Luminex

Guava® Muse® Cell Analyzer

Experience Simple, Affordable Flow Cytometry.

Simple, Affordable Flow Cytometry. Now at Your Side.

Sophisticated cell analysis doesn't have to be exclusive, complicated, or costly. With the Guava® Muse® Cell Analyzer, you can now achieve highly quantitative results at a fraction of the price, effort, and time. The Muse® Cell Analyzer packs 3-parameter analysis into a compact, easy to use benchtop device, making flow cytometry accessible to anyone, any time. A user-friendly touchscreen interface, intuitive software, and optimized "Mix-and-Read" assays work to simplify your research.

- Sleek design creates simple, effortless operation
- Intuitive software and touchscreen interface enables rapid set-up and analysis
- Optimized Muse Assays facilitate simplified protocols and a short time to answers
- Compact size; footprint of only 8 in x 10 in (20 cm x 25 cm) takes up only a small amount of precious lab bench space
- Affordable price point allows for easier access to reliable flow cytometry analysis

Highly intuitive touchscreen interface

The Muse Instrument features a highly intuitive touchscreen interface that allows for simple step-by-step operations, so easy that no flow expertise is required to run assays. The touchscreen prompts you through simple on-screen instructions and guides you through sample loading to simple setting adjustments to results—in just a few steps!

Cell analysis is effortless and fast

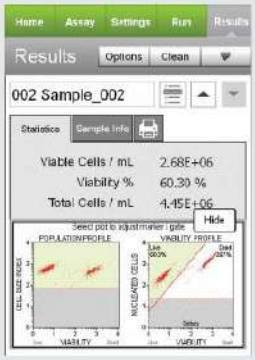
For the assays you rely on most, we've developed optimized kits validated for robust performance on the Muse Cell Analyzer. Typical cell preparation protocols have been condensed and simplified so sample preparation is fast and easy. You don't need to optimize any software settings—the Muse Instrument calculates all gating parameters and thresholds for you. Results are displayed in both graphical and statistical formats specific to each application, making analysis unambiguous. Spend less time with experimental set-up, avoid reagent waste, and save money—we've done all the work for you.

Muse Assays

Choose from a broad range of Muse Assays for interrogating multiple aspects of cell biology:

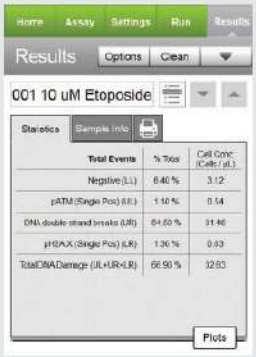
- Count and viability
- Cell proliferation
- Apoptosis
- Cell signaling
- Cell cycle
- DNA damage
- Autophagy
- Immunology
- Algae research
- Malaria research

Muse Cell Count and Viability Kit



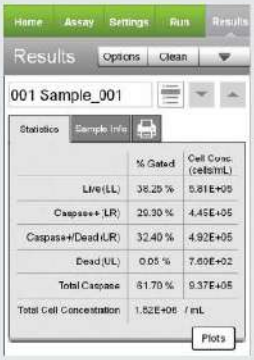
Absolute total cell counts and viability of dead and dying cells based on differential permeability of two DNA-binding dyes.

Muse Multi-color DNA Damage Kit



Multiplex analysis of phosphorylated ATM and Histone H2A.X to detect extent of cellular DNA damage.

Muse MultiCaspase Kit



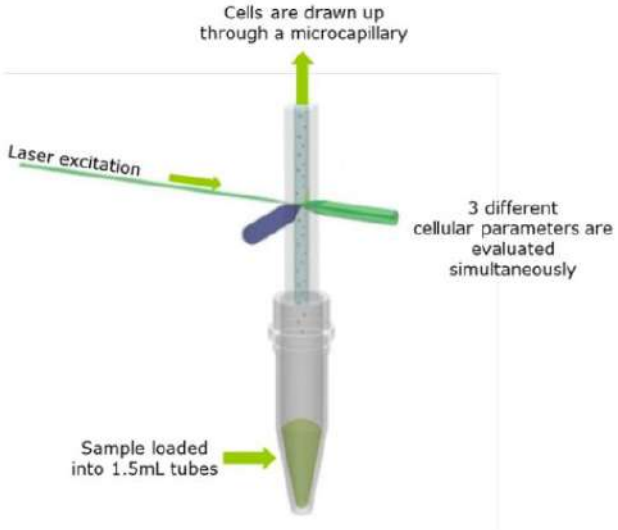
Apoptosis monitoring using a single reagent detecting multiple caspase activity and a dead cell dye.

Novel, miniaturized cytometry

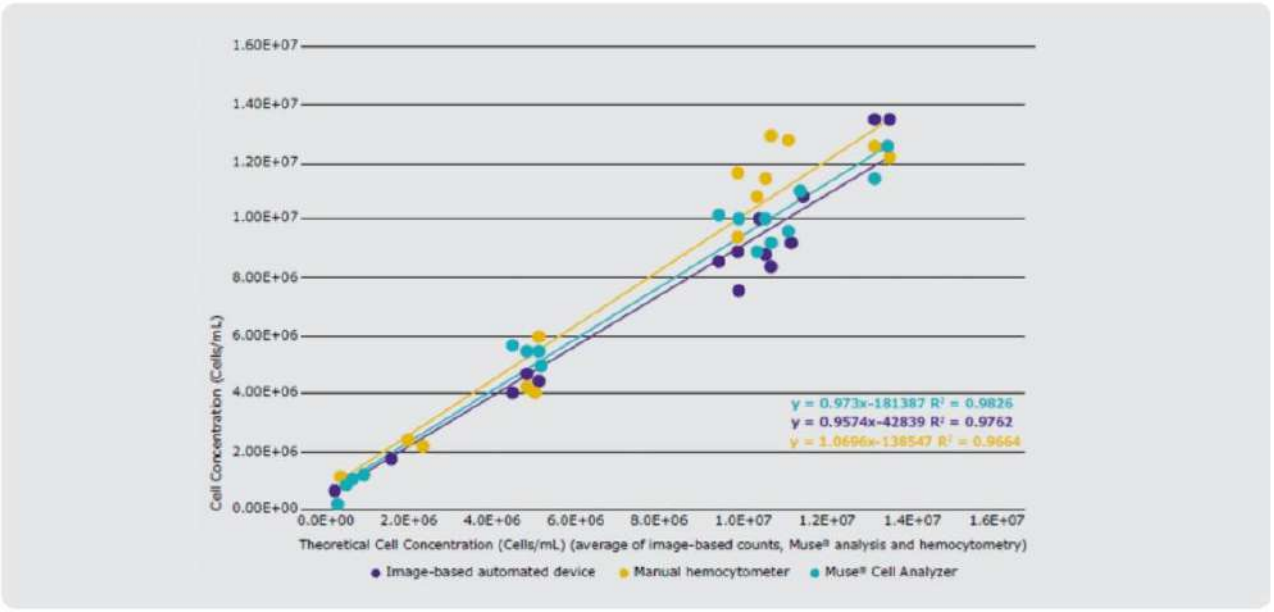
The Muse Cell Analyzer uses miniaturized fluorescent detection and microcapillary technology to deliver truly accurate, precise, and quantitative cell analysis compared to other methods. Versatile enough to analyze both suspension and adherent cells 2–60 µm in diameter, the Muse Cell Analyzer provides greater accuracy and precision than other analysis methods.

Laser-based fluorescence detection

The Muse System delivers high-performance cell analysis using a microcapillary and miniaturized optics, which occupy one-tenth the space of a typical flow cytometer. Laser-based fluorescence detection of each cell event can evaluate up to 3 cellular parameters.



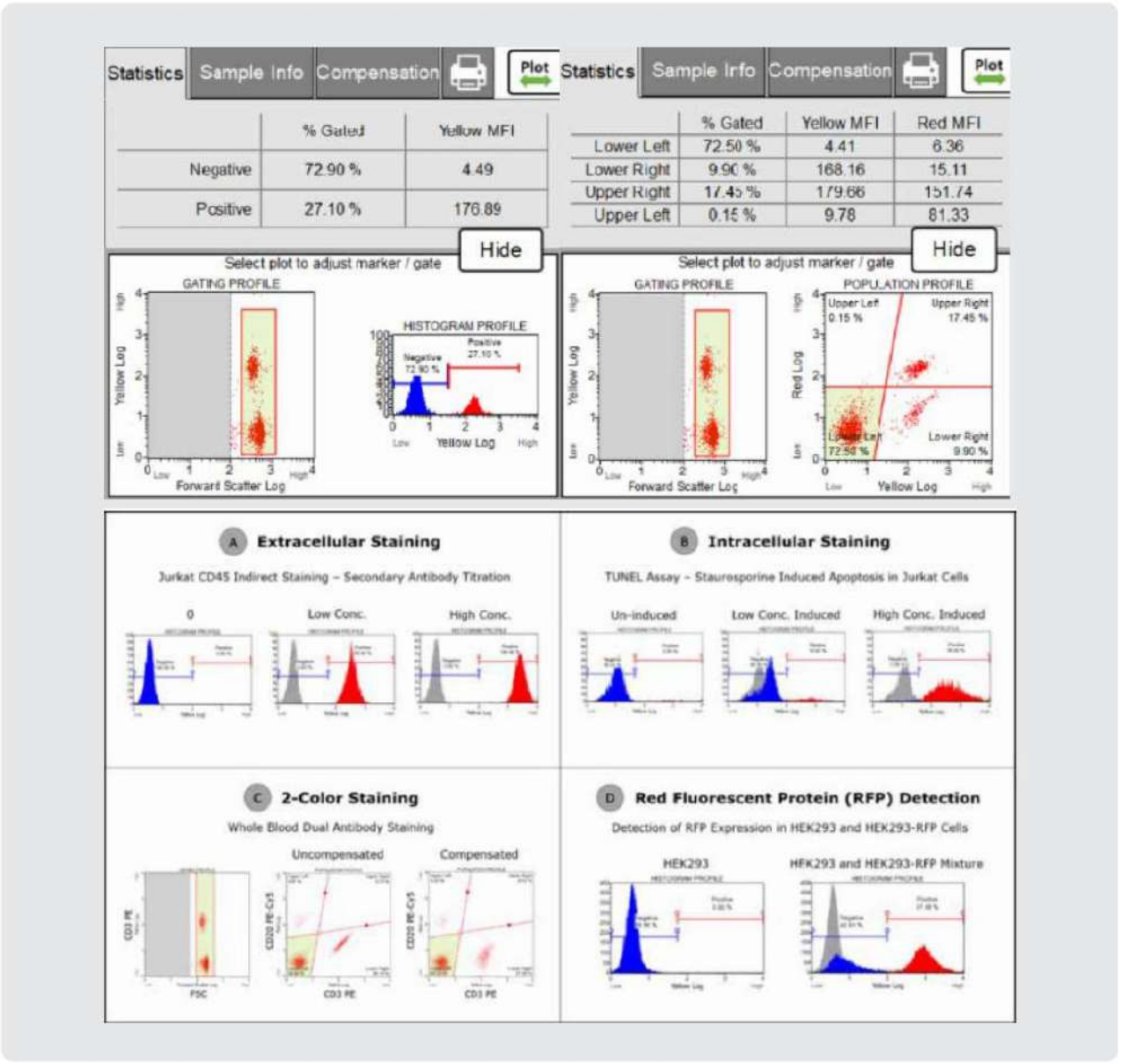
Measure more accurately and reliably



The Muse Cell Analyzer counts cells more accurately than manual hemocytometry or image-based automated analysis. Multiple adherent and suspension cell types (MCF-7, K562, HB, CHO-K1, and Jurkat cells) were counted using the methods shown. Cell counts from all 3 methods were averaged to obtain a "theoretical cell concentration." Each point represents the average of 3 replicates, and each data series was fit with linear regression. Muse concentration values showed the highest correlation coefficient and slope when compared to the "theoretical cell concentration," indicating superior accuracy.

