BD FACSDiscover™ A8 Cell Analyzer with BD SpectralFX™ Technology and BD CellView™ Image Technology

Unlock cellular secrets like never before with spectral flow cytometry and real-time imaging in one powerful instrument

BD

BD FACSDiscover™ A8 Cell Analyzer

Charting the next era of flow cytometry

The BD FACSDiscover™ A8 Cell Analyzer redefines single-cell analysis by seamlessly integrating cutting-edge spectral flow cytometry with real-time imaging, enabling researchers to achieve breakthrough discoveries. This innovative platform combines unparalleled experimental power and simplified workflows to deliver reproducible results and single-cell insights that were previously undetectable.

By delivering state-of-the-art capabilities in a single instrument, the BD FACSDiscover™ A8 Cell Analyzer maximizes research efficiency, enhances data quality and unlocks deep biological insights. Across all lab settings, the BD FACSDiscover™ A8 Cell Analyzer positions scientists at the forefront of flow cytometry to tackle complex biological questions, publish meaningful results and facilitate drug discovery and development, with unprecedented precision and speed.

This versatile, robust and reliable instrument comes in a 5-laser configuration (B-R-V-YG-UV) with 78 fluorescence detectors and 8 scatter and imaging detectors. Please refer to the technical specifications for comprehensive details.

Flow cytometry innovations that matter to you

BD SpectralFX™ Technology: Delivers exceptional sensitivity and resolution. Optimal hardware design, system-aware unmixing, and next-gen setup and QC based on LED calibrated gain interface provide highly accurate data consistently and easily at default gain settings.

BD CellView™ Image Technology: This real-time imaging technology adds spatial dimension to flow cytometry analysis. In addition to scatter and fluorescence images, this technology generates imaging parameters, including Diffusivity, Max Intensity, Radial Moment and 12 other automatically generated parameters.

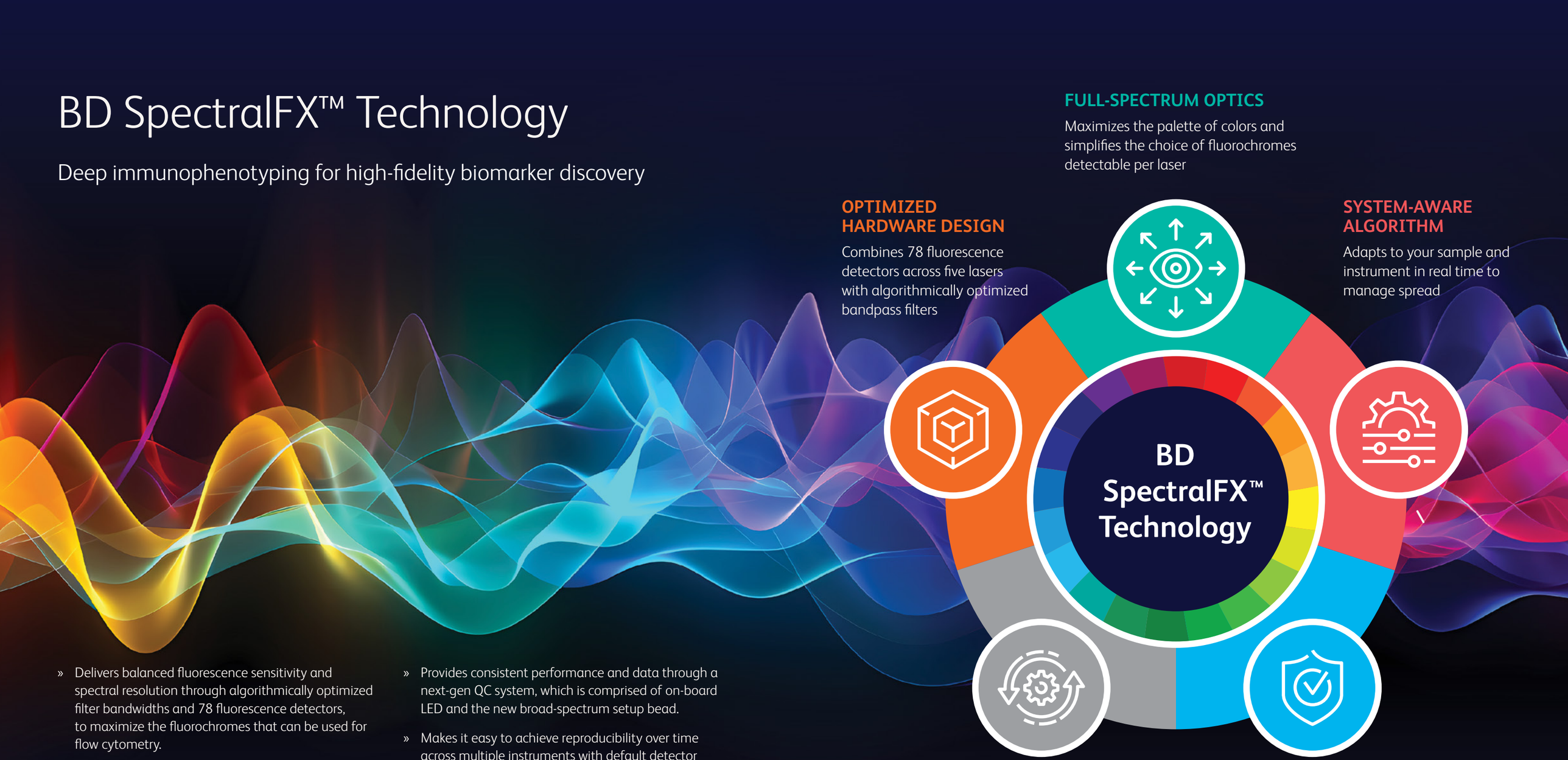
Integrated Autoloader: Fully integrated inside the instrument, the autoloader eliminates connectivity issues for sample acquisition from plates and tube racks. Engineered for performance, the autoloader delivers high throughput, exceptional reliability and maximum sample integrity with advanced temperature control and automated mixing—plus true walkaway automation with intelligent clog and bubble detection.

BD FACSChorus™ Software: Provides an intuitive interface for step-by-step guided navigation making it easy to optimize, acquire and analyze data from spectral panels.

