

## Electronic Supporting Information

### Sandwiching Analytes with Structurally Diverse Plasmonic Nanoparticles on Paper Substrates for Surface Enhanced Raman Spectroscopy

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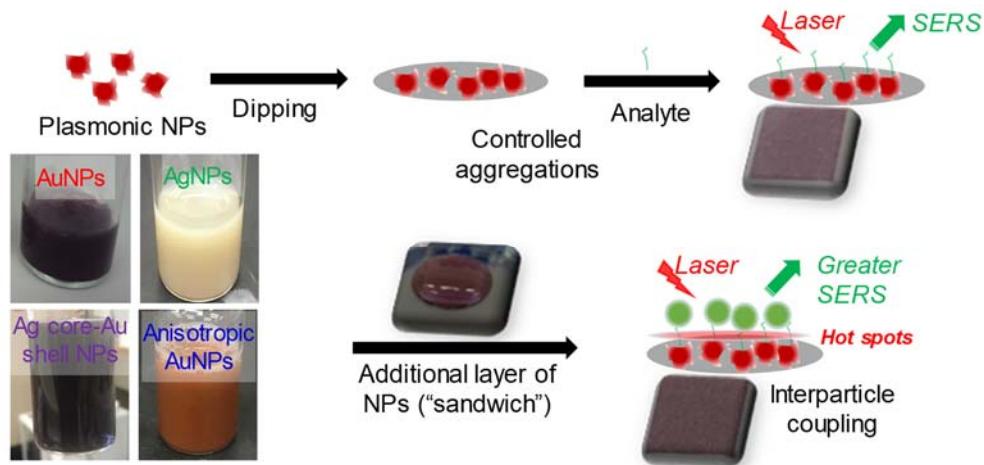


Figure S1. Overall process of sandwiching analytes with plasmonic NPs on filter paper for SERS measurements.

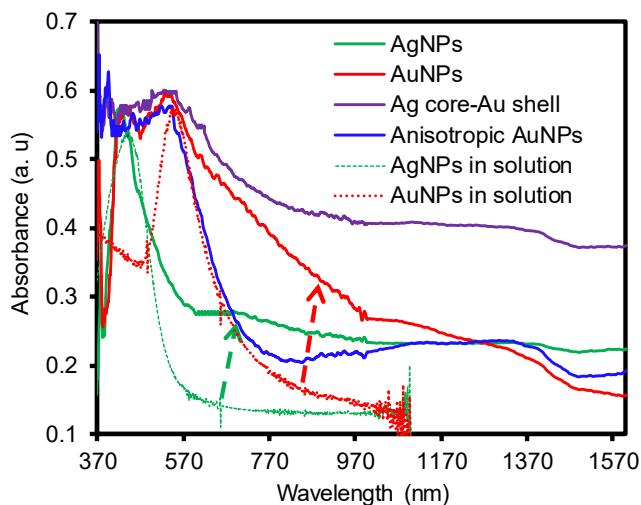


Figure S2. Surface absorption spectra of four types of plasmonic NPs on filter paper and absorption patterns of AgNPs and AuNPs in solution (arrows indicate the appearance of new broad peaks possibly caused by local aggregations).