Muse Open Modules

The Muse Cell Analyzer has 2 open modules, allowing the user to run their own 2-color assays. The open modules allow users flexibility to run 2-color (yellow and red fluorescence) experiments while still maintaining the simplicity of a guided software interface. Using the open modules, users can apply the system to a variety of extended problems such as: extracellular marker detection, intracellular detection, and the characterization of red fluorescent proteins and transfection levels.



Example experiment that can be performed using Muse® Open Module Yellow: (A) Jurkat cells were stained with unlabeled anti-CD45 primary antibody and two different concentrations of PE-labeled secondary antibody. (B) Jurkat cells were induced to apoptosis by staurosporine and the TUNEL assay was performed on the cells. (C) Whole blood was stained with PE-labeled anti-CD3 and PE-Cy5 labeled anti-CD20 antibodies. (D) Red fluorescent protein (RFP) expression was tested using untransfected HEK293 and RFP transfected HEK293-RFP cells lines.

Ordering Information

Muse® Assays

Part Number	Product Name
Cell Health	
MCH100102	Muse® Count & Viability Kit (100 tests)
MCH100104	Muse® Count & Viability Reagent (200x)
MCH200109	Muse® Autophagy LC3-Antibody Based Kit (50 tests)
MCH200110	Muse® RFP-LC3 Reporter Autophagy Assay Kit (100 tests)
MCH600103	Muse® Count & Viability Reagent (600 tests)
MCH100111	Muse® Oxidative Stress Assay (100 tests)
MCH100112	Muse® Nitric Oxide Assay (100 tests)
MCH100114	Muse® Ki67 Proliferation Assay (100 tests)
MCH100106	Muse® Cell Cycle Kit (100 tests)
MCH100107	Muse® Cell Dispersal Reagent (100 tests)
Cell Signaling	
MCH200101	Muse® H2A.X Activation Dual Detection Kit (50 tests)
MCH200102	Muse® EGFR-RTK Activation Dual Detection Kit (50 tests)
MCH200103	Muse® PI3K Activation Dual Detection Kit (50 tests)
MCH200104	Muse® MAPK Activation Dual Detection Kit (50 tests)
MCH200105	Muse® Bcl-2 Activation Dual Detection Kit (50 tests)
MCH200107	Muse® Multi-Color DNA Damage Kit (50 tests)
MCH200108	Muse® PI3K/MAPK Dual Pathway Activation Kit (50 tests)
MCH200113	Muse® STAT-1 Activation Dual Detection Kit (50 tests)
MCH200114	Muse® EGFR/MAPK Activation Dual Detection Kit (50 tests)

Part Number	Product Name
Apopotsis	
MCH100105	Muse® Annexin V & Dead Cell Kit (100 tests)
MCH100108	Muse® Caspase-3/7 Kit (100 tests)
MCH100109	Muse® MultiCaspase Kit (100 tests)
MCH100110	Muse® MitoPotential Kit (100 tests)
Immunology	
MIM100102	Muse® Human CD8 T Cell Kit (100 tests)
MIM100101	Muse® Human CD4 T Cell Kit (100 tests)
MIM100103	Muse® Human B Cell Kit (100 tests)
MIM100104	Muse® Human CD25 Lymphocyte Kit (100 tests)
MIM100105	Muse® Human CD69 Lymphocyte Kit (100 tests)
Algae Research	
MIA100101	Muse® Algae Count & Viability Kit (100 tests)
MIA100102	Muse® Algae Nile Red Kit (100 tests)
Malaria Research	
MPA100101	Muse® *P.f.*-*P.v.* Antigen Detection Assay (100 tests)
MMA100101	Muse® RBC Invasion Assay (100 tests)

Ordering Information

Instruments and Accessories

Part Number	Product Name
0500-3115	Muse® Cell Analyzer
0500-3120	Muse® Replacement Flow Cell
4200-0140	Instrument Cleaning Fluid (100 mL)
MCH100101	Muse® System Check Kit
0110-XXXX	Muse® Yellow and Red Open Modules

Muse® Product Specifications

Input Cell Numbers	User selected; Cell concentration range of 10,000-500,000/mL
Sample Format	Single loader; <2 minutes per sample Sample volume and number of cells counted can be specified Absolute cell counts
Cell Types	Homogeneous or heterogeneous, suspension or adherent, primary cells or cell lines
Cell Size	2-60+ microns (µm) in diameter
Data Handling	Data analyzed on system, with USB export of graphs, CSV files, and raw data files

We are continually releasing new **Muse Assay Modules and Kits**!

- Video demonstration
- Most recent listing of Muse Assays
- Application notes
- Publications
- Software updates
- And more!

Please visit **luminexcorp.com/muse** for the most up-to-date listing of Muse Assays. New assay software modules can be downloaded free of charge from the website.

Luminex

Amnis® Imaging Flow Cytometers

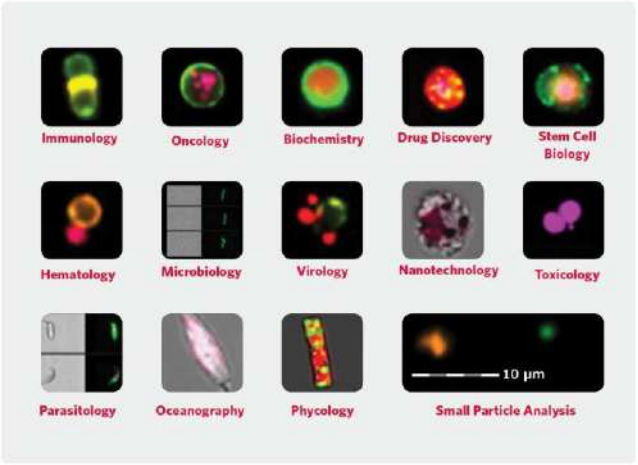
Microscopy in Flow

Spanning the Research Disciplines in the Life Sciences.

Microscopy offers detailed cellular images and morphologic information, which are useful scientific tools for the study of cell function. However, the interpretation of microscopy images can be subjective, qualitative, and laborious.

Flow cytometry is excellent for quantitative phenotyping and yields statistically robust results by rapidly interrogating large numbers of cells. However, flow cytometry lacks any ability to image, so sub-cellular localization and functional studies are difficult at best.

By combining the speed, sensitivity, and phenotyping abilities of flow cytometry with the detailed imagery and functional insight of microscopy, the Amnis® ImageStream^{X} Mk II and Amnis® FlowSight® Instruments overcome the limitations of both techniques and open the door to an extensive range of novel applications.



Amnis® FlowSight®
Imaging Flow Cytometer

Capable: Applicable to every research discipline

Sensitive: Camera-based detection dramatically increases resolution over traditional flow cytometry

Affordable: Smaller footprint with configurations for any lab focus and budget

Powerful: Characterizes populations by virtually any visual or fluorescent attribute

Amnis® ImageStream®^{X} Mk II
Imaging Flow Cytometer

High-throughput: Analyzes thousands of cells per second at up to 60X magnification

Intuitive: Simple user interface with real time plotting and gating

Adaptable: Can be configured with 1 to 7 lasers

Boundless: Variable magnification images small particles and your largest cells

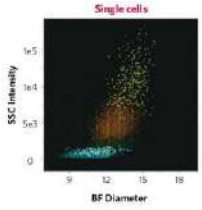
Powerful Flow Cytometry.

The ImageStream® Mk II and FlowSight Systems deliver multiple images of every cell in flow, including brightfield, darkfield (SSC), and up to 10 fluorescent markers at high speed. The ImageStream® Mk II camera operates with a pixel size of 0.1/0.25/1 µm² with 60X/40X/20X magnification, respectively, allowing visualization of fluorescence location from the membrane, cytoplasm, subcellular organelles, and nucleus at high resolution. The FlowSight System operates at 20X magnification with a 1 µm² pixel.

The innovative design of Amnis Flow Cytometers increases signal and minimizes noise to provide exceptional photonic sensitivity. Design details like a dedicated side scatter laser, adjustable laser intensities, and brightfield imagery for the direct measurement of cell size allow the systems to resolve cell populations more effectively than far more expensive cytometers. The ease of use, outstanding performance, and imagery of each cell meet the needs of flow cytometry novices and experts alike.

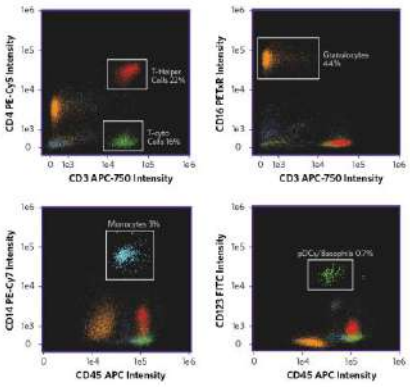
Beyond forward and side scatter

Traditional flow cytometers do an admirable job of using low-resolution scattering characteristics to approximate size and intracellular granularity. Amnis imaging flow cytometers produce familiar 'size vs. complexity' scatter plots, but with the power of 20X magnification—or more—can report absolute rather than relative cell size by measuring the actual diameter of objects in brightfield images.



Multichannel immunophenotyping

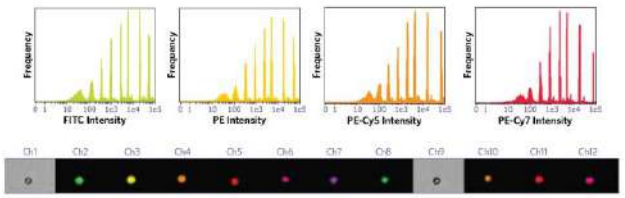
Immunophenotyping requires multiple fluorescence channels in addition to dual scatter. Below is a 6-color immunophenotype of human PBMC using antibodies against CD3, CD4, CD14, CD16, CD45, and CD123, plus DAPI. The arrangement of detection channels, available laser options, and automated compensation wizard allows for the straightforward separation of complex cell populations.



