GUAVA® EASYCYTE SYSTEMS

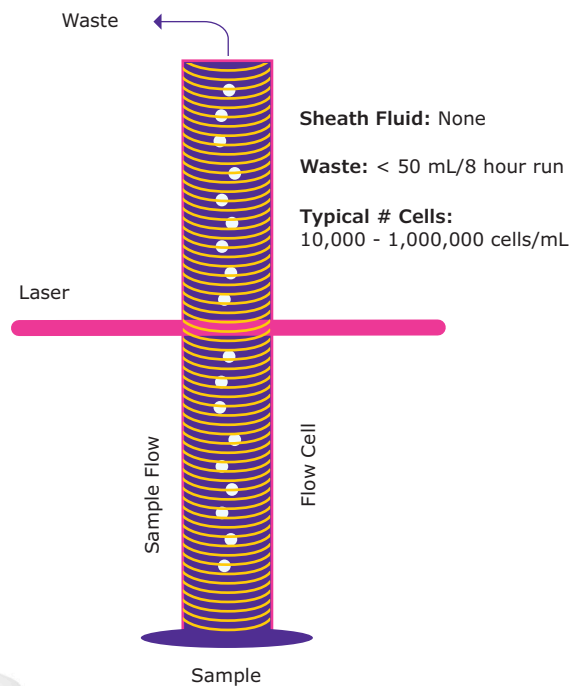## Expanding the potential of flow cytometry
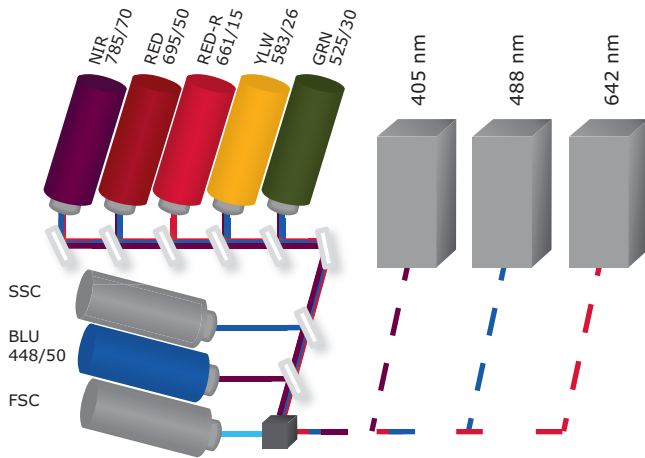
UNLEASH WHAT'S POSSIBLE

Over fifteen years ago, Guava Technologies introduced the first compact benchtop flow cytometers. Today, the Guava® 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, the Guava® 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
- Microcapillary fluidics design eliminates sheath fluid and waste carboys
- Accurate absolute cell counts via microcapillary and positive displacement syringe pump
- Intuitive software includes comprehensive cell-health related assays
- Detection of particles as small as 0.2 μm
- High-throughput option for walk-away acquisition of up to 96 samples