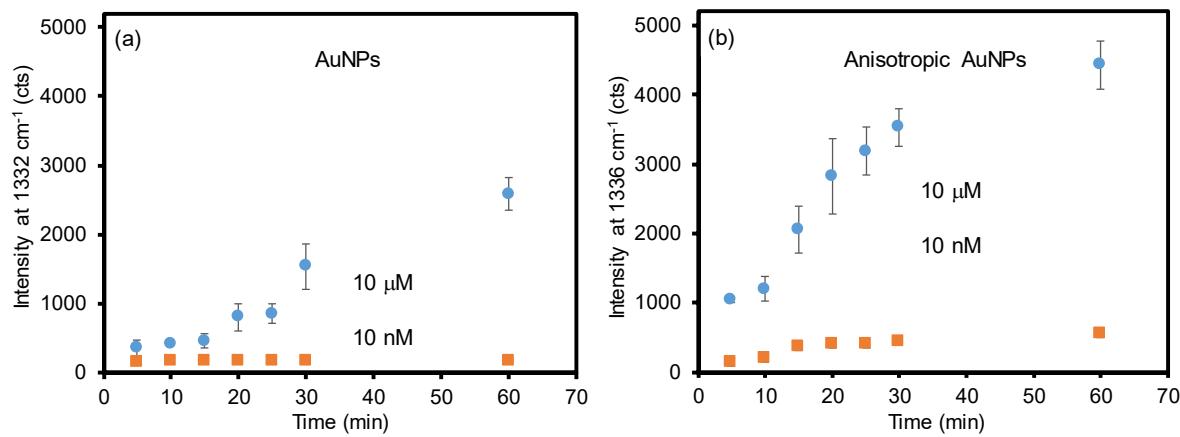


Figure S3. SERS intensity of (a) sphere and (b) anisotropic AuNP plasmonic paper as a function of time; the substrates were treated with 10  $\mu$ M and 10 nM of 4-NBT.

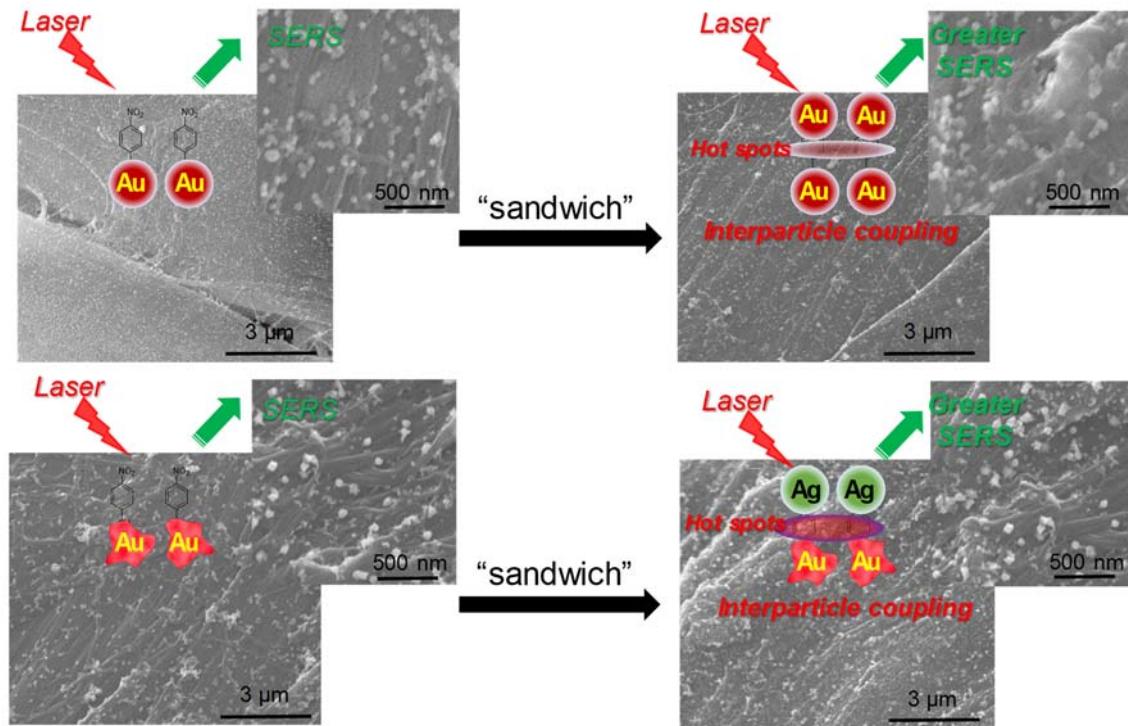


Figure S4. SEM images of before and after applying another layer of NPs (AuNPs on AuNP plasmonic paper and AgNPs on anisotropic AuNP plasmonic paper).