Fluidics: Dual-mode fluidics offers flexibility with acquisition rates of up to 35,000 events/sec in high-speed mode and 12,500 events/sec in imaging mode.

BD SpectralFX™ Technology

Deep immunophenotyping for high-fidelity biomarker discovery



- Delivers balanced fluorescence sensitivity and spectral resolution through algorithmically optimized filter bandwidths and 78 fluorescence detectors, to maximize the fluorochromes that can be used for flow cytometry.
- The system-aware unmixing algorithm adapts to the electronic noise and optical background from the sample and detector gains to minimize spillover spreading error and maximize data quality. This enables resolution of populations with dim markers with more confidence.
- Provides consistent performance and data through a next-gen QC system, which is comprised of on-board LED and the new broad-spectrum setup bead.
- Makes it easy to achieve reproducibility over time across multiple instruments with default detector settings that significantly reduce the need for gain adjustments.
- BD FACSChorus™ Software guides users through an easy and flexible workflow one step at a time and allows users to handle complex experiments with confidence by providing visual tools, such as the BD® Spectral Hotspot Matrix, within the acquisition software.

Experience the BD SpectralFX™ Technology that elevated flow cytometry to 50 colors

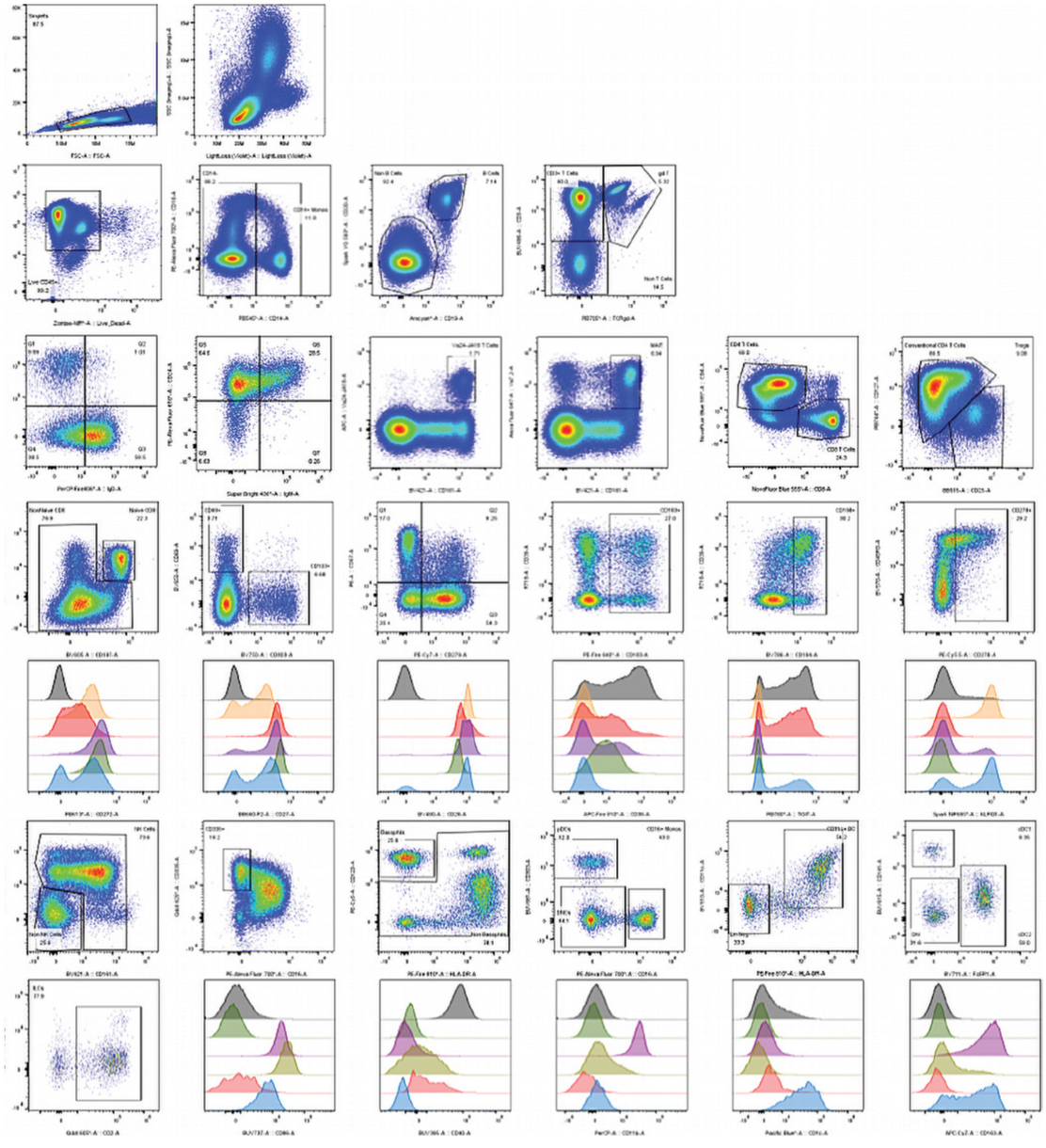
In situations where sample and time are limited, why not get the maximum cell marker information in one panel? Capture the interplay between different types of immune cell populations accurately and efficiently.

Deep immunophenotyping enables in-depth and efficient analysis of the immune system in human blood and tissues, which is essential for high-fidelity biomarker discovery. Overcoming the challenges of resolving a high number of fluorochromes and minimizing spillover spread to obtain meaningful biological insights is key. With careful panel design and innovative BD SpectralFX™ Technology, the BD FACSDiscover™ Platform sets the standard in high-parameter immunophenotyping with a 50-color panel (OMIP-102).

