

CytoSMART Exact FL

Fluorescence cell counter with the best eye for detail

The Exact FL is a compact and versatile automated fluorescence cell counter that provides highly accurate cell counts due to its high-resolution camera, high magnification and large field-of-view combined with sophisticated AI-based image analysis. Whether you need to count primary cells, heterogeneous samples, small cells, such as PBMCs or need to determine the viability or transfection efficiency of your samples, the CytoSMART Exact FL can do it all due to its eye for detail.

Benefits of fluorescent cell counting

Many labs still count cells manually, which is subjective and time-consuming. Even for the trained eye, it can be challenging to distinguish cells from cell debris. Next to this, the commonly used Trypan Blue stain to distinguish dead from live cells, does not always stain the cells properly. This makes it hard to determine whether a cell is dead or alive. Furthermore, countless hours spend behind the microscope to count hundreds of cells can be very labour-intensive.

Brightfield automated cell counters drastically decrease the time needed for cell counting and the integrated image analysis algorithms provide objective cell counts. However, not all issues related to distinguishing cells from debris and live from dead cells are resolved. To solve this, fluorescent cell counting provides a solution. By using fluorescent dyes, it is very easy to distinguish cells from debris, since cellular debris is not stained with the fluorescent dyes. The commonly used red dye Propidium Iodide (PI) only binds to DNA of cells with an impaired cell membrane (i.e. dead cells) making it more reliable than Trypan Blue. PI is often used in combination with Acridine Orange (AO), a green, cell-permeable, DNA-binding dye that stains all cells in the sample.

Benefits of the Exact FL

Due to its high-quality optics and AI-based image analysis, the CytoSMART Exact FL is one of the most detailed and versatile fluorescence cell counters available. It not only provides the option to count cells using both brightfield and dual fluorescence (red and green), but also enables analysis of viability, transfection efficiency and many more applications.

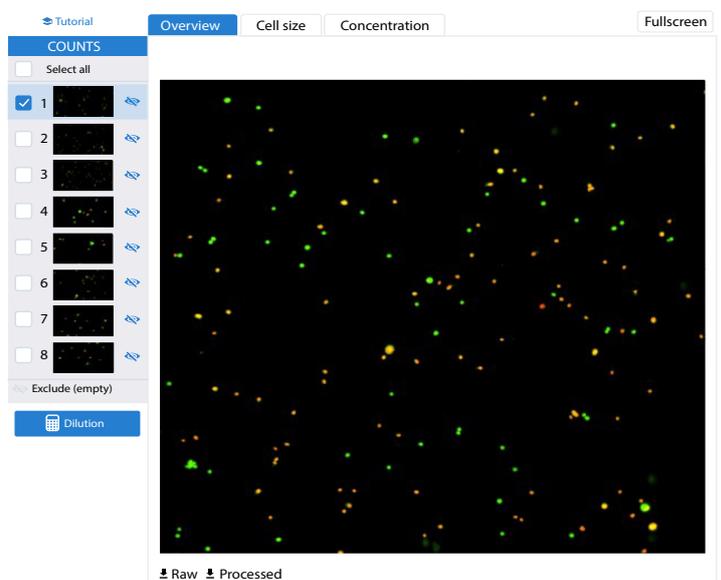


Figure 1. The multicount feature allows users to take images at different positions of the same sample, providing an average and standard deviation to increase accuracy and precision.



<https://cytosmart.com/products/cytosmart-exact-fl>

*Research use only. Not intended for diagnostic purposes.