Sensitive and Flexible for Any Research Need.

Exceptional fluorescence sensitivity

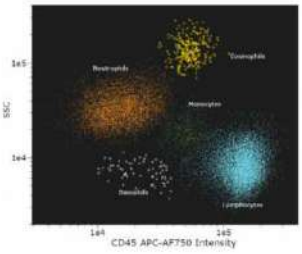
The patented architecture of Amnis imaging flow cytometers provides extraordinary fluorescence sensitivity across the visible spectrum, outperforming other imaging devices. The four plots below demonstrate the ability of the FlowSight Instrument to discriminate all intensities in the Spherotech 8-peak calibration bead set, across the spectrum from FITC to PE-Cy7. Note the distinct peak separation, low coefficients of variance (CVs), and high sensitivity from the FITC to the PE-Cy7 channels.



FlowSight® 12 channel imagery of 3-micron diameter Spherotech 8-peak Rainbow beads.

5-Part white blood cell differential

Because of its exceptional sensitivity, the FlowSight System excels at the resolution of mixed sub-populations in heterogeneous samples. Human peripheral blood mononuclear cells (PBMC) are partitioned into 5 distinct populations using CD45 expression and side scatter intensity. High fluorescence sensitivity and tight coefficients of variance (CVs) resolve monocytes (green) from lymphocytes (blue) and facilitate the detection of rare basophils (white). The dedicated side scatter laser clearly resolves eosinophils (yellow) from neutrophils (orange).

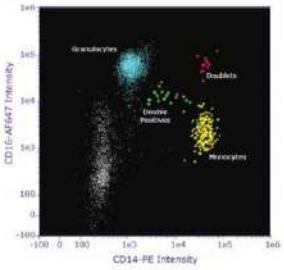


Sensitive and Flexible for Any Research Need.

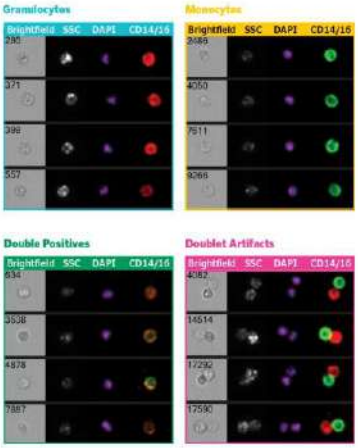
Images of every cell

The FlowSight and ImageStream® Mk II Instruments operate like conventional flow cytometers, but also provide imagery of every cell. Powerful and intuitive analysis software seamlessly links quantitative data to images:

- Click on a dot in any plot to see its corresponding image
- Click on a bin in any histogram to view every cell in that bin
- Draw gates on dot plots and view the resulting populations to validate results



With imaging capabilities, you'll never wonder about outliers or whether your gates are in the right place, as shown in the example above. Once you've drawn a gate on a plot, you can click inside and out to determine if it's in the right place, as shown in the example to the right. With visual feedback, you can optimize gate size, shape, and position for better data quality.



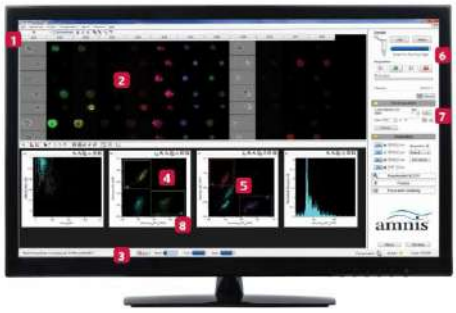
Data Acquisition Software.

Fast and easy.

INSPIRE™ Software offers powerful, image-based gating and real time fluorescence compensation.

1. **Instant Population Viewer**: Every population is added to a pull-down list as soon as you draw a gate. Simply select a population of interest from the list to view the corresponding cells during data acquisition.
2. **Image Gallery**: Imagery of cells of interest appear in the gallery as they are acquired, allowing you to inspect morphology, assess staining patterns, and optimize laser power settings.
3. **Instrument Status at a Glance**: Convenient gauges, indicators, and text alerts provide continuously updated instrument operational status.
4. **Real Time Intensity Compensation**: An easy to use compensation wizard quickly guides you through the setup of multi-color compensation matrices.
5. **Gating Without Guesswork**: Gates are easily drawn using graphical tools, and verified for accuracy by visual inspection of gated cells.
6. **Efficient Sample Handling**: Up to 95% of the sample volume is utilized, facilitating the analysis of rare cells. Unused sample can be recovered for further analysis.
7. **Intuitive Acquisition**: A simple and intuitive user interface provides complete control of sample acquisition settings and data storage criteria.
8. **Familiar Dot Plots and Histograms**: Data plots are updated in real time, just as with conventional flow cytometers. Unlike conventional cytometers, you can also plot morphologic parameters such as Area, Cell Width, Cell Height, Aspect Ratio, and others.

INSPIRE™ Software

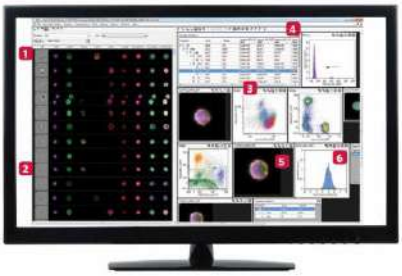


Software That Turns Data Into Understanding.

IDEAS® Software combines image analysis, statistical rigor, and visual confirmation in an easy to use package.

1. **Inspect Your Populations**: The Image Gallery allows you to see every image of every cell or perform a "virtual cell sort" to inspect and validate the cells within a specific population.
2. **Images for Every Dot**: Every dot in every scatter plot is linked to the corresponding cell imagery. Simply click on a dot to see the associated cell images or vice-versa.
3. **Graphical Population Definitions**: Define populations using familiar graphical tools and combine them with logical functions.
4. **Comprehensive Population Statistics**: Characterize your cell populations with a wide range of statistical metrics to reveal differences in cell morphology, phenotype, and function.
5. **Flexible Image Display Tools**: Create composite images, pseudo-color representations, and a host of other image transformations for reporting and publication.
6. **Graph What You See**: Virtually anything you see in the imagery can be plotted as a histogram or dot plot. Hundreds of parameters are calculated for every cell, including fluorescence intensity, fluorescence location, cell shape, cell texture, and numerous other morphologic and photometric features.

IDEAS® Software



A Wealth of Applications.

Any application you can imagine.

Featured applications

The applications detailed on the following pages demonstrate the types of studies that can be performed using the ImageStream® Mk II and FlowSight Instruments with their powerful companion IDEAS image analysis software.

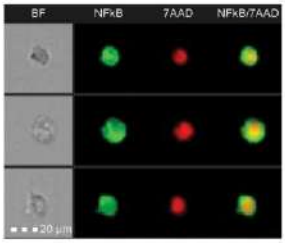
Any application you can imagine

The ImageStream® Mk II and FlowSight Systems are designed to be general-purpose platforms for cellular studies and are not limited to the applications illustrated in this brochure.

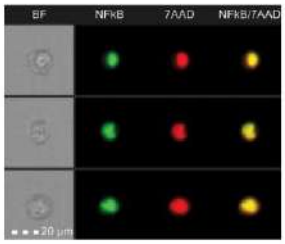
Quantifying Nuclear Translocation...

20X resolution tells the story

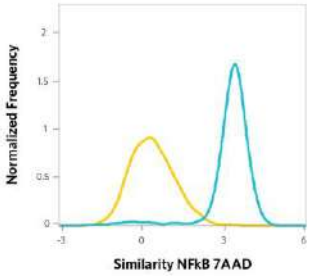
Translocation of NFkB from the cytoplasm to the nucleus of the cell is a key event in the response to the presence of cell stressors. Only imaging flow cytometers can analyze translocation quantitatively, in thousands of cells. For this data, the 20X objective of the FlowSight System is used to locate NFkB in relation to 7-AAD fluorescence from the nucleus in untreated THP-1 cells and cells stimulated with lipopolysaccharide (LPS). The similarity feature of the IDEAS Software produces a score for every cell, quantifying the co-localization of NFkB and 7-AAD.



THP-1 Control (no LPS)
Mean similarity score = 0.4



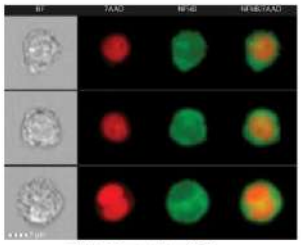
THP-1 + 1 µg/mL LPS
Mean similarity score = 3.2



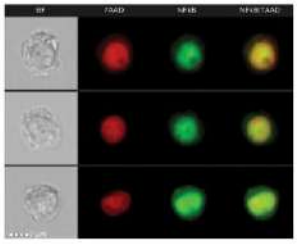
...with Flourescent Image Similarity.

A closer look at NFkB signaling with 60X magnification

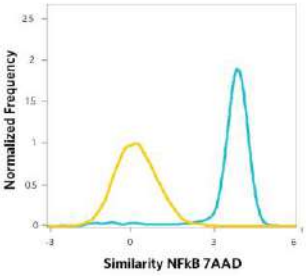
Here, THP-1 cells stimulated or not with LPS and stained with anti-NFkB and 7-AAD to counterstain the nucleus were collected on the ImageStream® Mk II System using the 60X objective. The IDEAS Software similarity feature demonstrates binning of samples consistent with the FlowSight histogram, and establishes the quality of visual detail that the ImageStream® Mk II System can provide for studies when greater details are needed.



THP-1 Control (no LPS)
Mean similarity score = 0.2



THP-1 Control (no LPS)
Mean similarity score = 3.8

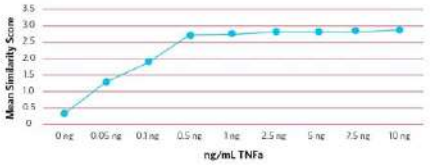


Amnis® Spectral Imaging Channels And Corresponding Fluorophores

Quantitative Imaging and Robust Population Statistics.

Quantitative imaging means Luminex's imaging flow cytometers have a powerful and intuitive image processing package with thousands of analysis parameters and optimized analysis wizards for many common image-based applications, including nuclear translocation, shape change, internalization, and apoptosis.

Objective, quantitative image analysis on large numbers of cells is backed by a large set of statistical parameters for data reporting.

