

## Supporting Information

*for*

### **Single Gold Nanoprobe for Colorimetric Detection of Silver (I) Ions with Dark-Field Microscopy**

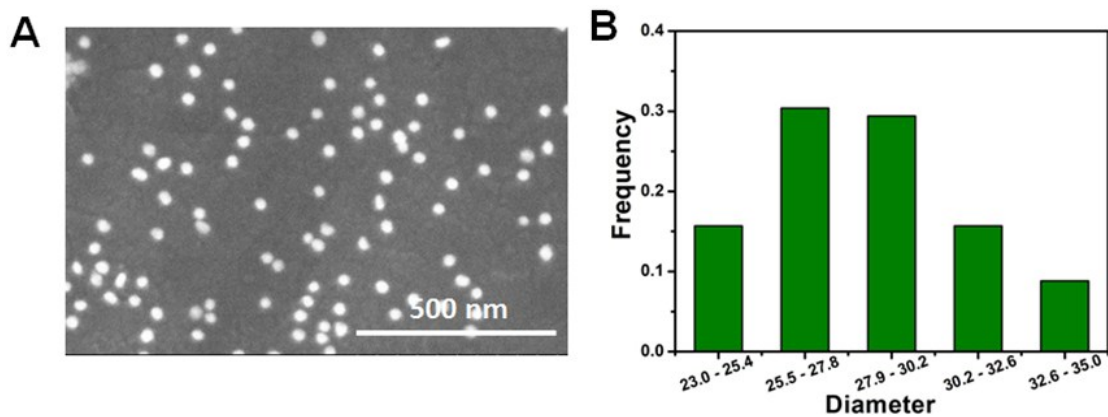
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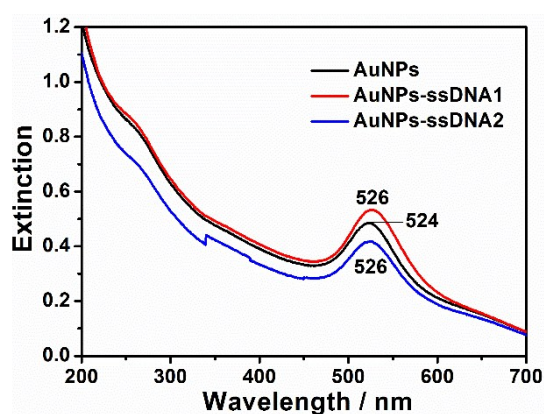
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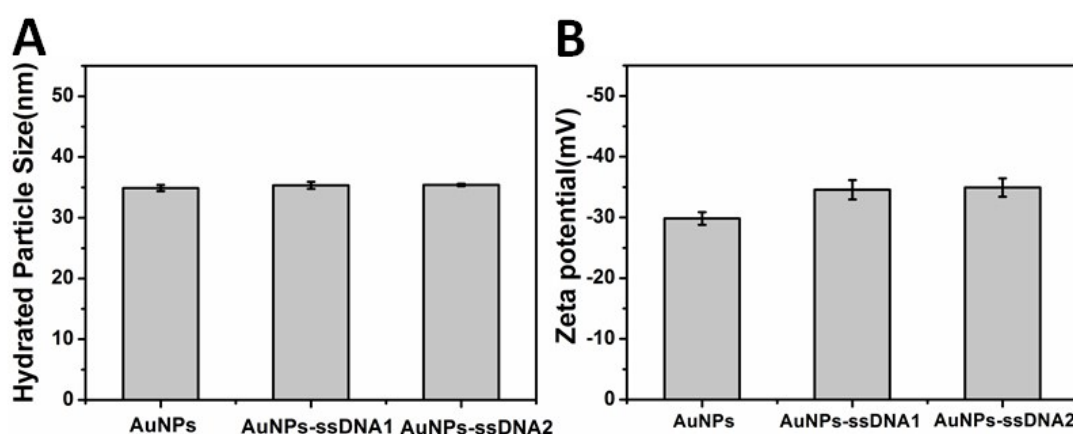
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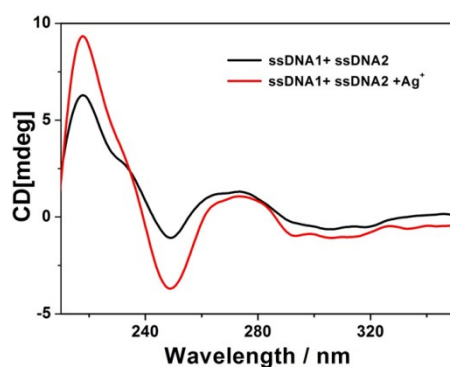
**Fig. S1** Characterization of AuNPs. (A) SEM image and (B) size distribution of AuNPs.



