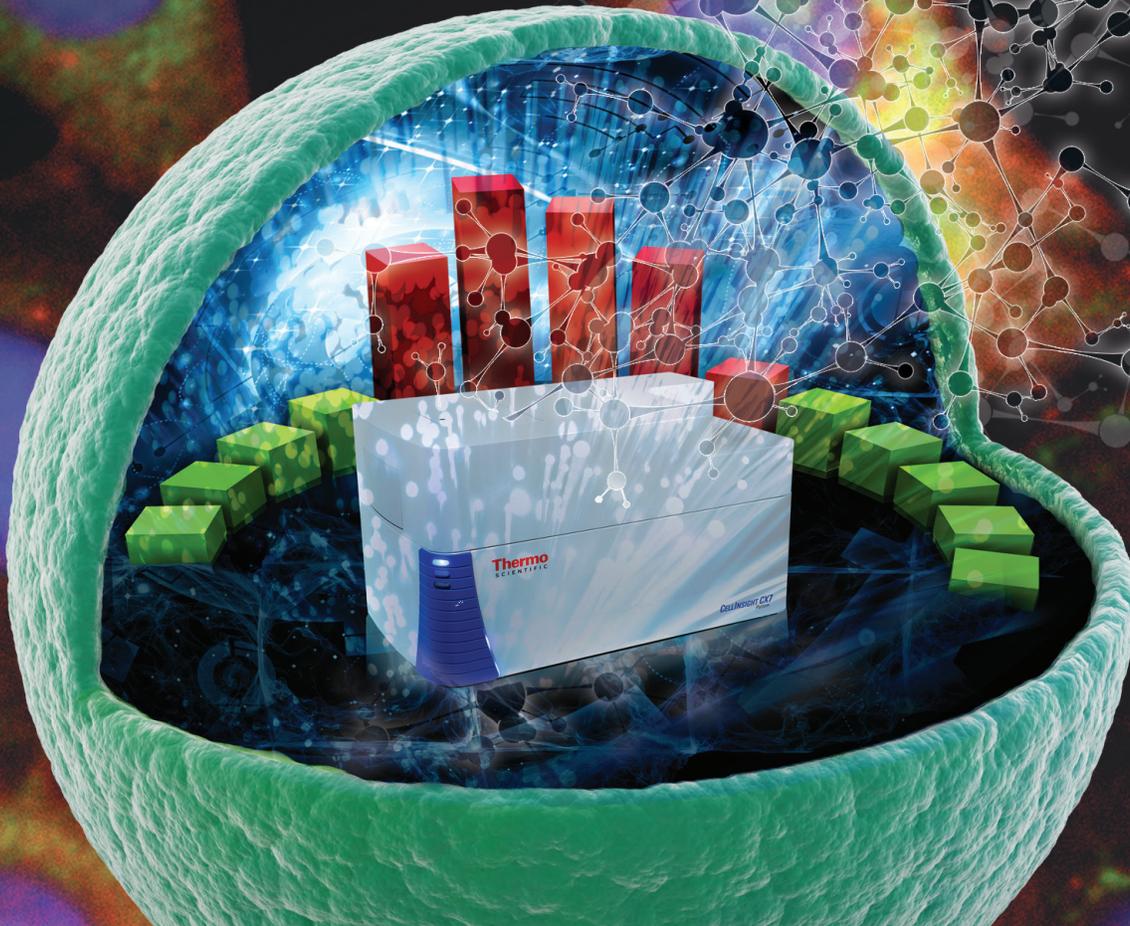


high content analysis

thermoscientific invitrogen



Automated imaging and
high-content analysis

ThermoFisher
SCIENTIFIC

Automated imaging and high-content analysis

A complete portfolio of imaging platforms, reagents, and software tools for high-content analysis

High-content analysis requires high-quality microscope images and multiple channels of data. When you incorporate automation into data collection and analysis, you increase the number of samples you can process and the amount of biological data you can acquire. Automated microscopy and analysis provide the foundation for the entire field of high-content analysis, while capabilities like environmental control and integrated fluidics expand the range of questions you can ask.

See how EVOS™ imaging systems and Thermo Scientific™ high-content analysis platforms can help you take your research to the next level with automated imaging and analysis to increase your throughput and data content.

Take advantage of the entire spectrum of Molecular Probes™ fluorescent reagents matched to the channels on your imaging system. See how functional probes and labeling strategies can be multiplexed to create high-content assays that answer your research questions (page 11).