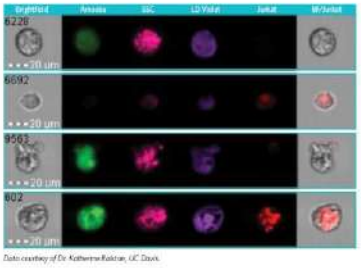


File	Count All	Count Focus	Count Singlet	Count Positive	Mean Similarity	Std Dev Similarity
TNFa_0ng_2_2016.daf	10000	4909	4265	3140	0.36	0.71
TNFa_0-05ng_3_2016.daf	10000	4621	4060	3635	1.28	0.81
TNFa_0-1ng_4_2016.daf	10000	4290	3739	3365	1.90	0.82
TNFa_0-5ng_5_2016.daf	10000	4861	4167	3516	2.68	0.66
TNFa_1ng_6_2016.daf	10000	3811	3231	2913	2.72	0.63
TNFa_2-5ng_7_2016.daf	10000	3893	3425	3073	2.80	0.58
TNFa_5ng_8_2016.daf	10000	4162	3685	3380	2.80	0.62
TNFa_7-5ng_9_2016.daf	10000	4361	3982	3387	2.82	0.58
TNFa_10ng_10_2016.daf	10000	4005	3656	2988	2.90	0.65

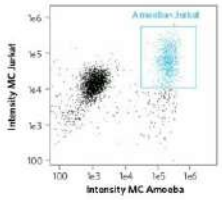
Internalization Identifies Trogocytosis.

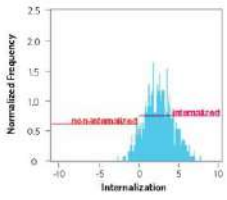
20X objective for a wider field of view

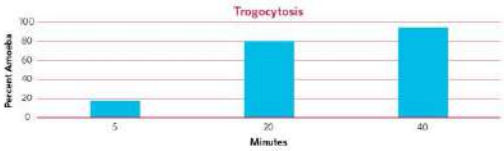
The FlowSight Instrument is optimized for imaging large objects such as epithelial cells, macrophages, neutrophils, fibroblasts, and even large eukaryotic parasites. Here, *Entamoeba histolytica* demonstrates amoebic trogocytosis of immune cells. Following attachment to Jurkat cells, the FlowSight Instrument measures every *E. histolytica* expressing Jurkat markers internalized or on their surface.



Data courtesy of Dr. Katherine Ralston, UC Davis.

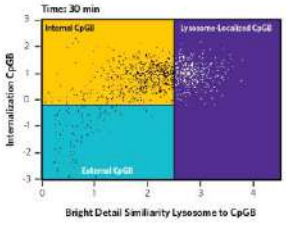




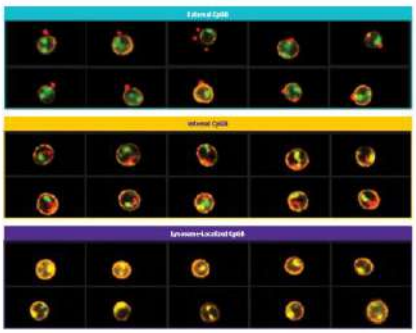


Co-localization and Trafficking.

The ImageStream^{X} Mk II instrument greatly improves co-localization studies by combining the rapid collection of large numbers of cell images with objective measurement of the similarity of bright image details.



Example: Internalization and Trafficking of CpGB in Primary Plasmacytoid Dendritic Cells (pDC)



Lysosomal trafficking of CpGB within pDC is quantified using the Internalization (Y-axis) and the Bright Detail Similarity (X-axis) scores. Representative merged images of pDC (orange), CpGB (red), and lysosomes (green) are shown at 40X magnification cells within the lower left region of the plot and have surface-bound CpGB. As CpGB molecules enter the pDC, the Internalization score increases (upper left region). Once the CpGB traffics to the lysosomes, the similarity between the CpGB and lysosome image pair increases (upper right region).

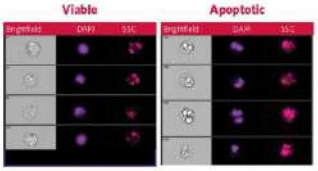
Data courtesy of Dr. Patricia Fitzgerald-Bocarsly, University of Medicine and Dentistry, New Jersey.

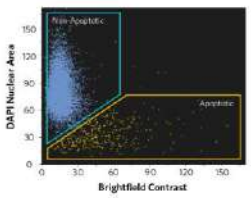
Apoptosis and Necrosis.

Apoptosis and necrosis detection by image analysis

The apoptosis wizard analyzes the nuclear morphology and brightfield image contrast of each cell to detect apoptosis in any sample containing a nuclear stain.

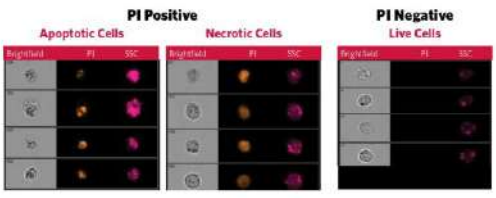
Differentiate necrotic and apoptotic cells from each other by measuring the texture of the PI images.





Necrosis versus apoptosis

Conventional flow cytometers can use membrane-impermeant dyes to identify dead or dying cells that have lost membrane integrity. However, it can be difficult to determine if cell death is via apoptosis or necrosis. The FlowSight System simplifies this determination by revealing the nuclear morphology of every cell. As shown in this sample of THP-1 cells labeled with propidium iodide, the nuclei of necrotic cells have normal nuclear morphology, while the nuclei of apoptotic cells are shrunken and fragmented.



Autophagy.

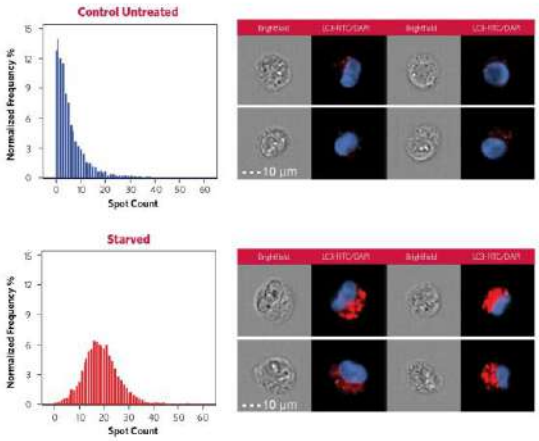
During autophagy, cytoplasmic LC3 is processed and recruited to the outer membrane of autophagosomes. Cells undergoing autophagy can be identified by visualizing LC3 puncta and enumerating the spots within each cell using the Spot Count feature of the IDEAS Software package.

The IDEAS image processing software included with the ImageStream® Mk II System determines the Spot Count of every cell. In this example, cells with varying number of LC3-RFP (red) spots are shown with their corresponding Spot Count.

Example: Autophagy in the human CML cell line K562

The apoptosis wizard analyzes the nuclear morphology and brightfield image contrast of each cell to detect apoptosis in any sample containing a nuclear stain.

Differentiate necrotic and apoptotic cells from each other by measuring the texture of the PI images.

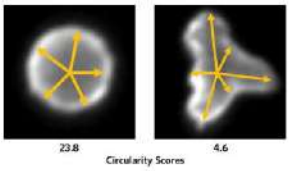


U2OS RFP-LC3 human osteosarcoma reporter cell line was starved for 4 hours at 37°C. Both the control and starved samples were supplemented with a degradation inhibitor. FlowCellect RFP-LC3 Reporter Autophagy Kit (Catalog No. FCCH100183).

Morphology.

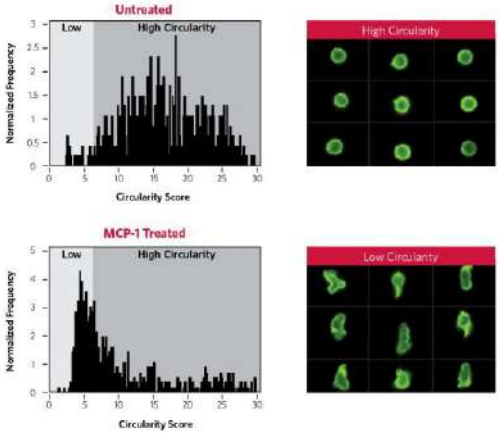
Change in cell shape is correlated with change in function, particularly in the case of macrophage activation, stem cell differentiation, and cellular response to drugs. The ImageStream® Mk II Instrument measures cell shape using powerful, pre-defined features in the IDEAS image analysis software. One such feature is the Circularity score.

The Circularity score is a measure of how much the cell radius varies. Round cells (left) have high Circularity scores while irregularly shaped cells (right) have low Circularity scores.



Example: Shape change in primary monocytes

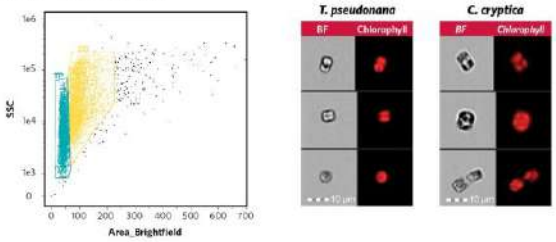
Chemoattractant MCP-1 induces monocyte shape change and migration to sites of inflammation, as evidenced by the significant decrease in the Circularity score of the MCP-1 treated sample relative to the untreated control. In contrast, treatments that reduce inflammatory response – such as drugs for autoimmune disorders – result in an increase in Circularity scores.



Microalgae.

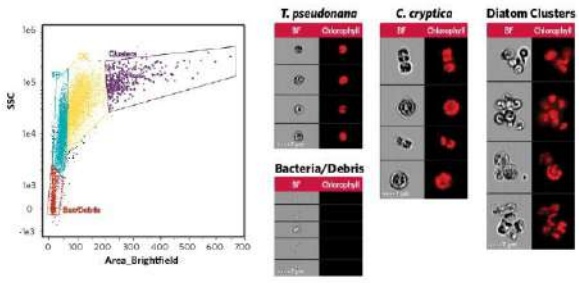
Mixed cultures of microalgae

The images below demonstrate microalgae identification in mixed cultures using morphological parameters and the ImageStream® Mk II Instrument at 40X magnification.



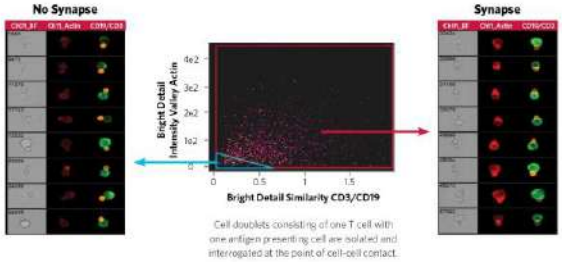
Microalgae quality control

The images below demonstrate detection of bacterial contamination, cellular debris, and clusters in mixed culture of microalgae. A mixed culture of *T. pseudonana* and *C. cryptica* contaminated with bacteria was analyzed on the ImageStream® Mk II System at 60X magnification.