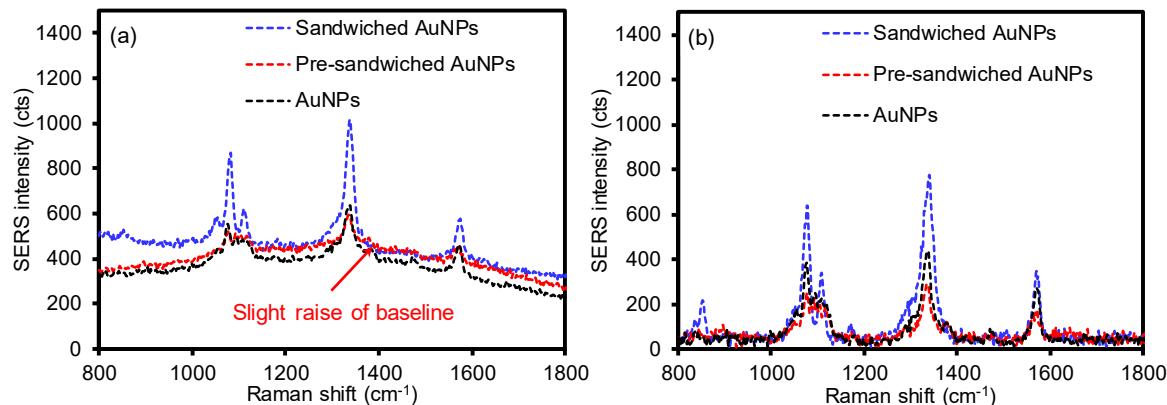


Figure S5. Representative SERS spectra of 4-NBT (1  $\mu$ M) obtained from AuNPs, pre-sandwiched AuNPs, and after sandwiching with AuNPs (a) with and (b) without the baseline correction (single scan).

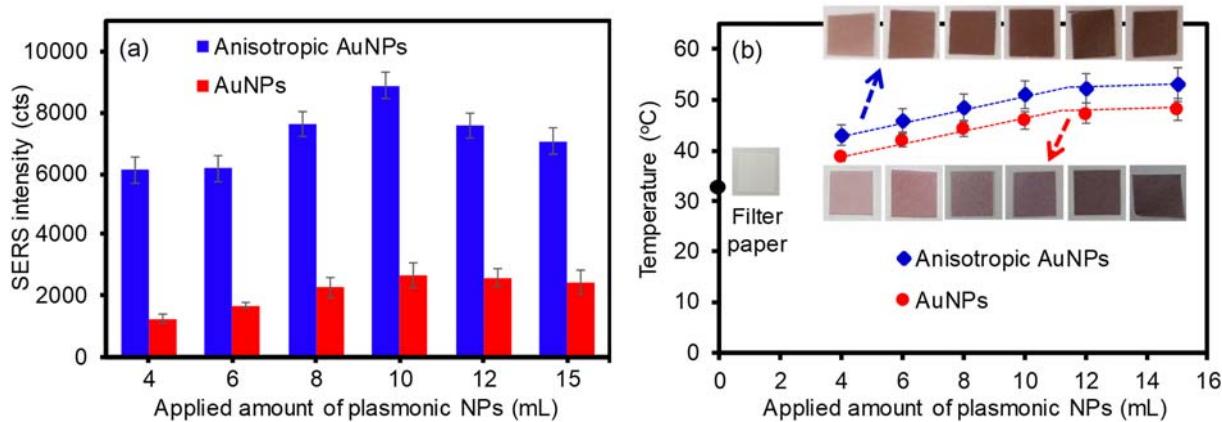


Figure S6. Plasmonic paper prepared by the treatment of AuNP and anisotropic AuNPs solutions at different concentrations (a) SERS signals of 4-NBT (1 mM) and (b) digital photos and photothermal heating properties.

