

Supporting information

Gold-modified silver nanorod arrays for SERS-based immunoassays with improved sensitivity

Chunyu Song^{1,2,3*}, Jing Chen^{3,4}, Yiping Zhao^{2,3}, and Lianhui Wang^{1*}

Corresponding authors.

E-mail: iamcysong@njupt.edu.cn Phone: +86-25-85866332 Fax: +86-25-85866332

iamlhwang@njupt.edu.cn Phone: +86-25-85866333 Fax: +86-25-85866333

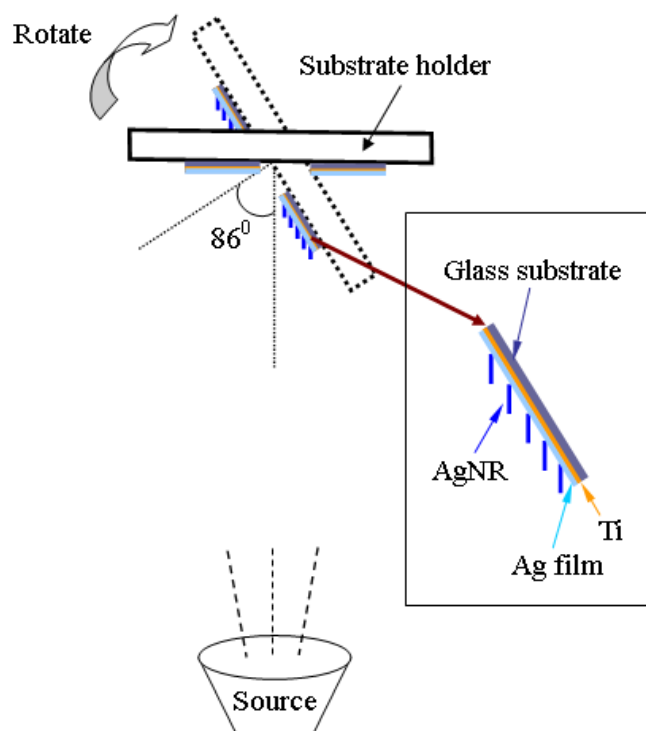


Figure. S1 Oblique angle deposition (OAD) for the fabrication of silver nanorod (AgNR) arrays.

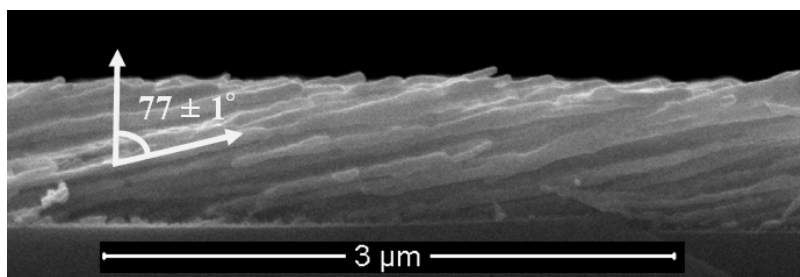


Figure. S2 Cross-section view SEM image of the AgNR array.

