

# capabilities today. Flexibility for tomorrow.

NEW CellStream™ benchtop flow cytometry system  
with Amnis® detection technology inside



The life science business of Merck KGaA,  
Darmstadt, Germany operates as  
MilliporeSigma in the U.S. and Canada.

Capabilities Today. Flexibility for Tomorrow.



Unparalleled combination of

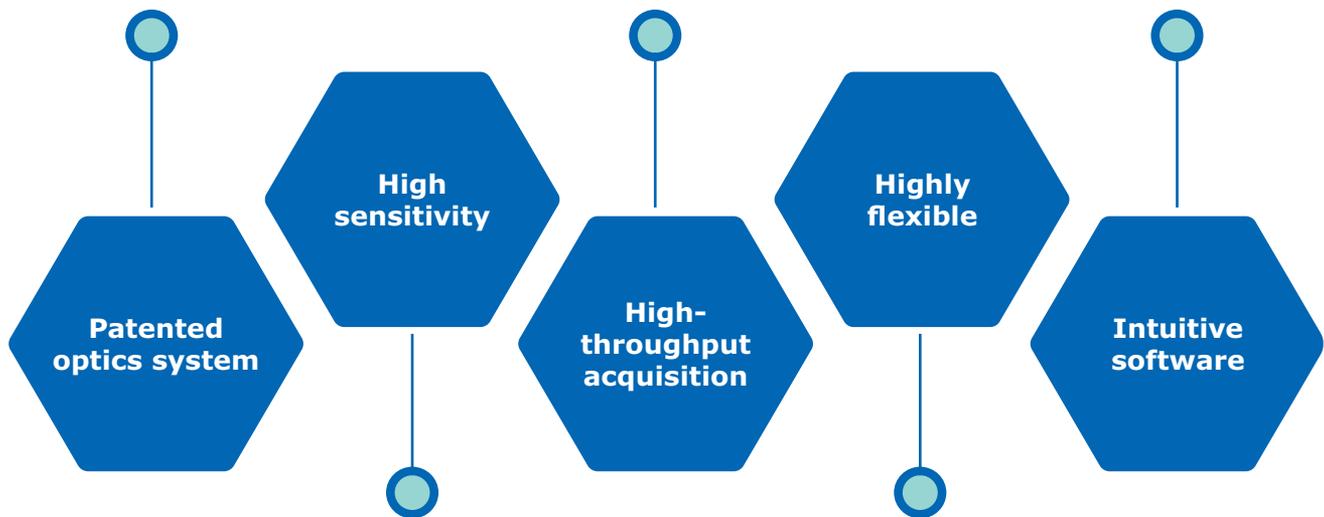
# FLEXIBILITY & PERFORMANCE

The CellStream™ flow cytometer is a new benchtop system that offers unparalleled capability, sensitivity, and expandability at an accessible price.

Contains patent-protected camera technology unique to our state-of-the-art Amnis® flow cytometers

Single tube and 96-well plate sampling

- 21 CFR Part 11-enabling features
- Automated daily system calibration
- Unique Event Gallery for visual sample verification

