bennubio®

THIS CHANGES EVERYTHING

Introducing the **Velocyt®**

by BennuBio

The Velocyt is a revolutionary analytical instrument combining the imaging power of microscopy with the speed of flow cytometry for high throughput and rapid analysis of intact 3D multicellular models and other large particles

IMAGINE
THE POSSIBILITIES

The Velocyt®

A novel, multi-stream cytometer for high throughput analysis of a wide range 3D multicellular models and other large particles.

With features such as high volumetric rates, multiplex image analysis, automated total sample recovery and an easy-to-use design, the Velocyt ensures data confidence, provides deeper biological insight, and simplifies the 3D multicellular workflow. Expand, enhance, and accelerate your research program by:

ANALYZING A WIDE VARIETY OF SAMPLE TYPES

MULTICELLULAR MODELS

- Organoids
- Spheroids
- c. elegans
- iPSC aggregates

OTHER LARGE SAMPLES

- Cell Clusters
- Cardiomyocytes
- Algal Colonies
- Microcarriers

ADVANCING MULTIPLE DISCIPLINES

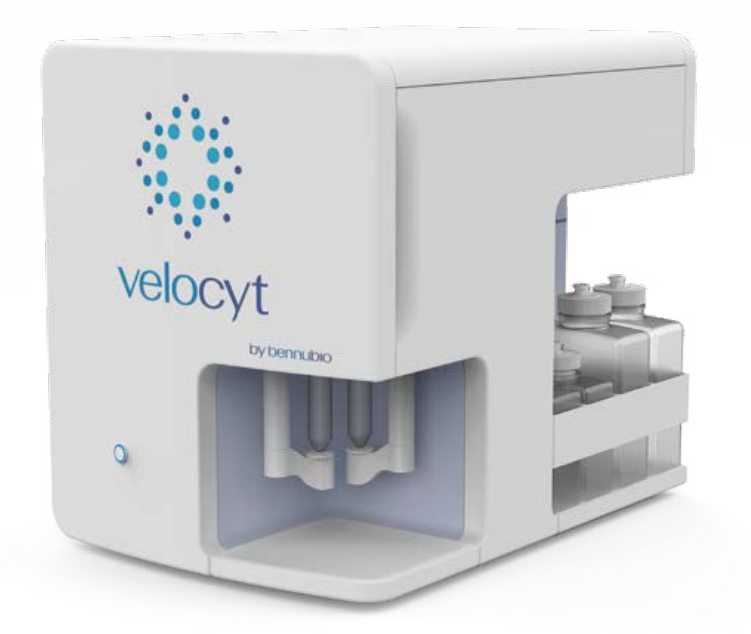
Immuno-oncology

Drug Discovery

Personalized & Regenerative Medicine

Process Monitoring & Quality Control

EXPANDING
CAPABILITES



Analyze a wide range of particle sizes
measure particles up to 300 µm in diameter and 1000 µm in length

High Throughput Analysis
image 100s to 1000s of 3D particles in less than 5 minutes

Extremely Gentle Processing
3D multicellular models remain intact and viable after analysis

Total Sample Recovery
Samples returned to user unadulterated for additional downstream assays or kinetic and QC studies

Generate Images and Flow Cytometry Data
Measure size, morphology, scatter and fluorescence and display data as images or in traditional flow cytometry plots

