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Open vs Closed Automated Cell Counters

Automated cell counters, offer an alternative to manual cell counting, providing a greater level of precision and accuracy in counting results.

Whitepaper

Open vs Closed Automated Cell Counters

Manual cell counting is often time-consuming and prone to error, particularly if the researcher is dealing with large sample sizes. Human perception of cell definition as well as dilution and pipetting errors are common pitfalls in manual cell counting. Although manual counting provides an initially lower start-up cost, the time spent counting the cells as well as the errors made in the process can give rise to greater long-term labor-associated costs.

Automated cell counters, offer an alternative to manual cell counting, providing a greater level of precision and accuracy in counting results.

Practically all automated cell counters are closed systems, which provides some level of protection from environmental influences which can affect the final analysis. Open systems, however, may have greater flexibility and utility in research.
Open automated cell counting systems, such as the CytoSMART™ EXACT, may provide greater durability, higher efficiency, and potentially fewer long-term costs during cell culture research.

In order to determine the best automated cell counter strategy, a potential operator must understand the advantages of both a closed and an open system.

Advantages of open cell counters

There are advantages with an open system, advantages which may streamline cell counting. The time savings associated with an open automated cell counter potentially translates into a more cost-efficient experiment. Advantages include having the ability to view larger areas of the counting chamber as well as requiring fewer or no disposables.

The CytoSMART™ EXACT is the only automated cell counter at present that is completely open. This type of system allows the researcher to move throughout the counting chamber more fully, while enabling easier quantification of multiple different cell areas.
Thus, the greater analysis of a larger area allows for higher accuracy compared with a closed device.

Instead of using only specific parts of a counting chamber, an open system allows for fuller analysis of the entire counting grid. Open systems also do not require disposables and can be used with any standard hemocytometer, reducing the need to purchase additional tools and materials. Therefore, an open system is more cost-efficient than a closed system.

Advantages of a closed system

Despite the potential cost-related disadvantage, closed systems may provide extra protection from outside influences, such as cells from nearby solutions, viruses, or bacteria that may accidently enter the system. The potential risk of outside contamination can vary greatly depending upon laboratory conditions. Open systems are also more prone to medium loss, whereas a closed system helps to contain the medium and reduces the likelihood of contamination.

Contamination of the cell sample may lead to incorrect visuals of the cells, subsequently causing egregious judgement in cell numbers. Also, some closed system cell counters will feature an additional module that requires the use of fluorescence, a feature not typically present in open system cell counters. Fluorescence aids in the visualization of cells and allows for a clear view of cell numbers.

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Open vs Closed Cell Counters

Aside from the CytoSMART™ EXACT, almost all automated cell counters on the market are closed systems. Closed systems usually require disposables, which can increase costs associated with an experiment.

Thus, a closed automated cell counter may not always be as cost-effective when compared to open systems or even manual counting. Still, closed systems are perhaps one of the most widely utilized types of automated cell counters where accurate and precise cell counting is essential.

CytoSMART™ EXACT: The World's First Open System Automated Cell Counter

The CytoSMART™ EXACT is the only open system automated cell counter on the market today. This system can perform a single measurement faster than other automated cell counters could dream of.

The EXACT also analyzes images faster than traditional automated counters. In fact, this cell visualization and counting device can provide a single measurement in less than two seconds, depending upon the type of computer used during the imaging process.

Also, compared with other automated cell counters which use algorithms that require processing by a small onboard computer system, the EXACT open system cell counter can be connected to a laptop, PC, or Windows tablet.

In keeping with its open system feature, the EXACT allows the operator to move the counting chamber, facilitating the counting of multiple areas. Additionally, this system uses the full counting grid and enables a larger field of view, which provides a more accurate result in the total cell count of a sample.

As an automated cell counter, the EXACT will calculate the average cell concentration, median, standard deviation, and will display the images of the counted cells quickly and accurately.

This quick turnaround time allows operators to channel a greater proportion of their time toward more important experimental tasks.

Click here to learn more about the CytoSMART™ EXACT

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