

**NEVER MISS A MOMENT
WITH LIVE-CELL IMAGING**



MuviCyte™ Live-Cell Imaging System

[Introduction](#)

[Applications](#)

[Features](#)

[Specifications](#)

[OneSource Services](#)

[Portfolio](#)

To Keep Your Research Alive and Well . . .

Pharmaceutical, biotech, and disease research labs today are focused on the study of cellular functions, behaviors, and pathways to gain a deeper understanding of disease mechanisms and responses to treatments. And live-cell imaging is key to getting the most information from precious cell samples.

Unlike traditional fixed-endpoint cell assays, which give you a point-in-time snapshot of cellular responses, live-cell imaging provides a fuller picture of the effects of perturbations. But to wrest the most physiologically relevant data from your cells, they must be kept viable over time.

That's where our MuviCyte™ live-cell imaging system comes in.

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MuviCyte Live-Cell Imaging System

[Learn More ►](#)

[Introduction](#)

[Applications](#)

[Features](#)

[Specifications](#)

[Support](#)

[Portfolio](#)

... Bring Imaging to Your Incubator

The MuviCyte system is designed to operate inside your incubator, so you can maintain your cells under optimal conditions and keep them healthy for weeks at a time. Because it's controlled by an external PC, you can observe your cells remotely, helping to keep the chamber at optimum levels of temperature, CO₂, and humidity. The automated operation allows you to focus on your science while the instrument runs unattended.

With three-color fluorescence imaging, z-stacking, and stitching capabilities, you can perform a wide range of assays in a variety of culture vessels, including chamber slides, Petri dishes, flasks, and microplates. And with automated imaging taking place over days or even weeks, you can do assays at much higher throughput than with a traditional microscope.

Put that together with flexible moviemaking software, allowing you to interpret and share results with colleagues, and you've got a great way to gain more realistic and meaningful insights into cell behavior, function, and responses to therapies.



[Learn More ►](#)

[Introduction](#)

[Applications](#)

[Features](#)

[Specifications](#)

[Support](#)

[Portfolio](#)

Your Live-Cell Assays, Your Way

It's all about application flexibility: our four-channel imaging (blue, green, and red fluorescence plus brightfield), together with a range of magnifications, automated imaging, image quantification software, and much more, all come together to deliver great application flexibility. And the system is compatible with all microplates up to 384 wells, plus cell-culture dishes, microslides, and flasks.

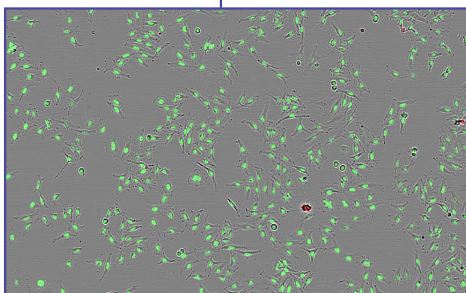
The system has an open design that provides flexibility to use the culture vessels of your choice, such as microfluidics platforms.

TYPICAL APPLICATIONS

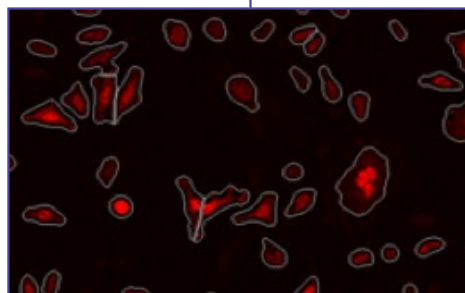
Proliferation	Reporter gene
Apoptosis	Chemotaxis
Fluorescent cell counting	Neurite growth
Cell morphology	Stem cell monitoring

KEY APPLICATIONS

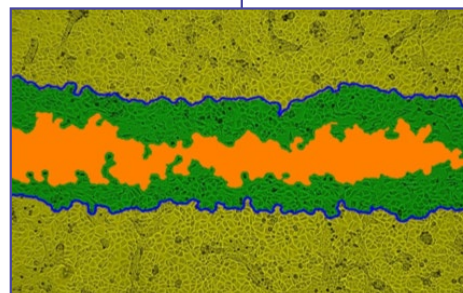
Click each image to learn more.



