

Electronic Supplementary Information (ESI)

Towards Targeted *Escherichia coli* Fluorescence Biosensor using Quantum Dots Decorated Geothermal Silica Nanoparticles

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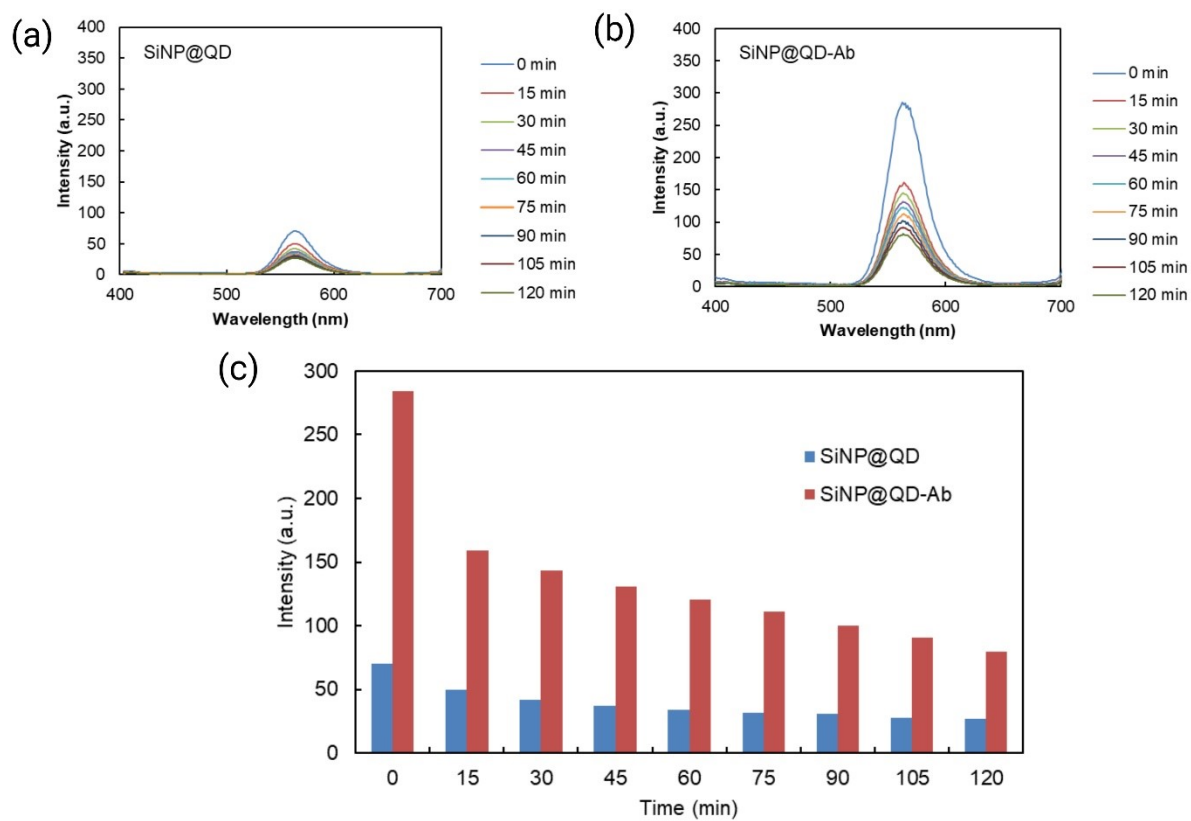


Fig. S1 Time-dependent fluorescence stability of SiNP@QD and SiNP@QD-Ab over 120 minutes. (a–b) Emission spectra recorded at 0–120 min and (c) Intensity comparison showing gradual decay in both samples.

