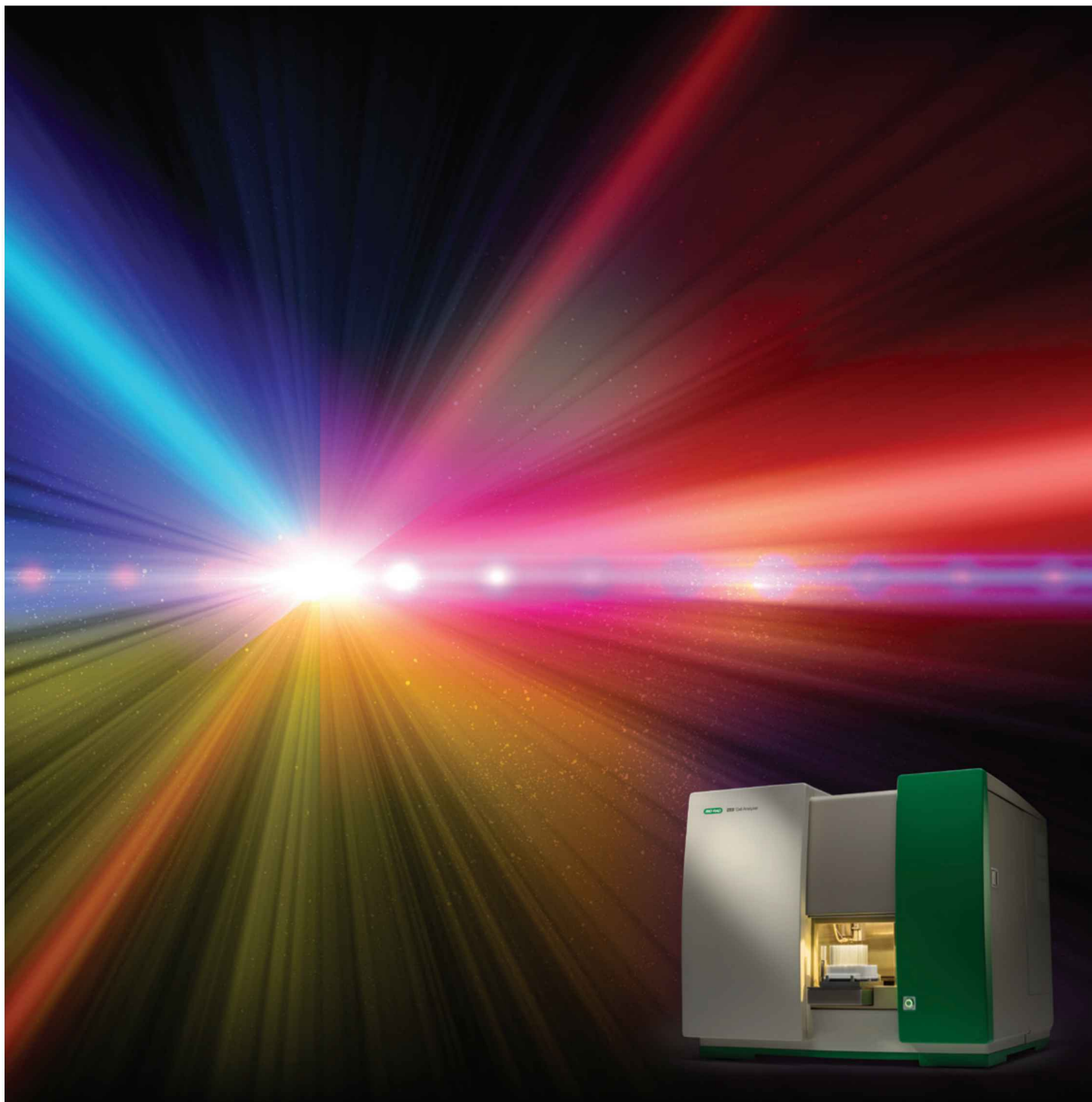


ZE5 Cell Analyzer

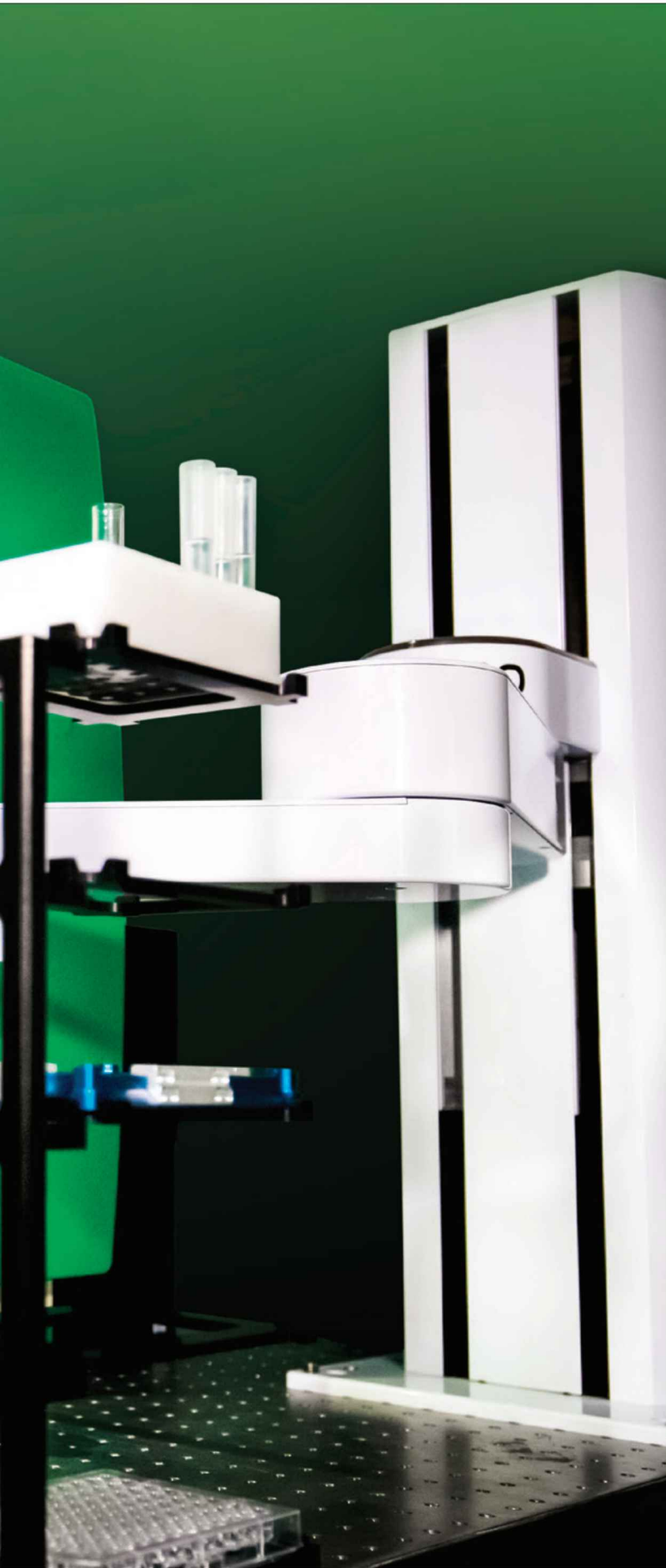
Quite Possibly the Only Cell Analyzer You Will Ever Need



Visit bio-rad.com/ZE5 for more information.

