Electronic Supplementary Material (ESI) for Analytical Methods.

Supplementary Material

Inkjet printing paper-based immunodevice for fluorescence determination of Immunoglobulin G

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Results and discussion

Exploration of printing results with different sizes of nanoparticles

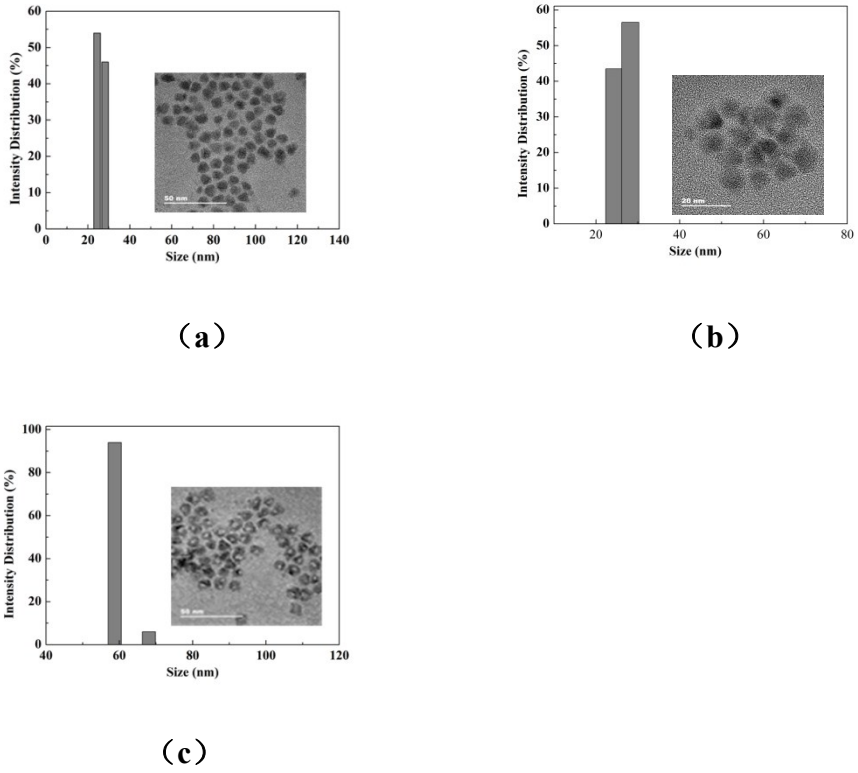


Fig.S1 TEM image and DLS result of (a) IgG capture antibody, (b) IgG, (c) CdTe QD labeled detection antibody.

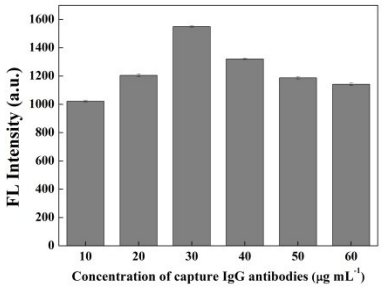
Optimization of immunoassay conditions

In the immunoassay procedure, we examined the effect of the concentration of the capture antibody. The concentration of BSA (0.05%), detection antibody (50 μg mL^{-1}) and IgG (20 ng mL^{-1}) were fixed. The concentration of the capture antibody was examined in the range of 10-60 μg mL^{-1} (Fig. S2a). When the concentration of capture antibody was below 30 μg mL^{-1}, the fluorescence intensity increased with the increasing concentration of capture antibody. The FL intensity decreased when the concentration was higher than 30 μg mL^{-1}. Therefore, 30 μg mL^{-1} was selected as the optimal concentration of the capture antibody.

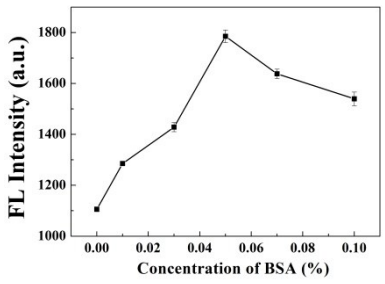
With the optimal concentration of capture antibody (30 μg mL^{-1}), detection

antibody (50 μg mL^{-1}), and IgG (20 ng mL^{-1}), the effect of BSA concentration on the immunoassay was investigated in the range of 0.01-0.1%. As shown in Fig. S2b, the FL intensity increased with the increasing concentration of BSA in the range of 0.01-0.1% and the FL intensity increased to a maximum level at 0.05% of the BSA. After that, the FL intensity decreased with the increasing of BSA in the range of 0.05 to 0.1%. Thus, 0.05% was used as the optimal concentration of BSA for the further immunoassay study.

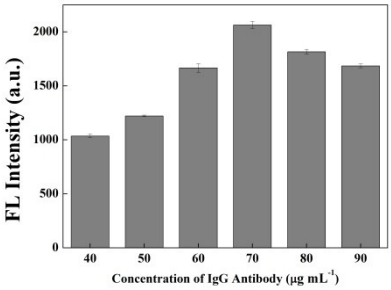
In the immunoassay, detection antibody has a great effect on the detection results since it can directly affect the FL intensity. We examined the effect of detection antibody concentration in the range of 40-90 μg mL^{-1} on the immunoassay (Fig. S2c). The results showed that, with the increasing of detection antibody concentration in the range of 40-70 μg mL^{-1}, the FL intensity gradually increased to maximum value at 70 μg mL^{-1}. The FL intensity decreased when the concentration of detection antibody was higher than 70μg mL^{-1}. So, 70 μg mL^{-1} was chosen as the suitable concentration of detection antibody in the immunoassay.



(a)



(b)



(c)

Fig. S2 Parameter optimization of (a) Effect of the capture antibody concentration on the immunoassay; (b) Effect of BSA concentration on the immunoassay; (c) Effect of detection antibody concentration on the immunoassay.