Microcapillary Flow Cytometry

Waste

Laser

Sample Flow

Flow Cell

Sample

Sheath Fluid: None

Waste: < 50 mL/8 hour run

Typical # Cells:
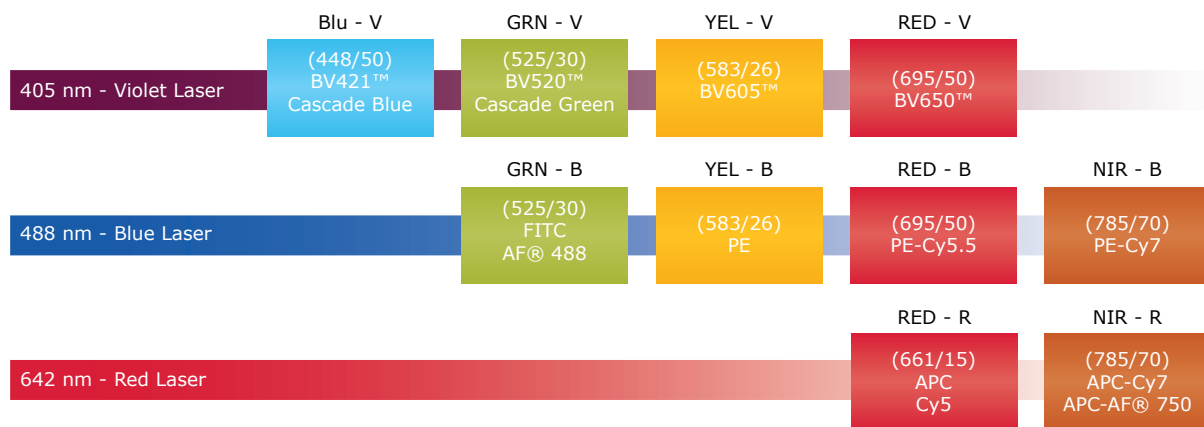10,000 - 1,000,000 cells/mL
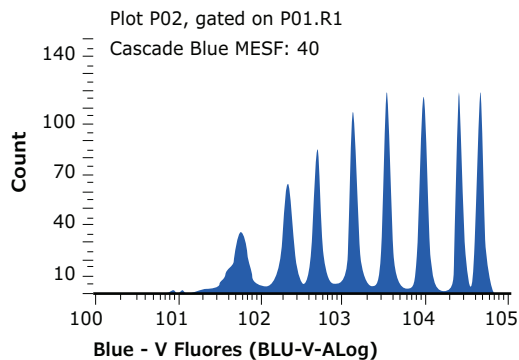
Inside the Guava® easyCyte 12HT systems

How it Works

The Guava® 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 a uniquely proportioned microcapillary flow cell. Forward and side scatter characteristics are detected by photodiode, and fluorophores excited by the violet, blue, or red laser emit signals that are spectrally filtered to resolve up to 10 fluorophores simultaneously.

	Blu - V	GRN - V	YEL - V	RED - V	
405 nm - Violet Laser	(448/50) BV421™ Cascade Blue	(525/30) BV520™ Cascade Green	(583/26) BV605™	(695/50) BV650™	

		GRN - B	YEL - B	RED - B	NIR - B
488 nm - Blue Laser		(525/30) FITC AF® 488	(583/26) PE	(695/50) PE-Cy5.5	(785/70) PE-Cy7

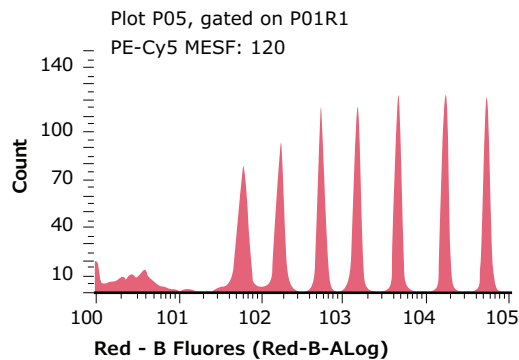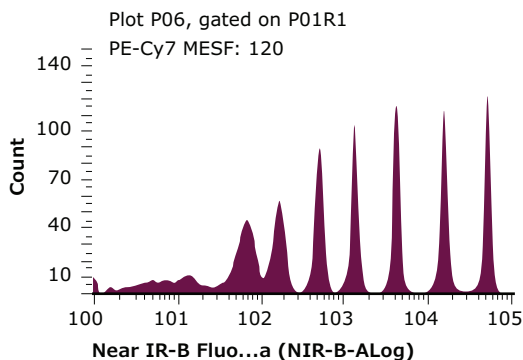|				RED - R	NIR - R
642 nm - Red Laser				(661/15) APC Cy5	(785/70) APC-Cy7 APC-AF® 750

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.
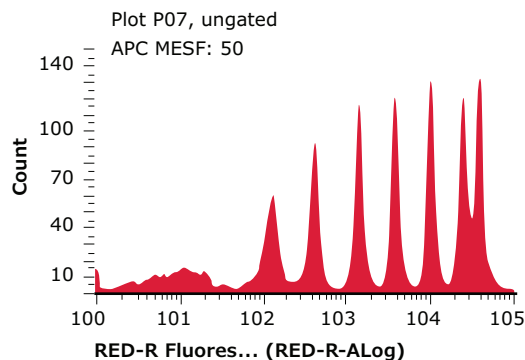
Plot P02, gated on P01.R1
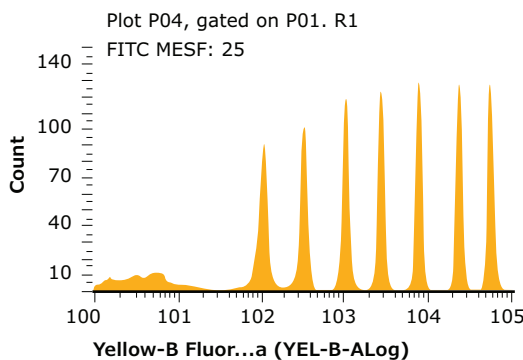Cascade Blue MESF: 40