BIO-RAD





A Cell Analyzer Made for Modern Laboratories

Combining speed, automation, performance, and flexibility, the ZE5 Cell Analyzer is the long-awaited solution for modern laboratories. It changes the questions you may have and provides answers you can trust.

- **Switch between tubes and plates with no hardware exchange** — integrated sample loader, accommodating both tube racks and plates, with onboard sample mixing and temperature control provides unparalleled flexibility in handling samples
- **Maximize throughput and productivity using automation** — device-agnostic application programming interface (API) and external fluidics upgrades let you scale up your high-throughput screening with 24/7 operation
- **Power your research with the ability to run high-complexity samples** — up to 5 spatially separated lasers, 27 fluorescence detectors, and a small particle detector offer ultimate flexibility for your assays
- **Analyze a 96-well plate in less than 15 minutes or a 384-well plate in less than 60 minutes** — high-velocity flow cell and high-speed electronics enable fast acquisition with virtually no aborts and provide higher resolution data in less time
- **Transform manual setup and maintenance procedures into vacation mode** — onboard quality control (QC) beads, bulk fluidics and cleaner, scheduled startup and automated shutdown, and smart designs enable worry-free operation





High-Throughput Screening

When you need to analyze thousands of samples before moving forward in drug discovery, your low-throughput cytometer just won't cut it. An automation-ready cell analyzer catering to all your high-throughput needs is the ultimate solution.

Fast and Reliable Screening

- Run 96-well plates in <15 minutes or 384-well plates in <60 minutes in High-Throughput Mode
- Analyze up to 100,000 events/sec without data loss
- Ensure low carryover while maintaining speed with a flying collar wash station
- Enable assay miniaturization by allowing sampling from extra small volumes

Automation-Friendly and Scale-Up Ready

- Interface with the laboratory information management system and laboratory robotic system through the device-agnostic API
- Choose a turnkey automation system or select your own integration partner for full customization
- Extend operation time to 24/7 with external large-capacity fluidics upgrades

Efficient and Flexible Sample Handling

- Switch between tube racks and plates seamlessly without hardware exchange
- Maintain sample integrity during long screens with onboard temperature control and orbital agitation
- Enable return of unused samples with the bidirectional sample pump*
- Sample with minimal dead volume using intuitive, crash-proof probe calibration

* For non-high-throughput modes only.



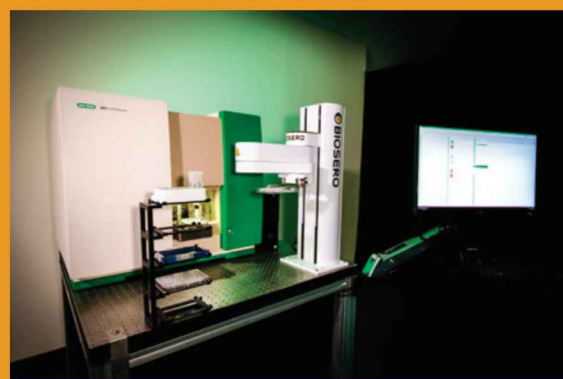
Easily switch between tubes, 96-well plates, and 384-well plates with no hardware changes using the integrated sample loader.

High-Throughput Enabling Software

- Save time with protocol and whole-plate sample name import options
- Export data files (FCS 3.1) and statistics using multiple export options
- Visualize target regions with Hit Detection and Heat Map features
- Monitor sample population shifting with the Track Region function



Hit Detection: A rapid visualization of the target region during screening. Wells containing the hit region are colored green, nonhit wells blue.



The Green Button Go System from Biosero, Inc. is one of the integration solutions for the ZE5 Cell Analyzer, fully customizable to automate your workflow and accelerate your discovery.



Multicolor Immunophenotyping

Getting the most information from every single sample is crucial for your research and discovery. Splitting samples to analyze a large number of targets in separate panels is no longer a viable option.

By combining superior optical capabilities with intuitive panel design and autocompensation tools, the ZE5 Cell Analyzer turns high complexity into a simple reality.

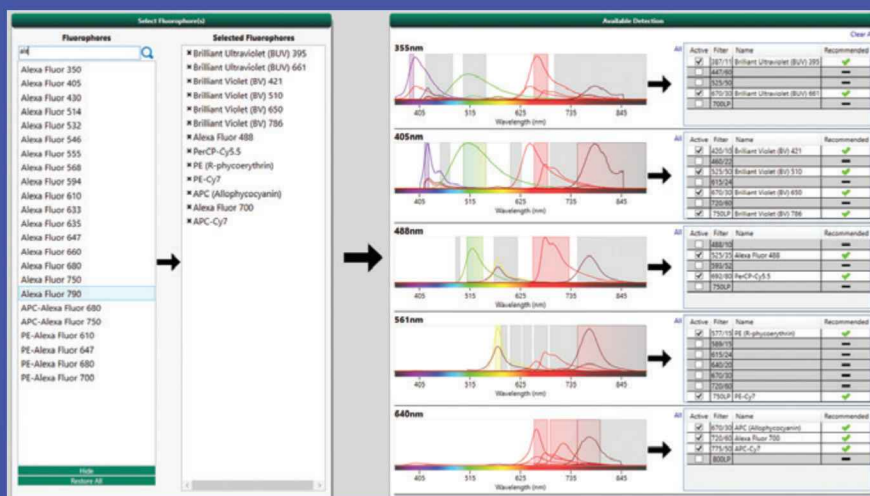
High-Complexity Immunophenotyping Simplified

- Provides up to 5 spatially-separated Coherent OBIS lasers and 30 Hamamatsu photomultiplier tube (PMT) detectors

- Detect up to 27 different colors in a single panel
- Validate optical filters automatically with the ZE5-EYE
- Build panels easily with Everest Software's Fluorophore Selector and built-in Spectra Viewer
- Get publication-quality, presentation-ready results with FCS Express Flow Cytometry Software, bundled with new ZE5 Cell Analyzer sales
- Select from thousands of flow cytometry antibodies available from Bio-Rad™. Use StarBright™ Blue Dye–labeled antibodies to boost your resolution. Visit bio-rad-antibodies.com for more information



Up to five spatially separated lasers with water cooling system to maintain beam stability.



Everest Software allows users to easily select fluorophores and view their spectral overlaps side by side for comprehensive experiment and panel building.

