

official distributor

SZABO-SCANDIC HandelsgmbH  
Quellenstraße 110, A-1100 Wien  
T. +43(0)1 489 3961-0  
F. +43(0)1 489 3961-7  
mail@szabo-scandic.com  
www.szabo-scandic.com



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SCANDIC

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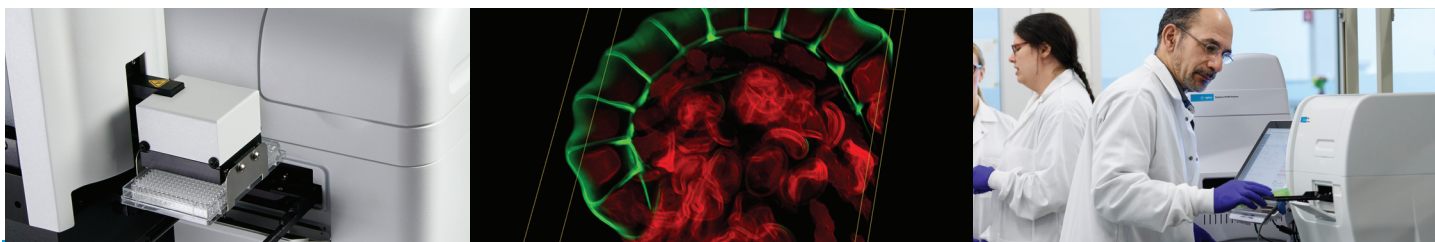


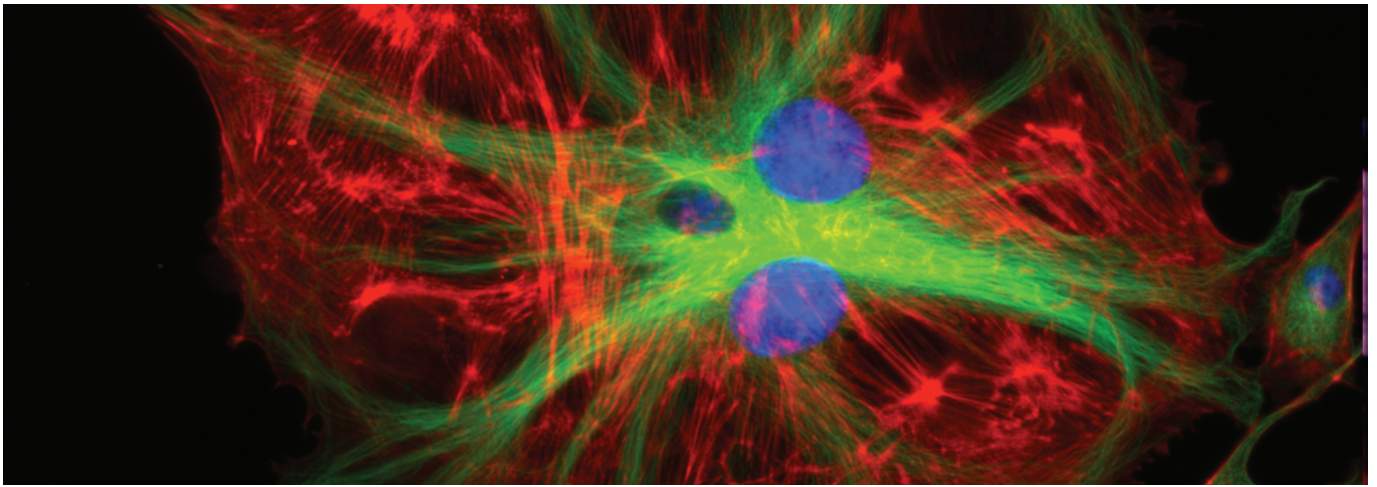
Agilent

Trusted Answers

# Agilent BioTek Life Science Instrumentation

**Catalog 2022:** imaging and microscopy, detection, liquid handling, and robotics





# Growing toward a deeper understanding of the cell

Our advanced cell analysis technologies provide both quantitative and phenotypic results faster, for deeper insight into your live cell samples.

Agilent BioTek is a global leader in the development, manufacture, and sale of life science instrumentation, including imaging and microscopy, multimode detection, liquid handling, and automation systems.

Agilent BioTek instrumentation is used to aid in the advancement of life science research, facilitate the drug discovery process, provide rapid and cost-effective analysis, and to enable sensitive and accurate quantification of a wide range of molecules across diverse applications.

For more detailed information and up-to-date product specifications, visit our website, at: [www.agilent.com/lifesciences/biotek](http://www.agilent.com/lifesciences/biotek).



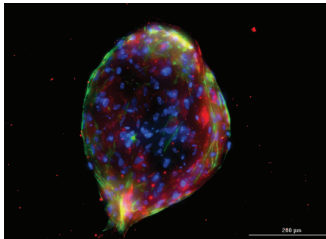


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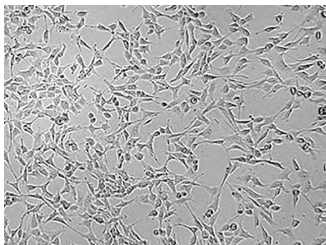
# Applications

Agilent BioTek life science instrumentation addresses a very broad range of applications in imaging and microscopy, multimode microplate detection, associated liquid handling, and assay automation. Browse our growing list of timely research applications, and see how BioTek instrumentation can facilitate even the most complex workflows.



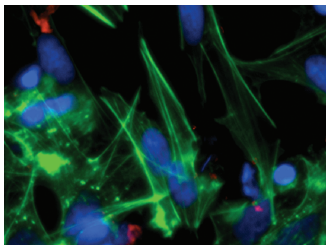
## 3D cell culture

Some of the most commonly incorporated technologies to create the desired 3D spheroids or tumoroids include polymeric and biological scaffolds, ultralow attachment, hanging drop, and magnetic bioprinting. 3D workflows are performed in a variety of microplate types, and are commonly analyzed using microplate reader optics or digital widefield microscopy.



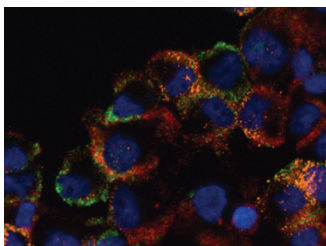
## Live cell assays

Agilent BioTek instruments support a wide variety of live cell applications, addressing diverse biological processes in timescales of milliseconds to weeks. Features such as reagent injectors, temperature and CO<sub>2</sub>/O<sub>2</sub> control, and humidity monitoring enable applications in live cell kinetics and uninterrupted monitoring of rapid cellular reactions.



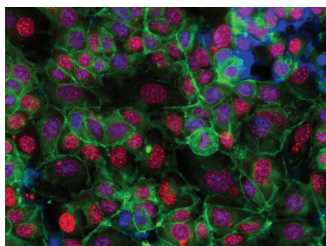
## Immunofluorescence

Immunofluorescence reagent options range in scope from individual primary antibodies, to out-of-box multiplexed assay solutions for cell signaling pathway analysis. The basic IF workflow can be labor-intensive, thus benefits from automation in order to manage assays in microplates, microscope slides, Petri dishes, and cell culture inserts.



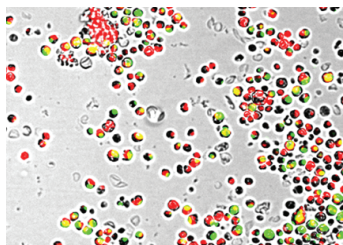
## Biomarker assays

Quantitative determination of specific mRNA and protein biomarkers in cells can be performed using either conventional microplate reading, to obtain an averaged cell population result, or digital widefield microscopy, to provide individual cell responses and the spatial location of a molecular biomarker. Biomarker assays are commonly run in higher density microplates using automated microscopy and multimode detection, as well as automated liquid handling for sample preparation through to reagent addition.



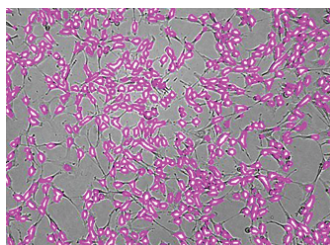
## Phenotypic assays

Phenotypic assays provide quantitative cellular structure and function data, measured using digital widefield microscopy. They are used to assess whether a compound or drug produces a desired effect on the cells. Agilent BioTek Gen5 software can analyze multiple cellular phenotypic parameters simultaneously, including size, shape, area, and intensity. This can provide a comprehensive picture of individual cell phenotypes and entire population phenotypes, which allows a researcher to make an educated decision.



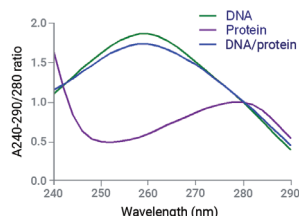
### Cellular and microbial growth

Microplate-based cell proliferation assays can take on many different characteristics. For example, fluorescence stains that bind DNA are used to quantitate relative changes in DNA using whole-well PMT-based detection, and stained nuclei can be counted using microscopy followed by image-based analysis. Furthermore, compounds that become colored, fluorescent, or luminescent when acted upon in live cells can be used to quantitate cell growth or cell death, though increases or decreases of their signal, respectively.



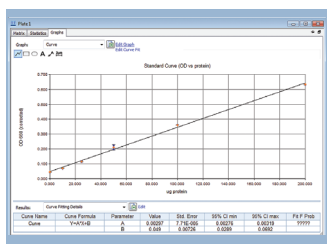
### Cell-based assays

Microplate readers have adapted to accommodate advances in, and the complexities of, cell-based assays. Highly sensitive detection modes, such as time-resolved fluorescence, aid in the development of robust assays using cell lines or primary cells. Environment control within the detection chamber enables long kinetic readouts. Many of these assays are now incorporated into screening campaigns, where sample throughput and automation are of prime importance.



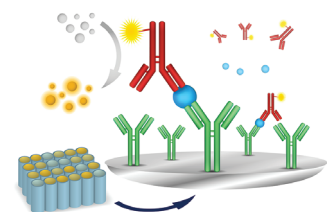
### Nucleic acid quantification

Nucleic acid quantification assays use either absorbance or fluorescence to measure the concentration of DNA or RNA in the sample. With either method, many laboratories have adapted single-cuvette protocols to 96- and 384-well microplate-based formats. These standardized formats, in conjunction with instrumentation capable of recording measurements from them, allow for the rapid quantification of large numbers of samples.



### Total protein quantification

Total protein is quantified using the same methods as nucleic acids: spectrophotometric determination of protein and peptides at A280; colorimetric determination; and fluorometric determination using intrinsic fluorescence or fluorescent probes. Several different fluorescence techniques eliminate many of the problems associated with traditional absorbance-based colorimetric methods that measure total protein content.



### ELISA and related immunoassays

The ELISA technique causes formation of specific immune complexes that can be measured with colorimetric, fluorometric, or luminometric detection; TR-FRET or HTRF, or AlphaScreen and AlphaLISA methods. ELISAs are typically run in 96- to 1536-well microplates, but can also be performed in microvolumes using specialized low-volume plates, such as the the Agilent BioTek Take3 microvolume Plate.





## Make the most of your Agilent BioTek instrument

### Our field applications scientists (FAS) provide unparalleled scientific support

The Agilent BioTek FAS team assists with experimental planning and assay optimization on BioTek instrumentation and software. Most team members are Ph.D.-level scientists, who have performed multiyear, post-doctoral fellowships at top research institutions all over the world. The breadth and diversity of the team's training and expertise, from microbiology to materials science, gives customers the confidence to pursue innovative ideas with Agilent BioTek product lines.

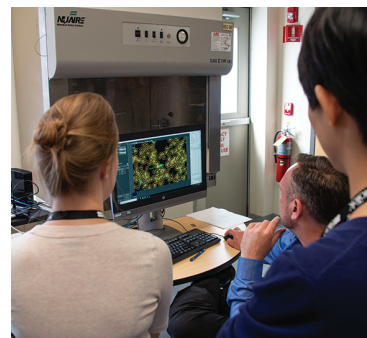
Scientific achievement is reliant upon the successful union of experimental design, instrumentation, and analysis. The FAS team is focused on your research goals and helping you to realize your innovative ideas throughout the purchase process. From predemonstration through to ownership, we'll provide you with:

#### **Customized experimental plan for your demonstration**

Engaging the FAS team ahead of your demonstration allows us to fully understand your research goals. Jointly, we can create a customized experimental plan for your demonstration, to provide an accurate preview of how our products will improve your laboratory's workflows and drive success for all lab members.

#### **Hands-on product demonstration**

Our hands-on product demonstrations ensure that all potential end users have the opportunity to gain experience using the instrument and software on their own samples, with the FAS on hand to provide support and guidance as needed.



## Postdemonstration summary report with data, images, and protocols for you to keep

All data and images are available to you during and after your demonstration, including a custom summary report. Furthermore, all Gen5 protocols generated are saved and shared upon purchase, so you can begin your work as soon as your instrument arrives.

## Assay-specific instrument training

Your initial instrument training is customized to your assays, and leverages the protocols and knowledge developed during your product demonstration. FAS-driven product training ensures that when we leave your lab, you feel ready to run your own experiments on your new equipment.

## Ongoing scientific support

FAS support does not end at the conclusion of your initial training session. Remote scientific support is included with your purchase for the first year and can be renewed thereafter. So, whether you need a hand with optimizing your analysis, or want to brainstorm about a new reagent, assay, or research direction, our scientists are available as an ongoing resource for your laboratory.

## Product technical support

Should you have a hardware, software, instrument troubleshooting, maintenance, or repair question, our technical experts are available to answer your questions. With years of laboratory and instrument experience, our technical support specialists can provide in-depth knowledge and expertise.

## Applications laboratory scientists

Our in-house, full time scientists have over 100 years accumulated experience, all with the goal of assisting our existing and prospective customers with their most difficult challenges. With over 500 scientific articles, including peer-reviewed publications, application notes, and conference presentations on topics such as 3D cell culture methods, quantitative phenotypic assays, and live cell imaging, the Applications Team is experienced in the latest assay technologies.

To request service for Agilent BioTek products, please navigate to: <https://www.agilent.com/en-us/contact-us/page> to find the contacts relevant for your region.



# Agilent BioTek Lionheart FX automated microscope

The Agilent BioTek Lionheart FX automated microscope enables image capture and analysis with a combined power and ease of use that sets it apart from traditional microscopes. Lionheart FX and Agilent BioTek Gen5 microplate reader and imager 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 of these features in one compact system. With Lionheart FX, you can capture, process, analyze, annotate images, and produce videos with ease.

### Whole-organism to subcellular imaging

Lionheart FX offers fluorescence, brightfield, color brightfield, and phase contrast imaging modes to cover a broad range of applications. With four channels and more than fifteen color cubes available, Lionheart FX is compatible with a wide range of fluorophores for multicolor imaging. With magnification of 1.25x to 60x (air), and 60x and 100x oil immersion magnification, as well as new tools in Agilent BioTek Gen5 Image Prime software, the image capture and analysis streamlines the workflow. The automated six-position objective turret provides quick selection of optimal imaging magnification.

### Kinetic live cell assay support

With Lionheart FX, live cell assays can be measured over seconds, minutes, hours, or days. The environmental control cover ensures 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, and the new Agilent BioTek AutoScratch wound making tool automates sample preparation for all migration assays. The dual-reagent injectors provide rapid sequential dispensing and imaging to capture rapidly changing cellular activities.



## Typical research applications

- 2D and 3D cell imaging and analysis
- Cell growth and death dynamics
- Label-free cell counting
- Cell viability/toxicity
- Immunofluorescence
- Phenotypic assays
- Subpopulation analysis
- Translocation assays
- Cell migration/invasion assays
- Wound healing



## Technical details

General	
Microplate Types	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	Incubation to 40 °C with optional environmental control cover
Software	Agilent BioTek microplate reader and imager software included Agilent BioTek Gen5 Secure software for 21 CFR Part 11 compliance (option) Agilent BioTek Image+ and Image Prime software available for full image analysis (option)
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 and incubation control (option)
X/Y Stage Resolution	Lead screw-driven stage with 0.1 µm resolution
Humidity Control	Humidity chamber with rapid gas recharge (option)
Imaging System	
Imaging Modes	Fluorescence, brightfield, high-contrast brightfield, color brightfield, phase contrast
Imaging Methods	Single-color, multicolor, montage, time-lapse, z-stacking, burst mode
Image Processing	Z-projection, digital phase contrast, stitching
Light Source	High-power LEDs; wavelengths from 365–740 nm available
Camera Exposure Range	5 milliseconds to 4 seconds
Image Outputs Available	Raw images: 16-bit TIFF Saved images: TIFF, JPG, BMP, PNG, EMF, GIF Movies: MP4, WMV
Objective Capacity	Six onboard, user-replaceable objectives

Objectives Available	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 objectives available: 4x, NA: .13; 10x, NA: .30; 20x, NA: .45; 40x, NA: .60
Image Filter Cube Capacity	Four fluorescence cubes plus brightfield channel; more than twenty colors available
Automated Functions	Autofocus, auto-exposure, autoLED intensity
Autofocus Method	Image-based autofocus User-trained autofocus Laser autofocus (option)
Image Collection Rate	Single-well fastest frame rate capture: Full resolution: up to 10 frames per second for single-color images 2x2 binning: up to 20 frames per second for single-color images
Microscope Stage Control	Agilent BioTek Gen5 software control Optional joystick controller
Reagent Injectors	
Number	Two syringe pumps
Supported Labware	6- to 384-well microplates, Petri and cell culture dishes, chamber slides
Dead Volume	<1.65 mL with backflush
Dispense Tip Options	Aligned tip: aligned with optical path for dispensing for fast kinetic assays Offset tip: dispensing is offset from the optical path
Dispense Volume	5–1000 µL in 1 µL increments
Dispense Accuracy	±1 µL or 2%
Dispense Precision	≤2% at 50–200 µL
Physical Characteristics	
Power Consumption	250 W (max)
Dimensions	With cover closed or without cover: 17.9" W, 18.3" D, 14.1" H (45.5 x 46.5 x 35.8 cm) With cover fully open: 17.9" W, 18.3" W, 27.5" D (45.5 x 46.5 x 69.8 cm)
Weight	Without environmental control cover: 51 lb (23.1 kg) With environmental control cover: 58 lb (26.3 kg)

# Agilent BioTek Lionheart LX automated microscope

Agilent BioTek Lionheart LX automated microscope is designed for affordability and simplicity. Along with Agilent BioTek Gen5 software, Lionheart LX enables Augmented Microscopy to fully automate image capture, processing, and analysis. Load samples, start a run, and come back to publication-ready images and quantitative data. Lionheart LX can help increase your research output, while reducing processing time and costs.

### Affordable, automated digital microscopy

Lionheart LX has an automated six-objective turret and can contain up to four LED/filter cubes for multichannel image capture. The precise automated stage and autofocus, auto-exposure, and other Gen5 software features enable simple, automated image capture and analysis.

### Multiple imaging modes

With brightfield, color brightfield and fluorescence imaging in four channels, and more than twenty available LED/filter cubes, Lionheart LX offers versatility. Imaging processing from z-stacking to z-projection; montage collection to stitching, plus analysis from label-free cell counting to mitochondrial membrane potential are all accomplished with Lionheart LX and Gen5 software.