Fluorochromes and markers for the 50-color panel

Laser	Antigen	Fluorochromes
UV	NKp46 (CD335)	Biotin
	CD45RA	Spark UV 387
	CD40	BUV395
	CD3	BUV496
	CD56	BUV563
	CD2	Qdot 605
	CD141	BUV615
	Streptavidin	Qdot 625 (or Qdot 525)
	CD303	BUV661
	CD86	BUV737
	CD45	BUV805
Violet	CD161	BV421
	IgM	Super Bright 436
	CD1c	Pacific Blue
	CD28	BV480
	CD19	AmCyan
	CD11c	BV510
	CD45RO	BV570
	CCR7 (CD197)	BV605
	CD69	BV650
	FcER1	BV711
	CD103	BV750
	CCR4 (CD194)	BV786
Blue	CD25	BB515
	CD14	RB545
	CD8a	NovaFluor Blue 555
	CD4	NovaFluor Blue 585
	BTLA (CD272)	RB613
	CD27	BB660-P2
	CD11b	PerCP
	IgG	BB700
	TCRgd	RB705
	CD127	RB744
	TIGIT	RB780
	IgD	PerCP-Fire806
Yellow Green	CD57	PE
	CD20	Spark YG 593
	CD24	PE-Alexa Fluor 610
	CXCR3 (CD183)	PE/Fire 640
	CD123	PE-Cy5
	ICOS (CD278)	PE-Cy5.5
	CD16	PE-Alexa Fluor 700
	PD1 (CD279)	PE-Cy7
	HLA-DR	PE/Fire 810
Red	Va24-JA18	APC
	Va7.2	Alexa Fluor 647
	KLRG1	Spark NIR685 (or AF660)
	CD39	R718
	Live/Dead	Zombie-NIR
	CD163	APC-Cy7
	CD38	APC/Fire 810

Cell Type	Antigen	Fluorochromes
Lineage & Live/Dead	Live/Dead	Zombie-NIR
	CD45	BUV805
	CD14	RB545
T Cells	CD45RA	Spark UV 387
	CD3	BUV496
	CD28	BV480
	CD45RO	BV570
	CCR7 (CD197)	BV605
	CD69	BV650
	CD103	BV750
	CCR4 (CD194)	BV786
	CD25	BB515
	CD8a	NovaFluor Blue 555
	CD4	NovaFluor Blue 585
	BTLA (CD272)	RB613
	CD27	BB660-P2
	TCRgd	RB705
	CD127	RB744
	TIGIT	RB780
	CD57	PE
	CXCR3 (CD183)	PE/Fire 640
	ICOS (CD278)	PE-Cy5.5
	PD1 (CD279)	PE-Cy7
	Va24-JA18	APC
	Va7.2	Alexa Fluor 647
	KLRG1	Spark NIR685 (or AF660)
	CD39	R718
	CD38	APC/Fire 810
B Cells	IgM	Super Bright 436
	CD19	AmCyan
	NKp46 (CD335)	Biotin
	IgG	BB700
	IgD	PerCP-Fire806
	CD20	Spark YG 593
	CD24	PE-Alexa Fluor 610
Dendritic Cells	CD141	BUV615
	CD303	BUV661
	CD11c	BV510
	FcER1	BV711
	CD123	PE-Cy5
	HLA-DR	PE/Fire 810
NK Cells	CD56	BUV563
	Streptavidin	Qdot 625 (or Qdot 525)
	CD161	BV421
	CD16	PE-Alexa Fluor 700
Innate Lymphoid & Antigen Presenting Cells	CD40	BUV395
	CD86	BUV737
	CD2	Qdot 605
	CD1c	Pacific Blue
	CD11b	PerCP
	CD163	APC-Cy7

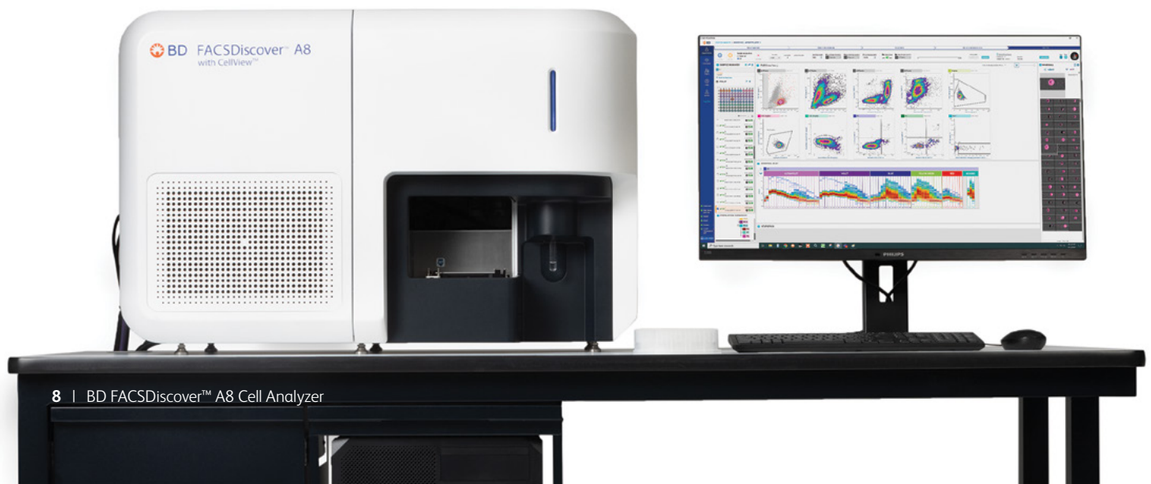


Human PBMC 50-color OMIP-102 panel* on BD FACSDiscover™ A8 Cell Analyzer

*Konecny, A. J., Mage, P. L., Mair, F., Tyznik, A. J., & Prlic, M. (2024). OMIP-102: 50-color phenotyping of the human immune system with in-depth assessment of T cells and dendritic cells. *Cytometry Part A*. https://doi.org/10.1002/cyto.a.24841

Intuitive workflows easily tackle complex experiments with confidence and reproducibility

BD FACSChorus™ Software for the BD FACSDiscover™ A8 Cell Analyzer is designed to streamline and enhance your flow cytometry experience, making flow analysis more accessible and efficient. With an intuitive interface, guided workflow and real-time visualizations, you will get software that is easy-to-use and allows you to focus on your science.