27-Color Immunophenotyping Panel of Red Blood Cell Lysed Human Peripheral Blood

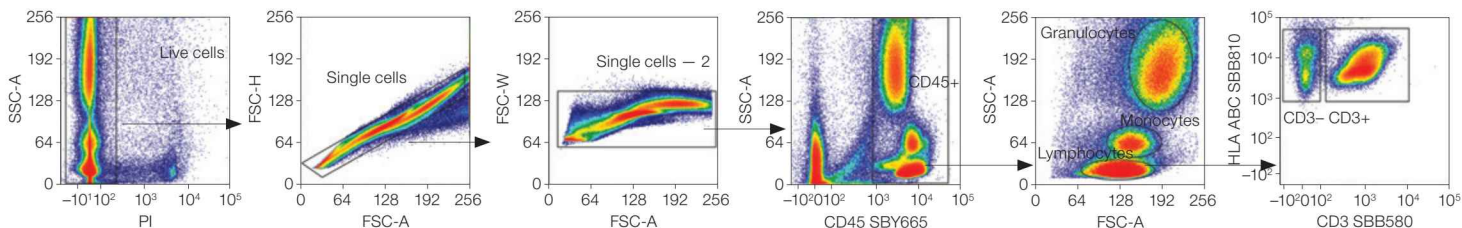
355 nm Filter	Target	Fluorophore	405 nm Filter	Target	Fluorophore	488 nm Filter	Target	Fluorophore	561 nm Filter	Target	Fluorophore	640 nm Filter	Target	Fluorophore
387/11	HLA DP DQ DR	SBUV400	420/10	CD56	BV421	525/35	CD57	FITC	583/30	CD10	SBY575	670/30	CD16	A647
509/24	CD20	SBUV510	460/22	CD24	SBV440	593/52	CD3	SBB580	615/24	CD4	SBY605	720/60	CD31	A700
577/15	CD33	SBUV575	525/50	CD45RA	SBV515	692/80	CD11b	SBB700	670/30	CD45	SBY665	775/50	CD19	SBR775
615/24	L/D	PI	615/24	CD45RO	SBV610	750LP	HLA ABC	SBB810	720/60	CD27	SBY720	800LP	CD8	SBR815
670/30	CD163	SBUV665	670/30	CD40	SBV670				750LP	CD38	SBY800			
747/33	CD28	SBUV795	720/60	CD2	SBV710									
780LP	CD62L	SBUV795	750LP	CD14	SBV790									

Note: This is not a comprehensive list of fluorophores and dyes that can be used with the ZE5 Cell Analyzer.

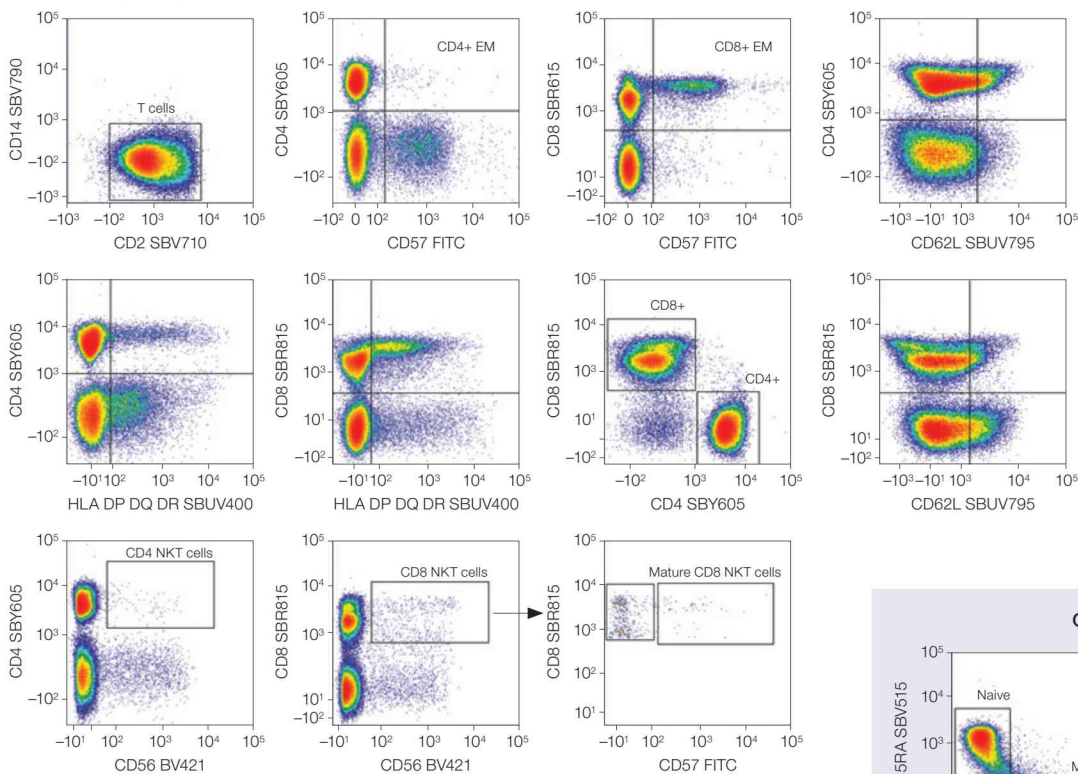
Axxx, Alexa Fluor; BV421, Brilliant Violet 421; FITC, fluorescein isothiocyanate; PE, phycoerythrin; PI, propidium iodide; SBB, StarBright Blue; SBR, StarBright Red; SBUV, StarBright UltraViolet; SBV, StarBright Violet; SBY, StarBright Yellow.

27-Color Immunophenotyping Panel Including StarBright Blue, UltraViolet, Violet, Yellow, and Red Dyes