### Augmented Microscopy

Augmented Microscopy automates image capture, processing, and analysis workflows for publication-ready images and data. Image capture starts with image-based and laser autofocus, plus autoLED intensity and auto-exposure. Automated image preprocessing optimizes images for downstream analysis, from cell counting to characterization of subcellular details.

### Quick analyze: instant counts

Gen5 software makes it fast and easy to obtain cell counts and confluence calculations directly on the live camera feed from Lionheart LX. Gen5 quickly finds the region of interest and displays counts onscreen, without needing to capture the image. The quick analyze function works for samples in a variety of labware.

### Integrated, compact design

Lionheart LX integrates all microscopy hardware into a very compact footprint, saving valuable bench space. The easily accessible objectives and LED/filter cubes make setup and operation fast and simple, with a minimal learning curve.



## Typical research applications

- 2D and 3D cell imaging and analysis
- Cell counting
- End-point live cell assays: Apoptosis, autophagy, cytotoxicity
- Histology (HandE)
- Label-free cell counting
- Confluence
- Immunofluorescence

## Technical details

General	
Microplate Types	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
Software	Agilent BioTek Gen5 microplate reader and imager software included Agilent BioTek Gen5 Secure for 21 CFR Part 11 compliance (option) Agilent BioTek Gen5 Image+ and Image Prime software available for full image analysis (option)
Imaging System	
Imaging Modes	Fluorescence, high-contrast brightfield, and color brightfield
Imaging Methods	Single-color, multicolor, montage, time-lapse, z-stack, z-stack montage, burst mode
Image Processing	Z-projection, digital phase contrast, stitching
Light Source	High-power LEDs (available wavelengths: 365, 390, 465, 505, 523, 590, 623, 655, and 740 nm)
Camera	Sony CMOS, 16-bit grayscale
Camera Binning	Optional 2 x 2 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: TIFF, JPG, BMP, PNG, EMF, GIF, color TIFF Movies: MP4, WMV
Objective Capacity	Six onboard, user-replaceable objectives
Objectives Available	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; 60x, NA: 1.25; 100x, NA: 1.4; 100x, NA: 1.3 High NA: 20x, NA: 0.75; 40x, NA: 0.95
Image Filter Cube Capacity	Four user-replaceable fluorescence cubes plus brightfield channel; more than twenty colors available
Automated Functions	Autofocus, user-trained autofocus, auto-exposure, autoLED intensity
Autofocus Method	Image-based autofocus Laser autofocus option
Image Collection Rate	Single-well fastest frame rate capture: Full resolution: up to 10 frames per second for single color images 2 x 2 binning: up to 20 frames per second for single color images
Microscope Stage Control	Agilent BioTek Gen5 software control Optional joystick controller
Physical Characteristics	
Power Consumption	60 W (max)
Dimensions	17.9" W, 18.3" D, 14.1" H (45.5 x 46.5 x 35.8 cm)
Weight	51 lb (23.1 kg)



# Agilent BioTek Cytation C10 confocal imaging reader

The Agilent BioTek Cytation C10 confocal imaging reader brings cost-effective automated spinning disk confocal and widefield microscopy, along with established multimode reading design in a single, easy-to-use instrument.

### Compact, affordable confocal imager

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

### Improved image quality and analysis

Confocal microscopy enables detailed visualization of samples that are not effectively imaged with a widefield microscope. Not only can you obtain improved image quality, you can get improved quantification and analysis with confocal images and Gen5 microplate reader and imager software.

### High-quality optical components

High-quality objectives, filters, and other components, including Olympus objectives, Hamamatsu sCMOS Orca camera, and Semrock filters are used in Cytation C10, enabling the capture of stunning, publication-ready images.

### Confocal imaging and multimode plate reader in one

With a combination of spinning disk confocal and widefield imaging, plus multimode reader, Cytation C10 is ready for any assay. And since Cytation C10 is upgradable, you can get the functionality you need today and add modules later as requirements change.

### Confocal and widefield generate 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.

### Environmental controls for live cell imaging

A consistent environment, including temperature control and CO<sub>2</sub>/O<sub>2</sub> control and monitoring provides the perfect environment to grow and analyze live cells over time. Cytation C10 can be integrated to Agilent BioTek BioSpa 8 automated incubator to automate confocal and widefield imaging analysis workflows.

### Variable bandwidth for sensitivity and specificity

The plate reader optics use a quad monochromator with variable bandwidth, selectable between 9 and 50 nm in 1 nm increments. Large bandwidths provide increased sensitivity and lower limits of detection. Small bandwidths provide increased specificity when multiple signals are present, reducing signal crosstalk and enhancing assay performance.



## Typical research applications

### Imaging

- 3D cell culture
- Cell viability/toxicity
- Cell migration
- Automated ROI identification
- Time-lapse live cell imaging
- Label-free cell counting
- Slide scanning
- Whole-organism imaging
- Cell cycle analysis
- Calcium kinetics
- Transfection efficiency
- Stem cell differentiation

### Genotoxicity

### Multimode detection

- ELISA
- Nucleic acid and protein quantification
- Luciferase reporter assays
- Cell growth studies

## Technical details

General	
Detection Modes	UV-Vis absorbance, fluorescence intensity, luminescence
Read Methods	End-point, kinetic, spectral scanning, well-area scanning
Microplate Types	Monochromators: 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 (hemocytometer), Agilent BioTek Take3 microvolume plates
Temperature Control	To 45 °C with Condensation Control
Shaking	Linear, orbital, double-orbital
Software	Agilent BioTek microplate reader and imager software included Agilent BioTek Gen5 Secure for 21 CFR Part 11 compliance (option) Agilent BioTek Image+ and Image Prime software available for full image analysis (option)
Automation	Agilent BioTek BioStack microplate stacker and BioSpa 8 automated incubator compatible, and third-party automation compatible
CO <sub>2</sub> and O <sub>2</sub> Control (option)	Range: 0–20% (CO <sub>2</sub> ); 1–19% (O <sub>2</sub> ), with optional gas controller
Imaging: Confocal Microscope	
Imaging Modes	Fluorescence
Image Processing	Z-projection, digital phase contrast, stitching
Camera	Hamamatsu Orca sCMOS, 16-bit grayscale camera, or Sony CMOS 16-bit grayscale camera
Objective Capacity	Six-position automated turret for user-replaceable objectives
Objectives Available	20x, 40x, 60x
Imaging Filter Cubes/ Capacity Available	CFP, CY5, DAPI, GFP, RFP, TRITC, brightfield/four user-replaceable fluorescence cubes
Laser	Six-line
Automated Functions	Autofocus, user-trained autofocus, auto-exposure, autoLED intensity
Autofocus Method	Laser autofocus (option), software autofocus
Positional Controls	Software control, joystick controller (option)
Image Methods	Single-color, multicolor, montage, time-lapse, z-stacking, z-stack montage
Image Collection Rate	Laser autofocus, 0 millisecond delay, 96 wells: 8 minutes, 9 seconds
Imaging System: Widefield	
Imaging Modes	Fluorescence, phase contrast, color brightfield, user-selectable brightfield/high-contrast brightfield
Imaging Methods	Single-color, multicolor, time-lapse, montage, z-stacking, z-stack montage
Image Processing	Z-projection, digital phase contrast, stitching
Camera	Hamamatsu Orca sCMOS, 16-bit grayscale camera, or Sony CMOS 16-bit grayscale camera
Objective Capacity	Six-position automated turret for user-replaceable objectives
Objectives Available	1.25x, 2.5x (2.25x eff), 4x, 10x, 20x, 40x, 60x
Phase Objectives Available	4x, 10x, 20x, 40x

Image Filter Cube Capacity	Four user-replaceable fluorescence cubes, plus brightfield channel
Imaging Filter Cubes Available	>20 color cubes available
Autofocus Method	Laser autofocus, software autofocus
Positional Controls	Software control, joystick controller (option)
Image Collection Rate	Image-based autofocus: 96 wells, 1 color (DAPI), 4x, 6 minutes Laser autofocus: 96 wells, 1 color (DAPI), 4x, <3 minutes
Fluorescence Intensity	
Light Source	Xenon flash
Detector	PMT
Wavelength Selection	Quad monochromators (top/bottom)
Wavelength Range	250–700 nm (900 nm option)
Monochromator	Variable, from 9–50 nm in 1 nm increments
Dynamic Range	Seven decades
Reading Speed (kinetic)	96 wells, sweep mode: 10 seconds
Luminescence	
Wavelength Range	300–700 nm
Dynamic Range	>6 decades
Absorbance	
Light Source	Xenon flash
Detector	Photodiode
Wavelength Selection	Monochromator
Wavelength Range	230–999 nm, 1 nm increments
Monochromator	4 nm (230–285 nm), 8 nm (>285 nm)
Dynamic Range	0–4.0 OD
Resolution	0.0001 OD
Pathlength Correction	Yes
Reading Speed (Kinetic)	96 wells: 10 seconds
Reagent Injector Module (Optional)	
Number	Two syringe pumps
Supported Labware	6- to 384-well plates, Petri and cell culture dishes
Dead Volume	1.1 mL, with backflush
Dispense Volume	5–1000 µL in 1 µL increments
Dispense Accuracy	±1 µL or 2%
Dispense Precision	≤2% at 50–200 µL
Physical Characteristics	
Power	Instrument: external 250 W (minimum), 24 VDC power supply compatible with 100–240 VAC at 50–60 Hz. Optional six-channel laser light source: external with 250 W power supply, compatible with 100–240 VAC at 50–60 Hz. Optional Hamamatsu scientific camera: external 5 W power supply, compatible with 100–240 VAC at 50–60 Hz.
Dimensions	18.5" H x 27" W x 20" D, (45.72 x 68.6 x 50.8 cm)
Weight	122 lb (53.3 kg)

# Agilent BioTek Cytation 7 cell imaging multimode reader

The Agilent BioTek Cytation 7 cell imaging multimode reader combines automated upright and inverted widefield microscopy with monochromator-based multimode microplate reading.

### Multimode plate reader with sophisticated imaging

Cytation 7 offers modular and upgradable imaging and detection modes. 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 with the Cytation 7 imaging mode.

### Comprehensive imaging solution

The inverted microscope module enables fluorescence, brightfield, and color brightfield from 1.25x to 60x, to analyze both large objects and intracellular details. The upright microscope offers both reflected and transmitted light imaging for applications including ELISpot, colony counting, material inspection, and much more.

### Hit picking: multimode detection and imaging

Save time and computer memory by using multimode detection to identify wells of interest, then image only those wells.

### ELISpot imaging

The upright imaging module automates 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, by scanning 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 use a quad monochromator design with variable bandwidths between 9 and 50 nm. 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.

### Microvolume analysis with Take3 microvolume plate

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



## Typical research applications

### Imaging

- LD cell imaging
- Cell migration/invasion assays
- ELISpot assay imaging
- Slide scanning

- Live cell imaging
- Cell viability/toxicity
- Colony counting

### Multimode detection

- ADME/Tox assays
- ELISA

- Nucleic acid and protein quantification
- Inject/read calcium assays
- ROS assays
- Flash luminescence assays
- Cell growth assays



## Technical details

General	
Detection Modes	Fluorescence, luminescence, UV-Vis absorbance
Read Methods	Kinetic, spectral scanning, well area-scanning
Microplate Types	Monochromators: 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). Agilent BioTek Take3 microvolume plates
Temperature Control	4-Zone Incubation to 45 °C with Condensation Control
Cooling	Optional Peltier cooling module maintains internal temperature with <1 °C rise over ambient. Provides internal cooling after incubated processes
Shaking	Linear, orbital, double-orbital
Software	Agilent BioTek microplate reader and imager software included Agilent BioTek Gen5 Securefor 21 CFR Part 11 compliance (option) Agilent BioTek Image+ and Image Prime software available for full image analysis (option)
Automation	Agilent BioTek BioStack microplate stacker and third-party automation compatible Agilent BioTek BioSpa 8 automated incubator compatible Agilent BenchCel microplate handler
CO <sub>2</sub> and O <sub>2</sub> Control (Option)	Range: 0–20% (CO <sub>2</sub> ); 1–19% (O <sub>2</sub> )
Imaging System: Inverted Microscope	
Imaging Modes	Fluorescence, color brightfield, user-selectable brightfield/high-contrast brightfield
Imaging Methods	Single-color, multicolor, time-lapse, montage, z-stacking, z-stack montage
Image Processing	Z-projection, digital phase contrast, stitching
Camera	Sony CMOS, 16-bit grayscale
Objective Capacity	Six-position automated turret for user-replaceable objectives
Available Objectives	1.25x, 2.5x (2.25x eff), 2.5x (2.75x eff), 4x, 10x, 20x, 40x, 60x
Imaging Filter Cube Capacity	Four user-replaceable fluorescence cubes, plus brightfield channel
Imaging Filter Cubes Available	>20 LED/filter cube colors available
Automated Functions	Autofocus, user-trained autofocus, auto-exposure, autoLED intensity
Autofocus Method	Laser autofocus (option), software autofocus
Positional Controls	Software control, joystick controller (option)
Image Collection Rate	Image-based autofocus: 96 wells, 1 color (DAPI), 4x, 6 minutes Laser autofocus: 96 wells, 1 color (DAPI), 4x, <3 minutes
Imaging System: Upright Microscope	
Imaging Modes	Reflected color brightfield, transmitted color brightfield
Imaging Methods	Single-image, montage, time-lapse, z-stacking
Image Processing	Z-projection, digital phase contrast, stitching
Camera	Sony CMOS, 16-bit, WFOV
Lenses	Finder scope, 2x, 4x, 8x
Positional Controls	Software control, joystick controller (option)

Image Collection Rate	Entire 100 mm dish at 1x: ≤2:40 minutes Entire microscope slide at 1x: ≤1:15 minutes 96-well ELISpot plate at 1x: ≤5 minutes
Fluorescence Intensity	
Light Source	Xenon flash lamp
Detector	PMT (red-shifted PMT option)
Wavelength Selection	Quad monochromators (top/bottom)
Wavelength Range	250–700 nm (900 nm option)
Monochromator	Variable, from 9–50 nm in 1 nm increments
Dynamic Range	Seven decades
Sensitivity (Sodium Fluorescein)	Fluorescein 2.5 pM (0.25 fmol/well, 384-well plate)–top Fluorescein 4 pM (0.4 fmol/well, 384-well plate)–bottom
Reading Speed (Kinetic)	96 wells: 11 seconds 384 wells: 22 seconds
Luminescence	
Light Source	300–700 nm
Detector	>6 decades
Wavelength Selection	20 amol ATP (flash)
Absorbance	
Light Source	Xenon flash
Detector	Photodiode
Wavelength Selection	Monochromator
Wavelength Range	230–999 nm, 1 nm increments
Monochromator	4 nm (230–285 nm), 8 nm (>285 nm)
Dynamic Range	0–4.0 OD
Resolution	0.0001 OD
Pathlength Correction	Yes
Monochromator Wavelength Accuracy	±2 nm
Reading Speed (Kinetic)	96 wells: 11 seconds 384 wells: 22 seconds
Reagent Injector Module (Optional)	
Number	Two syringe pumps
Dispense Volume	5–1000 µL in 1 µL increments
Dead Volume	1.1 mL, with backflush
Injection Speed	225, 250, 275, 300 µL/sec
Plate Geometry Supported	6- to 384-well microplates
Dispense Precision	≤2% at 50–200 µL
Dispense Accuracy	±1 µL or 2%
Physical Characteristics	
Power	External 24 VDC power supply compatible with 100–240 VAC at 50–60 Hz. 150 W maximum consumption
Dimensions	20.2" D x 16.4" W x 17.5" H (51.4 x 41.6 x 44.5 cm)
Weight	80 lb (36.3 kg)

# Agilent BioTek Cytation 5 cell imaging multimode reader

The Agilent BioTek Cytation 5 cell imaging multimode reader combines automated digital microscopy and conventional multimode microplate detection in a configurable, upgradable platform. Gen5 software provides complete control over all imaging and data capture, plus powerful image and data analysis.

### Multimode plate reader with imaging

The imaging capability of Cytation 5 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 easily obtained with Cytation 5.

### Ready for any assay

With its combination of hybrid plate reader and advanced microscopy mode, Cytation 5 can transform your lab and increase your productivity.

### Advanced microscopy: unlimited possibilities

Cytation 5 automates many traditionally manual microscopy tasks, from slide scanning to time-lapse live cell assays. Low to high magnification enables powerful image capture for a variety of biologies. CO<sub>2</sub>/O<sub>2</sub> and temperature control enable time-lapse live cell imaging.

### Hit picking: multimode detection and imaging

Save time and computer memory by using multimode detection to identify wells of interest, then image only those wells.

### Powerful image processing and analysis

With Gen5 software you can preprogram analysis tasks and walk away. Extensive image processing includes stitching, z-projection, deconvolution, and digital phase contrast. Image analysis includes cell count, confluence, cytoplasm analysis, intracellular analysis, subpopulation analysis, signal translocation and more.

### Hybrid plate reader: flexibility and performance

With its combination of monochromator and filter optics, Cytation 5 is an advanced plate reader that delivers both the flexibility and performance you need for UV-Vis absorbance, fluorescence, luminescence, fluorescence polarization, time-resolved fluorescence, and laser-based Alpha detection.

### Variable bandwidth for sensitivity and specificity

Cytation 5 uses a quad monochromator with variable bandwidth, which can be set between 9 and 50 nm in 1 nm increments. Large bandwidths provide increased sensitivity and lower limits of detection. Small bandwidths provide increased specificity when multiple signals are present, reducing signal crosstalk and enhancing assay performance.