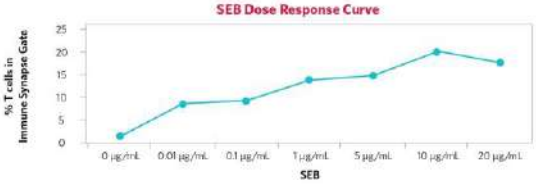
Quintessential Cell Interactions at the Immunological Synapse.

FlowSight 20X images



Cell doublets consisting of one T cell with one antigen presenting cell are isolated and interrogated at the point of cell-cell contact.

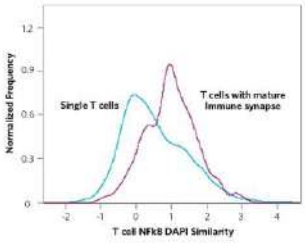
SEB Dose Response Curve



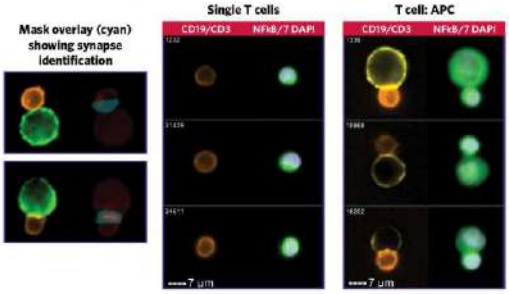
Raji B cells were exposed to SEB (0-20 µg/mL) and incubated with human primary T cells.

Take the Analysis Even Further with Higher Resolution.

- T:APC conjugates are easily identified using morphological features
- The point of cell-cell contact is identified using a mask (cyan overlay)
- Actin accumulation within the mask confirms formation of an immunological synapse
- All T cells are then identified either in conjugates or not
- NFkB translocation is measured in the T cells specifically



ImageStream^X Mk II 60X images



Modular Options for the **FlowSight** and **ImageStream^X Mk II** Instruments.

Additional excitation lasers

The 488 nm blue laser comes standard with the FlowSight and ImageStream^X Mk II Instruments. Adding excitation lasers increase experimental flexibility by permitting a broader palette of fluorescent markers. All lasers are intensity adjustable to ease protocol development.

12 channels of detection

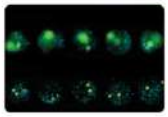
Up to 12 high resolution image channels are available with the addition of an optional second camera and associated optics for the ImageStream^X Mk II System. Twelve channels are standard on the FlowSight Instrument.

Multi-well plate AutoSampler

The AutoSampler option enhances productivity with unattended sample loading from 96-well plates. The fully integrated AutoSampler option greatly facilitates dose response and time course studies.

MultiMag

The MultiMag option for the ImageStream^X Mk II System provides 60X and 20X objectives on a motorized stage, in addition to the standard 40X objective. The 60X objective offers greater resolution for the morphologic analysis of cells as small as yeast and bacteria, while the 20X objective offers a 120 micron wide field of view for very large cells.



EDF: Extended depth of field

The EDF option incorporates Wavefront Coding technology from OmniVision CDM Optics, which is a combination of specialized optics and unique image processing algorithms, to project all structures within the cell into one crisp plane of focus. Ideal for automated FISH spot counting.

Option	FlowSight®	ImageStream^X Mk II
Additional Excitation Lasers	Standard 488 Option 405, 561, 642	Standard 488 Option High Power 488, 375, 405, 561, 592, 642, and 730
12 Channels of Detection	Standard	6 Standard High Resolution 12 Channel Option
Multi-well Plate Autosampler	96-Well Plate	96-Well Plate
MultiMag	Not Available	40X Standard; 20X and 60X Option
EDF: Extended Depth of Field	Not Available	Available

Progressive Engineering...

FlowSight Instrument specifications

Performance Characteristics	Magnification 20X
Numeric aperture	0.6
Pixel size	1.0 x 1.0 µm
Field of view	60 x 256 µm
Imaging rate	4,000 cells/sec

Sample characteristics
- **Volume** – 20-200 µL
- **Utilization Efficiency** – Up to 95% of sample

Automated instrument operations
- Start up and shut down
- Sample load and acquisition
- Laser alignment, focus adjustment, calibration, and self-test

Operational requirements
- 400W, 100-240 VAC, 50/60 Hz
- No external air or water necessary

Physical characteristics
- 18" W x 18" H x 25" D in (457 mm x 466 mm x 635 mm)
- 135 lbs. (61 kg)

Illumination
- **Excitation** – Standard: 488 nm; Optional: 405 nm, 561 nm, and 642 nm
- **Side scatter** – 785 nm standard
- **Brightfield** – Multi-channel

...Advances Performance.

ImageStream^X Mk II Instrument specifications

Performance Characteristics	Magnification		
	40X	60X	20X
Numeric aperture	0.75	0.9	0.5
Pixel size	0.5 x 0.5 µm	0.3 x 0.3 µm	1.0 x 1.0 µm
Field of view	60 x 128 µm	40 x 170 µm	120 x 256 µm
Imaging rate	2,000 cells/sec	1,200 cells/sec	5,000 cells/sec

Sample characteristics
- **Volume** – 20-200 µL
- **Utilization Efficiency** – Up to 95% of sample

Automated instrument operations
- Start up and shut down
- Sample load and acquisition
- Laser alignment, focus adjustment, calibration, and self-test

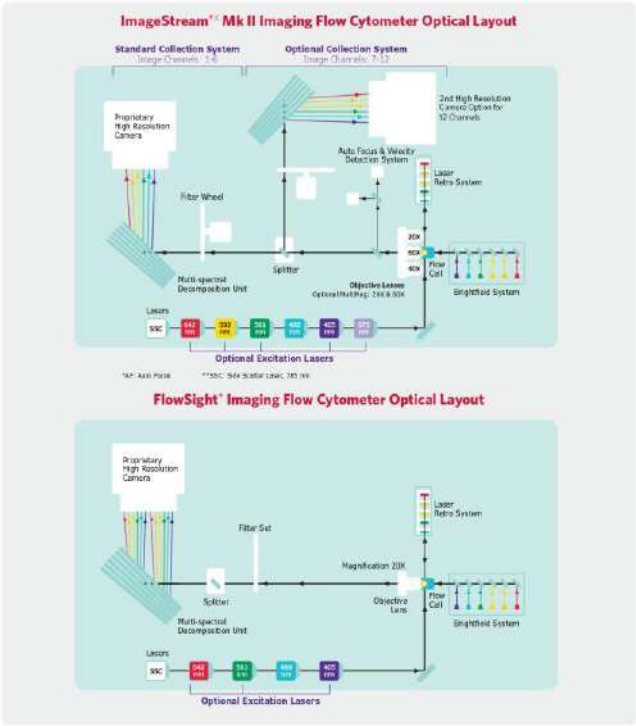
Operational requirements
- 450W, 100-240 VAC, 50/60 Hz
- No external air or water necessary

Physical characteristics
- 35" W x 26" H x 25" D in (889 mm x 660 mm x 635 mm)
- 400 lbs. (182 kg)

Illumination
- **Excitation** – Standard: 488 nm; Optional: High Power 488, 375 nm, 405 nm, 561 nm, 592 nm, 642 nm, and 730 nm
- **Side scatter** – 785 nm standard
- **Brightfield** – Multi-channel

The Path to Scientific Enlightenment...

...passes through the Amnis® multi-spectral decomposition element, which enables simultaneous collection of brightfield, laser scatter, and multiple fluorescent images per cell.



Ordering Information

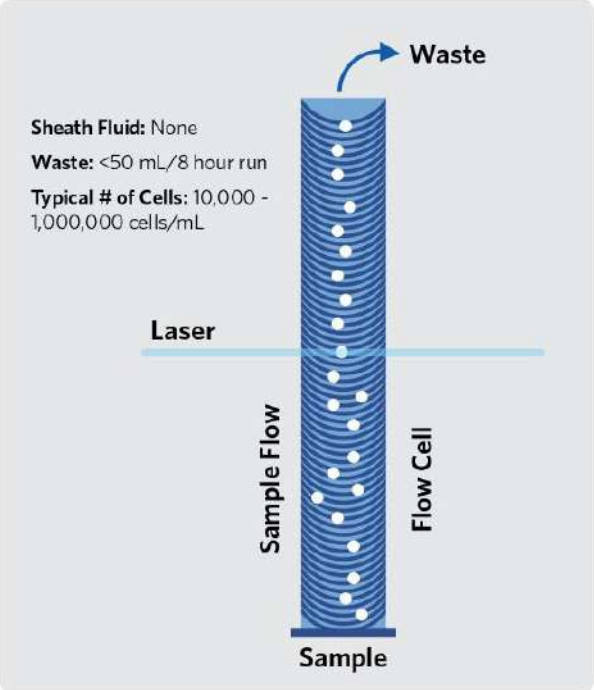
Product Name	Part Number
Instruments	
Amnis® FlowSight® Flow Cytometer	100320
Amnis® ImageStream® Mk II Flow Cytometer	100220
Reagents	
Amnis® SpeedBead® Kit	400041
FlowSight® Calibration Beads	400300
Kits	
Amnis® NFκB Translocation Kit	ACS10000
Amnis® Protein Aggregate and Silicone Oil Detection Kit	APH10001
Amnis® Intracellular Staining Kit	ACS10002
Service Plans	
ImageStream® Mk II Complete Maintenance and Service Agreement	SLA-ISXMkII-COMPLETE
ImageStream® Mk II Basic Maintenance and Service Agreement	SLA-ISXMkII-BASIC
FlowSight® Complete Maintenance and Service Agreement	SLA-FS-COMPLETE
FlowSight® Basic Maintenance and Service Agreement	SLA-FS-BASIC
Training Options	
ImageStream® Mk II training at Luminex, 3 days – per person	5020
Onsite ImageStream® Mk II or FlowSight® training - FAS 1 day - up to 5 people	50200-1
Onsite ImageStream® Mk II or FlowSight® training - FAS 2 consecutive days - up to 5 people	50200-2
Onsite ImageStream® Mk II or FlowSight® training - FAS 3 consecutive days; Up to 5 people	50200-3
Onsite ImageStream® Mk II or FlowSight® training - FAS 4 consecutive days; Up to 5 people	50200-4
Onsite ImageStream® Mk II or FlowSight® training - FAS 5 consecutive days; Up to 5 people	50200-5

Luminex

Guava® easyCyte™ Systems

Expanding the potential of flow cytometry.

