

More Flexibility For Your Cytometry Research

*Cytomics™ FC 500 Series
Flow Cytometry Systems*



BECKMAN
Coulter™

 **BECKMAN
COULTER™**

 **Cytomics™**
The Door To Discovery



Open The Door To Discovery With The Cytomics™ FC 500 Series Flow Cytometry Systems

For today's busy researchers, speed and performance are critical. They need cost-effective technologies that can be easily utilized and confidently adapted to multiple tasks by multiple researchers. They need flexibility and simplicity.

Beckman Coulter's all-new Cytomics™ product platform was created to meet these exact needs. With the launch of each new product and service, Beckman Coulter demonstrates its ongoing commitment to serve the needs of cell-based researchers. An excellent example is the new Cytomics™ FC 500 Series, a sophisticated product family equipped with the most advanced technologies available. The FC 500 Series specializes in delivering flexible testing, powerful software and a user-friendly interface—features that help researchers optimize their overall workflow efficiency while maintaining true cost-effectiveness.

And regardless of which FC 500 Series system researchers choose, they'll have the assurance of knowing it's backed by Beckman Coulter's unsurpassed reputation for quality and service. Discover the Cytomics™ FC 500 Series, and let it open new doors of flexibility and simplicity in your laboratory today.



First In The Series: The Cytomics™ FC 500 Flow Cytometry System



Precise, Flexible Analysis Every Time

Not only is the FC 500 designed for powerful performance and unmatched simplicity, it boldly breaks through industry standards with its ability to conduct 5-color analysis from either a single laser or dual laser excitation. This automated feature improves efficiency by enabling researchers to analyze more antibodies per tube than ever before.

The FC 500 also gives investigators the power to expertly manage every aspect of their flow cytometry research with the revolutionary RXP software.

Increased Flexibility With Two Lasers and Multiple Fluorochromes

Equipped with a collinear second laser, the FC 500 offers a robust optical system that maintains a stable alignment with a single beam path and allows greater versatility in antibody and fluorochrome choices. This unique feature also increases efficiency by:

- Providing versatility to use either PCS or APC as the fluorochrome for FL4 in multicolor immunophenotyping applications
- Eliminating the need for time delay calculations and challenges associated with spatially-separated beams.
- Streamlining system set-up
- Facilitating application development with no restrictions on fluorochrome detector



Simplified Multicolor Analysis With Advanced Digital Compensation (ADC)

Beckman Coulter's ADC technology is the most advanced and accurate method of color compensation available. Its proven algorithm provides superior correction of spectral overlap and more accurate results. With ADC technology, biological samples can be used for automated color compensation, without the limitations of latex beads.

Only Beckman Coulter flow cytometers offer patented Digital Signal Processing (DSP) for excellent linearity, drift-free amplification and color compensation.

The FC 500 with ADC also enables researchers to:

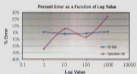
- Perform digital signal processing with 20-bit data in real-time
- Obtain fast, intuitive compensation feedback to set or fine-tune compensation manually with the QuickCOMP feature
- Increase the visualization of low intensity fluorescence populations



The FC 500 offers three modes of operation, from automated carousel to single-tube acquisition for maximum flexibility.



The FC 500's two laser system, with superior enclosed-quartz flow cell design offers multiple scatter angles, for maximum flexibility in application design.

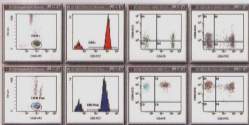


The graph displays a comparison between the FC 500 and a system which utilizes log amplifiers to transform linear to log data. A set of calibrated particles was used to measure percent deviation from expected values. The data were normalized to the same log value scale for ease of comparison.

Using patented DSP technology for log transformers, exceptional quantitative analysis is guaranteed with superior linearity; which also allows compensation settings to apply across all levels of fluorescence intensity.



To accommodate numerous configurations, the FC 500's user-changeable filters provide fluorochrome selection flexibility. Customized Photomultiplier Tubes (PMTs) detect a broad range of wavelength emissions, which can be used for virtually any dye collection.



The study of immune activation is a complement to immune reconstitution applications, for the assessment of immune status. Current investigations are in the area of activation with multicolor applications like the one shown above, as well as in functional and therapeutic studies. The upper panel displays a normal peripheral whole blood; the lower shows activation with phorbol myristate acetate (PMA). *IOtest* CD8-FITC/CD4-PE/CD3-PC7,* plus the addition of *IOtest* CD45-APC and *IOtest* CD69-ECF* were used in this example.

