Cellometer Auto 2000 Cell Viability
Optimized Analysis of Primary Cells

Features of the Cellometer Auto 2000

- Dual Fluorescence and bright field imaging: imaging of both live and dead cells in heterogeneous samples.
- All-in-One Design: Simple, space-saving design; robust instrument manufactured in the U.S., no maintenance.
- User- Friendly Touch Screen and Assay Selector: Enhanced user operability, easy submission, quick operation.
- Fast Results: Obtain cell images, counts, size measurements, and viability calculations in 30 seconds.
- Small Sample Size: Only 20 µl of sample.
- Broad Dynamic Range: Measurable concentration range of 1 x 10^5 to 1 x 10^7 cells/mL using Nexcelom’s patent-pending de-clustering function.
- Many Compatible Dyes: Trypan blue, AO, PI, EB, 7AAD, AO/PI, AO/EB, Calcein AM, CFDA, Calcein-AM/PI, CFDA/PI.

Advantages of Cellometer Image Cytometry

- Cell Imaging: Viable, cell morphology and counted live/dead cells.
- Export cell images for presentations and publications.
- Pattern Recognition Software: Accurately count cells in clumps.
- Count irregular shaped cells.
- Eliminate debris from cell counts.
- Differentiate cells based on size.
- Automated Data Management: Prevent assay and automated reports.
- Archive sample images and pull out results.
- Maintenance-Free System: Dispense counting chambers = no wash steps.
- No required instrument maintenance.

Learn why thousands of users, including the top ten pharmaceutical companies, trust Cellometer.

On-Line Demonstrations are completed in just 20 to 25 minutes and provide an overview of how Cellometer works using existing images of cells that interest you.

On-Site Demonstrations are a convenient way to test a Cellometer system for a specific application. An experienced Applications Specialist will arrive at your lab for a hands-on demonstration to show you how your lab can benefit from using the Cellometer Auto 2000. Cellometer can enhance your workflow. Technical specialists can be an excellent help to introduce Cellometer systems to a lab group or collaboration in different laboratories within an organization. A trained biologist will discuss and demonstrate the capabilities and advantages of Cellometer image cytometry.

Contact us at 978.327.5340 or info@nexcelom.com today to schedule a free demonstration or technical seminar.

For more information, visit www.nexcelom.com.

Contact us at Nexcelom Bioscience LLC, Lawrence, MA 01843, USA.
Phone: 978.327.5340 Fax: 978.327.5341 Email: info@nexcelom.com

www.nexcelom.com/products

Cellometer Cell Counters, Cell Analysis Systems & Image Cytometry

Nexcelom offers a wide range of Cellometer systems developed and optimized for specific applications and cell types.

- Cellometry for Primary Cells
- Cellometry for Yeast
- Cellometry for Cell Line
- Cellometry for Platelets
- Cellometry for Algae
- Cellometry for PBMCs
- Cellometry for PBMCs

PBMcs
Splenocytes
Monocytes
and Other Primary Cells
Advantages of Cellometer Image Cytometry

- Cell Imaging
  - Verify cell morphology and counted live/dead cells
  - Export cell images for presentations and publications
- Pattern Recognition Software
  - Accurately count cells in clumps
  - Detect irregular-shaped cells
  - Differentiate cells based on size
- Automated Data Management
  - Pre-set assays and automated reports
  - Archive sample images and auto-save results
- Maintenance-Free System
  - Disposable counting chambers – no wash steps
  - No required instrument maintenance

Features of the Cellometer Auto 2000

Dual Fluorescence and Bright Field Imaging: imaging of both live and dead cells in heterogeneous samples

All-in-One Design: simple, space-saving design; robust instrument manufactured in the U.S.; no maintenance

User-Friendly Touch Screen and Assay Selector: enhanced user experience; touchpad interface, intuitive, easy-to-use

Fast Results: obtain cell images, counts, size measurements, and viability calculations in 30 seconds

Small Sample Size: only 20 µl of sample

Broad Dynamic Range: measurable concentration range of 1 x 10^3 to 1 x 10^7 cells using Nexcelom’s patent-pending de-clustering function

Many Compatible Dyes: AO/EB, Calcein AM, CFDA, Calcein AM/PI, CFDA/PI

Simple, space-saving design; robust instrument manufactured in the U.S.; no maintenance

All-in-One Design: simple, space-saving design; robust instrument manufactured in the U.S.; no maintenance

Maintenance-Free System

Disposable counting chambers – no wash steps

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PBMCS

Stem Cells

Splenocytes

Monocytes and Other Primary Cells
Primary Cell Analysis

Accurate concentrations and % viability for primary cells (PBMCs, stem cells, splenocytes, neural cells, and more)