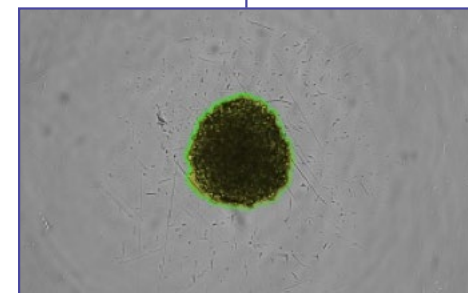
Cell Health and Viability



Transfection Efficiency



Scratch Wound Assay



Spheroid Analysis

[Learn More ►](#)

[Introduction](#)

[Applications](#)

[Features](#)

[Specifications](#)

[Support](#)

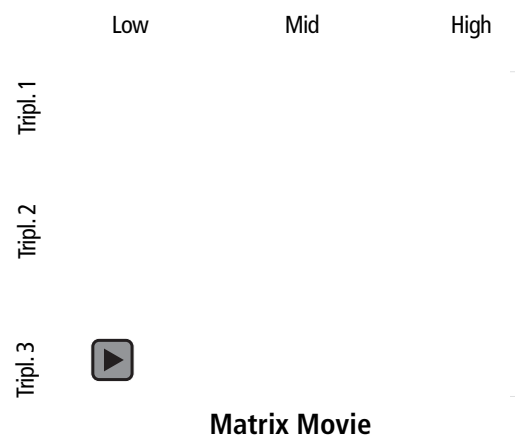
[Portfolio](#)

KEY APPLICATION:

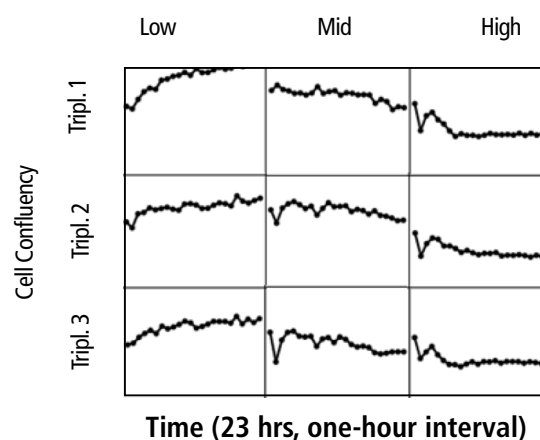
Cell Health and Viability

Measurements of cell health and viability are essential tools in analyzing the safety and efficacy of drugs or other cell perturbations. With the MuviCyte live-cell imaging system, you can perform real-time proliferation, apoptosis, and cytotoxicity assays to characterize the kinetics of compound effects on cell health and viability.

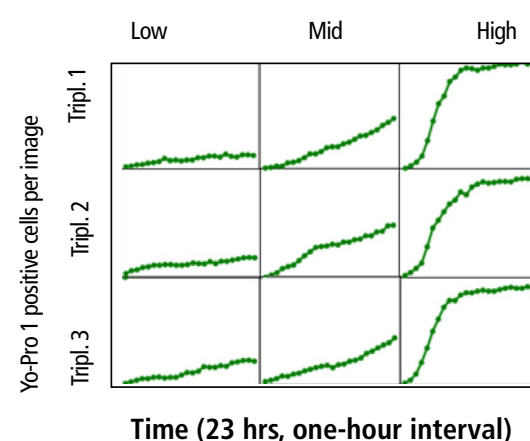
A.



B.



C.



Kinetic cytotoxicity assay: A) Time-lapse matrix movie of MCF7 cells treated in triplicate with low, medium, and high concentrations of camptothecin, generated on the MuviCyte live-cell imaging system using a 10x objective. MCF7 cells were seeded into a PerkinElmer 96-well ViewPlate™ microplate and dead cells stained with Yo-Pro1 (green). Images were acquired every hour for a total time of 23 hours. B) Quantification of the cell confluency based on brightfield images. C) Quantification of dead cells based on Yo-Pro1 staining.

