

## Supplementary Information for

### **Ag@AuNPs functionalized capillary-based SERS sensing platform for interference-free detection of glucose in urine by using SERS tags with built-in nitrile signal**

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#### **Table of Content**

Figure S1. TEM and size distribution of AgNPs.

Figure S2. TEM and size distribution of Ag@AuNPs.

Figure S3. TEM and size distribution of Ag@MBN@AuNPs.

Figure S4 Energy spectrum of (A) Ag@AuNPs and (B) Ag@MBN@AuNPs.

Table S1 Energy spectrum quantification report.

Figure S5. UV-vis spectra of (A) AgNPs, (B) Ag@AuNPs and (C) Ag@MBN@AuNPs before and after treatment with H<sub>2</sub>O<sub>2</sub>.

Table S2 SERS bands assignment of SERS spectra observed in Figure. 2 and Figure. 3.

Figure S6. (A) UV-vis spectra of (A) Ag@AuNPs and (B) Ag@MBN@AuNPs before and after modified by MBA.

Figure S7. Photographs of aminosilylated capillary treated with Ag@AuNPs (a) and raw capillary treated with Ag@AuNPs (b).

Figure S8 Simulated near-field electromagnetic field distributions of the SERS sensing platform.

## Additional figures

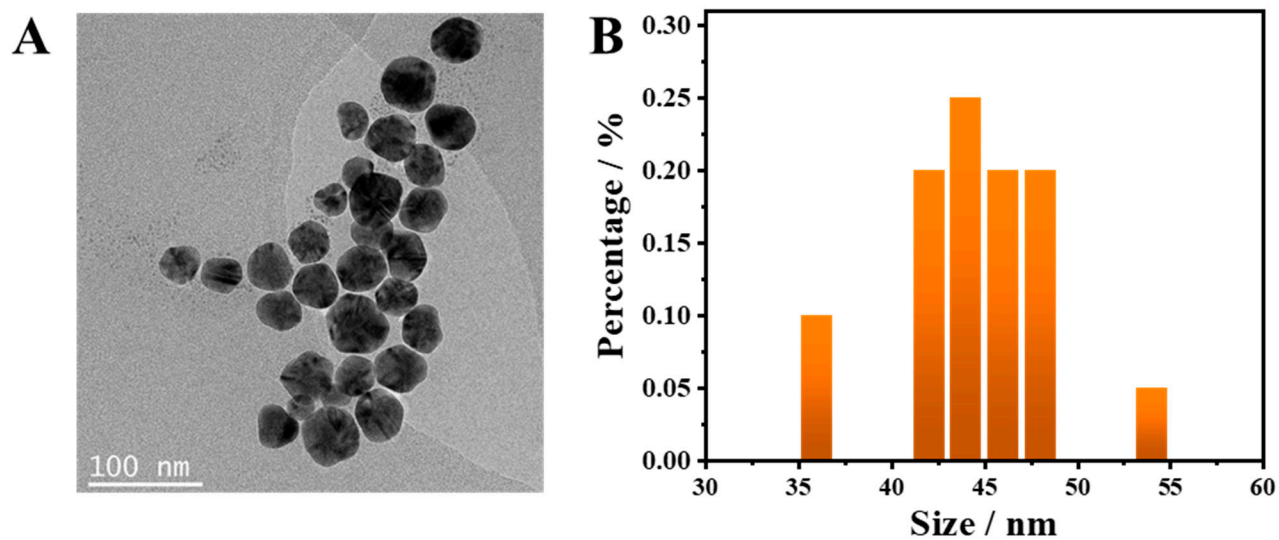


Figure S1 (A) TEM and (B) size distribution of AgNPs.

