

**Supplementary Material**

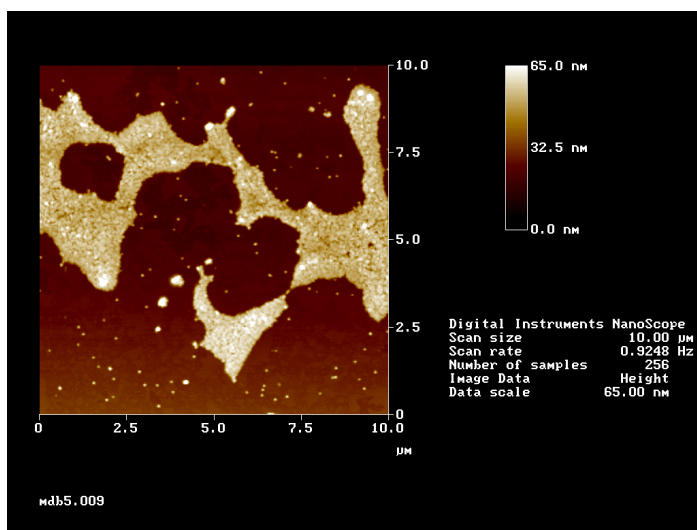
**Table S1.**

Raman Frequencies for CTAB –coated Au nanoparticles in the 400-1700 Region<sup>30</sup>

<b>CTAB</b>	<b>Assignment (ref. 30)</b>
<b>532vw</b>	CH <sub>3</sub> rock from N+(CH <sub>3</sub> ) <sub>3</sub> group
	CH <sub>2</sub> rock along the tail
<b>752wv</b>	C-Br stretching vibration
<b>765m</b>	
<b>877w</b>	CH <sub>3</sub> rock (terminal methyl) C-N <sup>+</sup> stretch
<b>999m</b>	C-C sym stretch + CH <sub>2</sub> wag
<b>1013s</b>	
<b>1040m</b>	C-C sym stretch + CH <sub>2</sub> wag
<b>1078w</b>	CH <sub>2</sub> twist
<b>1110vw8</b>	C-C asym stretch +CH <sub>2</sub> wag in <i>TGmT</i>
<b>1160s</b>	CH <sub>2</sub> rock
<b>1320s</b>	CH <sub>2</sub> wag
<b>1370vw</b>	C-CH <sub>3</sub> sym bending
<b>1476s</b>	N-CH <sub>3</sub> asym bending
<b>1537m</b>	CH <sub>2</sub> rock in tail and N+(CH <sub>3</sub> ) <sub>3</sub> group
<b>1600s</b>	
<b>2729w</b>	C-H asym stretch of -CH <sub>2</sub> -
<b>2847m</b>	C-H asym stretch of -CH <sub>2</sub> -
<b>2887s</b>	C-H sym stretch of -CH <sub>3</sub>
<b>3020m</b>	C-H sym stretch of N <sup>+</sup> (CH <sub>3</sub> ) <sub>3</sub>

Abbreviations: asym., asymmetric; b, broad; def., deformation; m, medium; vib., vibration; rock, rocking s, strong; stretch, stretching; sym., symmetric; twist, twisting; v, very; wag, wagging; w, weak.

**Figure S1:** AFM (tapping mode) of 50 nm CTAB decorated gold nanoparticles deposited on silicon wafer modified with 3-(mercaptopropyl) trimethoxysilane, i.e. where the chain length of the linker is too short to penetrate the CTAB bilayer



**Figure S2:** Amide I region for 10 μmol BPTI in phosphate buffer, pH 9.5, administered onto the nanoarray, spectra are normalized. \* shows contribution from the Raman spectrum of the array.