[Learn More ►](#)

[Introduction](#)

[Applications](#)

[Features](#)

[Specifications](#)

[Support](#)

[Portfolio](#)

KEY APPLICATION:

Transfection Efficiency

Transfection and transduction efficiency are frequently measured to optimize the delivery of DNA into cultured cells without affecting cell viability. With the MuviCyte live-cell imaging system, you can easily perform and analyze transfection efficiency as well as reporter gene expression over time inside the cell culture incubator.

A. Low Mid High

Tripl. 1

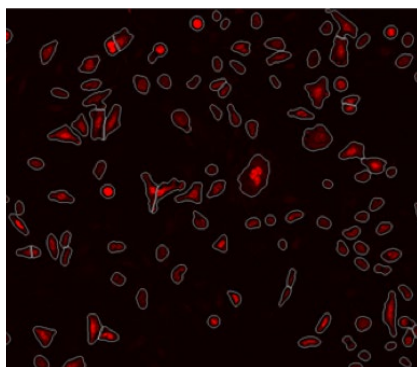
Tripl. 2

Tripl. 3



Matrix Movie

B.



Cell Detection

C.

Low

Mid

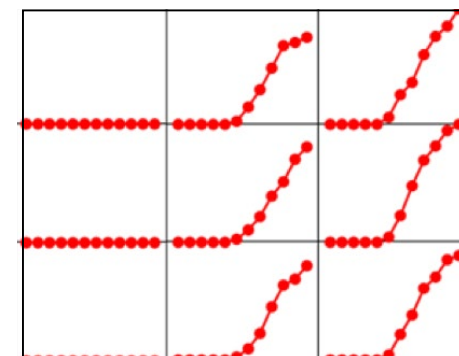
High

RFP pos. cells (n/image)

Tripl. 1

Tripl. 2

Tripl. 3



Time (22 hrs, two-hour interval)

Transfection/transduction efficiency analysis: A) Time-lapse matrix movie of HeLa cells transduced with BacMam Nuc RFP in triplicate, generated on the MuviCyte live-cell imaging system. HeLa cells were seeded into a PerkinElmer 96-well ViewPlate microplate and transduced with low, medium, or high doses of BacMam RFP. Images were acquired every two hours for a total time of 22 hours using a 4x objective. RFP expression (red) is detected in the cells at medium and high doses. B) Cell segmentation to detect RFP-positive fluorescent cells. C) Quantification of the number of RFP-positive cells over time.

[Learn More](#) ►

Introduction

Applications

Features

Specifications

Support

Portfolio

KEY APPLICATION:

Scratch Wound Assay

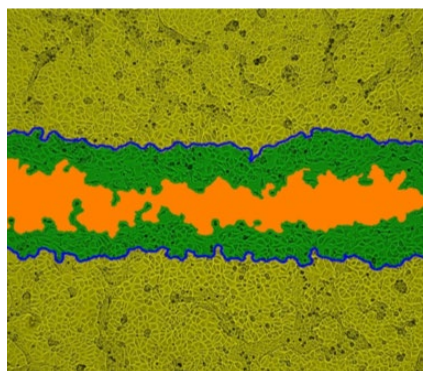
Cell migration is a central process in the development and maintenance of multicellular organisms and plays an important role in the progression of various diseases, including cancer. Scratch wound assays are a simple and reproducible method of quantifying cell migration and identifying drugs affecting the wound closure. With the MuviCyte live-cell imaging system, it's easy to perform and analyze kinetic scratch wound assays and monitor parameters of wound closure over time.

A.



