Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Branched Gold Nanoparticles on ZnO 3D Architecture as Biomedical SERS Sensors

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Supplementary Information: List of contents

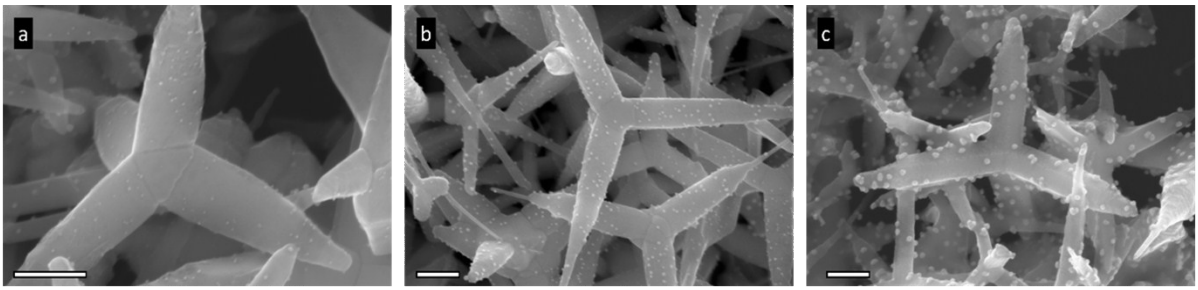

Fig. S1: FE-SEM picture of ZnOTP loaded with different amounts of gold nanoparticles. Scale bar is 200nm. By increasing the $HAuCl_4$ concentration from 1mM (a) to 10mM (b), the density of Au nanoparticles on ZnO surface increases accordingly. By extending the illumination time, and the overall quantity of gold precursor, it affects the mean dimension of Au nanoparticles, ranging from 8 nm (b) to 25 nm (c).

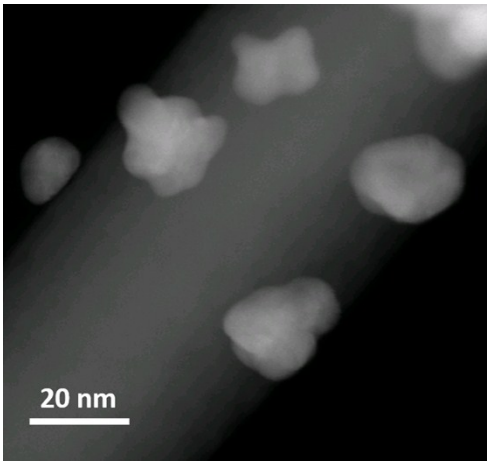

Fig. S2: STEM image depicting gold nanoclusters on ZnOTP. Z-contrast image of a ZnO tetrapod arm with Au particles, that are brighter as the Au atomic number is larger than the average ZnO one. The particles appear branched, with much higher surface/volume ratio with respect to the common spheroidal ones. Image taken with the FEI Tecnai F20 ST at IMM-CNR, Bologna, by courtesy of Dr Andrea Migliori.

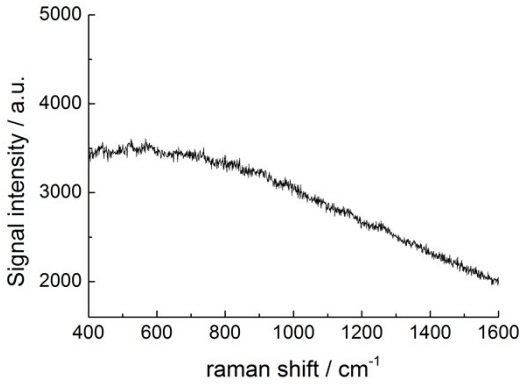

Fig S3: Raman spectrum of the bare ZnOTP Au substrate after the treatment with HEPES

