Agilent

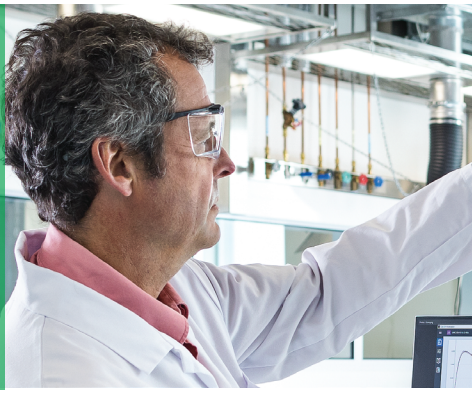
Trusted Answers

Agilent BioTek 406 FX Washer Dispenser

The benchtop liquid handling workhorse



Agilent BioTek 406 FX Washer Dispenser

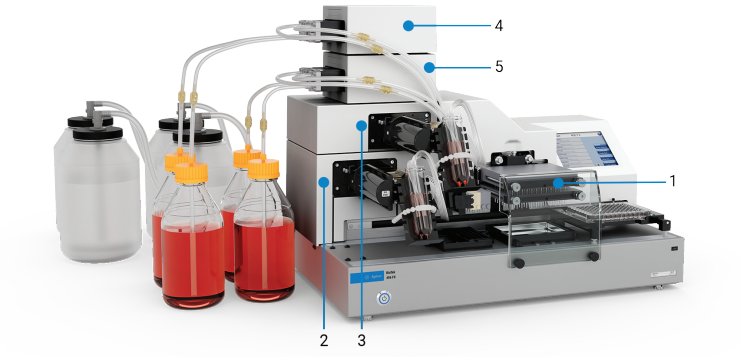




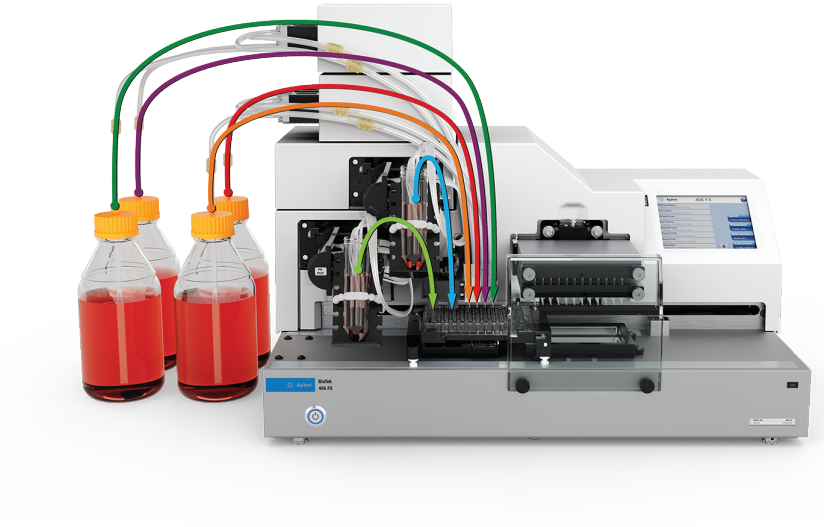
Agilent BioTek 406 FX washer dispenser with single peristaltic pump and dual syringe pump.

The Agilent BioTek 406 FX washer dispenser is a compact instrument offering fast, full-plate washing along with up to six reagent dispensers. The Agilent BioTek Dual-Action manifold optimizes washing for a variety of cell types, in addition to biomagnetic protocols, in a broad range of plate configurations. The noncontact plate-dispensing capabilities offer maximum flexibility, including up to four syringe pumps and two peristaltic pump dispensers that enable rapid dispensing of cells and precious reagents. Plate access on both the left and right side of the instrument allows the instrument to be completely automation friendly.

Multiple processes in a single instrument



The flexibility and capabilities of the 406 FX washer dispenser allow noncontact dispensing as well as full-plate washing in a variety of plate densities, all in one instrument. This eliminates the need to move microplates between a plate washer (1), peristaltic pump dispensers (2 to 3), and syringe pump dispensers (4 to 5) for complex liquid handling workflows.



