Luminex®

Capabilities Today.
Flexibility for Tomorrow.

CellStream® benchtop flow cytometry system with Amnis® detection technology inside.

Unparalleled Combination of **Flexibility** and **Performance**.

The Amnis® CellStream® Flow Cytometer is a new benchtop system that offers unparalleled capability, sensitivity, and expandability…all at an accessible price.

Patented optics system

- Patent-protected camera technology unique to our state-of-the-art Amnis® Flow Cytometers provides the ability to view cells as they are analyzed in real time for quality control and troubleshooting

High sensitivity

- Enabled by a single CCD detector that replaces PMTs for unparalleled sensitivity for small particles
- Extremely low MESF values of <10 FITC and MESF <5 PE enable detection of low concentration fluorophores
- Excellent small particle detection makes this system great for bacteria and extracellular vesicle detection
- Resolves complex cell populations, which works well for immunophenotyping and other high color applications

High-throughput acquisition

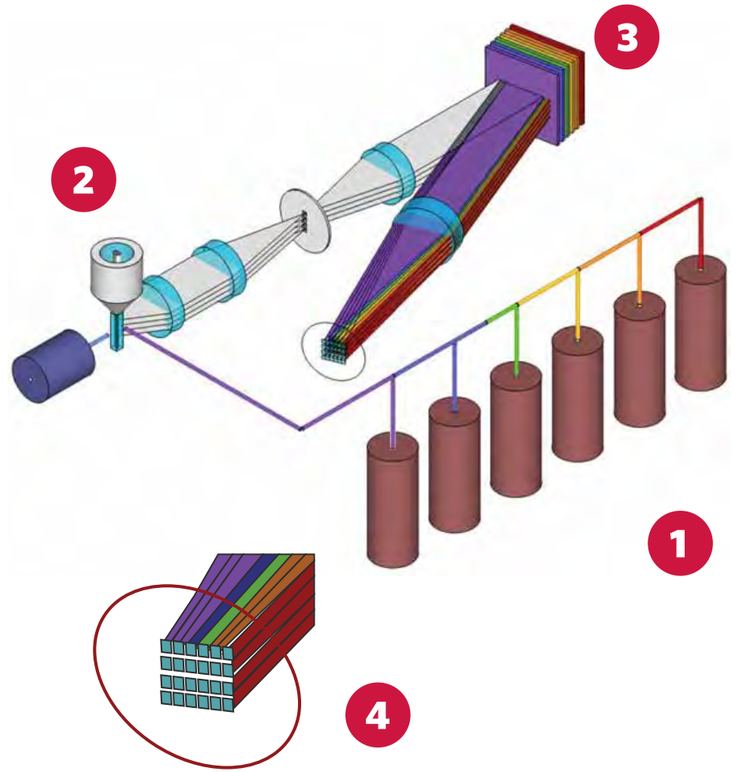
- Single tube and 96-well plate sampling is suitable for all sizes of experiments
- Highly flexible
- Fully field upgradeable with onsite laser upgrades available right in the laboratory
- 1 to 7 lasers provide up to 22 detection channels – up to 20 colors are able to be detected, as well as forward scatter and side scatter

Intuitive software

- 21 CFR Part 11-enabling features allow for management of electronic records and electronic signatures in a closed, FDA-compliant system
- Automated daily system calibration ensures consistent and accurate results from day to day
- Unique Event Gallery for visual sample verification allows for quality control and real time troubleshooting

Inside the **CellStream®** System.

Our patented Time Delay Integration (TDI) and camera technology deliver 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's sensor contains multiple discrete collection fields using the same CCD as patented Amnis Technology.