## Typical research applications

### Imaging

- Label-free cell counting
- Calcium kinetics
- Time-lapse live cell imaging
- 3D cell culture
- Slide scanning

- Cell viability/toxicity assays
- Cell migration assays
- Stem cell differentiation
- Genotoxicity

### Multimode detection

- ELISA

- TR-FRET
- Luciferase reporter assays
- Nucleic acid and protein quantification
- AlphaScreen
- Fluorescence polarization

## Technical details

General	
Detection Modes	UV-Vis absorbance Fluorescence intensity Luminescence Fluorescence polarization Time-resolved fluorescence Alpha detection
Read Methods	End-point, kinetic, spectral scanning, well-area scanning
Microplate Types	Monochromator: 6- to 384-well plates Filters: 6- to 1536-well plates Imaging: 6- to 1536-well plates
Other Labware	Microscope slides, Petri and cell culture dishes, cell culture flasks (T25), counting chambers (hemocytometer) Agilent BioTek Take3 microvolume plates
Temperature Control	4-Zone incubation to 65 °C with Condensation Control
Cooling	Optional Peltier cooling module maintains internal temperature with <1 °C rise over ambient. Provides cooling after incubated processes.
Shaking	Linear, orbital, double-orbital
Software	Agilent BioTek microplate reader and imager software included Agilent BioTek Gen5 Secure for 21 CFR Part 11 compliance (option). Agilent BioTek Gen5 Image+ and Image Prime software available for full image analysis (option)
Automation	Agilent BioTek BioStack microplate stacker and third-party automation compatible. Agilent BioTek BioSpa 8 automated incubator compatible. Agilent BenchCel microplate handler compatible
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
Light Source	Fluorescence and absorbance: xenon flash lamps Alpha detection: 100 mW 680 nm laser Imaging: high-power LEDs
Detector	Fluorescence and luminescence: PMTs Absorbance: photodiode
Imaging System	
Imaging Modes	Fluorescence, brightfield, high-contrast brightfield, color brightfield, phase contrast
Imaging Methods	Single-color, multicolor, montage, time -apse, z-stacking
Image Processing	Z-projection, digital phase contrast, stitching
Camera	Sony CMOS, 16-bit grayscale; standard or WFOV
Objective Capacity	Six-position automated turret for user-replaceable objectives
Phase Objectives	4x, 10x, 20x, 40x
Imaging Filter Cubes Capacity	>20 LED/filter cube colors/four user-replaceable fluorescence cubes plus brightfield
Automated Functions	Autofocus, autoLED intensity, auto-exposure
Autofocus Method	Laser autofocus (option), software autofocus
Positional Controls	Agilent BioTek Gen5 software control / optional joystick controller
Image Collection Rate	Image-based autofocus: 96 wells, 1 color (DAPI), 4x, 6 minutes Laser autofocus: 96 wells, 1 color (DAPI), 4x, <3 minutes
Fluorescence Intensity	
Wavelength Selection	Quad monochromators (top/bottom). Filters (top)
Wavelength Range	Monochromators: 250–700 nm (900 nm option) Filters: 200–700 nm (850 nm option)
Monochromator	Variable, from 9 nm to 50 nm in 1 nm increments
Dynamic Range	Seven decades

Sensitivity (Sodium Fluorescein)	Fluorescein 2.5 pM (0.25 fmol/well, 384-well plate)–top Fluorescein 4 pM (0.4 fmol/well, 384-well plate)–bottom
Reading Speed (Kinetic)	96 wells: 11 seconds 384 wells: 22 seconds
Luminescence	
Wavelength Range	300–700 nm
Dynamic Range	>6 decades
Sensitivity	Monos: 20 amol ATP (flash) Filters: 10 amol ATP (flash), 100 amol (glow)
Fluorescence Polarization	
Wavelength Selection	Filters
Wavelength Range	280–700 nm (850 nm option)
Sensitivity	1.2 mP standard deviation at 1 nm fluorescence
Time-Resolved Fluorescence	
Wavelength Selection	Quad monochromators (secondary mode) Filters (top)
Wavelength Range	Filters: 200–700 nm (850 nm option)
Sensitivity	Filters: europium 40 fM (4 amol/well, 384-well plate) Monos: europium 1200 fM (120 amol/well, 384-well plate)
Absorbance	
Wavelength Selection	Monochromator
Wavelength Range	230–999 nm, 1 nm increments
Monochromator	4 nm (230–285 nm), 8 nm (>285 nm)
Dynamic Range	0–4.0 OD
Resolution	0.0001 OD
Pathlength Correction	Yes
Optical density	Accuracy: <1% at 2.0 OD; <3% at 3.0 OD. Linearity: <1% from 0 to 3.0 OD. Repeatability: <0.5% at 2.0 OD Stray light: 0.03% at 230 nm
Reading Speed (Kinetic)	96 wells: 11 seconds 384 wells: 22 seconds
Alpha Detection	
Wavelength Selection	Filters (top)
Sensitivity	100 amol LCK peptide (384-well plate)
Reagent Injectors	
Number	Two syringe pumps
Dispense Volume	5–1000 µL in 1 µL increments
Dead Volume	1.1 mL, with backflush
Injection Speed	225, 250, 275, 300 µL/sec
Plate Geometry Supported	6- to 384-well microplates
Dispense Precision	≤2% at 50–200 µL
Dispense Accuracy	±1 µL or 2%
Physical Characteristics	
Power	External 24 VAC power supply compatible with 100–240 VAC at 50–60 Hz. 150 W maximum consumption
Dimensions	20.2" D x 16.4" W x 17.5" H (51.4 x 41.6 x 44.5 cm)
Weight	80 lb (36.3 kg)

# Agilent BioTek Cytation 1 cell imaging multimode reader

The Agilent BioTek Cytation 1 cell imaging multimode reader combines fluorescence and high-contrast brightfield imaging with conventional multimode detection in an upgradable, affordable platform. This design enables applications from cell proliferation studies to microvolume nucleic acid quantification, without requiring additional hardware. Gen5 software provides powerful image and data analysis in an easy-to-use interface.

### Quantitative image analysis

The microscopy module in Cytation 1 offers 1.25x to 60x magnification to capture large regions of interest or intracellular details in slides, microplates, cell culture dishes, and other labware. Four color channels, plus high-contrast brightfield mode, enable fixed and live cell imaging applications, including label-free cell counting, 3D cell culture, and phenotypic assays. Temperature and CO<sub>2</sub>/O<sub>2</sub> control support kinetic live cell imaging.

### Augmented Microscopy

Gen5 software automates image capture, processing, and analysis steps to help create publication-ready images and data. Augmented Microscopy facilitates these workflows in Gen5, efficiently guiding scientists through the entire process without requiring extensive training.

### Peltier cooling module

The Peltier cooling module ensures environmental stability inside Cytation 1, maintaining internal temperature with less than a 1 °C rise over ambient during normal operation for uncompromised assay integrity. The module also accelerates cooling three times faster than typical, rapidly returning the system to ambient temperature after incubated workflows.

### Affordable automation

The automated stage positioning, autofocus, auto-exposure and autoLED intensity bring efficiency to common microscopy tasks. Cytation 1 integrates with BioSpa 8 automated incubator to automate long-term, kinetic live cell imaging workflows for up to eight microplates. Agilent BioTek BioStack microplate stacker can process up to 50 lidded or unlidded plates at a time to automate imaging or multimode detection processes.

### Multimode versatility

Cytation 1 uses filter-based optics for excellent sensitivity in multimode measurements. The monochromator-based absorbance optics offer a 200 to 999 nm wavelength range, enabling applications from nucleic acid quantification to turbidimetric measurements. Shaking and reagent injectors expand applications to kinetics and fast inject/read protocols.



## Typical research applications

### Imaging

- 2D and 3D cell imaging and analysis
- Cell proliferation studies
- Label-free cell counting
- Cytotoxicity
- Biomarker quantification

### Multimode detection

- Drug discovery
- Genetic analysis
- Drug absorption and metabolism
- Biologics drug discovery and development

- Environmental testing
- Food safety
- Nucleic acid quantification
- Protein quantification

## Technical details

General	
Detection Modes	UV-Vis absorbance Fluorescence intensity Luminescence Fluorescence polarization Time-resolved fluorescence
Read Methods	End-point, kinetic, spectral scanning, well-area scanning
Microplate Types	Monochromator: 6- to 384-well plates Filters: 6- to 1536-well plates Imaging: 6- to 1536-well plates
Other Labware	Microscope slides, Petri and cell culture dishes, cell culture flasks (T25), counting chambers (hemocytometer) Agilent BioTek Take3 microvolume plates
Temperature Control	4-Zone Incubation to 45 °C with Condensation Control
Cooling	Optional Peltier cooling module maintains internal temperature with <1 °C rise over ambient. Provides cooling after incubated processes
Shaking	Linear, orbital, double-orbital
Software	Agilent BioTek microplate reader and imager software included Agilent BioTek Gen5 Secure software for 21 CFR Part 11 compliance (option) Agilent BioTek Image+ and Image Prime software available for full image analysis (option)
Automation	Agilent BioTek BioStack microplate stacker and third-party automation compatible Agilent BioTek BioSpa 8 automated incubator Agilent Benchcel microplate handler compatible
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
Light Source	Fluorescence and absorbance: xenon flash lamps Imaging: high-power LEDs
Detector	Fluorescence and luminescence: PMTs Absorbance: photodiode
Imaging System	
Imaging Modes	Fluorescence High-contrast brightfield
Imaging Method	Single-color, multicolor, montage, time-lapse, z-stacking
Image Processing	Z-projection, image stitching
Camera	Sony CCD, 16-bit grayscale
Objective Capacity	Two user-replaceable objectives
Objectives Available	1.25x, 2.5x, 4x, 10x, 20x, 40x, 60x
Imaging Filter Cubes/Capacity	Four user-replaceable fluorescence cubes plus brightfield channel; more than twenty colors available
Automated Functions	Autofocus, autoLED intensity, auto-exposure
Autofocus Method	Laser autofocus (option), software autofocus
Positional Controls	Agilent BioTek Gen5 software
Image Collection Rate	Image-based autofocus: 96 wells, 1 color (DAPI), 4x, 6 minutes Laser autofocus: 96 wells, 1 color (DAPI), 4x, <3 minutes

Absorbance	
Wavelength Selection	Monochromator
Wavelength Range	200–999 nm, in 1 nm increments
Monochromator Bandwidth	2.4 nm
Optical Density	Accuracy: <1% at 2.0 OD; <3% at 3.0 OD Linearity: <1% from 0 to 3.0 OD Repeatability: <0.5% at 2.0 OD Stray light: 0.03% at 230 nm
Reading Speed (Kinetic)	96 wells: 11 seconds, 384 wells: 22 seconds
Fluorescence Intensity	
Wavelength Selection	Deep blocking band pass filters/dichroic mirrors
Wavelength Range	Filters: 200–700 nm (900 nm option)
Dynamic Range	Seven decades
Reading Speed	96 wells: 11 seconds, 384 wells: 22 seconds
Luminescence	
Wavelength Range	300–700 nm
Dynamic Range	>6 decades
Sensitivity	10 amol ATP (flash), 100 amol (glow) Fluorescein: 0.25 pM (0.025 fmol/well, 384-well plate)
Fluorescence Polarization	
Wavelength Selection	Filters
Wavelength Range	280–700 nm (850 nm option)
Sensitivity	1.2 mP standard deviation at 1 nm fluorescein
Time-Resolved Fluorescence	
Wavelength Selection	Filters
Wavelength Range	200–700 nm (850 nm option)
Sensitivity	Europium 40 fM (4 amol/well, 384-well plate)
Reagent Injectors	
Number	Two syringe pumps
Supported Labware	6- to 384-well plates, Petri and cell culture dishes
Dead Volume	1.1 mL with backflush
Dispense Volume	5–1000 µL in 1 µL increments
Dispense Accuracy	±1 µl or 2%
Dispense precision	≤2% at 50–200 µL
Physical Characteristics	
Power Consumption	250 W (max)
Dimensions	20.2" D x 16.4" W x 17.5" H 51.4 x 41.6 x 44.5 cm
Weight	80 lb (36.3 kg)

# Agilent BioTek BioSpa live cell analysis system

Capture detailed cellular images and get in-depth, cell-level analyses for migration and wound healing assays, 3D spheroid formation, and many other kinetic applications in up to eight microplates or other labware. Built-in scheduling, environmental monitoring, and available liquid handling allow you to walk away with confidence, and allows multiple users to run processes simultaneously without disrupting others. The Agilent BioTek BioSpa live cell analysis system offers unique benefits for a wide variety of live cell imaging applications.

### Multiple imaging modes

Confocal, fluorescence, brightfield, color brightfield, high-contrast brightfield and phase contrast imaging enable an astonishing range of microscopy applications within a single, compact system. Automate workflows for up to eight microplates or other labware, including cell culture dishes, flasks, and microscope slides.

### Broad magnification range

Capture the level of detail you need, from whole-well montage, to intracellular detail, with 1.25x to 60x objectives available. The automated, six-position turret makes it simple to capture multiple magnifications in a single workflow.

### Environmental controls

Successful long-term live cell assays rely on a controlled environment to keep cells healthy and aid proliferation. BioSpa has integrated temperature and CO<sub>2</sub>/O<sub>2</sub> control and monitoring, plus humidity monitoring to protect cells during kinetic runs that last days or weeks.

### Powerful 3D image processing

Gen5 software has powerful z-stacking capabilities to capture the important details of a 3D cell structure. Z-projection and image analysis provides in-depth information about the spheroid. Z-stacking montage capability brings powerful processing for 3D biologies.

### Advanced cell-level analysis

Powerful tools like nuclear and cytoplasmic masking define critical, information-rich regions of interest for automated, detailed cellular analysis.



## Typical research applications

- Cell migration and invasion
- Cell cycle progression and analysis
- Cytotoxicity
- Apoptosis and necrosis assays
- Cell proliferation assays



## Technical details

General	
Microplate Types	6- to 1536-well standard height microplates, with or without lids Plate height range: 7.6–25.4 mm
Other Labware	Cell culture dishes (35 and 60 mm)
Lidded Plate Handling	Automated plate movement, including delidding and relidding between the incubator and imager
Microplate Capacity	Up to eight microplates (or other labware)
Air Filter	User-replaceable HEPA filter
Compatible Instruments	Agilent BioTek Cytation C10 confocal imaging reader Agilent BioTek Cytation 1/5/7 cell imaging multimode readers Agilent BioTek EL406 washer dispenser, 405 TS washer Agilent BioTek MultiFlo FX multimode dispenser
Temperature Control	Range: to 45 °C Uniformity $\pm 0.5$ °C at 37 °C
Software	Agilent BioTek BioSpa On-Demand mode for simplified, intuitive workflows for single or multiple users Agilent BioTek BioSpa Session mode for all imaging, detection, and liquid handling operations
CO <sub>2</sub> and O <sub>2</sub> Control (Option)	Range: 0–20% (CO <sub>2</sub> ); 1–19% (O <sub>2</sub> )
Humidity Control	rH: 80–95% (lidded plates and 5% CO <sub>2</sub> ); removable water pan with low level alert
Imaging System	
Imaging Mode	Confocal, fluorescence, brightfield, high-contrast brightfield, color brightfield and phase contrast
Imaging Method	Single-color, multicolor, montage, time-lapse, z-stacking
Image Processing	Z-projection, digital phase contrast, stitching
Camera	16-bit gray scale Sony, Hamamatsu Orca sCMOS 16-bit grayscale camera (Agilent BioTek Cytation C10 confocal imaging reader only)
Objective Capacity	Six user-replaceable objectives
Objectives Available	1.25x, 2.5x, 4x, 10x, 20x, 40x, 60x
Phase Objectives Available	4x, 10x, 20x, 40x
Image Filter Cube Capacity	Four user-replaceable fluorescence cubes, plus brightfield channel
Imaging Filter Cubes Available	More than twenty colors are available for fluorescence imaging
Automated Functions	Autofocus, auto-exposure, autoLED intensity
Autofocus Method	Image-based autofocus, user-trained autofocus, laser autofocus (option)

## Imaging and Microscopy Comparison Chart

	Lionheart FX	Lionheart LX	Cytation C10
<b>General</b>			
Microplate Types	6- to 1536-well plates	6- to 1536-well plates	6- to 1536-well plates
Other Labware	Slides, cell culture dishes, flasks (T75), hemocytometers, chamber slides	Slides, cell culture dishes, flasks (T75), hemocytometers, chamber slides	Slides, cell culture dishes, flasks (T75), hemocytometers, chamber slides
Labware Capacity	1	1	1
Incubation	To 40 °C		To 45 °C
Peltier Cooling Module			
CO <sub>2</sub> and O <sub>2</sub> Control Available	•		•
Joystick Controller Available	•	•	•
Automation Compatible			•
Multimode Detection Available			•
Upright Microscope			
<b>Objectives</b>			
Capacity	6	6	6
Air Objectives	1.25x, 2.5x, 4x, 10x, 20x, 40x, 60x	1.25x, 2.5x, 4x, 10x, 20x, 40x, 60x	1.25x, 2.5x, 4x, 10x, 20x, 40x, 60x
Phase Objectives	4x, 10x, 20x, 40x	4x, 10x, 20x, 40x	4x, 10x, 20x, 40x
Oil Immersion Objectives	60x, 100x	60x, 100x	
<b>Imaging Modes and Methods</b>			
Widefield Fluorescence	•	•	•
Confocal Fluorescence			•
Brightfield	•	•	•
High-Contrast Brightfield	•	•	•
Color Brightfield	•	•	•
Phase Contrast	•		•
<b>Processing and Analysis</b>			
Z-stacking	•	•	•
Montage	•	•	•
Cell Counting	•	•	•
Z-projection*	•	•	•
Digital phase contrast*	•	•	•
Image Stitching*	•	•	•
Advanced Image Analysis*	•	•	•

\* With Gen5 Image+ or Gen5 Image Prime software

Cytation 7	Cytation 5	Cytation 1	BioSpa System
6- to 1536-well plates	6- to 1536-well plates	6- to 1536-well plates	6- to 1536-well plates
Slides, cell culture dishes, flasks (T75), hemocytometers, chamber slides	Slides, cell culture dishes, flasks (T75), hemocytometers, chamber slides	Slides, cell culture dishes, flasks (T75), hemocytometers, chamber slides	Slides, cell culture dishes, hemocytometers, chamber slides
1	1	1	8
To 45 °C	To 65 °C	To 45 °C	To 45 °C
•	•	•	
•	•	•	•
•	•		•
•	•	•	•
•	•	•	•
•			
6	6	2	6
1.25x, 2.5x, 4x, 10x, 20x, 40x, 60x	1.25x, 2.5x, 4x, 10x, 20x, 40x, 60x	1.25x, 2.5x, 4x, 10x, 20x, 40x, 60x	1.25x, 2.5x, 4x, 10x, 20x, 40x, 60x
4x, 10x, 20x, 40x	4x, 10x, 20x, 40x	4x, 10x, 20x, 40x	4x, 10x, 20x, 40x
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# Agilent BioTek Gen5 software for imaging and microscopy

With Agilent BioTek Gen5 software and Lionheart or Cytation imaging systems, you can acquire high-quality images across a broad range of fixed and live biologies for applications in life science, drug discovery, and clinical research laboratories. The new, highly visual interface makes image capture, processing, and analysis easy and powerful, to produce publication-ready images and data.

### Image capture

Gen5 captures images from fixed and live cell assays, tissues, whole biology, and more. From large regions of interest to subcellular and intracellular details, Gen5 captures images in a batch, endpoint, time-lapse sequence, and z-stacks. Fluorescence, brightfield, color brightfield, or phase contrast modes enable diverse applications.

### Process

Brightness and contrast adjustments, background flattening, and deconvolution are a few of the many image preprocessing steps available in Gen5. Z-stacks can automatically be z-projected, and digital phase contrast improves the appearance of challenging images. The processing steps in Gen5 allow you to work within one software package, without requiring extensive training.

### Analyze

Gen5 analyzes cellular features such as intensity or morphology (size, perimeter, circularity), enabling applications such as transfection efficiency, nuclear translocation, or cell cycle assays, where multiple cell subpopulations are present in the samples. Label-free confluence and cell counts are accomplished with the unique high-contrast brightfield mode. The add-on spot counting module enables detailed analysis of intracellular activity.

### Publish

During or after image analysis, integrated tools enable convenient annotation of important information in each image, without having to export to a third-party software package. The built-in movie maker turns time-lapse images into movies with a click of the mouse. Not only does Gen5 provide amazing visualization of your samples, it provides quantitative data and results from the entire experiment. Heat maps, dose response curves, and multimode and image-based quantitative data can be combined to rapidly obtain, analyze, and acquire both phenotypic and quantitative results.