	EVOS™ FL system	EVOS™ FL Auto system	CellInsight™ CX5 platform	CellInsight™ CX7 platform	ArrayScan™ module
LED light cubes	x	x			
LED light engine			x	7-channel	7-channel
Monochrome camera	x	x	x	x	x
Color camera	Optional	x			
Widefield fluorescence	4-channel	4-channel	5-channel	7-channel	7-channel
Brightfield	x	x	x	x	x
Phase contrast	x	x			
Confocal				7-channel	6-channel
Objective turret	5-position	5-position	1-position	3-position	4-position
Autofocus		Software	Software	Laser	Laser
Live-cell chamber		Optional			Optional
Automated scanning		x	x	x	x
Robotics compatible			x	x	x
Automated fluidics					Optional
Software	EVOS FL	EVOS FL Auto	HCS Studio	HCS Studio	HCS Studio
Page	3	4	5	6	7

EVOS FL Imaging System

Form, function, and flexibility for fluorescence imaging

Manual imaging for multichannel fluorescence, brightfield, and phase-contrast microscopy

- Exceptional ease of use
- Wide range of sample types
- Multichannel overlay
- Automatic cell counting and time-lapse imaging



System highlights

Hardware	
Illumination	Select from 14 adjustable-intensity LED light cubes
Camera	High-sensitivity CCD (choice of monochrome or color)
Widefield	4-channel fluorescent imaging (wide choice of wavelengths)
Brightfield	White light brightfield and phase-contrast imaging
Objectives	5-position objective turret (1.25x–100x range, low and high NA)
Stage	Wide range of slide, plate, and vessel holders available
Software	Manual cell counting, time-lapse, and transfection measurement

EVOS FL Auto Imaging System

An intuitive, affordable fully automated system

Multidimensional and time-lapse imaging, tile stitching and Z-stack automation

- Exceptional ease of use
- Touch screen software control
- Automated X/Y scanning stage, autofocus, and flat-focus Z-stack
- Precise environmental control for live-cell imaging



System highlights

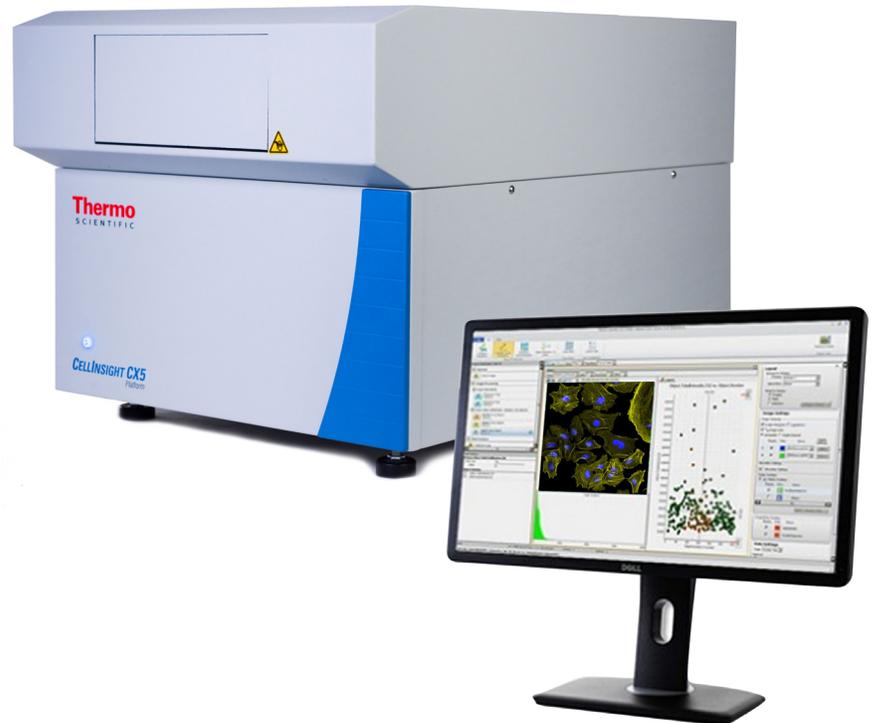
Hardware	
illumination	Select from 14 adjustable-intensity LED light cubes
Cameras	Dual monochrome (CCD) and color (high-sensitivity CMOS) camera
Widefield	Automated 4-channel fluorescent imaging
Brightfield	Automated white light brightfield and phase-contrast imaging
Objectives	Automated 5-position objective turret (1.25x–100x range, low and high NA)
Focus	Software-based autofocus
Live-cell chamber	Environmental control with EVOS™ Onstage Incubator
Automation	Automated multi-well plate scanning
Software	Automated cell counting, time-lapse, image tiling and stitching