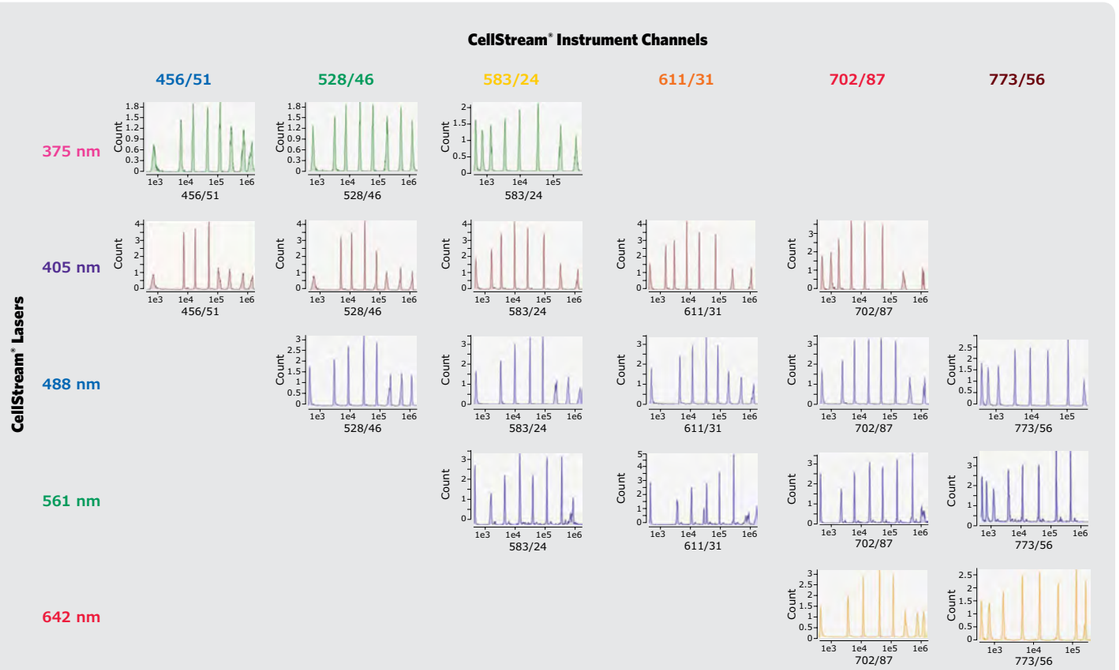
Stream the Power of Sensitivity.

High sensitivity fluorescence detection.

The 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:

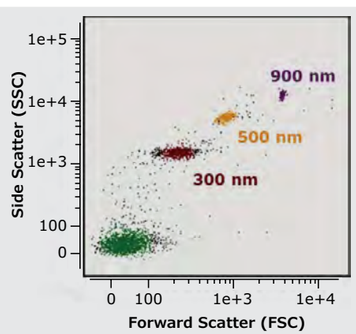
- All 8 peaks are clearly resolved on every detection channel
- Low MESF (Molecules of Equivalent Soluble Fluorochrome) values are determined
- MESF <10 FITC; MESF <5 PE



High sensitivity submicron particle detection

CellStream clearly detects and discriminates particles as small as 0.3 µm.

