# Automated Organoid Imaging and High-Throughput 3D Analysis

for FLUOVIEW Series Microscopes

EVIDENT

Automated Object Detection and Image Acquisition

From identifying target objects to capturing high-resolution 3D images, the workflow for imaging organoids can be time consuming, particularly when imaging multiple wells across a microplate or multichambered vessels. The Macro-to-Micro software module for FLUOVIEW™ systems is a smart solution that automates the organoid imaging workflow for nearly effortless results.

With dramatically increased imaging efficiency, the Macro-to-Micro module's automatic object detection function transforms formerly manual tasks into a single-step process. The system executes a seamless workflow to automatically capture "macro" images at magnifications as low as 1.25X, identify objects of interest, and then capture "micro" images at higher resolution. This automated process significantly reduces the time you spend on microscope operation, giving you more time to focus on other aspects of your research.
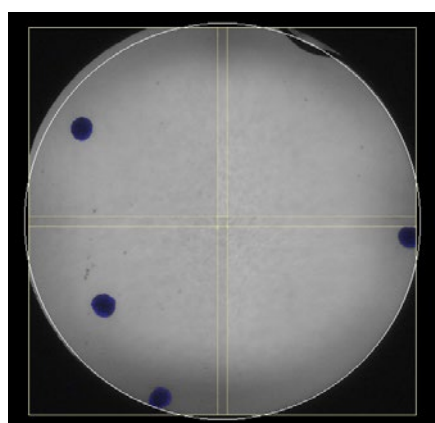
Low-magnification "macro" image
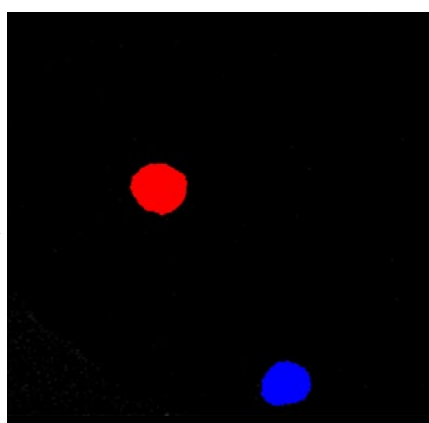
Automatic object detection/positioning
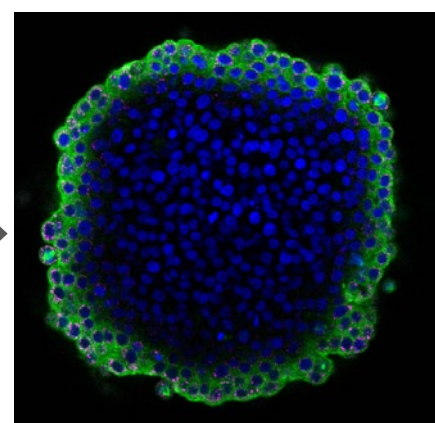
High-magnification "micro" image

High-Quality Images with X Line and A Line Objectives

Evident offers several objectives with features that help solve the challenges of various organoid imaging conditions and observation requirements.

For organoids on a glass- or film-bottomed microplate, we recommend the UPLXAPO20X objective from the award-winning X Line™ series. It features a high NA of 0.8, a 600 μm working distance, and air immersion, which makes it easy to image across a microplate.

To image deep inside sections of thick spheriods and organoids, optical clearing techniques help reduce light scattering. Evident offers a variety of application-specific A Line™ objective lenses for optimal refractive index (RI) matching to acquire clearer, aberration-free images. We recommend the UPLSAPO30XS 30X silicone oil immersion objective, which enables you to see fine details up to 800 μm deep into your sample. Offering an impressive working distance range of 800 μm to 1800 μm, our UCPLFLN20XPH objective also enables imaging through plastic-bottomed vessels.


|	UPLXAPO20X	UCPLFLN20XPH	UPLSAPO30XS
Numerical Aperture (NA)	0.8	0.7	1.05
Working Distance (WD)	600 μm	800 μm–1800 μm	800 μm
Immersion Medium	Air/Dry	Air/Dry	Silicone Oil

High-Throughput 3D Image Analysis

Image analysis is a key element in the organoid-based research workflow, and the right image analysis software can deliver the tools you need for efficient recognition and quantitative and statistical analysis of your 3D models.

NoviSight™ 3D cell analysis software is optimized to detect and analyze 3D models on microplates. NoviSight software can load images as plate data from any of the FLUOVIEW family of systems to enable you to quantify cell activity in three dimensions and more easily capture rare cell events, obtain accurate cell counts, and improve detection sensitivity. Once target objects are detected in 3D, the software comes with a variety of ready-to-use 3D cell assays to classify the detected objects based on extracted information such as object counts, intensity, morphology, and spatial position (XYZ). Maximizing the software's image-based analysis, you can examine the data using different dimensional views, including statistical information (1D), XY image (2D), and voxel (3D). Automate sequential processes for multiple data sets and assays to evaluate the experimental results in a high-throughput, quantitative manner.
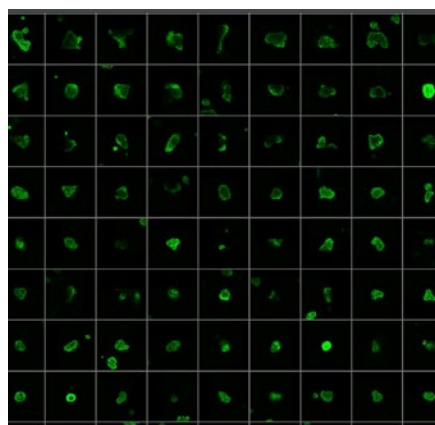

