Data Sheet

guava easyCyte™ Flow Cytometry Systems

Flexible, Intuitive and Affordable

The guava easyCyte™ flow cytometry systems are easy to use and deliver complete and comprehensive cell analysis—right on your benchtop. The culmination of over a decade of flow cytometry expertise, these instruments consume less sample, generate less waste and are easier to use and maintain than traditional flow cytometers—all while providing the analytical power you need to expand your research horizons.

Single blue (488 nm), dual blue and red (642 nm), or triple blue, red, and violet (405 nm) excitation lasers provide up to 12 simultaneous detection parameters, including 10 fluorescent colors plus forward and side scatter for size and granularity determination. The guava easyCyte™ family also meets your sample throughput needs by offering both single sample and multi-sample processing. The guava easyCyte™ HT instruments provide high throughput analysis with a robotic sample tray that automatically handles a 96-well micro-plate and up to 10 sample tubes, while the guava easyCyte™ systems enable single sample processing with additional cost savings.

Benefits

- Flexible
  - Up to 12 detection parameters
  - Multi-sample or single sample processing
- Easy to Use
  - No sheath fluid required, enabling small samples and low waste
  - Intuitive software
  - Absolute cell counts—determine accurate cell numbers and populations without reference beads
- Affordable
  - Designed and priced for every laboratory and budget

Microcapillary Flow Cytometry

At the heart of every guava easyCyte™ system is a patented, microcapillary flow cell that eliminates the need for sheath fluid and provides absolute cell counts. This translates into less complexity, smaller samples and minimal waste, saving you both time and money. Plus, the flow cell is self-aligning and user-replaceable to reduce downtime and service visits.

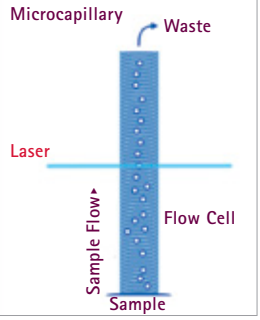
- No laser alignment or sheath fluid required
- Uses smaller sample volume and generates less waste
- Flow cell is user replaceable for minimal downtime
- Aspirates sample directly from the tube