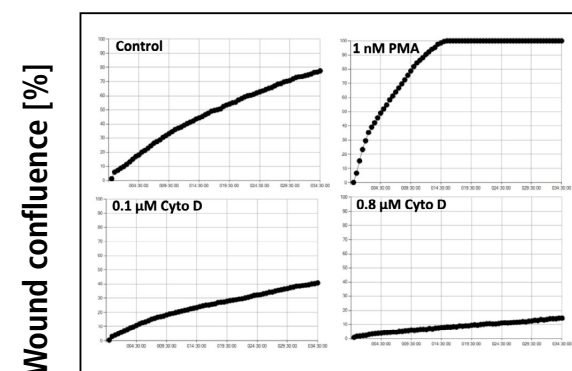
Matrix Movie

B.



Scratch Wound Detection

C.



Time (35 hrs, 30-min interval)

Wound closure monitoring and analysis: A) Time-lapse matrix movie of wound closure, generated on the MuviCyte live-cell imaging system using a 4x objective. MCF7 cells were seeded confluent into a PerkinElmer 96-well ViewPlate microplate and homogenous wounds were generated in all wells using the MuviCyte Scratcher. Wound healing was inhibited with cytochalasin D or stimulated with PMA (phorbol 12-myristate 13-acetate) at different concentrations. Images were acquired every 30 minutes for a total time of 35 hours. B) MuviCyte scratch wound detection mask showing cells that grew into the wound in green, initial cell layer in yellow, initial wound border in blue, and remaining wound area in orange. C) Quantification of the wound confluency over time.

[Learn More ►](#)

Introduction

Applications

Features

Specifications

Support

Portfolio

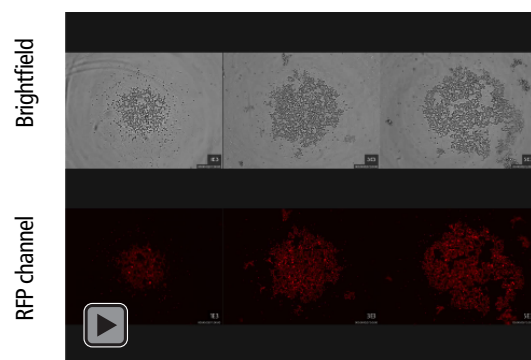
KEY APPLICATION:

Spheroid Analysis

3D spheroid assays have emerged as advanced tools in preclinical drug development and basic research, enabling more physiologically relevant responses from *in vitro* cell models. With the MuviCyte live-cell imaging system, you can automatically monitor and quantify spheroid formation, growth, and health over time.

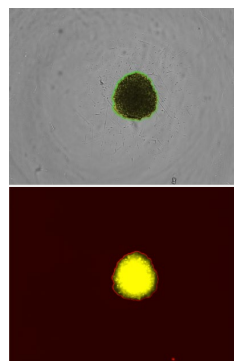
A.

1E3 HeLa/well 3E3 HeLa/well 5E3 HeLa/well



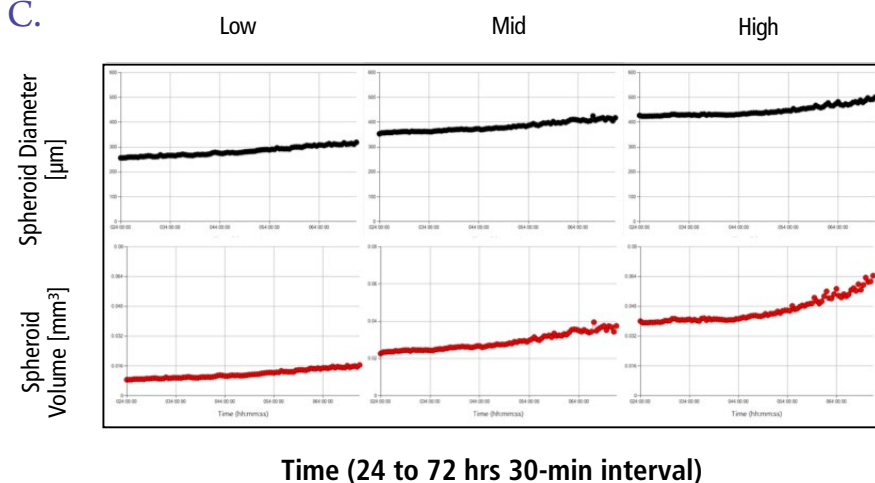
Matrix Movie

B.



