Supporting Information

Bridging flocculation of sterically stabilised cationic latex as a biosensor for detection of microbial DNA after amplification *via* PCR

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Additional experimental details

Aqueous electrophoresis and dynamic light scattering (DLS)

Measurements were conducted in the presence of 1 mM KCl using a Malvern Zetasizer Ultra instrument to measure both hydrodynamic diameter and zeta potential. Samples were diluted to 0.1 % w/w and data were averaged over three consecutive runs at 25 °C. Zeta potential was calculated from the electrophoretic mobility using the Smoluchowski relationship. An MPT-3 autotitrator equipped with an auto degasser was used for titration using disposable capillary cells. The solution pH was adjusted by adding either dilute (0.025-0.25 M) HCl or KOH.

Transmission electron microscopy (TEM)

TEM studies were conducted using a FEI Tecnai G2 20 instrument operating at 200 kV and equipped with a Gatan 1k CCD camera. Aqueous polymer dispersions were diluted to approximately 0.1 % w/w using deionised water at ambient temperature. TEM samples were prepared by depositing 2 μl of diluted copolymer dispersion onto carbon-coated copper grids (Agar Scientific, 400 mesh) and dried under ambient conditions for 30 minutes.

Supporting Figures

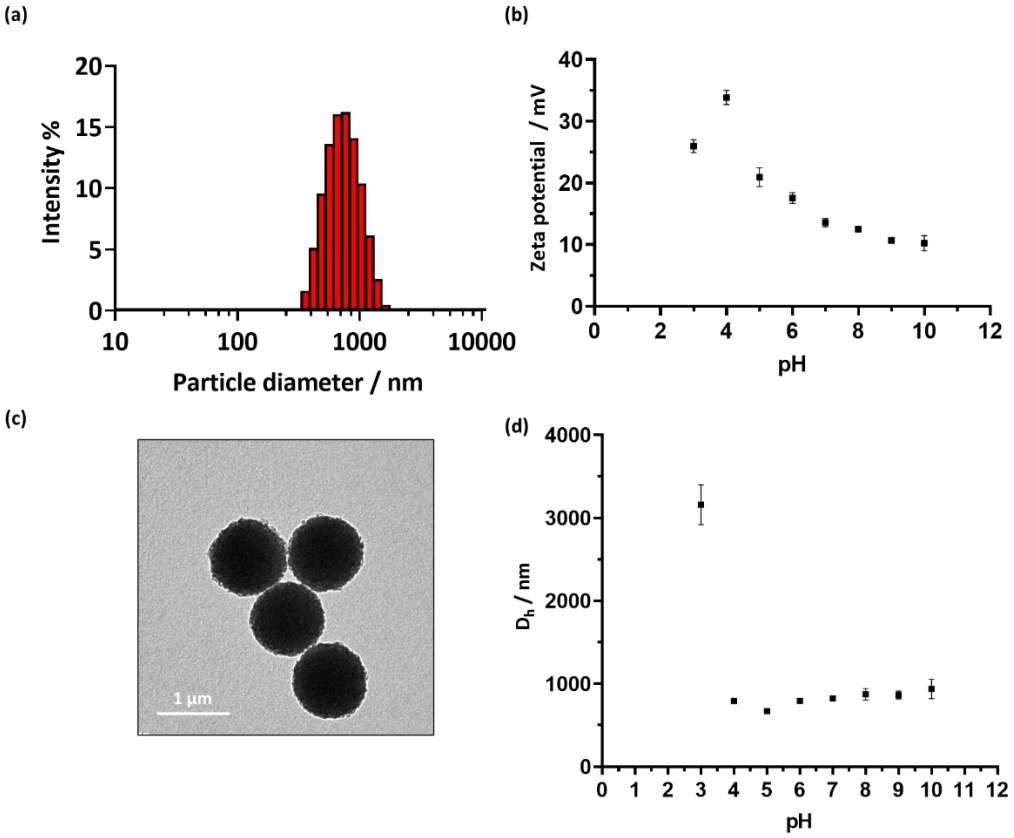

Figure SI1. Characterisation of cationic PEGMA-stabilised P2VP latex particles prepared by aqueous emulsion polymerisation. (a) Particle size distribution measured *via* dynamic light scattering (DLS). (b) Zeta potential as a function of pH. (c) Representative TEM image. (d) Mean hydrodynamic diameter as a function of pH. DLS and Zeta potential measurements were conducted at a latex concentration of approximately 0.1 % w/w with 1 mM KCl as a background electrolyte. The pH was adjusted using KOH and HCl.

