

CELL
Microsystems®

AIR 3D™

THE NEXT GENERATION
OF 3D CELL CULTURE

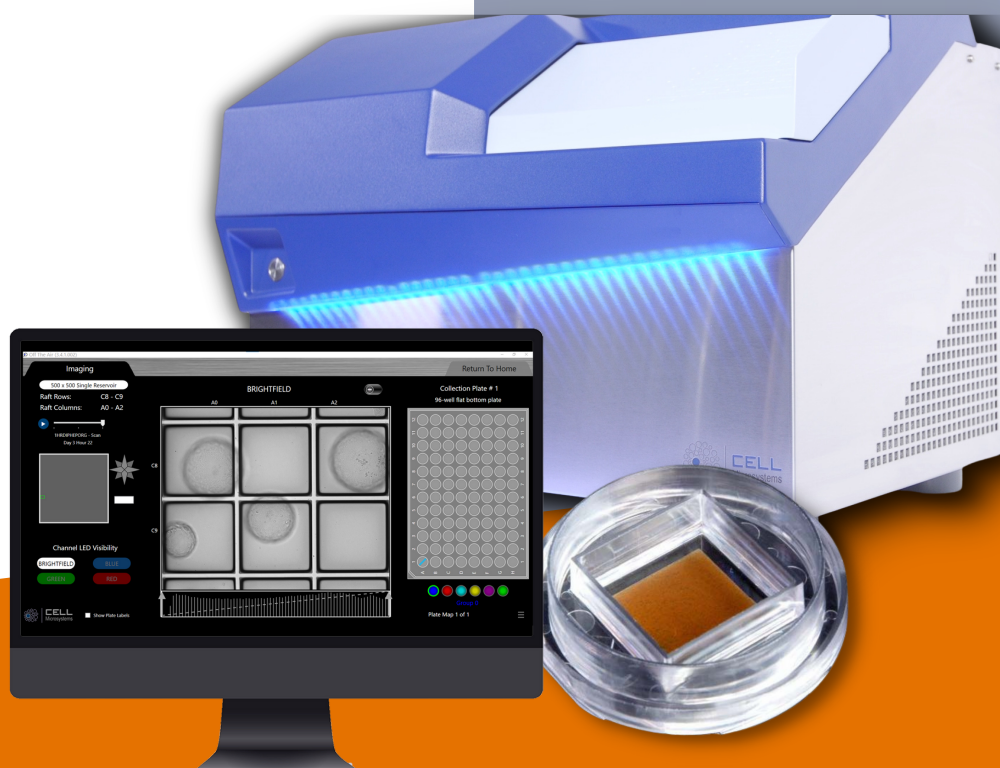


IMAGE • IDENTIFY • ISOLATE

IMAGE, IDENTIFY, AND ISOLATE ORGANOID

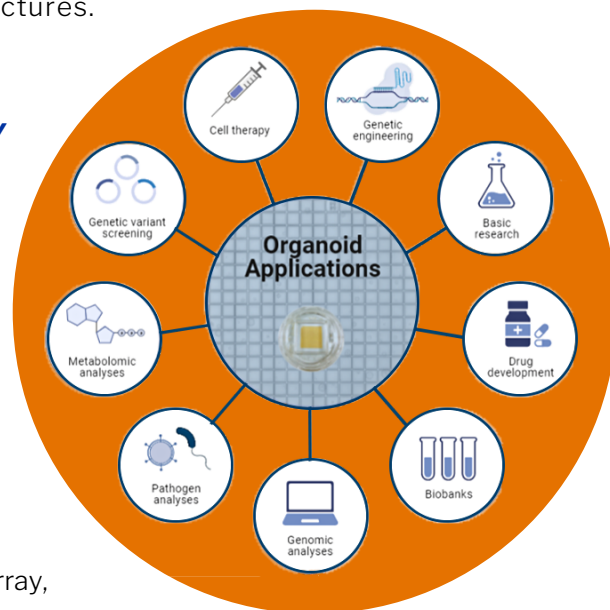
AIR 3D is a fully automated, all-in-one system that enables image-based identification and isolation of intact 3D structures.

RECOVERING INTACT ORGANOID OFF THE AIR SYSTEM UNLOCKS THE ABILITY TO USE 3D CELL CULTURE IN A UNIVERSE OF APPLICATIONS

On one instrument, users can grow and maintain individual organoids, serial image over time, perform on-array phenotypic assessment, and automatically isolate intact 3D structures at multiple time points.

