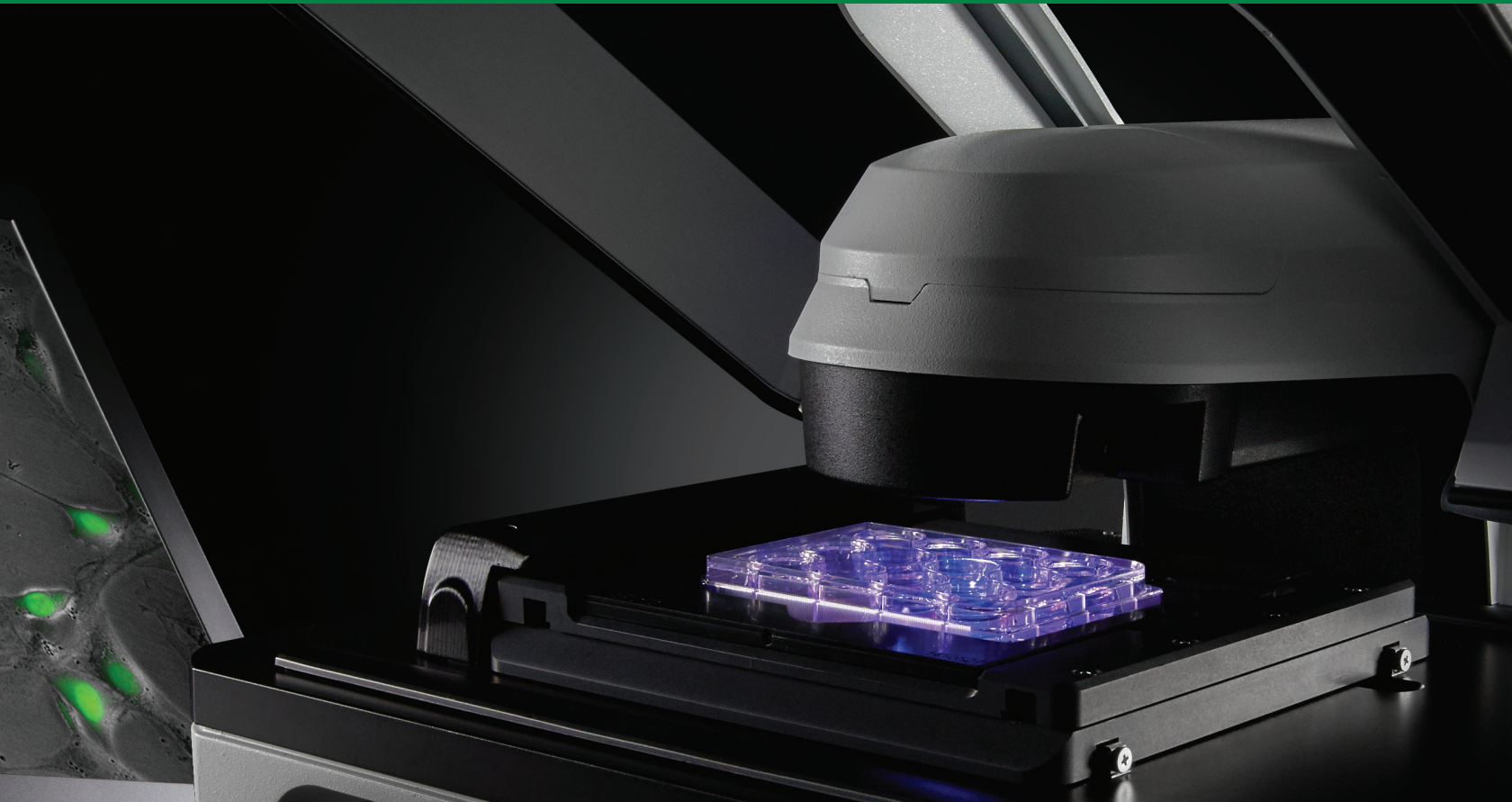




## Augmented Microscopy™

capture ▶ process ▶ analyze ▶ publish



Think Possible





Email: [sales@mscience.com.au](mailto:sales@mscience.com.au)