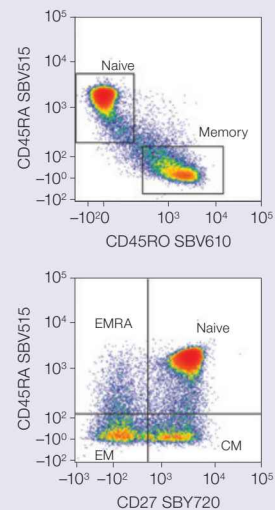
Basic Gating



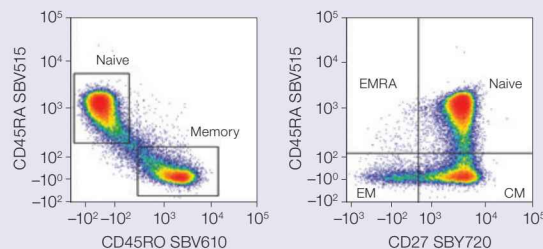
T-Cell (CD3+) Gating

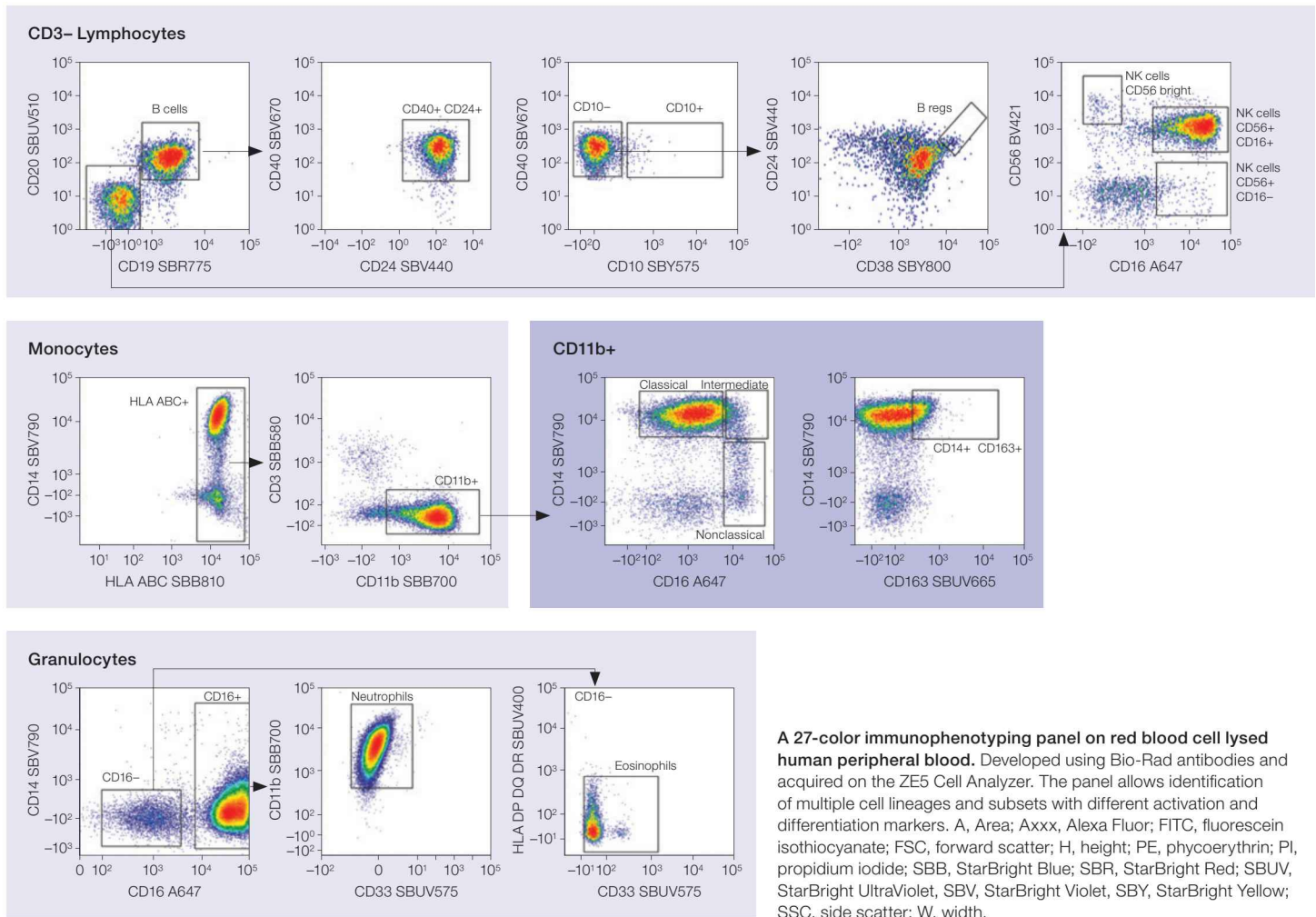


CD8+ Cytotoxic T Cells

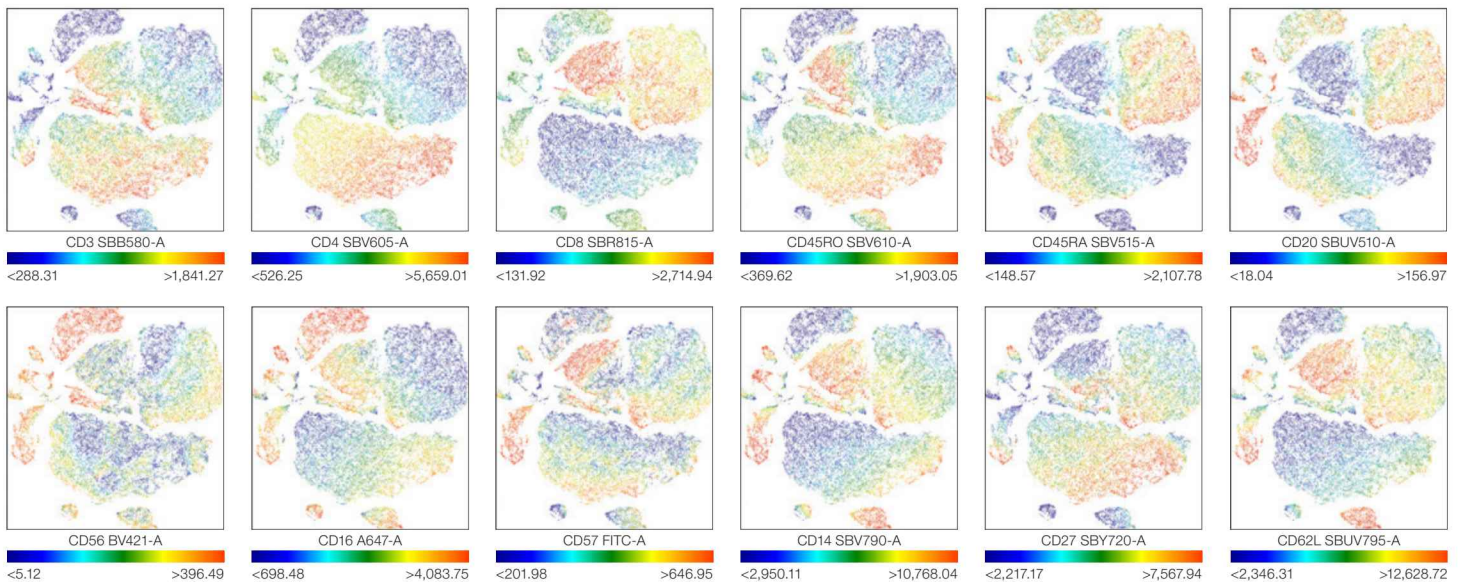


CD4+ Helper T Cells





T-Distributed Stochastic Neighbor Embedding (t-SNE) Analysis

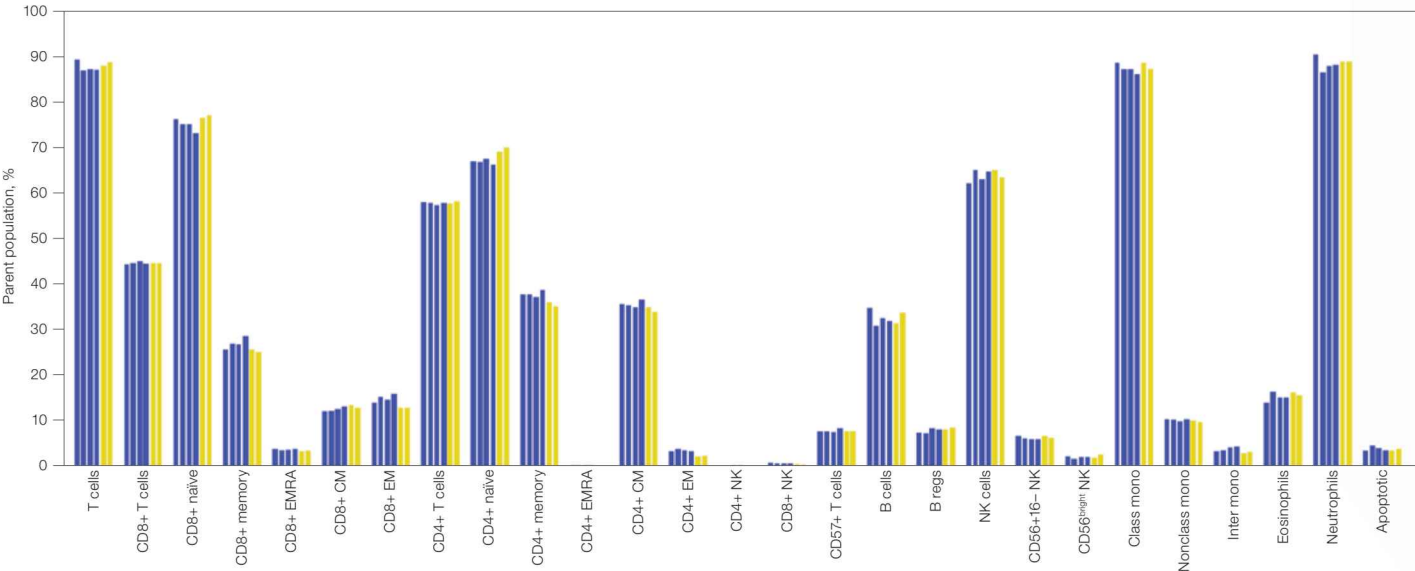




Speed with Reproducibility

The ZE5 Cell Analyzer can acquire complex immunophenotyping data at rates that significantly exceed other instruments. Its innovative fluidics and electronics synergize to enable it to process a 96-well plate in less than 15 minutes while still being

able to collect tens of thousands of events per well. Importantly, there is no compromise between speed and reproducibility meaning it is possible to perform complex immunophenotyping in seconds per sample.



