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Bigfoot Cell Sorter: spectral sorting and analysis

Time savings, safety, precision, and flexibility

ThermoFisher
SCIENTIFIC

Discover the cutting-edge Bigfoot Spectral Cell Sorter

The Invitrogen™ Bigfoot Spectral Cell Sorter with Sasquatch Software (SQS) provides the innovation, ease of use, and high-speed cell sorting to meet the needs of your lab today and into the future.

1. Convenient storage is provided for adapters, spare parts, and tubes to help reduce cluttered lab space.

No external support components are needed. Say goodbye to external water baths, vacuum pumps, and compressors.

2. Hot-swappable, bulk-fluid bottles allow for a full shift of operation or for continuous operation by changing the fluid during a sort. Optional kits are available for connecting to house deionized (DI) water and waste to reduce the need to fill and empty bulk-fluid tanks.

Onboard cleaner, decontamination, and sheath concentrate bottles allow for automated sheath mixing as well as system rinsing and cleaning without manual intervention.



Six input positions—the Bigfoot Spectral Cell Sorter enables sampling from 1.5, 5, and 15 mL tubes with automatic tube-type sensing and built-in crash detection

Integrated wash station and on-board calibration beads—the integrated wash station reduces carryover and on-board calibration beads allow programmable, automated start-up and calibration

Built-in agitation and temperature control—using the built-in agitation and temperature control (4–37°C), the Bigfoot Spectral Cell Sorter maintains the integrity of your samples from start to finish



3. With a custom-designed, integrated Class II biocontainment cabinet, the Bigfoot Spectral Cell Sorter provides safety and protection in a compact footprint without compromising high-parameter sorter performance.



4. Multitube input paired with 18-way virtual sorting and integrated temperature control gives flexibility for all sorting applications.

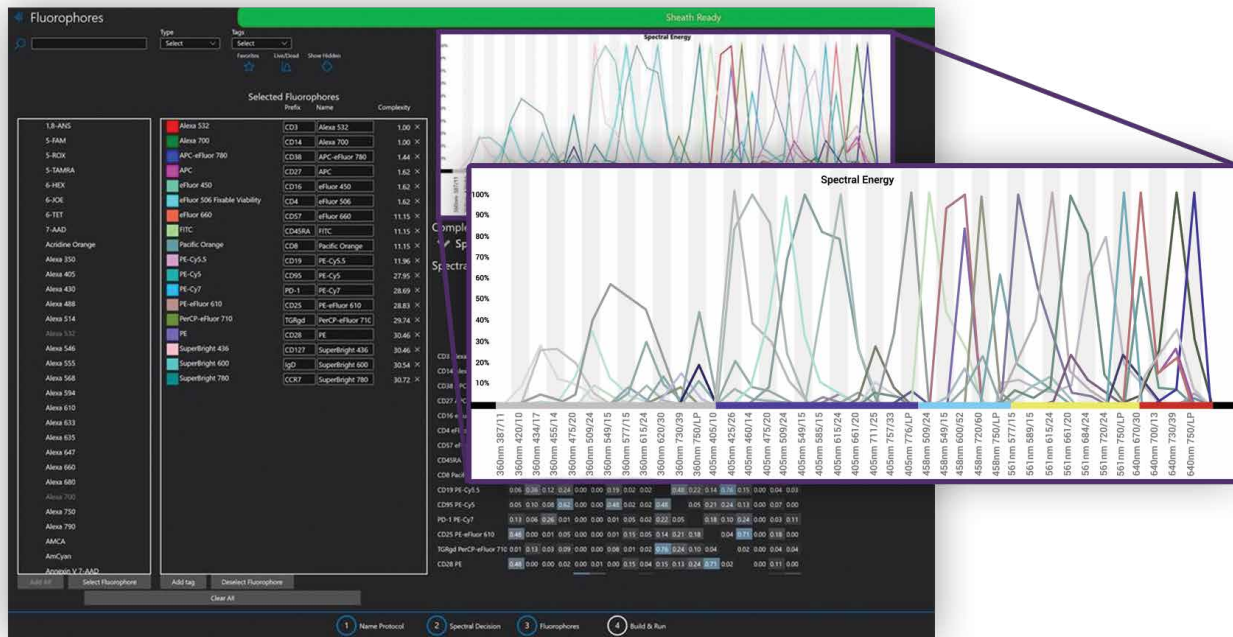
5. Custom electronics, designed from the ground up specifically for cell sorting, enable >100,000 events per second (EPS) acquisition and >70,000 EPS sorting, providing unmatched performance.



6. The Bigfoot Spectral Cell Sorter can be configured with up to 9 lasers and 60 detectors, providing the versatility for both standard fluorescence detection and spectral unmixing; multiple scatter options allow simultaneous standard and small-particle detection, multi-laser scatter detection, and/or polarization.