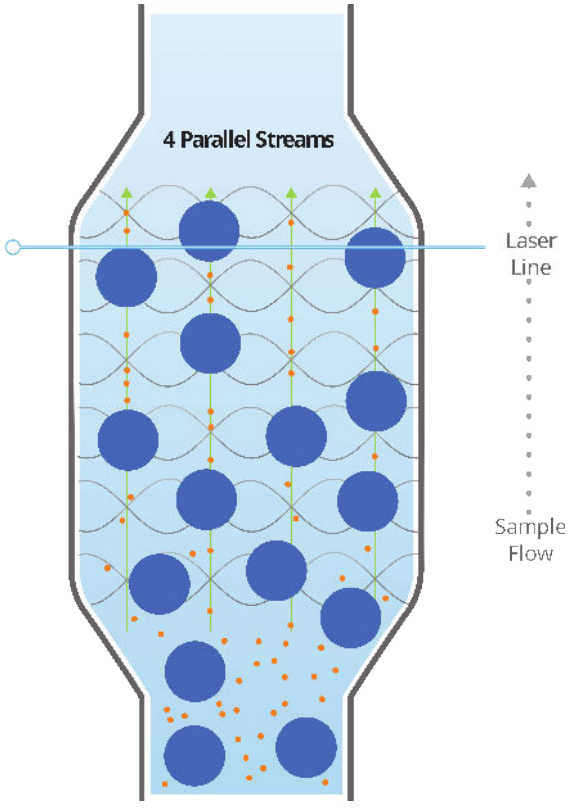
ACOUSTIC FOCUSING
A REVOLUTIONARY DIFFERENCE

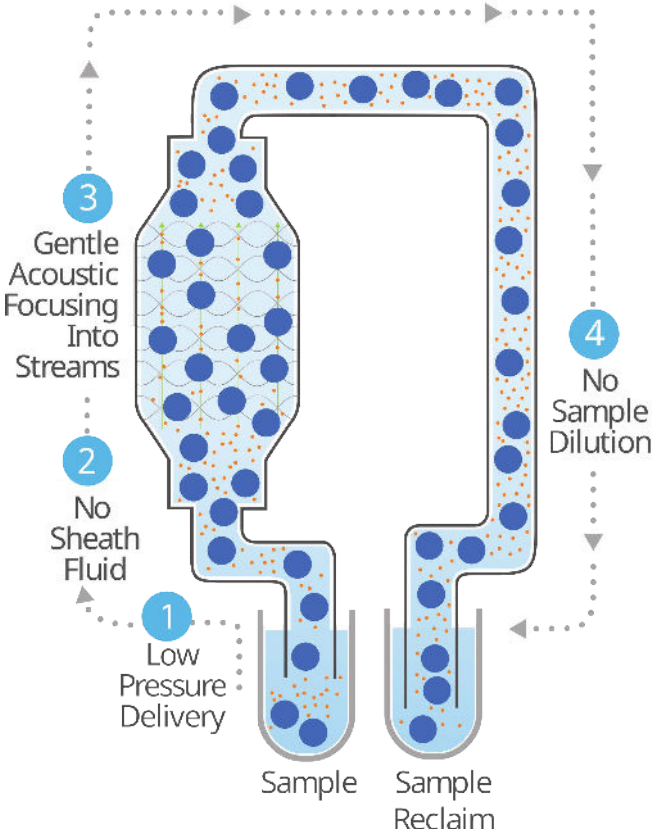
Multistream Acoustic Focusing

Our powerful, yet simple technology deploys multiple parallel focused streams created by standing acoustic waves. The novel flow cell geometry provides gentle, large particle focusing with high volumetric acquisition rates all without the clogs that hamper traditional cytometers.

