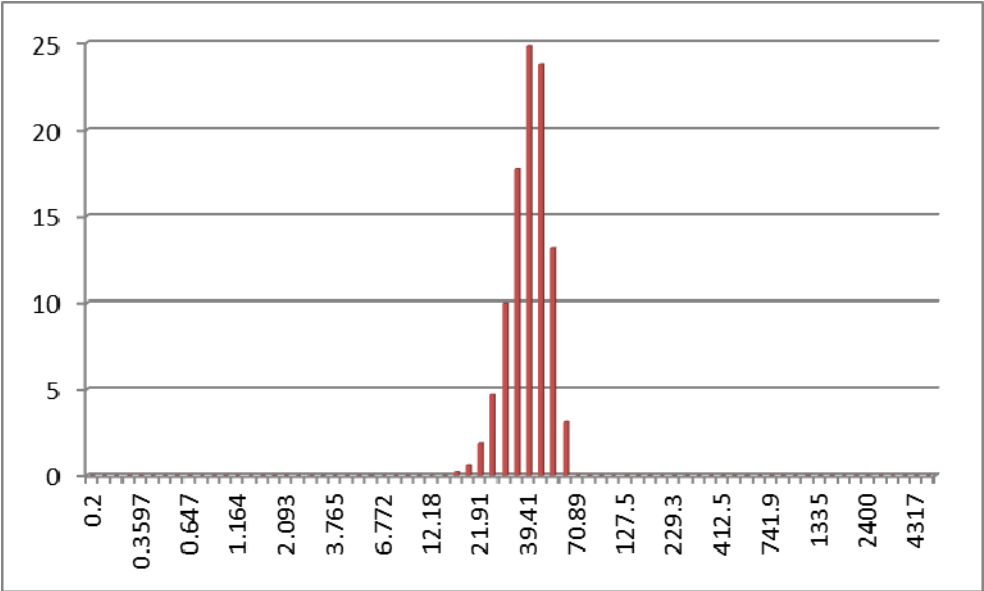
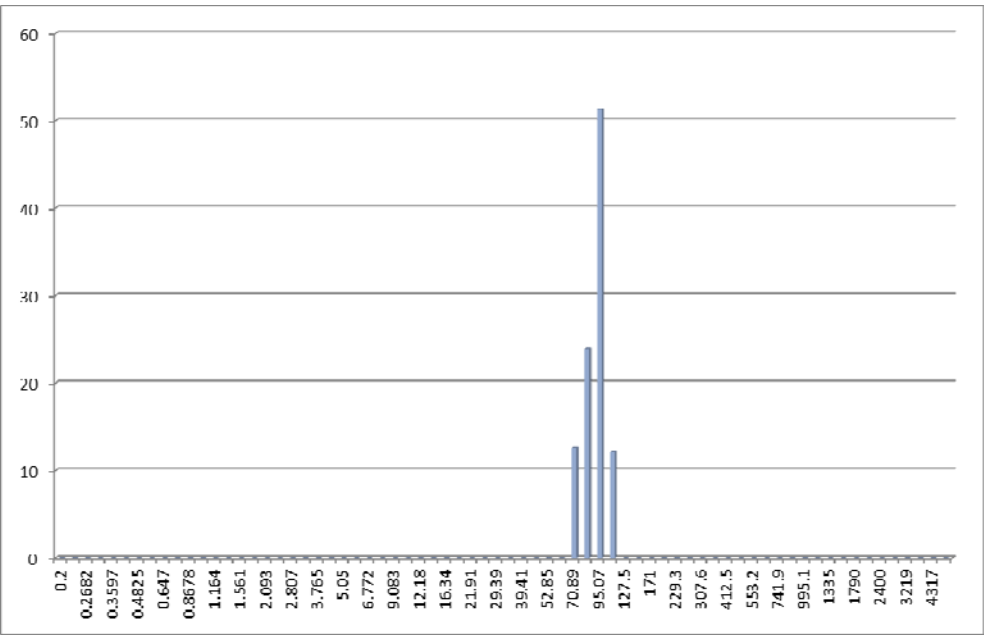


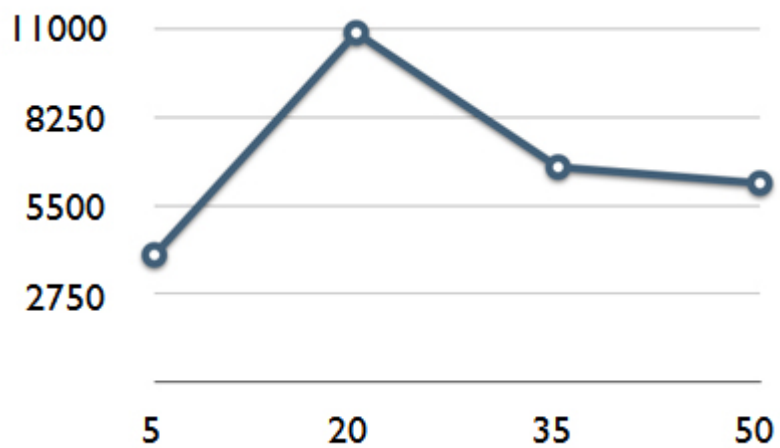


(a)