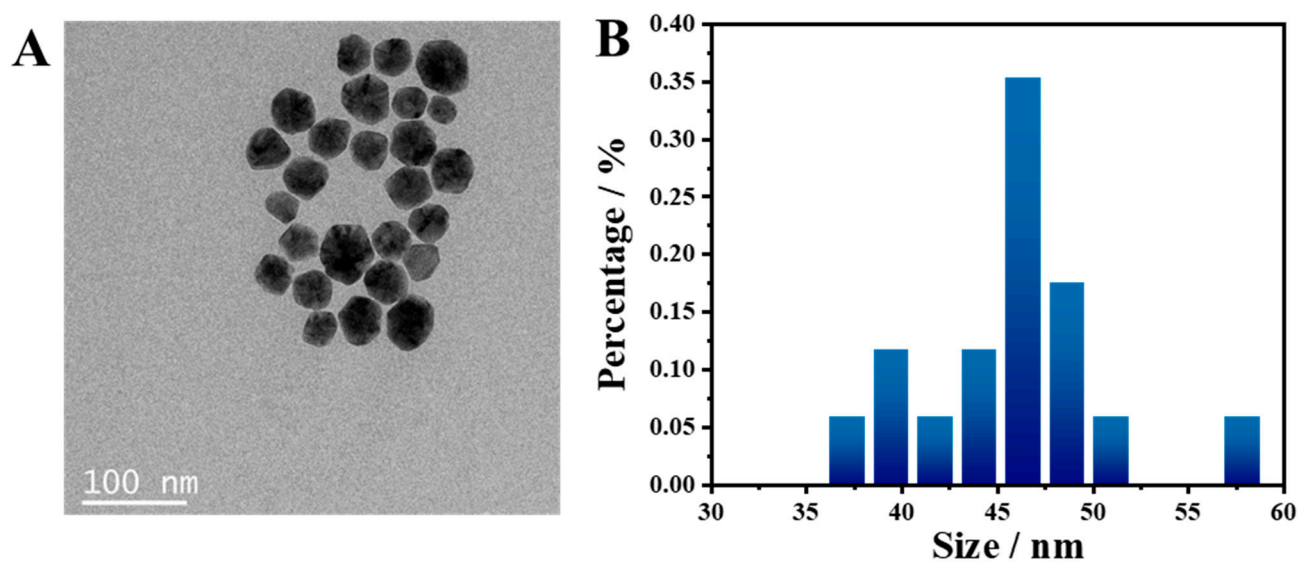


Figure S2 (A) TEM and (B) size distribution of Ag@AuNPs.

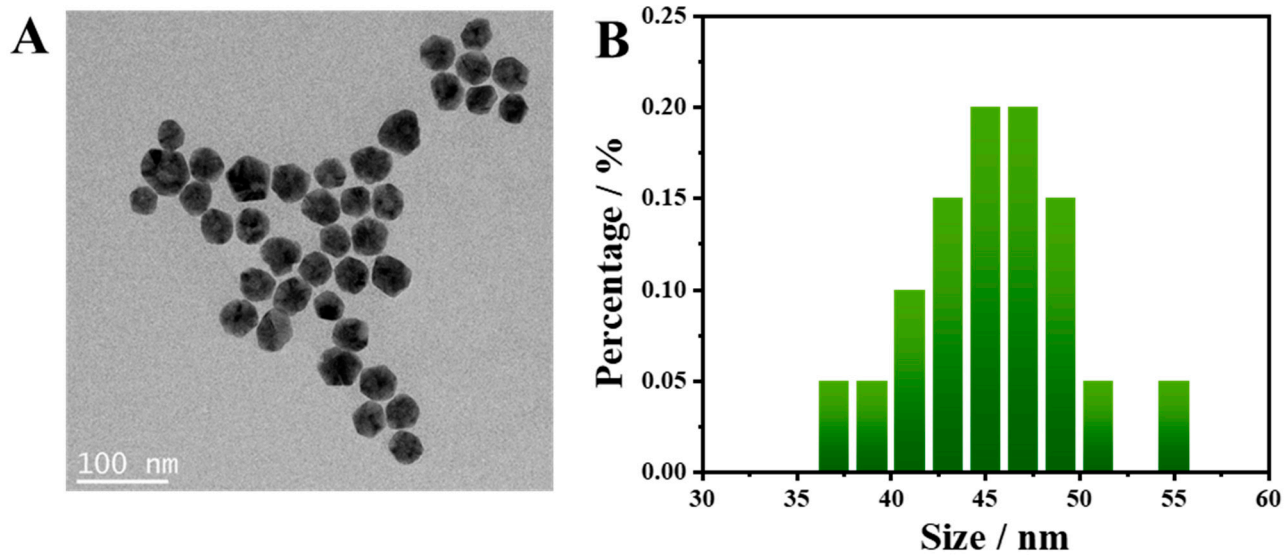


Figure S3 (A) TEM and (B) size distribution of Ag@MBN@AuNPs.

