

Agilent BioTek Cytation C10 Confocal Imaging Reader

The bench-size microplate imaging and analysis workhorse



Agilent BioTek Cytation C10 Confocal Imaging Reader



The Agilent BioTek Cytation C10 confocal imaging reader brings cost-effective, automated spinning-disk confocal microscopy to any lab that needs it, along with an established multimode reading design in a single, easy-to-use instrument.



The Agilent BioTek Cytation C10 shown with CO₂/O₂ gas controller and dual-reagent injectors.

A compact, affordable confocal imager for every laboratory



Expertise gained over several years of Cytation development, along with customer feedback, resulted in the Cytation C10—an automated confocal microscope with excellent performance at a truly attainable price.

High-quality optical components



Olympus

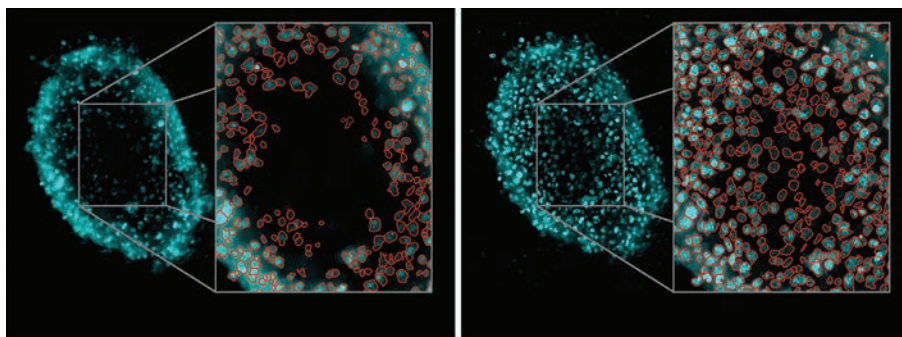


Hamamatsu



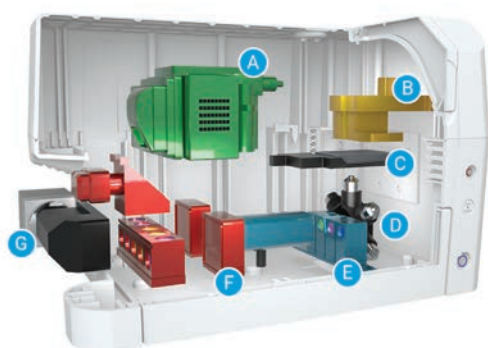
Semrock

High-quality components including Olympus air, water immersion and phase contrast objectives, Hamamatsu sCMOS Orca camera and Semrock filters, and other well-known brands are used in Cytation C10, enabling the capture of stunning, publication-quality images.



Confocal—improved image quality and analysis

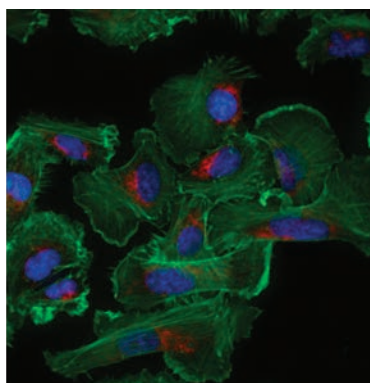
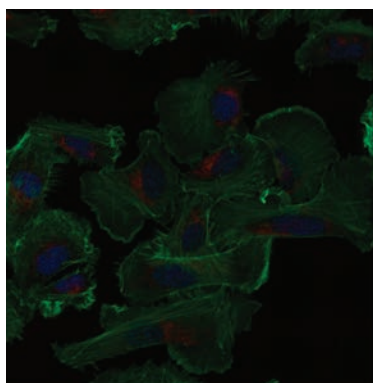
Confocal microscopy can enable you to see a level of detail in your samples that is not possible with widefield optics. Not only can you obtain improved image quality, you can get improved quantification and analysis with confocal images and Agilent BioTek Gen5 software. Widefield (left), confocal (right).