Analyze large intact 3D multicellular models and other large particles

Increased events provides greater statistical power and data confidence



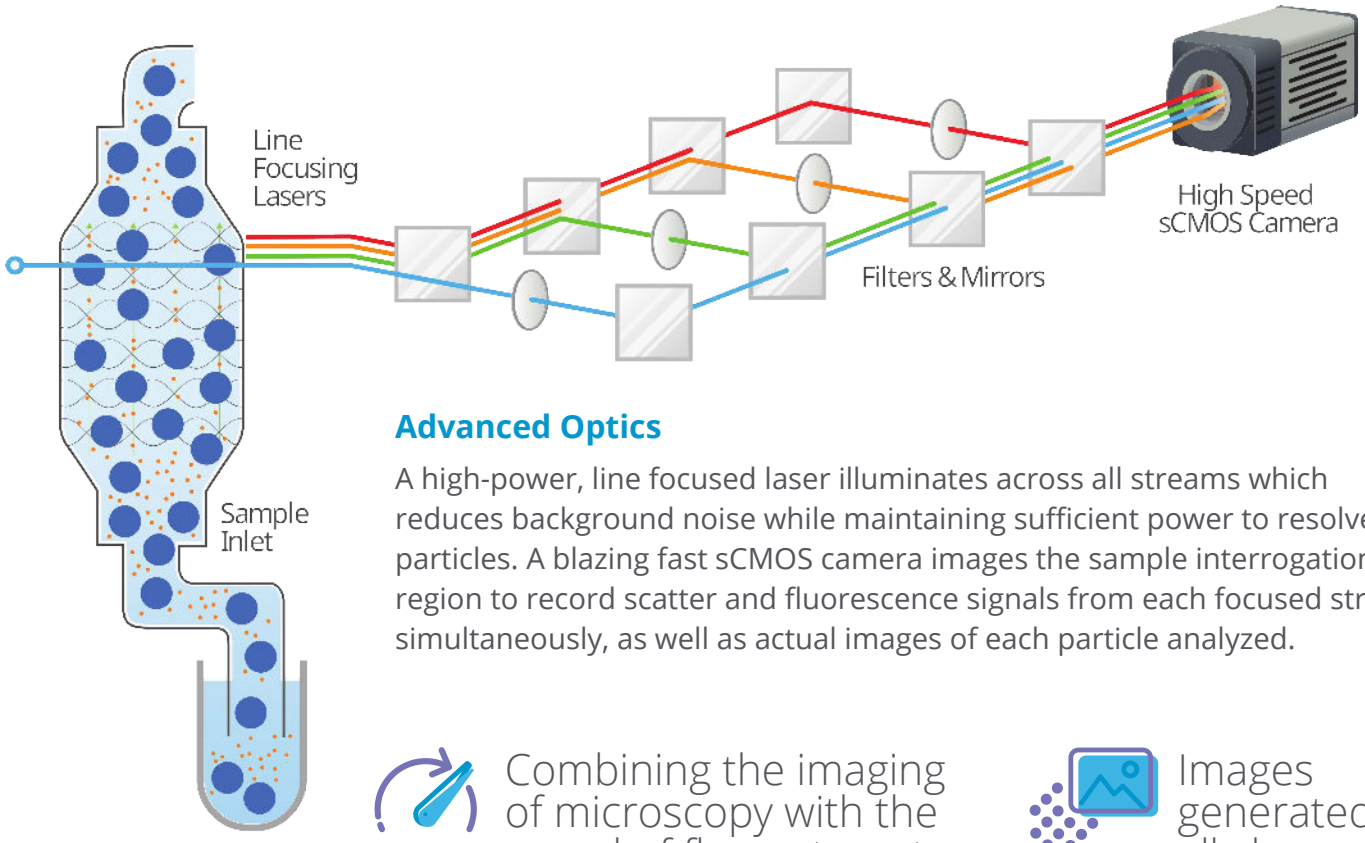


Simplified Fluidics

Acoustic focusing eliminates sheath fluid and combined with low pressure sample delivery, enables complete recovery of unaltered sample. Precious 3D samples are intact and viable after analysis for further, downstream analysis saving time and money

Samples returned, unaltered & viable

High sample recovery



Advanced Optics

A high-power, line focused laser illuminates across all streams which reduces background noise while maintaining sufficient power to resolve dim particles. A blazing fast sCMOS camera images the sample interrogation region to record scatter and fluorescence signals from each focused stream simultaneously, as well as actual images of each particle analyzed.

Combining the imaging of microscopy with the speed of flow cytometry

Images generated for all channels

TRANSFORMING DATA TO KNOWELDGE

Instrument Operation & Experimental Setup

Intuitive and easy to use software for simple experimental and data acquisition setup. User friendly interface for instrument startup, calibration, QC, and automated instrument maintenance.

kytos

Acquisition and Imaging Software

User friendly, powerful software

Customize, set up, and run experiments

Automated, one click access to FCS Express software

Provides Morphological Data

Signal Extraction & Visualization

Advanced data analytics allow users to organize and manage large sets of data efficiently.