Blue - V Fluores (BLU-V-ALog)

Blue Fluorescence - 405nm laser

Plot P05, gated on P01R1
PE-Cy5 MESF: 120

Red - B Fluores (Red-B-ALog)

Red Fluorescence - 488nm laser

Plot P06, gated on P01R1
PE-Cy7 MESF: 120

Near IR-B Fluo...a (NIR-B-ALog)

NIR Fluorescence - 488nm laser

Plot P07, ungated
APC MESF: 50

RED-R Fluores... (RED-R-ALog)

Red Fluorescence - 642nm laser

Plot P04, gated on P01. R1
FITC MESF: 25

Yellow-B Fluor...a (YEL-B-ALog)

Yellow Fluorescence - 488nm laser

Plot P03, gated on P01. R1
FITC MESF: 75

Green-B Fluor... (GRN-B-ALog)
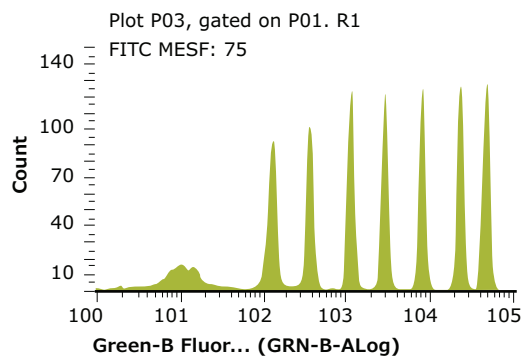
**Green Fluorescence - 488nm laser**