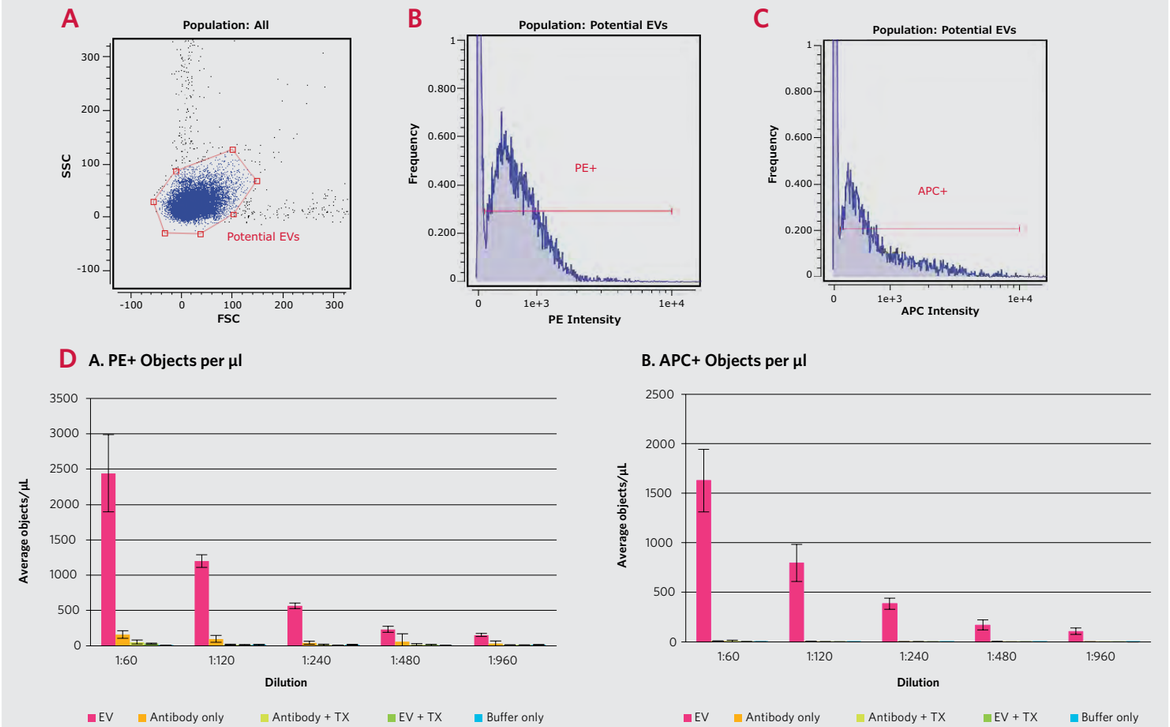
The figure shows the acquisition of Megamix-Plus FSC size beads containing 300, 500, and 900 nm fluorescent beads in a known ratio of 4:2:1. Instrument settings: 70 mW SSC, 10% FSC, and 200 mW 488 nm; slow speed.



Stream Superior Detection of Small Particles Using **Small Particle Detection (SPD) Mode**.

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. The study below shows the high sensitivity and capabilities of the Small Particle Detection Mode on the CellStream System.

In this study, RBC-derived EVs were stained with anti-CD235ab-PE and/or anti-CD41-APC. Control samples were collected for antibody only, PBS only, and RBC EVs labeled with anti-CD235ab-PE and anti-CD41-APC incubated with Triton® X-100 (TX). (A) An initial gate (SSC vs. FSC plot) was used to identify potential EVs. Using this gate, (B) PE+ and (C) APC+ events were identified. PE+ and APC+ objects per µl for the various experimental and control samples are shown in (D): Labeled EVs, antibody only, antibody + Triton® X-100, labeled EVs + Triton® X-100, and buffer only. The objects per µL are the events in the PE+ and APC+ gates shown in (B) and (C).