Analysis of Cells from Heterogeneous Samples

- Whole Blood
- Peripheral Blood
- Cord Blood
- Bone Marrow

Nucleated Cell Concentration & Viability

Evaluate cord blood and bone marrow samples

GFP Transfection Efficiency & Viability

Quickly and easily monitor GFP, YFP, and dYFP transfections

Analysis of Clumpy & Irregular-Shaped Cells

Nexcelom’s exclusive pattern-recognition software enables accurate analysis of >98% of mammalian cell types

Proven Performance in Many Research Areas

- Clinical Immunology: PBMCs
- Regenerative Medicine: Stem Cells
- Transplantation: Nucleated Cells
- Vaccine Development: Splenocytes
- Oncology: Cell Lines
- Basic Research: Primary Cells / Cell Lines

My colleague and I purchased a Cellometer Auto 2000 cell counter and have been using it. It has allowed us to work more efficiently and significantly reduce our cell counts from both fresh whole blood and bone marrow samples. The Cellometer Auto 2000 is also the only instrument that can provide cell viability percentages for primary cells such as PBMCs, splenocytes, and stem cells in samples containing dead cells and unwanted non-nucleated cell types including red blood cells.

Why isn’t trypan blue recommended for viability analysis of primary cells?

Trypan blue dye loại and stains all cells with a compromised membrane, including both nucleated and non-nucleated cells. Nucleated cell viability, fluorescent nucleated cell typing, and red blood cell typing are required.

Dual-fluorescence viability, using acridine orange (AO) and propidium iodide (PI), is the recommended method for accurate viability analysis of primary cells such as PBMCs, splenocytes, and stem cells. PI permeability to live and dead cells and stains all nucleated cells to generate green fluorescence. AO enters dead cells with compromised membranes and stains all dead nucleated cells to generate red fluorescence.

Because nucleated mammalian red blood cells do not contain nuclei, only live and dead mononuclear cells produce a blue-green fluorescence signal. There is no reason to pipet dead blood cells, saving time and eliminating an extra sample preparation step.

Feasibility of the Cellometer Auto 2000 Cell Viability Counter

- One-Step Cell Viability
- Total Nucleated Blood Cells
- Viability
- Concentration & Viability
- Primary Splenocyte Viability
- Accurate Viability Counters for the Presence of Red Blood Cells
- One Step Cell Viability & Viability
- Assay

Figure 1: Table of results for cell concentration.

<table>
<thead>
<tr>
<th>Sample</th>
<th>N Value</th>
<th>Average Live Cell Count</th>
<th>% Viability</th>
<th>CV of Concentration</th>
<th>CV of Viability</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4</td>
<td>1.04E+04</td>
<td>22.7</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>2.20E+05</td>
<td>57.3</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>4.00E+05</td>
<td>77.5</td>
<td>7%</td>
<td>7%</td>
</tr>
</tbody>
</table>

Figure 2: Table of results for cell viability.

The results show the viability of the Cellometer Auto 2000 instrument in assessing the viability of Jurkat cells using PI, trypan blue, and hydroxylation assays. These measurements were performed for each sample. The viability average was calculated and plotted. The results show the viability and accuracy of the Cellometer Auto 2000 in measuring cell concentration and viability of mammalian cells.
Primary Cell Analysis

Accurate concentration and % viability for primary cells. (PBMCs, stem cells, splenocytes, neural cells, and more)

Analysis of Cells from Heterogeneous Samples

Whole Blood
Peripheral Blood
Cord Blood
Bone Marrow

Nucleated Cell Concentration & Viability
Evaluate cord blood and bone marrow samples

GFP Transfection Efficiency & Viability
Quickly and easily monitor DNA, RNA, and siRNA transfection

Live / Dead Cell Concentration using AO / PI
Dual-Fluorescence for Primary Cell Viability in Heterogeneous Samples

Concentration (cells/ml)
Sample N Value
0.00E+00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00
0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00

Average Live Cell Concentration % Viability CV of Concentration CV of Viability
A 4 4.20E+06 91.1 10% 2%
B 4 1.06E+06 22.7 7% 1%
C 4 3.27E+06 57.5 7% 7%

Dual-Fluorescence Viability, using acridine orange (AO) and propidium iodide (PI), is the recommended method for accurate viability analysis of primary cells, such as PBMCs, splenocytes, and stem cells. In samples containing debris and unwanted non-nucleated cell types including red blood cells, acridine orange (AO) and propidium iodide (PI) are nucleic staining (nucleic acid binding) dyes. AO is permeable to live and dead cells and stains all nucleated cells to generate green fluorescence. PI enters dead cells with compromised membranes and stains all dead nucleated cells to generate red fluorescence.

Because mature mammalian red blood cells do not contain nuclei, only live and dead mononuclear cells produce a fluorescent signal. There is no need to lyse red blood cells, saving time and eliminating an extra sample preparation step.

