



# CELL COUNTER & ANALYZER



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# Comprehensive Cell Count and Status Monitoring

Label-free with outstanding precision and reproducibility.

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Performing reproducible cell assays requires comprehensive knowledge of the condition of cells in real time. Given the OLS CASY Cell Counter's reliability, speed and ease of use, cytena is offering this premier instrument to give microbiologists and tissue engineers all the tools and support needed for complete 3D cell culture workflows.

## Precision and reliability

For years, CASY has been a workhorse in cell-culture laboratories. It is referenced in a myriad of publications and PhD theses and can be found on laboratory benches around the world. CASY systems are essential tools in academic and industrial research and in process control because they deliver precision with outstanding reliability. Satisfied users number in the thousands, proving the robustness, reproducibility and reliability of the system, even in scenarios where multiple users have varying degrees of training.



## CASY tracks all relevant aspects of the condition of cell cultures

### Label-free cell status, instantly

Within seconds, measurement is performed noninvasively without using distorting dyes.

### Statistically relevant data

Analysis of more than 4,000 cells per run ensures statistically significant results.

### Get the full picture

Quantifies all relevant parameters, including cell viability, size and aggregation – at extremely low running costs.

## CASY's legendary reliability

- Certified lifetime calibration: Guaranteed maximum  $\pm 2\%$  variation comparing measurements and instruments
- Automatic electronic monitoring of all relevant parameters of the system
- Integrated quality control system
- GLP/GMP compliance
- 21 CFR Part 11 option available



## How It Works

### Differentiation of viable/dead cells

CASY quantifies cells and particles passing a measuring pore exposed to a low voltage electrical field. Based on a cell's size and conductivity, a resistance signal is generated and recorded. Living cells generate high resistance signals due to their intact membrane structure. Dying or dead cells cause much lower resistance due to their increased membrane permeability and are measured by the size of their cell nuclei.

### Cell viability

Cell viability is determined by automatically comparing the number of viable cells with that of dead cells, the latter being represented by the size of their nuclei in the measurement chart.

### Maximum information from flow-through measurement

Objects passing through the measuring pore are scanned with a high frequency of 1 MHz. This allows a precise recording of cell number and cell volume.

### High dynamic measuring range

The 1 MHz sampled pulse area analysis leads to an unsurpassed dynamic measuring range that allows the software to visually represent the full range of particles from cell debris to large cellular aggregates in a single measurement.

## Get the full picture

In a simple, fast and dye-free measurement, the high dynamic measuring range allows for the real-time monitoring of all aspects of the cell culture's current state—quantifying cell debris, distinguishing viable cells from dead cells and readily observing cell clusters/aggregates, at a glance.

