Electronic Supplementary Information

Plasmonic gold dogbone nanorattles sniff out trace molecules through surface enhanced Raman scattering

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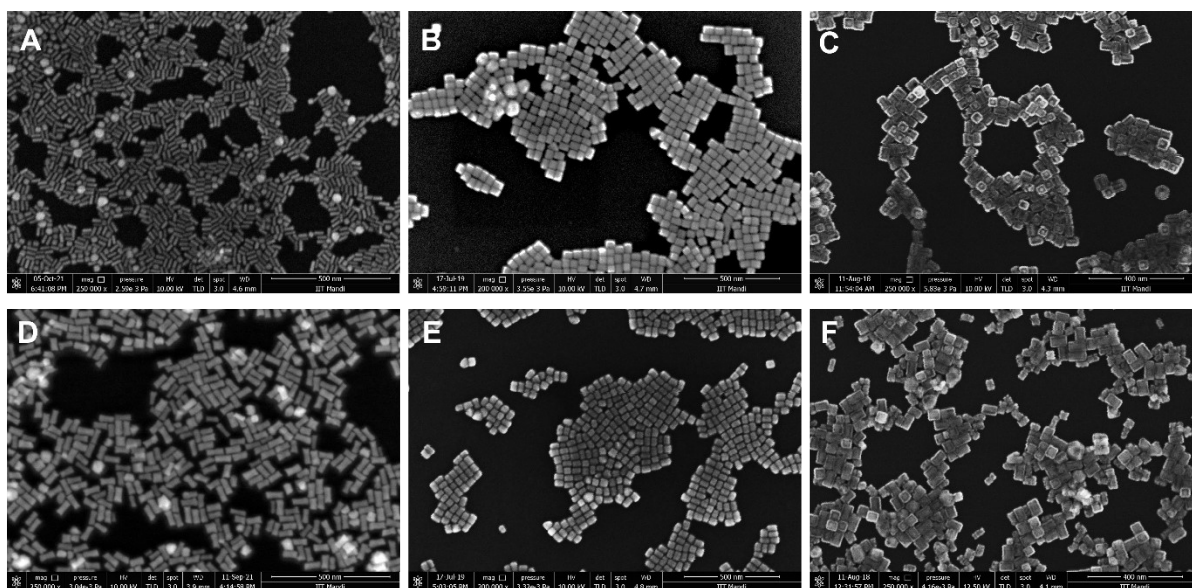
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Figure S1: Shows the SEM for all synthesized nanoparticles; A) Au-NRs, B) Au-NR@Ag, C) Au-NRNRT, D) Au-DBs, E) Au-DB@Ag, and F) Au-DBNRTs.
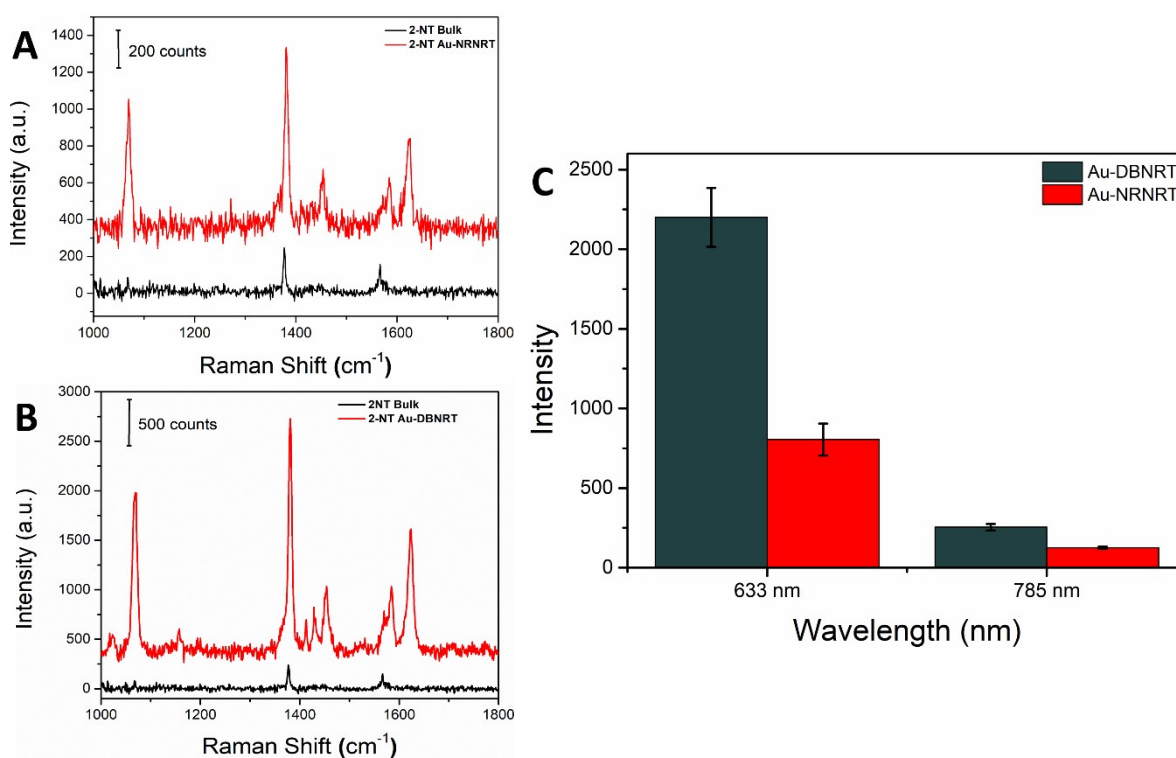