- A.** Monochromator-based multimode reader module
- B.** Transmitted light optics
- C.** Plate carrier
- D.** Automated six-position objective turret
- E.** LED-based widefield module
- F.** Laser-based spinning-disk confocal module
- G.** sCMOS camera

Confocal imager and multimode plate reader in one

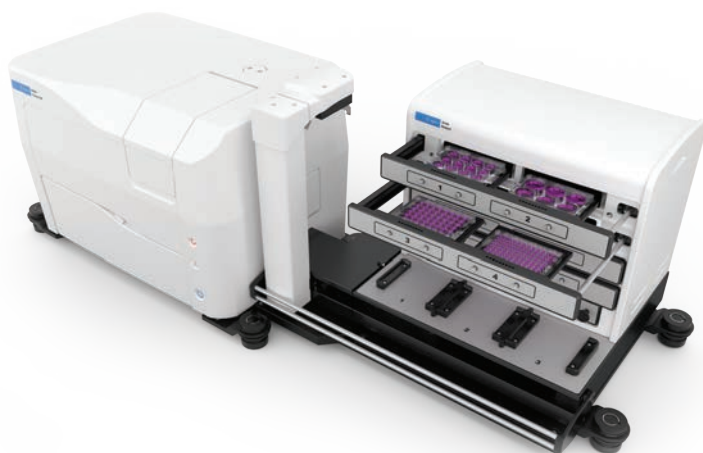
With a combination of spinning-disk confocal and widefield imaging, plus multimode reading, Cytation C10 is truly ready for any assay. Also, since Cytation C10 is a modular, upgradable instrument, you can get the functionality you need today and add modules later as your needs expand.



Water immersion objectives decrease exposure times

Water immersion objectives capture more light with lower exposure times, reducing the potential for phototoxicity and photobleaching in live cells. The increased signal enables more detailed analyses without increasing gain and noise. A proprietary bubble detection function ensures high quality image capture.

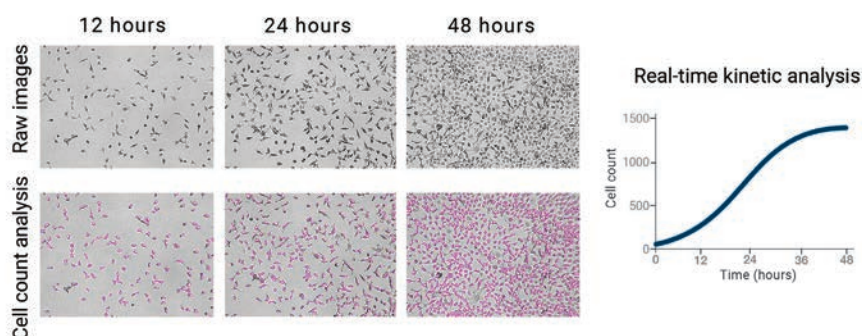
Cells captured with 40x air (left), 40x water (right) using identical exposure settings.



Automated, multiplate confocal and widefield live cell analysis

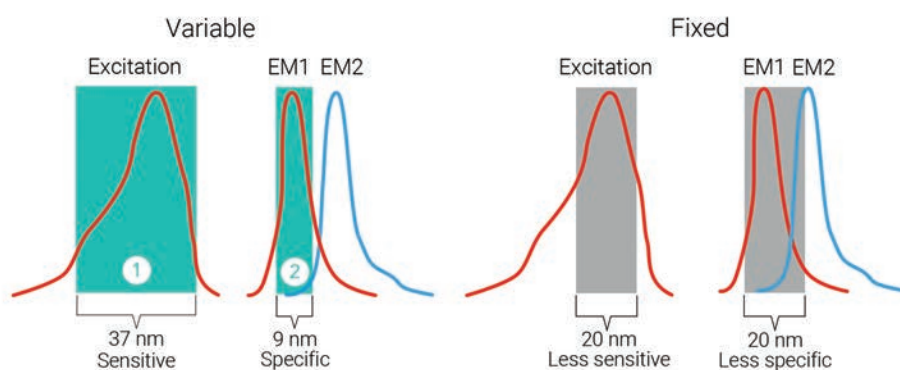
When paired with the Cytation C10 confocal imaging reader, the Agilent BioTek BioSpa 8 automated incubator automates a variety of applications in multiple plates for real-time live cell imaging and analysis.

This system provides incubation and humidity control for up to eight microplates when conducting long-term kinetic assays.



