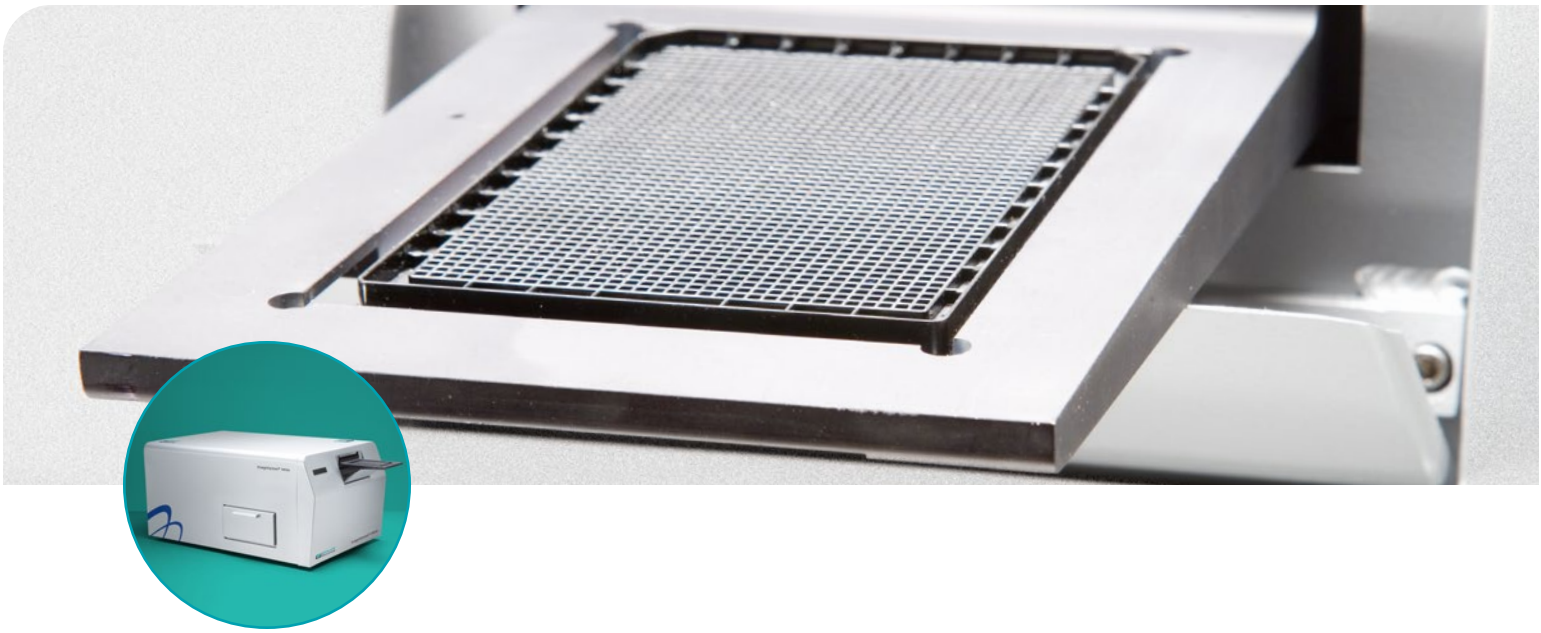
Molecular Devices

ImageXpress Velos Laser Scanning Cytometer

FAST AND SIMPLE CELLULAR ANALYSIS



- HIGH-SPEED IMAGING
- LASER-BASED ILLUMINATION
- WHOLE WELL IMAGING
- CELL-BY-CELL IMAGING
- WHOLE ORGANISM IMAGING

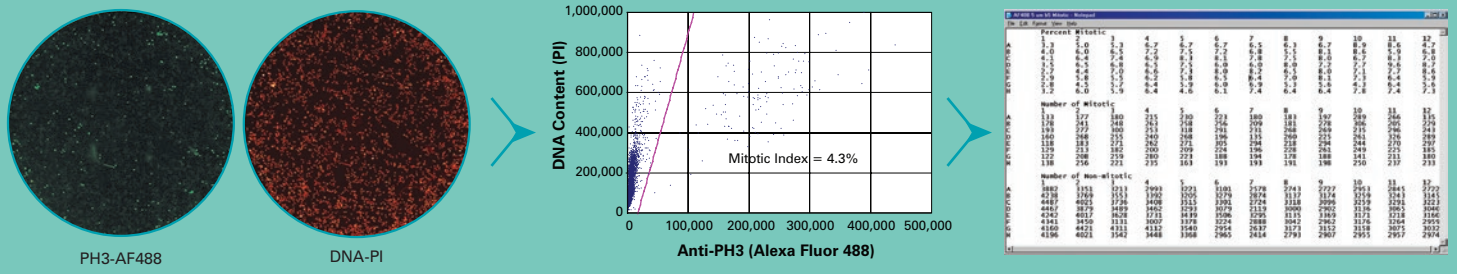
Molecular Devices offers a laser scanning imaging system with proprietary collection optics for high-content cell-based assays, colony morphology studies, and multiplexed spot and bead arrays. The versatile benchtop instrument provides speed and flexibility not available with microscopes or confocal scanners. The ImageXpress® Velos Laser Scnning Cytometer is the first fluorescence laser scanning system to provide imaging in fluorescence anisotropy. A label-free light scatter imaging mode allows interrogation of non-fluorescent objects (*e.g.*, cells and cell colonies) where exogenous dyes are unacceptable.