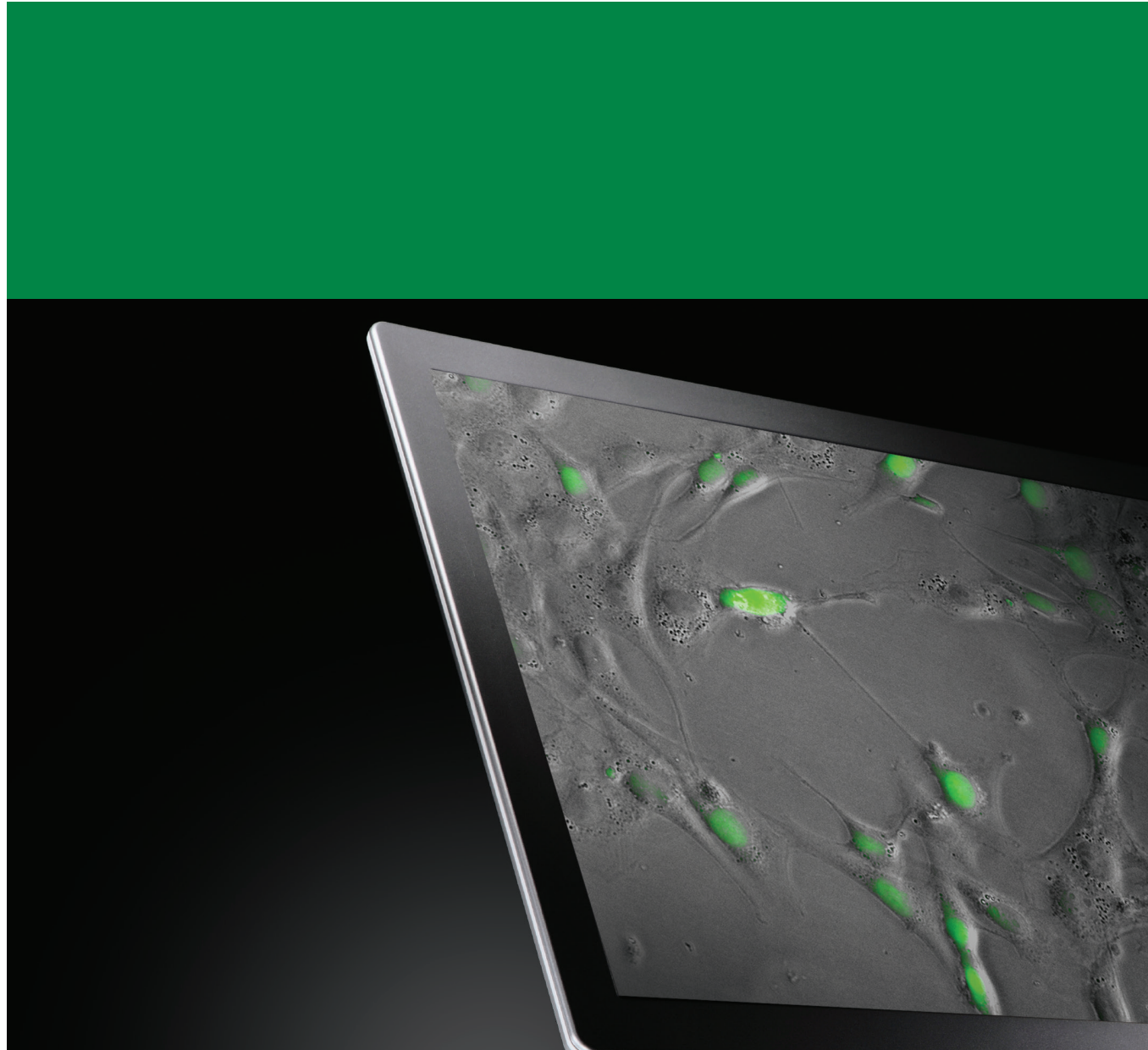
Twitter: [@mscienceaustnz](https://twitter.com/mscienceaustnz)

**Think Possible**



At BioTek, our philosophy transcends conventional thinking and challenges the old ways. We develop fresh, original solutions by unifying concepts that often appear to be opposed. It means to shape and reshape. To engineer, build, deliver and support products that *best* serve the marketplace by providing *what* you need, *when* you need it.

