

# Spiked-in tests of cancer cell lines for the platform development of circulating tumor cells enumeration

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## INTRODUCTION

### Circulating tumor cells (CTCs)

- Circulating tumor cells (CTCs) present in the peripheral blood of cancer patients, and the numbers of CTC are very low.
- It has been known that CTCs initiate the metastasis of tumor, thus the significance of CTCs is getting attentions.
- The numbers of CTCs are associated with prognosis and clinical outcomes in various types of cancers.

### Cytogen's CTC enumeration platform

- The CTC enumeration platform is an automatic counting system based on image processing algorithm using cell size, cell surface area, area intensity, maximum intensity, circularity.

### The purpose of this study

- In this study, we developed the CTC enumeration platform and tested the performance of the platform using spiked-in tests with PC9 cells.

## MATERIALS AND METHODS

### Blood Sample Collection

- PC9 cells were spiked-in 7.5 ml of blood from healthy volunteers, and the blood samples were processed through the size-based filtration.
- The recovered cells were stained for EpCAM and CD45

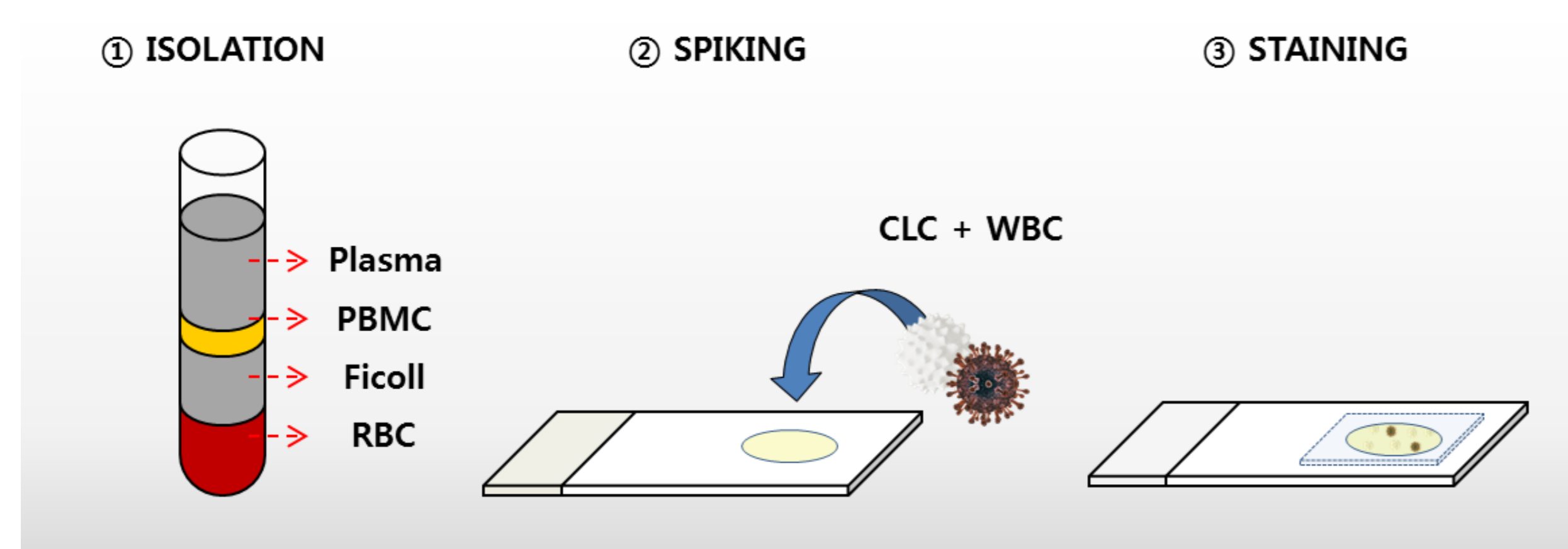


Figure 1. Production process of slide glass(Type : FRONTIER )

### Imaging Detection & Enumeration Algorithm

- The images were photographed by 3-channel fluorescent filters(UV2A, FITC, G2A) of the optical-based image analyzing system(Cytogen's CTC enumeration platform).