CellInsight CX5 High Content Screening Platform

Compact, affordable screening system for everyday use

Fast scanning and quantitative analysis for high-content screening

- Quantitative fluorescence and brightfield imaging
- Full automation of plate handling and scanning for high-throughput screening
- Compact footprint for lab bench or robotic line
- Thermo Scientific™ HCS Studio™ software provides a comprehensive suite of analysis tools



System highlights

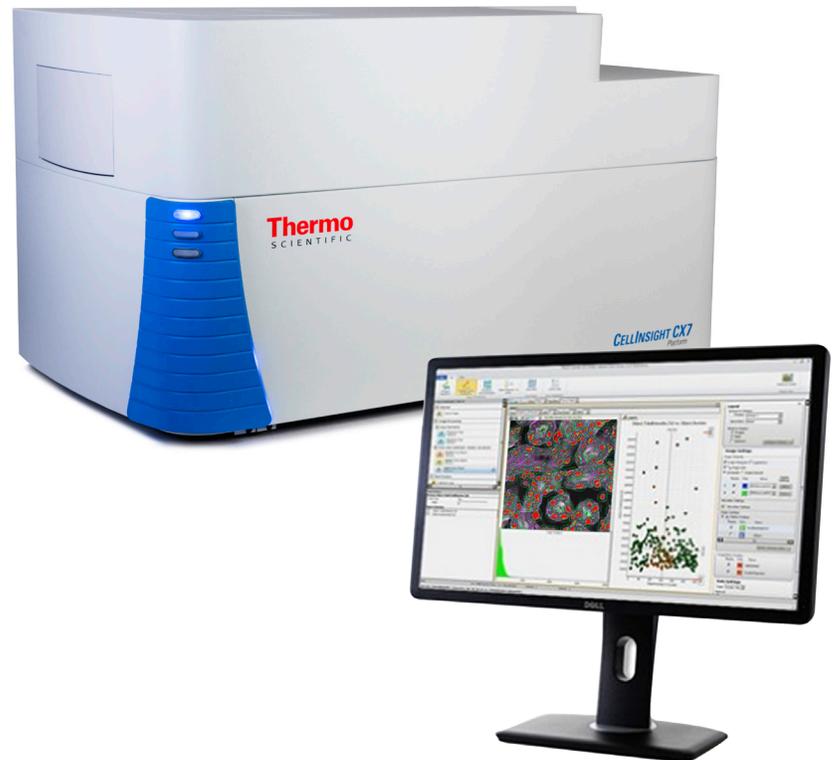
Hardware	
Illumination	5-channel solid-state LED light engine
Camera	Photometrics X™ camera
Widefield	5-channel fluorescent imaging
Brightfield	White light brightfield imaging
Objectives	Single-position objective (2x–20x range, low and high NA)
Focus	Software-based autofocus
Automation	Configured for fully automated plate handling and scanning
Software	HCS Studio software for integrated data collection and analysis

CellInsight CX7 High Content Platform

Integrated system for all-around performance

More wavelengths and integrated confocal optics to expand application areas

- Fully integrated confocal imaging for higher resolution of thick samples
- 7-channel fluorescence and 5-channel brightfield imaging
- Full automation and laser autofocus for high throughput
- HCS Studio software provides a comprehensive suite of analysis tools



System highlights

Hardware	
Illumination	7-channel solid-state LED light engine
Camera	Photometrics X1 camera
Widefield	7-channel fluorescent imaging
Brightfield	5-channel brightfield imaging
Confocal	7-channel confocal imaging
Objectives	3-position objective turret (2x–40x range, low and high NA)
Focus	Software- and laser-based autofocus for consistent scan times
Automation	Configured for fully automated plate handling and scanning
Software	HCS Studio software for integrated data collection and analysis

ArrayScan High Content Platform

Modular system for specialized applications

Modular design allows addition of confocal scanning, brightfield, and live-cell options

- Add confocal imaging for higher resolution of thick samples
- Add environmental control for long-term kinetic measurement of live cells
- Configured for full automation and high throughput
- HCS Studio software provides a comprehensive suite of analysis tools



System highlights

Hardware	
Illumination	7-channel solid-state LED light engine
Camera	Photometrics X1 camera
Wide field	7-channel fluorescent imaging
Bright field	White light brightfield imaging option
Confocal	6-channel confocal imaging option
Objectives	4-position objective turret (1.25x–63x range, low and high NA)
Focus	Software and laser-based autofocus for reduced phototoxicity
Live-cell chamber	Live-cell imaging chamber option
Liquid handling	Optional 1-channel aspirate and dispense, read-through imaging
Automation	Configured for fully automated plate handling and scanning
Software	HCS Studio software for integrated data collection and analysis

