

APPLICATION NOTE

A Disposable Plastic Hemocytometer : C-Chip

The C-Chip (Fig. 1) is a disposable plastic hemocytometer used for manual cell counting. It consists of surface-patterned two enclosed chamber with two ports for sample introduction. The C-Chip grid pattern (Fig. 2) is exactly same as the Neubauer improved. It consists of 9 large squares, each measuring 1×1 mm, giving a total area of 3×3 mm of counting area. The depth of the C-Chip chamber is 0.01 mm, giving a total volume for each. The objective of this report experiment is to show the superior characteristics of a disposable plastic hemocytometer in association with cell based assay.

Cell lines and culture conditions

For the comparison of total cell counting between C-Chip and a Neubauer-type counting chamber, NCI-H23 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. Cell samples were prepared in the range of 2×10^4 /ml ~ 2×10^7 /ml.

Total cell counting

The prepared cell samples were counted using the C-Chip and a Neubauer-type counting chamber. Cell samples were scored under transmitted-light microscope. Total cell concentration was calculated using appropriate dilution factors and volume factors.

Results

Fig. 3 shows the image of trypan blue stained NCI-H23 cells under transmitted-light microscope. The averages from replicate total cell counting are plotted in Fig. 4. The C-Chip shows good correlation to hemocytometer with correlation coefficient (R^2) of 0.99. From the results, the comparison showed good agreement between the C-Chip and hemocytometer and proved that C-Chip is extremely suitable for replacing re-usable hemocytometers.

FIGURE 1



Figure 1. The C-Chip

FIGURE 2

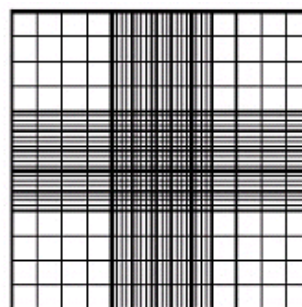


Figure 2. Grid pattern of the C-Chip

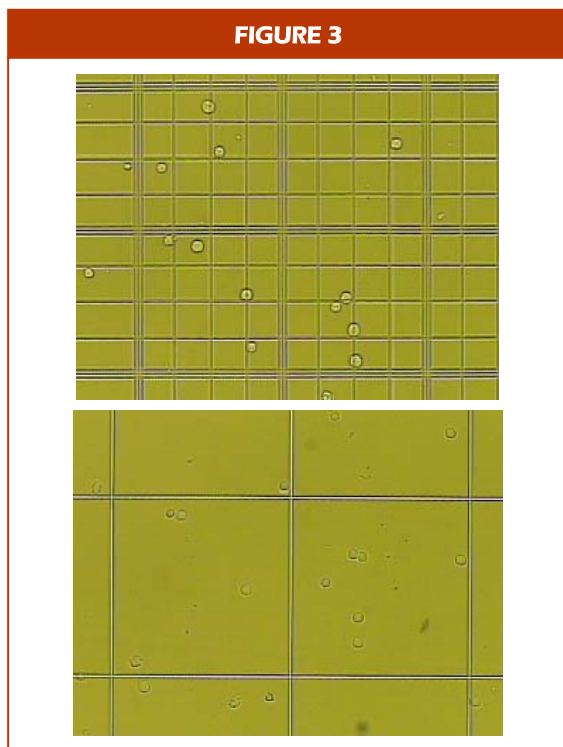


Figure 3. The image of trypan blue stained NCI-H23 cells in the C-Chip

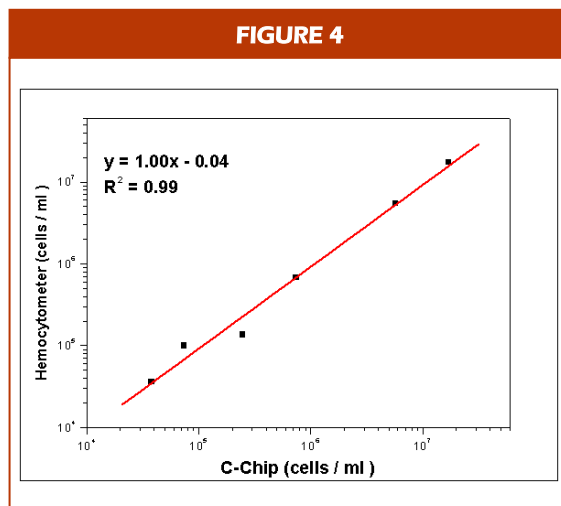


Figure 4. Correlation of total cell counting between C-Chip and hemocytometer using NCI-H23 cells



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