Electronic Supplementary Material (ESI) for RSC Advances.

An aptasensor based on microscopic enumeration of encoding-gold nanoparticles for the detection of C-reactive protein

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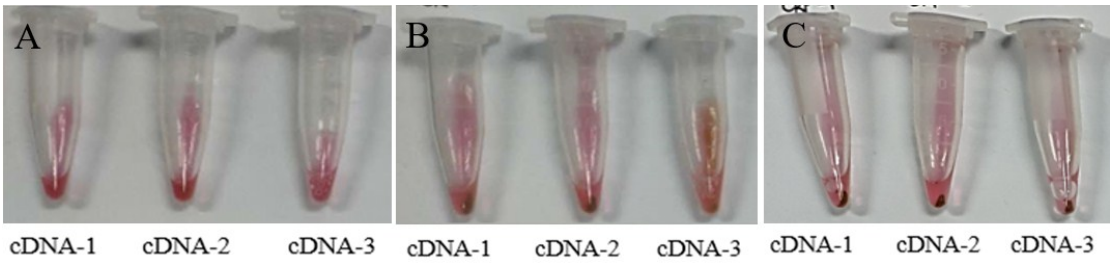

Fig. S1. (A) Photograph of the colorimetric images of AuNPs modified with different c-DNA, (B) Photograph of the colorimetric images right after the addition of MBs, (C) Photograph the colorimetric images after incubation of MBs and AuNPs for some time

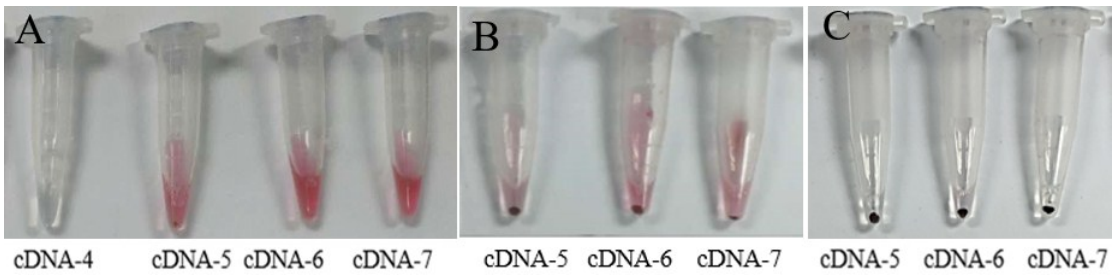

Fig. S2. (A) Photograph of the colorimetric images of AuNPs modified with different c-DNA, (B) Photograph of the colorimetric images right after the addition of MBs, (C) Photograph the colorimetric images after incubation of MBs and AuNPs for some time

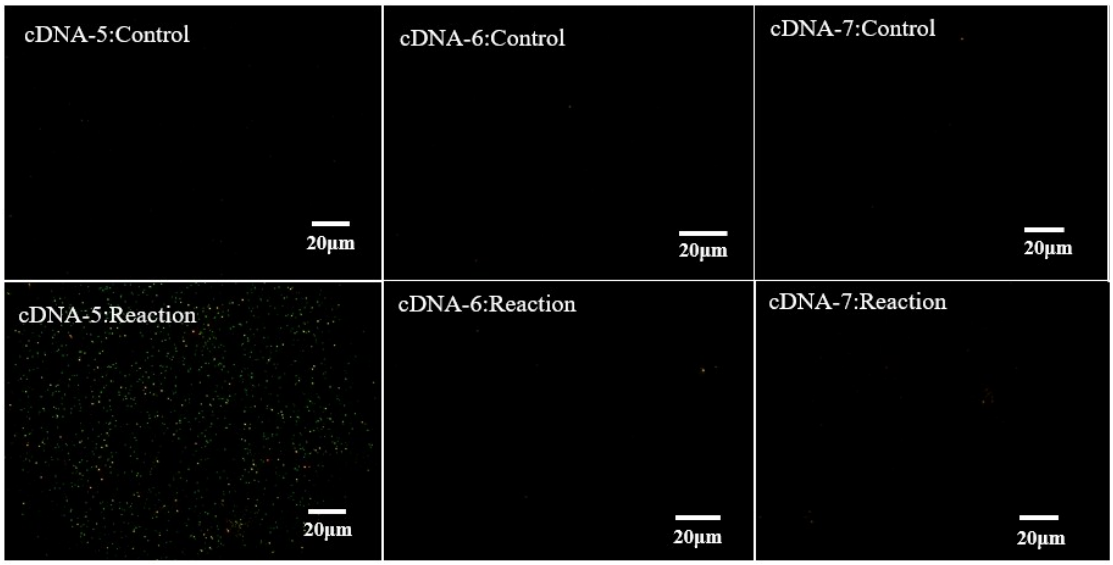

Fig. S3. Representative DFM images of AuNPs displaced by CRP and its control group

