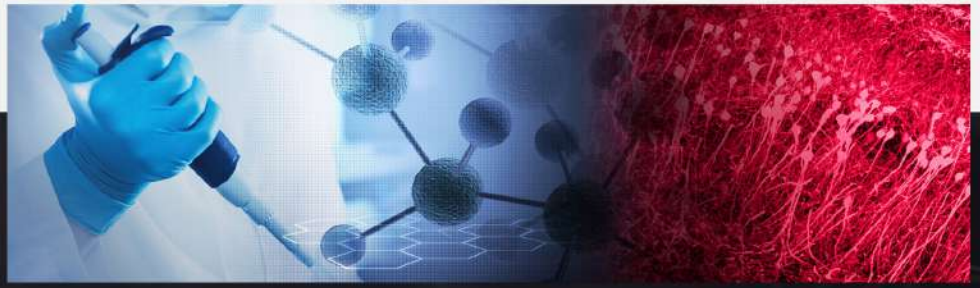
Tech Note

Fluorescent dye induced Background Signal in Microbial Culture Media



Bacterial Cell Counting: Fluorescent dye induced Background Signal in Microbial Culture Media

Introduction

With the introduction of microbial cell counter, QUANTOM™ Tx, measuring the number of bacterial cells at the single-cell level has become more popular, replacing time-consuming CFU/ml method. QUANTOM™ Tx uses a cell-permeable fluorescent dye to stain the nucleic acids of bacterial cells and can measure the total number of bacterial cells within minutes.

Different microbial cultures require specific broths based on their growth conditions, research purpose, and microbial species. While the commonly used broths are not usually autofluorescent, the constituents of the broth can interact with fluorescent agents, leading to an increase in background fluorescence. Therefore, it is essential to evaluate background noise by mixing broths with fluorescent agents like QUANTOM™ Total Cell Staining Dye to identify any variations in background signals.

Results and Discussion

The broths examined in this technical note include Nutrient Broth (NB), Luria-Bertani (LB), Tryptic Soy Broth without Sheep Blood (TSB), Tryptic Soy Broth with Sheep Blood (TSB-SB), Yeast Extract Peptone Dextrose (YPD), and de Man, Rogosa and Sharpe (MRS).

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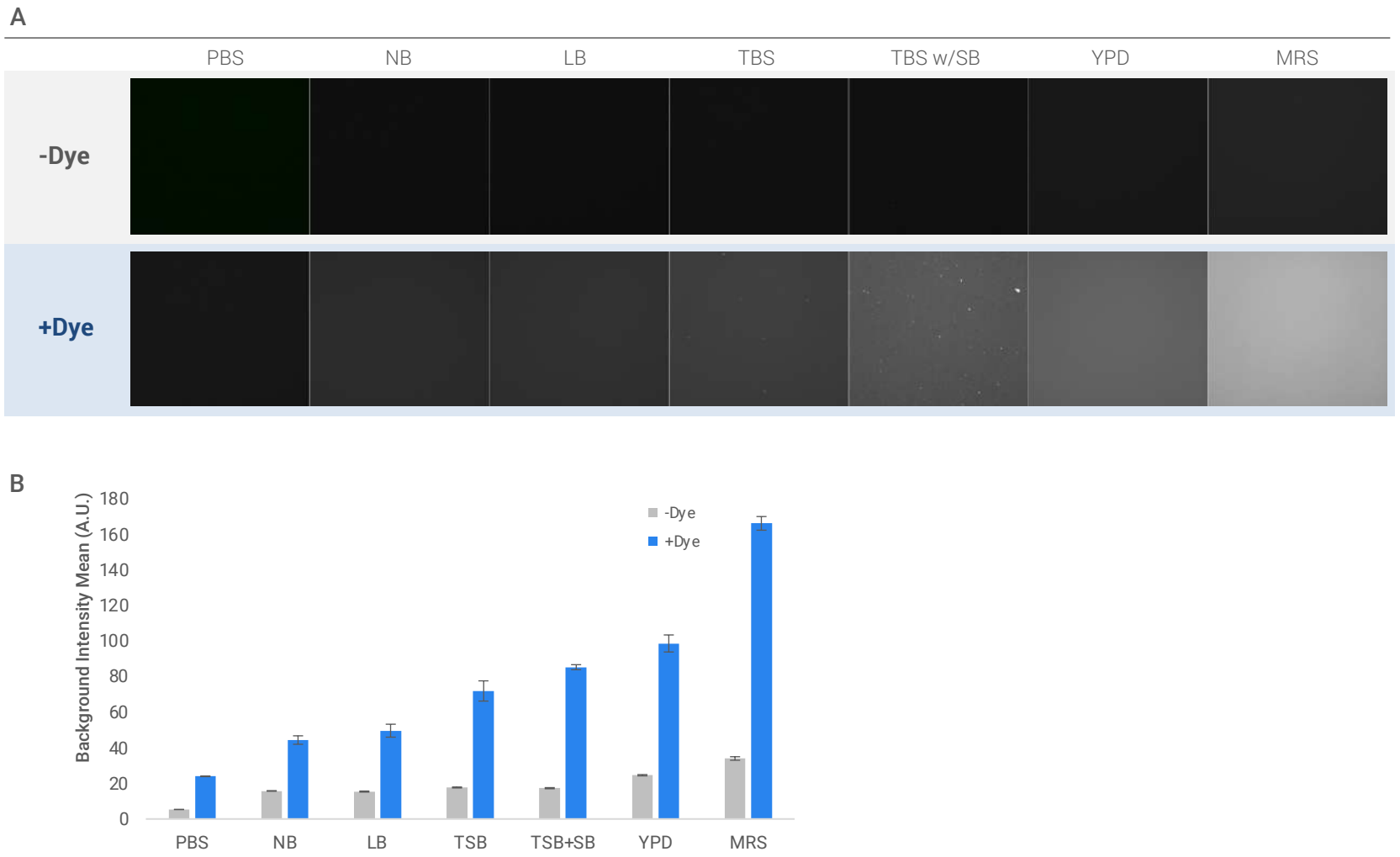

Figure 1. The broths exhibited increased background signal after a 1:10 QD mixture. The figure illustrates changes in GFP signal before and after QD mixing using a montage (A) and bar graph (B).

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Prior to adding QUANTOM™ Total Cell Staining Dye, there was no autofluorescence background signal observed in the broths. The introduction of QUANTOM™ Total Cell Staining Dye led to an increase in background signal in all broths, with MRS exhibiting the highest background noise. Therefore, it is highly recommended not to mix the fluorescence dye directly with the culture media. Instead, cultured cells should be diluted in PBS to avoid background fluorescence noise.

Find out more at https://logosbio.com/cell-counting-overview/