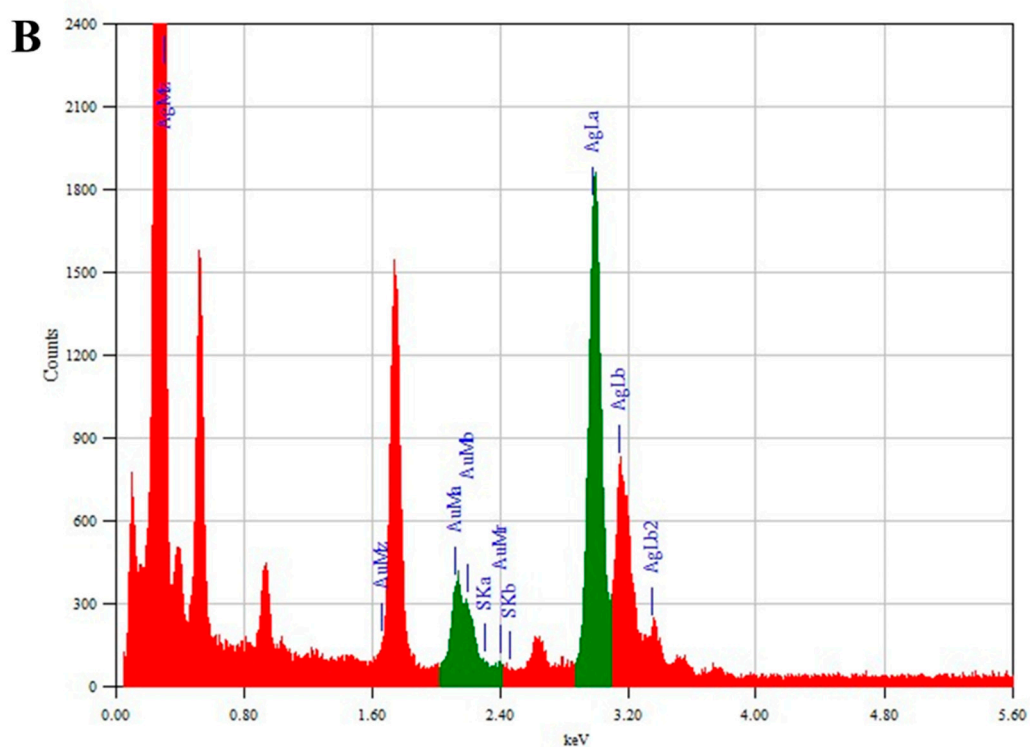
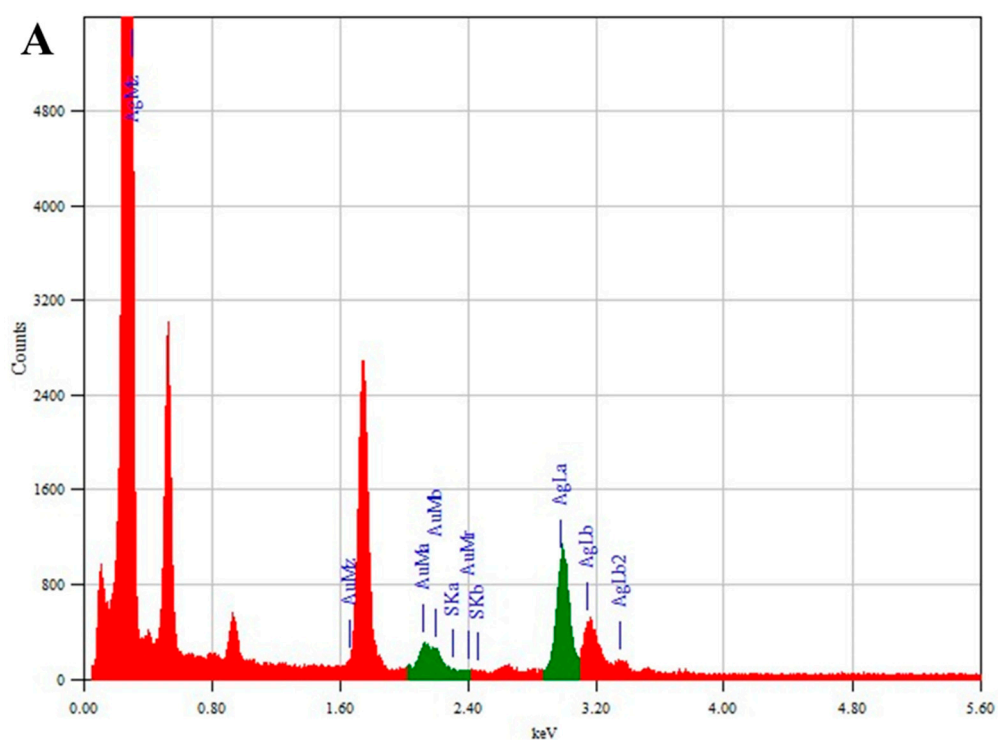


Figure S4 Energy spectrum of (A) Ag@AuNPs and (B) Ag@MBN@AuNPs.