Figure S2: Comparison of uniformly distributed single particle SERS. A) Bulk 2-NT versus SERS using Au-NRNRTs, B) Bulk 2-NT versus SERS using Au-DBNRT and C) Comparison of SERS intensities at 633nm and 785nm excitation wavelength for prominent spectral band of 2-NT at 1381cm^{-1} with Au-DBNRT and Au-NRNRT.
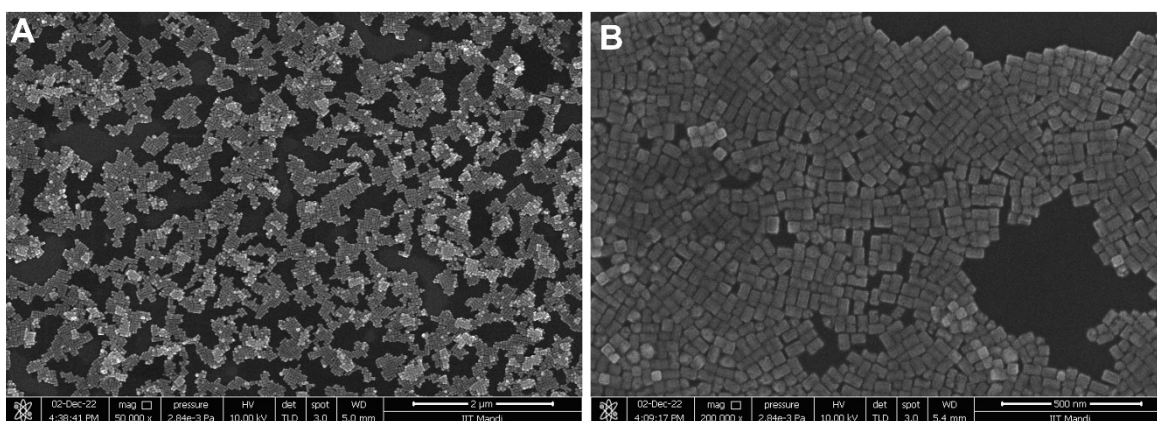
Figure S3: Shows the SEM image of the Au-DBNRT fabricated SERS substrate for sensing of thiabendazole; A & B) Au-DBNRT deposited si-substrate at scale bar= 2 µm, and 500 nm respectively.