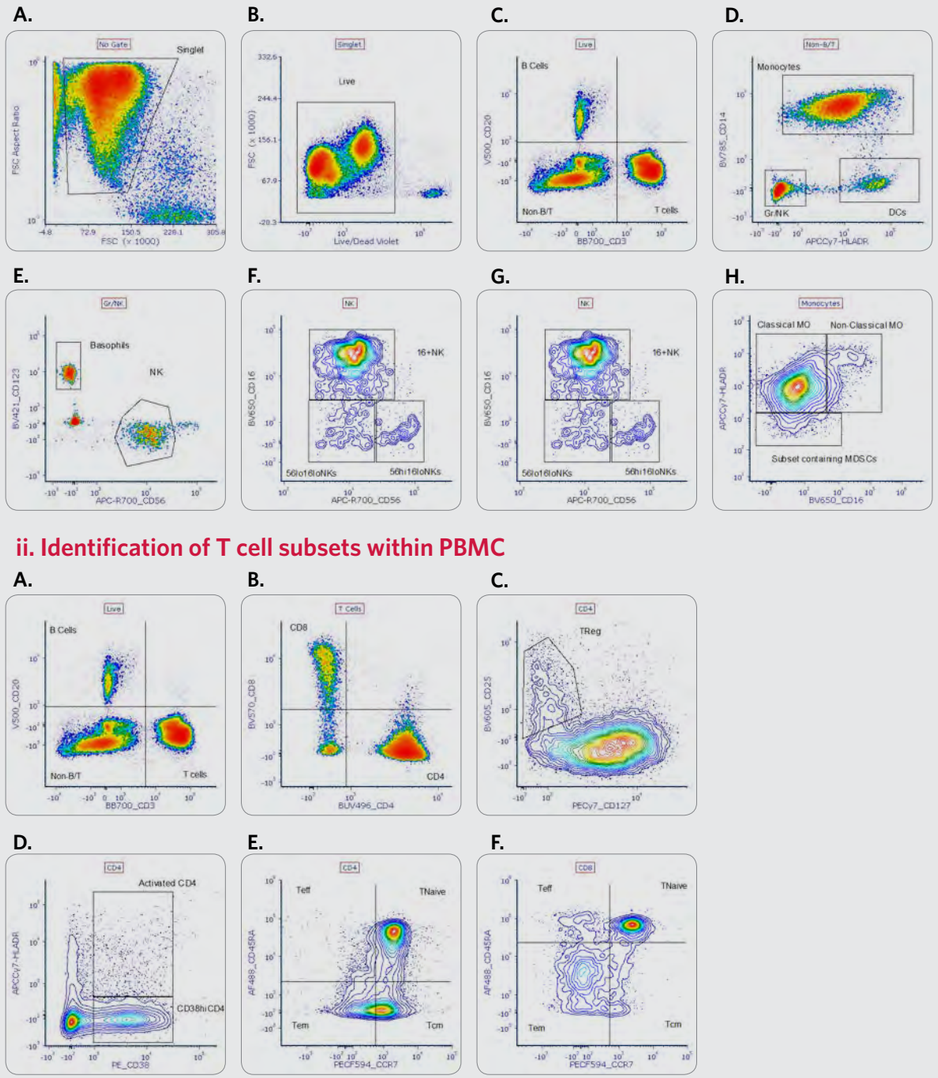
Stream the Power of **Versatility**.

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

Immunological phenotyping 16-color assay

In this example, a 4-laser CellStream System accurately resolves 16 different fluorochromes within a single assay. Below, different immune cell populations were resolved from one another within a sample of PBMCs.

i. Identification of white blood cell populations within human PBMC



ii. Identification of T cell subsets within PBMC

Staining protocol.

50 µL sample* of PBMCs was stained for 25 minutes with the following 16 fluorochromes (2 µL each):

	Specificity	Fluorochrome	Clone	Purpose
1	Live/Dead	Violet	N/A	Viability
2	CD4	BUV496	SK3	CD4 T Cells
3	CD56	APC-R700	5.1H11	NKs
4	HLADR	APCCy7	L243	DCs
5	CD123	BV421	6H6	pDCs
6	CD20	V500	L27	B Cells
7	CD8	BV570	RPA-T8	CD8 T Cells
8	CD25	BV605	BC96	Treg
9	CD16	BV650	3G8	Monocytes
10	CD14	BV785	M5E2	Monocytes
11	CD45RA	AF488	HI100	Naïve/memory
12	CD38	PE	HIT2	Activation
13	CD3	BB700	HIT3a	T cells
14	CCR7	PECF594	150503	Central/effector
15	CD11c	PeCy5	3.9	mDCs
16	CD127	PeCy7	A019D5	Treg

After staining, samples were washed once, resuspended in wash buffer (0.5% FBS, 2 mM EDTA, PBS), and acquired on the CellStream System. A minimum of 100,000 events was acquired on a 7-laser CellStream System in 'fast' mode.