Guava®-Patented microcapillary system

Sheath Fluid:
None

Waste:
< 50 mL/8 hour run

Typical # Cells Per Protocol:
1,000 – 10,000 cells/test

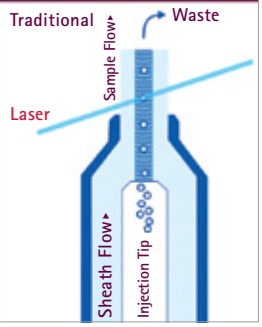


Traditional sheath fluid system

Sheath Fluid:
~10 mL/test

Waste:
8,000 mL per 8 hour run

Typical # Cells Per Protocol:
100,000 – 1,000,000 cells/test

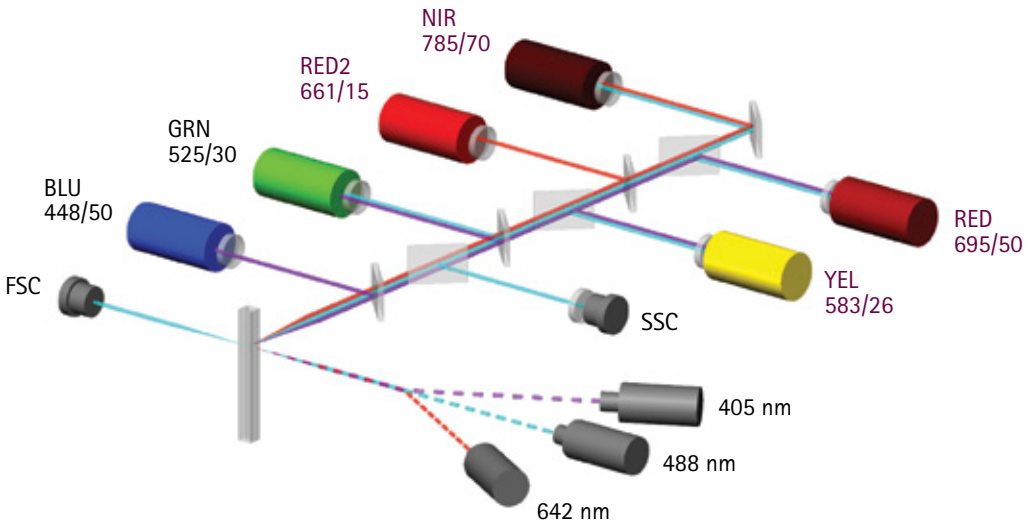


Inside the guava easyCyte™ 12HT and guava easyCyte™ 12 systems

See page 7 for specifications.

How it Works

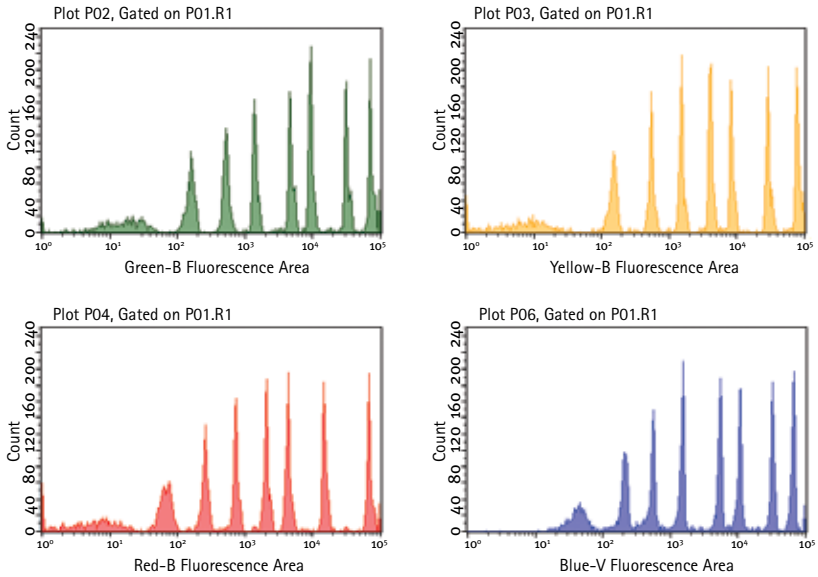
The guava easyCyte™ systems use patented, microcapillary, laser-based technology capable of detecting mammalian and microbial cells and beads. A sample of fluorescently labeled cells is aspirated into a uniquely proportioned microcapillary flow cell. A red, blue or violet laser excites fluorophores, and each cell emits signals that are individually detected by photomultipliers and photodiodes.