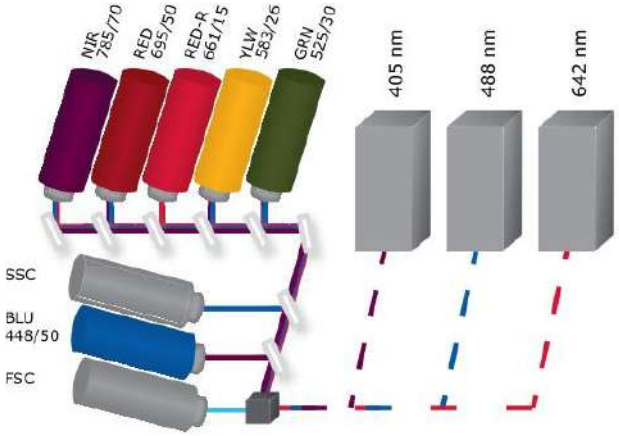
Unleash What's Possible.



More than 20 years ago, Guava Technologies introduced the first compact benchtop flow cytometers. Today, the easyCyte™ line has been updated to offer up to 3 lasers and 14 parameters, with greater sensitivity and optional high throughput capabilities. Powered by intuitive software, easyCyte Flow Cytometers are some of the most dynamic and flexible benchtop systems available:

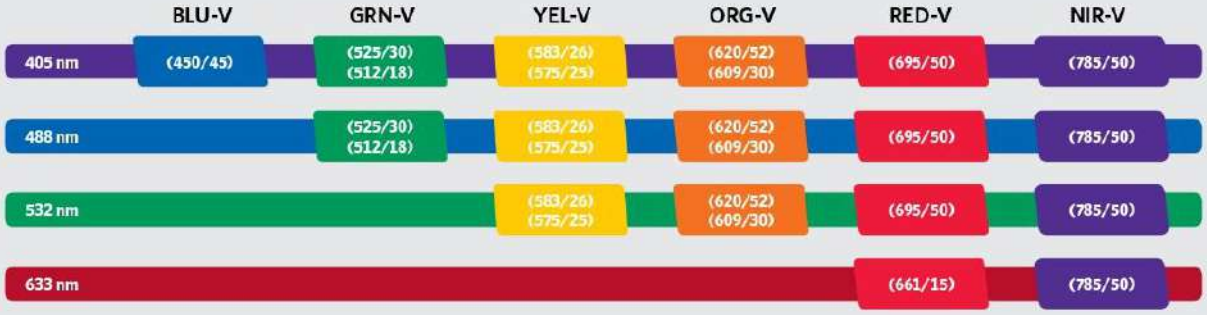
- Up to 3 lasers and 14 parameters on a benchtop instrument, to allow for a high degree of flexibility
- Microcapillary fluidics design eliminates sheath fluid and lowers waste stream
- The combination of microcapillary technology and a positive displacement syringe pump allows for direct absolute counting
- Intuitive software interface enables simplified assessment of results, including cell-health assays
- Detection limits of particles as small as 0.2 µm facilitate the evaluation of a variety of samples
- High-throughput option enables walkaway acquisition of up to 96 samples

Inside the **Guava® easyCyte™ 12HT** Systems.



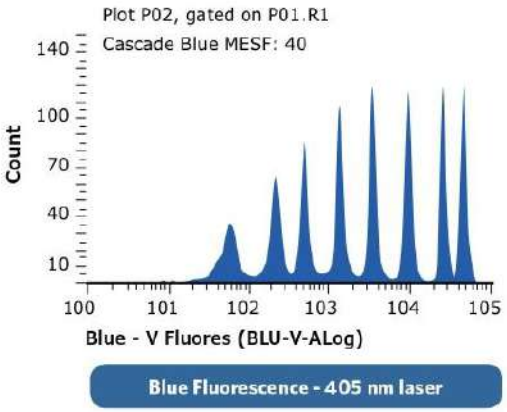
How They Work

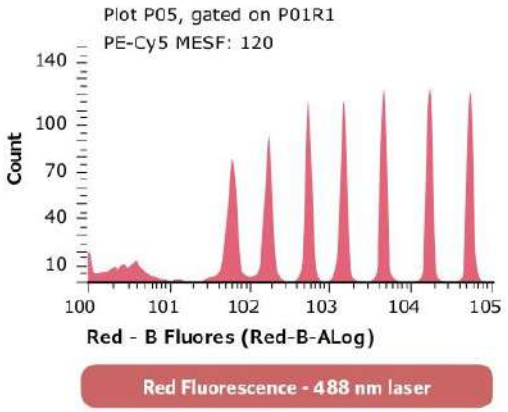
The easyCyte Systems use patented, microcapillary, laser-based technology capable of detecting mammalian and microbial cells, particles, and beads. A sample of fluorescently labeled cells is aspirated into the microcapillary flow cell. Forward and side scatter characteristics are detected by photodiodes. Fluorescence emission resulting from the excitation of fluorophores by the lasers is spectrally filtered and detected by several PMTs. The easyCyte Systems can resolve the fluorescence from up to 12 fluorophores simultaneously.

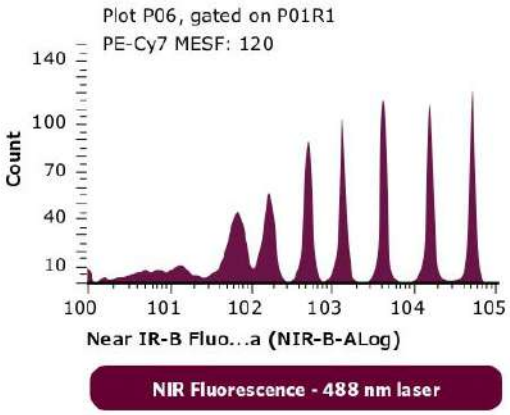


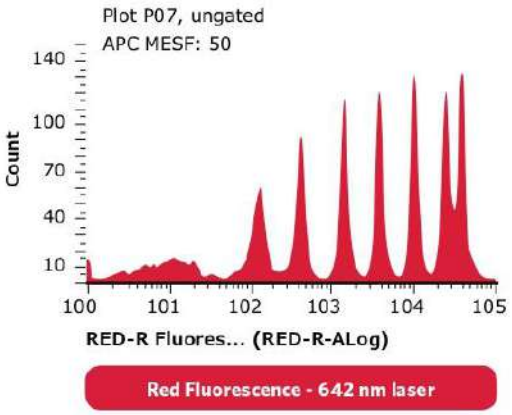
Sensitive and Specific.

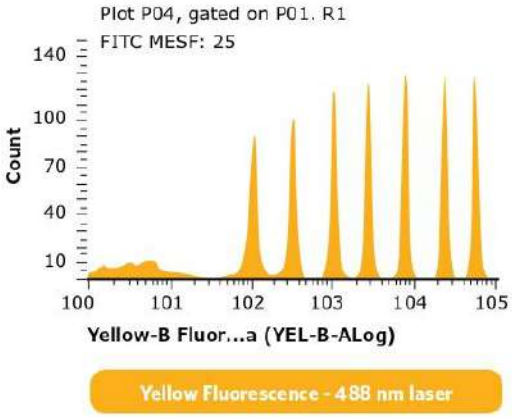
Spherotech 8-color beads analyzed on the Guava easyCyte 12HT System demonstrate the instrument's proficiency for resolving adjacent fluorophores in multiple detection channels.

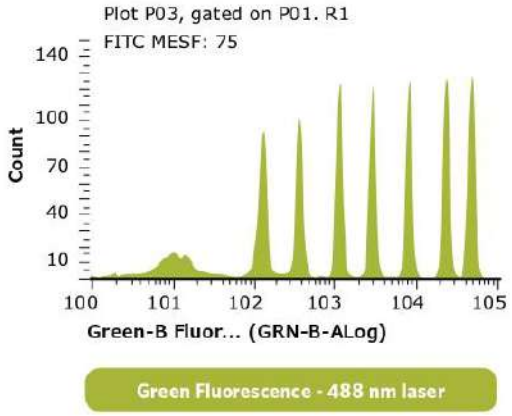






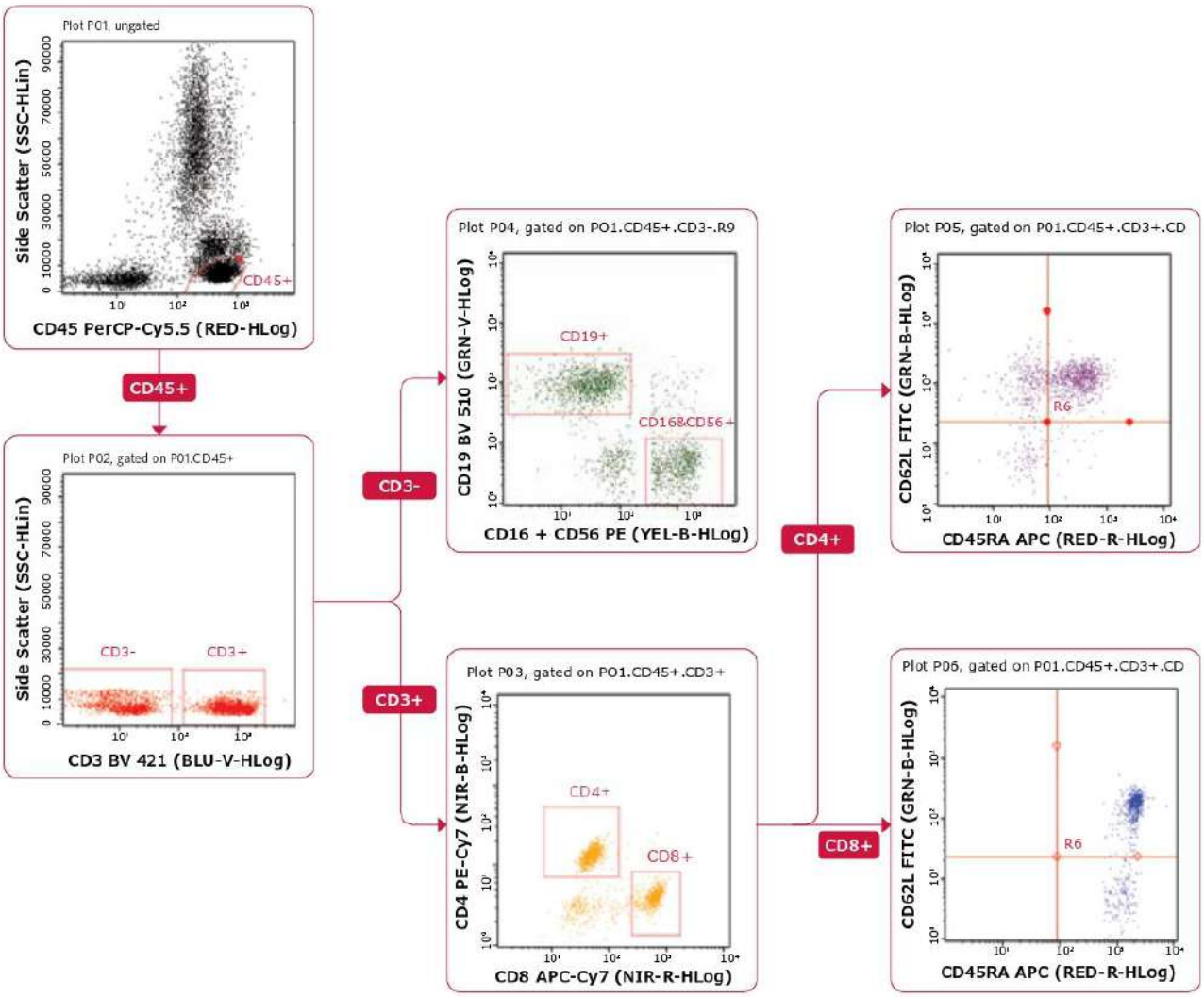






Immunology Phenotyping.

