Supplementary Materials for

Ultrasensitive absorbance detection system for online bacterial monitoring in digital microfluidics

Fig. S1.

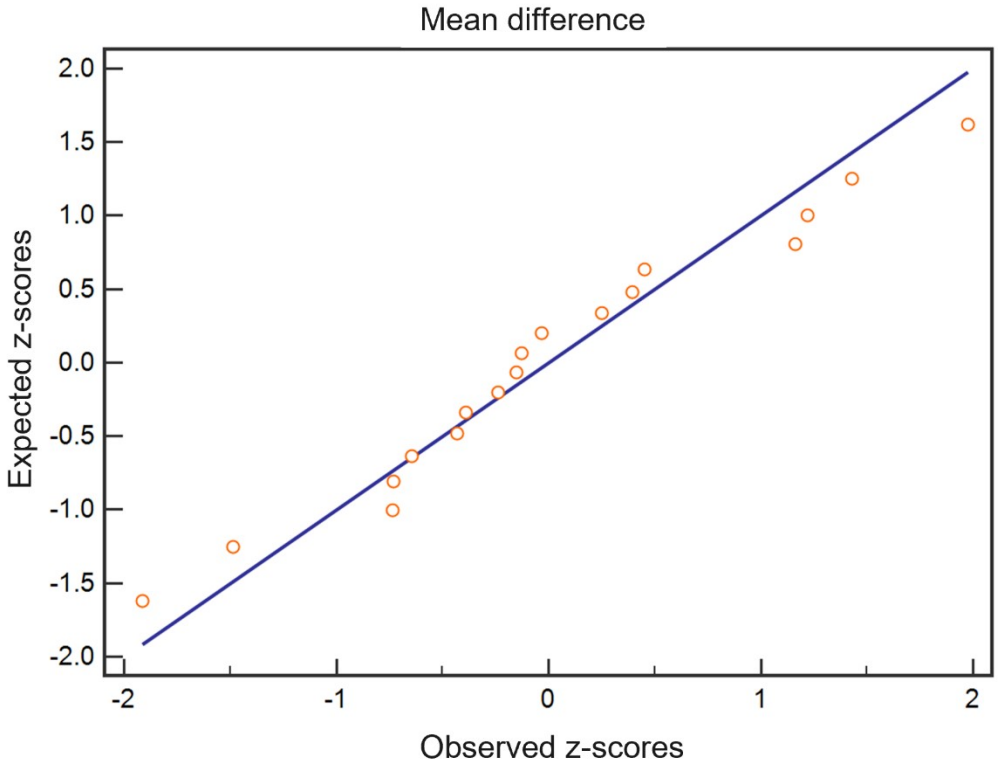

Fig S1 Quantile-Quantile Plot for Normality Test
Based on the normal Q-Q plot, the differences are distributed mainly around the diagonal line, indicating an approximate normal distribution. The Shapiro-Wilk test was chosen to test for normality, with a test statistic of W=0.9401 and a p-value of P=0.8591 (>0.05), suggesting that the differences approximately follow a normal distribution. This satisfies the condition for using the Bland-Altman method to conduct a consistency analysis.

Fig. S2.

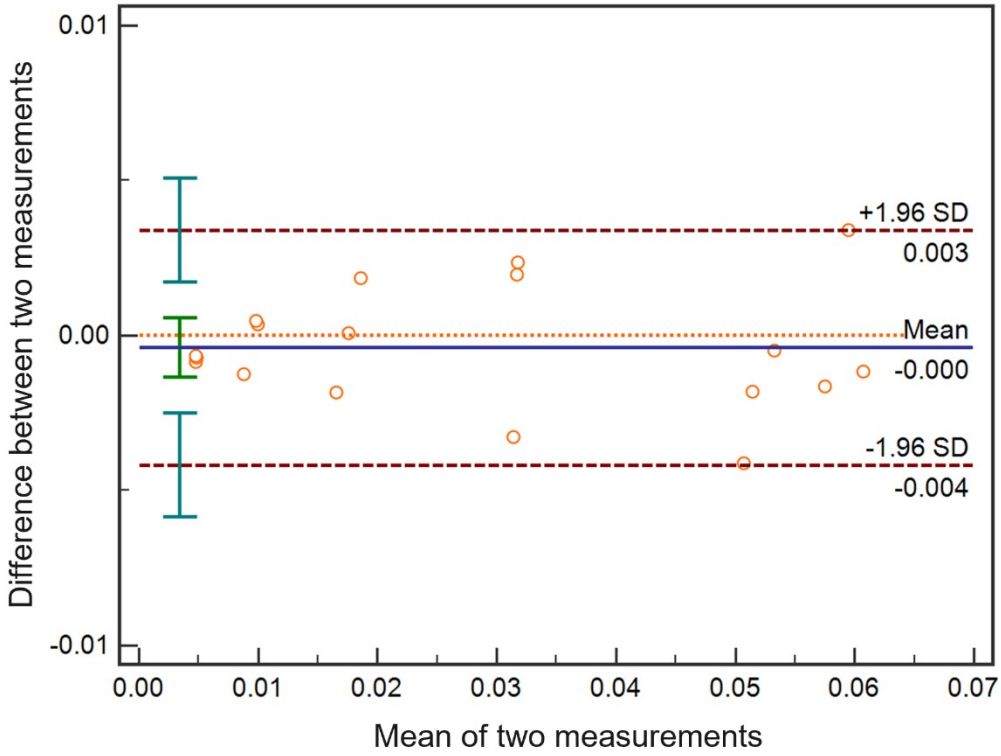

Fig S2 Bland-Altman Plot for Consistency Analysis of Protein Samples between Our System and Commercial Plate Reader