Independent dispenser fluid paths

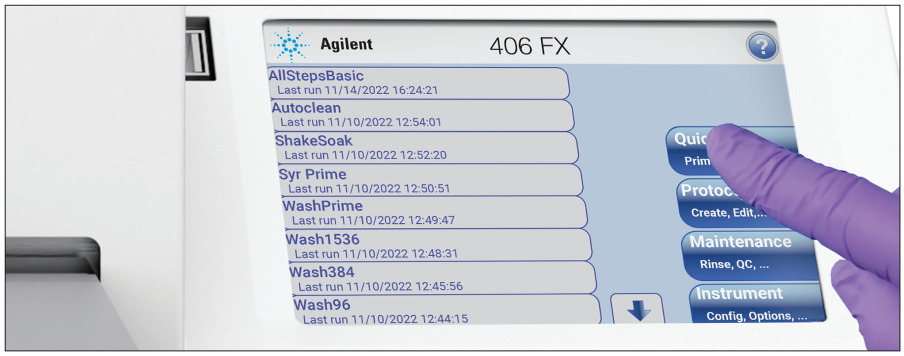
Multiple independent fluid paths means that up to six different reagents can be loaded and dispensed in a single procedure, eliminating the need to incorporate multiple dispensers.

Application	Peristaltic Pump	Syringe Pump	Wash Manifold
Cells	✓✓	X	X
Wash Buffer	✓	✓	✓✓
Media	✓✓	✓✓	X
Precious Reagents	✓✓	✓	X

✓✓ Highly recommended
✓ Not highly recommended, but possible
X Not recommended

The right bulk-reagent dispenser for your needs

Dual peristaltic pump dispensers and quad syringe pumps enable noncontact dispensing of buffers, media, cells, and other precious reagents, in volumes ranging from 500 nL to 3,000 µL, with minimal dead volume.



User-friendly touch screen

The onboard touch screen on the the 406 FX makes protocol creation simple and intuitive.

Agilent BioTek 406 FX Washer Dispenser

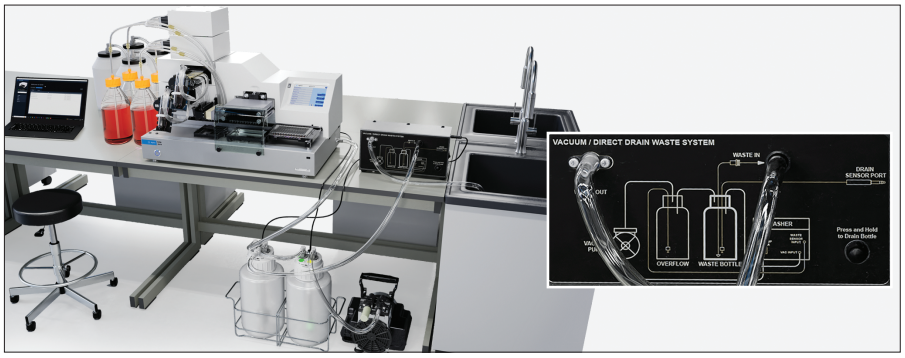
Multiple plate-washing and reagent-dispensing steps in one instrument





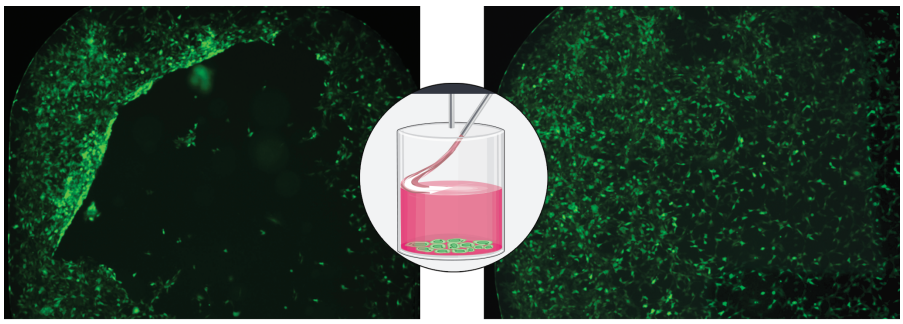
Automation friendly

Left- and right-side robotic arm accessibility allows the 406 FX to be easily integrated with the Agilent BioTek BioStack microplate stacker, and Agilent BenchCel microplate handler, and other third-party automation to increase assay throughput.



Direct-to-drain waste

The direct-to-drain waste system eliminates the need to empty waste bottles as waste can go directly to a drain.