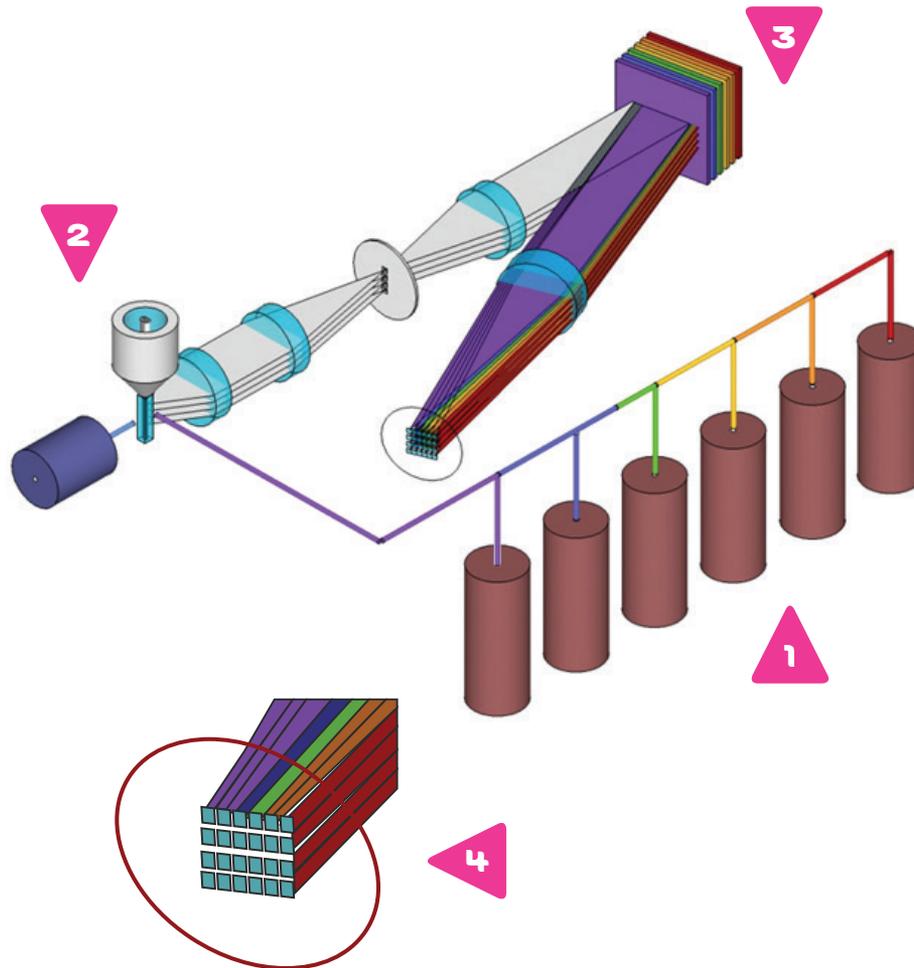


- Enabled by a single CCD detector that replaces PMTs
- MESF <10 FITC; MESF <5 PE
- Excellent small particle detection
- Resolves complex cell populations

- Fully field upgradeable
- 1 to 7 lasers provide up to 22 detection channels

# Inside the CellStream™ System

Our patented time delay integration (TDI) and camera technology delivers *sensitivity* and *expandability* beyond what is possible with traditional flow cytometers.



## CellStream™ system architecture

1. Up to 7 lasers are focused in discrete locations.
2. Hydrodynamically focused cells pass through the laser-illuminated region. Fluorochromes bound to the cells are excited and emit into the collection system. Fluorescence is collected and directed toward an intermediate image plane.
3. The filter stack decomposes each of the four discrete vertical positions in the intermediate image plane into 22 separate channels of data.
4. All 22 channels fit efficiently onto a CCD (charge-coupled device) array.

CellStream™ system's sensor contains multiple discrete collection fields using the same CCD as patented Amnis® technology.

Capabilities Today. Flexibility for Tomorrow.