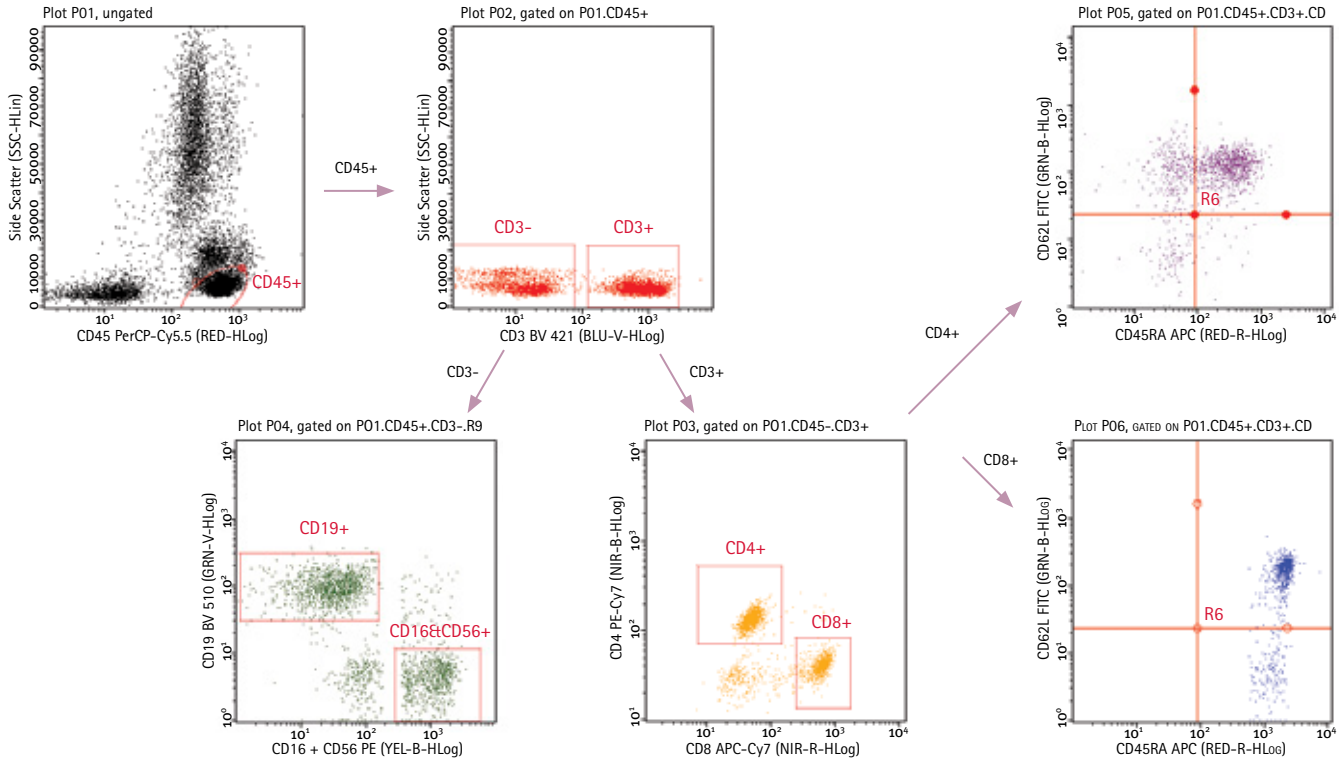
Three-Laser Excitation

The guava easyCyte™ flow cytometers use up to three lasers (488, 642, and 405 nm), to achieve up to 12 simultaneous detection parameters, including 10 fluorescent colors plus forward and side scatter. In the two- and three-laser systems, the lasers overlap spatially and are modulated out of phase at high frequency so that each particle is sampled many times as it travels through the overlapped beams. Modulation is particularly important for identifying dyes which have overlapping emissions, such PE-Cy7 (blue laser excitation) and APC-Cy7 (red laser excitation). Unlike spatially separated beams, modulation eliminates the need for time-delay calibration, simplifying the overall operation of the instrument.

- Up to 12-parameter analysis (10 colors, plus forward and side scatter for size and granularity determination)
- Compatible with commonly used fluorophores and dyes
- Eliminates the need for time-delay calibration