My colleague and I purchased a Cellometer Auto 2000 recently and are using it now. It has outstanding results, including high sensitivity for PBMCs from both fresh whole blood and from frozen samples. The Cellometer Auto has made it much easier to get cell numbers and viability percentage for our in-house preparations such as for in vitro and human longevity, Inc.

The %CV at each concentration was below 10%.

The results indicate the accuracy of the Cellometer Auto 2000 instrument in assessing the viability of Jurkat cells using PI staining. The %CVs at each concentration were below 10%. This data set was taken on a concentration series of primary mouse splenocytes.

The %CVs at each concentration were below 10%. This data set was taken on a concentration series of primary mouse splenocytes.

The Cellometer Auto 2000 is a non-invasive cell concentration and viability counter that can measure viability in one step. It eliminates the need for time-consuming counting and viability steps. It provides accurate concentration and % viability for primary cells, such as PBMCs, splenocytes, and stem cells. The Cellometer Auto 2000 uses a dual-fluorescence method that allows for simultaneous measurement of viability and concentration. This makes it ideal for research and clinical applications where accurate cell counting and viability data are critical.

Performance of the Cellometer Auto 2000 Cell Viability Counter

Sample N Value Average Live Cell Concentration % Viability CV of Concentration CV of Viability
A 4 8.20E+06 75.7 7% 7%
B 4 2.00E+06 37.5 7% 7%
C 4 4.20E+06 91.1 7% 7%

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Stem Cell Analysis

Accurate concentration and % viability for stem cells. (PBMCs, stem cells, splenocytes, neural cells, and more)

Transplantation

Insert Counting

Regenerative Medicine

Diameter in 30 seconds!

concentration, Trypan blue or PI viability, and mean fluorescent cell images, easily.

Cell Line Analysis

Automatically capture fluorescent cell images, either.

Types

enables accurate analysis of >98% of mammalian cell types.

Transfection

Quickly and easily monitor DNA, RNA, and siRNA transfection.

GFP Transfection Efficiency & Viability

Evaluate cord blood and bone marrow samples.

Nucleated Cell Concentration & Viability

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**Primary Cell Analysis**

Accurate concentration and % viability for primary cells. (PMBCs, stem cells, splenocytes, neural cells, and more)

**Analysis of Cells from Heterogeneous Samples**

- Whole Blood
- Peripheral Blood
- Cord Blood
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**Nucleated Cell Concentration & Viability**

Evaluate cord blood and bone marrow samples

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Quickly and easily monitor GFP, RNA, and siRNA

**Live / Dead Cell Concentration using AO / PI**

**Dead Cells**

**Live Cells**

**Concentration & Viability**

**One-Step Cell Count & Total Nucleated Blood Cells**

**Presence of Red Blood Cells**

**Accurate PBMC Viability Concentration & Viability**

**Dual-Fluorescence Viability Analysis**

Using acridine orange (AO) and propidium iodide (PI). It is recommended for accurate viability analysis of primary cells, such as PBMCs, splenocytes and stem cells. In samples containing debris and unwanted non-nucleated cell types including red blood cells.

**Primary Spincycle**

Accurate PBMC Count in the Presence of Red Blood Cells

**Accurate HNC Count in the Presence of Red Blood Cells**

**One-Step Nucleated Cell Count & Viability**

**Cellometer Auto 2000 Cell Viability Counter for Primary Cells from Nexcelom Bioscience**

**FEATURES**

- Touch Screen
- Image for Data Verification
- Body Fat and Import Assays
- Cell Size Histogram

**Performance of the Cellometer Auto 2000 Cell Viability Counter**

The %CV at each concentration was below 10%. The %CV of each concentration was below 10%. This data was taken on a concentration series of primary mouse splenocytes.

**Dual-Fluorescence for Primary Cell Viability in Heterogeneous Samples**

Why isn't trypan blue recommended for viability analysis of primary cells?

Trypan blue dye wets and stains all cells with a compromised membrane, including both nucleated and non-nucleated cells, and stains all dead and viable nucleated cells, facilitating our work greatly. We routinely process PBMCs from both fresh whole blood and from frozen stock. The Cellometer has made it much easier to get cell numbers and viability percentages for use in downstream applications such as IVS and Elispot.

**Proven Performance in Many Research Areas**

- Clinical Immunology: PBMCs
- Regenerative Medicine: Stem Cells
- Transplantation: Nucleated Cells
- Vaccine Development: Splenocytes
- Oncology: Cell Lines
- Basic Research: Primary Cells, Cell Lines

**How It Works**

- Pipette 20µL
- Insert Counting Chamber
- Select Assay & Click Count
- Get Results

**Assays**

- Trypan blue dye
- Acridine orange (AO)
- Propidium iodide (PI)
- Trypan blue dye and acridine orange (AO) / propidium iodide (PI)
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