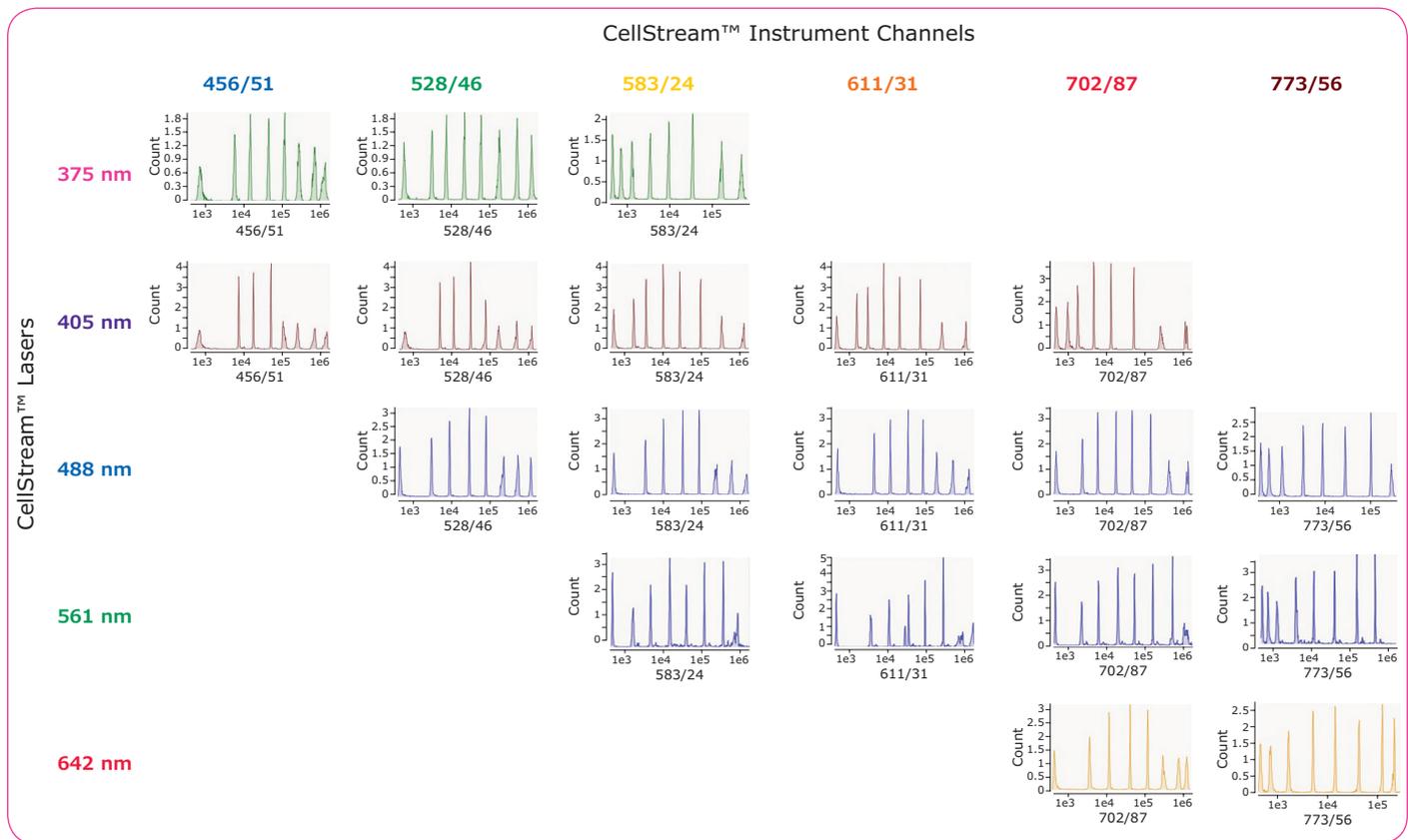
# STREAM THE POWER OF SENSITIVITY

## High sensitivity fluorescence detection

Fluorescence sensitivity of the CellStream™ flow cytometry platform was evaluated using industry standard 8-peak Spherotech rainbow calibration beads.

The data demonstrate high fluorescence sensitivity of the CellStream™ system:

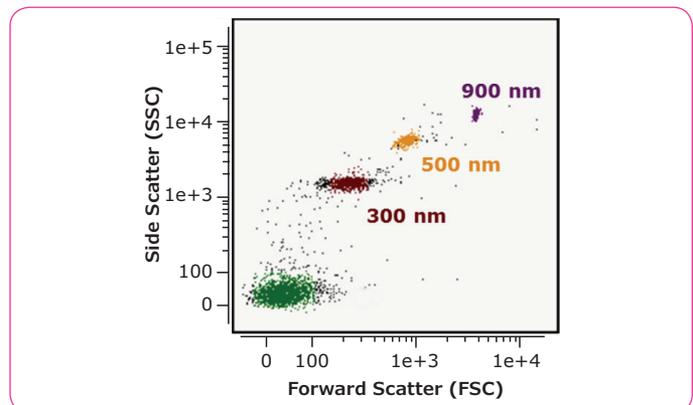
- All 8 peaks are clearly resolved on every detection channel
- Low MESF (Molecules of Equivalent Soluble Fluorochrome) values determined:
  - MESF <10 FITC; MESF <5 PE



## High sensitivity submicron particle detection

The CellStream™ flow cytometer clearly detects and discriminates particles as small as 0.3 μm.