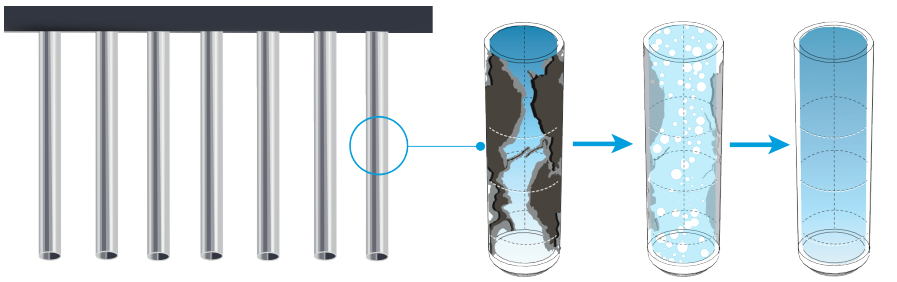


Cells washed with straight tips

Cells washed with angled tips

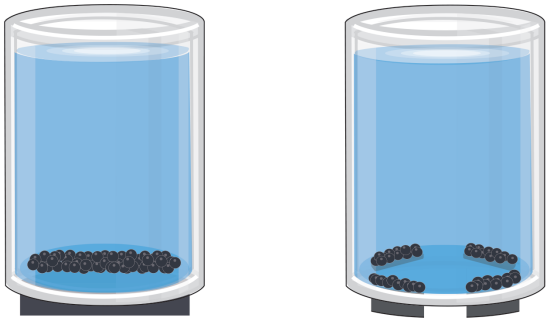
Cell-friendly design

The combination of angled dispense tubes, highly adjustable aspiration and dispense rates, and X- and Y-axis positioning ensure the integrity of cell monolayers during dispensing and wash procedures.



Self-maintaining Ultrasonic Advantage system

The built-in Agilent BioTek Ultrasonic Advantage allows the instrument to clean buildup in the manifold tube automatically, preventing failure during wash procedures.