Table S1 Energy spectrum quantification report.

	Ag (Mass%)	Au (Mass%)	S (Mass%)
Ag@AuNPs	87.28	12.72	ND
Ag@MBN@AuNPs	88.39	11.52	0.09

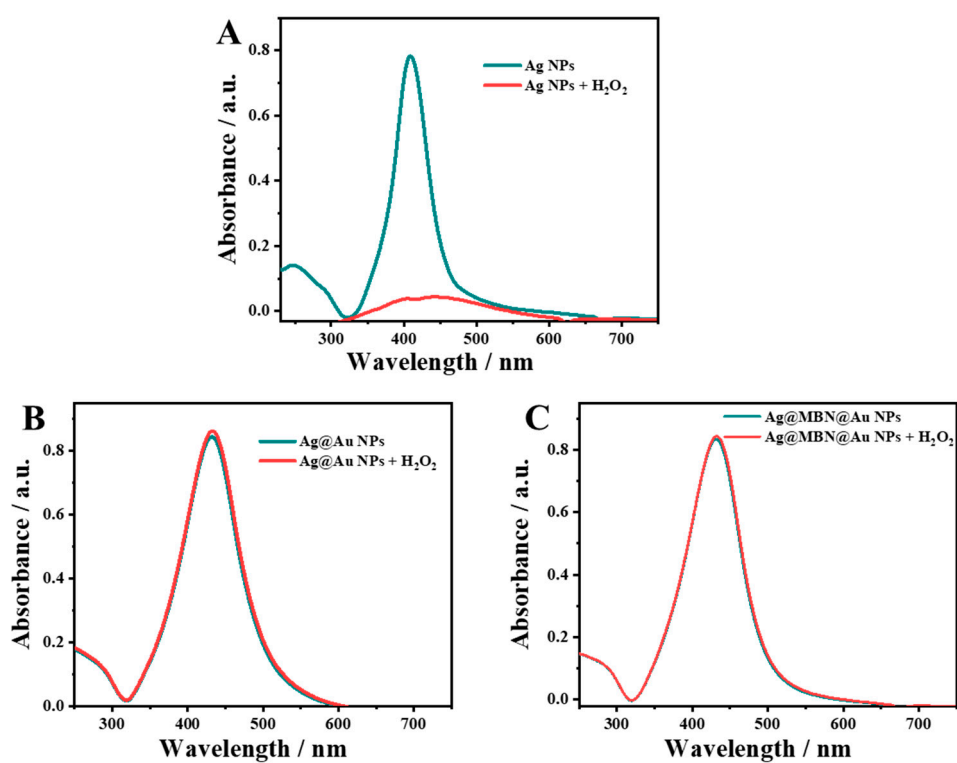


Figure S5. UV-vis spectra of (A) AgNPs, (B) Ag@AuNPs and (C) Ag@MBN@AuNPs before and after treatment with  $H_2O_2$ . (1mM).

Table S2 SERS bands assignment of SERS spectra observed in Fig 2 and Fig 3.<sup>[1-4]</sup>

Raman shift (cm <sup>-1</sup> )	vibrational assignment
993	B–O symmetric stretching
1070	C–H in-plane deformation coupled with C–S stretching vibrations
1582	C=C stretching vibrations
2222	C≡N stretching vibration