From the Bland-Altman plot, it can be seen that there are 2 points falling outside the limits of agreement (LoA), but no points fall outside the 95% confidence interval (CI) of the LoA, which indicates good consistency between the two methods. The difference in measurement results between the two methods is not statistically significant (P=0.3924).

Fig. S3.

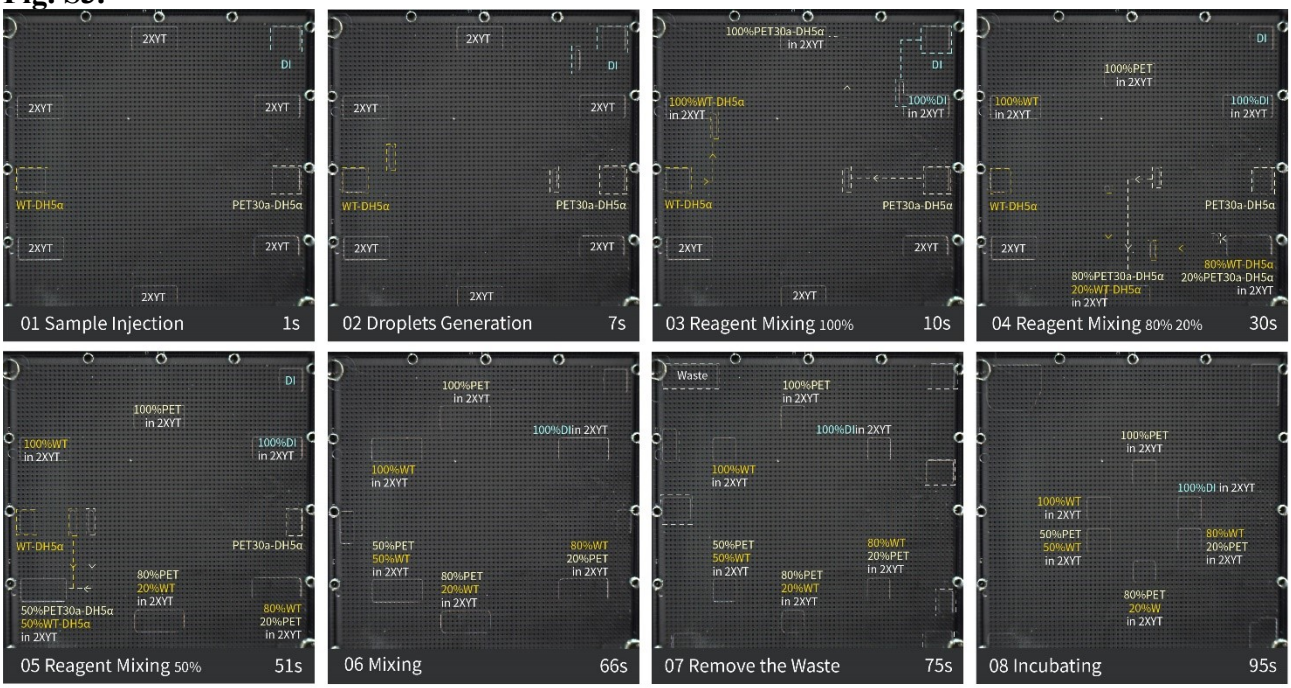

Fig S3 shows the entire process of WT-DH5α and PET30a-DH5α mixed and screened on a DMF chip. To prepare for the test, samples were injected into the chip's six reservoirs, and the droplets were then split, mixed and moved in a pre-programmed procedure.

Different coloured boxes represent other reagents. Dashed lines indicate the position of each sample and its direction of movement. Fig S3 (03) to Fig S3 (05) shows the process of reagents being mixed along pre-programmed paths, while Fig S3 (06) shows droplets being moved back and forth to mix. Fig S3 (07) shows that excess waste liquid moves to the four corners of the chip and waits to be discharged. Fig S3 (08) represents each sample moving to the position to be tested, ready for incubation reaction.

Movie S1.

The workflow of droplet operation for WT-DH5α and PET30a-DH5α mixing and screening on the DMF chip

Movie S2.

Growth of mixed WT-DH5α and PET30a-DH5α in different proportions in resistance media

Movie S3.

On-chip growth of PET30a-DH5α under different concentrations of kanamycin