Immunological Phenotyping



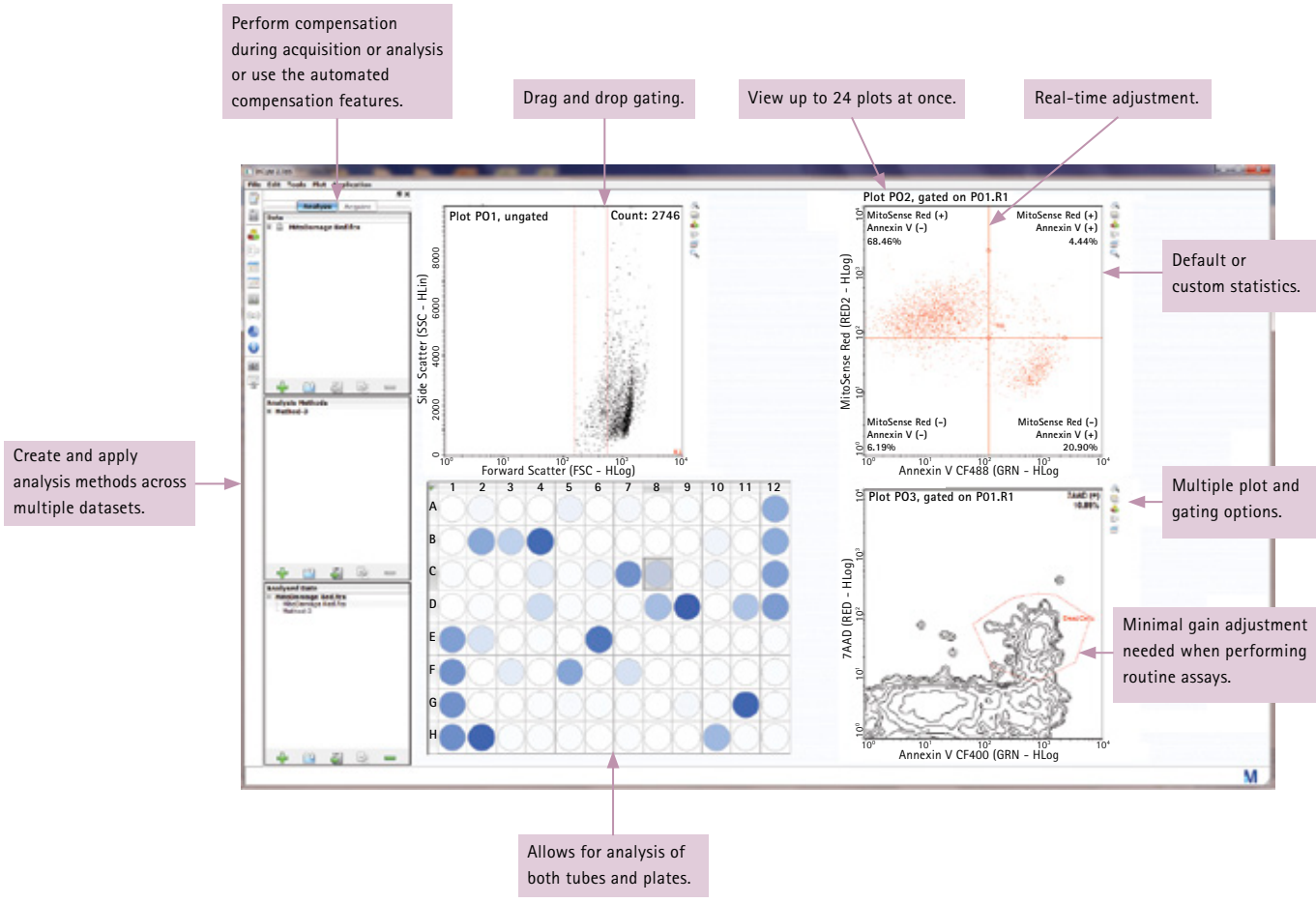
10 µL adult human blood was stained for 20 minutes at room temperature with a cocktail containing anti-CD45 PerCP-Cy5.5, anti-CD3 Brilliant Violet 421, anti-CD4 PE-Cy7, anti-CD8 APC-Cy7, anti-CD16-PE, CD56-PE, anti-CD19 Brilliant Violet 510, anti-CD45 RA APC, and anti-CD62L FITC. After incubation, cells 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. Lymphocyte cells (CD45+) were gated into a SSC vs. CD3 plot. T cells (CD3+ and CD45+) were gated into a plot comparing CD4 and CD8 positive cells. CD4 and CD8 naïve memory cells were further discriminated by evaluating each population in a CD45RA (naïve T cells) vs CD62L (memory T cells). To separate the natural killer (NK) and B cells from the lymphocytes, CD3-negative cells were gated into a plot comparing CD19 (B-cells) and CD16+56 (NK cells). As the figure shows, separation is visible and is comparable to other published data.