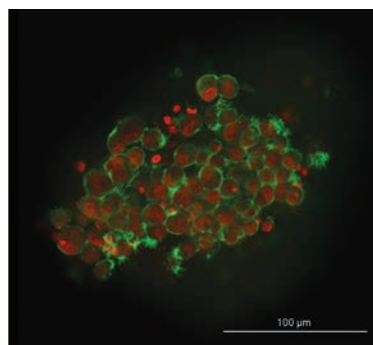
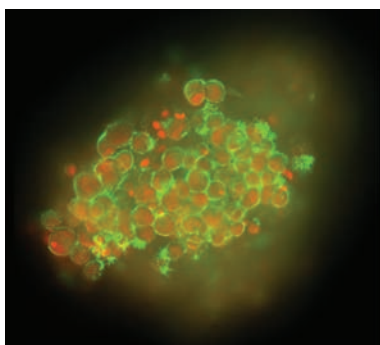
Environmental controls for live cell imaging

Successful live cell kinetic imaging relies on a consistent environment, including temperature and CO₂/O₂ control and monitoring. Cytation C10 provides the perfect environment to grow and analyze live cells over time. Powerful movie maker and kinetic analysis software tools allow visualization and analysis of time-lapse experiments.



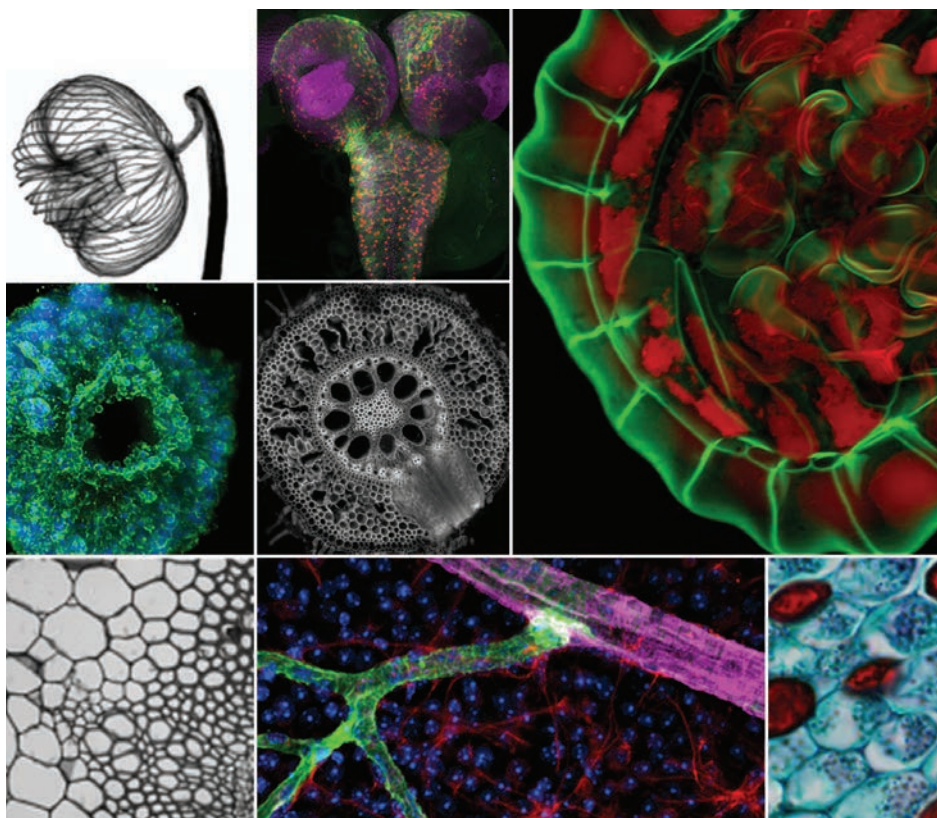
Variable bandwidth for sensitivity and specificity

The plate reader optics of Cytation C10 use a quad monochromator design with variable bandwidth. The bandwidth can be set anywhere between 9 and 50 nm in 1 nm increments. Large bandwidth settings provide increased sensitivity and lower limits of detection. Small bandwidth settings provide increased specificity when multiple signals are present, which reduces signal crosstalk and enhances assay performance.



The deep-sectioning disk brings clarity to thick biology

The deep-sectioning spinning disk (DSD) diminishes crosstalk in thick samples, allowing a clear view into thick tissue samples and spheroids. Gather more detailed data from deep within challenging sample types. Spheroid Z-slice captured with standard 60 μm disk (left) and 60 μm DSD (right).