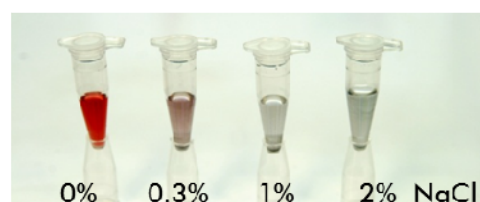


(b)

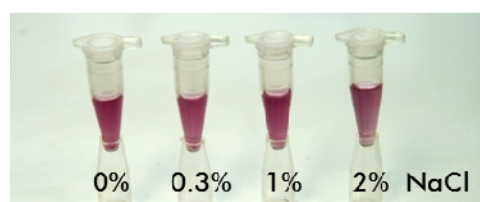
**Fig. S1 Dynamic light scattering (DLS) data for the size distributions of (a) gold nano particles (GNPs) and (b) dual modal nano probes (DMNPs).**



**Fig. S2 Variations of the fluorescence intensity of DMNPs along the silica shell thickness. The thickness of the silica shell was controlled by changing amounts of TEOS and ammonia to obtain maximum fluorescence intensity.**

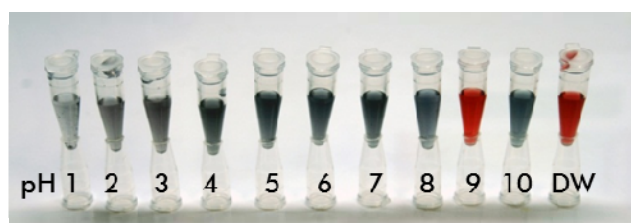


**Unencapsulated GNPs**

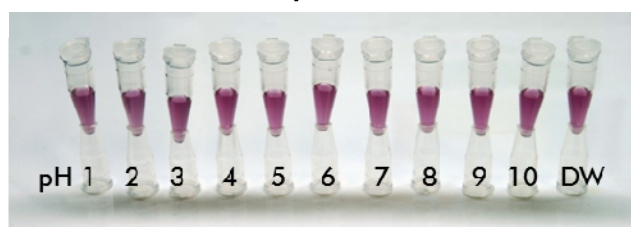


**Si-encapsulated DMNPs**

**(a)**



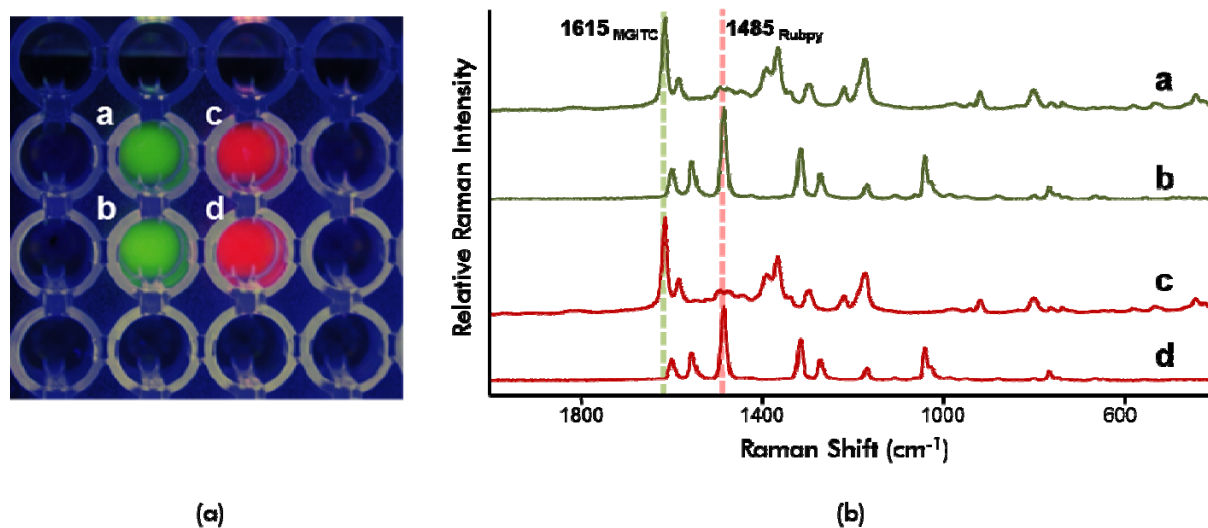
**Unencapsulated GNPs**



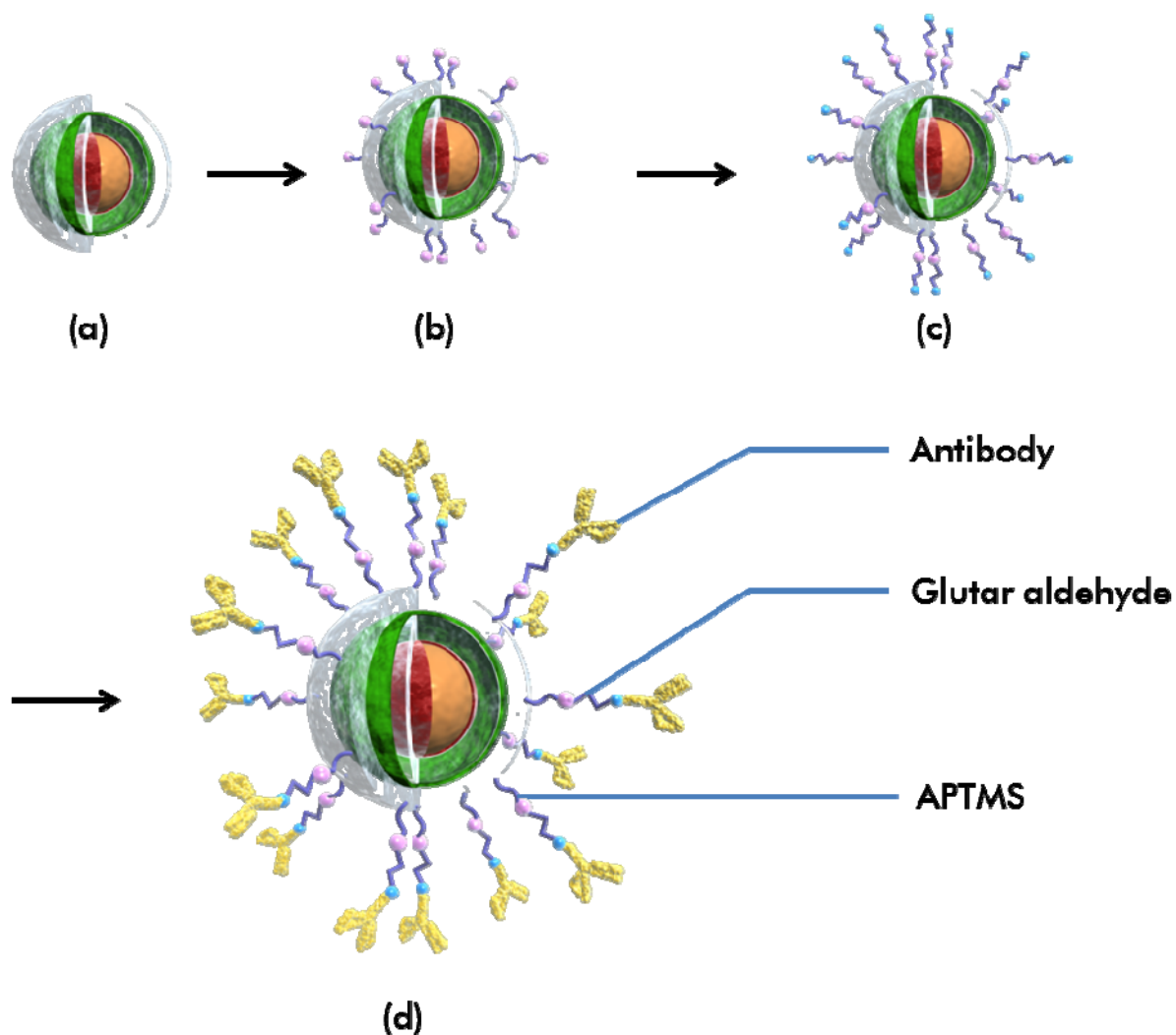
**Si-encapsulated DMNPs**

**(b)**

**Fig. S3 Comparison of physicochemical stability between unencapsulated GNPs and silica-encapsulated DMNPs. (a) salt concentrations; (b) pH.**



**Fig. S4** Fluorescence images and SERS spectra for four different Raman reporter/fluorescence dye DMNP sets. (a) MGITC/FITC; (b) Rubpy/FITC; (c) MGITC/RuITC; (d) Rubpy/RuITC. FITC, green; RuITC red. Unique and non-overlapping SERS signals for Rubpy at 1485  $\text{cm}^{-1}$  and MGITC at 1618  $\text{cm}^{-1}$ .



**Fig. S5 Sequential procedure for antibody conjugation to the DMNP surface. (a) DMNP; (b) amine-functionalized DMNP by APTMS; (c) glutaraldehyde linker-modified DMNP; (d) antibody-conjugated DMNP.**