7. SQS provides quick start-up, automated calibration, and accurate quality control combined with an experiment designer, intuitive interface, and efficient shutdown, making the system easy to use while reducing downtime. Remote access capability, system health information, and email notifications save time and streamline your workflow.

8. Adjustable monitor and keyboard arms provide ergonomically optimized flexibility over multiple heights and positions.



Live spectral unmixing for sorting and analysis

The Bigfoot instrument allows both spectral sorting and spectral analysis on cell populations.

- **Configurable**—the high-end configurations of the Bigfoot Spectral Cell Sorter take advantage of the large number of lasers and detectors and allow spectral unmixing for both analysis and sorting in real time
- **Simple**—the experiment wizard assists the user in running controls, identifying potential issues, and applying the unmixing algorithms to produce high-quality data
- **Flexible**—the Bigfoot Spectral Cell Sorter allows both acquisition and sorting on spectrally unmixed data or conventionally compensated data, streamlining the workflow from panel development to high-speed sorting

High speed

Configurable, quick, and calibrated, the high throughput of the Bigfoot Spectral Cell Sorter is in a league of its own: up to 10x faster than the competition.

- **Adaptable**—the Bigfoot system has user-configurable sort output holders for 1.5, 5, 15, and 50 mL tubes; microwell plates of up to 1,536 wells; microscope slides; and even 10x™ chips with integrated temperature control (4–37°C), providing maximum versatility
- **Virtual sorting**—with standard six-way sorting and virtual 18-way sorting, the Bigfoot Spectral Cell Sorter can be used to separate multiple populations—from a single sample or different samples—for walk-away sorting
- **Calibration**—with built-in stream calibration and drop delay as well as media detection, sort setup is simplified for users
- **High throughput**—with sort rates >70,000 EPS, sorting is fast and configurable; from four-way sorting into 96-well plates, eight-way sorting into 384-well plates, or straight-down sorting into 1,536-well plates, the speed and recovery of the Bigfoot instrument should exceed your expectations
- **Integrated**—from built-in media detection cameras to volume tracking of sorted samples, the integrated features of the Bigfoot Spectral Cell Sorter reduce common errors with cell sorting
- **Jet-in air**—the jet-in-air sensing of the Bigfoot instrument is gentle with fragile cells, which enables the usage of a wide range of nozzle tip sizes while taking advantage of high sort speed and yield

Stable

- **Five-axis automated stream alignment**—ease of use is improved and short- to long-term variability reduced with automated five-axis stream alignment and QC
- **Precise droplet monitoring**—integrated control systems enable optimal droplet formation persistence and position stabilization over time, supporting accurate drop delay maintenance through the day
- **Simplified tip swapping**—designed with ease of use in mind, the nozzle storage station and swap-tip wizard simplify the workflow and help reduce user errors during setup
- **Reduced dead volume**—built-in bubble detection notifies the user and automatically stops sample, reducing dead volume
- **70–150 µm nozzle tips**—supports 70, 100, 120, and 150 µm nozzle tips with varying sheath pressures
- **Hot-swappable sheath tanks**—provide for continuous multihour sort runs without interruption

Integrated biocontainment

With a custom-designed Class II biocontainment cabinet, the Bigfoot Spectral Cell Sorter enables both safety and sample protection and is ergonomically optimized for sorting workflows.

- **Ease of access**—the adjustable sash maintains containment while allowing easy access to the nozzle and sample/sort areas, providing constant user protection
- **Design**—only parts, such as the nozzle, sample, and sort chamber, are enclosed; the electronics, lasers, and optics remain outside the containment zone, improving service access and temperature regulation
- **Integrated**—dedicated sort-area aerosol management system (AMS), HEPA filter, and integrated software communication provide containment warnings and increased flow to maintain protection if a clog is detected
- **Organized**—built-in sample vortex, plate storage area, tube rack, and biohazard bag streamline your workflow
- **Compliant**—the system has been verified to be functionally equivalent to the personnel and product protection standards for a Class II Type A2 biosafety cabinet per NSF International Standard 49; an airflow/containment certification protocol is provided, giving guidance to your internal biohood certifier

The sliding sash on the Bigfoot system's integrated biosafety cabinet allows users access to the internal workspace including the nozzle and sample lines while maintaining consistent airflow into the instrument.



Powerful

With custom electronics, firmware, and software designed specifically for high-performance sorting, the Bigfoot Spectral Cell Sorter has the power and flexibility to tackle your application challenges.

