

# CYTATION|7

cell imaging multi-mode reader

BioTek's most comprehensive  
cell imaging multi-mode reader.



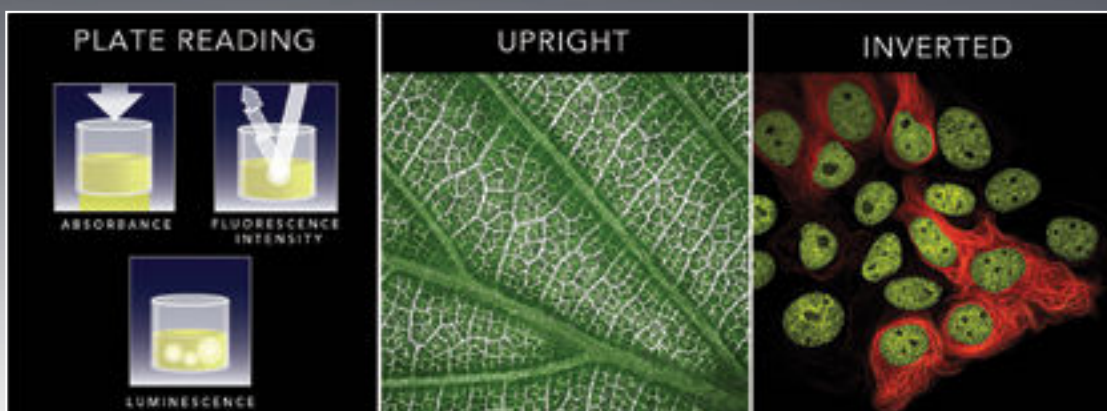
# CYTATION<sup>7</sup>

cell imaging multi-mode reader

Cytation 7 is BioTek's most comprehensive imaging plate reader with both inverted and upright microscopy enabling a wide range of applications in a compact and easy-to-use instrument.



## Multi-mode plate reader with sophisticated imaging



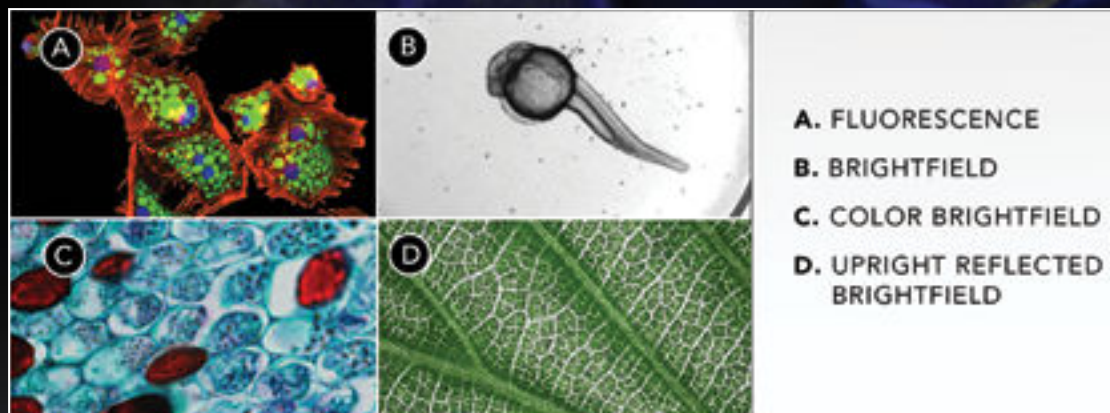
Cytation 7 builds on the legacy of the BioTek line of Synergy and Cytation readers with modular and upgradeable modes. Cytation 7 includes both upright and inverted microscopy optics which opens up a wide range of cellular and reflected light applications that cannot be performed on a standard plate reader. Information on cell morphology, localization of signal, cell count, object identification and quantification can be obtained with Cytation 7's imaging modes. The monochromator plate reader optics allows running all of the standard plate reader assays.

## Ready for any assay



With its combination of flexible plate reader and advanced microscopy mode, Cytation 7 is truly ready for any assay. Contact us to learn how Cytation 7 can transform your lab and greatly increase your productivity.

