Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information

Bifunctional Plasmonic-Magnetic Particles for an Enhanced Microfluidic SERS Immunoassay

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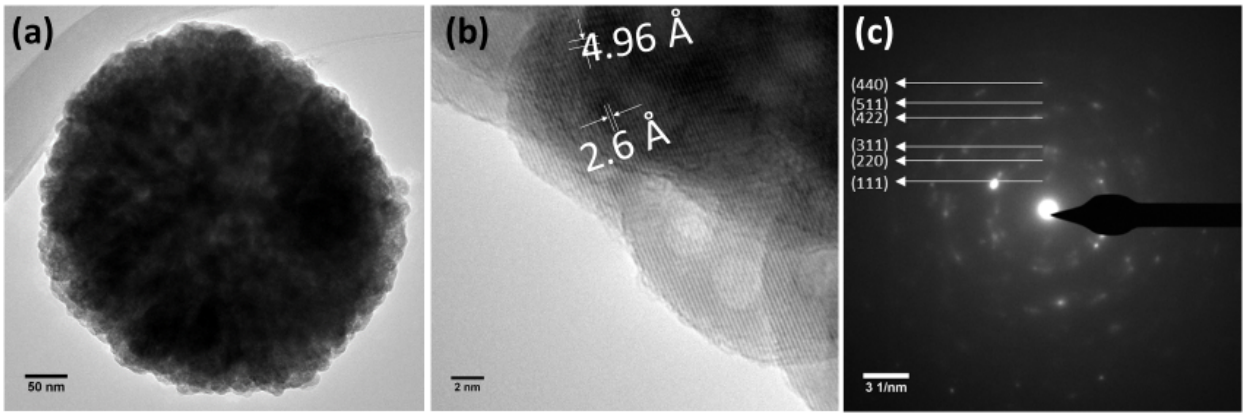

Fig. S1 (a) TEM characterization of Fe_3O_4 composed of multiple nanocrystals resulting in rough surface (b) TEM characterization of Fe_3O_4 under high magnification with spaced lattice fringes of 2.6 Å and 4.96 Å which correspond to the {311} and {111} plane of Fe_3O_4 particle respectively (c) Selected area diffraction (SAED) patterns of Fe_3O_4 particle.

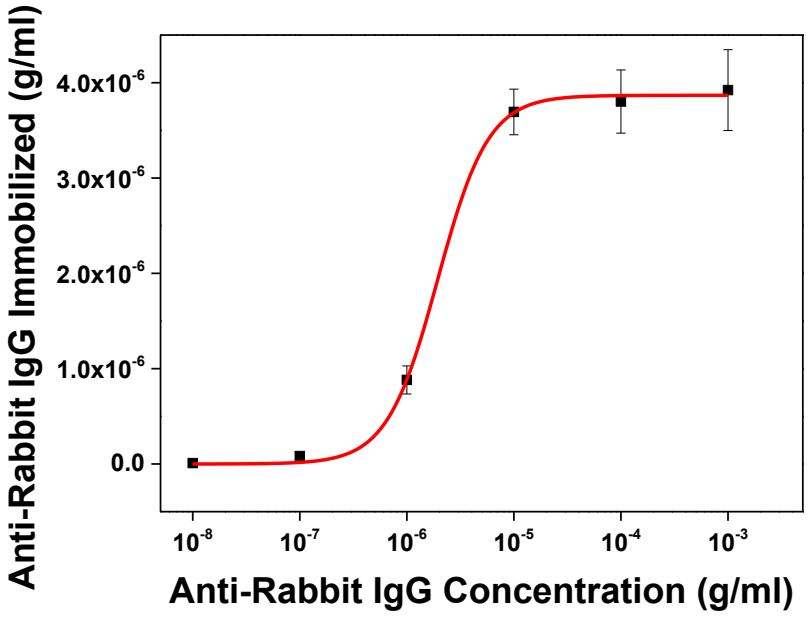

Fig. S2 ELISA detection of Anti-IgG concentration immobilized on 1mL of Fe_3O_4@AuNPs nanoparticle.