Plate readers measure the total signal for the whole well and suffer variability when sample signals are not uniformly distributed. Microscopes image a region with a limited field-of-view, restricted by an objective lens. Refocusing is required for imaging an entire well with multiple exposures at multiple filter wheel positions. The ImageXpress Velos Cytometer provides the best of both worlds with true microplate imaging. The entire well, regardless of density, is imaged at micron resolution in four colors simultaneously. The ImageXpress Velos Cytometer also uniquely rejects background fluorescence allowing homogeneous "no wash" assays.

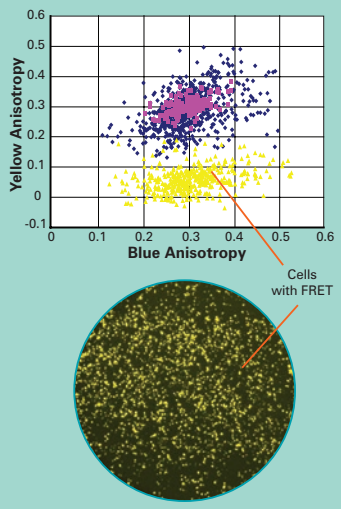
Well images are automatically processed in real-time to produce cell-by-cell data. (See mitotic index assay data on the following page.) Assay results are then calculated from the cell data. Acquisition and analysis occurs simultaneously at high speed to provide the user full plate results in the time it takes to scan.

Performance and Applications

Two-Color Cellular Analysis for Mitotic Index

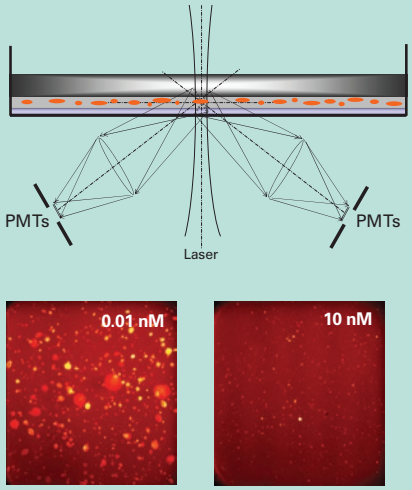


Live Cell Protein-Protein Interaction by FRET



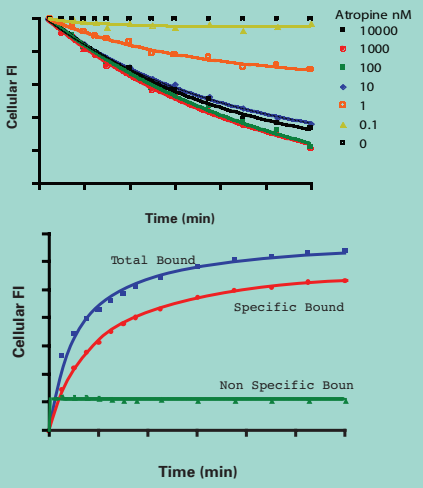
Real-time, two-color anisotropy data from the ImageXpress Velos Cytometer.

Large Depth Of Field



The ImageXpress Velos Cytometer's large depth of field allows imaging in 3D cell cultures.

GPCR On and Off Rates



Data from live cell surface receptor binding assays run on the ImageXpress Velos Cytometer.

ROBUST PERFORMANCE

The ImageXpress Velos Cytometer has been designed to provide robust assay performance, flexibility in sample format, and wide fluorophore compatibility. A patented confined detection region provides high sample signals with efficient background rejection. Object-by-object identification and enumeration allows cell sub-population analysis such as live vs. dead, or cells in mitosis. Homogeneous cell-based, microarray, and multiplexed bead binding assays become easy to develop and run as primary screens. For the first time, high throughput, two-dimensional anisotropy can provide novel information on the interactions of relevant biomolecules and structures. The instrument accepts microplates with industry standard Society of Biomolecular Sciences formats or microscope slides. Scanning speeds allow total cycle times of 4-5 minutes per plate at 5 micron sampling regardless of density.

Beyond the applications proven and under development, Molecular Devices invites you to contact us to discuss your specific application needs. We offer full customer support in assay development, validation, and automation. We are customer driven and look forward to seeing how the ImageXpress Velos Cytometer meets your assay needs.