10 µL adult human blood was stained for 20 minutes at room temperature with a cocktail containing anti-CD45 PerCP-Cy5.5, anti-CD3 Brilliant Violet™ 421, anti-CD4 PE-Cy7, anti-CD8 APC-Cy7, anti-CD16+CD56 PE, anti-CD19 Brilliant Violet™ 510, anti-CD45 RA APC, and anti-CD62L FITC. After incubation, cells were lysed and fixed with 180 µL Guava Lysing Solution for 15 minutes at room temperature. Samples were then acquired on the Guava easyCyte 12HT System. Lymphocytes identified as CD45+ were selected and subsequently gated into an SSC vs. CD3 plot. T cells (CD3+ and CD45+) were gated into a CD4 vs. CD8 plot. CD4+ and CD8+ T cells were subtyped by evaluating each population using CD45RA and CD62L to differentiate naive from memory cells. To distinguish natural killer (NK) and B cells, CD3-negative cells were gated into a plot comparing CD19 (B cells) and CD16+/CD56+ (NK cells).

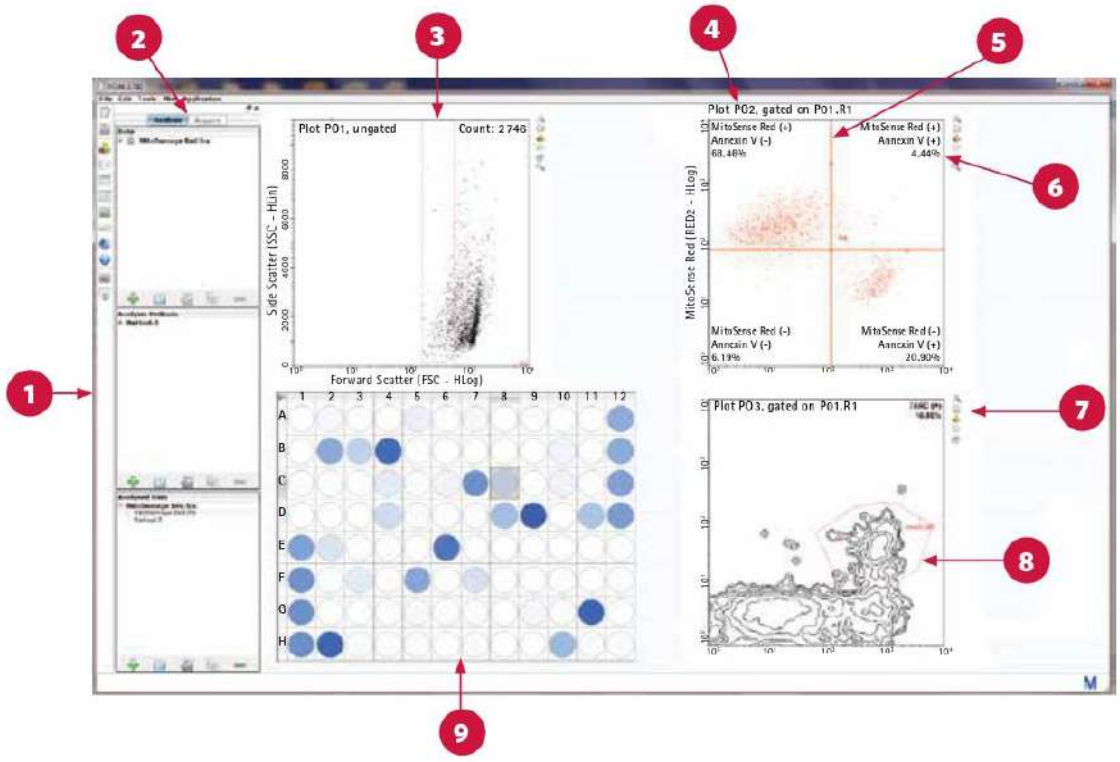


Software.

The GuavaSoft™ operating system software provides access to modules for acquisition and analysis, as well as instrument setup and maintenance. The GuavaSoft operating system includes templates for use with a wide range of Luminex Flow Cytometry kits to simplify your experiments and data collection. Additionally, the GuavaSoft package includes InCyte™, an intuitive open software package for custom analysis. Results can be exported to spreadsheets or as industry-standard FCS 2.0 or 3.0 files for further analysis. GuavaSoft Software includes 21 CFR Part 11-enabling features.

InCyte™ Software: Intuitive

Our InCyte Software has an intuitive, easy to use interface that enables you to focus on data at the sample or experimental level. The software simplifies setup and analysis of plots with drag-and-drop features, while automated compensation makes it easy to perform complex, multi-color assays. The instant update feature responds in real time to change analysis conditions for viewing. The multiparameter heat mapping function allows for analysis of entire plates of data in the time previously required to analyze a single sample. These features provide a simple and rapid means to attain a macroscopic view of experiment "hits" and easily compare different experiments in real time. InCyte Software is especially useful for interpreting the results of high-throughput, cell-based assays.

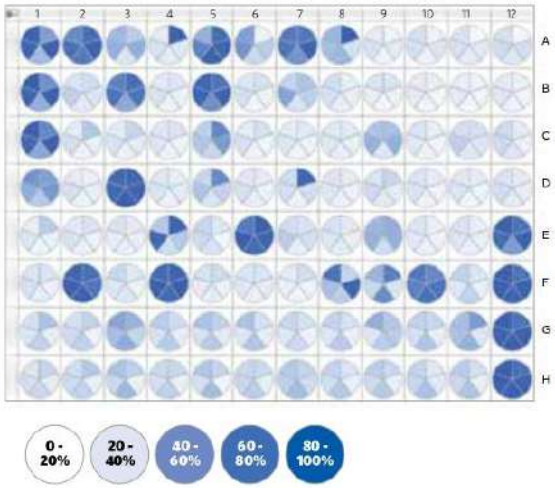


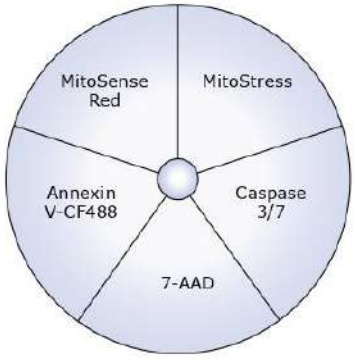
1. Create and apply analysis methods across multiple data sets.
2. Perform compensation during acquisition or analysis or use the automated compensation features.
3. Drag-and-drop gating.
4. View up to 24 plots at once.
5. Refine gates in real time.
6. Default or custom statistics.
7. Multiple plot and gating options.
8. Minimal gain adjustment needed when performing routine assays.
9. Analyze both tubes and plates.

InCyte™ Software Heat Map View.

HeLa 24 Hours

HeLa cells in microtiter plates were treated with various cytotoxic compounds for 24 hours. Cells were stained using Luminex's MitoDamage, Capase 3/7 Kits, as well as a marker to evaluate mitochondrial stress. The InCyte heat map function facilitated the rapid identification of compounds inducing positive results, by simultaneous comparison of all 5 parameters, as shown in the pie charts below. The data show the results for cells treated with 80 different compounds in a single plate.



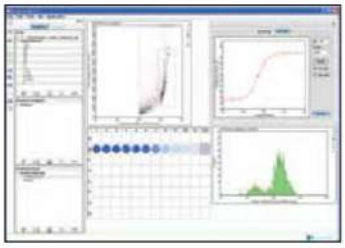


Combine groups of data to construct heat maps, IC_{50}, or EC_{50} curves.

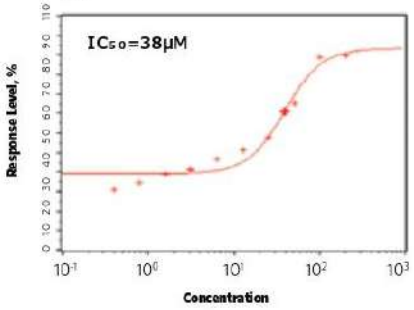
IC_{50} Determination Within InCyte Software

IC_{50} determination using the Cytochrome c Kit was analyzed with the built-in IC_{50}/EC_{50} curve fitting feature of InCyte Software. Cells were acquired on the Guava easyCyte 8HT System. Plot A shows the drag-and-drop gating strategy used for the IC_{50} determination. Plot B shows the IC_{50} curve results for gambogic acid, and Plot C shows the IC_{50} for etoposide. The once-complex task of generating the IC_{50} or EC_{50} curve for a given compound is automated by InCyte, based on quantitation of fluorescent signal.

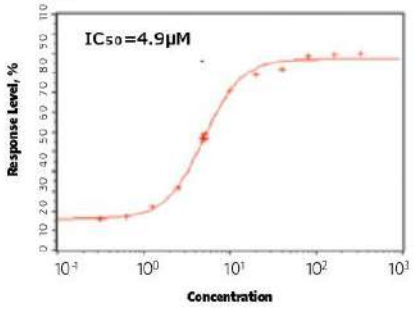
A.



B.

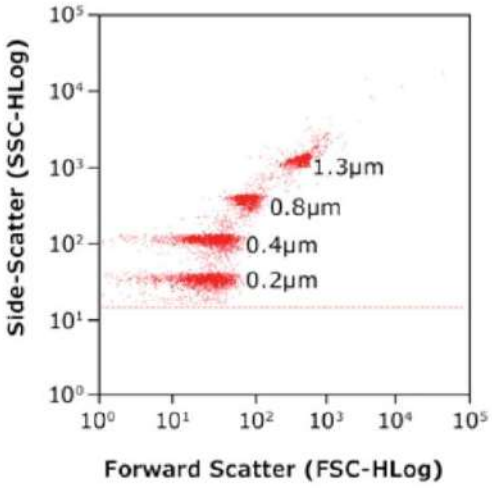


C.