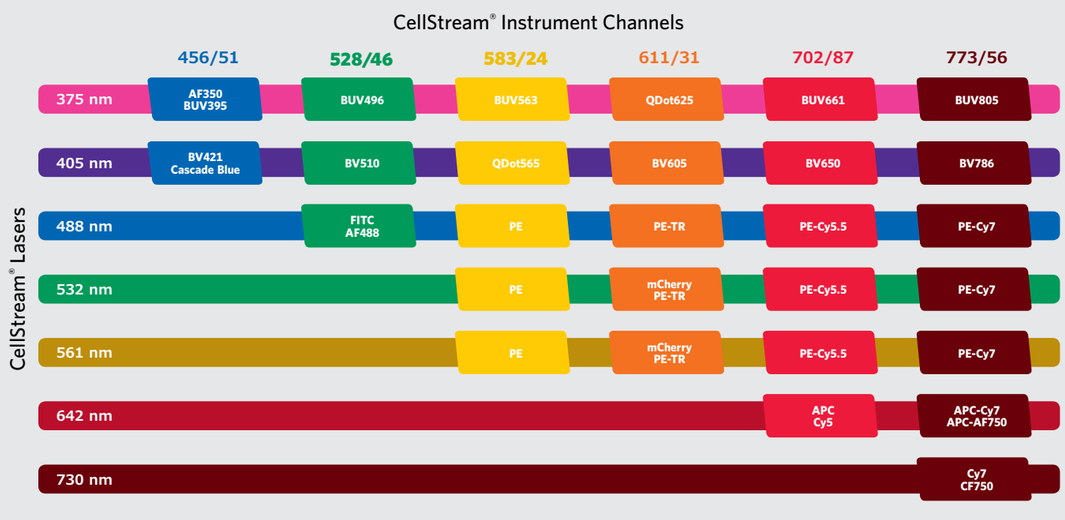
*Approx. 0.6-1.65 million white blood cells, depending on donor.

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, 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 and customizable AutoSampler set up

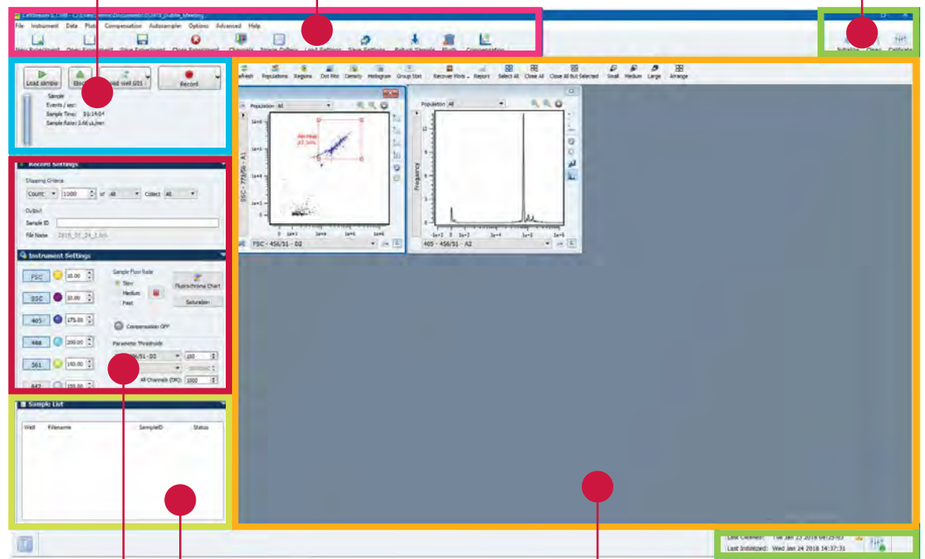
Toolbar

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

Startup/Shutdown/System Status

One click:

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



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

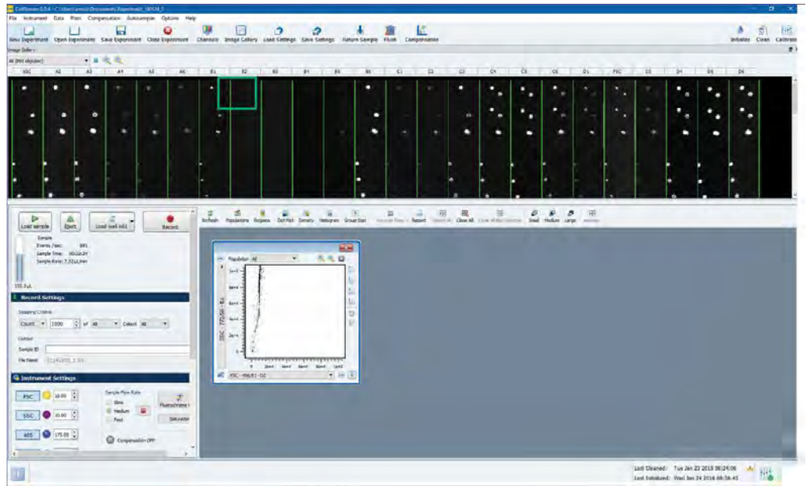
Display & Analysis

- Full suite of data display and analysis tools (histograms, dot plots, density plots, overlays, dot plot backgating, multi-file analysis, etc.)
- 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.

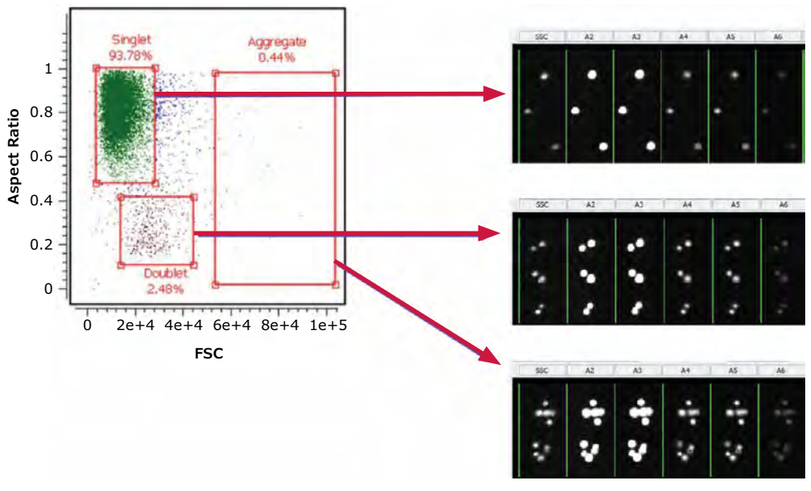
Real-time event gallery

- 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
- 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 **luminexcorp.com/cellstream**.

System Performance

Parameter	Performance
Fluorescence Sensitivity	MESF <10 FITC 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, and 730 nm
Camera-enabled Morphology Parameters	3 (area; aspect ratio; raw max. pixel)
Event Rate	20,000 cells/second
Flow Rates	3.66 µL/min (Low speed/high sensitivity) 14.64 µL/min (High speed)
Scatter Resolution	FSC <300 nm from 450 nm SSC <200 nm from 785 nm
Dynamic Range	7 decades
System Size (W × D × H)	440 × 625 × 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

Product Name	Part Number
CellStream® Base System with 488 nm Laser (200 mW) 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, 70 mW	CS-200375
CellStream® Option 405 nm Laser, 175 mW	CS-200405
CellStream® Option 532 nm Laser, 150 mW	CS-200532
CellStream® Option 561 nm Laser, 150 mW	CS-200561
CellStream® Option 642 nm Laser, 150 mW	CS-200642
CellStream® Option 730 nm Laser, 40 mW	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

Luminex®
complexity simplified.

For more information, please visit luminexcorp.com/cellstream

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