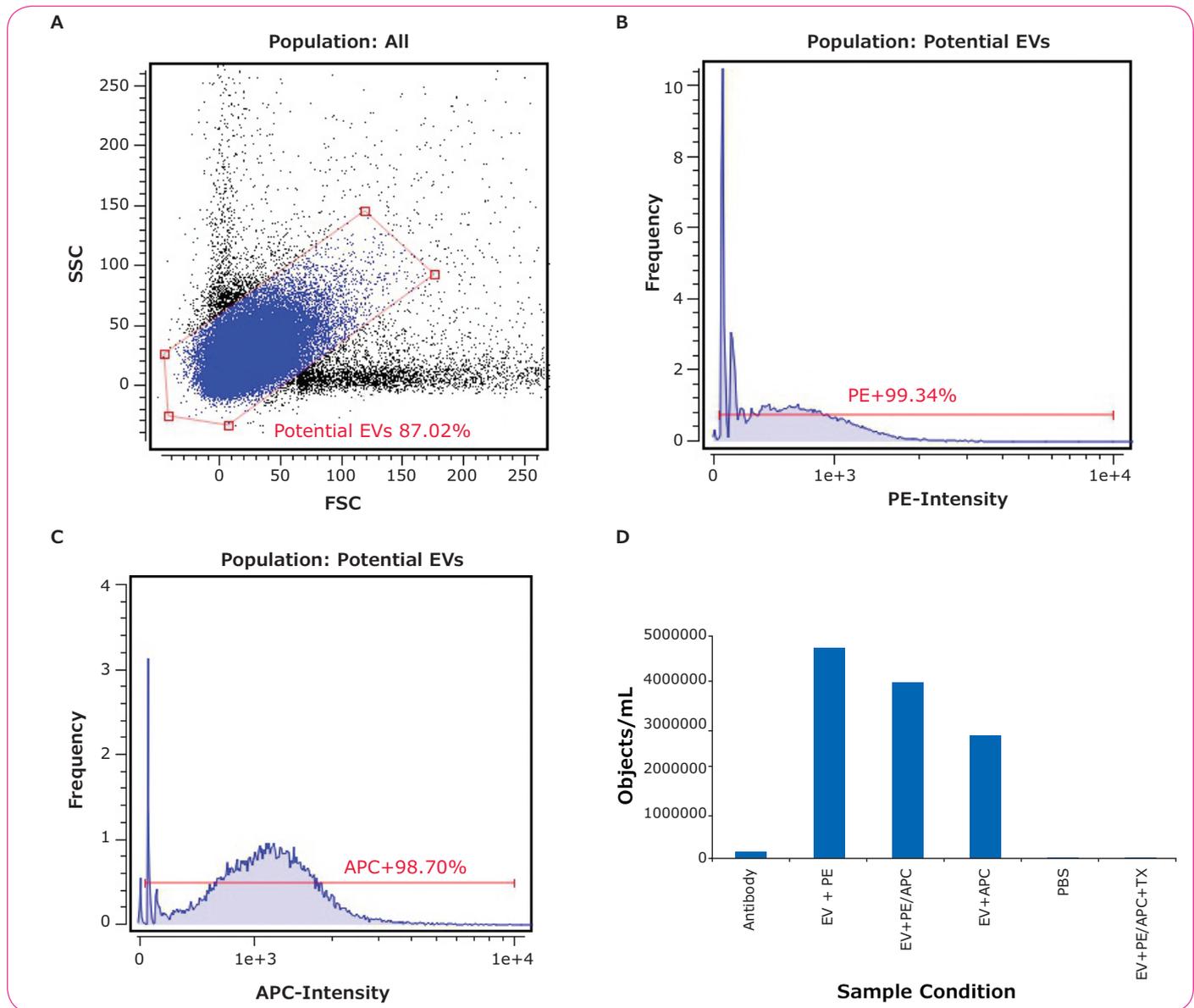
The figure shows the acquisition of Megamix-Plus FSC size beads containing 300, 500, and 900 nm fluorescent beads in a known ratio of 4:2:1. Instrument settings: 70 mW SSC, 10% FSC, and 200 mW 488 nm; slow speed.



# STREAM SUPERIOR DETECTION OF SMALL PARTICLES

Only recently has the importance of extracellular vesicles (EVs) as key mediators of intercellular communication been appreciated. EVs are membrane-derived structures that include exosomes, microvesicles and apoptotic bodies.

In this study, RBC-derived EVs were stained with anti-CD235ab-PE and/or anti-CD235ab-APC. Control samples were collected for antibody only, PBS, and RBC EVs labeled with anti-CD235ab-PE and anti-CD235ab-APC incubated with Triton-X 100 (TX). **(A)** Initial gate to identify potential EVs. Using this gate, **(B)** PE+ and **(C)** APC+ events were identified. **(D)** Chart showing PE+ and APC+ objects/mL for the control samples and the CD235ab-PE and anti-CD235ab-APC labeled samples.