**Think Possible.** It's the difference between leading and following.

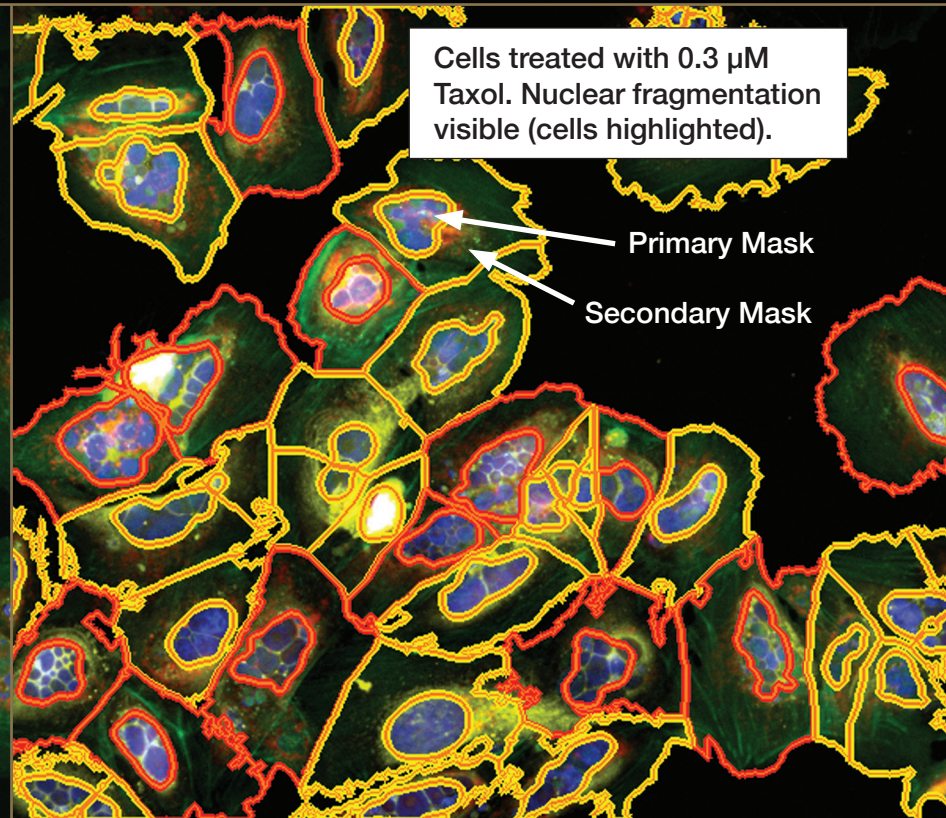
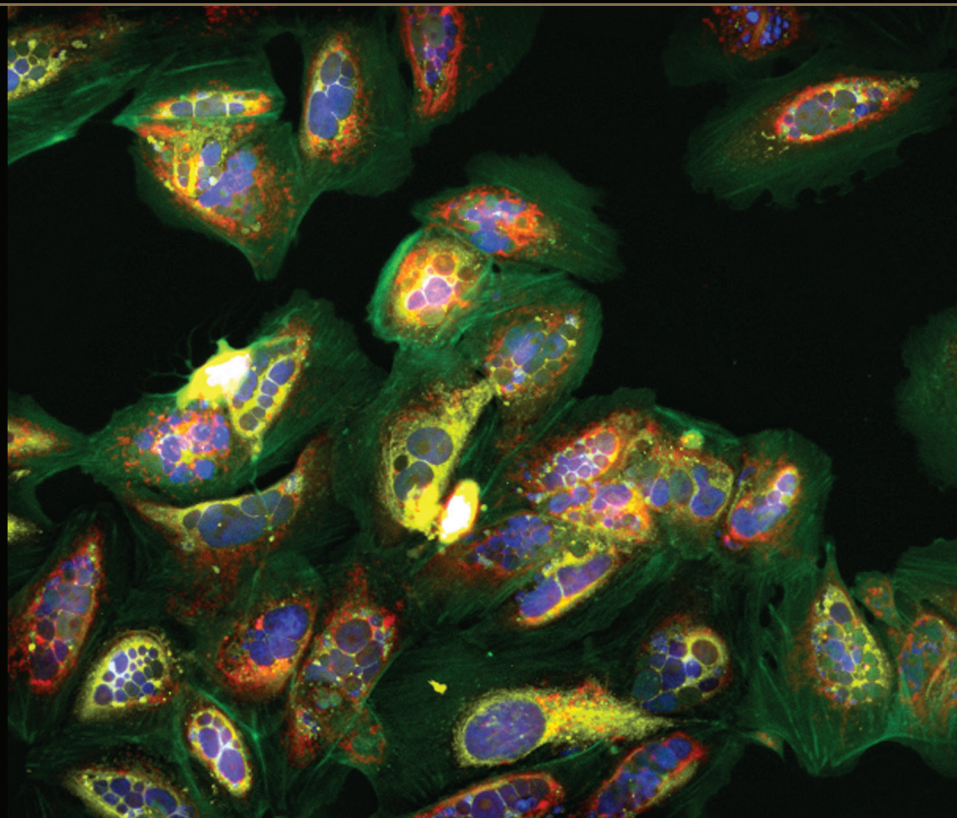


**BioTek Instruments, Inc.**

Phone: 802-655-4040 • Toll-Free: 888-451-5171 • Outside the USA: 802-655-4740

[www.biotek.com](http://www.biotek.com)





Cells treated with 0.3  $\mu\text{M}$  Taxol. Nuclear fragmentation visible (cells highlighted).