VeloView provides morphological information not found on traditional flow cytometer software packages. With a single click, data is ready for analysis in FCS Express™

Image Analysis

increase biological insight with event imaging tools not found with traditional cytometers. VeloView's imaging analysis toolbox dramatically broadens research applications to include rapid and large-scale measurements of size and morphology. Florescent imaging easily identifies specific cell types and immune cell penetrance into 3D objects.

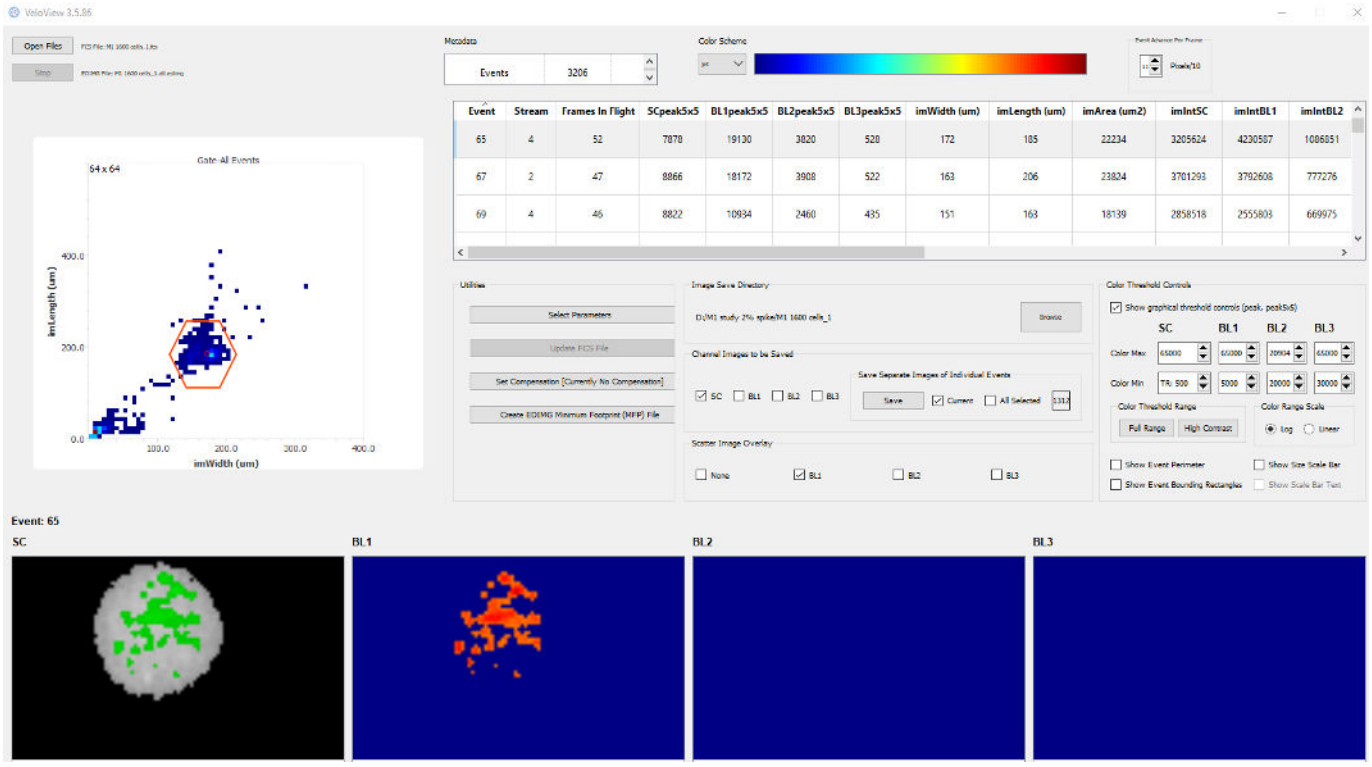
Export data in FCS File Formats

View your images to gain additional insight into your biology

^Licenses to De Novo™ software included in Velocyt instrument package

VeloView image analysis software is integrated into Kytos allowing the user to rapidly visualize data, and analyze size, morphology and fluorescence of individual particles.