## Biomass determination or aggregates

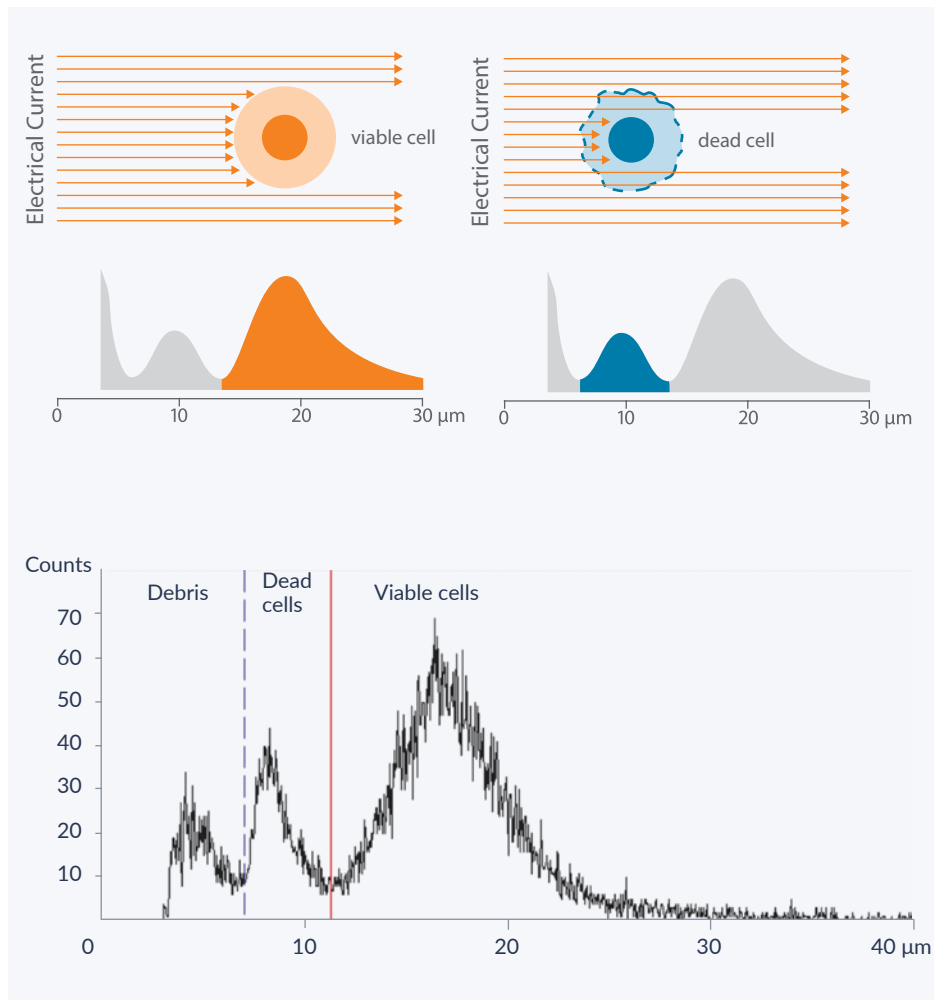
High-frequency scanning of objects and the high dynamic measuring range enable CASY to precisely measure the volume of cells or objects. Thus, cell aggregates and the entire biomass content of each sample are immediately available.

## Accurate total cell count includes aggregates

Mathematically breaking down aggregates into single cells, CASY is able to count all cells hidden in aggregates and, thus, provides an accurate total cell count.

## Measures cell lines, primary cells, bacteria and more

With a detection range of 0.7 to 120  $\mu\text{m}$ , CASY measures all mammalian cells and stem cells, as well as bacteria, yeast, algae, parasites, pollen, sperm and more. Any particle in the size range can be measured—and a wide range of samples have been easily measured.



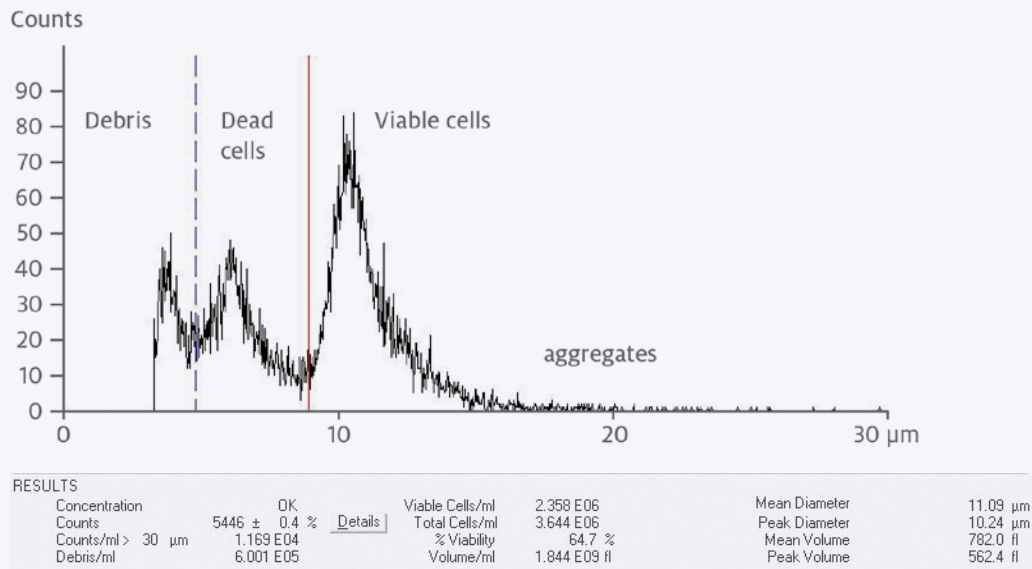
CASY's measuring technology discriminates between debris, dead and viable cells—and how these are graphically represented during measurement (mixture of chondrocyte primary culture).