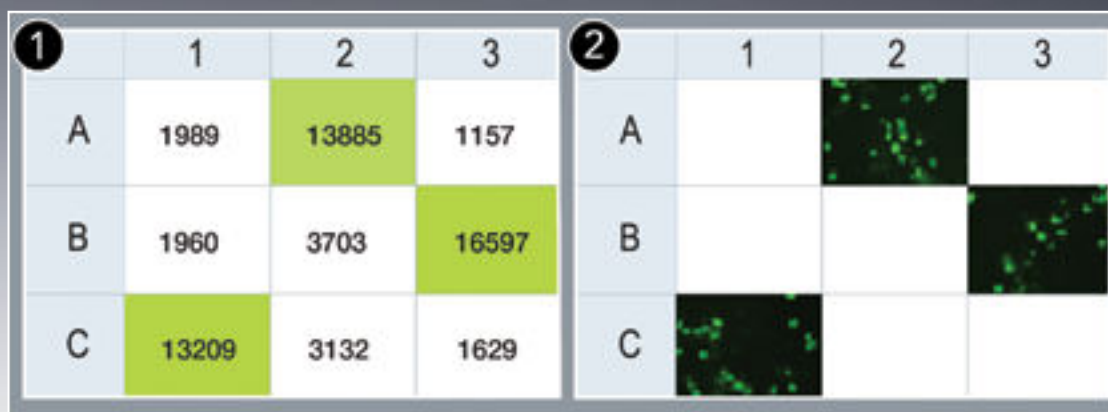
## Comprehensive imaging solution



Cytation 7's inverted microscopy module supports fluorescence, brightfield and color brightfield from 1.25x to 60x to analyze both large objects and intracellular details.

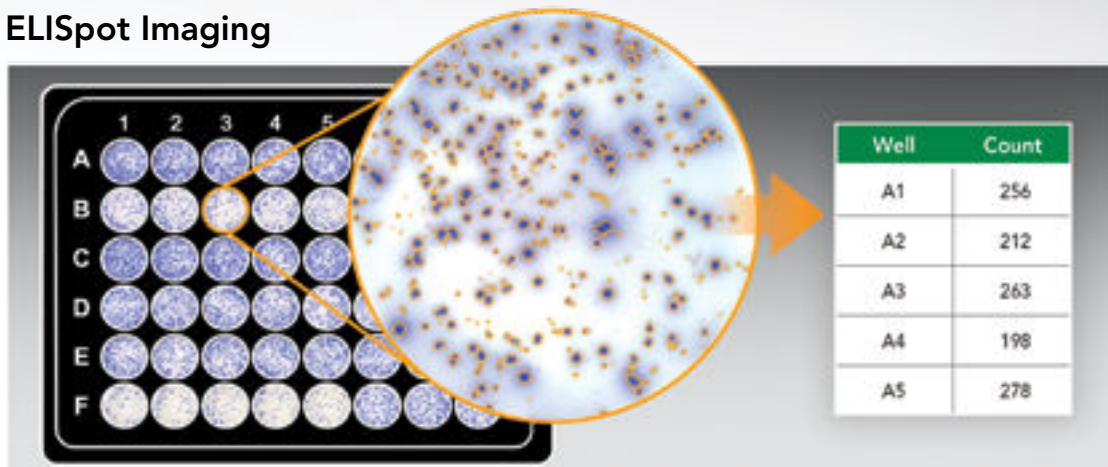
Cytation 7's upright reflected light imaging module enables a broad range of applications such as ELISpot, colony counting, material inspection, and much more.

## Hit-picking: Multi-mode detection + imaging



**(1)** Plate reader quickly identifies GFP positive wells. **(2)** Only GFP positive wells are imaged, saving both time and computer memory.