An unmixing workflow for your experiments

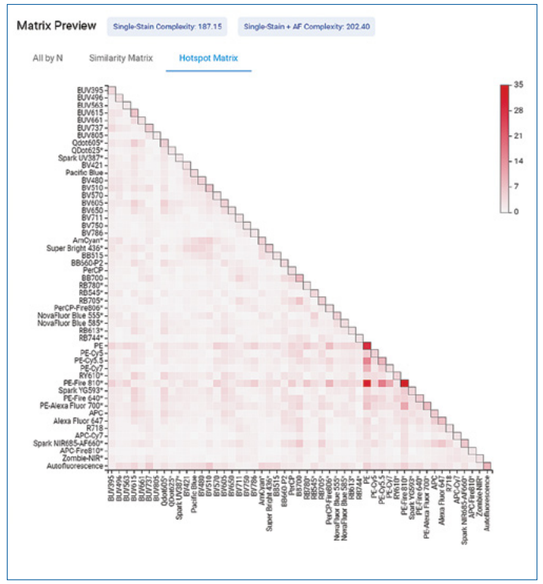
- A comprehensive unmixing workflow in BD FACSChorus™ Software enables flexible control choices, previews of the unmixing matrix and confidence in your unmixing.
- Define multiple autofluorescent populations to add to your unmixing matrix to get the best resolution for your biological markers.
- Visualizations offer information on the spectral signatures, similarity of your fluorochromes, complexity of your panel and the impact of your matrix on fully-stained samples or single-color controls.
- Use the BD® Spectral Hotspot Matrix to identify optimal combinations of autofluorescence spectra and problematic hotspots of unmixing-dependent spread for your panel.
- After acquisition, calculate a new unmixing matrix in BD FACSChorus™ Software or FlowJo™ v11 Software for flexibility and reproducibility.

Portable and reproducible assays

- Experiment duplication and templates allow you to quickly pick up where you left off after your last experiment.
- Built-in experiment settings are updated with the results of system QC to ensure that biological differences rather than instrument differences are the highlight of your experiment.
- BD FACSChorus™ Software enables easy importing and exporting of experiment templates across the BD FACSDiscover™ Platform family of instruments to quickly move your workflow from analysis to sorted cells.

The right balance of flexibility and guidance

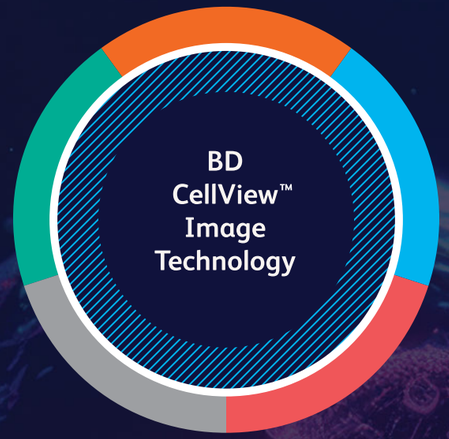
- BD FACSChorus™ Software provides a simple workflow for adjusting gains when detectors are off-scale. It is as simple as lowering affected detectors without the need for additional work to “balance” gains.
- The software gives you the ability to adjust gains at any time in the workflow by automatically recalculating the unmixing matrix so that you can save time and avoid reacquiring single-color controls.
- Optional guided setup and QC workflows ensure optimal performance by leading new users through experiment definition, adjusting gains, creating the unmixing matrix and acquiring samples. Advanced users can bypass this guided workflow to quickly set up their experiments.



BD® Spectral Hotspot Matrix embedded in the BD FACSChorus™ Software

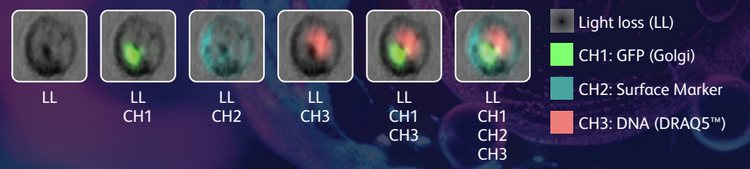
BD CellView™ Image Technology

With Dual-Mode enabled, BD SpectralFX™ Technology works hand-in-hand with BD CellView™ Image Technology to deliver fast real-time imaging that integrates spatial and morphological insights with flow cytometry data.



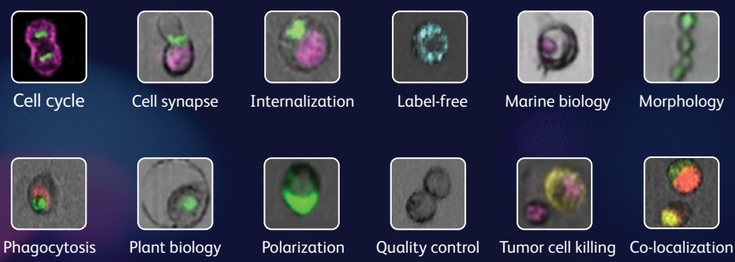
IMAGING DETECTORS

Imaging detectors together with fluorescence, scatter and light loss allow you to visualize events in real time and at high speed with 3-color fluorescence imaging



NEW INSIGHTS

New insights and image-based applications help to address previously impossible-to-answer questions



CELL MORPHOLOGY

Explore cell morphology, including internal and external spatial characteristics

SAMPLE QC

Visualize and confirm images in real time to obtain sample data for flow cytometry and downstream assays

IMAGE FEATURES

Image features combined with traditional flow parameters open the door to new dimensions in single-cell analysis

ADDITIONAL IMAGE FEATURES

Center of mass (X)
Center of mass (Y)
Forward scatter (FSC)
Light loss (blue)
Long moment
Short moment
Size
Side scatter (SSC)
Total intensity