The CytoSMART Exact FL provides

- **High quality optics for detailed analysis:** The 6.4 MP CMOS camera combined with 10x magnification allow the user to count cells as small as 4 μm with high accuracy, providing detailed images of your count for review.
- **Multi-count feature:** By taking up to eight images of the same sample, the counted area increases up to 17 μm^2 (fig. 1). This results in an increased accuracy and precision of the count. This is especially beneficial in case your sample has a low number of cells.
- **Sophisticated AI-based image analysis:** The deep-learning neural network algorithm was trained to easily distinguish cells from debris and cells within clusters, making it suitable to count even the most challenging samples.
- **Software customizable to your needs:** One of the unique features of the Exact FL is that you can customize the software modules to adapt the device to your research. Whether you need to determine cell viability, transfection efficiency or count organoids, it is all possible.
- **Suitable for a wide range of fluorescent dyes:** The green and red fluorescent channels allow for a wide variety of fluorophores that can be used to count cells. Examples of compatible dyes are AO, (e)GFP, Calcein AM, pSIVA, and CellTracker Green for the green channel and PI, RFP, dtTomato, and CellTracker Orange for the red channel.
- **Compatibility with glass and plastic counting slides:** Use the counting slide that suits your needs. Use a reusable glass slide to reduce waste or use a disposable plastic slide to save precious cleaning time.

Specifications

Concentration range: $5 \cdot 10^4 - 1 \cdot 10^7$ cells/ml
Size range: 4 – 70 μm
Size range organoids: 10 – 200 μm
Measurement time: < 3 sec. (depends on internet connection)
Sample volume: 10 μl (20 μl for organoids)
FOV: 2.10 – 16.82 mm^2
Magnification: 10x
Image resolution: 2072 x 2072 pixels
Exported formats: png, xlsx, pdf
Light source: LED
Fluorescence filters:

- Green: Ex.: 452/45 nm, Em.: 512/25 nm
- Red: Ex.: 561/14 nm, Em.: 630/90 nm

Camera: 6.4 MP CMOS
Weight: 1.3 kg
Unit dimensions: 166 x 140 x 135 mm

Applications

- **Cell viability:** Determine the number of live and dead cells in your sample using AO and PI staining.
- **Transfection efficiency:** Quickly determine the transfection efficiency by calculating the percentage of fluorescent cells in your sample.
- **Heterogenous populations:** Use fluorescent labels to distinguish different cell types in your sample.
- **Primary cells:** Easily count cells in freshly harvested samples.
- **Contaminated samples:** The sophisticated AI-powered image analysis quickly distinguishes cells from debris.
- **Small cells:** Counting small cells, such as PBMCs, is no problem for the Exact FL, it can count cells with diameters as small as 4 μm .
- **Cell cycle analysis:** By adding fluorescent markers the cell cycle stages can be evaluated using the Exact FL.

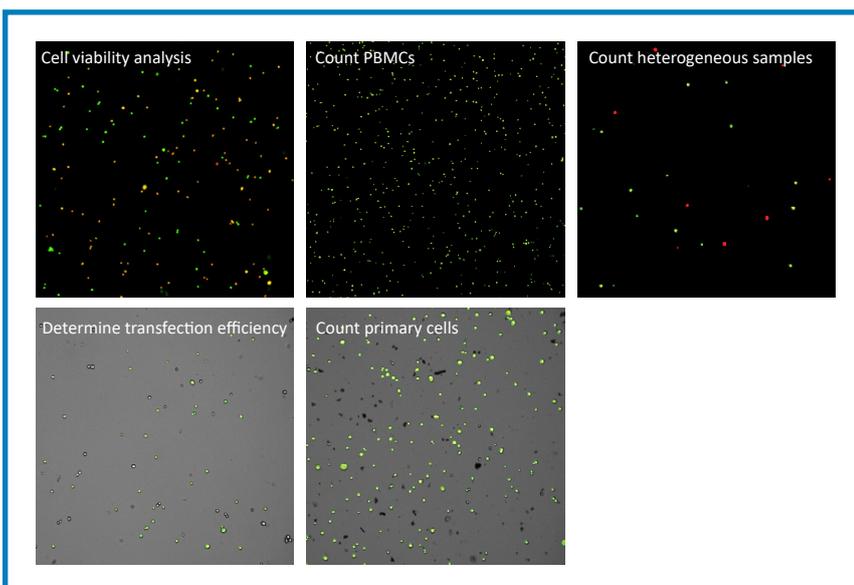


Figure 2. Examples of applications of the Exact FL.