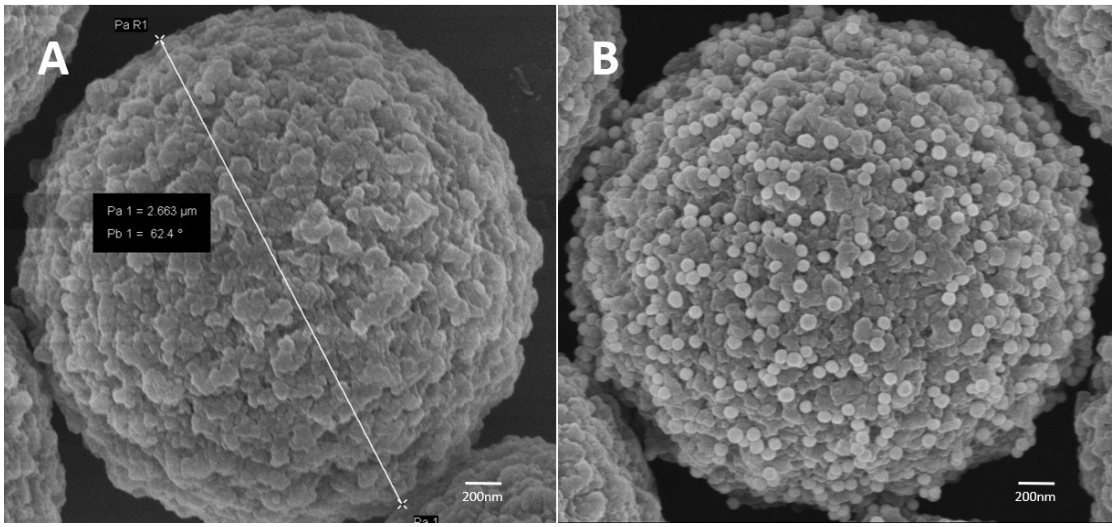

Fig. S4. SEM image of the MBs before (A) and after (B) modification with AuNPs

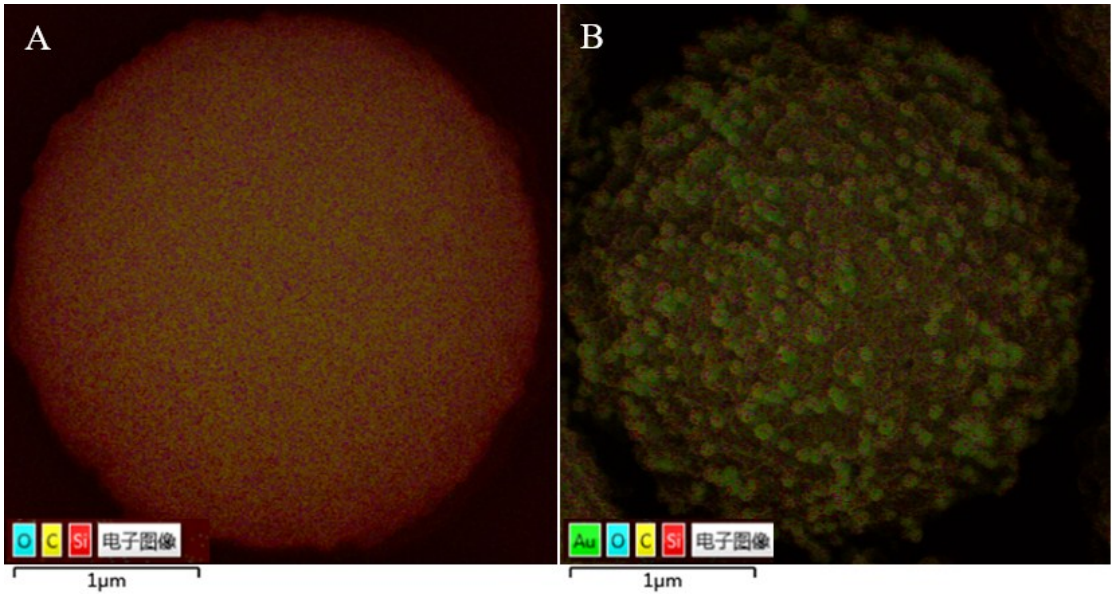

Fig.S5. The EDS image of the MBs before (A) and after (B) modification with AuNPs, green represents for Au element, light green represents for Pt elements