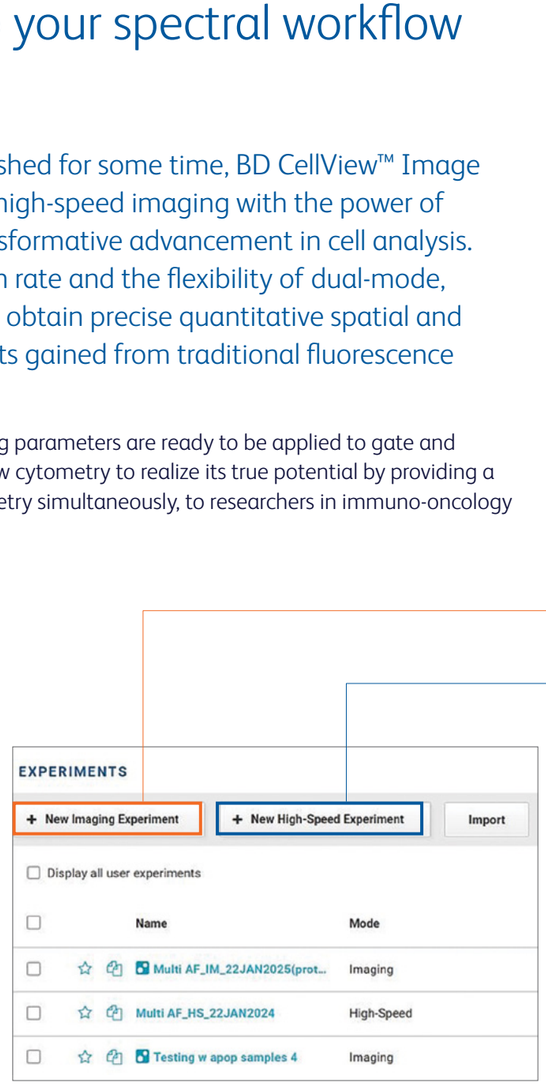
Dual-mode fluidics innovation gives you the flexibility to add real-time imaging to your spectral workflow when you want it

While imaging flow cytometry has been established for some time, BD CellView™ Image Technology sets a new standard by combining high-speed imaging with the power of spectral flow cytometry—delivering a truly transformative advancement in cell analysis. With a12,500 events/second sample acquisition rate and the flexibility of dual-mode, the BD FACSDiscover™ A8 Cell Analyzer lets you obtain precise quantitative spatial and morphological insights in addition to the insights gained from traditional fluorescence parameters, all in one seamless workflow.

Images are generated in real-time, which means the imaging parameters are ready to be applied to gate and analyze your cells during acquisition. This allows imaging flow cytometry to realize its true potential by providing a spatial dimension of insights along with spectral flow cytometry simultaneously, to researchers in immuno-oncology and beyond.

- **Discover more:** Don't miss a key dimension. Discover distinct cell populations or characteristics that are often unresolvable by traditional flow cytometry.
- **Discover confidently:** Ensure the validity of your data using quantitative imaging parameters and real-time visual confirmation during your flow cytometry experiment.
- **Discover efficiently:** Accelerate your research by skipping microscopy confirmation when possible, saving time, effort and costs.
- **Discover with ease:** Step-by-step guided navigation paired with the integrated autoloader makes discovery easier than ever.

One seamless workflow for spectral with imaging



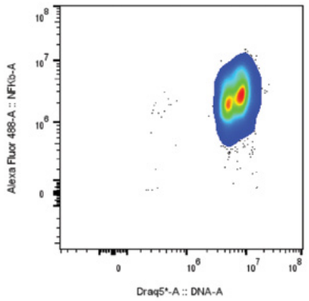
Imaging Mode (spectral + imaging)

High-Speed Mode (spectral only)

Precise quantitative spatial and morphological insights to power your translational research

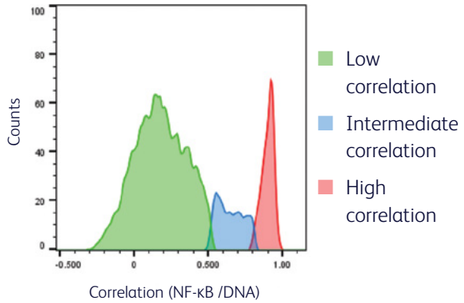
Experiments such as dose-response studies often require the ability to assess cellular processes that are not distinguishable by fluorescence intensity alone. Using the quantitative imaging features of BD CellView™ Technology you can now clearly resolve spatial and morphological events, such as NF-κB nuclear translocation in response to TNF-α treatment.

Treated cells
(Traditional density plot)



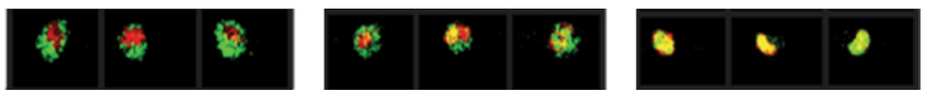
When analyzed with BD CellView™ Imaging Technology using the Correlation imaging parameter

Treated cells
(Histogram with Correlation imaging parameter)



Populations with distinct nuclear translocation can not be easily resolved with traditional flow cytometry.

Images of treated cells with different levels of NF-κB translocation



Low correlation | Intermediate correlation | High correlation

Cells with different levels of translocation can be resolved easily on the BD FACSDiscover™ A8 Cell Analyzer. Translocation, assessed using the Correlation imaging parameter, can be quantified using traditional flow plots and gates and confirmed visually through the images. Correlation is the degree to which the location of two imaging channels are the same within the region of pixels defined by the region of analysis in BD CellView™ Image Technology.

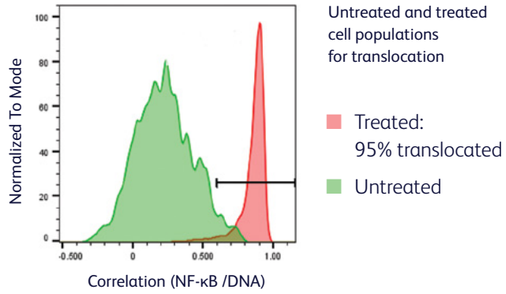
The integrated autoloader simplifies dose-response experiments

Culture Time	TNF-α treatment duration	0.001 ng/mL	0.01 ng/mL	0.1 ng/mL	1.0 ng/mL	10.0 ng/mL	100.0 ng/mL
24 h	20 min	7.7%	7.9%	36.7%	22.4%	23.9%	48.5%
24 h	40 min	5.17%	4.73%	55.93%	31.13%	95.20%	86.60%
30 h	20 min	4.29%	9.34%	7.98%	25.13%	35.60%	31.20%
30 h	40 min	2.7%	5.9%	9.6%	33.9%	40.2%	53.4%