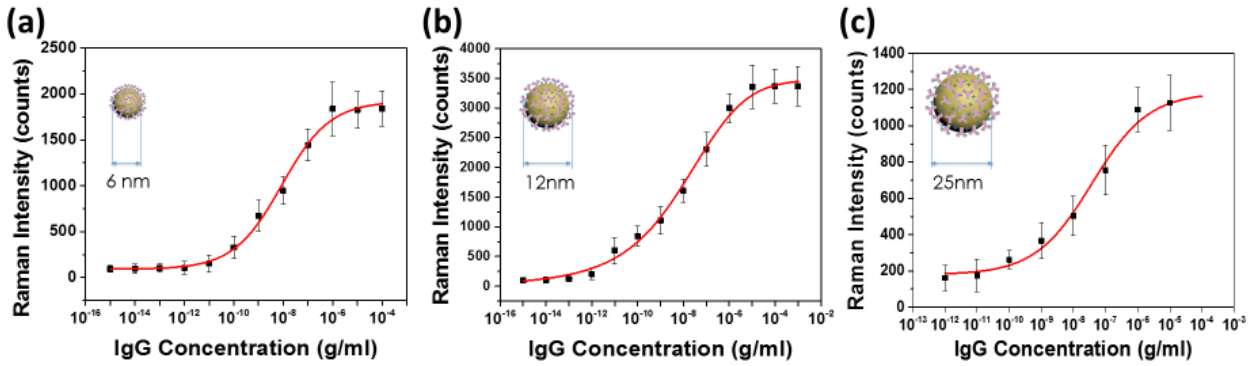

Fig. S3 Dose-response curves for SERS-based detection of rabbit IgG using various SERS reporting particle sizes of (a) 6nm, (b) 12nm and (c) 25nm.

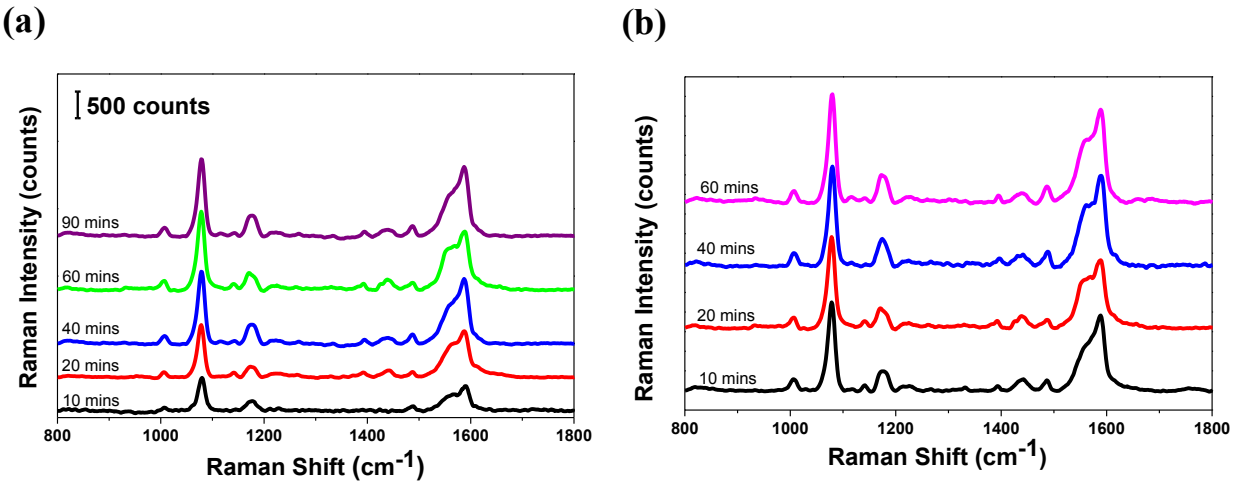

Fig. S4 (a) SERS spectra while varying mixing time of SERS-active immuno-magnetic particle and rabbit IgG protein (b) SERS spectra while varying mixing time of rabbit IgG protein immobilized on SERS substrates and SERS reporting particle in microfluidic device