Comparison of data acquired in standard and high-throughput mode on the ZE5 Cell Analyzer. The 27-color panel shown previously was collected in high throughput (n=4) and standard mode (n=2). Each high throughput mode replicate was collected in 8 seconds. Each bar represents an individual replicate collected in high-throughput mode (■) and standard mode (■). B regs, regulatory B cells; class mono, classical monocytes; CM, central memory T cells; EM, effector memory T cells; EMRA, terminally differentiated effector memory T cells re-expressing CD45RA; inter mono, intermediate monocytes; NK, natural killer cells; NKT, natural killer T cells; nonclass mono, nonclassical monocytes.

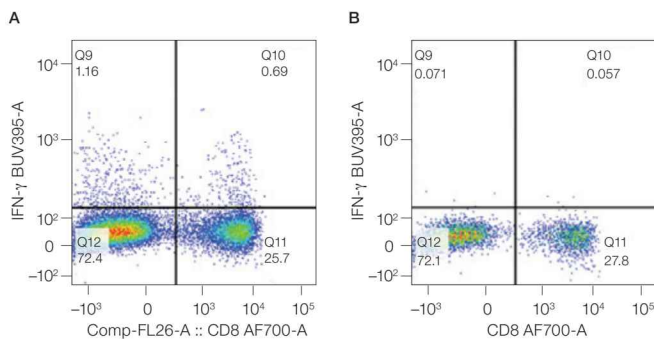




Rare Event Detection

Monitoring cytokine-producing T cells during infection or tracking minimal residual disease in blood requires sampling more than 100 million cells just to characterize a sufficient number of targets. Analyzing so many cells in a slow flow cytometer can take hours. Having to do so for dozens of samples may take days.

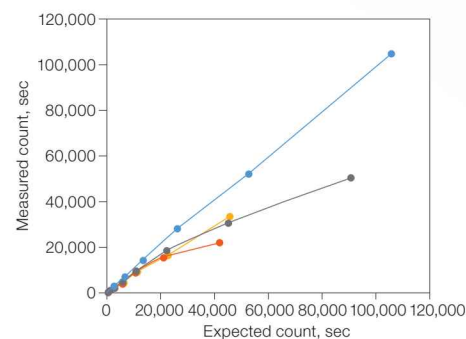
With the ZE5 Cell Analyzer, you can analyze up to 100,000 events per second (eps), which enables you to analyze 100 million cells in just 15 min. The ZE5 Cell Analyzer has a high-velocity flow operating at 8 m/sec, twice the stream velocity of other systems. High-velocity fluidics, sensitive optics, and capable and fast electronics all come together to achieve such a feat.



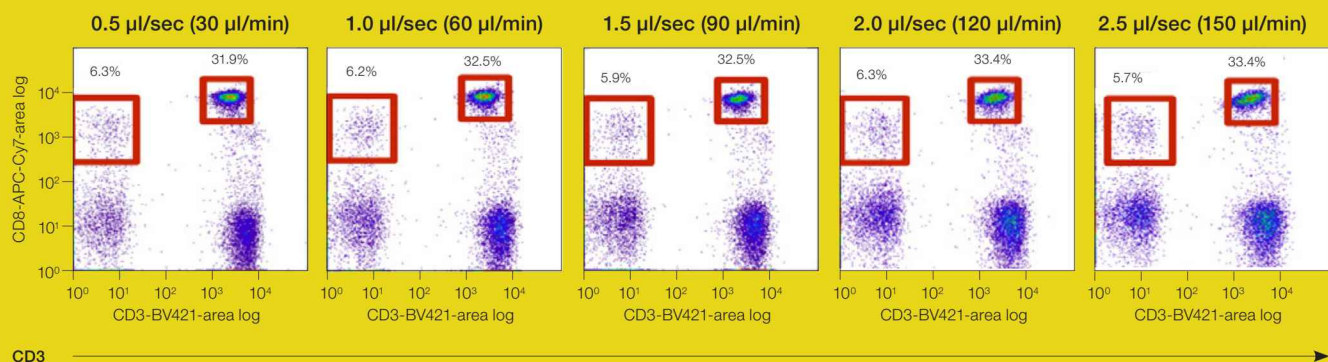
Intracellular cytokine detection. **A**, identification of rare IFN- γ -producing CD8⁺ T cells (<1% frequency) in nivolumab-stimulated human PBMCs; **B**, fluorescence minus one (FMO) control. A, area; AF, Alexa Fluor; BUV, Brilliant UltraViolet.

Fast and Sensitive Rare Event Detection

- Ensure every event gets processed, even at high speeds, with powerful 50 MHz data processing and dynamic window extension
- Minimize data spread during high-speed acquisition. With 10 psi sheath pressure and a narrow lumen flow cell, the ZE5 Cell Analyzer maintains a tight sample core that ensures great resolution over a broad range of sample flows
- Get higher resolution and better signal-to-noise ratio with liquid-cooled, high-powered lasers and low-noise, sensitive PMT detectors



The ZE5 Cell Analyzer outperforms other systems as it continues to acquire data into the 100,000 eps range with no data loss. Other systems drop off around 20,000 eps due to data aborts. Serially diluted Dragon Green Beads (Bangs Laboratories, Inc.) at known concentrations were used to determine when the measured count fell off the expected count. ZE5 Cell Analyzer (—); cytometer 1 (—); cytometer 2 (—); cytometer 3 (—). Data courtesy of Karen Helm, University of Colorado, Denver.



Human whole blood was lysed and stained with CD45-AF488, CD3-BV421, and CD8-APC-Cy7. Twenty thousand events were acquired and data resolution was consistent at increasing flow rates from 0.5 to 2.5 µl/sec. APC, allophycocyanin; BV, Brilliant Violet; Cy, cyanine.



Top: Onboard, level-monitored deionized (DI) water and waste tanks allowing for 8 hr operation. **Bottom:** Optional fluidic upgrade, including 20 L DI and waste carboys on level-monitored fluidic carts lasting for 22 hr. Fluidic upgrade option 2, the direct house DI connection is not shown.



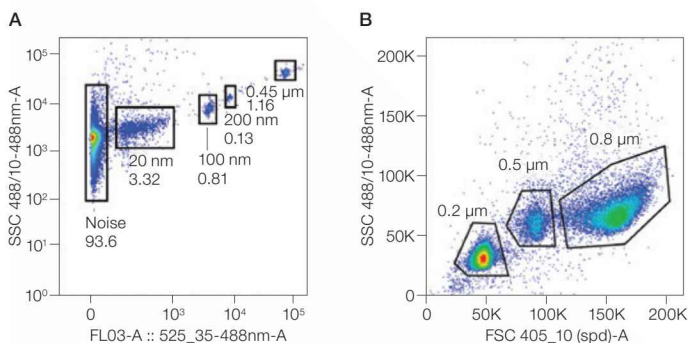
Small Particle Detection

Exosomes and their roles as biomarkers and therapeutic targets are emerging areas of research. Detection of exosomes and microvesicles by flow cytometry can be difficult because resolving these extracellular vesicles (EVs) from electronic noise and sheath impurity is challenging and limited by the optical sensitivity of the cytometer.