4

Immunological Phenotyping
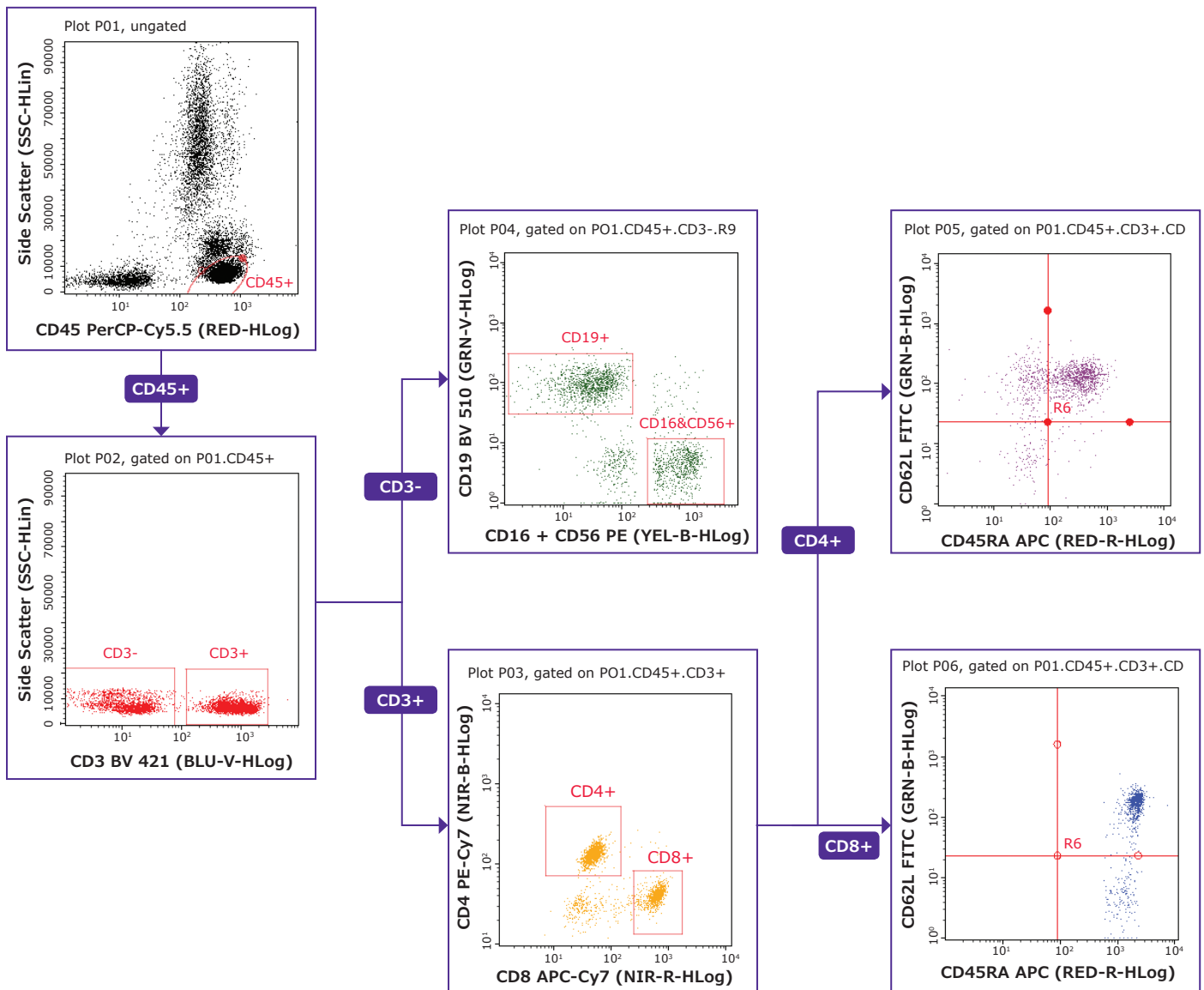
10 µL adult human blood was stained for 20 minutes at room temperature with a cocktail containing anti-CD45 PerCP-Cy5.5, anti-CD3 Brilliant™ Violet 421, anti-CD4 PE-Cy7, anti-CD8 APC-Cy7, anti-CD16+CD56 PE, anti-CD19 Brilliant™ Violet 510, anti-CD45 RA APC, and anti-CD62L FITC. After incubation, cells 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 a 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+56 (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® system includes templates for use with a wide range of MilliporeSigma 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 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.
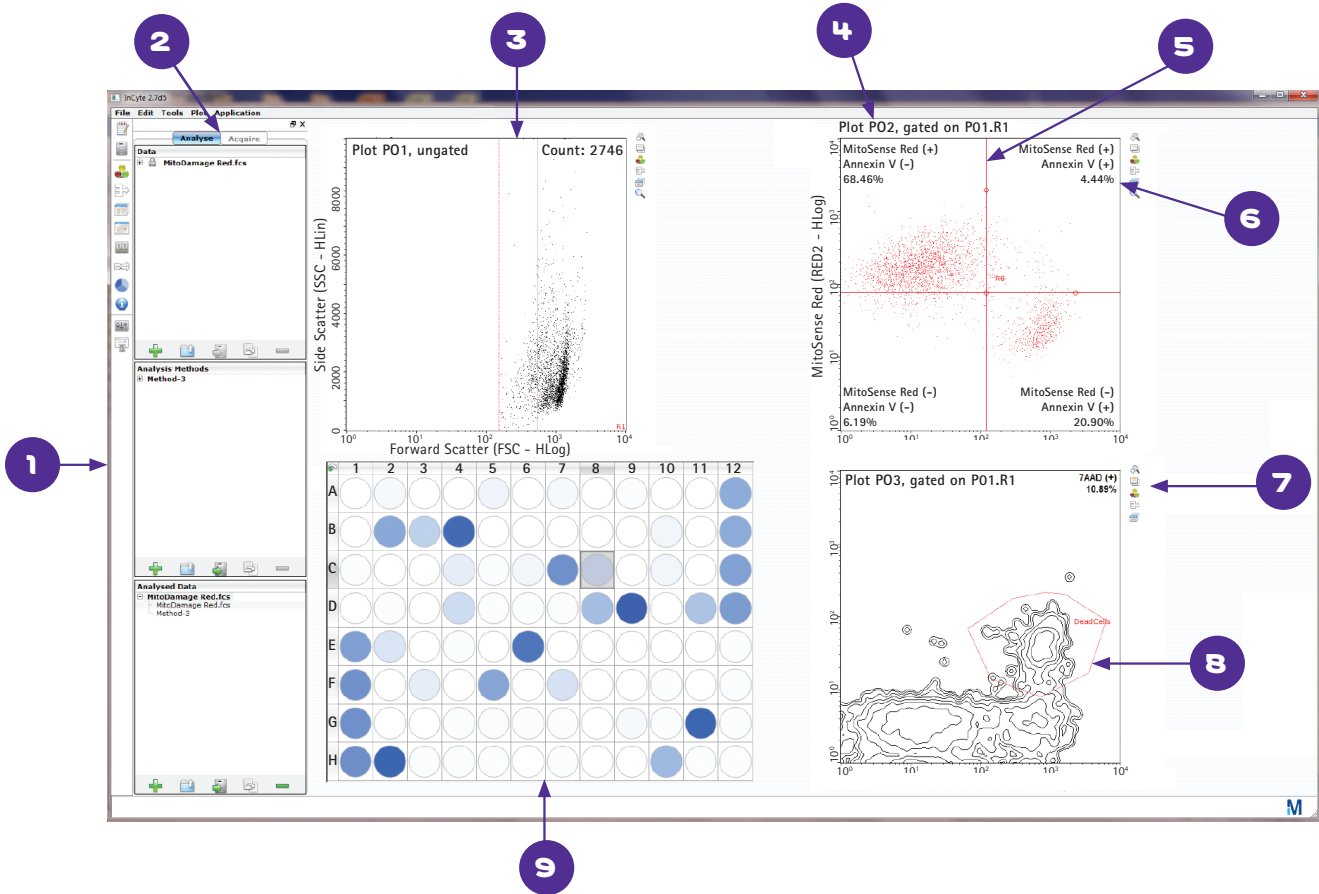