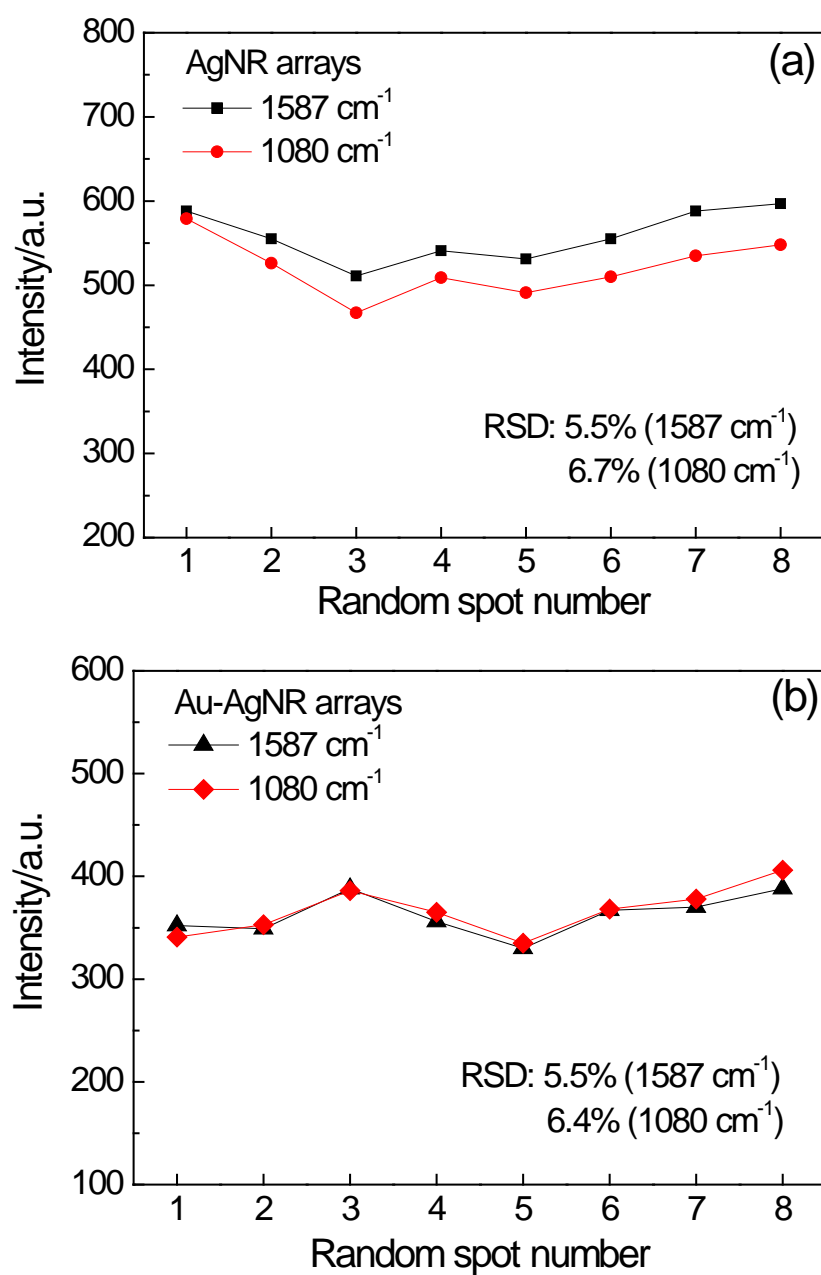


Figure. S3 Peak intensities of 4-MBA at 1587 cm⁻¹ and 1080 cm⁻¹ on the AgNR and Au-modified AgNR substrates. All intensities were averaged from 8 spectra collected from 8 random locations on the substrates.

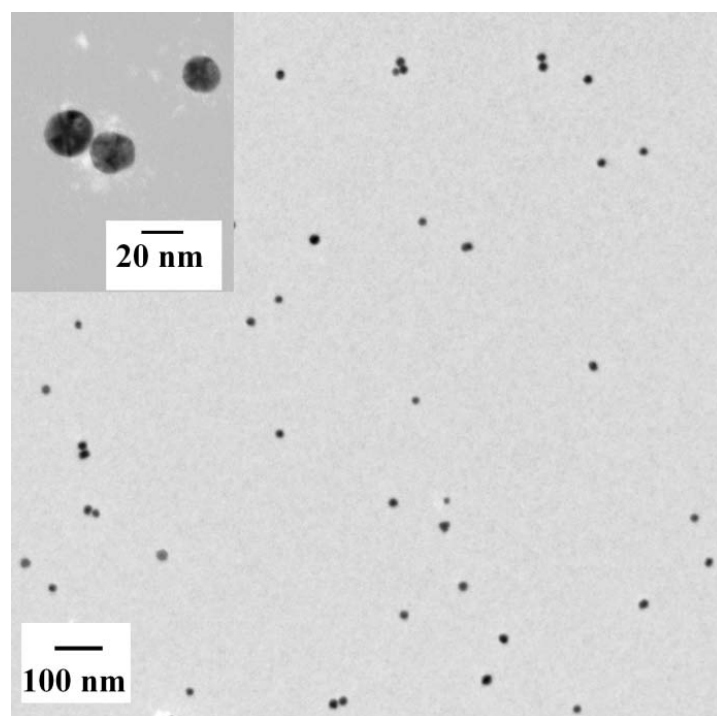


Figure. S4 TEM image of colloidal gold.