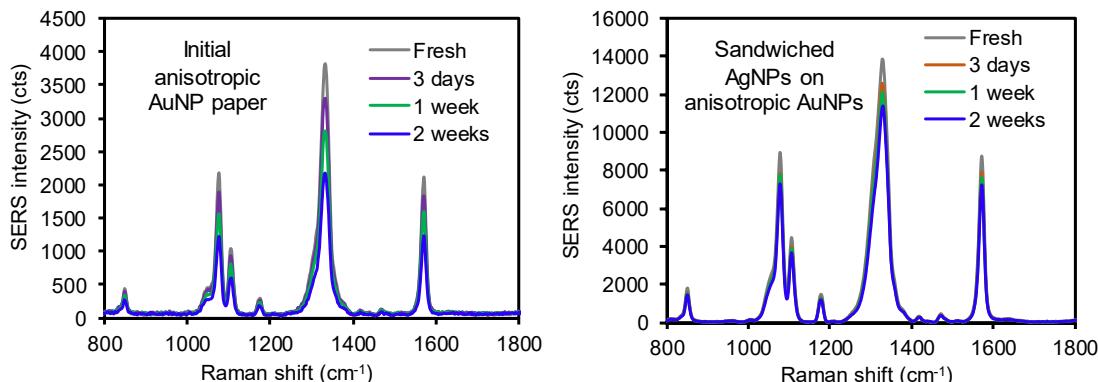


Figure S7. SERS spectra of 4-NBT on anisotropic AuNP plasmonic paper and after sandwiching it with AgNPs as a function of time (single scan).

