

Sources of variation in cell counting and how to avoid them.

Considerations for consistent data and workflow improvement

From sample collection and preparation to media transfer and data acquisition, cell counting is a multi-step process that must be fit-for-purpose to ensure accuracy and consistency. Any changes to vessels, dilution steps, or cell counting methods can lead to mismatched counts and inconsistent data. When planning the method and selecting instrumentation for cell counting, several factors must be considered.

1. All sample collection and preparation elements must be specified and followed

- I. Define preparation steps, dilution ratios, and mixing strategies
- II. Define collection and thawing times
- III. Specify dye protocols for Trypan blue versus AO/PI



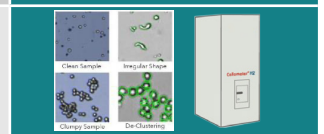
2. Proper transfer of cells into counting vessels

- I. Use the appropriate type of vessel (slide, cup, cassette, drop, etc.)
- II. Note the type of pipette for future reference and ensure calibration is in date



3. Data acquisition and analysis must be performed on a capable instrument

- I. Instrument software and hardware must have the ability to identify specified cells
- II. Identification must dismiss unwanted cells and debris



4. Data output should be easy to obtain and provided in a usable format

- I. Cell calculation processes must be pre-defined and consistently used for accurate data



The International Organization for Standardization (ISO) has published cell counting standards to serve as practical guides for evaluating and analyzing cell counting and viability. Revvity scientists can assist with understanding the use of ISO Cell Counting Standards and collaborate with customers to analyze new cell types, validate cell-based assays, and improve cell counting performance and consistency.

Revvity cell counting solutions

The Revvity product range includes cell viability counters, high-throughput automated image cytometry workstations, reagents, slides, and other cell imaging, quantification, and cell-based analysis products. Revvity's instruments include the Cellometer™, Cellaca™, and the Celigo™ Image Cytometer, each of which features scalable 21 CFR part 11 options. The instruments are used in laboratories around the globe to automate time-consuming procedures and streamline cell-based assays between groups with different throughput needs, enabling scientists to focus less on the process and more on their research results.



Cellometer Ascend automated cell counter makes viewing, analyzing, and reporting on complex samples easier with automated fluorescence and brightfield detection.

- Counts up to 8 samples at a time with as little as 10 μ L of sample
- Generate counts, concentration, viability, and size in less than 60 seconds
- Built-in assays and cell types for fast and easy analysis of isolated nuclei and mammalian cells
- Quickly analyze apoptosis, transfection efficiency, and cell cycle



Cellaca MX and Cellaca PLX high-throughput cell counters automatically count up to 24 samples in 3 minutes or less while maintaining high consistency.

- Only 25 μ L of a cell sample required
- Multiple fluorescent filter options with autofocus function
- Perform cell-based assays including viability, vitality, and apoptosis



Celigo whole-well image cytometer performs cell-based assays with adherent and suspension cells in only a few clicks using various types of vessels without disturbing cells.

- Fully automated live-cell analysis and cell sample characterization
- Simplified data acquisition process with a scan run in minutes
- Data output at a single cell level enabling numerous cell-based assays including apoptosis, mitochondrial membrane potential, and protein expression

The Revvity logo, consisting of the word "revvity" in a lowercase, sans-serif font.