Spheroid Detection

C.



Time (24 to 72 hrs 30-min interval)

Spheroid growth analysis over time: A) Time-lapse matrix movie of HeLa spheroids labeled with 4μM CellTracker™ Orange, generated on the MuviCyte live-cell imaging system. HeLa cells were seeded at three initial densities into a PerkinElmer CellCarrier™ spheroid ULA 96-well round-bottom plate. Brightfield and RFP images were acquired every 30 minutes for three days using a 4x objective. B) Spheroid detection can be based on the brightfield or RFP channel. C) Analysis of spheroid diameter (brightfield based) and spheroid volume (RFP based) starting from 24 hours post seeding, up to 72 hours. In total, six different properties can be analyzed: spheroid diameter, perimeter, area, volume, intensity, and circularity.

[Learn More](#) ►

Introduction

Applications

Features

Specifications

Support

Portfolio



Features at a Glance

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THE IMAGING CHANNELS](#)

Operates inside incubator	Provides optimal conditions for cells throughout experiments. Hypoxia experiments feasible with appropriate incubator
Open stage-top design	Compatible with a wide range of cell culture vessels including active microfluidic devices
Three-color fluorescence plus brightfield imaging	Flexibility to work label-free or select from a wide range of dyes and fluorescent proteins
4x, 10x, and 20x (LWD) objectives, digital zoom	Flexibility to work with a range of magnifications for different cell applications
Image-based autofocus	Chooses focus position independent of sample carrier for stable focusing over time; compatible with a wide range of sample carriers
Unlimited imaging positions (FOVs) within wells	Image and revisit imaging positions for cells of interest, from small cell colonies to entire wells
Image stitching	Create a stitched image, enabling analysis of larger objects such as tissue sections, stem cell colonies, or an entire well
Z-stacking	Extends range in z direction for 3D objects or thicker samples; enhances ability to capture living samples over time
Automated operation	Reduces hands-on time and is less prone to error than manually operated research microscopes
Image quantification software for commonly used assays	Easier, more reliable quantification than by manual methods
Movie Maker	Enables easy moviemaking; multiple movie modes (single, sequence, and matrix) enable easy interpretation of responses and comparison of multiple wells side by side
Columbus® software importer	Imports data into Columbus image data storage and analysis system for more sophisticated analysis methods, including analysis of different cell populations, protein translocation assays, neurite analysis, and single-cell tracking

[Learn More ►](#)

[Introduction](#)

[Applications](#)

[Features](#)

[Specifications](#)