- **Accurate**—proprietary electronics simultaneously collect high dynamic range data for measured peak, area, and width for every channel to accurately characterize your sample
- **High-end performance**—the massively parallel, pipelined architecture eliminates hard aborts and allows complex, high-color experiments with up to a 60 x 60 compensation matrix, or spectral unmixing without limiting instrument performance
- **Zero dead time**—dynamic window extension supports full data collection for every sample
- **Automatic laser delay**—without user interaction, the electronics automatically configure the optimal laser delay for different nozzle sizes and pressures
- **Sort logic**—flexible configuration allows for independent sort logic setups built from 64 total bivariate gates of up to 512 x 512 resolution, along with multiple modes for purity, enrichment, and drop envelopes

Consistent path lengths, stable optical filter layouts, and highly sensitive photomultiplier tube (PMT) detectors optimize detection across the entire spectrum.

Flexible

The optical platform of the Bigfoot system adapts to your needs with flexible laser options and optimized filter sets.

- **Flexible**—the Bigfoot Spectral Cell Sorter offers free space excitation of up to nine lasers into seven pinholes ranging from 349 nm to 785 nm, allowing flexible wavelength selection for your multicolor experiments
- **Stable**—integrated beam shaping and short path lengths maintain optical stability day to day
- **Configurable**—with up to 60 detectors, the Bigfoot instrument will adapt to your multicolor applications while still allowing optical filter changes for future needs

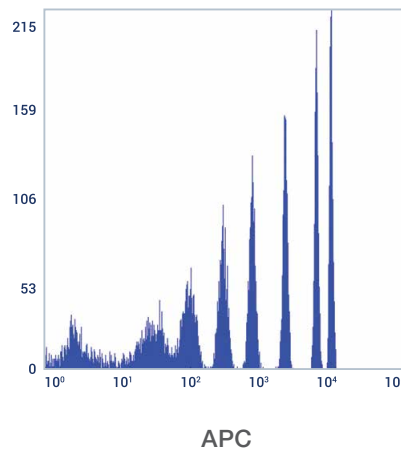
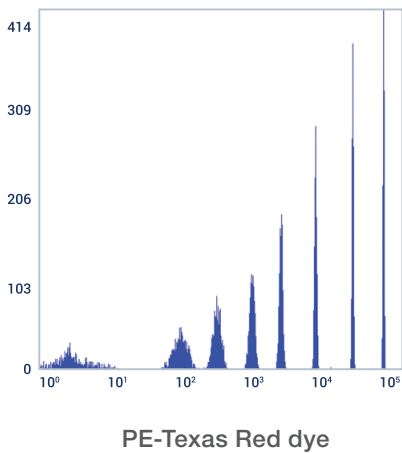
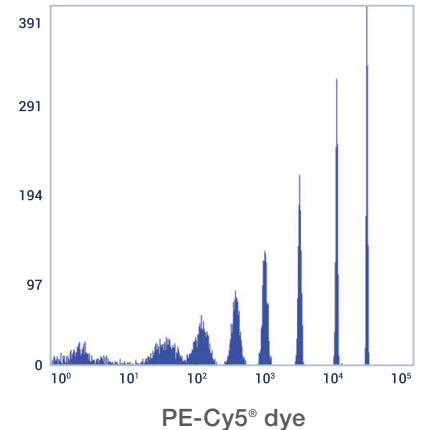
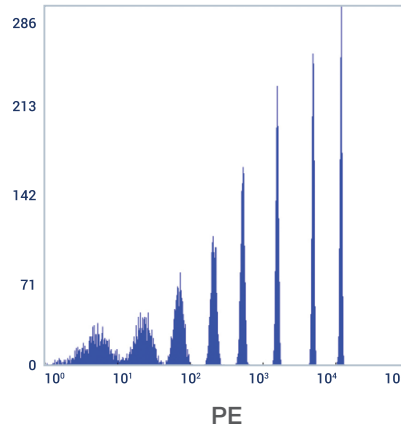
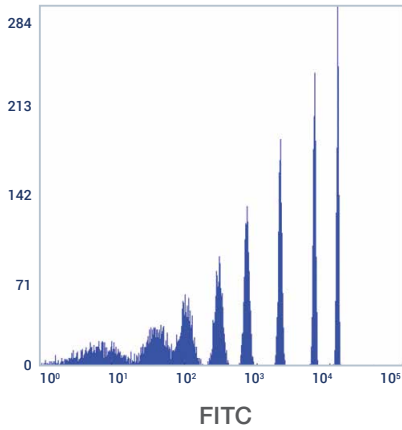
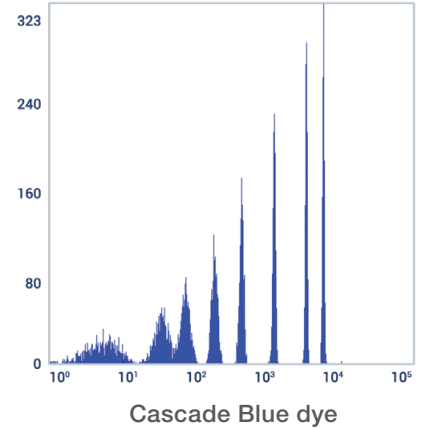
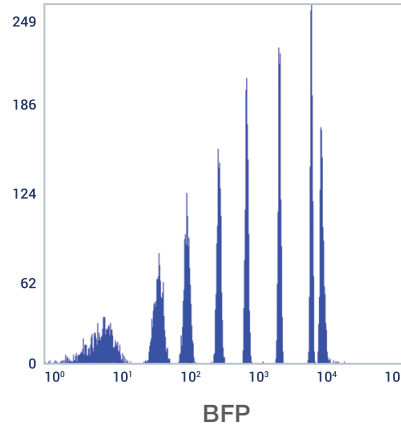
Optics