TNF-α

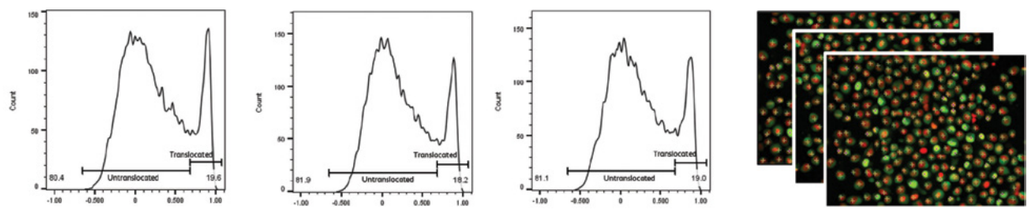
Median % responding cells of all treated cells

The Correlation imaging parameter enables quantification of cells with translocation



The integrated autoloader provides the flexibility to test numerous experimental variables to determine the optimal conditions, particularly helpful in dose response studies. In this example, 192 variables: (24 + 8 controls) x 2 (treated and untreated) x (3 replicates) were tested in a 96-well plate. The run time was 1 hour 22 mins. The most robust response was observed at 10 ng/mL, 24-hour culture and 40-minute TNF-α treatment duration: 95.2% of the treated cells showed nuclear translocation as measured by BD CellView™ Image Technology.

Instrument-to-instrument reproducibility with imaging parameters



% of cells showing NF-κB translocation

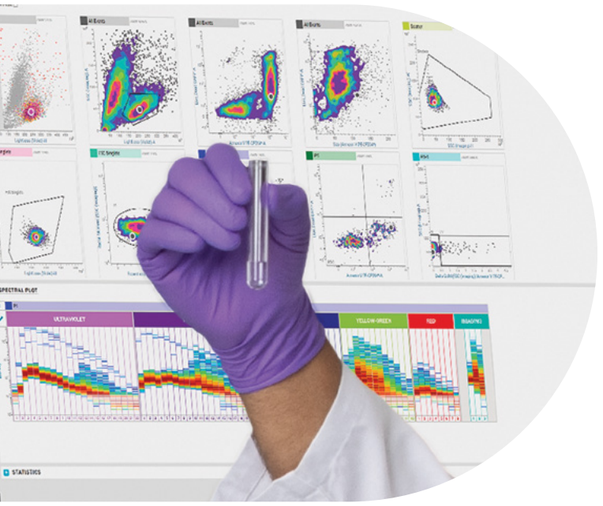
19.6% | **18.2%** | **19.0%** | **18.8%**

Instrument standardization through BD SpectralFX™ Technology enables reproducibility. In this experiment, mixed populations of translocated and non-translocated cells were analyzed on three different instruments and delivered remarkable instrument-to-instrument reproducibility.

The results are corroborated using microscopy on the Cell Profiler image analysis platform equipped with automated translocation classifier. Note that analyzing 531 cells using microscopy and the Cell Profiler required 8 hours whereas >10,000 cells could be analyzed on the BD FACDiscover™ A8 Cell Analyzer in one hour.

Get consistent and reproducible data with instrument standardization at default settings

Expect consistency in the data acquired at default gains on the BD FACSDiscover A8™ Cell Analyzer—day-to-day and instrument-to-instrument, for all of your assays.



Being able to run a wide range of experiments in default mode minimizes the need for the user to adjust gain settings and helps obtain unmixing results with less spread.

BD SpectralFX™ Technology system-aware unmixing reduces spreading errors across a wide range of detector gain settings compared to standard unmixing.

Instrument detectors are calibrated using an onboard LED pulser, resulting in precise and accurate detector setting adjustment and performance. Detector setting adjustments are intuitive due to the use of a calibrated gain scale in decibel units, rather than linear scale used in other flow cytometers.

The exceptional instrument detector standardization enables researchers to achieve reproducibility across multiple data generation sites without tedious, time-consuming and resource intensive procedures.

24-color T Cell Panel		
Laser	**Antigen**	**Fluorochromes**
UV	CD27	BUV395
	CD4	BUV496
	CD197 (CCR7)	BUV615
	CD56	BUV737
	CD8	BUV805
Violet	CX3CR1	BV421
	CD19	V450
	HLA-DR	BV480
	Live/Dead	FVS 575V
	CD185 (CXCR5)	BV650
Blue	CD57	RB545
	CD45RA	BB515
	CD95	RB613
	CD183 (CXCR3)	RB670
	CD196 (CCR6)	RB705
	CD28	RB744
	CD39	RB780
Yellow Green	CD279 (PD-1)	RY586
	TCR γδ	RY610
	CD25	RY703
	CCD127	RY775
Red	CCR10	APC
	CD194 (CCR4)	R718
	Live/Dead	Zombie-NIR
	CD3	APC-H7

RY, BD Horizon RealYellow™ Reagent. RB, BD Horizon RealBlue™ Reagents

Reproducibility with default detector settings

This 24-color deep immunophenotyping panel focused on T cell subsets is used to demonstrate reproducibility across instruments. This panel was chosen based on the high number of coexpressed markers and difficult to resolve chemokine receptors.

To build this panel, BD Horizon RealBlue™ and BD Horizon RealYellow™ Reagents were used. These reagents are engineered to deliver reduced spillover and optimize resolution when used with other fluorochromes—helping to enable flexible panel design on both conventional and spectral flow cytometers.

Exceptional inter-instrument portability of a 24-color panel

Experience walkaway automation with the integrated autoloader

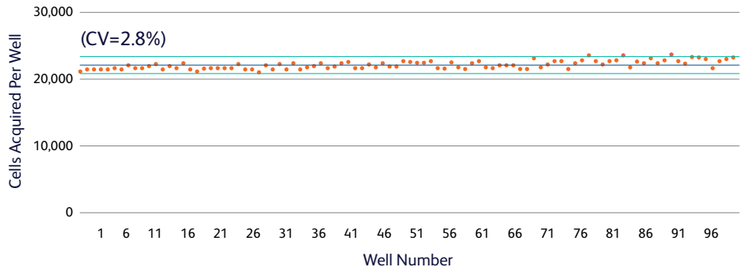
Streamline your workflow with automated sample handling for increased efficiency, consistency and productivity. The integrated autoloader offers walkaway automation with features such as automated clog/bubble detection and recovery, automated sample mixing, sample cooling and heating with temperature control.

