

Agilent BioTek Cytation 5 Cell Imaging Multimode Reader

Powerful imaging and microscopy, and advanced multimode detection



Agilent BioTek Cytation 5 Cell Imaging Multimode Reader

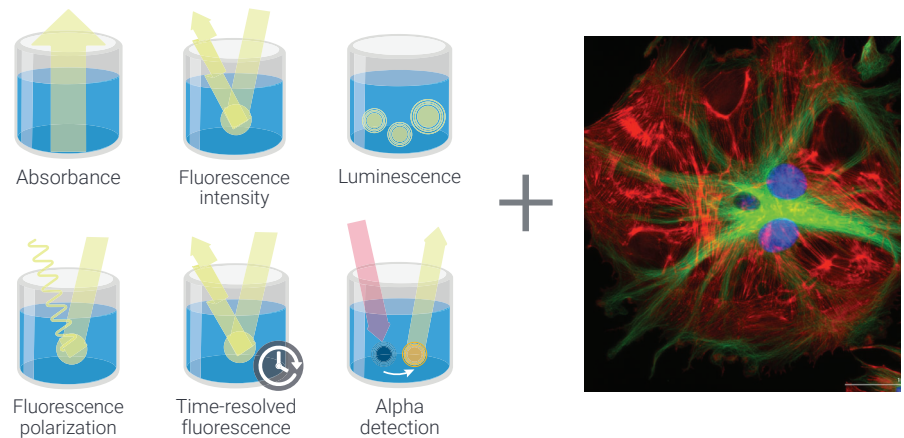


The Agilent BioTek Cytation 5 cell imaging multimode reader combines automated, digital microscopy and conventional microplate detection in a configurable, upgradable platform. This proprietary design, along with Agilent BioTek Gen5 microplate reader and imager software, enables automated workflows across a vast range of biochemical and imaging applications.



Cytation 5 shown with
CO₂/O₂ gas controller and
dual-reagent injector.

Multimode plate reader with sophisticated imaging



Cytation 5 extends the legacy of the Agilent BioTek multimode plate readers with a modular and upgradable imaging mode. Imaging opens up a range of applications for cell-based assays that cannot be performed on a standard plate reader. Information on cell morphology, localization of signal, cell count, and more is obtained using the Cytation 5 imaging mode.

Plate reading: absorbance, fluorescence; luminescence; advanced reading modes.

Imaging: fluorescence; phase contrast; high-contrast brightfield; brightfield; color brightfield.

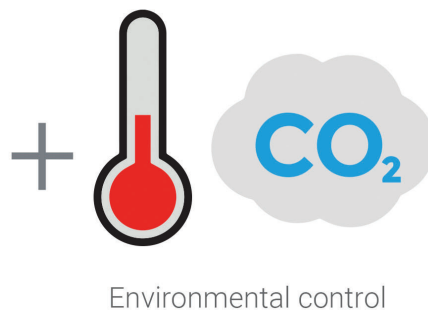
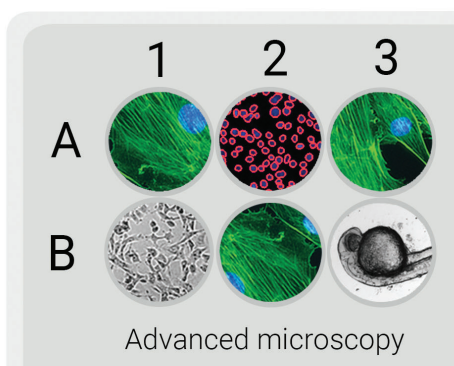
"The combination of luminescence fluorescence and imaging covers a wide variety of assays from one instrument. It is robust and can accommodate numerous fluorescent wavelengths using LED cubes, has a wide range of objectives, and the software is easy to use."

– **Laura McMullan,**
CDC

- 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
- Phenotypic assays
- Stem cell differentiation
- Transfection efficiency
- Whole-organism imaging
- Normalization
- Phagocytosis
- Signal transduction
- Translocation
- Fast kinetics
- Genotoxicity
- Immunofluorescence
- Microbiology

Ready for any assay

With its combination of hybrid plate reading and advanced microscopy mode, Cytation 5 is truly ready for any assay. Contact us to learn how Cytation 5 can transform your lab and greatly increase your productivity.