Resolution in key channels with 8-peak beads

Spherotech™ 8-peak beads run on the Bigfoot Spectral Cell Sorter show signal resolution in key channels.





Spectral and conventional flow cytometry panel builder

Design your panel for your Invitrogen™ Attune™ Flow Cytometer using the Invitrogen™ Flow Cytometry Panel Builder:

- A quick and easy-to-use web tool (Figure 1)
- Allows incorporation of antibodies using the configuration of your Attune Flow Cytometer

- Fluorophore selection built on spectral visualization of all fluorophores per laser

Find out more at

thermofisher.com/flow-cytometry



Figure 1. Simplified panel design with a five-step panel design strategy. The Flow Cytometry Panel Builder offers a customizable panel-building process to fit your flow cytometry experimental needs, no matter what your experience level is.

An innovation in dye development

A new paradigm for multicolor flow cytometry

Invitrogen™ NovaFluor™ dyes

- Unique spectral signatures
- Designed with narrow emission
- Designed with minimal cross-laser excitation
- Decrease spillover spread for higher resolution
- Easy for today's most powerful instruments

Find out more at

thermofisher.com/novafluor-dyes

AB Assurance Service Plan

Preferred coverage for peace of mind

Our technical services, field engineering, and training teams are fully committed to your success using the Bigfoot Spectral Cell Sorter for your research. Instrument service plans, consulting, and training programs are designed to help ensure instrument performance, team readiness, and overall optimal research outcomes using the system. In the field or on the phone, our team has the professional know-how to support your research and the personal dedication to help ensure your satisfaction with our instruments.



Peace of mind—during every stage of ownership: instrument installation, repair, and maintenance



Flexible service options—over 1,000 technical specialists delivering 30 years of experience servicing life sciences instrumentation



AB Assurance plan and extended warranty—covers all costs associated with instrument repairs

	AB Assurance
Response time	2 business days*
Planned maintenance	✓
Access to technical support (Monday–Friday, standard business hours)	✓
Parts, labor, and travel	✓
Qualification service	Available as add-on
Field application scientist (FAS) consultation	Available as add-on

* Availability limited in some geographic areas.

Service contracts for the Bigfoot Spectral Cell Sorter

Description	Cat. No.
AB ASSURANCE, BIGFOOT 9 L	ZG11SCBIGFOOT9L
AB ASSURANCE, BIGFOOT 7 L	ZG11SCBIGFOOT7L
AB ASSURANCE, BIGFOOT 6 L	ZG11SCBIGFOOT6L
AB ASSURANCE, BIGFOOT 5 L	ZG11SCBIGFOOT5L
AB ASSURANCE, BIGFOOT 4 L	ZG11SCBIGFOOT4L

Configurations

All configurations of the Bigfoot Spectral Cell Sorter offer two or more forward- and side-scatter channels in addition to the fluorescence channels shown in the tables.

Configurations offering both spectral analysis and conventional compensation

Lasers	Number of fluorescence detection channels for included lasers									Total detection channels	Cat. No.
	UV (349 nm)	Violet (405 nm)	Blue violet (445 nm)	Blue (488 nm)	Green (532 nm)	Yellow green (561 nm)	Red (594 nm)	Far red (640 nm)	Near-IR (785 nm)		
5	12	12		7		12		5		53	PL00302
6	12	12		7		12		5	3	56	PL00301
6	12	12	4	7		12		5		57	PL00300
7	12	12	4	7		12		5	3	60	PL00299
9	12	12	7		12		4	4	3	60	PL00285

Configurations offering only conventional compensation

Lasers	Number of fluorescence detection channels for included lasers									Total detection channels	Cat. No.
	UV (349 nm)	Violet (405 nm)	Blue violet (445 nm)	Blue (488 nm)	Green (532 nm)	Yellow green (561 nm)	Red (594 nm)	Far red (640 nm)	Near-IR (785 nm)		
4		7		7		7		4		27	PL00304
5	7	7		5		7		4		35	PL00303

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