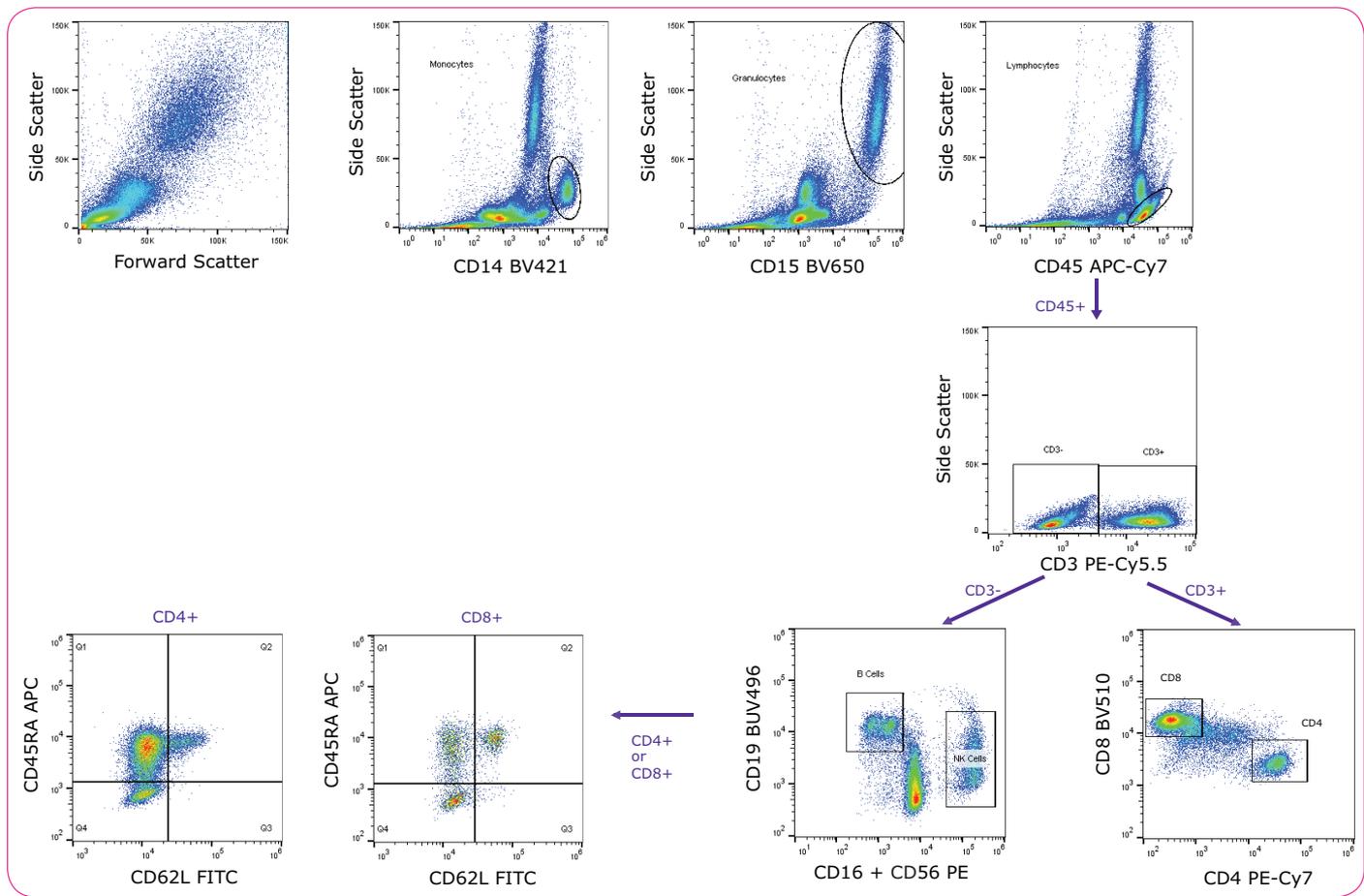
Capabilities Today. Flexibility for Tomorrow.

# STREAM THE POWER OF VERSATILITY

CellStream™ flow cytometer enables cell researchers to obtain reproducible, multi-parametric single cell data for a wide variety of applications.

## Immunological Phenotyping 10-Color Assay

In this example, a 4-laser CellStream™ system accurately resolves 10 different fluorochromes within a single assay. Below, different immune cell populations were clearly resolved from one another within a sample of PBMCs.



### Staining protocol

50  $\mu$ L sample\* of PBMCs were stained for 20 minutes with the following 10 fluorochromes (5  $\mu$ L each):

- CD19 BUV 496 (B Cells)
- CD14 BV 421 (Monocytes)
- CD8 BV 510 (CD8 T Cells)
- CD15 BV 650 (Granulocytes)
- CD62L FITC (Naive and Memory T cells)
- CD16 + CD56 PE (NK cells)
- CD3 PE-Cy5.5 (T Cells)
- CD4 PE-Cy7 (CD4 T Cells)
- CD45RA APC (Naive and Memory T cells)
- CD45 APC-Cy7 (Lymphocytes)

After staining, samples were washed once, resuspended in Guava® Antibody Dilution Buffer, and acquired on the CellStream™ system. A total of 10,000 lymphocyte events were acquired.

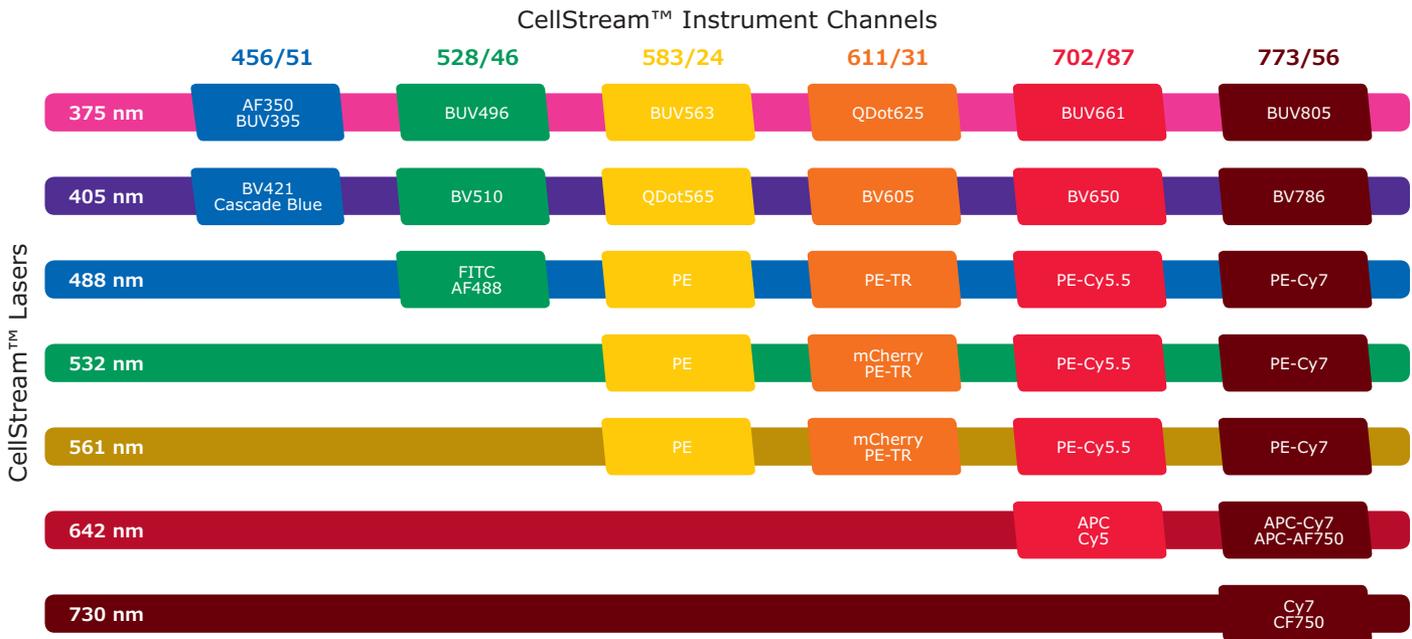
\*Approx. 0.6-1.65 million white blood cells, depending on donor.