1. Create and apply analysis methods across multiple datasets.
2. Perform compensation during acquisition or analysis or use the automated compensation features.
3. Drag-and-drop gating.
4. View up to 24 plots at once.
5. Refine gates in real time.
6. Default or custom statistics.
7. Multiple plot and 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 MilliporeSigma's MitoDamage, MitoCaspase, or MitoStress kits. Cells were acquired on the Guava® easyCyte system and percent population data were compared in a heat map format using our InCyte™

Software. The InCyte™ heat map function facilitated the rapid identification of compounds inducing positive results, by comparison of all 5 parameters simultaneously as shown in the pie charts above. 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.
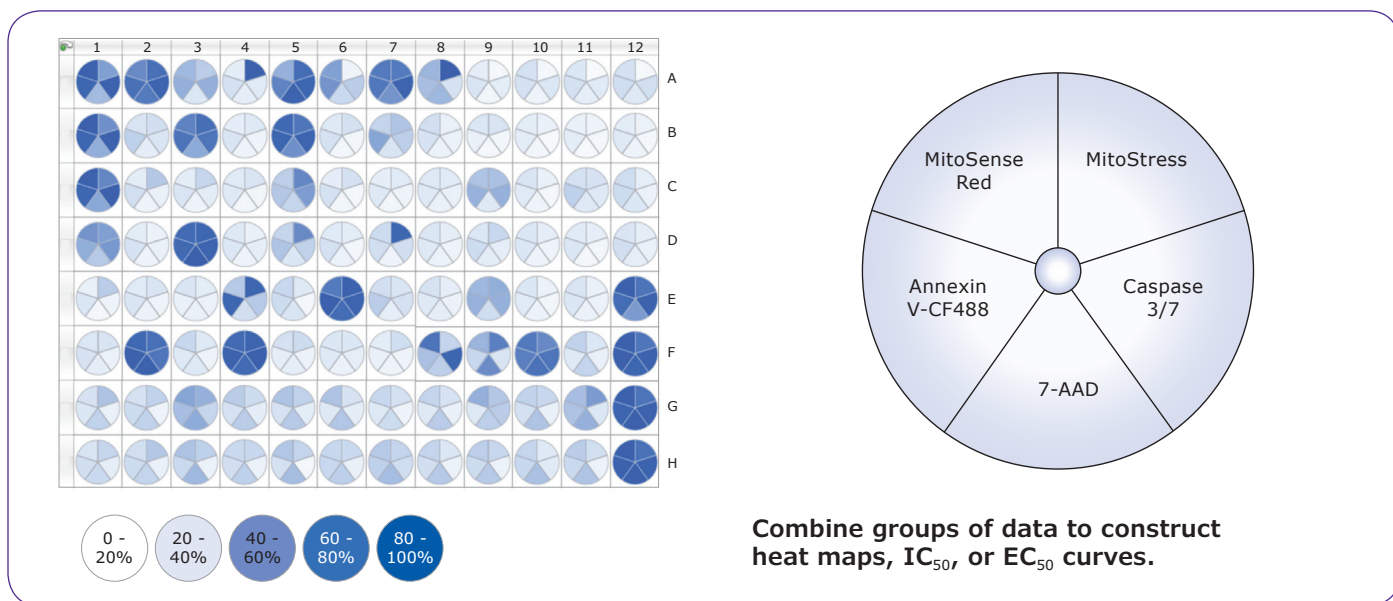
IC_{50} Determination within InCyte™ Software