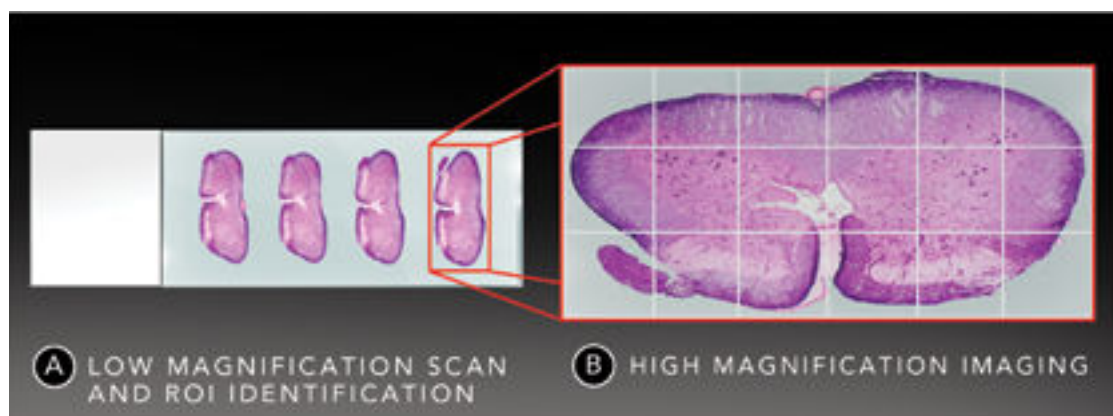
## ELISpot Imaging



Cytation 7's upright imaging module can be used to automate assays such as ELISpot, in which cell secretions are rendered visible through the use of a colorimetric reaction. Cytation 7 fully automates image acquisition, processing, image analysis and object count.

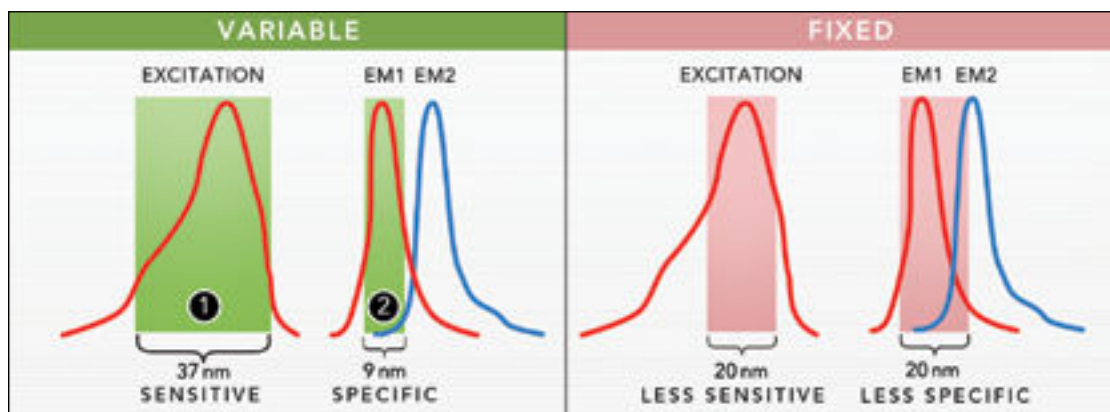


## ROI Identification feature



Cytation 7 and Gen5™ software facilitate ROI identification. Cytation 7 scans samples at low magnification before prompting the user to identify regions of interest to be imaged at high magnification. This greatly accelerates the process of imaging ROIs in batches of complex microscopic samples.

## Variable bandwidth for sensitivity and specificity



The plate reader optics of Cytation 7 uses 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.

## Micro-volume analysis with Take3 plate



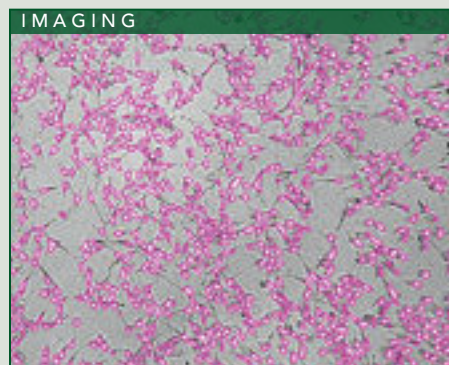
Turn your Cytation 7 into a micro-volume analysis system with Take3. You can run 16 or 48 samples in one run to save a lot of time compared to single-sample devices. Gen5 is pre-programmed for ssDNA, dsDNA, RNA and protein quantification in 2  $\mu$ L.

# APPLICATIONS

BioTek's Cytation 7, along with Gen5 software, can automate a broad range of application workflows. Here are several examples of important applications in Imaging & Microscopy and Multi-Mode Detection that are easily managed with Cytation 7 Cell Imaging Multi-Mode Reader.