Confocal plus widefield creates stunning images and analysis

Cytation C10 captures stunning detail in a wide variety of sample types. Use widefield imaging for faster acquisition of large samples at lower magnification; switch to confocal to image small intracellular details or 3D samples. Or combine both modes for highly multiplexed, multiparameter imaging experiments.

Water immersion objectives or the 60 μm deep-sectioning disk (DSD) can help capture the highest quality, finely detailed images of challenging sample types, like thick tissues and spheroids.

- 3D cell culture
- Nucleic acid quantification
- Live cell imaging
- Biochemical assays
- Label-free cell counting
- Histology
- Calcium flux
- Apoptosis and necrosis
- Cell migration and invasion
- Cell proliferation
- Cell viability and toxicity
- Confluence
- Fast kinetics
- Genotoxicity
- Immunofluorescence
- Microbiology
- Phenotypic assays
- Stem cell differentiation
- Transfection efficiency
- Whole-organism imaging
- Normalization
- Phagocytosis
- Signal transduction
- Translocation

Ready for any assay

With its combination of flexible plate reading and advanced microscopy mode, Cytation C10 is truly ready for any assay. Contact us to learn how Cytation C10 can transform your lab and greatly increase your productivity.

1	1	2	3
A	1989	13885	1157
B	1960	3703	16597
C	13209	3132	1629

(1) Plate reader quickly identifies GFP-positive wells.

2	1	2	3
A			
B			
C			

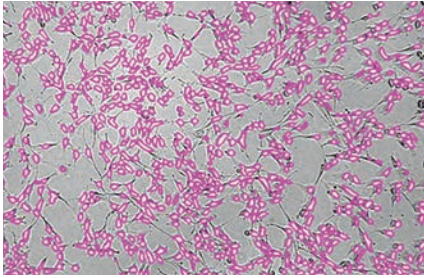
(2) Only GFP-positive wells are imaged, saving both time and computer memory.

Hit picking—multimode detection and imaging saves time and data storage

Acquiring imaging datasets can take a long time and can require high data-storage capacity. The hit picking function saves time and storage. Set the hit picking criteria, quickly prescreen the microplate with the plate reader optics, and Cytation C10 will automatically image only the samples that meet your criteria.

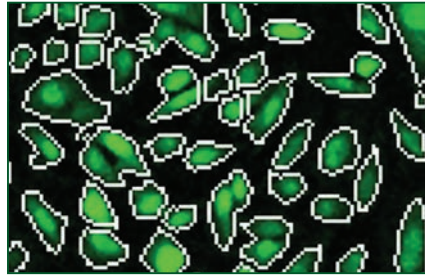
Applications

Label-free cell counting



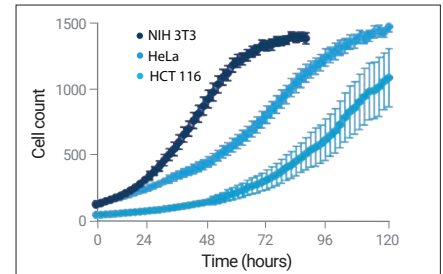
Use high-contrast brightfield imaging for accurate, label-free cell counting without the need for cell-labeling dyes.

Calcium kinetics



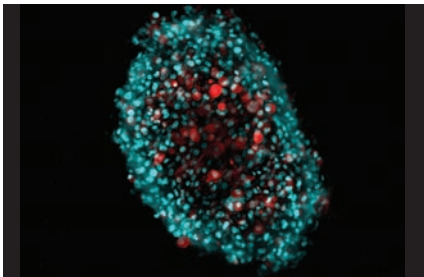
The Cytation C10 dual-reagent injectors enable capture and analysis of fast inject/image assays like calcium kinetics.

Time-lapse live cell imaging



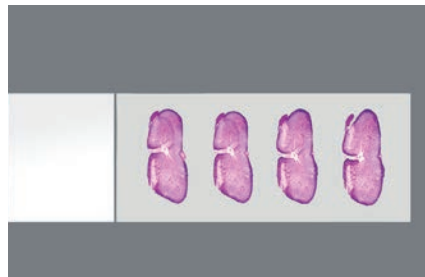
Cell proliferation studies require controlled environments. Cytation C10 automates image capture through analysis.