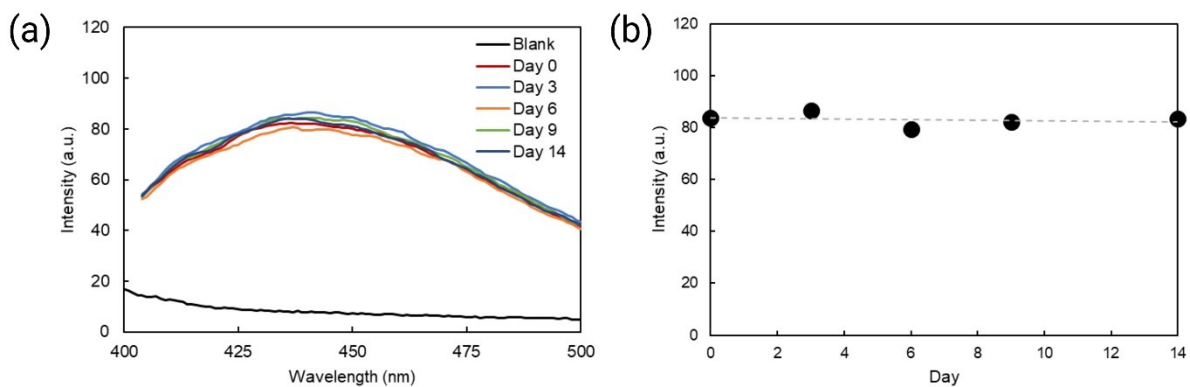


Fig. S2 Fluorescence stability of SiNP@QD-Ab stored at 4 °C for 14 days in the presence of 10^4 CFU/mL *E. coli*, showing minimal changes in emission intensity and peak position throughout the storage period.

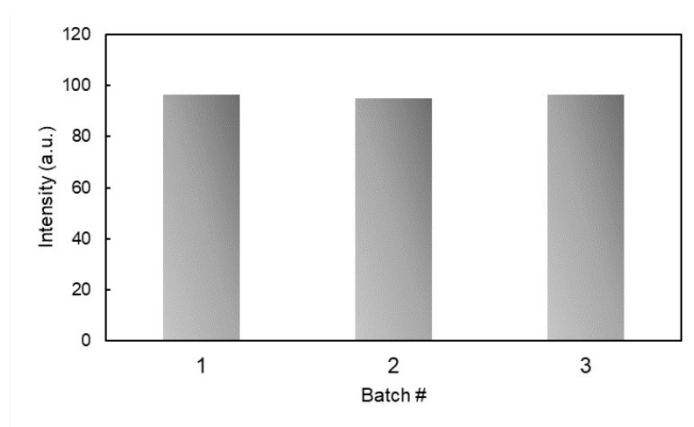


Fig. S3 Batch-to-batch reproducibility of SiNP@QD-Ab evaluated at 10^5 CFU/mL *E. coli*, with three independently synthesized batches exhibiting highly consistent fluorescence intensities at 435 nm.

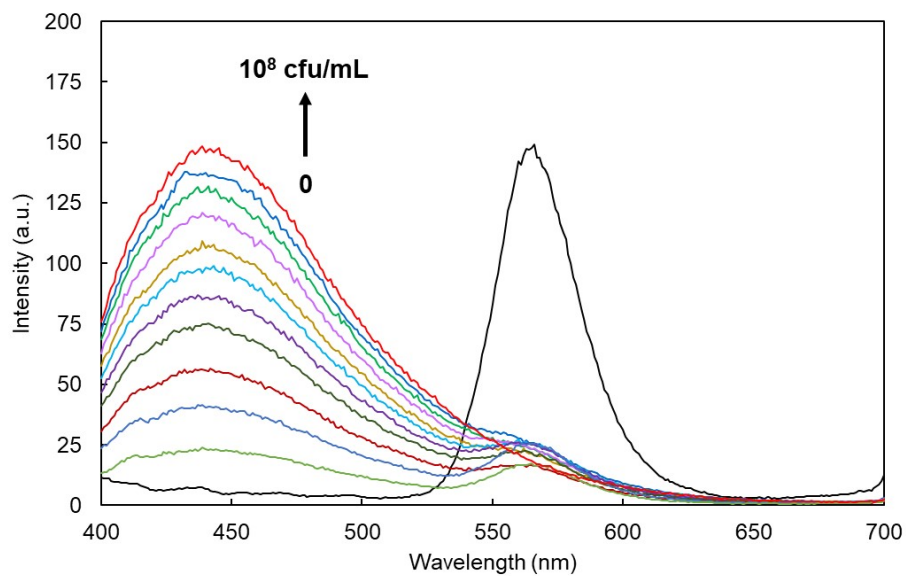


Fig. S4 Full-range fluorescence spectra (400–700 nm) for *E. coli* detection using SiNP@QD-Ab at varying concentrations of 0– 10^8 CFU/mL.