APPLICATIONS

- → Cell based assays
  - ◦ Homogeneous antibody detection
  - ◦ Cytotox (ToxCount) assay
  - ◦ Mitotic index
  - ◦ Multiplexed phospho-protein detection
  - ◦ Proliferation
  - ◦ Apoptosis
  - ◦ Cell cycle
  - ◦ Protein-protein interactions
  - ◦ Whole organism (zebrafish)
- → FRET by anisotropy
- → Hybridoma & Stem cell colonies in 3D media
- → Spot & Bead Arrays in plates

Data Acquisition and Analysis Overview

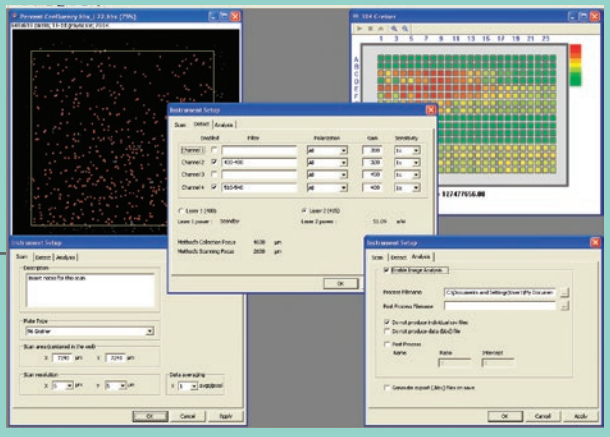
Simultaneously Acquire & Process Assay Data

Acquire Well Images

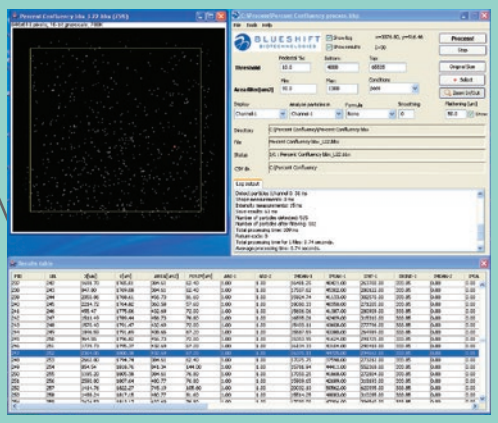
Identify and Enumerate Cells in Each Well

Generate Well Result

Assay Result
Whole plate image data (.bbd)
Cell-by-cell data for each well (.csv)
Plate results (.txt)
Flow cytometry standard (.fcs)



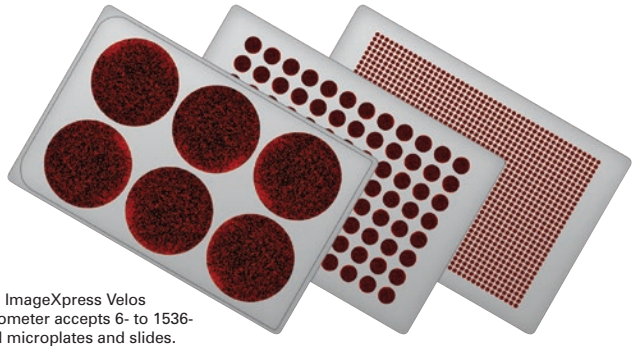
The instrument control software for the ImageXpress Velos Cytometer sets basic scanning parameters such as channel selection, PMT gain, resolution and sample format. It allows well selection and viewing of the scan results.



The analysis software included with the ImageXpress Velos Cytometer finds objects, enumerates them, and calculates intensity and morphology parameters. Results are displayed in a comma separated variable table.

ImageXpress Velos Cytometer Microplate Tray

Image the Whole Well at Micron Resolution



The ImageXpress Velos Cytometer accepts 6- to 1536-well microplates and slides.

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TECHNICAL SPECIFICATIONS

The ImageXpress Velos SL System is a single-laser system from the selection of laser lines offered. The ImageXpress Velos DL System is a dual-line laser system consisting of any two lines from the selection of laser lines offered.

Laser lines and output powers

Laser line selectable through software

- 405 nm 50 mW
- 440 nm 40 mW
- 488 nm 25 or 50 mW
- 532 nm 50 mW
- 640 nm 40 mW

Detection modes

User selectable through software

- Fluorescence
- Anisotropy (polarized fluorescence)
- Enhanced laser scatter

Detectors

Four independently adjustable photomultiplier tubes

- 4 channel (color) intensity
- 2 channel (color) anisotropy

Digital acquisition system

- 40 MHz sampling rate
- 14 bit digitization
- Dual digital signal processing

Sample format

- Standard multi-well plate (clear bottom)
- Microscope slides with adaptor

Dimensions

(in.): 18.5 (W) x 29 (D) x 15 (H)
(cm): 47 (W) x 73.7 (D) x 38.1 (H)

Windows-based PC environment

- Dual-core processor
- 4GB DRAM
- 500GB Hard Drive

Integrated data analysis package

Automation-ready platforms

- Caliper Twister II robot
- Thermo Scientific CRS Polara* robot
- Velocity11 VWorks* robot

* Via third-party software

ORDERING INFORMATION

Contact your Molecular Devices sales representative for configuration options.

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