# A Fully Configurable System

CellStream™ systems are made to order. Build an instrument specific for your needs from the available lasers below. All systems come standard with:

- AutoSampler for 96-well plates
- Single tube sampler
- 488 nm laser

## Excitation & Emission Capabilities of the 7-Laser CellStream™ Flow Cytometer



## Inside the 7-Laser CellStream™ System



# STREAM THE CONFIDENCE OF INTUITIVE SOFTWARE

Integrated software provides an intuitive and easy-to-use interface, enabling you to focus on your experiments and your data. Software includes 21 CFR Part 11-enabling features for quality control and data integrity, essential in regulated environments.

## Load & Record

- Tubes or plates
- Simple & customizable AutoSampler set up

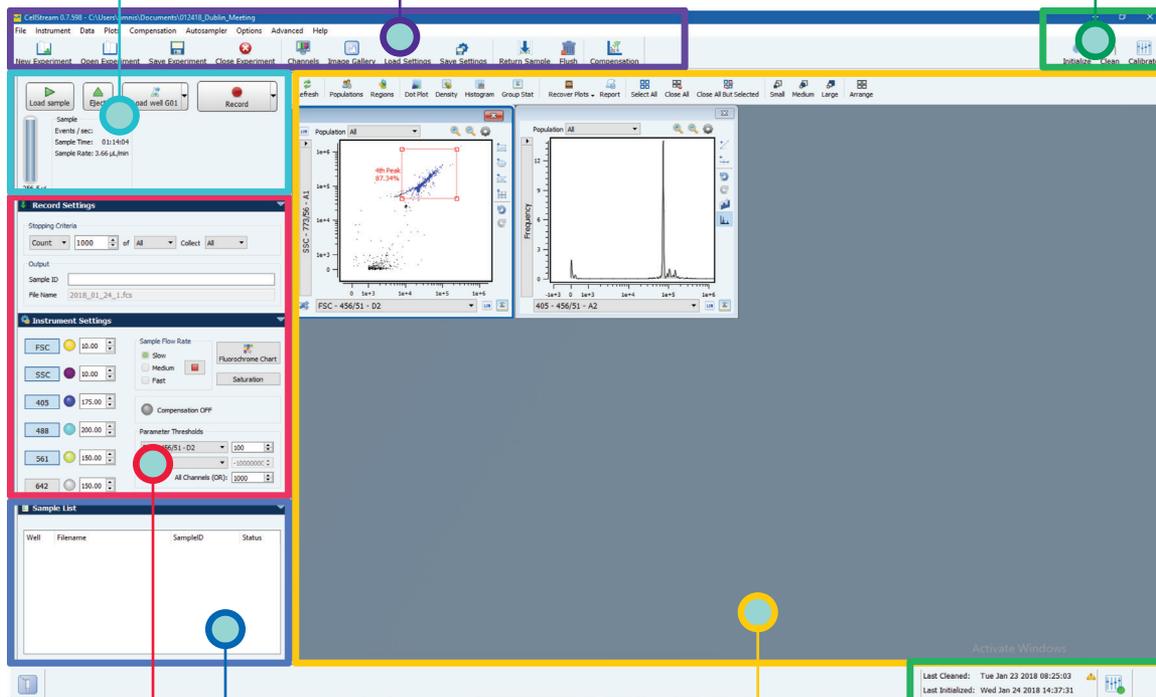
## Toolbar

- Quickly define experiments, view Event Gallery or access other frequently-used parameters