A



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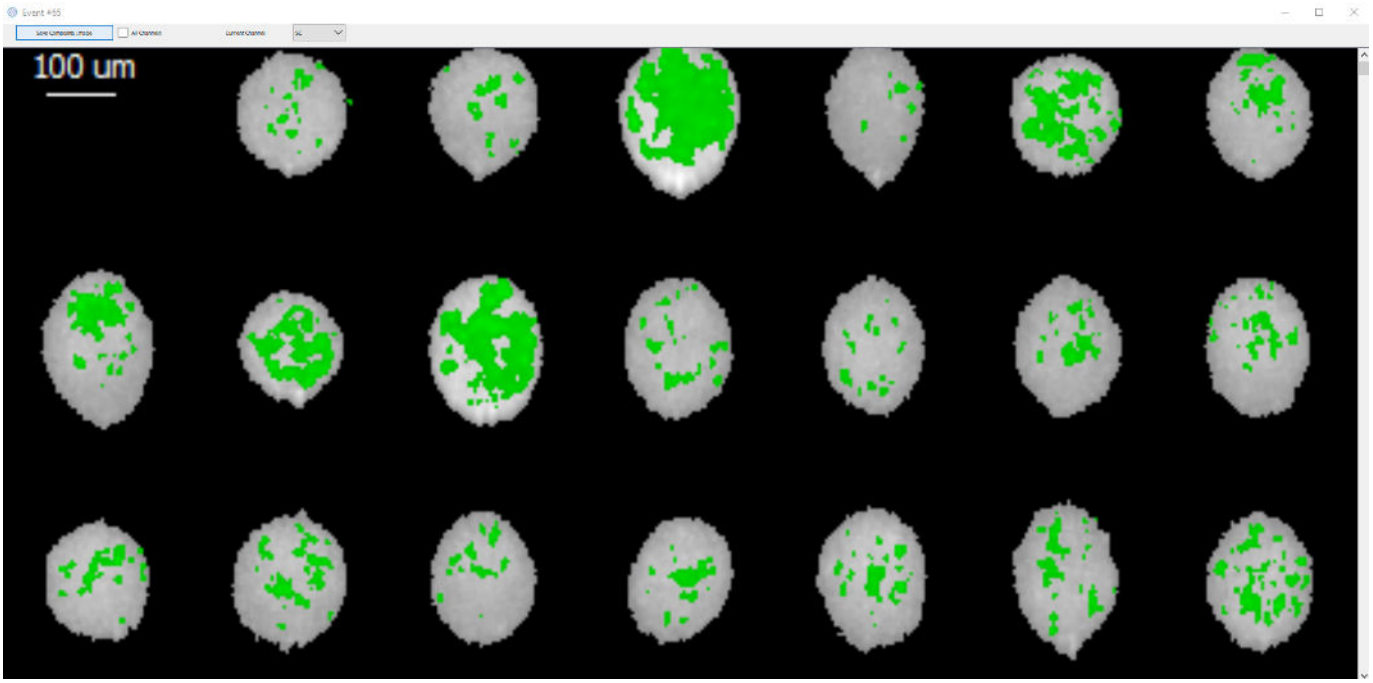


A. VeloView software allows the user to generate image galleries by gating specific populations based on size, fluorescence, or scatter. Data parameters on individual event is as easy as clicking on an image. Color compensation and fluorescent thresholding can be performed in VeloView.