## Key features

### Powerful instrument control

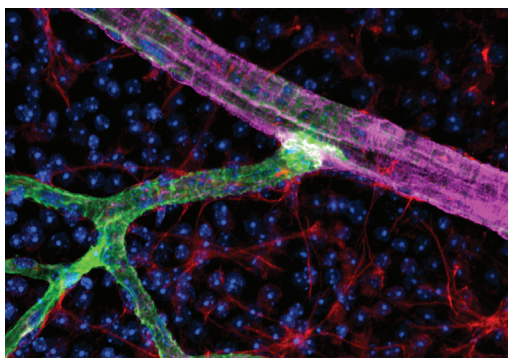
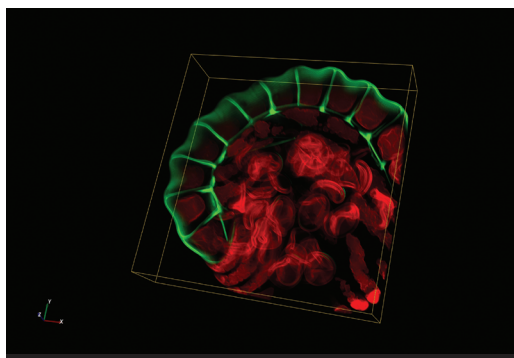
- User-trained autofocus, image-based, and laser autofocus
- Automatic camera gain, exposure, and LED intensity settings
- End-point, montage, z-stack, and time-lapse imaging modes

### Image preprocessing tools

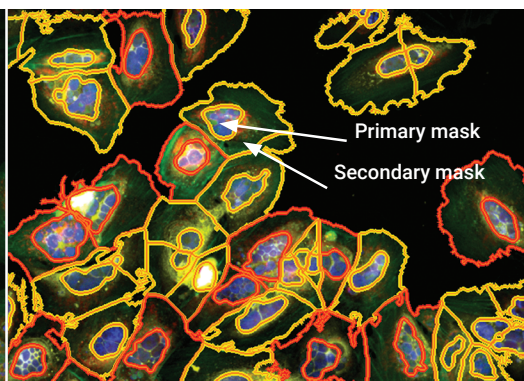
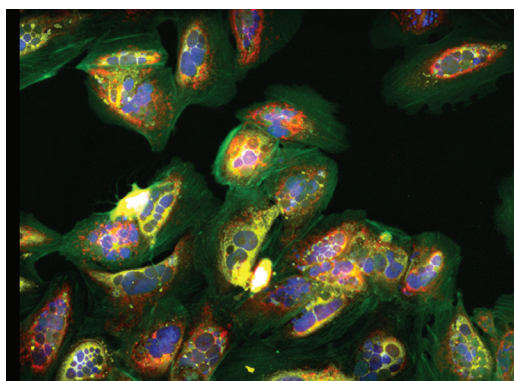
- Image deconvolution for improved visualization
- Automated flattening, smoothing, background correction
- Image stitching, z-projection
- Digital phase contrast algorithm

### Image and data analysis tools

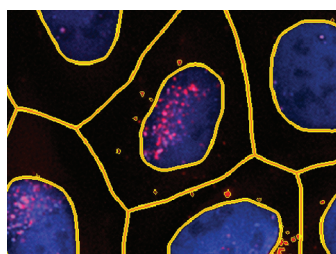
- Automated cell counting and confluence; label-free cell counting
- Spot counting for intracellular detail analysis
- Primary and secondary masks; nucleus, cytoplasm, or whole cell analysis
- Subpopulation analysis and image statistics
- EC<sub>50</sub> standard curves, kinetic analysis and more



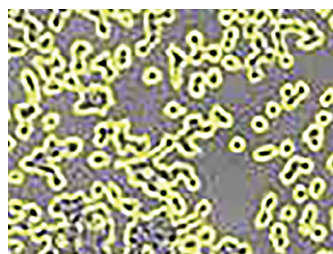
Agilent BioTek Gen5 microplate reader and imager software has a highly visual interface to facilitate imaging workflows



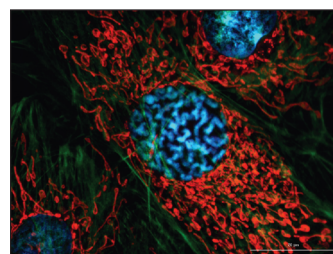
Cells treated with 0.3  $\mu$ M Taxol; nuclear fragmentation visible (cells highlighted)



Spot counting: intracellular details



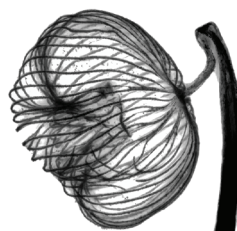
Confluence determination: high-contrast brightfield



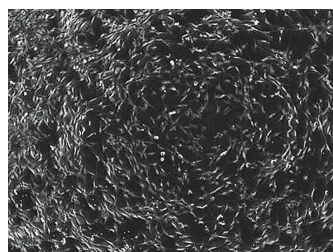
BPAE cells at 100x



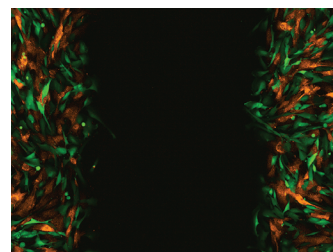
Zebrafish embryo at 2x, z-stacked and z-projected in brightfield



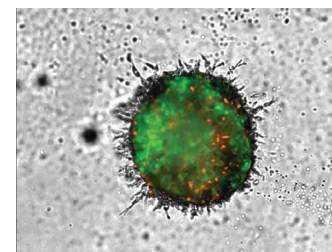
*Dictyidium sporotheca*, 4x montage in color brightfield, z-stacked and z-projected



3T3 cells at 4x, digital phase contrast



Fibroblasts expressing RFP and U-87 cell expressing GFP, just after scratch wound creation



U-87 fibroblast tumoroid at 4x, 4 x 4 montage, z-stacked and stitched

# Agilent BioTek Synergy Neo2 hybrid multimode reader

Agilent BioTek Synergy Neo2 hybrid multimode reader is designed for the screening laboratory, with speed and ultrahigh performance. Synergy Neo2 features Agilent BioTek Hybrid Technology, with its independent optical paths that ensure uncompromised performance in all detection modes.

### Hybrid Technology

Some workflows benefit from the flexibility of monochromator-based optical systems; there is no need to purchase multiple filters, and when the spectral peaks from a fluorophore are unknown, monochromators can scan to find the ideal excitation and emission peaks. Other assays require the high sensitivity found in filter-based optical systems. Hybrid Technology offers both major benefits in a single platform, so there is no compromise of performance or flexibility.

### Variable bandwidth quad monochromators

The Synergy Neo2 uses quad monochromators, which have variable bandwidths for excitation and emission. Selectable from 3 to 50 nm in 1 nm increments, these continuously variable bandwidths help optimize detection of some fluorophores. Detection parameters for complex multiplexed assays, such as FRET and SNPs, can be fine tuned for the highest signal with the lowest crosstalk, and the results you expect.

### Ultrafast: two lasers and multiple PMT detectors

High throughput is not just about fast plate reading; a high-throughput multimode reader should handle common and complex assays with equally high performance, even in 1536-well plates. Synergy Neo2 has a TRF laser to provide the fastest measurements with excellent sensitivity for critical screening applications like TRF and TR-FRET. Laser-based excitation ensures the best performance for Alpha assays. The available BioStack microplate stacker provides walk-away automation of multiple plate processes.

### Controlled environment for live cell assays

Along with incubation to 70 °C and shaking, Synergy Neo2 can be equipped with a CO<sub>2</sub>/O<sub>2</sub> controller to provide the ideal environment for robust live cell assays. Direct bottom detection provides ultrasensitivity for measuring cell-based fluorescence intensity. To automate live cell workflows, Synergy Neo2 integrates with the BenchCel microplate handler and BioSpa 8 automated incubator.



## Typical research applications

- HTS screening
- Drug absorption and metabolism
- Biologics drug discovery and development
- Drug discovery
- Cell proliferation
- Cytotoxicity
- Biomarker quantification
- Genetic analysis
- Environmental testing
- Food safety
- Nucleic acid quantification
- Protein quantification



## Technical details

General	
Detection Modes	UV-Vis absorbance Fluorescence intensity Luminescence Fluorescence polarization Time-resolved fluorescence Alpha detection
Read Methods	End-point, kinetic, spectral scanning, well-area scanning
Microplate Types	6- to 1536-well plates
Other Labware	Petri and cell culture dishes Agilent BioTek Take3 microvolume plates
Temperature Control	Four-Zone Incubation to 70 °C with Condensation Control
Shaking	Linear, orbital, double-orbital
Software	Agilent BioTek Gen5 microplate reader and imager software included. Agilent BioTek Gen5 Secure software for 21 CFR Part 11 compliance (option)
Automation	Agilent BioTek BioStack microplate stacker and third-party automation compatible Agilent BioTek BioSpa 8 automated incubator Agilent BenchCel microplate handler
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
Barcode Reader	1D and 2D camera-based scanner
Absorbance	
Light Source	Xenon flash
Detector	Photodiode
Wavelength Selection	Monochromator
Wavelength Range	230–999 nm, in 1 nm increments
Monochromator Bandwidth	2 nm (230–285 nm); 4 nm (>285 nm)
Dynamic Range	0–4.0 OD
Resolution	0.0001 OD
Pathlength Correction	Yes
Optical Density	Accuracy: <1% at 2.0 OD; <3% at 3.0 OD. Linearity: <1% from 0 to 3.0 OD. Repeatability: <0.5% at 2.0 OD Stray light: 0.03% at 230 nm
Reading Speed (Kinetic)	96 well: 6 seconds 384 well: 11 seconds 1536 well: 25 seconds
Fluorescence Intensity	
Light Source	Xenon flash
Detector	PMT
Wavelength Selection	Quad monochromators (top/bottom) Filters (top/bottom)
Wavelength Range	Monochromators: 250–700 nm (850 nm option) Filters: 200–700 nm (850 nm option)
Monochromator Bandwidth	Variable; from 3–50 nm, in 1 nm increments
Dynamic Range	Seven decades
Sensitivity (Fluorescein)	Filters: 0.2 pM (4 amol/well, 384-well low-volume plate)–top 1 pM (10 amol/well, 1536-well plate)–top 1 pM (0.1 fmol/well, 384-well plate)–bottom Quad monochromator: 2 pM (40 amol/well, 384-well low-volume plate)–top 2.5 pM (0.25 fmol/well, 384-well plate)–bottom

Reading Speed (Kinetic)	96 well: 6 seconds 384 well: 11 seconds 1536 well: 25 seconds
Luminescence	
Wavelength Range	300–700 nm
Dynamic Range	>6 decades
Sensitivity	5 amol ATP (384-well low-volume plate)
Fluorescence Polarization	
Light Source	Xenon flash
Detector	Dual PMT or single PMT (option)
Wavelength Selection	Filters
Wavelength Range	280–700 nm (850 nm option)
Sensitivity	1 mP standard deviation at 1 nM fluorescein (384-well low-volume plate)
Time-Resolved Fluorescence	
Light Source	Xenon flash or TRF laser (option)
Detector	Dual PMT or single PMT (option)
Wavelength Selection	Quad monochromators (top/bottom) Filters (top/bottom)
Wavelength Range	Monochromators: 250–700 nm (850 nm option) Filters: 200–700 nm (850 nm option)
Sensitivity	With TRF laser: 5 fM (384-well low-volume plate) With xenon flash lamp: 40 fM (384-well low-volume plate)
Alpha Detection	
Light Source	100 mW 680 nm laser
Detector	PMT
Wavelength Selection	Filters (top)
Sensitivity	100 amol bio-LCK-P (384-well low-volume plate)
Read Speed	96 well: 30 seconds 384 well: 1 minute 50 seconds 1536 well: 7 minutes 20 seconds
Reagent Injectors	
Number	Two syringe pumps
Supported Labware	6- to 384-well plates, Petri dishes
Dead Volume	1.1 mL with backflush
Dispense Volume	5–1000 µL in 1 µL increments
Physical Characteristics	
Power Consumption	250 W (max)
Dimensions	Without TRF laser: 15.4" W x 20.7" D x 16.1" H (39.2 x 52.5 x 40.8 cm) With TRF laser: 15.4" W x 24.2" D x 16.1" H (39.2 x 61.4 x 40.8 cm)
Weight	Without TRF laser: 78 lb (35.4 kg) With TRF laser: 100 lb (45.3 kg)

# Agilent BioTek Synergy H1 multimode reader

Agilent BioTek Synergy H1 multimode reader is a configurable multimode microplate reader, with monochromator-based optics for flexibility, filter-based optics for sensitivity, or both. Hybrid Technology offers application versatility and excellent performance in a modular platform to expand as your laboratory's needs change.

### Hybrid plate reader: flexibility and performance

Synergy H1 is an advanced plate reader that delivers both the flexibility and performance you need for any microplate assay in your lab. Monochromators offer UV-Vis absorbance, fluorescence intensity, and luminescence; filters enable fluorescence intensity, polarization, time-resolved fluorescence, and filtered luminescence.

### Upgradable to meet future application needs

The Synergy H1 modular design allows you to start with what you need now, and add detection modes, gas control, and dual-reagent injectors as your laboratory's workflows evolve.

### Variable bandwidth for sensitivity and specificity

Excitation and emission bandwidths can be set between 9 and 50 nm in 1 nm increments. Large bandwidths provide increased sensitivity and lower limits of detection. Small bandwidths provide increased specificity when multiple signals are present, reducing crosstalk and enhancing assay performance.

### Automated z-focus: best performance with all plate types

Automated z-focus enables reading height to be precisely adjusted for best performance in all plate types and all volumes.

### Extended dynamic range

The seven log extended dynamic range detects signals with optimal sensitivity from the low and high ends of the assay range. Other systems can measure only small portions of the dynamic range of Synergy H1 using preset gains; this can cause reduced sensitivity on the low end or saturated signals on the high end of the assay signal range.

### Environmental controls for cell-based assays

Temperature control to 70 °C, Condensation Control, CO<sub>2</sub>/O<sub>2</sub> control and shaking create the ideal environment for live cell assay workflows. A consistent environment leads to consistent data for long-term kinetic assays.

### Dual syringe injectors with specialized tips

The robust, precise dual syringe eliminates the need for regular tubing replacement required by some peristaltic pump injector designs. There are two available tip types: straight tips enable vigorous mixing for rapid inject/read assays, and angled tips will not disturb cell layers for applications such as calcium kinetics.



## Typical research applications

- |   |                             |                       |
|---|-----------------------------|-----------------------|
| – ELISA                                   | – TR-FRET                   | – Protein aggregation |
| – Luciferase reporter assays              | – Fluorescence polarization | – Cell-based assays   |
| – Nucleic acid and protein quantification | – BRET                      | – Metabolic activity  |
| – Microbial growth assays                 | – Enzyme kinetics           | – ROS                 |

## Technical details

General	
Detection Modes	UV-Vis absorbance Fluorescence intensity Luminescence Fluorescence polarization Time-resolved fluorescence
Read Methods	End-point, kinetic, spectral scanning, well-area scanning
Microplate Types	6- to 384-well plates
Other Labware	Petri and cell culture dishes Agilent BioTek Take3 microvolume plates
Temperature Control	4-Zone Incubation to 70 °C ("M2" configurations) or to 45 °C (all other configurations)
Shaking	Linear, orbital, double-orbital
Software	Agilent BioTek Gen5 microplate reader and imager software included Agilent BioTek Gen5 Secure software for 21 CFR Part 11 compliance (option)
Automation	Agilent BioTek BioStack microplate stacker and third-party automation compatible Agilent BioTek BioSpa 8 automated incubator compatible
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
Absorbance	
Light Source	Xenon flash
Detector	Photodiode
Wavelength Selection	Monochromator
Wavelength Range	230–999 nm, in 1 nm increments
Monochromator Bandwidth	4 nm (230–285 nm); 8 nm (>285 nm)
Dynamic Range	0–4.0 OD
Resolution	0.0001 OD
Pathlength Correction	Yes
OD Accuracy	<1% at 2.0 OD <3% at 3.0 OD
OD Linearity	<1% from 0 to 3.0 OD
OD Repeatability	<0.5% at 2.0 OD
Stray Light	0.03% at 230 nm
Reading Speed (Kinetic)	96 wells: 11 seconds 384 wells: 22 seconds
Fluorescence Intensity	
Light Source	Xenon flash
Detector	PMT
Wavelength Selection	Quad monochromators (top/bottom) Filters (top)
Wavelength Range	Monochromators: 250–700 nm (900 nm option)

Monochromator Bandwidth	Variable: from 9–50 nm in 1 nm increments ("M2" configurations) Fixed: 16 nm
Dynamic Range	Seven decades
Sensitivity (Fluorescein)	Filters: 0.25 pM (0.025 fmol/well, 384-well plate) Quad Monochromator: 2.5 pM (0.25 fmol/well, 384-well plate)–top 4 pM (0.4 fmol/well, 384-well plate)–bottom
Reading Speed (Kinetic)	96 well: 11 seconds 384 well: 22 seconds
Luminescence	
Sensitivity	Monos: 20 amol ATP Filters: 10 amol ATP
Fluorescence polarization	
Light Source	Xenon flash
Detector	PMT
Wavelength Selection	Filters
Wavelength Range	Excitation range: 330–700 nm Emission range: 400–700 nm
Sensitivity	2 mP standard deviation at 1 nm fluorescein
Time-resolved Fluorescence	
Light Source	Xenon flash
Detector	PMT
Wavelength Selection	Filters (top)
Sensitivity	<40 fM
Reagent Injectors	
Number	Two syringe pumps
Supported Labware	6- to 384-well plates, Petri dishes
Dead Volume	1.1 mL with backflush
Dispense Volume	5–1000 µL in 1 µL increments
Dispense Accuracy	±1 µL or 2%
Dispense Precision	≤2% at 50–200 µL
Physical Characteristics	
Power Consumption	130 W (max)
Dimensions	15.4" W x 18.6" D x 12.9" H (39.1 x 47.2 x 32.8 cm)
Weight	50 lb (22.6 kg)

# Agilent BioTek Synergy HTX multimode reader

The Agilent BioTek Synergy HTX multimode reader is an entry-level, affordable, and upgradable multimode microplate reader. Available read modes include top and bottom fluorescence, UV-visible absorbance, and luminescence detection. Temperature control to 50 °C, shaking, and advanced Gen5 microplate reader and imager software are also included. A dual-reagent injector module is available for all read modes and plate types.

### Ideal for basic research applications

The Synergy HTX is the ideal instrument for nucleic acid and protein quantification, enzyme assays, biomarker quantification, and ELISA assays, as well as cell-based assays (gene expression, cellular growth, cytotoxicity).

### AlphaScreen/AlphaLISA

AlphaScreen and AlphaLISA assays can be performed on Synergy HTX with excellent results. Alpha-capable configurations add assay versatility to basic research requirements.