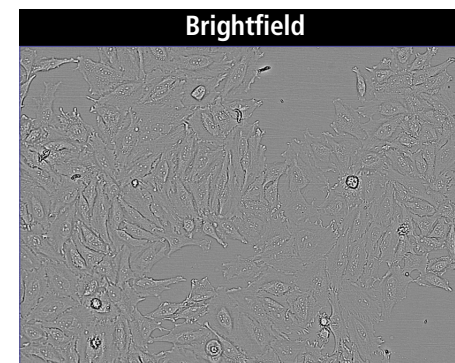
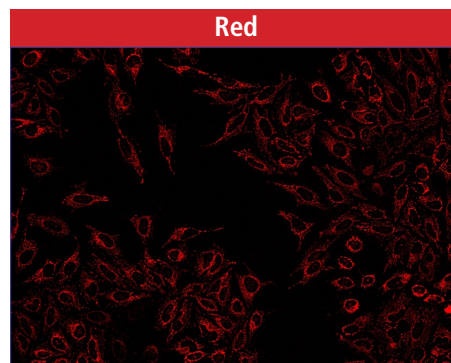
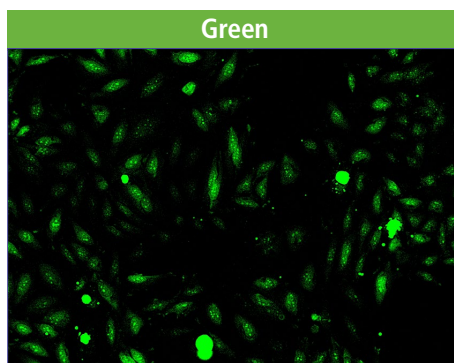
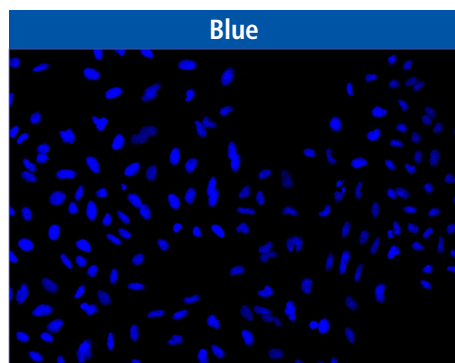
[Support](#)

[Portfolio](#)

Imaging Channels

Fluorescence Excitation and Emission

Emission Color	Excitation Band	Emission Band	Typical Fluorophore
Blue	370 nm – 410 nm	430 nm – 474 nm	Hoechst, DAPI, BFP, HCS CellMask™ Blue
Green	446 nm – 486 nm	500 nm – 525 nm	GFP, Yo-PRO®-1, MitoTracker® Green
Red	532 nm – 554 nm	580 long pass	RFP, MitoTracker® Orange, CellTracker™ Red
Plus Brightfield Imaging			



[Learn More ►](#)

[Introduction](#)

[Applications](#)

[Features](#)

[Specifications](#)

[Support](#)

[Portfolio](#)

Specifications

Objective Lens	4x, 10x, 20x, - interchangeable, digital zoom available
Excitation	LED, power adjustable
Imaging Modes	Fluorescence and transmitted light for brightfield imaging
Fluorescence	DAPI: excitation 390/40, emission 452/45 GFP: excitation 466/40, emission 525/50 RFP: excitation 543/22, emission 580 LP
Camera	Monochrome CCD 1936 x 1456 pixels (2.8 M), 14 bit
Stage	Automated, motorized, X-Y-Z stage Vessel holders (optional)
File Type and Export Formats	Image: JPEG, TIFF, BMP, PNG Video: AVI Raw data: CSV
PC	Desktop computer, desktop monitor 24-in. LCD CPU: Intel i5, 6 cores OS: Windows® 10 Pro 64 bit RAM: 8 GB Hard drive: 2 TB Network: Gigabit Ethernet, WiFi <i>*PC specifications may change without notice</i>
Power Requirements	100 – 240 V, 1.5 A, 50/60 Hz
Electronic Input	12 VDC, 5.0 A
Operating Environment	5 °C – 40 °C, 20% - 95% relative humidity
Dimensions	Width: 43 cm, depth: 31 cm, height: 33 cm
Weight	18 kg / 40 lb.

Ordering Information

Part Number	Name	Description
HH40000000	MuviCyte Live-Cell Imaging Kit	Comprises MuviCyte instrument, three objectives, PC and monitor
HH40000201	Vessel holder, microslide	Holder for two 26-mm x 76-mm slides
HH40000202	Vessel holder, Petri dishes (35 mm)	Holder for two 35-mm Petri dishes (Nunc®, Corning®)
HH40000203	Vessel holder, Petri dishes (60 mm)	Holder for two 60-mm Petri dishes (Nunc®, Corning®, BD Falcon®)
HH40000204	Vessel holder, Petri dish (100 mm)	Holder for 100-mm Petri dish (Nunc®)
HH40000205	Vessel holder, T-flask	Holder for 25-cm ² or 75-cm ² cell-culture flasks
HH40000301	MuviCyte Scratcher	Tool to create scratch wounds in a 96-well microplate
HH40000501	MuviCyte Scratch Software (optional)	Analysis software for scratch-wound assays
HH40000502	MuviCyte Spheroid Software (optional)	Analysis software for spheroid assays
HH16150200	4 TB external USB 3.0 hard drive	External hard drive to extend storage capacity