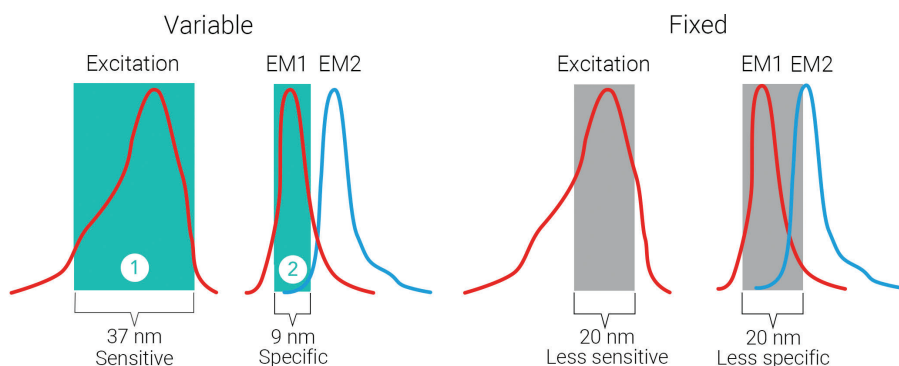
Advanced microscopy–unlimited possibilities

Cytation 5 automates many traditionally manual microscopy tasks, from slide scanning to time-lapse live cell assays; from low to high magnification. Cytation 5 is ready for any imaging assay.

Flexible hardware: Six-objective turret, 1.25x to 60x, 20+ colors available, wide field of view (WFOV) camera.

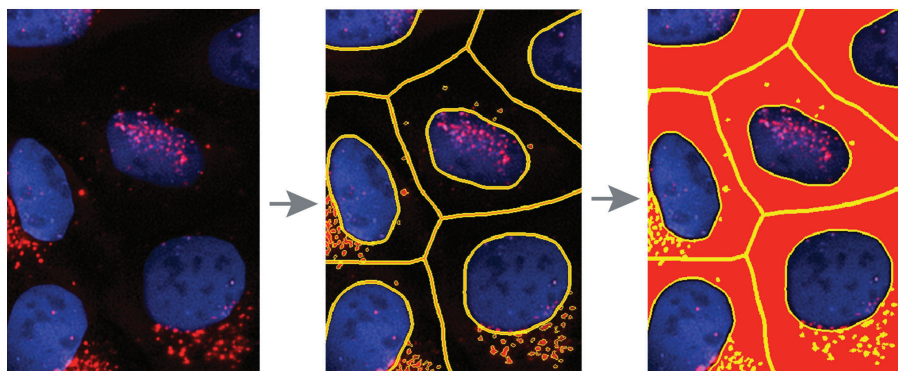
Full automation: Automated stage, autofocus, automated turret.

Live cell imaging: Temperature and gas (CO₂ and O₂) control for time-lapse live cell imaging.



Variable bandwidth for sensitivity and specificity

Cytation 5 offers quad monochromator optics with variable bandwidths. The excitation and emission bandwidths can be set between 9 and 50 nm in 1 nm increments. Large bandwidths **(1)** provide increased sensitivity and lower limits of detection. Small bandwidths **(2)** provide increased specificity when multiple signals are present, reducing crosstalk and enhancing assay performance.

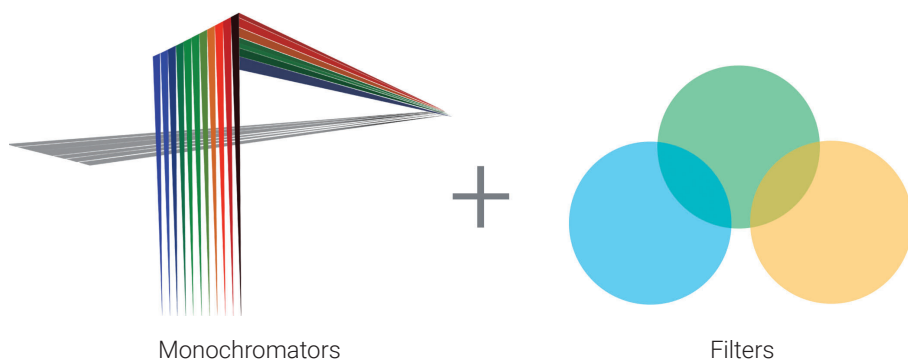


Powerful image processing and analysis

No need to process and analyze images one by one on a dedicated computer. In Gen5, preprogram your analysis tasks and walk away.