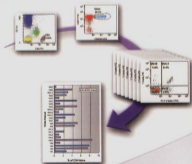
* For Research Use Only. Not for use in diagnostic procedures.



Five-Color Analysis From A Single Laser Has Never Been Easier

Only the FC 500 can be used with a variety of fluorochromes to analyze five colors (FITC, PE, ECD, PC5 or APC and PC7) using either one or two lasers. Or if they prefer, researchers can use Beckman Coulter's iQTest multicolor reagents and drop in their choice of additional conjugated antibodies to make their own combinations.

The FC 500 also performs five-dimensional automated phenotyping analysis with Prism, a unique data reduction display allowing analysis of up to 32 individual phenotypes in a single plot. This feature extends multicolor analysis to utilize the full visible emission spectra, which further boosts the level of flexibility that can be achieved.

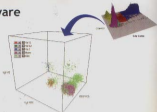


Immune response is studied using the Beckman Coulter iQTest Beta Mark TCR V β Repertoire kit.* Using the panel of 8 tubes containing J TCR V β antibodies plus CD45RA-ECD, CD27-PC5 and CD4 or CD8-PC7 drop-ins, researchers can subset 24 different TCR V β specificities on either CD4 or CD8 populations.

*Prior to iQTest BetaMark TCR V β Repertoire kit (PN: M3457; package insert). For Research Use Only. Not for use in diagnostic procedures.

Automate Data Acquisition and Application Set-Up With RXP Software

Beckman Coulter's powerful RXP software is an invaluable component of the FC 500. Its Windows-based platform enables users to fully automate instrument set-up and data acquisition with the Auto Setup Wizard — a feature that not only enhances ease-of-use, but also saves valuable time. In addition, RXP software is rich with features that help streamline data management and reporting processes, including:



Automated application set-up

Standardizes daily application setup and quality control of PMT voltages and compensation values for multi-user facilities

- Automatically exports quality control results
- Accommodates a variety of multicolor applications

Auto Setup Wizard

Increases convenience and user-friendliness

- Provides rapid application setup with minimal user interaction
- Auto Setup panel allows users group applications for single daily standardization



Easy compensation set-up and adjustment

Ideal for researchers running multiple applications

- Off-line compensation adjustment minimizes repeat sampling
- Live and listmode compensation increases analytical flexibility



Real-time or listmode compensation using 20-bit data

Provides the flexibility to manipulate data either while samples are running or after they've been processed; Enhances resolution for color compensation

Run time protocols stored in listmode

Allows users to easily reanalyze data with the original acquisition protocol

Multi-Carousel Loader (MCL) with barcode reader

Enables users to perform positive sample identification and achieve automated walk-away data acquisition for improved workflow

- Features region count detection and an exclusive pre-sampling vortex mixer
- Eliminates sample mismatches, ensuring quality results
- Automatic worklist updates maximize quality and minimize input errors

Exclusive QuickSET/QuickCOMP

Enhances flexibility and convenience

- Provides the freedom to quickly change settings, adjust voltages and alter compensation with a simple mouse click
- Simplifies the setup of developmental and research applications

Sophisticated "point-and-click" gating

More intuitive for new users

- Provides the flexibility to either manually draw a region around a population or use pre-defined parameters to automatically create elliptical or contour gates
- Intuitive region modification tools make it easy to adjust and rotate regions when necessary
- Automatic gating algorithms accommodate variations in tube-to-tube populations



Proprietary Prism feature

Used during both acquisition and analysis of listmode data

- Displays a matrix of all fluorescent parameters being analyzed, which facilitates the interpretation of complex multicolor data

Built-in Acrobat Creator

Enables users to create pdf files from standard reports and desktop layouts quickly and easily, thus reducing file size, preventing unwanted file modification, and increasing security



Dual monitor support

Facilitates multitasking and gives users increased workspace

Multi-user log-in

Enables each user to personalize his/her software interface

- Administrator capabilities provide secure access to data files
- User billing and log-on tracking increases security