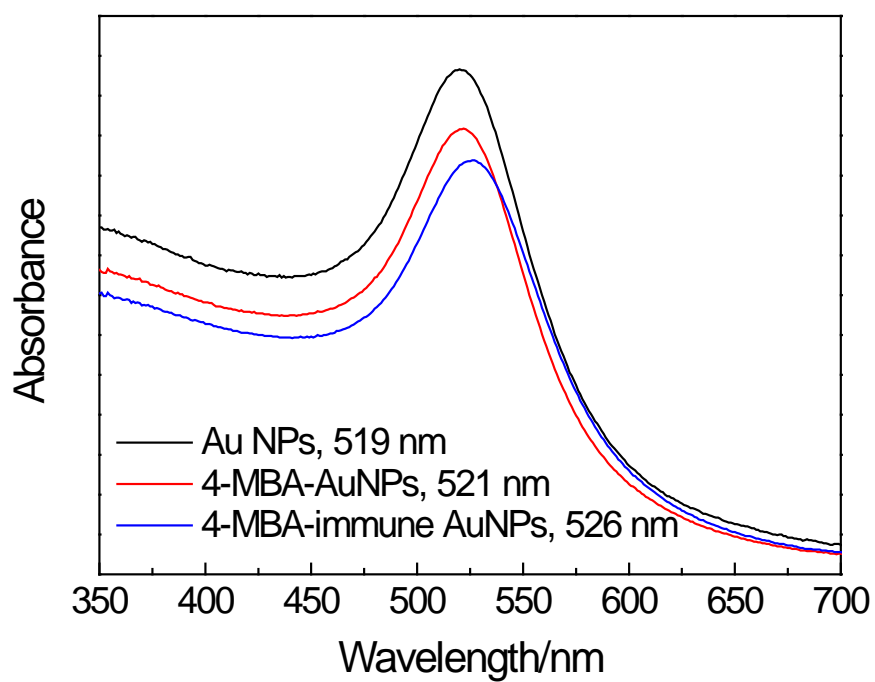


Figure. S5 Optical properties of AuNPs (black), 4-MBA-labeled AuNPs (red), and 4-MBA-immune AuNPs (blue).

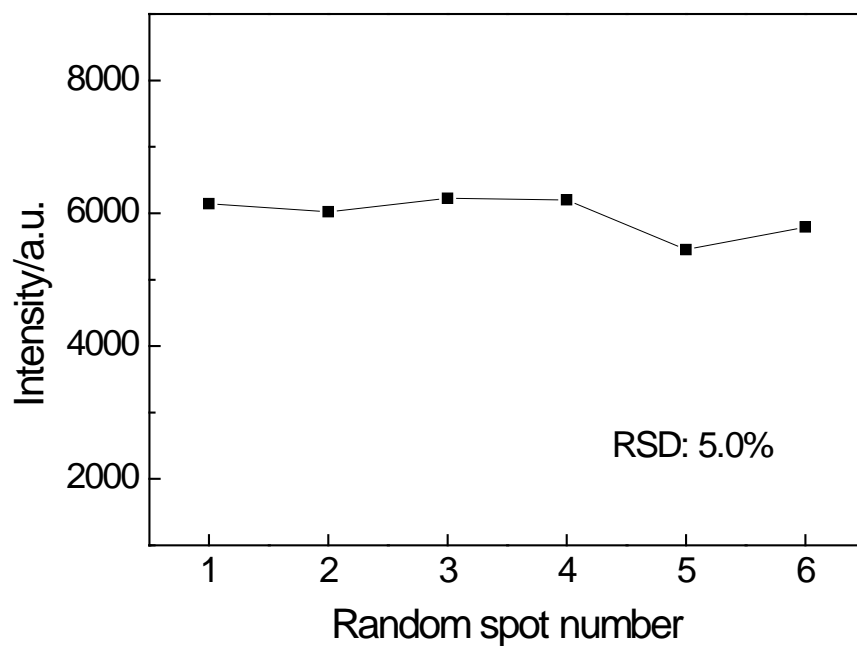


Figure. S6 Peak intensities at 1080 cm⁻¹ on six random locations on the Au-modified AgNR substrate.

