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Supporting Information

Highly sensitive SERS assay of genetically modified organisms in maize via a nanoflower substrate coupling with hybridization chain reaction amplification

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1. Results and discussion

1.1 Optimization of experimental condition

To achieve great analytical performance of the dual-amplification strategy for the DNA detection in maize, the buffer pH was further optimized. As illustrated in Fig. S1, the influence of pH value ranging from 6.4 to 8.4 on the relative capturing yield of target DNA was observed. And the relative capturing yield reached a maximum at pH 7.4. Therefore, we selected pH 7.4 as the optimum pH value.

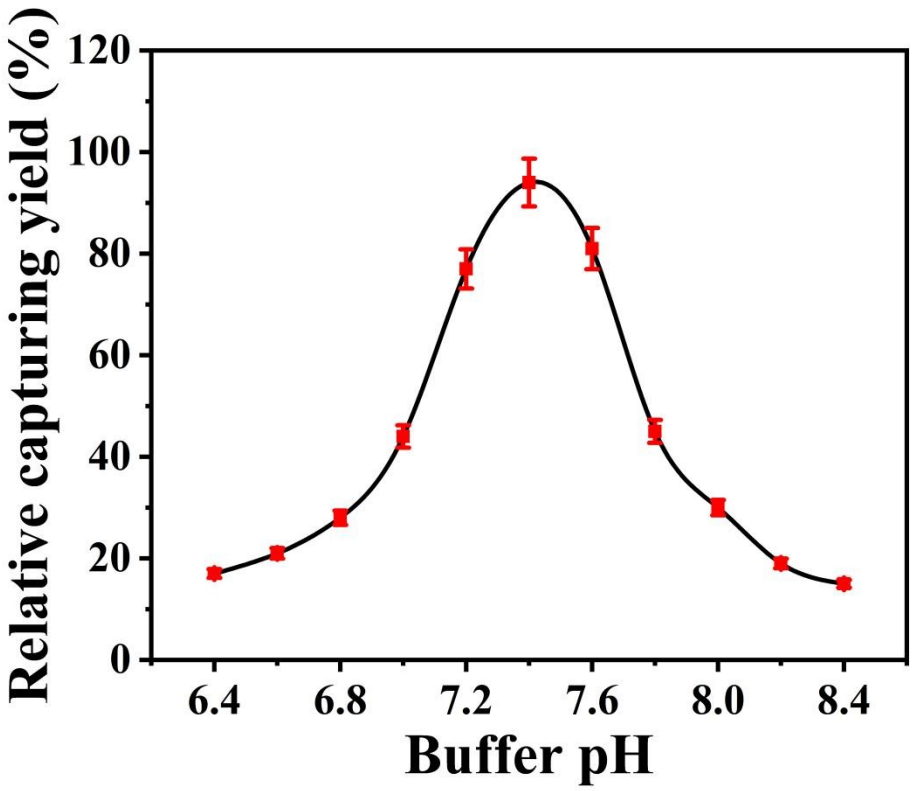

Fig. S1 Optimization of the buffer pH.

1.2 The stability of Ag-AuNRs and SERS probe

Since Ag-AuNRs were to be exploited as SERS probes, they should retain their optical properties and the stability of the attached Raman reporter in the physiological medium. Therefore, the stability of SERS probes was checked via a reliable

aggregation test. We investigated the effect of highly concentrated salted solution of 1 M NaCl on the stability of unconjugated Ag-AuNRs and SERS probes as NaCl was known to induce nanoparticle aggregation. Indeed, the UV-vis absorption spectra of the probes modestly decreased upon the addition of 1 M NaCl (Fig. S2B). No significant changes in the LSPR spectral position and shape were observed, because BSA was efficiently chemisorbed on the Ag-AuNRs surface through the strong sulfur-gold bonds in order to reduce the aggregation of the Ag-AuNRs solution. While the absorption spectra of unconjugated Ag-AuNRs were greatly reduced (Fig. S2A), suggesting at least partial aggregation of Ag-AuNRs. Taken together, these observations demonstrated that BSA provided effective stabilization against aggregation. Meanwhile, Ag-AuNRs also presented a great stability to a certain extent.

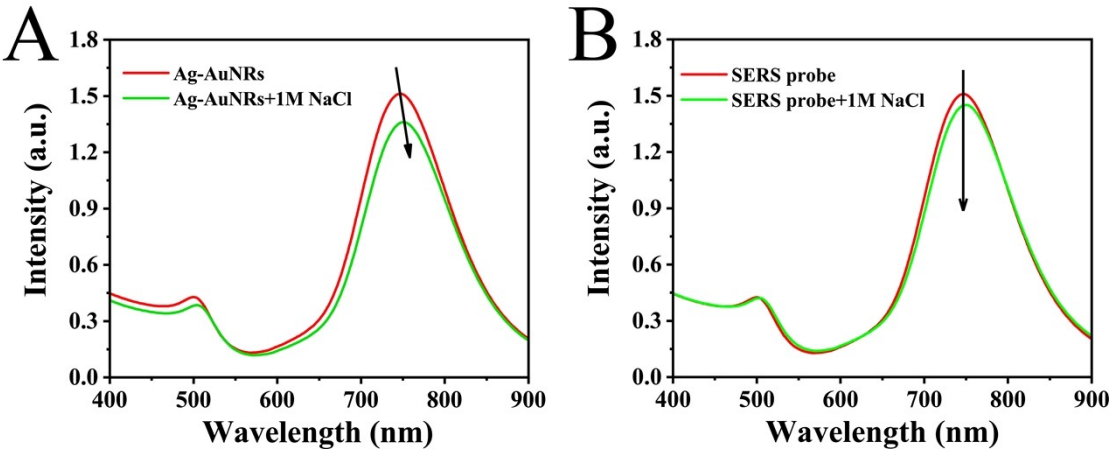

Fig. S2 UV-vis spectral analysis of (A) Ag-AuNRs and (B) SERS probe after incubation in 1 M NaCl.