# 4 Key Application Areas

## 1 Mammalian cell counting

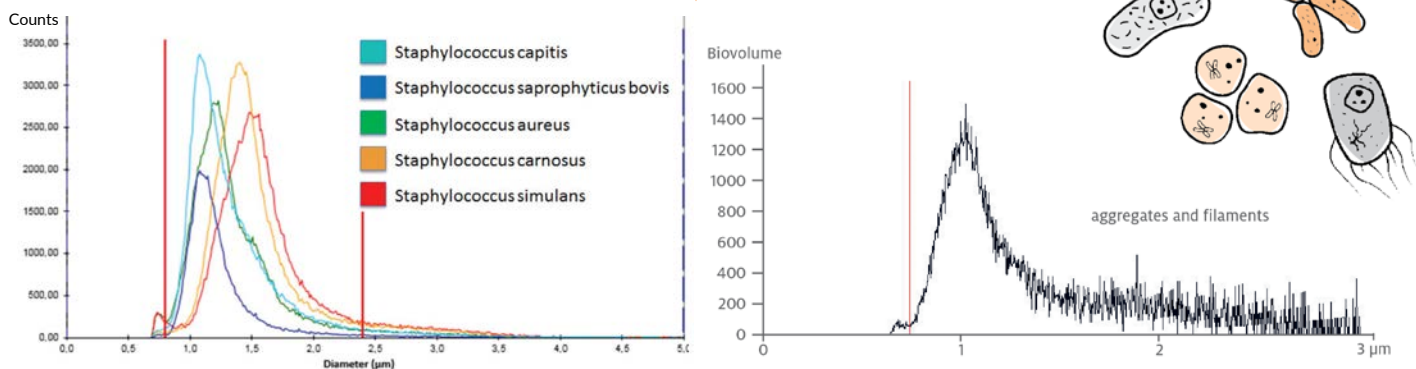
Before starting long-term experiments with high-value mammalian cells, it is important to precisely count cells. The CASY provides these comprehensive insights into cell health, viability and aggregation in one easy measurement.



Measurements of human stem cells from cord blood, including cell count, cell concentration, viability, aggregation factor, biomass volume, cell diameter and cell volume.

## 2 Bacterial cell counting

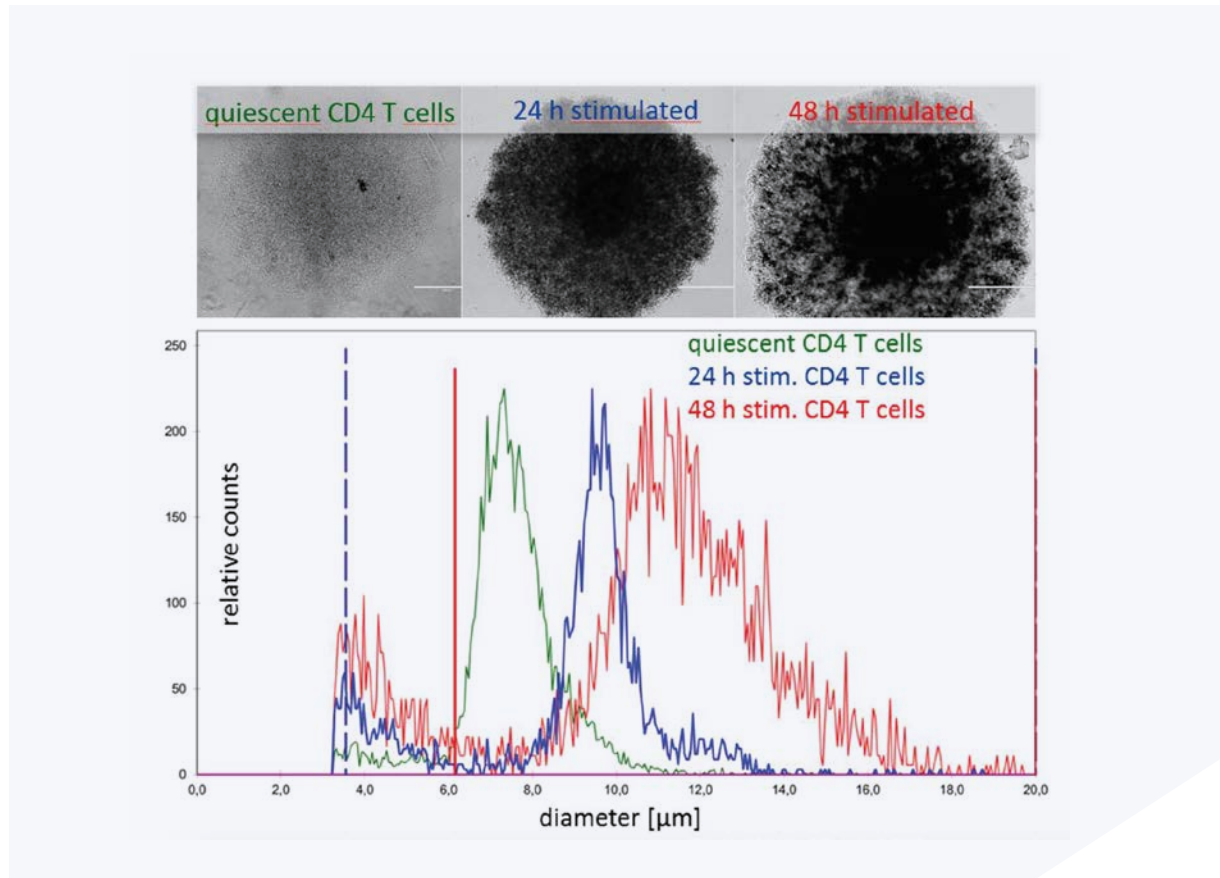
CASY's 45  $\mu\text{m}$  capillary is ideally suited to monitor bacterial proliferation and aggregation. Researchers can plot changes in cell volume and number and monitor biovolume with an easy-to-use, dye-free tool.