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.
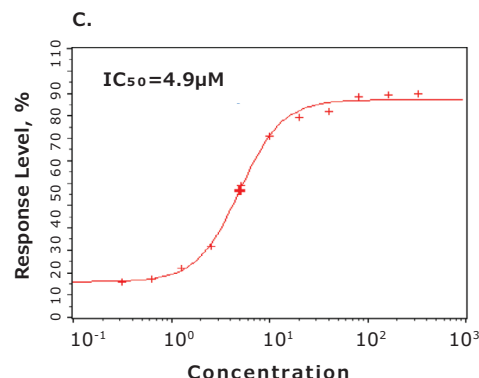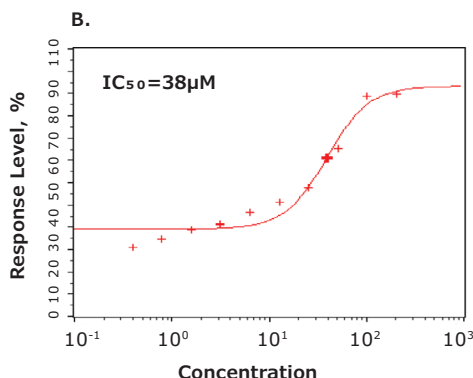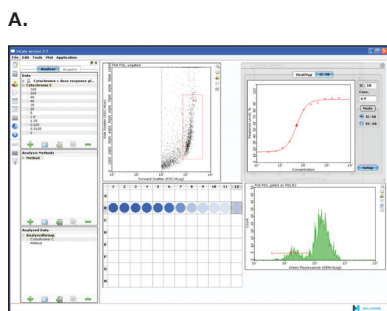
Small Particle Detection

The Guava® 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 means better separation, making gating and identification of dim populations easier. These capabilities may prove particularly useful for researchers analyzing particulates, beads, bacteria or algae.
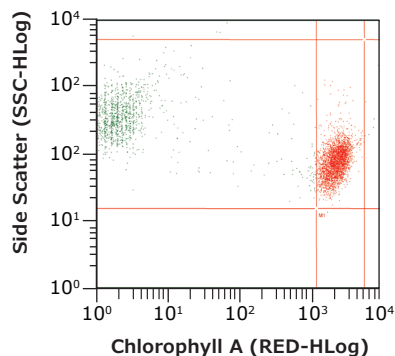
Acquisition of a mixture of beads of known size demonstrates the ability of Guava® easyCyte 12HT instruments to detect and discriminate particles as small as 0.2 μm.
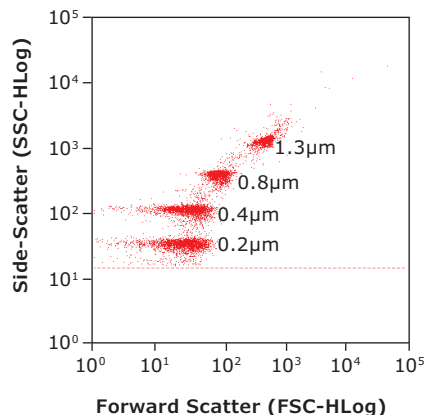
Turning algae into biofuels