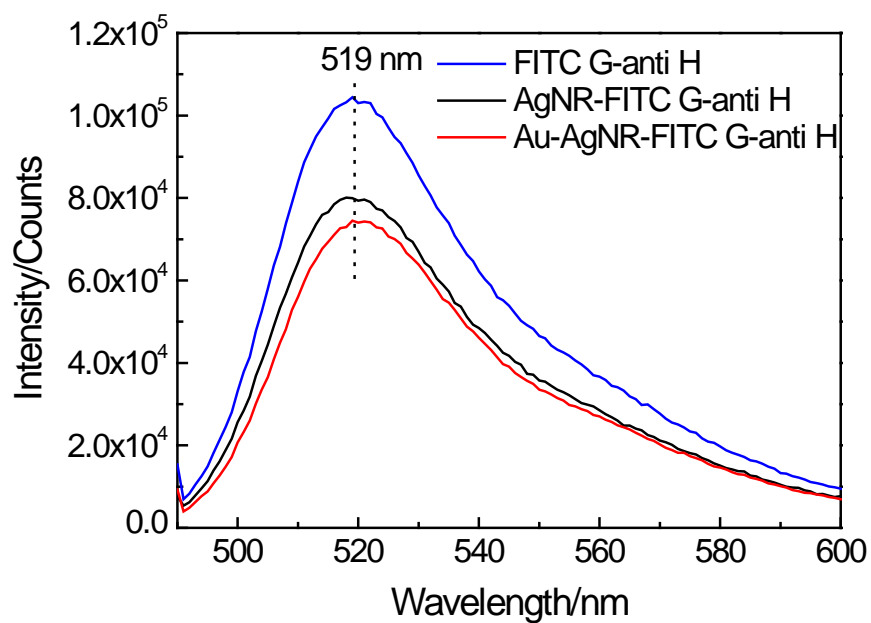


Figure. S7 Fluorescence spectra of FITC-labeled goat anti-human IgG solution (blue), residual soaking solutions for the AgNR (black) and Au-modified AgNR (red) substrates.

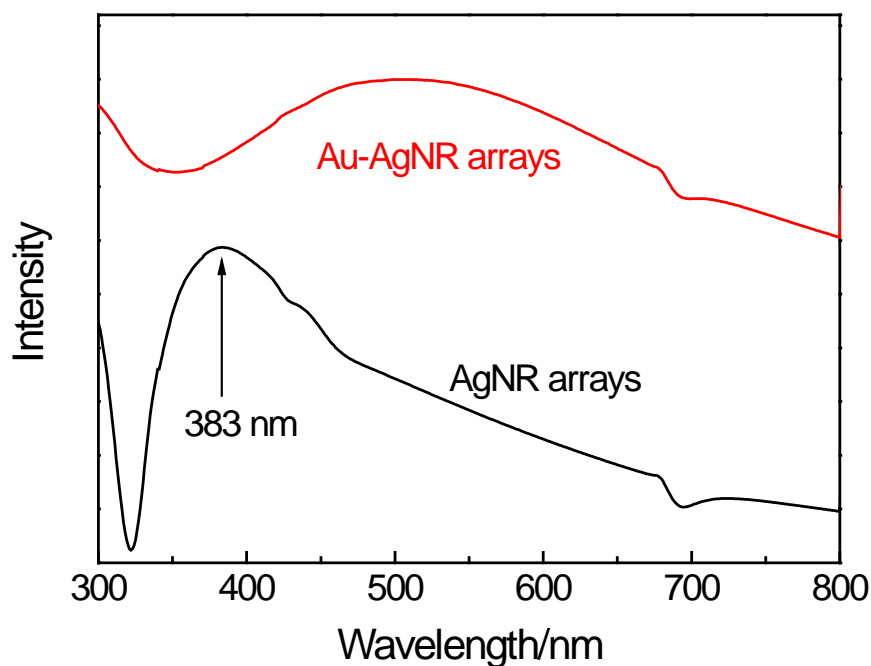


Figure. S8 Optical properties of the AgNR arrays and Au-modified AgNR arrays without the underlying Ag film. The optical absorbance spectra were collected by a JASCO (Easton, MD) V-570 UV/Vis/NIR double beam spectrophotometer with a clean glass slide as a reference.

Table S1. Summary of the reported sandwich structured SERS immunoassays for IgG

| SERS tags | Substrate | Sensitivity | Ref. |
|---|--|-------------|--------------|
| gold nanospheres (30 nm) | gold film (thickness 300 nm) | 30 ng/mL | 9 |
| gold aggregates | silver nanoparticles assembled substrate | 100 fg/mL | 21 |
| gold/silver core-shell nanorods | glass slide | 70 fM | 39 |
| truncated octahedral gold nanoparticles | glass slide | 36.56 fg/mL | 38 |
| gold nanostar aggregates | gold nanostars assembled substrate | 10 fg/mL | 23 |
| gold nanospheres (18 nm) | gold-modified silver nanorod array | 2.5 fg/mL | current work |