HCS Studio cell analysis software

Intuitive interface and intelligent design

Intelligent data acquisition analyzes just enough cells for statistical relevance

- Icon-based guidance, accessible to novice users
- Fully customizable for experienced users
- Thermo Scientific™ BioApplications software tools for assay development and screening
- Scalable to many thousands of images

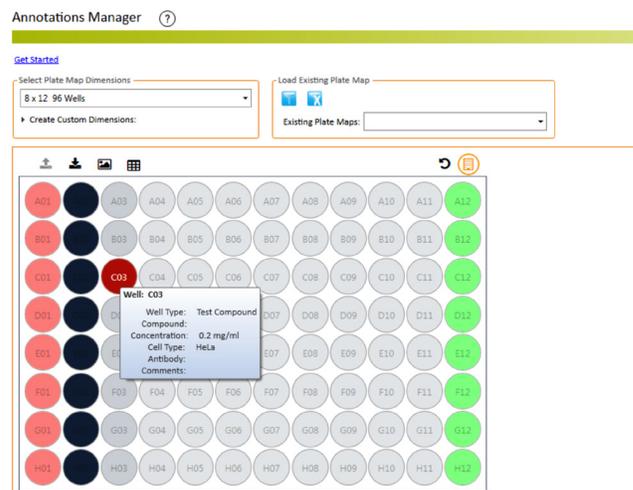
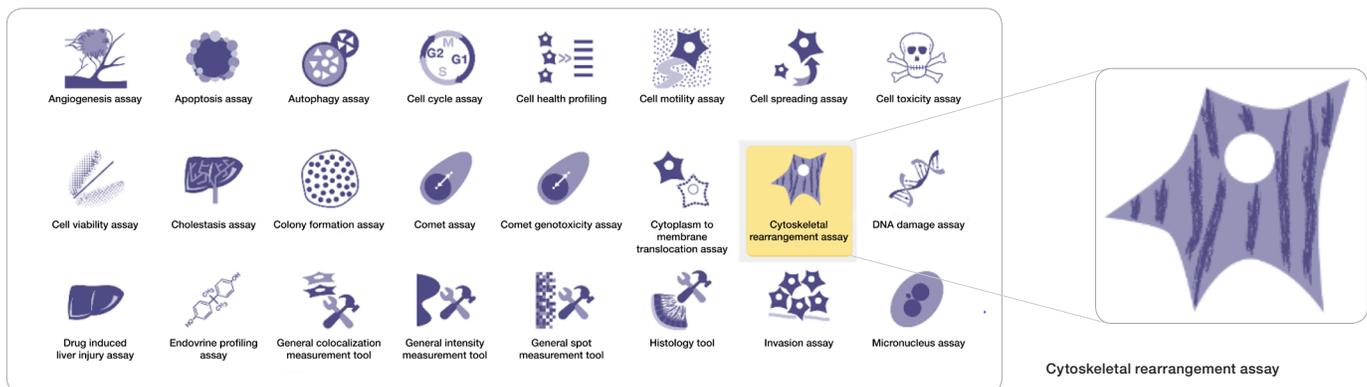


Plate maps to manage your experimental design.



Cytoskeletal rearrangement assay

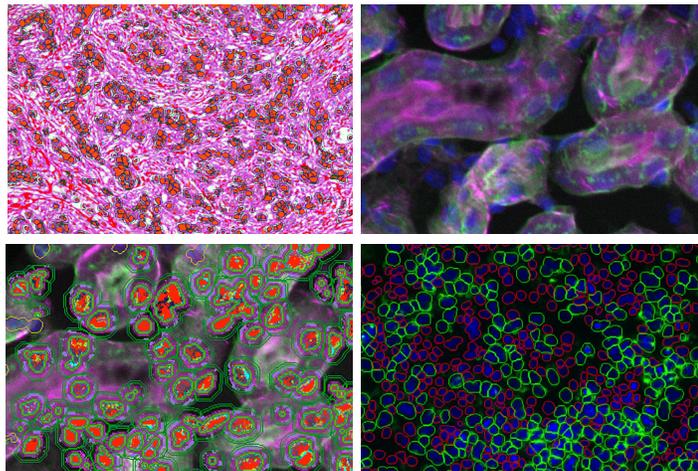
Icon-based guidance, accessible to novice users.