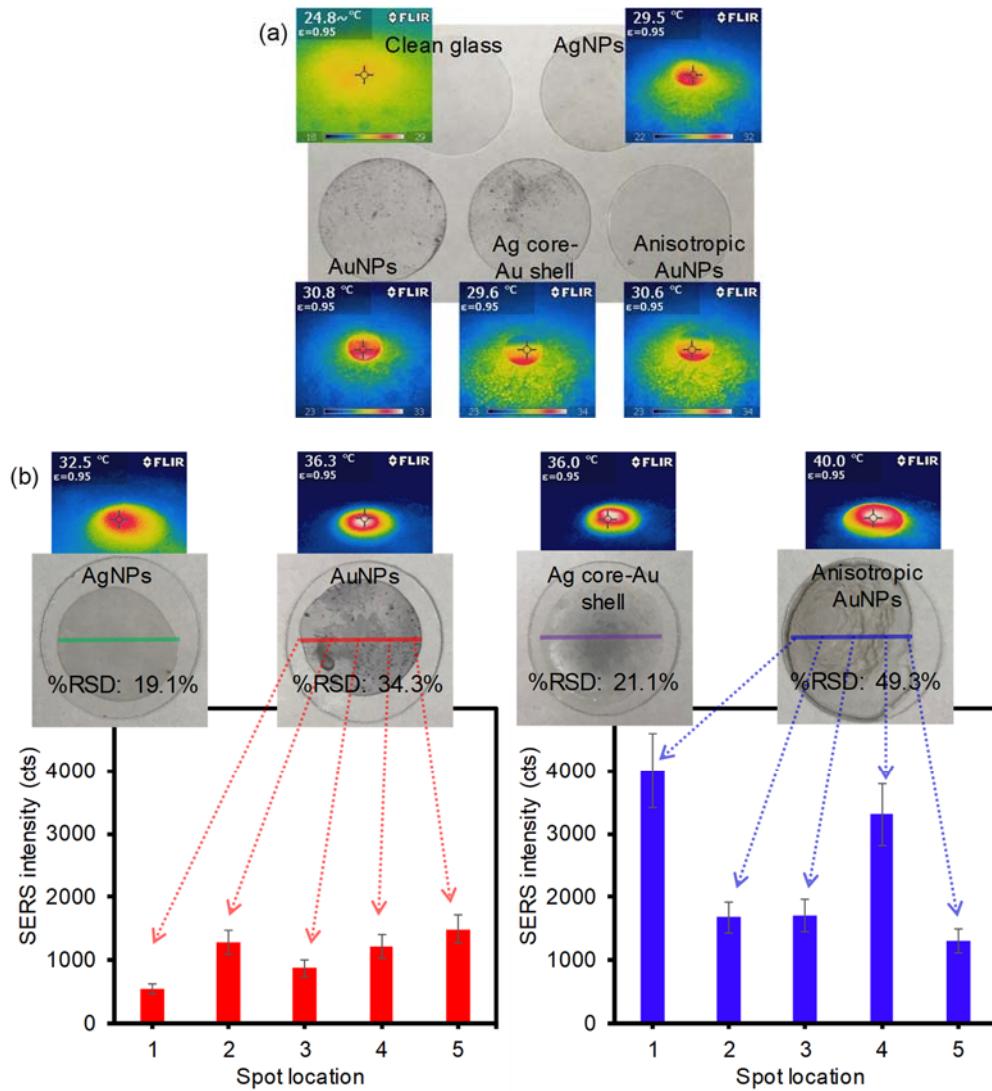


Figure S8. Digital photos and thermal images of glass slides loaded with four types of plasmonic NPs; (a) samples prepared by the soaking method, (b) samples prepared by the drop and dry method as well as their SERS signals of 4-NBT (single scan) at five spots across the substrates (the glass slides were fully soaked in 1 mM of 4-NBT solution to saturate the surface).

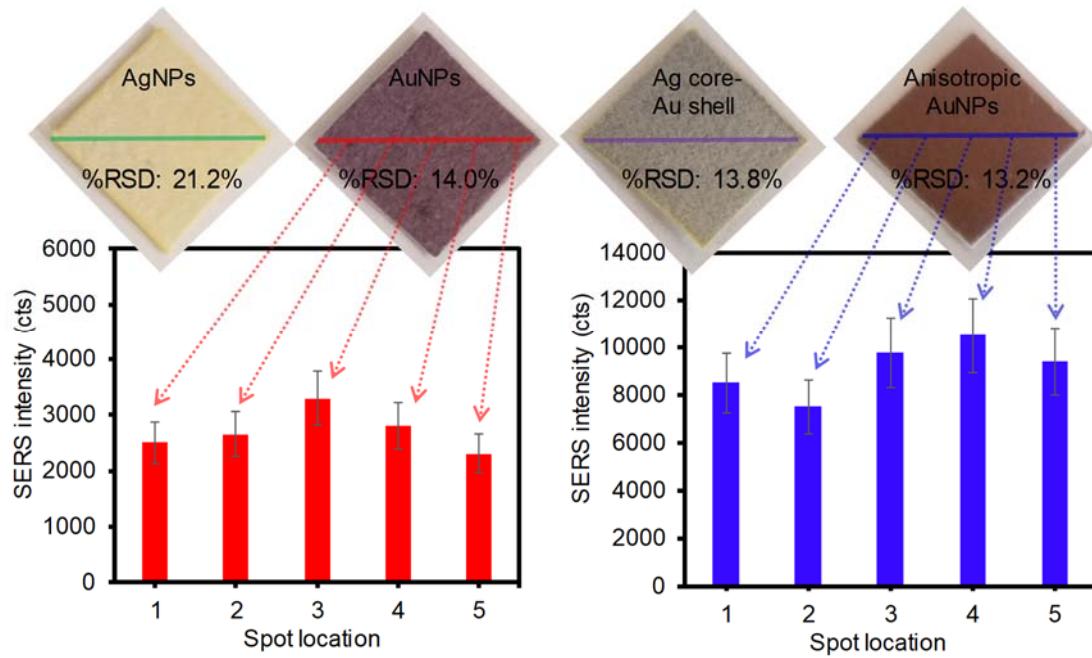


Figure S9. Digital photos of filter paper loaded with four types of plasmonic NPs and their SERS signals of 4-NBT (single scan) at five spots across the substrates (the papers were fully soaked in 1 mM of 4-NBT solution to saturate the surface).