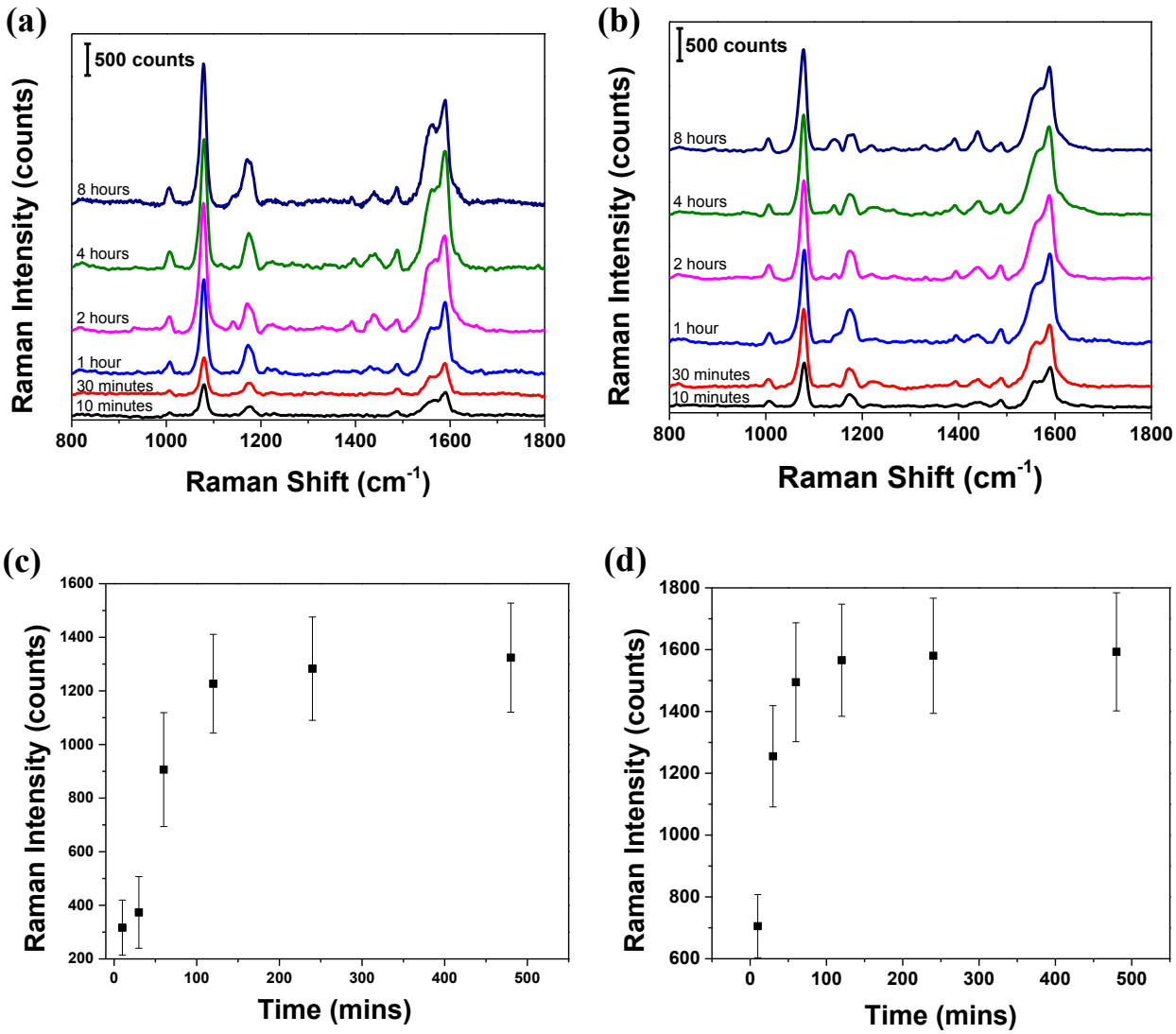

Fig. S5 (a) SERS spectra and (c) rabbit IgG concentration against immunoassay time of SERS-active immuno-magnetic particle and rabbit IgG protein. (b)SERS spectra and (d) rabbit IgG concentration against immunoassay time of rabbit IgG protein immobilized on SERS substrates and SERS reporting particle in non-microfluidic immunoassay.

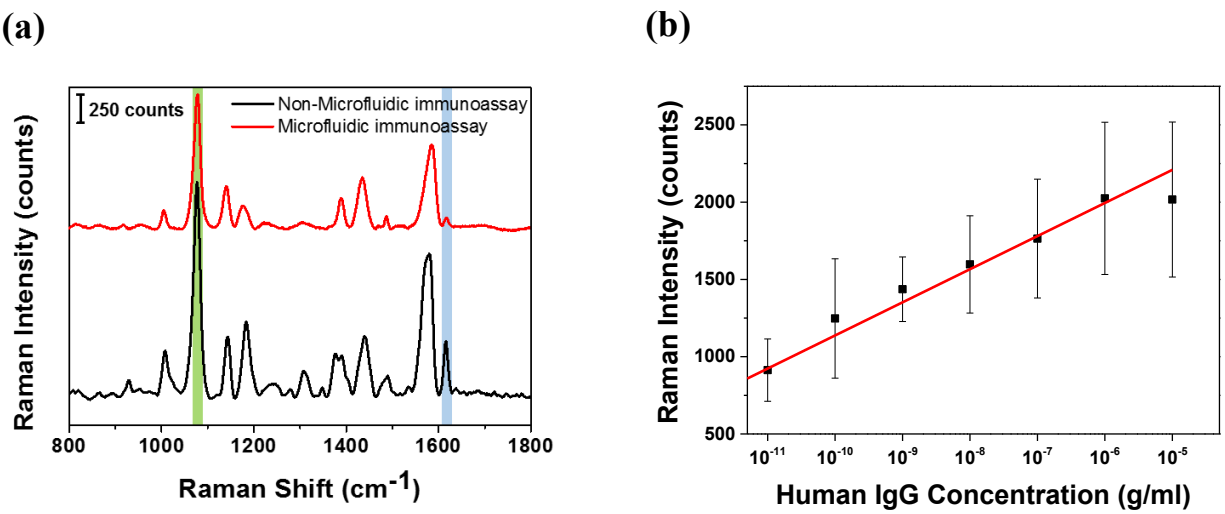

Fig. S6 (a) Binding specificity test of rabbit IgG (green highlighted peak) and human IgG (blue highlighted peak) in microfluidic immunoassay and non-microfluidic immunoassay (b) Corresponding dose-response curve for SERS-based detection of human IgG. Each point was obtained from the average of 10 measurements