## Startup/Shutdown/System Status

One click:

- Initialization & daily cleaning with on-board fluidics
- Calibration & testing (laser alignment, dark current, flow core position, flow core stability, channel alignment, laser power)



## Sample Listing

## Settings

- Record by count, volume or time
- Intuitive control of instrument, experiment and plotting parameters, and thresholds
- Pop-up fluorochrome chart for easy channel identification

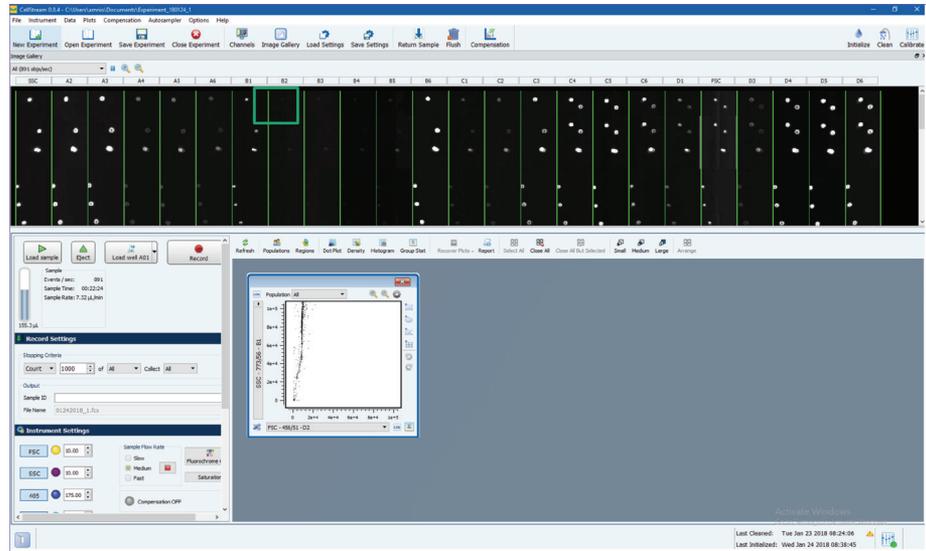
## Display & Analysis

- Full suite of data display and analysis tools (histograms, dot plots, density plots, overlays, dot plot backgrounding, multi-file analysis, ...)
- Streamlined acquisition of compensation files
- Export statistics or create customized PDF reports

**A unique Event Gallery feature of CellStream™ Acquisition Software allows for population verification, aids in troubleshooting and resolves doublets.**

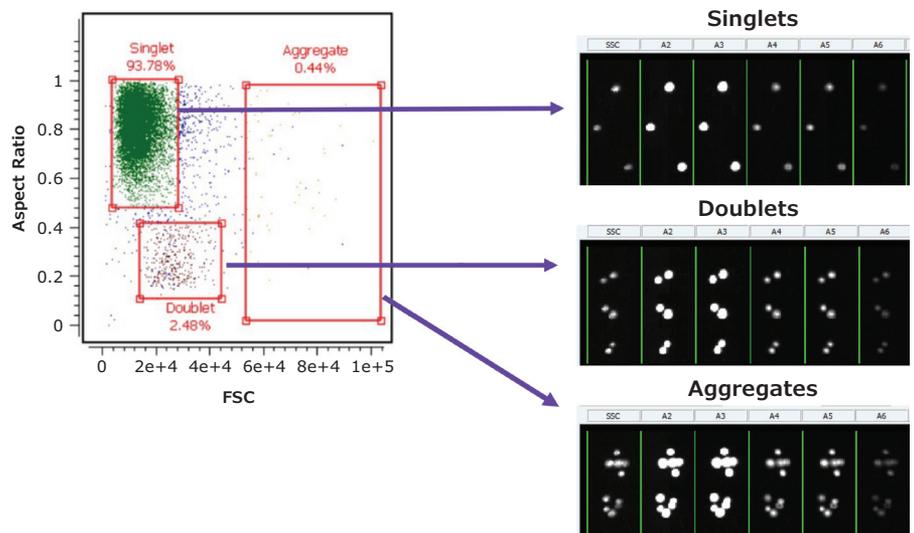
**Real-time Event Gallery**

- Low resolution images of your cells in flow
- Provides verification of suspected populations
- Aids in troubleshooting
- Unlike any other non-imaging flow cytometer



**Doublet Discrimination**

- Aspect ratio feature allows for visual confirmation
- Clear resolution between singlet, doublet and aggregate events
- Calculated for each channel



## Instrument Service Plans

To help you get the most out of your CellStream™ flow cytometry system, our worldwide service organization offers a variety of service plans to support your individual needs and maintain the longevity of your instrument. Our service agreements are structured yet flexible, so you can select the level of hardware, application and software support you prefer.