B. Partial image gallery showing spheroids generated with a small percentage of labeled fibroblasts. Full image galleries can be saved. Files can also be exported for additional analysis in third party software such as Cell Profiler.

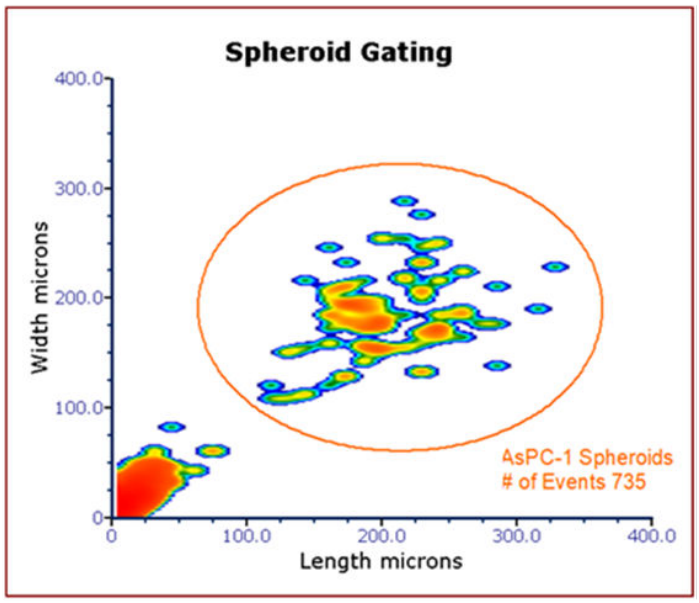
Export data in FCS File Formats

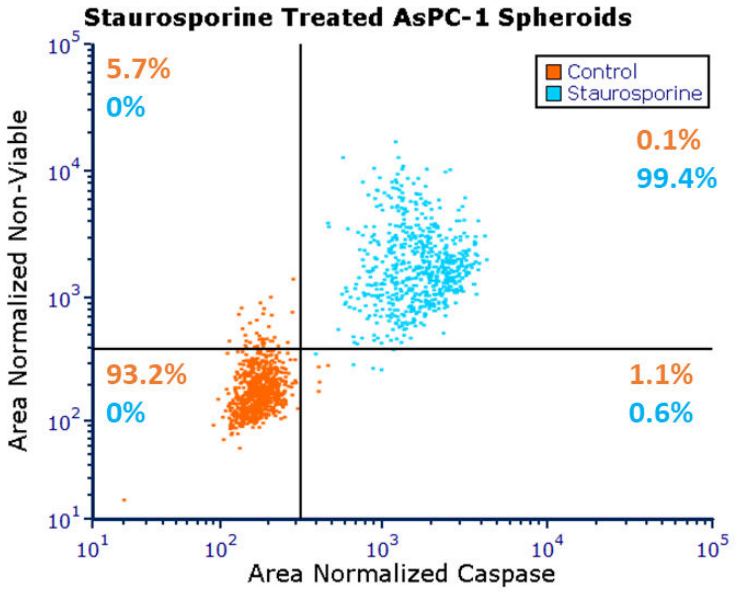
Analyzed data using traditional flow cytometry plots

