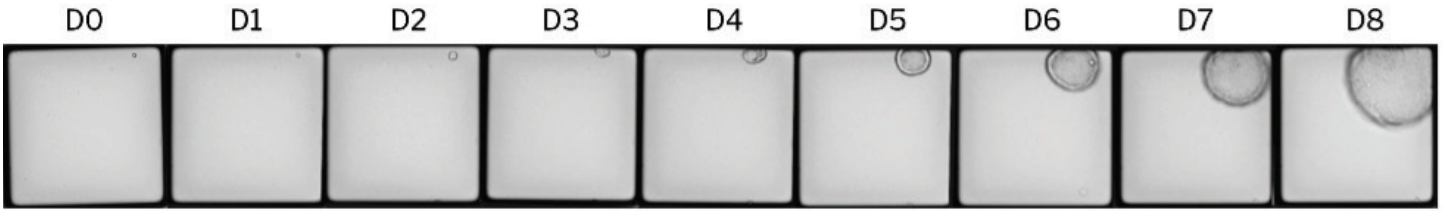
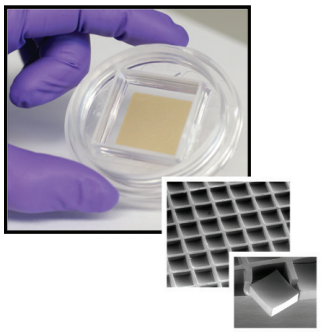


Figure 1. The 3D CellRaft Array and CellRaft AIR System enable temporal imaging and clonal verification of single cell-derived mouse hepatic organoids.



Grow Hundreds of Organoids

The 3D CellRaft Array has more than 2,000 microwells, each containing a releasable, retrievable CellRaft, for growing organoids up to 1mm in diameter. In the CellRaft Array, spatially segregated organoids are growing in a single focal plane and each organoid can be reliably imaged over time.

Capture Z-stack Images

Images in brightfield and fluorescence can be captured throughout the full height of the organoid with z-stack imaging (Figure 2). The images showing detailed phenotypic characterization are cataloged and easily exported for the desired use.

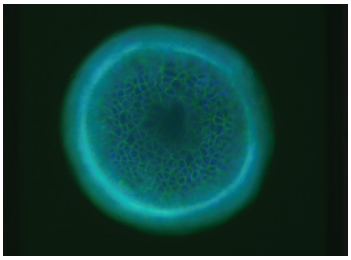
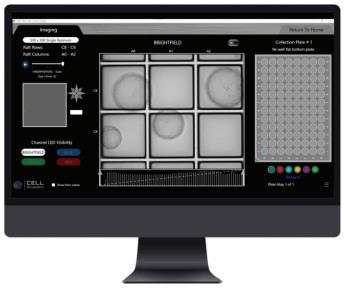


Figure 2. Mouse Hepatic organoid, live stained with a direct-conjugated antibody for EpCAM (green) and Hoescht (blue).



Software-guided Identification of Organoids of Interest for Reproducability

Verify single cell clonality, morphological data, and growth rate-critical data points for workflows requiring track and traceability to confirm clonality. Organoids can be further evaluated and selected for phenotypic characteristics, such as organoid diameter, circularity, and fluorescence intensity.

Automated Isolation for Organoid-based Assays

Perform automated release and transfer of intact, viable organoids without disassociation, or damage to the 3D structure. CellRafts, with attached organoids of interest are gently dislodged from the 3D CellRaft Array by a release needle and collected by a magnetic wand before being transferred to a collection plate, without the use of fluidics, for growth and downstream assessment (Figure 3).

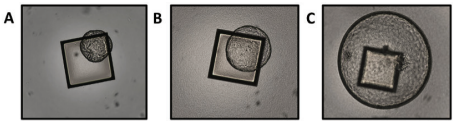


Figure 3. Mouse hepatic organoids isolated from the 3D CellRaft Array continue to grow in 96-well collection plates. Images were taken immediately post-isolation (A), 1 day after isolation (B), and 5 days after isolation (C) in dilute ECM.

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