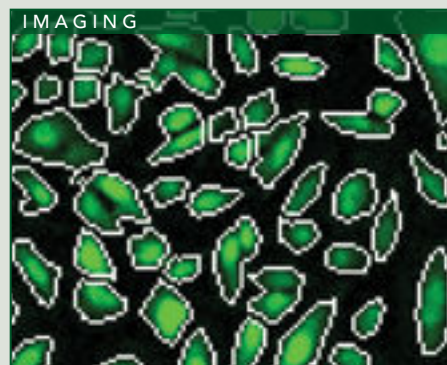


## Label-free cell counting



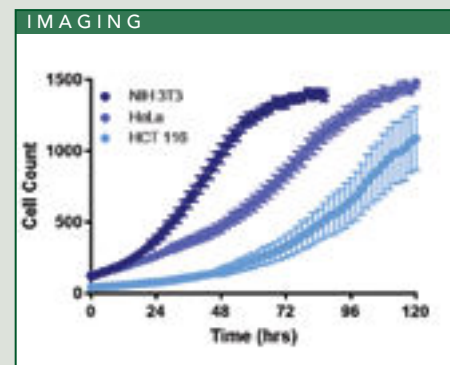
Use high contrast brightfield imaging for accurate label free cell counting without the need for cell labeling dyes.

## Calcium kinetics



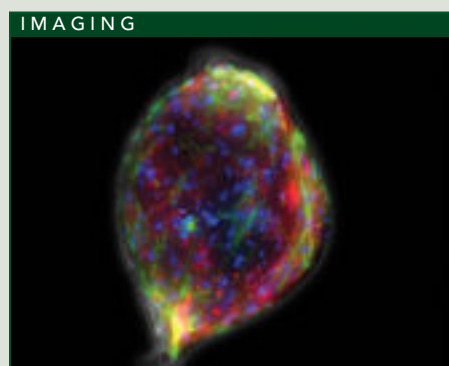
Cytation 7's dual reagent injectors enable capture and analysis of fast inject/image assays like calcium kinetics.

## Time-lapse live cell imaging



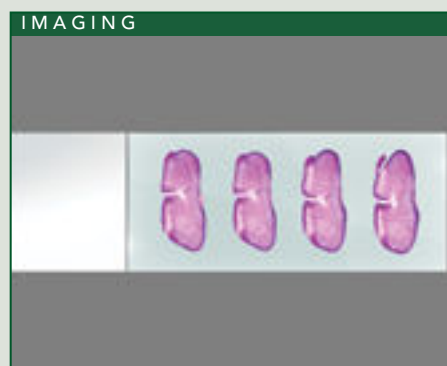
Cell proliferation studies require controlled environments. Cytation 7 automates image capture through analysis.

## 3D cell culture



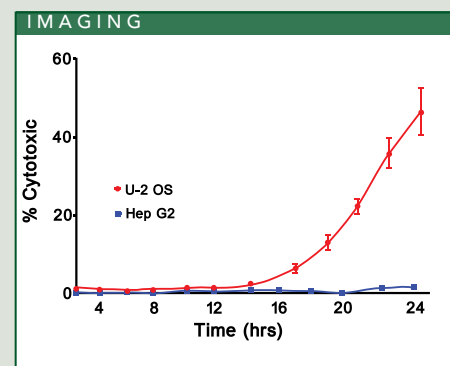
Automate 3D spheroid and tumoroid assays using environmental control and automated media exchange with a BioTek liquid handler. Z-stack, z-project and analyze with Gen5 software.

## Slide scanning



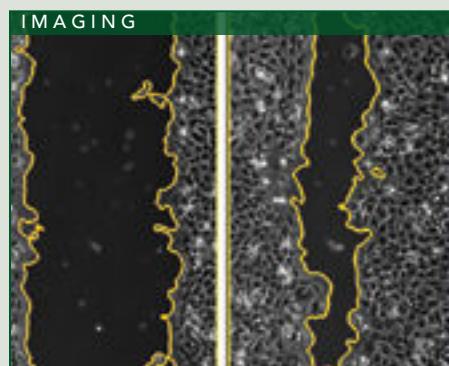
H&E staining and color brightfield allow easy, rapid image capture and analysis. Automate and increase throughput by integrating Cytation 7 to BioStack™ Microplate Stacker.

## Cell viability/toxicity



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

## Cell migration



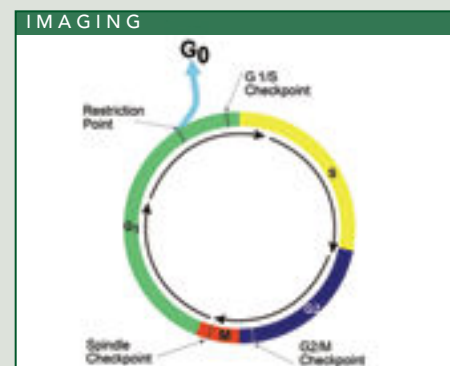
High throughput cell migration assays are enabled with AutoScratch Wound Making Tool, with time-lapse imaging under environmental controls in Cytation 7.