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 Merck Millipore flow cytometry kits to simplify your experiments and data collection. Additionally, the guavaSoft™ package includes InCyte™ software, an intuitive open software package for analysis. Results can be exported to spreadsheets or as industry-standard FCS 2.0 or 3.0 files for further analysis. GuavaSoft™ software has 21CFR Part 11 enabling features.

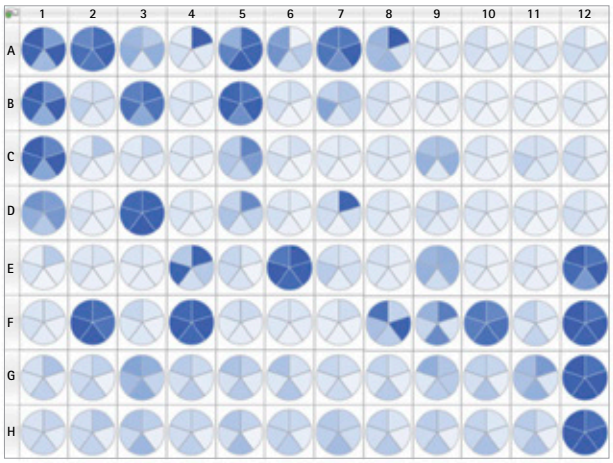
InCyte™ Software: Intuitive

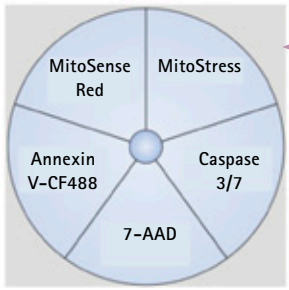
Merck Millipore's InCyte™ software has an intuitive, easy-to-use interface that enables you to focus on data at either the sample or experimental level. The software simplifies setup and analysis of plots with the drag-and-drop features, while automated compensation makes it easy to perform complex, multi-color assays. The instant update feature responds in real time to change analysis conditions for viewing. InCyte™ software allows you to analyze entire plates of data in the time it would previously require to analyze a single sample using the multi-parameter heat mapping function. 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.