Choice of Imaging Plates

Part Number	Name	Description
6005182	ViewPlate-96 Black, case of 50	96-well tissue-culture-treated sterile microplates with black well walls and clear bottom for viewing plates under a microscope
6055330	CellCarrier Spheroid ULA 96-well Microplates, case of 10	Round-bottom, clear 96-well polystyrene microplates coated with ultralow-attachment (ULA) surface for 3D culture of mammalian cells
6055302	CellCarrier-96 Ultra Microplates, case of 40	96-well tissue-culture-treated sterile microplates with black well walls and an optically clear cyclic olefin bottom for high-content analysis, high-content screening, and other cellular assays
6057300	CellCarrier-384 Ultra Microplates, case of 50	384-well tissue-culture--treated sterile microplates with black well walls and an optically clear cyclic olefin bottom for high-content analysis, high-content screening, and other cellular assays

[Learn More ►](#)

Introduction

Applications

Features

Specifications

Support

Portfolio

COUNT ON OUR SUPPORT

Today's scientific lab leaders are facing new pressures and demands to continue to innovate while looking for more lab productivity. And much of the time that could be spent on scientific discovery is spent on noncore activities instead.

To help you overcome these barriers to success, OneSource® Laboratory Services has built a complete suite of solutions that provide the knowledge, applications, services, and manpower labs need, including uptime optimization, lab analytics, and workflow solutions. Digital innovations give you access to real-time reports that help you make informed decisions about your lab.

Wherever your challenges lie, OneSource Laboratory Services can ensure that your lab runs at maximum efficiency, returning time to your scientists so they can do what they do best.



[Learn More ►](#)

[Introduction](#)

[Applications](#)

[Features](#)

[Specifications](#)

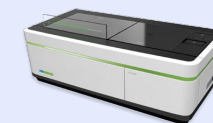
[Support](#)

[Portfolio](#)

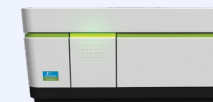
IMAGING WITHOUT COMPROMISE

Scientists today are taking an orthogonal approach to their research, seeking new ways to increase certainty in their results, improve biological understanding, and enable better decisions sooner. Our imaging portfolio helps scientists turn data into *knowledge*.

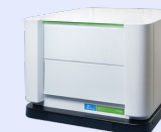
Opera Phenix: From routine assays to demanding high-content screening applications, the Opera Phenix™ system incorporates advanced optics to deliver more physiologically relevant information from your assays. It's perfect for fixed- and live-cell assays, complex cellular models, protein-protein interactions, and high-throughput phenotyping.



Operetta CLS: The Operetta CLS™ high-content analysis system delivers all the speed and sensitivity you need for both everyday assays and more complex challenges, including live cells, phenotyping, rare events, and much more. And it's simple to use, so everyone in your lab can get started – and be productive – right away.



EnSight: Drawing on a quarter century of experience in multimode detection, our EnSight® plate reader delivers high-performance detection and well-imaging technologies that enable you to gain insights you couldn't achieve with detection measurements alone – in a single, easy-to-use benchtop instrument.



Microplates: We have microplates for virtually any assay: high-throughput cell-based assays, plates designed to preserve sample, cell-imaging plates, and more. Plus, we deliver full and half-area 96-well plates, and 384- and shallow-volume 384-well plates, in a variety of colors to suit your assay requirements.



[Learn More ►](#)

[Introduction](#)

[Applications](#)

[Features](#)

[Specifications](#)

[Support](#)

[Portfolio](#)

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www.perkinelmer.com/MuviCyte

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