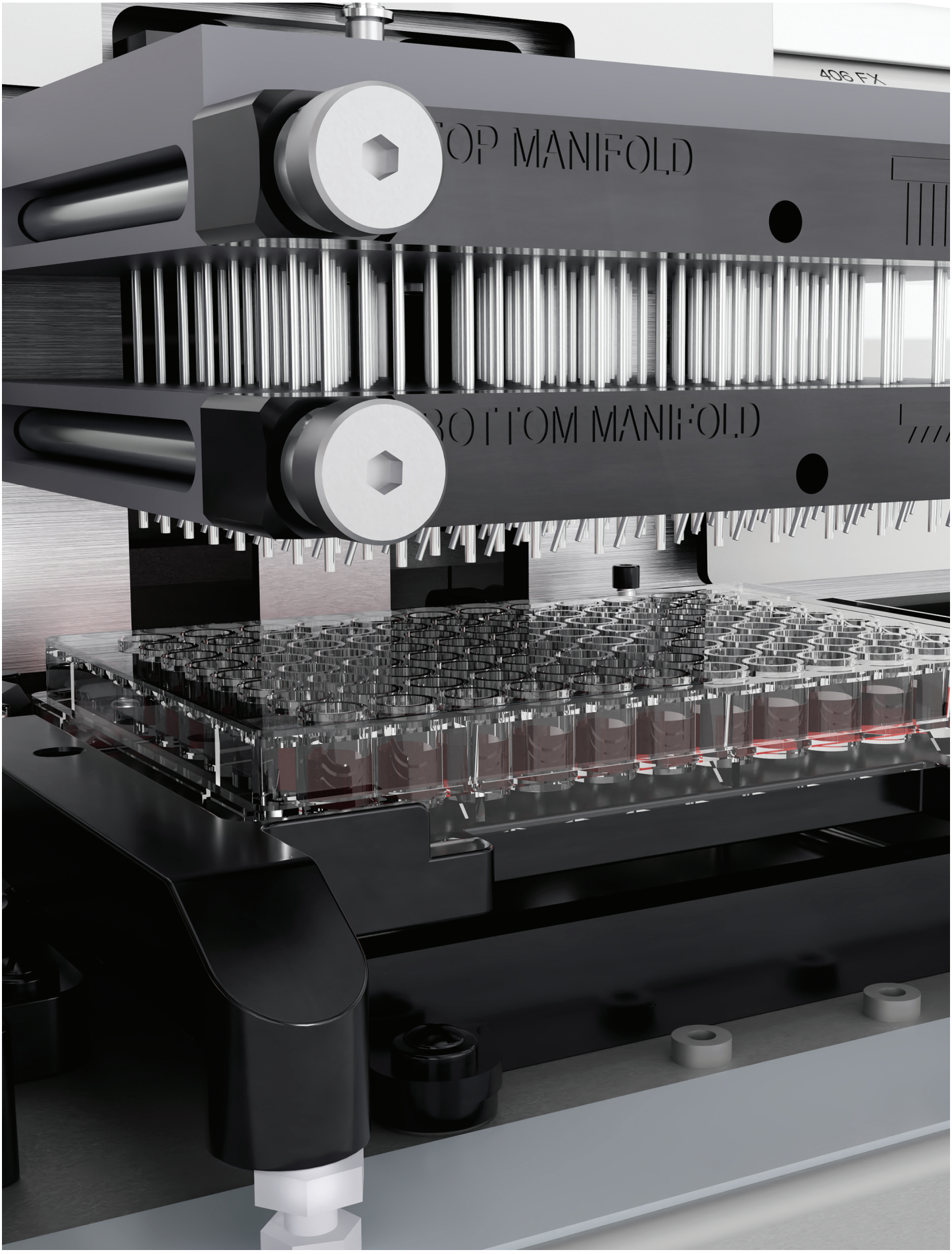


Flat magnets pull beads to the well center.

Ring magnets pull beads to the outer well edge.

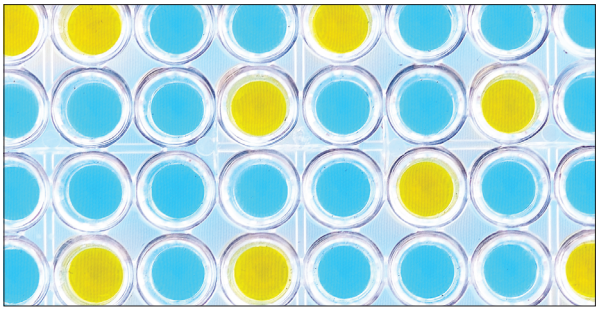
Automated magnetic bead-based assays

Available accessories automate magnetic bead-based multiplex assays. Depending on the magnet type used, beads are pulled to the center or to the edges of the well.


406 FX
TOP MANIFOLD
BOTTOM MANIFOLD

Applications

ELISA



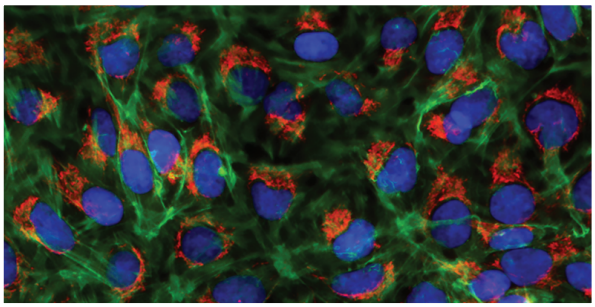
Wash steps are critical to many ELISA processes, including colorimetric, fluorometric, and luminometric methods. The 406 FX easily accomplishes automated plate washing for accuracy and efficiency.

Bead-based multiplex assays



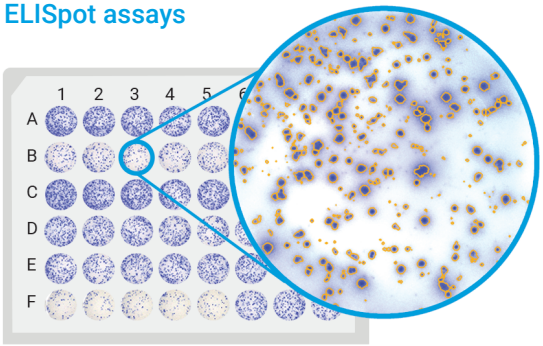
Flat or ring-style magnet plates optimize bead retention during washing.

Cell-based assays



Minimal disruption of cells during washing keeps the monolayer intact for superior image capture or multimode detection.

ELISpot assays



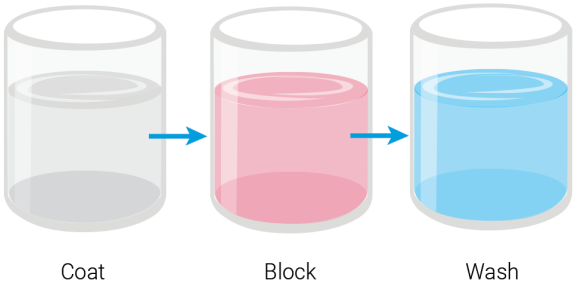
The 406 FX automates the wash steps required of ELISpot assays, in which cell secretions are made visible via colorimetric reactions. Cell secretions can be imaged using the Agilent BioTek Cytation 7 cell imaging multimode reader.