Primary Mask

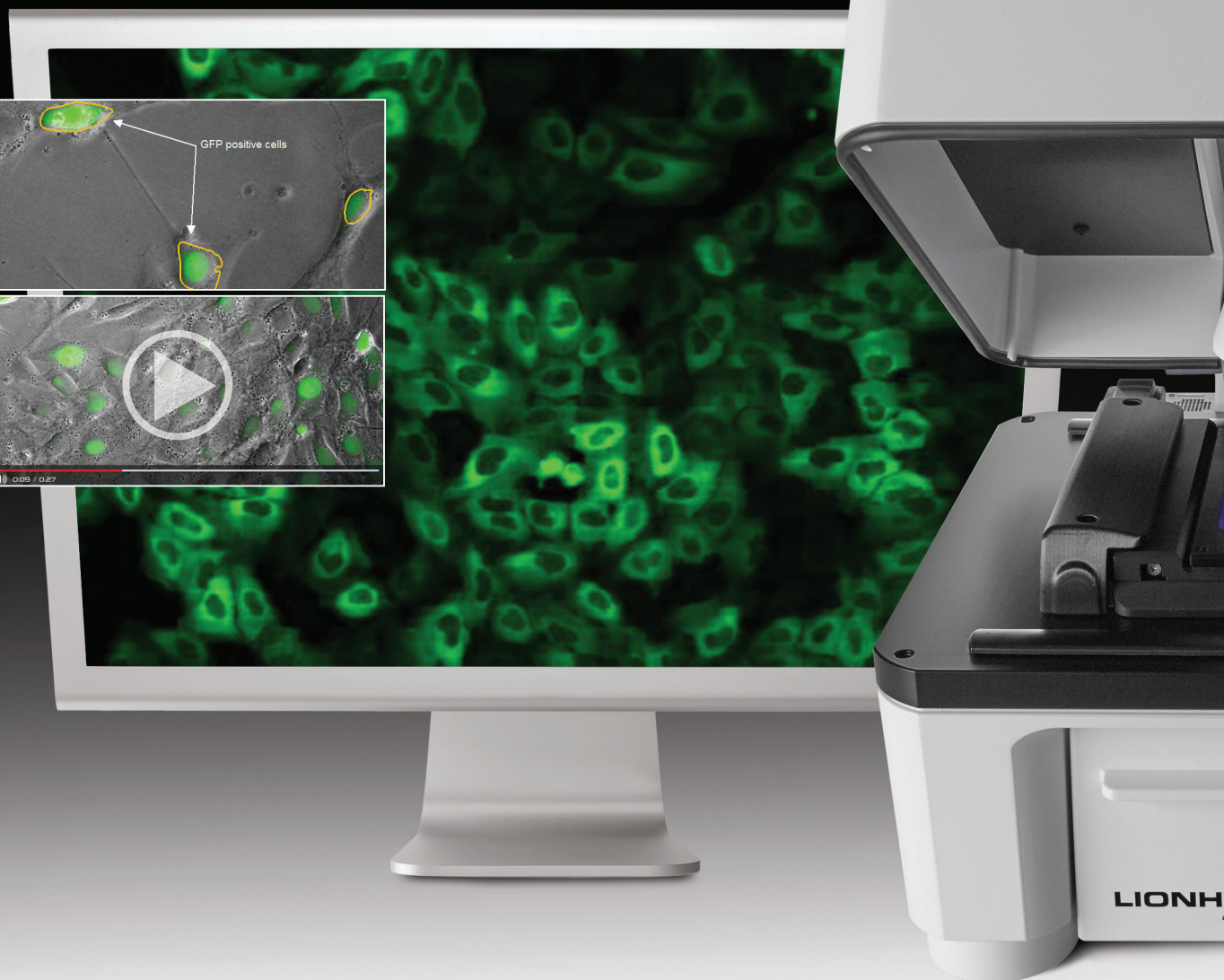
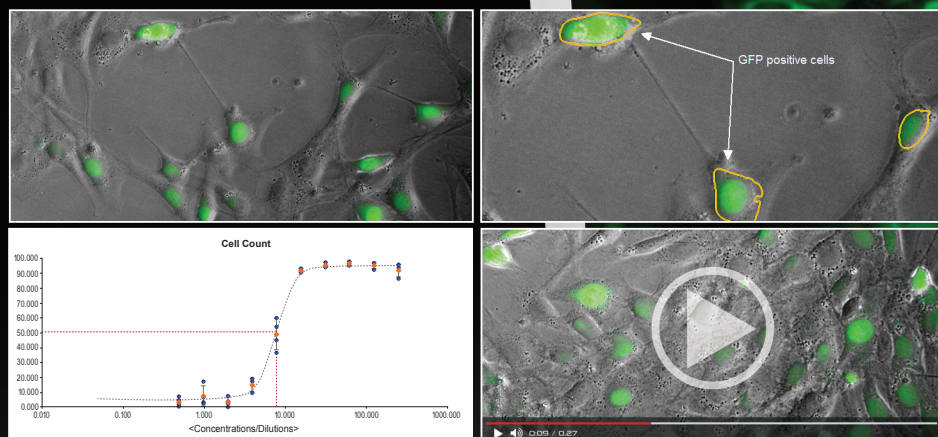
Secondary Mask



# Imaging and analysis has never been easier or more powerful.

Lionheart™ FX Automated Live Cell Imager is a digital microscope that automates image capture and analysis with a combined power and ease of use that dramatically sets it apart from other microscopy systems. Lionheart FX and Gen5™ 3.0 Software capture and produce detailed information from live cell assays in real time, providing valuable

qualitative and quantitative data quickly and easily. Augmented Microscopy™ is the collection of all these features in one compact system. With Lionheart FX, you can capture, process, analyze and produce publication-ready images, videos and data.