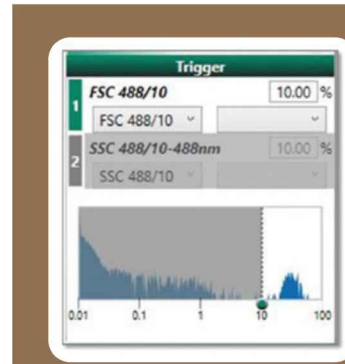
The ZE5 Cell Analyzer was intuitively engineered to accommodate a large range of particle sizes and offers great sensitivity for detection of nanoparticles. With its extremely low noise electronics, dedicated small particle PMT detector, and dual-parameter live thresholding, distinguishing small particles from debris and noise is no longer a challenge.

Gain Confidence in Small Particle Detection

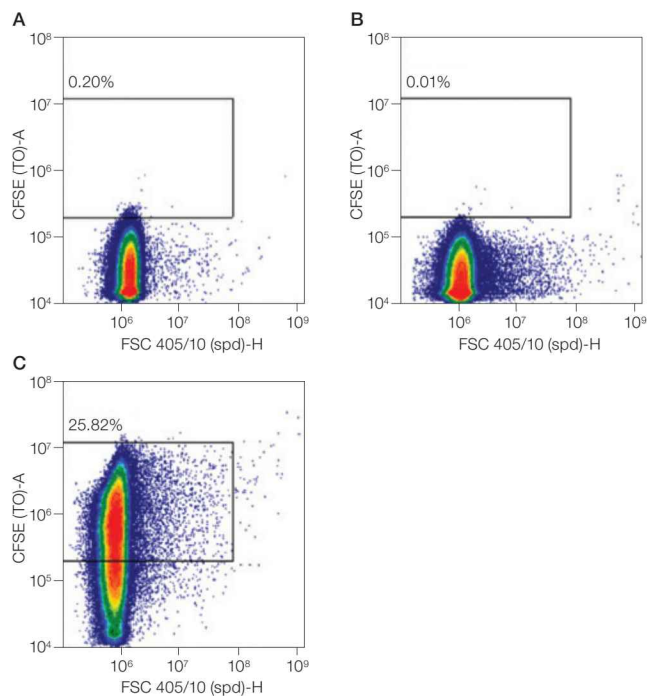
- Resolve 0.1–0.2 μm polystyrene beads with minimal effort
- Eliminate manual setup with the dedicated small particle detector and 0.22 μm inline sheath filter
- Trigger off any 2 parameters (light scatter or fluorescence) for best chance of detection
- Set threshold values with a unique live threshold plot, with visibility to the full range of electronic signals



Microparticle resolution. **A**, resolution of 20, 100, and 200 nm, and 0.45 μm nanoparticles (Flow Cytometry Sub-Micron Particle Size Reference Kit, Thermo Fisher Scientific Inc.) with FITC as trigger; **B**, detection of 0.2, 0.5, and 0.8 μm particles (Submicron Bead Calibration Kit, Bangs Laboratories) with FSC 488/10 as trigger. Data courtesy of Dr. Daniel Mielcarz, Geisel School of Medicine, Dartmouth College. A, area; FSC, forward scatter; SSC, side scatter.



The live threshold plot of the ZE5 Cell Analyzer allows thresholding from up to two detectors, with the entire range of signals made visible. FSC, forward scatter; SSC, side scatter.



Detection of malaria-derived EV cargos using the ZE5 Cell Analyzer.

P. falciparum-derived EVs were purified with a size distribution of 50–120 nm. Protein cargo of the EVs was stained with carboxyfluorescein succinimidyl ester (CFSE) and analyzed on the ZE5 Cell Analyzer. **A**, CFSE only (without EVs); **B**, unstained EVs; **C**, EVs stained with CFSE. Data courtesy of Dr. Ziv Porat, Weizmann Institute of Science, adapted from publication: Dekel E et al. (2020). Antibody-free labeling of malaria-derived extracellular vesicles using flow cytometry. *Biomedicine* 8, 98. FSC, forward scatter.



An Efficient Flow Cytometry Core Lab

A busy core lab is a successful core lab. However, being busy means accommodating lots of users and all of their unique needs.

The ZE5 Cell Analyzer was designed to handle a highly flexible workload with minimal effort. The adaptable sample loading platform, built-in checks and balances, and intuitive software ensure that every user gets their way. Level-monitored and optional high-capacity fluid tanks allow the system to run all day long. In addition, startup, cleaning, filter check, and shutdown are all automated to give you a much-needed break.

Easy User Onboarding and Operation

- Spot potential panel design issues with the built-in Spectra Viewer
- Streamline sample loading through the integrated, versatile sample loader
- Maintain sample integrity during long screens with onboard temperature control and agitation

☒ **Enable Vacation Mode**

Schedule from 3/31/2020 to 4/4/2020

Start up the system every 3 day(s) at 2 : 00 PM

Shut down the system after running for 30 minutes after each startup

Set up the Vacation Mode for automatic Startup and Shutdown during prolonged instrument downtime.

- Save sample using the innovative sample pump with minimal dead volume and ability to return unused samples
- Manage multiple users and track login times with User Management and Report functions from Everest Software

Hassle-Free Setup and Maintenance

- Free up your instrument on time with scheduled Startup and automatic Shutdown
- Enjoy hands-free setup with onboard QC beads and an automatic 3.5 min QC process
- Catch incorrect filter placement with the ZE5-EYE
- Enable Vacation Mode for the administrator to set intervals for automatic Startup and Shutdown
- Track the instrument's performance with an array of functionality reports
- Prolong operation time with level-monitored, hot-swappable fluid tanks. Upgrade from 4 to 20 L tanks to extend run time from 8 to 22 hr

Shutdown ZE5

Proceed to Shutdown?

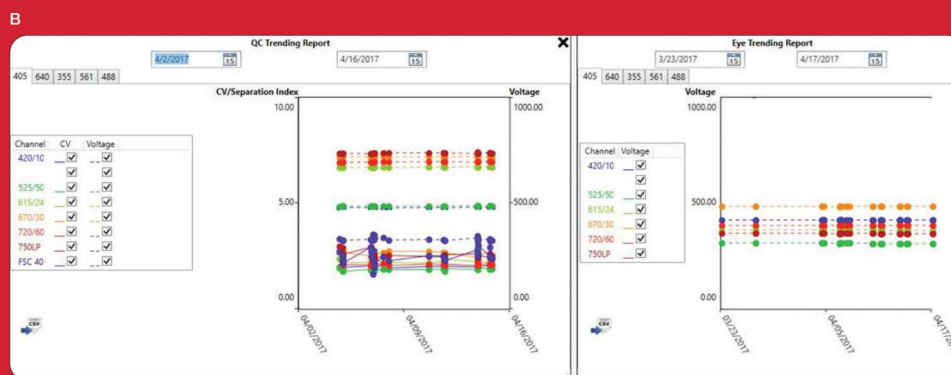
☒ **Enable Automatic Startup**

Date: 7/20/2020

Time: 8 : 30 AM

OK Cancel

Enable Automatic Startup for a future time.



Instrument setup and performance tracking. A, onboard QC beads for hands-free QC process; B, QC Trending Report and ZE5-EYE Report for instrument performance monitoring.