Analysis or screening

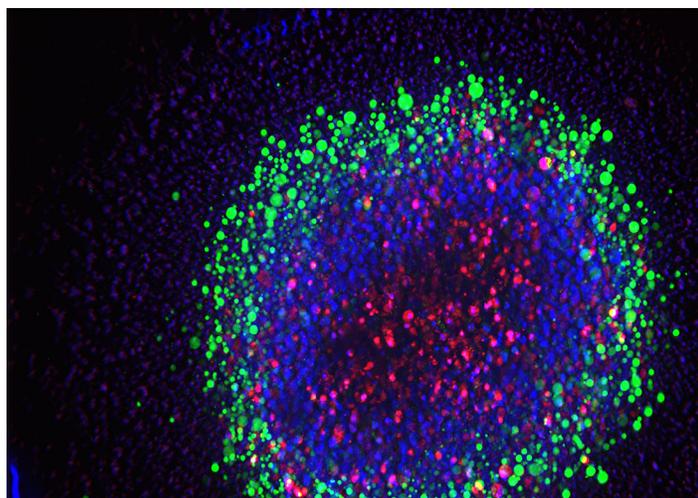
Whether you are analyzing a few slides to answer basic research questions or screening thousands of samples in a systems biology study, we can offer you the platform of choice to meet your application.

Go from image collection to tabulated results and population statistics—and back again, because the data always come back to cells.

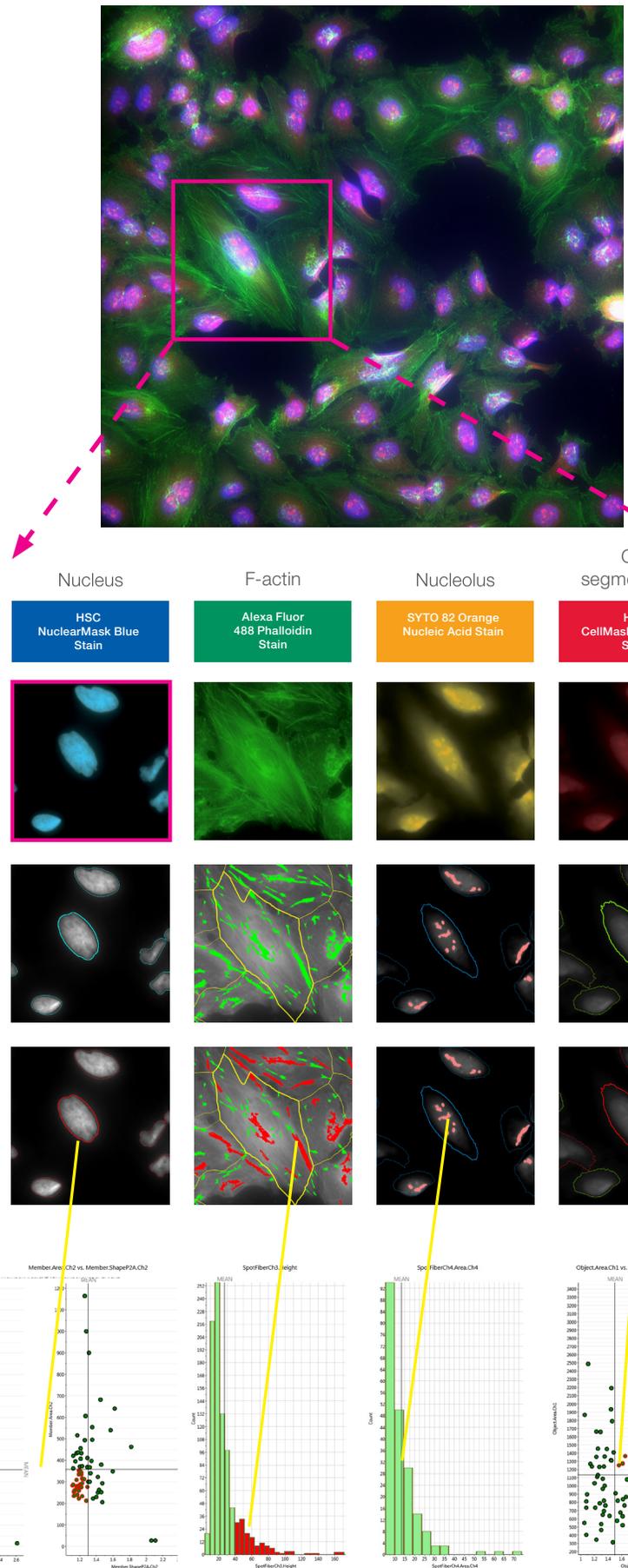
- Data are seamlessly linked to both image and protocol
- Move from tabulated data to view cells, wells, or fields
- Make decisions grounded in biology



Multiple imaging modes for cells and tissues.