The autoloader is fully integrated inside the instrument, which contributes to seamless operation and reliable connectivity. Supporting both plates and tube racks, the high-throughput autoloader allows for hands-free operation, saving valuable time while minimizing manual intervention.

Delivering extremely low sample carryover at default SIT Flush settings and almost zero dead volume, the autoloader offers the best there is to sample processing and utilization.

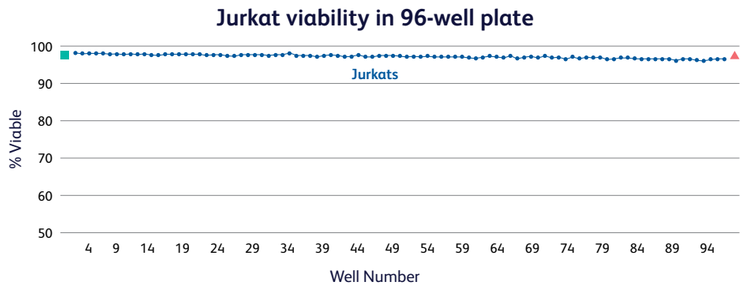
Keep cells in suspension during plate acquisition

25 µL of Jurkat cells (1 million cells/mL) were analyzed from each well of a standard 96-well plate to determine cell suspension consistency throughout sample mixing and analysis. Plate agitation occurred every 4 wells.



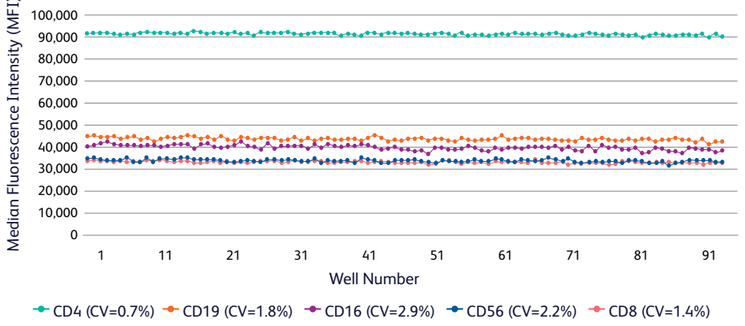
Maintain cell viability throughout plate acquisition

25 µL of Jurkat cells (1 million cells/mL) were analyzed from each well of a standard 96-well plate to determine impact of agitation on cell viability (7-AAD staining). Plate agitation occurred every 4 wells. No agitation controls were run before (green square) and after (red triangle) plate to determine baseline.



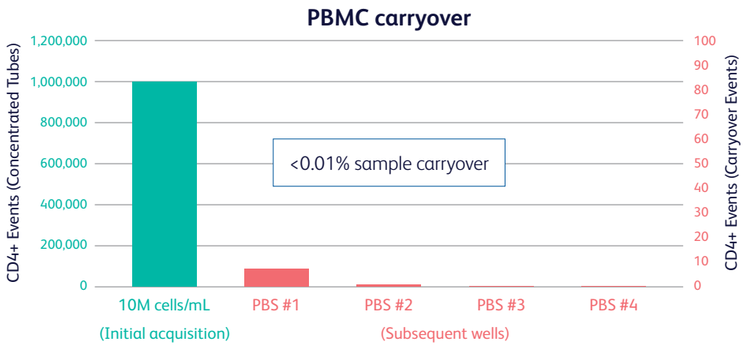
Preserve signal integrity across cells

25 µL of PBMCs (1 million cells/mL) were analyzed from each well of a 96-well plate to determine impact of agitation on signal intensity. Plate agitation occurred every 4 wells.



<0.01% sample carryover with SIT Flush

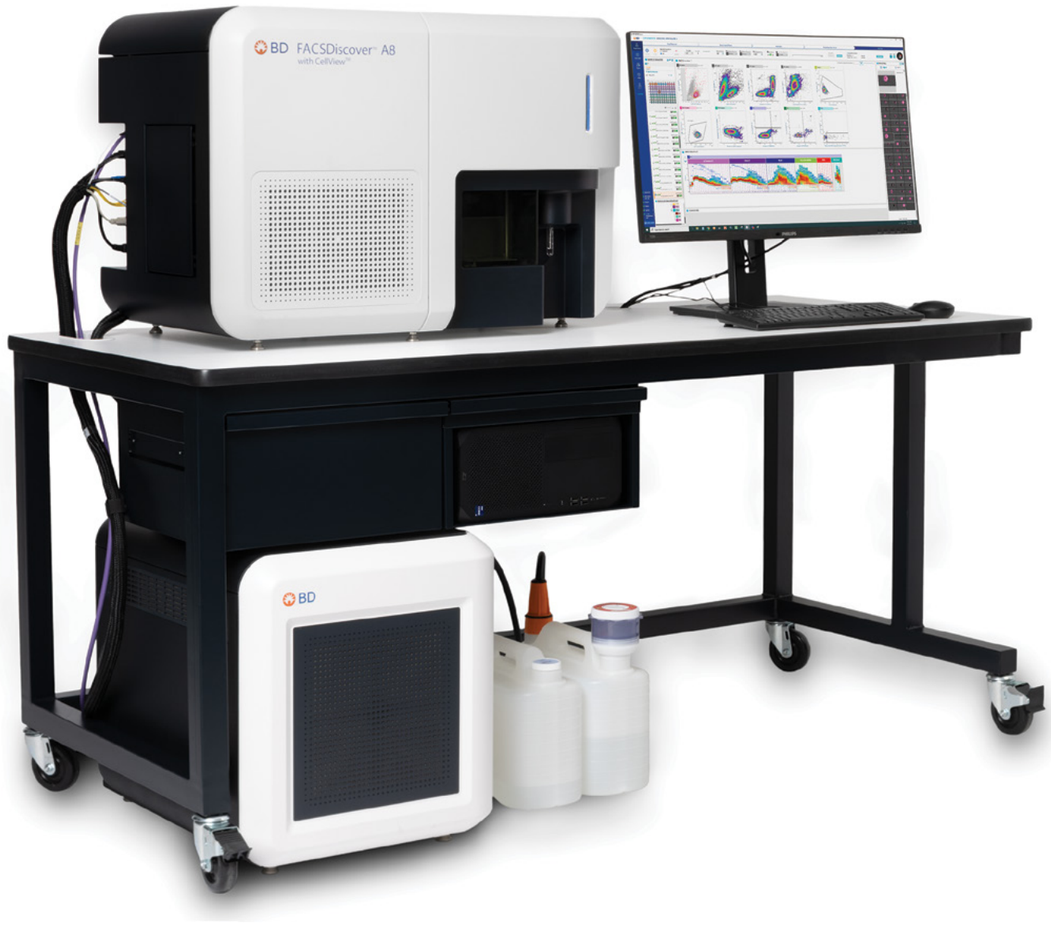
100 µL of concentrated PBMCs cells (10 million cells/mL) were acquired from one well and 1 SIT Flush was done before proceeding to the next well (automated without any manual intervention). 100 µL were acquired from the subsequent wells with PBS to measure carryover.