Automatic data archival to a network drive

Automatically transfers data to a network site, minimizing data loss

- Enables multiple users to access data quickly and easily
- Manages storage space of resident computer

3-D surface plots, Tomogram plots

- Simplifies data visualization and provides an excellent format for presentations and publications
- Increases the flexibility of data analysis with multiple plot resolutions

Acquisition Manager window

Combines the Worklist and acquisition log; Simplifies panel-based acquisition

- Provides a quick view of user workload progression

Panel acquisition

Simplifies elaborate test or experimental protocols

- Allows the use of common gating strategies and region definitions throughout an experiment
- Ensures instrument settings are controlled throughout application

Baseline offset

Provides alternative data visualization for pattern-recognition-based analysis

Unique window tiling

Streamlines workspace layout and sorting

- Exclusive Special Tile feature organizes a workspace for easy viewing

Shortened Learning Curve With A Common Software Interface

Existing flow cytometry users will appreciate the shortened learning curve with RXP software, as it introduces a similar interface with other software packages. In addition, RXP software performs extended analysis through the following features:

Powerful overlay tool

The histogram overlay feature provides three display modes: gallery, angled, and overlay; Enables users to perform Overton Histogram subtraction and K/S analysis quickly and easily

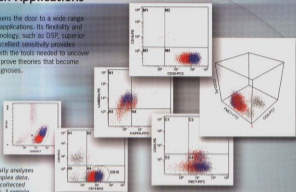
- Import histograms from compatible software or previous experiments for comparison and analysis

Third-party software connectivity

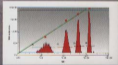
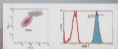
- Automatic publishing of results into MS Excel – Enables advanced automated report generation with calculated statistics; Links directly to power of Pivot Tables for in-depth analysis of experimental results
- Adheres to Windows 2000 guidelines – Makes learning easy and intuitive
- Integrates with Microsoft Office – Extends capability and familiarity of software
- Standard Windows Help Tools – Provides help to users through the software and online via a Web site
- Simplifies production of posters and publication-ready text with improved plot labeling, plus drag and drop connectivity to Microsoft Office and other programs

Superior Data Using Advanced Research Applications

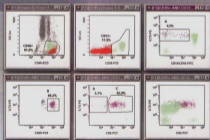
The FC 500 opens the door to a wide range of specialized applications. Its flexibility and advanced technology, such as DSP, superior linearity and excellent sensitivity provides investigators with the tools needed to uncover mysteries and prove theories that become tomorrow's diagnoses.



The FC 500 easily analyzes multicolor complex data. This data was collected using one laser, 3 sample tubes, 5 colors and 9 surface markers, including a CD45 gating strategy. Analysis tools in FXP software, such as the Tomogram and Surface plots, can resolve populations and help identify intensity shifts. iQTest antibodies plus PC5 & PC7 drop-in reagents, combined with the FC 500 Auto Setup Wizard offer a simple solution to five-color phenotyping.



Above: GPIIb/IIIa platelet occupancy assay results. The scatter plot shows excellent resolution for platelet studies. The calibration particles and Excel graph represent the FC500's ability to easily perform quantitation applications. The actual calibration particles are shown as the map to the Excel quantitation curve.*



Dendritic Cells play an important role in the regulation of immunity. They are involved in a number of disorders such as infectious diseases, cancer, autoimmunity and allergy. Using the following iQTest monoclonal antibodies, five-color analysis allows exceptional Dendritic Cell analysis: CD (14+16)-FITC, CD85h(ILT3)-PE, CD45-ECD, CD33-PC5, CD2-PC7.*

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Standardize Sample Preparation And Boost Efficiency

One of the most time consuming and variable aspects of flow cytometry is sample preparation. Whether researchers need an entry-level sample preparation system or a more comprehensive one, Beckman Coulter has a scalable solution that meets their needs perfectly—and the expertise in automation that remains unmatched in the industry.