Confocal image acquired with the CellInsight CX7 platform, of spheroid labeled with Hoechst™ 33342 stain, calcein AM, and ethidium homodimer.



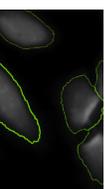


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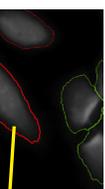
Label



Detect



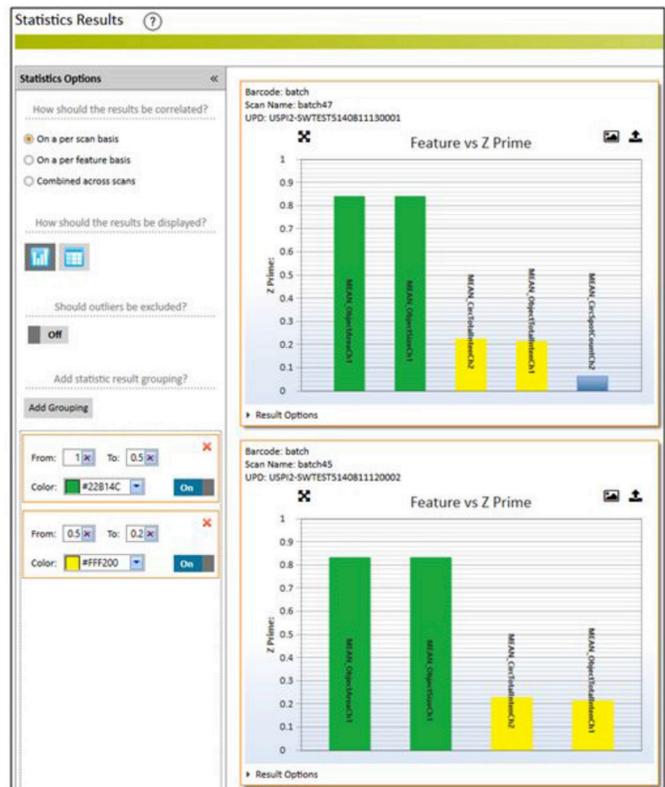
Measure



Analyze



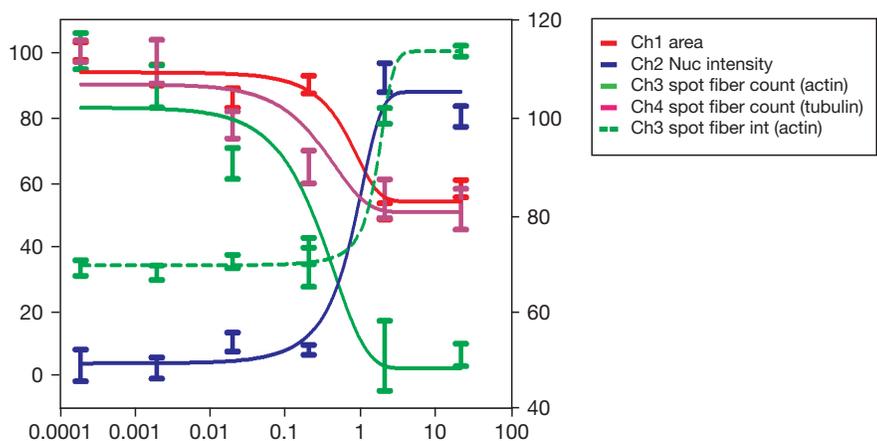
Automated



Rapid Z-prime tool to measure assay performance.

Assay performance

With HCS Studio Cell Analysis Software you can be confident of robust assay performance. Rank your assay parameters based on Z-prime before starting a screen, and then adjust your stopping criteria to collect only the data you need for statistical significance.



Multiparameter reporting of cellular responses.

Multiplexing reagents for assay optimization

Recommended reagents

Drawing on decades of experience in fluorescence imaging, Molecular Probes HCS products are developed using Thermo Scientific high-content platforms with special considerations for the high-throughput workflow and automated imaging:

- Alexa Fluor™ secondary antibodies for brightness and stability
- Cell and nuclear masks for automated demarcation
- Robust functional probes for cell health interrogation
- Validated on multiple imaging platforms

Take advantage of the entire fluorescent spectrum to multiplex your assay—and maximize your instrument performance. Use the table below to select reagents for each platform and channel.