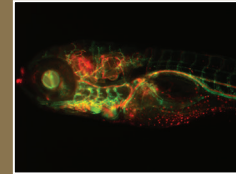
## Automated, integrated digital microscope saves time, space and budget

Lionheart™ FX makes the most of your microscopy budget, with its compact, robust hardware and thoughtfully designed software, yet offers powerful functionality typically seen only in much higher priced imaging systems. Installation and setup are quick and easy - image capture and analysis are just minutes away. Auto LED intensity, auto exposure, image-based and laser autofocus and the high resolution automated stage make Lionheart FX a truly automated microscope, suited to a wide variety of imaging applications.

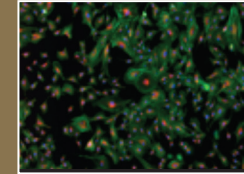


## Whole organism to subcellular imaging

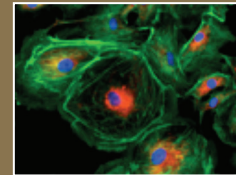
With 1.25x up to 100x oil immersion magnification and new tools in Gen5™ Image Prime software, image capture and analysis rivals that of very expensive custom microscopy systems. The 6-position objective turret and 4-color channels provide quick selection of optimal imaging parameters.



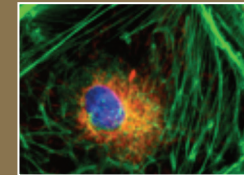
Zebrafish at 4x



Cells at 4x



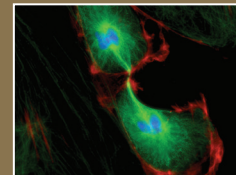
Cells at 20x



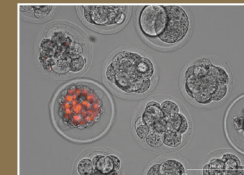
Cells at 60x

## Imaging modes

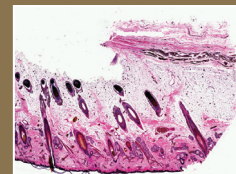
Lionheart FX offers brightfield, color brightfield, phase contrast and fluorescence imaging modes to cover a broad range of applications. With four channels and more than 15 color cubes available, Lionheart FX provides fast, multi-color imaging for a broad range of dyes to meet many automated imaging requirements.



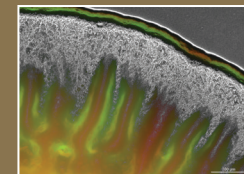
3-color fluorescence



Brightfield and fluorescence



Color brightfield

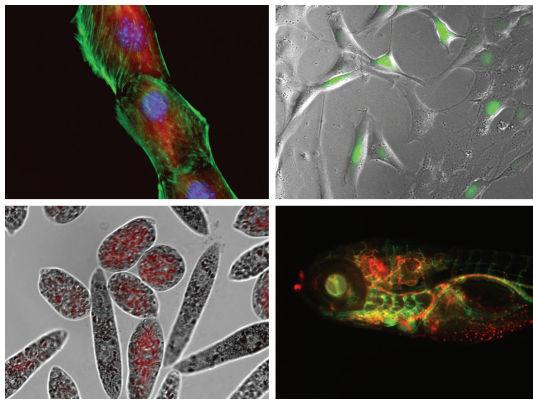


Phase contrast and fluorescence

# Augmented Microscopy™

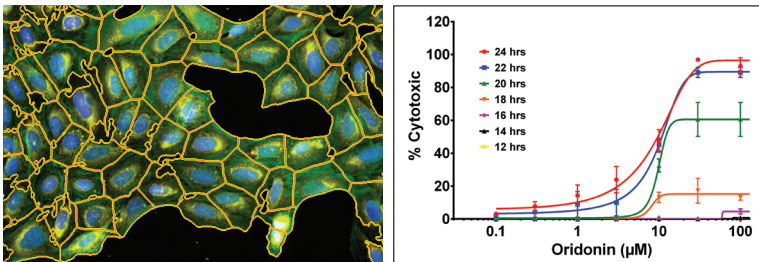
## Capture

Gen5™ 3.0 software offers truly automated microscopy. Image and laser-based autofocus, auto exposure and auto LED intensity aid in capturing images in real time, with remarkable clarity. From single sample imaging to long-term live cell kinetics, Gen5 captures each image quickly, easily and automatically.