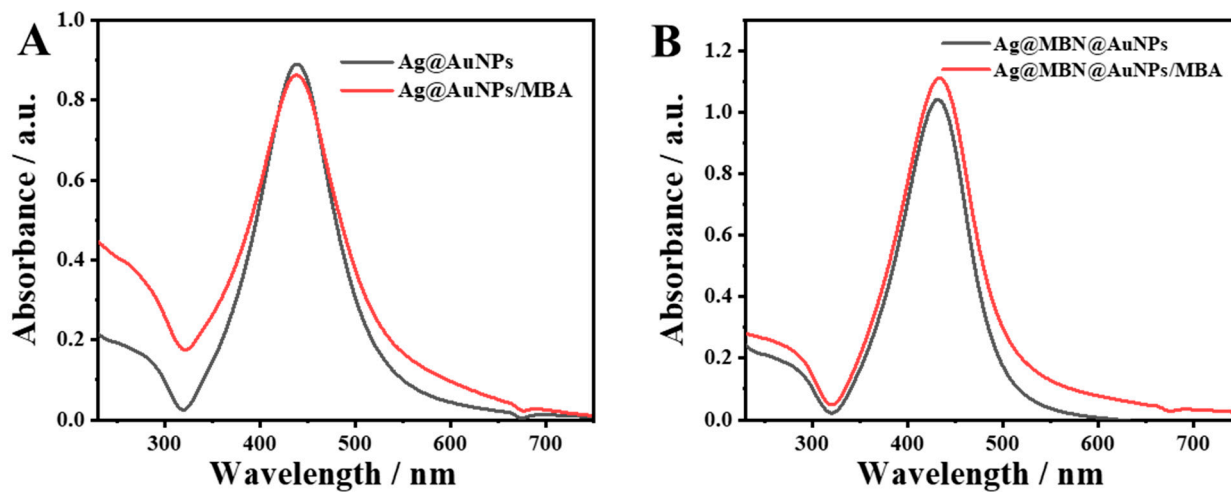


Figure S6. UV-vis spectra of (A) Ag@AuNPs and (B) Ag@MBN@AuNPs before and after modified by MBA

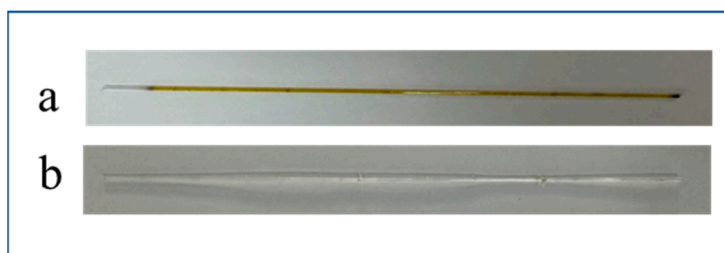


Figure S7. Photographs of aminosilylated capillary treated with Ag@AuNPs (a) and raw capillary treated with Ag@AuNPs (b).

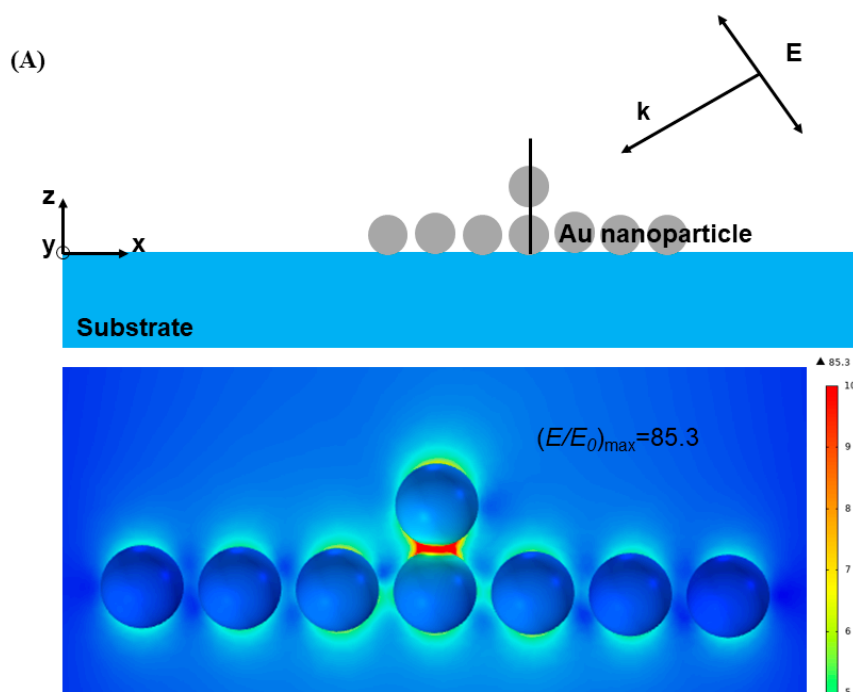


Figure S8 Simulated near-field electromagnetic field distributions of the SERS sensing platform. The distance between the SERS tags and the Ag@AuNPs-layer is about 2 nm calculating based on the molecular structure.

Note: The simulations were performed using the COMSOL software to obtain electric field distributions under 60 deg oblique incidence. Total-field scattered-field source is employed in the simulation. The excitation wavelength was set at 532 nm with the electric field polarized along the x-axis. The complex dielectric constants of the materials were obtained from the database of Johnson-Christy (The Ag@AuNPs were assumed to be Au, and the

size was set to be 46 nm) and Palik (SiO<sub>2</sub>, substrate), respectively, perfectly matched layer was used in both three directions and a mesh size of 1.5 nm for the structure region was utilized.

## References

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