ZE5 Cell Analyzer Laser and Filter Configuration Guide

5-Laser (27 colors)		
Laser	Filter	Fluorophore
355	387/11	SBUV400, BUV395
	447/60	SBUV445, AF350, DAPI
	525/50	SBUV510, BUV496
	670/30	SBUV665, BUV661
	700LP	SBUV740, SBUV795, BUV737
405	420/10	BV421
	460/22	SBV440, Pacific Blue
	525/50	SBV515, BV510, CFP
	615/24	SBV610, BV605
	670/30	SBV670, BV650
	720/60	SBV710, BV711
488	750LP	SBV760, SBV790, BV786
	488/10	Side scatter
	525/25	FITC, GFP, YFP, AF488, Kiravia520
	593/52	SBB580
	692/80	SBB675, SBB700, PerCP-Cy5.5
561	750LP	SBB765, SBB810
	577/15	SBY575, PE
	589/15	DsRed, tdTomato
	615/24	SBY605, PE-Dazzle, PE-CF594, mCherry
	640/20	mPlum
	670/30	SBY665, PE-Cy5, PE-AF647
640	720/60	SBY720, PE-Cy5.5
	750LP	SBY800, PE-Cy7, PE-AF750
	670/30	SBR670, APC, AF647
	720/60	SBR715, AF700
	775/50	SBR775, APC Cy7, AF750
800LP	800LP	SBR815, AF700, APC/Fire810

5-Laser 7 Off UV Option A (27 colors)		
Laser	Filter	Fluorophore
355	387/11	SBUV400, BUV395
	509/24	SBUV510, DAPI, Zombie UV
	577/15	SBUV575, BUV536
	615/24	SBUV605, BUV615
	670/30	SBUV665, BUV661
405	747/33	SBUV740, BUV737
	780 LP	SBUV795, BUV805
	420/10	BV421
	460/22	SBV440, Pacific Blue
	525/50	SBV515, BV510, CFP
488	615/24	SBV610, BV605
	670/30	SBV670, BV650
	720/60	SBV710, BV711
	750LP	SBV760, SBV790, BV786
	488/10	Side scatter
561	525/35	FITC, GFP, YFP, AF488, Kiravia520
	593/52	SBB580
	692/80	SBB675, SBB700, PerCP-Cy5.5
	750LP	SBB765, SBB810
	583/30	SBY575, PE, DsRed, tdTomato, RFP
640	615/24	SBY605, PE-Dazzle, PE-CF594, mCherry
	670/30	SBY665, PE-Cy5, PE-AF647
	720/60	SBY720, PE-Cy5.5
	750LP	SBY800, PE-Cy7, PE-AF750
	670/30	SBR670, APC, AF647
800LP	720/60	SBR715, AF700
	775/50	SBR775, APC Cy7, AF750
	800LP	SBR815, AF700, APC/Fire810

5-Laser 7 Off UV Option B (27 colors)		
Laser	Filter	Fluorophore
355	387/11	SBUV400, BUV395
	460/22	SBUV445, DAPI, Zombie UV, L/D Blue
	509/24	SBUV510, BUV496
	577/15	SBUV575, BUV563
	670/30	SBUV665, BUV661
405	747/33	SBUV740, BUV737
	780 LP	SBUV795, BUV805
	420/10	BV421
	460/22	SBV440, Pacific Blue
	525/50	SBV515, BV510, CFP
488	615/24	SBV610, BV605
	670/30	SBV670, BV650
	720/60	SBV710, BV711
	750LP	SBV760, SBV790, BV786
	488/10	Side scatter
561	525/35	FITC, GFP, YFP, AF488, Kiravia520
	593/52	SBB580
	692/80	SBB675, SBB700, PerCP-Cy5.5
	750LP	SBB765, SBB810
	583/30	SBY575, PE, DsRed, tdTomato, RFP
640	615/24	SBY605, PE-Dazzle, PE-CF594, mCherry
	670/30	SBY665, PE-Cy5, PE-AF647
	720/60	SBY720, PE-Cy5.5
	750LP	SBY800, PE-Cy7, PE-AF750
	670/30	SBR670, APC, AF647
800LP	720/60	SBR715, AF700
	775/50	SBR775, APC Cy7, AF750
	800LP	SBR815, AF700, APC/Fire810

Note: This is not a comprehensive list of fluorophores and dyes that can be used with the ZE5 Cell Analyzer.

continues



ZE5 Cell Analyzer Laser and Filter Configuration Guide, continued



4-Laser (24 colors)***		
Laser	Filter	Fluorophore
405	420/10	BV421
	460/22	SBV440, Pacific Blue
	525/50	SBV515, BV510, CFP
	615/24	SBV610, BV605
	670/30	SBV670, BV650
	720/60	SBV710, BV711
	750LP	SBV760, SBV790, BV786
488	488/10	Side scatter
	509/24	FITC, GFP, AF488, Kiravia520
	549/15	YFP
	583/30	SBB580, PE
	615/24	SBB615, PE-CF594, PE-Dazzle
	692/80	SBB675, SBB700, PerCP-Cy5.5, PE-Cy5
	750LP	SBB765, SBB810, PE-Cy7, PE-AF750
561	577/15	SBY575, PE
	589/15	DsRed, tdTomato
	615/24	SBY605, PE-Dazzle, PE-CF594, mCherry
	640/20	mPlum
	670/30	SBY665, PE-Cy5, PE-AF647
	720/60	SBY720, PE-Cy5.5
	750LP	SBY800, PE-Cy7, PE-AF750
640	670/30	SBR670, APC, AF647
	720/60	SBR715, AF700
	775/50	SBR775, APC Cy7, AF750
	800LP	SBR815, AF790, APC/Fire810

3-Laser (17 colors)***		
Laser	Filter	Fluorophore
405	420/10	BV421
	460/22	SBV440, Pacific Blue
	525/50	SBV515, BV510, CFP
	615/24	SBV610, BV605
	670/30	SBV670, BV650
	720/60	SBV710, BV711
	750LP	SBV760, SBV790, BV786
488	488/10	Side scatter
	509/24	FITC, GFP, AF488, Kiravia520
	549/15	YFP
	583/30	SBB580, PE
	615/24	SBB615, PE-CF594, PE-Dazzle
	692/80	SBB675, SBB700, PerCP-Cy5.5, PE-Cy5
	750LP	SBB765, SBB810, PE-Cy7, PE-AF750
640	670/30	SBR670, APC, AF647
	720/60	SBR715, AF700
	775/50	SBR775, APC Cy7, AF750
	800LP	SBR815, AF790, APC/Fire810

3-Laser Option 2 (17 colors)**		
Laser	Filter	Fluorophore
488	488/10	Side scatter
	509/24	FITC, GFP, AF488, Kiravia520
	549/15	YFP
	583/30	SBB580, PE
	615/24	SBB615, PE-CF594, PE-Dazzle
	692/80	SBB675, SBB700, PerCP-Cy5.5, PE-Cy5
	750LP	SBB765, SBB810, PE-Cy7, PE-AF750
561	577/15	SBY575, PE
	589/15	DsRed, tdTomato
	615/24	SBY605, PE-Dazzle, PE-CF594, mCherry
	640/20	mPlum
	670/30	SBY665, PE-Cy5, PE-AF647
	720/60	SBY720, PE-Cy5.5
	750LP	SBY800, PE-Cy7, PE-AF750
640	670/30	SBR670, APC, AF647
	720/60	SBR715, AF700
	775/50	SBR775, APC Cy7, AF750
	800LP	SBR815, AF790, APC/Fire810