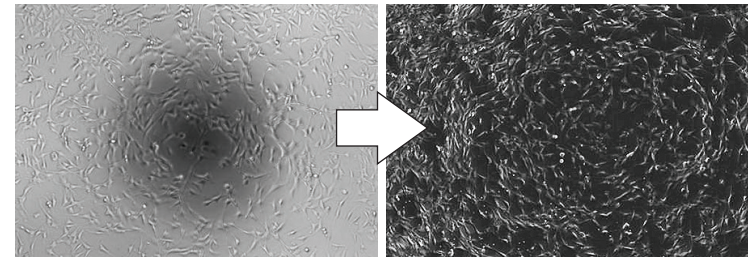
## Analyze

While images are being captured, Gen5 automatically updates the image cellular analysis. After capture, images and data can be reviewed, along with the detailed analysis of each image in the review pane.



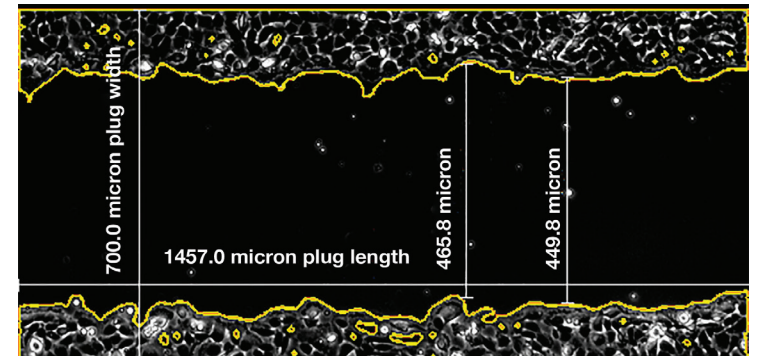
## Process

Image processing is an essential step in microscopy for downstream visualization and analysis. Pre-processing steps like background flattening or digital phase contrast aid in preparing images for segmentation and analysis. For optimal image quality and content prior to analysis, use Gen5 3.0 image processing tools.



## Publish

With Gen5 software, publication-ready images and qualitative data are just a few clicks away. With built-in annotation, a variety of image file outputs and an automated movie-maker, Gen5 does it all – no third party software required.







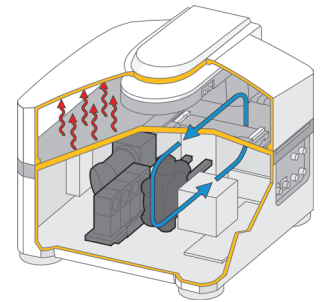
## Kinetic live cell assay support

With Lionheart™ FX and Gen5™ 3.0, live cell assays can be measured over seconds, minutes, hours or days. The environmental control cover contains

the required temperature and gas circulation, and provides a darkroom-like environment for fluorescence imaging.

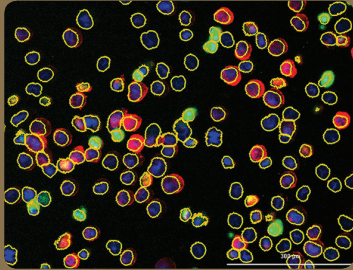
A humidity chamber offers added protection for cells during long-term measurement, including the ability to quickly re-charge the gas environment to maintain

stability. Dual reagent injectors provide rapid sequential dispensing and imaging to capture rapidly changing cellular activities. Gen5's annotation tools allow easy documentation of significant phenotypic information in real time, and the movie maker function automates video production without requiring external software.