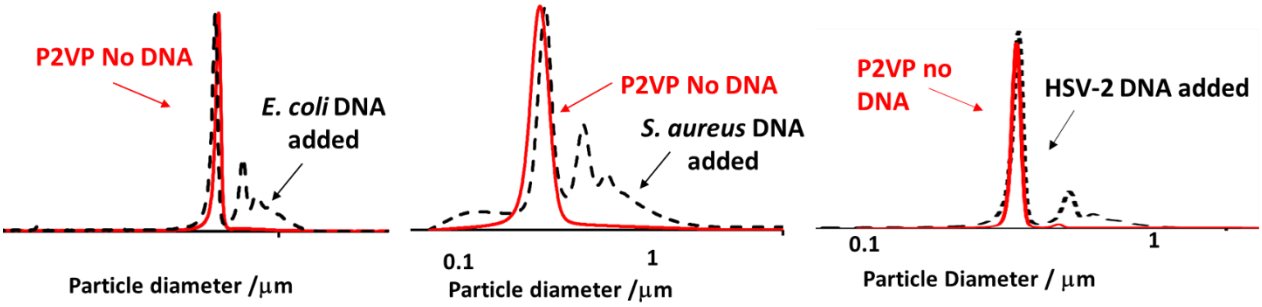

Figure SI2: Disc centrifuge photosedimentometry (DCP) analysis of PEGMA-P2VP latex before and after being added to amplified DNA from PCR for *E. coli*, *S. aureus* and HSV-2. The overall latex concentration was 0.01 %, and the approximate overall DNA concentration was 4 ng μl^{-1}.

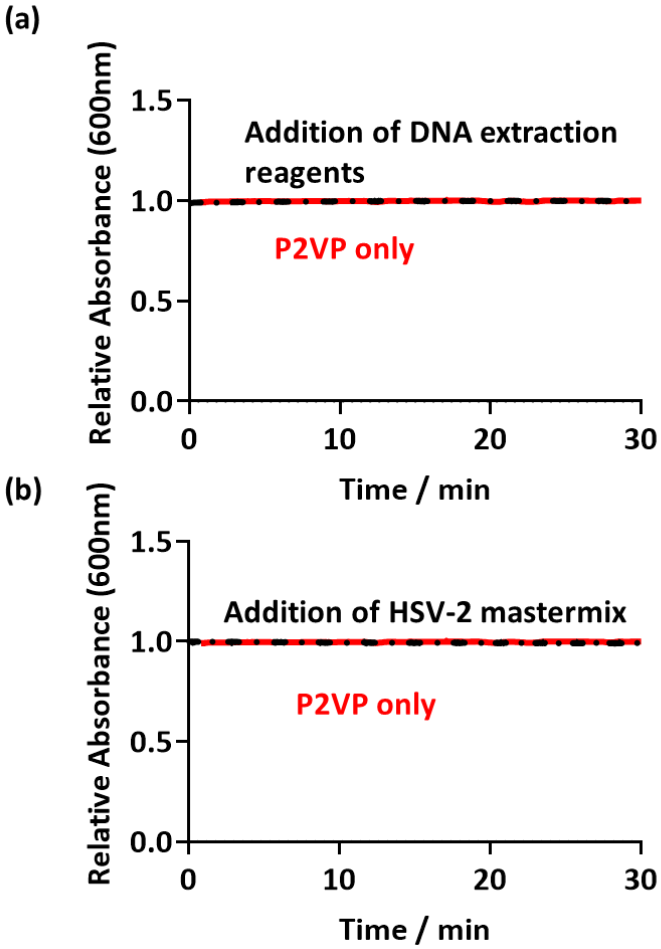

Figure SI3. UV-Vis spectrophotometry absorbance at 600 nm obtained for PEGMA-P2VP latex (red) for; (a) addition of viral DNA extraction reagents; (b) addition of 20 µl HSV-2 PCR mastermix. The latex concentration was 0.1 % w/w and reagents were added at the concentration used during PCR.