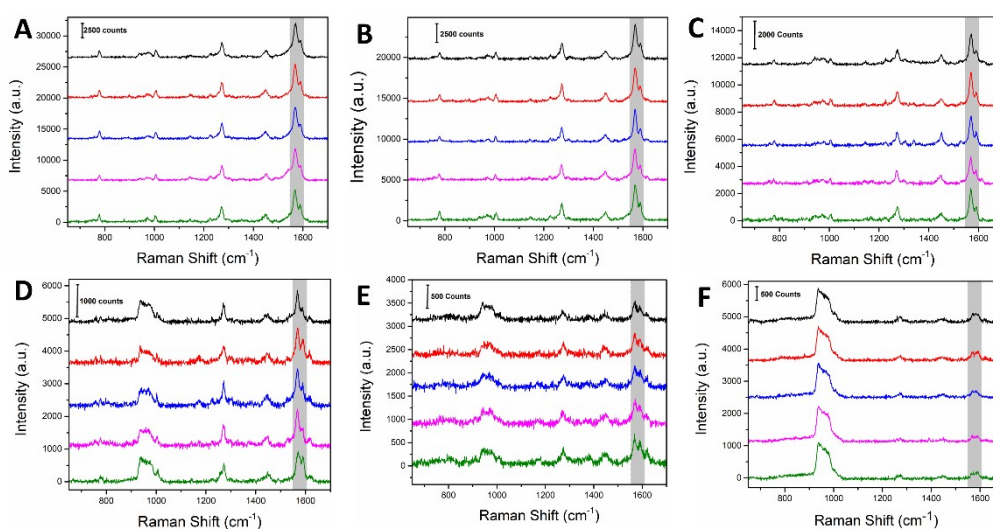

Figure S4: Data shows the reproducibility of SERS signals of thiabendazole at different concentrations A) 10^{-3}M, B) 10^{-4}M, C) 10^{-5}M, D) 10^{-6}M, E) 10^{-7}M, and F) 10^{-8}M (at 5 different spots on substrate).
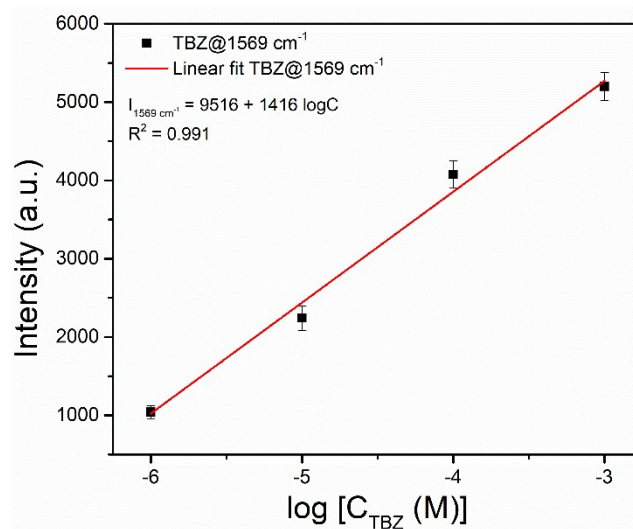
Figure S5: Data shows the linear relationship between SERS signal intensities at different concentrations of thiabendazole (TBZ).
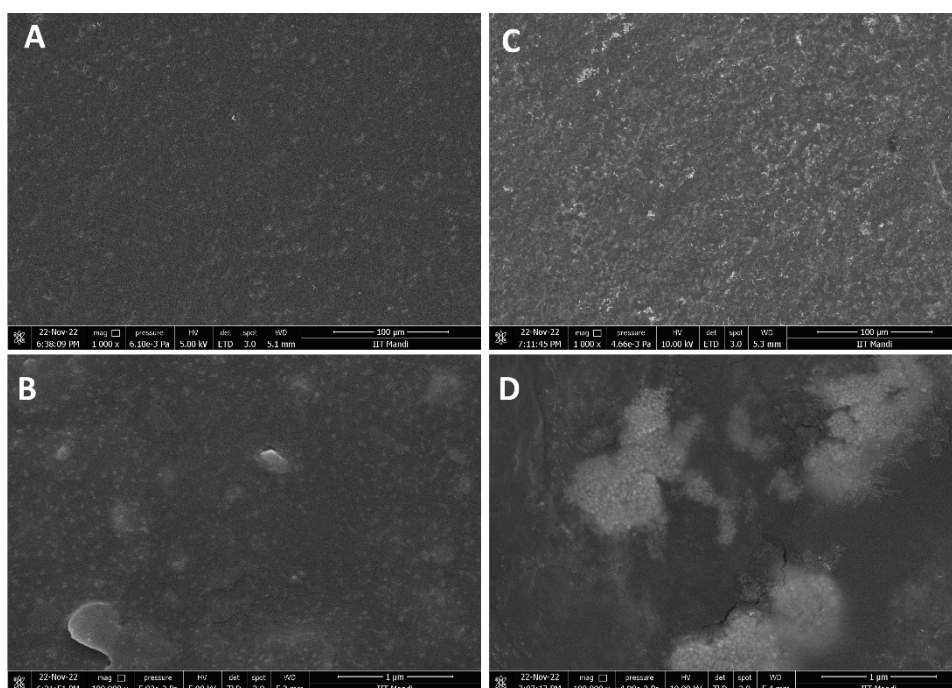

Figure S6: Shows the SEM characterization image for polymeric shrink films without heat treatment; A & B) Bare shrink film (at scale 100 and 1 μm respectively), C & D) Au-DBNRT deposited shrink film (at scale 100 and 1 μm respectively).