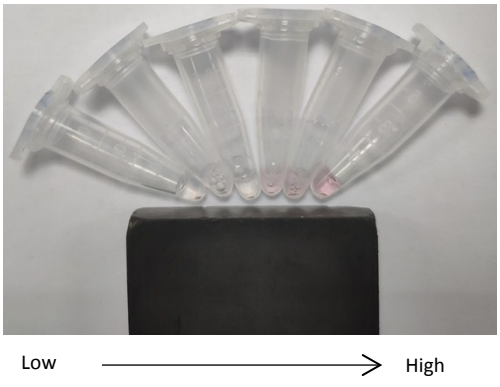

Fig. S6. Photograph of **c**olorimetric image of supernatants after the addition of CRP of gradient concentration (from low to high concentration: 0, 0.43, 0.86, 1.30, 1.74, 2.17 μM, respectively.)

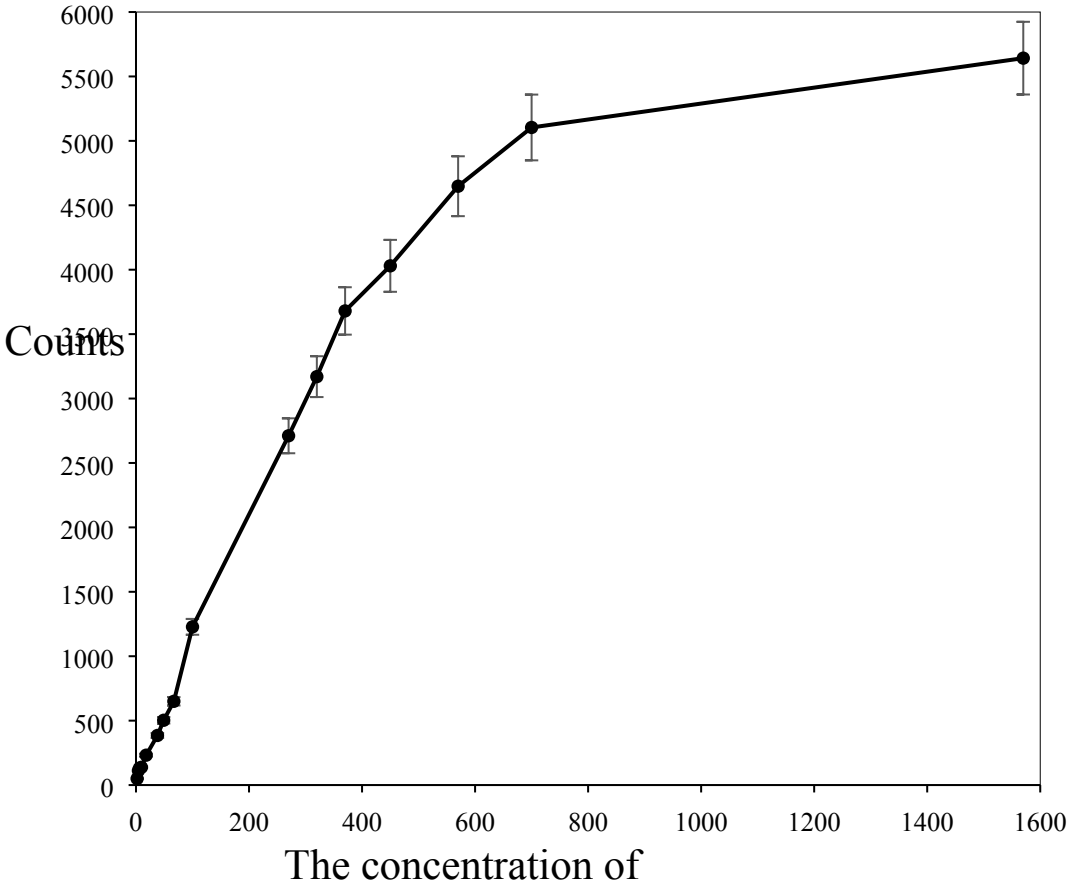

Fig. S7. The relationship between AuNPs counts and CRP concentrations.