## Whole organism imaging



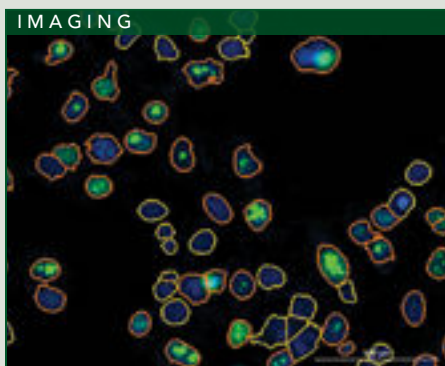
Essential to current drug screening methods, whole organisms like zebrafish and nematodes are effectively imaged and analyzed with Cytation 7 and Gen5 software.

## Cell cycle analysis



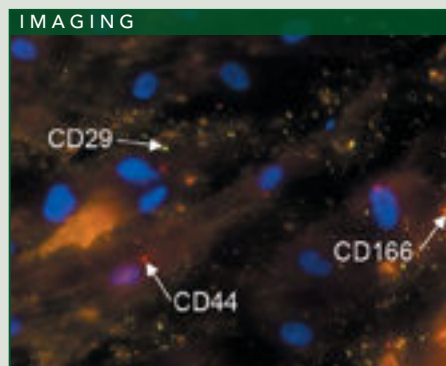
The progression of cellular growth through the cell cycle is a highly regulated process. Automated histogram analysis of objects facilitates threshold definition.

## Transfection efficiency



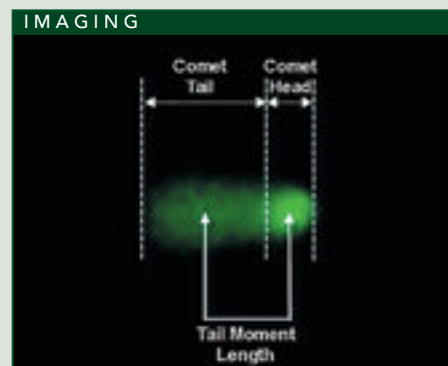
Cytation 7 provides intuitive image analysis for automating the assessment of transfection efficiency.

## Stem cell differentiation



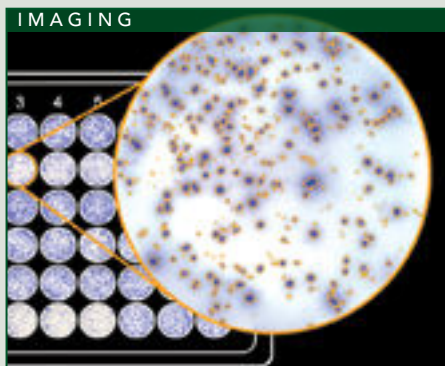
Cytation 7, integrated with BioSpa™, Automated Incubator and MultiFlo™ FX, Multi-Mode Dispenser automate analysis of the lengthy process of stem cell differentiation to find highly physiologically relevant cells for drug discovery.

## Genotoxicity



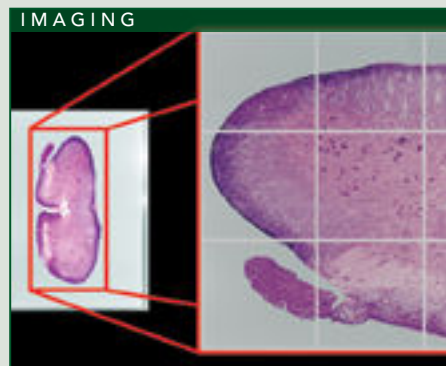
The destructive effects of mutagens such as high energy radiation and chemicals on nuclear DNA are measured with the comet assay and γH2AX immunofluorescence assays. Cytation 7 is an ideal imaging platform for these assays.

## ELISpot



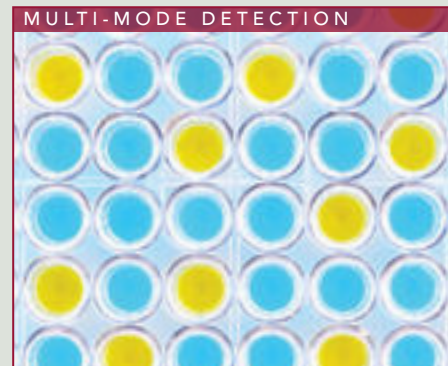
ELISpot assays, in which cell secretions are made visible via colorimetric reactions, can be automated using Cytation 7's upright microscope.