AIR 3D is the latest expansion of the **CellRaft AIR® System** with Image-Guided Isolation. **3D CytoSort® Arrays** support organoid growth up to 1mm in diameter. With over 2,000 CellRafts® per array, users can reliably grow hundreds of organoids for downstream applications.

3D-Enabled Software automatically detects CellRafts containing organoids, and individual structures can be further evaluated and selected for phenotypic characteristics, such as organoid diameter, circularity, and fluorescence intensity.



THE NEXT DIMENSION OF ORGANOID CULTURE TECHNOLOGY

AIR 3D fills the instrumentation gap in organoid workflows.

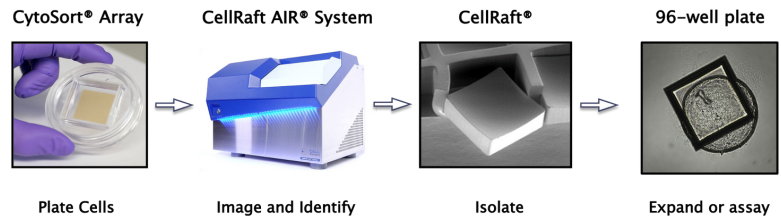
In typical organoid cultures, the structures overlap, requiring multifocal imaging with expensive equipment. They grow at different sizes and rates, leading to heterogeneity in viability and phenotype, resulting in confusing and uninterpretable data. Organoids grown in bulk culture are stuck in viscous extracellular matrix and difficult to retrieve intact. The AIR 3D overcomes these bottlenecks to enable a fully automated imaging and isolation workflow for organoid culture.

	Low attachment 96 well plates	Clone Pickers	High Content Imager	AIR 3D™
Brightfield Imaging	✗	✓	✓	✓
Fluorescent Imaging	✗	✓	✓	✓
Time course Imaging	✗	✗	✓	✓
Contiguous Media	✗	✓	✗	✓
Organoid Isolation	✗	✓	✗	✓
Isolation without aspiration	✗	✗	✗	✓
On-platform Cell-based Assays	✗	✗	✓	✓

AUTOMATING ISOLATION WITH AIR 3D

The workflow begins by seeding cells on the 3D CytoSort Array, which consists of thousands of microwells, each with an individually releasable CellRaft for cell culture growth.

Organoids are spatially segregated on the array and can be analyzed using brightfield and fluorescence microscopy, including live cell staining. Select organoids for further Z-stack imaging and phenotypic characterization. **Unique to our platform is the ability to perform automated isolation of live, intact organoids without fixation, dissociation, or damage to the 3D structure.**



BENEFITS OF AIR 3D

AUTOMATED RELEASE AND TRANSFER

CellRafts with organoids are **gently dislodged from the 3D CytoSort Array by a release needle and collected by a magnetic wand** before being transferred to a collection plate for growth or downstream assessment.

PHENOTYPIC CHARACTERIZATION

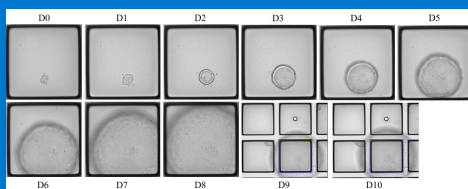
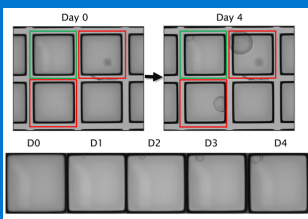
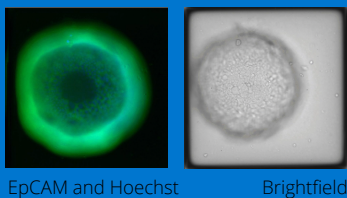
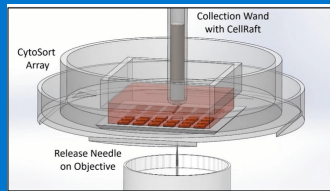
Capture high-resolution images in brightfield and fluorescence throughout the full height of the organoid with z-stack imaging. The **images showing detailed phenotypic characterization are cataloged and easily exported** for the desired use.

VISUALLY VERIFY CRITICAL DATA POINTS

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

STORE TIME-COURSE IMAGING CHRONOLOGICALLY

Time course imaging is a key feature of the AIR System. After cells are seeded on the CytoSort Array, the array is **serially scanned at the desired frequency and stored in a central database**.





CELL
Microsystems®

801 Capitola Drive
Suite 10
Durham, NC 27713
info@cellmicrosystems.com

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