3D cell culture



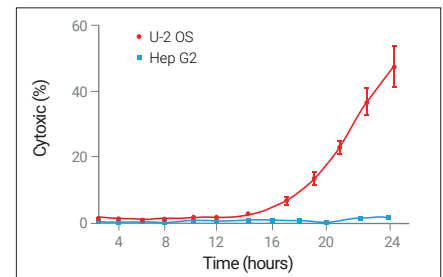
Automate 3D spheroid and tumoroid assays using environmental control and Agilent BioTek Automated Media Exchange with an Agilent BioTek liquid handler. Z-stack, Z-project, and analyze with Gen5 software.

Slide scanning



H&E staining and color brightfield allow easy, rapid image capture and analysis. Automate and increase throughput by integrating Cytation C10 to the Agilent BioTek BioStack microplate stacker.

Cell viability/toxicity



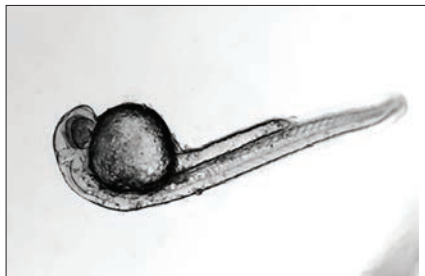
Classic live/dead assays use fluorescent probes or membrane-impermeable dyes; viability or toxicity is measured in real time.

Microbiology



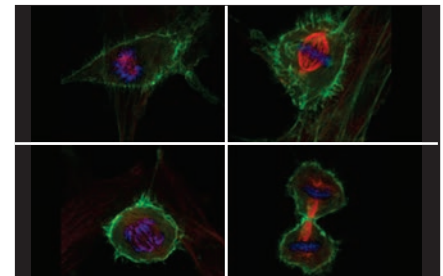
High-magnification objectives, multiple imaging channels, and advanced image analysis capabilities enable analysis of a variety of microorganisms.

Whole-organism imaging



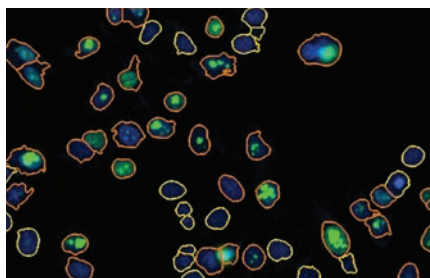
Essential for current drug screening methods, whole organisms like zebrafish and nematodes are effectively imaged and analyzed with Cytation C10 and Gen5 software.

Cell cycle analysis



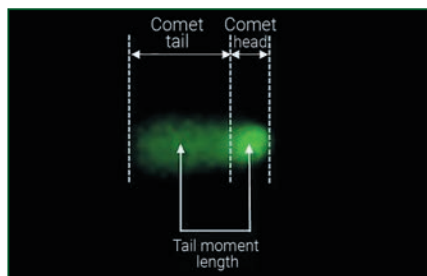
The progression of cell growth through the cell cycle is a highly regulated process. Automated histogram analysis of objects facilitates threshold definition.

Transfection efficiency



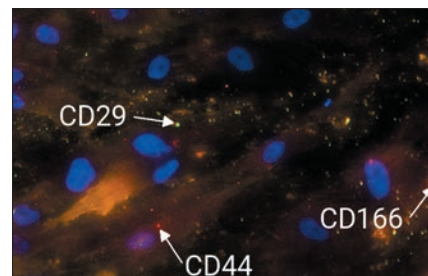
Cytation C10 provides intuitive image analysis for automating the assessment of transfection efficiency.

Genotoxicity



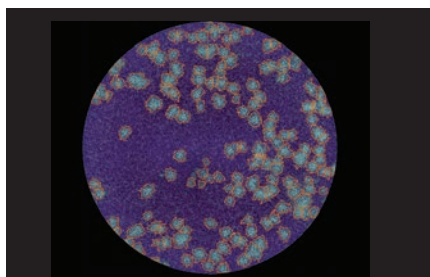
The destructive effects of mutagens such as high-energy radiation and chemicals on nuclear DNA are measured with the comet assay and γ H2AX immunofluorescence assays. Cytation C10 is an ideal imaging platform for these assays.