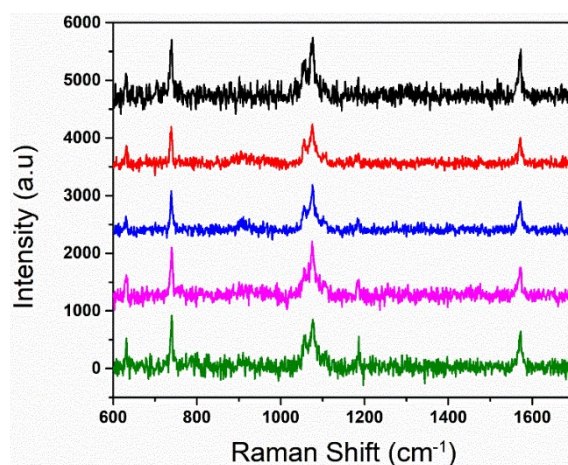
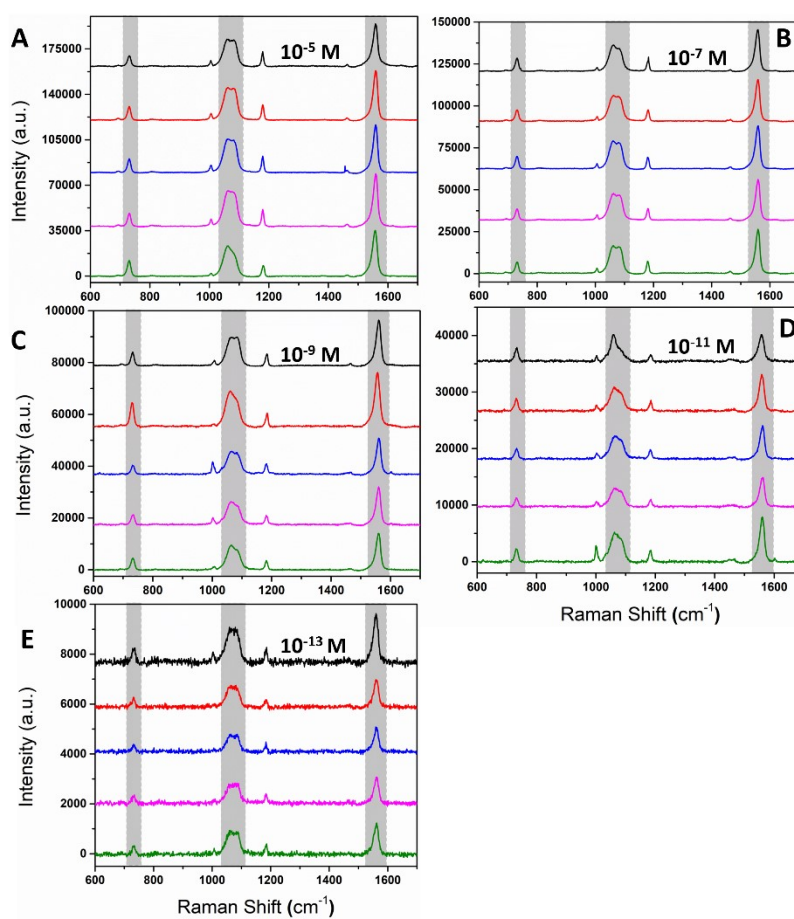**Figure S7:** Represents the bulk Raman spectra for 1,4-BDT molecule with excitation source of 633 nm

Figure S8: Shows the reproducibility of SERS signals for BDT at gradient concentrations used. A) 10^{-5}M, B) 10^{-7}M, C) 10^{-9}M, D) 10^{-11}M, and E) 10^{-13}M (at 5 different spots on substrate).