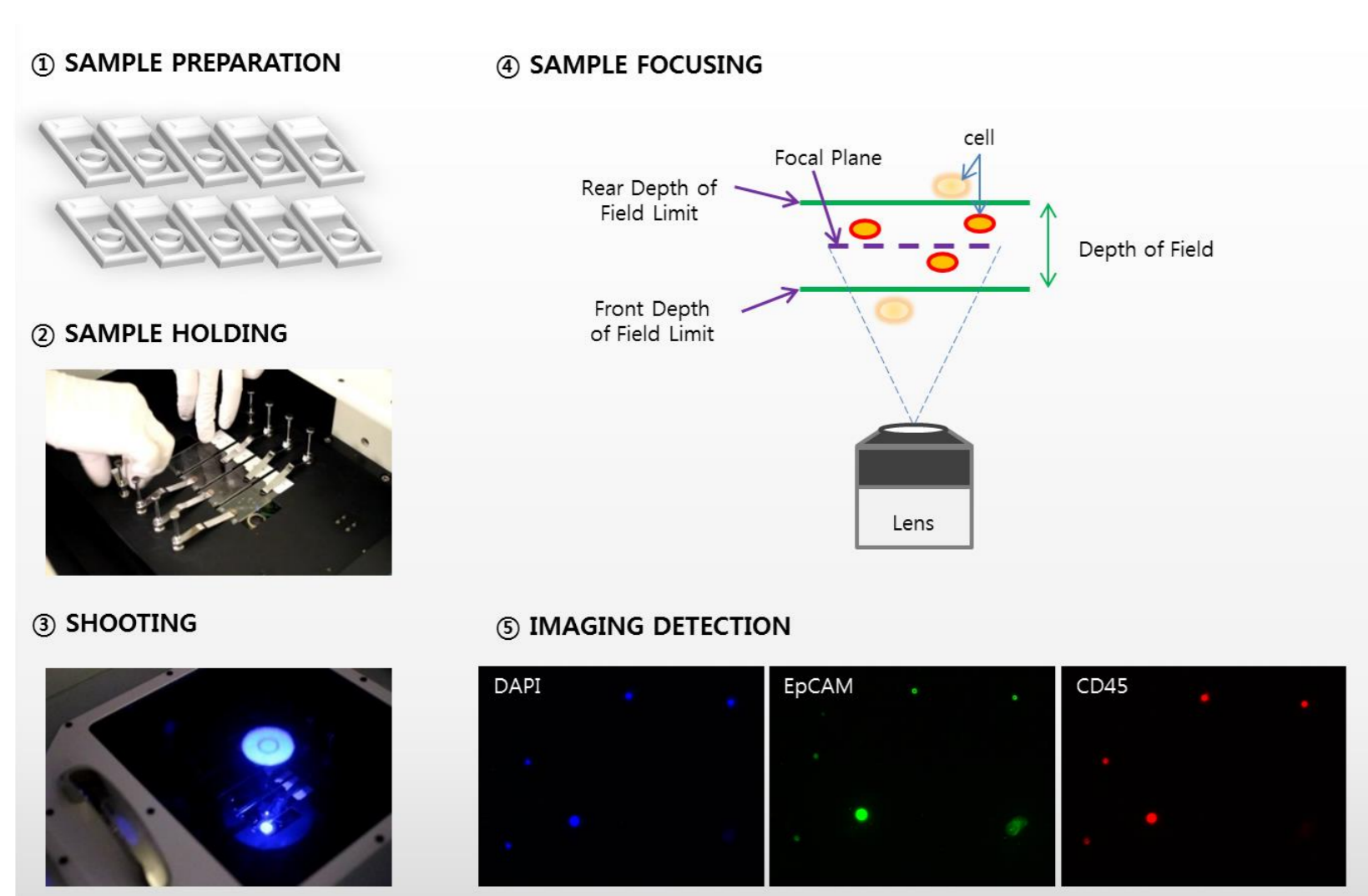


Figure 2. Imaging detection process

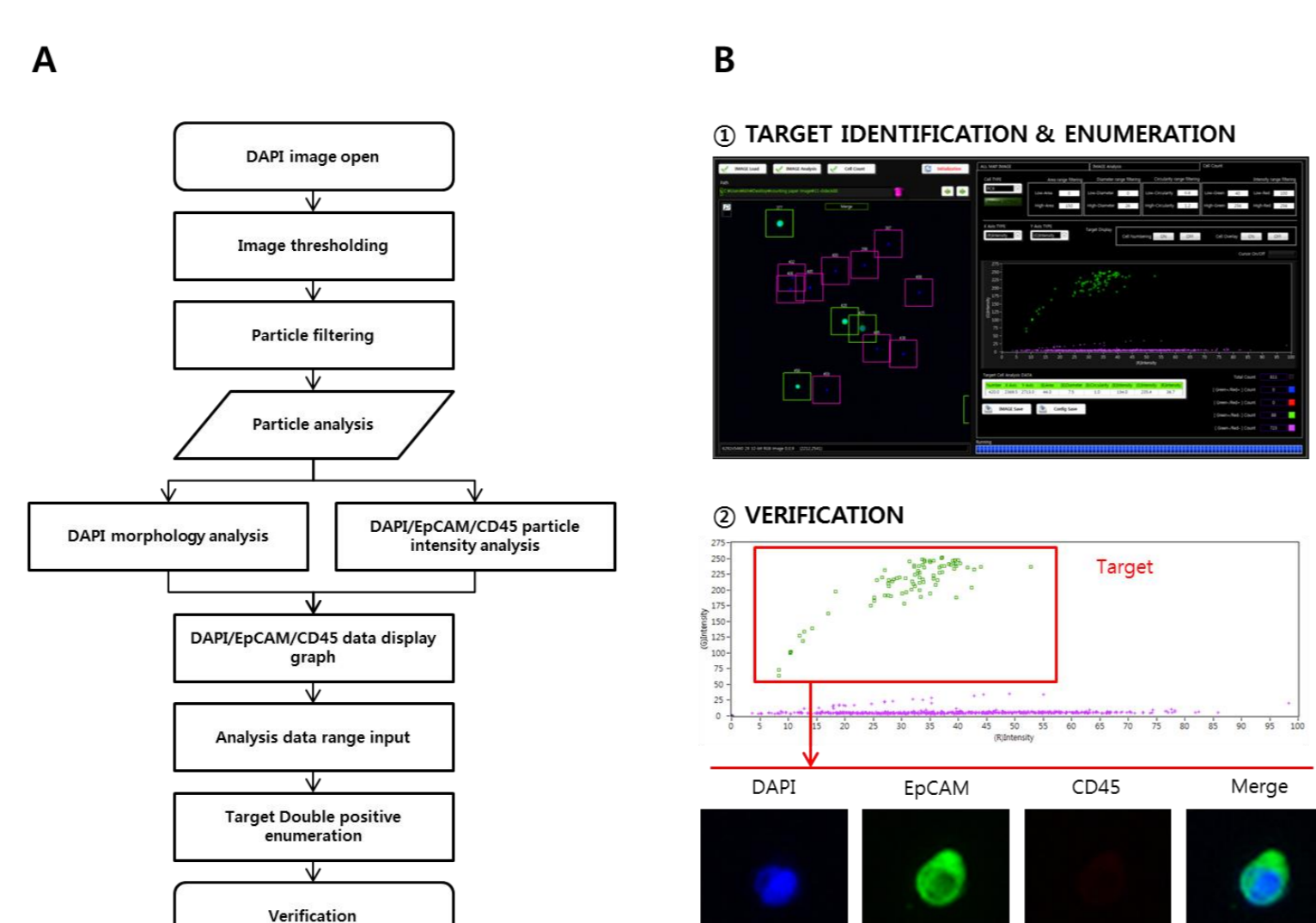


Figure 3. CTC enumeration algorithm

## RESULTS

### Cell DATA Analysis & Enumeration results

- From 10 individual experiments, the average number of cell counting was 98 ( $\pm 0.49$ ).
- The cell Intensity, cell diameter, cell area showed characteristic of cell morphology