Object gallery
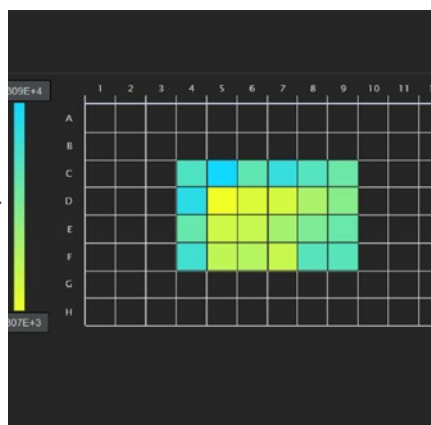
Heat map
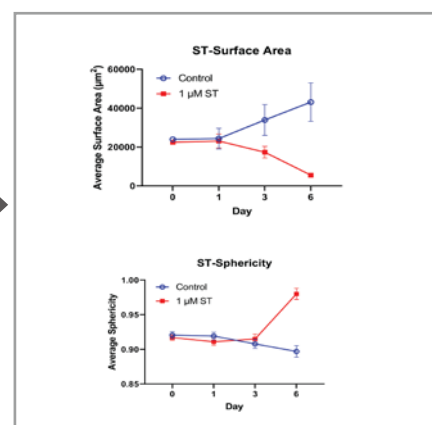
Statistical results

"Automatic organoid imaging enables researchers to perform targeted imaging, which allows for fast detection and sequential high-magnification imaging of 3D objects.

This ultimately contributes to the efficiency of our imaging workflow to examine phenotypic changes of patient-derived organoids in response to drug perturbations.

NoviSight software provides seamless and interactive 3D organoid image analysis by measuring multiple parameters with high reproducibility, which is key for high-content imaging and high-throughput drug screening."

Seungil Kim, PhD, Microscopy Team Manager
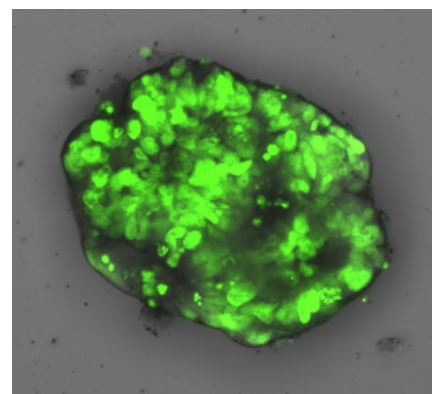Lawrence J. Ellison Institute for Transformative Medicine of University of Southern California
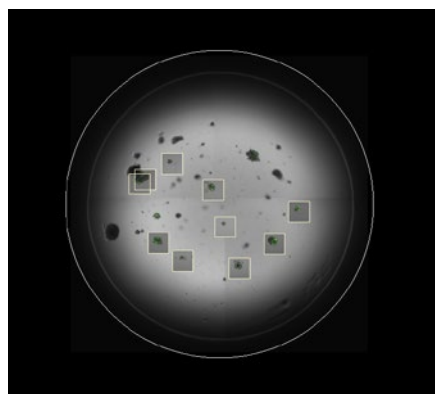
Map at 4X
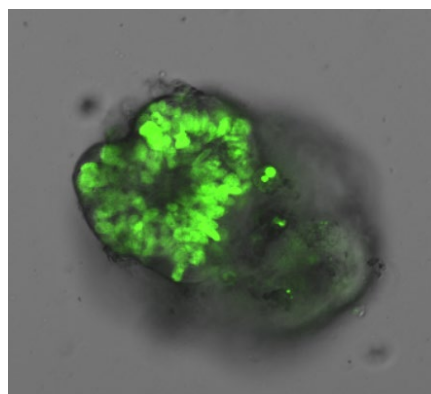
Single slice at 20X

Maximum intensity projection at 20X

Recommended Systems*
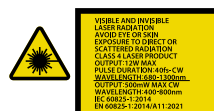

FV4000
Confocal Laser Scanning Microscope

- Game-changing dynamic range for imaging from the macro scale to subcellular structures

- Multiplex up to six channels simultaneously with TruSpectral technology

- Redesigned high-speed, high-resolution scanners for fixed and live cell imaging

- Improved depth and photosensitivity with pioneering NIR capabilities and renowned optics

- Peace of mind with the reliable, repeatable SilVIR detector

- Industry leading* ten laser lines with a broader spectral range from 405 nm to 785 nm

*As of October 2023.

WARNING - VISIBLE AND INVISIBLE LASER RADIATION AVOID EXPOSURE TO BEAM CLASS 3B LASER PRODUCT

500mW MAX CW 400-800nm
IEC 60825-1:2014
EN 60825-1:2014/A11:2021

FV4000MPE
Multiphoton Laser Scanning Microscope

- Acquire accurate, quantitative image data from the macro scale to subcellular structures

- Obtain more information from a single multicolor image

- Monitor neuron and other essential dynamics with high-speed imaging

VISIBLE AND INVISIBLE LASER RADIATION
AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION
CLASS 4 LASER PRODUCT
OUTPUT:12W MAX
PULSE DURATION:40fs CW
WAVELENGTH:680~1300nm
OUTPUT:500mW MAX CW
WAVELENGTH:400~800nm
IEC 60825-1:2014
EN 60825-1:2014/A11:2021

*Software upgrades may be required.

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