Image processing: stitching, Z-projection, deconvolution, digital phase contrast.

Image analysis: cell count, confluence, cytoplasm analysis, intracellular analysis, subpopulation analysis, signal translocation, and much more.



Hybrid plate reader—flexibility and performance

With its unique combination of monochromator and filter optics, Cytation 5 is an advanced plate reader that delivers both the flexibility and performance you need for any microplate assay in your lab.

Monochromator: variable bandwidth, absorbance, fluorescence, luminescence.

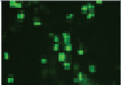
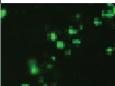
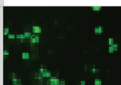
Filters: fluorescence polarization, time-resolved fluorescence, Alpha laser.



Cytation 5

The Cytation 5, along with Gen5 software, can easily automate and manage a broad range of imaging, microscopy, and multimode detection application workflows.

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

2	1	2	3
A			
B			
C			

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

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

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

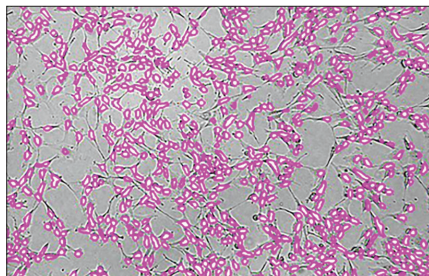


Microvolume analysis with the Take3 microvolume plate

Enable microvolume analysis with the Cytation 5 using the Agilent BioTek Take3 microvolume plate. Measure up to 16 or 48 samples in one run and save time compared to using single-sample devices. Gen5 microplate reader and imager software has customizable protocols for ssDNA, dsDNA, RNA, and protein quantification in 2 μ L.

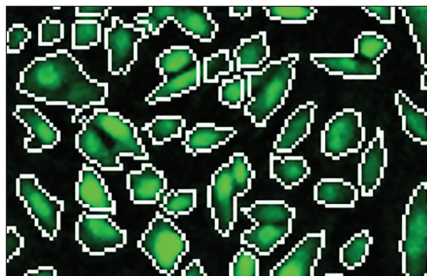
Applications–imaging

Label-free cell counting



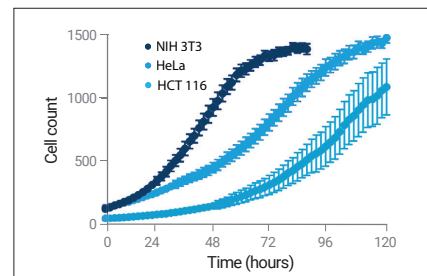
Use high-contrast brightfield imaging for accurate label-free cell counting without the need for cell labeling dyes.

Calcium kinetics



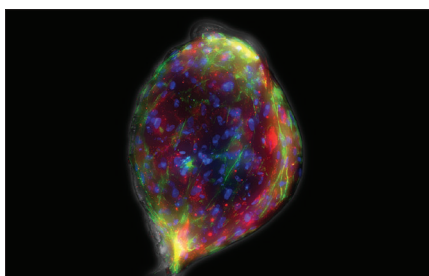
The Cytation 5 dual-reagent injectors enable capture and analysis of fast inject/image assays like calcium kinetics.

Time-lapse live cell imaging



Cell proliferation studies require controlled environments. Cytation 5 automates image capture through analysis.

3D cell culture



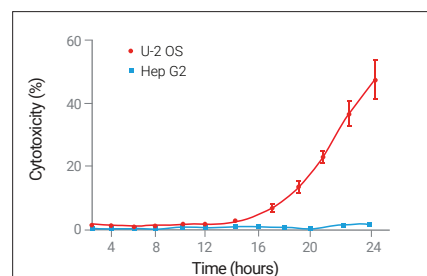
Automate 3D spheroid and tumoroid assays using environmental control and Agilent BioTek Automated Media Exchange with an Agilent BioTek liquid handler. Z-stack, Z-project, and analyze with Gen5 software.

Microbiology



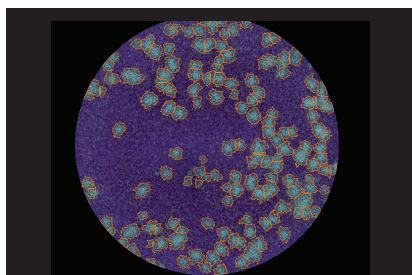
High-magnification objectives, multiple imaging channels, and advanced image analysis capabilities enable analysis of a variety of microorganisms.