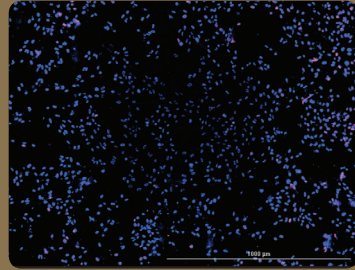




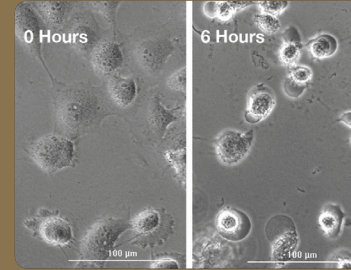
# Applications



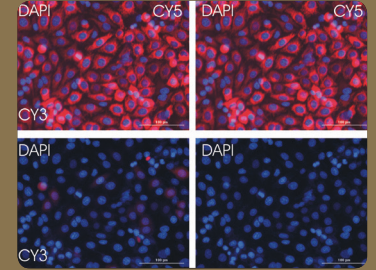
Cell Counting



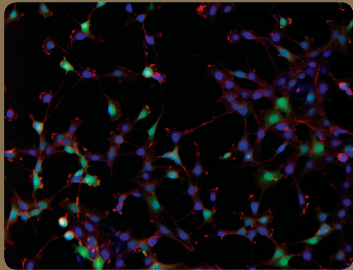
Cell Viability/Toxicity



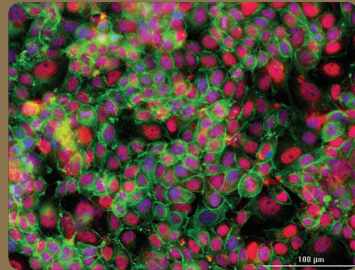
Apoptosis



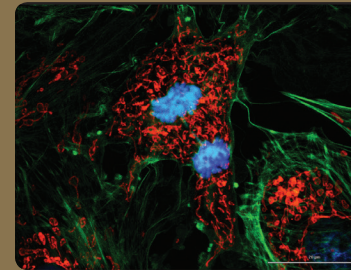
Live Cell Imaging



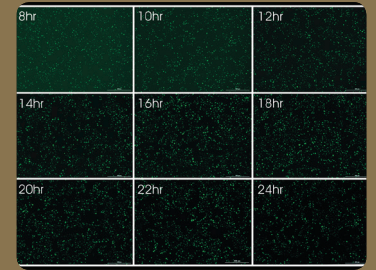
Confluence



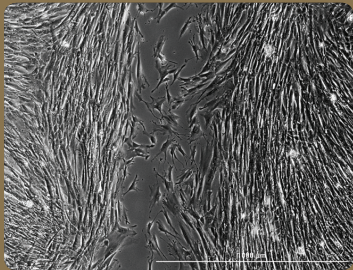
Cell Proliferation



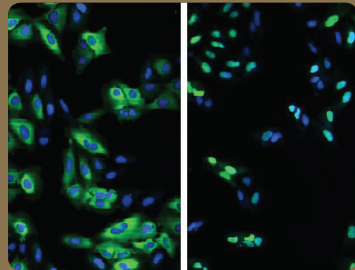
Cell Cycle



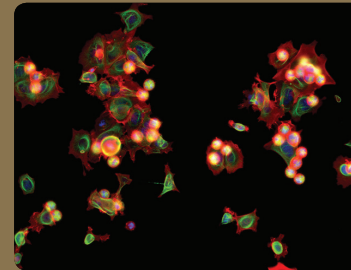
Transfection Efficiency



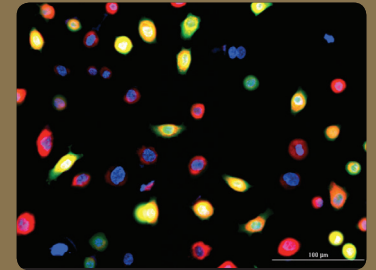
Cell Migration/Invasion



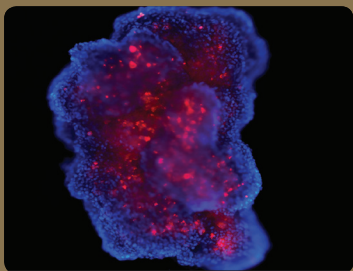
Translocation Assays



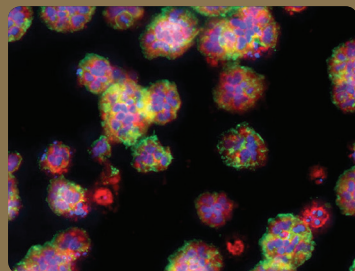
Drug Discovery



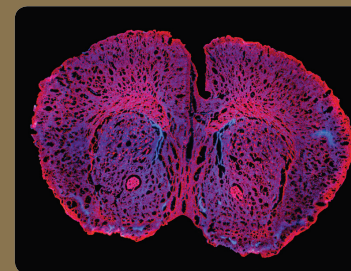
Phenotypic Assays



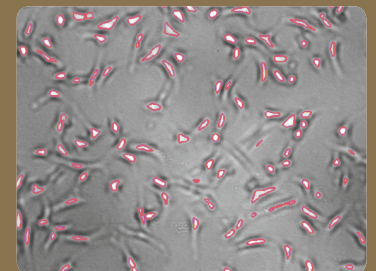
3D Spheroids



3D Scaffolds

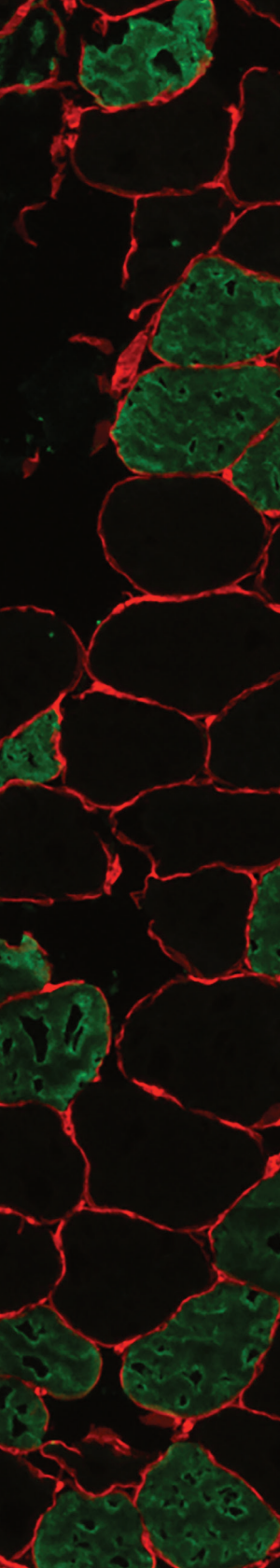


Histology



Label-free Cell Counting



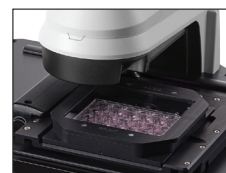


## High quality imaging, high quality accessories

BioTek offers a wide range of accessories to help increase productivity and expand your capabilities.