Small particle detection

Enhance your research capabilities with advanced small particle detection. This instrument demonstrates high sensitivity, reliably detecting 80 nm polystyrene beads using the V-SSC detector. BD CellView™ Image Technology further supports detailed analysis and visualization of small particles.

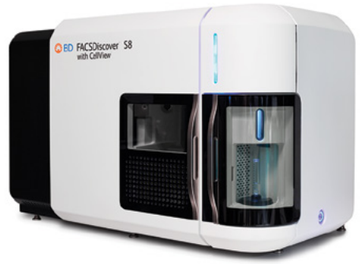
With its broad and advanced capabilities, the BD FACSDiscover™ A8 Cell Analyzer offers exceptional versatility, enabling flow cytometry core labs to effectively support researchers across diverse disciplines in achieving their scientific objectives.



Seamlessly pairs with the BD FACSDiscover™ S8 Cell Sorter

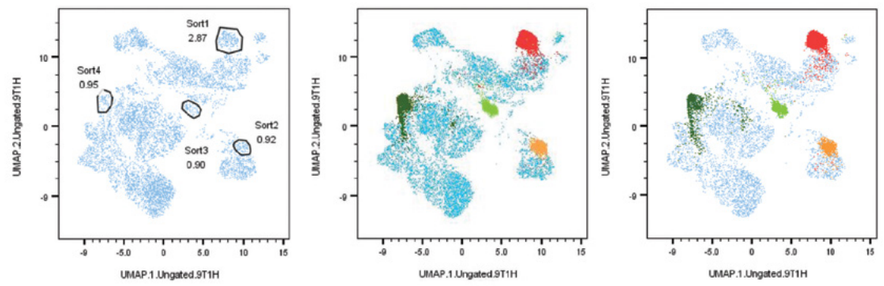
Transform your lab with the perfect partnership of the BD FACSDiscover™ A8 Cell Analyzer and BD FACSDiscover™ S8 Cell Sorter. Seamlessly move from analysis to sorting with systems engineered to work together to provide effortless panel transfer, unified workflows and consistent, high-quality data, all supported seamlessly by the industry-leading BD ecosystem of instruments, informatics, reagents and service.

BD FACSDiscover™ A8 Cell Analyzer



BD FACSDiscover™ S8 Cell Sorter

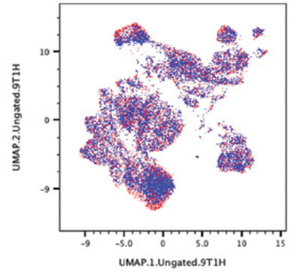
24-color T cell panel sort consistency across several experiments



Hyperfinder Sort Results

- Sort 1 Purity (99.8%)
- Sort 2 Purity (99.1%)
- Sort 3 Purity (97.0%)
- Sort 4 Purity (90.7%)

Overlay of 24-color T cell panel from analyzer and sorter



- BD FACSDiscover™ A8 Cell Analyzer
- BD FACSDiscover™ S8 Cell Sorter

An ecosystem of instruments, informatics, reagents and service supports your research at every step

INDUSTRY-LEADING INFORMATICS SOLUTIONS

BD FlowJo™ Software

- Advanced image analysis
- Automatic image extraction
- High-dimensional and large data analysis

BD® Research Cloud (BD RC)

- Enhanced research collaboration
- Remote instrument health monitoring
- Streamlined lab workflow
- Data storage solutions
- BD® Spectral Hotspot Matrix
- BD® Spectrum Viewer

HIGH-QUALITY INNOVATIVE REAGENTS

BD Horizon™ Chroma Dried Panel

- Spectral + Imaging high-parameter panel (20-color): ready-to-use
- Reduce inter-experiment variability
- Long shelf life at room temperature – ideal for multisite and longitudinal studies

BD Horizon RealYellow™ and BD Horizon RealBlue™ Reagents

- Reduced spillover and optimized resolution
- Reduced monocyte background
- Optimized for intracellular analysis

BD Technical Services is a strong partner to maintain performance

You can count on the BD Service team's deep knowledge and experience to help ensure your BD FACSDiscover™ A8 Cell Analyzer delivers expected, timely results.

Increase uptime and maximize the value of your investment with robust service coverage. Service contracts optimize performance by providing regular preventive maintenance as well as remote and on-site support.

Maximum uptime	At BD, we understand the cost and consequences of unexpected downtime. Therefore, we are committed to maximizing your system uptime. Contract customers receive priority service compared to customers without a service contract. In addition, remote diagnostics help maximize system uptime by properly diagnosing instruments.	» Responsive on-site repair » Remote service capability » Preventive maintenance
Peace of mind	No more wondering how and when your instrument will be repaired. Rest assured knowing you have access to BD service professionals whenever you need them. Having a dedicated project manager during installation helps with effective implementation, accelerates value realization and provides exceptional customer experience.	» Email and chat support » Unlimited repairs » Local field service expertise
Predictable Expense	Protect your budget from unexpected costs. BD fees cover both corrective and maintenance-related service needs. Customers also have the option to lock-in their contract price for multiple years.	» No hidden charges » Extends your service warranty » Multi-year pricing available

Contact your representative to learn more about the BD FACSDiscover™ A8 Cell Analyzer

BD flow cytometers are Class 1 Laser Products.

For Research Use Only. Not for use in diagnostic or therapeutic procedures.

BD Life Sciences, Milpitas, CA 95035, U.S.

bdbiosciences.com/A8

BD