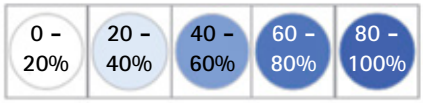
InCyte™ Software Heat Map View

HeLa 24 hours



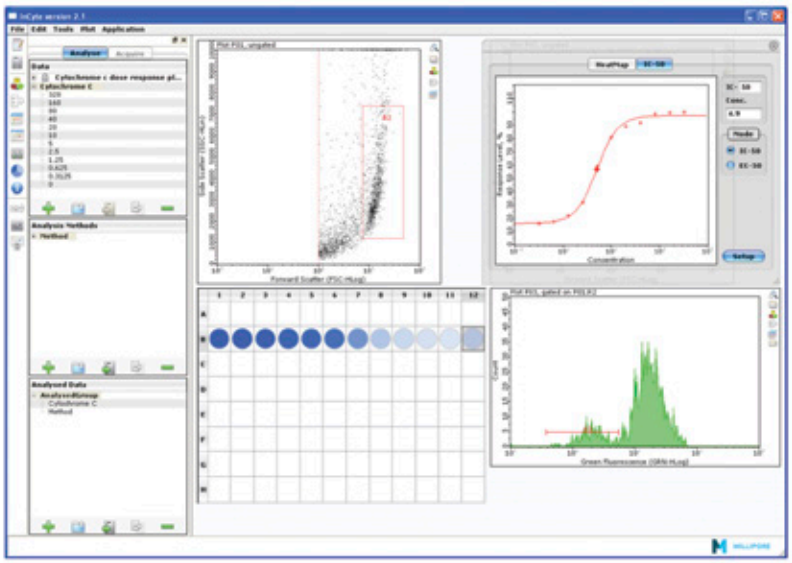


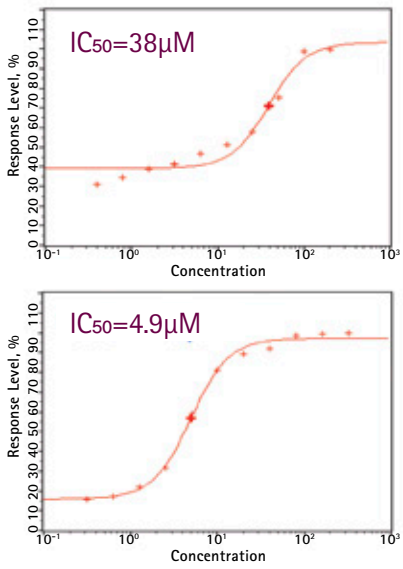
Combine groups of data to construct heat maps, IC_{50}, or EC_{50} curves.



HeLa cells in microtiter plates were treated with multiple cytotoxic compounds for 24 hours. Cells were stained using Merck Millipore's MitoDamage, MitoCaspase, or MitoStress kits. Cells were analyzed on the guava easyCyte™ system and percent population data were compared in a heat map format using Merck Millipore's InCyte™ Software. InCyte™ software allowed for the quick identification of hit compounds and comparison of all 5 parameters simultaneously as shown in the pie charts above. The data above shows the data for the 80 compounds on both cell lines.

IC_{50} Determination within InCyte™ Software





IC_{50} determination using the Cytochrome c Kit and analyzed the built-in IC_{50}/EC_{50} curve fitting feature of InCyte™ software. Cells were analyzed 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 EC_{50} for etoposide. The once-complex task of finding the IC_{50} or EC_{50} for a compound has been made as easy as a few clicks of the mouse.

Anatomy of the guava easyCyte™ Systems

guava easyCyte™ Single Sample System

Number	System Feature Description
1.	Up to 12 simultaneous detection parameters
2.	Microcapillary flow cell
3.	Wash vial
4.	Waste vial
5.	Small footprint saves valuable laboratory space
6.	Single sample loader
7.	Robotic sample tray for 96-well microplate

guava easyCyte™ HT System

guava easyCyte™ System Features

System	easyCyte™ 5	easyCyte™ 5HT	easyCyte™ 6-2L	easyCyte™ 6HT-2L	easyCyte™ 8	easyCyte™ 8HT	easyCyte™ 12	easyCyte™ 12HT
Catalogue No.	0500-5005	0500-4005	0500-5007	0500-4007	0500-5008	0500-4008	0500-5012	0500-4012
Violet (405 nm) Laser							✓	✓
Blue (488 nm) Laser	✓	✓	✓	✓	✓	✓	✓	✓
Red (642 nm) Laser			✓	✓	✓	✓	✓	✓
FSC	✓	✓	✓	✓	✓	✓	✓	✓
SSC	✓	✓	✓	✓	✓	✓	✓	✓
Blue-V (448/50 nm)							✓	✓
Green-V (525/30 nm)							✓	✓
Yellow-V (583/26 nm)							✓	✓
Red-V (695/50 nm)							✓	✓
Green-B (525/30 nm)	✓	✓	✓	✓	✓	✓	✓	✓
Yellow-B (583/26 nm)	✓	✓	✓	✓	✓	✓	✓	✓
Red-B (695/50 nm)	✓	✓	✓	✓	✓	✓	✓	✓
NIR-B (785/70 nm)					✓	✓	✓	✓
Red-R (661/15 nm)			✓	✓	✓	✓	✓	✓
NIR-R (785/70 nm)					✓	✓	✓	✓
Microcapillary Fluidics	✓	✓	✓	✓	✓	✓	✓	✓
Direct, Absolute Cell Counts	✓	✓	✓	✓	✓	✓	✓	✓
Automation-plate and tubes		✓		✓		✓		✓
Mixing		✓		✓		✓		✓
Dell® Laptop	✓	✓	✓	✓	✓	✓	✓	✓
InCyte™ Software	✓	✓	✓	✓	✓	✓	✓	✓
Digital Signal Processing	✓	✓	✓	✓	✓	✓	✓	✓