## ROI identification



An accelerated process for imaging ROIs in complex microscopic samples: use the functionality in Cytation 7 to scan samples at low magnification to find ROIs. Then scan at higher magnification.

## ELISA



ELISA methods with colorimetric, fluorescent and luminescent substrates are easily detected on Cytation 7.

## Luciferase reporter assays



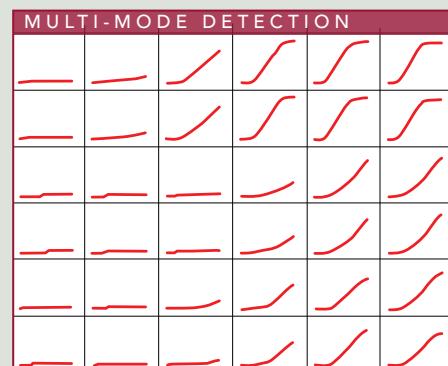
Luciferase-based reporter assays measure luminescent signal, allowing the quantification of the activity of factors affecting the signaling pathways under investigation.

## Nucleic acid & protein quantification



Nucleic acid and protein quantification assays can be executed by spectrophotometric or fluorescent determination with Cytation 7, in microplates or in micro-volumes with the Take3 Plate.

## Cell growth



Microbial growth assays including yeast and bacteria can be measured by several methods, including turbidimetric measurements with Cytation 7.



# P E R I P H E R A L S

BioTek offers peripherals and accessories to facilitate imaging and multi-mode workflows with Cytation 7. Here, we have highlighted a few key peripherals; See the Imaging & Microscopy Accessories section on [www.biotek.com](http://www.biotek.com) for more.



## **BioSpa 8 Automated Incubator**

BioSpa's environmental controls and labware handling capabilities, integrated with Cytation 7, facilitate long term live cell kinetic imaging processes for up to 8 microplates and other labware.



## **BioStack Microplate Stacker**

BioStack manages up to 50 microplates for automated imaging or multi-mode operations, including de-lidding and re-lidding of microplates used with cell-based assays.



## **CO<sub>2</sub>/O<sub>2</sub> controller**

The compact gas controller maintains control of CO<sub>2</sub> and O<sub>2</sub> levels in Cytation 7 to support live cell assays.



## **Peltier cooling module**

The Peltier Cooling Module cools the interior after incubated processes, enabling efficient switching between multiple applications without unwanted temperature influences. The Cooling Module maintains environmental stability within Cytation 7, allowing <1 °C rise in ambient temperature, regardless of external and internal temperature fluctuation.



## **Take3 Micro-Volume Plate**

Measure multiple 2 µL samples at a time with the Take3™ Micro-Volume Plate, used with Cytation 7. Micro-volume nucleic acid and protein quantification made fast and easy.

## TECHNICAL DETAILS

General	
Multi-mode reading methods	Endpoint, kinetic, spectral scanning, well area scanning
Detection modes	UV-Vis absorbance, fluorescence intensity, luminescence
Imaging methods	Single color, multi-color, montage, time-lapse, z-stacking
Autofocus methods	Image-based and laser autofocus
Microplate types	Multi-mode detection: 6- to 384-well plates Imaging: 6- to 1536-well plates
Other labware supported	Microscope slides, Petri and cell culture dishes, cell culture flasks (T25), counting chambers (hemocytometers) Take3 Micro-Volume Plates
Environmental controls	Temperature control to 45 °C CO <sub>2</sub> /O <sub>2</sub> controller Peltier cooling module
Automation	BioSpa 8, BioStack and 3rd party automation capable
Modularity and configurability	Cytation 7 can include inverted and upright microscopes or upright only; with or without multi-mode detection. Modules can be added as laboratory needs change.
Inverted Microscope	
Imaging modes	Fluorescence, color brightfield, user-selectable brightfield/high contrast brightfield
Camera	Wide field of view (WFOV) monochrome camera
Imaging objectives/capacity	1.25x to 60x magnification/6 position automated turret
Imaging filter cubes	More than 20 filter/LED cubes available
Image filter cube capacity	4 color channels plus brightfield
Upright Microscope	
Imaging modes	Reflected light and transmitted light microscopy
Camera	Wide field of view (WFOV) color camera
Lenses	Finder scope, 2x, 4x, and 8x magnification



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