3-Laser (20 colors)***		
Laser	Filter	Fluorophore
405	420/10	BV421
	460/22	SBV440, Pacific Blue, mTurquoise
	525/50	SBV515, BV510, CFP, Cascade Yellow
	615/24	SBV610, BV605
	670/30	SBV670, BV650
	720/60	SBV710, BV711
	750LP	SBV760, SBV790, BV786

Laser	Filter	Fluorophore
488	488/10	Side scatter
	509/24	FITC, eGFP, AF488, Kiravia520, mClover
	549/15	eYFP
	583/30	SBB580, PE
	615/24	SBB615, PE-CF594, PE-Dazzle
	692/80	SBB675, SBB700, PerCP-Cy5.5, PE-Cy5
	750LP	SBB765, SBB810, PE-Cy7, PE-AF750

Laser	Filter	Fluorophore
561	577/15	SBY 575, PE
	589/15	DsRed, tdTomato, RFP
	615/24	SBY605, PE-Dazzle, PE-CF594, mCherry
	640/20	mPlum
	670/30	SBY665, PE-Cy5, PE-AF647
	720/60	SBY720, PE-Cy5.5
	750LP	SBY800, PE-Cy7, PE-AF750

Note: This is not a comprehensive list of fluorophores and dyes that can be used with the ZE5 Cell Analyzer.

* Small particle detector can be included in configuration or omitted from configuration with the option to add later.

** Eligible for an upgrade with a UV laser.

AF, Alexa Fluor; APC, allophycocyanin; BUV, Brilliant UltraViolet; BV, Brilliant Violet; CFP, cyan fluorescent protein; Cy, cyanine; DAPI, 4',6-diamidino-2-phenylindole; dsRed, *Discosoma* red fluorescent protein; eGFP, enhanced green fluorescent protein; eYFP, enhanced yellow fluorescent protein; FITC, fluorescein isothiocyanate; GFP, green fluorescent protein; LP, long pass; PE, phycoerythrin; PerCP, peridinin chlorophyll protein; RFP, red fluorescent protein; SBB, StarBright Blue; SBR, StarBright Red; SBUV, StarBright UltraViolet; SBV, StarBright Violet; SBY StarBright Yellow; UV, ultraviolet; YFP, yellow fluorescent protein.



Specifications

System

Fluorescence sensitivity	Average MESF — FITC: <70; PE: <50; APC: <40
Forward scatter sensitivity	<0.2 μm FSC resolution with small particle detection module
Loader	Integrated sample loader with agitation and temperature control. 96- and 384-well standard and deep-well plates; 40-tube rack for 5 ml 12 x 75 mm tubes; 24-tube rack for 1.5 ml microcentrifuge tubes; stat tube position for single 5 ml tube
Throughput	<15 min for 96-well plate and <60 min for 384-well plate in High-Throughput Mode

Optics

Excitation	Up to five spatially separated lasers. Standard options include: 355 nm, 50 mW 488 nm, 100 mW 640 nm, 100 mW 405 nm, 100 mW 561 nm, 50 mW
Detection	Up to 30 detectors, including FSC and SSC; optional second FSC detector (for small particle detection)
Cuvette	Fused silica with 145 x 265 μm channel

Electronics

Speed	Up to 100,000 eps with all parameters enabled
Data processing	Simultaneous measured peak, area, and width for every channel. 24-bit data for peak and area. 17-bit data for width with high-resolution linear interpolation at the half height

Fluidics

Sample flow rates	0.025–3.5 $\mu\text{l}/\text{sec}$
Bulk fluids	4 x 4 L bulk fluid tanks on board for sheath and waste. Onboard additive concentrate and cleaner

Installation

Power	100–240 VAC, 50/60 Hz
Dimensions (W x D x H)	29 x 27 x 26 in.; 74 x 69 x 66 cm
Weight	<240 lb; <110 kg
Temperature and humidity	18–28°C; 20–60% RH
Air and vacuum supply	Included, on board

Software

Flow cytometry standard (FCS) format	FCS 3.1
QC	Automated quality control with onboard calibration beads
Acquisition and analysis	Everest Software

Workstation

Dell Precision Workstation	
Processor	Intel Core i7-7700 (Quad Core, 3.6 GHz, 4.2 GHz turbo, 8 MB)
Operating system	Windows 10 Pro
Language pack	English
Graphics	Intel 630 integrated
Memory	DDR4; 32 GB RAM
Networking	Intel Gigabit LAN
Monitor	29 in. with speakers
SSD boot drive	256 GB
HDD data drive	4 TB

Regulatory Compliance

Regulation	CE, Class I (1) laser product Research use only
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Ordering Information

Catalog # Description

Instrument Configurations

12004276	ZE5 Cell Analyzer, 3 Laser (405/488/640 nm) , 17 fluorescence detectors plus 488 FSC and 488 SSC
12014141	ZE5 Cell Analyzer, 3 Laser (405/488/640 nm) with SPD , 17 fluorescence detectors plus 488 FSC, 488 SSC, and 405 small particle detector (SPD)
12004277	ZE5 Cell Analyzer, 3 Laser (488/561/640 nm) , 17 fluorescence detectors plus 488 FSC and 488 SSC
12014139	ZE5 Cell Analyzer, 3 Laser (405/488/561 nm) , 20 fluorescence detectors plus 488 FSC and 488 SSC
12014140	ZE5 Cell Analyzer, 3 Laser (405/488/561 nm) with SPD , 20 fluorescence detectors plus 488 FSC, 488 SSC, and 405 SPD
12004278	ZE5 Cell Analyzer, 4 Laser (405/488/561/640 nm) , 24 fluorescence detectors plus 488 FSC and 488 SSC
12014138	ZE5 Cell Analyzer, 4 Laser (405/488/561/640 nm) with SPD , 24 fluorescence detectors plus 488 FSC, 488 SSC, and 405 SPD
12004279	ZE5 Cell Analyzer, 5 Laser (355/405/488/561/640 nm) , 27 fluorescence detectors plus 488 FSC, 488 SSC, and 405 SPD
12014135	ZE5 Cell Analyzer, 5 Laser (355/405/488/561/640 nm) with 7 off UV Option A , 27 fluorescence detectors plus 488 FSC, 488 SSC, and 405 SPD
12014136	ZE5 Cell Analyzer, 5 Laser (355/405/488/561/640 nm) with 7 off UV Option B , 27 fluorescence detectors plus 488 FSC, 488 SSC, and 405 SPD

Optional Fluidics Upgrades*

12009651	External House DI Water Upgrade Kit , enables a connection between the ZE5 Cell Analyzer and the laboratory's source of pressurized house deionized water
12009707	ZE5 External DI Water Carboy and Fluidics Cart Upgrade Kit , external 20 L carboy and a fluidics cart, enabling approximately 22 hours of uninterrupted run time
12009734	ZE5 External Waste Carboy and Fluidics Cart Upgrade Kit , external 20 L carboy and a fluidics cart, enabling approximately 22 hours of uninterrupted run time

* The ZE5 Cell Analyzer has fully integrated onboard fluidics. The purchase of these items is not required for normal function. For detailed information about additional upgrades, including optical upgrades and automation, please visit bio-rad.com/CellAnalyzer or contact your local sales representative.

Catalog # Description

Required Consumables

12004403	ZE-Series QC Beads , package of 3 x 5 ml
12004271	ZE5 Additive , package of 4 x 300 ml
12004272	Cytometer Cleaner , 1 L

Visit bio-rad.com/ZE5 for more information.

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