Counting of Staphylococcus strains (left) and plotting of E. coli biovolume against cell diameter (right).

### 3 T-cell monitoring

CASY can be used to monitor T-cell cultures for immunotherapeutic approaches by determining cell size and cell proliferation during T-cell stimulation.



Cluster formation and cell size distribution during CD4 T-cell stimulation.

### 4 Cell line development

The CASY requires no sample preparation and provides fast, label-free, gentle and precise measurements about cell concentration, volume, aggregation, viability and more, letting researchers easily isolate preferred cells and set up the right concentrations for cell line development.



# New Control and Analysis Software

- Intuitive instrument control
- Expanded and simplified measuring routines
- Evaluation and data organization tools

## Hardware

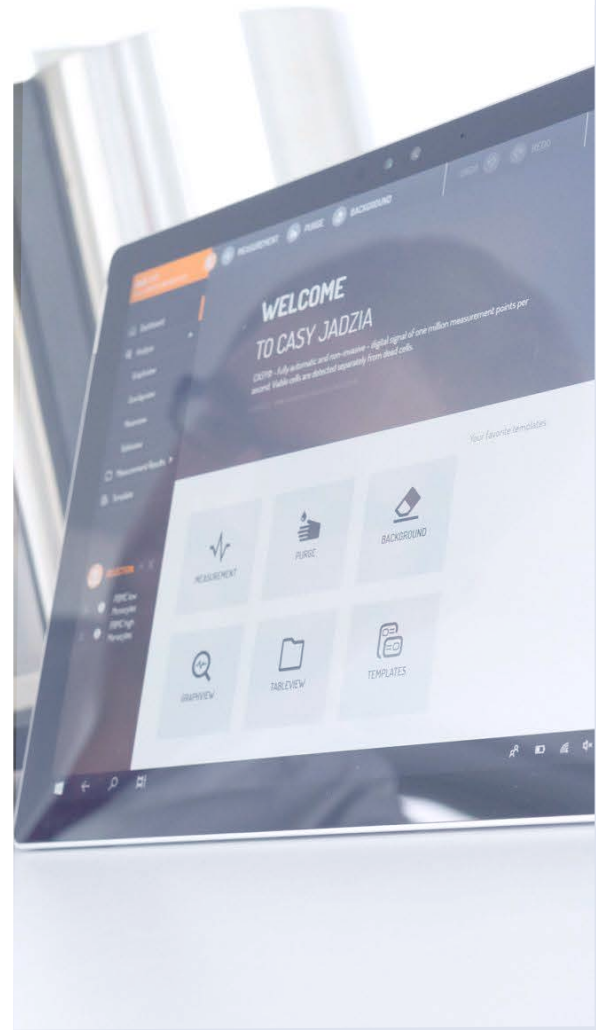
Choose between Surface-PC and laptop or use your own Windows-based computer.\*

\*Minimum requirements will be provided.