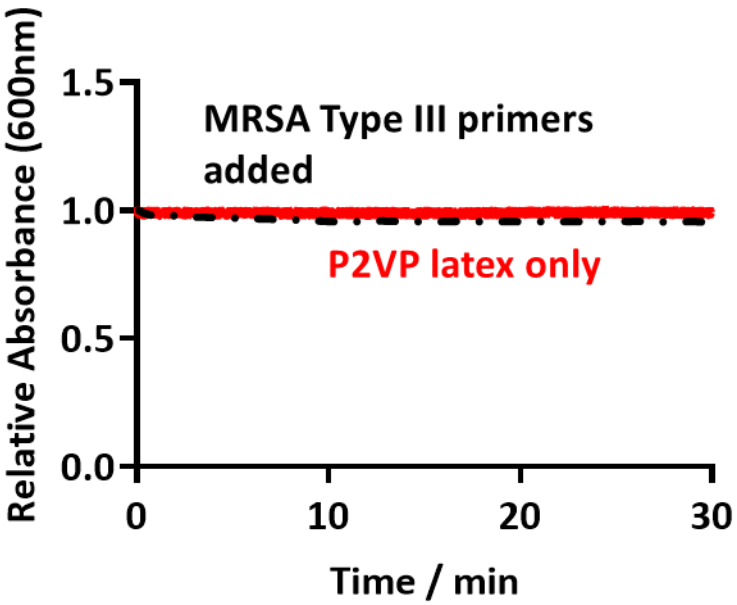

Figure SI4. UV-Vis absorbance spectrophotometry absorbance at 600 nm obtained for PEGMA-P2VP latex (red) and on the addition of MRSA type III primers (black). The latex concentration was 0.1 % w/w, and reagents were added at the concentration used during PCR.

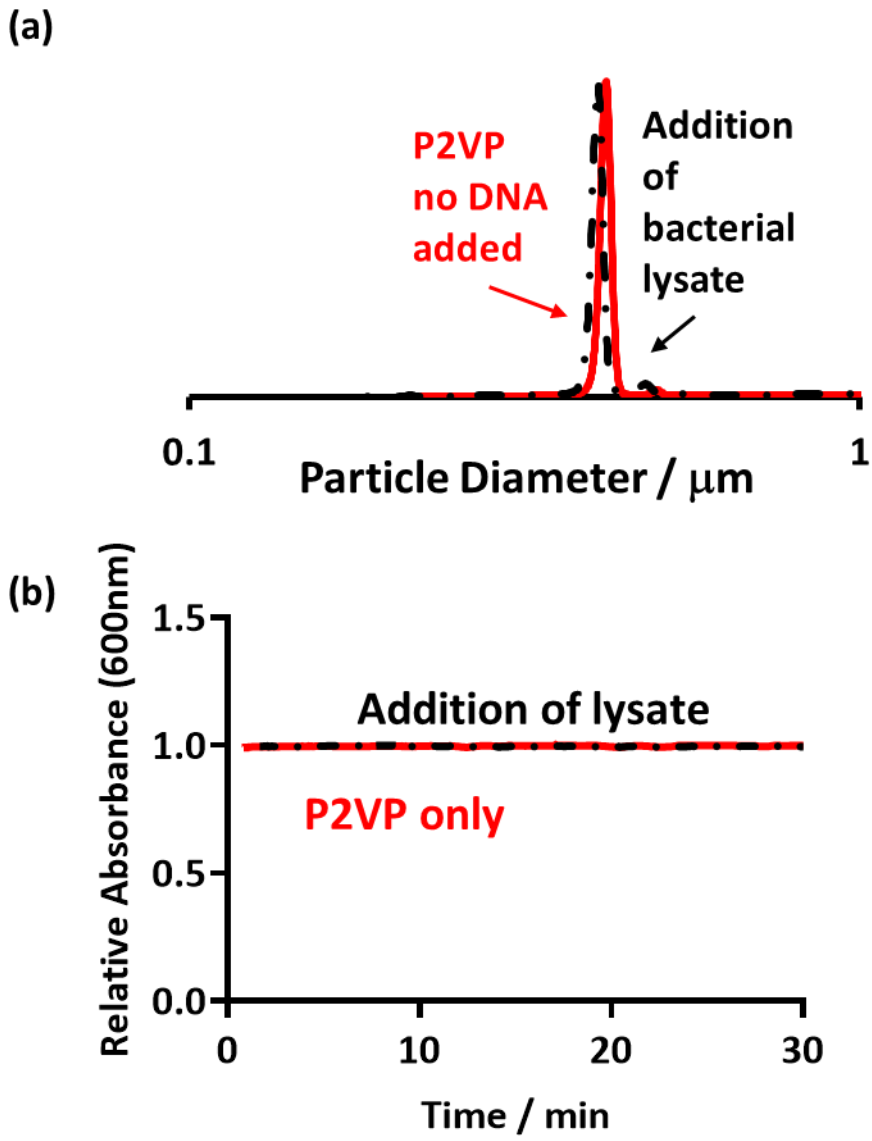

Figure SI5 (a) DCP analysis of PEGMA-P2VP latex before and after being added to bacterial lysate. (b) UV-Vis absorbance spectrophotometry absorbance at 600 nm obtained for PEGMA-P2VP latex (red) and on the addition of bacterial lysate (black). The latex concentration was 0.1 % w/w, and reagents were added at the concentration used during PCR.