### Sensitive filter-based fluorescence

Two excitation and two emission filters are included with the reader, and can be used for top and bottom reading. Bottom reading is usually recommended when working with adherent cells, as it often provides better signal-to-background ratios. Top reading is typically best for assays where the fluorescence signal comes from the solution.

### Flexible monochromator-based absorbance

All Synergy readers use monochromators for absorbance detection. This provides unlimited wavelength selection from the low UV to the near infrared, in 1 nm increments, and enables spectral scanning.

### Low-noise luminescence detection

The Synergy HTX can automate glow and flash luminescence assays, thanks to its optional dual-reagent injector module. Typical assays include ATP quantification as well as luciferase gene expression assays.



## Typical research applications

- AlphaScreen/AlphaLISA
- Nucleic acid quantification
- Protein quantification
- Enzyme kinetics
- Biomarker quantification
- ELISAs
- Genetic analysis
- Cell proliferation
- Cytotoxicity
- Drug absorption and metabolism
- Food safety
- Environmental monitoring

## Technical details

General	
Detection Modes	UV-Vis absorbance Fluorescence intensity Luminescence Time-resolved fluorescence (secondary mode) Alpha detection
Read Methods	End-point, kinetic, spectral scanning, well-area scanning
Microplate Types	6- to 384-well plates
Other Labware	PCR plates, Petri and cell culture dishes Agilent BioTek Take3 microvolume plates
Temperature Control	4-Zone Incubation to 50 °C with Condensation Control
Shaking	Linear, orbital
Software	Agilent BioTek microplate reader and imager software included Agilent BioTek Gen5 Secure for 21 CFR Part 11 compliance (option)
Automation	Agilent BioTek BioStack microplate stacker and third-party automation
Absorbance	
Light Source	Xenon flash
Detector	Photodiode
Wavelength Selection	Monochromator
Wavelength Range	200–999 nm, in 1 nm increments
Monochromator Bandwidth	2.4 nm
Dynamic Range	0–4.0 OD
Resolution	0.0001 OD
Pathlength Correction	Yes
Monochromator Wavelength Accuracy	±2 nm
Monochromator Wavelength Repeatability	±0.2 nm
OD Accuracy	<1% at 2.0 OD <3% at 3.0 OD
OD Linearity	<1% from 0 to 3.0 OD
OD Repeatability	<0.5% at 2.0 OD
Stray Light	0.03% at 230 nm
Reading Speed (Kinetic)	96 wells: 14 seconds 384 wells: 26 seconds
Fluorescence Intensity	
Light Source	Tungsten halogen Xenon flash (option)
Detector	PMT
Wavelength Selection	Filters
Wavelength Range	300–700 nm (200–850 nm option)
Dynamic Range	>6 decades
Sensitivity (Fluorescein)	5 pM (1 fmol/well, 96-well plate)–top and bottom
Reading Speed (Kinetic)	96 wells: 31 seconds 384 wells: 80 seconds

Luminescence	
Wavelength Range	300–700 nm
Dynamic Range	>6 decades
Sensitivity	10 amol ATP (flash)–Lum and Abs/Lum configurations 30 amol ATP (flash)–Multimode configurations
Time-Resolved Fluorescence	
Light Source	Xenon flash
Detector	PMT
Wavelength Selection	Monochromator
Alpha Detection	
Light Source	Tungsten halogen
Detector	PMT
Wavelength Selection	Filters
Sensitivity	300 amol bio-LCK-P, 25 µL/well in 384-well plate
Read Speed	96 well: 2 minutes
Reagent Injectors	
Supported Detection Modes	All modes
Number	Two syringe pumps
Supported Labware	6- to 384-well plates
Dead Volume	1.1 mL with backflush
Dispense Volume	5–1000 µL in 1 µL increments
Dispense Accuracy	±1 µL or 2%
Dispense Precision	≤2% at 50–200 µL
Physical Characteristics	
Power Consumption	130 W (max)
Dimensions	16" W x 15" D x 10" H (40.6 x 38.1 x 25.4 cm)
Weight	40 lb (18 kg)

# Agilent BioTek Synergy LX multimode reader

UV-Vis absorbance, fluorescence, and luminescence detection are just a touch away, with the Agilent BioTek Synergy LX multimode reader. The color touch screen simplifies programming and offers quick data display and output to a USB drive, printer, or PC with powerful Gen5 microplate reader and imager software. Synergy LX is the ideal microplate reader for many common end-point assays including nucleic acid and protein quantification, ELISA, and cell viability.

### Affordable, excellent performance

At about half the price of similar instruments, Synergy LX is the solution for labs looking for an easy-to-use microplate reader for UV-Vis, fluorescence, and luminescence assays. The independent optical paths use high-quality components, ensuring uncompromised performance in all detection modes.

### Common assays

Synergy LX supports most common assays. The monochromator-based absorbance optics enable a wide range of UV-Vis measurements, including nucleic acid and protein quantification, while easily exchanged filter cubes make the Synergy LX a practical workstation for fluorescence intensity and luminescence assays. The onboard software includes several preprogrammed protocols, and allows easy programming for unique requirements.

### Microvolume quantification

Use the Take3 microvolume plate with Synergy LX for fast and easy nucleic acid and protein determinations. Preprogrammed protocols in Synergy LX display immediate results for up to sixteen 2  $\mu$ L samples. Output results to a USB drive for use in downstream workflows.

### Easy operation

With its large color touch screen, Synergy LX makes it simple to select and run a protocol. The data is displayed immediately after the measurement with a color gradient to help quickly visualize the data range.



## Typical research applications

- Nucleic acid quantification ( $A_{260}$  and fluorescence-based)
- Nucleic acid purity assessment ( $A_{260}$   $A_{280}$ )
- Microvolume nucleic acid quantification (Take3 microvolume plate)
- ELISA
- Fluorescence ELISA
- Protein quantification
- Gene expression (luminescence and fluorescence)
- Cell viability assays
  - Absorbance MTT
  - Luminescence ATP
  - Various fluorescence-based



## Technical details

General	
Detection Modes	UV-Vis absorbance Fluorescence intensity Luminescence
Read Methods	End-point (onboard software) End-point, kinetic, area scanning, absorbance spectral scanning (under Agilent BioTek Gen5 software control)
Microplate Types	UV-Vis absorbance: 6- to 384-well plates (onboard software) Fluorescence intensity and luminescence: 96- and 384-well (onboard software) All modes: 6- to 384-well microplates (under Agilent BioTek Gen5 software control)
Other Labware	Agilent BioTek Take3 microvolume plates Agilent BioTek Take3 Trio microvolume plates (under Agilent BioTek Gen5 software control)
Shaking	Linear, orbital, double-orbital
Software	End-point protocols (onboard software) Full data analysis and reporting (under Agilent BioTek Gen5 software control)
Absorbance	
Light Source	Xenon flash
Detector	Photodiode
Wavelength Selection	Monochromator
Wavelength Range	200–999 nm, in 1 nm increments
Monochromator Bandwidth	≤5 nm
Wavelength Accuracy	±2 nm
Wavelength Repeatability	±0.2 nm (standard deviation)
Dynamic Range	0 to 4.0 OD
Resolution	0.001 OD (onboard software) 0.0001 OD (under Agilent BioTek Gen5 software control)
Pathlength Correction	Yes (under Agilent BioTek Gen5 software control)
OD Accuracy	<1% at 2.0 OD <3% at 2.5 OD
OD Linearity	<1% from 0–2.5 OD
OD Repeatability	<0.5% at 2.0 OD
Stray Light	0.03% at 230 nm
Reading Speed (Kinetic*)	96 wells: 12 seconds 384 wells: 23 seconds (*under Agilent BioTek Gen5 software control)

Fluorescence Intensity	
Light Source	Halogen
Detector	PMT
Wavelength Selection	Bandpass filters
Wavelength Range	320–700 nm (low noise PMT) 320–850 nm (red-shifted PMT)
Dynamic Range	>6 decades
Sensitivity	2 pM fluorescein
Reading Speed (Kinetic*)	96 wells: 24 seconds 384 wells: 76 seconds (*under Agilent BioTek Gen5 software control)
Luminescence	
Dynamic Range	>6 decades
Sensitivity	10 amol ATP
Physical Characteristics	
Power Consumption	60 W (max)
Connectivity	(1) USB 2.0 ports for computer control, (2) USB 2.0 ports for printer connection and USB thumb drive (touch screen configurations only)
Dimensions	15" W x 15" D x 15" H (with touch screen) (38.1 x 38.1 x 38.1 cm) 15" W x 15" D x 12" H (38.1 x 38.1 x 30.5 cm)
Weight	≤27 lb (12.3 kg)

## Multimode reader comparison chart

	Synergy Neo2	Cytation
<b>General</b>		
Microplate types	6- to 1536-well	Monochromator: 6- to 384-well Filter and imaging: 6- to 1536-well
Gas controller compatible	•	•
BenchCel compatible	•	•
BioSpa 8 compatible	•	•
BioStack compatible/automation-ready	•	•
Dual-reagent injector compatible	•	•
Take3 compatible	•	•
Temperature control system	To 70 °C	To 45 °C (Cytation 7, Cytation 1) To 65 °C (Cytation 5)
Peltier cooling module compatible		•
Condensation Control	•	•
<b>Key Features and Application Areas</b>		
Monochromator-based UV-Vis absorbance	•	•
Monochromator-based fluorescence	•	•
Variable bandwidth fluorescence monochromator	•	Cytation 7, Cytation 5
Filter-based fluorescence	•	Cytation 5, Cytation 1
Luminescence	•	•
Filtered luminescence	•	Cytation 5, Cytation 1
TRF and TR-FRET	•	Cytation 5, Cytation 1
TRF Laser	•	
Fluorescence polarization	•	Cytation 5, Cytation 1
AlphaLISA/AlphaScreen	100 mw 680 nm laser	100 mw 680 nm laser (Cytation 5)
Hybrid Technology	•	Cytation 5
Dual-PMT read head	•	
Upgradable to imaging		•

Synergy H1	Synergy HTX	Synergy LX
6- to 384-well	6- to 384-well	Onboard software Absorbance: 6- to 384-well FI and LUM: 96- and 384-well Under Agilent BioTek Gen5 software control All modes: 6- to 384-well
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To 70 °C ("M2" configurations) To 45 °C	To 50 °C	
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# Agilent BioTek Epoch 2 microplate spectrophotometer

Agilent BioTek Epoch 2 microplate spectrophotometer is a compact monochromator-based microplate spectrophotometer for 6- to 384-well microplates, cuvettes, and 2  $\mu$ L measurements. Epoch 2 features a color touch screen interface with easy-to-navigate controls, onboard software for data collection, analysis, and flexible export and report options. Incubation, shaking, and robot compatibility are standard features.

### UV-Vis measurements

The monochromator-based optics offer wavelength selection from 200 to 999 nm, for applications from nucleic acid quantification to ELISA, without using filters. Epoch 2 can measure up to forty-eight 2  $\mu$ L samples in the unique Take3 microvolume plates, for rapid, direct quantification. An optional cuvette port provides 1 cm measurements, making Epoch 2 a versatile spectrophotometer for multiple applications.

### Touch screen and onboard software

The color touch screen enables easy program creation and selection for a wide range of end-point and kinetic assays. The quick read function provides the fastest read-to-results. Select from predefined programs or create new programs for basic data analysis. Use the convenient flash drive or available printer for data output. Available Gen5 software enables computer control of all Epoch 2 read modes, including well-area scanning and expanded data analysis capabilities. When controlled by Gen5, Epoch 2 is automation compatible.

### Advanced 4-Zone Incubation

Epoch 2 features Agilent BioTek 4-Zone Incubation up to 65 °C, with minimal variation across the plate; ideal for a wide range of temperature-sensitive assays. The Condensation Control feature solves the common problem of condensation buildup on plate lids during incubated kinetic runs. Epoch 2 can be integrated with the BenchCel microplate handler or BioSpa 8 automated incubator for unattended automation.



## Typical research applications

- ELISA
- Enzyme kinetics
- Nucleic acid and protein quantification
- Cell proliferation
- Cytotoxicity
- Spectral scanning
- Reactive oxygen species
- Food safety and quality
- Bacterial identification
- Total protein determination
- Nucleic acid purity assessment

## Technical details

General	
Detection Mode	Absorbance
Read Methods	End-point, kinetic, well-area scanning
Microplate Types	6- to 384-well plates
Other Labware	Agilent BioTek Take3 microvolume plates, standard cuvettes (option)
Temperature Control	4-Zone Incubation to 65 °C
Shaking	Linear, orbital, double-orbital
Onboard Software	Protocol creation including end-point and kinetic reading parameters, basic data analysis, reporting, and exporting
Software	Agilent BioTek microplate reader and imager software included Agilent BioTek Gen5 Secure software for 21 CFR Part 11 compliance (option)
Automation	Agilent BioTek BioStack microplate stacker and third-party automation compatible Agilent BioTek BioSpa 8 automated incubator compatible
Absorbance	
Light Source	Xenon flash
Detector	Photodiode
Wavelength Selection	Monochromator
Wavelength Range	200–999 nm, in 1 nm increments
Monochromator Bandwidth	2.9 nm
Dynamic Range	0–4.0 OD
Resolution	0.0001 OD
Pathlength Correction	Yes
Monochromator Wavelength Accuracy	±2 nm
Monochromator Wavelength Repeatability	±0.2 nm
OD Accuracy	0.0–2.0 OD: ±1% ±0.010 OD 2.0–2.5 OD: ±3% ±0.010 OD
OD Linearity	0–2.0 OD: ±1% ±0.010 2.0–2.5 OD: ±3% ±0.010
OD Repeatability	0–2.0 OD: ±1% ±0.005 2.0–2.5 OD: ±3% ±0.005
Stray Light	0.03% at 230 nm
Reading Speed (Kinetic)	96 wells: 8 seconds 384 wells: 14 seconds
Physical Characteristics	
Power Consumption	120 W (max)
Dimensions	With touch screen: 12.5" W x 15.5" D x 13" H (31.8 x 39.3 x 33 cm) Without touch screen: 12.5" W x 15.5" D x 8" H (31.8 x 39.3 x 20.3 cm)
Weight	With touch screen: 25 lb (11.3 kg) Without touch screen: 20 lb (9.1 kg)

# Agilent BioTek Epoch microplate spectrophotometer

Agilent BioTek Epoch microplate spectrophotometer is a monochromator-based microplate spectrophotometer that offers functionality for the life science laboratory at an accessible price. Controlled by the powerful, yet easy-to-use Gen5 software, Epoch is designed to be the new lab workhorse for a wide variety of applications. For walkaway automation, an optional BioStack compatible Epoch is available.

## Wavelength range of 200 to 999 nm

The monochromator-based optical system in Epoch allows any wavelength selection between 200 and 999 nm in 1 nm increments. No filters required! From low-UV nucleic acid measurements, to standard ELISA assays, Epoch is ideally suited to the life science laboratory, where application flexibility is required.

## Microplate reading for 6- to 384-well plates

The Epoch optical and mechanical systems are designed to provide optimal measurements in a variety of microplates. The area scanning capability provides multiple measurements across larger diameter wells, resulting in more meaningful data analysis.

## Take3 microvolume plate compatible

When sample size matters, as in critical nucleic acid and protein quantification, the Take3 microvolume plate provides up to sixteen 2 µL measurements, without needing to dilute important samples.

## End-point, kinetic, spectral scanning

There is no need to buy expensive instrumentation to perform a variety of absorbance measurements. Epoch, driven by Gen5 software, is a high-value system with maximum assay flexibility.

## Typical research applications

- Nucleic acid quantification
- Protein quantification
- 260/280 and 260/230 purity measurements
- ELISA
- Enzyme kinetics
- Cytotoxicity
- Cell proliferation
- Microvolume assays with Take3 microvolume plate



## Technical details

General	
Detection Mode	Absorbance
Read Methods	End-point, kinetic, well-area scanning
Microplate Types	6- to 384-well plates
Other Labware	Agilent BioTek Take3 microvolume plates
Software	Agilent BioTek Gen5 microplate reader and imager software included Agilent BioTek Gen5 Secure software for 21 CFR Part 11 compliance (option)
Automation	Agilent BioTek BioStack microplate stacker and third-party automation compatible ("R" model)
Absorbance	
Light Source	Xenon flash
Detector	Photodiode
Wavelength Selection	Monochromator
Wavelength Range	200–999 nm, in 1 nm increments
Monochromator Bandwidth	5 nm
Dynamic Range	0–4.0 OD
Resolution	0.0001 OD
Pathlength correction	Yes
Monochromator Wavelength Accuracy	±2 nm
Monochromator Wavelength Repeatability	±0.2 nm
OD Accuracy	0.0–2.0 OD: ±1% ±0.010 OD 2.0–2.5 OD: ±3% ±0.010 OD
OD Linearity	0–2.0 OD: ±1% ±0.010 2.0–2.5 OD: ±3% ±0.010
OD Repeatability	0–2.0 OD: ±1% ±0.005 2.0–2.5 OD: ±3% ±0.005
Reading Speed (Kinetic)	96 wells: 15 seconds 384 wells: 31 seconds
Physical Characteristics	
Power Consumption	48 W (max)
Dimensions	12" W x 12.5" D x 7.7" H (30.5 x 31.8 x 19.6 cm)
Weight	<15 lb (6.8 kg)



# Agilent BioTek Take3 Microvolume Plate

Quickly quantify ultralow-volume samples of DNA, RNA and protein.  
Measure up to 48 samples with volumes as low as 2  $\mu\text{L}$  without dilution.

## Compatible with most BioTek multi-and single-mode detection systems

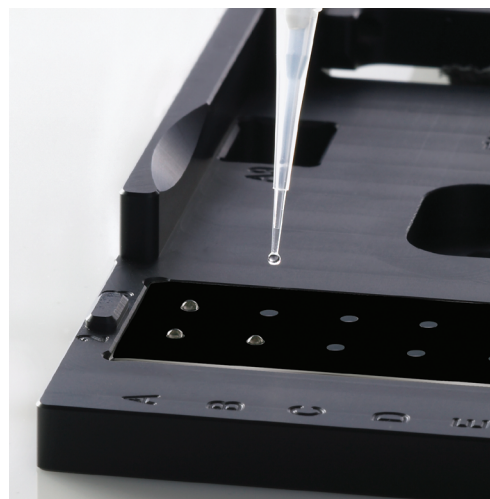
Use the Agilent BioTek Take3 microvolume plate with your Cytation, Synergy or Epoch reader to rapidly and easily measure multiple 2  $\mu\text{L}$  samples for direct DNA, RNA and protein quantification.

## Unique robust construction and easy maintenance

For routine cleaning, use laboratory wipes on all anodized surfaces. Damaged slides are easily user replaced, saving time and expense.

## Automated DNA, RNA and Protein Quantification

Gen5 software includes predefined protocols for microvolume quantification with Take3. Results include concentration, spectral scans and purity ratios.



## Typical research applications

- Microvolume DNA, RNA, and protein quantification
- Microvolume fluorescence measurements
- Fluorescent dye incorporation measurements

## Technical Details

	Take3	Take3 Trio
2 $\mu\text{L}$ Sample Capacity	16	48
Detection Limit	2 ng/ $\mu\text{L}$ dsDNA	2 ng/ $\mu\text{L}$ dsDNA



## Agilent BioTek 800 TS absorbance reader

For high-quality microplate reading at an affordable price, look no further than the Agilent BioTek 800 TS absorbance reader, with its robust hardware and powerful software.