Cell viability/toxicity



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

Virology



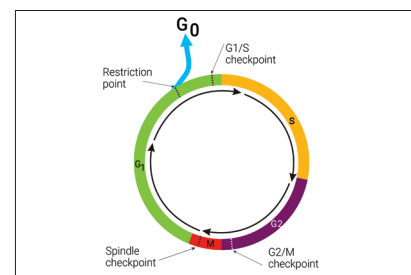
The flexibility of the Cytation 5 and Gen5 software enable a variety of assays to be imaged and analyzed when performing viral research.

Whole-organism imaging



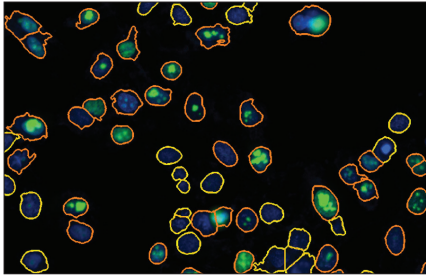
Essential to current drug screening methods, whole organisms like zebrafish and nematodes are effectively imaged and analyzed with Cytation 5 and Gen5 software.

Cell viability/toxicity



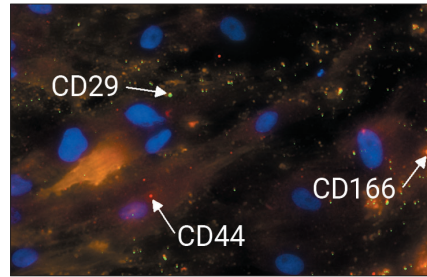
The progression of cell growth through the cell cycle is a highly regulated process. Automated histogram analysis of objects facilitates threshold definition.

Transfection efficiency



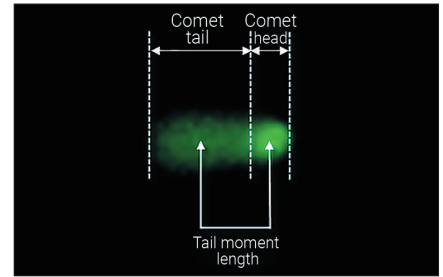
Cytation 5 provides intuitive image analysis for automating the assessment of transfection efficiency.

Stem cell differentiation



Cytation 5, when integrated with the Agilent BioTek BioSpa 8 automated incubator and MultiFlo FX multimode dispenser, automates analysis of the lengthy process of stem cell differentiation to find highly physiologically relevant cells for drug discovery.

Genotoxicity

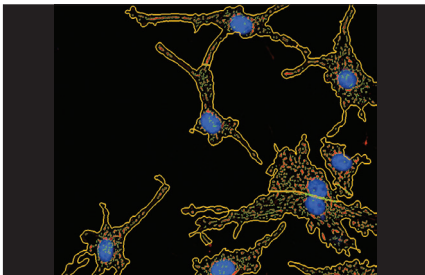


The destructive effects of mutagens such as high-energy radiation and chemicals on nuclear DNA are measured with the comet assay and H2AX immunofluorescence assays. Cytation 5 is an ideal imaging platform for these assays.

Advanced Gen5 image analysis modules

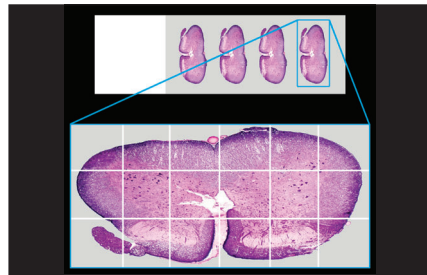
Beyond the powerful analysis features in Gen5 software, specialized add-on modules expand method-specific analyses to automate processes and generate advanced metrics.

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



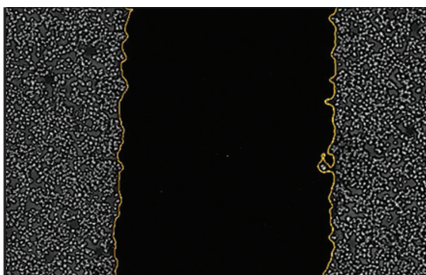
The automatic region-of-interest (AutoROI) module is a three-step process to eliminate superfluous image capture. A low magnification step quickly images the entire area. The regions of interest are automatically identified, and then imaged at high magnification.