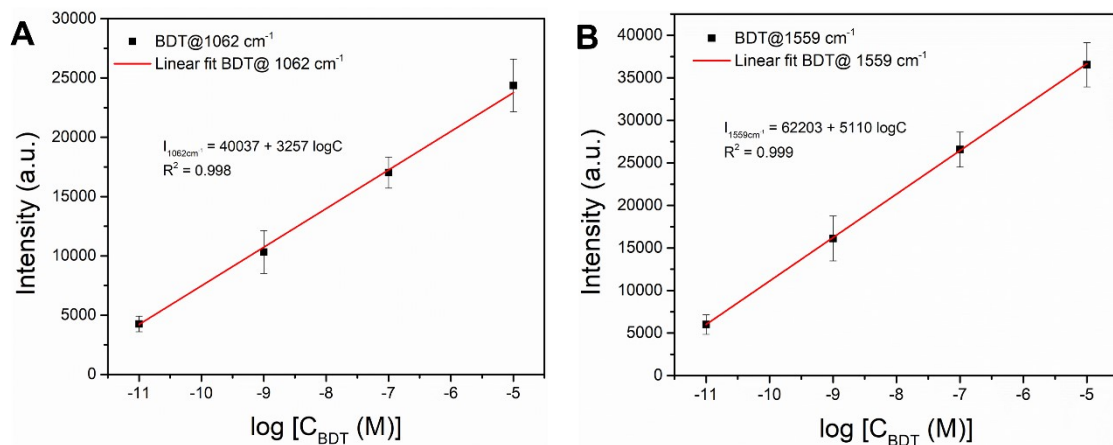
Figure S9: Data shows the linear relationship between SERS signal intensities versus different concentrations of 1,4-benzenedithiol (BDT) at Raman shift A) 1062 cm^{-1}, and B) 1559 cm^{-1}.
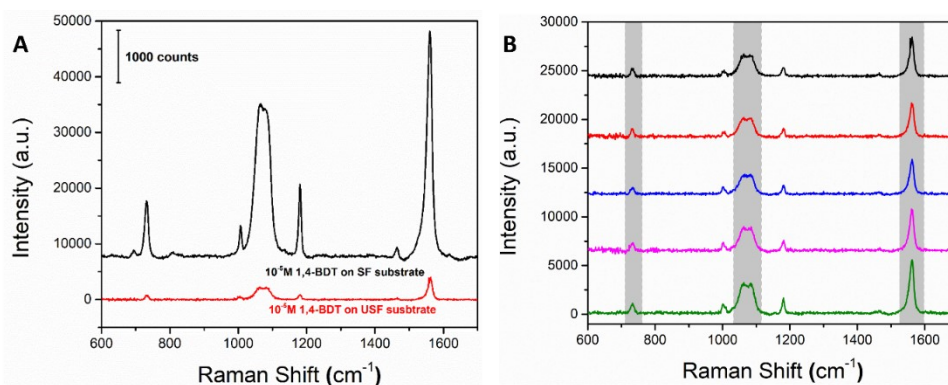

Figure S10: Represents the SERS signals of BDT. A) AuDBNRT deposited shrink film after heating the shrink film (black) vs without heating shrink film (red), B) Reproducibility of SERS signals of 10^{-5}M of BDT on AuDBNRT deposited shrink film (without heating).
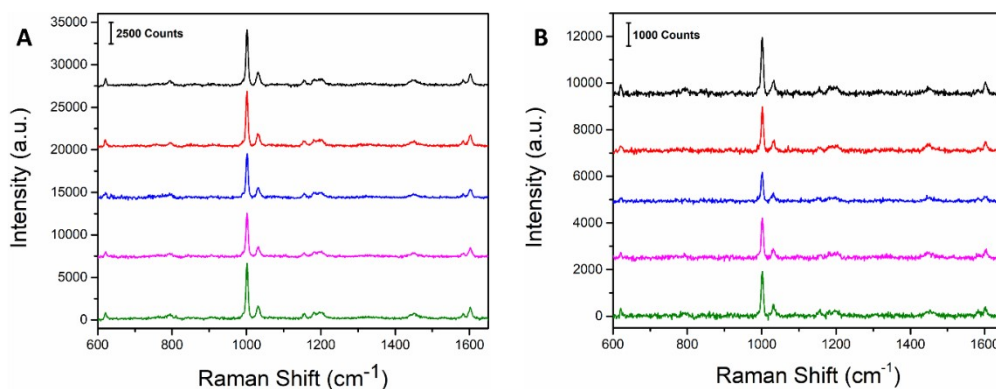

Figure S11: Represents the SERS signals of A) bare shrink film (plain) before heating, and B) bare wrinkled shrink film after heating (at 5 different spots on shrink film).