### Advantages of maintaining a service plan:

- Best-in-class service support maintains optimal performance, enabling high-quality data
- Planned instrument maintenance reduces overall service costs
- Service plans are the best protection for your instrument investment and its long-term operation

### Instrument Service Plan Options

| Service Plan Features*                                | One-Year Warranty | Service Total™ Plan | Service Advanced™ Plan | Service Essential™ Plan |
|---|-------------------|---------------------|------------------------|-------------------------|
| Travel & Labor Expenses                               | •                 | •                   |                        |                         |
| Coverage of Parts                                     | •                 | •                   |                        |                         |
| Preventative Maintenance Visit                        |                   | •                   | •                      | •                       |
| Factory Trained & Authorized Service Engineers        | •                 | •                   | •                      | •                       |
| Technical Support Services                            | •                 | •                   | •                      | •                       |
| Priority Scheduling                                   | •                 | •                   |                        |                         |
| One visit for instrument diagnostics or basic repairs |                   |                     | •                      |                         |

\*No service contract is required for one-time service requests.

### Our highly-qualified field application and instrument specialists also provide:

- Support by email or phone
- On-site instrument training
- On-site scientific applications support

For more information on our comprehensive range of service and support agreements, please contact your sales representative or visit [EMDMillipore.com/cellstream](http://EMDMillipore.com/cellstream).

## System Performance

| Parameter                            | Performance   |
|--------------------------------------|---|
| Fluorescence sensitivity             | MESF <10 FITC<br>MESF <5 PE   |
| CV* (precision)                      | <3%   |
| Number of channels                   | Up to 22 (20 fluorescent, plus FSC, SSC)  |
| Number of lasers                     | 1-7   |
| Available lasers                     | 375, 405, 488, 532, 561, 642, 730 nm  |
| Camera-enabled morphology parameters | 3 (area; aspect ratio; raw max. pixel)  |
| Event rate                           | 20,000 cells/second   |
| Flow rates                           | 3.66 $\mu$ L/min (Low speed/high sensitivity)<br>14.64 $\mu$ L/min (High speed) |
| Scatter resolution                   | FSC <300 nm from 450 nm<br>SSC <200 nm from 785 nm                              |
| Dynamic range                        | 7 decades   |
| System size (W x D x H)              | 440 x 625 x 495 mm  |
| Field upgradeable                    | Yes   |
| Sample formats                       | Single tube or 96-well plate  |
| Absolute Cell Counting               | Yes   |

\*Coefficient of Variation using Chicken Erythrocyte Nuclei (CEN)

## Ordering Information

| Description  | Cat. No.  |
|--|-----------|
| CellStream™ Base System with 488 nm laser and AutoSampler                                | CS-100196 |
| CellStream™ Four-Laser System with 488 nm, 642 nm, 405 nm, 561 nm lasers and AutoSampler | CS-100496 |
| CellStream™ Option 375 nm Laser  | CS-200375 |
| CellStream™ Option 405 nm Laser  | CS-200405 |
| CellStream™ Option 532 nm Laser  | CS-200532 |
| CellStream™ Option 561 nm Laser  | CS-200561 |
| CellStream™ Option 642 nm Laser  | CS-200642 |
| CellStream™ Option 730 nm Laser  | CS-200730 |
| CellStream™ Software Multi Access  | CS-300300 |
| CellStream™ Calibration Reagent  | CS-400104 |
| CellStream™ On-Site Training   | CS-500200 |
| CellStream™ Installation   | CS-600200 |
| CellStream™ IQOQ Document  | CS-600250 |

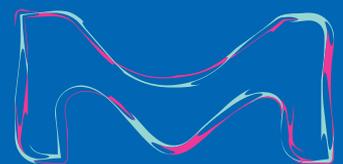
"Absolute Cell Counting" "Yes"

MilliporeSigma  
400 Summit Drive  
Burlington, MA 01803

## To place an order or receive technical assistance

In the U.S. and Canada, call toll-free 1-800-645-5476  
For other countries across Europe and the world, please visit: [EMDMillipore.com/offices](https://www.emdmillipore.com/offices)  
For Technical Service, please visit: [EMDMillipore.com/techservice](https://www.emdmillipore.com/techservice)

[EMDMillipore.com/cellstream](https://www.emdmillipore.com/cellstream)



© 2018 Merck KGaA, Darmstadt, Germany and/or its affiliates. All Rights Reserved. MilliporeSigma, the Vibrant M, CellStream, Guava, Amnis, Service Total, Service Advanced and Service Essential are trademarks of Merck KGaA, Darmstadt, Germany or its affiliates. All other trademarks are the property of their respective owners. Detailed information on trademarks is available via publicly accessible resources.

Lit. No. MS\_BR1380EN Ver. 1.0  
2018 - 13114  
06/2018