Single object tracking



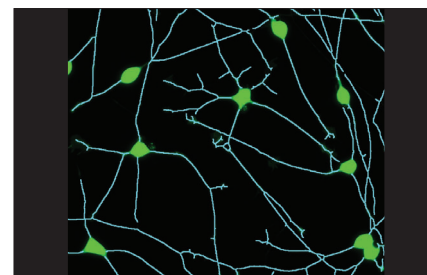
The Agilent BioTek Gen5 object tracking module provides the ability to track single objects over time. Relative motility can be visualized by selecting single cells or entire populations within an image. Calculated metrics include total distance, Euclidean distance, and mean, median, and maximum object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

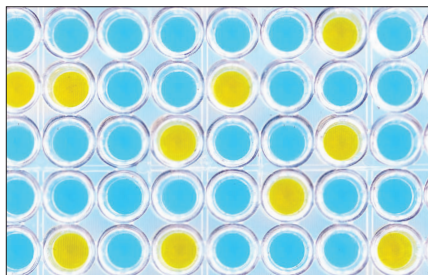
Neurite outgrowth



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.

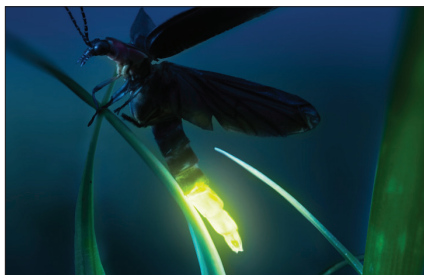
Applications—multimode detection

ELISA



ELISA methods with colorimetric, fluorescent, and luminescent substrates are easily detected with Cytation 5.

Luciferase reporter assays



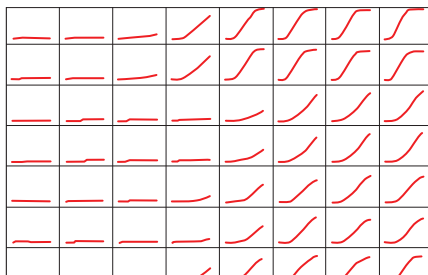
Luciferase-based reporter assays measure luminescent signal. This enables users to quantify the activity of factors that affect particular signaling pathways.

Nucleic acid and protein quantification



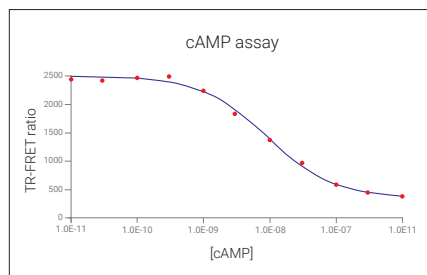
Nucleic acid and protein quantification assays can be executed by spectrophotometric or fluorescent determination with Cytation 5, in microplates or in microvolumes with the Agilent BioTek Take3 microvolume plate.

Cell growth



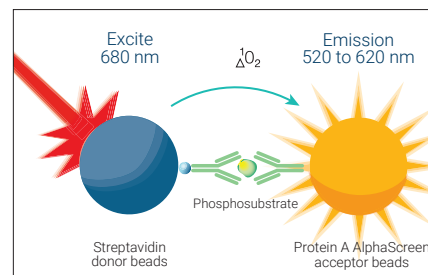
Microbial growth assays, such as those using yeast and bacteria, can be measured by several methods, including turbidimetric measurements with Cytation 5.

TR-FRET



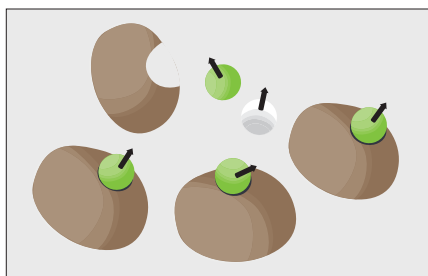
TR-FRET and HTRF are sensitive, robust methods. Cytation 5 and Gen5 provide excellent sensitivity for optimal Z-factors.

AlphaScreen



AlphaScreen technology provides high signal-to-background ratios. The measurable energy transfer is emitted in the 520 to 620 nm range.

Fluorescence polarization



Fluorescence polarization is widely used in research labs to study molecular binding or dissociation events, and in screening labs to screen for drug candidates.