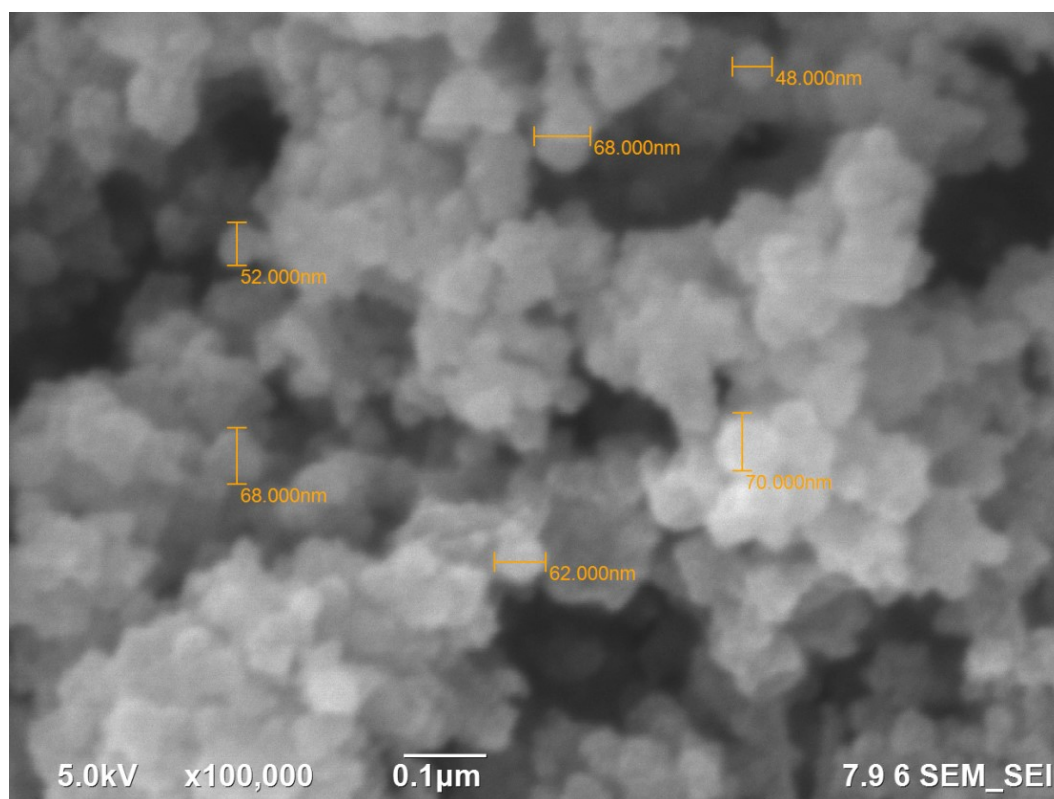


Fig. S5 FESEM micrograph of SiNP@QD-Ab showing the size of the particles.