Guava® 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.
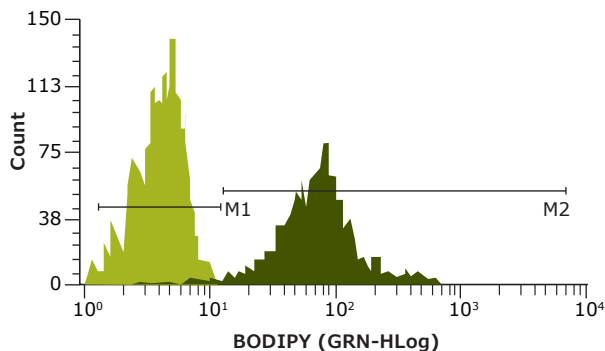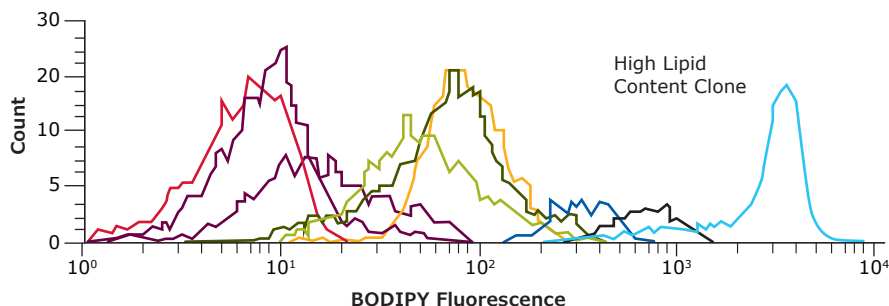
Lipid measurement of chlorophyll A-positive algae. Identification of algal cells containing chlorophyll A; chlorophyll A fluoresces in the red channel (A). Gate applied to select for chlorophyll A-positive cells (B). Histograms showing a wide range of lipid content (as evidenced by BODIPY green fluorescence 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 facilitate fluorescence-based detection of proteins and nucleic acids, and have been validated for use on the Guava® easyCyte instrument platform.

FlowCellect® Flow Cytometry Kits

MilliporeSigma's optimized, turnkey assay kits reduce sample preparation time, minimize assay development and simplify data analysis.

We offer more than 40 FlowCellect® kits optimized for key assays in cell health, immunology and cell signaling.

The FlowCellect® MitoDamage Kit for flow cytometry contains MitoSense Red, a fluorescent cationic dye that accumulates in the mitochondria and is responsive to changes in mitochondrial potential, a hallmark of early apoptosis.

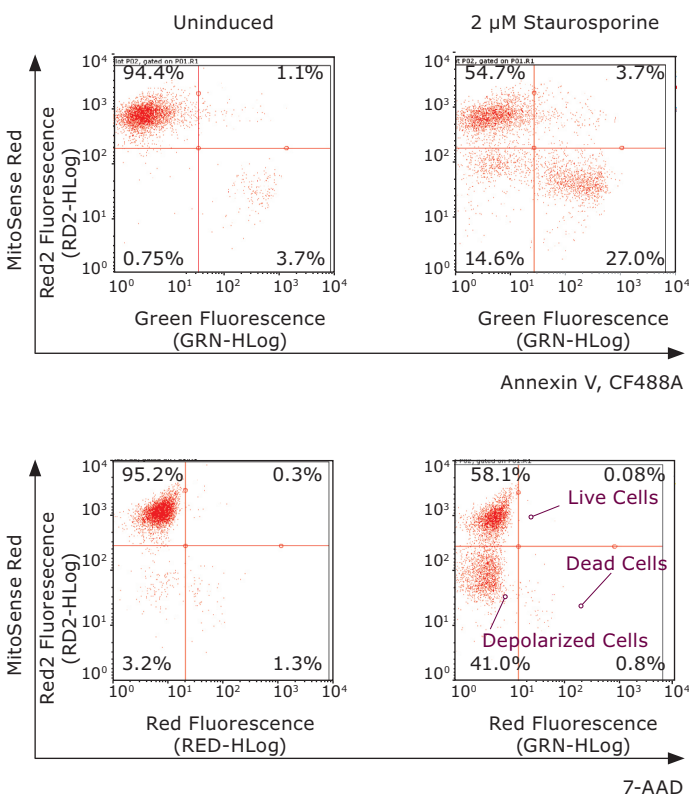Dot plots depicting Jurkat cells treated with multiple inducers and stained using MitoDamage kit. Dot plots of cells treated or not with staurosporine to induce apoptosis and acquired on the Guava® easyCyte 12HT system show percentages of cells positive for MitoSense Red (left). The guavaSoft® MitoDamage module facilitates experiment-level assessment of changes in mitochondrial potential that signal early apoptosis via heat mapping of up to 96 samples.