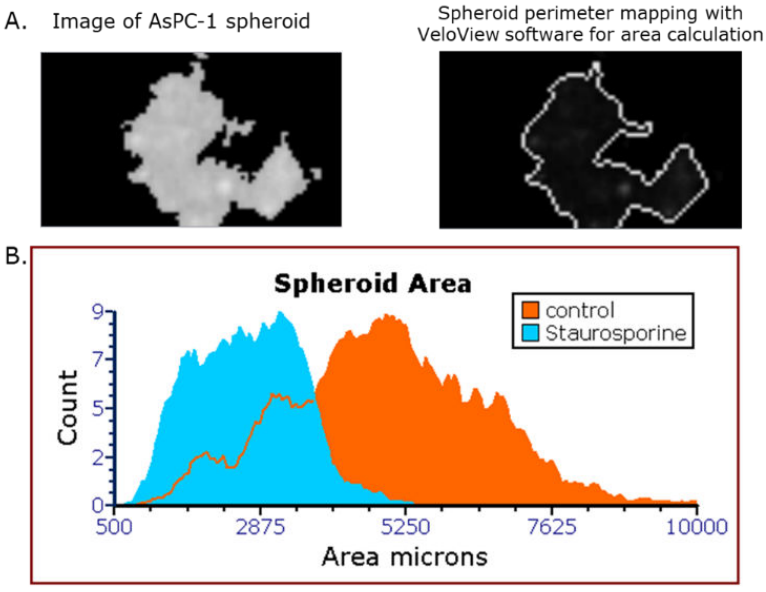
TRUE 3D MULTICELLULAR MODEL ANALYSIS

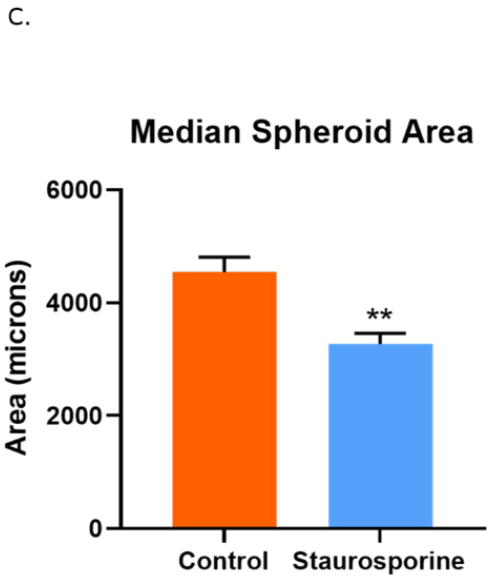
WITH FLOW CYTOMETRY SOFTWARE

All image parameters generated in Kytos software including integrated fluorescent measurements and size normalized fluorescent measurements are saved as FCS 3.0 file formats.

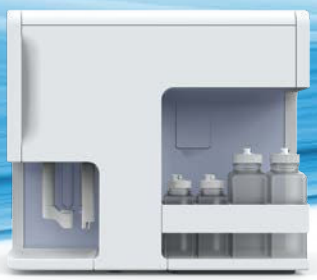








HCT116 spheroids were treated with staurosporine and the data was acquired on the Velocyt. Data generated in Kytos software was imported into FCS Express. Density and dot plots, histograms and bar graphs including statistical analysis were generated. A licence for FCS Express is included with Velocyt purchase.



KEY SPECIFICATIONS^

Key Features of the Velocyt:

- Flow based system capable of analyzing intact 3D models and live *C. elgans* up to 300 microns in width and 1000 microns in length
- Images in all fluorescent channels along with morphological measurements
- High throughput analysis with flow rates at 3mL/minute to image 100s-1000s of particles in 5 minutes
- Automated total sample recovery for additional analysis or kinetic studies
- On board VeloView image analysis software

Optics:

- **Laser:** 488 nm: 1 W (20mW to 1W)
- Scatter = 460 / 60 nm
- BL1 = 525 / 30 nm
- BL2 = 590 / 36 nm
- BL3 = 675 / 70 nm
- **Detector:** sCMOS camera

Performance:

- **FITC:** <70 molecules of equivalent soluble fluorochrome (MESF-FITC)
- **PE:** <40 molecules of equivalent soluble fluorochrome (MESF-PE)
- **PE-Cy5**: <65 molecules of equivalent soluble fluorochrome (MESF-PE-Cy5)

BennuBio Inc. has greatly expanded the power of cytometry by developing instruments that can use the flow cytometry paradigm to analyze samples regardless of particle size or sample volume. These instruments simplify workflows to save time and money. Our gentle approach retains sample viability and morphology while analyzing at considerably faster rates. Thereby, improving diagnostics, decreasing time to markets and accelerating fundamental health science research.

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^ for a detailed list of specifications, please refer to the complete specification list