### Wide range of applications

The 800 TS is ideal for a variety of applications including ELISA, protein and other end-point protocols. Incubation and shaking expand the application range to include enzyme kinetics and cell-based assays. The 800 TS partners perfectly with the Agilent BioTek 50 TS washer to automate all your workflows.

### Quick and easy programming

The touch screen interface makes protocol creation intuitive and simple. Defined protocols are saved onboard for convenient, quick selection. The 800 TS reads the plate efficiently, delivering results quickly and reliably.

### USB flash drive convenience

Results are displayed immediately after measurement, and can be sent to the optional printer or a USB flash drive. Import data to Gen5 software for advanced data handling and custom reporting

### High performance, excellent results

With the 800 TS, affordability doesn't mean compromised performance. The high-quality hardware and optical design ensure results for all assays. As an FDA registered and ISO certified manufacturer, Agilent BioTek understands the importance of performance and data verification. Verify and qualify the 800 TS performance over time, using the Agilent BioTek absorbance test plate and product qualification package.



### Technical details

General	
Detection Mode	Absorbance
Read Methods	End-point, kinetic, and well-area scanning (under computer control)
Microplate Types	6-, 12-, 24-, 48-, 96-well microplates; 384-well and Terasaki trays (NB configurations)
Temperature Control	To 50 °C
Shaking	Linear (except NB configurations)
User Interface	4.3" color LCD touch screen display
Onboard Software	Up to 40 user-programmable protocols
Software	Agilent BioTek Gen5 software included Agilent BioTek Gen5 Secure software (option)
Absorbance	
Light Source	Tungsten halogen lamp
Detector	Photodiode
Wavelength Selection	Filters
Wavelength Range	400–750 nm; 340–750 nm (UV configurations)
Filter Capacity/Supplied	Five positions/four (five with UV configurations)
Dynamic Range	0–4.0 OD (normal and rapid read modes)
Resolution	0.001 OD (standalone mode) 0.0001 OD (under Agilent BioTek Gen5 software control)
OD Accuracy	Normal read mode ±1.0% ±0.010 OD from 0.0–2.0 OD at 405 nm
OD Linearity	Normal read mode ±1.0% ±0.010 OD from 0.0–2.0 OD at 405 nm
OD Repeatability	Normal read mode ±0.5% ±0.005 OD from 0.0 to 2.0 OD at 405 nm
Read Speed	96 wells, single wavelength Normal/rapid/sweep read mode: 30 seconds/ 18 seconds/11 seconds
Physical characteristics	
Power Consumption	40 W (max) 150 W (max with incubation)
Dimensions	15" W x 16.5" D x 7" H (38.1 x 41.9 x 17.8 cm)
Weight	18.5 lb (8 kg)

## Typical research applications

- ELISA
- Enzyme kinetics
- Protein assays
- Cell-based assays

# Agilent BioTek Gen 5 software for detection

Agilent BioTek Gen5 microplate reader and imager software offers extensive data analysis tools for quantitative and qualitative analysis, including four-parameter (4PL) and five-parameter (5PL) curve fits, EC/IC<sub>50</sub> and Z' calculations. Data reduction transformations and customizable validation and cutoff calculations are all easily defined within the protocol. Gen5 provides quick, low-volume results with the Take3 microvolume plate, and data from any screen is exportable to Microsoft Excel at the touch of a single button.

## Targeted apps: ultimate ease

Individual, assay-specific apps make it even easier to run your lab's most common assays, like BCA, Bradford, and Lowry Protein assays, and fluorescence DNA quantification, among others. The simplified user interface has predefined, customizable protocols for easy set up, and data reduction is automated, using the power of Gen5 software.

## Logical workflow

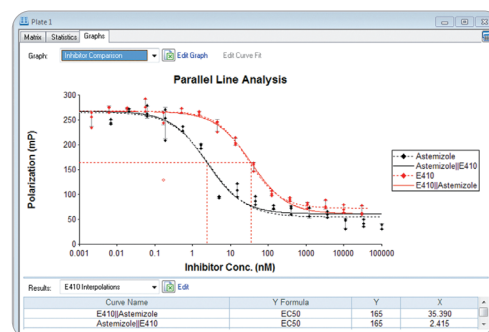
Gen5 is built around logical laboratory workflows to read microplates and produce/analyze data. The Gen5 task manager makes it simple to get started designing a protocol or simply reading a plate quickly. With Gen5 you do not have to spend hours figuring out how to get things done.

## Gen5 Secure: GxP compliance

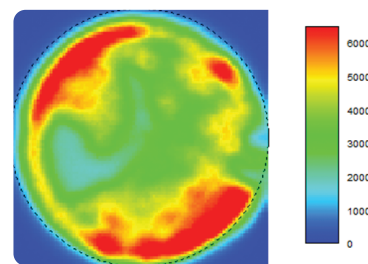
To meet GxP laboratory requirements, Gen5 Secure offers features designed to meet 21 CFR Part 11 regulations. Gen5 Secure is available for multimode and imaging applications. All include: built-in administration with no additional software required, multilevel user permissions, electronic signature, and protocol and data audit trails with configurable alerts.

## QC and validation tools

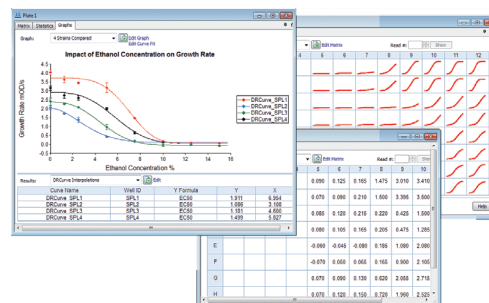
Gen5 is fully validated at Agilent BioTek, however, the available Gen5 validation package provides an efficient, step-by-step approach to facilitate your internal validation. The Gen5 validation package is compatible with Agilent BioTek microplate reader product qualification packages (IQ/OQ/PQ).



Parallel line analysis and EC<sub>50</sub> determinations



High-resolution 99 x 99 area scan



Multiple window views of plate data and results

# Agilent BioTek LogPhase 600 microbiology reader

The Agilent BioTek LogPhase 600 microbiology reader is in a class of its own, designed for measuring microbial growth curves in up to four standard 96-well microplates at a time. It features purpose-built, robust shaking, and consistent temperature control, which are critical to optimal bacteria and yeast cell growth, ensuring data quality. The LogPhase 600 is controlled with an app to acquire data and perform microbiology-focused analysis for all plates.

### Four-plate microplate reader

LogPhase 600 is a four-plate microplate reader that facilitates microbial growth assays.

### Keep your cells in suspension for optimal growth

The shaking mechanism in LogPhase 600 is specifically designed for microbial growth assays; its robust shaking ensures that your cells will not settle, even during long-term kinetic assays.

### Optimized incubation

Consistent temperature control is essential to successful microbial growth assays. Incubation in the LogPhase 600 is controlled by several sensors to ensure even heating throughout, without edge effect or evaporation. Incubation can be inconsistent in some microplate readers, but LogPhase 600 ensures consistent interplate and intraplate heating.

### Condensation Control

Condensation Control sets a temperature gradient from top to bottom to prevent condensation on the sealed plates that can cause light scatter and reading artifacts.

### Consistent growth conditions produces consistent data

LogPhase 600 provides consistent growth conditions that are essential for microbial growth assays.

### Targeted, powerful, and easy-to-use app

The LogPhase 600 app has an easy-to-use interface, with analysis tools designed for microbial growth researchers. New users can be up and running in minutes, with very little training. Multiplate data can be viewed on the screen at the same time. The app automatically calculates lag time, maximum rate (OD/min), and time to stationary phase.



## Typical research applications

- Yeast growth assays
- Bacterial growth assays
- Antimicrobial resistance
- Algal research
- Biofuels research
- Food and beverage testing

## Technical details

General	
Detection Modes	Absorbance
Microplate Types	96-well microplates
Microplate Capacity	Four-microplate capacity
Temperature Control	Incubation to 45 °C with Condensation Control Variation $\pm 0.5$ °C at 37 °C Plate to plate uniformity $\pm 0.5$ °C at 37 °C
Shaking	Orbital, user-selectable velocity
Software	LogPhase app included; provides reader control, data collection, and complete analysis.
Absorbance	
Light Source	LED
Detector	Two photodiodes (measurement and reference)
Wavelength Range	560–640 nm, configuration dependent
Read Methods	Discontinuous kinetic
Dynamic Range	0–4.0 OD
Resolution	0.001 OD
OD Accuracy	0.000–2.000 OD $\pm 1\%$ $\pm 0.010$ OD
OD Linearity	0.000–2.000 OD $\pm 1\%$ $\pm 0.010$ OD
OD Repeatability	0.000–2.000 OD $\pm 1\%$ $\pm 0.005$ OD
Reading Speed	Reading speed: <60 seconds per plate Minimum kinetic interval: 2 minutes 30 seconds (<60 seconds read time; 90 seconds shake) per plate
Physical Characteristics	
Power Consumption	24 VDC power supply compatible with 100–240 volts AC at 50–60 Hz, 250 W (minimum)
Dimensions	10.5" H x 26.0" W x 16.0" D (26.7 x 66 x 40.6 cm)
Weight	50 lb (22.7 kg)

## Absorbance reader comparison chart

	Epoch 2	Epoch
<b>Key Features</b>		
Wavelength selection	Monochromator	Monochromator
Wavelength range	200–999 nm	200–999 nm
Microplate types	6- to 384-well	6- to 384-well
Microplate capacity	1	1
Absorbance range	0–4.0	0–4.0
Temperature control	To 65 °C	
Shaking	Linear, orbital, double-orbital	
Cuvette measurement	Cuvette port (optional), Take3 or cuvette adapter	Take3 or cuvette adapter
Filter capacity	n/a	n/a
Automation ready/BioStack compatible	•	("R" configuration)
BenchCel compatible	•	
BioSpa 8 compatible	•	
Gen5 software version included	Gen5	Gen5
Take3 compatible	•	•
Fastest read speed: 96 wells	8 seconds	15 seconds

LogPhase 600	800 TS
Filter	Filter
560–640 nm (configuration dependent)	400–750 nm (340–750 nm option)
96-well	6- to 96-well (6- to 384-well option)
4	1
0–4.0	0–4.0
To 45 °C	To 50 °C
Orbital	Linear
1	5
LogPhase 600 app	Gen5
<60 seconds per plate	11 seconds



# Agilent BioTek EL406 washer dispenser

The Agilent BioTek EL406 washer dispenser offers fast microplate washing and unique Agilent BioTek Parallel Dispense technology to optimize liquid handling processes.

### Unattended automation of ELISA and cell-based assays

The EL406 integrates 96-, 384-, and 1536-well microplate washing with three dispensers in one compact instrument. Now you can simply press a button and walk away, or automate an entire batch by adding a BioStack microplate stacker. For entire workflow automation, the EL406 can be integrated to the BenchCel microplate handler, or the BioSpa 8 automated incubator along with a with an Agilent BioTek imager or reader.

### Dual-Action manifold and Ultrasonic Advantage

The EL406 incorporates the Agilent BioTek Dual-Action manifold for thorough yet gentle washing of loosely adherent cell layers. Agilent BioTek Ultrasonic Advantage provides integrated ultrasonic cleaning for the manifold tubes, to automate wash manifold maintenance.

### Parallel Dispense technologies

The EL406 eliminates the need to choose a dispensing technology by offering both peristaltic and syringe pumps on a single platform.

### Fast and efficient biomagnetic separation and vacuum filtration

The EL406 automates full microplate washing of magnetic microspheres, which are used in an increasing number of multiplex assays. Developed in conjunction with Luminex xMAP technology leaders, Agilent BioTek separation modules incorporate high energy neodymium iron boron magnets for speed and efficiency. An available vacuum filtration module makes the EL406 well suited for polystyrene beads and filtration-to-waste processes.



## Typical research applications

- ELISA automation
- MSD assay automation
- HCS immunocytochemistry
- Cell-based assays
- FLIPR  $\text{Ca}^{2+}$  flux
- Magnetic bead assay automation
- Polystyrene bead assay automation
- Drug transport assays
- Automated cell washing, fixing, and staining for cellular imaging

## Technical details

General	
Microplate types	96-, 384-, 1536-well Low profile and standard height Solid and filter bottom (option)
Onboard Software	Create, edit, or run multiple protocols
Software	Agilent BioTek LHC software (option) Agilent BioTek LHC Secure software for 21 CFR Part 11 compliance (option) SiLA compliant driver (option)
Separation	Biomagnetic separation, vacuum filtration (option)
Shaking	Programmable up to 60 minutes Slow, medium, fast, or variable
Soaking	Programmable up to 60 minutes
Ultrasonic Advantage	Yes (standard on most configurations)
Automation	Agilent BioTek BioStack microplate stacker and third-party automation compatible Agilent BioTek BioSpa 8 automated incubator compatible
Washing	
Manifold Types	96-well washing: 96-tube manifold 96- and 384-well washing: 96-tube Dual-Action manifold 384-well washing (fast): 192-tube Dual-Action manifold 1536-well washing: Two 32-tube dispense manifolds, 316 SS tubes or sapphire-jeweled 316 SS tubes
Volume Range	3–3000 µL/well, in 1 µL increments
Wash Cycles	1–250
Buffer/Reagent Selection	Automated buffer switching module for up to four buffers (option)
Supply Bottle	4 L or 10 L (optional)
Dispense Accuracy	±3%
Dispense Precision	<3% CV (model dependent)
Residual Volume	<2 µL/well
Wash Speed	96 wells, 300 µL/well, 96-tube manifold: 13 seconds 384 wells, 100 µL/well, 192-tube manifold: 17 seconds 1536 wells, 10 µL/wells, two 32-tube manifolds: 36 seconds
Flow Rates	High flow to low flow Optimized rates for cell assays
Sterilization	Chemical
Vacuum Range for Filtration	0 to–380 mm Hg
Dispensing: Peristaltic Pump (Multichannel)	
Manifold Types	8-tip (1 x 8) cassette with plastic, 316 stainless steel or sapphire-jeweled 316 stainless steel tips
Dispense Speed	96 wells, 10 µL/well: 8 seconds 384 wells, 5 µL/well: 12 seconds 1536 wells, 1 µL/well: 27 seconds
Volume Range	500 nL to 3000 µL/well, selectable in 1 µL increments
Flow Rates	User-programmable rates from high to low Optimized rates for cell assays

Dispense Performance	1 µL cassette: Recommended volume range: 1–50 µL Dispense accuracy: ±5% at 1 µL Dispense precision: ≤5% CV at 1 µL ≤10% CV at 500 nL Minimum prime volume: 1.20 mL 5 µL cassette: Recommended volume range: 5–2500 µL Dispense accuracy: ±2.0% at 5 µL Dispense precision: ≤2.5% CV at 5 µL Minimum prime volume: 4.23 mL 10 µL cassette: Recommended volume range: 10–3000 µL Dispense accuracy: ±2.0% at 10 µL Dispense precision: 2.0 CV at 10 µL Minimum prime volume: 7.36 mL
Recommended Cassette Replacement Interval	1 µL cassette: one-thousand 384-well microplates at 5 µL/well 5 µL cassette: one-thousand 96-well microplates at 50 µL/well 10 µL cassette: one-thousand 96-well microplates at 100 µL/well
Sterilization	Autoclave, chemical
Dispensing: Syringe Pump (multichannel)	
Manifold Types	96-well dispensing: One 16-tube (2 x 8) manifold: 316 stainless steel tubes 96-/384-well dispensing: Two 16-tube (1 x 16) manifolds: 316 stainless steel tubes 1536-well dispensing: Two 32-tube (1 x 32) manifolds: sapphire-jeweled 316 stainless steel or 316 stainless steel tubes
Dispensing Speed	20 µL/well, 96 wells, 1 x 16 tubes: 5 seconds 20 µL/well, 384 wells, 1 x 16 tubes: 14 seconds 3 µL/well, 1536 wells, 2 x 32 tubes: 7 seconds
Volume Range	3–3000 µL/well, selectable in 1 µL increments Minimum prime volume: 12 mL
Flow Rates	User-programmable rates from high to low
Dispense Accuracy	±1 µL at 5 µL ±1 µL at 20 µL ±1% at 100 µL
Dispense Precision	≤5% CV at 5 µL ≤2.5% CV at 20 µL ≤1% CV at 100 µL
Supply Bottle	1 L or 2 L
Sterilization	Chemical, autoclavable option
Physical Characteristics	
Power Consumption	900 W (max) 1250 W (max with vacuum pump)
Dimensions	16.5" W x 18" D x 12.5" H (41.9 x 45.7 x 31.8 cm)
Weight	32 lb (14.5 kg)

# Agilent BioTek 405 TS washer

The Agilent BioTek 405 TS washer takes plate washing to the next level with an enhanced user interface, increased convenience, assay applications, and automated maintenance features.

The 405 TS washer incorporates all the features and functionality of the prior Agilent BioTek ELx405 models, and improves accessibility through its touch screen and extensive onboard software. 96- and 384-well microplate-based wash procedures are only “two touches” away with the easy-to-use interface. Additionally, two USB ports provide convenient file transfer, storage, and operation. A context-sensitive Help system and several instructional videos are also included.

### The standard for automation

The 405 TS washer makes quick work of any washing assay, and is especially well suited for integration into automated systems, where the wash process is controlled remotely. The 405 TS can be integrated with the BioSpa 8 automated incubator for unattended automation of many common processes.

### Cell and bead assays

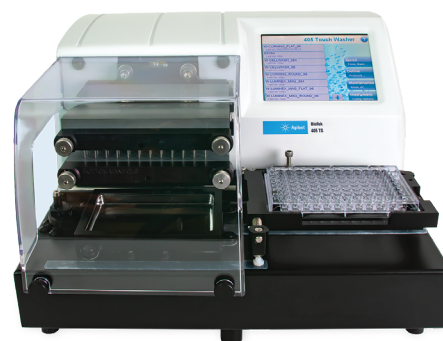
The 405 TS is available in various models for optimized performance with the most sensitive and rigorous assay requirements. When the protocol calls for washing loosely adherent cells, angled dispense tubes, extralow flow rates, and software-adjustable X, Y, and Z positioning enable washing without cell layer disruption. Magnetic and polystyrene bead washing are effectively accomplished with the 405 TS.

### Verify technology and automated Ultrasonic Advantage cleaning

Agilent BioTek Verify technology runs an automated QC check for manifold tube blockage, and visually reports any failures. Ultrasonic Advantage can then be used to automatically clean the manifolds. Together, these features make the 405 TS a self-checking, self-maintaining microplate washer!

### Applications in deep well washing

The Agilent BioTek Select deep well washer washes 96- and 384-well plates up to 50 mm tall, and is also compatible with standard height plates without any hardware or software changes. This versatile system is optimal for labs working in deep well blocks and standard plates.