Stem cell differentiation



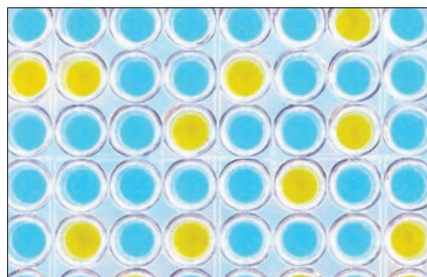
Cytation C10 facilitates the process of stem cell differentiation to find highly physiologically relevant cells for drug discovery.

Virology



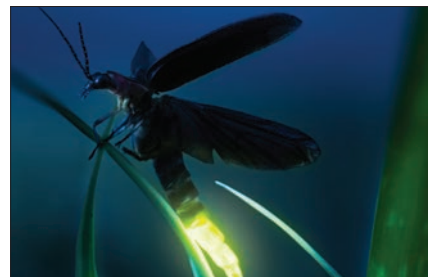
The flexibility of the Cytation C10 and Gen5 software enable a variety of assays to be imaged and analyzed when performing viral research.

ELISA



ELISA methods with colorimetric, fluorescent, and luminescent substrates are easily detected with Cytation C10.

Luciferase reporter assays



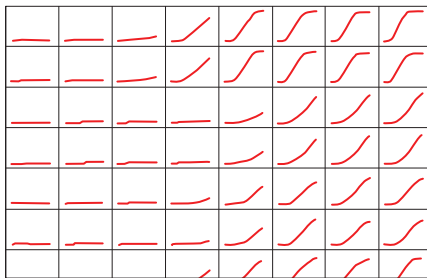
Luciferase-based reporter assays measure luminescent signal. This enables users to quantify the activity of factors that affect particular signaling pathways.

Nucleic acid and protein quantification



Nucleic acid and protein quantification assays can be executed by spectrophotometric or fluorescent determination with Cytation C10, in microplates or in microvolumes with the Agilent BioTek Take3 microvolume plate.

Cell growth

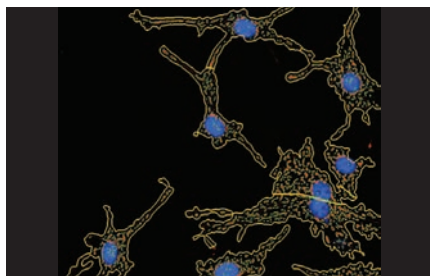


Microbial growth assays, including those with yeast and bacteria, can be measured by several methods, including turbidimetric measurements with Cytation C10.

Advanced Gen5 image analysis modules

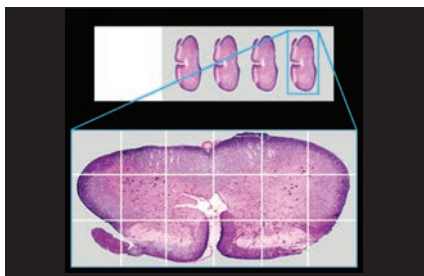
Beyond the powerful analysis features in Gen5 software, specialized add-on modules expand method-specific analyses to automate processes and generate advanced metrics.

Spot counting



The Agilent BioTek Gen5 spot counting module enables users to gain information about a second set of objects within primary and/or secondary mask compartments, which are tied to the original primary mask data.

Automatic region of interest



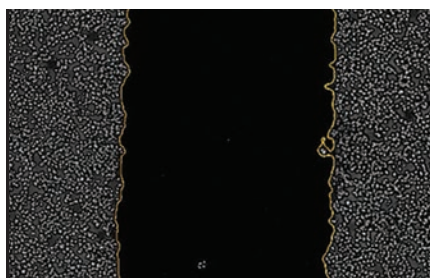
The automatic region-of-interest (AutoROI) module is a three-step process to eliminate superfluous image capture. A low magnification step quickly images the entire area. The regions of interest are automatically identified, and then imaged at high magnification.