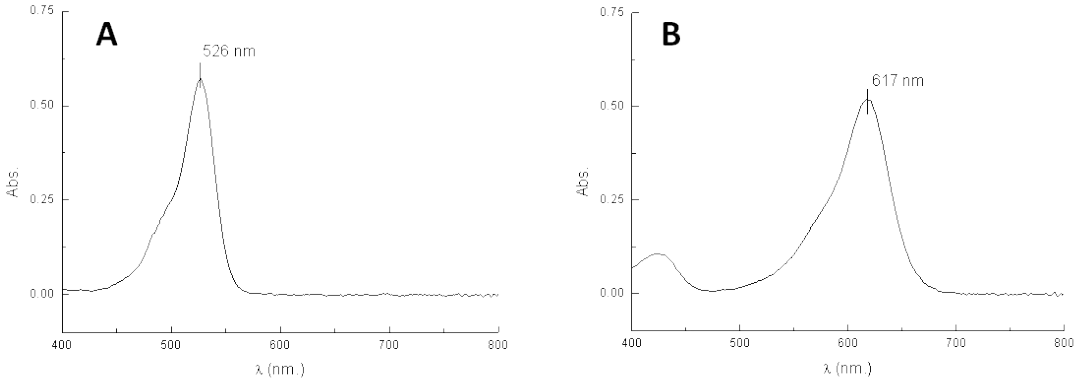

Fig. S4: UV-Vis spectra of rhodamine 6G (A) and malachite green (B)

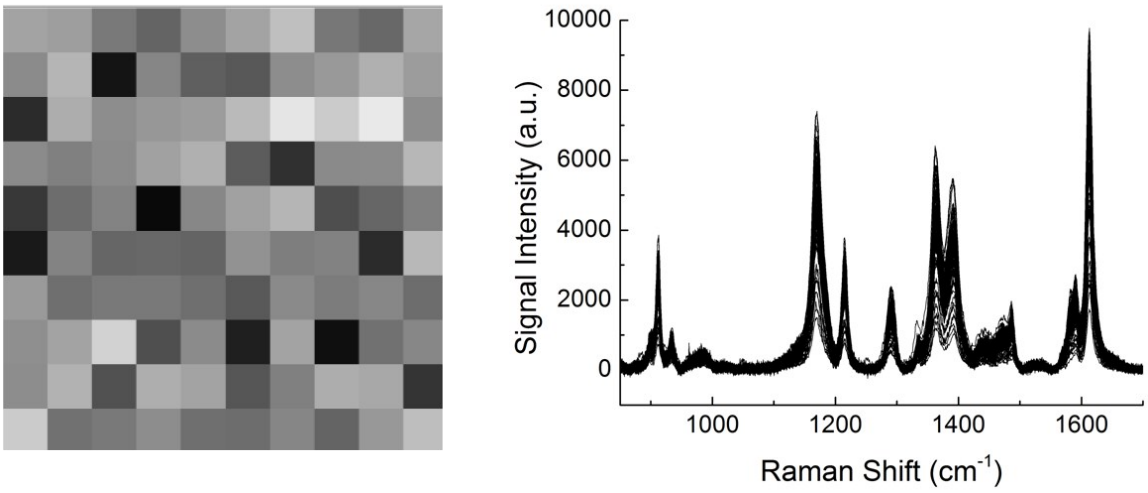

Fig. S5. SERS spectra of malachite green (1 µM concentration) acquired from 100 different spots on the substrate. Left: map distribution of the intensity measured on the peck at 1170 cm^{-1} .Right: all spectra