MSD assay automation



Multiplex assays such as Meso Scale Discovery PLEX assays, require effective washing—easily accomplished with the 406 FX.

ELISA plate coating



The adjustable X-, Y-, and Z-positioning allows precise control of fluid levels for automated ELISA plate coating and manufacturing processes.

Related instruments

The 406 FX, used in conjunction with several other Agilent BioTek instruments, enhances and automates many workflows.



Epoch 2 microplate spectrophotometer

With the Agilent BioTek Epoch 2 microplate spectrophotometer, ultimate assay flexibility is offered with filter-free wavelength selection from 200 to 999 nm. The 406 FX partners with Epoch 2 for many wash-read workflows.



Cytation 1/5/7 cell imaging multimode readers

The 406 FX can automate pre-imaging liquid handling processes for live cell imaging with the Agilent BioTek Cytation 1/5/7 cell imaging multimode readers.



Synergy H1 multimode reader

The Agilent BioTek Synergy H1 multimode reader has multimode reading capabilities as well as monochromator- and filter-based detection modes that enable a wide variety of absorbance, fluorescence, and luminescence wash-read workflows when partnered with the 406 FX.



Synergy Neo2 hybrid multimode reader

Ultrafast wash and read workflows are easily carried out when the Hybrid Technology, independent optical paths, and up to four PMTs available on the Agilent BioTek Synergy Neo2 hybrid multimode reader are matched with the full-plate washing capabilities of the 406 FX.

Related instruments

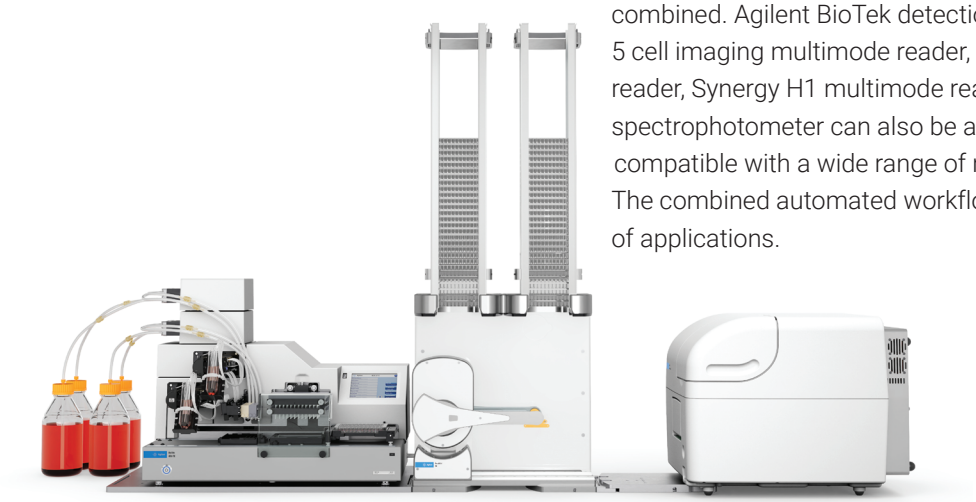


BioStack microplate stacker

Automate routine microplate washing processes with the compact Agilent BioTek BioStack microplate stacker. BioStack 4 offers proprietary plate de and relidding for sensitive cell-based workflows, and all BioStack configurations are available with 10-, 30-, or 50-plate-capacity stacking columns.

BenchCel microplate handler

The Agilent BenchCel microplate handler is a compact, automated system that can be integrated with a variety of Agilent BioTek instrumentation. For liquid handling, the Agilent BioTek MultiFlo FX multimode dispenser, 406 FX and EL406 washer dispensers, 405 TS and 405 LS washers, and ELx405 Select deep well washers can be combined. Agilent BioTek detection instruments, including the Cytation 5 cell imaging multimode reader, Synergy Neo2 hybrid multimode reader, Synergy H1 multimode reader, and Epoch 2 microplate spectrophotometer can also be added. In addition, the BenchCel is compatible with a wide range of microplates, including deep-well plates. The combined automated workflows enable a wide variety of applications.