## Software

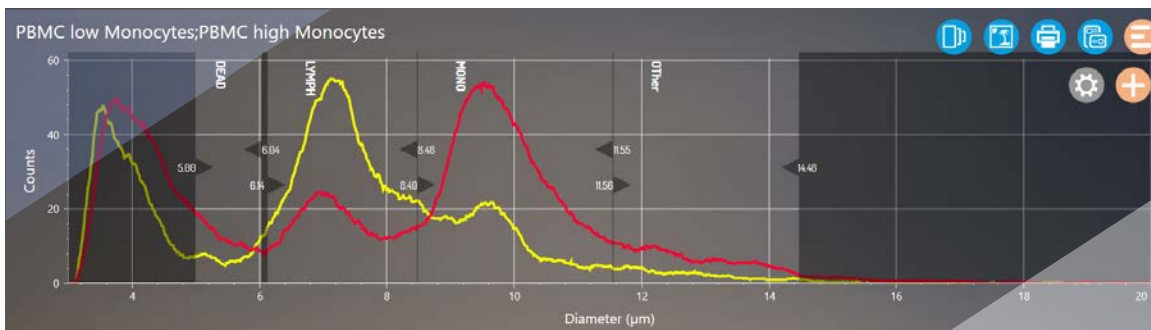
Discover a wealth of new possibilities in data organization and data evaluation, such as:

- Viability: live/dead evaluation
- Differentiation of up to 5 cell populations per sample
- Detection and analysis of cell aggregates
- Overlaying multiple sample plots
- Calculating mean values and a mean value graph
- Intuitive control, wizard-based routines
- Easy data export and customization tools
- A dashboard for quick access to all relevant functions of the CASY
- User management and experiment organization



## Renowned superior precision with enhanced control

Example: Compare PBMC monocytes from different donors

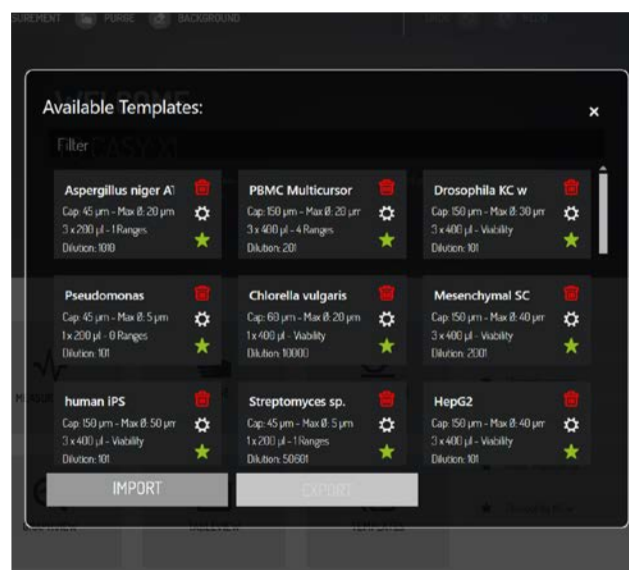


Not all PMBC are the same. Depending on the donor, the ratio between monocytes and lymphocytes can vary significantly, having a major impact on downstream steps.





Within easy reach: The new CASY dashboard provides 1-click access to all central functions.



User-friendly template management.

CASY Software is also available for select existing systems. Please contact us for upgrade options.

## Technical Data

Measurement technology	Electronic pulse area analysis with 1 million measurements per second acc. to ISO 13319
Viability determination	Electrical current exclusion (ECE)
Dynamic range	In volume > 1:70,000; in diameter > 1:40
Measured size channels	512,000
Displayed size channels	1,024
Measurement range	0.7–120 µm
Volume resolution	1 in 512,000
Typical analysis time	10 seconds
Typical sample volume	10–100 µL



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