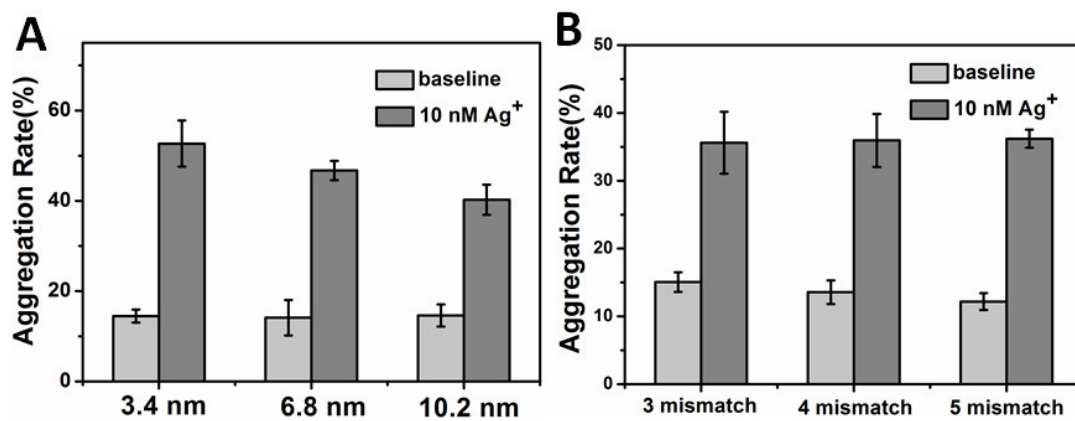
**Fig. S2** The normalized extinction spectra of AuNPs, ssDNA1-AuNPs, ssDNA2-AuNPs, respectively.



**Fig. S3** Characterization of ssDNA-AuNPs. (A) The average mean hydrated size of AuNPs, ssDNA1-AuNPs, ssDNA2-AuNPs, respectively. (B) The zeta potential for AuNPs, ssDNA1-AuNPs, ssDNA2-AuNPs, respectively.



**Fig. S4** CD spectra of ssDNA before and after adding  $\text{Ag}^+$ . 5  $\mu\text{M}$  ssDNA1 and ssDNA2 were incubated with  $\text{Ag}^+$  (100 nM).



**Fig. S5** Comparison the effect of (A) DNA sequences length and (B) the number of C-C mismatches on DNA sequences.

**Table. S1** Sequences of oligonucleotides used in this work.

Number	Name	Sequences (5' to 3')
1	ssDNA 1 (3.4 nm)	A30 TCA CTC CAC T
2	ssDNA 2 (3.4 nm)	A30 ACT CCA CTC A
3	ssDNA 1 (6.8 nm)	A30 TCA CTC CAC T TCA CTC CAC T
4	ssDNA 2 (6.8 nm)	A30 ACT CCA CTC A ACT CCA CTC A
5	ssDNA 1 (10.2 nm)	A30 TCA CTC CAC T TCA CTC CAC T TCA CTC CAC T
6	ssDNA 2 (10.2 nm)	A30 ACT CCA CTC A ACT CCA CTC A ACT CCA CTC A
7	ssDNA 1	A30 TCA CTC CAC T
8	ssDNA 2 (3c)	A30 AC TCG ACT GA
9	ssDNA 2 (4c)	A30 AC TCG ACT CA
10	ssDNA 2 (5c)	A30 AC TCC ACT CA