Agilent BioTek 406 FX
washer dispenser

Technical Details



General	
Microplate Types	96-, 384-, and 1536-well Low profile and standard height
Onboard Software	Create, edit, or run multiple protocols
Software (Computer Control)	Agilent BioTek Liquid Handling Control (LHC3) software Agilent BioTek LHC3 Secure software enables 21 CFR Part 11 compliance (option)
Separation	Biomagnetic separation (optional)
Shaking	Programmable up to 60 minutes Slow, medium, fast, or variable
Soaking	Programmable up to 60 minutes
Ultrasonic Advantage	Standard
Automation	Agilent BioTek BioStack microplate stacker and third-party automation compatible Agilent BenchCel microplate handler compatible
Washing	
Manifold Types	96-well washing: 96-tube manifold—straight dispense tubes 96- and 384-well washing: 96-tube Dual-Action manifold—20° angled dispense tubes 384-well washing (fast): 192-tube Dual-Action manifold—7° angled dispense tubes 1536-well washing: two 32-tube dispense manifolds—7° angled dispense tubes
Volume Range	3–3,000 µL/well, in 1 µL increments)
Wash Cycles	1—250
Buffer/Reagent Selection	Autoswitching module for up to four buffers
Supply Bottle	4 or 10 L (optional)
Waste Bottles	4, 10, and 20 L waste bottles available; direct-to-drain option available
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 s 384 wells, 100 µL/well, 192-tube manifold: 17 s 1536 wells, 10 µL/wells, two 32-tube manifolds: 36 s
Flow Rates	High to low flow Optimized rates for cell assays
Sterilization	Chemical
Dispensing—Peristaltic Pump	
Manifold Types	8-tip (1 x 8) cassette with plastic tubes, 316 stainless steel (SS) tubes, or sapphire-jeweled 316 SS tubes
Fluid Delivery	Up to two peristaltic pumps
Dispense Speed	96 wells, 10 µL/well: 8 s 384 wells, 5 µL/well: 12 s 1536 wells, 1 µL/well: 27 s
Volume Range	500 nL to 3,000 µL/well, selectable in 1 µL increments
Flow Rates	User-programmable rates from high to low Optimized rates for cell assays

Dispense Performance	
Recommended Volume Range	1 µL cassette: 1–50 µL 5 µL cassette: 5–2,500 µL 10 µL cassette: 10–3,000 µL
Dispense Accuracy	1 µL cassette: ± 5% at 1 µL 5 µL cassette: ± 2.0% at 5 µL 10 µL cassette: ± 2.0% at 10 µL
Dispense Precision	1 µL cassette: ≤ 5% CV at 1 µL; ≤ 10% CV at 500 nL 5 µL cassette: ≤ 2.5% CV at 5 µL 10 µL cassette: ≤ 2.0% CV at 10 µL
Minimum Prime Volume	1 µL cassette: 1.20 mL 5 µL cassette: 4.23 mL 10 µL cassette: 7.36 mL
Recommended Cassette Replacement Interval	1 µL cassette: 1,000 384-well microplates at 5 µL/well 5 µL cassette: 1,000 96-well microplates at 50 µL/well 10 µL cassette: 1,000 96-well microplates at 100 µL/well
Sterilization	Autoclave, chemical
Dispensing—Syringe Pump	
Manifold Types	96-well dispensing: One 16-tube (2 x 8) manifold—316 SS tubes 96-/384-well dispensing: Two 16-tube (1 x 16) manifolds—316 SS tubes 1536-well dispensing: Two 32-tube (1 x 32) manifolds—316 SS tubes or sapphire-jeweled 316 SS tubes
Fluid Delivery	Two positive-displacement syringe drives per syringe pump, up to two syringe pumps per 406 FX
Dispense Speed	20 µL/well, 96 wells, 1 x 16 tubes: 5.25 s 20 µL/well, 384 wells, 1 x 16 tubes: 14 s 3 µL/well 1536 wells, 2 x 32 tubes: 7 s
Volume Range	3–3,000 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 or 2 L
Sterilization	Chemical, autoclavable option
Physical Characteristics	
Power	100–240 VAC at 50–60 Hz
Dimensions*	Instrument only: 25" W x 14.25" D x 12.5" H (63.5 x 36.2 x 31.8 cm) Instrument with two stacked syringe pump modules: 25" W x 16" D x 18.75" H (63.5 x 40.6 x 47.6 cm)
Weight	45 lb (20.4 kg)

**The dimensions shown are for the configured instrument only and do not include bottles and tubing. Overall bench space required for system installation will be greater.*

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