Fluorescence-conjugated Flow Cytometry Antibodies

Choose from our growing portfolio of over 1500 conjugated antibodies, including antibodies specific to many CD markers and immune signaling targets. With the reliability and quality of Upstate, Chemicon and Calbiochem, MilliporeSigma's conjugated antibodies validated for flow cytometry are available in multiple colors, to enable you to unequivocally discriminate cell subpopulations:

- FITC
- APC
- PE-Cy7
- PerCP-Cy5.5
- PE
- PE-Cy5
- APC-Cy7
- Violet450

All of our flow-validated antibodies come with our 100% performance and satisfaction guarantee.
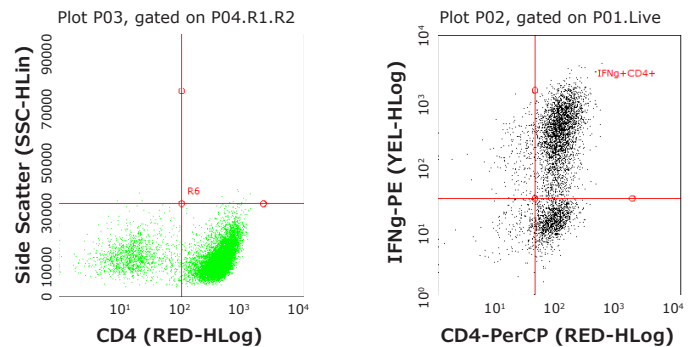
Mouse peripheral blood cells gated on lymphocytes (left) were stained with Milli-Mark® FCMAB244CP5 anti-mouse CD4 (clone GK1.5) PerCP/Cy5.5. CD4+Th1 cells were identified (right) by costaining with FCMAB243P, anti-mouse IFN gamma (clone XMG1.2) PE. Data were analyzed with InCyte™ software on a Guava® easyCyte HT cytometer.

Guava® easyCyte Single Sample Systems

Guava® easyCyte Single Sample System	5	5 HPL	6-2L	8
Catalog No.	0500-5005	0500-5009	0500-5007	0500-5008
Violet (405 nm) Laser				
Blue (488 nm) 50 mW Laser	●		●	
Blue (488 nm) 150 mW Laser		●		●
Green (532 nm) Laser				
Red (642 nm) Laser			●	●
FSC	●	●	●	●
SSC	●	●	●	●
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)	●	●	●	●
Yellow-B (575/25 nm)				
Yellow-B (583/26 nm)	●	●	●	●
Red-B (695/50 nm)	●	●	●	●
NIR-B (785/70 nm)				●
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)			●	●
NIR-R (785/70 nm)				●
Microcapillary Fluidics	●	●	●	●
Direct, Absolute Cell Counts	●	●	●	●
Automation-plate and tubes				
Mixing				
Dell® Laptop	●	●	●	●
InCyte™ Software	●	●	●	●
Digital Signal Processing	●	●	●	●

Guava® easyCyte HT Systems

Guava® easyCyte HT System	5HT	5HT HPL	6HT-2L	8HT	11HT	12HT	BG HT	BGR HT	BGV HT
Catalog No.	0500-4005	0500-4009	0500-4007	0500-4008	0500-4020	0500-4012	0500-4015	0500-4025	0500-4030
Violet (405 nm) Laser					●	●			●
Blue (488 nm) 50 mW Laser	●		●						
Blue (488 nm) 150 mW Laser		●		●	●	●	●	●	●
Green (532 nm) Laser							●	●	●
Red (642 nm) Laser			●	●		●		●	
FSC	●	●	●	●	●	●	●	●	●
SSC	●	●	●	●	●	●	●	●	●
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)	●	●	●	●	●	●			
Yellow-B (575/25 nm)							●	●	●
Yellow-B (583/26 nm)	●	●	●	●	●	●			
Red-B (695/50 nm)	●	●	●	●	●	●	●	●	●
NIR-B (785/70 nm)			●	●	●	●	●	●	●
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)			●	●		●		●	
NIR-R (785/70 nm)				●		●		●	
Microcapillary Fluidics	●	●	●	●	●	●	●	●	●
Direct, Absolute Cell Counts	●	●	●	●	●	●	●	●	●
Automation-plate and tubes	●	●	●	●	●	●	●	●	●
Mixing	●	●	●	●	●	●	●	●	●
Dell® Laptop	●	●	●	●	●	●	●	●	●
InCyte™ Software	●	●	●	●	●	●	●	●	●
Digital Signal Processing	●	●	●	●	●	●	●	●	●

Ordering Information

Description	Cat. No.
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**