EVOS light cubes	DAPI Light Cube	CFP Light Cube	
CellInsight CX5 channels	Blue		
CellInsight CX7 channels	Blue	Cyan	
ArrayScan channels	Blue	Cyan	

Secondary antibodies			
Goat anti-mouse	Alexa Fluor 350 (A11045)	Alexa Fluor 405 (A31553)	
Goat anti-rabbit	Alexa Fluor 350 (A11046)	Alexa Fluor 405 (A31556)	
Cell segmentation			
Whole cell segmentation	HCS CellMask Blue (H32720)		
Nuclear segmentation	HCS NuclearMask Blue (H10325)		S
Cell tracking and tracing	CellTracker Blue (C12881)	CellTracker Violet (C10094)	
Cell structure			
Cytoskeleton (actin)	Alexa Fluor 350 Phalloidin (A22281)		
Lysosomes			
Mitochondria			
Cell function probes			
Cell viability			Im
Cell proliferation			Click
Apoptosis (caspase activity)			

To see more reagents validated for use in high-content analysis, go to [thermofisher.com/hcs](https://www.thermofisher.com/hcs)

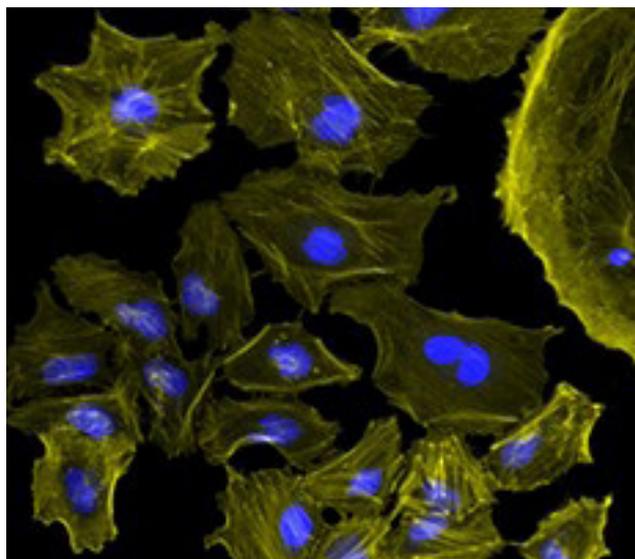


Image acquired with the CellSight™ CX5 platform, of cells labeled with Hoechst 33342 stain and Alexa Fluor™ 680 phalloidin.

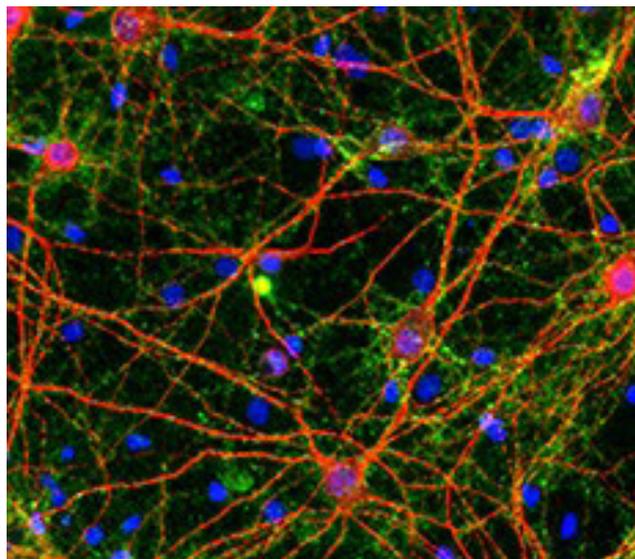


Image acquired with the ArrayScan platform, of cells labeled with DAPI, Alexa Fluor™ 488 goat anti-mouse IgG, and Alexa Fluor™ 647 goat anti-rabbit IgG.