The error bar was the standard deviation value of three repetitions.

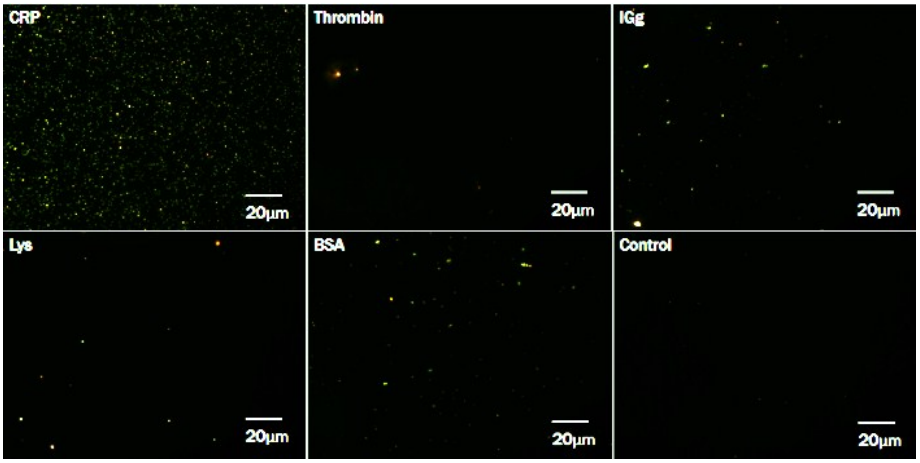

Fig. S8. Typical DFM images of AuNPs displaced by addition of different proteins. CRP (0.43 μM), Thrombin (5 μM), IgG (5 μM), Lys (5 μM), BSA (5 μM), and buffer only.

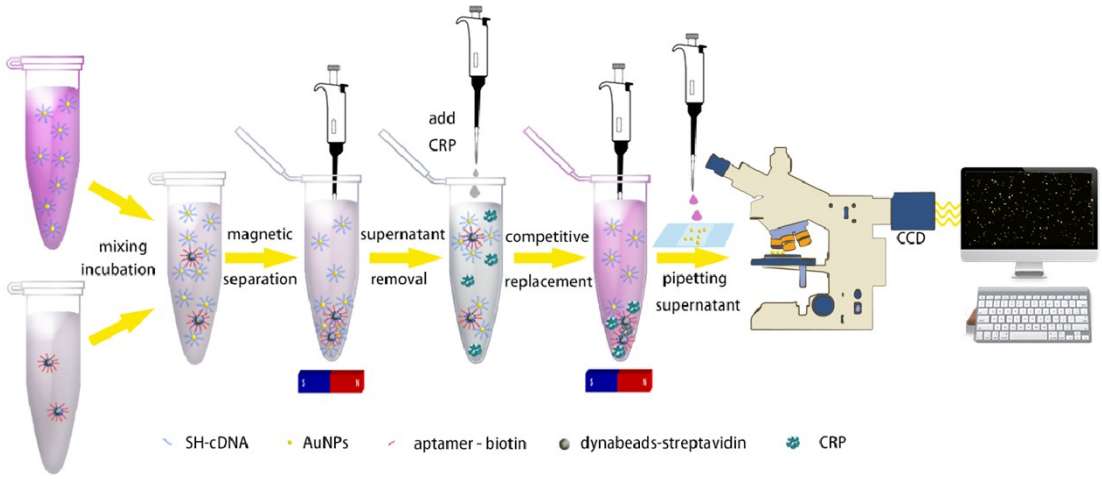

Fig. S9. Schematic illustration for the detection of the target CRP.

As is shown in Fig. S9, mixed functionalized AuNPs with c-DNA and functionalized MBs with aptamer to fabricated an aptamer-based probe with sandwich structure by DNA hybridization. Then the AuNPs not attached to the MBs in the supernatant are removed, and finally a stable nanoprobe for detecting CRP is prepared. In the presence of CRP, the interaction between CRP and aptamer is stronger than the interaction of complementary pairing between cDNA and aptamer, the AuNPs attached to the nanoprobe will be replaced by the CRP from the MBs and free in the supernatant. The green scattering information of the AuNPs was recorded by CCD on the DFM, and then counted the number of free AuNPs by the MATLAB program, and finally the relationship between AuNPs counts and the CRP concentration were obtained. Thereby achieving the purpose of detecting C-reactive protein.