High quality Zeiss and Olympus objectives, from 1.25x to 100x oil immersion, to suit a wide range of applications.



Humidity and gas control chamber; controlled environment for live cell assays, with a rapid gas re-charge function to quickly replenish as necessary.



Compatible with microscope slides, Petri and cell culture dishes, cell culture flasks (T25, T75), 6-1536-well microplates, counting chambers, chamber slides and hemocytometers.



Dual reagent injectors provide quick inject/image to observe fast reaction.



Available joystick controller to enable quick and accurate sample movement.



CO<sub>2</sub>/O<sub>2</sub> gas controller to facilitate kinetic live cell assays.

## Specifications

General	
Microplate types	Imaging: 6- to 1536-well plates
Other labware	Microscope slides, Petri and cell culture dishes, cell culture flasks (T25, T75), counting chambers (hemocytometers), chamber slides Support for labware up to 1.5" tall
Temperature control	4-Zone™ incubation to 40 °C and Condensation Control™ with optional environmental control cover
CO <sub>2</sub> and O <sub>2</sub> control	0 – 20% CO <sub>2</sub> control and 1 – 19% O <sub>2</sub> control, with optional Gas Controller
Environmental control cover	Top cover for light tight imaging, incubation and gas control (option)
X/Y stage resolution	Lead screw driven stage with 0.1 micron resolution
Humidity control	Humidity chamber with rapid gas recharge (option)
Software	Gen5™ 3.0 Microplate Software included Gen5 Image+ and Image Prime Software available for advanced image analysis (option) Gen5 Secure, Secure Image+ and Secure Image Prime available for 21 CFR Part 11 compliance
Imaging	
Imaging modes	Fluorescence, brightfield, color brightfield, and phase contrast
Imaging methods	Single color, multi-color, montage, time lapse, Z-stacking, burst mode
Light source	High power LEDs (available wavelengths: 365 nm, 390 nm, 465 nm, 505 nm, 523 nm, 590 nm, 623 nm, 655 nm, 740 nm)
Camera	16-bit gray scale, Sony CCD, 1.25 megapixel
Camera binning	Optional 2x2 binning for focus and/or image capture
Camera exposure range	5 milliseconds to 4 seconds
Image outputs available	Raw Images: 16-bit TIFF Saved Images: TIF, JPG, BMP, PNG, EMF, GIF Movies: MP4, WMV
Filter cube capacity	Up to 4 onboard, user-replaceable cubes
Colors available	DAPI, CFP, GFP, YFP, RFP, Texas Red, CY5, CY7, Acridine Orange, CFP-YFP FRET, Chlorophyll, Phycoerythrin (PE), Propidium Iodide, CY5.5, TagBFP, GFP (Ex)-CY6 (Em), RFP (Ex)-CY5 (Em)
Objective capacity	6 onboard, user-replaceable objectives
Available objectives	Fluorescence: Air: 1.25x, NA .04; 2.5x (2.25x eff), NA: .07; 2.5x (2.75x eff), NA: .12; 4x, NA: .13; 10x, NA: .30; 20x, NA: .45; 40x, NA: .60; 60x, NA: .70 Oil: 60x, NA: 1.42; 100x, NA: 1.40 Phase Contrast: 4x, NA: .13; 10x, NA: .30; 20x, NA: .45; 40x, NA: .60
Image collection rate	Single Well Fastest Frame Rate Capture (integration time dependent) Full Resolution: up to 10 frames per second for single color images 2x2 Binning: up to 20 frames per second for single color images
Automated functions	Autofocus, user-trained autofocus, auto exposure, auto LED intensity
Autofocus method	Image-based autofocus Laser autofocus option
Microscope stage control	Gen5 Software control Optional joystick controller
Reagent Injector Module (option)	
Number	2 syringe pumps
Dispense volume	5 – 1000 µL in 1 µL increments
Dispense tip options	Aligned tip – aligned with optical path for dispensing for fast kinetic assays Offset tip – dispensing is offset from the optical path
Dead volume	<1.65 mL with back flush
Labware supported	6- to 384-well microplates, Petri and cell culture dishes, chamber slides
Dispense precision	≤ 2% at 50 – 200 µL
Dispense accuracy	± µL or 2%

Specifications are subject to change. Performance values represent the average observed factory test values.