

Comparison of Cell Counting Methods

EVE™ Automatic Cell Counter vs Hemocytometer

Introduction

Many researchers need to check counting results before each experiment. It will be helpful to achieve the standardization of cell concentration between samples.

Most common method for cell counting is using hemocytometer under microscope. Now days the automatic cell counter, EVE™ provides the accurate counting results with low variation in less time.

This application note is to compare the automatic cell counter, EVE™ to the conventional hemocytometer of counting method.

EVE™ Automatic cell counter

The EVE™ Automatic cell counter uses state-of-the-art optics and provides image analysis to automatic cell counting. The EVE™ is a bench top cell counter designed to measure cell count and viability (live, dead, and total cells) fast and precisely, using the standard trypan blue technique (Figure 1).

Using the same amount of sample that you currently use with the hemocytometer, the EVE™ takes less than 20 seconds per sample

for a typical cell counting and is compatible with a wide variety of eukaryotic cells and provides information on cell size.

The EVE™ offers an intuitive user interface and support the option to save and print cell count data using the EVE™ Software and USB drive which is supplied with the instrument or available separately. (For detailed information, please visit our website; <http://www.nanoentek.com>)

Hemocytometer, manual cell counting method

The hemocytometer used for manual cell-counting. It consists of 9 large squares, each measuring 1 x 1 mm, giving a total area of 3 x 3 mm of counting area. The volume of the chamber is 0.1 µm of each 1 x 1 mm square, giving a total volume for each.

Sample preparation

To compare total cell counting result between EVE™ Automatic cell counter and traditional hemocytometer, HeLa cell line was used. Cells were grown in defined medium in humidified 5% CO₂ incubator at 37° C. Cells were trypsinized using standard methods to prepare cell suspensions for

counting. The cell samples were prepared in the range of 1×10^4 mL ~ 1×10^7 mL.

Mix well the 10 µL of the sample and the 0.4% trypan blue stain using a pipette. Load 10 µL of the sample mixture on EVE™ Cell counting slide and hemocytometer.

Result

The results show that the glass hemocytometer counting method was less accurate than EVE™ Automatic cell counter. Moreover, the EVE™ Automatic cell counter can count the broad range of cell concentration than hemocytometer. It also significantly extends further along the high concentration range than hemocytometer readings.

In conclusion, EVE™ Automatic cell counter is the efficient automatic cell counter for broad range of cells. It cannot only reduce error from human variation in comparison with the traditional counting method, but also provides accurate and fast counting result through counting software and

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Figure 1. Automatic cell counter, EVE™

Using disposable chamber that contain two enclosed chambers can count the cells with just 3 steps. step 1. Load the sample, step 2, adjust focus, step 3. Obtain the results.



Cell Type	Animal	Organ	Growth Properties
HeLa	Human	Skin	Adherent
NIH-3T3	Mouse	Embryo	Adherent
U-2 OS	Human	Bone	Adherent
Jurkat	Human	Blood	Suspension
KG-1	Human	Blood	Suspension
HepG2	Human	Liver	Adherent
Hep3B	Human	Liver	Adherent
LNCaP	Human	Prostate	Adherent
SH-SY5Y	Human	Brain	Adherent
SCN2.2	Rat	Brain	Adherent
F9	Mouse	Embryo	Adherent
MCF7	Human	Breast	Adherent
A549	Human	Lung	Adherent
GH3	Rat	Pituitary gland	Adherent

Table 1. Cell lines validated on EVETM Automatic cell counter

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enclosed disposable chamber. Therefore, EVE™ Automatic cell counter is considered as new opportunities for various research applications in which cell counting and viability test are required.

Ordering information

Cat. No.	Cat. No.	Unit
EVE™ Automated Cell Counter	10027-452	Each
EVE™ Automated Cell Counter + 550 Slides (1,100 Counts)	10027-448	Each
EVE™ Chamber Slides (100 Counts)	10027-446	Pack of 50

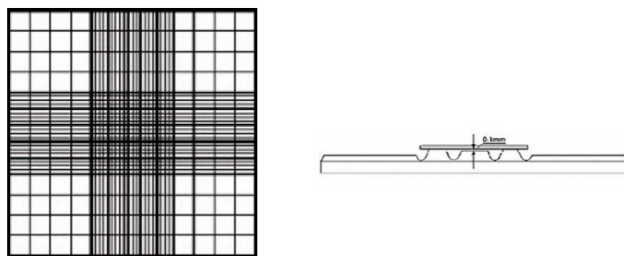


Figure 2. Hemocytometer, manual cell counting method

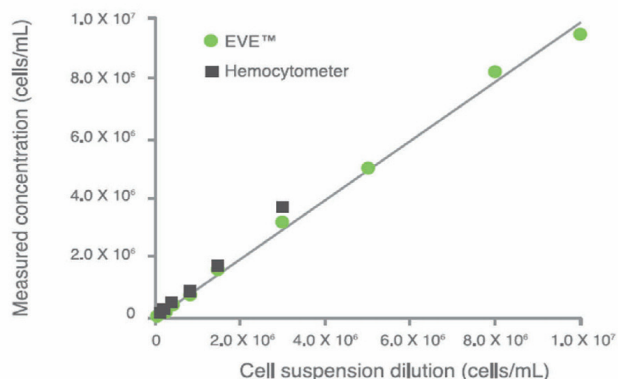


Figure 3. Measuring from the EVE™ extend further along the high concentration range than hemocytometer readings. The EVE™ Automatic Cell Counter has a significantly higher effective concentration range than the hemocytometer.