## Typical research applications

- ELISA automation
- MSD assay automation
- HCS immunocytochemistry
- FLIPR  $\text{Ca}^{2+}$  flux
- Cell-based assays
- Magnetic and polystyrene bead assays
- Gene expression assays
- Cytokine assays
- ELISPOT assays
- Plasmid DNA purification
- Serum/plasma sample preparation
- Cell signaling: phospho flow setup for flow cytometry
- SiLA compliant integration (with Agilent BioTek Liquid Handling Control 'LHC' software)

## Technical details

General	
Microplate Types	96- and 384-well Low profile and standard height Solid and filter bottom (option) Filter pore sizes from 0.45–1.2 µm
Onboard Software	Create, edit, or run multiple protocols
Software	Agilent BioTek LHC software Agilent BioTek LHC Secure for 21 CFR Part 11 compliance (option) SiLA compliant driver (option)
Separation	Biomagnetic separation, vacuum filtration (optional)
Shaking	Programmable up to 60 minutes Slow, medium, fast, or variable
Soaking	Programmable up to 60 minutes
Automation	Agilent BioTek BioStack microplate stacker and third-party automation compatible Agilent BioTek BioSpa 8 automated incubator compatible
Washing	
Manifold Types	96-tube manifold for 96-well washing 96-tube Dual-Action manifold for 96- and 384-well washing 192-tube Dual-Action manifold for fast 384-well washing
Volume Range	25–3000 µL/well, in 1 µL increments
Wash Cycles	1–250
Buffer/Reagent Selection	Automated buffer switching (internal) for up to four buffers (option)
Supply Bottle	4 L or 10 L (optional)
Dispense Precision	<3% CV: 300 µL/well (96-well washing) <4% CV: 80 µL/well (384-well washing)
Residual Volume	<2 µL/well (96- and 384-well plates) 96-tube manifold for 96 wells; 192-tube for 384 wells
Wash Speed	96-wells, 300 µL/well, 3 cycles; ≤30 seconds 384-wells, 100 µL/well, 3 cycles; ≤80 seconds 384-wells, 400 µL/well, 1 cycle; ≤20 seconds
Flow Rates	High flow to low flow Optimized rates for cell assays
Sterilization	Chemical
Vacuum Range for Filtration	–38 to –506 mm Hg
Ultrasonic Advantage	Ultrasonic manifold cleaning (option)
Verify Clog Detection	Automated clog detection and reporting (option)
Physical Characteristics	
Power Consumption	800 W (max) 1250 W (max with vacuum pump)
Dimensions	14" W x 17" D x 10" H (35.6 x 43.2 x 25.4 cm)
Weight	With internal buffer switching: 36 lb (16.5 kg)

# Agilent BioTek 50 TS washer

The Agilent BioTek 50 TS washer brings high quality and excellent automated washing to your laboratory at an affordable price. The robust design, easy-to-use software and excellent performance are typical of Agilent BioTek microplate washers.

### Broad applications range

Applications for the 50 TS extend beyond simple dispense and aspirate routines typical of many ELISA processes. Fluid delivery can be optimized for gentle cell-based assay washing, and available modules automate biomagnetic and vacuum filtration protocols. To automate many lower-throughput workflows, the 50 TS partners well with the 800 TS microplate absorbance reader.

### Simple, powerful programming and operation

The 50 TS software includes predefined protocols for quick selection of commonly used wash parameters. Creating custom protocols onboard the 50 TS is easy: the touch screen interface makes multistep program creation intuitive and simple. Protocols are saved for quick recall. From just a single strip to a full microplate, the 50 TS washes quickly, efficiently, and reliably.

### Automated buffer switching

To facilitate maintenance or to accommodate complex wash routines, the 50 TS offers automated switching between supply bottles. Automated buffer switching is an affordable option for the 50 TS.

### Reliable, safe, and low maintenance

Liquid level sensors will alert you to low supply or full waste levels, allowing wash programs to run safely and reliably. Predefined, automated maintenance routines keep the fluid path clean and prevent buildup of salt, protein, or other material that can block manifold tubes, causing inadequate washing. Agilent BioTek understands the importance of performance and data verification: the 50 TS product qualification package provides simple, straightforward instructions for verification of the 50 TS performance over time.



## Typical research applications

- ELISA
- Cell-based assays
- Biomagnetic separation protocols
- ELISpot assays
- Vacuum filtration protocols
- Multiplex assays

## Technical details

General			
Microplate Types	96 wells 96 and 384 wells ("16" configurations) Low profile and standard height 24 wells (with 4-well manifold) Solid and filter bottom ("V" models) Filter pore sizes 0.45–1.2 µm		
Onboard Software	Up to 75 user-programmable protocols Quick menu Create or edit custom protocols Run protocols created onboard or downloaded from Agilent BioTek LHC software		
Software	Agilent BioTek LHC software, for external computer control and operation (optional)		
Separation	Biomagnetic separation ("M" configurations) Vacuum filtration ("F" configurations)		
Shaking	Programmable in mm:ss up to 30 minutes		
Soaking	Programmable in mm:ss up to 30 minutes		
User Interface	4.3" color LCD touch screen display		
Washing			
Manifolds	Manifold Type		Plate Type
	4-well manifold		24-well
	8-well manifold		96-well
	8s-well manifold (short dispense tube)		96-well
	2 x 8-well manifold		96-well
	12-well manifold		96-well
	16-well manifold		96- and 384-well
Volume Range	25–3000 µL/well		
Wash Cycles	1–10		
Buffer/Reagent Selection	Automated buffer switching module for up to three buffers ("V" configurations)		
Dispense Precision	Plate Type	Manifold	Performance
	96-well	8- and 8s-well	≤3.0% CV when measured over six 300 µL/well dispenses of deionized water with 0.1% Tween 20
	96-well	12-well	≤3.0% CV when measured over four 300 µL/well dispenses of deionized water with 0.1% Tween 20
	384-well	8-,16-well	≤4.0% CV when measured over six 100 µL/well dispenses of deionized water with 0.1% Tween 20
	96-well	2 x 8-well	≤4.0% CV when measured over six 300 µL/well dispenses (whole plate) of deionized water with 0.1% Tween 20
	24-well	4-well	≤4.0% CV when measured over six 1120 µL/well dispenses of deionized water with 0.1% Tween 20
Residual Volume	Plates	Manifold	Performance (Average Residual/Well)
	96-well	8-well, 12-well	≤2.0 µL/well after 3-cycle wash, 300 µL/well dispensed
	96-well	2 x 8-well	≤4.0 µL/well after 3-cycle wash, 300 µL/well dispensed
	384-well	8-,16-well	≤4.0 µL/well after 1-cycle wash, 100 µL/well dispensed
	24-well	4-well	≤5.0 µL
	96-well filter bottom	8-, 2 x 8-, 12-well	<1.2 g increase after blotting
Wash Speed	96 wells, 8-tube manifold, >300 µL/well: <130 seconds		
Fluid Delivery	One positive displacement syringe drive		
Physical Characteristics			
Power Consumption	40 W (max)		
Dimensions	15" W x 15" D x 8" H (38.1 x 38.1 x 20.3 cm)		
Weight	22 lb (9.9 kg)		

## Washer comparison chart

	EL406	MultiFlo FX
Key Features		
6-, 12-, 24-, 48-well microplates		•
96-well microplates	•	•
384-well microplates	•	•
96-/384-deep well microplates		
1536-well microplates	•	
24-well microplates		
Full microplates	•	•
Strip microplates		•
Vacuum filtration	•	•
Biomagnetic separation	•	
Dual-Action manifold	•	
Ultrasonic Advantage	•	
Verify technology		
Optimized cell washing	•	•
BenchCel compatible	•	•
BioSpa 8 compatible	•	•
BioStack compatible	•	•
LHC software compatible	•	•
Touch screen UI		•
USB flash drive port		•



405 TS	405 LS	ELx405 Select	50 TS
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# Agilent BioTek MultiFlo FX multimode dispenser

Agilent BioTek MultiFlo FX multimode dispenser is an automated multimode reagent dispenser for 6- to 1536-well plates, dispensing volumes as low as 500 nL. Several available modules expand its versatility and applications. A fully configured MultiFlo FX can replace up to five liquid handlers.

### Parallel Dispense technologies

A combination of peristaltic- and microprocessor-controlled syringe pump dispensers enables MultiFlo FX users to choose which is best for a specific reagent. Peristaltic pumps offer low prime volumes and backflush capabilities, and syringe drives are program-and-forget solutions that never require recalibration.

### Random Access Dispensing (RAD)

When the liquid handling workflow calls for individual well dispensing along with rapid bulk dispensing, RAD module provides single-channel dispensing to discrete wells of 6- to 384-well plates. A custom plate map can be imported for use in concentration normalization protocols.

### Wash module

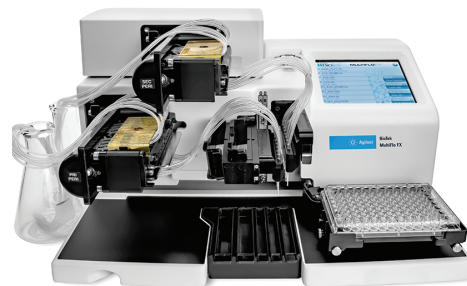
The wash module automates 6- to 384-well plate washing, using a precise syringe-driven dispense pump. A MultiFlo FX configured with multiple dispensers and the wash module provides astounding liquid handling versatility.

### Automated Media Exchange (AMX)

With the AMX module, MultiFlo FX can meet the needs of important research that uses 3D cell structures such as spheroids and tumoroids, plus suspension cell-based applications. The AMX module provides automated, gentle media exchange for these critical workflows.

### Modular and upgradable

The MultiFlo FX is configurable and upgradable from dispense or wash only, to a combined dispense and wash combination, plus AMX or single-channel dispensing with the RAD modules. MultiFlo FX fits on any lab bench, and is easily integrated with the BenchCel microplate handler, BioSpa 8 automated incubator or BioStack microplate stacker.



## Typical research applications

- Live cell workflows
- Automated media exchange
- 2D and 3D cell culture
- Cell fix and staining for imaging
- Concentration normalization
- Suspension cell culture
- Cell seeding
- ELISA

## Technical details

General	
Microplate Types	Dispensing (peri pump and syringe) 96-, 384- and 1536-well standard, deep and PCR plates; 6-, 12-, 24- and 48-well plates (dispense tip configurable) Washing 96-, 384-well standard plates; 6-, 12-, 24-, and 48-well plates (with compatible manifold configuration)
Onboard Software	Create, edit, or run multiple protocols
Software (Computer Control)	Agilent BioTek LHC2 software Agilent BioTek LHC2 Secure software for 21 CFR Part 11 compliance (option) SiLA Compliant driver (option)
Shaking	Programmable up to 60 minutes Slow, medium, fast, or variable
Soaking	Programmable up to 60 minutes
Automation	Agilent BioTek BioStack microplate stacker and third-party automation compatible Agilent BioSpa 8 automated incubator compatible Agilent BenchCel compatible
Dispensing: Peristaltic Pump (Multichannel)	
Manifold Types	1 x 8 tube, sapphire-jeweled 316 SS, 316 SS, or polypropylene tips
Fluid Delivery	One or two peristaltic pumps
Dispense Speed	96 wells, 5 µL cassette, 10 µL/well: 3 seconds 384 wells, 5 µL cassette, 5 µL/well: 6.5 seconds 384 wells, 1 µL cassette, 1 µL/well: 6 seconds 1536 wells, 1 µL cassette, 1 µL/well: 21 seconds
Dispense Volume Range	500 nL to 300 µL/well, selectable in 1 µL increments
Flow Rates	User-programmable rates from high to low
Dispense Performance	1 µL cassette: recommended range: 1–50 µL Accuracy: +5% at 1 µL Precision: <5% CV at 1 µL <10% CV at 500 nL Minimum prime volume: 1.20 mL  5 µL cassette: recommended range: 5–2500 µL Accuracy: +2.0% at 5 µL Precision: <2.5% CV at 5 µL Minimum prime volume: 4.23 mL  10 µL cassette: recommended range: 10–3000 µL Dispense accuracy: +2.0% at 10 µL Dispense precision: <2.0% CV at 10 µL Minimum prime volume: 7.36 mL
Dispensing: Syringe Pump (Multichannel)	
Manifold Types	96- and 384-well dispensing: One 16-tube (2 x 8) manifolds: 316 SS tubes Two 16-tube (1 x 16) manifolds: 316 SS tubes  1536-well dispensing: Two 32-tube (1 x 32) manifolds: sapphire-jeweled 316 SS or 316 SS tubes 6- to 48-well dispensing: custom autoclavable manifolds available
Fluid Delivery	Two positive displacement syringe drives
Dispense Speed	20 µL/well, 96 wells, 1 x 16 tubes: 5 seconds 20 µL/well, 384 wells, 1 x 16 tubes: 14 seconds 3 µL/well, 1536 wells, 2 x 32 tubes: 7 seconds
Volume Range	3–3000 µL/well selectable in 1 µL increments Minimum prime volume: 12 mL
Flow Rates	User-programmable rates from high to low
Dispense Accuracy	±1 µL at 5 µL and 20 µL ±1 % at 100 µL
Dispense Precision	<5% CV at 5 µL <2.5% CV at 20 µL <1% CV at 100 µL

Supply Bottle	1 L or 2 L
Sterilization Method	Chemical, autoclavable option
Washing	
Wash Volume Range	20–30,000 µL/well
Wash Cycles	1–10
Wash Speed	96 wells, 8-tube manifold, 3 cycles, 300 µL/well: <130 seconds
Dispense Accuracy	±3%
Dispense Precision	96-/384-well plates, 300 µL/well: <3% CV 6-well plates, 5560 µL/well: <5% CV
Residual Volume	96-well plate, 300 µL/well: <2 µL/well
Bottle Capacity	2 L supply and waste
Waste Level Detection	Yes
Sterilization Method	Chemical
Media Exchange: AMX Module	
Manifold Types	Two 8-channel autoclavable manifolds
Cassettes	Autoclavable cassettes with 5 µL tubing
Dispense Precision	≤5% CV
Dispense Accuracy	≤±5%
Aspiration Uniformity	≤±5%
Sterilization Method	Cassettes and manifolds: chemical and autoclavable
Dispensing: RAD Module	
Microplate Types	Single tip: 6-to 384-well plates; low profile, standard height, and deep well formats 8-to-1 tip: 6-, 12-, and 24-well plates
Other Labware Supported	96-well cluster tubes (minitubes) up to 50 mm height (requires custom carrier p/n 7212042)
Manifold Types	RAD single, with plastic or steel tip with 1, 5, or 10 µL tubing, 7° angle RAD 8-to-1 plastic tip, with 5 µL tubing, angled bulk dispense chute
Volume Range	500 nL to 30,000 µL
Minimum Prime Volume	1 µL cassette, 18": 90 µL ; 1 µL cassette, 30": 150 µL 5 µL cassette, 18": 320 µL; 1 µL cassette, 30": 530 µL 10 µL cassette, 18": 555 µL; 10 µL cassette, 30": 920 µL
Dispense Speed (High Flow Rate)	1 µL cassette, 1 µL/well: 19 seconds (96 wells), 19 seconds (384 wells) 5 µL cassette, 5 µL/well: 19 seconds (96 wells), 58 seconds (384 wells) 10 µL cassette, 10 µL/well: 21seconds (96 wells), 66 seconds (384 wells)
Dispense Performance	1 µL cassette (medium), 0.5 µL/well: precision 10% CV 1 µL cassette (medium), >2 µL/well: accuracy +5%, precision 5% CV 5 µL cassette (high), >10 µL/well: accuracy +2%, precision 2.5% CV 10 µL cassette (high), >20 µL/well: accuracy +2%, precision 2% CV 8-to-1 cassette (high), >10 µL/well: precision 2.5% CV 8-to-1 cassette (high), >80 µL/well: accuracy +2%
Physical Characteristics	
Power Consumption	90 W (max)
Dimensions	Base instrument: 17.2" W x 11.8" D x 8" H (43.7 x 29.9 x 20.3 cm)
Weight	Base instrument: 19.5 lb (8.8 kg)
Connectivity	Two USB ports: protocol storage/transfer and for optional external mouse or keyboard

# Agilent BioTek MicroFill dispenser

With its microprocessor-controlled syringe drive technology, the Agilent BioTek MicroFill dispenser provides outstanding accuracy and precision while dispensing into 24-, 96-, and 384-well plates.

### Low-maintenance design

The MicroFill is an economical, compact, and reliable alternative to conventional microplate dispensers. Its microprocessor-controlled syringe pump provides optimal dispense performance without time-consuming recalibration, cassette replacement, and maintenance. Syringes are ideal for higher-volume filling, with noteworthy speed improvements compared to other dispense technologies.

### Guaranteed sterility

The entire fluid path is autoclavable for applications requiring sterility. The MicroFill pump, tubing, dispense manifold, and supply bottle are quickly changed with no reagent carryover. User-controlled dispense flow rates allow low- to high-velocity dispensing for both biochemical and cell-based assays. Low profile, standard, and deep well microplates are all accommodated with a broad volume range from 5  $\mu$ L to 6 mL.

### Unattended operation

For increased throughput, the MicroFill can be integrated with the BioStack microplate stacker, or interfaced to third-party automated systems with its available interface software. MicroFill drivers are available from most of today's leading system providers.



## Typical research applications

- Primary and secondary screening assays
- Compound storage
- Genomics and proteomics research
- Cell-based assays
- ELISAs

## Technical details

General	
Microplate Types	24-, 96-, and 384-well Low profile, standard, and deep well formats
Other Labware	PCR tubes, microtubes
Onboard Software	Create, edit, or run multiple protocols
Software (PC Control)	Interface software (optional) for robotic system integration
Shaking	Programmable up to 60 minutes Slow, medium, fast, or variable
Soaking	Programmable up to 60 minutes
Automation	Agilent BioTek BioStack microplate stacker and 3rd party automation compatible
Dispensing: Syringe Pump (Multichannel)	
Manifold Types	24-well dispensing: One 8-tube (1 x 8) manifold: 316 stainless steel tubes 96-well dispensing: One 8-tube (1 x 8) manifold: 316 stainless steel tubes 96-/384-well dispensing: One 16-tube (1 x 16) manifold: 316 stainless steel tubes
Dispense Speed	96 wells, 10 µL/well, 1 x 16: 4 seconds 384 wells, 5 µL/well, 1 x 16: 7 seconds
Volume Range	5–6000 µL/well (manifold dependent) Minimum prime volume: 10 mL
Flow Rates	User-programmable rates from high to low
Dispense Accuracy	±1 µL at 5 µL and 20 µL ±1% at 100 µL
Dispense Precision	≤5% CV at 5 µL ≤2.5% CV at 20 µL ≤1% CV at 100 µL
Supply Bottle	1 L
Sterilization	Autoclave, chemical
Physical Characteristics	
Power Consumption	40 W (max)
Dimensions	15" W x 18" D x 7" H (38.1 x 45.7 x 17.8 cm)
Weight	20 lb (9.1 kg)

## Dispenser comparison chart

	EL406
<b>General</b>	
Microplate types	96, 384, and 1536, standard and low profile
Modules available	Peristaltic dispense pump module Dual syringe pump module
Number of reagents	1–3
Dispense technology	Peristaltic pump Dual syringe pump
Fully modular and upgradable	•
Automation ready/BioStack compatible	•
BenchCel compatible	•
BioSpa 8 compatible	•
Variable flow rates	•
Volume range	1–3000 µL/well
Microplate shaking	•
Autoclavable fluid path	•
Onboard software included	•
LHC software compatible	•
<b>Key Features and Application Areas</b>	
ELISA	•
Cell-based assays	•
Bulk reagent dispensing	•
Single-well dispense	
Automated media exchange	•
<b>Performance</b>	
Dispensing speed	
Peristaltic pump (8-tip, 1 x 8), 96-well, 10 µL/well; 384-well, 5 µL/well	3 seconds; 6 seconds
Syringe pump (16-tube, 1 x 16), 96-well, 20 µL/well; 384-well, 20 µL/well	5.25 seconds; 14 seconds
Dispense accuracy: at 5 µL, peristaltic pump; syringe pump	±2%; ±1 µL
Dispense precision: at 5 µL, peristaltic pump; syringe pump	≤2.5% CV; ≤2.5% CV

MultiFlo FX	MicroFill
6 to 1536 standard, low profile and deep well	24, 96 and 384 standard, low profile and deep well
Wash module AMX Automated Media Exchange module RAD Random Access Dispense module Peristaltic dispense pump module Dual syringe pump module	
1–5	1
Peristaltic pump Dual syringe pump	Single syringe pump
•	
•	•
•	
•	
500 nL to 30,000 µL/well	5–6000 µL/well
•	
•	•
•	•
•	
•	•
•	•
•	•
RAD module	
AMX module	
3 seconds; 6 seconds	n/a
5.25 seconds; 14 seconds	4 seconds; 7 seconds
±2%; ±1 µL	n/a; ±1 µL
≤2.5% CV; ≤5% CV	n/a; ≤5% CV



# Agilent BioTek Liquid Handling Control (LHC) software

Agilent BioTek Liquid Handling Control (LHC) software allows the MultiFlo FX dispenser, EL406 washer dispenser, and 405 TS washer users the convenience of programming important assay-specific protocol requirements in a Microsoft Windows environment.