Spectral Bands and Applicable Dyes

For a complete list please see: **www.merckmillipore.com/guava**

Blue (448/50 nm)	Green (525/30 nm)	Yellow (583/26 nm)	Red (661/15 nm)	Red (695/50 nm)	NIR (785/70 nm)
DAPI	Alexa Fluor® 430	Pacific Orange™ dye	Alexa Fluor® 647	eFluor® 650	PE-Alexa Fluor® 750
Hoescht 33258	Pacific Green	Brilliant Violet™ dye	APC	Brilliant Violet™ dye	Propidium Iodide
Alexa Fluor® 405	Brilliant Violet™ dye	Qdot® 565	CD647	Qdot® 705	PE-Cy-7
Marnia Blue® dye	Qdot® 525	Qdot® 585	Cy5	7-AAD	APC-Cy7
Pacific Blue™ dye	Qdot® 545	Alexa® 555	Qdot® 655	Propidium Iodide	APC-Alexa Fluor® 750
Cascade Blue® dye	FITC	Alexa® 568	DRAQ5	PE-Alexa Fluor® 647	
LIVE/DEAD® Violet	GFP	CF555	Ethidium Bromide	PE-Alexa Fluor® 700	
DyLight® 405	Alexa Fluor® 488	PE-B, PE-R	Ethidium Homodimer	PE-Cy5	
eFluor® 450	CF488	Qdot® 565	SYTOX® Red	PE-Cy5.5	
Zombie Aqua™ dye	FAM	Acridine Orange	TO-PRO®-3	PE-Texas Red® dye	
Brilliant Violet™ dye	Qdot® 525	dsRED	TOTO-3	PerCP	
	Acridine Orange	Ethidium Bromide	DilC1(5)	PerCP-Cy5.5	
	SYBR® Green	SYBR® Green	MitoSense Red	Qdot® 705	
	SYTOX Green®	SYTOX® Orange	BODIPY 650/665	DRAQ5	
	JC-1	JC-1		Ethidium Bromide	
	BODIPY-FL	TMRE		Ethidium Homodimer	
	Calcein	TRMR		LDS-751	
	CFSE	CFSE		Nile Red	
	Oregon Green® dye	Nile Red			
	405 nm Laser	488 nm Laser	642 nm Laser		

Ordering Information

Description	Catalogue No.
Single Sampling Instruments	
guava easyCyte™ 5 Base System	0500-5005
guava easyCyte™ 6-2L Base System	0500-5007
guava easyCyte™ 8 Base System	0500-5008
guava easyCyte™ 12 Base System	0500-5012
High Throughput Sampling Instruments	
guava easyCyte™ 5HT Base System	0500-4005
guava easyCyte™ 6HT-2L Base System	0500-4007
guava easyCyte™ 8HT Base System	0500-4008
guava easyCyte™ 12HT Base System	0500-4012
Software Modules for guava easyCyte™ Systems	
guavaSoft™ Software Package (includes InCyte™, Express Pro, Express Plus and guavaSuite™ modules)	0500-4115
InCyte™ Software Module	0500-4120
guava® Express Pro Software Module	0500-4125
guavaSuite™ Software Modules	0500-4130

Flow Cytometry Kits

Merck Millipore's FlowCellect® kits and Milli-Mark® conjugated primary antibodies are fully optimized for fast, easy, and accurate multiparametric flow cytometry. We've taken the guesswork out of assay development so you can focus on your results. Assay components are highly stable so you can run samples sequentially or as a large group, without compromising results.

The combination of user friendly software with optimized, turnkey assay kits provides many benefits, including reduced sample preparation time, shortened assay development, low-cost multiplexing capability without the need for compensation, and ease of detection. Or you can build your own assay with any compatible flow cytometry reagents, and use automated compensation following acquisition.

Learn more at: **www.merckmillipore.com/guava**

Service Plans for guava easyCyte™ Systems

Maintain your instrument's great performance through regularly scheduled maintenance. Choose from a variety of service programs to ensure optimal value from your instrument purchase.

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