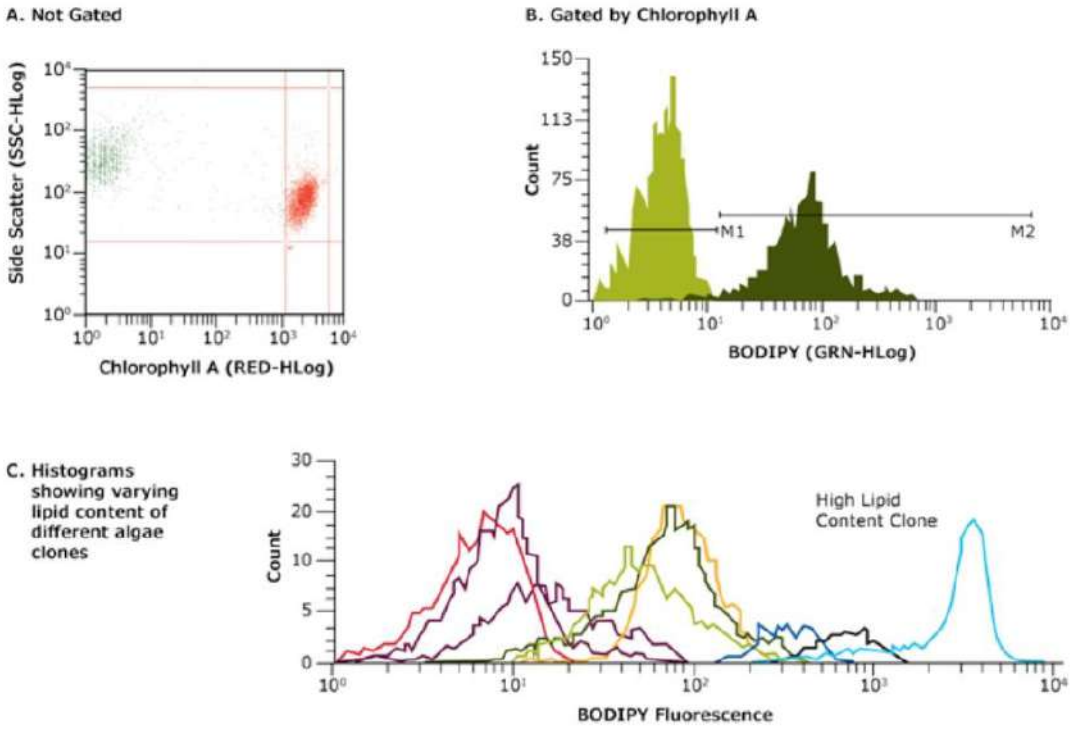
Small Particle Detection.

The easyCyte™ 8HT and 12HT Systems have been shown to detect particles as small as 0.2 µm, a significant improvement over typical flow cytometers. This increased resolution and sensitivity allow for better separation, making gating and identification of dim populations easier. These capabilities may prove particularly useful for researchers analyzing particulates, beads, bacteria, and algae. Acquisition of a mixture of beads of known size demonstrates the ability of easyCyte 12HT Instruments to detect and discriminate particles as small as 0.2 µm.



Turning Algae into Biofuels

The easyCyte Systems are currently participating in algal biomass laboratories worldwide, where flow cytometry facilitates selection of high lipid content strains and efficient monitoring of cultures. Because microcapillary systems require smaller sample volumes, generate significantly less waste, have lower operating costs, enable high sample throughput, and have a small instrument footprint, they are a natural choice for demanding laboratory settings.



Lipid measurement of chlorophyll A-positive algae. Identification of algal cells containing chlorophyll A; chlorophyll A fluoresces in the red channel **(A)**. Gate applied to select for chlorophyll A-positive cells **(B)**. Histograms showing a wide range of lipid content (as evidenced by BODIPY green fluorescence intensity) for a variety of algal strains **(C)**, with one clone showing as much as 500 times the lipid content as others.

Flow Cytometry Reagents.

Our diverse portfolio of reagents and assays facilitates fluorescence-based detection of proteins and nucleic acids and has been validated for use on the easyCyte Instrument platform.

Guava Flow Cytometry Kits

Luminex's optimized, turnkey assay kits reduce sample preparation time, minimize assay development, and simplify data analysis. We offer Guava Kits optimized for key assays in cell health, immunology, and cell signaling.

Guava® Flow Cytometry Kits

Product Name	Part Number
System Maintenance Kits	
Guava® Instrument Cleaning Fluid (ICF)	4200-0140
Guava® Easy Check Kit	4500-0025
Cell Health and Apoptosis Kits	
Guava® ViaCount™ Reagent (40mL)	4000-0040
Guava® ViaCount™ Reagent (240mL)	4000-0041
Guava® ViaCount™ Flex Reagent (100 Tests)	4500-0110
Guava® ViaCount™ Flex Reagent (500 Tests)	4700-0060
Guava® ViaCount™ Cell Dispersal Reagent	4700-0050
Guava Nexin® Kit (100 tests)	4500-0450
Guava Nexin® Kit (500 tests)	4500-0455
Guava® Cell Cycle Kit	4500-0220
Guava® TUNEL Kit	4500-0121
Guava® Express 7-AAD Reagent	4000-0061
Guava® MitoDamage Kit	FCCH100106
Guava® Annexin Red Kit	FCCH100108
Guava® Cytochrome c Kit	FCCH100110
Guava® Autophagy LC3 Antibody-based Detection kit	FCCH100171
Guava® DNA Damage Histone H2A.X Dual Detection Kit	FCCS025153
Guava® Histone H2A.X Dual Detection kit	FCCS100182
Algae Kit	
Guava® Lipid Screen Green Kit	FCIA100101

Guava® easyCyte™ SL Systems

Guava® easyCyte™ Single Sample System	5	5 HPL	6-2L	8
Part Number	0500-5005	0500-5009	0500-5007	0500-5008
Violet (405 nm) Laser				
Blue (488 nm) 50 mW Laser	x		x	
Blue (488 nm) 150 mW Laser		x		x
Green (532 nm) Laser				
Red (642 nm) Laser			x	x
FSC	x	x	x	x
SSC	x	x	x	x
Blue-V (450/45 nm)				
Green-V (512/18 nm)				
Green-V (525/30 nm)				
Yellow-V (575/25 nm)				
Yellow-V (583/26 nm)				
Orange-V (620/52 nm)				
Red-V (695/50 nm)				
NIR-V (785/70 nm)				
Green-B (512/18 nm)				
Green-B (525/30 nm)	x	x	x	x
Yellow-B (575/25 nm)				
Yellow-B (583/26 nm)	x	x	x	x
Red-B (695/50 nm)	x	x	x	x
NIR-B (785/70 nm)				x
Yellow-G (575/25 nm)				
Orange-G (609/30 nm)				
Orange-G (620/52 nm)				
Red-G (695/50 nm)				
NIR-G (785/70 nm)				
Red-R (664/20 nm)			x	x
NIR-R (785/70 nm)				x
Microcapillary Fluidics	x	x	x	x
Direct, Absolute Cell Counts	x	x	x	x
Automation Plate and Tubes				
Mixing				
Dell® Laptop	x	x	x	x
InCyte™ Software	x	x	x	x
Digital Signal Processing	x	x	x	x

Guava® easyCyte™ HT Systems

Guava® easyCyte™ HT System	5HT	5HT HPL	6HT-2L	8HT	11HT	12HT	BG HT	BGR HT	BGV HT
Part Number	0500-4005	0500-4009	0500-4007	0500-4008	0500-4020	0500-4012	0500-4015	0500-4025	0500-4030
Violet (405 nm) Laser					x	x			x
Blue (488 nm) 50 mW Laser	x		x						
Blue (488 nm) 150 mW Laser		x		x	x	x	x	x	x
Green (532 nm) Laser							x	x	x
Red (642 nm) Laser			x	x		x		x	
FSC	x	x	x	x	x	x	x	x	x
SSC	x	x	x	x	x	x	x	x	x
Blue-V (450/45 nm)					x	x			x
Green-V (512/18 nm)									x
Green-V (525/30 nm)					x	x			
Yellow-V (575/25 nm)									x
Yellow-V (583/26 nm)					x	x			
Orange-V (620/52 nm)									x
Red-V (695/50 nm)					x	x			
NIR-V (785/70 nm)					x	x			
Green-B (512/18 nm)							x	x	x
Green-B (525/30 nm)	x	x	x	x	x	x			
Yellow-B (575/25 nm)							x	x	x
Yellow-B (583/26 nm)	x	x	x	x	x	x			
Red-B (695/50 nm)	x	x	x	x	x	x	x	x	x
NIR-B (785/70 nm)				x	x	x	x	x	x
Yellow-G (575/25 nm)							x	x	x
Orange-G (609/30 nm)								x	
Orange-G (620/52 nm)							x		x
Red-G (695/50 nm)							x	x	x
NIR-G (785/70 nm)							x	x	x
Red-R (664/20 nm)			x	x		x		x	
NIR-R (785/70 nm)	x	x	x	x	x	x	x	x	x
Microcapillary Fluidics	x	x	x	x	x	x	x	x	x
Direct, Absolute Cell Counts	x	x	x	x	x	x	x	x	x
Automation Plate and Tubes	x	x	x	x	x	x	x	x	x
Mixing	x	x	x	x	x	x	x	x	x
Dell® Laptop	x	x	x	x	x	x	x	x	x
InCyte™ Software	x	x	x	x	x	x	x	x	x
Digital Signal Processing	x	x	x	x	x	x	x	x	x

Ordering Information

Product Name	Part Number
Single Sampling Instruments	
Guava® easyCyte™ 5 Base System	0500-5005
Guava® easyCyte™ 5HPL Base System	0500-5009
Guava® easyCyte™ 6-2L Base System	0500-5007
Guava® easyCyte™ 8 Base System	0500-5008
High Throughput Sampling Instruments	
Guava® easyCyte™ 5HT Base System	0500-4005
Guava® easyCyte™ 5HT HPL Base System	0500-4009
Guava® easyCyte™ 6HT-2L Base System	0500-4007
Guava® easyCyte™ 8HT Base System	0500-4008
Guava® easyCyte™ HT BG Base System	0500-4015
Guava® easyCyte™ 11HT Base System	0500-4020
Guava® easyCyte™ HT BGR Base System	0500-4025
Guava® easyCyte™ 12HT Base System	0500-4012
Guava® easyCyte™ HT BGV Base System	0500-4030

Luminex
complexity simplified.

For more information, please visit luminexcorp.com/guava-easycyte-flow-cytometers

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Luminex
complexity simplified.

13 July 2020
13 de julio de 2020

J&B Lab S.A.C.
Calle José Galvez 651 int. 203
Lima 15073
Perú

Re: Luminex Distribution Authorization
Re: Autorización de distribución Luminex

To Whom It May Concern:
A quien le interese:

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Luminex authorizes J&B Lab to promote and sell the Products in the Region.
Luminex autoriza a J&B Lab a promocionar y vender los Productos en la Región.

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Sincerely,
Sinceramente,

Richard W. Rew II
SR VP, General Counsel and Corporate Secretary
SR VP, Asesor General y Secretario Corporativo

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