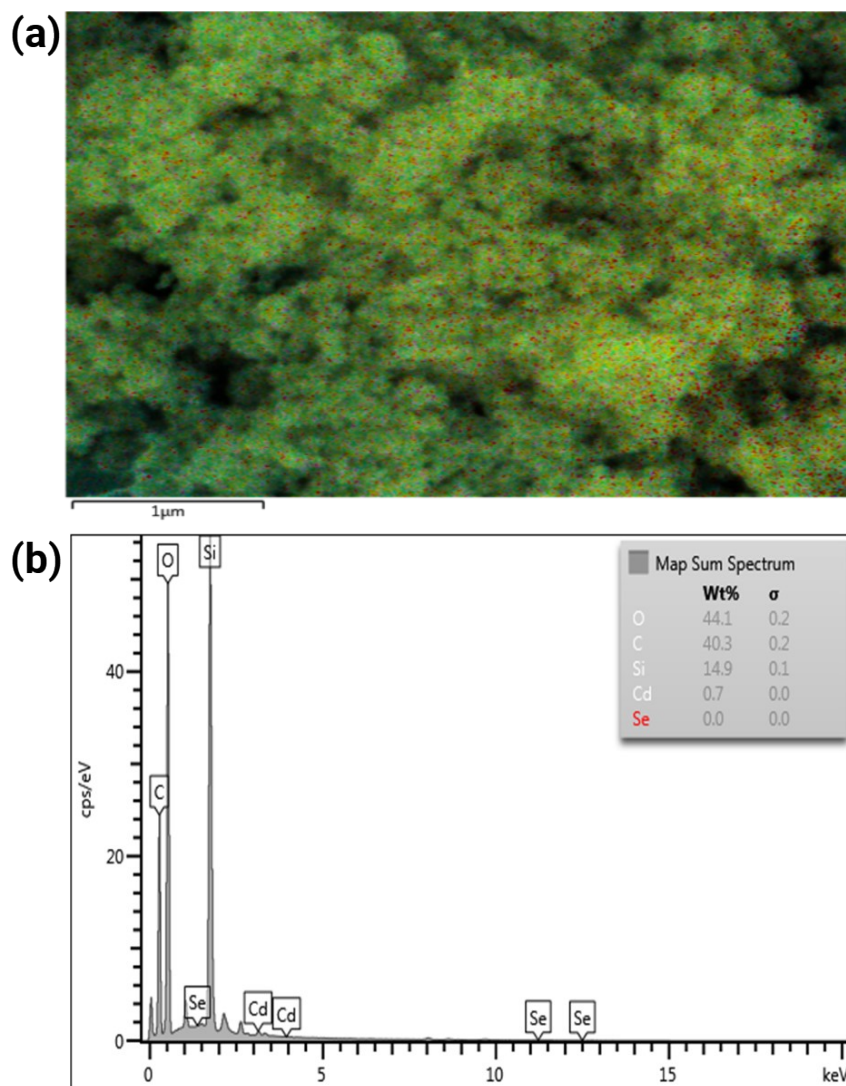


Fig. S6 Energy-dispersive X-ray spectroscopy of SiNP@QD-Ab showing total layered (a) and (b) energy-dispersive X-ray spectra showing the amount of O, C, Si, and layer of CdSe.

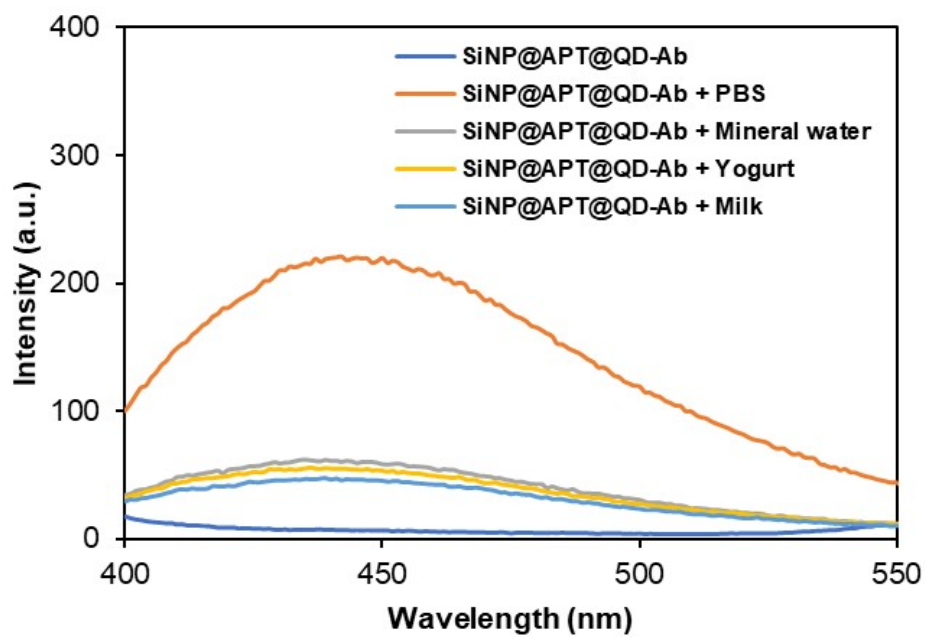


Fig. S7 Fluorescence spectra at 435 nm excitation for *E. coli* detection using SiNP@QD-Ab in PBS and various food samples with 15 minutes of incubation time. All measurements were made in triplicate.