The COULTER® PrepPlus™ 2 Workstation

*For automated
sample processing*

The PrepPlus 2, provides precision pipetting of reagents, patient samples, controls, Flow-Set™ and Flow-Count™ fluorospheres

into daughter tubes of the FC 500 carousel. Lysing is then automatically performed on the TQ-Prep. Other features include:

- Flexible software programming of reagents, controls and pipetting parameters
- Improved safety with closed tube sampling

The COULTER® TQ-Prep™ Workstation

*For standardized
whole blood
lysis*

With the TQ-Prep workstation, your laboratory can standardize whole blood lysis while performing immunophenotyping. Its direct compatibility with the FC 500 flow cytometer ensures long-term efficiency and cost savings. It also features:

- True walk-away operation from on-board incubation and lysis cycle processing
- Optimized cost-effectiveness and labor efficiency through reduced sample repeats
- Better quality assurance from improved sample reproducibility with automation



The COULTER® CellPrep®

*For complete
automation of
preanalytical
processes*

The CellPrep completes the industry's first front-end automation system for streamlined preparation of cells in research applications. This automated system delivers accurate, precise and reproducible cell washing, coupled with ease of use. It features:

- Innovative hollow-fiber filter technology
- Ability to process whole and lysed blood
- Pre-lyse, post-lyse wash and sample concentration protocols included
- Reduced cell activities for use in functional studies

*For Research Use Only. Not for use in diagnostic procedures.



Service And Support You Can Count On

As a world leader in innovative service and support, Beckman Coulter ensures that flow cytometry systems perform at peak efficiency throughout their lifetime. Our global network of technical experts stands ready to assist with all system support needs – providing support online, on the phone and on-site, so laboratories can maintain increased research efficiency for years to come.

Quality Research Through High-Quality Reagents

Beckman Coulter further supports cytometry research by providing:

- Multiple fluorochrome choices
- High fluorochrome photostability
- High fluorochrome sensitivity
- Low non-specific staining

Superior products. Superior product support. Beckman Coulter provides the tools to make the most efficient use of time and personnel. For more information on how the FC 500 can open the door to higher flexibility and simplicity in your lab, contact your Beckman Coulter representative or visit www.beckmancoulter.com/cytomics today.



Expanded Research Capabilities With the Custom Design Service

Through Beckman Coulter's Custom Design Service, gain access to custom-configured monoclonal antibodies for use in a wide range of research activities. Whether the antibodies are supplied by the laboratory or Beckman Coulter's extensive product line, the Custom Design Service provides reagents that help identify specific antigens associated with virtually all areas of disease research.





Specifications

Lasers

- Uniphase Argon Ion, 488nm, 20mW output
- Uniphase Red Helium-Neon, 633nm, 20mW output

Flow Cell

150 x 450 micron rectangular channel BioSense enhanced optics quartz mounted with vertical (upwards) flow path for superior hydrodynamic focusing

User-Interchangeable Optical Filters

- Band Pass (BP): 525nm, 575nm, 675nm, 755nm
- Dichroic Long Pass (DL): 488nm, 550nm, 600nm, 710nm
- Long Pass (LP): 500nm
- Dichroic Short Pass (DSP): 615nm
- Short Pass (SP): 620nm

Detectors

- Forward Scatter Detector — Solid state detector with Patented Fourier design allowing for adjustable forward scatter angle collection
- Side Scatter Detector — High performance photodiode
- Fluorescent Detectors — High performance photomultipliers with spectral sensitivity from 185nm-900nm

Flow Rates

- Continuous pressure is applied to the sample tube based on user selected flow rates.
- Low, Medium and High

Sensitivity & Resolution

- Resolves 0.5µm diameter particles from background noise, with maximum detection up to 40µm diameter particles
- < 600 MESF for FITC*
- < 300 MESF for PE*
- < 600 MESF for APC**

* When measured with SpheroTech™ Rainbow Calibration particles and IsoFlow™ Sheath Fluid

** When measured with Linear Flow Beads from Molecular Probes

Detector Parameters/Data Acquisition

Up to 16 signals including Auxiliary, Prism, Time, and Ratio can be acquired simultaneously from a possible 24 available parameters

- Forward Scatter — linear, log, and peak
- Side Scatter — linear, log, and peak
- PMT1-PMT5—linear, log, and peak
- One Auxiliary (ALDO) signal assignable to any linear or peak signal
- Time
- Ratio (derived parameter)
- PRISM (derived parameter)
- Four Decade logarithmic Digital Signal Processing (DSP) of linear FS, SS, FL1-FL5 data

Throughput and Acquisition Rates

Throughput is linked to various items such as the number of events acquired, flow rate, sample concentration, target population, sampling mode and parameters acquired. Maximum acquisition rate is 3,300 events/sec.