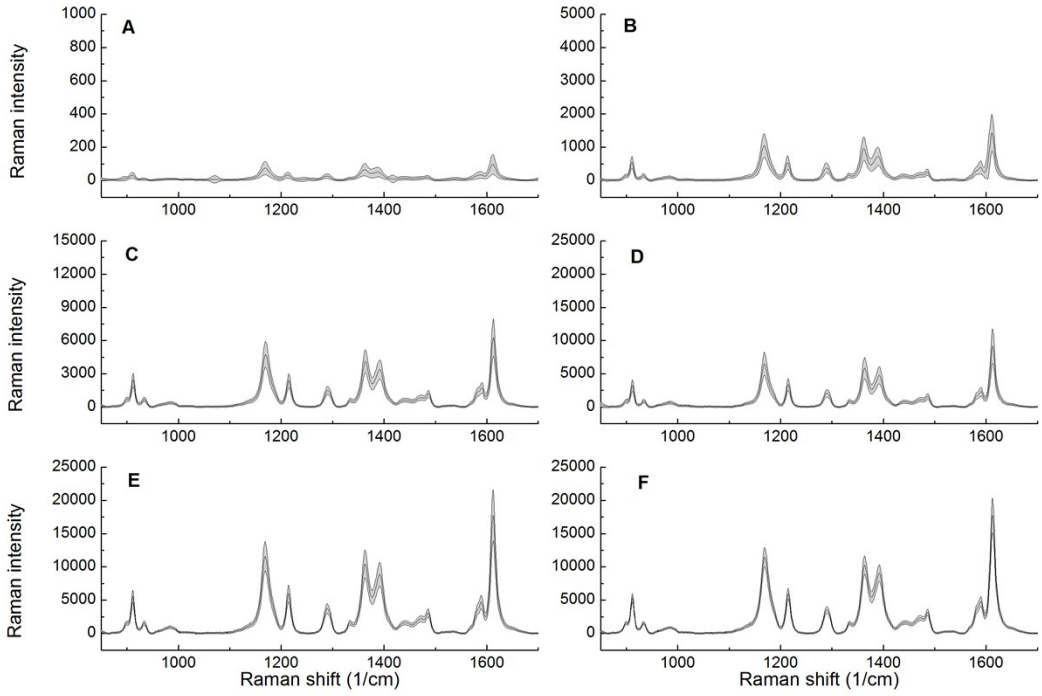

Fig. S5: SERS spectra of malachite green obtained at A) 100 nM; B) 500 nM; C) 1 µM; D) 2 µM; E) 10 µM; F) 100 µM

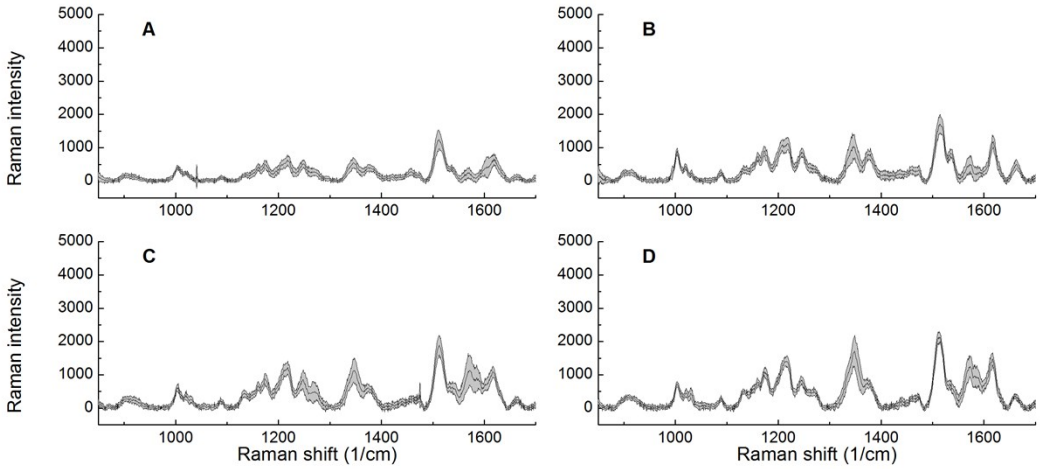

Fig. S6: : SERS spectra of apomorphine obtained at A) 1 µM; B) 10 µM; C) 100 µM; D) 1 mM

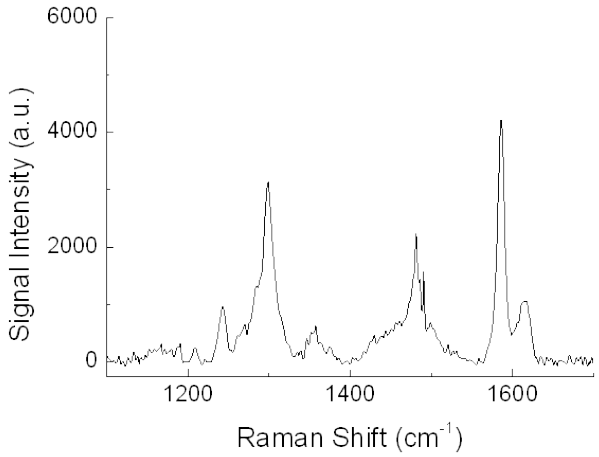

Fig. S8: Raman spectrum of solid apomorphine