### Expanded versatility

LHC software is a powerful yet flexible interface for use with Agilent BioTek microplate dispensers and washers. Any programming sequence possible onboard the liquid handler may be duplicated from the computer with LHC software. LHC also allows a virtually unlimited number of methods to be linked together for the most complex liquid handling routines. From a washer's first prime routine, to multiple microplate processes over time, and ultrasonic cleaning to dissolve protein or salt crystal build-up to a final system rinse, LHC software enables unattended operation.

### 21 CFR Part 11 compliance

To meet the demands of the GxP laboratory, LHC Secure software offers features to ensure compliance to 21 CFR Part 11. Flexible multi-user permission levels, and electronic protocol, and system audit trail signing are all available whenever additional security is required.

### Custom maintenance reminders

To facilitate maintenance and keep a washer or dispenser in peak condition, factory-recommended maintenance procedure reminders can be preset and customized appropriately for a busy laboratory's usage and throughput requirements. LHC also supports the BioStack microplate stacker and BioSpa automated incubator integrations.

### Safe record keeping

Protocol parameters may be quickly printed for safe record keeping. Alternatively, onboard instrument protocols may be uploaded and backed up on a laboratory's network. Satellite research labs working on joint projects can be certain their wash parameters are identical for experimental integrity.

### SiLA compliant drivers

For automated systems that require SiLA compliant integration, LHC SiLA is available.



**Protocol Steps**

- Remark: Exchange buffer after incubation
- W-Wash 100 µL of buffer A for 3 cycles**
- S-Dispense 50 µL using syringe A without pre-dispense
- Move carrier home, Shake for 00:05, Soak for 00:10
- P-Dispense 10 µL, High flow rate, Any cassette
- P-Dispense 30 µL, High flow rate, Any cassette
- BioStack returns the plate to the output stack

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**Step Details**

**W-Wash**

- Pre-dispense before washing: No
- Bottom Wash: No
- Number of Wash Cycles: 3
- Wash Format: Plate
- Sectors to wash: 1, 2, 3, 4

# Agilent BenchCel microplate handler

The Agilent BenchCel microplate handler is a compact, automated system that can be integrated with Agilent BioTek plate washers, dispensers, plate readers, and imagers, enabling automated workflows for a variety of applications. The high-speed robot has capacities to meet a broad range of throughput requirements, and its modular design provides the flexibility and scalability required to accommodate many diverse laboratory applications.

### Open, flexible platform automates a variety of workflows

BenchCel fully automates workflows between several Agilent BioTek liquid handling, detection, and imaging instruments, including:

- Multiflo FX multimode dispenser
- EL406 washer dispenser
- Synergy Neo2 hybrid multimode reader
- Cytation 5 cell imaging multimode reader
- Epoch 2 microplate spectrophotometer

### ELISA workflow automation

The BenchCel microplate handler with an EL406 washer dispenser and Synergy Neo2 hybrid multimode reader can batch process several ELISA plates. Automated plate washing, reagent addition, and absorbance measurements facilitate the process to get results quickly.

### Flexible scheduling software

Agilent VWorks automation control software offers an intuitive graphical interface and dynamic scheduling capabilities. Users can create and run protocols, forms, and monitor progress of their workflows from VWorks.

### Several stack sizes: variety of vessels

BenchCel's convenient front-loading stacks can be used in a wide variety of environments: bench top, hood, or biosafety cabinet. They accommodate a variety of microplate types including deep well plates.



## Typical research applications

- Automated ELISA workflows
- Automated add and read assays
- Automated cell fixation, staining, and imaging

## Technical details

Dimensions: Agilent BenchCel 2R/4R Microplate Handler					
Overall Height	250 mm stacks	27.8 in	70.1 cm		
	660 mm stacks	43.8 in	111.1 cm		
	860 mm stacks	51.8 in	131.6 cm		
Dimensions: Agilent BenchCel 2R Microplate Handler					
Liquid Handler	Reader/Imager	Width (in)	Width (cm)	Depth (in)	Depth (cm)
EL406	Epoch 2	56.52	143.56	18.80	47.75
EL406	Neo2	64.09	162.79	20.32	51.61
EL406	Cytation 5	62.82	159.56	20.77	52.76
EL406		35.48	90.12	17.27	43.87
MultiFlo FX with Wash	Epoch 2	58.13	147.65	20.83	52.91
MultiFlo FX with Wash	Neo2	65.61	166.65	22.35	56.77
MultiFlo FX with Wash	Cytation 5	64.34	163.42	22.80	57.91
MultiFlo FX with Wash		37.02	94.03	18.94	48.11
MultiFlo FX without Wash	Epoch 2	58.08	147.52	14.80	37.59
MultiFlo FX without Wash	Neo2	65.61	166.65	16.16	41.05
MultiFlo FX without Wash	Cytation 5	64.34	163.42	16.57	42.09
MultiFlo FX without Wash	NA	37.02	94.03	12.85	32.64
	Epoch 2	38.08	96.72	12.68	32.21
	Neo2	45.63	115.90	15.35	38.99
	Cytation 5	44.35	112.65	16.34	41.50
Dimensions: Agilent BenchCel 4R Microplate Handler					
Liquid Handler	Reader/Imager	Width (in)	Width (cm)	Depth (in)	Depth (cm)
EL406	Epoch 2	73.52	186.74	18.80	47.75
EL406	Neo2	81.09	205.97	20.32	51.61
EL406	Cytation 5	79.82	202.74	20.77	52.76
EL406		52.48	133.30	17.27	43.87
MultiFlo FX with Wash	Epoch 2	75.13	190.83	20.83	52.91
MultiFlo FX with Wash	Neo2	82.61	209.83	22.35	56.77
MultiFlo FX with Wash	Cytation 5	81.34	206.60	22.80	57.91
MultiFlo FX with Wash		54.02	137.21	18.94	48.11
MultiFlo FX without Wash	Epoch 2	75.08	190.70	14.80	37.59
MultiFlo FX without Wash	Neo2	82.61	209.83	16.16	41.05
MultiFlo FX without Wash	Cytation 5	81.34	206.60	16.57	42.09
MultiFlo FX without Wash	NA	54.02	137.21	12.85	32.64
	Epoch 2	55.08	139.90	12.68	32.21
	Neo2	62.63	159.08	15.35	38.99
	Cytation 5	61.35	155.83	16.34	41.50
Weight					
BenchCel 2R	Without stacks: 60 lb (28 kg)		With 660 mm stacks: 72 lb (32.5 kg)		
BenchCel 4R	Without stacks: 87 lb (32.5 kg)		With 660 mm stacks: 107 lb (48.6 kg)		

General	
Microplate Types	ANSI/SLAS standard microplates, deep well plates
Capacity: Number of Stacks	BenchCel is available in 2-stack or 4-stack versions for a range of throughput requirements
Stack Height/Capacity (14 mm Plates)	860 mm (34")/61 660 mm (26")/47 250 mm (10")/17
Stack Type	Front loading: when opened, rack accepts stack of plates for efficiency and convenience
Instrument Compatibility	Synergy Neo2 hybrid multimode reader Cytation 5 cell imaging multimode reader Epoch 2 microplate spectrophotometer EL406 washer dispenser MultiFlo FX multimode dispenser
Software	Agilent VWorks automation control software, integrated with Agilent BioTek Gen5, LHC, and LHC2 Secure software
Safety Features	Safety shield, emergency-stop pendant
Sensors	Plate-presence sensor, rack-presence sensor, plate orientation sensor

## Agilent BioTek BioStack microplate stacker

Agilent BioTek BioStack microplate stacker is a compact and versatile microplate stacker compatible with Agilent BioTek microplate washers, dispensers, pipetting, detection, and imaging systems. BioStack is easy to use, and provides walk-away automation for routine processes, including processes requiring plate delidding and relidding.

### Fast transfer speeds

BioStack takes less than 10 seconds to remove and replace plates on the instrument carrier. BioStack is well-suited for high-throughput plate stacking requirements with Agilent BioTek readers, washers and dispensers.

### Plate delidding

Many cell-based microplate processes require lidded plates during incubation and to protect sterility. Typically, automation of these processes meant purchasing an expensive microplate handler to delid the plates for measurement or liquid handling operations. Agilent BioTek BioStack 4 microplate stacker offers plate delidding and relidding for use with cell-based assays.

### Multiple microplate geometry compatible

BioStack is compatible with standard 96- and 384-well plates, low-volume 384-well plates and 1536-well plates. The BioStack 4 adds 24- and 48-well plates to its menu of compatible microplate labware, providing higher throughput in a walk-away system for a variety of microplate geometries. An available barcode scanner provides additional automation for high-throughput plate processing.

Plate IDs are read and sent to the plate data file in Gen5 microplate reader and imager or LHC Secure software, for storage or export.

### 10-, 30-, or 50-microplate stacks

Choose between 10-, 30-, or 50-plate stacks to best suit your throughput requirements. Low-volume, half-height plates are also compatible, with up to a 75-plate capacity in the 50-plate stack.

### Compact, rugged design

BioStack allows worry-free operation, even under the heaviest usage. The motors, mechanical assemblies, and software are all designed for long-term, continuous, and maintenance-free use. The rotational gripper and small footprint allows for integration position versatility, optimal fit within a biosafety enclosure, or for space savings on the benchtop.



## Typical research applications

- Cell-based assays
- ELISAs
- Primary screening assays
- Colorimetric, fluorometric, and luminescent assays

## Technical details

	BioStack 4	BioStack 3 • BioStack Neo • BioStack
<b>General</b>		
Microplate Types	ANSI/SLAS standard and low-profile 96-, 384-, and 1536-well plates 24- and 48-well plates (model dependent) Maximum plate height: 23.2 mm	ANSI/SLAS standard and low-profile 96-, 384-, and 1536-well plates Maximum plate height: 14.6 mm
Lidded Plate Handling	Delidding capability: (lids always removed during processing) 96-, 384-, and 1536-well plates Maximum height, including lids: 16.9 mm  Nunc plates: (lids can remain on plate during process, or can be removed) 6-, 12-, 24-, 48-well plates Maximum height, including lids: 23.2 mm	n/a
Microplate Capacity	10- and 30-plate stacks are removable and interchangeable (50-plate stacks may be used with nonlidded plates only)  96-/384-well plates: up to 30 plates (with lids) 1536-well plates: up to 75 plates	10-, 30-, and 50-plate stacks are removable and interchangeable  96-/384-well plates: up to 50 plates 1536-well plates: up to 75 plates
Barcode Scanner (Option)	Landscape or portrait orientation, Code 39, Codabar, UPC/EAN, Code 128 compatible	Landscape or portrait orientation, Code 39, Codabar, UPC/EAN, Code 128 compatible 1D and 2D barcodes: Agilent BioTek BioStack Neo microplate stacker
Processing Speed (Plate Exchange Time)	<20 seconds (with delidding) <12 seconds (without lids)	<10 seconds: Agilent BioTek BioStack 3/Neo microplate stacker <33 seconds: Agilent BioTek BioStack microplate stacker
Direct Control	Washers and dispensers with keypad interface can directly control Agilent BioTek BioStack microplate stacker	Washers and dispensers with keypad interface can directly control Agilent BioTek BioStack microplate stacker
Software (PC Control)	Agilent BioTek LHC software for liquid handling instruments (optional) Agilent BioTek Gen5 software for readers	Agilent BioTek LHC software for liquid handling instruments (optional) Gen5 for readers
<b>Physical Characteristics</b>		
Power Consumption	40 W (max)	40 W (max)
Dimensions	8.3" W x 22" D (21.1 x 55.9 cm)  Overall height will vary depending on connected instruments and stacks used	Agilent BioTek BioStack and BioStack Neo microplate stacker 7.4" W x 20.7" D (18.8 x 52.6 cm)  Agilent BioTek BioStack microplate stacker 7" W x 18.5" D (17.8 x 47.0 cm) Overall height will vary depending on connected instruments and stacks used
Weight	<25 lb (11.3 kg)	<25 lb (11.3 kg)

# Related instruments: a solution for your workflow

Agilent BioTek offers a wide range of related instruments and accessories to help automate processes, increase productivity, and expand the applications reach of your microplate reader.

## BenchCel microplate handler

The BenchCel microplate handler integrates to Synergy Neo2, Cytation 5, and Epoch 2, along with EL406 and MultiFlo FX liquid handlers, to automate workflows, including ELISA, add/read protocols, and cell fixing, staining, and imaging processes.



## BioSpa 8 automated incubator

BioSpa 8 automated incubator links Agilent BioTek readers and imagers together with washers and dispensers. This integration provides a full workflow automation of up to eight microplates or other labware. Temperature, CO<sub>2</sub>/O<sub>2</sub> control, humidity monitoring, and lid handling ensure an ideal environment for cell cultures. BioSpa software records session timelines and environmental conditions, and sends text and email alerts during long- and short-term runs. Link a washer, dispenser, plate reader, or imager for complete workflow automation.



## BioStack microplate stacker

Automate routine microplate washing or dispensing processes with the compact BioStack microplate stacker. BioStack 4 offers plate delidding and relidding for sensitive cell-based workflows. BioStack Neo is a dedicated stacker offering super-fast plate processing exclusively for Synergy Neo2.





## Peltier cooling module

The Peltier cooling module promotes a rapid interior cool down after incubated processes. The rapid cooling enables efficient switching between multiple applications without unwanted temperature influences. For temperature-sensitive assays typically run at ambient or room temperature, the cooling module maintains environmental stability within the Agilent BioTek Cytation instrument. This stability allows <1 °C rise in ambient temperature, regardless of external and internal temperature fluctuation. Rigorous temperature control gives you confidence in your assay results.



## Dual-reagent injector

Dual-reagent injector module enables applications that require rapid inject/read functions, like calcium flux assays. Two precision syringes supply rapid injection of 5 to 1000 µL, in 1 µL increments, directly into the microplate wells inside the reading or imaging chamber. Injectors are available for Lionheart FX, Cytation, Synergy Neo2, Synergy H1, and Synergy HTX. The flexible dual-reagent injector module automates precise reagent additions while saving time in your laboratory.



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

The CO<sub>2</sub> and O<sub>2</sub> gas controller has control over CO<sub>2</sub> and O<sub>2</sub> concentrations within the instrument environment to facilitate live cell assays. The controller regulates the environment for pH buffering or to create a hypoxic condition. Automation of live cell-based assays in microplates allows for high-throughput analysis and requires cell-friendly microplate instrumentation. Automated live cell assays enable walk-away processes and increased laboratory efficiency.



### Cytation Cell Count and Viability Starter Kit

The Agilent BioTek Cell Count and Viability app is an efficient tool for automating mammalian cell counts, enabling rapid counts and producing high-quality data. The app is a key component of the Cell Count and Viability Starter Kit, which is designed to help you get started with automated cell counting with your phase contrast-equipped Cytation or Lionheart imager.



### AutoScratch wound making tool

The AutoScratch wound making tool automatically creates reproducible scratch wounds in cell monolayers grown in 24- or 96-well microplates for cell migration and invasion studies. AutoScratch automates the sample preparation for imaging using Cytation cell imaging multimode readers and Lionheart automated microscopes. The Scratch Assay app automates image collection and analysis of wound width, wound confluence, and maximum wound healing rate.



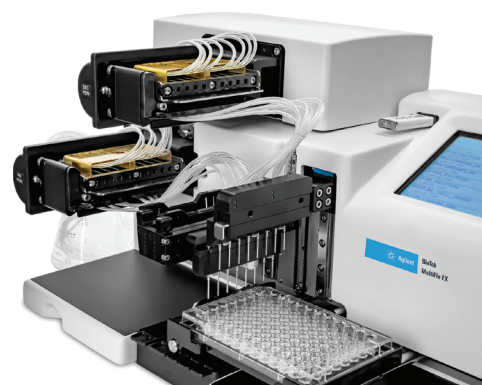
### Take3 microvolume plate

Microvolume quantification is fast and easy with the Take3 microvolume plate, used in your Agilent BioTek microplate reader. Measure multiple 2  $\mu$ L samples at a time, without diluting and the need for specialized equipment. Preprogrammed nucleic acid and protein protocols in the Take3 app make quantification fast and easy. Take3 handles up to 16 samples at a time; the Take3 Trio supports up to 48 samples at a time.



## Automated Media Exchange (AMX) module

The AMX module for the MultiFlo FX multimode dispenser enables gentle automated media exchange. This process protects and encourages proliferation of spheroids, tumoroids, and other 3D cell structures, and 2D and suspension cells in microplate-based assays. The AMX module uses both peristaltic pumps: one to dispense, and one to aspirate media from the plate wells.



## Dispense and waste systems

Robust reagent supply and waste removal systems are critical elements to many liquid handling operations. Agilent BioTek offers a complete line of supply and waste systems to accommodate low- to high-throughput workflows. High-quality bottles with available 4, 10, and 20 L capacity plus standard and high-flow pumps or direct drain systems offer options that provide the best performance for your washing and dispensing systems.



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Asia Pacific

**[inquiry\\_lsca@agilent.com](mailto:inquiry_lsca@agilent.com)**

RA44595.3805902778

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© Agilent Technologies, Inc. 2022  
Published in the USA, February 17, 2022  
5994-4602EN