Sample Handling

Bohazard contained wash station rinses sample probe preventing carryover

- 12 x 75mm glass or plastic tubes
- Single tube sampling mode
- 32 tube Multi Carousel Loader (MCL)
- The MCL patented design vortexes each tube individually before sample acquisition
- The MCL uses a visible Class II laser reader operating at 670nm with a maximum power output of 1 mW, for use with Interleaved 2-of-5, Code 39*, Codabar, Code 128 bar codes

Cytomics™ FC 500 Flow Cytometry System

Carryover

Scatter and fluorescence carryover < 1% when the number of gated events is between 100 and 10,000

RXP Software

- Unlimited histogram displays per sample
- One parameter histograms have 1,024 channel resolution
- Two parameter histograms graphical resolution:
64 x 64, 128 x 128, 256 x 256, 512 x 512 channel resolution
- 256 regions (contour, elliptical, linear, polygonal, quadrant, rectangular) are available per protocol with up to 32 available for gating regions
- Up to 8 regions can be combined to make a gate
- Real time data analysis and gating
- Real time and listmode compensation using 20-bit data (2nd channel resolution)
- Storage of both compensated and un-compensated data
- Stop counts available for all histograms
- Auto or User defined scaling
- Positive analysis for automatically setting regions on control tubes
- User definable statistics
- Single platform absolute counts using FlowCount™ fluorospheres
- Elliptical autogating with 3 selectable levels
- Contour autogating with 5 selectable levels
- ColorGate Precedence and Color Blend mode color event analysis
- AutoPrime event monitoring during sample acquisition
- Auto Set-Up Wizard for automatically adjusting voltages, gains, and color compensation settings
- QuickSET direct visual histogram adjustment of cytometer voltages and gains

- QuickCOMP direct visual histogram adjustment of cytometer color compensation
- Minimal Event Counter for use with rare event collection
- Worklist function for specimen labeling, with positive specimen identification when using barcoding
- Multi-file analysis, including batch automator, listmode compensation, overlay analysis plot, surface and Tomogram displays
- Customizable FlowPage for reporting with automated pdf or printer output
- QC export for daily monitoring
- Data management for automatic file archival
- FCS 3.0 file format
- Acquisition protocol replay mode

Optional Software

- RXP analysis software
- Multi-user analysis packages: 3, 5- or 10-user/network-user packages

Operating System

- Microsoft® Windows™ 2000

Workstation

- Pentium® Intel® 4 1.7 GHz processor (minimum specification)
- System Bus 400 MHz
- 256MB RAM
- 30GB Hard Drive
- Dual Display Video Card
- 700MB RW CD-ROM (40x)

- On-board SCSI Controller
- 4 USB ports, 2 USB controllers
- Integrated sound and Ethernet 10/100

Optional Hardware Accessories

- Bar code gun
- Optics filter kit
- Color and black & white printers

Monitor Options

- 17" flat screen display (1280 x 1024 maximum resolution)
- 22" Monitor (1600 x 1200 maximum resolution)

Installation Requirements

Environmental operating temperature 16-32° C (60-90° F)

Dimensions

Allow sufficient space for ventilation, and access for maintenance and service:

Cytometer

30.5 cm (12 in.) from the back
45.7 cm (18 in.) from the top
30.5 cm (12 in.) on both sides

Power Supply

12.7 cm (5 in.) from the back

Utility Connections

Four dedicated 50/60Hz lines:
100WAC, 25A
115WAC, 20A
220WAC, 15A
240WAC, 15A

Component	Height	Width	Depth	Weight
Computer	15.75 cm (6.2 in.)	53.34 cm (21 in.)	42.55 cm (16.75 in.)	18.14 kg (40 lb.)
Cytometer	61.0 cm (24 in.)	111.8 cm* (44 in.)	73.7 cm (29 in.)	84.8 kg (187 lb.)
22" Monitor	42.7 cm (16.81 in.)	40.5 cm (15.94 in.)	43.8 cm (17.25 in.)	22 kg (48.4 lb.)
Power Supply	48.3 cm (19 in.)	40.64 cm (16 in.)	50.8 cm (20 in.)	54.4 kg (120 lb.)

*The width of the FC 500 with a single argon laser is 90.0 cm (35.5 in.)



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