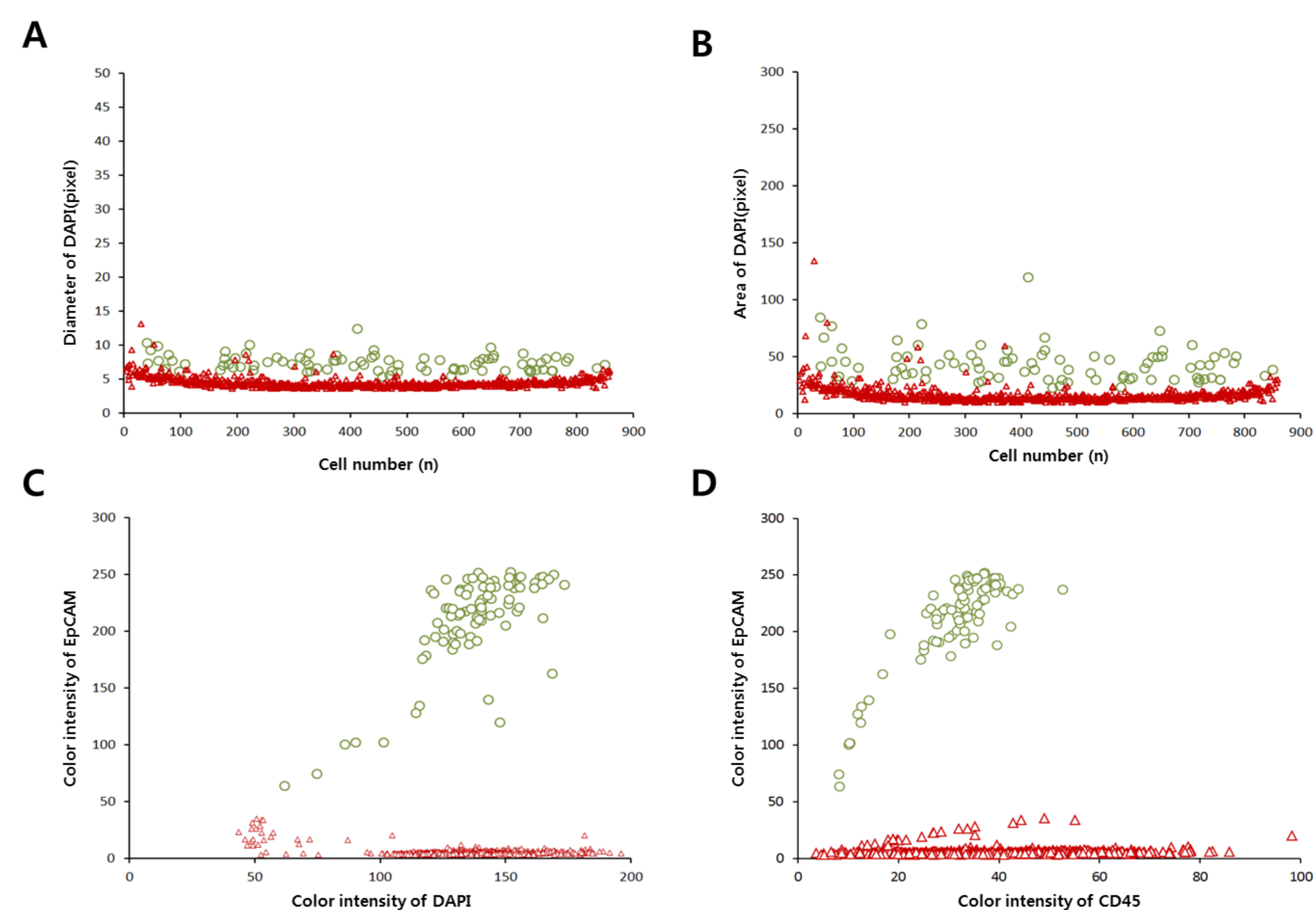


Figure 4. Morphological cell analysis

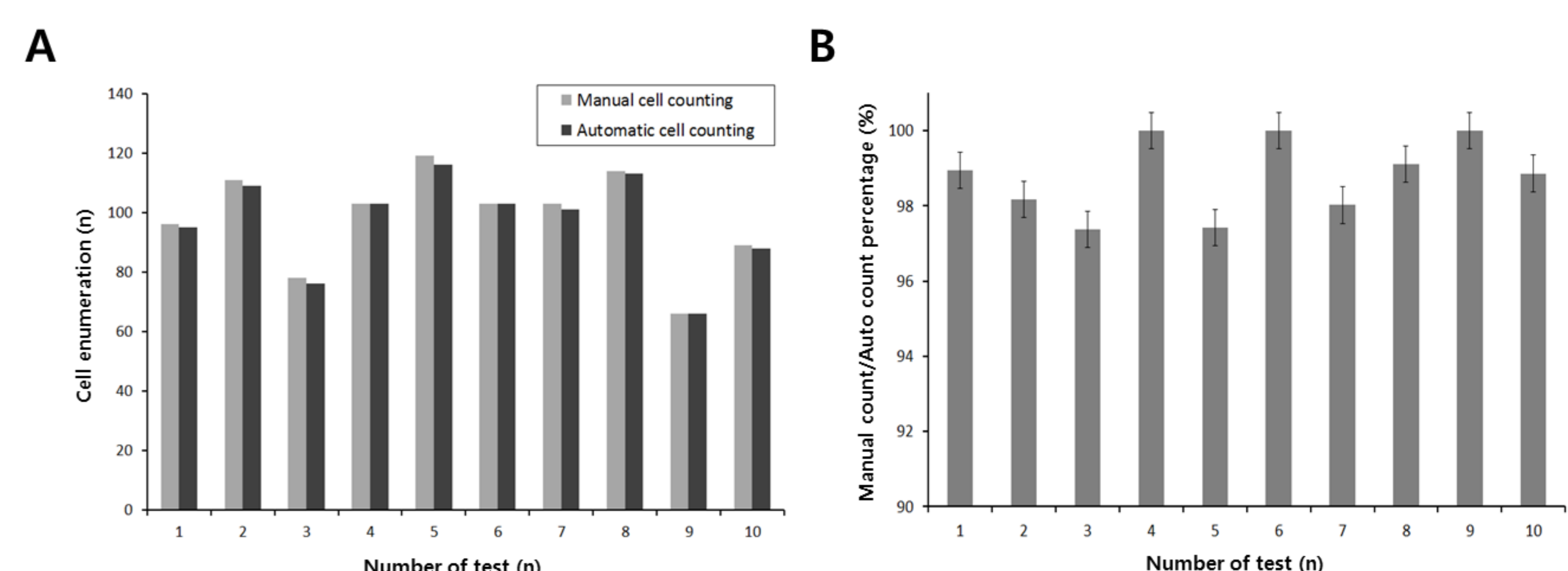


Figure 5. Comparison of two cell enumeration methods (automatic and manual counting)

## CONCLUSION

- We developed the CTC enumeration platform and tested the performance of the platform using spiked-in tests with PC9 cells.
- These results showed the reliability of the CTC enumeration platform.
- The CTC enumeration platform may provide the potential applicability in CTC counting of patients' samples.