Single object tracking



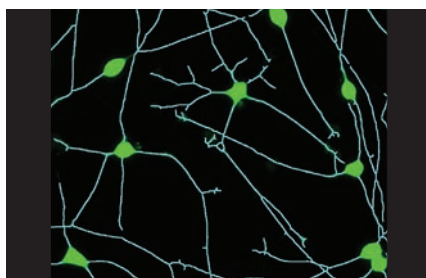
The Agilent BioTek Gen5 object tracking module provides the ability to track single objects over time. Relative motility can be visualized by selecting single cells or entire populations within an image. Calculated metrics include total distance, Euclidean distance, and mean, median, and maximum object velocity.

Scratch Assay app



The Agilent BioTek Scratch Assay app provides an integrated workflow to capture, process, and analyze images from 2D scratch-wound healing assays. Predefined protocols for 24- and 96-well plates include automated processing and analysis to calculate average wound width, percent wound confluence, and maximum wound healing rate.

Neurite outgrowth



The Agilent BioTek Gen5 neurite outgrowth module accurately quantifies neuronal cell metrics and provides masking options including soma and neurite masks, along with skeletonized images. The module also accurately detects neuronal outgrowth in kinetically monitored, unlabeled live cells.

Peripherals



BioStack microplate stacker

BioStack manages up to 50 microplates for automated imaging or multimode operations, including delidding and relidding of microplates used with cell-based assays. BioStack can also be used for automated microscope slide loading.



CO₂/O₂ controller

The compact gas controller maintains control of CO₂ and O₂ levels in Cytation C10 to support live cell assays.

Dual-reagent injector

The dual-reagent injector module enables fast inject/read processes. Angled injector tips protect cell monolayers from shear stress during injection.



Take3 microvolume plate

Measure multiple 2 μ L samples at a time with the Take3 microvolume plate, used with Cytation C10. Microvolume nucleic acid and protein quantification made fast and easy.



Labware adapters

Specialized holders can accommodate a variety of labware, including microscope slides, Petri dishes, tissue culture flasks, and chamber slides.



Technical Details



General	
Microplate Types	Imaging: 6- to 1536-well plates Detection: monochromator: 6- to 384-well plates
Other Labware Supported	Microscope slides, Petri and cell culture dishes, cell culture flasks (T25), counting chambers (hemocytometer)
Environmental Controls	Temperature control to 45 °C CO ₂ and O ₂ control
Shaking	Linear, orbital, double-orbital with user-selectable amplitude
Automation Compatibility	BioStack, BioSpa 8 and third-party products
Software	Gen5 microplate reader and imager software (included) Optional software: <ul style="list-style-type: none"> Gen5 Image+: Image analysis Gen5 Image Prime: Advanced image analysis Gen5 Secure, Gen5 Secure Image+, Gen5 Secure Image Prime: Enables 21 CFR Part 11 compliance Neurite outgrowth module, AutoROI module, spot counting module, object tracking module, and Scratch Assay app
Imaging	
Imaging Modes	Confocal: Fluorescence Widefield: Fluorescence, brightfield, high-contrast brightfield, color brightfield, and phase contrast
Imaging Methods	Single color, multicolor, time lapse, montage, Z-stacking, Z-stack montage
Camera Options	Hamamatsu scientific CMOS camera 16-bit Sony CMOS camera
Light Sources	Confocal: Six-line laser Widefield: Long-life LEDs
Objectives/Capacity	1.25x to 60x air, 4x to 40x phase contrast, 20x to 60x confocal, and 40x to 60x water immersion objectives/six-position automated turret
Imaging Filter Cubes Available	Confocal: CFP, CY5, DAPI, GFP, RFP, TRITC Widefield: More than 20 filter/LED cubes available
Imaging Filter Cubes Capacity	Confocal: Four user-replaceable fluorescence cubes Widefield: Four user-replaceable fluorescence cubes plus brightfield
Autofocus Methods	Image-based autofocus Laser autofocus
Multimode Detection	
Detection Modes	UV-Vis absorbance, fluorescence intensity, luminescence
Reading Methods	End point, kinetic, spectral scanning, well-area scanning
Physical Characteristics	
Dimensions	18.5" H x 27" W x 20" D (46.9 x 68.6 x 50.8 cm)
Weight	122 lb (53.3 kg)
Power	100/240 VAC at 50/50 Hz input Instrument: External 250 W power supply Laser light source: External 250 W power supply Hamamatsu sCMOS camera: External 75 W power supply

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© Agilent Technologies, Inc. 2023, 2024
Published in the USA, March 19, 2024
5994-4075EN