GFP Light Cube	YFP Light Cube	RFP Light Cube	
Green			Orange/red
	Green/yellow	Orange	
	Green/yellow	Orange	

Alexa Fluor 488 (A11001)	Alexa Fluor 532 (A11002)	Alexa Fluor 555 (A21422)	
Alexa Fluor 488 (A11008)	Alexa Fluor 532 (A11009)	Alexa Fluor 555 (A21428)	
HCS CellMask Green (H32714)		HCS CellMask Orange (H32713)	
SYTO 9 Green Nucleic Acid Stain (S34854)		SYTO 82 Orange Nucleic Acid Stain (S11363)	H
CellTracker Green (C7025)		CellTracker Orange (C34551)	
Alexa Fluor 488 Phalloidin (A12379)		Alexa Fluor 555 Phalloidin (A34055)	Ale
MitoTracker Green FM (M7514)			Ly
Image-iT DEAD Green Viability Stain (I10291)			
Image-iT EdU Alexa Fluor 488 HCS Assay (C10351)		Click-iT EdU Alexa Fluor 555 HCS Assay (C10353)	Click-iT Ed
CellEvent Caspase-3/7 Green (C10423)			

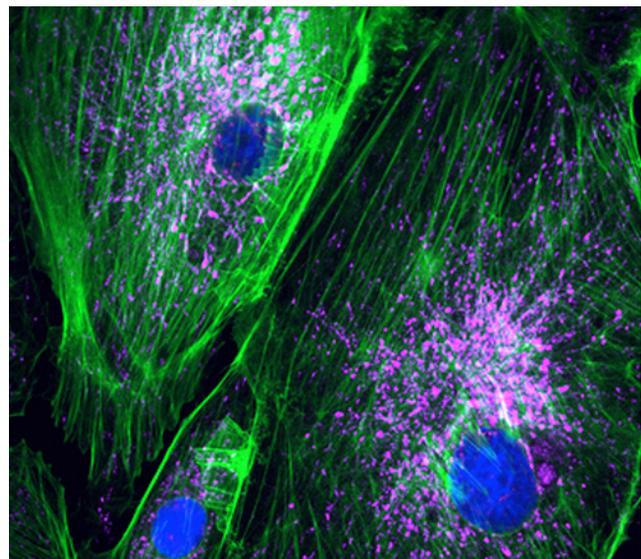


Image acquired with the EVOS FL Auto platform, of cells labeled with Qdot™ 655 secondary antibody, NucBlue™ Live ReadyProbes™ reagent, and ActinGreen™ 488 ReadyProbes™ reagent.

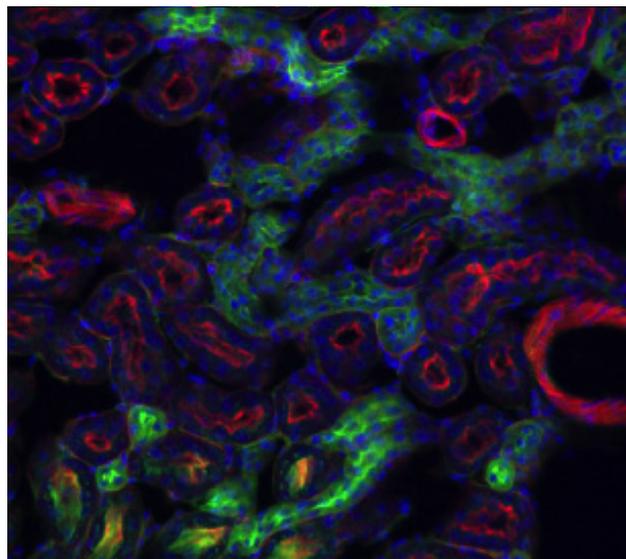


Image acquired with the CellInsight CX7 platform, of cells labeled with DAPI, Alexa Fluor™ 488 wheat germ agglutinin, and Alexa Fluor™ 568 phalloidin.

Texas Red™ Light Cube	Cy5 Light Cube	Cy7 Light Cube
	Deep red	Near-IR
Red	Deep red	Near-IR
Red	Deep red	Near-IR
Alexa Fluor 594 (A11005)	Alexa Fluor 647 (A21235)	Alexa Fluor 750 (A21037)
Alexa Fluor 594 (A11012)	Alexa Fluor 647 (A21244)	Alexa Fluor 750 (A21039)
HCS CellMask Red (H32712)	HCS CellMask Deep Red (H32721)	
HCS NuclearMask Red (H10326)	HCS NuclearMask Deep Red (H10294)	
CellTracker Red (C34552)	CellTracker Deep Red (C34565)	
Alexa Fluor 594 Phalloidin (A12381)	Alexa Fluor 647 Phalloidin (A22287)	
LysoTracker Red DND-99 (L7528)	LysoTracker Deep Red (L12492)	
MitoTracker Red (M7513)	MitoTracker Deep Red FM (M22426)	
Propidium Iodide (P1304MP)		
Click-iT EdU Alexa Fluor 594 HCS Assay (C10355)	Click-iT EdU Alexa Fluor 647 HCS Assay (C10357)	

Find out more at [thermofisher.com/hcs](https://www.thermofisher.com/hcs)

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